1. Introduction

1.1 Background

1.1.1 This Environmental Statement (ES) has been prepared by Avison Young to accompany an application for full planning permission being submitted by the Applicant, Maritime View Ltd, to the Royal Borough of Greenwich (RBG) to redevelop a 1.24 hectare (ha) area of land at Enderby Place at Telcon Way, Greenwich, London, SE10 0TB (the 'Site').

1.1.2 The proposal (known as 'the Development') is for the comprehensive redevelopment of the Site for a residential-led, mixed-use development and construction of three new buildings:

- Telcon Tower, located towards the south-east of the Site, would extend up to ground plus 22 storeys in height (up to 82.795 metres AOD).
- Morden Tower, located towards the north-east of the Site, would extend up to ground plus 34 storeys in height (up to 119.995 metres AOD).
- River Tower, located towards the south-west of the Site, would extend up to ground plus 22 storeys in height (up to 82.795 metres AOD).

1.1.3 The Development would comprise:

- Up to 564 new homes (Use Class C3)
- Light industrial floorspace (Use Class E)(g)(iii)
- Community/café use (Use Class Sui Generis)
- Landscaping and play space.
- Accessible car parking and cycle parking.

1.2 Site Context

1.2.1 As shown in **Figure 1.1**, the Site is located on the western frontage of the Greenwich Peninsula and is 1.24 ha in size.

1.2.2 The Site is located in an area which is dominated by commercial and industrial uses to the north and north-east of the Site but becomes predominantly residential to the south and south-east.

1.2.3 The Site is broadly bound by:

- **To the north -** A site currently in use as open yard space and for storage use. This site has hybrid planning consent for a residential-led development (ref. 20/1730/O, hereafter referred to as 'Morden Wharf'). The section of the site along Telcon Way is bound by commercial properties to the north. The Blackwall Lane

interchange with the Blackwall Tunnel Southern Approach (A102) is located approximately 70m north of the Site boundary.

- **To the east -** Blackwall Lane (A2203) and residential dwellings.
- **To the south -** residential uses including Enderby Wharf and apartments south of Telcon Way. Further east along Telcon Way are commercial uses.
- **To the west -** the Thames Path and River Thames.

1.2.4 The Site envelopes the Grade II Listed Enderby House, as shown on **Figure 1.2**. No works are proposed within the eastern extent of the Site along Telcon Way.

Figure 1.1: The Site Location

Figure 1.2: The Site Boundary

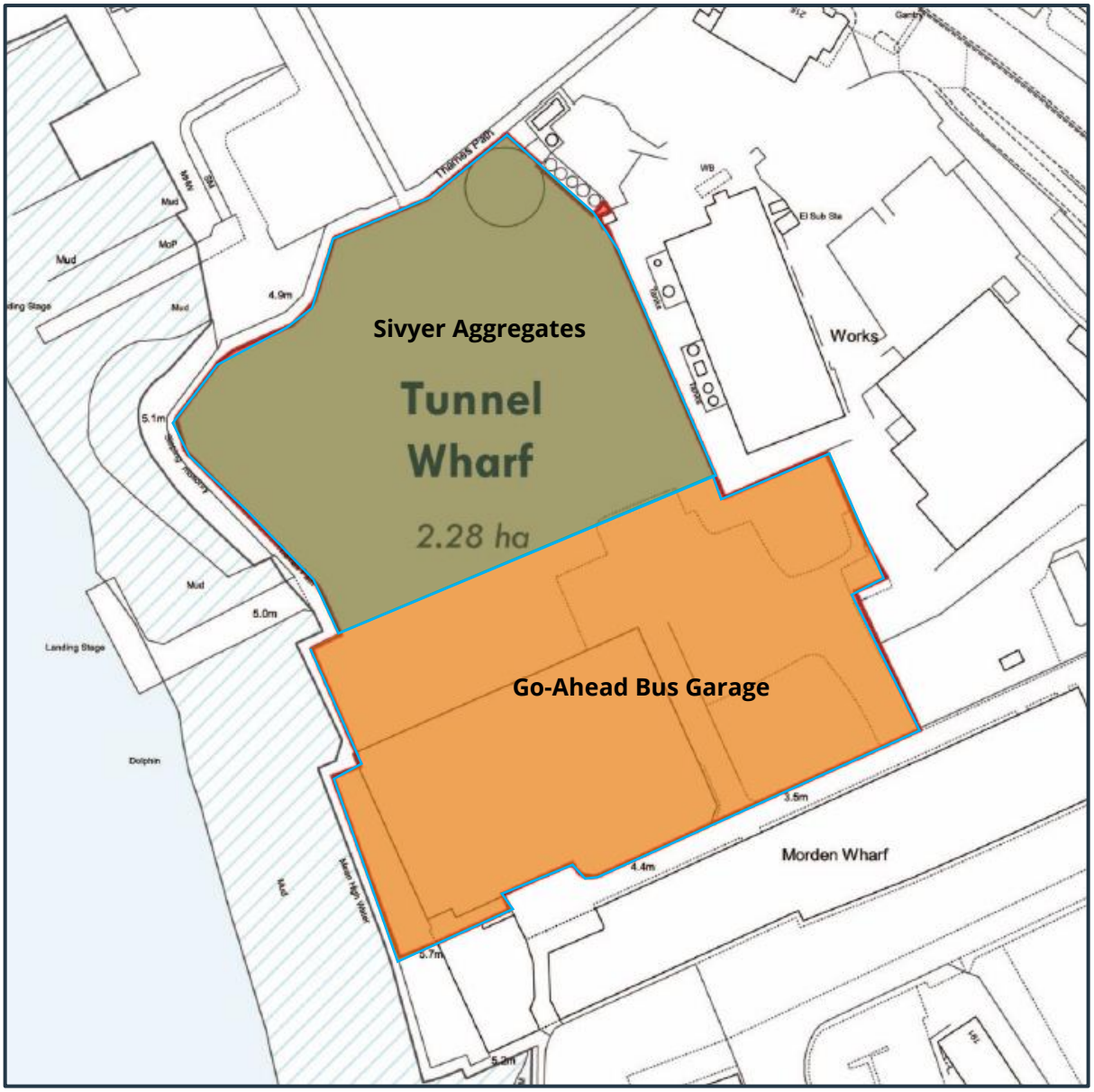
1.2.5 The Site currently comprises a partially excavated, vacant site, having also been previously used as a construction compound for the adjacent Enderby Wharf to the south. The ground excavation required for the basement areas was completed under an extant consent for the Site (ref: 15/0973/F). An area of spoil is present in the western

extent of the Site. The remainder of the Site comprises bare ground with some areas of hardstanding. The eastern extent of the Site encompassing Telcon Way, until it joins with Blackwall Lane, is dominated by concrete with sections of tarmacadam. Fencing encloses the main body of the Site on all sides, except for the northern boundary where there is a stone wall.

1.2.6 To the north of the Site, beyond the Morden Wharf site, is a safeguarded wharf ('Tunnel Wharf'). The full extent of Tunnel Wharf is shown on **Figure 1.3**. Tunnel Wharf is currently used for:

- Sivyer aggregates import and recycling facility (shown within the northern portion of the Site on **Figure 1.3**). This site subject to a full planning application for the reactivation of the wharf, primarily to provide two conveyor belts on the site's jetty to enable the ingress and egress of materials to the site without restriction to the river path (ref. 19/3298/F).
- Go Ahead London bus garage (shown within the southern portion of the Site on **Figure 1.3**). This site is subject to a full planning application to extend its current use as a bus garage until 2047 (ref. 23/1161/F).

Figure 1.3: Tunnel Wharf Boundary and Uses



1.2.7 Further detail on the Site and the surrounding area is provided in **ES Volume 1, Chapter 3: Existing Land Uses and Activities**.

1.3 Development Context

1.3.1 The adopted statutory Development Plan for the Site comprises the following:

- GLA London Plan (March 2021)
- RBG Local Plan: Core Strategy with Detailed Policies (July 2014) and Policies Map

1.3.2 The area in which the Site is located is therefore experiencing change, evident from the approved developments ('Cumulative Schemes') within the vicinity of the Site (refer to **ES Volume 1, Chapter 2: EIA Methodology**). Such Cumulative Schemes and the adopted planning policy provide the context for redevelopment and regeneration of

the area, including the Site. In particular, the Development offers a contribution towards to the housing need of RBG. A full description of the Development is provided in **ES Volume 1, Chapter 5: The Development**.

Legal Framework for the Environmental Statement

1.3.3 The need for Environmental Impact Assessment (EIA) is determined by the definitions and criteria provided in Schedule 1 or Schedule 2 and Schedule 3 of The Town and Country Planning (Environmental Impact Assessment) Regulations, 2017 (the 'EIA Regulations')[1] as amended[2]. Where development is of a description within Schedule 1 ('Schedule 1 development') EIA is mandatory. The Development does not meet the requirements of Schedule 1 and, therefore, EIA is not mandatory in this case.

1.3.4 Where development is of a description mentioned in column 1 of the table in Schedule 2 and meets or exceeds one or more of the criteria or thresholds set out in the corresponding Column 2 of the table, or any part of it is located in a sensitive area, it is 'Schedule 2 development'. EIA is required for Schedule 2 development if the development is likely to have significant effects on the environment by virtue of factors such as its nature, size of location, with reference to Schedule 3 'Selection Criteria for Screening Schedule 2 Development'.

1.3.5 The EIA Regulations also define a 'sensitive area'. The above-mentioned criteria and thresholds do not apply to development proposed within a 'sensitive area' and such development is automatically 'Schedule 2 development'. A 'sensitive area is defined as follows:

- Land notified under section 28(1) (Sites of Special Scientific Interest (SSSIs)) of the Wildlife and Countryside Act 1981[3].
- A National Park within the meaning of the National Parks and Access to the Countryside Act 1949[4].
- The Broads[5].
- A property appearing on the World Heritage List kept under article 11(2) of the 1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage[6].
- A Scheduled Monument (SM) within the meaning of the Ancient Monuments and Archaeological Areas Act 1979[7].

1 HMSO. The Town and Country Planning (Environmental Impact Assessment) Regulations. 2017 as amended.
2 HMSO. The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018.
3 Wildlife and Countryside Act. 1981.
4 National Parks and Access to the Countryside Act. 1949.
5 Norfolk and Suffolk Broads Act. 1988.
6 The Convention Concerning the Protection of the World Cultural and Natural Heritage. 1972.
7 Ancient Monuments and Archaeological Areas Act. 1979.

- An Area of Outstanding Natural Beauty (AONB) designated as such by an order made by Natural England under section 82(1) (areas of outstanding natural beauty) of the Countryside and Rights of Way Act 2000[8] as confirmed by the Secretary of State.
- A European site[9].

1.3.6 Whilst the Development does not sit wholly or in part in a sensitive area (and therefore does not constitute Schedule 2 development by virtue of its location in a sensitive area), it does meet criteria in column of Schedule 2 and so is Schedule 2 development. As such, the Development was considered against the criteria in Schedule 3, which provides guidance as to whether it is development that is likely to have significant environmental effects and therefore require an EIA. The criteria set out in Schedule 3 relate to:

- The characteristics of the development;
- The location of the development;
- The types and characteristics of the potential impact.

1.3.7 The Development is of a type described in Schedule 2, 10(b) of the EIA Regulations. That is:

"10. Infrastructure projects…(b) Urban development projects, including the construction of shopping centres and car parks, sports stadiums, leisure centres and multiplex cinemas…"

1.3.8 Furthermore, the Development meets the second of the three applicable thresholds for Schedule 2, 10(b) projects:

"…(i) The development includes more than 1 hectare of urban development which is not dwellinghouse development; or (ii) the development includes more than 150 dwellings; or (iii) the overall area of the development exceeds 5 hectares."

1.3.9 Therefore, the Development is Schedule 2 development, giving due regard to Schedule 3 of the EIA Regulations, and the Applicant recognises the potential for the Development to give rise to significant environmental effects. Accordingly, a formal EIA Screening Opinion (to determine the need (or otherwise) for EIA) was not requested from RBG. The scoping opinion of RBG was sought to determine which aspects of the environment identified in the EIA Regulations would be likely to be significantly affected by the Proposed Development and an EIA was undertaken in accordance with this scoping opinion to determine the likely significant environmental effects of the Development and the nature of any mitigation measures required to avoid, reduce, ameliorate and / or offset any significant adverse environmental effects.

[8] Countryside and Rights of Way Act. 2000. As amended by the Natural Environment and Rural Communities Act. 2006.
[9] A European Site refers to a site within the meaning of Regulation 8 of the Conservation of Habitats and Species Regulations 2010.

1.3.10 The scope of the EIA was formally agreed with RBG via a request for a formal EIA Scoping Opinion under Regulation 15 of the EIA Regulations. **ES Volume 1, Chapter 2: EIA Methodology** provides further detail regarding the scoping stage of this EIA.

1.3.11 In accordance with the EIA Regulations, this ES reports the findings of the EIA process. As such, the ES sets out:

- The likely significant environmental effects of the Development during the enabling, demolition and construction works (the 'Works').
- The likely significant environmental effects of the Development following completion of the Works and during the occupation and operation of the Development (the completed and operational Development).
- The likely significant cumulative effects of the Development.
- Mitigation measures required to avoid, reduce, ameliorate and / or offset any likely significant adverse environmental effects.
- The likely significant residual effects of the Development which would occur following implementation of the above mitigation measures.

1.4 Structure of the Environmental Statement

1.4.1 This ES comprises four Volumes:

- **ES Volume 1 - Main Text and Figures** (this document).
- **ES Volume 2 – Built Heritage, Townscape and Visual Impact Assessment.**
- **ES Volume 3 - Appendices.**
- **ES Volume 4 - Non-Technical Summary.**

Environmental Statement Volume 1 - Main Text and Figures

1.4.2 **ES Volume 1** (this document) comprises 14 Chapters, which are illustrated throughout by a series of figures.

1.4.3 The 14 Chapters comprise the key findings of the EIA process undertaken in respect of the Development and provide:

- A description of the methodology applied in the EIA (refer to **ES Volume 1, Chapter 2: EIA Methodology**).
- A description of the Site, its environmental context and sensitivity (refer to **ES Volume 1, Chapter 3: Existing Land Uses and Activities**).
- The main alternatives that were reasonably considered by the Applicant and a comparison of their environmental effects (refer to **ES Volume 1, Chapter 4: Alternatives and Design Evolution**).
- The nature and purpose of the Development (refer to **ES Volume 1, Chapter 5: The Development**).

- The enabling, demolition and construction processes and timetable (refer to **ES Volume 1, Chapter 6: The Works**).

1.4.4 **ES Volume 1, Chapters 7** to **14**, present the findings of the EIA for the following environmental topics:

- Daylight, Sunlight and Overshadowing (refer to **ES Volume 1, Chapter 7: Daylight, Sunlight, Overshadowing**).
- Wind microclimate (refer to **ES Volume 1, Chapter 8: Wind Microclimate**).
- Traffic and Transport (refer to **ES Volume 1, Chapter 9: Transport and Access**).
- Air Quality (refer to **ES Volume 1, Chapter 10: Air Quality**).
- Noise and Vibration (refer to **ES Volume 1, Chapter 11: Noise and Vibration**).
- Socio-economics (refer to **ES Volume 1, Chapter 12: Socio-economics**).
- Flood Risk (refer to **ES Volume 1, Chapter 13: Flood Risk and Drainage)**.
- Effect interactions (refer to **ES Volume 1, Chapter 14: Effect Interactions**).

1.4.5 Generally speaking, within each of the topic assessments in **Volume 1, Chapters 7 to 13** the following information is provided:

- An introduction.
- A methodology of assessment.
- A description of the relevant baseline conditions.
- An assessment of the likely environmental effects of the Development and their significance, taking into account embedded and tertiary mitigation.
- A description of additional mitigation measures and an assessment of the likely residual environmental effects of the Development and their significance.
- An assessment of the likely residual cumulative effects of the Development together with other Cumulative Schemes (refer to **ES Volume 1, Chapter 2: EIA Methodology** for the full list of cumulative schemes).
- Conclusion, summarising the findings of the assessment.

1.4.6 **ES Volume 1, Chapter 2: EIA Methodology** defines the specific scope of assessment for **ES Volume 1, Chapters 7 to 13**.

Environmental Statement Volume 2 – Heritage, Townscape and Visual Impact Assessment

1.4.7 **ES Volume 2** presents the key findings of the townscape, heritage and visual impact assessment, including a series of Accurate Visual Representations (AVRs) of the Development. **ES Volume 2** presents:

- An introduction.
- A methodology of assessment.
- A description of the relevant baseline conditions.
- A description of the visual characteristics of the Development and Embedded Mitigation.
- An assessment of the likely environmental effects of the Development and their significance.
- A description of additional mitigation measures and an assessment of the likely residual environmental effects of the Development and their significance.
- An assessment of the likely residual cumulative effects of the Development together with other Cumulative Schemes (refer to **ES Volume 1, Chapter 2: EIA Methodology**).

Environmental Statement Volume 3 - Appendices

1.4.8 **ES Volume 3** comprises the detailed supporting data, information and the full text of all relevant technical assessments undertaken as part of the EIA process.

Environmental Statement Volume 4 - Non-Technical Summary

1.4.9 The EIA Regulations requires the submission of a summary of the ES in 'non-technical language'. As such, **ES Volume 4** provides a concise summary of the ES without excessive technical detail or scientific language so as to be readily and quickly understood by non-technical experts and members of the public who may not be familiar with EIA. The Non-Technical Summary (NTS) is produced as a separate document to facilitate wider public distribution. The NTS provides a description of the Development and existing environment, the main alternatives considered, the methodologies used to assess effects, the potential environmental effects and any identified mitigation measures and the resultant likely significant effects of the Development.

1.5 Project Team and Competency

1.5.1 Regulation 18(5) of the EIA Regulations states:

"In order to ensure the completeness and quality of the ES: (a) the developer must ensure that the ES is prepared by competent experts; and (b) the ES must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts."

1.5.2 The EIA was co-ordinated by Avison Young in conjunction with a team of specialist consultants. Avison Young is registered in the UK by the Institute of Environmental Management and Assessment (IEMA) as a participant in their EIA Quality Mark Scheme. The Scheme recognises that Avison Young produces ES's in accordance with current best practice standards and contribute to improved practice in the industry. The Applicant's EIA Team and relevant credentials are set out within **Table 1.1**.

Table 1.1: The Applicant's EIA Team

Name and Professional Title	Organisation	Project Role	Statement of Relevant Experience
Patrick Duffy	Avison Young.	EIA Project Director	30 years' experience managing, co-ordinating and directing EIAs, and preparing ESs for a range of major urban regeneration and extension and rural developments.
Tom Kane	Avison Young.	EIA Project Assistant	2 years' experience assisting with the co-ordination of ESs for urban-regeneration, residential-led and mixed-use projects.
Neil Cawood	CPMC	Daylight, Sunlight and Overshadowing Lead	Over 14 years' experience in providing expert advice on Daylight and Sunlight matters for developments within the United Kingdom.
Robin Stanfield	Architectural Aerodynamics Limited (ArcAero)	Wind Microclimate Lead	15 years' experience delivering wind microclimate studies including EIA
Damian Tungatt	Markides Associates	Traffic and Transport Lead	Over 20 years' experience in development transport planning for both the public and private sector at all scales, including major urban schemes and urban extensions.
Sarah Chapman	Markides Associates	Traffic and Transport Consultant	Over 7 years' experience with transport planning, nationwide in the UK, with extensive experience in London for mixed use development.
Bridget Grant	Markides Associates	Traffic and Transport Consultant	Over 7 years' experience in development travel planning throughout the UK and Ireland for a range of land uses, with extensive experience in the preparation of traffic and transport EIAs
Nick Hawkins	Hawkins Environmental	Noise and Vibration & Air Quality Lead	20 years' experience conducting and managing noise, air quality, daylight, odour and vibrations assessments for planning applications and Environmental Impact Assessments.
Will Totty	Hawkins Environmental	Air Quality Consultant	6 years' experience conducting air quality assessments for residential and mixed used schemes.
Mathew Vaughan	Hawkins Environmental	Noise and Vibration Consultant	2 years' experience conducting noise and vibration assessments for residential and mixed used schemes.
Zoe Crampton	Ekosgen	Socio-economics Lead	19 years' experience leading on socio-economic and health chapters for residential, commercial and mixed-use schemes.

Name and Professional Title	Organisation	Project Role	Statement of Relevant Experience
Mark Bullen	MAB Consulting	Flood Risk Lead	Over 23 years' experience preparing Flood Risk Assessments and Drainage Strategies for commercial, residential and mixed use developments

1.6 Environmental Statement Availability and Comments

1.6.1 Following the submission of the full planning application, there is an opportunity for any interested parties to comment on the proposals.

1.6.2 The ES is available for viewing by the public on the RBG website at:

https://planning.royalgreenwich.gov.uk/online-applications/

1.6.3 The ES is also available for viewing by the public during normal office hours at the following address:

Planning Department
Royal Borough of Greenwich
The Woolwich Centre
35 Wellington Street
London
SE18 6HQ

1.6.4 Additional electronic copies of the ES can be purchased on request from Avison Young at a cost of £50 per CD. Contact details for Avison Young are as follows:

Avison Young
65 Gresham Street
London
EC2V 7NQ
Tel: 020 7911 2424

1.6.5 Comments on the planning application and ES may be made online via RBG's planning applications website as noted above or should be addressed to the Planning Officer, Tim Edwards, at the following email address: planningapps@royalgreenwich.gov.uk

2. EIA Methodology

2.1 Introduction

2.1.1 This Chapter sets out the methodology applied in undertaking the Environmental Impact Assessment (EIA), details the process of identifying the environmental issues to be addressed in the EIA, and the methods used to identify likely environmental effects and their significance.

2.1.2 Details pertaining to the assessment methodologies and significance criteria relating to each environmental topic considered in the Environmental Statement (ES) can be found by reference to **ES Volume 1**, **Chapters 7 to 13** and **ES Volume 2**.

2.2 General Approach

2.2.1 This ES was prepared to comply with the EIA Regulations[1] and reference was also made to currently available good practice guidance in EIA including:

- Impact Assessment Guidelines and ES Review Criteria from the Institute of Environmental Management and Assessment (IEMA)[2].
- Environmental Impact Assessment: A Guide to Good Practice and Procedures. A Consultation Paper[3].
- IEMA Guidance 'Shaping Quality Development'[4].
- IEMA Guidance 'Delivering Quality Development'[5].
- Topic specific guidance referred to in **ES Volume 1**, **Chapters 7 to 13** and **ES Volume 2** where appropriate.

2.2.2 The assessment of likely significant environmental effects was based on current knowledge of the Site and its surrounding environment. The assessments addressed both the likely beneficial and adverse effects of the Development during the Site preparation, demolition and construction works required to facilitate the Development (the 'Works') and of the Development once completed and operational.

2.2.3 In line with legislative requirements, direct, indirect, cumulative, short-, medium-, long-term, permanent, temporary, beneficial and adverse effects are addressed where applicable.

2.2.4 As part of the iterative EIA and design process, the design of the Development has evolved to take account of various environmental constraints and opportunities. In this respect, environmental desktop reviews, interim

1 The Town and Country Planning (Environmental Impact Assessment) Regulations. 2017 as amended.
2 Institute of Environmental Management (IEMA). Guidelines for Environmental Impact Assessment. 2004.
3 Department for Local Communities and Local Government. Environmental Impact Assessment: A guide to good practice and procedures. A Consultation Paper. June 2006.
4 IEMA. Environmental Impact Assessment Guide to Shaping Quality Development. 2015.
5 IEMA. Environmental Impact Assessment Guide to Delivering Quality Development. July 2016.

assessments of the emerging Development and relevant knowledge gained from environmental baseline surveys all worked to influence the evolution of the Development (refer to **ES Volume 1, Chapter 4: Alternatives and Design Evolution**). Consequently, a number of potentially significant adverse environmental effects were 'designed out' or reduced in severity as part of the overall EIA and design process. Similarly, where feasible, potentially significant beneficial environmental effects were encouraged. In undertaking the assessment of likely significant environmental effects, such design measures (commonly referred to as 'Primary Mitigation') were considered as inherent components of the Development (refer to **ES Volume 1, Chapter 5: The Development**).

2.2.5 Similarly, and in accordance with the Institute of Environmental Management and Assessment (IEMA) best practice guidance[6], when identifying likely significant environmental effects, any methods of environmental management or protection that *"…will be required regardless of any EIA assessment, as is imposed, for example, as a result of legislative requirements and / or standard sectorial practices…"* (commonly known as 'Tertiary Mitigation') were reasonably assumed to be implemented. Examples include (not exhaustive):

- Implementation of a Construction Environmental Management Plan (CEMP).
- Considerate Contractor practices.
- Remediation of contaminated land, appropriate to the end-use of the land.

2.2.6 Following the assessment of the Development's likely significant environmental effects (inherently accounting for Primary and Tertiary Mitigation), any remaining likely significant adverse effects were identified. Furthermore, additional methods to prevent, reduce, ameliorate and / or offset any remaining significant adverse environmental effects were formulated (commonly referred to as 'Secondary Mitigation'). Such additional mitigation and any monitoring requirements necessary to ensure the efficacy of the mitigation measures are set out in **ES Volume 1, Chapters 7 to 13** and **ES Volume 2**.

2.2.7 Following the identification of 'additional' Secondary Mitigation, the remaining likely significant residual effects of the Development were identified. The 'additional' Secondary Mitigation was reasonably assumed to be implemented.

[6] IEMA. Environmental Impact Assessment Guide to Shaping Quality Development. 2015.

2.3 Scoping the EIA

2.3.1 'Scoping' is a voluntary, albeit helpful, component of the EIA process. It involves focussing the EIA (and hence the resultant ES) on the significant environmental effects that are likely to arise as a result of the development, as opposed to every single environmental effect that 'might' result from the development. This focussed and proportionate approach to EIA is encouraged within the online Planning Practice Guidance (PPG)[7] which states:

"Whilst every ES should provide a full factual description of the development, the emphasis should be on the 'main' or 'significant, environmental effects to which a development is likely to give rise. The ES should be proportionate and not be any longer than is necessary to assess properly those effects. Where, for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered."

2.3.2 The EIA Regulations provide an opportunity for applicants for development proposals to ask the relevant Local Planning Authority (LPA) to state in writing the information that ought to be provided in an ES. The result is a 'Scoping Opinion'. The Applicant recognised the value of seeking a Scoping Opinion from RBG and so commissioned Quod to undertake an EIA Scoping Study in 2020. The 'EIA Scoping Report' was submitted to RBG on October 7th 2020, and provided RBG and the statutory consultees the opportunity to comments on the methodology proposed to be used for the EIA and the scope and content of the ES. A copy of the EIA Scoping Report is provided is **ES Volume 3, Appendix 2.1**.

2.3.3 To form their Scoping Opinion, RBG consulted with a number of statutory consultees in accordance with the 2017 EIA Regulations in order to give consultees the opportunity to comment on the methodology proposed to be used for the EIA and the scope and content of the ES. RBG then commissioned RPS to undertake a review of the EIA Scoping Report and consultee comments received. This review was provided in a report dated November 25th 2020 (the 'EIA Scoping Review') (**ES Volume 3, Appendix 2.2**). Based on the EIA Scoping Review, RBG issued their formal EIA Scoping Opinion on 17th December 2020 (**ES Volume 3, Appendix 2.3**).

2.3.4 The EIA Scoping Opinion broadly agreed that the following should be 'scoped-in' to the ES:

- Daylight, Sunlight and Overshadowing (effects associated with the completed and operational Development).
- Wind Microclimate (effects associated with the completed and operational Development).
- Built Heritage, Townscape and Visual (effects associated with the completed and operational Development).

[7] https://www.gov.uk/guidance/environmental-impact-assessment#Preparing-an-Environmental-Statement1.

2.3.5 Marine Ecology should only be scoped into the ES if the Thames Clipper Jetty is proposed as part of the proposals. The Thames Clipper Jetty is not proposed as part of the Development and has therefore an assessment of effects on Marine Ecology has been scoped-out of the ES.

2.3.6 The EIA Scoping Opinion requested the Applicant to include the following items in addition to that proposed within the EIA Scoping Report:

Daylight, Sunlight and Overshadowing

2.3.7 The assessment should include an assessment of the potential impacts on future residents and open spaces within the proposed Morden Wharf scheme (ref. 20/1730/O) immediately to the north of the Site.

Wind Microclimate

2.3.8 The assessment should include a fourth configuration within the wind tunnel that includes any mitigation features (e.g. screens and landscaping) which are proposed. Any mitigation deemed necessary should be appropriately tested to ensure its effectiveness and therefore the safety and suitability of the site for its proposed uses.

Traffic and Transport

2.3.9 It was agreed that traffic and transport impacts from the Development alone could be scoped out of the ES, however cumulative traffic and transport impacts (including impacts on the local road network and public transport network) should be scoped into the ES.

Air Quality

2.3.10 It was agreed that air quality effects associated with the Works could be scoped-out of the ES, however specific air quality impacts associated with the completed and operational Development should be scoped into the ES. These are as follows.

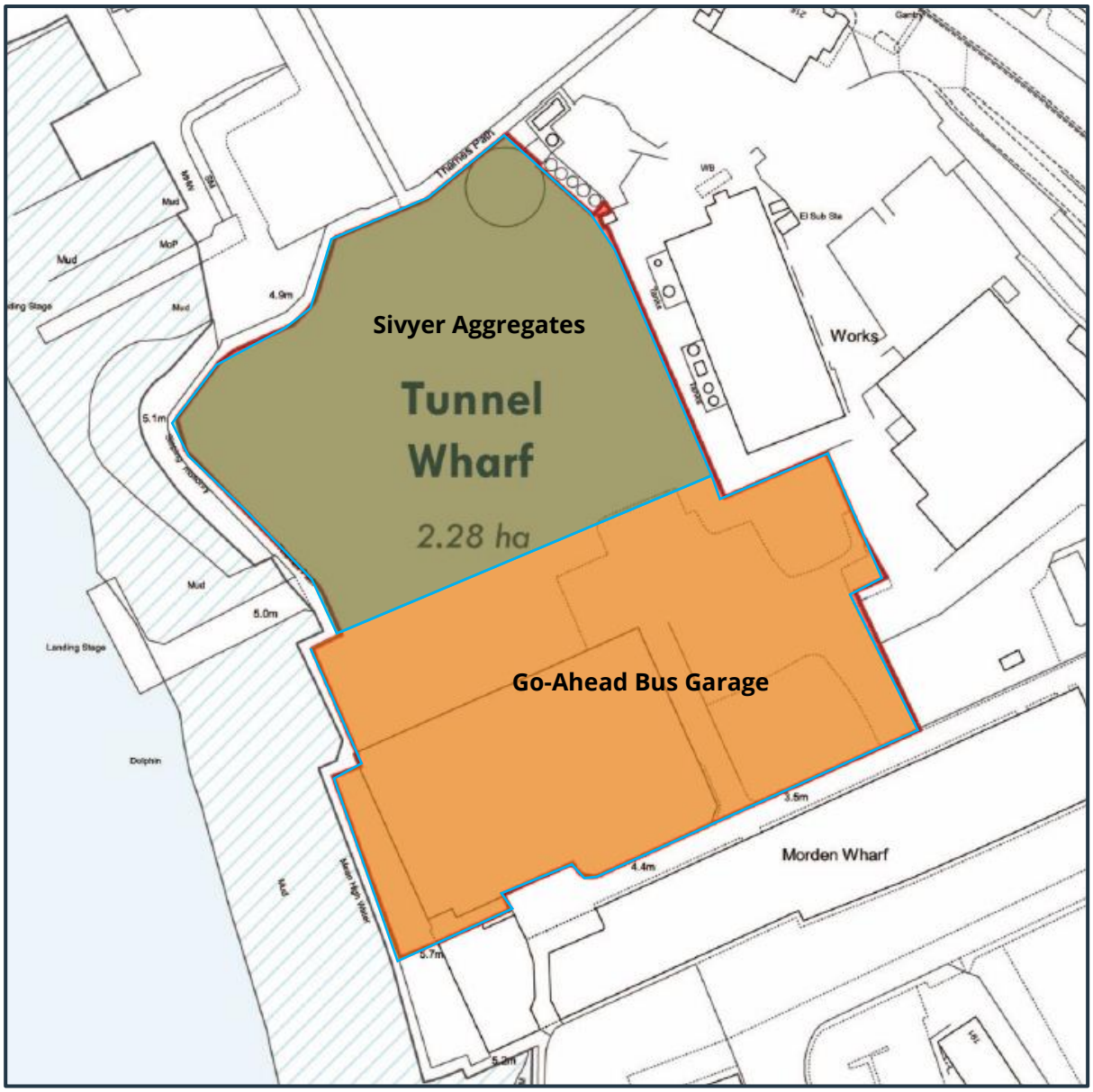
2.3.11 Tunnel Wharf, located to the north of the Site, should be assessed for its impacts on future residents of the Development (i.e. a site suitability assessment) to confirm that the future occupation of the Development would not materially affect the operation of Tunnel Wharf activities and that future residents would not be affected by Tunnel Wharf operations. Whilst this would typically sit outside of an ES, to be in accordance with the EIA Scoping Opinion this has been included. Given the uncertainty surrounding the Tunnel Wharf site, the Applicant was advised to consider various scenarios:

- Site Suitability Scenario 1: Tunnel Wharf continues to operate for storage/distribution;
- Site Suitability Scenario 2: Tunnel Wharf is reactivated for waterborne cargo handling in accordance with planning application ref. 19/3298/F;
- Site Suitability Scenario 3: Tunnel Wharf is developed for residential in accordance with planning ref. 20/1730/O.

2.3.12 To clarify Site Suitability Scenario 3 above, since the EIA Scoping Opinion was issued in November 2020, the extent of Tunnel Wharf has been amended as per **ES Volume 3, Appendix 2.4**. The amended extent of Tunnel Wharf is

shown in **Figure 2.1** below. The Morden Wharf site is no longer included within the Tunnel Wharf boundary as of March 2021.

Figure 2.1: Tunnel Wharf Boundary and Uses



2.3.13 In order to ensure that a worst-case assessment of air quality effects from activities within Tunnel Wharf on future residents of the Development has been undertaken, the following assumptions were made in Site Suitability Scenario 1 and Site Suitability Scenario 2:

- The Go Ahead London bus garage (located within the southern portion of Tunnel Wharf as shown in **Figure 2.1)** continues to operate as its current use and in accordance with planning ref. 23/1161/F.
- Morden Wharf (ref. 20/1730/O) has not been modelled within the Site Suitability Scenario 1 and 2. This prevents intervening buildings reducing dust and particulate matter reaching the future residents of the Development from Tunnel Wharf activities.

2.3.14 If required, a qualitative approach to Site Suitability Scenario 3 would be undertaken based on the findings of Site Suitability Scenario 1 and Site Suitability Scenario 2.

2.3.15 An assessment of operational air quality should be scoped into the ES, even if this section of the ES is relatively brief.

2.3.16 An assessment of traffic emissions associated with the completed and operational Development should be scoped into the ES.

Noise and Vibration

2.3.17 An assessment of noise and vibration effects associated with the Works should be scoped into the ES.

2.3.18 It was agreed that noise and vibration effects associated with the completed and operational Development could be scoped out of the ES, however, the impacts of Tunnel Wharf on internal and external ambient noise levels (i.e. a site suitability assessment) should be scoped into the ES. The same assumptions detailed in paragraph 2.3.13 and 2.3.14 above are applied to Site Suitability Scenario 1 and 2 within **ES Volume 1, Chapter 11: Noise and Vibration**.

Socio-economics

2.3.19 Likely adverse socio-economics effects should be scoped into the ES, notably the increased demand on social and community infrastructure in the local area, including schools.

Flood Risk

2.3.20 Flood risk should be scoped into the ES if further work to flood defences are required. As new flood defences are proposed to the east side of the existing riverside foot and cycle paths as part of the Development, flood risk has been scoped into the ES.

Built Heritage, Townscape and Visual

2.3.21 Effects associated with the Works should be scoped into the ES.

2.3.22 **Table 2.1** below summarises the scope of the ES, accounting for both the EIA Scoping Report and EIA Scoping Opinion.

Table 2.1: Summary of ES Scope

Technical Topic	The Works	Completed and Operational Development	Cumulative Effects
Daylight, Sunlight and Overshadowing	x	✓	✓
Wind Microclimate	x	✓	✓
Traffic and Transport	x	x	✓
Air Quality	x	✓	✓
Noise and Vibration	✓	✓	✓
Socio-economics	x	✓	✓
Flood Risk	x	✓	✓
Built Heritage, Townscape and Visual	✓	✓	✓

2.3.23 Through the EIA Scoping process it was identified that the Development would have the potential to give rise to a number of significant environmental effects that would, therefore, warrant assessments as part of the EIA process. These were categorised within the key environmental topics listed below:

- Daylight, Sunlight and Overshadowing (refer to **ES Volume 1, Chapter 7**).
- Wind Microclimate (refer to **ES Volume 1, Chapter 8**).
- Traffic and Transport (refer to **ES Volume 1, Chapter 9**).
- Air Quality (refer to **ES Volume 1, Chapter 10**).
- Noise and Vibration (refer to **ES Volume 1, Chapter 11**).
- Socioeconomics (refer to **ES Volume 1, Chapter 12**).
- Flood Risk (refer to **ES Volume 1, Chapter 13**).
- Built Heritage, Townscape and Visual (refer to **ES Volume 2).**

2.3.24 The scoping process also identified that the Development would be unlikely to result in significant environmental effects relating to other environmental topics. This being the case, such environmental topics did not require assessment as part of the full EIA process. Further information regarding insignificant effects scoped out of the ES

can be found by reference to **ES Volume 3, Appendix 2.1, Appendix 2.2 and Appendix 2.3**. This is not to say that the assessment work has not been undertaken for the purposes of supporting the planning (not EIA) submission.

2.4 Consultation

2.4.1 Consultation was carried out throughout the EIA process. The following statutory and non-statutory organisations were consulted either directly by the Applicant's EIA Team or through RBG as part of its own consultations:

- RBG Planning and Environmental Health Departments.
- The London Borough of Tower Hamlets (LBTH) – for the purposes of agreeing the viewpoints to be assessed within the Isle of Dogs.
- Greater London Authority (GLA).
- Transport for London (TfL).
- Thames Water.
- The Greater London Archaeological Advisory Service (GLAAS).
- Historic England.
- The Environment Agency.
- Local residents.

2.4.2 All relevant comments from the consultees relating to the EIA are addressed in **ES Volume 1**, **Chapters 7 to 13** and **ES Volume 2**.

2.5 Nature of the Planning Application and EIA Compliance

2.5.1 As noted in **ES Volume 1, Chapter 1: Introduction**, the Development is subject to a full planning application. Where an EIA is required, the description of the Development within the ES must be sufficient to enable the requirements of the EIA Regulations to be fulfilled, and in particular, to enable the likely significant environmental effects of the Development to be identified.

2.5.2 The Development is defined by the quantum of the Development and the schedule of accommodation, together with the massing, layout, landscaping, articulation and architectural details shown in the full planning application drawings submitted for approval. The schedule of accommodation, the full planning application drawings, together with the detailed description of the Development and its implementation are presented in **ES Volume 1, Chapter 5: The Development** and **ES Volume 1, Chapter 6: The Works**, respectively. The information contained therein was used for the purposes of undertaking the EIA and the preparation of this ES (**ES Volumes 1** to **4**).

2.6 Means of Assessment

2.6.1 The content and extent of the ES is based on the following:

- Review of the current situation through existing information, data and reports.
- Desk-top studies.
- Site surveys.
- Consideration of planning policies (national, regional and local), where relevant.
- Identification of likely environmental effects and an evaluation of their likely duration, magnitude, spatial extent and significance.
- Consideration of potential sensitive receptors.
- Professional judgement and expert opinion.
- Use of technical guidance and best practice.
- Specific consultations with appropriate statutory and non-statutory consultees.

2.7 Evaluation of Significance

2.7.1 As previously noted, the EIA process as underpinned by the EIA Regulations aims to provide the determining authority with sufficient information regarding the *"…likely significant environmental effects…"* of a development to enable it to lawfully determine the planning application.

2.7.2 Likely environmental effects reported in this ES (**ES Volumes 1** to **4**) were predicted with reference to definitive standards and legislation, where available. Where it was not possible to precisely quantify effects, a qualitative assessment has been undertaken, based on available knowledge and professional judgement. Where uncertainty exists, this has been set out within **ES Volume 1, Chapters 7 to 13 and ES Volume 2.**

2.7.3 The significance of predicted likely environmental effects was determined by reference to assessment criteria for each environmental topic considered and these are set out in **ES Volume 1**, **Chapters 7 to 13** and **ES Volume 2**. These criteria apply a common EIA approach of classifying effects (either beneficial or adverse) according to whether they are of minor significance, moderate significance, major significance or insignificant.

2.7.4 Specific criteria for each environmental topic scoped into this ES (**ES Volume 1**, **Chapters 7 to 13** and **ES Volume 2**) were developed, giving due regard to some or all of the following:

- Extent, magnitude and reversibility of the effect.
- Duration of the effect (whether short-, medium- or long-term).
- Nature of the effect (whether direct or indirect, reversible or irreversible).

- Likelihood for the effect to occur.
- Whether the effect occurs in isolation, is cumulative or interactive.
- Performance against environmental quality standards or other relevant pollution control thresholds.
- Sensitivity of the receptor.
- Compatibility with environmental and planning policies, where applicable.

2.7.5 In order to provide a consistent approach to expressing the outcomes of the assessments undertaken as part of the full EIA process the following terminology has been used throughout the ES. Effects have been expressed as either:

- **Adverse:** Detrimental or negative effects to an environmental resource or receptor;
- **Beneficial:** Advantageous or positive effect to an environmental resource or receptor.

2.7.6 The Built Heritage, Townscape and Visual Assessment (BHTVIA) uses a further term, Neutral, whereby for neutral effects the quality of the environment is preserved or sustained or there is a balance of adverse and beneficial effects. A neutral effect is one where, regardless of the scale of the effect, the nature of the change has no qualitative effect on the receiving environment. This could mean, for example, that there is a change to the character or composition of the view, but that the quality of the visual experience is neither better nor worse than the existing condition or that there is a balance of adverse and beneficial effects. This equates to the heritage significance or appreciation of heritage significance of a heritage asset being 'sustained' in the National Planning Policy Framework (NPPF)[8] terms.

2.7.7 Although there is no recognised definition of what constitutes a 'significant' effect, it is good practice to identify the subjective degree of significance. In this ES (**ES Volumes 1** to **4**), where adverse, beneficial or neutral effects are identified 'significance' was assessed as follows:

- **Insignificant:** No significant effect (either adverse or beneficial) to an environmental resource or receptor.
- **Minor significance:** Slight, very short or highly localised effects which, on balance, would also be considered insignificant.
- **Moderate significance:** Noticeable effect (by extent, duration or magnitude) which may be considered significant**.**
- **Major significance:** Considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

[8] HMSO. National Planning Policy Framework. 2021.

2.7.8 **ES Volume 1**, **Chapters 7 to 13** and **ES Volume 2** provides specific significance criteria and, where possible, such significance criteria was based upon quantitative, quantitative and accepted criteria, together with the use of value judgements and expert interpretations.

2.7.9 For the purposes of the assessment reported in **ES Volume 2**, **'short-'** / **'medium-term'** effects were considered to be those associated with the Works, and **'long-term'** effects were those associated with the completed, occupied and operational Development. **'Local'** effects were those affecting the Site and neighbouring receptors, whilst effects upon receptors within the wider RBG administrative boundary were considered to be at a **'District'** level. Effects upon Greater London were considered to be at a **'Regional'** level while effects upon different parts of the country, or England as a whole, were considered to be **'National'**. Finally, effects across national boundaries were considered at an **'International / global'** level.

2.8 Cumulative Effects

2.8.1 In line with the EIA Regulations, an ES must provide a description of the likely significant effects of a development on the environment resulting from:

"…The culmination of effects with other existing and / or approved projects…"

2.8.2 Given that existing development is considered in the environmental baseline conditions relevant to the Site and the Development and an assessment of likely significant environmental effects of the Development are judged against the relevant environmental baseline conditions, the potential for cumulative effects focuses predominantly on *"…approved projects…"*.

2.8.3 'Approved Projects' (hereafter referred to as 'Cumulative Schemes') are defined as those with:

- A resolution to grant planning permission.
- A valid planning permission and yet to start on-site.
- A valid planning permission and under construction.

2.8.4 However, where relevant, projects which are currently unapproved but are under consideration were included within the cumulative assessment where there is a high degree of certainty of the project coming forward, or the project is of a scale or in proximity of the Site where discounting it could lead to likely significant cumulative effects being unaccounted for.

2.8.5 Seven Cumulative Schemes were identified in the EIA Scoping Report. A further seven were identified within the EIA Scoping Review and EIA Scoping Opinion. Given the time-lapse between the writing of the EIA Scoping Report and EIA Scoping Opinion and now (approximately 3 years), further discussions were held with RBG to agree which Cumulative Schemes could be removed due to their recent completion (and therefore being inherently included within the existing baseline) and which new Cumulative Schemes should be included. This correspondence with RBG is provided at **ES Volume 3, Appendix 2.5.** Please note that since the agreement of the Cumulative Schemes in **ES Volume 3, Appendix 2.5**, it has been noted that Alcatel, Telegraph House (ref. 18/2356/NM) is now complete

and operational so has also been omitted from the Cumulative Schemes to be assessed as it is now accounted for in the baseline scenario.

2.8.6 It should also be noted that additional Cumulative Schemes are located beyond a 1km radius of the Site and would be visible in some of the longer distance agreed viewpoints, for example LVMF 5A.1 from Greenwich Park. Additional Cumulative Schemes for inclusion within these views have been identified based on a search of the RBG and London Borough of Tower Hamlets (LBTH) planning portals[9][10].

2.8.7 In the cumulative assessment narrative, Cumulative Schemes are named and their interaction with the Development described where relevant to the assessment.

2.8.8 The Cumulative Schemes are presented in **Table 2.2**, which should be read in conjunction with **Figure 2.2.**

[9] https://planning.royalgreenwich.gov.uk/online-applications/
[10] https://development.towerhamlets.gov.uk/online-applications/

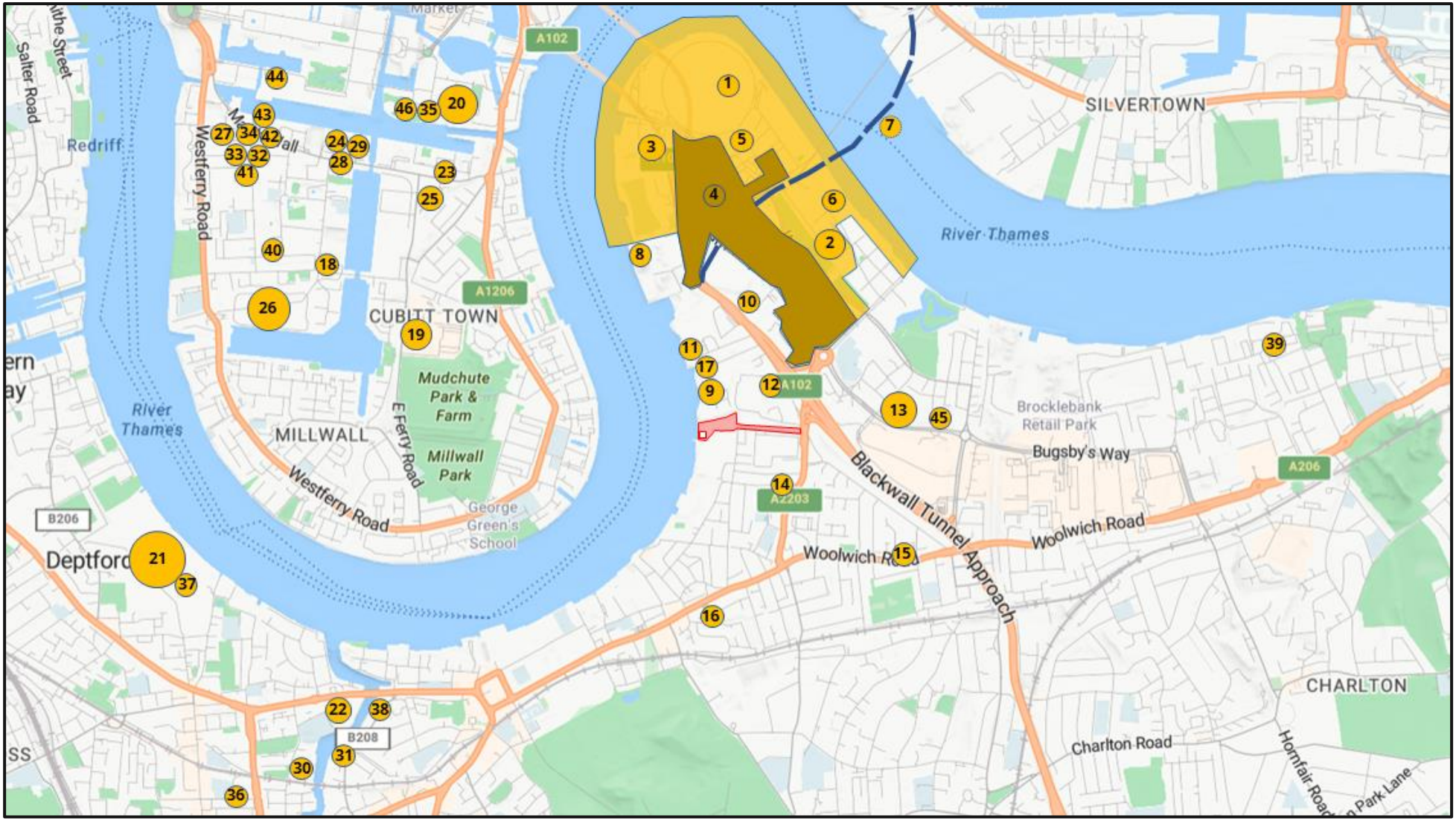
Table 2.2: Cumulative Schemes

Ref. (Figure 2.2)	Scheme	Planning Reference	Status
1	Greenwich Peninsula Masterplan 2015 Meridian Quays and Lower Riverside neighbourhoods.	15/0716/O As amended: 20/2000/NM	Approved December 2015 Approved September 2022
2	Greenwich Peninsula Plot 19.05	21/2077/R (reserved matters) Related to 15/0716/O	Approved September 2022
3	Greenwich Peninsula Plots 1.02 and 1.03	23/0418/R (reserved matters) Related to 15/0716/O	Validated April 2023
4	Greenwich Peninsula Masterplan 2019 (Hybrid application - detailed elements relate to Plots 18.02 and 18.03 currently being built out)	19/2733/O	Approved September 2022
5	Greenwich Peninsula Plot N0201	23/2150/F	Validated June 2023
6	Greenwich Peninsula Plot M0121	23/1565/F	Validated June 2023
7	Silvertown Tunnel (DCO)	N/A	
8	Victoria Deep Water Terminal	17/1142/F As amended:18/2729/MA	Approved June 2017
9	Morden Wharf	20/1730/O	Approved June 2022
10	1 Boord St	19/0939/F	Approved January 2021
11	Temporary bus garage – Go-ahead London, Northern Warehouse	23/1161/F	Validated April 2023
12	Unit 2 & 7 Peterboat Close	22/1026/F	Approved December 2022
13	GMV – Phases 9 and 10 (Plots 401-405)	19/4075/R	Approved November 2021
14	87 Blackwall Lane	19/0512/F	Approved December 2019
15	141-143 Woolwich Road	21/3944/F	Approved February 2023
16	Former Sam Manners House	20/1815/F	Approved April 2021
17	Land North of Northern Warehouse, Morden Wharf, Morden Wharf Road, London, SE10 0NU	19/3298/F	Validated November 2019
18	Glengall Quay – Pepper Street	PA/16/03518	Approved December 2018

Ref. (Figure 2.2)	Scheme	Planning Reference	Status
19	Crossharbour District Centre (Asda)	PA/19/02534	Approved September 2021
20	Wood Wharf – Parent Consent	PA/13/02966/P0	Outline permission approved December 2014
21	Convoys Wharf – Parent Consent	DC/13/83358	Approved March 2014
22	Thanet Wharf (Creekside Village East)	DC/18/108548	Approved November 2020
23	One Thames Quay	PA/21/00900	Approved June 2023
24	Mill Harbour	PA/20/01969	Approved October 2021
25	Skylines Village	PA/17/01597/A1	Approved March 2021
26	Westferry Printworks	PA/22/02317	EIA Scoping Opinion issued December 2022
27	Cuba Street	PA/20/02128/A1	Approved December 2022
28	South Quay Plaza Phase 4	PA/15/03073/B1	Approved March 2017
29	South Quay Plaza Phases 1-3	PA/14/00944 Amended by: PA/21/02721	Approved March 2015 Validated December 2021
30	Sun Wharf	DC/20/118229	Approved August 2023
31	Saxon Wharf	18/1594/F	Approved October 2020
32	54 Marsh Wall	PA/16/01637/A1	Approved January 2020
33	Aspen Consort Place	PA/15/02671	Approved March 2017
34	56-58 Marsh Wall	PA/22/00591/A1	Approved July 2023
35	Wood Wharf - RM03 - E1/E2/E3/E4 - 10 George Street + 40 Charter Street	Reserved matters PA/21/01440/NC Related to: PA/13/02966	Approved January 2022 Approved December 2014
36	Frankham Walk (Tidemill Primary School)	DC/16/095039	Approved July 2018
37	Convoys Wharf	DC/18/107698	Approved August 2021
38	Ravensbourne Wharf	23/1414/F	Validated May 2023

Ref. (Figure 2.2)	Scheme	Planning Reference	Status
39	Charlton Riverside - Hyde - Herringham Quarter	19/3456/F	Approved December 2022
40	111-113 Mellish Street	PA/19/01299/A1	Approved September 2019
41	The Bellamy	PA/21/02776/A1	Validated December 2021
42	Ensign House	PA/21/00952/A1	Validated May 2021
43	Quay House	PA/20/02649	Approved August 2021
44	HQW1 - Heron Quays West	PA/16/02956	Approved June 2017
45	Millennium Village (Parcel 4 and 5 (Plot 401 – 405 and 501-503))	12/0022/O	Approved March 2012
46	225 Marsh Wall	PA/16/02808/A1	Approved October 2018

Figure 2.2: Cumulative Schemes



2.8.9 The assessment of all cumulative effects reasonably assumes that all mitigation relevant to the Development and Cumulative Schemes (Primary, Secondary and Tertiary) would be implemented. Relevant mitigation was identified through a review of planning application documents. For this reason, only the likely residual cumulative effects and their significance are identified. Such effects are considered for the Works and for the completed and operational Development as appropriate.

2.8.10 The extent to which likely significant cumulative effects can be quantified and / or qualified is dependent upon the information available for each of the Cumulative Schemes. However, where possible, the determination of likely significant cumulative effects was informed by professional and expert judgement, calculations and / or detailed, scientific modelling with the significance of the likely cumulative effect(s) being defined as previously noted.

2.9 Structure of ES Volume 1, Chapters 7 to 13 and ES Volume 2

2.9.1 Each key environmental topic considered within the full EIA process is assigned either a separate technical Chapter in **ES Volume 1** (**Chapters 7 to 13**), or is presented in **ES Volume 2, Built Heritage, Townscape and Visual Impact Assessment**. Appendix B of the EIA Scoping Report sets out the proposed structure of each technical Chapter. Whilst the terminology below differs to that presented in the EIA Scoping Report, the same methodological process is followed within the assessments.

2.9.2 Within each of these Chapters the assessment is structured as set out below. ES Volume 2 is broadly structured as below with the addition of a section entitled 'Visual Characteristics of the Development and Embedded Mitigation' after Relevant Baseline Conditions.

Introduction

2.9.3 The introduction provides a brief summary of what is considered in the assessment and states the assessment's author.

Assessment Methodology and Significance Criteria

2.9.4 The methods used in undertaking the technical study are outlined in this section with reference to published legislation, standards, guidelines and best practice. The significance criteria used in the assessment are also explained and defined as well as any assumptions made for the assessment or limitations to the assessment methodology.

Relevant Baseline Conditions

2.9.5 In order to assess the likely significant environmental effects of the Development, it is necessary to determine the environmental conditions that exist at and around the Site. These are known as the baseline conditions and are typically used to provide a datum against which environmental change attributable to the Development is measured or judged so that the likely effect of the Development and their significance can be established.

2.9.6 It should be noted that the EIA Regulations require the ES to include a description of the future baseline; the baseline conditions without implementation of the Development as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of available environmental information and scientific knowledge. Future baseline conditions are considered within **Chapter 4: Alternatives and Design Evolution** and **Chapters 7 to 13**. Where relevant, certain Cumulative Schemes have been considered as part of a future baseline scenario, where necessary, in order to assess the impacts of the Development on new receptors. For example, Morden Wharf (ref. 20/1730/O) has been considered as part of a future baseline in **Chapter 7: Daylight, Sunlight and Overshadowing** in order to assess the potential impacts of the Development on future residents of Morden Wharf.

Likely Effects of the Development and their Significance

2.9.7 This section identifies the likely significant effects resulting from the Development (as defined in **ES Volume 1, Chapter 5: The Development**) and considers effects during the Works, and the completed and operational Development as necessary. As previously noted, all likely effects reasonably assume the implementation of Primary Mitigation and Tertiary Mitigation and reflect the Development for which detailed planning approval is sought.

Additional Mitigation / Enhancement and Likely Residual Effects of the Development and their Significance

2.9.8 Should the assessment of likely effects (accounting for Primary and Tertiary Mitigation) give rise to significant adverse environmental effects, this section sets out any additional mitigation (Secondary Mitigation) required to prevent, reduce, ameliorate and / or offset such significant adverse environmental effects, together with any monitoring requirements necessary to ensure the efficacy of the mitigation measures. Similarly, should there be an opportunity to further enhance any likely beneficial effects (accounting for Primary and Tertiary Mitigation), these are also set out.

2.9.9 This section also identifies the likely residual effects for the Development, assuming implementation of the proposed 'additional' (Secondary) Mitigation Measures and / or enhancements and includes an assessment of the significance of those residual effects in accordance with the relevant significance criteria.

Likely Residual Cumulative Effects and their Significance

2.9.10 The likely residual effects of the Development with other Cumulative Schemes are identified, together with their significance, using the approach outlined above.

Conclusions

2.9.11 A summary of the key findings of the assessment are provided at the end of the ES Volume.

2.10 Assumptions and Limitations

2.10.1 The principal assumptions and limitations associated with undertaking the EIA for the Development are set out as follows:

- Information received from third parties is accurate, complete and up to date.
- The assessment of the Works is based on the assumed enabling works, demolition and construction programme and methodologies as provided by the Applicant (refer to **ES Volume 1, Chapter 6: The Works**).
- The design, construction and operation of the Development would satisfy environmental standards consistent with contemporary legislation, practice and knowledge as a minimum, but would also strive to achieve best practice at the time of the Works, where reasonable.

2.10.2 Assumptions relevant to specific technical assessments are described in **ES Volume 1, Chapters 7 to 13** and **ES Volume 2**.

3. Existing Land Uses and Activities

3.1 Introduction

3.1.1 This Chapter presents a summary of the predominant existing land uses and activities currently occurring on, and around, the Site. This Chapter also describes the key environmental characteristics of the Site and its adjacent areas, thereby identifying potentially sensitive receptors which may be affected by the Development.

3.1.2 A full description of the baseline conditions relevant to each environmental topic considered within the Environmental Impact Assessment (EIA) is provided within each technical Chapter of this Environmental Statement (ES) (**ES Volume 1, Chapters 7 to 13**) and **ES Volume 2**.

3.2 Location and Setting

3.2.1 As described in **ES Volume 1, Chapter 1: Introduction**, the Site is located on the western frontage of the Greenwich Peninsula, within the administrative boundary of the Royal Borough of Greenwich (RBG). The extent of the Site is illustrated in **Figure 1.2** and is broadly bound by:

- **To the north** - The Morden Wharf site, which is currently in use as open yard space and for storage use. The section of the site along Telcon Way is bound by commercial properties to the north. The Blackwall Lane interchange with the Blackwall Tunnel Southern Approach (A102) is located approximately 70m north of the Site boundary.
- **To the east** - Blackwall Lane (A2203) and residential dwellings.
- **To the south** - residential uses including Enderby Wharf and apartments south of Telcon Way. Further east along Telcon Way are commercial uses.
- **To the west** - the Thames Path and River Thames.

3.3 Topography

3.3.1 The low point of the Site is located on the eastern corner at circa 1.64m AOD, whilst the high point of the Site is located in the south-west corner circa 5.90m AOD. The main body of the site generally falls from west to east to Telecon Way.

3.4 Predominant Land Uses and Activities

Within the Site

3.4.1 The 1.24 ha Site currently comprises a partially excavated, vacant site, having also been previously used as a construction compound for the adjacent Enderby Wharf to the south. An area of spoil is present in the western

extent of the Site. The remainder of the Site comprises bare ground with some areas of hardstanding. The eastern extent of the Site encompassing Telcon Way, until it joins with Blackwall Lane, is dominated by concrete with sections of tarmacadam. Fencing encloses the Site on all sides, except for the northern boundary where there is a stone wall.

3.4.2 Vehicular and pedestrian access to the Site is gained from Telcon Way at the Site's eastern boundary. Telcon Way connects with Blackwall Lane (A2203) which links to a four-arm roundabout approximately 280m north-east of the Site boundary. This roundabout provides access to the wider Greenwich Peninsula area and the Blackwall Tunnel Southern Approach (A102) southbound and connections to the wider strategic road network to the south.

3.4.3 Blackwall Lane (A2203) also connects to Tunnel Avenue, which provides access to the Blackwall Tunnel Southern Approach (A102) northbound and north London via the Blackwall Tunnel. The closest bus stops to the Site are situated along Blackwall Lane (A2203), approximately a 5-minute walk from the central area of the Site, and provide regular services between Russell Square, North Greenwich and Bexleyheath. North Greenwich London Underground Station and Westcombe Park Railway Station are situated 1km north and southeast of the Site boundary, respectively. Overall, the Site has a Public Transport Accessibility Level (PTAL) rating of 1b / 2, defined as a location with poor accessibility to public transport.

3.4.4 An aerial view of the Site with an indicative Site boundary is shown on **Figure 3.1**.

Figure 3.1: Aerial View of the Site

Surrounding the Site

3.4.5 Beyond the Morden Wharf site is (Tunnel Wharf) which is currently used for:

- Sivyer aggregates import and recycling facility (shown within the northern portion of the Site on Figure 1.3). This site subject to a full planning application for the reactivation of the wharf, primarily to provide two conveyor belts on the site's jetty to enable the ingress and egress of materials to the site without restriction to the river path (ref. 19/3298/F).
- Go Ahead London bus garage (shown within the southern portion of the Site on Figure 1.3). This site is subject to a full planning application to extend its current use as a bus garage until 2047 (ref. 23/1161/F).

3.4.6 As noted in **ES Volume 1, Chapter 2: EIA Methodology** the Tunnel Wharf site no longer includes the Morden Wharf site.

3.4.7 Beyond these Sites to the north are primarily industrial and commercial uses. Car parking associated with the O2 is located 550m north-east, beyond which are the mixed uses which serve the O2 complex. The O2 itself is located 1.10 km north of the Site.

3.4.8 To the east of the Site is Blackwall Lane (A2203) and residential properties along Tunnel Avenue. Blackwall Tunnel (A102) is slightly further to the east, beyond which is Millennium Leisure Park, a mixed-use shopping centre, located 400m east of the Site.

3.4.9 To the south of the Site are residential apartments located at Enderby Wharf. Beyond this, additional residential uses (apartment blocks) extend for 500m from the Site. Low-rise terraced housing is located beyond this, up to 1km from the Site until Greenwich Park.

3.4.10 To the immediate west of the Site is the Thames Path, beyond which is the River Thames. The Isle of Dogs, located within the London Borough of Tower Hamlets, is across the River Thames, 400m from the Site.

3.4.11 Residential properties and blocks located in close proximity are to the south. These are:

- Fiador Apartments.
- Ossel Court.
- Trefoil House.
- Morse Lodge.
- Gooch House.

3.4.12 Transport infrastructure adjacent to the Site comprises Blackwall Lane (A2203) which connects to Tunnel Avenue, providing access to the Blackwall Tunnel Southern Approach (A102) northbound and north London via the Blackwall Tunnel.

3.4.13 The closest bus stops to the Site are situated along Blackwall Lane (A2203), approximately a 5-minute walk from the central area of the Site, and provide regular services between Russell Square, North Greenwich and Bexleyheath. North Greenwich London Underground Station and Westcombe Park Railway Station are situated 1km north and south-east of the Site, respectively. Overall, the Site has a Public Transport Accessibility Level (PTAL) rating of 1b / 2, defined as a location with poor accessibility to public transport.

3.4.14 Education facilities surrounding the Site include:

- The Alphabet House Nursery located immediately south of the Site.
- Kido International Nursery & Preschool Greenwich located 210m south of the Site.
- Christ Church C of E Primary School, located 350m south-east of the Site.
- Robert Owen Nursery School and Children's Centre located 400m south-east of the Site.
- More2Riverside Nursery located 400m south of the Site.

3.5 Key Environmental Characteristics

3.5.1 Details regarding the key environmental characteristics of the Site and its surrounds are provided in **ES Volume 1, Chapters 7** to **13, ES Volume 2** and **ES Volume 3**. However, a summary of key characteristics is set out below.

3.5.2 There are no statutorily designated sites for nature conservation on or within the vicinity of the Site. There are two national statutory designated sites within 2km of the Site boundary, the closest of which is the Mudchute Park Farm Local Nature Reserve (LNR) which is 760m west of the Site boundary. There are seven non-statutory designated sites identified within 1km of the Site boundary, the closest is the River Thames and Tidal Tributaries Site of Nature Conservation Importance (SNCI) which borders the western Site boundary. The Site lies within an Impact Risk Zone (IRZ) associated with Oxleas Woodland SSSI which is located 4.8km south-west of the Site boundary.

3.5.3 The Site is not located within or in proximity to a Conservation Area and there are no listed or (non-statutory) locally listed buildings on-site. The closest Conservation Area, East Greenwich Conservation Area, is located approximately 490m south of the Site boundary. The closest listed building is the Grade II listed Enderby House which lies outside the Site boundary at its south-west corner but is encompassed on all sides by the Site. The Grade II listed Rothbury Hall is situated 170m south of the Site boundary.

3.5.4 There are no WHS, Scheduled Monuments, Registered Parks and Gardens or Registered Battlefields within the Site or within 500m of the Site boundary. The Maritime Greenwich WHS is located approximately 650m to the south-west of the Site boundary.

3.5.5 The EA Flood Zone Maps indicate that the Site lies within Flood Zone 3 of the indicative River Thames floodplain. The Site is therefore classified as being at a high probability of tidal flooding (1 in 200 or greater annual probability). Although the Site is located within Flood Zone 3, the Site is protected from tidal flooding, assuming normal

operation of the River Thames flood defences. However, a residual risk of tidal flooding to the Site could exist should the defences be breached (i.e. should the existing flood defences physically fail or be overtopped).

3.5.6 The majority of the Site is subject to a very low risk of flooding from surface water, although localised areas of land within the eastern area of the Site are subject to low risk of flooding from surface water. The Site is not subject to a risk of flooding from reservoirs. The Site does not contain any surface waterbodies.

3.5.7 The entirety of the RBG administrative area is designated as an Air Quality Management Area (AQMA) for exceedances in the 24-hour mean concentration of particulate matter (PM_{10}) and annual mean concentration of nitrogen dioxide (NO_2). The Site therefore lies entirely within the Greenwich AQMA.

4. Alternatives and Design Evolution

4.1 Introduction

4.1.1 Schedule 4, Paragraph 3 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017[1] (the 'EIA Regulations'), states an Environmental Statement (ES) is required to include an outline of the evolution of a Site in the absence of the Development *"…as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.*"

4.1.2 Schedule 4, Paragraph 2 of the EIA Regulations also requires an ES to include:

"A description of the reasonable alternatives…studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."

4.1.3 As identified above, the EIA Regulations do not require the identification of all possible alternatives, only those reasonable alternatives that were studied by the Applicant. In addition, the EIA Regulations require the ES to set out the main reasons for selecting the chosen option and also to include a comparison of the chosen option against the reasonable alternative scenarios. This has been interpreted to mean that justification should be provided that the Development is appropriate and acceptable in comparison to other potential design iterations and that an appropriate balance between environmental effects and commercial / economic implications was reached.

4.1.4 Accordingly, this Chapter focusses on the following:

- The 'Do Nothing' / No Development scenario.
- Alternative sites.
- Alternative approaches to Design.

4.2 The 'Do-Nothing / No Development' Alternative

4.2.1 This scenario covers the consequences of no development taking place on the Site and *"…an outline of the likely evolution thereof* [of the Site] *without implementation of the development as far as natural changes from the baseline scenario can be assessed…"* Although not strictly a 'reasonable alternative' considered by the Applicant, the EIA Regulations state that the ES must set this information out.

4.2.2 Details regarding the existing baseline conditions of the Site and its surrounds for all environmental topics scoped into this ES (**ES Volumes 1 to 4)**, are provided within **ES Volume 1, Chapters 3, 7 to 13** and **ES Volume 2.**

[1] The Town and Country Planning (Environmental Impact Assessment) Regulations. 2017.

4.2.3 Should the Development not be implemented, it would be expected that the existing Site would remain in its current cleared, inactive use for the foreseeable future. As such, a review was undertaken of the environmental topic areas scoped into this ES, to determine the implications in terms of evolution of the environmental baseline conditions if the Development were not to come forward.

Evolution of Baseline Conditions

Daylight, Sunlight and Overshadowing

4.2.4 A daylight, sunlight and overshadowing assessment of the Development, including the identification of existing daylight, sunlight and overshadowing conditions is provided in **ES Volume 1, Chapter 7: Daylight, Sunlight and Overshadowing.**

4.2.5 In the 'Do-Nothing' scenario, the existing Site would remain with no significant built form and massing present. As there would be no development coming forward in this scenario on the Site, there would be no impacts or changes to the daylight, sunlight and overshadowing on the surrounding area. Current conditions would remain; the existing Site does not cause significant daylight and sunlight impacts to surrounding sensitive receptors including residential receptors and amenity spaces.

4.2.6 However, the construction of the Morden Wharf scheme (ref. 20/1730/O) immediately to the north would influence light levels within the Site.

Wind Microclimate

4.2.7 As there would be no development coming forward in this scenario, there would be no impacts or changes to the wind microclimate the Site. In the 'Do-Nothing' scenario, the wind microclimate conditions across the majority of the Site and surrounding area would remain as current (Configuration 1) in **ES Volume 1, Chapter 8: Wind Microclimate**.

4.2.8 However, the construction of the Morden Wharf scheme (ref. 20/1730/O) immediately to the north would affect wind microclimate conditions within the Site.

Traffic and Transport

4.2.9 In the 'Do-Nothing' scenario, the Site would remain in its current state. As detailed in **ES Volume 1, Chapter 9: Traffic and Transport**, traffic flows in the area would increase over time without the Development. There are no forecast changes to Maze Hill or Westcombe Park, or North Greenwich Stations within the immediate future.

4.2.10 Buses are likely to be subject to change on the Greenwich peninsula, with re-routeing, new services, and amendments to service frequencies as the result of the completion of the Silvertown Tunnel in 2025. The Site will also be served by a diverted service with a minimum frequency of 2 per hour or more likely 4 per hour, improving the PTAL of the Site.

4.2.11 It is expected that in future the Thames Path north of the Site will be opened up, widened and improved; however, the timescales for this are unknown. Some changes to pedestrian access will occur as a result of the completion of the Silvertown Tunnel works; however, these are expected to be improvements compared to the existing, enabling upgrade to pedestrian crossings and signals where existing facilities are aged. Cycle provision is also expected to be improved and created where currently there are none existing. The extent of this revision, however, is not fully known at the time of writing.

Air Quality

4.2.12 In the 'Do-Nothing' scenario, the Site would remain in its current state. However, air quality is generally expected to improve with time, particularly through the introduction of more stringent vehicle emissions standards. Air quality conditions at the Site would therefore be expected to improve and this is reflected in **ES Volume 1, Chapter 10: Air Quality**.

Noise and Vibration

4.2.13 In the 'Do-Nothing' scenario the Site would remain in its current inactive use and would not contribute to the ambient noise environment as per the current situation.

4.2.14 The Noise and Vibration Chapter and associated figures and appendices are presented at **ES Volume 1, Chapter 11: Noise and Vibration.**

Socio-economics

4.2.15 In the 'Do-Nothing' scenario, the Site would remain in its current condition. The conditions in the wider area of the Site would be expected to change over time as a result of Cumulative Schemes coming forward. This would include continued population and employment growth in the area. If the Development was not to come forward, these projected changes as a result of other schemes coming forward in the area would not be affected and would still be realised. The community uses provided within the Development would not be provided in the 'Do-Nothing' scenario.

4.2.16 The Socio-economics Chapter and associated figures and appendices are presented at **ES Volume 1, Chapter 12: Noise and Vibration.**

Flood Risk

4.2.17 In the 'Do-Nothing' scenario, the Site would remain in its current state. The site would remain Flood Zone 3, protected by tidal flooding, assuming normal operation of the River Thames flood defence. However, a residual risk of tidal flooding to the Site could exist should the defences be breached (i.e. should the existing flood defences physically fail or be overtopped).

4.2.18 In the event of a breach of the flood defence, the area would be likely to experience rapidly rising flood waters. The Site would remain within a breach flood risk area, based on the TE2100 modelled water levels[2]. Based upon this information, areas of the Site would be considered to be at risk of tidal flooding in a breach scenario.

4.2.19 A present-day extreme water level of 4.700m AOD would remain for the short-term, with the future water TE2100 level rising to 5.680m AOD, including the effects of climate change up to 2100 applied in line with the Government Guidelines[3]. In the 'Do-Nothing' scenario the flood defences on-Site would not be improved, resulting in increased flood risk in the long-term.

4.2.20 The Flood Risk Chapter and associated figures and appendices are presented at **ES Volume 1, Chapter 13: Flood Risk.**

4.3 Alternative Sites

4.3.1 No alternative sites for the Development were considered as the Site is under ownership of the Applicant. Additionally, the Site is situated in the Greenwich Peninsula Opportunity Area and on the edge of the Greenwich Peninsula West Masterplan, making it a suitable location for a residential-led mixed use development.

4.4 Design Drivers

4.4.1 Throughout the design process, a number of planning and design policies and guidance have been referred to aid in the process. There have also been multiple consultations with the Greater London Authority (GLA), Royal Borough of Greenwich (RBG) and Design Review Panel (DRP). The Greenwich Peninsula has been identified as a Opportunity Area within the Greenwich Local Plan with identified the opportunity for housing, urban development and employment use, involving the release of industrial land.

4.4.2 Based on this, the opportunities and constraints of the Site were analysed. Opportunities for the Site include:

- The ability to provide a contribution of residential housing on the Site, including affordable housing provision.
- The Site is entirely closed off with no public routes for walking or cycling, allowing for opportunities to enhance permeability via new pedestrian routes.
- The Site falls within a 'Local Park Deficiency Area'. This offers the opportunity to create generous public green spaces whilst integrating the Thames Path.
- The Site offers the opportunity to stitch adjoining developments. The proposed towers within Morden Wharf to the north range from 25 to 37 storeys. The already built Enderby Wharf to the south scheme ranges from 8 to 13 storeys. Therefore, the Development plays an important part in providing transition between the two developments.

[2] London Thames Breach Assessment (2017).
[3] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.

4.4.3 Constraints for the Site include:

- The Site is located within Flood Zone 3 and is therefore at high risk of fluvial and tidal flooding, however the Site is protected from fluvial and tidal flooding on account of existing flood defences.
- Sunlight on the Site has influenced design with the riverside area being the sunniest, but also the windiest. The southern and eastern edges of the Site are in continuous shadow and Morden Wharf will impact light levels in the evening.
- The Site is located within an area of high archaeological importance. The Site contains no statutory listed buildings or heritage assets, however, the Grade II Listed Enderby House is enveloped by the Site boundary. Enderby House is a building of importance, therefore must be sensitively addressed by the proposals.

4.4.4 These opportunity and constraints for the Site informed early consultation and the feedback from this influenced the overall design process which has culminated in the Development. The following design drivers were followed:

- Provide a great place to live:
    - Provide a garden for residents to enjoy;
    - Design the garden so that it is a meaningful space, sheltered from the wind and with good levels of sunlight;
    - Create the potential for larger trees and landscape;
    - Create good quality apartments including providing affordable housing; and,
    - Provide private external amenity to supplement the shared garden.
- Enhance the riverside:
    - Create generous public green space adjacent to the river front;
    - Continue the string of green spaces to Morden Wharf;
    - Provide green space as a stopping point along the Thames path; and,
    - Integrate the Thames Path with the wider area around the Site.
- Mend the Context:
    - Stitch together the fragmented adjoining sites architecturally and topographically;
    - Relate the Site to its varied neighbouring sites including:
        - The Thames path
        - Morden Wharf
        - Light industrial site
        - Enderby Wharf
        - Enderby House

4.5 Design Evolution

4.5.1 The original masterplan was produced to incorporate the key design drivers (as detailed above), creating a base for further refinement of the development. The existing approval, in December 2015, for the Site was for a cruise liner terminal and three residential towers. The three tower blocks ranging in height from 24 storeys to 32 storeys with 477 residential units. There was a two-storey basement allocated for parking with 198 spaces. A two storey cruise liner was included within the proposal along with a new pontoon and jetty proposed for the docking of cruise liners.

Pre-Applications 1, 2 and 3, DRP and GLA before 2021

4.5.2 A series of Pre-Application meetings and consultations with DLP and GLA informed the design of the Site. During this period, the principal driver was that the proposals previously approved (ref: 15/0973/F) should be used as the basis for proposals albeit with the cruise liner terminal omitted. These varying design iterations were developed, investigating the way other elements of the proposals could be enhanced with the removal of the cruise liner terminal. These included offering improved connectivity across the Site, increased ground level landscape and the opportunities to create a more sensitive relationship with Enderby House.

4.5.3 Pre-App 1 increased the number of units, including the provision of serviced apartment, from the extant consent, thus increasing storey heights of the blocks and the amount of public realm at ground level. There was also the proposal of making the Site car-free, with only provision of blue-badge spaces and on-site servicing. These changes would potentially result in negative impacts on daylight and sunlight levels to adjacent properties and enhance wind channelling effects, but by being car-free would minimise traffic flows on the road networks and limit air quality effects.

4.5.4 Pre-App 2 further increased the number of residential units, omitting serviced apartment, with the maximum viable amount of affordable housing. The proposed number of units was 793 with 35% of affordable housing provision with all units provided at Discount Market Rent.

4.5.5 Pre-App 3 then reduced the total number of units whilst maintaining the 35% of affordable units. The building heights remained as the extant consent. There was an increase in ground level public realm from Pre-App 1 to 7,818 sqm. Good levels of affordable housing and public realm provision would benefit the social and economic effects of the proposals.

Pre-Applications 4 and 5, DRP and GLA after 2021

4.5.6 Following the feedback to the previous pre-apps and the GLA and DRP, the design team took a design and landscape-led approach to the evolving proposals. The landscape-led approach was framed such that the buildings should be located within the spaces which remain.

4.5.7 The creation of two meaningful green spaces was included within the design. The river side public space, which relates to Enderby House, and the more sheltered private amenity space that is more sheltered from wind and public circulation routes.

4.5.8 The scale of the Morden Wharf development is a strong consideration within the design of the Enderby Wharf Site and the Development responds to the scale of Morden Wharf. Pre-app discussions suggested that the heights of the building should be adjusted so that development ascends from west to east responding to daylight/sunlight, wind and townscape aspirations.

4.5.9 During 2022, two pre-application meets and a second DRP and GLA consultation were undertaken following the new proposals from the revised brief.

4.5.10 In April 2022, following the new design briefs, a fourth Pre-App was designed. This proposed that the scheme would have 633 units, a reduction from the previous Pre-Apps. Morden Tower was to be moved away from Morden Wharf to increase the sky view for the surrounding areas.

4.5.11 The fifth Pre-Application meeting in August 2022 proposed the reduction in the number of units to 594 with the reduction in the size of the building footprints. The form was sculpted to form nine different elements, and the heights adjusted to allow successful transition of scale between Enderby Wharf and Morden Wharf, influenced by townscape and visual considerations.

4.5.12 Feedback to these designs gave the conclusions:

- The central part of Morden/Telcon floorplan needed to improve its sky view, thus Morden Tower should be moved away from Morden Wharf.
- The buildings on the Site had slightly too much height, influencing townscape and visual discussions.

Other Environmental Considerations

Daylight and Sunlight

4.5.13 The evolution of the building form and internal layouts have been informed by the daylight and sunlight testing that has been carried out throughout the design development period.

4.5.14 The proposed building forms give improvements to daylight and sunlight than previous design iterations. The omission of a central tower achieves a more open outlook from the north facing facades of Enderby Wharf.

4.5.15 In response to the testing of the proposals, the position and orientation of the Morden and Telcon Towers were adjusted to further reduce the impacts from Morden Wharf.

4.5.16 The internal layout design has been developed to achieve optimal daylight to the living spaces. The living spaces are either dual aspect or are provided with corner windows. Balconies are positioned to the side of living spaces to avoid overshadowing and limiting the views out.

Wind Microclimate

4.5.17 Wind tunnel testing showed that the development with landscaping has a positive impact on the wind conditions, however two locations where accelerated wind conditions may have been experienced. At the north-east corner of the Telegraph Avenue, the low rise block caused accelerated wind conditions caused by a funnelling effect through a gap between the corner of this block and the Telcon Tower. Additionally, the pedestrian ramp at the south-east corner of the Telcon Tower had higher wind conditions.

4.5.18 Units were removed from the Telegraph Block units to decrease wind acceleration. The removal of the end ground / first and second / third floor maisonettes worked to address the accelerated wind conditions, but also allowed for ramp to be moved to the west, starting off Telegraph Avenue. This therefore avoiding the area of accelerated wind to the south-east corner of the Telcon Tower.

4.6 The Development

4.6.1 The design of the final Development, as described in **ES Volume 1, Chapter 5: The Development**, has responded to feedback from the Local Planning Authority, consultees and other relevant stakeholders engaged (including the provision of a community/café use within the Development as result of feedback from Ward Councillors). The design has been influenced by environmental and social factors as outlined above. The above indicates that the aspirations of the Applicant, objectives set and decisions taken resulted in a scheme that designs in environmental benefits and designs out, as far as possible, adverse environmental effects.

5. The Development

5.1 Introduction

5.1.1 This Chapter provides a description of the Development, as defined by the full planning application, and is supported by **ES Volume 3, Appendix 5.1: Full Planning Application Drawings**.

5.1.2 The Development is described on the planning application form as:

'The erection of part-3, part-23, part-35 storey buildings, providing up to 564 residential apartments (Class C3), light industrial, café and community use (Class E), and associated highways, landscaping and public realm works.'

5.1.3 The Development comprises:

- Site clearance;
- Site preparation and enabling works;
- The construction of three buildings comprising heights of ground plus 35, 23 and 3-storeys (up to 119.995 metres AOD);
- Provision of new homes (Use Class C3), light industrial units (Class E(g)(iii)), and community / café use (Sui Generis);
- New public realm landscaping, internal and external amenity space and other playspace;
- Flood defence improvements.

5.1.4 The description of the Development in this Chapter together with **ES Volume 3, Appendix 5.1** form the basis for the assessments presented in **ES Volume 1, Chapters 7 to 14** and **ES Volume 2: Heritage, Townscape and Visual Impact Assessment**. The Design and Access Statement (DAS), which is submitted with the planning application, provides further details regarding the description of the Development, but the information presented within this Chapter is sufficient to understand the Development sought for approval, and is the basis of the EIA.

5.2 Full Planning Application Drawings

5.2.1 A series of Full Planning Application Drawings have been submitted to RBG for approval. For ease of reference, a selection of these Drawings, as presented in **ES Volume 3, Appendix 5.1**, are listed within **Table 5.1**.

Table 5.1: Full Planning Application Drawings Included within ES Volume 3, Appendix 5.1

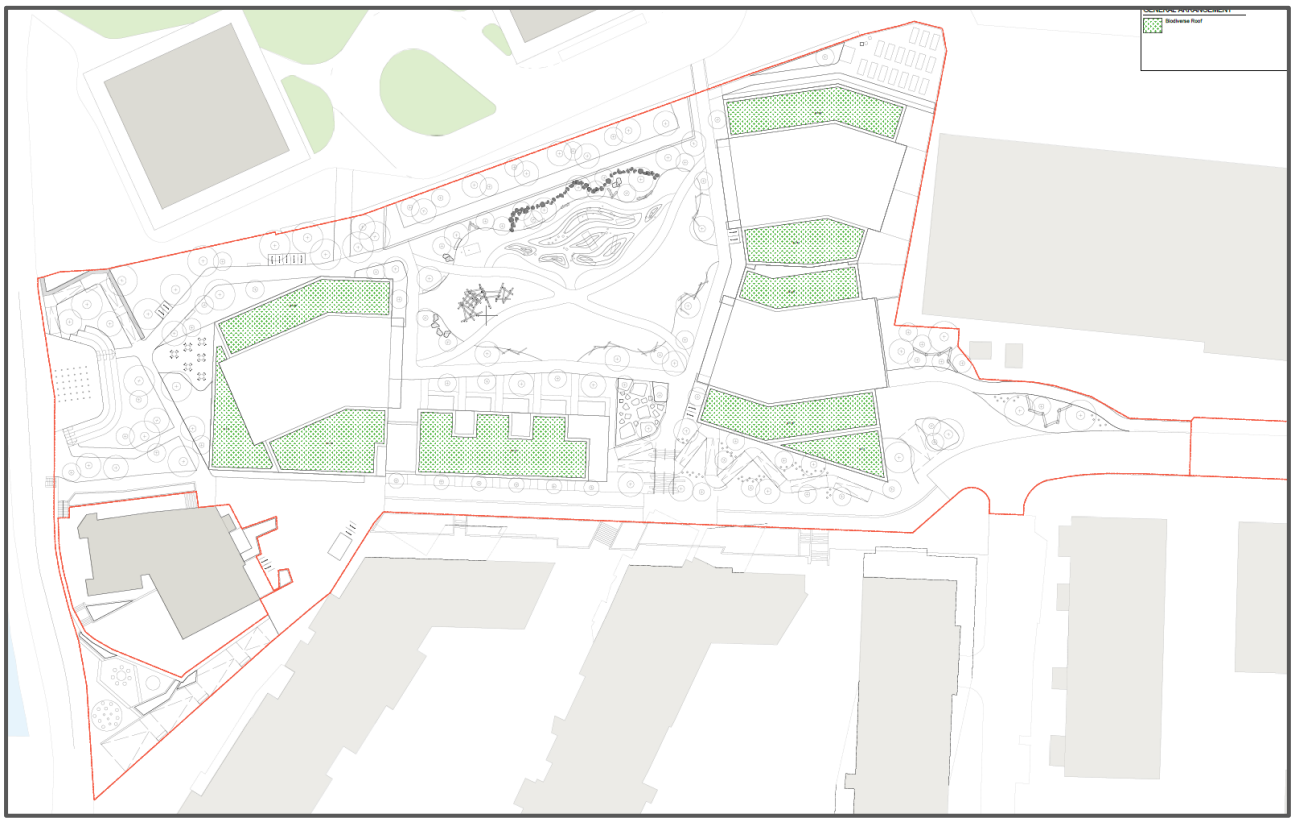
Detailed Planning Application Drawing Title	Drawing Reference Number
Site Layout and Massing Plans	
Location Plan – Existing Plan with Official Red Line Boundary	1136_LP-100
Site Wide – Existing Site Plan	1136_SP-000
Proposed Site Plan - Without Morden Wharf Development	1136_SP-101
Proposed Site Plan - With Morden Wharf Development	1136_SP-102
Proposed Site Plan - With Red Line Boundary Excluding Telegraph Avenue	1136_SP-103
Existing Site Elevations	1136_EE-100
GA Plans – Ground Floor Level	1136_GA-00
GA Plans – Podium Level	1136_GA-01
GA Plans – Podium Mezzanine Level	1136_GA-02
GA Plans - Level 01	1136_GA-03
GA Plans - Level 02	1136_GA-04
GA Plans - Level 03-16	1136_GA-05
GA Plans - Level 17-19	1136_GA-06
GA Plans - Level 20	1136_GA-07
GA Plans - Level 21	1136_GA-08
GA Plans - Level 22	1136_GA-09
GA Plans - Level 23	1136_GA-10
GA Plans - Level 24-31	1136_GA-11
GA Plans - Level 32	1136_GA-12
GA Plans - Level 33-34	1136_GA-13
GA Plans – Roof Plan	1136_GA-14
Proposed Elevations – River / Telegraph South	1136_GE-100

Detailed Planning Application Drawing Title	Drawing Reference Number
Proposed Elevations – River West	1136_GE-101
Proposed Elevations – River / Telegraph North	1136_GE-102
Proposed Elevations – River / Telegraph East	1136_GE-103
Proposed Elevations – Telcon South	1136_GE-104
Proposed Elevations – Telcon / Morden West	1136_GE-105
Proposed Elevations – Morden North	1136_GE-106
Proposed Elevations – Telcon / Morden East	1136_GE-107
Proposed Elevations – Site Elevation East	1136_GE-108
Proposed Elevations – Site Elevation South	1136_GE-109
Proposed Elevations – Site Elevation North	1136_GE-110
Proposed Section AA	1136_GS-100
Proposed Section BB	1136_GS-101
Proposed Section CC	1136_GS-102
Landscape Plans	
Landscape General Arrangement Plan – Ground Floor	8416-PL-X-GA-100
Landscape General Arrangement Plan - Roof Plan	8416-PL-X-GA-101

5.3 Development Layout and Massing

5.3.1 The Development would provide a total of three main residential buildings above a podium structure. There is also community / café use located at the base of the River Tower. The layout of the Development is shown in **Figure 5.1** (and also included in **ES Volume 3, Appendix 5.1**).

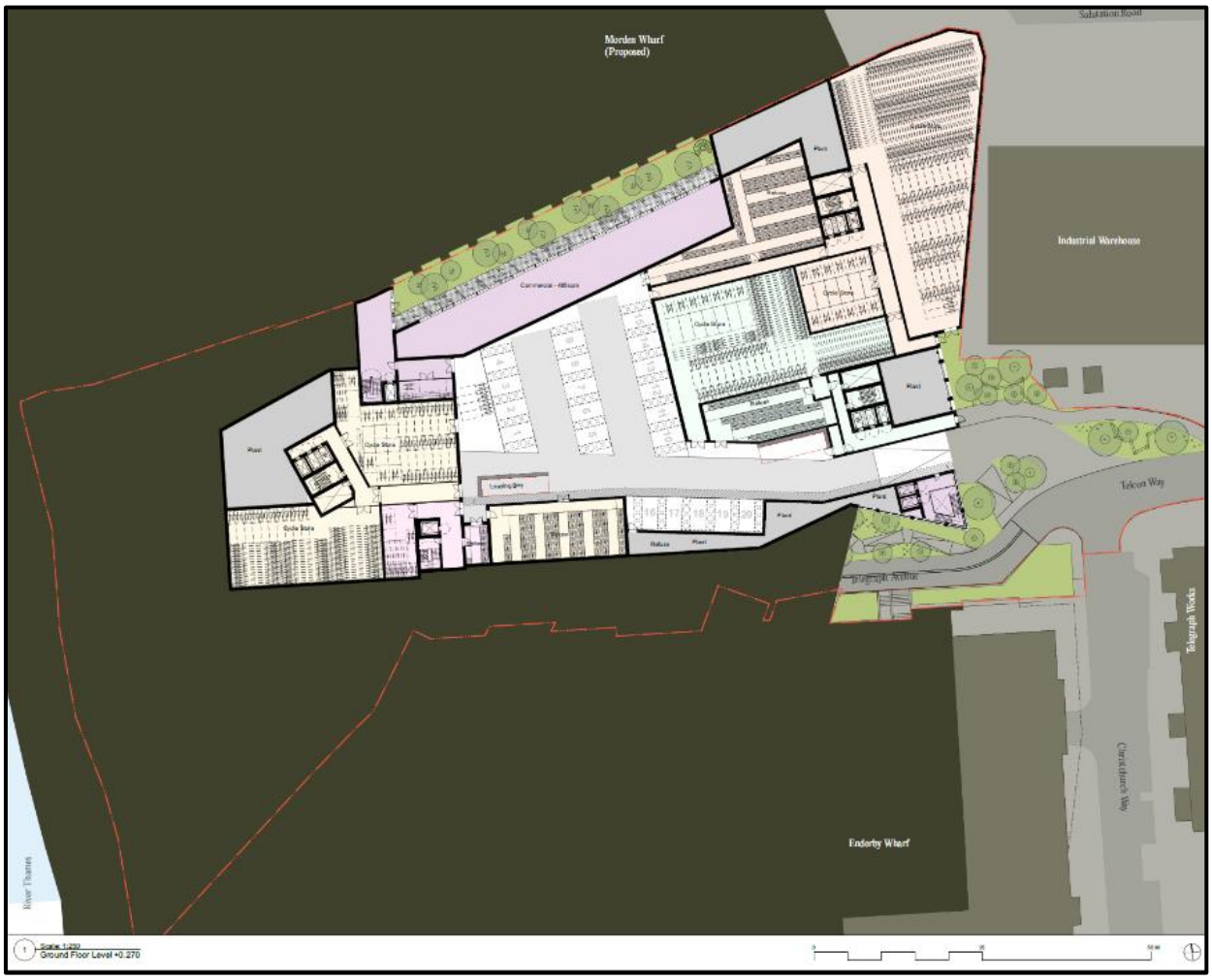
Figure 5.1: Layout of the Development (Source: SpaceHub)



Ground Floor Level (Basement)

5.3.2 The Ground Floor Level would predominantly provide back of house floorspace, such as plant, servicing areas, car and cycle parking and refuse storage areas. Light industrial space is also provided within the Super Ha-ha within the north of the Site (see Paragraph 5.9.1). The Ground Floor Level layout plan is shown in **Figure 5.2** (and also included in **ES Volume 3, Appendix 5.1)**.

Figure 5.2: Ground Floor Level (Basement) Plan (Source: DAS)



Podium

5.3.3 A podium structure would be provided across the Site. The Podium Level Plan can be seen in **Figure 5.3** (and also included in **ES Volume 3, Appendix 5.1)**.

5.3.4 The Podium Level would be provided across the majority of the Site. The Podium Level would provide a variety of floorspace including residential, light industrial and community / café use and amenity spaces. At Podium Level would be two greenspaces. The riverside park and public amenity space would face the Thames and integrate with the Thames Path and the Grade II Listed Enderby House. The Central Park would be publicly accessible during the daytime.

Figure 5.3: Podium Level Plan (Source: DAS)

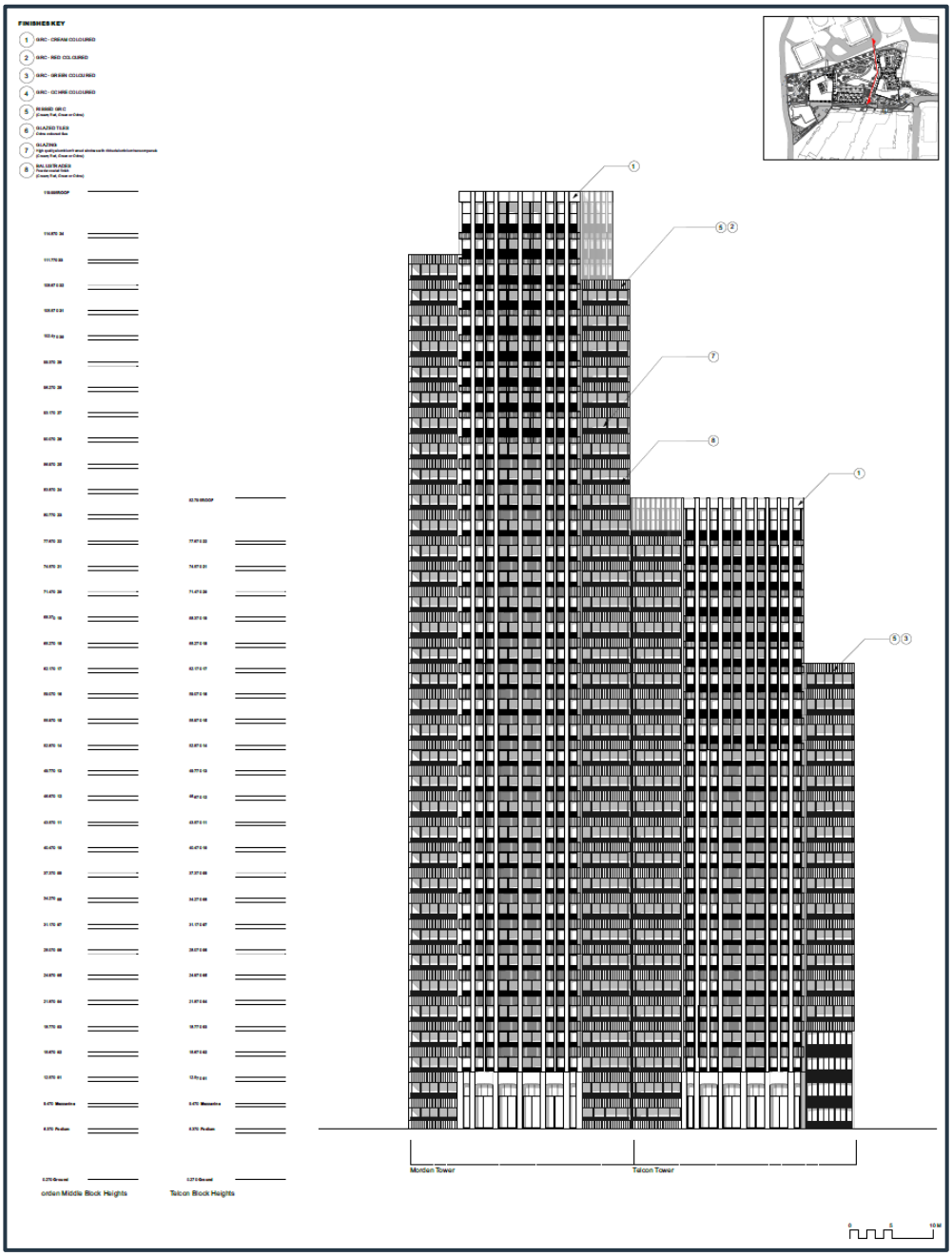
5.3.5 As shown on **Figure 5.4**, it is proposed that the Podium would be level with the Morden Wharf scheme to allow for a future connection between the sites. An indicative Site boundary is shown in red.

Figure 5.4: Illustrative Image showing Site Levels in Relation to Morden Wharf (Source: DAS)

Telcon and Morden Towers

5.3.6 Telcon and Morden Towers would be located on the eastern end of the Site. The block consists of two identical floor plans which have been mirrored. Telcon Tower would be 22 storeys (plus ground) in height extending to 82.795m AOD in height and Morden Tower would be 34 storeys in height (plus ground), extending 119.995m AOD storeys in height. Light industrial floorspace would be provided at Podium Level and Level 01, with residential floorspace located above. The proposed elevation of Telcon and Morden Towers is shown in **Figure 5.5** (and also included in **ES Volume 3, Appendix 5.1**).

Figure 5.5: Telcon and Morden East Elevation (Source: DAS)



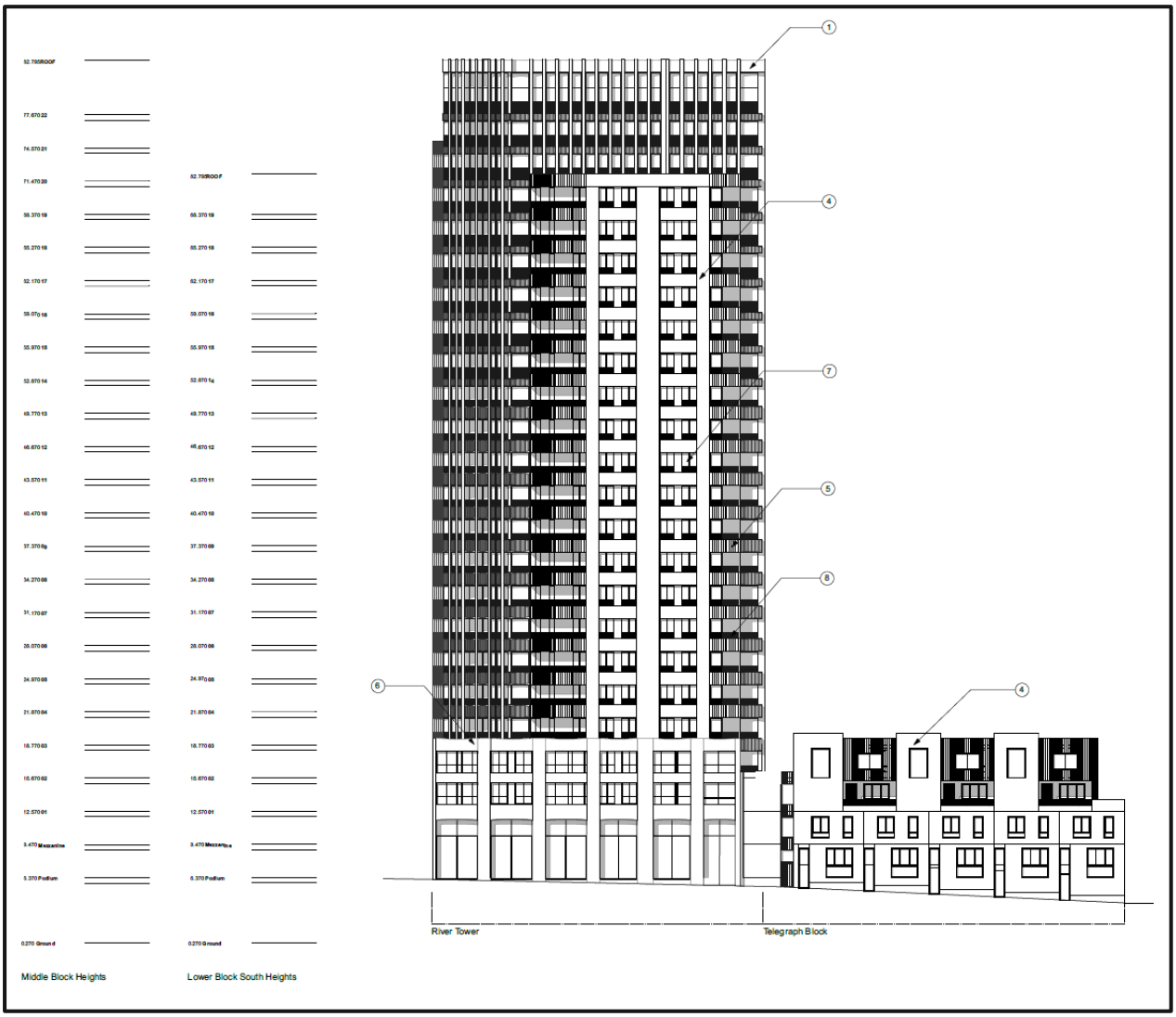
River Tower

5.3.7 The River Tower would be located on the western extent of the Site. The building would be 22 storeys (plus ground), extending to a height of 82.795m AOD. Community / cafe floorspace would be located at Podium Level (with the potential for additional mezzanine space) and residential units would be located above. The proposed massing can be seen in **Figure 5.6**.

Telegraph Block

5.3.8 The Telegraph block is located within the south-west of the Site. This block would be connected to the River Tower, extending to a maximum height of 16.770m AOD. The proposed elevation of the Telegraph Block (and River Block) is shown in **Figure 5.6** (and also included in **ES Volume 3, Appendix 5.1**).

Figure 5.6: River and Telegraph South Elevation (view from Telegraph Avenue) (Source: DAS)



5.4 Quantum of Development

5.4.1 The total amount of residential units is set out in **Table 5.2.**

Table 5.2: Proposed Number of Residential Units and Floorspaces

Building / Block	Residential Units (Use Class C3)
River Tower	166
Telegraph Block	8
Morden Tower	258
Telcon Tower	132
Total	**564**

5.4.2 The Development will provide 564 Residential Units (2,903 habitable rooms) with 10% accessible units across a range of tenure types and unit sizes, as set out in **Table 5.3** below.

Table 5.3: Proposed Residential Mix

Tenure	Mix				Totals
	1 Bed	2 Bed	3 Bed	4 Bed	
Private	223 (39.5%)	105 (18.6%)	50 (8.9%)	0 (0.0%)	**378 (67%)**
Intermediate Rent	45 (8.0%)	17 (3.0%)	6 (1.1%)	0 (0.0%)	**68 (12.1%)**
Affordable Rent	14 (2.5%)	82 (14.5%)	14 (2.5%)	8 (1.4%)	**118 (20.9%)**
Total	**282 (50.0%)**	**204 (36.2%)**	**70 (12.4%)**	**8 (1.4%)**	**564 (100%)**

5.4.3 A total of 1,445 square meters (sqm)) of non-residential floorspace (Gross Internal Area (GIA)) would be provided, the location of which is set out in **Table 5.4.**

Table 5.4: Location of Non-Residential

Location	Non-Residential Floorspace (sqm) (GIA)
Super Ha-Ha (Ground Floor Level)	485
Telcon Tower (Podium & Level 1)	460
River Tower (Podium Level)	500
Total	**1,445**

5.5 Land Uses

Residential Land Uses (Use Class C3)

5.5.1 A total of 564 residential units would be provided across the Site, of which 10% of would be accessible:

- River Tower: This building would provide residential units from Level 01 up to Level 22.
- Telegraph Block: This building would provide residential units from Podium Level up to level 2.
- Morden Tower: This building would provide residential at Podium Level and Mezzanine Level up to Level 34.
- Telcon Block: This building would provide residential at Podium Level and Mezzanine Level up to Level 22.

Non-Residential Land Uses

5.5.2 A total of 1,445 sqm GIA of non-residential use is proposed, as detailed in **Table 5.4**. 500 sqm of this would be located at Podium Level of the River Tower. It is anticipated that this floorspace would be used for community / cafe use, with the unit having subdivisible floor space to be able to maximise the flexibility of the space and size of the units.

5.5.3 The remaining non-residential floorspace would be located at Podium and Level 1 of the Telcon Tower and within the Super Ha-Ha at Ground Floor Level, within the north of the Site – all within light industrial use.

5.6 Façade Materials and Design

5.6.1 A simple material palette has been selected comprising of:

- Glass reinforced concrete panels (GRC). This includes a mixture of flat/smooth and fluted panels.
- Aluminium framed windows with fluted aluminium spandrel panels.

- Metal balustrades.

5.6.2 Colour is integrated into each of the towers to tie them into the surrounding urban context and to articulate the form. The three towers are treated with tonally different colours: umber to Morden Tower, dark green to Telcon Tower and ochre to River Tower. The central element to each of the towers is given a neutral cream tone with the intention of enhancing the slender appearance and provide a visual link between the three towers.

5.6.3 Glazed tiles are proposed on the base of River Tower to emphasise the café and community space along the riverside.

5.6.4 The windows vary throughout the height of the blocks. On lower levels the windows have a lower wider proportion to emphasise the 'plinth' concept.

5.6.5 On the middle floors the proportions are lengthened with the addition of a central column.

5.6.6 The upper floor windows relate to the wider city and the sky. The proportions are further lengthened to make the top of the tower look lighter.

Figure 5.7: Varying Window/Bay Sizes (Source: DAS)

Figure 5.8: Illustrative Image Looking West at the Development from Telcon Way (Source: DAS)

Figure 5.9: Illustrative Image Looking East at the Development from the River Thames (Source: DAS)

5.7 Access and Servicing

Vehicular Access and Servicing Arrangements

5.7.1 Key access to the Site for pedestrians, cyclists, vehicles and service vehicles will be via Telcon Way to the east of the Site. There would be separate entrances for pedestrians, cyclists and vehicles.

5.7.2 Vehicular access opens directly off Telcon Way and ramps down to the Ground Floor (basement). The pedestrian access to the car park runs parallel to the vehicular access but is separated.

Pedestrian and Cycle Access

5.7.3 Pedestrian and cycle access to the Site would be provided from Telcon Way, along the Thames Path and from the Morden Wharf development. Pedestrians and cyclists could then access the buildings from street level or Podium Level.

5.7.4 Pedestrian and cycle access routes into and through the Site are shown on **Figure 5.10** and vehicular access is shown on **Figure 5.11.**

Figure 5.10: Pedestrian and Cycle Access (Source: SpaceHub)

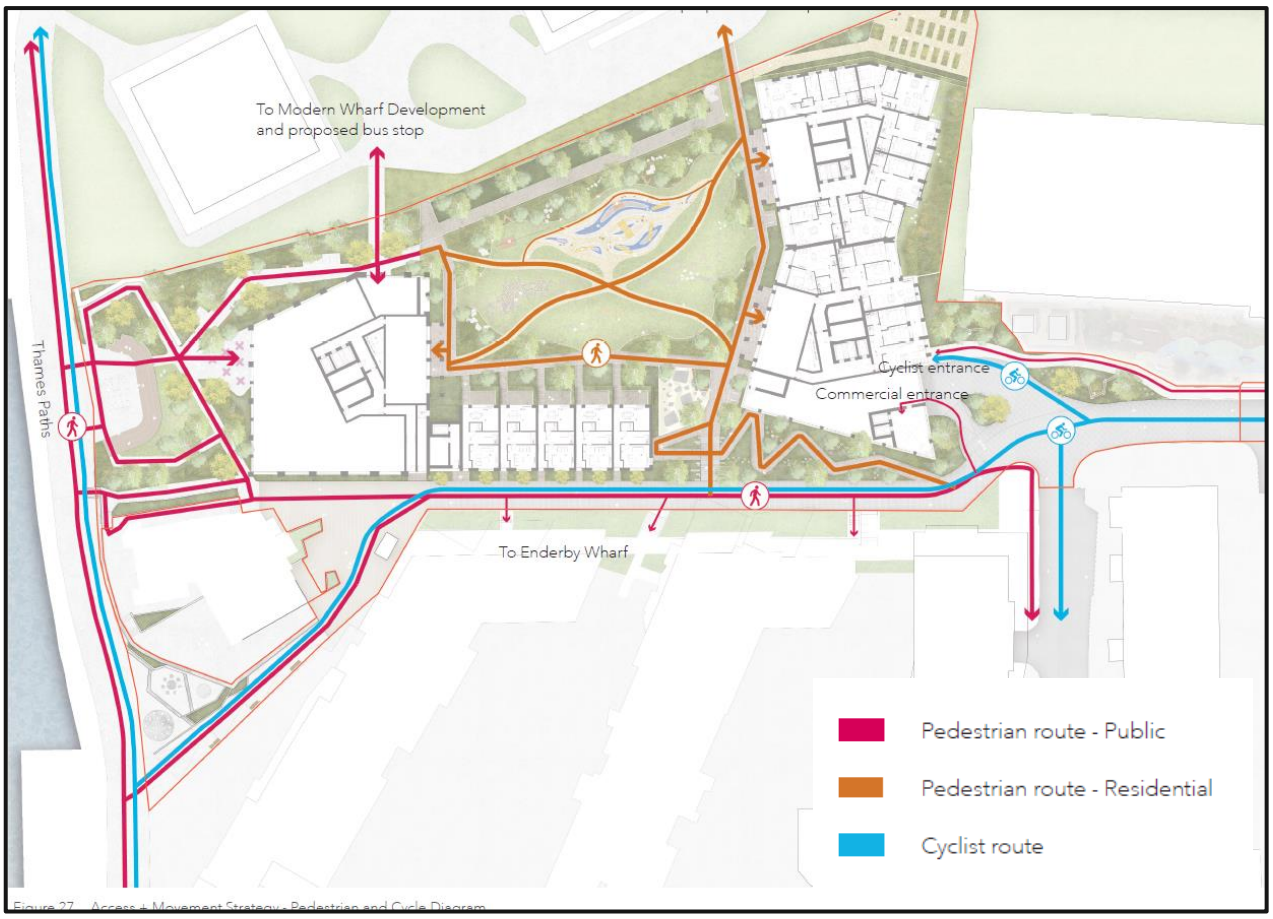


Figure 5.11: Vehicular Access (Source: SpaceHub)

Car-Parking

5.7.5 The Development would be primarily car free. The ground floor level would provide 20 proposed blue-badge parking spaces. There would be no parking on-Site for non-residential uses.

Cycle Parking

5.7.6 The Development would provide 1,075 cycle parking spaces, as follows:

- Residential:
  - 987 Long-stay spaces
  - 27 Visitor spaces
  - 49 Accessible spaces
- Non-residential:
  - 10 long-stay spaces
  - 2 visitor spaces

5.7.7 The cycle stores accommodate a range of cycle provision, including larger spaces. The stores are accessible and separated from vehicular access.

5.8 Flood Defence

5.8.1 Following consultation with the Environment Agency, the existing flood defence (5.76m AOD) will be raised to 6.20m AOD to meet the requirements of the TE2100.

5.8.2 The existing flood defence is formed from a sheet piled wall, capped with a concrete beam. The 6.20m AOD and lower wall both tie into higher ground at 5.86m AOD on the southern side of Enderby House to allow access to the River walk.

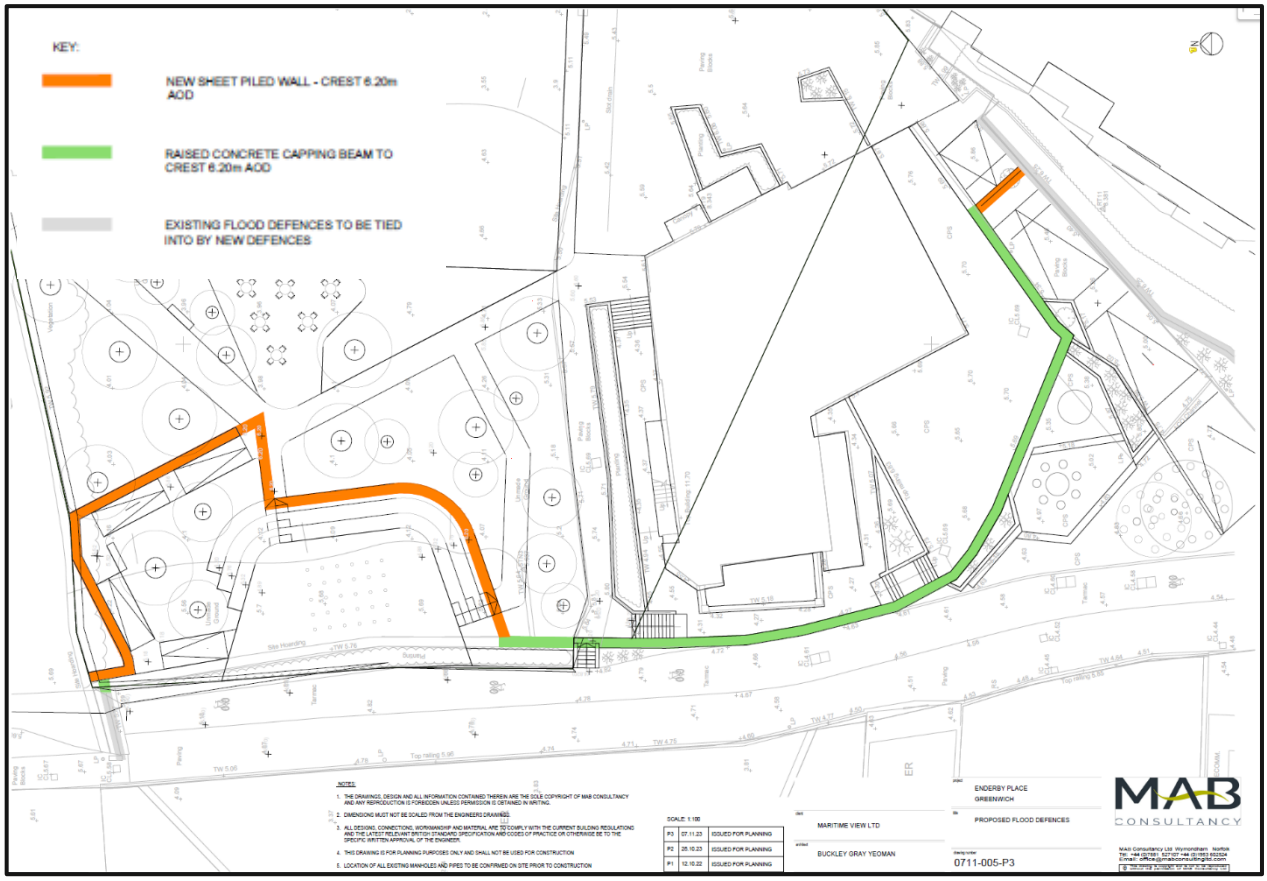
5.8.3 The current flood wall extent which is below 6.20m AOD will either be raised through an extension to the concrete capping beam (shown in green on **Figure 5.10)**. A new sheet piled wall will be constructed at the northern extent of the River-facing boundary of the Site (shown in orange in **Figure 5.10**).

5.8.4 In the event that the existing wall cannot be raised due to structural reasons, then a new sheet piled flood wall with a concrete capping beam will be constructed as near to the flood defence as reasonably possible.

5.8.5 For assessment purposes it is therefore proposed to adopt the worst-case scenario of a replacement of the flood defence wall. It is assumed that any replacement flood defence wall would be wall would be installed using either vibropiling or pressing methods of installation and driven piling will not be used.

5.8.6 Full details regarding flood defences can be found in the Flood Risk Assessment which is submitted as part of the planning application.

Figure 5.12: Extent of Flood Defence Works

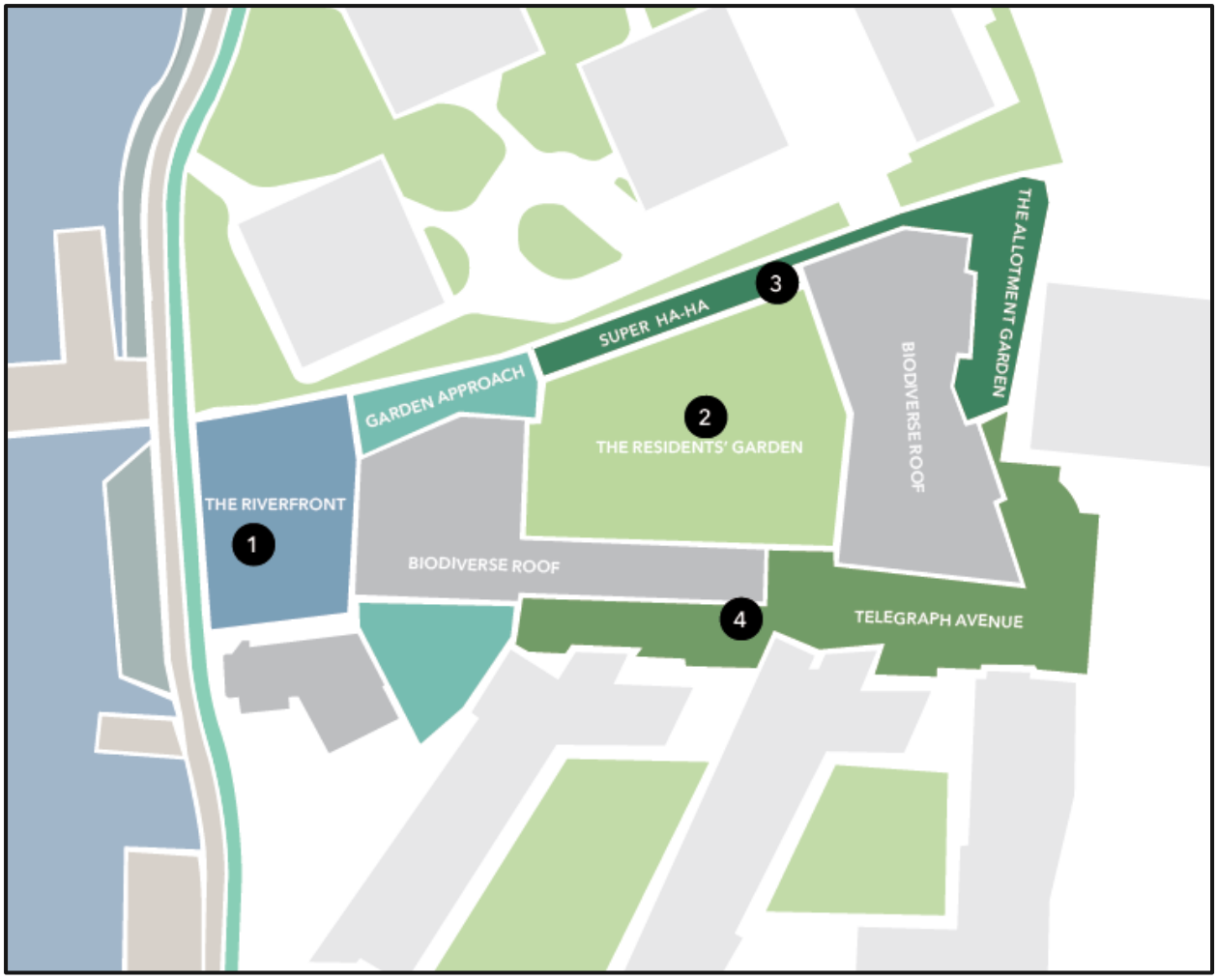


5.9 Public Realm, Amenity Space and Landscaping

5.9.1 As shown on Error! Reference source not found.**1**, the Development would provide the following key amenity s paces:

- The Riverfront would be an open public space along the Thames path. It would provide amphitheatre seating and water fountains intended for social gatherings and plays. The new flood defence would be integrated into the design, as shown on Figure 5.12. A lawn area and cafe seating space would be located at the higher level.
- The Garden Approach would be located between the public realm fronting the River Thames and the Residents' Garden. This would include defined pathways and benches.
- The Residents' Garden is an area with a combination of open lawns, two designated play areas, and residents' front gardens with a curated planting scheme. Play trails are integrated into the woodland edges.
- The Super Ha-Ha is a sunken and shaded garden area adjacent to the light industrial unit located at Ground Floor Level in the north of the Site.
- The Allotment Garden includes residential allotments and private gardens, aiming to create communal green space.
- Telegraph Avenue / Telcon Way is an area that combines the leads from existing public realm to the lobbies and gardens. It comprises a planting strip for the Telegraph Block series of compliant ramps and landscaped steps.

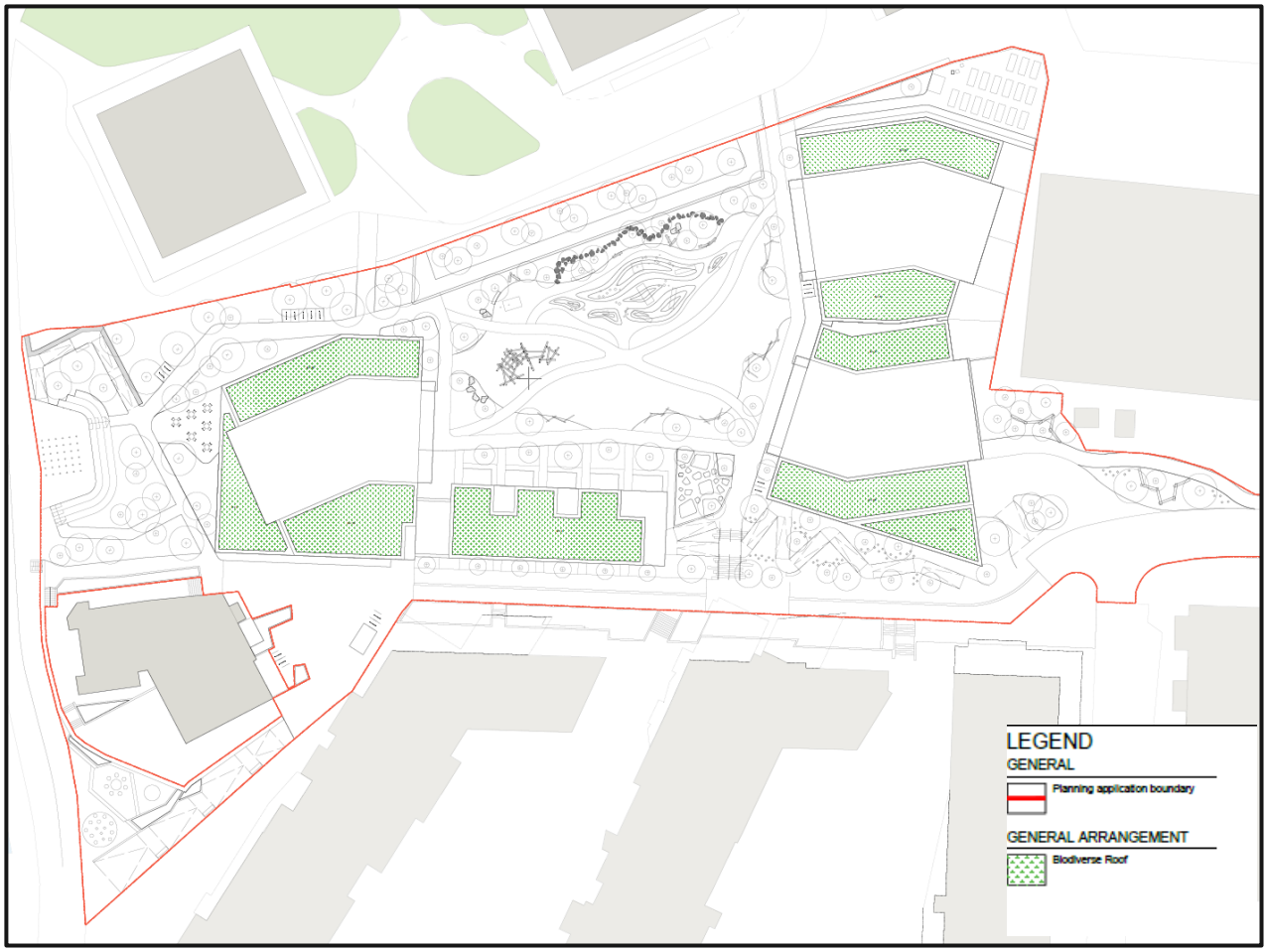
Figure 5.11: Key Amenity Spaces (Source: SpaceHub)



5.9.2 The landscaping strategy is shown on **Figure 5.12** and **Figure 5.13** below. This includes the location of biodiverse roofs within the Site.

Figure 5.12 Landscape General Arrangement Plan – Ground Floor (Source: SpaceHub)

Figure 5.13: Landscape General Arrangement Plan – Roof Level (Source: SpaceHub)



5.9.3 The planting for the Riverside area would incorporate a blend of shrubs, grasses, and perennial flowers that thrive naturally along the water's edge. The selection has been made with a focus on resilience against winds from the River Thames. The planting palette design for pollinator garden areas would combine grasses mixed with flowers. The woodland planting mix provides diversity through its selection of shade-tolerant plants, whilst the species-rich lawn area includes a wide variety of nectar-rich annual and perennial flower seeds mixed in with wild grasses. Biodiverse roofs would be planted with herbaceous perennials and sedums given their low maintenance and beneficial for biodiversity.

5.9.4 Further information on landscaping and planting can be found in the Landscape and Public Realm Strategy, which is submitted as part of the planning application.

Play Space

5.9.5 The Development will provide a total of 1,552sqm of children's play space split including 855sqm for children aged 0-4 years and 697sqm for children aged 5-11 years. This play space would be integrated with the private and public realm throughout the Site.

5.10 Surface Water Drainage Strategy

5.10.1 The Development will incorporate a Site-wide surface water drainage strategy that will ensure that surface water runoff from the eastern part of the Site is restricted an agreed rate of 5 l/s for all events up to and including the 1 in 100 year plus 40% climate change scenario. The eastern part of the Site would drain into the Thames Water sewer via an existing outfall located on Telcon Way.

5.10.2 The western part of the Site would discharge, via a connection point located in the south-west of the Site, into the River Thames with no restricted rate.

5.10.3 SuDS would be incorporated through green roofs, which would be present throughout the Site, including the Podium which would act as a green roof. Areas at Podium Level which are not landscaped would utilise permeable paving.

5.10.4 Full details of the proposed surface water drainage strategy are provided within the Flood Risk Assessment submitted as part of the planning application.

5.11 Energy Strategy

5.11.1 The Development would incorporate energy efficiency measures, mechanical ventilation with heat recovery, and an ambient loop heating system located at basement and roof level that would use external communal air source heat pumps to heat a low temperature heating loop to 25 degrees that would link all residential dwellings and non-residential uses. Individual water source heat pumps would then be used within each residential dwelling to raise the temperature for heating and hot water.

5.12 Waste Management

5.12.1 Waste storage provision in the Development would be provided in line with RBG Waste Guidance Notes for New Developments and British Standard BS5906:2005 requirements. Waste storage would be located in the basement (Ground Floor Level) with separate stores for non-residential and residential waste. Waste would be separated into food waste, dry recycling and residual general waste. A Framework Operational Waste Management Plan is submitted as part of the planning application.

5.13 Climate Change Resilience

5.13.1 The Development incorporates a number of features that would contribute to climate change resilience. These include:

- A surface water drainage strategy which accounts for future climate change was developed for the Site. The strategy was designed to accommodate surface water runoff during all events up to and including 100 year

plus 40% climate change allowance. A summary description of the surface water drainage strategy is provided earlier in this Chapter.

- Provision of green roofs and permeable paving to limit the surface water runoff to agreed rates.
- An Energy Strategy that minimises energy demand and CO_2 emissions, as described earlier in this Chapter; the Development is all electric.
- Being a car-free development to further reduce CO_2 emissions.
- The Development has been designed to avoid excessive overheating and cope with the predicted increase in global temperatures as a result of global climate change. Measures include:
    - Bedrooms largely have significant recesses and self-shading from the balconies above.
    - Façades have been developed with suitable glazing-to-solid ratios.
    - Mechanical ventilation provided to all residential units.

6. The Works

6.1 Introduction

6.1.1 This Chapter has been prepared by Avison Young with relevant advice and information provided by the Applicant. It describes the anticipated programme of enabling works and construction, and the key activities that would be undertaken in relation to the implementation and construction of the Development (the 'Works'). It identifies, in general terms, the potential effects associated with the Works and outlines the proposals for the mitigation of potential likely significant effects. Where required, consideration of likely significant environmental effects related to the Works are presented within **ES Volume 1: Chapters 7 to 13** and **ES Volume 2: Built Heritage, Townscape, and Visual Impact Assessment**

6.1.2 A Site-specific Construction Management Plan (CMP) has been produced for the Development (**Appendix 6.1**). The CMP includes details of the proposed methodologies, programme, method statements and environmental mitigation measures. The appointed Principal Contractor(s) for the Works would be obliged, via planning condition, to adhere to the CMP.

6.1.3 This Chapter draws on the information within the CMP and **ES Chapters 7** to **13** of **ES Volume 1: Main Text and Figures** and **ES Volume 2: Built Heritage, Townscape and Visual Impact Assessment**.

6.1.4 Planning for the Works is necessarily broad at this stage and may be subject to modification. However, it is considered that sufficient planning has taken place at this stage to enable the likely significant environmental effects relating to the Works to be identified and assessed.

6.1.5 The following terminology is used throughout this Chapter for the buildings which comprise the Development (as described in **ES Volume 1, Chapter 5: The Development**):

- Telcon Tower, located towards the south-east of the Site.
- Morden Tower, located towards the north-east of the Site.
- River Tower, located towards the south-west of the Site.
- Telegraph Block, adjoined to the River Tower.
- The Podium, located above ground floor level around the buildings listed above.

6.2 Programme of Works

6.2.1 Subject to full planning permission, the Works are anticipated to commence in December 2024 and complete in December 2027.

6.2.2 As such, 2027 is considered to be the year of completion and occupation of the Development.

6.2.3 In general terms, the Works would comprise the following phases:

- **Site Set Up**
  - Securing of construction site boundaries via the use of hoardings.
  - Set-up of contractor welfare and site accommodation.
  - Site clearance, including vegetation / tree removal and implementation of protective measures around retained features.
  - Diversion of utilities, as required.
  - Earth works, including remediation of any existing contaminants (if encountered), excavation and reprofiling and installation of flood defence wall.
- **Construction**
  - Erection of tower cranes and platform hoists
  - Piling and substructure works.
  - Superstructure.
  - Building envelope.
  - Fit-out.

6.2.4 An indicative programme for the Works is presented in **Table 6.1**. Although the exact dates may vary, the estimated periods would still apply as an indication for each element / activity of the Works. In addition, it is possible that a number of the activities within **Table 6.1** would overlap.

Table 6.1: Indicative Construction Programme

	Dec-24	Feb-25	Apr-25	Jun-25	Aug-25	Oct-25	Dec-25	Feb-26	Apr-26	Jun-26	Aug-26	Oct-26	Dec-26	Feb-27	Apr-27	Jun-27	Aug-27	Oct-27	Dec-27
River Tower & Maisonettes																			
Enabling Works	■	■																	
Piling		■	■																
Substructure			■	■															
Superstructure				■	■	■	■	■	■	■	■	■							
Fitout						■	■	■	■	■	■	■	■	■	■				
Morden Tower																			
Enabling Works			■	■															
Piling				■	■														
Substructure					■	■													
Superstructure							■	■	■	■	■	■	■	■	■	■	■	■	
Fitout									■	■	■	■	■	■	■	■	■	■	■
Telcon Tower																			
Enabling Works			■	■															
Piling			■	■	■														
Substructure					■	■	■												
Superstructure							■	■	■	■	■	■	■	■					
Fitout									■	■	■	■	■	■	■	■			

6.3 Description of the Works

Site Establishment

6.3.1 One of the first activities of the Works would be to establish the area as a construction site. Construction areas would be made safe and secure prior to any work commencing, with the use of solid and well maintained 2.4m high hoardings and screening around the Site. Secure access points with wheel cleaning facilities would be established at all Site entrances.

6.3.2 The construction project offices and associated welfare facilities for the workforce would initially be located on-Site. As works proceed, accommodation may be relocated to temporary accommodation inside the new buildings. The locations would be identified in advance and agreed with RBG as part of the detailed construction logistics programming.

6.3.3 A tower crane would be positioned within the building footprints.

Site Clearance and Exacavation

6.3.4 If required, Site would be cleared of any items remaining from its previous use as a construction compound for the Enderby Wharf scheme to the south.

6.3.5 Waste would be segregated into recyclable streams on-Site and removed by skip or tipper lorry and fine water spray would be employed to limit dust emissions.

6.3.6 It is anticipated that the excavation required on-Site would give rise to an indicative 6,000m^3 tonnes of materials, typically comprising rock and soil.

Flood Defence Works

6.3.7 To achieve the required height of flood defence at the Site of 6.2m AOD it is proposed to apply a capping beam on top of the existing flood defence wall along the frontage of the southern portion of the Site. The northern portion of the flood defence wall would be replaced with a new structure allowing access to and from the existing riverside foot and cycle path.

6.3.8 The application of the capping beam to the retained portion of the existing flood defence wall is subject to further investigations into the load bearing capacity of this wall. If necessary, it is proposed to replace this existing wall with a new sheet piled and concrete capped flood defence wall to achieve the required level of flood defence.

6.3.9 For assessment purposes it is therefore proposed to adopt the worst-case scenario of a replacement of the flood defence wall. It is assumed that any replacement flood defence wall would be wall would be installed using either vibropiling or pressing methods of installation and driven piling will not be used.

Piling and Substructure

6.3.10 Further ground investigation works would be undertaken before any groundworks commence.

6.3.11 Foundations under the buildings would be piled raft foundations with pile caps. The expected pile diameters and depths for each Building are shown in **Table 6.2** below.

Table 6.2: Piled Raft Foundation Diameters and Depths

Building	Pile Diameter	Pile Depth
Telcon Tower	900 mm	30m
Morden Tower	900 mm	30 m
River Tower / Telegraph Block	900 mm	30 m

6.3.12 It is anticipated that continuous flight auger (CFA) piling would be used and, if required, specialist piling rigs may also need to be used to accommodate Site limitations.

Concrete Frame / Superstructure

6.3.13 The proposed superstructures to all buildings would likely be reinforced concrete frames.

Cladding and Façade

6.3.14 Precast concrete external panels (200m thick) have been assumed for the cladding.

6.3.15 The lifting and access equipment (mobile cranes, tower cranes, other lifting equipment such as elevated working platforms or forklifts) that would be required throughout the Works is yet to be determined in detail. A lifting strategy would be developed and prepared in accordance with the detailed design and statutory obligations. RBG would be consulted throughout preparation of the lifting strategy to ensure an appropriate proposal is put forward for consent. All necessary permits and licenses would be secured, and risk assessments and safe working instructions prepared and approved, ready for implementation by the Principal Contractor prior to the use of this type of equipment on-Site.

Core Installations, Finishes and Fit-Out

6.3.16 New operational plant would be housed at ground floor and would be delivered and installed at an early stage in the programme.

6.3.17 Mechanical & electrical installations in risers and common areas would commence as soon as the roofs and risers can be made watertight, with temporary water proofing added to mid-height floors to allow earlier progress. Finishes and services fit out of all floors to the buildings would progress once a level of temporary or permanent water tightness has been achieved across the floors, working from the lower floors upwards.

6.3.18 Fit out materials generally would be delivered and distributed by goods/ passenger hoists until such time as they are removed, and the envelope sealed. Final deliveries would utilise a permanent lift installation.

External / Landscaping

6.3.19 Externally, hard and soft landscaping in accordance with the landscape design would be constructed.

6.3.20 As the works come to an end, temporary accommodation and hoardings would be cleared, and final landscaping completed.

6.4 Site Access and Egress

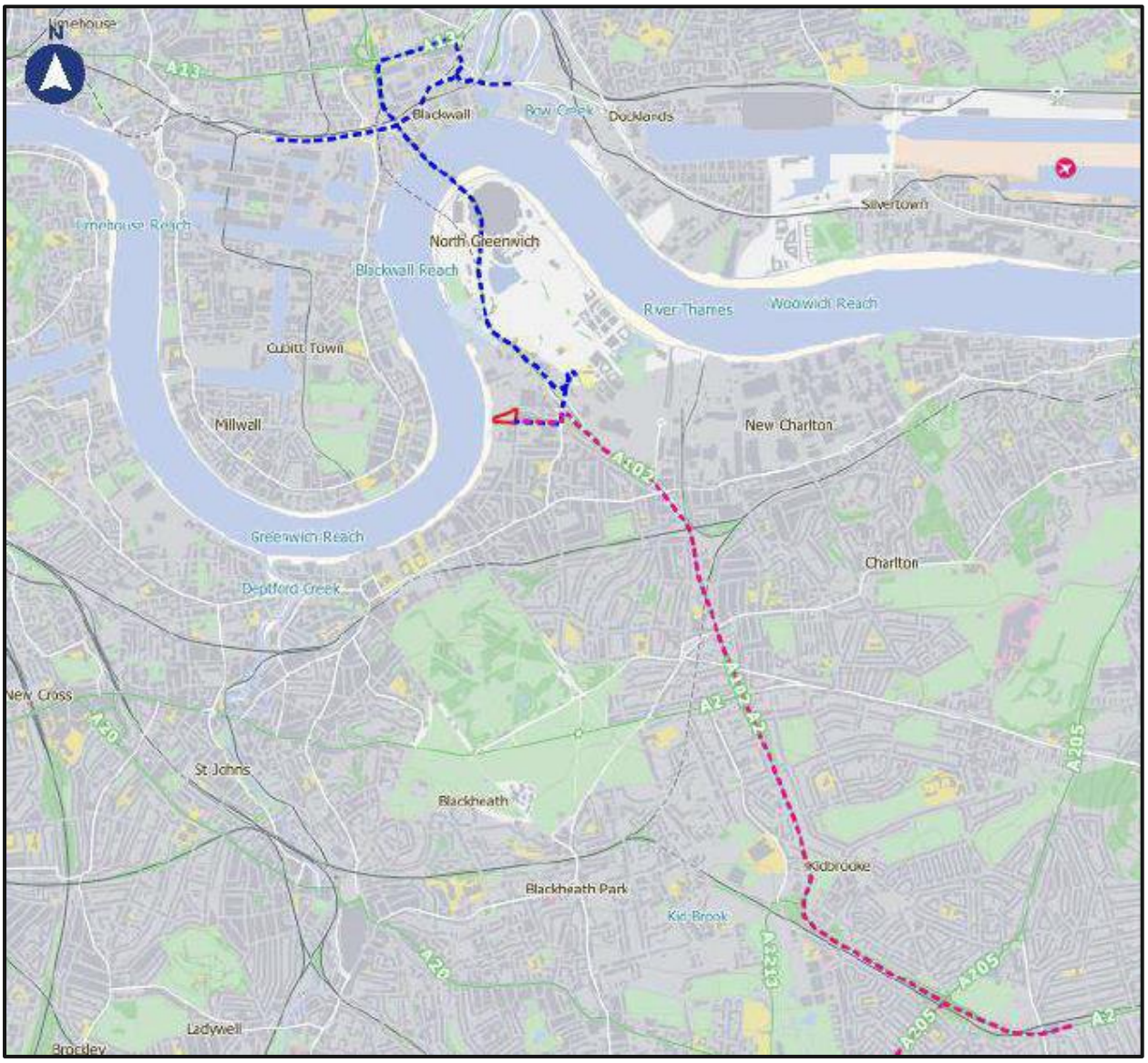
6.4.1 Vehicles and pedestrians would be able to access the Site via the existing access point on Telcon Way from Blackwall Lane. The entrance / exit into the Site is appropriate for larger construction vehicles and would be monitored by banksmen throughout the day before being gated.

6.4.2 To minimise the likelihood of congestion during the construction period, strict monitoring and control of vehicles entering and egressing the Site would be implemented. Construction deliveries would be carefully planned with delivery times agreed with each contractor using a booking system. Delivery schedules would be produced in order to look at the profiles of up-and-coming deliveries, and to regulate deliveries and eliminate bottlenecks.

6.4.3 **Figure 6.1** shows the proposed construction vehicle routing plan. It is proposed that construction-related vehicles approach the site from the north via A13 and Blackwall Tunnel, or the south via the A205, followed by the A206 (if from the north or south) and then the A2203.

6.4.4 It is noted that only a small proportion of trips will travel to and from the site via the north (and it would be LGVs only) due to height restrictions in the Blackwall Tunnel.

Figure 6.1: Construction Vehicle Routing Plan



6.5 Materials and Resource Use

6.5.1 The typical materials required for the construction of the Development are estimated to be as follows:

- Soil / muck-away.
- Concrete.
- Brick, tiles and ceramics.
- Glazing / glass.
- Metals.
- Plastic.
- Packaging Waste.

- Timber.
- Floor coverings.
- Electrical and electric equipment.
- Furniture / canteen / office equipment.
- Block work / plasterboard.
- Liquids.
- Oils.
- Bituminous material.
- Insulation material.

6.6 Plant and Equipment

6.6.1 Consideration was given to the types of plant and equipment likely to be used during the Works. An indication of the typical types of plant and equipment associated with each key element of the Works are shown in **Table 6.3**.

Table 6.3: Indicative Plant and Equipment

Plant and Equipment	Enabling Works	Piling	Substructure	Superstructure	Fit Out
Diggers	✓	✓	✓	×	×
Piling Rig	✓	✓	✓	×	×
Mobile Crane	✓	✓	✓	×	×
Telehandler	✓	✓	✓	✓	×
Generators	✓	✓	✓	✓	×
Tower Crane	×	×	×	✓	×

6.7 Hours of Work

6.7.1 Prescribed hours of work would be agreed and secured by condition with RGB. It is anticipated that the core working hours for the Works would be as follows:

- 08:00 - 18:00 hours weekdays.
- 08:00 - 13:00 hours on Saturday.
- No works would be carried out on Sundays or bank Holidays.

6.7.2 Approval from RGB would be required for any noisy works that need to be undertaken outside of permitted hours.

6.8 Construction Management Plan

6.8.1 As noted earlier in this Chapter, an CMP has been produced and is submitted in support of the planning application (**Appendix 6.1**).

6.8.2 The CMP addresses requirements in relation to environmental controls and includes the following:

- Site working hours.
- An indication of the specific mitigation measures to be employed in accordance with the principles outlined in this Chapter.
- Details of proposed routes for heavy goods vehicles (HGV) associated with the Works.
- Plans for the storage of materials, vehicular movements, delivery and Site access and egress.
- A procedure to ensure communication is maintained with RBG and the local community, including provisions for affected parties to register complaints and the procedures for responding to complaints.
- Reference to, and provision of, a framework for compliance with relevant legislation and guidance.
- Details of emergency procedures which would be implemented on the Site.

Management of the Works and Liaison

6.8.3 The registering of the Considerate Construction Scheme[1] will be encouraged.

6.8.4 All Works would be undertaken in line with the relevant legislative requirements, including the Construction (Design and Management) Regulations 2015[2] and Environmental Protection Act[3].

6.8.5 Following the appointment of the Principal Contractor, a single point of contact for neighbours, RBG and public relations would be established, with a senior member of the project staff nominated for the role. Contact details would be displayed on the Site hoarding. Outside normal working hours, Site security would act as the main point of contact via a dedicated phone number. It is anticipated that regular meetings would take place to review progress and to agree any necessary actions. Notwithstanding this, it is recognised that positive action and reaction in the field are essential components for effective environmental management. Should there be any complaints,

[1] Considerate Constructors Scheme. Available at https://www.ccscheme.org.uk/. 1997.
[2] Construction (Design and Management) Regulations 2015 (Statutory Instrument No. 51) (online) Available at: http://www.legislation .gov.uk /uksi/2015/51/contents/made. 2015.
[3] Environmental Protection Act (as amended) (online) Available at: https://www.legislation.gov.uk/ukpga/1990/43/contents. 1990.

these would be logged, fully investigated and, if requested, reported to the relevant department within RBG as soon as possible. The complainant would be informed as to what action had been taken.

6.8.6 The Principal Contractor would continue to liaise with the local community, RBG and other stakeholders, as appropriate, during the Works. The key liaison activities are anticipated to include:

- Site information boards, outlining progress to date and emergency contact details.
- Regular newsletters and letter drops to businesses / key local community members in advance of any specific operation likely to cause disruption.

Management of Contractors and Sub-Contractors

6.8.7 Individual contracts (for example waste removal) would incorporate appropriate requirements in respect of environmental management and control. contractors and sub-contractors would be required to demonstrate how they would achieve the provisions of the CMP, how targets would be met and how potential adverse effects would be prevented, reduced and offset.

Scope of Environmental Management Control

6.8.8 The CMP includes information on the controls to be implemented for the following:

- Public liaison (refer to above).
- Complaints procedure (refer to above).
- Public safety, emergencies and accidents.
- Traffic and access management (interaction with public highways, protection measures for pedestrians and cyclists and access and egress arrangements).
- Control of noise, vibration, dust and lighting.
- Materials storage and handling.
- Waste management and minimisation.
- Hazardous materials and contaminated land.
- Water use.

Public Safety, Emergencies and Accidents

6.8.9 The Site Manager will ensure that the Site is secure at the end of each working day, including the removal or locking down of any access ladders/ stairs to scaffolding and the gantry areas. The scaffolding will be alarmed, along with CCTV Cameras positioned around the entire hoarding.

6.8.10 All Works would be undertaken in line with the Health and Safety at Work Act[4]. In addition, there would be a requirement for the preparation of risk assessments and method statements prior to the commencement of activities. This would aid with the identification of risks and the development of mitigation measures to reduce any risk to an acceptable level.

6.8.11 Project offices and a main workforce welfare facility would be provided, as appropriate, with relocation according to the particular stage of the Works.

6.8.12 There would also be a series of procedures / measures for emergencies / accidents that could occur alongside contact details for relevant organisations that need to be notified.

Vehicular Traffic and Access Management

6.8.13 All traffic entering and leaving the Site would be closely controlled. Vehicles making deliveries or removing spoil or waste material would travel via designated routes which would be agreed with RBG.

6.8.14 To minimise the likelihood of congestion during the Works, strict monitoring and control of vehicles entering and exiting, and travelling around Site, would be implemented through the Construction Logistics Plan (CLP) which is submitted as part of the planning application.

6.8.15 Construction deliveries would also be carefully planned with delivery times agreed with each contractor using a booking system. Delivery schedules would be produced in order to look at the profiles of deliveries, regulate them and eliminate bottle necks.

6.8.16 Notices regarding any planned closures and diversion of either roads or footpaths would be given by the Principal Contractor to RBG, the police, fire brigade and other emergency services. This would be undertaken sufficiently in advance of the required closures or diversion.

6.8.17 Effective wheel cleaning facilities would be provided at all Site entrance gate locations, together with a concrete hardstanding. In addition, recycled water would be used wherever possible. Supplementary cleaning would be provided as necessary using suitable means to keep the surrounding highway clean. Collected debris would be disposed of as controlled waste at a licensed waste disposal facility.

Pedestrian Routing

6.8.18 Pedestrians would be segregated from the Works at all times. Operative and staff access points would generally be located close to the main vehicular access gates, with separate pedestrian gates and footpaths provided.

6.8.19 Where temporary closures of pedestrian routes may be required for the erection of scaffolds, incoming services connections and construction of the Site access, the relevant permissions and licences would be obtained for the

[4] Health and Safety at Work Act 1974 (as amended) (Statutory Instrument No. 37) (as amended) (online) Available at: http://www.legislation.gov.uk/ukpga/1974/37/contents. 1974.

re-routing of pedestrian thoroughfares. Where more extensive closures or diversions are required, temporary proposals would be agreed with RBG and the Local Highways Authority.

Construction Traffic Management

6.8.20 The topic of transport and access was scoped out of the ES except in so far as it relates to cumulative effects with other developments identified in **Table 2.2** of **ES Volume 1, Chapter 2: EIA Methodology** (refer to **ES Volume 1, Chapter 9: Traffic and Transport** for assessment).

6.8.21 The estimated number of HGV movements was projected for the busiest periods during the Works to allow for the assessment of a robust reasonable worst-case scenario. An average of 200 daily HDV trips are expected during the busiest period of the Works (June 2025).

6.8.22 **Table 6.4** shows the anticipated traffic generation during the Works.

Table 6.4: Forecast Construction Traffic

	Vehs per day	Movements per day	Dec-24	Feb-25	Apr-25	Jun-25	Aug-25	Oct-25	Dec-25	Feb-26	Apr-26	Jun-26	Aug-26	Oct-26	Dec-26	Feb-27	Apr-27	Jun-27	Aug-27	Oct-27	Dec-27
River Tower & Maisonettes	**-**	**-**																			
Enabling Works	20	40	40	40																	
Piling	20	40		40	40																
Substructure	15	30			30	30															
Superstructure	5	10				10	10	10	10	10	10	10	10	10							
Fitout	15	30						30	30	30	30	30	30	30	30	30					
Morden Tower	**-**	-																			
Enabling Works	20	40			40	40															
Piling	20	40				40	40														
Substructure	15	30					30	30													
Superstructure	5	10							10	10	10	10	10	10	10	10	10	10	10	10	
Fitout	15	30									30	30	30	30	30	30	30	30	30	30	30
Telcon Tower	**-**	-																			
Enabling Works	20	40			40	40															
Piling	20	40			40	40	40														
Substructure	15	30					30	30	30												
Superstructure	5	10							10	10	10	10	10	10	10	10					
Fitout	15	30									30	30	30	30	30	30	30	30			
Total Movements			**40**	**80**	**190**	**200**	**150**	**100**	**90**	**60**	**120**	**120**	**120**	**120**	**110**	**110**	**100**	**70**	**40**	**40**	**30**

6.8.23 A full assessment of the cumulative vehicle movements associated with the Works on the surrounding road network is presented within **ES Volume 1, Chapter 9: Traffic and Transport**, as well as **ES Volume 1, Chapter 11: Noise and Vibration**.

Car Parking

6.8.24 The labour force would be encouraged to use public transport. Local traffic management measures for Site access would be agreed with RBG prior to construction commencing in conjunction with surrounding development sites.

Control of Noise, Vibration, Dust and Lighting

6.8.25 It is anticipated that noise mitigation measures and the Best Management Practices as outlined in British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Part 1 noise'[5] and British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Part 2 vibration'[6], would be implemented.

6.8.26 Mitigation measures that would be considered include using quiet construction methods, locating plant and equipment away from noise sensitive receptors, limiting hours of construction, and ongoing monitoring.

6.8.27 It is recognised that Works generating noise, vibration and dust could give rise to temporary and local disturbance. Site-specific best practice measures would therefore be implemented by all contractors to minimise the disturbance to potentially sensitive receptors in the surrounding area. **ES Volume 1, Chapter 10: Noise and Vibration** includes a detailed review of the proposed noise mitigation measures during construction. However, in addition, the following measures address dust emissions:

- Display contact details on hoarding and in newsletters (specific individual who is based on Site).
- Record all dust, air quality and noise complaints, identify causes, take appropriate measures to reduce emissions in a timely manner, and record the measures taken, make the log available to RBG.
- Familiarisation by all trade contractors with current legislation and best practice measures.
- Carry out regular dust inspections.
- Plan the Site layout so that noise producing and dust causing machinery and activities are located away from receptors, as far as possible.
- Erect barriers around dusty activities where practical.
- Avoid Site runoff of water or mud.
- Keep hoarding, barriers and scaffolding clean using wet methods.

[5] British Standards Institution. British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 noise. 2014.

[6] British Standards Institution. British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 vibration. 2014.

- Remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used on the Site.
- Cover or fence stockpiles to prevent wind whipping, where practicable.
- Ensure all vehicles switch off engines when stationary – no idling vehicles.
- Ensure all on-road vehicles use Ultra Low Sulphur Diesel (ULSD).
- Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment, where practicable.
- Impose appropriate speed limits around Site and enforce them.
- Use cutting, grinding or sawing equipment fitted, or in conjunction, with suitable dust suppression techniques such as water sprays or local extraction.
- Ensure adequate water supply on the Site for effective dust/particulate matter suppression / mitigation, using non-potable water, where possible and appropriate.
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving the Site are covered to prevent escape of materials during transport.
- Use of enclosed chutes and conveyors and covered skips.
- Use of hoarding around the perimeter of the Site.
- Use of hydraulic construction methods in preference to impact techniques where practical.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate and in a manner which minimises noise.
- Ensure equipment is readily available on the Site to clean any dry spillages. Clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- Inspect on-Site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Effective wheel cleaning and specific fixed wheel washing on leaving the Site and damping down on haul routes.
- Access gates to be located at least 10 m from sensitive receptors, where possible.
- Employ best practices and adherence to appropriate guidance such as British Standard 5228 – Part 1[1].
- Switch all audible warning systems to the minimum setting required by the Health and Safety Executive (HSE).
- Selection of the quietest working equipment available (for example, electric / battery powered equipment which is generally quieter than petrol / diesel powered equipment) where practicable.

- Undertake activities such as loading and unloading, dismantling of equipment including scaffolding, and moving equipment and materials around the Site to minimise noise generation and, where practical, such activities would be undertaken away from noise sensitive areas.
- Position equipment behind physical barriers such as existing features or hoarding where practicable.
- Use of modern plant and equipment which is properly maintained and silenced where appropriate. All equipment to comply with EC Directives and UK Regulations set out in British Standard 5228-2:2009.

6.8.28 Noise and vibration levels would be monitored during the Works.

6.8.29 Dust monitoring would also be undertaken during the Works, with special provisions applied for any materials containing asbestos. A safety method statement would outline the control measures necessary to minimise the risks to an acceptable level, and all statutory notices would be placed with the HSE.

6.8.30 Good practice guidance documents prepared by the CIRIA[7] note that lighting on construction sites is typically part of on-site security and health and safety requirements. As such, it is assumed that the following sources of lighting would be present during the Works:

- Health, safety and security lighting associated with the Site perimeter, access(s), working areas and construction compound(s). It is assumed that construction lighting would not include floodlighting.
- Vehicular / plant lighting required for particular work tasks.
- Internal lighting associated with any temporary office units / welfare facilities in the construction compound(s).

6.8.31 There would be a curfew to ensure that no lighting would be kept switched on overnight aside from low level lighting (for security / safety purposes), which would be implemented along the perimeter of the Works area(s) as part of a presence detection type security system.

6.8.32 Measures to minimise light spill and glare would be adopted during the Works, including use of baffles / shields, directional lighting and advanced notice / prior notification of works that would require construction lighting in proximity to sensitive receptors and post-installation checks, to ensure that any temporary lighting is suitably controlled.

Materials Storage and Handling

6.8.33 Environmental issues would be considered in the procurement of raw materials and all such materials would be appropriately stored in order to minimise damage by vehicles, vandals, weather or theft.

6.8.34 Contractors and their subcontractors would be expected to maintain a tidy Site and where practical, to operate a 'just-in-time' policy for the delivery and supply of materials for the Works.

[7] Construction Industry Research and Information Association. Environmental good practice on-site guide 4th edition (C741) available at: https://www.ciria.org/ 2015.

6.8.35 Excavated materials would primarily be removed from Site as there would be limited opportunity to store this material on spoil heaps. The excavated material would be loaded into HGVs for transportation to nearby construction or disposal sites.

6.8.36 Tanks and drums of liquid chemicals and fuels would be stored in bunded compounds and, where feasible, packaging would be returned.

Waste Management and Minimisation

6.8.37 Potential waste would be generated during all stages of the Works. An indication of likely waste types and volumes associated with the Works are set out earlier in this Chapter.

6.8.38 The following measures would be investigated to facilitate the minimisation of waste generation:

- Agreements with material suppliers to reduce the amount of packaging, to use reusable packaging or to participate in a packaging take-back scheme.
- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which would increase the risk of their damage and disposal as waste.
- Attention to material quantity requirements, to avoid over-ordering and generation of waste materials.
- Re-use of materials wherever feasible.
- Segregation of waste at source where practical.
- Re-use and recycling of materials off-Site, where re-use on-Site is not practical (e.g. through use of an off-Site waste segregation facility and re-sale for direct re-use or re-processing).

6.8.39 In order to reduce potential risks throughout the construction works, the following waste management measures would also be implemented:

- Skips would be colour coded and signposted to reduce risk of cross contamination.
- Skips would be covered to prevent dust and debris blowing about the Site and immediate environment.
- Burning of waste or unwanted materials would not be permitted on-Site.
- All potentially hazardous materials would be properly sealed and securely stored when not used.
- Food waste from the welfare facilities on-Site would be suitably packaged and stored for collection by the authorities to reduce the risk of infestation by pests or vermin. In the unlikely event of there being a local infestation then the local environmental health officer would be consulted about the action to be taken.
- All hazardous materials, including chemicals, cleaning agents, solvents and solvent containing products would be properly sealed in sealed containers at the end of each day prior to storage in appropriately protected and bunded storage areas.

6.8.40 The movement of materials would adhere to the guidance set out in the 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'[8]. The destination of all waste or other materials removed during construction would be notified to the relevant authority by the Principal Contractor or relevant contractor for approval. Loads would only be deposited at authorised waste treatment and disposal sites. Deposition of waste would be in accordance with the requirements of legislation.

Contaminated Land

6.8.41 The Works would be carried out to prevent, contain or limit, as far as reasonably practicable, any adverse impacts arising from the presence of contaminated land or materials such as asbestos. A Site investigation would be undertaken to provide further information on potential contamination and for geotechnical design purposes.

6.8.42 Any contaminated ground encountered would be excavated, separated, stockpiled and removed off-Site, via an approved waste contractor under the Duty of Care Regulations to the level of contamination present and the waste classification determined from chemical analysis and Waste Acceptance Criteria testing as necessary, to ensure compliance with relevant legislation.

6.8.43 Key information on excavated and fill materials, which fall within the Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Code of Practice (version 2) would be registered with the CL:AIRE Register of Materials with the intention of linking up with other project partners and services providers to make the process quicker and easier to find 'homes' for reuse of the soil or fill materials.

6.8.44 Appropriate use of Personal Protective Equipment (PPE) would be enforced and implemented, in adherence to health and safety protocols, plans and procedures. Construction workers would be reminded to remain vigilant of ground conditions at all times and report to the Principal Contractor, any areas of potential contamination. Provision would be made for adequate facilities and procedures for personal washing and changing.

6.8.45 Oils and hydrocarbons would be stored in designated locations with specific measures to prevent leakage and release of their contents, including the siting of storage areas away from surface water drains, on impermeable bases with impermeable bunds that have no outflow and are of adequate capacity to contain 110% of the contents. Valves and trigger guns would be protected from vandalism and kept locked up when not in use.

6.8.46 The ground investigations would inform the Foundation Works Risk Assessment, which would define the appropriate piling methods and foundation design to mitigate risk.

6.8.47 The Works would be managed in accordance with the CIRIA guidance 'C532 - Control of Water Pollution from Construction Sites'[9] and the relevant Guidelines for Pollution Prevention (GPP)[10].

[8] Department for the Environment, Food and Rural Affairs. Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (online) Available at: https://www.gov.uk/ government/uploads/system/uploads/attachment_ data/file/ 69308/pb13298-code-of-practice-090910.pdf. 2009.

[9] Construction Industry Research and Information Association. Control of Water Pollution from Construction Sites. Guidance for consultants and contractors (C532) (online) Available at: https://www.ciria.org/ProductExcerpts/C532.aspx. 2001.

[10] Environment Agency. Pollution Prevention Advice and Guidelines. Withdrawn 2015.

Unexploded Ordnance (UXO)

6.8.48 The risk from UXO is considered to be moderate. It is recommended that a detailed UXO Threat Assessment Study is undertaken of the Site. Screening for UXO would be undertaken on behalf of the Principal Contractor. A watching brief for UXO would be maintained during excavation works.

Site Drainage

6.8.49 The Principal Contractor would ensure that potentially contaminated water is disposed of in accordance with the Water Resource Act (1991)[11] and other relevant legislation, and to the satisfaction of the Environment Agency and / or Thames Water.

6.8.50 Best practice pollution prevention measures would be put in place to isolate environmentally damaging substances and the prevention of their release into surface water or underground drainage systems. These would include:

- Careful siting and bunding of fuel storage facilities and any areas used for the storage of potentially hazardous materials.
- Works involving concrete would be carefully controlled.
- Management of Site drainage to prevent sediment laden / contaminated run-off entering the wider environment.
- Surface drainage would pass through settlement tanks and oil interception facilities where required and discharge arrangements would be agreed with Thames Water and RBG.
- Construction vehicle parking areas may need to be paved.
- Provision of safe disposal of wastewaters.

6.8.51 Procedures to be implemented in the instance of accidents and / or spillages would include the on-Site provision of equipment for containing spillages, such as emergency booms and chemicals to soak up spillages. In the unlikely and unplanned event of an incident occurring, the Environment Agency (EA) and Thames Water would be immediately contacted.

Water Use

6.8.52 All contractors would be required to investigate opportunities to minimise and reduce the use of water, such as:

- Implementation of staff-based initiatives such as turning off taps when not in use, both on-Site and within Site offices.
- Use of recycling water systems such as wheel washes.
- Use of a rainwater harvesting system, for use in equipment and vehicle washing, would also be investigated.

[11] HMSO. Water Resources Act 1991 (as amended). 1991.

6.8.53 Water consumption during the Works would be monitored, either through sub-metering or reading of utility bills, to allow comparison against best practice benchmarks and improvements to be made.

Energy Use

6.8.54 All relevant contractors would be required to investigate opportunities to minimise and reduce the use of energy, such as:

- Use of alternatives to diesel / petrol powered equipment where possible.
- The incorporation of sources of renewable energy, to offset the use of main utilities, would be considered.
- Selection and specification of energy efficient plant and equipment wherever viable.
- Implementation of staff-based initiatives such as turning off plant and equipment when not in use, both on-Site and within Site offices.

6.8.55 Energy consumption during the Works would be monitored, either through sub-metering or reading of utility bills, to allow comparison against best practice benchmarks and improvements to be made.

Archaeology

6.8.56 As outlined in the Archaeological Desk-Based Assessment submitted as part of the planning application, it is expected that further archaeological work will be necessary to confirm the presence or absence of archaeology and allow the design of an appropriate mitigation strategy to offset the anticipated adverse impact from the Development. However, as any archaeology at the Site is not expected to be more than of local significance, it is considered that any further archaeological work can be secured by a standard planning condition attached to consent. Any required archaeological work at the site should be undertaken by an approved archaeological contractor, following the compilation of a 'Written Scheme of Investigation' which has been approved in advance by RBG and their advisors at Historic England

6.9 Conclusions

6.9.1 The Works, subject to planning permission being granted, would commence in December 2024 and complete in December 2027. The year of opening and operation of the Development is taken to be 2027.

6.9.2 The Works would be managed via the CMP which is submitted alongside the planning application. The appointed Principal Contractor(s) for the Works would be obliged, via planning condition, to adhere to the CMP.

6.9.3 The above procedures would ensure the delivery of a high level of environmental control throughout the Works, thereby minimising the potential for adverse effects. Further detail regarding specific mitigation during the Works are presented within **ES Volume 1, Chapters 7** to **13** and **ES Volume 2: Townscape, Heritage and Visual Impact Assessment**.

7. Daylight, Sunlight and Overshadowing

7.1 Introduction

7.1.1 This Chapter has been prepared by CPMC Chartered Surveying Ltd in relation to the likely significant effects of the Proposed Development on the daylight and sunlight amenity of neighbouring receptor properties and relevant neighbouring external amenity spaces.

7.1.2 This Chapter is supported by further detailed information contained within:

- **Appendix 7.1:** - Vertical Sky Component, Daylight Distribution and external amenity results for the currently open site scenario.
- **Appendix 7.2:** Vertical Sky Component, Daylight Distribution and external amenity results for the extant scheme and Morden Wharf scenario.
- **Appendix 7.3:** Model views and window (test rectangles in the case of Morden Wharf), room and amenity references.

7.1.3 On the basis that the site has been cleared to make way for redevelopment in accordance with the extant Royal Borough of Greenwich planning permission 15/0973/FUL, the current open site represents a significant underdevelopment of this inner urban location. Therefore, the neighbouring receptors to the south enjoy uncharacteristically high levels of daylight and sunlight for an inner urban context such as the Greenwich peninsula. The results for an open and undeveloped site represent the worst case scenario. In the case of the Morden Wharf development (20/1730/O), this consent was designed with the expectation that the extant (15/0973/FUL) development would be in place,

7.2 Scope, Assessment Methodology and Significance Criteria

Scope of Assessment

7.2.1 The EIA Scoping Report was submitted to RBG on October 7th 2020 and RBG issued its formal EIA Scoping Opinion on 17th December 2020 (ES Volume 3, Appendix 2.3). EIA Scoping Opinion confirmed that Daylight, Sunlight and Overshadowing (effects associated with the completed and operational Development). The Scoping Opinion confirmed that the assessment should include an assessment of the potential impacts on future residents and open spaces within the proposed Morden Wharf scheme (ref. 20/1730/O) immediately to the north of the Site. This is in accordance with the EIA Scoping Opinion as outlined with **ES Volume 1, Chapter 2: EIA methodology**, construction effects have been scoped out of the assessment.

Guidance

7.2.2 The primary guidance used for assessing daylight and sunlight assessments is contained in the Building Research Establishment's (BRE) 'Site Layout Planning for Daylight and Sunlight – A guide to good practice' (the 'Bre Guide'[1]).

7.2.3 The BRE Guidelines are the industry recognised standard for assessing all matters related to daylight, sunlight and overshadowing, and are the primary reference within all national[2] and local policy[3]. The BRE Guidelines provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. The BRE Guidelines are intended for use by building designers, developers, consultants and Local Planning Authorities (LPAs). The advice presented in the BRE Guidelines is not mandatory and should not be used as an instrument of planning policy, the Guidelines state:

"*This guide is a comprehensive revision of the 2011 edition of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice. It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location."*

7.2.4 The BRE Guide also states[4]:

"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values… in an area with modern high-rise buildings, a higher degree of obstruction maybe unavoidable if new developments are to match the height and proportions of existing building"

7.2.5 The values in the BRE Guidelines are derived on the basis of a 2-3 storey suburban model, therefore the application of its guidelines in urban environments or regeneration areas should be treated flexibly. This is acknowledged within the BRE Guidelines, stating in paragraph 2.2.3:

"Note that the numerical values given here are purely advisory. Different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints."

7.2.6 Therefore, when determining whether changes in light conditions are in line with policy and guidance, it is

[1] Building Research Establishment (BRE) Guidelines: Site Layout Planning for Daylight and Sunlight 2022, A Guide to Good Practice, Third Edition, 2022

[2] Department for Communities and Local Government (DCLG), (2021). National Planning Policy Framework, 2021

[3] London Borough of Tower Hamlets (LBTH), 2020, Local Plan: Tower Hamlets Local Plan 2031: Managing Growth and Sharing Benefits, 2020.

[4] Paragraph 1.6.

important to consider other contextual matters, such as instances where the existing light levels within neighbouring properties are already low, or where the proposed residual values are commensurate with those that would be expected in urban areas of similar density. Furthermore, the daylight and sunlight impact of a development should be balanced against the improvements and benefits which the scheme will bring to the area.

Study Area

7.2.7 The BRE Guide focusses on residential properties, albeit other receptors, such as schools, hospitals and *some* commercial properties are identified therein. In this case the receptors are all residential, with the exception of potential nursery use in the lower levels of one property (Distel Apartments). The room uses that are most relevant to residential daylight and sunlight assessments are kitchens, living/dining rooms and bedrooms.

7.2.8 Additionally, in line with the BRE Guide, public and private amenity areas surrounding the Site which have the potential to be affected by the Proposed Development are considered within this Chapter.

7.2.9 In this case the study area was determined from a site visit and review of the relevant local authority planning information relating to the site and its surroundings. This review was undertaken for all surrounding properties in close enough proximity to the Site to be affected by the Proposed Development to identify any receptors that should be considered as potentially sensitive. The BRE Guidelines outline that if a new development, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal of the existing building, it may be adversely affected. As such, this suggestion is used to define the study area, which is refined (extended or reduced) using professional judgement. The sensitive receptors within the study area and therefore included in the assessment are shown in **Figure 7.1**.

Figure 7.1 – Assessed neighbouring receptors / properties

7.2.10 Based on the study scope review a three-dimensional (3D) model was then developed for the existing surrounding properties and the Approved Development buildings. No existing buildings have been modelled within the Site owing to its cleared status in the baseline condition.

Scenarios Assessed

7.2.11 Following the creation of the study area and the 3D model the following scenarios were considered and are reported on within this Chapter:

- The completed and operational Development.
- Cumulative scenario

Effects on Existing Receptors

7.2.12 This scenario represents the open and cleared condition as currently found on the Site.

Effects on Proposed / Consented Receptors

7.2.13 This scenario considers the impact that the proposal has on consented receptors. In this case the only relevant consent is found on the Morden Wharf site (20/1730/O) to the north of the Site. In this scenario, the extant consent on the Site is treated as baseline on the basis that this was used as the baseline in the Morden Wharf application.

Cumulative

The only scheme with the potential to act cumulatively with the proposed development on the identified existing receptors is the Morden Wharf scheme to the north of the Proposed Development.

Assessment Methodology & Significant Criteria

The Works

7.2.14 No technical analysis of the likely significant effects on the surrounding properties and amenity areas during the construction phase was undertaken due to the changing and evolving nature of the massing as the construction on site takes place. No assessment of the likely effects during the Works was undertaken as this was scoped out of the assessment (see paragraph 7.2 .1 above).

The Completed and Operational Maritime View Development

7.2.15 With regard to daylight assessment, the BRE Guide focusses on two methods of assessing the daylight impact that the completed and operation Development will have on relevant neighbouring receptors:

- Vertical Sky Component (VSC)

- Daylight Distribution (DD)[5]

Vertical Sky Component (VSC)

7.2.16 VSC is a 'spot' measure of the skylight reaching the mid-point of a window from an overcast sky. It represents the amount of visible sky that can be seen from that reference point, from over and around an obstruction in front of the window. That area of visible sky is expressed as a percentage of an unobstructed hemisphere of sky, and, therefore, represents the amount of daylight available for that particular window.

7.2.17 The 3D model uses Waldram Diagrams (used to calculate the percentage of sky that a building allows to the street below) to establish the VSC and 3D geometric calculations for daylight distribution.

7.2.18 Only those surrounding properties which have windows facing towards the Site were included in the assessment. If a nearby property has no windows facing the Site, these properties would not be affected by the Proposed Development in terms of light.

7.2.19 The assessment is calculated from the centre of a window on the outward face and measures the amount of light available on a vertical wall or window following the introduction of visible barriers, such as buildings.

7.2.20 The maximum VSC value is 39.9% for a completely unobstructed vertical wall or window. In terms of assessment criteria, the BRE Guidelines state[6]:

- *The VSC measured at the centre of an existing main window is less than 27%, and less than 0.8 times its former value.*

- *The area of the working plane in a room which can receive direct skylight is reduced to less than 0.8 times its former value."*

7.2.21 Where there is an existing consent the BRE Guide states that[7]:

"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[8]. 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 0.8 times the value for the permitted scheme as benchmarks.

5 Also known as the 'No Sky Line' (NSL).
6 Paragraph 2.2.23 of the BRE Guide.
7 Paragraph F5 of the BRE Guide.
8 Note that it is commonly accepted that it also appropriate for DD to also be reviewed in the same manner.

Daylight Distribution (DD)

7.2.22 The DD method is a measure of the distribution of daylight at the 'working plane' within a room. The 'working plane' is a horizontal plane 0.85 m above finished floor level for residential properties. The DD divides those areas of the working plane which can receive direct sky light from those which cannot. If a significant area of the working plane lies beyond the DD (i.e. it receives no direct sky light), then the distribution of daylight in the room may be poor and supplementary electric lighting may be required. The potential effects of daylighting distribution in an existing building can be found by plotting the DD in each of the main rooms. For houses, this would include living rooms, dining rooms and kitchens. Bedrooms should also be analysed, although they are less important. The BRE Guidelines identify that if the area of a room that does receive direct sky light is reduced to less than 0.8 times its former value, then this would be noticeable to its occupants.

7.2.23 In this case indicative layouts for the properties to the south of the Maritime View Limited site were obtained and used for the analysis. Because the Morden Wharf development (20/1730/O) is an outline consent, there are no floorplans. The assessment has therefore been carried out by dividing the façade into test rectangles corresponding with the approximate floor levels of the neighbouring buildings. Therefore, the DD test has not been carried out on the associated block massing at Morden Wharf.

7.2.24 The properties where indicatice plan information has been obtained (or site visits have provided an indication of the layout) include:

- Gooch House
- Morse Lodge
- Loop Court
- Tiggap House
- Trefoil House
- Ossel Court
- Bowline Court
- Distel Apartments
- Fiador Apartments
- Lariat Apartments

Sunlight

7.2.25 The BRE Guidelines specify one method for assessing sunlight within an existing sensitive receptor, Annual Probable Sunlight Hours (APSH). This method of sunlight assessment used for the Proposed Development assessment is described in further detail below.

7.2.26 The Annual Probable Sunlight Hours (APSH) is a measure of sunlight that a given window may expect over a year period, and where there is no obstruction. The BRE Guidelines recognise that sunlight is less important than daylight in the amenity of a room and is heavily influenced by orientation. North facing windows may receive

sunlight on only a handful of occasions in a year, and windows facing eastwards or westwards will only receive sunlight for some of the day. The BRE Guidelines states that only windows with an orientation within 90 degrees of south ought to be assessed. Therefore, in terms of sunlight, only windows facing within 90 degrees of due south are assessed for APSH as north facing windows will not receive direct sunlight.

7.2.27 The future baseline condition of both total/annual (APSH) and winter (WPSH) are assessed. The APSH and winter PSH have different BRE Guidelines criteria, as set out in Figure 7.1. For the assessment of the Proposed Development, the total APSH and winter PSH were reported separately, to provide a more detailed assessment reflecting the different sunlight conditions.

Overshadowing

7.2.28 The following methodologies are used to assess overshadowing:

- Transient Overshadowing (TOS)
- Sun Hours on Ground

7.2.29 Both TOS and Sun Hours on Ground assessments determine the extent of overshadowing on surrounding public and private amenity areas. TOS is initially used as a screening exercise to determine the approximate hours of the day an amenity area is cast in shadow in existing and proposed scenarios. Where significant effects are expected to occur on an amenity area with distinct boundaries, a Sun Hours on Ground assessment is undertaken to quantify any additional overshadowing owing to the proposed development.

Transient Overshadowing

7.2.30 The BRE Guidelines suggests that where large buildings are proposed that may affect open spaces, it is useful to plot a shadow plan to illustrate the location of shadows at different times of the day and year. For the purpose of this assessment the hourly shadows were on the spring equinox.

7.2.31 Transient overshadowing was calculated at hourly intervals from sunrise, throughout the day, until sunset.

Sun on the Ground

7.2.32 The BRE Guidelines suggest that 'sun hours on ground' assessment should be undertaken on the Equinox (21st March). Using specialist software, the path of the sun was tracked to determine where the sun would reach the ground and where it would not on the equinox.

7.2.33 It is recommended that at least half of an amenity area should receive at least 2 hours of sunlight on March 21st or the area which receives 2 hours of direct sunlight should not be reduced to less than 0.8 times its former value (i.e. there should be no more than a 20% reduction).

7.2.34 The criteria set out within the BRE Guidelines for daylight, sunlight and overshadowing summarised in **Figure 7.2** are used as guidance for the assessments. Numerical analysis and professional judgement have also been used to determine the scale and nature of the likely effects.

Figure 7.2 – Summary of the BRE Guidelines Criteria for Daylight, Sunlight & Overshadowing

Topic	Method	BRE Guidelines Criteria
Daylight	Vertical Sky Component (VSC)	A window may be adversely affected if the VSC measured at the centre of the window is less than 27% and less than 0.8 times its former value.
	Daylight Distribution (DD)	A room may be adversely affected if the daylight distribution (also known as the 'no sky line') is reduced beyond 0.8 times its existing area.
Sunlight	Annual Probable Sunlight Hours (APSH)	A room may be adversely affected if a point at the centre of its window(s) receives for the whole year, less than 25% of the APSH including at least 5% of the PSH during the winter months (21st September to 21st March) and less than 0.8 times its former sunlight hours during either period, and (for existing neighbouring buildings), if there is a reduction in APSH which is greater than 4%.
Overshadowing	Transient Overshadowing and Sun Hours on Ground	An area of amenity space or garden may be adversely affected if less than half (50%) of the area is prevented by buildings from receiving two hours of sunlight on the 21st March (as suggested by the BRE Guidelines[9]) and the area which can receive some sun on the 21st March is less than 0.8 times its former value.

[9] Building Research Establishment (BRE) Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition, 2011

Significant Criteria

7.2.35 In terms of sensitivity, in accordance with the BRE Guidelines, surrounding residential properties are considered highly sensitive to daylight and sunlight levels, and specifically habitable rooms within the properties such as living rooms, kitchens and bedrooms. All existing and consented residential receptors included within this assessment are considered highly sensitive due to the expectation of natural light and given equal weighting, although it should be noted consented residential buildings are not yet present and may come forward in a different form.

7.2.36 For overshadowing, all public and private areas of open space such as parks, squares and communal gardens in proximity to the Site are considered highly sensitive and are considered within the assessment.

7.2.37 The key terminology used to describe the magnitude of effects within this chapter is as follows and is further described in the below sections of this chapter:

7.2.38 If an effect was judged as negative, then the resulting effect was described as being adverse.

- Major
- Moderate
- Minor
- Insignificant*

*The BRE Guide refers to the term negligible, however in order to remain consistent with the rest of the ES, the term insignificant was used.

Evaluating the Significant of Effects – Daylight & Sunlight

7.2.39 For daylight and sunlight, the BRE Guidelines outline the approach within the accompanying Appendix H, in terms of assigning criteria to assess the effects:

"Adverse impacts occur when there is a significant decrease in the amount of skylight [...] reaching an existing building where it is required [...]. The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied."

7.2.40 Paragraph 5 of Appendix H states:

"Where the loss of skylight [...] fully meets the guidelines, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows [...] lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines and a larger number of windows [...] are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight [...] in the affected building [...]."

7.2.41 Paragraph 6 of Appendix H states:

"Where the loss of skylight [...] does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse."

7.2.42 The classification of minor adverse is documented within Appendix 1, Paragraph 6 of the BRE Guidelines:

"Factors tending towards a minor adverse impact include:

- *Only a small number of windows [...] are affected*
- *The loss of light is only marginally outside the guidelines;*
- *An affected room has other sources of skylight [...]; and/or*
- *The affected building [...] has a low level of requirement for skylight [...]."*

7.2.43 The classification of major adverse is documented within Appendix I, Paragraph 7 of the BRE Guidelines:

"Factors tending towards a major adverse impact include:

- *A large number of windows [...] are affected;*
- *The loss of light is substantially outside the guidelines;*
- *All the windows in a particular property are affected; and*
- *The affected indoor [...] spaces have a particular strong requirement for skylight [...], e.g. a living room in a dwelling [...]."*

7.2.44 There are no set criteria for assessing beneficial impacts, but the BRE Guide states at paragraph H8 that:

"Beneficial impacts occur when there is a significant increase in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space. Beneficial impacts should be worked out using the same principles as adverse impacts. Thus a tiny increase in light would be classified as a negligible impact, not a minor beneficial impact."

10.1.1 Where the BRE Guidelines are met, the effects would be considered insignificant.

7.2.45 The initial numerical criteria for determining the significance of effect for VSC, NSL and APSH is generally based on percentage alterations and it is commonly accepted among practitioners that the effects referenced in **Figure 7.3** correspond to insignificant, minor, moderate and major.

Figure 7.3 – Summary of VSC, NSL & APSH Significant Criteria

Effect	Criteria
Insignificant *.	Where results show compliance with the BRE Guidelines criteria, the effect is considered to be insignificant since the BRE Guidelines indicate that the occupants are unlikely to experience any noticeable change to their daylight and sunlight amenity levels. **Equivalent to alterations less than 20% from the relevant baseline conditions.**
Minor	An alteration from the relevant baseline conditions that may be marginally noticeable to the occupant. This may include a number of marginal infringements (adverse) or marginal improvements (beneficial) of the numerical levels suggested in the BRE Guidelines which should be viewed in context. **Equivalent to alterations between 20 to 29.9% from the relevant baseline conditions**.
Moderate	An alteration from the relevant baseline conditions that may cause a moderate noticeable change to the occupant. This may consist of a large proportion of marginal infringements (adverse) or marginal improvements (beneficial) of the numerical values suggested in the BRE Guidelines and / or a small percentage of significant infringements. **Equivalent to alterations between 30 to 39.9% from the relevant baseline conditions.**
Major	An alteration from the relevant baseline conditions that may cause a major noticeable change to the occupant. This would consist of a large proportion of significant infringements (adverse) or significant improvements (beneficial) of the numerical values suggested within the 2022 BRE Guidelines. **Equivalent to alterations greater than 40% from the relevant baseline conditions**

* BRE guidance refers to *Negligible* effects. To remain consistent with the EIA approach, the terms used is *Insignificant*.

7.2.46 In addition to the thresholds set out within **Figure 7.3** if the retained VSC levels are ≥27% and the NSL levels are >80%, the effects are considered insignificant, regardless of the alteration. Similarly, if the retained total APSH levels are ≥25% with at least 5% of this occurring in the winter months, the effects are considered insignificant, regardless of the alteration.

7.2.47 Additionally, it is acknowledged that the values in the BRE Guide are derived on the basis of a 2-3 storey suburban model. Paragraph 2.2.3 of the BRE Guide notes that "*The numerical values given here are purely advisory. Different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints.*" Therefore, the application of the BRE Guide should be treated flexibly, particularly in an inner urban location.

7.2.48 In more urban environments large factor reductions are difficult to avoid and, as such, weight should also be given to the retained values rather than just the percentage change whereby a realistic VSC level in a dense urban

environment could be considered to be locally lower than 10 percent. This is particularly the case when windows are located under existing restrictions or within 'canyons' created by existing buildings.

7.2.49 Detailed matters such as window size, room use, room size, window number or dual aspect rooms are also taken into account when assigning an overall significance per property, as well as the percentage alterations, absolute changes, and any other relevant factors. For example, there may be mitigating factors such as balconies, overhangs or design features which may also affect the determination of assigning the criteria.

7.2.50 For instances where existing VSC, NSL and APSH levels within a property are low, any alteration may result in a disproportionate percentage change, whereby the actual change in daylight or sunlight within the property experienced by the occupant may not be as noticeable as the percentage change would suggest. This is another example of when professional judgement is taken into account.

7.2.51 Where the scale of VSC levels and NSL levels within a property differ, professional judgement was also applied to determine an overall significance of effect. In addition, if the scale of APSH and Winter (WPSH) differ greatly, professional judgement has also been used to determine the significance of the effect.

Evaluating the Significance of Effects - Overshadowing

7.2.52 The BRE Guide does not include criteria for the scale and nature of effects and subsequent significance of transient overshadowing other than to identify the different times of the day and year when shadow would be cast over a surrounding area.

7.2.53 The assessment of likely effects as a result of transient overshadowing is therefore based on professional judgement, taking into consideration the conditions of the existing Site and surrounding area, and comparing these conditions against the effect of the transient overshadowing arising from the proposed massing.

7.2.54 It is suggested in the BRE Guidelines that for an area to appear adequately sunlit throughout the year, at least half (50%) of any assessment area should see direct sunlight for at least two hours on the 21st March. If, as a result of new built form, an existing assessment area will not meet the BRE Guidelines and the area which can receive two hours of direct sunlight on 21st March is reduced to less than 0.8 times its former area, then the loss of sunlight is likely to be noticeable. A quantitative (sun hours on ground) assessment has been undertaken for amenity areas with distinct boundaries. The sun hours on ground criteria is outlined in **Figure 7.4.**

Figure 7.4 – Summary of Overshadowing Significance Criteria

Effect	Criteria
Insignificant *.	Over 50% of the amenity area will receive 2 hours of sunlight or less than 20% alteration in area which receives 2 hours of direct sunlight.
Minor	20-29.9% reduction or increase in the area which receives 2 hours of direct sunlight (and below 50% retained area).

Effect	Criteria
Moderate	30-39.9 % change in the area which receives 2 hours of direct sunlight (and below 50 % retained area) when compared to the relevant baseline conditions.
Major	≥ 40% reduction or increase in the area which receives 2 hours of direct sunlight (and below 50% retained area).

Assumptions & Limitations

10.1.2 Where actual room layouts were available, these have been considered when modelling the internal layouts of surrounding properties. Where layout information was not available, or it is suspected that the as built construction may differ for existing neighbouring buildings, assumptions have been made as to the use and internal configuration of the rooms (from external observations).

10.1.3 Where levels have been assumed for surrounding properties where access has not been obtained. With the working plane located 850mm above the finished floor level, this has the potential to affect the assessment of DD. As there is no detailed design available for the Morden Wharf proposals at this time the assessment approach used is consistent with that used in relation to that scheme to determine the daylight and sunlight effects as a result of the extant Enderby Wharf permission.

7.3 Relevant Baseline Conditions

7.3.1 The existing baseline condition for the properties to the south for this assessment is based on a cleared Site and without the Morden Wharf development in place. Whilst there is an existing extant permission on the site, which is a material consideration in this case, for baseline EIA purposes the open Site, with no development in place, or the inclusion of Morden Wharf to the north, has been adopted.

7.3.2 For the Morden Wharf development (20/1730/O) site to the north of the Site is not yet built out and no reserved matters applications have been submitted in relation to the extant permission in relation to the parts of the permitted development located closest to the Site. The site therefore comprises a largely cleared site used for the storage of materials and a small number of vehicles. However, for assessment purposes a future baseline scenario has been assessed which assumes the presence of the Morden Wharf development so that effects on it of the changed scale of development on the Site can be determined.

7.4 Likely Effects of the Development and their Significance

The Works

7.4.1 The magnitude of impact and resultant potential effect in relation to the daylight, sunlight and overshadowing on the surrounding receptors would vary throughout the construction phase, depending on the level of obstruction caused.

7.4.2 During the Works, a number of tall cranes are likely to be present on Site, however their size and temporary presence would lead to generally imperceptible effects of a temporary nature. Given the cleared nature of the existing Site, the effects to daylight, sunlight, and overshadowing at receptors surrounding the Site would range from **insignificant**, to those reported in the Completed and Operational section of this Chapter. For this reason an analysis of the construction phase of the development has been scoped out of the assessment through the EIA scoping process reported in Chapter 2.

The Completed and Operational Development

7.5 This assessment is based on the current open and cleared Site without any relevant extant and unconstructed planning consents. However, there is an extant scheme relating to the Site (15/0973/FUL) which is a material consideration and therefore the difference between the extant scheme and the Proposed Development has also been considered along with the inclusion of the consented Morden Wharf permission massing (20/1730/O). This is effectively the cumulative scenario on the basis that the residual light levels for the proposed development represent a worst case scenario.

7.5.1 The full daylight assessment for the currently open site without Morden Wharf in place can be found at Appendix **7.1** and is summarised in **Figures 7.6. – 7.7.**

7.5.2 In this scenario 1341 windows have been assessed serving 794 rooms. The VSC results show that 61 percent (824) of the windows will meet the BRE Guide criteria. The DD results shown that 83 percent (658) of the neighbouring rooms will also meet the BRE Guide criteria.

7.5.3 Of the 300 neighbouring windows that require assessment for APSH, all windows meet the BRE criteria.

7.5.4 Of the three amenity areas assessed all areas meet the BRE Guide criteria.

7.5.5 The summary tables for the nine properties that have been assessed are shown in **Figures 7.6 – 7.8**. These effect on these properties is discussed further beneath these figures.

Figure 7.5 – VSC summary table

Property	Number of Windows Tested	Windows that meet BRE Guidelines		Windows that experience gains beyond the consented baseline		VSC Windows No. of Windows Experiencing Adverse Impacts		
		No.	%	No.	%	20-29.99% loss (minor)	30-39.99% loss (moderate)	>40% loss (Major)
Gooch House	131	100	76%	0	0	11	6	14
Morse Lodge	107	47	44%	0	0	8	12	40
Loop Court	257	119	46%	0	0	31	51	56
Tiggap House	68	49	72%	0	0	9	6	4
Trefoil House	12	3	25%	0	0	0	4	5
Ossel Court	216	98	45%	0	0	19	20	79
Bowline Court	129	111	86%	0	0	2	9	7
Distel Apartments	296	203	69%	0	0	10	21	62
Fiador Apartments	46	46	100%	0	0	0	0	0
Lariat Apartments	79	48	61%	0	0	7	9	15
Total	**1341**	**824**	**61%**	**0**	**0%**	**97**	**138**	**282**

Figure 7.6 – DD summary table

Property	Number of Rooms Tested	Rooms that meet BRE Guidelines		Rooms that experience gains beyond the consented baseline		DD Rooms No. of Rooms Experiencing Adverse Impacts		
		No.	%	No.	%	20-29.99% loss (minor)	30-39.99% loss (moderate)	>40% loss (Major)
Gooch House	84	77	92%	0	0	3	1	3
Morse Lodge	75	39	52%	0	0	10	9	17
Loop Court	151	137	91%	0	0	8	0	4
Tiggap House	24	22	92%	0	0	2	0	0
Trefoil House	7	0	0%	0	0	1	5	1
Ossel Court	110	70	64%	0	0	3	11	26
Bowline Court	103	94	91%	0	0	6	0	3
Distel Apartments	165	151	92%	0	0	9	2	3
Fiador Apartments	41	41	100%	0	0	0	0	0
Lariat Apartments	34	27	79%	0	0	6	1	0
Total	**794**	**658**	**83%**	**0**	**0%**	**48**	**29**	**57**

Figure 7.7 – APSH summary table

Property	Number of Windows Tested	Annual					Winter				
		Windows that meet BRE Guidelines		No. of Windows Experiencing Adverse Impacts	Windows that experience gains beyond the consented baseline		Windows that meet BRE Guidelines		No. of Windows Experiencing Adverse Impacts	Windows that experience gains beyond the consented baseline	
		No.	%		No.	%	No.	%		No.	%
Morse Lodge	8	8	100%	0	0	0%	8	100%	0	0	0%
Loop Court	20	20	100%	0	0	0%	20	100%	0	0	0%
Tiggap House	22	22	100%	0	0	0%	22	100%	0	0	0%
Trefoil House	3	3	100%	0	0	0%	3	100%	0	0	0%
Ossel Court	75	75	100%	0	0	0%	75	100%	0	0	0%
Bowline Court	1	1	100%	0	0	0%	1	100%	0	0	0%
Distel Apartments	131	131	100%	0	0	0%	131	100%	0	0	0%
Fiador Apartments	22	22	100%	0	0	0%	22	100%	0	0	0%
Lariat Apartments	18	17	94%	0	0	0%	17	94%	0	0	0%
Total	**300**	**299**	**100%**	**0**	**0**	**0%**	**299**	**100%**	**0**	**0**	**0%**

Gooch House

7.5.6 The location of all assessed properties can be found in **Figure 7.1**.

7.5.7 The assessment of this building included 131 windows and 84 rooms.

7.5.8 76 percent of the windows (100) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the 31 affected windows, 11 will experience a minor adverse effect, 6 will experience a moderate effect and 14 will experience a major effect.

7.5.9 Of the 14 most significant relative reductions, six of the windows have an existing baseline VSC less than 5 percent and 12 of the windows have a baseline VSC of less than 12 percent. This means they are sensitive to new neighbouring massing, and small reduction n the VSC metric can result in disproportionate relative differences. Ten of the more significant window impacts also serve rooms served by windows which comfortably comply. The same is true of the moderate impacts, with most of the associated rooms also being served by well performing windows.

7.5.10 There are 7 DD BRE Guide transgressions caused to Gooch House, of which 3 are considered to be substantial and 1 is considered to be moderate. The more significant reductions are found within rooms that have a baseline of c.30-33 percent, which means the spaces are relatively sensitive to new massing.

7.5.11 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.12 Overall, the number of BRE Guide transgressions is low but of locally minor to moderate scale and therefore occupants are considered to experience **direct, long-term** and local effects of **moderate** to **Major adverse significance**.

Morse Lodge

7.5.13 The assessment of this building included 107 windows and 84 rooms.

7.5.14 Forty-four percent of the tested windows (47) meet the BRE Guide VSC criteria and are therefore considered to experience an adverse effect. Of the tested windows 8 experience minor adverse losses, 12 experience moderate losses, and 40 receive major losses.

7.5.15 Of the 75 tested rooms 52 percent (39 rooms) meet the BRE Guide DD criteria. Of the tested rooms 10 experience minor adverse losses, 9 experience moderate losses, and 17 experience major losses.

7.5.16 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.17 Albeit mitigation applies in this case owing to the number and nature of BRE Guide transgressions occupants are considered to experience **direct, long-term** and local effects of **major adverse significance**.

Loop Court

7.5.18 The assessment of this building included 257 windows and 75 rooms.

7.5.19 Forty-six percent of the windows (119) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the tested windows 31 experience minor adverse losses, 12 experience moderate losses, and 56 receive major losses.

7.5.20 Of the 151 tested rooms 91 percent (137 rooms) meet the BRE Guide DD criteria. Of the tested rooms 8 experience minor adverse losses and 4 experience major losses. Significantly more rooms meet the BRE DD criteria than the individual windows meet the VSC. This is because there are a high number of rooms which are served by more than one aperture. This provides an opportunity for light distribution within rooms to remain relatively unaffected with the development on the Site in place.

7.5.21 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.22 Albeit mitigation applies in this case, owing to the number and nature of BRE Guide transgressions occupants are considered to experience **direct, long-term** and local effects of **moderate** to **major adverse significance**.

Tiggap House

7.5.23 The assessment of this building included 68 windows and 24 rooms.

7.5.24 Seventy-two percent of the windows (49) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the tested windows 9 experience minor adverse losses, 6 experience moderate losses, and 4 receive major losses. However, the VSC losses are between c.2-3 percent o the VSC metric, which is unlikely to perceptible to occupiers.

7.5.25 Of the 24 tested rooms 92 percent (22 rooms) meet the BRE Guide DD criteria. Of the tested rooms 2 experience minor adverse losses. These losses are only 0.01 below the BRE Guide compliance threshold and whilst technical a minor adverse impact, the impact is very close to being insignificant.

7.5.26 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.27 The effect is considered to be **insignificant**.

Trefoil House

7.5.28 The assessment of this building included 12 windows and 7 rooms.

7.5.29 Twenty-Five percent of the windows (3) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the tested windows 4 experience moderate losses, and 5 receive major losses.

This property is a low level building found between Ossel and Loop Court. It is therefore found within a 'canyon' between buildings, making it more susceptible to massing on the Site. Furthermore, the window baseline VSC levels are below 12 percent in all cases accept one, which is just over 13 percent. This also means that the property is sensitive to additional massing.

7.5.30 Of the 7 tested rooms none of them meet the BRE Guide DD criteria. Of the tested rooms 1 experience minor adverse losses, 5 experience moderate losses, and 1 experience major losses. It may be that not all of the tested rooms are habitable spaces on the basis that they have small windows appear to be entrance areas, and it is important to note the mitigation referenced above, which significantly increases this property to relatively distant neighbouring mass on the Site.

7.5.31 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.32 Albeit mitigation applies in this case, occupants are considered to experience **direct, long-term** and local effects of **major** adverse **significance**.

Ossel Court

7.5.33 The assessment of this building included 216 windows and 110 rooms.

7.5.34 Forty-five percent of the windows (98) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the tested windows 19 experience minor adverse losses, 20 experience moderate losses, and 7 receive major losses. Thirty of the adversely affected windows have a baseline VSC of c.12 percent or less, which significantly increases their susceptibility to additional neighbouring massing.

7.5.35 Of the 110 tested rooms 64 percent (70 rooms) meet the BRE Guide DD criteria. Of the tested rooms 3 experience minor adverse losses, 11 experience moderate losses, and 26 experience major losses.

7.5.36 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.37 Albeit mitigation applies in this case, occupants are considered to experience **direct, long-term** and local effects of **major** adverse **significance**.

Bowline Court

7.5.38 The assessment of this building included 129 windows and 103 rooms.

7.5.39 Eighty-six percent of the windows (111) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the tested windows 2 experience minor adverse losses, 9 experience moderate losses, and 7 receive major losses. Of the 18 impacted windows 14 of them see VSC metric reductions of c.3 percent, which is unlikely to be perceptible.

7.5.40 Of the 103 tested rooms 91 percent (94 rooms) meet the BRE Guide DD criteria. Of the tested room 6 experience minor adverse losses and 3 experience major losses. In the case of the major losses, 2 of the rooms have a baseline of less than 5 percent due to existing obstructions.

7.5.41 Albeit mitigation applies therefore occupants are considered to experience **direct, long-term** and local effects of **moderate** to **major** adverse **significance**.

Distel Apartments

7.5.42 The assessment of this building included 296 windows and 165 rooms.

7.5.43 Sixty-nine percent of the windows (203) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the tested windows 10 experience minor adverse losses, 21 experience moderate losses, and 62 receive major losses.

7.5.44 Of the 165 tested rooms 92 percent (151 rooms) meet the BRE Guide DD criteria. Of the tested rooms 9 experience minor adverse losses, 2 experience moderate losses, and 3 experience major losses. Of the major adverse reductions 2 of the rooms retain over 50 percent DD, which is reasonable for an inner urban location, and the other room retains 34 percent DD, which is considered to be acceptable/typical for a localised impact.

7.5.45 Albeit mitigation applies in this case, occupants are considered to experience **direct, long-term** and local effects of **moderate** to **major** adverse **significance**.

Fiador Apartments

7.5.46 The assessment of this building included 46 windows and 41 rooms.

7.5.47 All tested windows meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect.

7.5.48 All 41 tested rooms meet the BRE Guide DD criteria.

7.5.49 The effect is considered to be **insignificant**.

Lariat Apartments

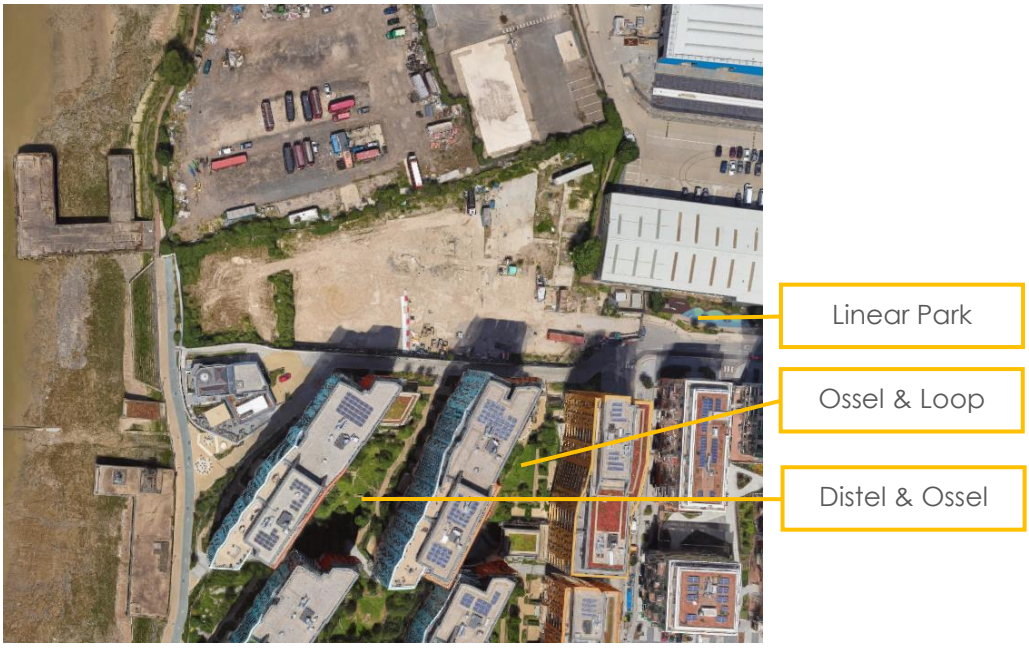
7.5.50 The assessment of this building included 79 windows and 34 rooms.

7.5.51 Albeit mitigation applies in this case, occupants are considered to experience **direct, long-term** and local effects of **moderate** to **major** adverse **significance**.

Overshadowing

7.5.52 Because the amenity spaces occupy spaces between receptors and in the wider area, transient overshadowing and sun on the ground has been separately considered for the receptors shown in Figure 7.8.

Figure 7.8 – Transient Overshadowing & sun on the ground assessment



7.5.53 The results of the assessment show that there will be no adverse effects on these spaces and therefore the impact is classed as **insignificant**.

Extant Permission & Morden Wharf Scenario

Gooch House

7.5.54 The location of all assessed properties can be found in **Figure 7.1**.

Morse Lodge

7.5.55 The assessment of this building included 107 windows and 84 rooms.

7.5.56 Forty-four percent of the tested windows (47) meet the BRE Guide VSC criteria and are therefore considered to experience an adverse effect. Of the tested windows 8 experience minor adverse losses, 12 experience moderate losses, and 40 receive major losses.

7.5.57 Of the 75 tested rooms 52 percent (39 rooms) meet the BRE Guide DD criteria. Of the tested rooms 10 experience minor adverse losses, 9 experience moderate losses, and 17 experience major losses.

7.5.58 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.59 Albeit mitigation applies in this case owing to the number and nature of BRE Guide transgressions occupants are considered to experience **direct, long-term** and local effects of **major adverse significance**.

Loop Court

7.5.60 The assessment of this building included 257 windows and 75 rooms.

7.5.61 Forty-six percent of the windows (119) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the tested windows 31 experience minor adverse losses, 12 experience moderate losses, and 56 receive major losses.

7.5.62 Of the 151 tested rooms 91 percent (137 rooms) meet the BRE Guide DD criteria. Of the tested rooms 8 experience minor adverse losses and 4 experience major losses. Significantly more rooms meet the BRE DD criteria than the individual windows meet the VSC. This is because there are a high number of rooms which are served by more than one aperture. This provides an opportunity for light distribution within rooms to remain relatively unaffected with the development on the Site in place.

7.5.63 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.64 Albeit mitigation applies in this case, owing to the number and nature of BRE Guide transgressions occupants are considered to experience **direct, long-term** and local effects of **moderate** to **major adverse significance**.

Tiggap House

7.5.65 The assessment of this building included 68 windows and 24 rooms.

7.5.66 Seventy-two percent of the windows (49) meet the BRE Guide VSC criteria and are therefore not considered to experience an adverse effect. Of the tested windows 9 experience minor adverse losses, 6 experience moderate losses, and 4 receive major losses. However, the VSC losses are between c.2-3 percent of the VSC metric, which is unlikely to perceptible to occupiers.

7.5.67 Of the 24 tested rooms 92 percent (22 rooms) meet the BRE Guide DD criteria. Of the tested rooms 2 experience minor adverse losses. These losses are only 0.01 below the BRE Guide compliance threshold and whilst technical a minor adverse impact, the impact is very close to being insignificant.

7.5.68 The more significantly impacted rooms and windows either looks towards the currently uncharacteristically Site or are impacted by existing restrictions.

7.5.69 The effect is considered to be **insignificant**.

7.5.70 Trefoil House

7.5.71 The assessment of this building included 68 windows and 24 rooms.

7.5.72 **Ossel Court**

7.5.73 The assessment of this building included 216 windows and 110 rooms.

Bowline Court

7.5.74 The assessment of this building included 129 windows and 103 rooms.

Distel Apartments

7.5.75 The assessment of this building included 296 windows and 165 rooms.

Fiador Apartments

7.5.76 The assessment of this building included 46 windows and 41 rooms.

Lariat Apartments

7.5.77 The assessment of this building included 79 windows and 34 rooms.

Morden Wharf

7.5.78 The assessment of these blocks considers a total of 575 test rectangles approximating with the floor levels found within the Morden Wharf scheme (20/1730/O).

7.6 Additional Mitigation / Enhancement and Likely Residual Effects of the Development and their Significance

The Completed and Operational Development

7.6.1 No further mitigation can be proposed on the basis that the effects are inherent to the massing of the Proposed Development. As such the effects will remain as those reported above.

7.7 Likely Residual Cumulative Effects and their Significance

7.7.1 The assessment reported above is inherently cumulative. As such the effects remain as those reported above.

7.8 Conclusions

The Completed & Operational Development

7.8.1 The analysis associated with this Chapter considers 10 receptors to the south of the Site and 4 blocks at the Morden Wharf site found to the north of the Site.

7.8.2 The open site scenario represents a significant underdevelopment of the site, with very little obstruction found to the north of the residential receptors located to the south of the Site. The impacts range from insignificant to major.

7.8.3 The combined extant permission and Morden Wharf compared with the Proposed Development effectively the cumulative scenario on the basis that the residual light levels for the proposed development represent a wort case scenario.

8. Wind Microclimate

8.1 Introduction

8.1.1 This chapter of the ES assesses the likely significant effects of the Development on the environment within and around the Site in respect of Wind Microclimate. Consideration is given to likely significant effects of wind upon pedestrian comfort as well as the potential for exceedances of the safety criteria.

8.1.2 This Chapter provides a description of the methods used in the assessment. This is followed by a description of the relevant baseline conditions of the Site and surrounding area, together with an assessment of the likely effects of the Development once completed and operational. The significance of such effects is highlighted.

8.1.3 Where appropriate, additional mitigation measures are identified to avoid, reduce or offset any likely significant adverse effects. Taking account of the additional mitigation measures, the nature and significance of the likely residual effects are described. The cumulative local wind microclimate effects of the Development and other relevant Cumulative Schemes are also considered.

8.1.4 This chapter has been prepared by Architectural Aerodynamics Ltd. (ArcAero), a leading wind microclimate consultant with experience of Environmental Impact Assessment (EIA). This Chapter is supported by further detailed information contained within **Appendix 8.1**: Wind Microclimate Assessment (report 0540123rep1v1).

8.2 Assessment Methodology and Significance Criteria

Assessment Methodology

Overview

8.2.1 The microclimate of any development is the distinctive climate of a small-scale area. The weather variables in a microclimate, such as wind, may be different to the conditions prevailing over the area as a whole. The assessment considers the study area to comprise the Site plus buildings and spaces within a radius of 450 metres from the centre of the Site. For a development of this scale, this allows for approximately 450 metres of the surrounding area to be modelled, including relevant cumulative schemes.

8.2.2 This assessment considers the wind conditions that would result upon the introduction of the Development into the study area. This assessment further considers the impact following the introduction of cumulative schemes within the surrounding area.

8.2.3 The cumulative schemes included within the assessment are:

- Morden Wharf (20/1730/O)

- Travelodge Boord Street (19/0939/F)
- Unit 2 & 7 Peterboat Close (22/1026/F)

8.2.4 Cumulative schemes such as the Bus Garage (23/1161/F) and Wheel Washing Facility (19/3298/F) are within the study area. These comprise tweaks to uses with no alterations to the massing, so will have a negligible effect on the wind microclimate of the study area. As such, they have been scoped-out of the cumulative assessment.

8.2.5 Other developments, the closest of which being Victoria Deep Water Terminal at 900 metres from the Site, are sufficiently far from the Development that potential cumulative effects will be negligible and do not warrant consideration within the assessment.

8.2.6 The assessment predicts the proportion of time an area will experience wind speeds in excess of threshold values for safety as well as a series of typical activities such as walking, waiting and outdoor sitting. It can therefore be shown within the various parts of a new development proposal and the adjacent developments, whether wind conditions are suitable or unsuitable, and whether design adjustment or mitigation measures are required.

Computational Fluid Dynamics and Wind Tunnel Testing

8.2.7 Preliminary Computational Fluid Dynamics (CFD) studies were carried out to guide the Wind Tunnel Testing. The CFD modelling employed a steady-state RANS approach. This method employs turbulence models to approximate the magnitude of velocity fluctuations about the average wind speeds predicted, in order to derive an estimation of the effect of gusts.

8.2.8 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[1] 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.

8.2.9 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.

[1] Lawson, T.V. The determination of the wind environment of a building complex before construction. Bristol : University of Bristol, Department of Aeronautical Engineering, 1990..

8.2.10 A 1:300 scale model of the existing buildings within a 450 metre radius of the centre of the Site was constructed. The building proposals that comprise the Development and relevant cumulative schemes were also constructed, and the following scenarios were modelled in the wind tunnel:

a) Baseline conditions (the Site in the existing context).
b) Development (without landscaping measures) within the context of existing surrounding conditions.
c) Development (with landscaping measures) within the context of existing surrounding conditions.
d) Development (with landscaping measures) within the context of cumulative surrounding conditions (existing surrounding conditions plus cumulative schemes).

8.2.11 Detailed results for the Development without soft landscaping can be found within **Appendix 8.1**, the others are presented herein.

8.2.12 The model was installed in an atmospheric boundary layer wind tunnel on an automated turntable. Measurements were taken for 16 wind directions, in increments of 22.5°, from 0° round to 337.5°.

8.2.13 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. This procedure is set out in detail in **Appendix 8.1**.

8.2.14 Wind speed measurements at assessment locations were made using probes capable of measuring fluctuating pressure differences that are calibrated against wind speed. A system of probes running simultaneously was used to obtain results from 157 locations, 122 located at the ground level and 35 located throughout balconies and other elevated spaces.

8.2.15 For each location, the measured wind speeds were combined with long-term wind frequency statistics to assess the potential effects of the Development on the local wind conditions in terms of the probability of local wind speeds exceeding comfort and safety thresholds considered suitable for a range of common pedestrian activities, based on the industry standard Lawson criteria..

Site Wind Climate

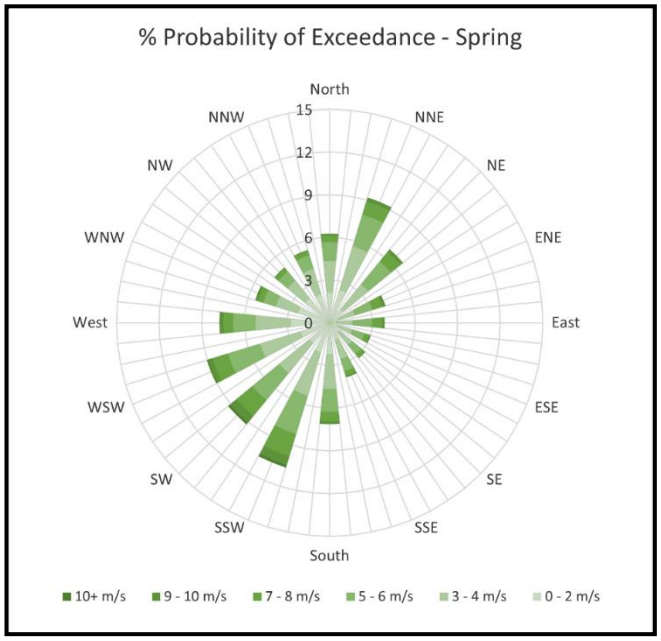
8.2.16 Wind environment studies require that wind speed data obtained from a measurement station be transposed to the site of interest. The measurement station of choice for the assessment is that at Heathrow Airport, London.

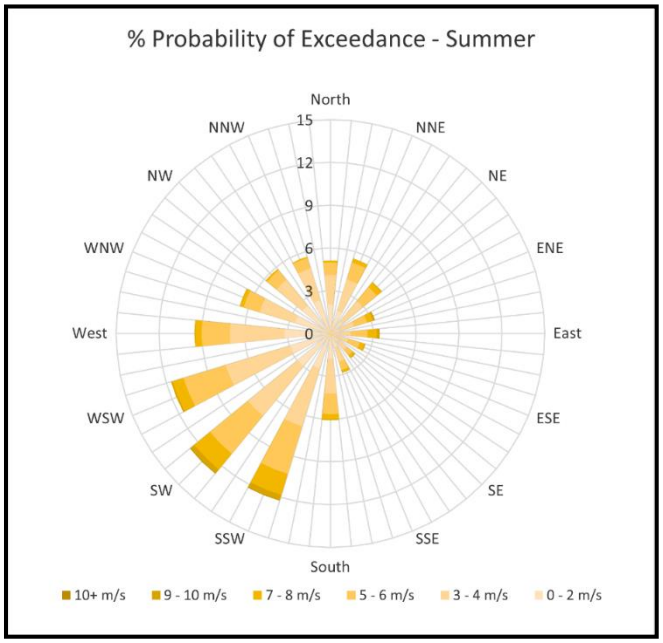
8.2.17 The wind speed history, provided by weather organisations such as the UK Met Office or the National Oceanic & Atmospheric Administration, is reformatted into the number of observations of wind speeds within each of several

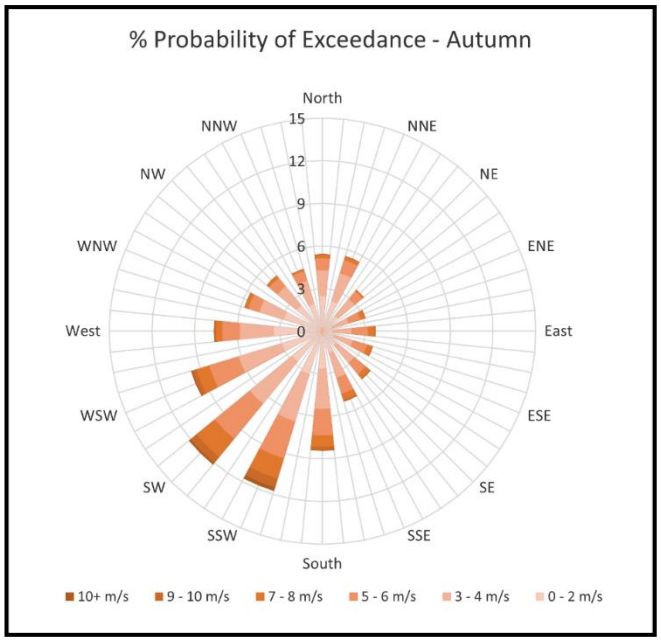
wind speed ranges, for each wind direction and for each month of the year. The months are grouped into seasons and a Weibull distribution is fitted to the wind speed distribution for each wind direction, for each season. The resulting weather centre wind data is transposed to open country terrain at sea-level, accounting for upwind terrain. The open country wind data is then transposed to reference height at the Site.

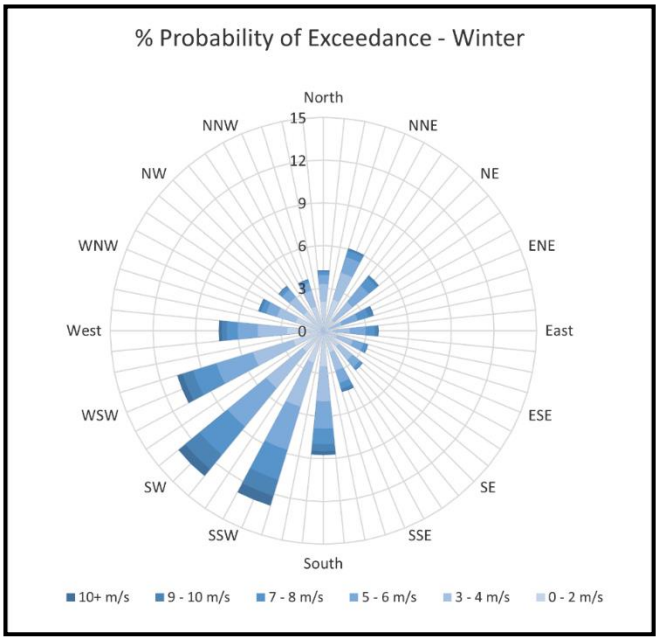
8.2.18 Wind roses for each season are presented in **Figure 8.1**.

Figure 8.1: Seasonal Wind Roses









Assessment Criteria

8.2.19 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' (London Docklands Development Corporation) variant of the Lawson Criteria.

8.2.20 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.

8.2.21 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.

8.2.22 The LLDC 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.

8.2.23 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 8.1**.

Table 8.1: 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.
> 10	C0	Uncomfortable	Uncomfortable for all pedestrian activities.

8.2.24 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. The assessment is summarised in terms of suitability for various activities. The activities considered, and their relation to the LCC, are summarised in **Table 8.2**.

Table 8.2: Suitability Assessment

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.

Significance Criteria

8.2.25 With respect to wind microclimate, the significance of the environmental effects when the Development is built is based on the suitability of wind conditions at each location assessed within the study area against either the current or planned pedestrian activities based upon the Lawson Criteria.

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

8.2.27 The following are the significance criteria used to assess likely wind conditions as a result of the introduction of the Development:

- **Major beneficial significance**: 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.
- **Moderate beneficial significance**: Any effect on wind conditions which is expected to improve pedestrian comfort from unsuitable to suitable for planned activities.
- **Minor beneficial significance**: 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.
- **Insignificant**: Any effect that does not alter the suitability of existing wind conditions with respect to planned activities.
- **Minor adverse significance**: Any effect on wind conditions which worsens pedestrian comfort from suitable to marginal/tolerable for planned activities, or from marginal/tolerable to unsuitable for planned activities.
- **Moderate adverse significance**: Any effect on wind conditions that worsens pedestrian comfort from suitable to unsuitable for planned activities.
- **Major adverse significance**: Any effect on wind conditions adversely affecting pedestrian safety, namely a deterioration in conditions from being considered safe to being considered safe.

Limitations and Assumptions

8.2.28 The wind tunnel model has been constructed based on the design information supplied by Buckley Gray Yeoman in September 2023.

8.2.29 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.

8.2.30 Effects associated with the Works (i.e. the Site preparation, demolition and construction works required to facilitate the Development) were scoped out of the assessment via the EIA Scoping process (see **ES Volume 1, Chapter 2: EIA Methodology** and associated appendices).

8.3 Relevant Baseline Conditions

8.3.1 The Site and surrounding context is predominantly medium-rise. Baseline wind conditions meet the Lawson safety criteria and – being predominantly suitable for short-term standing / sitting or at worst, strolling, year-round – are suitable for pedestrian access to, and passage through, the Site and immediate surrounding area, and for ingress / egress at entrances.

8.3.2 The baseline wind microclimate is presented within **Figure 8.2** and **Figure 8.3**.

Figure 8.2: Pedestrian Wind Conditions, Existing Site within Existing Surrounds, 'Worst' Season

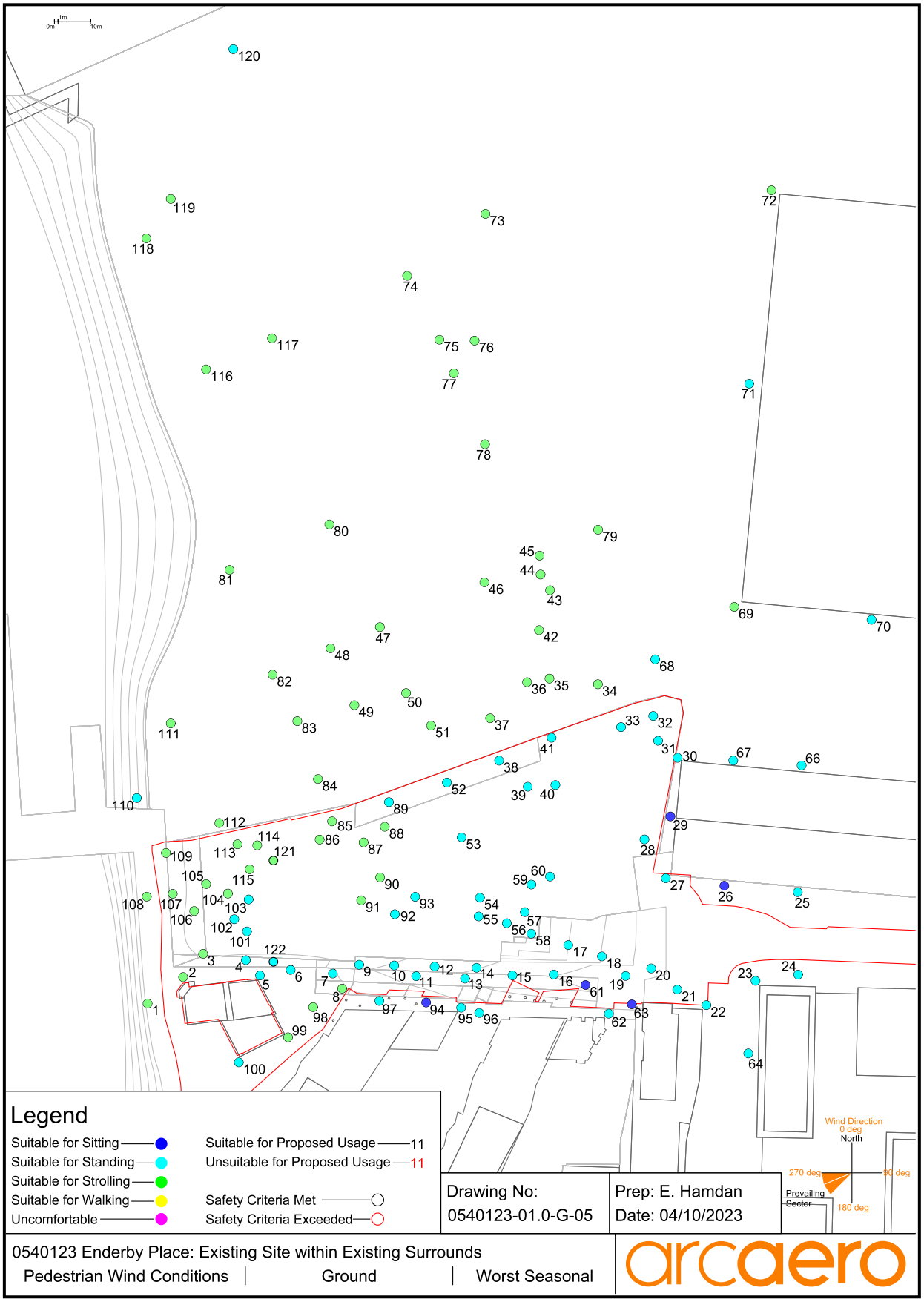
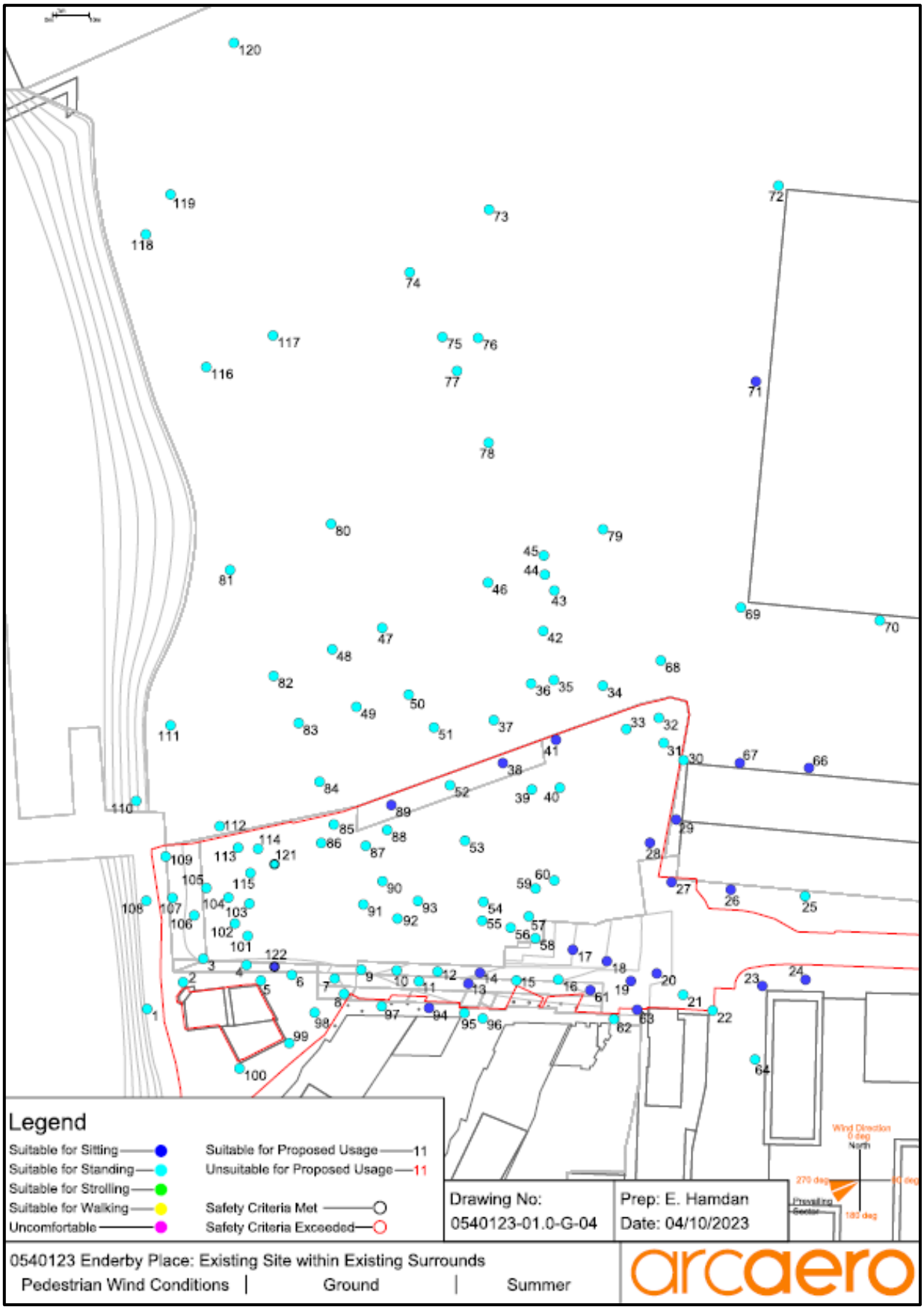


Figure 8.3: Pedestrian Wind Conditions, Existing Site within Existing Surrounds, Summer



8.4 Likely Effects of the Development and their Significance

The Completed and Operational Development

8.4.1 The wind microclimate predicted following the introduction of the Development is presented within **Figure 8.4** and **Figure 8.5**.

Figure 8.4: Pedestrian Wind Conditions, Development with Soft Landscaping within Existing Surrounds, 'Worst' Season – Ground Level

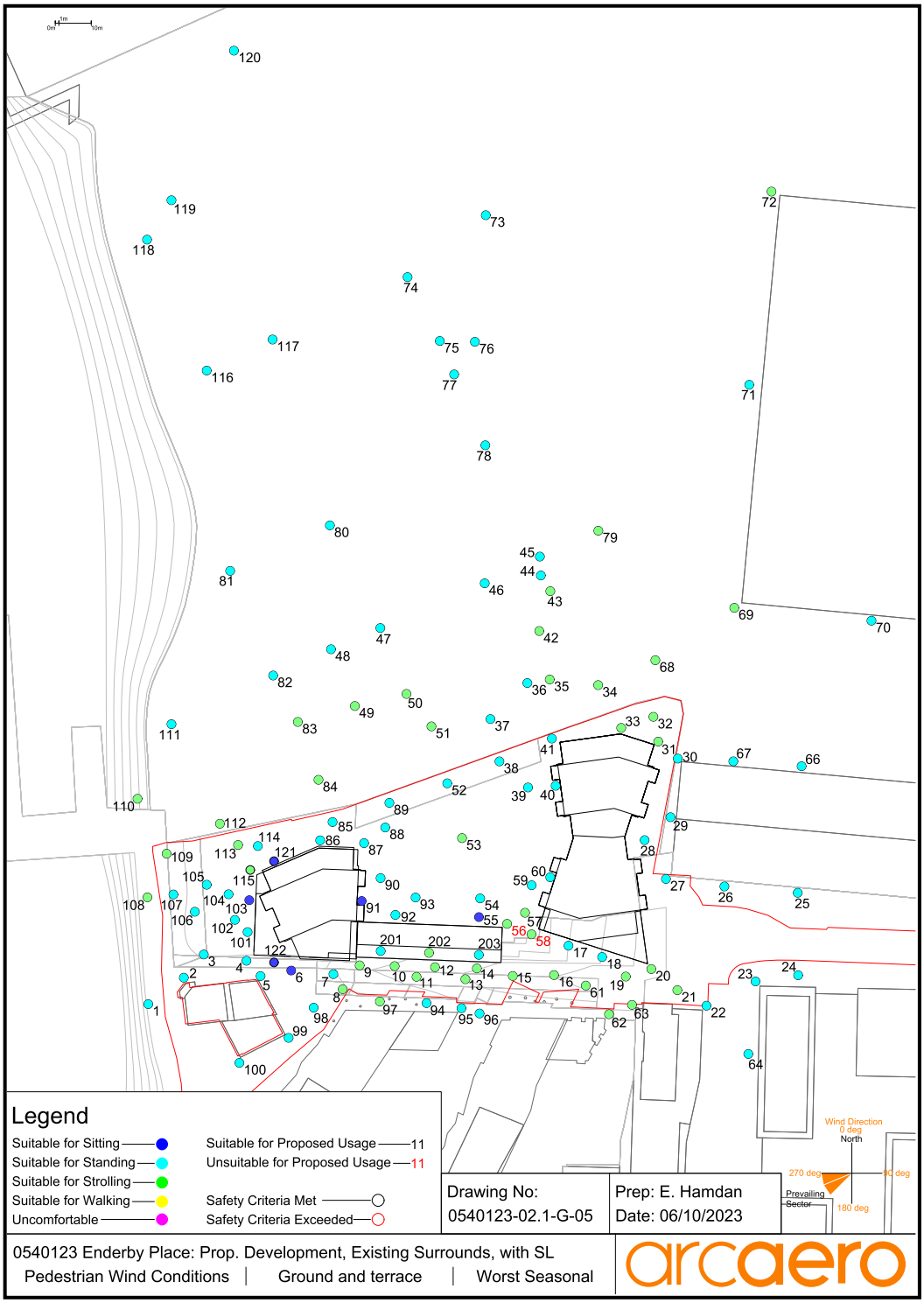
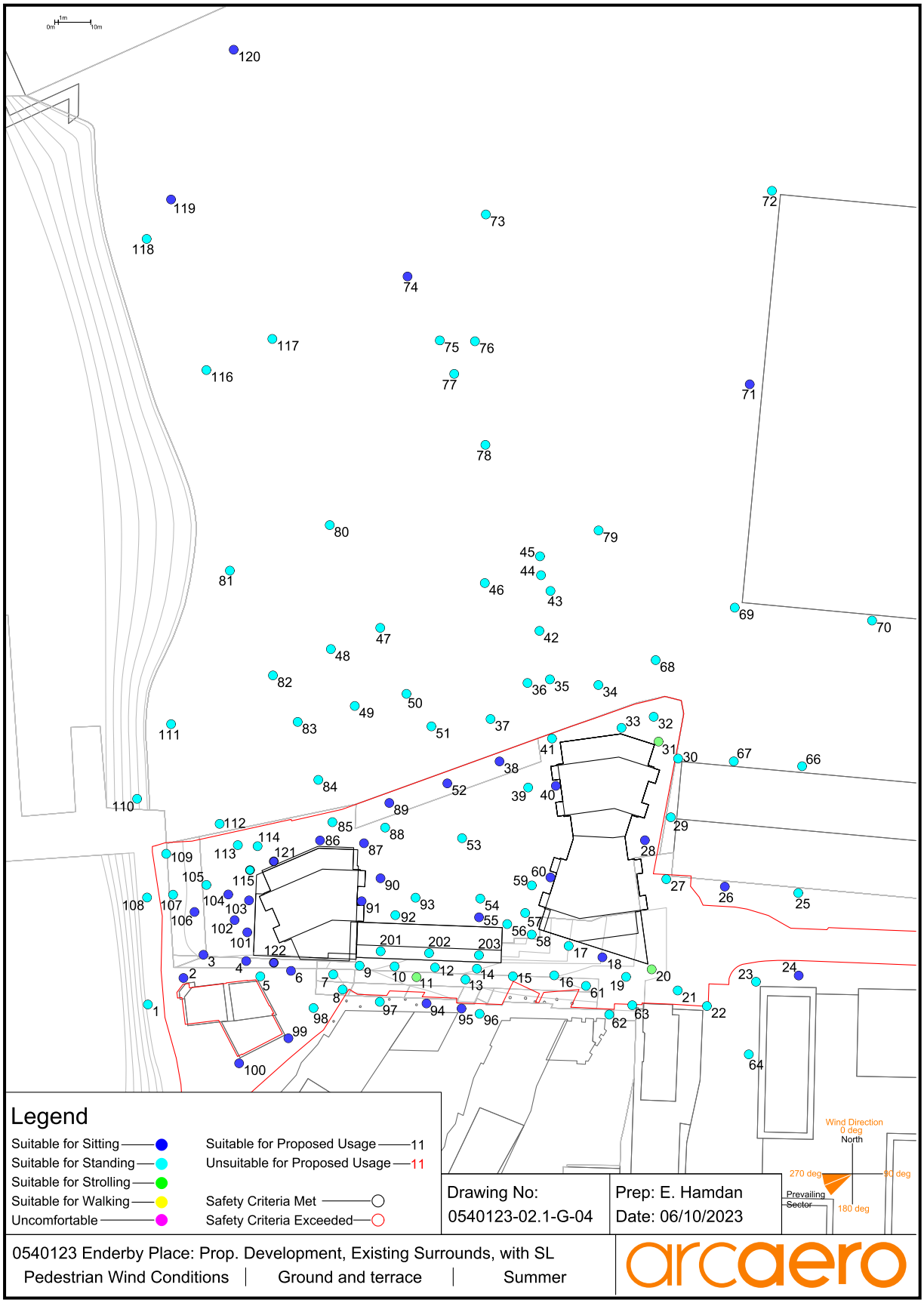


Figure 8.5: Pedestrian Wind Conditions, Development with Soft Landscaping within Existing Surrounds, Summer – Ground Level



8.4.2 Wind conditions throughout the Site and surrounding areas satisfy the safety criteria for wind following the introduction of the Development. This is considered to be an **insignificant** effect.

8.4.3 With regards to the throughfares, thoroughfares within the Development are suitable for strolling or better throughout the year and thus are suitable for comfortable for pedestrian access to and passage throughout the Site. This is considered to be an **insignificant** effect.

8.4.4 Furthermore, all entrances within the Development are suitable for at least standing throughout the year and thus are comfortable for pedestrian ingress / egress. This is considered to be an **insignificant** effect.

8.4.5 With the introduction of the Development, the wind comfort conditions on the recreational throughfares leading into Central Garden are marginally exceeded in spring. Being a thoroughfare, these conditions can be classified as suitable, but there is a desire on the part of the design team for yet calmer conditions to be achieved. This is therefore considered to be an effect of a **direct, long term, local effect of minor adverse** significance.

8.4.6 Elsewhere throughout the Development, conditions at recreational spaces are suitable for at least short periods of sitting from spring to autumn and thus are comfortable for recreational use. This includes areas within the Super Ha-Ha, Central Garden, Townhouse Gardens, gardens at the North of the Telcom Tower and Riverside Park. The outdoor seating area to the west of River Tower is suitable for long-term sitting in at least summer. With favourable conditions in each of these areas this is reflective of the **insignificant** effect of the Development.

8.4.7 Conditions on balconies are suitable for short-term standing in summer, spring and autumn, in the absence of side-screens. This is acceptable for private balconies and is considered to be an **insignificant** effect.

8.4.8 In area surrounding the Site, following the introduction of the Development, conditions remain suitable for existing pedestrian uses. This is considered to be an **insignificant** effect.

8.5 Additional Mitigation / Enhancement and Likely Residual Effects of the Development and their Significance

The Completed and Operational Development

8.5.1 As reflected in Section 8.4, the effects introduced by the Development are **insignificant** in all cases except in the recreational throughfares leading into Central Garden where an effect of **Minor adverse** significance is predicted, and as a result there is little need for additional mitigation.

8.5.2 However, there were aspirations for calmer conditions on the recreational throughfares leading into the Central Garden and a **Minor adverse** significance of effect was identified. Since the wind tunnel test, it has been confirmed that the eastern Townhouse has been removed from the Development. It is expected that the removal of the eastern Townhouse would improve these conditions by reducing the channelling of wind through this space between the remaining Townhouses and the southwest walls of Telcon Tower. An improvement in conditions

would result which is considered to reduce the effect to **insignificant** as the wind comfort conditions would be met for these thoroughfares.

8.6 Likely Residual Cumulative Effects and their Significance

8.6.1 The wind microclimate predicted following the introduction of the Development within cumulative surroundings is presented within **Figure 8.6** and **Figure 8.7**.

Figure 8.6: Pedestrian Wind Conditions, Development with Soft Landscaping within Cumulative Surrounds, 'Worst' Seasonal – Ground Level

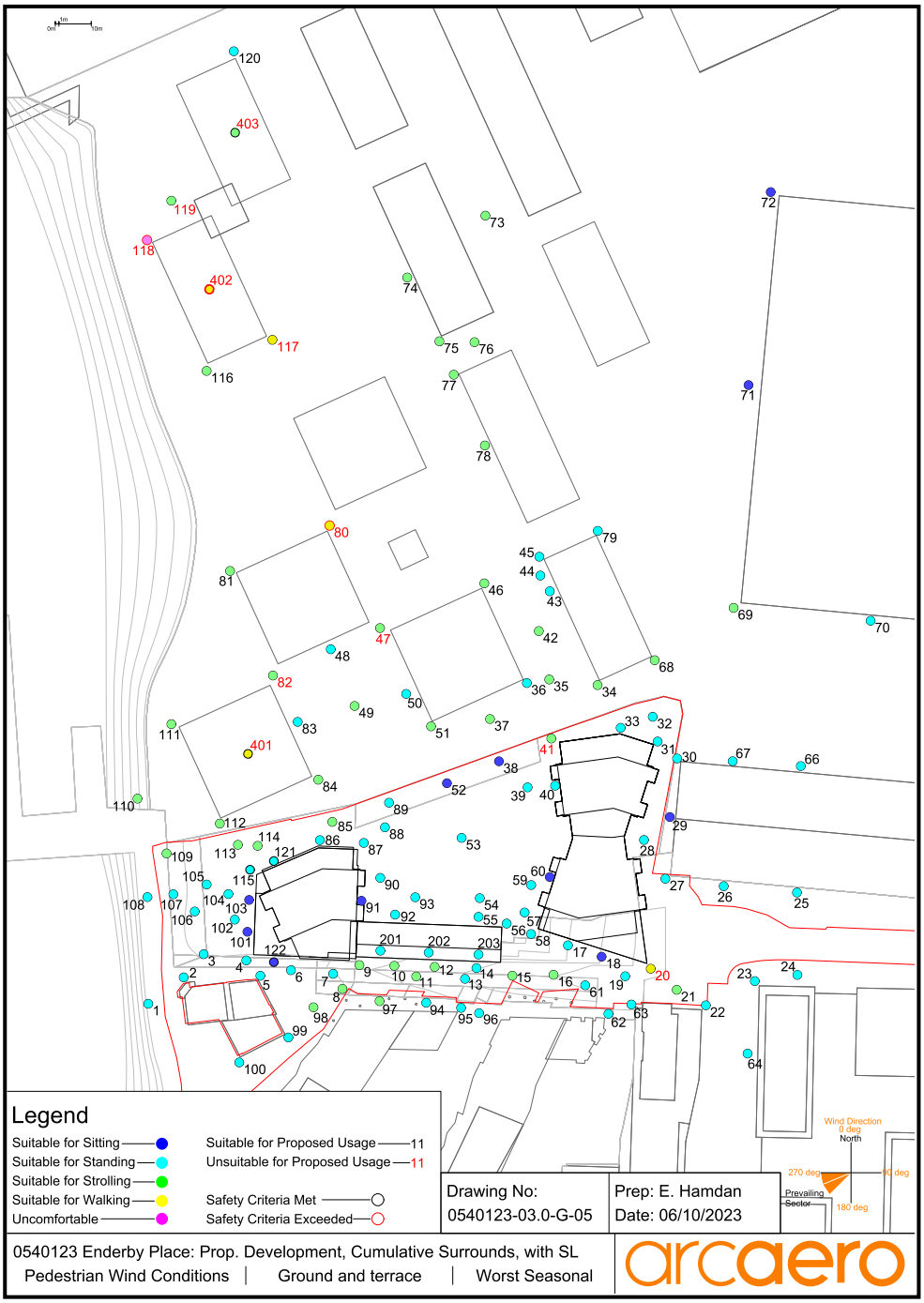
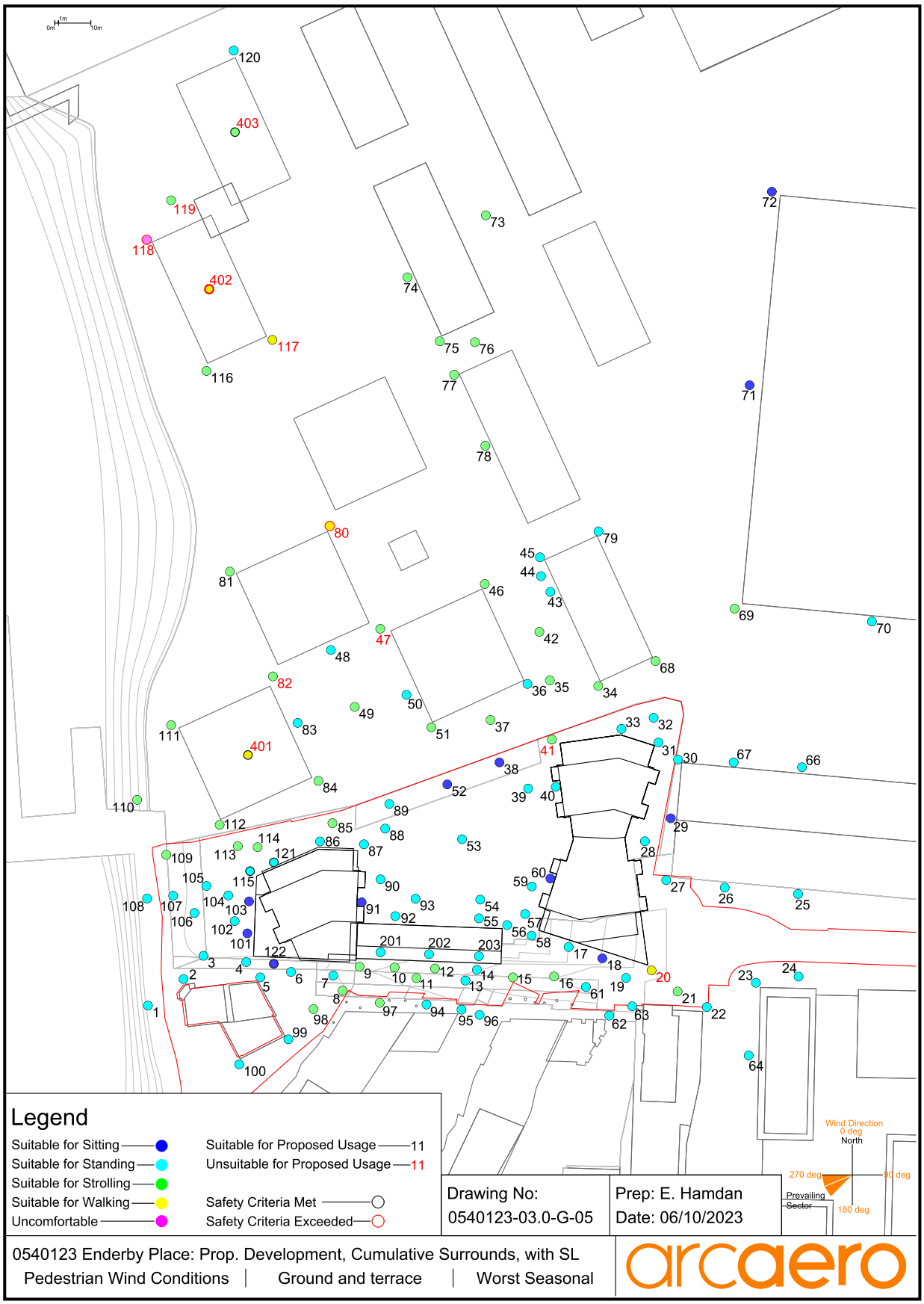


Figure 8.72: Pedestrian Wind Conditions, Development with Soft Landscaping within Cumulative Surrounds, Summer – Ground Level



8.6.2 In terms of safety, there are no safety exceedances around the Site following the introduction of the Development within cumulative surrounds. This is considered to be an **insignificant** effect.

8.6.3 With regards to the throughfares, all thoroughfares within the Development are suitable for strolling at the least throughout the year and thus are suitable for comfortable for pedestrian access to and passage throughout the Site. This is considered to be an **insignificant** effect.

8.6.4 Furthermore, all entrances within the Development are suitable for at least standing throughout the year and thus are comfortable for pedestrian ingress / egress. This is considered to be an **insignificant** effect.

8.6.5 Conditions in recreational spaces are suitable for at least short periods of sitting from spring to autumn and thus are comfortable for recreational use. This includes areas within the Super Ha-Ha, Central Garden, Townhouse Gardens, gardens at the North of the Telcom Tower and Riverside Park. The outdoor seating area to the west of River Tower is suitable for long-term sitting in at least summer. With favourable conditions in each of these areas this is reflective of the **insignificant** effect.

8.6.6 Conditions on balconies are suitable for short-term standing in summer, and substantially also during spring and autumn, in the absence of side-screens. This is acceptable for private balconies and is considered to be an **insignificant** effect.

8.6.7 Within the majority of the surrounding area, following the introduction of the Development, conditions remain suitable for existing pedestrian uses. This is considered to be an **insignificant** effect.

8.6.8 Morden Wharf in its current outline form (ref. 20/1730/O) would benefit from additional shelter being provided upon introduction of the Development. Conditions at Morden Wharf are presented within **Figure 8.6** and **Figure 8.7**, while conditions for the existing Site within Cumulative Surrounds are presented within **Figure 8.8** and **Figure 8.9**. By comparing these results, it shows that conditions within Morden Wharf are improved with the introduction of the Development. This includes a number of areas where exceedances of the safety criteria, in the absence of the Development, are resolved, upon its introduction. This represents a **direct, long term, local effect of major beneficial significance** effect of the Development.

Figure 8.8: Existing Site within Cumulative Surrounds, 'Worst' Season

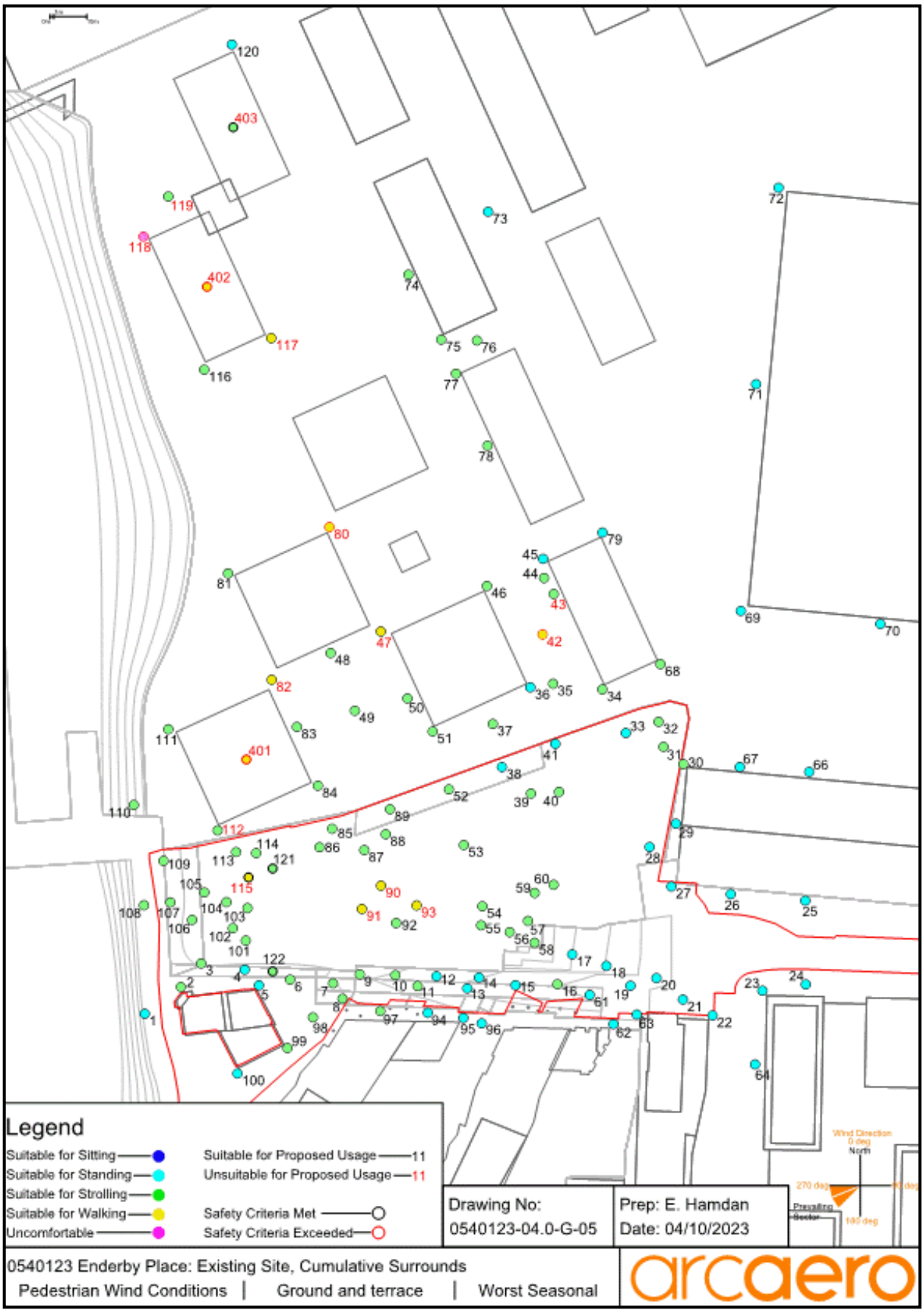
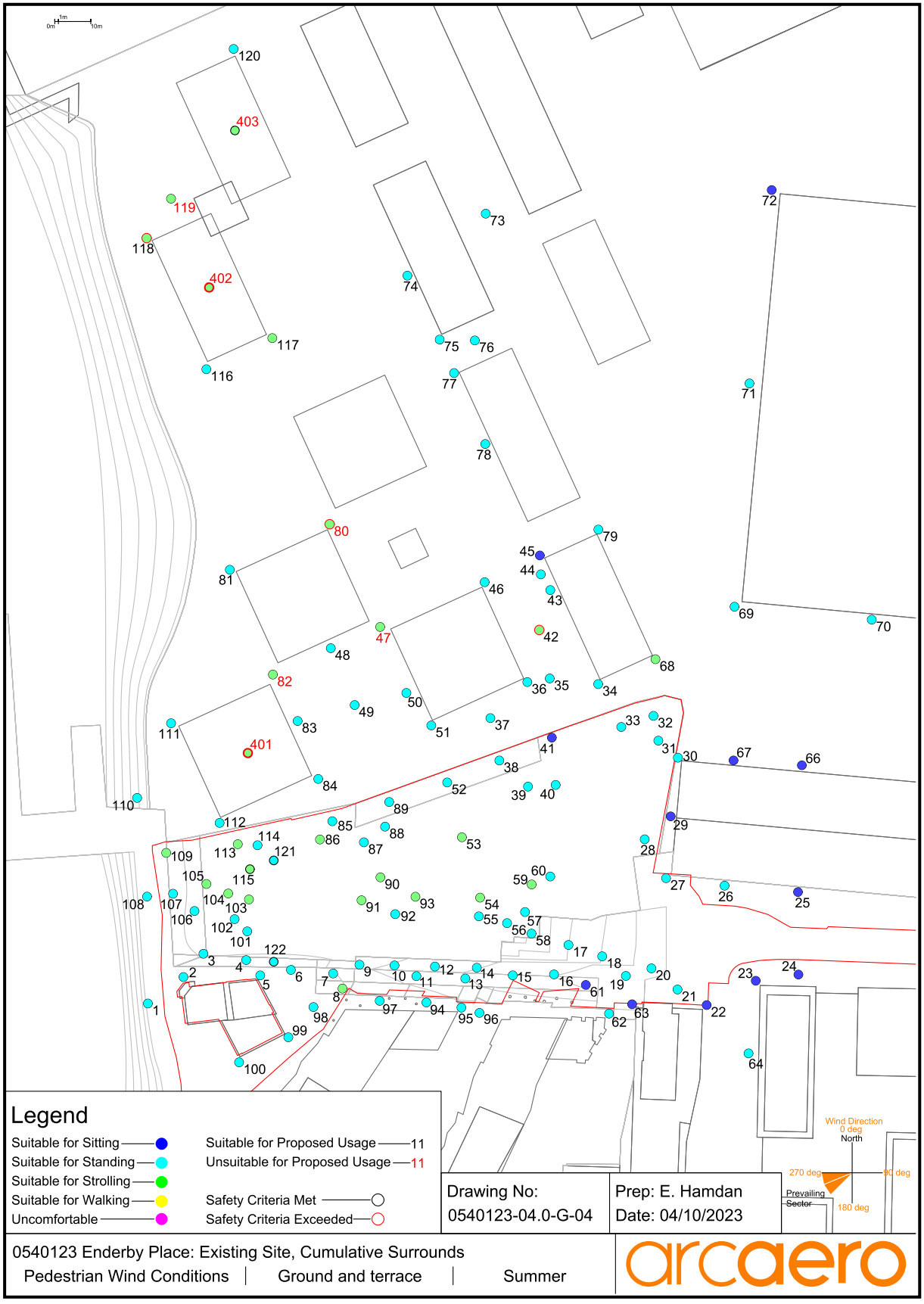


Figure 8.9: Existing Site within Cumulative Surrounds, Summer



8.7 Conclusions

8.7.1 When the Development is complete, the conditions within the existing Site and surrounds will satisfy the safety and comfort criteria for all uses.

8.7.2 The Development will have a generally positive impact on the wind microclimate within the immediate region, including for Morden Wharf.

9. Traffic and Transport

9.1 Introduction

9.1.1 This Chapter sets out the likely significant cumulative effects of the Development traffic and transport. It has been prepared by Markides Associates. This Chapter is supported by further detailed information contained within:

- **Appendix 9.1:** Review of Cumulative Assessment Sites.
- **Appendix 9.2:** Transport Assessment Report.

9.2 Assessment Methodology and Significance Criteria

Assessment Methodology

9.2.1 As requested through the EIA Scoping opinion issued by RBG an assessment has been undertaken for the cumulative development scenario only. This has employed the methodology as set out in the IEMA Guidance[1]. Therefore, the scope of this chapter addresses the operational traffic data only. Where the IEMA guidance is lacking in specific thresholds, measures for assessment, or other guidance, a qualitative assessment has been made based on professional judgement, supported by the associated Transport Assessment (TA) (Document Ref: 22181-MA-DR-TA01, included as **Appendix 9.2**), which is submitted as part of the planning application.

9.2.2 The TA in turn has been informed by TfL guidance for the creation of such documents and the relevant National, Regional and Local planning policy, which has set out within the TA in more detail.

Relevant Guidance

9.2.3 Reference has been made to the IEMA Guidelines for the Environmental Assessment of Traffic and Movement. These Guidelines are for the assessment of the environmental impact of road traffic associated with major new developments. The Guidelines are only designed to be applied to off-site traffic impacts.

9.2.4 Reference has also been made to Transport for London (TfL)'s guidance for Active Travel Zone assessment and Transport Assessment reports. [2]

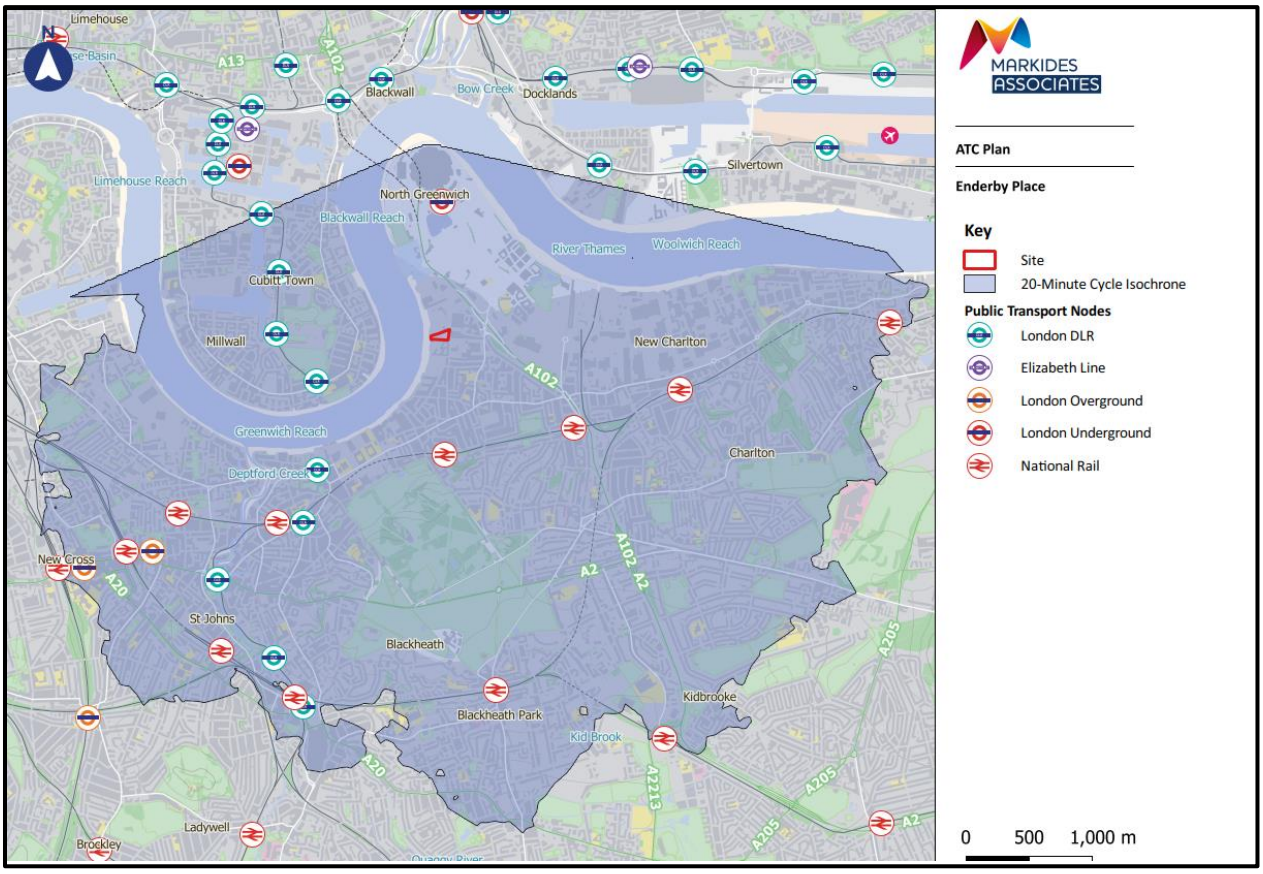
9.2.5 Finally, reference has been made to the Design Manual for Roads and Bridges LA 104 Sustainability & Environment ('DMRB').[3]

[1] Institute of Environmental Management and Assessment (IEMA) (2023) Guidelines for the Environmental Assessment of Traffic and Movement
[2] https://tfl.gov.uk/info-for/urban-planning-and-construction/transport-assessment-guide/transport-assessments
[3] https://www.standardsforhighways.co.uk/search/0f6e0b6a-d08e-4673-8691-cab564d4a60a

Study Area

9.2.6 The geographical scope of study in terms of vehicle impact has been broadly defined as per TfL's assessment methodology for Active Travel Zone (ATZ) assessment[4], and Transport Assessment. The extent of ATZ area is shown in **Figure 9.1.**

Figure 9.1: Extent of Wider Active Travel Zone



9.2.7 The ATZ scope as per the TfL methodology has been further refined to focus on the active travel destinations pertinent to the Site, comprising 7 routes. These are shown in **Figure 9.2** and comprise the extent of the detailed Active Travel/Healthy Streets Assessment.

[4] https://tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/healthy-streets

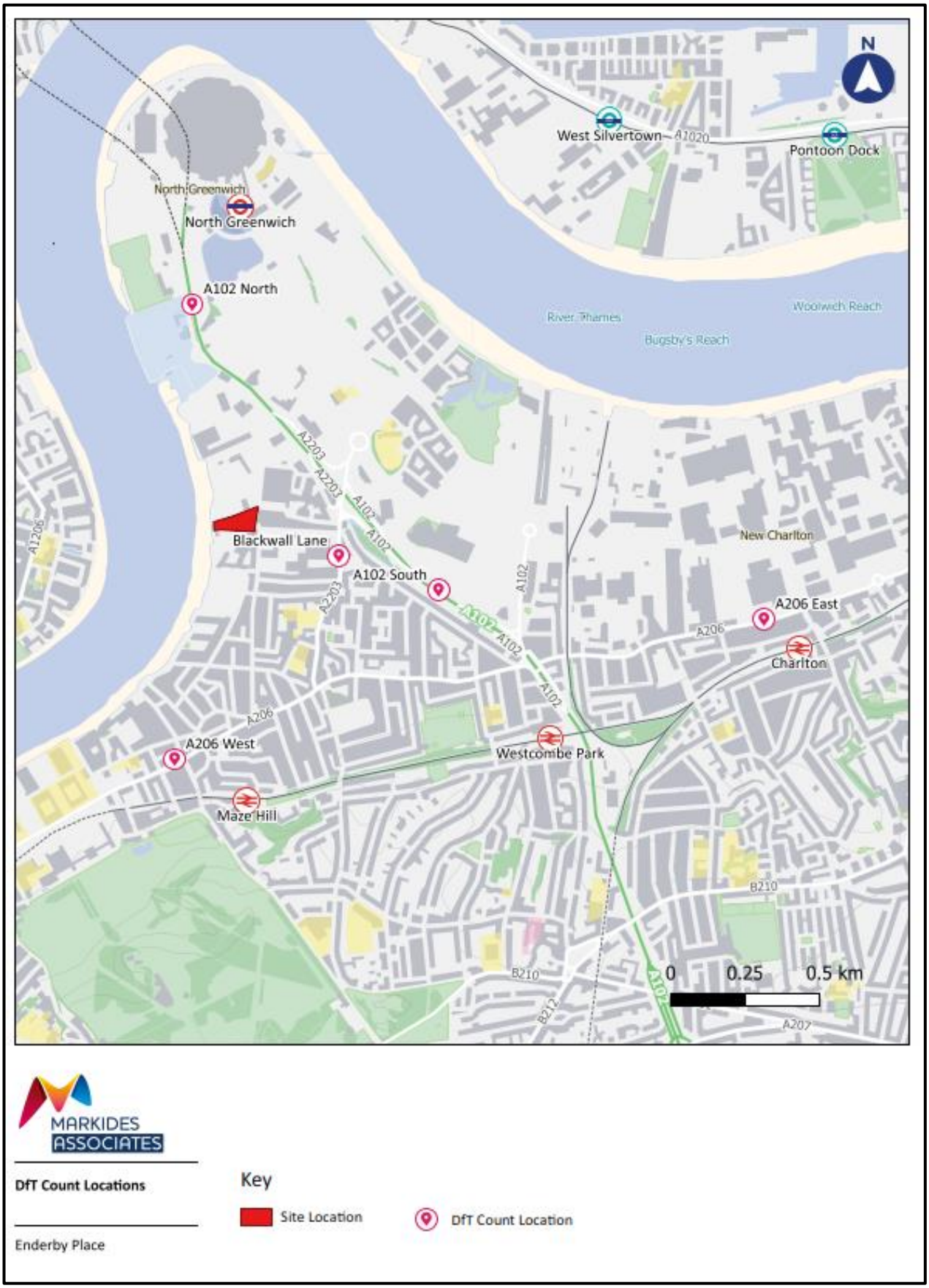
Figure 9.2: ATZ Active Travel Destinations

9.2.8 The Development will be car free other than for operational traffic associate with servicing and disabled parking. On that basis, no traffic distribution, network, or junction modelling has been considered necessary as vehicle journey times and delay across the network will not be affected by the Development.

9.2.9 While there are relatively few Department for Transport (DfT) traffic survey points[5] on the local highway, they are located on the key distribution roads for the Development and it is therefore considered that sufficient data is available to inform the scope of the assessment. Locations are set out in **Figure 9.3.** Duplicate counts and older 2019 counts have been discounted on the basis that these no longer adequately reflect the baseline due to the level of change that has occurred on the peninsula since 2019 in respect of completed development and amendments to bus services and highways.

[5] https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints

Figure 9.3: DfT Count Locations



9.2.10 Finally, the scope of assessment has also been informed by the distribution of traffic from the Site. This has been informed by the Transport for London LTS Local Transport Model, as utilised by the Morden Wharf planning application (ref. 20/1730/O) – this distribution is considered to be consistent with the Development as the two sites are neighbouring and of similar type.

Baseline Methodology

9.2.11 The 2022 traffic volumes on the network were determined using DfT survey data, as per the locations above, to form the baseline. These were factored using TEMPro factors to 2027 for the assessment of the opening year of the Development, using local growth rates for output area Greenwich 036 which encompasses the peninsula only, all road types, with growth rates identified for AM Peak, PM Peak, and Annual Average Weekday Traffic flow (AAWT). In addition, a site visit was undertaken in October 2023 with all defined Active Travel Routes to Active Travel Destinations walked and a qualitative assessment undertaken as per TfL guidance for ATZ assessment. This included a Killed or Seriously Injured (KSI) road collision assessment, and the KSI and the ATZ combined has been used to inform effects such as pedestrian amenity (more detail given later in this chapter).

9.2.12 The following key issues are identified for consideration as per the IEMA guidance and are assessed in this chapter for the cumulative development scenario in the operational year of 2027 only:

- Potential for increased/reduced severance, pedestrian amenity and delay and driver delay due to changes to traffic to and from the Project.
- Likely effects on public transport, associated with improvements to public transport connections and increased number of users of bus and rail services.
- Likely effects on pedestrian/cycle amenity from changes to the pedestrian and cycle network and traffic flows once the Project is complete.

9.2.13 The temporal scope has been determined as per common practice and the time periods used to assess the operation of the highway network are the AM peak hour (08:00-09:00) and the PM peak hour (17:00-18:00) and the AAWT. The following data sources have informed the baseline assessment:

- Google Maps[6];
- Google Satellite[7];
- Transport for London (TfL) Timetables for bus and rail information[8];
- TfL Datasets for cycle infrastructure information and geospatial mapping[9];
- TfL and Royal Borough of Greenwich (RBG) websites have been used to obtain planning policy, strategic transport information and details committed developments to inform the future base flows;
- DfT Road Traffic Counts[10]
- Morden Wharf 2020 Transport Assessment and associated agreed distributions as per TfL's LTS Local Traffic Model;[11]
- TEMPro (Trip End Model Presentation Program) used to forecast projections of growth over time for use in local and regional transport models; and
- Nomis, to interrogate Census 2011 data[12].

Scope of Assessment

9.2.14 This Chapter has been informed by the EIA Scoping Report (see **ES Volume 3, Appendix 2.1**), the EIA Scoping Review (see **ES Volume 3, Appendix 2.2**), and EIA Scoping Opinion (see **ES Volume 3, Appendix 2.3**). The EIA Scoping Opinion states:

"It is noted that the Thames Path is already complete and therefore will remain unaffected unless the Thames Clipper Jetty is proposed, this should be detailed in the ES if the Jetty is bought forward. As per RPS's report, the cumulative impact should be fully considered."

9.2.15 The Scoping Report by RPS (2020) also states that:

"4.1 It is understood that the Thames Path is located outside of the site boundary to the west. However, should the development include the Thames Clipper Jetty, it is assumed that temporary closures of the Thames Path would be required to facilitate this. This is not clear from the Scoping Report. 4.2 Should any works be required to the Thames Path

[6] https://www.google.com/
[7] https://www.google.com/
[8] https://tfl.gov.uk/travel-information/timetables/
[9] https://tfl.gov.uk/info-for/open-data-users/
[10] Referenced previously
[11] Morden Wharf planning application (ref. 20/1730/O) via RBG's planning search
[12] Nomis (Subsidy of the Office for National Statistics) https://www.nomisweb.co.uk/

during the construction period, an assessment of the potential impacts on users of the Thames Path should be included. 4.3 While it is agreed that traffic and transport impacts from the proposed development alone can be scoped out of the assessment, there is potential for significant cumulative effects on both the local road network and public transport network when considering the proposed development in combination with others in the vicinity, notably Lovell's, Granite Badcocks and Pipers Wharf and Alcatel-Lucent to the south/south east, and Morden Wharf to the north and the part of the Enderby Wharf scheme which has been delivered. Cumulative transport impacts should therefore be considered in the ES."

9.2.16 In accordance with the above, as the Development does not include the provision of the Thames Clipper Jetty, construction traffic is therefore considered scoped out of this assessment and cumulative traffic and transport impacts only should be assessed.

9.2.17 However, given the ambiguity of the wording, consideration has also been given to the immediate cumulative construction traffic impacts of the Development. It should be noted that operational flows for development of this scale are larger than construction traffic flows at peak. It is also considered likely that peak construction will be 2025, at which point it is highly unlikely that any significant works will have commenced at Morden Wharf, which as the neighbouring site is the most likely to generate meaningful cumulative effect in respect of construction traffic.

Limitations of the Assessment

9.2.18 The assumptions and limitations are as follows:

- The modes of travel and associated percentage split for the residential uses have been derived from the 2011 Census for the area local to the Site as the most applicable and most recent data available.
- The modes of travel and associated percentage split for the commercial space has been derived from the TRICS database multi-modal survey data. The proposed land use is E(g)(iii) industrial processes, and the TRICS equivalent is the older B1(c) 'light industrial' category, It should be noted; however, that the intent is for the space to be leased to arts use and creative workshops, which are expected to generate significantly less than the trip rate derived from the proxy sites in TRICS for B1(c) assumes (e.g., TRICS proxy sites include uses such as chemical supply, a paper manufacturer, builder's merchants, Topps Tiles, motor parts sales); particularly far fewer heavy vehicles.
- The proposed commercial floorspace will operate daytime hours only between 06:00-20:00, with no operations at weekends or on public holidays.
- The proposed community/café floorspace has not been assessed on the basis that it is not expected to be a trip generator in its own right but patroned by residents of the Site or immediate neighbours, or otherwise visited in the form of pass-by trips.
- The Development is car free, except for disabled parking provision, servicing, and deliveries.

9.2.19 Cumulative development trip generation and distribution data is limited and available consistently for the peak hours only. The data also does not consistently provide net difference in trips and therefore the gross development trips have been used. Therefore, there is an element of double-counting as existing uses are captured in the 2022 baseline, and subsequently not removed in the 2027 future baseline or in the 2027 cumulative development scenario.

9.2.20 Collision data was obtained from TfL's public datasets as per TfL's recommendation and the assessment focuses on KSI incidents only, again as per TfL's guidance.

9.2.21 Traffic Data for local roads and key vehicle routes was obtained from the DfT for the year 2022. TEMPro factors local to regional output area Greenwich 036, which encompasses the Site, were used to factor daily traffic and HGV flows to the 2023 baseline and subsequently to future year scenario 2027 (year of occupation). DfT data provides AADT data only and does not provide peak hour data. Multi-modal flow data for local roads available from the DfT is also limited in terms of locations and no additional surveys have been undertaken.

Significance Criteria

Assessment Criteria

9.2.22 The IEMA Guidelines recommend two rules as a screening process to delimit the scale and extent of the assessment within the study area. These are as follows:

- **Rule 1:** Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- **Rule 2:** Include highway links of high sensitivity where traffic flows have increased by 10% or more.

9.2.23 The rules are not applicable in the case of **road safety** or **driver delay.**

9.2.24 The IEMA Guidelines are based upon knowledge and experience of environmental effects of traffic. The 30% threshold in Rule 1 is based upon research and experience of the environmental effects of traffic, with less than a 30% increase generally resulting in imperceptible changes in the environmental effects of traffic. At a simple level, the IEMA Guidelines consider that projected changes in total traffic flow of less than 10% creates no discernible environmental effect, hence the second threshold as set out in Rule 2.

9.2.25 In cases where the thresholds are exceeded, the IEMA Guidelines set out a list of environmental effects which should be assessed for their magnitude of change. Definitions of each of the potential effects identified in the IEMA guidelines are summarised below along with explanatory text for the assessment criteria used to determine the magnitude of impact. The assessment in this chapter has been undertaken on this basis.

Potential Effect - Severance

9.2.26 Severance is the perceived division that can occur within a community when it becomes separated by major transport infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.

9.2.27 Factors that need to be considered in determining whether severance is likely to be an important issue include road width, traffic flow and composition, traffic speeds, the availability of crossing facilities and the number of movements that are likely to cross the affected route.

9.2.28 The IEMA Guidance recommends that the assessment involves:

(a) Defining the facilities to which access is potentially impaired.

(b) Defining facility catchment areas from which users may be drawn.

(c) Estimating the populations within those areas, both in total and in vulnerable groups.

9.2.29 The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively.

Potential Effect - Driver Delay

9.2.30 Traffic delays to non-development traffic can occur at several points on the network surrounding a development site including:

- On the highways passing the development site where there is likely to be additional traffic and the flow might be affected by additional parked cars.
- At other key intersections along the highway which might be affected by increased traffic.
- At side roads where the ability to find gaps in the traffic may be reduced, thereby lengthening delays.
- At the proposed site access where there will be additional turning movements.

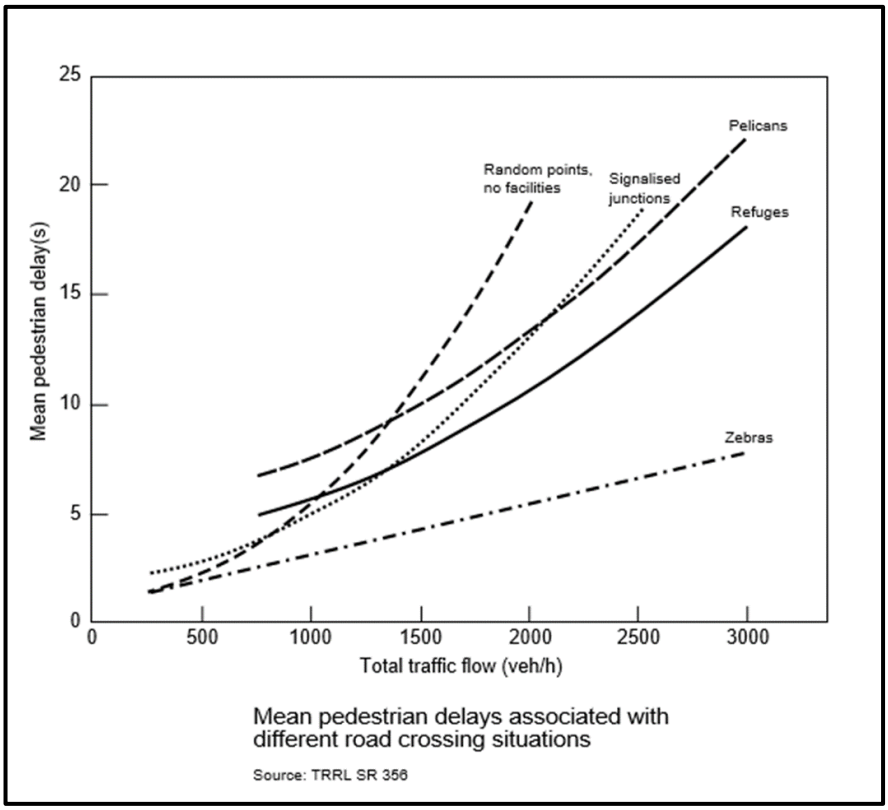
9.2.31 These delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. Values for delay due to these elements can be determined by the use of proprietary software packages such as Transport Research Laboratory's Junctions 10 suite.

Potential Effect - Pedestrian Delay

9.2.32 The assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads. Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads. In general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity, visibility, and general physical conditions of the development site. The IEMA Guidance goes on to specifically state that "a predictive method for determining the mean delay experienced by pedestrians for different types of crossing for different traffic flow can be found in the Transport and Road Research Laboratory Supplementary Report 356"[13]. These are replicated below in **Figure 9.4**.

[13] J Goldschmidt, 1977

Figure 9.4: Mean Delay



9.2.33 The IEMA guidance states explicitly that "The level of delay will be calculated in seconds and then used to inform 'before development' and 'with development' impacts."[14] These are defined as:

- **None** - Little or no hindrance to pedestrian movement.
- **Slight -** All people wishing to make pedestrian movements will be able to do so, but there will probably be some hindrance to movement.
- **Moderate -** Pedestrian journeys will be longer or less attractive; some people are likely to be dissuaded from making some journeys on foot.
- **Severe -** People are likely to be deterred from making pedestrian journeys to an extent sufficient to induce a reorganisation of their activities. In some cases, this could lead to a change in the location of centres of activity or to a permanent loss of access to certain facilities for a particular community.

9.2.34 The guidance does not state how hindrance is to be defined nor how it correlates to the mean delay. It has therefore been assigned as follows based on professional judgement and as per EIA assessment submitted and accepted for other sites in London:

- **None** – 0-5 seconds delay
- **Slight –** 6-10 seconds delay

[14] According to the Department for Transport TAG Unit A4-1 Social Impact Appraisal (2021)

- **Moderate –** 10-15 seconds delay
- **Severe –** 15+ seconds delay

Potential Effect – Non-Motorised User Amenity

9.2.35 The term amenity is defined by the IEMA Guidelines as the relative pleasantness of a journey. It is considered to be affected by traffic flow, speed, and composition as well as footway width and the separation/protection from traffic, and for London Sites, Healthy Streets Criteria.

9.2.36 There is no commonly agreed guidance for determining the magnitude of change for amenity. However, guidance refers to the DfT's Manual of Environmental Appraisal[15] which suggests that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its heavy vehicle component) is halved or doubled, and to the Pedestrian Comfort Guidance for London (2019)[16] by TfL which has an accompanying spreadsheet to undertake evaluating a new design or assessing an existing footway.

9.2.37 Amenity encompasses the overall relationship between non-motorised users and traffic, including fear and intimidation, which is the most emotive and difficult effect to quantify and assess.

Potential Effect – Fear and Intimidation

9.2.38 The extent of fear and intimidation is dependent on:

- The total volume of traffic.
- The heavy vehicle composition.
- The speed these vehicles are passing.
- The proximity of traffic to people – and/or the feeling of the inherent lack of protection created by factors such as a narrow pavement median, a narrow path, or a constraint (such as a wall or fence) preventing people stepping further away from moving vehicles.

9.2.39 In the absence of commonly agreed thresholds, the IEMA guidance explicitly quote previous work that put forward thresholds for fear and intimidation based on an earlier study[17]. These thresholds define the degree of hazard to pedestrians by average traffic flow, 18-hour heavy vehicle flow and average speed over an 18-hour day in miles/hour. These are replicated from the IEMA guidance below in **Figure 9.5**.

[15] https://assets.publishing.service.gov.uk/media/6494324a9e7a8b00139329bc/tag-unit-a3-environmental-impact-appraisal.pdf
[16] https://content.tfl.gov.uk/pedestrian-comfort-guidance-technical-guide.pdf
[17] Crompton and Gilbert, 1976

Figure 9.5: Thresholds for Fear and Intimidation

Table 3.1: Fear and intimidation degree of hazard			
Average traffic flow over 18-hour day – all vehicles/hour 2-way (a)	**Total 18-hour heavy vehicle flow (b)**	**Average vehicle speed[18] (c)**	**Degree of hazard score**
+1,800	+3,000	->40	30
1,200–1,800	2,000–3,000	30–40	20
600–1,200	1,000–2,000	20–30	10
<600	<1,000	<20	0

9.2.40 These are rated 'extreme' where the total hazard score (a + b+ c) is 71+, 'Great' at 41-70, 'Moderate' at 21-40 and 'Small' at 0-20. The magnitude of impact is subsequently considered to be as per the level of change as replicated here in **Figure 9.6.**

Figure 9.6: Magnitude of Impact – Fear and Intimidation

Table 3.3: Fear and intimidation magnitude of impact	
Magnitude of impact	**Change in step/traffic flows (AADT) from baseline conditions**
High	Two step changes in level
Medium	**One step change in level, but with** • >400 veh increase in average 18hr AV two-way all vehicle flow; and/or • >500 HV increase in total 18hr HV flow
Low	**One step change in level, with** • <400 veh increase in average 18hr AV two-way all vehicle flow; and/or • <500 HV increase in total 18hr HV flow
Negligible	No change in step changes

Potential Effect - Collisions and Safety

9.2.41 It is possible to estimate the effects of increased traffic on collisions and safety from existing collision records, national statistics, the type, and quantity of traffic generated, journey lengths and the characteristics of the routes in question. Collision data to inform the collision analysis has been provided by TfL. This is based on the number of collisions within the study area during the period 2017-2022 (most recent data available).

9.2.42 Where relevant, the effects on collisions and safety are considered within this chapter and the magnitude of impact identified using professional judgement and the advice provided in the above guidance documents.

Potential Effect – Impact on Public Transport

9.2.43 The IEMA Guidance provides no thresholds for the potential for impact on public transport. This has therefore been derived on a distribution basis from the associated Trip Generation Assessment set out within the Transport Assessment in **Appendix 9.2.**

Potential Effect – Impact on the Thames Path

9.2.44 The Thames Path is fully segregated from vehicular traffic and in the operational phase, the Site will not generate any traffic onto, or immediately near, the Thames Path. The potential for impact is therefore considered to solely the level of cycle and pedestrian trips generated by the Site onto the Thames Path. It should be noted that at present the Thames Path north of the Site boundary is limited to a narrow and substandard footway, with no cycle facilities.

9.2.45 **Receptor Sensitivity/Value**

9.2.46 IEMA Guidelines suggest that locations or users which may be sensitive to changes in traffic conditions could be:

- Non-motorised users
- Public right of way users
- Motorists and freight vehicles
- Public transport
- Emergency services

9.2.47 However, links where there will be high concentrations of sensitive locations (such as hospitals, schools, and tourist attractions) are likely to be highly sensitive to changes in traffic flow unless there is separation from traffic. Following this exercise, each highway link within the agreed study area can be assigned a sensitivity value.

9.2.48 The sensitivity of a road can be defined by the vulnerability of the user groups who may use it, e.g., elderly people or children. A sensitive area may be where pedestrian activity may be high, for example in the vicinity of a school or where there is already an existing accident issue. It should be noted that the sensitivity of the receptor is judged on the sensitivity of road users (primarily pedestrians). It also takes account of the existing nature of the road. For example, an existing 'A' road is likely to have a lower sensitivity than a minor residential road.

9.2.49 The sensitivity of receptors has been classified as low, medium, or high, in accordance with the criteria set out in Table 9.1 below.

Table 9.1: **Sensitivity of Receptors**

Sensitivity	Criteria
Negligible	Receptors with low sensitivity to traffic flows and public transport trips: roads with wide carriageways and cycle lanes, roads with wide and segregated footways, multiple public transport nodes in areas with high accessibility.
Low	Receptors with some sensitivity to traffic flow and public transport trips: places of worship, public open space, tourist attractions and residential areas with adequate footway provision, public transport nodes in areas of good accessibility.
Medium	Receptors with moderate sensitivity to traffic flow and public transport trips: congested junctions, doctor surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, recreation facilities, public transport nodes in areas of moderate accessibility.
High	Receptors of greatest sensitivity to traffic flow and public transport trips: schools, colleges, playgrounds, accident clusters, retirement homes, roads without footways that are used by pedestrians, public transport nodes in areas of low accessibility.

The assigned sensitivity of the road links within the study area is therefore set out in **Table 9.2** below:

Table 9.2: **Sensitivity of Assessed Links**

Receptor	Characteristics	Sensitivity
Blackwall Lane	A single-carriageway road which supports 2 bus stops. It has footways on each side of the carriageway. The northern end of Blackwall Lane is primarily industrial in nature, with more residential use to the south. It carries more than 5,000 trips AADT. It has a PTAL of 3-4, which is moderate to good.	**Low**
A102 North	This is a London Lorry Permissible Route and designed to carry strategic freight transit. It is the approach to the Blackwall tunnel, supporting only a single bus route with no permitted pedestrian or cycle access and has no PTAL score as a result.	**Negligible**
A102 South	This is a London Lorry Permissible Route and designed to carry strategic freight transit. It is a large grade-separated dual carriageway with no pedestrian or cycle access.	**Negligible**
A206 East	This is a London Lorry Permissible Route and designed to carry strategic freight transit. It supports 3 bus routes, and there is a 2 way cycle lane intermittently. It is	**Negligible**

Receptor	Characteristics	Sensitivity
	largely mixed in nature, with large retail/industrial to the east and residential to the west. Footways are wide and signal pedestrian crossings are provided. It has a PTAL of 4-5 and good accessibility.	
A206 West	This is a single carriageway road with a cycle lane in each direction and wide footways. It supports 6 bus routes. It carries a large volume of baseline traffic. It is mixed in nature, with local centre retail, commercial/industrial uses and some residential use. Junctions have pedestrian signals and advanced stopping lines for cyclists.	**Low**

Summary of Thresholds for Magnitude of Impact

9.2.50 **Table 9.3** below summarises the criteria used to determine magnitude of impacts. It should be noted that the absolute level of an impact is also important, for example, the total traffic or HGV on a link. This explains why in some instances an increase of 100% may only lead to a negligible or minor impact if the existing flows are low.

Table 9.3: Magnitude of Change

Impact	Insignificant	Minor	Moderate	Major
Severance	Change in total traffic or HGV flow of less than 30%	Change in total traffic or HGV flow of 30-60%	Change in total traffic or HGV flow of 60-90%	Change in total traffic or HGV flow over 90%
Pedestrian Delay	0-5 seconds delay	6-10 seconds delay	10-15 seconds delay	15+ seconds delay
Non-Motorised User Amenity	Change in total traffic or HGV flows of less than 100%	A judgement based on the routes with change in total traffic or HGV flows over 100%		
Driver Delay	A judgement based on the results of network statistics assessment			
Collisions & Safety	A judgement based on quantitative KSI analysis as set out in the Transport Assessment and summarised in this chapter.			
Public Transport	A judgement based on quantitative Trip Generation analysis as set out in the Transport Assessment and summarised in this chapter.			

Assessment of Significance

9.2.51 The approach to the assessment of significance of effects is adapted from the DMRB and summarised in **Table 9.4** below. This shows how the significance of the effect is determined based on the combination of the sensitivity and the magnitude of change of the receptor.

9.2.52 This approach considers the duration, magnitude, direction, and location of each effect as well as the sensitivity of the receptor. Where any of the above likely effects define any specific criteria to determine effects, these will be assessed in conjunction with the tables below.

Table 9.4: Significance Criteria

Sensitivity of Receptor	Magnitude of Impact			
	Insignificant	**Minor**	**Moderate**	**Major**
Negligible	Insignificant	Insignificant or Minor	Insignificant or Minor	Insignificant or Minor
Low	Insignificant or Minor	Minor	Minor or Moderate	Moderate
Medium	Minor	Minor or Moderate	Moderate	Major
High	Minor	Minor or Moderate	Moderate or Major	Major or Extreme

9.2.53 Minor, Moderate and Major impacts will be defined as 'beneficial' or 'adverse' accordingly.

9.2.54 The broad definitions of the terms used to determine significance criteria are as follows:

- Insignificant: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.
- Minor: These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process.
- Moderate: These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision- making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
- Major: These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.

9.2.55 In accordance with the above IEMA Guidelines, the assessments are based upon the relative change between the baseline conditions and the future cumulative scenarios. The effect along key road links of the adjacent road network where any development related traffic is predicted to route along and could result in an environmental effect will be assessed in accordance with the above methodology.

9.3 Relevant Baseline Conditions

2022 Existing Baseline

9.3.1 DfT count data from 2022 has been sourced from their website. The baseline flows are summarised in **Table 9.5** following.

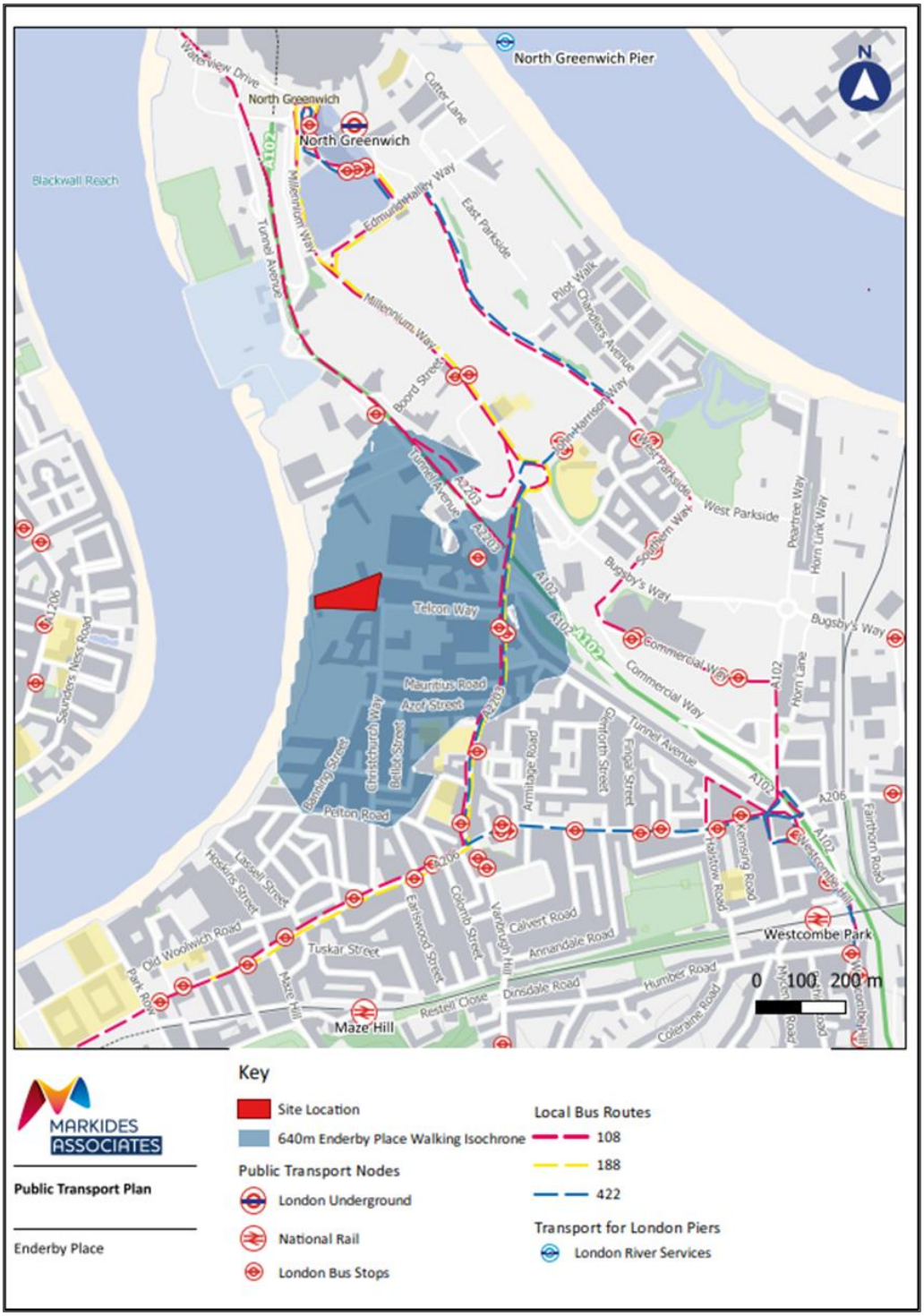
Table 9.5: DfT Baseline Flows - 2022

Link	2022 Base (DfT)		
	AADT	HDV	% HDV
Blackwall Lane	8,556	812	9%
A102 North	85,714	4,971	6%
A102 South	73,290	3,226	4%
A206 East	14,325	1,330	9%
A206 West	18,882	1,765	9%

Public Transport Baseline

9.3.2 The existing TfL bus stops and local bus routes that operate in the vicinity of the sites are illustrated in **Figure 9.7.** These services are all captured within the PTAL walk distance.

Figure 9.7 Local Bus Stops and Routes



9.3.3 The frequency and route for the associated local bus routes is given in **Table 9.6** below.

Table 9.6: Local Bus Services

Route	Direction	Peak Hour Frequency			Weekday Services	
		Weekday	Saturday	Sunday	First	Last
108	Stratford International (Stop MU)	7-11 mins	9-12 mins	2-4 per hour	24-hour service	
	Lewisham (Stop MW)	9-12 mins	8-12 mins	2-4 per hour		
188	Russell Square (Stop MP)	8-12 mins	8-12 mins	9-13 mins	24-hour service	
	North Greenwich (Stop MQ)	8-12 mins	9-13 mins	10-14 mins		
422	North Greenwich (Stop MQ)	9-12 mins	9-12 mins	10-13 mins	04:42	00:50
	North Greenwich (Stop MN)	9-12 mins	9-12 mins	11-13 mins	05:02	01:12

9.3.4 The 108 service is restricted to a single-decker bus due to routeing through the Blackwall Tunnel, which is too low for double-decker vehicles. Additional services are also available from North Greenwich Station to the wider area, including the 129, 132, 161, 180, 335, 472 and 486 bus services, with destinations including Tottenham Court Road, Lewisham, and Stratford International.

9.3.5 The nearest railway station is located at North Greenwich, approximately 2.5km to the northeast of the Site (a 7-minute cycle ride). The station is also accessible via bus using the 188 service from Tunnel Avenue Stop MQ northbound. Bus stop Tunnel Avenue (Stop MP) in the southbound direction is temporarily closed at the time of writing; it is understood that this is due to works on the adjacent network to improve Tunnel Avenue as part of the Silvertown Tunnel highways package and the associated bus diversions, It is expected that this bus stop will be reinstated no later than 2025 and in advance of occupation of the site. In the interim, southbound passengers can alight at Christ Church Primary School (Stop MR).

9.3.6 North Greenwich Station is a London Underground Line station served by the Jubilee Line, which benefits from frequent peak hour services between Stanmore and Stratford via central London, as well as Night tube services.

9.3.7 Some of the key stations on the jubilee line, and the length of time it takes to reach them are listed below:

- Stanmore (far western station) – 53 minutes
- Waterloo – 12 minutes
- London Bridge – 9 minutes
- Canary Wharf – 2 minutes
- Stratford (far eastern station) – 9 minutes

9.3.8 Both Maze Hill and Westcombe Park stations are located approximately 1.5km south of the Site (20-minute walk or 10-minute cycle). The bus journey to Trafalgar Road/Maze Hill bus stop using the 188 service takes 5 minutes, followed by a 250m walk to reach the station. The 422 service can be used to access Westcombe Park via the Westcombe Park Station Stop B bus stop followed by a 200m walk.

9.3.9 Both Maze Hill and Westcombe Park stations are served by Southeastern Rail and Thameslink trains and benefit from cycle parking. Each station is served by:

- 2 trains per hour to London Cannon Street;
- 2 trains per hour to Luton;
- 2 trains per hour to Barnehurst, returning to London Cannon Street via Bexleyheath and Lewisham; and
- 2 trains per hour to Rainham via Chatham.

9.3.10 During the peak hours, the stations are served by an additional half-hourly circular service to and from London Cannon Street via Sidcup and Lewisham in the clockwise direction and direct to London Bridge anticlockwise, for a total of 10 trains at peak hour.

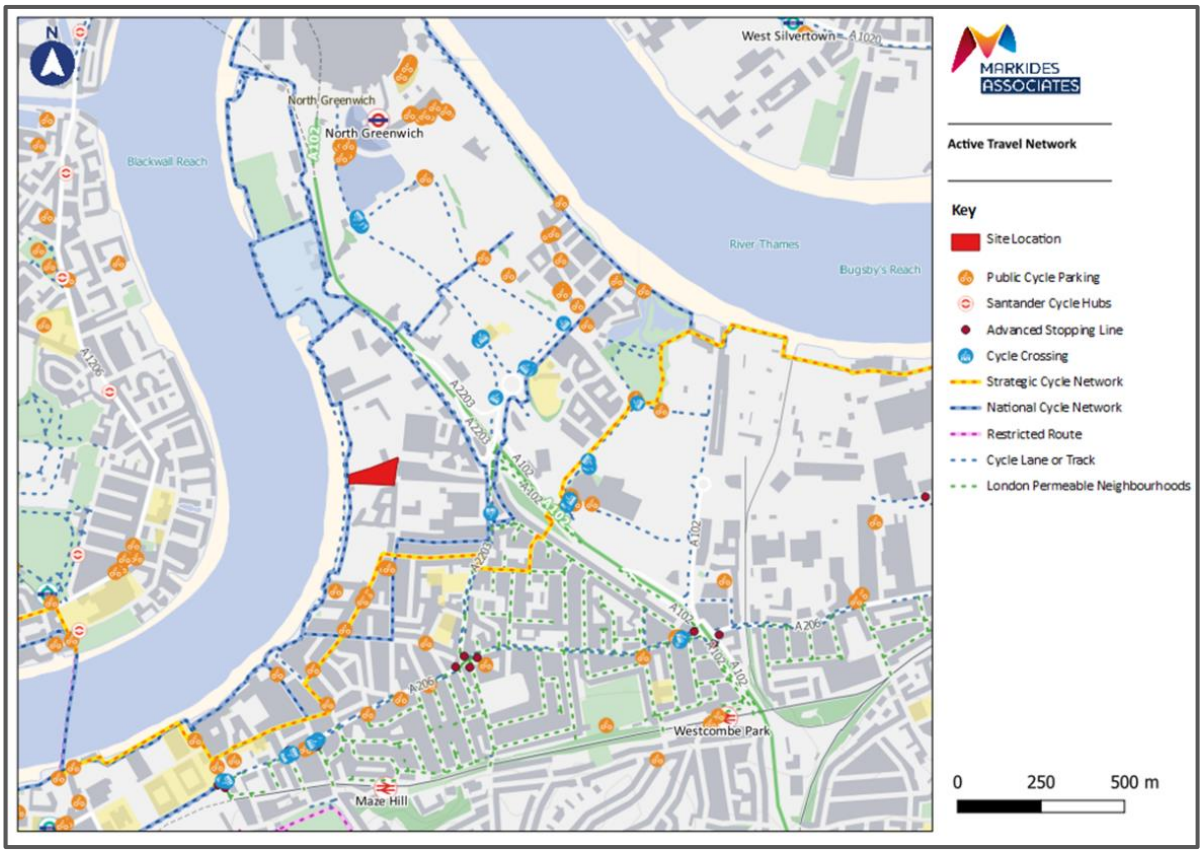
Active Travel Baseline

9.3.11 The local pedestrian environment is of good quality and offers access to many local amenities, as well as various modes of public transport. The Site benefits from proximity to the Strategic Cycle Network, which is located a short distance to the south, and which bisects the Greenwich peninsula.

9.3.12 Locally, there is an evolving network of other cycle paths, including the Olympian Way foot and cycle link along the bank of the Thames via Enderby Wharf, providing an off-road cycle connection from Cutty Sark up to the O2 Arena, and proceeding east as far as Erith via other Thames-side cycle connections.

9.3.13 A plan showing the extent of the active travel network is included overleaf as **Figure 9.8.**

Figure 9.8 Active Travel Network



2027 Future Baseline

9.3.14 DfT count data from 2022 has been factored to 2027 using TEMPro. The future baseline flows are summarised in **Table 9.7**.

Table 9.7: DfT Future Baseline Flows - 2027

Link	2027 Future Year		
	AADT	HDV	% HDV
Blackwall Lane	8,662	822	9%
A102 North	86,781	5,033	6%
A102 South	74,202	3,266	4%
A206 East	14,503	1,347	9%
A206 West	19,117	1,787	9%

Public Transport Future Baseline

9.3.15 There are no forecast changes to Maze Hill or Westcombe Park, or North Greenwich Stations ahead of the year 2027.

9.3.16 Buses are likely to be subject to change on the Greenwich peninsula, with re-routeing, new services, and amendments to service frequencies as the result of the completion of the Silvertown Tunnel in 2025. The Site will also be served by a diverted service with a minimum frequency of 2 per hour or more likely 4 per hour, improving the PTAL of the Site.

Active Travel Future Baseline

9.3.17 It is expected that in future the Thames Path north of the Site will be opened up, widened and improved; however, this is unlikely to have been completed by 2027. Some changes to pedestrian access will occur as a result of the completion of the Silvertown Tunnel works; however, these are expected to be improvements compared to the existing, enabling upgrade to pedestrian crossings and signals where existing facilities are aged. Cycle provision is also expected to be improved and created where currently there are none existing. The extent of this revision, however, is not fully known at the time of writing. As the future baseline is expected to be an improvement on the existing baseline, therefore no change to the 2022 baseline scenario has been assumed for the purposes of a robust assessment.

9.4 Likely Residual Cumulative Effects and their Significance

9.4.1 The EIA Scoping Review and EIA Scoping Opinion highlight the following cumulative sites which should be included within the cumulative assessment. As outlined in **ES Volume 1, Chapter 2: EIA Methodology**, given the time elapsed since the writing of the EIA Scoping Report and EIA Scoping Opinion and now (approximately 3 years), further discussions were held with RBG to agree which Cumulative Schemes could be removed due to their recent completion (and therefore being inherently included within the baseline scenario). As such, the following schemes have not been assessed:

- **Enderby Wharf** – This site has been fully built out and occupied at the time of writing. The TEMPro factors and DfT road traffic data used now also include data from 2022 which captures Enderby Wharf within the background flows. On that basis, this site has not been included within the Cumulative Assessment.
- **Lovell's, Granite Badcocks, and Pipers Wharf. –** These are all parts of one larger application dated as far back as 2007, which at the time of the scoping was noted to be part-built, part-occupied. It is now understood that these have completed construction and are occupied. As per Enderby Wharf above, the background flows are expected to have already captured and this site has not been included within the Cumulative Assessment.
- **Alcacel-Lucent (**planning reference 14/0293/F) has been built out and is therefore captured within the background flows. On that basis, this site has not been included within the Cumulative Assessment.

9.4.2 The list of additional Cumulative Schemes, agreed with RBG, is provided in **ES Volume, Chapter 2: EIA Methodology**. These have additionally been reviewed and a summary is provided in **Appendix 9.1.**

9.4.3 It should be noted that some of these additional sites relate to significantly older planning permissions and have therefore been considered 'committed development' since prior to 2020. The extent to which they are captured within localised TEMPro factors, within local plan forecasts, or within the various local traffic models used to assess the impact of other development sites to which we have referred is not known. There is a significant potential therefore that their inclusion is generating a significant level of double counting in assumptions of the future baseline.

9.4.4 Additional sites which have been scoped out of the assessment are as follows:

- **Former Sam Manners House (20/1815/F)** – This site is a car-free development of only 30 flats, and the associated transport work concludes that it would generate a negligible level of vehicle traffic, which once distributed onto the road network would generate no assessable overlap with the scope of study area (less than 1 vehicle). On that basis, it has not been included within the cumulative assessment.
- **87 Blackwall Lane (19/0512/F)** – Likewise, this site is a car-free development of only 27 flats, and the associated transport work concludes that it would generate a negligible level of vehicle traffic, which once distributed onto the road network would generate no assessable overlap with the scope of study area (less than 1 vehicle). On that basis, it has not been included within the cumulative assessment.
- **111-113 Mellish Street (PA/19/01299/A1)** - – Likewise, this site is a car-free development of only 22 flats in Tower Hamlets and therefore significantly distant from the site, and the associated transport work concludes that it would generate a negligible level of vehicle traffic, which once distributed onto the road network would generate no assessable overlap with the scope of study area (less than 1 vehicle). On that basis, it has not been included within the cumulative assessment.
- **Millennium Village (Phase 4 and 5) (12/0022/O) –** This is a legacy planning application dating back to 2012. A review of the site and the contractor's website indicates that this site has been largely built out and is part occupied, excepting Phase 5, which will comprise 112 residential units, due for completion in 2024. On that basis, only 112 residential units have been retained within the scope of the cumulative assessment.
- **Victoria Deep Water Terminal (17/1142/F, amended:18/2729/MA) –** This application is for a temporary relocation of concrete works to facilitate Thames Tideway. The 2018 application was for an extension of relocation for up to 2 years but is understood to have expired and concluded in 2020. This site is assumed to have returned to its original location and therefore is captured within the baseline. On that basis, it has not been included within the cumulative assessment.
- **Frankham Walk (Tidemill Primary School) (DC/16/095039) –** The approved TA for this application identifies negligible vehicle trips across the day, with none at peak hour. When distributed, this would generate no assessable overlap with the scope of study area (less than 1 vehicle). On that basis, it has not been included within the cumulative assessment.
- **Convoy's Wharf (DC/13/83358)** – This application is the parent application and is covered by Site 37, dated 2018. This contains the later Transport Assessment work considered more up to date in its assumptions. On that basis, the older 2013 application has been disregarded.
- **Glengall Quay – Pepper Street (PA/16/03518) –** A review of the associated transport assessment and various applications for the discharge of conditions has identified that no distribution of traffic is expected within the study area, including for construction traffic. The development also generates very low levels of vehicle trips. On that basis, it has not been included within the cumulative assessment.
- **Greenwich Peninsula Plot 19.05 (21/2077/R) -** This application is a Reserved Matters Application only and contains no additional transport assessment work. On that basis, it has not been included within the cumulative assessment.

- **Wood Wharf (PA/21/01440/NC & PA/13/02966)** – Part of this development has been built out and will be contained within the baseline. Of the remainder, it should be noted that the original TA assessed the total development for the design year 2026 and identified no distribution onto the Greenwich Peninsula and the original EIA (and approved addendum in 2021) concluded that there was no significant residual adverse impact which was not mitigated. On that basis, this scheme has been discounted from the cumulative assessment.
- **South Quay Plaza Phases 1-3 (PA/14/00944) –** A later Phase 4 application was submitted (PA/15/03073/B1), which is included as a separate site (Site 28) within the cumulative development sites list. The Phase 4 application includes an updated review of Phases 1-3 and therefore this application reference has been discounted as a duplicate. When the Phase 4 application was reviewed, the TS identified very low levels of vehicle trips at peak hours and no distribution into the study area. The EIA concluded that the vast majority of effects studied resulted in a Negligible Impact. On that basis, this scheme has been discounted from the cumulative assessment.
- **54 Marsh Wall (PA/16/01637/A1)**– The net trips for this development are very low and when distributed onto the network are not expected to overlap with the assessment area. The EIA associated with this development concluded that all potential impact effects studied were negligible. On that basis, this scheme has been discounted from the cumulative assessment.
- **Aspen Consort Place (PA/15/02671) -** The net trips for this development are very low and when distributed onto the network are not expected to overlap with the assessment area. The EIA associated with this development concluded that all potential impact effects studied were negligible. On that basis, this scheme has been discounted from the cumulative assessment.
- **HQW1 - Heron Quays West (PA/16/02956) -** The TS for this application identifies a net change in traffic that is a significant decrease compared to the former use. On that basis, this site has not been included. The associated EIA concluded no significant effects, and when examined, the distribution of vehicle trips is likely to result in no assessable overlap with the scope of study area (less than 1 vehicle).
- **Greenwich Peninsula Masterplan 2015 (15/0716/O) -** This masterplan is part superseded by the 2019 update, which includes assessment of the retained aspects of the 2015 masterplan. The 2019 masterplan, being the more recent and more comprehensive transport assessment has been included the scope and the 2015 masterplan has been disregarded as a duplication.
- **Greenwich Peninsula Plots 1.02 and 1.03 (23/0418/R) –** This is a Reserved Matters application and does not include any transport assessment additional to the original application, which is already included as the 2019 masterplan. This is considered a duplicate and has therefore been disregarded.
- **Greenwich Peninsula Plot N0201 (23/2150/F);** This is part of the 2019 masterplan and is expected to have been considered within that application. This development application has been validated but not approved. The proposals are for car-free and permit free student accommodation, generating a negligible amount of operational traffic, and on the basis of the above, has been disregarded from the assessment.
- **Greenwich Peninsula Plot M0121 (23/1565/F) -** This is part of the 2019 masterplan and therefore already considered. This development application has been validated but not approved. The proposals are for 51

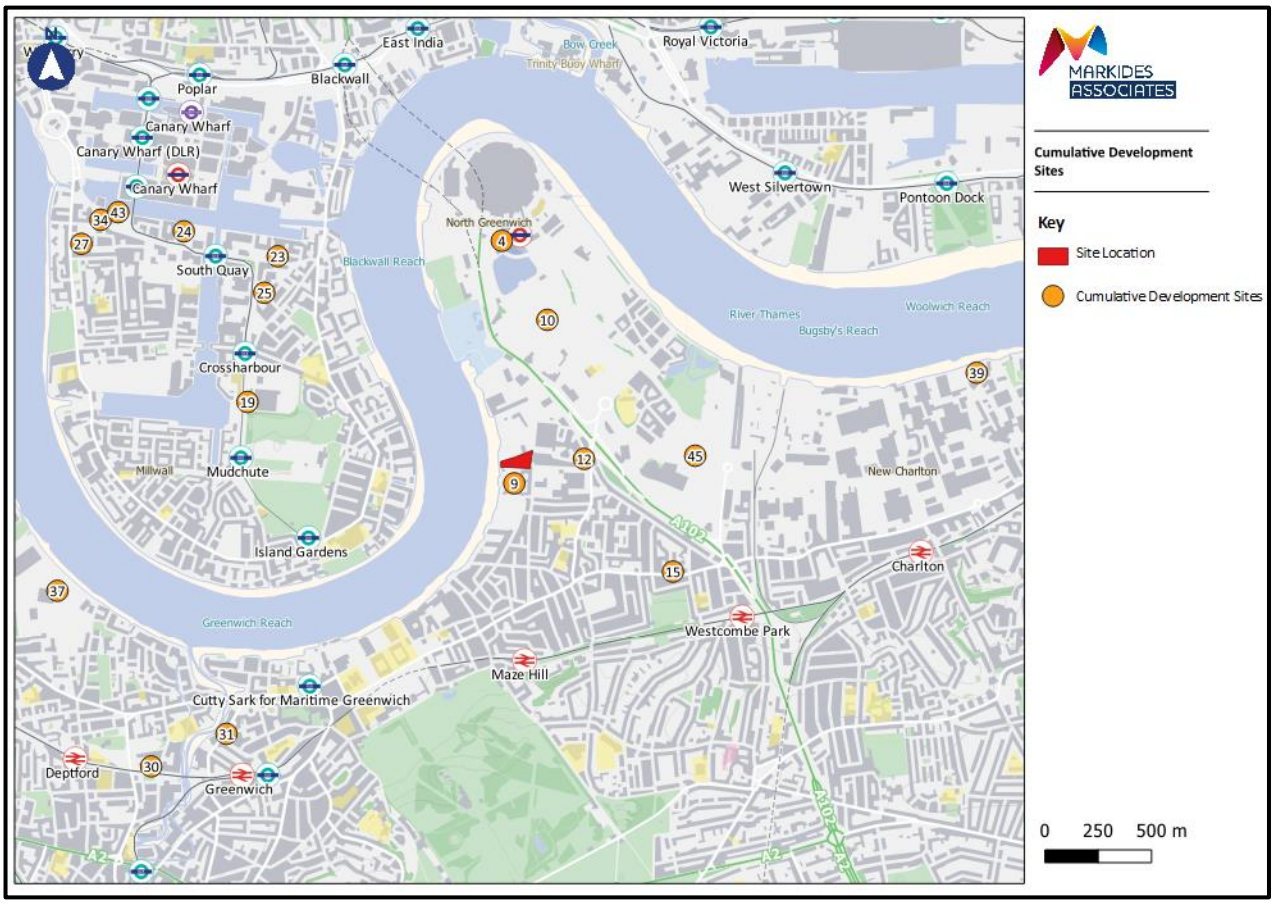
additional residential units compared to the masterplan; however, the trip generation shows a total net reduction in vehicle trips compared to the extant consent. On that basis, it is considered a duplication and has been disregarded from the analysis. This does; however, demonstrate that the 2019 masterplan assessment for residential use was over-robust.

- **GMV – Phases 9 and 10 (Plots 401-405) (19/4075/R)** – This is a Reserved Matters application and does not include any transport assessment additional to the original application, which is already included as Site 45. This is considered a duplicate and has therefore been disregarded.
- **Temporary bus garage – Go-ahead London, Northern Warehouse (23/1161/F)** - This is a validated but not yet approved application for the temporary relocation of a bus depot, with currently existing travel patterns and a low level of private car use (10 two-way trips per peak hour); it is considered that these flows are already on the network and therefore not 'new' impact; it has therefore not been included in the assessment on that basis.
- **"Land North of Northern Warehouse, Morden Wharf, Morden Wharf Road, London, SE10 0NU" (19/3298/F)** – This is a minor application for wheel-washing facilities and contains no transport assessment. It therefore has been discounted.
- **Thanet Wharf (Creekside Village East) (DC/18/108548)** – The Transport Assessment or similar work is noted within documents associated with this application (validated only, not yet approved) to be within Chapter 16 of the EIA; however, this is not available on the public planning search and therefore cannot be reviewed at this time.
- **Westferry Printworks (PA/22/02317) –** This application is an EIA Scoping request only and has not been consented. The EIA Scoping Opinion issued by Tower Hamlets states that both LBTH and TfL are advising that the development should be car-free aside from blue badge spaces, in line with current policy. Current Tower Hamlets policy is 3% provision, with demonstration that 10% can be provided if required. We could therefore assume 120 blue badge spaces as a maximum. Once distributed on the network, a negligible level of traffic enters the study area. On that basis, this proposal has been discounted from the assessment.
- **Ravensbourne Wharf (23/1414/F) -** This application is validated only and has not been consented. The proposals are for car-free student accommodation with a single disabled parking space, and a negligible number of servicing trips across the day which do not distribute into the study area. On that basis, this proposal has been discounted from the assessment.
- **The Bellamy (PA/21/02776/A1) -** This application is validated only and has not been consented, with queries regarding the trip generation raised by TfL yet to be resolved. It is car free, providing only a maximum of 6 disabled parking bays. The net trip generation currently shows a reduction in vehicle trips compared to the existing use, and on that basis, the proposal has been discounted from the assessment.
- **Ensign House (PA/21/00952/A1) -** The EIA associated with this development assumes no significant effects and no distribution into the Greenwich Peninsula. The development is car-free and generates a negligible increase in vehicle movements across the day, and therefore none within the study area. On that basis, this development has been discounted from the assessment.

- **Silvertown Tunnel (DCO)**- This scheme is scheduled to complete in 2025 and by the time of completion of the development proposals at Enderby Place will not generate additional traffic. The main boring works have been completed and the scheme is understood to currently generate negligible traffic volumes; on that basis, it has been discounted from the assessment.
- **225 Marsh Wall (PA/16/02808/A1) -** A review of the associated transport assessment and various applications for the discharge of conditions has identified that no distribution of traffic is expected within the study area, including for construction traffic. The development also generates very low levels of vehicle trips, being car-free. On that basis, it has not been included within the cumulative assessment.

9.4.5 The included sites are shown diagrammatically overleaf as **Figure 9.9.**

Figure 9.9: Included Cumulative Assessment Sites



9.4.6 For the Development, the likely traffic volumes generated has been estimated using the TRICS database to derive trip rates for the proposed uses. This data has been used to determine the associated traffic impact on the local road network.

9.4.7 For the cumulative assessment, cumulative sites data has been taken from the Transport Documents available for each site as available on the planning search for the relevant planning authority. These are also included as **Appendix 9.1.** It should be noted that the availability of daily flows was not consistent across all sites, nor were trips by all modes available in all cases. Most other assessments included no distribution model and therefore some high-level assumptions have been made in lieu of more precise data.

Construction Traffic

9.4.8 An indicative Gantt chart detailing phasing and vehicle movements by task is shown in **Table 9.8.** At the first opportunity following the appointment of a contractor, this will be updated to ensure more accurate estimates. This demonstrates that peak construction is expected to occur in June 2025 with 200 two-way vehicle movements per day, with piling, substructure, and superstructure activities for each block coinciding.

Table 9.8: Forecast Construction Traffic

	Vehs per day	Movements per day	Dec-24	Feb-25	Apr-25	Jun-25	Aug-25	Oct-25	Dec-25	Feb-26	Apr-26	Jun-26	Aug-26	Oct-26	Dec-26	Feb-27	Apr-27	Jun-27	Aug-27	Oct-27	Dec-27
River Tower & Maisonettes	**-**	**-**																			
Enabling Works	20	40	40	40																	
Piling	20	40		40	40																
Substructure	15	30			30	30															
Superstructure	5	10				10	10	10	10	10	10	10	10	10							
Fitout	15	30						30	30	30	30	30	30	30	30	30	30				
Morden Tower	**-**	-																			
Enabling Works	20	40			40	40															
Piling	20	40				40	40														
Substructure	15	30					30	30													
Superstructure	5	10							10	10	10	10	10	10	10	10	10	10	10	10	
Fitout	15	30									30	30	30	30	30	30	30	30	30	30	30
Telcon Tower	**-**	-																			
Enabling Works	20	40			40	40															
Piling	20	40			40	40	40														
Substructure	15	30					30	30	30												
Superstructure	5	10							10	10	10	10	10	10	10	10					
Fitout	15	30									30	30	30	30	30	30	30	30			
Total Movements			**40**	**80**	**190**	**200**	**150**	**100**	**90**	**60**	**120**	**120**	**120**	**120**	**110**	**110**	**100**	**70**	**40**	**40**	**30**

9.4.9 It should be noted that this is a worst-case assumption based on each tower operating independently in respect of vehicle requirement (as at this stage the level of coordination and overlap is not easily identified).

9.4.10 An examination of potential dig-out volume estimates circa 6000m3 of excavation combined across all three towers, over the enabling works period of circa 6 months. This would generate 400 lorries in total (800 two-way vehicle movements, assuming a 15m3 capacity lorry), which equates to 33 movements per week and 6-8 two-way movements per day across a 5.5 day working week.

9.4.11 It could also be assumed that the total enabling works would require 20 vehicles per day in total (rather than per tower), with a robust Site Waste Management plan and delivery strategy. This would generate 40 two-way vehicle movements in addition to the 8 noted above, plus circa 40 two-way movements for the purpose of piling (again, potentially in total not per tower). This therefore could generate some 88 two-way movements per day in a more likely scenario for the duration of the excavation works during the enabling and piling works period.

9.4.12 Assuming a worst-case of 200 two-way vehicle movements a day equates to approximately 20 per hour (assuming 10-hour working days). This is just over one movement per hour when divided over an 8-hour working day. This is 10 vehicles in total, and a level of accumulation which could be contained on site. It is less than could theoretically be generated by the operational phase of the development and would be a temporary worst-case situation that assumes no additional control through the implementation of this CLP or any other Construction Management Plan.

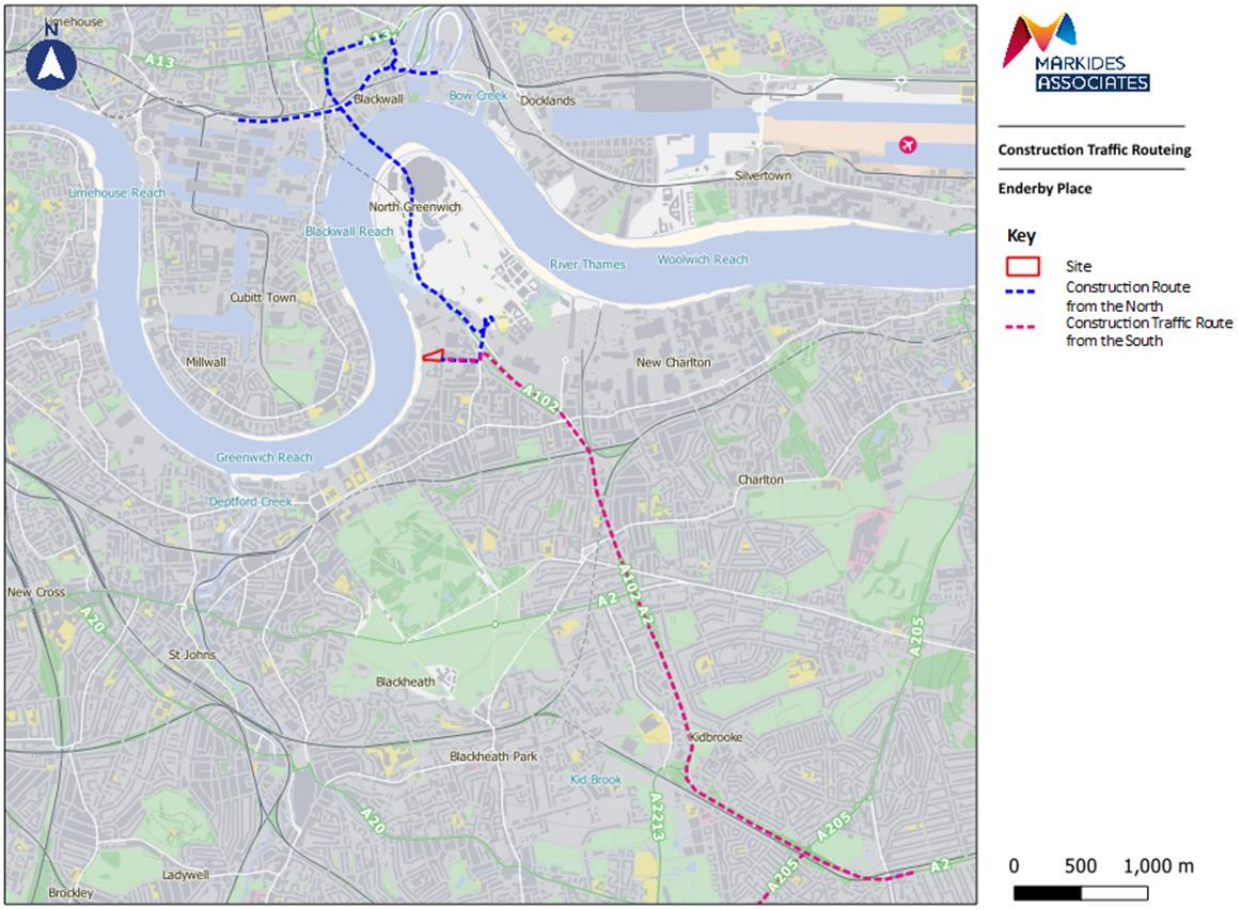
9.4.13 The more likely peak-construction scenario would be fewer than 100 two-way vehicle trips per day.

9.4.14 The Principal Contractor(s) would ensure that all delivery drivers receive a plan clearly identifying the approved “works traffic route”. The approved works traffic route would be detailed in the Traffic Management Plan and agreed with the highway authority.

9.4.15 It is proposed that construction-related vehicles would approach the site from the north via A13 and Blackwall Tunnel, or the south via the A205, followed by the A206 (if from the north or south) and then the A2203. This routeing is indicated in **Figure 9.10.** These are indicative and will be dictated by the origin-destination of materials. It is considered that the extent of movement north will be extremely limited, with the majority of trips routeing

south and east via the A2. This is due to height restrictions at the Blackwall Tunnel which preclude most larger construction vehicles.

Figure 9.10 Construction Traffic Routeing



The Completed and Operational Development

9.4.16 The trip generation associated with the completed and operational Development are set out in **Table 9.9** following:

Table 9.9: Development Trips Distributed

Link	2027 Future Year		
	AADT	HDV	% HDV
Blackwall Lane	273	20	7%
A102 North	44	3	7%
A102 South	147	11	7%
A206 East	34	3	7%
A206 West	48	4	8%

9.4.17 The Development will also deliver proportionate contributions to active travel, public transport in respect of a new bus service and associated stops. There is also an extant permission for a new Thames pier (although this item is not expected to be implemented in 2027) on land at Morden Wharf. These funds will be secured by S106 agreement

and implemented as per the need of the local area. The site itself will open up new walking routes, deliver additional improvements to the Thames Path and on-site facilities such as cycle parking.

The Cumulative Development Scenario

9.4.18 As per the flows set out in **Appendix 9.1**, there are 16 Cumulative Schemes included in the study. Of these, the following sites would require distribution of traffic through the Blackwall Tunnel to generate any impact onto roads scoped within the study area.

- **Site 19 - Crossharbour District Centre (Asda)** – This site generates a net reduction in traffic compared to the baseline uses and should therefore result in a betterment to the area. No distribution is provided but on the basis that the total peak hour vehicle trips are reduced, no distribution has been assumed through the Blackwall Tunnel onto the assessed roads.
- **Site 23 – One Thames Quay** – This site generates a net reduction in total vehicle trips in the AM peak and a minor increase in the PM peak (11 two-way trips). The distribution does not include any roads within the study area and on that basis, this site is not included in the assumed distribution adjacent to the site.
- **Site 24 – Mill Harbour** - This site generates a net reduction in traffic compared to the baseline uses and should therefore result in a betterment to the area. The distribution does not include any roads within the study area and on that basis, this site is not included in the assumed distribution adjacent to the site.
- **Site 25 – Skylines Village** – This site generates a net reduction in trips by all modes compared to the baseline uses and therefore should result in a betterment to the area. As all trips by all modes are lower than the baseline uses, then this development has been fully scoped out of the cumulative assessment.
- **Site 27 – Cuba Street** – This site generates a small net increase in vehicle flows of <10 two-way trips in each peak hour. The distribution does not include any roads within the study area and on that basis, this site is not included in the assumed distribution adjacent to the site.
- **Site 34 – 56-58 Marsh Wall** –This site generates a small net increase in vehicle flows of <10 two-way trips in each peak hour. No distribution onto local roads is noted; however, with such small increases, the likelihood of more than 1 car crossing the Blackwall Tunnel into the assessment area is limited and therefore, this site is not included in the assumed distribution adjacent to the site.
- **Site 43 – Quay House** – This site generates a small net increase in vehicle flows of 12 two-way vehicle trips in the AM peak and a net reduction of 15 fewer two-way vehicle trips in the PM peak. The distribution does not include any roads within the study area and on that basis, this site is not included in the assumed distribution adjacent to the site.
- **Site 30 - Sun Wharf** was identified as generating very low levels of travel and the associated trip distribution indicated no flows on roads within the assessment area. This site has not been included in the further assessment on that basis.
- **Site 39 - Herringham Quarter** also generates a net reduction in trips by all modes compared to the baseline uses and has therefore not been included.

9.4.19 The total cumulative development flows to be distributed and assessed on the network are therefore as set out in **Table 9.10 below.** HDV flows where not otherwise available have been assumed to be 10% of total vehicle flows based on local proportionality and a robust level of HGV flow according to professional experience and judgement.

Table 9.10 Total Cumulative Development Trips (Not Including Development)

Development	Total Vehicle						HDV					
	AM Peak			PM Peak			AM Peak			PM Peak		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
1 Boord Street	10	38	49	19	0	19	1	4	5	2	0	2
Morden Wharf	132	251	383	253	182	435	13	25	38	25	18	44
Greenwich Peninsula	1,057	1,453	2,514	1,288	1,126	2,412	106	145	251	129	113	241
Woolwich Road	0	3	3	3	0	3	0	0	0	0	0	0
Peterboat Close	0	5	5	7	1	8	3	6	9	8	4	12
Convoys Wharf	191	342	533	259	290	269	19	34	53	26	29	27
Millenium Village Phase 5	1	4	6	3	2	5	0	0	1	0	0	1
Saxon Wharf	0	2	3	1	0	2	0	0	0	0	0	0
Total Without Greenwich Peninsula	**335**	**645**	**981**	**546**	**475**	**741**	**36**	**70**	**106**	**61**	**51**	**85**

9.4.20 As shown in the table above, Greenwich Peninsula by far generates the greatest increase in trips on the local highway network. However, examining WSP's approach to the assessment, it was concluded that following mitigation, there would be a negligible residual effect on the local network. The only other effects noted to be other than 'negligible' were 'moderate positive direct long-term' effects on active travel amenity and accessibility.

9.4.21 It therefore follows that in terms of future impact, the 2019 Masterplan mitigates it's impact fully and therefore should no longer be considered as a potential residual impact. It has been scoped out of the remaining assessment on that basis.

9.4.22 The remaining sites retained within the scope generate <1,000 two-way trips at peak hour.

9.4.23 To assume the AADT for the Cumulative Sites in total, the AM peak has been assumed (as per TRICS) to equate to 10% of the AADT. The resulting impact on the highway network is shown below in **Table 9.11.** Some values have been rounded up where percentage of HDVs is not a whole number.

Table 9.11 Total Cumulative Impact

Link	2022 Base (DfT)		
	AADT	HDV	% HDV
Blackwall Lane	8,556	812	9%
A102 North	85,714	4,971	6%
A102 South	73,290	3,226	4%
A206 East	14,325	1,330	9%
A206 West	18,882	1,765	9%
Link	**2027 Future Year**		
	AADT	HDV	% HDV
Blackwall Lane	8,662	822	9%
A102 North	86,781	5,033	6%
A102 South	74,202	3,266	4%
A206 East	14,503	1,347	9%

A206 West	19,117	1,787	9%	
Link	**Development Traffic**			
	AADT	Daily HDV	% Daily HDV	% Change
Blackwall Lane	273	20	7%	3.16%
A102 North	44	3	7%	0.05%
A102 South	147	11	7%	0.20%
A206 East	34	3	7%	0.23%
A206 West	48	4	8%	0.25%
Link	**2027 Base + Development**			
	AADT	HDV	% HDV	
Blackwall Lane	8,936	843	9%	
A102 North	86,825	5,036	6%	
A102 South	74,349	3,277	4%	
A206 East	14,537	1,349	9%	
A206 West	19,165	1,791	9%	
Link	**Cumulative**			
	AADT	HDV	% HDV	
Blackwall Lane	418	39	9%	
A102 North	4,189	243	6%	
A102 South	3,582	158	4%	
A206 East	700	65	9%	
A206 West	923	86	9%	
Link	**2027 Base + Cumulative**			
	AADT	HDV	% HDV	
Blackwall Lane	9,081	856	9%	
A102 North	90,970	5,277	6%	
A102 South	77,784	3,428	4%	
A206 East	15,203	1,411	9%	
A206 West	20,040	1,872	9%	
Link	**2027 Base + Cumulative + Dev**			
	AADT	HDV	% HDV	% Change
Blackwall Lane	9,354	882	9%	7.98%
A102 North	91,014	5,279	6%	4.88%
A102 South	77,931	3,435	4%	5.03%
A206 East	15,237	1,414	9%	5.06%
A206 West	20,088	1,877	9%	5.08%

9.4.24 As shown in the table above, of the links assessed, none result in a net change of +/- 10% total AADT or greater and therefore do not meet either Rule 1 or Rule 2 for additional assessment.

9.4.25 The sensitivity of the road links are set out in **Table 9.12** relation to the magnitudes of change by potential effects.

Table 9.12: **Sensitivity & Magnitude of Change**

Receptor	Sensitivity	Magnitudes of Change								
		Rule 1/Rule 2	Severance	Pedestrian Delay	Amenity	Fear	Driver Delay	Collisions and Safety	Public Transport	Cumulative Effect
Blackwall Lane	Low	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Minor	Minor	Minor	Insignificant
A102 North	Negligible	Insignificant	Insignificant	Not Applicable	Insignificant	Not Applicable	Insignificant	Insignificant	Insignificant	Insignificant
A102 South	Negligible	Insignificant	Insignificant	Not Applicable	Insignificant	Not Applicable	Insignificant	Insignificant	Insignificant	Insignificant
A206 East	Negligible	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
A206 West	Low	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant or Minor	Insignificant or Minor	Insignificant or Minor	Insignificant

9.4.26 As shown in the table above, and as mentioned, none of the links meet the threshold rules for additional assessment. There is a proportionately small increase in traffic flow on the assessed links in the cumulative development scenario, which result in a potential **minor adverse**, **long-term, direct** impact; however, the following considerations must be reiterated:

- Seven of the sites above in **Table 9.10** that have been included within the assessment are dated prior to 2020, and as a result, are largely included within the cumulative assessment of the other EIA assessments crossreferenced within this chapter (for example, that of Greenwich Peninsula), all of which assumed no significant, permanent adverse impact following mitigation. Where these are allocated or very large scale they are likely to have been reflected in the updated 2023 issue of the localised TEMPro factors.
- All of the sites that have been included within the assessment have been referenced in respect of their net trip generation and those with an increase in vehicle trips have been kept in the scope; however, these flows do not account for any mitigation and are therefore also a worst-case scenario. All of these sites are committed and therefore subject to S106 agreements for proportionate contribution to packages of transport mitigation measures including financial contributoin to public transport, walking and cycling infrastructure, Travel Planning, Delivery and Servcing Controls, Construction Traffic Management Controls, and modal shift objectives such as the provision of car club memberships.

Mitigation Measures

9.4.27 It should be noted that the Development will be subject to a range of management measures, expected to be secured by S106 contribution or otherwise as a condition of any planning approval. These include, but are not limited to:

- A proportionate contribution to the onward improvement of the Thames Path in tandem with the delivery of Morden Wharf, which will mitigate the impact of increased access demand.
- A proportionate contribution to local bus improvements, including new bus stops and a diverted route close to the Site. This is expected to mitigate at least a proportion of the potential impact.
- A Delivery and Servicing Management Plan[18] to control, monitor and manage vehicle movements to and from the site, driver behaviour and interaction between servicing/delivery demand generated by the different land uses.
- A Site Travel Plan[19] to monitor, manage and encourage sustainable mode shift across all users on the site, including Car Club membership.
- An Operational Waste Management Plan to monitor, manage and control according to RGB, wider London and Statutory Waste Controls the storage, handling, and removal of waste from the site.[20]
- A Parking Management Plan to monitor, control, and manage the allocation of all parking on the site or associated with it, the impact on local roads, and parking behaviour.

9.4.28 On that basis, it is considered that any potential impact of the operational site traffic below the threshold of significance (insignificant overall) will be fully and further mitigated by the mechanisms listed above, which will also be subject to continuous update and review for some 5 years post-occupation as a minimum.

9.4.29 It should also be noted that by condition of any planning approval, all construction works associated with development in RGB of any scale are subject to the implementation measures including but not limited to:

- Construction Logistics Planning[21] as per TfL guidance, which would include requirements for fixed routeing and an on-site delivery booking system and consolidation of materials.
- Construction Site Waste Management Planning[22]
- FORS[23]/CLOCS[24] certification for contractors
- Considerate Contractor Scheme registration[25]

9.4.30 On that basis, it is considered that the impact of construction will be fully mitigated by the mechanisms listed above, which will also be subject to continuous update and review throughout the construction period.

[18] https://content.tfl.gov.uk/delivery-and-servicing-plan-guidance.pdf
[19] https://tfl.gov.uk/info-for/urban-planning-and-construction/transport-assessment-guide/travel-plans
[20] https://www.royalgreenwich.gov.uk/info/200198/building_control/1452/storage_and_collection_of_waste_and_recycling_in_new_developments
[21] https://www.clocs.org.uk/resources/clp_guidance_clocs_final.pdf
[22] https://www.netregs.org.uk/media/1114/swmp_simple_guide.pdf
[23] https://www.fors-online.org.uk/cms/
[24] https://www.clocs.org.uk/
[25] https://www.ccscheme.org.uk/

9.5 Conclusions

9.5.1 It is considered that all relevant Cumulative Schemes would have mechanisms in place to tightly control and manage all construction related traffic, thereby ensuring minimal increases and effects associated with local HDV traffic. The consideration of the Development with other Cumulative Schemes found that traffic generated by these Cumulative Schemes during construction and once completed would give rise to **insignificant** transportation effects on the local road network, following the implementation of mitigation measures.

10. Air Quality

10.1 Introduction

10.1.1 This Chapter sets out the likely significant effects of the Development in regards to air quality. It has been prepared by Will Totty MSc AMIEnvSc and checked by Nick Hawkins MSc MIOA MIAQM MIEnvSc PIEMA of Hawkins Environmental Limited. This Chapter is supported by further detailed information contained within:

- **Appendix 10.1**: Glossary of Air Quality Terms.
- **Appendix 10.2**: Air Quality Model.
- **Appendix 10.3**: Modelling Procedure and Input Data.
- **Appendix 10.4**: Air Quality Modelling Results.
- **Appendix 10.5**: Policy & Guidance.

10.1.2 This Chapter of the ES considers the potential impacts and likely effects of the Development on local air quality as well as the suitability of the Site for it's intended use. The assessment includes a description of the assessment methodology; a review of the baseline air quality within the study area; and considers the suitability of the Site for the Development. Potential emissions sources have been identified and assessed in the context of existing air quality and the nature and location of receptors.

10.1.3 The assessment of the likely significant effects of the Development on air quality takes into account embedded mitigation. Additional mitigation measures are identified where appropriate to avoid, reduce or offset any significant adverse effects identified, and an overview of the nature and significance of residual effects, taking into account the additional mitigation, is presented. A cumulative assessment has also been undertaken which considers the in-combination effects from the Development and Cumulative Schemes.

10.2 Scope, Assessment Methodology and Significance Criteria

Assessment Methodology Overview

10.2.1 The assessment of air quality considered several different areas, specifically:

- A Site suitability assessment, considering any constraints that existing air quality has on the Development.
- The impact of emissions associated with the operation of the Development on the local area.
- The cumulative effects of the Development in combination with Cumulative Schemes.

Scope

10.2.2 As detailed in **ES Volume 1, Chapter 2: EIA Methodology**, the scope for the air quality assessment has been agreed to be as follows:

The Completed and Operational Development

- Effects associated with traffic generated by the completed and operational Development.;
- Effects from the activities of Tunnel Wharf on air quality within the Development (i.e. a Site suitability assessment).
- Effects associated with operational phase plant (depending on the energy strategy).

Air Quality Objectives

10.2.3 **Table 10.1** below presents the National Air Quality Objectives (NAQOs) for the pollutants of concern.

Table 10.1: National Air Quality Objectives

Pollutant	NAQO		
	Concentration	Measured As	Date to be Achieved By
NO_2	200 µg/m^3 not to be exceeded more than 18 times per year	1 Hour Mean	31 December 2005
	40 µg/m^3 not to be exceeded	Annual Mean	21 December 2005
PM_{10}	50 µg/m^3 not to be exceeded more than 35 times per year	24 Hour Mean	31 December2004
	40 µg/m^3 not to be exceeded	Annual mean	31 December 2004
$PM_{2.5}$	25 µg/m^3 no to be exceeded	Annual Mean	2020

10.2.4 The NAQOs apply to external air where there is relevant exposure to the public over the relevant averaging periods for each NAQO. Guidance is provided by Defra for Local Authorities on where the NAQOs apply, as detailed in **Table 10.2**. The NAQOs do not apply in workplace locations, to internal air or where people are unlikely to be regularly exposed (i.e. centre of roadways).

Table 10.2: Application of the NAQOs

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual Mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless used as a permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
4-hour mean and 8-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be shorter than either the 24- or 8-hour relevant mean.
1-hour mean	All locations where the annual mean and 24- and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expect to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

10.2.5 The sensitivity of receptors in the vicinity of the Development and the roads affected by it, as well as receptors introduced by the Development, is dictated by the land use at that location. The relevance of the land use to specific air quality objectives is specified by LAQM.TG (22)[1]. The sensitivity of receptors has been determined by which objective applies at that location, as set out in **Table 10.3**.

[1] Defra, Local Air Quality Management Technical Guidance, 2022.

Table 10.3: Receptor Sensitivity

Sensitivity	Criteria
Medium – where exposure would be short term and the 1-hour mean applies	All locations where the annual mean apply and: • hotels and gardens of residential properties; • kerbside sites (for example, pavements of busy shopping streets); • those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more; and • any outdoor locations where members of the public might reasonably expect to spend one hour or longer.
High – where exposure may be longer and the annual mean objective applies	All locations where members of the public might be regularly exposed to pollutants for extended periods. Building façades of residential properties, schools, hospitals, care homes etc.

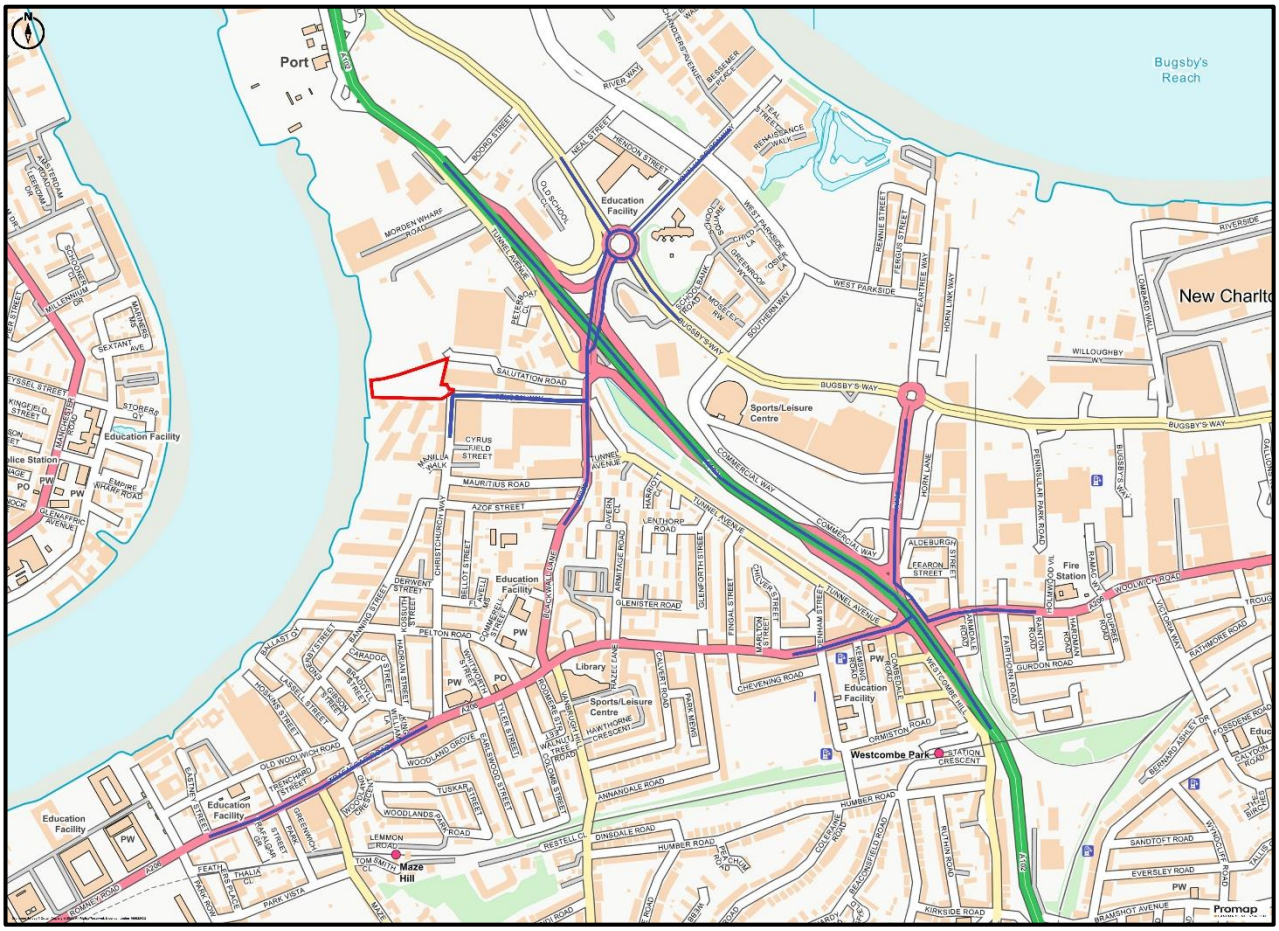
Study Area

10.2.6 For the completed Development stage assessment, the study area entails the Site itself, any roads up to 250 m from the Site, any receptors situated on roads that meet IAQM criteria[2], and any roads up to 250 m from said receptors. The IAQM criteria for roads that require an assessment are those with a predicted change in light vehicle flow of 100 AADT (500 AADT outside of an Air Quality Management Area (AQMA)) or heavy vehicle flow of 25 AADT (100 AADT outside of an AQMA).

10.2.7 The approximate extent of the study area is shown in **Figure 10.1**.

[2] IAQM/EPUK, Land-Use Planning & Development Control: Planning For Air Quality, 2017

Figure 10.1: Study Area



Baseline Characterisation & Site Suitability Methodology

10.2.8 The baseline scenario considered two separate sets of Site conditions, specifically the existing 2022 baseline conditions (the most recent year for which pollutant concentration monitoring data is available) and the future 2027 baseline Site conditions, which represents the opening year of the Development. The consideration of a future baseline for air quality is important as it takes into account future changes in both traffic flow, but also emissions factors, which could vary.

10.2.9 To determine the baseline conditions, the following was undertaken:

- A review of the most recent annual status reports on air quality carried out by the local planning authority, as submitted to the Department for the Environment, Food and Rural Affairs (Defra).
- Determination of whether the Site is situated within a designated AQMA or Air Quality Focus Area.
- A review of local air quality monitoring within the area of the Site.
- A review of the Environment Agency's register of industrial sites under the EC Integrated Pollution Prevention and Control Directive (IPPC) to determine whether industrial sources of air pollution could be affecting the Site.

- Review of the list of registered Part A2 and Part B permitted premises under the Pollution, Prevention and Control Act 1999 and the Environmental Permitting (England and Wales) Regulations 2010 to determine whether any other sources of air pollution could be affecting the Site;
- Use of the ADMS-Roads dispersion modelling software, to predict concentrations of air pollutants on-site for the current baseline year and the future baseline year.

10.2.10 The dispersion modelling outlined in the final point above also informs part of the Site suitability assessment, in terms of the effect of road traffic emission on the Site. The operation of the neighbouring Tunnel Wharf, and how this affects Site Suitability is assessed separately.

10.2.11 Concentrations were first predicted with the ADMS-Roads model at several nearby monitoring locations using the 2022 baseline traffic flows and 2022 emissions factors in order to verify the modelled concentrations against the monitored concentrations at those locations. The difference between modelled and monitored pollutant concentrations leads to the determination of a verification factor, which is subsequently applied to the modelled concentration outputs at other receptor locations (as described in **Appendix 10.4**).

10.2.12 To consider the future baseline conditions, 2022 traffic flows for all relevant roads were scaled up using high growth factors to estimate flows for the opening year of the proposed development. This reflects the likelihood that traffic levels will continue to rise and presents a robust, worst-case assessment. 2027 emissions factors are also used; however, given the uncertainty in projecting background concentrations in future years, the 2022 background concentrations have been used in the predictions of the opening year pollutant concentrations. This is considered to present a robust, worst-case scenario.

10.2.13 The second part of the Site suitability study regards the operation of the neighbouring Tunnel Wharf. Rather than the quantitative dispersion modelling described above, this is assessed using a qualitative approach as per IAQM Guidance[3]. The guidance uses a simple distance-based screening process to identify those mineral sites where the dust impacts are unlikely to be significant and therefore require no further assessment in order to be considered so. For sites that do require further assessment, a basic assessment framework is provided which employs the source pathway receptor approach to evaluate both the risk of dust impacts and effects.

Operational Effects Methodology

10.2.14 Operational impacts on local air quality would primarily arise from exhaust emissions associated with vehicle movements generated as a result of the proposed development. Emissions from road traffic are the major contributor to poor air quality in urban areas within the UK and could contribute to exceedance of the current air quality objectives within the vicinity of the application site. Accordingly, the potential impacts associated with additional vehicle trips generated by the proposed development have been considered within this assessment.

[3] IAQM, Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016.

10.2.15 The air quality impacts due to increased traffic emissions have been predicted using the ADMS-Roads (version 5) dispersion modelling software. This model has been extensively validated against both field and laboratory data sets and against monitoring data in cities throughout the UK.

10.2.16 The following scenarios were considered for purposes of the assessment:

- 2022 baseline to allow verification of the model against monitored results;
- 2027 future baseline (site suitability scenario);
- 2027 future baseline with Development (operational impacts);
- 2027 future baseline with Development and Cumulative Schemes (cumulative operational impacts).

10.2.17 It is noted that the assessment of impacts arising from the energy strategy associated with the Development was scoped into the ES, based on the proximity of the Site to other existing receptors. It is also noted that since then, the energy strategy has been confirmed as Air Source Heat Pump (ASHP) driven. ASHPs are fully electrical and do not give rise to onsite emissions, therefore no further consideration has been given in this regard.

Significance Criteria

10.2.18 Significance criteria with regards to air quality impacts are determined specifically by IAQM Guidance[4].

Completed Development Stage

10.2.19 The assessment of the impact of the Development on local air quality has used the approach developed by the IAQM /EPUK guidance. The guidance has produced a matrix which has been used to describe the impacts at individual receptor locations, as shown in **Table 10.4**.

10.2.20 The impact descriptors are a product of both the absolute pollutant concentration at a given receptor, as well as the change in concentration at the receptor relative to the relevant annual mean air quality objective.

10.2.21 If the annual average pollutant concentration is close to or above the annual air quality objective, marginal changes in magnitude may be determined to be moderate; however if the annual average pollutant concentration is less than 75 % of the UK air quality objective level, similar changes in concentration may be determined to be negligible.

[4] IAQM, Land-Use Planning & Development Control: Planning For Air Quality, 2017.

Table 10.4: EPUK/IAQM Impact Descriptors for Individual High Sensitivity Receptors

Long term average concentration at receptor (with development)	Change in concentration relative to annual mean air quality objective (%)			
	<1	2-5	6-10	>10
75% or less of air quality objective	Negligible	Negligible	Slight	Moderate
76-94% of air quality objective	Negligible	Slight	Moderate	Moderate
95-102% of air quality objective	Slight	Moderate	Moderate	Substantial
103-109% of air quality objective	Moderate	Moderate	Substantial	Substantial
110% or more of air quality objective	Moderate	Substantial	Substantial	Substantial

Notes: If concentrations increase, the impact is described as adverse; if pollutant concentrations decrease, the impact is described as beneficial.

The change in pollutant concentration relative to the annual mean air quality objective is described as a percentage and is rounded to the nearest whole number. Therefore when the absolute change in concentration is less than 1% of the relative air quality objective, the impact will be considered negligible.

10.2.22 IAQM guidance states that the overall significance of the effect on air quality should be based on professional judgement, taking into account the predicted impacts at the modelled receptor locations and:

"…will need to take into account such factors as:

- *The existing and future air quality in the absence of the development;*
- *The extent of current and future population exposure to the impacts; and*
- *The influence and validity of any assumptions adopted when undertaking the prediction of impacts."*

10.2.23 The overall significance of the effect on local air quality is a binary judgement, i.e. the overall effect is either significant or it is not significant, and there are no degrees of significance of the overall effect. Moderate or substantial impacts may be considered to be a significant environmental effect, whereas negligible or slight impacts would not be considered significant.

10.2.24 In the case of air quality, completed development effects are expected to be long term, i.e. to persist for more than five to ten years.

Site Suitability Significance

10.2.25 There is no official guidance in the UK on how to assess the significance of air quality impacts of existing road traffic sources on proposed receptors introduced by a new development. The assessment of the Site suitability for residential use in this regard has been limited to predicting air quality at the Site and the significance of this is based on whether the NAQOs for each pollutant are exceeded or not.

10.2.26 Regarding the significance of effects caused by any dust impacts associated with Tunnel Wharf, IAQM Guidance[5] indicates that a conclusion on the significance of residual dust effects (should the screening criteria for an assessment be met) should be made using professional judgment taking into account controls that are incorporated into the scheme. If the outcome of the assessment is that the air quality effect is "not significant" then it is likely that these controls will be sufficient. If, on the other hand, the assessment predicts the impacts and their effects are likely to be "significant" then it is likely that additional mitigation will be required, to a proportionate degree to sufficiently reduce the impacts.

Assumption and Limitations

10.2.27 There are various elements that contribute to uncertainty in modelled pollutant concentrations. The software used is internationally recognised and has been used to create a model that has been validated against real world pollutant concentrations data, however no computer-based model is able to replicate real world conditions in their entirety.

10.2.28 The model used in the assessment requires input data in many forms, each of which will have inherent uncertainty associated with them. Model uncertainty has been assessed and is presented in **Appendix 10.3**.

10.2.29 Air pollutant concentration data has been obtained from monitoring reports published by the Royal Borough of Greenwich (RBG). It has been assumed that the results have been reported correctly and that instrumentation has been calibrated.

10.2.30 The baseline vehicle flows used in the model are taken from the Department for Transport, some of which are manual counts and some of which are estimated based on manual counts form previous years. Some additional flows have been taken from the Environmental Statement for the neighbouring Morden Wharf site, which were also based on manual counts. It is assumed that all such data is correct and that all necessary uplifts are representative.

10.2.31 The change in vehicle flows used in the model are based on a worst-case interpretation of the Development parameters. The increase in vehicle flows have been provided by the project's Transport Consultant, Markides Associates, calculated based on the worst-case interpretation of the Development area schedule, i.e. those use classes with the highest trip generation rates.

10.2.32 The traffic modelling has used 2022 background data, monitoring data, meteorological data and traffic data to verify the model. 2022 was the latest year with full monitoring results available.

10.2.33 The modelling has assumed a level Site that does not account for terrain effects. Similarly, the roads modelled are considered free of street canyon effects.

[5] IAQM, Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016

10.3 Relevant Baseline Conditions

Current Use

10.3.1 The Site in its current state is partially excavated and vacant, having also been previously used as a construction compound for the adjacent Enderby Wharf to the south. An area of spoil is present in the western extent of the Site. The remainder of the Site comprises bare ground with some areas of hardstanding. Enderby House lies outside the Site boundary at its south-west corner but is encompassed on all sides by the Site . It is not considered that the Site currently contributes significantly to air pollutant concentrations in the local area.

Existing Air Quality – Local Air Quality Monitoring

10.3.2 Local Authorities are required to carry out a review of local air quality within their boundaries to assess areas that may fail to achieve the NAQOs. Where these objectives are unlikely to be achieved, local authorities must designate these areas as AQMAs and prepare a written action plan to achieve the NAQOs.

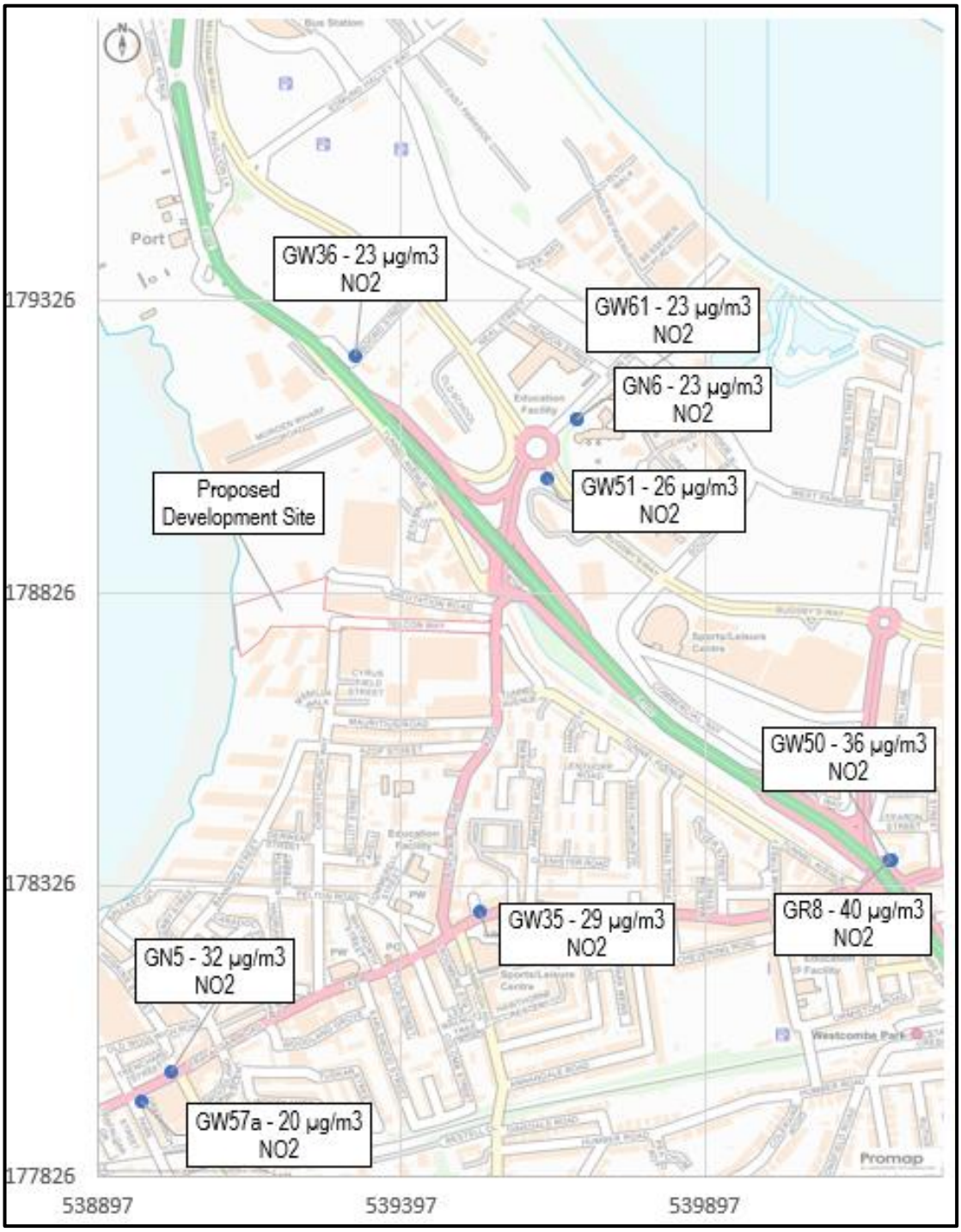
10.3.3 The review of air quality takes on several prescribed stages, of which each stage is reported. The review of historic Air Quality Annual Status Reports for the RBG indicates that exceedances of the annual mean objective for NO_2 have been experienced within the Borough, primarily centred on the main roads, and these exceedances are predicted to continue. It is understood that exceedances of the annual mean objectives for both PM_{10} and $PM_{2.5}$ are not expected within the Borough in future years.

10.3.4 As a consequence of the exceedances of the NAQOs, the RBG have declared an AQMA encompassing the entire Borough.

10.3.5 Concentrations of SO_2, Benzene, Lead and CO are not considered to be significant within the Borough. Consequently, no further consideration is given to these pollutants as it is highly unlikely that they would be of concern at the proposed development site.

10.3.6 The RBG has conducted air quality monitoring, including at several sites in the vicinity of the Development Site, including both automatic NO_2/PM continuous monitoring stations as well as passive NO_2 diffusion tubes. The locations of the monitoring sites relative to the Site are shown in **Figure 10.2**.

Figure 10.2: Monitoring Locations – Annual Average NO_2 Concentration



10.3.7 **Table 10.5** provides a summary of recent historic annual average NO_2 concentrations.

Table 10.5: Monitoring Data – Annual Mean NO_2

Site ID	Location	Type	Distance to Proposed Development	Annual Mean (µg/m³) – Objective <40 µg/m³				
				2018	2019	2020	2021	2022
GN5	Hoskins St	Roadside – Automatic	820 m	**43**	**41**	34	33	32
GN6	John Harrison Way	Roadside – Automatic	530 m	34	33	26	25	23
GR8	Woolwich Flyover	Roadside – Automatic	1010 m	**57**	**52**	**43**	**40**	**40**
GW35	Woolwich Rd Greenwich	Roadside – Diffusion Tube	560 m	**48.9**	**52.9**	**42**	34	29
GW36	Boord St	Roadside – Diffusion Tube	450 m	**46.9**	**49.3**	**41**	30.5	23
GW50	Woolwich Flyover (co-located with GR8)	Roadside – Diffusion Tube	1010 m	**54.3**	**53.2**	**49**	**41**	36
GW51	Bugsbys Way	Roadside – Diffusion Tube	430 m	37.0	39.0	30	29	26
GW57A	Trafalgar Rd	Roadside – Diffusion Tube	890 m	37.9	36.6	29	30	27
DW61	John Harrison Way (co-located with GN6)	Roadside – Diffusion Tube	530 m	31.9	32.8	26	23	23

Notes: Concentrations in excess of 40 µg/m³ annual NAQO shown in bold.

Concentrations in excess of 60 µg/m³ (indicative of potential hourly NAQO exceedances) shown in bold and underlined.

10.3.8 **Table 10.6** provides a summary of recent historic hourly average NO_2 concentrations.

Table 10.6: Monitoring Data – Hourly Mean NO_2

Site ID	Location	Type	Distance to Proposed Development	Number of Hours >200 µg/m³ NO_2 – Objective <18 hours of exceedance				
				2018	2019	2020	2021	2022
GN5	Hoskins St	Roadside – Automatic	820 m	1	0	0	0	0
GN6	John Harrison Way	Roadside – Automatic	530 m	0	0	0	0	0
GR8	Woolwich Flyover	Roadside – Automatic	1010 m	0	0	0	0	0

10.3.9 **Table 10.7** provides a summary of recent historic PM_{10} and $PM_{2.5}$ concentrations.

Table 10.7: Monitoring Data – Particulate Matter

Site ID	Location	Type	Distance to Proposed Development	2018	2019	2020	2021	2022
PM_{10} Annual Mean (µg/m^3) – Objective <40 µg/m^3								
GN5	Hoskins St	Roadside – Automatic	820 m	22	22	19	19	18.8
GN6	John Harrison Way	Roadside – Automatic	530 m	15	14	19	20	19
GR8	Woolwich Flyover	Roadside – Automatic	1010 m	25	23	21	20	18
PM_{10} Number of 24-hour periods >50 µg/m^3 – Objective <35 24-hour periods of exceedance								
GN5	Hoskins St	Roadside – Automatic	820 m	4	12	6	2	4
GN6	John Harrison Way	Roadside – Automatic	530 m	0	6	3	3	3
GR8	Woolwich Flyover	Roadside – Automatic	1010 m	6	10	5	5	5
$PM_{2.5}$ Annual Mean (µg/m^3) – Objective <25 µg/m^3								
GN5	Hoskins St	Roadside – Automatic	820 m	9	9	8	8	8
GN6	John Harrison Way	Roadside – Automatic	530 m	10	11	9	11	10
GR8	Woolwich Flyover	Roadside – Automatic	1010 m	12	11	12	12	12

10.3.10 The above data shows that across the monitoring locations in the vicinity of the Site, all NAQOs are being met, with the exception of the automatic monitoring station at Woolwich Flyover (GR8), which in 2022 monitored an annual average NO_2 concentration of 40 µg/m^3. Live data from the London Air Quality Network indicates that through 11 months of 2023, the average NO_2 concentration at GR8 has decreased to 32 µg/m^3.

10.3.11 Whilst there is not a discernible pattern in PM_{10} or $PM_{2.5}$ concentrations over the last five years, annual average NO_2 concentrations have broadly been decreasing year-on-year.

Modelled Baseline Concentrations

10.3.12 The results of the baseline model of the study area, validated against the annual average NO_2 monitoring data from the three automatic monitoring stations discussed in **Table 10.5**, indicate that at the Site, annual average pollutant concentrations were predicted to have been below the NAQOs in 2022. See results in **Appendix 10.4**.

Future Baseline

10.3.13 Growth factors of 1.5% per year have been applied to the 2022 baseline traffic flows to reflect worst-case predicted increases in traffic flow in future years.

10.3.14 The Emissions Factors Toolkit (EFT) is published by Defra and the Devolved Administrations. The EFT allows users to calculate road vehicle pollutant emission rates for NO_x, PM_{10} and $PM_{2.5}$ for a specified year, road type, vehicle speed and vehicle fleet composition. The current version of the EFT is version 11.0. 2027 emission factors were used in the future year scenario.

10.3.15 Background concentrations of air pollutants for the modelling were obtained from the UK National Air Quality Information Archive, in accordance with Local Air Quality Management Technical Guidance TG22. The Archive contains background values for the UK at 1 km^2 resolution. Although background concentrations are predicted to decrease year-on-year, baseline 2022 background concentrations were used in future modelling scenarios in order to present a robust, worst-case assessment. Background concentrations used within the modelling are shown in **Appendix 10.3.**

Sensitive Receptors

10.3.16 The sensitive receptor locations chosen are those which are likely to be most affected by changes in both relative and absolute traffic flows.

10.3.17 Trip generation data indicates that the road links that will meet the IAQM criteria[6] of an increase of 100 or more AADT for consideration of receptors are Blackwall Lane and the A102 south of the junction with Blackwall Lane. All trips generated by the Development (273 AADT) will travel onto the wider network via Telcon Way before being distributed either north (191 AADT) or south (82 AADT) on Blackwall Lane.

10.3.18 The receptors that require assessment are therefore those north of Telcon Way on Blackwall Lane as well as those bordering the A102 south of its junction with Blackwall Lane. The highest sensitivity receptors that meet such criteria are the residential properties on Tunnel Avenue, which runs roughly parallel to the A102 from the junction with the A206 northwards towards Blackwall Lane, and continues to do so briefly on the opposite side of Blackwall Lane.

10.3.19 All trips generated by the proposed dDevelopment will travel onto the wider network via Telcon Way before being distributed either north or south on Blackwall Lane. Trip distribution data has been provided to indicate this split,

[6] IAQM, Land-Use Planning & Development Control: Planning For Air Quality, 2017.

as well as the split travelling east and west on the A206 for trips travelling south on Blackwall Lane, and the split travelling north and south on the A102 for trips travelling north on Blackwall Lane.

10.3.20 Five receptors have been chosen on Tunnel Avenue either side of Blackwall Lane. Given their proximity to the A102 Blackwall Tunnel Southern Approach they are likely to have the highest existing pollutant concentrations relative to other receptors in the area and are therefore most susceptible to impacts. They are also situated just opposite Telcon Way, and so will be impacted by all trips associated with the Development. Each receptor has been modelled at both ground and first floor level.

10.3.21 For the site suitability assessment, receptor locations representative of the new buildings have been modelled, at each of the north and south facades of Morden Tower, and each of the east and west facades of River Tower. Receptor locations can be seen in **Appendix 10.4**. Each of the four locations across the Site have been modelled at ground plus four levels, after which height air pollutant concentrations continue to tend rapidly towards background concentrations.

10.3.22 There are no ecological receptors within the study area that meet IAQM criteria for a detailed assessment.

10.3.23 The receptors assessed identified as being the most susceptible to impacts from the Development are summarised in **Table 10.8**.

Table 10.8: Sensitive Receptors

ID	Location	X (m)	Y (m)	Sensitivity
R1	192 Tunnel Avenue	539570.76	178789.84	High
R2	176 Tunnel Avenue	539595.98	178739.4	High
R3	158 Tunnel Avenue	539627.32	178693.58	High
R4	212 Tunnel Avenue	539529.4	178869.2	High
R5	224 Tunnel Avenue	539508.55	178914.26	High

10.4 Likely Effects of the Development and their Significance

The Completed and Operational Development

Road Traffic Impacts

10.4.1 The results of the dispersion modelling for the future baseline at the identified sensitive receptors are shown in **Table 10.9** below.

Table 10.9: Future Baseline 2027 Results

Receptor/Location	NO_2 ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)
	Annual Mean	Annual Mean	Days >50 $\mu g/m^3$	Annual Mean
192 Tunnel Avenue Ground Floor	31.47	23.41	8.90	14.99
192 Tunnel Avenue 1st Floor	29.41	22.32	6.85	14.39
176 Tunnel Avenue Ground Floor	27.58	21.38	5.31	13.88
176 Tunnel Avenue 1st Floor	27.06	21.11	4.90	13.73
158 Tunnel Avenue Ground Floor	25.99	20.58	4.15	13.44
158 Tunnel Avenue 1st Floor	25.75	20.46	3.98	13.37
212 Tunnel Avenue Ground Floor	29.27	22.27	6.77	14.37
212 Tunnel Avenue 1st Floor	28.30	21.76	5.91	14.09
224 Tunnel Avenue Ground Floor	29.51	22.42	7.03	14.45
224 Tunnel Avenue 1st Floor	28.40	21.83	6.02	14.12

10.4.2 The results of the dispersion modelling for the future baseline with development scenario at the identified sensitive receptors are shown in **Table 10.10** below.

Table 10.10: Future Baseline 2027 with Development Results

Receptor/Location	NO_2 ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)
	Annual Mean	Annual Mean	Days >50 $\mu g/m^3$	Annual Mean
192 Tunnel Avenue Ground Floor	31.52	23.43	8.95	15.01
192 Tunnel Avenue 1st Floor	29.45	22.33	6.88	14.40
176 Tunnel Avenue Ground Floor	27.61	21.39	5.32	13.88
176 Tunnel Avenue 1st Floor	27.08	21.12	4.92	13.73
158 Tunnel Avenue Ground Floor	26.01	20.59	4.16	13.44
158 Tunnel Avenue 1st Floor	25.77	20.46	3.99	13.37
212 Tunnel Avenue Ground Floor	29.30	22.29	6.79	14.38
212 Tunnel Avenue 1st Floor	28.32	21.77	5.92	14.09
224 Tunnel Avenue Ground Floor	29.53	22.43	7.05	14.46
224 Tunnel Avenue 1st Floor	28.42	21.84	6.03	14.13

10.4.3 The predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ concentrations in 2027 both with and without the Development in place are below the relevant objectives at all assessed existing receptor locations.

10.4.4 The predicted annual mean NO_2 concentrations for all receptors is below 60 $\mu g/m^3$, which according to research from Laxen & Marner, indicates that the hourly mean objective is unlikely to be exceeded[7]. None of the predicted

[77] Laxen and Marner, Analysis of Relationship between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites, 2003.

annual mean PM_{10} concentrations exceed 32 µg/m^3 and therefore the 24-hour mean PM_{10} objective is not predicted to be exceeded[8], as per the IAQM Guidance.

10.4.5 The increase in NO_2 concentrations is assessed in **Table 10.11** below. With reference to **Table 10.4**, the impact on annual mean NO_2 concentrations is described as **negligible** at all receptor locations.

Table 10.11: Assessment of Development NO_2 Impacts

Receptor/Location	NO_2 (µg/m^3) Annual Mean		Change in concentration relative to AQAL (%)	Long-term average NO_2 concentration at receptor	Impact Descriptor
	Without Development	With Development			
192 Tunnel Avenue Ground Floor	31.52	23.43	0.125	79% of AQAL	Negligible
192 Tunnel Avenue 1st Floor	29.45	22.33	0.1	74% of AQAL	Negligible
176 Tunnel Avenue Ground Floor	27.61	21.39	0.075	69% of AQAL	Negligible
176 Tunnel Avenue 1st Floor	27.08	21.12	0.05	68% of AQAL	Negligible
158 Tunnel Avenue Ground Floor	26.01	20.59	0.05	65% of AQAL	Negligible
158 Tunnel Avenue 1st Floor	25.77	20.46	0.05	64% of AQAL	Negligible
212 Tunnel Avenue Ground Floor	29.30	22.29	0.075	73% of AQAL	Negligible
212 Tunnel Avenue 1st Floor	28.32	21.77	0.05	71% of AQAL	Negligible
224 Tunnel Avenue Ground Floor	29.53	22.43	0.05	74% of AQAL	Negligible
224 Tunnel Avenue 1st Floor	28.42	21.84	0.05	71% of AQAL	Negligible

10.4.6 The magnitude of increase relative to the AQALs is smaller for PM_{10} and $PM_{2.5}$ than for NO_2. With reference to **Table 10.4**, the impacts on annual mean PM_{10} and $PM_{2.5}$ concentrations are described as **negligible** at all receptor locations

[8] IAQM, Land-Use Planning & Development Control: Planning For Air Quality, 2017.

10.4.7 Overall, using the IAQM criteria for assessing significance, the air quality effects of the Development on existing receptors are considered to be **insignificant.**

Site Suitability – Road Traffic Emissions

10.4.8 Existing air quality can also impact the occupants of the Development, through the introduction of new sensitive receptors into an area of poor air quality.

10.4.9 The results of the dispersion modelling for the assessment of site suitability are shown in **Table 10.12** below, and **Appendix 10.4**.

Table 10.12: Onsite Pollutant Concentrations

Receptor/Location	NO_2 (µg/m^3)	PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)
	Annual Mean	Annual Mean	Days >50 µg/m^3	Annual Mean
Receptor A Ground Floor	23.21	19.16	2.45	12.66
Receptor A 1st Floor	23.17	19.15	2.44	12.65
Receptor A 2nd Floor	23.10	19.12	2.41	12.63
Receptor A 3rd Floor	23.03	19.09	2.38	12.62
Receptor A 4th Floor	22.97	19.06	2.35	12.60
Receptor B Ground Floor	23.10	19.13	2.42	12.64
Receptor B 1st Floor	23.09	19.12	2.41	12.63
Receptor B 2nd Floor	23.06	19.11	2.39	12.62
Receptor B 3rd Floor	23.02	19.09	2.38	12.61
Receptor B 4th Floor	22.97	19.06	2.35	12.60
Receptor C Ground Floor	22.96	19.06	2.34	12.60

Receptor C	1st Floor	22.95	19.05	2.34	12.59
Receptor C	2nd Floor	22.92	19.04	2.33	12.59
Receptor C	3rd Floor	22.89	19.03	2.31	12.58
Receptor C	4th Floor	22.86	19.01	2.30	12.57
Receptor D	Ground Floor	22.86	19.01	2.30	12.57
Receptor D	1st Floor	22.86	19.01	2.30	12.57
Receptor D	2nd Floor	22.84	19.00	2.29	12.57
Receptor D	3rd Floor	22.82	18.99	2.28	12.56
Receptor D	4th Floor	22.79	18.98	2.27	12.55

10.4.10 The predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ at the new residential receptors are well below the relevant objectives at all levels of the assessed receptor locations. The Site would therefore be suitable for the Development without the need for mitigation. Consequently, the impact of the existing environment on the future residents of the Development is considered to be **insignificant.**

Site Suitability – Tunnel Wharf

10.4.11 Tunnel Wharf, situated north of the Development on the other side of Morden Wharf has been identified as a potential source of dust emissions in the area. As outlined in **ES Volume 1, Chapter 2: EIA Methodology**, it has therefore been considered in terms of site suitability under two different scenarios; firstly that Tunnel Wharf will continue operations as currently, and secondly assuming that planning application 19/3298/F for the site is reactivated for waterborne cargo handling.

10.4.12 Tunnel Wharf is now operated by H. Sivyer Transport Limited, a resource and waste management company supporting construction projects across London and the Home Counties. Sivyer has an Environmental Permit for use of the site as a Non-Hazardous Waste Recycling and Aggregates Import Facility (ref: EPR/LP3395VN) and which enables on-site processing of waste material. Sivyer operates within the permit requirements and is permitted to import up to 800,000 tonnes of waste for treatment per year and store up to 40,000 tonnes of total waste at the site at any one time.

10.4.13 Planning application 19/3298/F is for the "*Provision of hardstanding and wheel washing facilities, conveyor belts and associated refurbishment works to jetty, and revised boundary treatment*". The wheel washing facility will be located in the northeast corner of the site to remove debris from vehicles before joining the road network. The refurbishments to the jetty will allow for unloading/loading of barges (all current operations distributed by road). The boundary treatments are retrospective and refer to reinforced concrete block walling around the site boundary. There would be no change in overall floorspace or nature of operation as a result of the application.

10.4.14 The potential dust impacts and effects have been assessed based on the IAQM Guidance on Mineral Dust Impacts[9].

10.4.15 The Screening Flow Chart in the IAQM Guidance indicates that for soft rock sites, a detailed assessment of receptors situated more than 250 m from the site activities can be screened out as the risk of impacts is considered to be negligible and the results effects insignificant.

10.4.16 The Tunnel Wharf site is situated ~250 metres from the Development, measured from the closest points on each boundary. When considering the Sivyer element of Tunnel Wharf where the dust generating activities are present, it is considered that they are situated ~320 m from the Site boundary. This is beyond the screening criteria and therefore a detailed assessment has been screened out. As the application 19/3298/F will not lead to a change in the nature of the onsite activities or the distance between the two sites, this holds true for both considered scenarios.

10.4.17 Overall, for both considered scenarios, the risk of impacts on the Development as a result of the continued operation of Tunnel Wharf is considered to be **negligible** and the effects **insignificant**. Air quality conditions for future residents will therefore be acceptable.

10.5 Additional Mitigation/Enhancement and Likely Residual Effects of the Development and their Significance

The Completed and Operational Development

10.5.1 The assessment has determined that the Site is considered suitable in that all NAQOs will be met across the Site in 2027. It is also considered suitable with regards to disamenity dust from Tunnel Wharf to the north, in that any effects have been deemed insignificant under current IAQM Guidance.

10.5.2 The assessment has determined that the risk of impacts resulting from an increase in road traffic as a consequence of the Development is negligible, and that any effects are deemed insignificant.

10.5.3 As a result of the above, additional mitigation measures are not required. All likely residual effects will remain **insignificant**.

[9] IAQM, Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016.

10.6 Likely Residual Cumulative Effects and their Significance

10.6.1 The list of Cumulative Schemes, agreed with RBG, is provided in **ES Volume, Chapter 2: EIA Methodology**.

10.6.2 The results of the dispersion modelling for the assessment of cumulative road traffic impacts on the local area are shown in **Table 10.13** below and **Appendix 10.4**.

Table 10.13: Future Baseline 2027 with Cumulative Traffic

Receptor/Location	NO_2 (µg/m^3)	PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)
	Annual Mean	Annual Mean	Days >50 µg/m^3	Annual Mean
192 Tunnel Avenue Ground Floor	31.52	23.43	8.95	15.01
192 Tunnel Avenue 1st Floor	29.45	22.33	6.88	14.40
176 Tunnel Avenue Ground Floor	27.61	21.39	5.32	13.88
176 Tunnel Avenue 1st Floor	27.08	21.12	4.92	13.73
158 Tunnel Avenue Ground Floor	26.01	20.59	4.16	13.44
158 Tunnel Avenue 1st Floor	25.77	20.46	3.99	13.37
212 Tunnel Avenue Ground Floor	29.30	22.29	6.79	14.38
212 Tunnel Avenue 1st Floor	28.32	21.77	5.92	14.09
224 Tunnel Avenue Ground Floor	29.53	22.43	7.05	14.46
224 Tunnel Avenue 1st Floor	28.42	21.84	6.03	14.13

10.6.3 The predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ concentrations in 2027 both with and without the proposed development and cumulative developments in place are below the relevant objectives at all assessed existing receptor locations.

10.6.4 The predicted annual mean NO_2 concentrations for all receptors is below 60 µg/m^3, which indicates that the hourly mean objective is unlikely to be exceeded. None of the predicted annual mean PM_{10} concentrations exceed 32 µg/m3 and therefore the 24-hour mean PM_{10} objective is not predicted to be exceeded.

10.6.5 The increase in NO_2 concentrations is assessed in **Table 10.14** below, with respect to the baseline concentrations in **Table 10.9** above. With reference to **Table 10.4**, the impact on annual mean NO_2 concentrations is described as **negligible** at all receptor locations.

Table 10.14: Assessment of Development NO_2 Impacts (Cumulative)

Receptor/Location	NO_2 (µg/m^3) Annual Mean		Change in concentration relative to AQAL (%)	Long-term average NO_2 concentration at receptor	Impact Descriptor
	Without Development	With Development			
192 Tunnel Avenue Ground Floor	31.52	31.74	0.55	79% of AQAL	Negligible
192 Tunnel Avenue 1st Floor	29.45	29.63	0.45	74% of AQAL	Negligible
176 Tunnel Avenue Ground Floor	27.61	27.77	0.4	69% of AQAL	Negligible
176 Tunnel Avenue 1st Floor	27.08	27.23	0.375	68% of AQAL	Negligible
158 Tunnel Avenue Ground Floor	26.01	26.14	0.325	65% of AQAL	Negligible
158 Tunnel Avenue 1st Floor	25.77	25.89	0.3	64% of AQAL	Negligible
212 Tunnel Avenue Ground Floor	29.30	29.54	0.6	73% of AQAL	Negligible
212 Tunnel Avenue 1st Floor	28.32	28.53	0.525	71% of AQAL	Negligible
224 Tunnel Avenue Ground Floor	29.53	29.82	0.725	74% of AQAL	Negligible
224 Tunnel Avenue 1st Floor	28.42	28.66	0.6	71% of AQAL	Negligible

10.6.6 With reference to **Table 10.4**, the impact on annual mean NO_2 concentrations is described as **negligible** at all receptor locations.

10.6.7 With reference to **Table 10.4**, the impacts on annual mean PM_{10} and $PM_{2.5}$ concentrations are described as **negligible** at all receptor locations.

10.6.8 Overall, using the IAQM criteria for assessing significance, the air quality effects of the Development and Cumulative Schemes in combination on existing receptors are considered to be **insignificant.**

10.7 Conclusions

10.7.1 Detailed dispersion modelling has been undertaken in order to assess concentrations of air pollutants both at the Development Site and at nearby sensitive receptors. The assessment considers the road traffic emissions of the surrounding network and how any increases in road traffic emissions as result of the Development would impact on local air quality.

10.7.2 It is predicted that the Development would not result in a significant change in pollutant concentrations at nearby high sensitivity receptors.

10.7.3 The Site suitability study has determined that existing air quality would not be a constraint on the Development with all Air Quality Objectives being met across the Development Site. Regarding Tunnel Wharf to the north of the Development, its activities are located at such a distance from the Development that impacts are not expected to occur.

10.7.4 The impacts of the Development have also been considered in combination with various other Cumulative Schemes in the vicinity of the Development. It is predicted that the Development in combination with such Cumulative Schemes would not result in a significant change in pollutant concentrations at nearby sensitive receptors.

10.7.5 Overall, it is considered that air quality should not be constraint on the Development.

11. Noise and Vibration

11.1 Introduction

11.1.1 This chapter sets out the likely significant effects of the Development in regard to noise and vibration. It has been prepared by Mathew Vaughan MSc AMIOA and reviewed by Nick Hawkins MSc MIOA MIAQM MIEnvSc PIEMA of Hawkins Environmental Limited. This Chapter is supported by further detailed information contained within:

- **Appendix 11.1: Glossary of Acoustic Terms**
- **Appendix 11.2: Schedule of Equipment**
- **Appendix 11.3: Summary of Noise Measurements**
- **Appendix 11.4: Planning Policy Context**

11.1.2 All noise measurements were conducted in accordance with BS 7445-2: 1991 '*Description and measurement of environmental noise Part 2: Guide to the acquisition of data pertinent to land use*', with the assessment methodology used to assess noise ingress into the proposed development conducted in accordance with BS 8233:2014 '*Guidance on Sound Insulation and Noise Reduction for Buildings*', and the National Planning Policy Framework.

11.2 Scope, Assessment Methodology and Significance Criteria

Scope of Assessment

11.2.1 As detailed in **ES Volume 1, Chapter 2: EIA Methodology**, the scope of this assessments is as follows:

The Works

- Noise and vibration effects associated with the Works.
- Noise and vibration effects associated with traffic generated by the Works.

The Completed and Operational Development

- Effects from the activities of Tunnel Wharf, located to the north of the Morden Wharf site, on ambient noise levels within the Development (i.e. a site suitability assessment).

Assessment Methodology

BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'

11.2.2 Originally published in 1999, the 2014 edition of BS 8233, significantly updates the guidance in light of the policy changes as a result of the advent of the NPPF and the withdrawal of PPG 24. The 2014 edition of BS 8233 sees a

change in the title of the Standard, moving from a *'Code of Practice'* to *'Guidance'*, as the text '*largely comprises guidance that does not support claims of compliance'*.

11.2.3 BS 8233:2014 [1] indicates that to control external noise ingress into a proposed development, a number of planning stages should occur as follows:

- "Assess the site, identify significant existing and potential noise sources, measure or estimate noise levels, and evaluate layout options.
- *Determine design noise levels for spaces in and around the building(s).*
- *Determine sound insulation of the building envelope, including the ventilation strategy".*

11.2.4 BS 8233:2014 suggests design noise levels for various types of building. The recommended noise levels for dwelling houses, flats and rooms in residential use (when unoccupied) can be seen in **Table 11.1** below. This is replicated from Table 4 of Section 7.7.2 of BS 8233:2014. The guidance suggests that *"In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values"*. The noise levels in **Table 11.1** are marginally different to those published in BS 8233:1999 *'Sound insulation and noise reduction for buildings – Code of practice'* but are based on the existing guidance from the current World Health Organisation (WHO) "Guidelines on Community Noise".

Table 11.1: Summary of Noise Criteria: BS 8233:2014

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Note: The $L_{Aeq,T}$ is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over the given period, T. For example, daytime noise is generally measured over a 16 hour period, so T is 16 hours. $L_{Aeq,T}$ can be measured directly with an integrating sound level meter.

11.2.5 When considering the noise level criteria considered in **Table 11.1**, the following points should be noted:

- BS 8233: 2014 suggests that the above criteria should be adopted flexibly and that *"where development is considered necessary or desirable… the internal target level may be relaxed by up to 5 dB and reasonable internal conditions still achieved".*
- The noise levels quoted above are annual averages and *"do not need to be achieved in all circumstances"* e.g. New Year's Eve or fireworks night.
- The noise levels in **Table 11.1** are *"for steady external noise sources"* such as traffic noise or plant noise. This is a departure from the 1999 version of BS 8233, where the recommended internal noise levels were irrespective

[1] British Standards Institution (BSI). BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings. 2014.

of the external noise source and therefore included the suggestion that in order to achieve *"reasonable"* noise levels within bedrooms at night, L_{AFmax} noise levels should not exceed 45 dB. Whilst this has been omitted from the 2014 version of BS 8233, it does state that *"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values."* Therefore, at sites which may be affected by individual noise events, it is more appropriate to use the guidance contained within the WHO *"Guidelines on Community Noise"* which suggest that good sleep will not generally be affected if internal levels of L_{AFmax} 45 dB are not exceeded more than 10-15 times per night.

- BS 8233:2014 notes that if the design of the building is *"relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the facade insulation or resulting noise level".*
- BS 8233 provides guidance for noise in gardens and outdoor amenity space. It suggests that *"it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments."* The guidance does go on to say that these guideline values are not achievable in all circumstances and in some areas, *"such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."*

World Health Organisation Guidelines for Community Noise (1999)

11.2.6 The 1999 World Health Organisation (WHO) guidance *"Guidelines for Community Noise"* [2], provides recommendations on maximum internal and external noise levels in a range of situations. The WHO guidelines are a consequence of a comprehensive review of the scientific evidence in relation to community noise exposure and the health and social aspects of such exposure. Whilst not adopted policy, the recommendations within the WHO Guidelines are often quoted and form the basis of the recommendations within BS 8233 and other similar guidance. A summary of the noise criteria can be seen in **Table 11.2**.

Table 11.2: Summary of Noise Criteria: BS 8233:2014

Residential Environment	Critical Health Effect	L_{Aeq}	L_{AFmax} Note	Time Base
Outdoor living area	Serious annoyance, daytime and evening	55 dB	-	07:00 – 23:00
	Moderate annoyance, daytime and evening	50 dB	-	07:00 – 23:00

[2] World Health Organisation (WHO). Guidelines for Community Noise. 1999.

Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35 dB	-	07:00 – 23:00
Inside bedrooms	Sleep disturbance, night-time	30 dB	45 dB	23:00 – 07:00
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45 dB	60 dB	23:00 – 07:00

Note: The L_{Amax} is the 'A'-weighted maximum sound pressure level measured over a measurement period.

WHO Night Noise Guidelines for Europe (2009)

11.2.7 In 2009, the World Health Organisation published the *"Night Noise Guidelines for Europe"* [3] as a partial update and extension to the *"Guidelines for Community Noise*", specifically in relation to development on the scientific evidence of night noise exposure. The 2009 guidance suggests that a *"$L_{night,outside}$ of 40 dB should be the target of the night noise guideline (NNG) to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly"*. However, since that target would be impossible to achieve in many situations, a *"$L_{night,outside}$ value of 55 dB is recommended as an interim target for the countries where the NNG cannot be achieved in the short term for various reasons, and where policy-makers choose to adopt a stepwise approach*".

BS 4142:2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound'

11.2.8 British Standard BS 4142: 2014 +A1:2019 *"Methods for rating and assessing industrial and commercial sound"* [4] provides a method for the measurement and rating of industrial noise or noise of an industrial nature and background noise levels outside dwellings in mixed residential and industrial areas. The rating level (defined in the BS) is used to rate the industrial noise source outside residential dwellings (this is defined as the *"specific noise source"*).

11.2.9 The procedure defined in BS 4142 for predicting the likelihood of complaints is based on establishing the difference between the rating level and the background level outside the residential property of interest. The greater the difference the greater the likelihood of complaints and more specifically:

- *"A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

[3] World Health Organisation (WHO). Night Noise Guidelines for Europe. 2009.
[4] British Standards Institution (BSI). BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound. 2019.

- *Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*

11.2.10 The guidance goes on to state that "where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night." Consequently, when considering the impact of a BS 4142 assessment, it is often also necessary to consider the absolute noise levels experienced at the receptor location in relation to BS 8233 and World Health Organisation guidelines.

Possible Options for the Identification of Lowest Observed Adverse Effect Levels (LOAELs) and Significant Observed Adverse Effect Level (SOAELs) in Support of the NPSE (2014)

11.2.11 Published by Defra, based on a Research Project prepared by AECOM, *"Possible Options for the Identification of SOAELs and NOAELs in Support of the NPSE"*[5] attempts to give values to the concepts of SOAELs and NOAELs, introduced by the Noise Policy Statement for England (NPSE). After the withdrawal of PPG24: Planning and Noise in 2012, which included Noise Exposure Categories, with specific numerical boundaries, the NPSE was heavily criticised for having no specific numerical guidance. Whilst the NPSE and NPPF encourage the development of location-specific criteria, in the context of the specific environment, the absence of guidance meant the implementation of the NPSE was difficult. Consequently, the project identifies both specific possible values and possible ranges of values for SOAELs and NOAELs for different noise sources based on research into the typical human response to these sources. These values can be seen in **Table 11.3** below.

Table 11.3: Summary of Noise Criteria: BS 8233:2014

Source	Effect	LOAEL	SOAEL
Road	Annoyance (daytime)	**56** *(53-59)*	**66** *(64-68)*
	Sleep (night-time)	**46** *(43-52)*	**56** *(51-64)*
Rail	Annoyance (daytime)	**63** *(61-66)*	**72** *(70-74)*
	Sleep (night-time)	**55** *(52-63)*	**68** *(61-77)*
Air	Annoyance (daytime)	**52** *(50-54)*	**60** *(58-62)*
	Sleep (night-time)	**41** *(40-49)*	**53** *(47-60)*

[5] Department for Environment, Food & Rural Affairs (Defra). Possible Options for the Identification of Lowest Observed Adverse Effect Levels (LOAELs) and Significant Observed Adverse Effect Level (SOAELs) in Support of the NPSE. 2014.

ProPG: Planning & Noise Professional Practice Guidance (2017)

11.2.12 *Planning & Noise: Professional Practice Guidance on Planning and Noise: New Residential Development* (the "ProPG")[6], published May 2017, provides a recommended approach for dealing with noise within the planning process, specifically in relation to new residential developments.

11.2.13 The ProPG follows a systematic, proportionate, risk-based, 2-stage approach. The two stages of the approach are:

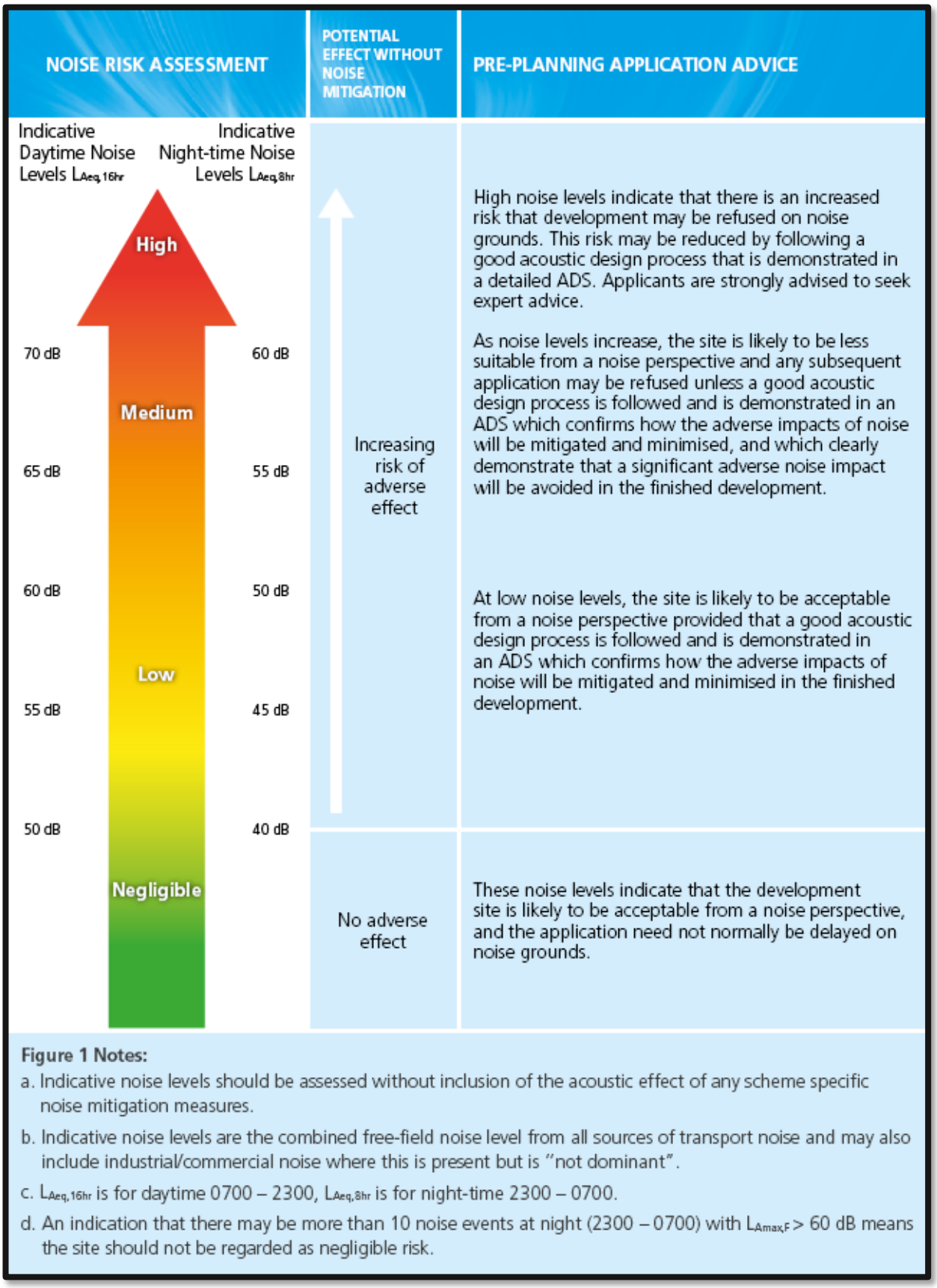
- Stage 1 – an initial assessment where external noise is rated against the risk of adverse effect; and
- Stage 2 – a systematic consideration of four key elements to determine the suitability of the site for housing.

11.2.14 The results of the initial Site noise risk assessment will determine the appropriate risk of developing the Site from a noise perspective. This approach is intended to give the developer, the noise practitioner, and the decision maker an indication only of the likely suitability of the site for new residential development from a noise perspective. Thus, a site with a higher risk will be recognised as presenting more acoustic challenges than a site with a low or negligible risk.

11.2.15 **Figure 11.1** outlines the initial site risk assessment. Stage 2 of the approach looks to determine whether a site is suitable for housing based on the noise risk of the site. Stage 2 essentially attempts to determine that good acoustic design principles have been incorporated into the design from the outset, that suitable internal noise levels can be achieved in habitable rooms and that suitable external noise levels can be achieved in gardens and outdoor amenity space.

[6] Institute of Acoustics (IOA), et al. ProPG: Planning & Noise. 2017.

Figure 11.1: Initial Site Risk Assessment (from the ProPG)



11.2.16 The ProPG encourages good acoustic design for all developments with the aim of protecting future residents from the effects of noise. Paragraph 2.21 of the ProPG notes that in the first instance, it would be necessary to try to achieve suitable internal noise levels with windows open:

"Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided; occupants generally prefer the ability to have control over the internal environment using openable windows, even if the acoustic conditions would be considered unsatisfactory when open. Solely relying on sound insulation of the building envelope to achieve acceptable acoustic conditions in new residential development, when other methods could reduce the need for this approach, is not regarded as good acoustic design."

11.2.17 However, the ProPG notes that in some instances it is not possible to achieve suitable internal noise levels when windows are open. The notes to Figure 2 of the ProPG note *""designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet target internal levels with windows open, internal noise levels can be assessed with windows closed…".* In these instances, one must consider the impacts of ventilation and overheating, with the need to provide a good acoustic environment. The ProPG notes in Para 2.36 that where a *"scheme is reliant on open windows to mitigate overheating, it is also necessary to consider the potential noise impact during the overheating condition. In this case a more detailed assessment of the potential impact on occupants should be provided*".

Acoustics, Ventilation and Overheating Residential Design Guide (2020)

11.2.18 Published by the Association of Noise Consultants; the *Acoustics, Ventilation and Overheating Residential Design Guide* ("AVO Guide")[7] recommends an approach for acoustic assessments to take due regard of the interdependence of acoustics, ventilation and overheating. The approach ensures that the ventilation strategy of a building becomes an integral part of the acoustic design process.

11.2.19 The AVO Guide notes that *"The starting position when considering mitigation of noise impact on new residential development is to apply good acoustic design, site-wide, as described in the ProPG"*. Since the ProPG advocates the importance of at least attempting to achieve suitable internal noise levels with windows open, the starting point of the AVO Guide is to first see whether windows can be opened; therefore, it is clear that the AVO Guide should be applied after good acoustic design principles have been applied.

11.2.20 The AVO Guide makes it clear that as part of the acoustic design process, one needs to consider both whole house ventilation (which the AVO calls the *"ADF ventilation condition"*) and provisions for ventilation cooling to mitigate overheating (the *"overheating condition"*). The Guide notes that *"In terms of noise effect, the important distinction between these two situations is that the ADF ventilation condition applies for the entire time whereas the overheating condition applies only for part of the time"*.

11.2.21 Regarding the overheating condition, the AVO Guide notes *"it is considered reasonable to allow higher levels of internal ambient noise from transport sources when higher rates of ventilation are required in relation to the overheating*

[7] Association of Noise Consultations (ANC). Acoustics, Ventilation and Overheating Residential Design Guide. 2020.

condition. The basis for this is that the overheating condition occurs for only part of the time. During this period, occupants may accept a trade-off between acoustic and thermal conditions, given that they have some control over their environment. In other words, occupants may, at their own discretion, be more willing to accept higher short-term noise levels in order to achieve better thermal comfort. The importance of control is relevant to daytime exposure, but not to night time exposure where the consideration is sleep disturbance".

11.2.22 To estimate the potential impact in the overheating condition, a two-stage approach has been taken. The two levels of the approach are:

- Level 1 - an initial assessment where external noise is rated against the risk of adverse effect based on the assumption that opening windows are the primary means of mitigating overheating; and
- Level 2 – a systematic consideration of the potential for adverse effect on occupants based on internal ambient noise levels.

11.2.23 A Level 1 assessment looks at the external noise levels to determine whether a partially open window can be used to manage overheating, assuming a 13 dB attenuation for an open window. For *"negligible"* sites, no further action is required and open windows will be sufficient to manage overheating. For *"high"* risk sites, a Level 2 assessment is required. This is also recommended for *"medium"* risk sites. For a Level 2 assessment, the internal noise levels are calculated with windows open to determine the likely impact when windows are open to satisfy the overheating condition. **Table 11.4** summarises the approach and guidance from the AVO Guide. Essentially the guidance is used to determine whether or not windows can or cannot be opened. This guidance should be read in conjunction with Approved Document O of the Building Regulations.

Table 11.4: Summary of Noise Criteria: BS 8233:2014

Daytime $L_{Aeq,16hrs}$	Night-time $L_{Aeq,8hrs}$	Night-time L_{AFmax}	Level 1 Risk	Level 2 Assessment	Outcome	Openable Windows?
≤ 48 dB(A)	≤ 43 dB(A)	-	***Negligible***	Not Required	*Noise can be heard, but does not cause any change in behaviour or attitude*	Yes
> 48 dB(A) to ≤ 53 dB(A)	> 43 dB(A) to ≤ 48 dB(A)	-	***Low***	Optional	*Limited behavioural change is expected unless conditions are prevalent for most of the time.*	Yes
> 53 dB(A) to ≤ 63 dB(A)	> 48 dB(A) to ≤ 55 dB(A)	Normally Exceeds > 74 dB(A) to ≤ 78 dB(A)	***Medium***	Recommended	*At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods.*	Yes, depending on duration
> 63 dB(A)	> 55 dB(A)	Normally Exceeds 78 dB(A) at night	***High***	Recommended	*Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.*	No

Approved Document O: Overheating (2021)

11.2.24 *Approved Document O of the Building Regulations 'Overheating'* ("AD-O") [8] was released in December 2021 and came into effect in England on 15th June 2022. It aims to protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures. AD-O requires the residential premises to:

- limit unwanted solar gains in summer; and
- provide an adequate means to remove heat from the indoor environment.

11.2.25 In meeting these requirements: account must be taken of the safety of any occupant, and their reasonable enjoyment of the residence; and, mechanical cooling may only be used where insufficient heat is capable of being removed.

11.2.26 Whilst this is a standard in relation to the Building Regulations and not planning (i.e. compliance does not need to be demonstrated in order to obtain planning permission), consideration of the amenity of future residents (and therefore the overheating management strategy) is a material planning consideration and consequently it is recommended that AD-O is considered as part of the overall glazing, ventilation and overheating strategy of the development.

11.2.27 AD-O includes two methods for demonstrating compliance – the *"Simplified Method"*, which relies on limiting the glazed area of a room based on the location and orientation of the rooms, as well as whether the dwelling is cross ventilated, and the "*Dynamic Thermal Modelling Method"*. The "*Dynamic Thermal Modelling Method"* should be used for dwellings that do not satisfy the *"Simplified Method"* and relies on detailed modelling of the building and may require additional mechanisms to remove excess heat. These include:

- Opening windows;
- Ventilation louvres in external walls;
- A mechanical ventilation system; and
- A mechanical cooling system.

11.2.28 It is noted in paragraph 3.2 of AD-O that "*In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am)*".

11.2.29 It is noted in paragraph 3.3 of AD-O that windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits:

- 40 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am); and
- 55 dB L_{AFmax}, more than 10 times per night (between 11pm and 7am).

[8] Department for Levelling Up, Housing and Communities (DLUHC). Approved Document O: Overheating. 2021.

Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O (2022)

11.2.30 *Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O*[9] was published jointly by the Institute of Acoustics and Acoustics and Noise Consultants in July 2022. The guide was compiled to aid acoustic professionals in demonstrating compliance with Approved Document O (AD-O) of the Building Regulations.

11.2.31 As noted above, AD-O provides guidance on when an open window cannot be used to deal with overheating. Whilst AD-O provides internal noise levels, the IOA/ANC Guidance translates this into external noise levels.

11.2.32 **Table 11.5** shows the external noise levels above which it will not be possible to use the *"Simplified Method"* to demonstrate compliance with AD-O. The IOA/ANC Guidance notes that *"It may be possible to increase these values and still satisfy the requirements of the simplified method using acoustically specified balconies"*.

11.2.33 The Guidance goes on to note that "*Based on the external noise levels presented in (Table 3.5), it is likely that external noise will be an issue for many sites exposed to only modest levels of noise*".

Table 11.5: External Noise Levels Above Which the Simplified Method Cannot Be Used

Parameter	High Risk Location[1]	Medium Risk Location[2]
$L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am)	44 dB	49 dB
L_{AFmax}, more than 10 times per night (between 11pm and 7am)	59 dB	64 dB

Note 1: High Risk Locations have been identified in Appendix C of AD-O as certain postcodes in London and select postcodes in Central Manchester.

Note 2: Medium Risk Locations are all other locations in England not previously identified as High Risk Locations within Appendix C of AD-O.

11.2.34 If noise levels exceed the levels identified in **Table 11.5**, it will be necessary to use the "*Dynamic Thermal Modelling Method"* to demonstrate compliance with AD-O. It should be noted that exceedances of the above noise thresholds do not necessarily mean that windows cannot be opened or that mechanical ventilation is required. For example, it may be possible to remove adequate heat from the rooms using a combination of smaller openable windows areas (through either smaller openable glazed panels or by fitting window restrictors) and ventilation louvres in external walls. The AVO Guide provides more definitive guidance on when windows can and cannot be opened in relation to noise.

IEMA Guidelines for Environmental Noise Impact Assessment (2014)

11.2.35 The 2014 IEMA *"Guidelines for Environmental Noise Assessment"*[10] address the key principles of noise impact assessment and are applicable to all development proposals where noise effects may occur. The guidance provides

[9] Institute of Acoustics (IOA), et al. Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O. 2022.
[10] Institute of Environmental Management and Assessment (IEMA). Guidelines for Environmental Noise Impact Assessment. 2014

advice with regards to the collection of baseline noise data, prediction of noise levels and how noise should be assessed.

11.2.36 Whilst the guidance contains a great deal of technical guidance for the noise practitioner, it also provides guidance on the assessment of significance, which is replicated later in this chapter.

11.2.37 The IEMA Guidelines provides guidance on how to assess the effects and significance of developments, but it stops short of providing specific assessment criteria which developments should achieve. The guidance instead suggests that the methodology adopted should be selected on a site-by-site basis with reference to relevant national and local standards, since the guidance recognises that the effect associated with a particular noise impact will be dependent on a number of factors including but not limited to the sensitivity of the receptor, frequency and duration of the noise source and time of day.

11.2.38 When describing the magnitude of the noise effect, the IEMA guide does not suggest a definitive method but does give a number of examples of ways of describing and determining the magnitude. One such example, which has been used in this assessment, is set out in **Table 11.6** below. This method provides a way to describe the impact based on the increase or decrease in absolute noise level. This method is commonly used where the change in operational noise levels are anonymous in nature, such as from transportation noise sources.

Table 11.6: Magnitude of Change in Noise Levels

Long Term Impact Magnitude	Sound Level Change, dB $L_{Aeq,T}$ (positive or negative)[Note]
Negligible	≥ 0 dB and < 3 dB
Minor	≥ 3 dB and < 5 dB
Moderate	≥ 5 dB and < 10 dB
Major	≥ 10 dB

Note: *T* = 16 hour day or 8 hour night period.

Assessment Criteria for Impact of Vibration on Humans

11.2.39 The assessment criteria for the impact of vibration on humans is based upon the Vibration Dose Value (VDV) and the criteria is given in **Table 11.7** below. This guidance is given in BS 6472-1:2008 *Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting*.

Table 11.7: Summary of Vibration Criteria BS 6472-1:2008

Place and time	Low probability of adverse comment ($m/s^{1.75}$)[Note 1]	Adverse comment possible ($m/s^{1.75}$)	Adverse comment probable ($m/s^{1.75}$)[Note 2]
Office buildings 16hr day	0.4 to 0.8	0.8 to 1.6	1.6 to 3.2
Residential buildings 16hr day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8hr night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

Note 1: Below these ranges, adverse comment is not expected.

Note 2: Above these ranges, adverse comment is very likely.

Assessment Criteria for Impact of Vibration on Buildings

11.2.40 People who are exposed to perceptible levels of vibration often believe that the vibration they can feel is capable of causing damage to the building they occupy. Humans, however, are relatively sensitive to vibration whereas buildings are not. Consequently, vibration levels at which the onset of building damage occurs are substantially greater than thresholds of perceptibility.

11.2.41 **Table 11.8** gives the limits above which cosmetic damage could occur for transient vibration. Minor damage is possible at vibration magnitudes which are greater than twice those given in **Table 11.8**, and major damage to a building structure can occur at values greater than four times the tabulated values. These values only relate to transient vibration. If there is a continuous vibration the guide values given in **Table 11.8** might need to be reduced by up to 50%. This guidance is reproduced from BS 5228-2:2009 and BS 7385-2:1993.

Table 11.8: Transient Vibration Guide Values for Cosmetic Damage

Place and time	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz – 15 Hz	≥15 Hz
Reinforced or framed structures Industrial and heavy commercial buildings	50mm/s at 4Hz and above	50mm/s at 4Hz and above
Unreinforced or light framed structures Residential or light commercial buildings	15mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

Significance Criteria

Significance of Demolition and Construction Effects – Noise

11.2.42 British standard BS 5228:2009+A1:2014 provides criteria for determining the significance of construction noise impacts. The standard provides two methods for determining significance; however, the most common most is

described below in **Table 11.9**. BS 5228 sets a maximum threshold value for construction noise based on the existing ambient noise levels. For example, if the ambient noise level was recorded to be 64 dB(A), this would indicate that the receptor would be a Category B receptor and therefore the maximum noise level would be 70 dB. This threshold level represents the sum of the pre-construction (ambient) noise and the construction noise at the receptor. If the construction noise exceeds this threshold, the effects of construction noise could be considered significant.

Table 11.9: Threshold for Significant Construction Noise Effect at Dwellings

Period	Parameter	Categories		
		A	B	C
Weekday Daytime (7am to 7pm)	Threshold value: (max construction noise level)	65 dB	70 dB	75 dB
Saturday Mornings (7am to 1pm)	Ambient Noise	< 62.5 dB	62.5 – 67.4 dB	> 67.4 dB

11.2.43 **Table 11.10** provides details of the magnitude of change in noise levels for short term construction impacts. These represent the magnitude of the impact over and above the threshold values.

Table 11.10: Magnitude of Change in Noise Levels – Construction Impacts

Short Term Impact Magnitude	Construction Noise Level Over and Above Threshold Level
Negligible	≥ 0 dB and < 1 dB
Minor	≥ 1 dB and < 3 dB
Moderate	≥ 3 dB and < 5 dB
Major	≥ 5 dB

Significance of Demolition and Construction Effects – Vibration

11.2.44 Although there is a lower threshold of perceptibility, BS 5228 (Ref: 8-19) assigns 1mm/s Peak Particle Velocity ("PPV") as the maximum target value for control of the impact of construction vibration. This target criterion is based on the guidance contained within BS5228, experience from previous sites and accepted vibration policy criteria across a range of enforcing authorities elsewhere in the UK. The limits are presented in terms of PPV as it is the simplest indicator for both perceptibility and potential complaints. It should be noted that this threshold relates only to perceptibility and the likelihood of complaints. The threshold of likely damage to buildings from construction vibration is considerably higher at 15mm/s PPV. **Table 11.11** summarises the magnitude of change descriptors for construction vibration.

Table 11.11: Magnitude of Vibration Level – Construction Impacts

Short Term Impact Magnitude	Vibration Level $m/s^{-1.75}$
Negligible	< 0.15
Minor	0.15 – 0.30
Moderate	0.30 – 1.0
Major	> 1.0

11.2.45 It should be noted that the effect of the noise, rather than the magnitude of the change, is a greater influence on determining whether an impact is considered to be significant. Consequently, it is not possible to simply state that a certain change in noise levels would be considered significant. **Table 11.12** below provides a guide to the generic relationship between the noise impact (i.e. the magnitude), the noise (i.e. the noise impact and the significance), as well as the significance. This is adapted from the IEMA guide. Professional judgement has been used to determine the significance of effect based on the magnitude of effect, duration of impact and the sensitivity of affected receptors.

Table 11.12: Relationship Between Magnitude, Perception & Significance

Magnitude	Description of the Effect	Significance
Major Beneficial	**Receptor Perception = Marked Change** Causes a material change in behaviour and/or attitude; e.g. people begin to engage in activities previously avoided due to noise conditions.	More likely to be significant
Moderate Beneficial	**Receptor Perception = Noticeable Improvement** Improved noise climate resulting in small changes in behaviour and/or attitude, e.g. opening windows.	
Minor Beneficial	**Receptor Perception = Just Noticeable Improvement** Improved noise climate resulting in small changes in behaviour and/or attitude, e.g. turning down volume on television; speaking more quietly.	Less likely to be significant

Negligible	No noticeable effect on the receptor	Not Significant
Minor Adverse	**Receptor Perception = Just Noticeable Improvement** Noise impact can be heard but does not cause any change in behaviour or attitude, e.g. closing of windows.	Less likely to be significant
Moderate Adverse	**Receptor Perception = Just Noticeable Improvement** Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. Potential for sleep disturbance.	
Major Adverse	**Receptor Perception = Disruptive** Causes a material change if behaviour and/or attitude, e.g. avoided certain activities during periods of intrusion. Potential for sleep disturbance.	More likely to be significant

Limitations and Assumptions

11.2.46 This assessment is based upon primary data collected onsite by Hawkins Environmental, in addition to data provided by others and upon the assumption that all relevant information provided by those parties is accurate. As such, this information has not been independently verified by Hawkins Environmental Ltd and is limited by the availability of data and information at the time of undertaking the assessment.

11.2.47 The assessment of demolition and construction effects is indicative and is based on an estimate of standard construction plant and equipment. At this stage, only a construction phasing plan and indicative list of equipment has been provided upon which to base the noise effects of demolition and construction. No indication on the number of items of plant, the likely plant location, the likely noise output of the plant or the typical duration of work for each item of plant (percentage on-time) has been provided for each construction stage. Consequently, this information has been estimated based on typical construction programmes. Whilst every endeavour has been made to make this as accurate as possible, it is likely that there will be some variation between the predicted and actual construction noise levels. However, the assessment contained within this chapter should give an indication of the magnitude of any impact.

11.3 Relevant Baseline Conditions

Noise

11.3.1 To determine the extent to which the site and its environs are affected by noise, a measurement study has been carried out on and around the proposed development site. The purpose of the noise measurement study is twofold:

- To determine the noise levels onsite with the proposed dwellings in place; and
- Determine the existing ambient and background noise levels at the closest sensitive receptors that could be affected by plant, traffic and construction noise.

11.3.2 Consequently, noise monitoring was carried out at the locations as marked on **Figure 11.2** and listed below:

- West boundary of Enderby Place (Unattended – 24 hours – Measurement Location 1);
- North-East boundary of Enderby Place (Attended – short duration – Measurement Location 2);
- South-East boundary of Enderby Place (Attended – short duration – Measurement Location 3);

11.3.3 All noise monitoring locations are considered to be representative of the noise levels likely to be experienced within the Proposed Development itself when constructed and are representative of noise levels at the existing adjacent dwellings within all of the nearest noise sensitive receptor buildings (Fiador Apartments, Ossel Court and Trefoil House). Aircraft noise is considered to be the dominant source of noise for all three of the noise monitoring locations. All noise measurement locations are considered to be freefield positions.

11.3.4 All noise measurements were attained using two Norsonic 140 sound level meters, which both conform to BS EN IEC 61672 as a Class 1 precision measurement system. A Norsonic 1251 field calibrator was used before and after the measurement periods in order to ensure that the equipment had remained within reasonable calibration tolerances (+/- 0.5 dB). Current certificates of calibration can be seen in **Appendix 11.2**. All noise monitoring has been performed in accordance with the guidance set out in BS 7445-2: 1991 *'Description and measurement of environmental noise Part 2: Guide to the acquisition of data pertinent to land use*'. This Standard details information that should be recorded in addition to the actual measured noise levels such as meteorological data, and a description of the noise source itself. The following statistical parameters were recorded during the survey: L_{Aeq}, L_{Amax}, L_{A10}, L_{A50}, L_{A90}[11]. During all monitoring periods, the weather conditions were conducive to successful monitoring, with no rainfall and windspeeds of typically less than 3 m/s. A location plan of the measurement locations can be seen in **Figure 11.2** below.

[11] The L_{AN} are statistical noise percentile levels which is exceeded for *N*% of the measurement time interval. *N* may have any value between 0% and 100%, although in practice *L*A10, *L*A50 and *L*A90 values are most commonly used.

Figure 11.2: Location Plan of the Noise Measurement Locations

11.3.5 **Table 11.15** and **Figure 11.3** summarizes the unattended 24-hour noise measurements conducted at measurement location 1 situated towards the western boundary of the Site; **Table 11.16** summarises the noise measurements conducted at measurement location 2 on the eastern boundary and to the north of the site which characterises noise from the industrial estate; and, **Table 11.17** summarises the noise measurements conducted at measurement location 3 towards the south-eastern boundary of the Site.

Table 11.13: Summary of Noise Measurements – ML1 (West Boundary – 24hr Unattended)

Period (hours)	Measurement Location 1 – Measured Noise Level, dB			
	$L_{Aeq,T}$	$L_{Aeq,5mins}$	$L_{Amax,5mins}$	$L_{A90,5mins}$
Day (7am to 11pm)	53.4	46.0 – 57.3	51.9 – 73.9	44.6 – 49.0
Night (11pm to 7am)	44.9	37.9 – 52.8	46.0 – 68.4	35.9 – 45.1

Table 11.14: Summary of Noise Measurements – ML2 (North-East Boundary –Short Duration)

Period (hours)	Measurement Location 2 – Measured Noise Level, dB			
	$L_{Aeq,T}$	$L_{Aeq,5mins}$	$L_{Amax,5mins}$	$L_{A90,5mins}$
Day (7am to 11pm)	54.3	50.2 – 63.1	57.7 – 83.6	46.3 – 56.2

Table 11.15: Summary of Noise Measurements – ML3 (South-East Boundary –Short Duration)

Period (hours)	Measurement Location 2 – Measured Noise Level, dB			
	$L_{Aeq,T}$	$L_{Aeq,5mins}$	$L_{Amax,5mins}$	$L_{A90,5mins}$
Day (7am to 11pm)	53.6	49.6 – 59.0	58.1 – 81.5	46.8 – 53.2

11.3.6 The background sound levels have been calculated in accordance with BS 4142:2014+A1:2019, which represents the most up-to-date guidance on the subject. Prior to the publication of the 2014 version of BS 4142, acousticians would use the lowest measured background sound levels; however, BS 4142:2014 provides substantially more guidance on the determination of background sound levels. Section 8.1 of BS 4142:2014 states that *"for this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods. Among other considerations, diurnal patterns can have a major influence on background sound levels and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes"*. The guidance goes on to say that *"a representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value".*

11.3.7 It was determined that background noise measurements collected at measurement location 1 to the western boundary of the Site are likely to be representative of the background noise levels at the closest affected sensitive receptor locations. In order to determine the background sound levels for the day and night time periods, the background sound levels have been analysed over the appropriate time periods, i.e. 15 minutes for night time (11pm to 7am) and 1 hour for the daytime periods. **Figure 11.4** and **Figure 11.5** details the distribution of the background sound levels as described in BS 4142:2014 for the day and night time periods respectively.

11.3.8 It can be seen from **Figure 11.4** that during the day, the $L_{A90.1hour}$ ranged from 43 dB to 52 dB. It can be seen from **Figure 11.4** that most $L_{A90.1hour}$ noise levels were in the region of 45 to 48 dB and therefore, 45 dB is considered to be representative of the daytime background noise level.

11.3.9 It can be seen from **Figure 11.5** that during the night, the $L_{A90.15mins}$ ranged from 36 dB to 45 dB, with the worst-case background noise level value typically at 36 dB. To characterise a worst-case scenario in terms of night-time background noise levels, it is considered that 36 dB is the night-time background noise level.

Figure 11.3: Noise Survey Results

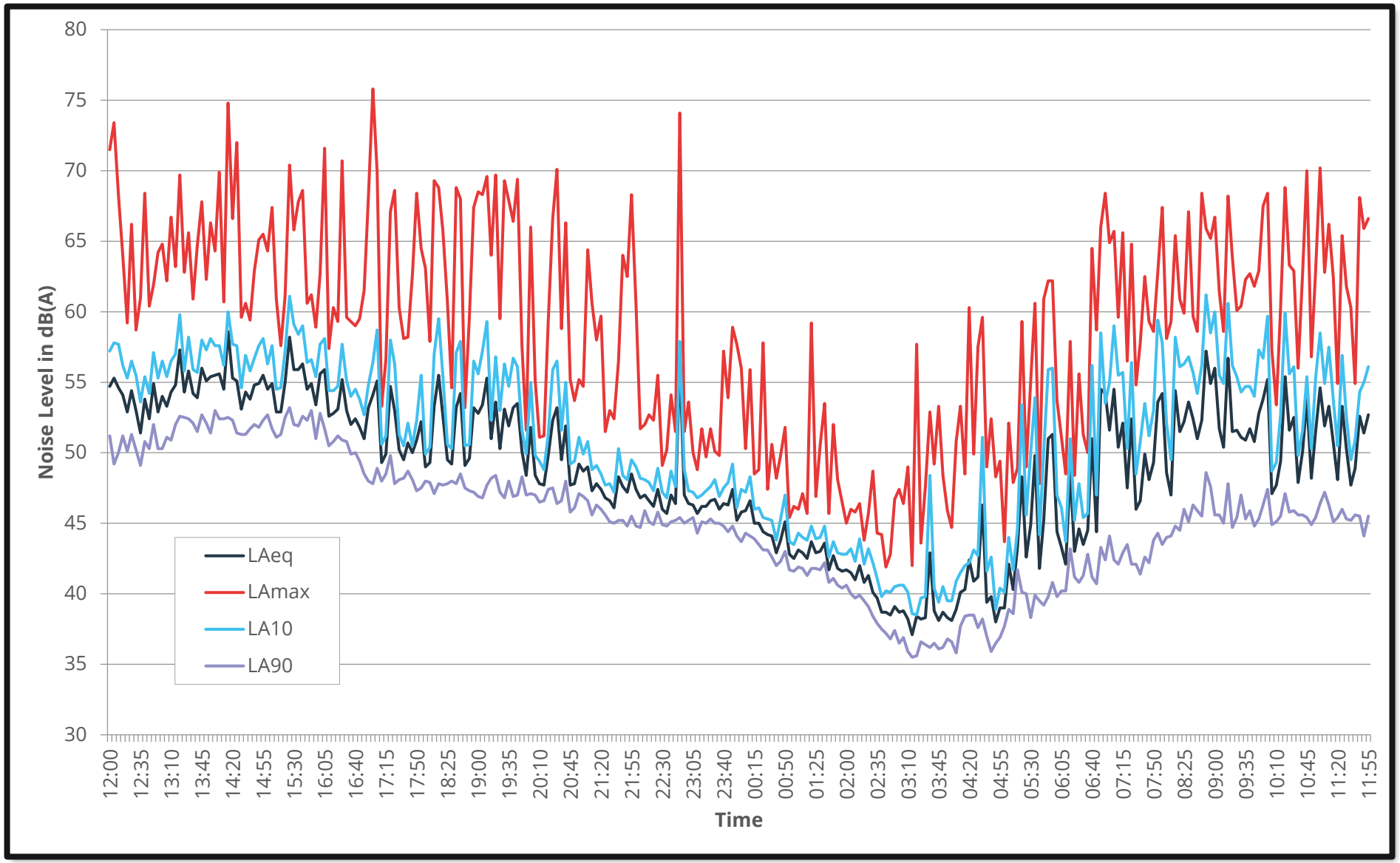


Figure 11.4: Distribution of Day Time $L_{A90,1hour}$ Sound Levels

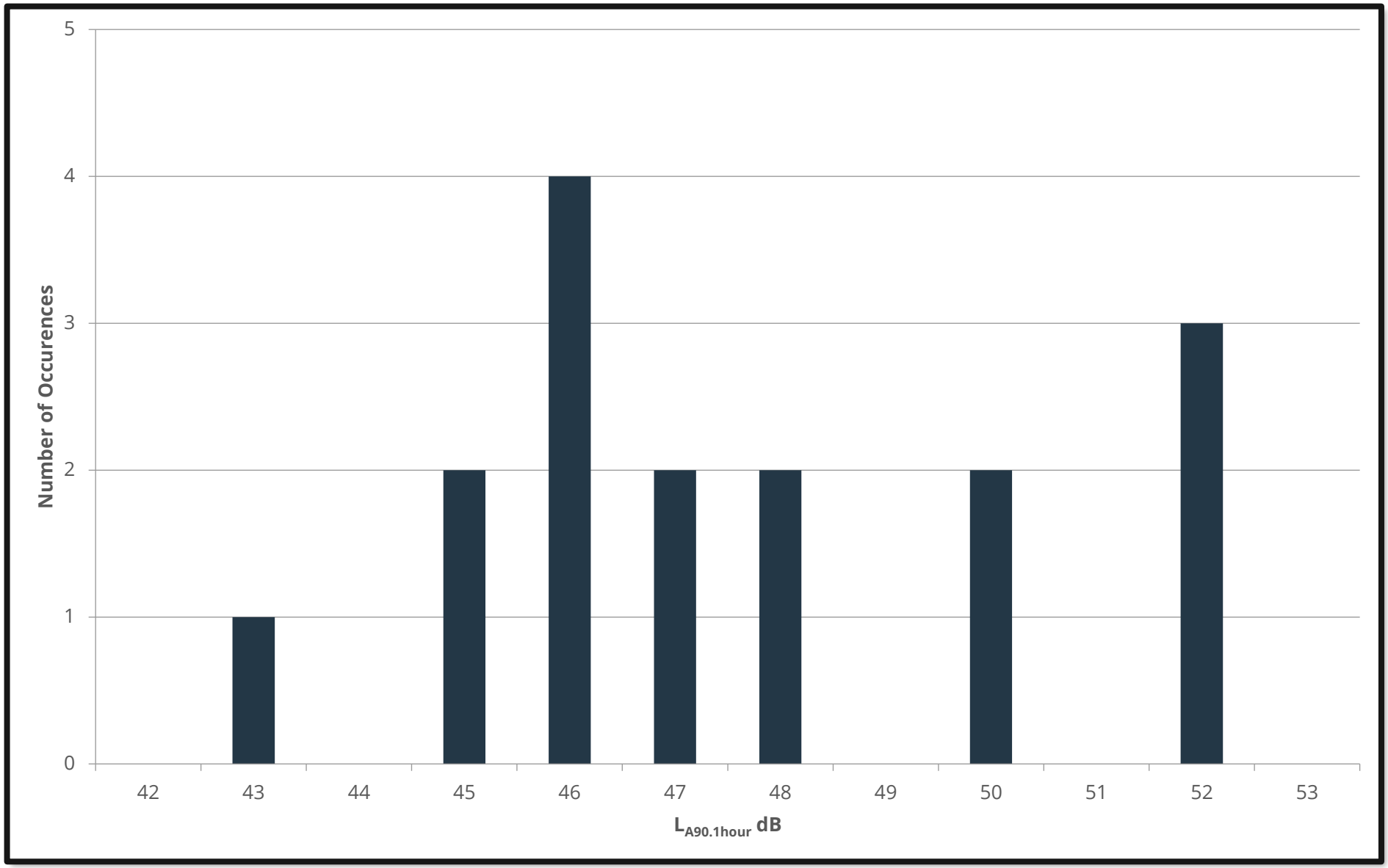
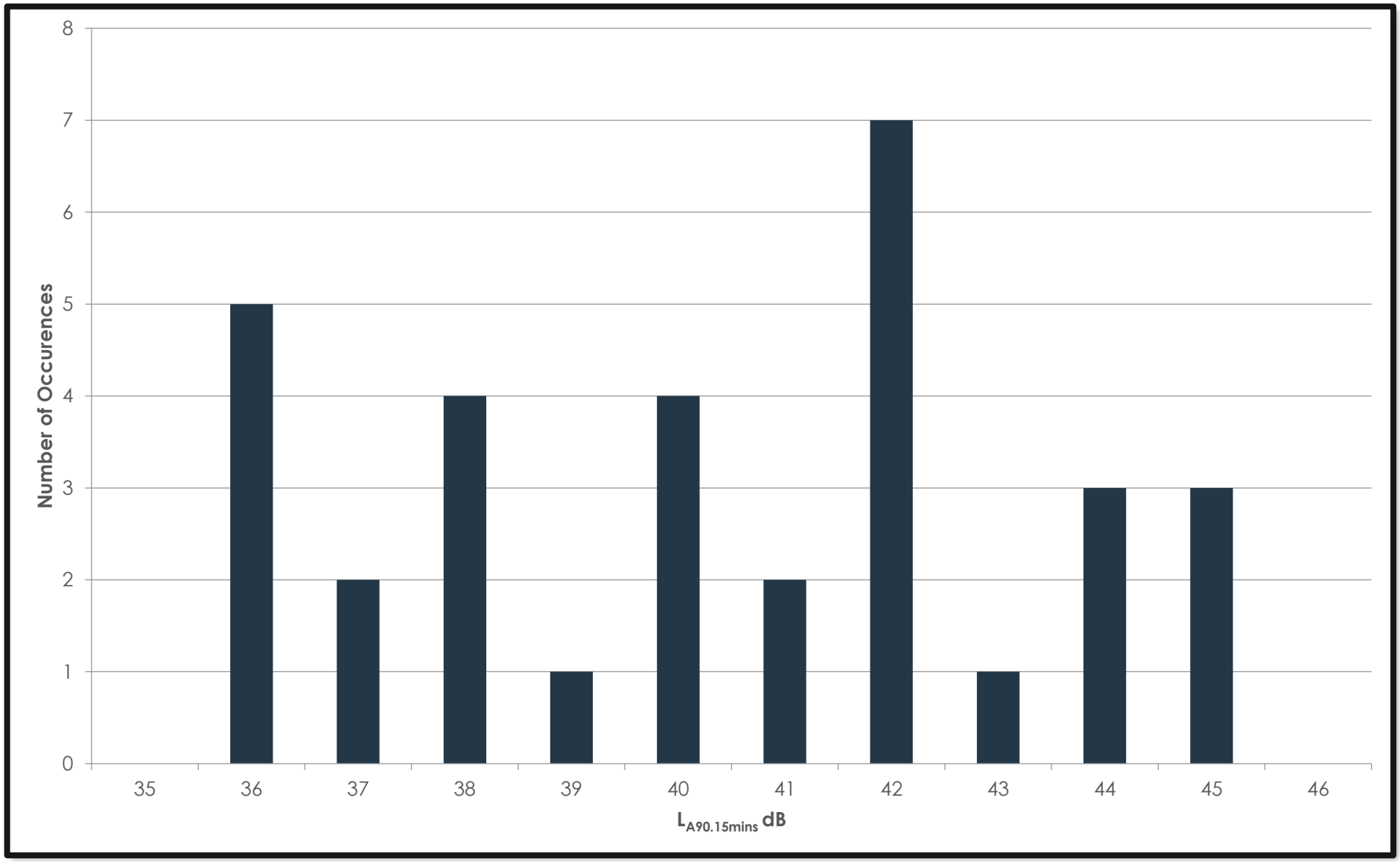


Figure 11.5: Distribution of Night-time $L_{A90,15mins}$ Sound Levels



11.3.10 Onsite observations noted minimal noise generating activity from the former Spicer Warehouse and adjacent industrial units situated to the north-east of the Site. As illustrated by measurement location 2, there is little variation in noise in comparison to measurement location 1 and 3. It is noted that the large former Spicer Warehouse is currently available to let with no current occupancy.

11.3.11 The adjacent smaller industrial units to the east of the Site consists of catering service providers, glass merchants and a bicycle shop. It was observed that noise from these units were minimal with some noise from occasional deliveries and customers arriving and leaving in their vehicles and light good vehicle deliveries.

11.3.12 Enderby House, which is enveloped by the Site boundary but not contained within it, is a restaurant and bar with some plant noise observed to the east of the Enderby House building. Noise from this plant was measured to be 56.7 dB(A) at 4 metres. At the nearest façade of the Proposed Development, noise levels from this plant would be 42.8 dB(A) and less than the background noise level of 45 dB(A). It is understood that the restaurant and bar does not operate during the night-time period of 11pm to 7am.

11.3.13 A childrens' nursery, The Alphabet House Nursery Greenwich is also observed to be situated on the ground floor of the Ossel Court building. Upon attending site, noise from the nursery activities were not audible and therefore were not measurable.

Vibration

11.3.14 In regard to the constraints of vibration on the proposed development site itself, it has been identified that there are no significant sources of vibration at this site, and as such, no further assessment would be necessary.

11.4 Likely Effects of the Development and their Significance

The Works

Construction Noise

11.4.1 Construction of the proposed development has the potential to cause impacts of excessive levels of noise and vibration during demolition and construction; given the proximity of the adjacent existing residential dwellings of Enderby Wharf. It is understood that there will be five phases to the construction project that are staggered for each of the three proposed towers (River Tower and Maisonettes; Modern Tower; and Telcon Tower):

- Phase 1: Enabling works
- Phase 2: Piling
- Phase 3: Substructure
- Phase 4: Superstructure
- Phase 5: Fit out

11.4.2 A list of typical plant that will be used has been provide for each phase in addition to percentage working times for each item of plant, as shown in **Table 11.16**. However, the exact models of plant are not yet known. Therefore, calculations of construction noise utilise the plant noise data contained within Annex C of BS 5228-1:2009+A1:2014.

11.4.3 It should be noted that it is assumed that there are three separate sets of plant utilised for each of the three proposed towers, e.g. during periods where the Substructure works are being undertake on all three proposed towers, three diggers, three piling rigs, three mobile cranes etc will be on site.

11.4.4 The plant data has been used in conjunction with the calculation methodology contained within BS 5228-1:2009+A1:2014 to calculate the cumulative noise level from all plant operating for each phase of the construction programme. **Figure 11.6** presents the nearest noise sensitive receptor locations and **Table 11.17** shows a summary of the cumulative noise levels at the nearest noise sensitive receptors.

Table 11.16: Summary of Plant Calculations Source Data

Plant	Reference	% Working Time	Time Corrected SPL, dB $L_{Aeq,T}$ at 10m	Included in Construction Phase				
				1	2	3	4	5
Diggers	Table C.2 Ref 21	75%	50 dB	✓	✓	✓	✗	✗
Piling Rig	Table C.3 Ref 1	100%	59 dB	✓	✓	✓	✗	✗
Mobile Crane	Table C.5 Ref 37	10%	46 dB	✓	✓	✓	✗	✗
Telehandler	Table C.4 Ref 54	25%	53 dB	✓	✓	✓	✓	✗
Generators	Table C.6 Ref 39	100%	45 dB	✓	✓	✓	✓	✗
Tower Crane	Table C.4 Ref 48	100%	57 dB	✗	✗	✗	✓	✗

Figure 11.6: Location Plan of the Nearest Noise Sensitive Receptors

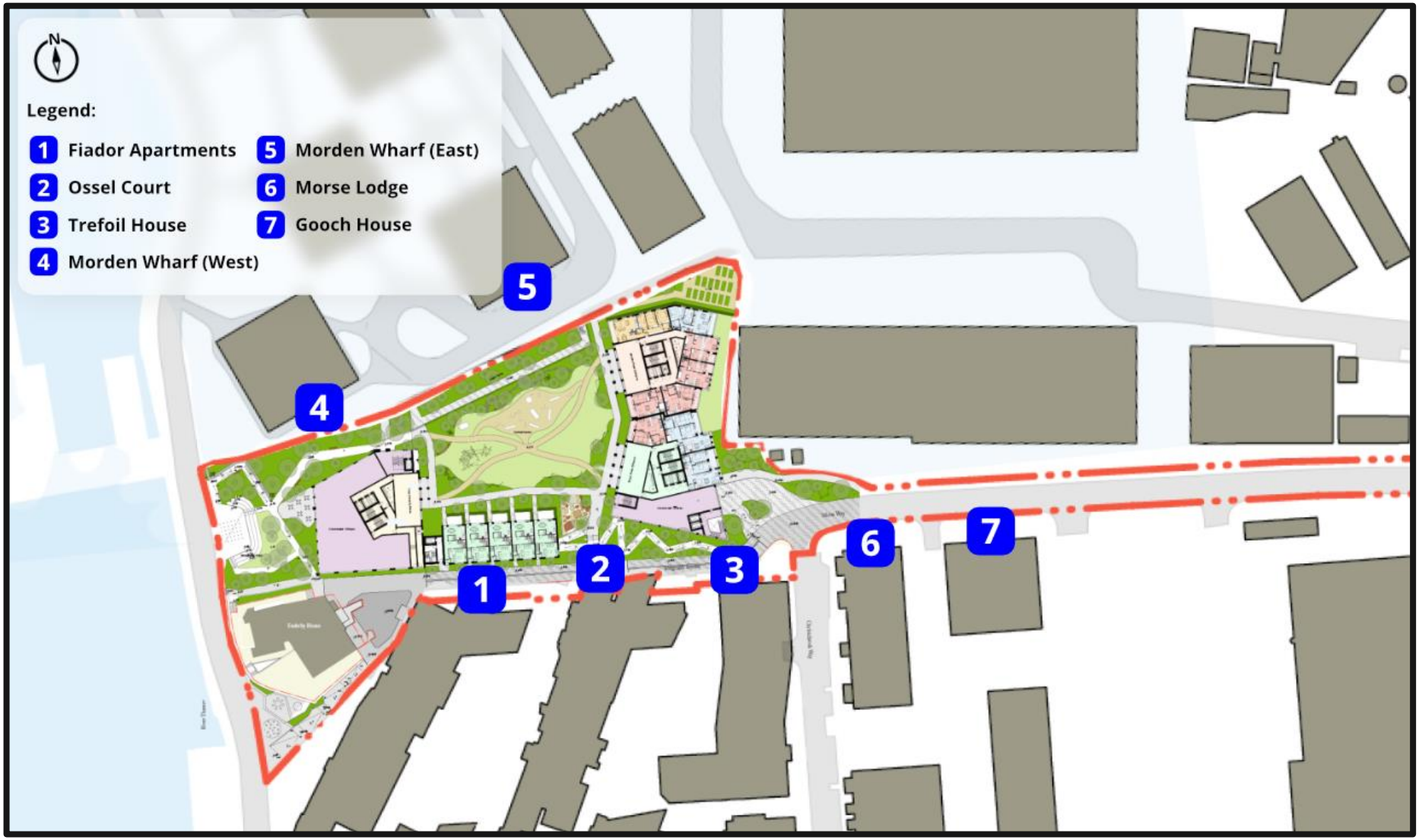


Table 11.17: Summary of Receptor Noise Levels Based on Plant Noise Calculations

Receptor	Cumulative Receptor Sound Pressure Level, dB $L_{Aeq,T}$ Months										
	1 to 3	4 to 7	8	9 to 10	11 to 13	14 to 16	17 to 23	24 to 27	28 to 29	30 to 32	33 to 36
1 – Fiador Apartments	65	65	65	60	60	59	59	59	40	40	40
2 – Ossel Court	62	63	63	59	59	57	57	57	42	42	42
3 – Trefoil House	47	62	62	62	62	56	56	56	41	41	41
4 – Morden Wharf (West)	55	55	55	50	50	49	49	49	36	36	36
5 – Morden Wharf (East)	46	55	55	54	54	48	48	48	47	47	47
6 – Morse Lodge	39	52	52	51	51	45	45	45	39	39	39
7 – Gooch House	38	47	47	47	47	41	41	41	36	36	36

11.4.5 To determine whether the external freefield noise levels are likely to be considered a constraint upon the development of the site, the predicted construction noise levels will be compared to Annex E.3.2 of British standard BS 5228-1:2009+A1:2014. Since the daytime ambient noise levels in the locality of the development site when rounded to the nearest 5 dB is less than 62.5 dB(A), the daytime threshold value of Category A for the nearest noise sensitive receptors is used. It is important to note that construction activities will only occur during the daytime.

11.4.6 The noise levels detailed in **Table 11.17** are considered representative of the facades of Fiador Apartments; Ossel Court; Trefoil House; Morden Wharf (nearest two buildings to the northern boundary of the Site); Morse Lodge, and; Gooch House. Noise levels are estimated to be 65 dB $L_{Aeq,T}$ at the nearest noise sensitive receptor to the construction activities (receptor 1 – Fiador Apartments).

11.4.7 Based on the calculations, there will be no exceedance events at any of the nearest noise sensitive receptors. As the calculation results of **Table 11.17** demonstrate that noise levels from the construction activities will not exceed ≤ 65 dB $L_{Aeq,T}$ at all of the NSRs, it is demonstrated that the impact magnitude would be **negligible** and therefore noise effects directly attributed to the works are considered **insignificant**.

Construction Traffic Noise

11.4.8 The demolition and construction traffic noise calculations have been carried out based on the peak construction traffic flow of 200 movements per day as outlined both in **ES Volume 1, Chapter 6: The Works and ES Volume 1, Chapter 9: Traffic and Transport**. A worst-case scenario is assumed that all 200 movements per day are related to HGVs since the % of HGVs is not known.

11.4.9 Using the methodology within the Calculation of Road Traffic Noise (CRTN), the change in noise levels as a consequence of the change in traffic flows relating to the construction of the Proposed Development has been calculated for the nearest noise sensitive receptors at locations likely to be most affected by the changes in traffic flows. **Table 11.18** shows the results of this assessment for the sensitive receptors on the road links most affected by changes in traffic flows.

Table 11.18: Magnitude of Change in Noise Levels – Construction Traffic

Rec. ID	Receptor	Change in Noise Levels Attributed to Construction Traffic, dB $L_{A10,18hrs}$	Impact Descriptor
1	Fiador Apartments	≤ 2.1 dB	Negligible
2	Ossel Court	≤ 2.1 dB	Negligible
3	Trefoil House	≤ 2.1 dB	Negligible
4	Morden Wharf (West)	≤ 2.1 dB	Negligible

Rec. ID	Receptor	Change in Noise Levels Attributed to Construction Traffic, dB $L_{A10,18hrs}$	Impact Descriptor
5	Morden Wharf (East)	≤ 2.1 dB	Negligible
6	Morse Lodge	≤ 2.1 dB	Negligible
7	Gooch House	≤ 2.1 dB	Negligible

Construction Vibration

11.4.10 Vibration is difficult to predict since the propagation of vibration depends on a number of factors that are not always easy to quantify. However, BS 5228 provides guidance on determining whether impacts are likely to be considered an impact by providing distances from typical construction activities at which the onset of perceptibility could occur. BS 5228 suggests that for the majority of people, the threshold of vibration perceptibility is between 0.14 and 0.3 mm/s^{-1} PPV.

11.4.11 It is known that hydraulic breakers could be used in the enabling works, piling and substructure phases of the construction programme and could occur at approximately 6 metres from the existing dwellings at Ossel Court; within the adjacent Enderby Wharf development. It is also known that the threshold of vibration perceptibility (i.e. a PPV between 0.14 and 0.3 mm/s^{-1}) is likely to occur within around 15-20 metres for the use of hydraulic breakers and for continuous flight auger ("CFA") piling methods which will be utilised on this scheme.

11.4.12 Based on the layout of the Proposed Development, it is understood that the use of piling equipment and hydraulic breakers could be occurring from around 6 metres to the nearest dwellings at Ossel Court. Therefore, in the enabling works, piling and substructure phases of the construction programme, it would be anticipated that a PPV of up to 0.3 mm/s^{-1} or more could be experienced during the use of the hydraulic breakers and CFA piling at the nearest noise sensitive receptors (within approximately 20 metres of hydraulic concrete breaking and CFA piling activities).

11.4.13 Vibration effects directly attributable to the Works are considered likely to result in **direct, temporary, short-term (10 months)** and **local** effects of **moderate adverse significance** during the daytime only. Receptors which are situated at a minimum distance of 20 metres or more from vibratory activities may experience **direct, temporary, short-term (10 months)** and **local** effects of **negligible to minor adverse significance**, dependent upon multiple variables – such as: distance from the sources of vibration and receptor; ground conditions; soil-structure interaction; and foundations, internal structure elements and materials of the receptors.

The Completed and Operational Development

Site Suitability: Scenario 1

11.4.14 Should Tunnel Wharf continue to operate for storage/distribution as it is at present (without the implementation of the conveyor system scheme (ref. 19/3298/F)), it is anticipated that noise levels would be 53 dB $L_{Aeq,16hrs}$ during the daytime and 45 dB $L_{Aeq,8hrs}$ during the night-time period. Therefore, standard double glazing with a minimum sound reduction index ("R_W") of 33 dB or more would be appropriate. In regard to ventilation, the site cannot rely on windows being opened for ventilation based on the onsite noise levels. Therefore, an alternative source of ventilation, such as mechanical ventilation, is considered. In regard to overheating, windows may be openable, depending on the duration. As the daytime ambient noise level is less than the *"upper guideline value"* of 55 dB(A) based on BS 8233 and the ProPG, a good level of amenity would be achieved.

Site Suitability: Scenario 2

11.4.15 Should the conveyor system scheme for Tunnel Wharf come forward, the impact of the conveyor system on the proposed development site has been calculated using BS 4142:2014+A1:2019. The specific sound level of the conveyor system has been estimated to be 47 dB(A) using a combination of line and point source distance attenuation calculations at the northern boundary of the development site; which is approximately 360 metres from the conveyor system. It is understood that the conveyor system is 70 metres in length and is positioned parallel in relation to the northern boundary of the site. Upon considering intervening structures, including the existing structures at Morden Wharf, a barrier attenuation of 10 dB derived from BS 5228 is considered appropriate, which would see the specific sound level reduce to 37 dB(A).

11.4.16 In regard to the rating penalty to be applied to the specific sound level, it would be anticipated that the conveyor system may have a just perceptible tonal component, in addition to a level of intermittency in operation. Therefore, a rating penalty of 5 dB is applied to the specific sound level. This results in a rating sound level of 42 dB(A) at the northern boundary of the Site.

11.4.17 Upon comparison to the daytime background sound level as determined in section 11.4 of this chapter, the proposed conveyor system would be 4 dB less than the background sound level. At night, the rating sound level of the conveyor system may exceed the night-time background sound level by up to 6 dB if unmitigated.

11.4.18 Whilst this may lead to an impact on the development at night, it is considered that the absolute night-time ambient noise level of 45 dB(A) may only increase by 1.8 dB if the contribution from the conveyor system scheme at Tunnel Wharf is added to the ambient noise, which would be considered a *"negligible"* long-term impact by the IEMA Guidelines. Furthermore, the proposed mitigation within Scenario 1 would ensure that internal ambient noise levels would be compliant with the noise level limits of **Table 11.1**.

11.4.19 Whilst the implementation of the conveyor system may see an impact at night, upon consideration of the absolute noise levels, the impact of the conveyor system is *"negligible"* and mitigated using standard double glazing with a minimum R_w of 33 dB and provisions for mechanical ventilation.

11.5 Additional Mitigation / Enhancement and Likely Residual Effects of the Development and their Significance

The Works

11.5.1 Upon consideration of plant and equipment noise attributed to the Works in addition to construction traffic, it has been determined that the impact of the scheme would be **negligible** and therefore **insignificant** at all of the identified nearest sensitive receptors.

11.5.2 When considering vibration attributed to the Works, it has been determined that the impact of the scheme would result in **direct, temporary, short-term (10 months)** and **local** effects of **moderate adverse significance** during the daytime only for receptors within 20 metres of vibratory activities. It is likely that receptors situated at a minimum distance of 20 metres or more from vibration inducing activities would result in **direct, temporary, short-term (10 months)** and **local** effects of **negligible to minor adverse significance.**

11.5.3 It would be critical to consider a margin of error attributed to the noise calculations of the Works in addition to the data derived from BS 5228:2014 which are used within the calculations. Therefore, mitigation would be recommended to ensure a negligible impact magnitude and insignificance of effects would be maintained.

11.5.4 The typical worst-case % working-time used for each plant within the calculations was used in the calculations. Careful planning of construction activities could be employed such that the noisiest activities would be restricted to a maximum number of hours per day. For example, noisy activities may occur only between working hours of 9am to 5pm during weekdays only so as to ensure that noise and vibration generating activities occur during the least sensitive working hours during each week.

11.5.5 Geographical planning could also be employed. The calculations mentioned previously in this chapter assume a distance of 6m to the closest receptor. By moving the noisiest activities further from the nearest noise sensitive receptors and increasing the average distance from the receptor, this may further reduce noise levels. For example, generators could be situated to the north of the site or otherwise at locations that are furthest from the nearest noise sensitive receptors.

11.5.6 Geographical planning may also apply to the movement of heavy goods by way of effective routing of construction vehicles when entering and leaving the site. Provisions of access as far as possible from the adjacent sensitive receptors would help to reduce the impact of noise and vibrations on the nearest sensitive receptors.

11.5.7 All plant and equipment ought to be maintained such that mechanisms are properly lubricated, worn bearings and faulty silencers are properly replaced; and cutting tools are sharpened. Poorly maintained plant and equipment could lead to unpredictable and detrimental increases in levels of noise and vibration.

11.5.8 Provisions of construction noise and vibration monitoring on the site boundaries would help to continuously monitor levels of noise and vibration at the boundaries of the site to assess compliance with noise and vibration control targets.

11.5.9 Providing regular briefings for all site-based personnel so that noise and vibration issues (or BPM audits) to ensure compliance with noise and vibration commitments.

11.5.10 Additional best-practice measures could also include:

- Use of large fully enclosed acoustic buildings to surround activities and/or worksites;
- Avoiding unnecessary revving of engines and switching off equipment when not in use;
- Starting-up plant and vehicles sequentially as opposed to simultaneously;
- Ensuring internal haul routes are properly maintained to minimise impulsive noise and vibration from vehicles driving over discontinuities in the running surfaces;
- Implementation of rubber linings to chutes, hoppers and dumper vehicles to reduce impact noise from material transfer;
- Minimise drop heights of materials;
- Carrying out regular inspections of mitigation measures (or BPM audits) to ensure compliance with noise and vibration commitments;
- Ensuring that all unloading is carried out within the worksite rather than on adjacent roads or laybys;
- Phasing of material deliveries to be controlled on a ‘just in time’ basis to minimise noise and congestion on roads around the site; and
- Setting out the stakeholder engagement initiatives to be undertaken, including the provision of information to local residents about noisy works and/or works planned to take place outside of core working hours.

Summary of Likely Residual Effects

11.5.11 Residual effects are identified as effects which cannot be eliminated through primary, secondary or tertiary mitigation. **Table 11.19** below presents a summary of the likely residual effects.

Table 11.19: Summary of Residual Effects – Demolition and construction

Effect Description	Receptor Sensitivity	Nature of Effect/Geographical Scale	Magnitude of Impact	Initial Class. of Effect	Additional Mitigation	Residual Classification of Effect
Construction Noise	High	Temporary, Short-term	Up to 9 dB above the construction noise limit	Negligible	Refer to paragraphs 11.5.4 to 11.5.10	Negligible
Construction Vibration	High	Temporary, Short-term	In excess of 1mms^{-1} PPV	Moderate	Ref. paragraphs 11.5.4 to 11.5.10	Moderate

11.6 Likely Residual Cumulative Effects and their Significance

11.6.1 Residual effects are identified as effects which cannot be eliminated through design changes or the application of mitigation measures. This section of the chapter assesses the potential effects of the Site in combination with the potential effects of other development schemes (referred to as the 'cumulative schemes') within the surrounding environs.

11.6.2 This assessment of the cumulative residual effects considers the following cumulative schemes:

- Morden Wharf (ref. 20/1730/O – Approved June 2022)

11.6.3 All other identified cumulative schemes are considered to be at a distance such that there will be no cumulative impacts of any significance, or where onsite activities would likely result in insignificant effects. Therefore, no further assessment of the likely cumulative noise and vibration effects of the other adjacent cumulative schemes would be necessary.

The Works

11.6.4 Due to the close proximity of the Enderby Wharf development to the south of the Site, which includes properties such as Fiador Apartments, Ossel Court and Trefoil House, careful planning will be required to reduce the potential impact of construction noise and vibration given that to the north of the Site it is proposed to develop Morden Wharf (ref. 20/1730/O). There could be cumulative effects of the Morden Wharf development if the construction of the Morden Wharf development at the development of this Site occur at the same time.

11.6.5 Demolition and construction noise and vibration from the cumulative schemes would be controlled by best practicable means, such as through effective communication and co-ordination of noisy works between both sites

where the resulting cumulative effects at the receptors would not be in excess of the levels predicted for the proposed development alone. As such, the cumulative effects would remain the same as those reported above.

11.7 Conclusions

11.7.1 The demolition and construction Works are anticipated to include activities that would be likely to increase noise levels and potentially cause vibration within and immediately adjacent to the Site. In particular, when activities are occurring closest to the Site boundary in relation to the nearest noise sensitive receptors, this could result in the following effects attributed to the Works:

- Noise: **insignificant**;
- Traffic: **insignificant;**
- Vibration: **direct, local, short-term, temporary (10 months), moderate adverse significant effects** on occupants within the surrounding properties that are situated within 20 metres from vibratory activities; and **direct, local, short-term, temporary (10 months), negligible to minor adverse significant effects** on occupants within the surrounding properties that are situated more than 20 metres from vibratory activities.

11.7.2 The implementation of noise and vibration mitigation and control measures for the demolition and construction Works would help to mitigate and minimise noise disturbances to the occupants of existing adjacent properties where negligible noise impacts would be ensured and vibration impacts minimised. Such measures would include the utilisation of low noise generating plant and equipment; enclosing and screening machinery; and using low vibratory foundation methods.

11.7.3 It is noted that through best practicable means, proper and consistent communication between site managers of the Site and Morden Wharf would ensure that the noisiest construction activities are co-ordinated such that the resulting cumulative effects at the receptors would not be in excess of the levels predicted for the proposed development alone.

11.7.4 An assessment of the suitability for the Site for residential uses has been undertaken. The results of the assessment indicate that through the provision of an appropriate glazing and ventilation strategy, the required internal ambient and maxima noise levels would be met for all noise sensitive locations. Similarly, it is preliminarily indicated that the onsite amenity spaces would be likely to achieve acceptable noise levels for external spaces with the incorporation of suitable mitigation measures.

12. Socio-Economics

12.1 Introduction

12.1.1 This Chapter sets out the likely significant effects of the Development upon socio-economics. It has been prepared by ekosgen.

12.2 Assessment Methodology and Significance Criteria

Scope of the Assessment

12.2.1 The effects considered in this Chapter are associated with the completed and operational Development. **ES Volume 1, Chapter 2: EIA Methodology** and the associated appendices provide more detail on the scope of this Chapter, including areas of assessment that have been scoped out. The likely significant socio-economic effects that are considered are:

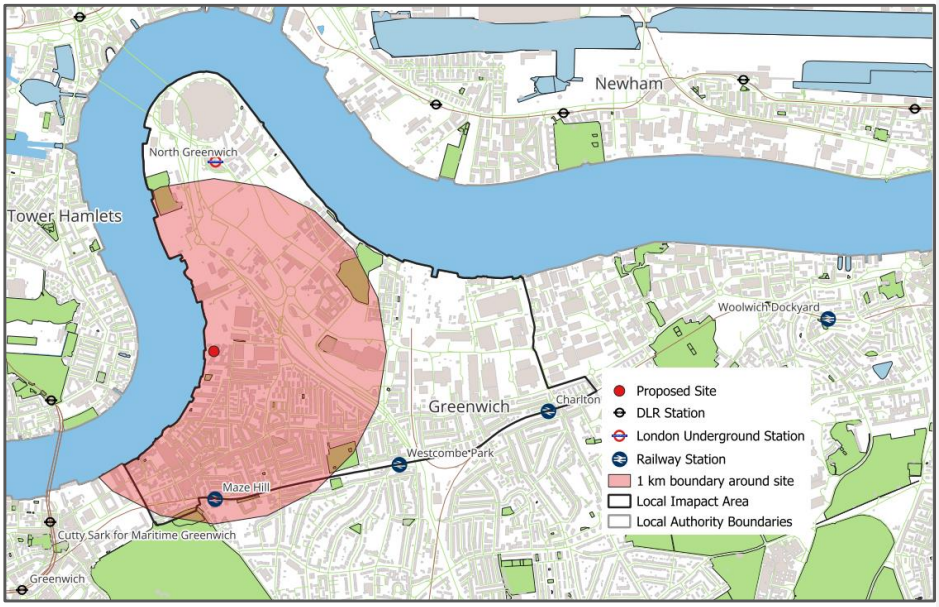
- Effects on local school (primary and secondary) capacity
- Effects on GP capacity (primary healthcare)
- Effects on Hospital capacity (secondary healthcare)
- Effects on Community facilities provision
- Effects on Open space capacity
- Effects on Play space capacity

Defining the Baseline

12.2.2 The baseline and effects of the Development are considered across the following geographies:

- Local Area – the definition of the Local Area varies depending on the effect being assessed and any associated need to use bespoke catchments and/ or administrative spatial scales as set out within relevant local and regional policies. (see **Table 12.1** below).
- District – The Royal London Borough of Greenwich (RBG) is identified as the administrative area in which the Development is located.
- Regional – London is predominantly considered for benchmarking purposes to add context to the baseline situation where relevant.

Figure 12.1: Site Location Map



12.2.3 **Table 12.1** summarises the geographical study areas.

Table 12.1: Geographical Study Areas

Effect	Study Area	Justification
Demand for Primary school capacity	Local Area (within RBG school place planning area 2)	Based on Local Education Authority (LEA) school place planning areas[1].
Demand for Secondary school capacity	District (RBG)	Based on LEA School Place Planning Area.
Demand for GP capacity	Local Area (one km)	Based on HUDU guidance and CCG indicating that impact on GP capacity should be assessed within one-km catchment from any Proposed Development.
Demand for Hospital Capacity	District (RBG)	Best-fit area with nearest hospital catchment area[2]
Demand for Community Facilities	Local Area (combined wards of Greenwich Peninsula and Greenwich East)	Combined these wards cover the Greenwich Peninsula area and a reasonable distance in which to travel to access community facilities

[1] Royal Borough of Greenwich, School Place Planning Data, 2022
[2] Lewisham and Greenwich NHS Trust Catchment Population

Effect	Study Area	Justification
Demand for Open space provision	District (RBG)	RBG's Green Space Strategy identified need at the Borough (i.e. RBG) level.
Demand for Play space provision	On-Site and Local Area (100m to 1km)	London Plan catchments for various types of play space.

Current Baseline Conditions

12.2.4 Data used to establish the current baseline conditions are drawn from a range of sources which are referenced at relevant sections throughout this ES Chapter. These include:

- The Census of Population[3].
- Department for Education[4] (DfE) for school locations and capacity.
- RBG School Place Planning Report[5].
- Greenwich Infrastructure Delivery Plan[6]
- National Health Service (NHS) Choices[7] and NHS Royal London Borough of Greenwich Clinical Commissioning Group (RBG CCG).

12.2.5 Where data from the most recent year is not available, the next best alternative has been used i.e. the most up to date.

Impact Assessment Methodology

Education

12.2.6 The estimated child yield of the Development is based on applying the proposed number and mix of housing units to the GLA's Population Yield Calculator[8] which generates an estimate of the number of children aged up to 18-years of age (broken down into children in early-years, primary and secondary school provision). The capacity of existing schools (in addition to planned schools) is assessed based on data and information from the Department for Education's (DfE) school capacity tables, together with a review of RBG's School Place Planning Strategy[9]. The Development effects on education capacity are assessed at various geographical levels:

- Primary Schools – located within RBG's Primary School Catchment Area 2.

[3] Office for National Statistics (2011), Census of Population, 2011 and 2021
[4] Department for Education, available at: https://get-information-schools.service.gov.uk/Establishments/Search?SelectedTab=Establishments&SearchType=EstablishmentAll&SearchType=EstablishmentAll&OpenOnly=true&TextSearchModel.AutoSuggestValue=&f=true&b=1&b=4
[5] Royal Borough of Greenwich, School Place Planning Data 2032
[6] Royal Borough Greenwich, 2020, Greenwich Infrastructure Delivery Plan
[7] NHS Digital (March 2023), 'General Practice Workforce 30 September 2023'
[8] Greater London Authority (October 2019), GLA Population Yield Calculator v3.2.
[9] School Place Planning Data Annex, 2022: Document.ashx (royalgreenwich.gov.uk)

- Secondary Schools – located within RBG.

12.2.7 The assessment of the Development on demand for education facilities is based on the increased gross additional demand, compared with the supply as set out in the baseline.

Healthcare Facilities

12.2.8 The effect on capacity of primary healthcare facilities (primarily GP surgeries) surrounding the Site is based on an assumed gross increase within the local population estimated by using the GLA's Population Yield Calculator[10]. The additional residents are added to the baseline registered patients, and the average patient list size per FTE GP is calculated. This is then compared against the existing average patient list size within a one-kilometre catchment of the Site, and the London HUDU benchmark of 1,800 patients per FTE GP in order to make a judgement on the effect the Development will have on local capacity.

12.2.9 The effect on capacity of secondary healthcare facilities (primarily hospitals) in proximity to the Site is based on an assumed gross increase within the population (using the same method as described above) and comparing this with the baseline hospital catchment population[11] to consider the increase. Consideration of the impact on quality of care is also considered, taking into account existing wait times and hospital performance and any added pressure that may arise.

Community and Leisure Facilities

12.2.10 The assessment of the Development on demand for community and leisure facilities is based on the increased demand arising from the gross additional population compared with a review of the existing supply of provision in the local area. In the absence of standard benchmarks for provision per population, qualitative judgement is used to assess the quantity and variety of existing provision, drawing on information within RBG's Community Infrastructure Delivery Plan.

Open Spaces and Play Space Provision

12.2.11 An assessment on the demand for open spaces provision is made based on the estimated additional population yield and gross child yield against on-site design provision (e.g. the amount of open space, and children's play space), against existing levels of provision in the borough and LIA and GLA play space requirements[12].

12.2.12 For any demands for play space from the newly introduced child yield not met on-site, the baseline establishes where there is any spare capacity in the infrastructure across the relevant impact areas. It is assumed that this spare capacity would be taken up by residents of the Development. However, if there are any outstanding demands that are not met by existing social infrastructure, mitigation measures are suggested.

[10] Greater London Authority (October 2019), GLA Population Yield Calculator v3.2.
[11] Lewisham and Greenwich NHS Hospital Trust Admissions Data, 2020
[12] GLA, 2012, Shaping Neighbourhoods: Play and Informal Recreation Supplementary Planning Guidance

Consultation Undertaken

12.2.13 Pre-application engagement has been undertaken with RBG and statutory consultees via the EIA Scoping Process (see **ES Volume 1, Chapter 2: EIA Methodology**).

Assumptions and Limitations

12.2.14 The assessment of effects is carried out against the socio-economic baseline conditions as defined by the data sources referenced above. As with any dataset these may be subject to change.

12.2.15 The assessment of effects assumes that the Development would be constructed in accordance with the planning permission applied for.

Significance Criteria

Receptors and Receptor Sensitivity

12.2.16 The sensitivity of each receptor, outlined in **Table 12.2**, is evaluated as being high, medium, low, or negligible based on a review of the baseline position of each receptor, and where relevant, its performance against other benchmark areas (in this case RBG and London). Where relevant, the importance of the receptor in local and regional policy terms is also considered in defining its sensitivity.

Table 12.2: Definition of Sensitivity of Receptor

Sensitivity	Definition
High	Evidence of direct and significant socio-economic concern relating to the receptor. May be given a high priority in local, regional and/ or national economic and regeneration policy.
Medium	Some evidence of socio-economic concern linked to receptor, which may be indirect. Change relating to receptor has medium priority in local, regional and/ or national economic and regeneration policy.
Low	There is little evidence of socio-economic concern relating to receptor. Receptor is given a low priority in local, regional and/ or national economic and regeneration policy.
Negligible	Very low importance with little or no priority even at the local scale.

Magnitude of Impact

12.2.17 The magnitude of impact experienced by each receptor is determined by considering the change from (future) baseline conditions, both before and (if required) after mitigation. The criteria used for the assessment of the magnitude of socio-economic effects (both beneficial and adverse) are outlined in **Table 12.3** below.

Table 12.3: Definition of Magnitude of Impact

Sensitivity	Definition
High	Loss of resources and/ or integrity of resource; severe damage to key characteristics, features, or elements.
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Medium	Loss of resource, but not adversely affecting its integrity; partial loss of and/ or damage to key characteristics, features, or elements.
	Benefit to and/ or addition of key characteristics, features, or elements; improvement of attribute quality.
Low	Some measurable change in attributes, quality, or vulnerability; minor loss of and/ or alteration to one (or more) key characteristics, features or elements.
	Minor benefit to and/ or addition of one (or more) key characteristics, features, or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Very low importance with little or no priority even at the local scale.

Nature of the Effect

12.2.18 The nature of the effect is defined as either:

- **Beneficial** – an advantageous effect on the impact area; or
- **Adverse** – detrimental effects on the impact area; or
- **Neutral** – neither beneficial or adverse.

Scale of the Effect

12.2.19 The scale of the effect is based on the matrix set out in the table below (**Table 12.4**).

Table 12.4: Matrix Used to Determine the Scale of Effect

Sensitivity of the Receptor	Magnitude of Impact			
	Negligible	**Low**	**Medium**	**High**
Negligible	Insignificant	Insignificant	Minor/ Insignificant	Minor/ Insignificant
Low	Insignificant	Minor	Minor	Minor/Moderate
Medium	Minor/ Insignificant	Minor	Moderate	Moderate/Major

High	Minor/Insignificant	Minor/Moderate	Moderate/Major	Major

12.2.20 Any effect deemed to be minor (beneficial or adverse) or greater is therefore deemed to be significant.

12.3 Relevant Baseline Conditions

Population

12.3.1 Population data indicates that currently around 25,900 people are resident in the local area (combined wards of Greenwich Peninsula and Greenwich East), whilst the RBG is home to around 289,067 people[13].

12.3.2 **Table 12.5** shows the age demographics at the of the local area, RBG and London. The working age population is reasonably higher in the local area (77%) compared to both RBG (69%) and London (69%). Conversely, the proportion of both children (17%) and in particular older residents (5%) in the local area is smaller than in the benchmarked areas.

Table 12.5: Population Breakdown

% of Population	Local Impact Area (LIA)	Borough	London
Total Population	25,901	289,067	8,799,729
% of age 0-15	17%	21%	19%
% of age 16-64	77%	69%	69%
% of age 65+	5%	10%	11%

Source: Office for National Statistics 'Census of Population', 2021

Education

Primary Schools

12.3.3 There are 58 primary schools, including faith schools and SEN schools, located across the Royal Borough of Greenwich[14], with overall capacity of around 13% across all schools during the 2021-22 academic year[15], and the large majority (over two thirds) of primary schools having over 5% capacity.

12.3.4 According to the Children and Young people's Scrutiny Panel, most areas across the borough are expected to see an overall steady or declining demand for school places over the medium term, with the north of the borough, where the Site is located, tending to see broadly steady demand, and the south seeing declining demand. In the

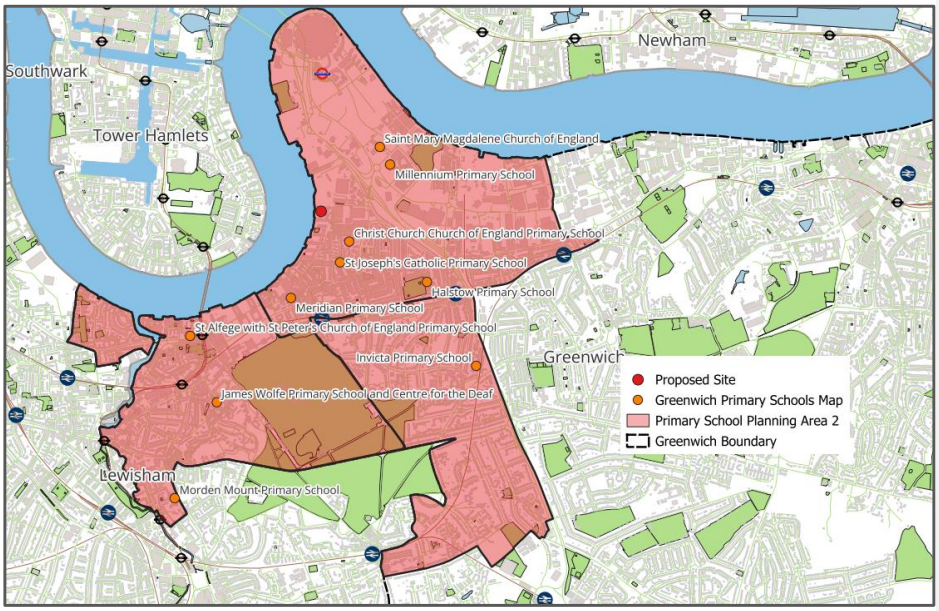
[13] Nomis, Census 2021 age by sex for 'East Greenwich' and 'Greenwich Peninsula'
[14] The Royal Borough of Greenwich Childcare Sufficiency Assessment, 2022: 2022_RBG_Childcare_Sufficiency_Assessment_FINAL_.pdf
[15] School capacity surveys - GOV.UK (www.gov.uk)

longer term it is anticipated that demand will rise in the north of the borough as more new homes are completed. However, the timing of any increase in demand will be dependent on the pace of delivery and occupation of new homes in these areas. Other related major factors impacting on migration and population flows and current and future demand for school places include the Brexit vote in 2016 and the COVID-19 pandemic[16].

12.3.5 The Site is situated in primary school place planning area 2 (PA 2), an area which includes Blackheath Westcombe, Greenwich West and the Peninsula[17]. There are 10 primary schools located within this area, across which 3,709 students were enrolled in 2021/22. Out of these 10 schools, none are currently operating either over or at full capacity. In the 2021/22 academic year, 11.46% of spaces across the schools went unfilled, which was equivalent to 480 available primary school places across PA 2[18]. This is above the Department for Education (DfE) recommendation of maintaining 5-10% capacity to allow for inter-school movements and indicates a surplus in capacity.

12.3.6 Within PA 2, demand for Reception places is anticipated to be overall reasonably stable in the short to medium term. However, over the medium to long term the demand for school places is expected to increase as more new homes are completed. The extent and timing of rising pressure on school places will depend on the pace of build and occupation of new homes being built, particularly on the Greenwich Peninsula, where the Site is located[19].

Figure 12.2: Primary Schools located across PA2



[16] Pre-Decision Scrutiny School Place Planning and Capital Programme 2021/22 - 2023/24: ANNEX 1 (royalgreenwich.gov.uk)
[17] School Place Planning Data Annex, 2022: Document.ashx (royalgreenwich.gov.uk)
[18] School capacity surveys - GOV.UK (www.gov.uk)
[19] School Place Planning Data Annex, 2022: Document.ashx (royalgreenwich.gov.uk)

Secondary Schools

12.3.7 Across the borough, the rate of demand for secondary school places is affected by school performance and popularity, cross border movement, and the extent to which RBG schools retain the number of pupils offered a place after National Offer Day, with RBG being a net exporter of secondary pupils, experiencing a net loss equivalent to around -11% of the secondary school population[20].

12.3.8 School place planning for the period of 2021-24 relied on projections which indicated a broadly stable but fluctuating demand for Year 7 places over the forecasting period, suggesting that there is sufficient secondary school provision in the short term[21].

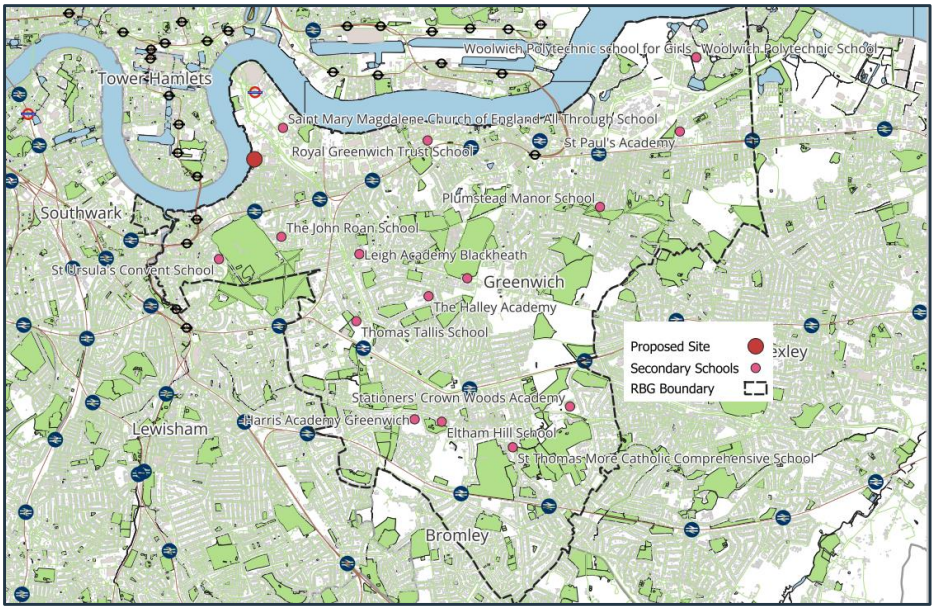
12.3.9 School place planning documents cited the proposed Harris Free School for Boys, which was due to open in its permanent accommodation from 2023, as ensuring sufficiency of school places and maintaining a reasonable gender balance of school places across the borough in the long-term[22]. However, plans surrounding this development have now changed, and the school is on track to open as a co-educational institution in 2025, with proximity to the proposed Site location not yet clear.

12.3.10 There are currently 16 secondary schools located across the borough (not including the proposed free school), with an overall surplus in capacity of 14.5% capacity in 2021-22[23]. Capacity amongst individual schools is variable and a number of schools having opened in the last five years have substantially more capacity than others. These include the Leigh Academy Blackheath (2 miles from the Site), the Halle Academy (3 miles from the Site) and the Woolwich Polytechnic School for Girls (5.7 miles from the Site).

12.3.11 The secondary schools located closest to the Site are St. Mary Magdalene CE School (1-mile from the Site), The John Roan School (1-mile from the Site) and St Ursula's Convent school (1.2 miles from the Site) were operating at a capacity of 80%, 78% and 91% respectively during the 2021-22 academic year.

[20] Pre-Decision Scrutiny School Place Planning and Capital Programme 2021/22 - 2023/24: ANNEX 1 (royalgreenwich.gov.uk)
[21] Pre-Decision Scrutiny School Place Planning and Capital Programme 2021/22 - 2023/24: ANNEX 1 (royalgreenwich.gov.uk)
[22] Pre-Decision Scrutiny School Place Planning and Capital Programme 2021/22 - 2023/24: ANNEX 1 (royalgreenwich.gov.uk)
[23] School capacity in England: academic year 2021 to 2022 - GOV.UK (www.gov.uk)

Figure 12.3: Secondary Schools Located Across the RBG



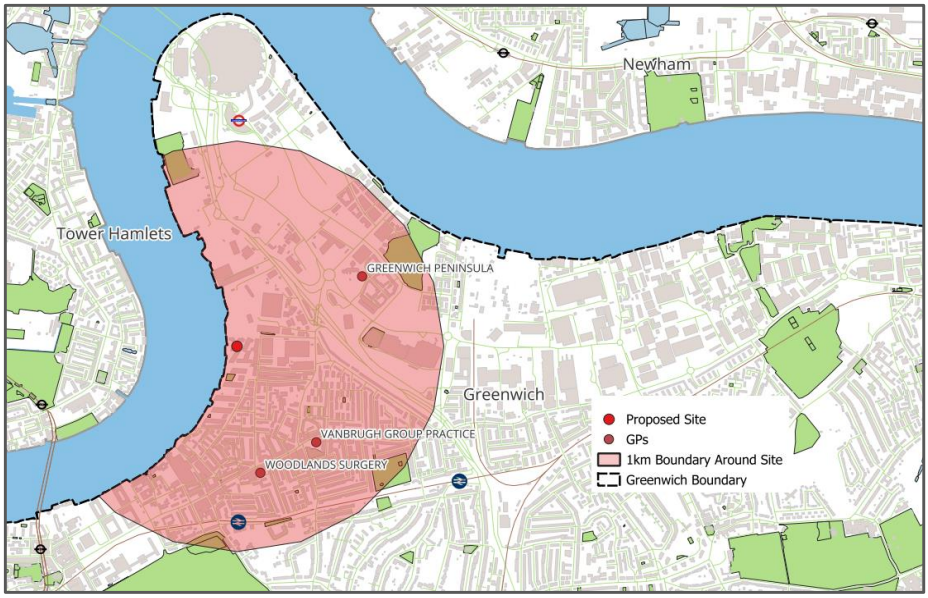
Health

Primary Health Care

12.3.12 There are 3 GP surgeries within 1km of the Site. As a worst-case scenario, GP surgeries outside of RBG, including those on the opposite side of the River Thames, are excluded from the baseline analysis. There is an average of 2,990 patients per full time equivalent (FTE) GP across all 3 GP surgeries, which is significantly higher than the HUDU benchmark of 1,800 patients[24], and slightly higher than the average for South-East London of 2,632 patients per FTE GP[25]. The GP surgery located closest to the Site is operating at a slightly lower average of 2,183 patients per FTE GP, however all 3 GP surgeries are located roughly 0.4 miles from the Site[26]. All 3 GP surgeries have a Care Quality Commission (QCC) rating of 'good'[27].

[24] London Healthy Urban Development Unit
[25] NHS General Practise Workforce Survey Interactive Dashboard: Microsoft Power BI
[26] General Practice Workforce, 31 July 2023 - NHS Digital
[27] Search Results - Care Quality Commission (cqc.org.uk)

Figure 12.4: GP Surgeries Located Within 1Km of the Site



Secondary Health Care

12.3.13 The Site is located within the Lewisham and Greenwich NHS Trust catchment area which had a catchment population of 492,826 people in 2020, and this is forecasted to reach 582,571 in 2025[28]. Total bed occupancy across the trust was at 91.7% in the first quarter of 2023-24, well above the recommended 85%[29]. Recent data shows that on average 34% of patients arriving at A&Es across the trust are waiting longer than the target time of 4 hours to be seen, which is higher than the England average of 29%. Furthermore, 42% of patients across the trust are waiting longer than the target time of 18 weeks to receive routine treatments, slightly higher than the England average of 41%[30].

12.3.14 The Royal Greenwich Health and Wellbeing Strategy (2023) identifies multiple high impact activities to be implemented in its 2023-24 delivery plan across the borough which will have a direct impact on secondary healthcare. These include actions to address waiting times for elective care and mental health services and the implementation of a single integrated urgent care system which would help tackle issues such as same day urgent care services [31].

[28] NHS Trust data 2020: Microsoft Power BI
[29] NHS hospital beds data analysis (bma.org.uk)
[30] NHS Tracker: Find out about hospital waiting times in your area this winter - BBC News
[31] Royal_Greenwich_Health_and_Wellbeing_Strategy_2023_28.pdf

12.3.15 The Queen Elizabeth Hospital is located 2.2 miles from the Site, and the University Hospital Lewisham is located 2.7 miles away, both include an A&E unit and are part of the Lewisham and Greenwich NHS Trust. The Queen Elizabeth Hospital and University Hospital Lewisham both have a QCC rating of 'requires improvement'[3233].

Community Facilities

12.3.16 The Local Plan identifies the important role that community facilities play in developing strong and cohesive communities and identifies action to help prevent the loss of community facilities in Policy CH(a)[34].

12.3.17 Research suggests that it is considered best practice for one community centre to be provided for every 7,000-11,000 residents in a community[35]. There is one community centre located within the Local Area and this is 0.5 - miles (less than 1km), or 9-minute walk, from the Site[36]. Based on the Local Area population this equates to one community centre per 25,901 residents, meaning provision of community centres across the LIA is below best practice standards.

12.3.18 In terms of Leisure centres, the East Greenwich Leisure Centre and Gym is located 0.5 miles (less than 1km), or a 9-minute walk from the proposed Site and includes a range of facilities including a gym, pool, library and studios for fitness classes.

Open Space

12.3.19 The Local Plan highlights the council's commitment to maintaining and improving green spaces across the borough[37] with policy OS 1 focusing on the safeguarding, enhancement, and improvement of access to existing public and private open space, including local green space[38].

12.3.20 According to the Greener Greenwich Strategy document (2017), there is 381.85ha of publicly accessible open space. Currently, there is only 1.9ha of publicly accessible green space per 1000 people[39], well below the proposed standards of public open space provision of 2.69ha per 1000 population within Greenwich's Green Infrastructure Study[40.] Furthermore, the uneven distribution of open space across the borough means that there were large areas the local council determined in the Local Plan were in an open space deficiency[41.] According to the Green Space Index 5,949 residents across the borough are not within a 10-minute walk of a green space[42].

[32] University Hospital Lewisham - Care Quality Commission (cqc.org.uk)
[33] Queen Elizabeth Hospital - Care Quality Commission (cqc.org.uk)
[34] Royal_Greenwich_Local_Plan__Core_Strategy_with_Detailed_Policies_main.pdf
[35] Barton, Grant and Guise, 2010. Shaping Neighbourhoods for Local Health and Global Sustainability
[36] Community centres | Royal Borough of Greenwich (royalgreenwich.gov.uk)
[37] Our Greenwich Local Plan, 2021: Our Greenwich Plan | Communities | Supported by Royal Borough of Greenwich
[38] Royal_Greenwich_Local_Plan__Core_Strategy_with_Detailed_Policies_main.pdf
[39] Green Space Index 2023 (arcgis.com)
[40] Towards_a_Greener_Greenwich_2017_chapters_1_4.pdf
[41] Our Greenwich Local Plan, 2021: Our Greenwich Plan | Communities | Supported by Royal Borough of Greenwich
[42] Green Space Index 2023 (arcgis.com)

12.3.21 Greenwich's Green Infrastructure Study sets standards for accessibility of public open space, with small local and pocket parks to be within 280 m, local parks to be within 400m, district parks to be within 1.2km and metropolitan parks within 3.2km.

12.3.22 Greenwich Park (Metropolitan Park) is 1km, or a 15-minute walk from the Site and identified as a site of importance for nature conservation in the Local Plan[43], and it is the largest area of green open space in central south-east London at 161.4 ha. The East Greenwich Pleasaunce Park is 1.1km, and Central Park 1.6km, away from the Site. According to the Local Plan, the Site is in an open space deficient area, specifically a local park deficient area[44]. Furthermore, more recently, the Greener Greenwich strategy identified the area around the Site as not being within an accessible distance of district, local or small local sites (green spaces)[45].

Children's Play Space

12.3.23 Policy H(e) 'Children's play areas' of the Local Plan indicates that in residential developments that include over 50 units of family housing, suitably equipped and well-designed children's play areas are required for different age groups. The Mayor of London's Supplementary Planning Guidance: Providing for Children and Young People's Play and Informal Recreation is also referred to in the Local Plan which sets quantitative standards for provision of $10m^2$ per child.

12.3.24 There are 44 sites within the borough which contain play provision. The Royal Borough manages 26 of these facilities. In addition to the dedicated provision, there are numerous open spaces that have informal areas suitable for children's play. When compared to the GLA's benchmark figure of 10sqm per child, Greenwich is well provided for in terms of child play space (when informal play areas are included). However, there is a need to improve provision and accessibility for some age categories[46].

12.3.25 Looking ahead, the Royal Greenwich Health and Wellbeing Strategy (2023) identifies multiple high impact activities to be implemented in its 2023-24 delivery plan across the borough including an increase the number of Play Streets, Play Estates and School Streets as part of a wider programme to increase journeys by foot and cycle and to reduce car journeys[47].

12.3.26 As previously noted, the Site is in an area of Local Park deficiency and therefore there are limited children's play areas in close proximity to the Site. Greenwich Park Playground is located 1km from the Site, as well as the Maritime Museum which often has interactive children's exhibitions and play areas set up. There is a small playground on Telecon Way (Linear Park). Further afield, the Colomb Street Playground is located 1km from the Site and The East Greenwich Pleasaunce Park, which is 1.1km from the Site, also has a small playground aimed toward toddlers and younger children.

Commented [LR1]: There is also a small playground on Telcon Way open to the public

[43] Our Greenwich Local Plan, 2021: Our Greenwich Plan | Communities | Supported by Royal Borough of Greenwich
[44] Our Greenwich Local Plan, 2021: Our Greenwich Plan | Communities | Supported by Royal Borough of Greenwich
[45] Towards_a_Greener_Greenwich_2017_chapters_1_4.pdf
[46] The Infrastructure Delivery Plan for Royal Greenwich: Final_IDP_pulbication_version_19.10.21.pdf
[47] Royal_Greenwich_Health_and_Wellbeing_Strategy_2023_28.pdf

Receptor Sensitivity

12.3.27 **Table 12.6** below summarises the sensitivity of reach of the receptors identified in the baseline.

Table 12.6: Summary of Receptor Sensitivity

Receptor	Impact Area	Sensitivity	Justification
Demand for Primary school capacity	Local Area (within RBG school place planning area 2)	Low	There are a range of schools in proximity to the Site and a surplus in capacity within the school place planning area which is above the upper end of the DfE benchmark of 10%
Demand for Secondary school capacity	District (RBG)	Low	There are a range of schools within reasonable distance from the Site and a surplus capacity which is above the upper end of the DfE benchmark of 10% including amongst the closest schools to the Site.
Demand for GP capacity	Local Area (one km)	High	The ratio of registered patients per FTE GP is well above the HUDU benchmark of 1,800 and above the South East London average.
Demand for Hospital Capacity	District (RBG)	Medium	There are two hospitals within catchment of the Site with A&E facilities and planned programme of improvements but waiting times and bed occupancy are currently above average.
Demand for Community Facilities	Local Area (combined wards of Greenwich Peninsula and Greenwich East)	Medium	The provision of community centres is well below the ideal benchmark, however, there are other community facilities within close proximity to the Site including the Greenwich Leisure centre which has a wide range of sporting facilities and a library.
Demand for Open space provision	District (RBG)	Medium	Current public open space provision per 1,000 population is well below recommended standards and the Site is an area of deficiency for local and district parks, however, it is in close proximity to Greenwich Park.
Demand for Play space provision	On-Site and Local Area (100m to 1km)	High	On-site provision is a strategic (GLA) priority and the Site is in an area of limited supply and deficiency in terms of existing local parks and play areas.

12.4 Likely Effects of the Development and their Significance

The Completed and Operational Development

Primary School Provision

12.4.1 The proposed Development is expected to yield a primary school age population of 66 children aged 5 to 11 years old. As a worst-case scenario, assuming all children are additional to the school place planning Area 2, this would lead to a 1.6 percentage point reduction in surplus capacity to from 11.5% to 9.9%. This is still within the 5-10% surplus capacity range recommended by the DfE. On this basis, the magnitude of impact is assessed as negligible.

Commented [LR2]: Can we see the child yield calculator they have used. Want to ensure consistency with what Spacehub are assuming.

Commented [ZC3R2]: Sent on 06.11 and agreed to use 'Inner London' - population and child yield now updated as a result

12.4.2 With the sensitivity of the receptor identified as low, the significance of effect is assessed as **insignificant** at the **Local** level.

Secondary School Provision

12.4.3 The proposed Development is expected to yield a secondary school age population of 40 children aged 12 to 18 years old. As a worst-case scenario, assuming all children are additional and not already attending schools in the borough, this would lead to a 0.3 percentage point reduction in surplus capacity to 14.2%. This is still above the 5-10% surplus capacity range recommended by the DfE. Furthermore, the future baseline position notes that capacity will be enhanced in the borough by planned openings of new schools including those within close proximity to the Site. On this basis, the magnitude of impact is assessed as negligible.

12.4.4 With the sensitivity of the receptor identified as low, the effect is assessed **insignificant** at the **District level**.

GP Capacity

12.4.5 The proposed Development is expected to yield an overall population of around 1,127 persons. As a worst-case scenario, assuming all of these people would be additional (and not already registered with GPs in the LIA) and assuming that a GP surgery is not brought forward as part of the flexible on-site uses (Use Class E), this would lead to an increase in the number of registered patients per FTE GP in the LIA from 2,990 to 3,082 (+3.1%). The magnitude of change is therefore assessed as low.

12.4.6 With the sensitivity of the receptor identified as high, the significance of effect is assessed as **direct**, **long-term** and of **minor adverse significance** at the **Local** level.

Secondary Health Care Capacity

12.4.7 As stated, the proposed Development is expected to yield an overall population of 1,127 persons. Assuming these people would all be additional to RBG, this would increase the patient catchment of the Lewisham and Greenwich NHS hospital trust by 0.2%. Taking into account the qualitative considerations of current waiting lists and bed occupancy performance, the magnitude of change is therefore assessed as low.

12.4.8 With the sensitivity of the receptor identified as medium, the significance of effect is assessed as **direct**, **long-term** and of **minor adverse significance** at the **District** level.

Community Facilities

Commented [LR4]: Community space is proposed at GF of river tower.

12.4.9 Research suggests that it is considered best practice for one community centre to be provided for every 7,000-11,000 people residing in a community[48] but the catchment population required to sustain one community centre in terms of viability is around 4,000.[49]

12.4.10 The baseline identifies the current provision within the LIA amounts to 1 facility per 25,900 population. As such, the additional population of 1,172 residents of the proposed Development is expected to lead to an increase of 4.5% in population per community facility. However, the Proposed Development includes up to 500 sq m of flexible community space within the River Tower which will help to meet demand. On this basis, the magnitude of change is assessed as negligible.

12.4.11 With the sensitivity of the receptor identified as medium, the significance of effect is assessed as **insignificant** at the **Local** level.

Open Space

12.4.12 The baseline assessment indicates current provision of around 1.9ha of publicly accessible green space per 1,000 people which is below the recommended standard of 2.69ha per 1,000 population.

12.4.13 There is 381.85ha of publicly accessible open space. Currently, there is only 1.9ha of publicly accessible green space per 1000 people[50], well below the standard of public open space provision of 2.69ha per 1000 population[51].

12.4.14 This takes into account demand arising from new housing developments. Whilst the expected population yield of 1,127 residents at the proposed Development will increase demand for open space, not all of this population will be net additional to the borough (RBG). Further, the proposed Development will bring forward 4,244 m^2 of public amenity space in addition to 1,552m^2 of children's play space as well as private communal and private residential space. Whilst any additional population will increase demand for open space, taking into account the on-site provision, this will not significantly reduce the level of provision per 1,000 residents within the Borough (<0.1%). On this basis, the magnitude of change on open space provision within the Borough is assessed as negligible.

12.4.15 With the sensitivity of the receptor assessed as medium, the significance of the effect on demand for open space at the **District** level is therefore assessed as **insignficant**.

[48] Barton, Grant and Guise, 2010. Shaping Neighbourhoods for Local Health and Global Sustainability
[49] Barton, Grant and Guise, 2003. Shaping Neighbourhoods: A Guide for Health, Sustainability and Vitality
[50] Green Space Index 2023 (arcgis.com)
[51] Towards_a_Greener_Greenwich_2017_chapters_1_4.pdf

Play Space

12.4.16 Based on an estimated gross child yield of 197 children aged 0-18, and a requirement for 10m^2 of play space per child, it is estimated that the proposed Development will require play space provision of 1,969 m^2 as follows:

- Children aged 0-4: 907m^2
- Children aged 5-11: 664m^2
- Children aged 12-18: 398m^2

Commented [LR5]: We need to see the calculator they've used

12.4.17 The Proposed Development is bringing forward a total of 1,552 sq m of children's place including 855 sq m for children aged 0-4 years, and 697 sq m for children aged 5-11 years which exceeds the requirement for this age group. Whilst the on-site provision will add to the supply of new, high quality play space in the local area, the quantity of provision will not quite be met on site in full and there is limited supply of play space within the LIA. The magnitude of change on demand for play space provision is therefore assessed as low.

12.4.18 With the sensitivity of the receptor assessed as high, the significance of the effect on demand for play space at the **Local** level is therefore assessed as **direct**, **long-term** and of **minor adverse significance**.

12.5 Additional Mitigation / Enhancement and Likely Residual Effects of the Development and their Significance

The Completed and Operational Development

12.5.1 Once completed and operational, the Proposed Development would lead to minor adverse effects on the demand for GP facilities, play space, and secondary health care. The Proposed Development will generate a substantial Community Infrastructure Levy (CIL) payment (over £4m), which will be used to fund a wide range of infrastructure including healthcare. Contributions would therefore help to mitigate the potential for adverse effects with respect to GPs and secondary healthcare. It is the responsibility of RBG to apply funds appropriately. Once mitigation is delivered, the residual effect in relation to GPs and secondary health care would be insignificant.

12.5.2 In regard to play space, the provision on-site will not meet GLA standards in full and therefore the Applicant will make relevant s.106 payments if required by RBG. Once mitigation is delivered, the residual effect in relation to play space would be insignificant.

12.5.3 All other effects, including primary school and secondary school provision are asssed as insignificant therefore do not require additional mitigation.

12.5.4 In summary, the likely residual effects of the complete and operational Proposed Development are considered to be as follows:

- Primary School Provision: **Insignificant** at the **LIA level.**

- Secondary School Provision: **Insignificant** at the **borough level**.
- GP Capacity: **Insignificant** at the **LIA level.**
- Secondary healthcare: **Insignificant** at the **borough level**.
- Community facilities: **Insignificant** at the **LIA level.**
- Open Space Provision**: Insignificant** at the **borough level**.
- Play Space Provision: **Insignificant** at the **LIA level.**

12.6 Likely Residual Cumulative Effects and their Significance

12.6.1 This section assesses the impact of Cumulative Schemes, together with residual effects of the proposed Development. The Cumulative Schemes that are included in this assessment are listed below and it is stated in brackets whether they form part of the assessment of effects at the Local and/or District level study areas depending on where they are located and therefore whether or not they fall within the relevant assessment areas within which each receptor is being assessed. All remaining cumulative schemes have been dismissed from the cumulative assessment because they fall outside of the areas of assessment that are relevant to socio-economic receptors and impacts.

- **15/0716/O** (All District Assessments and all Local Area Assessments)
- **21/2077/R** (reserved matters) / Related to 15/0716/O (All District Assessments and all Local Area Assessments)
- **23/0418/R (reserved matters/ related to 15/0716/O** (All District Assessments and all Local Area Assessments excluding GP capacity)
- **19/2733/O / related to 15/0716/O** (All District Assessments and all Local Area Assessments)
- **23/2150/F** (All District Assessments and all Local Area Assessments excluding GP capacity)
- **23/1565/F** (All District Assessments and all Local Area Assessments)
- **12/2658/K** (All District Assessments and all Local Area Assessments)
- **17/1142/F / As amended: 18/2729/MA** (All District Assessments and all Local Area Assessments)
- **20/1730/O** (All District Assessments and all Local Area Assessments)
- **19/0939/f** (All District Assessments and all Local Area Assessments excluding community facilities capacity)
- **23/1161/F** (All District Assessments and all Local Area Assessments)
- **22/1026/F** (All District Assessments and all Local Area Assessments)
- **19/4075/R** (All District Assessments and all Local Area Assessments excluding community facilities capacity)
- **19/0512/F** (All District Assessments and all Local Area Assessments)
- **21/3944/F** (All District Assessments and all Local Area Assessments)
- **20/1815/F** (All District Assessments and all Local Area Assessments excluding community facilities capacity)

- **20/1815/F** (All District Assessments and all Local Area Assessments)
- **18/1594/F** (All District Assessments and all Local Area Assessments excluding GP capacity & community facilities capacity)
- **23/1414/F** (All District Assessments and all Local Area Assessments excluding GP capacity & community facilities capacity)
- **19/3456/F** (All District Assessments)
- **12/0022/O** (All District Assessments and all Local Area Assessments excluding community facilities capacity)

The Completed and Operational Development

Primary School Provision

12.6.2 Once built and occupied, the proposed Development combined with the Cumulative Schemes will lead to a substantial increase in new residential units (around 7,500 in total), which in turn, will increase demand for additional primary school places. Whilst there is currently sufficient capacity amongst primary schools in the Local Area, any surplus capacity is likely to be absorbed by future developments, the extent to which will depend on the timing of schemes coming forward, which is still subject to a degree of uncertainty. A number of schemes within the Local Area include additional provision of primary school places, including at Greenwich Peninsula, which when delivered, will help to meet some of the increase in demand. It is therefore anticipated that RBG, as is their statutory duty, will ensure capacity remains available through future rounds of the school place planning process. Furthermore, it is assumed that any on or off-site mitigation required to meet the needs of the additional demand arising from the Cumulative Schemes will have been subject to the relevant negotiations. The effect at the **Local Area** level is therefore assessed as **insignificant**.

Secondary School Provision

12.6.3 Once built and occupied, the proposed Development combined with the Cumulative Schemes will lead to a substantial increase in new residential units in the borough (around 9,000 in total), which in turn, will increase demand for additional secondary school places. Whilst there is currently sufficient capacity amongst secondary schools in the borough, including within the newly opened St Mary Magdalene CofE school at Greenwich Peninsula, any surplus capacity is likely to be further absorbed by future developments, the extent to which will depend on the timing of schemes coming forward, which is still subject to a degree of uncertainty. It is therefore anticipated that RBG, as is their statutory duty, will ensure this remains the case through future rounds of the school place planning process. Furthermore, it is assumed that any on or off-site mitigation required to meet the needs of the additional demand arising from the Cumulative Schemes will have been subject to the relevant negotiations. The effect at the **district** level is therefore assessed as **insignificant**.

Secondary Healthcare

12.6.4 Once built and occupied, the proposed Development combined with the Cumulative Schemes will lead to a substantial increase in new residential units in the borough (around 9,000 in total), which in turn will lead a potential gross population increase of 19,600 equating to a 4% increase in the patient catchment of the Lewisham and Greenwich hospital trust area. It is assumed that any on or off-site mitigation required to meet the needs of the additional demand arising from the Cumulative Schemes will have been subject to the relevant negotiations. The effect is therefore assessed as **insignificant.**

GP Capacity

12.6.5 The increase in population arising from the new residential units delivered by the proposed Development together with the Cumulative Schemes in the local area is likely to lead to an increase in demand for GP services. It is estimated that local area population would increase by around 12,000 residents which would generate demand for around 6.6 FTE GPs based on the HUDU benchmark of 1,800 registered patients per FTE GP. This figure is based on a worst-case scenario assumption that none of the residents within either the proposed Development or the Cumulative Schemes considered are already registered with a GP in the LIA. A number of cumulative schemes include provisions for flexible space which could accommodate GP centres.

12.6.6 Furthermore, it is assumed that any on or off-site mitigation required to meet the needs of the additional demand arising from the Cumulative Schemes will have been subject to the relevant negotiations. The effect is therefore assessed as **insignificant**.

Community Facilities

Commented [LR6]: On site provision

12.6.7 The increase in population arising from the new residential units delivered by the proposed Development together with the Cumulative Schemes in the local area is likely to lead to an increase in demand for community facilities and place further pressure on existing facilities. Equally, an increase in population can help to sustain the viability of further community centres and provision of community facilities. Whilst the local area population increase is likely to lead to demand for at least one further community centre, a number of the cumulative schemes include provision for flexible community space and facilities, including within the Proposed Development and at Greenwich Peninsula, which could be used for such purposes.

12.6.8 Furthermore, it is assumed that any on or off-site mitigation required to meet the needs of the additional demand arising from the Cumulative Schemes will have been subject to the relevant negotiations. The effect is therefore assessed as **insignificant**.

Open Space

12.6.9 The increase in population arising from the new residential units delivered by the proposed Development together with the Cumulative Schemes within the borough is likely to lead to an increase in demand for open space provision. With the population yield from the Cumulative Schemes anticipated to be in the region of 20,000 persons

this would equate to a requirement for 52 ha of open space based on the standard of 2.69ha per 1,000 residents, However, not all of these will be additional residents to the borough. Furthermore, a number of the Cumulative Schemes will deliver open space and public realm amenities as part of their design proposals and it is assumed that any on or off-site mitigation required to meet the needs of the additional demand arising from the Cumulative Schemes will have been subject to the relevant negotiations. The effect is therefore assessed as **insignificant**.

Play Space

12.6.10 The increase in child population arising from the new residential units delivered by the proposed Development together with the Cumulative Schemes within the LIA is likely to lead to an increase in demand for play space provision. According to RBG's guidance, this needs to be provided on-site at a quantity of 10m^2 per child. It is therefore assumed that requirements for play space provision will either be provided in full on-site by each individual Cumulative Scheme, as is the case for the proposed Development, or where requirements cannot be met on-site, each scheme will be subject to financial contributions to provide adequate off-site provision/improvements. The effects is therefore assessed as **insignificant**.

12.7 Conclusions

12.7.1 It is estimated that the proposed Development would lead to an additional resident population of 1,127 of which 66 would be of primary and 40 would be secondary school age. It has been concluded that there is sufficient capacity within primary and secondary school education to provide for the additional demand for services that the new population on the Site would create.

12.7.2 Local healthcare capacity is currently over the benchmark level for patients per FTE and the Site would see an additional 1,127 patients added to this capacity. An increase in population will also increase demand on secondary health care services and community facilities, the latter of which are currently under-provided for in the local area. The Applicant will make CIL payments to the Council.

12.7.3 The proposed Development would provide 4,244 m^2 of new public amenity space as well as 1,552 m^2 of children's playspace made up of a number of varied and accessible communal spaces. The playspace provision on-site will not meet GLA standards in full. The Applicant will make s.106 contributions if required by RBG.

12.7.4 Together with the Cumulative Schemes, there will be 9,000 dwellings and a range of non-residential floorspace including community, health and education facilities and open space and play space. Similar to the proposed Development, it is assumed that any mitigation required to meet the needs of additional demand arising from the Cumulative Schemes in relation to primary, secondary school capacity, community facilities, healthcare and open space will be subject to negotiations to provide adequate on/off-site such that there would be no adverse effects.

13. Flood Risk

13.1 Introduction

13.1.1 This chapter covers those aspects pertaining to tidal and fluvial flood risk and the effect of the Development upon them. The assessment has been prepared by MAB Consulting Ltd. This Chapter is supported by further detailed information contained within:

- **Appendix 13.1**: Environment Agency Correspondence.

13.2 Assessment Methodology and Significance Criteria

Assessment Methodology

13.2.1 In determining the scope and extent of this assessment, the Royal Borough of Greenwich confirmed in their EIA Scoping Opinion that works to the flood defence need to be assessed within the Environmental Statement.

13.2.2 The comment from the Royal Borough of Greenwich states:

" It is understood that works to the river wall have already been undertaken as part of the previous development of the wider site. This should be confirmed in the Environmental Statement and evidence provided that the defence will be adequate for the lifetime of the development."

13.2.3 Aspects associated with other forms of flood risk and drainage were 'scoped-out' during the EIA Scoping process but are still addressed within the Flood Risk Assessment (FRA) which is submitted as part of the planning application.

13.2.4 The defined study area for this chapter is therefore the site, but focused to the current flood defence along the western edge of the development and to ensuring that it does indeed provide the adequate line of defence for the duration of the development lifetime.

13.2.5 In order to achieve this, the following information and baseline data has been collected:

- A topographic survey undertaken to m AOD in 2020.
- Environment Agency Flood Information from the Thames Estuary 2100 Thames Model.
- Thames Tidal Upriver Breach Inundation Modelling 2017.
- Thames Tidal Downriver Breach Inundation Modelling 2018.
- Environment Agency Pre-Application Consultation 27 October 2022 (ref: SL/2022/122257/01-L01) – **Appendix 13.1**
- Analysis of photographs from a site visit by others.

13.2.6 The Site is not considered to be directly at risk of flooding from tidal waters, but would be at risk of flooding if the flood defences were breached or overtopped during extreme events in exceedance of the flood defence design event. The EA have provided breach flood levels for the Site. For the worst-case breach scenario, taking into account the effects of climate change, the modelled breach flood level is 4.591mAOD.

13.2.7 The Environment Agency's criteria for the height of the flood defence in the area is for defences to meet the TE100 defence level. It is the responsibility of the developer to undertake any improvements to the defences in line with the Metropolis Management Act and should take into consideration:

- The current height and condition of the defences,
- The required level of the proposed defences to take into consideration climate change,
- Future maintenance and access.

13.2.8 A qualitative desk-based assessment has been undertaken to ascertain the likely flood risk issues relevant to the Site and the Development. The assessment has been based upon the findings of the FRA submitted as part of the application. The FRA has been prepared in accordance with the requirements and principles of the NPPF and supporting technical guidance. It outlines the potential sources and risk of flooding on-Site. As the Development is residential-led the FRA assumes a design life of 100 years.

13.2.9 The lifespan of the defences will be to the year 2100, meeting the criteria set out in the NPPF[1], London Plan[2] and Thames Estuary 2100[3] documents, along with all other planning policies which are derived from these.

13.2.10 The Site is protected from tidal flooding by man-made flood defences. The current statutory flood defence level is 5.23mAOD. As part of the Proposed Development, flood defences will be raises to the long term (2100) statutory level of 6.20mAOD as shown within the submitted FRA.

13.2.11 The flood defences will be retreated from the current alignment, increasing floodplain storage within the River Thames upstream of the Thames Barriers.

13.2.12 The integrity and continuity of the flood defences will be maintained throughout the construction period.

1 NPPF Para 153.
2 London Plan Policy 5.12.
3 Find Your Roles & Responsibilities Thames Estuary 2100 (TE2100)-Developers.

Significance Criteria

Receptor Sensitivity Classification

13.2.13 The occupants and Site usage receptors will be assessed based on the vulnerability of the receptors which are defined within the NPPF. **Table 13.1** and **Table 13.2** below set out the sensitivity classifications.

Table 13.1: Occupants & Site Use Sensitivity

Receptor Sensitivity / Importance	Definition (NPPF, Table 2 and 3)
Very High	Essential Infrastructure – Critical transport and utility infrastructure which must remain operational during flood events
High	Highly Vulnerable – Important infrastructure and services required to be operational during flood events plus vulnerable zones including basements, caravan sites or muster points
Medium	More Vulnerable – Buildings with permanent or semi-permanent dwellings such as residential development, prisons, care homes and important non-dwelling buildings including hospitals, schools and nurseries
Low	Less Vulnerable – Non-dwelling buildings including commercial, retail or industrial facilities as well as public service buildings not required to be operational during flood events
Very Low	Water Compatible – Water industry establishments such as docks, coastguard, ship building facilities as well as low risk spaces such as amenity or recreational spaces

Effect Magnitude Criteria

13.2.14 An assessment of the likely magnitude of effect to the Site. Flood risk effects can be judged on frequency of occurrence, extent of flooding, duration of flooding events and severity of flooding which can be assessed on depth, velocity or sensitivity. Magnitude of effect will be based on professional judgement using a combination of these factors and the potential consequence of the effect.

Table 13.2: Magnitude of Effect

Magnitude	Definition
Very High	Effect causes significant or permanent effect on a catchment or resource. Effect causes critical detriment to infrastructure or high health and safety risk to occupants of site or surrounding area

High	Effect causes moderately significant or long-term effect on a catchment or resource. Effect causes adverse detriment to infrastructure or moderate health and safety risk to occupants of site or surrounding area
Medium	Effect causes limited or medium-term effect on a catchment or resource. Effect causes some detriment to infrastructure or low health and safety risk to occupants of site or surrounding area
Low	Effect causes insignificant or short-term effect on a catchment or resource. Effect causes minor detriment to infrastructure with no health and safety risk to occupants of site or surrounding area
Very Low	Effect causes negligible or very short-term effect on a catchment or resource. Effect causes negligible/no detriment to infrastructure with no health and safety risk to occupants of site or surrounding area

Significance Criteria

13.2.15 The significance of potential effects will be assessed based on a combination of the likely magnitude of the effect and the sensitivity of the receptor for each effect as defined in **Table 13.3**

Table 13.3: Significance Criteria

Significance Criteria			Receptor Sensitivity				
			Very High	High	Medium	Low	Very Low
Magnitude of Effect	Beneficial	Very High	Major	Major	Moderate	Minor	Minor
		High	Major	Moderate	Minor	Minor	Insignificant
		Medium	Moderate	Minor	Minor	Insignificant	Insignificant
		Low	Minor	Minor	Insignificant	Insignificant	Insignificant
		Very Low	Minor	Insignificant	Insignificant	Insignificant	Insignificant
	Insignificant		Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
	Adverse	Very Low	Minor	Insignificant	Insignificant	Insignificant	Insignificant
		Low	Minor	Minor	Insignificant	Insignificant	Insignificant
		Medium	Moderate	Minor	Minor	Insignificant	Insignificant
		High	Major	Moderate	Minor	Minor	Insignificant
		Very High	Major	Major	Moderate	Minor	Minor

13.2.16 Any effect of minor beneficial/adverse or greater will deemed significant.

13.3 Relevant Baseline Conditions

13.3.1 The EA Flood Zone Maps indicate that the Site lies within Flood Zone 3 of the indicative River Thames floodplain. The Site is therefore classified as being at a high probability of tidal flooding (1 in 200 or greater annual probability).

13.3.2 Although the Site is located within Flood Zone 3, the Site is protected from tidal flooding, assuming normal operation of the River Thames flood defences. However, a residual risk of tidal flooding to the Site could exist should the defences be breached (i.e. should the existing flood defences physically fail or be overtopped).

13.3.3 In the event of a breach of the flood defence, the area is likely to experience rapidly rising flood waters. The EA has provided breach modelling maps which confirm the Site is located within a breach flood risk area, based on the TE2100 modelled water levels[4]. Based upon this information, areas of the Site are considered to be at risk of tidal flooding in a breach scenario.

13.3.4 No historic evidence has been found of the site flooding.

13.3.5 Based on the TE2100 model, a present day extreme water level of 4.700m AOD, with the future water TE2100 level rising to 5.680m AOD is expected, including the effects of climate change up to 2100 applied in line with the Government Guidelines[5].

13.3.6 From the London Thames Breach Assessment (2017), a breach level of 4.591m AOD can be expected.

13.3.7 All flood defences relevant to the Site are raised and man-made. The current flood defence level along the western edge of the site is between 5.76 and 5.86m AOD as shown within the topographic survey within the submitted FRA.

13.3.8 At present, the defence line is formed from a sheet piled wall with a concrete capping beam for the majority of its length, with a short length of circa 3.5m being provided by an area of high ground at the southern end of the site between Enderby House and the existing development flood wall to the south.

13.3.9 For the flood defence level required, the EA have stated in their consultation, that this should be set to 6.20m AOD to comply with the TE2100 level provided in order to be considered safe for the lifetime of the development.

Key Receptors

13.3.10 **Residential occupiers/users** – Within the Site and wider area occupiers/users have been assessed as having a medium receptor sensitivity due to the NPPF classification listed in **Table 13.1** above.

[4] London Thames Breach Assessment (2017).
[5] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.

13.3.11 **Commercial users** - Within the Site and wider area occupiers/users have been assessed as having a low receptor sensitivity due to the NPPF classification listed in **Table 13.1** above.

13.3.12 Given the residential user, this is considered the most significant risk user and will be used in assessing the site.

13.4 Likely Effects of the Development and their Significance

The Works

13.4.1 As detailed above, and within the submitted FRA, the Site is protected by flood defences. As such, based upon the existing information from the EA (and confirmed by the EA as being acceptable for use within this assessment) the Site would be protected from tidal and fluvial flooding. This would remain the case during the Works. The likely effect of tidal and fluvial flood risk to the Site and the surrounding area during the Works is considered **insignificant**.

The Completed and Operational Development

13.4.2 As detailed above and within the submitted FRA, the Site is protected by flood defences. As such, based upon the existing information from the EA the Site would be protected from tidal and fluvial flooding and the completed and operational Development is considered to be at low risk from tidal and fluvial flooding. Additionally, there is a low risk of breach in the flood defences.

13.4.3 To ensure the Site is protected from future flood levels, it is proposed to raise the current flood defence to 6.20m AOD.

13.4.4 Sleeping accommodation finished floor levels of the Development lie at 6.367m AOD which is above the peak flood level set at 6.067m AOD by 300mm, ensuring all residential occupants of the Development remain safe in the highly unlikely event of a breach or defences failing.

13.4.5 For those commercial units which are below the flood level of 6.067m AOD or the breach level of 4.591m AOD, access or a means of egress would be available to a place of safe refuge above the peak flood level.

13.4.6 It is proposed that the majority of buildings would be set back a minimum of 8m from the new flood defence to allow access to the flood defence for maintenance.

13.4.7 On the basis of the above, the likely effect of tidal and fluvial flood risk to the Site and the surrounding area once the Development is completed and operational would be **insignificant**.

13.5 Additional Mitigation / Enhancement and Likely Residual Effects of the Development and their Significance

The Works

13.5.1 The residual effect remains the same as that reported above.

The Completed and Operational Development

13.5.2 The residual effect remains the same as that reported above.

13.6 Likely Residual Cumulative Effects and their Significance

13.6.1 With regard to flood risk, this assessment has assumed that in order for planning permission to be granted, all cumulative schemes will have been approved by the Environment Agency (EA). This would mean that each cumulative scheme in isolation, and together, would not result in an unacceptable increase in flood risk. There is therefore no potential for significant cumulative flood risk effects to arise.

13.7 Conclusions

13.7.1 The raising of the defences will ensure that the length of the defences along the site boundary with the Thames are in line with the climate change guidelines.

13.7.2 The construction works would not give rise to any significant flood risk issues.

13.7.3 The Site is located within Flood Zone 3 and is therefore classified as having a high risk of tidal and fluvial flooding. However, the Site is protected from fluvial and tidal flooding on account of the existing flood defences. On this basis, the completed and operational Development is considered to be at low risk from tidal and fluvial flooding. In addition, the finished floor level of the Development lies above the present day extreme water level and all habitable floor space of the Development would be located well above the existing present day and future extreme water level.

13.7.4 It is proposed to replace the existing defences close to their current alignment to ensure they achieve the required 100-year design life. To prevent any loss of river volume, a balance between encroachment and retraction of the wall has been achieved which would result in an overall net gain in river area, while ensuring an 8m clear access strip is provided to allow for inspection and maintenance of the walls by the Environment Agency.

13.7.5 In conclusion, the likely residual effect of the Development upon water resources is considered to be **insignificant**.