Deloitte.



2-4 Whitworth Street West

Environmental Statement: Volume 1

December 2024

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1. Introduction

The Site

1.1. The Site comprises circa 0.17 hectares of brownfield land located within Manchester City Centre at 2 – 4 Whitworth Street West. A Site Location Plan is provided in Appendix 1.1.

1.2. The Site is bound by Whitworth Street West to the north, with the Grade II listed railway viaduct and Deansgate Station platform immediately to the south and at first floor level to the existing buildings. Rowendale Street bisects the Site travelling under the railway viaduct providing vehicle and pedestrian links to Hewitt Street to the south. The Site is bound by Cameron Street to the east and Bugle Street to the west, which also provide vehicle and pedestrian access into the Knott Mill area, characterised by a mix of employment and residential buildings. Beyond Bugle Street is a live music venue (Rebellion) and Deansgate Station is beyond this.

1.3. The Site currently comprises two buildings. 2 Whitworth Street West is a four-storey, red-brick building which is vacant. 4 Whitworth Street West is a three-storey red brick building which is also vacant. The redline boundary runs underneath the Grade II Listed Viaduct. The roadway underneath the Viaduct, to which the Site relates, does not form part of the Grade II listed structure.

1.4. Whitworth Street West separates the Site from Deansgate Locks and the associated outdoor seating areas and the Deansgate Castlefield Metro Station located to the north and adjacent to the Rochdale Canal.

1.5. The Site is located within the Deansgate Ward, an area that has witnessed significant investment and regeneration over the last 20 years, including along Whitworth Street West, and at the southern end of Deansgate.

1.6. Its context is characterised by established and emerging clusters of tall residential buildings forming around Great Jackson Street, First Street, and the Deansgate Transport Hub. These have refined the Manchester skyline along the southern gateway to the City Centre. The Site sits within the latter cluster.

1.7. In addition to tall buildings already built or under construction within the cluster, planning permission was granted for a 35-storey building on the adjacent plot at 10-12 Whitworth Street West (which has since expired), and a 36 Storey building to the east at Hotspur Press live applications are submitted for buildings rising to 76 and 26 storeys respectively at Viadux Phase 2, and Apex.

1.8. The southern portion of the City Centre more generally is also continually changing and evolving as planning permissions are implemented and developments come forward, most notably this includes the recently approved mixed use proposals at Great Northern (up to 34 Storeys), the new hotel under construction at 325 Deansgate (22 Storeys) and ongoing development at the First Street and New Jackson neighbourhoods.

1.9. The Site is within a pivotal location between established and emerging residential and commercial hubs within the Civic Quarter, First Street, Knott Mill and Great Jackson Street. The Site sits in close proximity to the Central Business District and central retail areas offering excellent access to jobs amenities and leisure facilities.

Proposed Development

1.10. The Proposed Development comprises the demolition of the existing buildings on-site and the erection of a 44 storey residential building of up to 364 residential units (Use Class C3) with supporting amenity space and landscaping. The development will be delivered in a single phase.

1.11. The description of the Proposed Development on the applications for planning are set out below:

"Demolition of buildings at 2 and 4 Whitworth Street West and the construction of a residential building (Class C3) with associated servicing arrangements, landscaping, and associated works."

Requirements for EIA

1.12. The EIA process is the mechanism by which development proposals are appraised in terms of their likely environmental effects, in addition to engineering and technical considerations.

1.13. The purpose of the EIA is to establish the nature of the Proposed Development and the environment in which it is likely to take place, during both construction and operational phases, as to identify the likely significant effects on the environment. The assessment compares the existing situation at the start of the work (baseline) with the situation during demolition, construction and operation.

1.14. The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') require that any Proposed Development falling within the description of a 'Schedule 2 development' (as defined within the meaning of the EIA Regulations), will be subject to an EIA where such development is likely to have 'significant' effects on the environment by virtue of such factors as its nature, size or location (Regulations 2(b)).

1.15. The Proposed Development is considered likely to fall under the category of 'urban development projects' (Schedule 2, 10, (b)) where:

- The development includes more than 1 hectare of urban development which is not dwellinghouse development; or
- The development includes more than 150 dwellings; or
- The overall area of the development exceeds 5 hectares.

1.16. The development will include more than 150 dwellings which exceeds which exceeds the threshold in relation to parts (i) listed in Schedule 2, 10, (b) of the Regulations. In addition, given that the Proposed Development results in development of a greater scale than the existing use, an EIA is therefore considered appropriate to test the likely significant effects of the Proposed Development.

1.17. A formal EIA scoping request was submitted to Manchester City Council on 15 October 2024 requesting formal confirmation of the proposed scope of the Environmental Impact Assessment required in respect of the Proposed Development. A formal Scoping Opinion was received on 21 November 2024. The technical chapters are based on a scope of assessment that has been agreed with the relevant statutory consultees through the scoping exercise. A copy of the Scoping Report and the Scoping Opinion is included in Appendix 3.1 and 3.2 of this ES.

1.18. In accordance with the EIA Regulations, this ES sets out the following information:

- A description of the Proposed Development comprising information on the Site, design, size and other relevant features of the development;
- A description of the likely significant effects of the Proposed Development on the environment;
- A description of any features of the Proposed Development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
- A description of the reasonable alternatives studied by the developer, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;
- A non-technical summary of the information, of the information specified above; and
- Any additional information specified in Schedule 4 relevant to the specific characteristics of the development or type of development and to the environmental features likely to be significantly affected.

Project Team

1.19. Deloitte has significant experience and expertise in managing the EIA process and hold the IEMA EIA Quality Mark. Details of the Project Team, EIA Technical Team and qualifications are set out in Table 1.1 and Table 1.2 below.

Table 1.1: Project Team and Technical Discipline

Consultant	Technical Disciplines
Deloitte	Planning and EIA Co-ordinator
Sheppard Robson	Architecture and design
Glenbrook WWS Ltd	Construction
Layer Studios	Townscape and Visual Impact
Katheryn Sather & Associates	Heritage
SRL	Air Quality
Hilson Moran	Noise and Vibration
GIA	Daylight/Sunlight/Overshadowing and Solar Glare
AKT II	Water Resources
GIA	Wind
Mainer	Climate Change, Energy, Sustainability, BREEAM, Ventilation
CBRE	Socio Economic
Enfusion	Human Health
Gtech	Broadband Connectivity TV Reception, and Aviation
AKT II	Ground Conditions
Curtins	Traffic and Transport, Waste
Hilson Moran	Ecology

Consultant	Technical Disciplines
Civic	Archaeology

Table 1.2: EIA Technical Team

Topic	EIA Consultant	Qualifications
EIA Coordinator	Deloitte	PIEMA, MRTPI, MPlan, BA (Hons) IEMA Quality Mark Registered
Demolition and Construction Methodology and Phasing	Glenbrook WWS Ltd	N/A
Climate Change	Mainer	BSc MSc, BREEAM AP, PIEMA & Fitwel Ambassador
Daylight/Sunlight/Overshadowing	GIA	LLB (Hons), BSc (Hons) MRICS
Heritage	Kathern Sather	BA, MSc, MCIFA, M.B.A
Human Health	Enfusion	BSc, MSc, CEnv, FIEMA
Noise and Vibration	Hilson Moran	BE, AMIOA, BSc (Hons), MSc, MIOA
Socio Economic	CBRE	BA (Hons), MRIC MRTPI
Solar Glare	GIA	MBSc, LLB (Hons)
Townscape and Visual Impact	Layer Studio	Member of Landscape Institute
Wind	GIA	BSc (Hons), MSc, PhD, MEng

EIA Scenarios

1.20. Developments that are already under construction are considered to form part of the Existing Baseline and those subject to planning permission or otherwise identified within the committed developments are considered as part of the cumulative analysis.

1.21. The scenarios to be considered for all the EIA Chapters are as follows:

- Scenario 1: Existing site (existing baseline as the Site is today (December 2024);
- Scenario 2: Baseline + Proposed Development; and
- Scenario 3: Baseline + Proposed Development + cumulative.

1.22. A list of cumulative developments to be assessed is provided within Appendix 3.3 of this report. This will be reviewed and updated as required within the environmental statement.

1.23. Table 1.3 below provides a summary of the scenario's tested for all disciplines.

Table 1.3: Scenarios Tested

Topic	Scenario(s) Tested
Climate Change	Scenario 2
Daylight/Sunlight/Overshadowing	Scenario 1, 2 and 3
Heritage	Scenario 1, 2 and 3
Human Health	Scenario 1, 2 and 3
Noise and Vibration	Scenario 1, 2 and 3
Socio Economic	Scenario 1, 2 and 3
Solar Glare	Scenario 2
Townscape and Visual Impact	Scenario 1, 2 and 3
Wind	Scenario 1: Existing Site (baseline scenario) with the existing surrounding buildings (including developments which have started on site); Scenario 2: Existing Site (future baseline scenario) with the cumulative surrounding buildings (including developments which have started on site and also developments which have not yet started on site at the time of the assessment); Scenario 3: Proposed Development with the existing surrounding buildings (including developments which have started on site, i.e. the existing baseline scenario plus the Proposed Development); and Scenario 4: Proposed Development with cumulative surrounding buildings (including developments which have started on site and also developments which have not yet started on site at the time of the assessment, i.e. the future baseline scenario plus the Proposed Development).

Organisation of the Environmental Statement

1.24. This ES comprises 16 Chapters and is supported by figures (located at the back for each Chapter within Volume 1) and technical appendices (within a separate Volume 2). A non-technical summary (NTS) of the full ES is provided as a separate standalone document.

1.25. Figures have been referenced using the Chapter number as a prefix followed by the number of the figure within a given Chapter. Appendices have been referenced in the same way but due to their size they are contained separately in Volume 2. Table 1.4 sets out the structure of the ES.

Table 1.4: Structure of this Environmental Statement

Chapter No.	Chapter Title	Description
VOLUME 1		Following Chapters
1.	Introduction	Introduction to the ES, EIA requirements, details of the project team, ES organisation and availability.

Chapter No.	Chapter Title	Description
2.	EIA Methodology	Methods used to prepare each Chapter, description of ES structure and content, generic significance criteria, scoping and consultation.
3.	Alternatives and Design Evolution	Outline of the main alternatives considered by the Applicant.
4.	Site and Description of Development	Site description and details of the Proposed Development.
5.	Outline Construction Management – Programme and Methodology	Details of anticipated programme for development and construction methodology.
6.	Climate Change	To assess the nature and magnitude of Greenhouse Gas Emissions, which are likely to arise from the Proposed Development during construction and operation, and the likely significant impact of this contribution towards climate change, in addition to mitigation measures required to minimise this contribution.
7.	Daylight/Sunlight/Overshadowing	To assess the significant impacts of the Proposed Development in relation to daylight and sunlight for nearby residential properties and overshadowing in relation to relevant public spaces.
8.	Built Heritage	To assess the likely significant effects of the Proposed Development in relation to heritage assets, both in terms of physical and visual impact.
9.	Human Health	To assess the likely significant effects of the Proposed Development on human health.
10.	Noise and Vibration	To assess the likely significant effects of the Proposed Development in relation to noise and vibration.
11.	Socio-Economic	To assess the likely socio-economic significant impacts of the Proposed Development upon the Site and surrounding area.
12.	Solar Glare	To assess the likely significant impacts on identified receptors (e.g., rail, road and light rail users) in relation to reflections of sunlight off the building in key locations.
13.	Townscape and Visual Impact	To assess the likely significant effects of the Proposed Development in relation to townscape and visual impact.
14.	Wind	To assess the likely significant effects of the Proposed Development in relation to environmental wind.
15.	Residual Effects	Summary of residual effects of the Proposed Development (including cumulative impacts alongside other committed developments).

Chapter No.	Chapter Title	Description
16.	Type 1 Cumulative Effects	An assessment of the combined effects arising from the Proposed Development upon a set of defined sensitive receptors.
VOLUME 2	Technical Appendices	Technical data and reports to support the Chapters in Volume 1.
Non-Technical Summary		A short concise document written in a non-technical language, necessary to meet the requirements of the EIA Regulations, to make the ES accessible to a non-technical audience.

Other Documents

1.26. Together with this ES and its appendices, the following documents will be submitted to Manchester City Council (MCC) in support of the planning application:

Table 1.5: Planning Application Supporting Documents

Document	Prepared by
Planning Application Form and Ownership Certificate	Deloitte
Covering Letter	Deloitte
Design and Access Statement, including Landscape Strategy	Shepperd Robson and Layer
Topographical Survey	ND Oliver & Co
Planning and Tall Building Statement	Deloitte
Blue and Green Infrastructure Statement	Deloitte
Statement of Community Involvement	Deloitte (with input from Counter Context)
Blue and Green Infrastructure Assessment	Deloitte
Ecological Appraisal (including BNG Assessment)	Hilson Moran
Flood Risk Assessment	AKT II
Drainage Strategy	AKT II
Crime Impact Statement	Greater Manchester Police
Ventilation Statement	Futurserv
Phase 1 Geo-Environmental Investigation Report	IGE Consulting
Waste Management Strategy, including Waste Proforma	Curtins
Transport Statement	Curtins
Interim Travel Plan	Curtins
Operational Management Plan	Glenbrook
Broadband Connectivity Assessment	G-Tech
Television and Radio Reception Impact Assessment	G-Tech
Utility Survey	GEO
Outline Fire Safety Strategy	OFR

Document	Prepared by
Financial Viability Statement	CBRE
Detailed Air Quality Assessment	SRL
Local Labour Method Statement	Glenbrook

Environmental Statement Availability

1.27. The ES is available for public viewing on Manchester City Council's Public Access website at the following address: https://www.manchester.gov.uk/planning/publicaccess https://www.stockport.gov.uk/find-planning-applicationsonce the application has been submitted and validated.

1.28. The ES may be purchased in volumes, the costs for which are set out below:

- Volume 1: ES Main Text and Figures - £150;
- Volume 2: ES Appendices - £150;
- Volume 3: Non-Technical Summary (NTS) - £15;
- Full Copy (Volumes 1 and 2, and NTS) of the ES on CD - £15.

1.29. For copies of any the above, please contact the Manchester Planning Team at Deloitte:

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Deloitte LLP
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2. EIA Methodology

Introduction

2.1. This Chapter sets out the methodology used to prepare each Chapter of the ES and describes its structure and content. In particular, it sets out the process of identifying and assessing the likely significant effects of the Proposed Development on the environment as defined in Chapter 1 and described in detail in Chapter 4.

Legislation and Guidance

2.2. This Chapter sets out the methodology used to prepare each Chapter of the ES and describes its structure and content. In particular, it sets out the process of identifying and assessing the likely significant effects of the Proposed Development on the environment as defined in Chapter 1 and described in detail in Chapter 4.

2.3. Reference has also been made to currently available good practice guidance in EIA including:

- Circular 02/99: Environmental Impact Assessment
- The European Commission's numerous EIA guidance documents available here: http://ec.europa.eu/environment/eia/eia-support.html
- Guidance on EIA Scoping, European Commission, June 2001
- Guidance on Transport Assessment, DCLG and DfT, March 2007
- National Planning Practice Guidance – Department for Communities and Local Government (March 2014 and continuously updated as a 'live' resource)

2.4. Reference has been made to the Institute of Environmental Management and Assessment (IEMA) publications, including:

- IEMA ES Review Criteria
- IEMA Guidelines for Environmental Impact Assessment (2004)
- IEMA Special Report into the State of Environmental Impact Assessment Practice in the UK (2011)
- IEMA Shaping Quality Development (2015)
- IEMA Delivering Quality Development (2016)
- IEMA Delivering a Proportionate EIA (2017)

2.5. The ES has also had regard to the National Planning Policy Framework December 2024 (NPPF). The NPPF sets out the Government's economic, environmental and social planning policies for England, articulating the Government's aspiration for sustainable development. The NPPF has been considered where it is relevant to EIA.

2.6. As relevant to the ES technical chapter's scope, methodology and assessment of effects, key local planning policy and guidance documents have been considered. These include:

- Places for Everyone (PfE) (2024)
- Manchester City Council Core Strategy (2012)

- Saved Unitary Development Plan Policies (1995)
- Any additional planning policy or guidance documents considered relevant have been identified within the relevant technical chapters.

Screening and Scoping

2.7. A formal EIA Screening and Scoping request was submitted to Manchester City Council on 20 December 2023 (Appendix 3.1) requesting a formal opinion and confirmation as to the proposed scope of the Environmental Impact Assessment required in respect of the Proposed Development. A formal scoping opinion was received on 21 November 2024, which confirmed agreement to the scope and contents of the EIA. The results of the scoping exercise have determined the subject areas of the EIA and any comments received as part of this Scoping response from the LPA have been factored into this ES.

2.8. Based on the contents of Appendix 3.1 and 3.2 the following chapters have been scoped into the EIA:

- Climate Change
- Daylight/Sunlight/Overshadowing
- Built Heritage
- Human Health
- Noise and Vibration
- Socio-Economic
- Solar Glare
- Townscape and Visual Impact
- Wind

Consultation

2.9. The Proposed Development has been prepared in consultation with Manchester City Council and a range of technical statutory stakeholders (refer to Table 2.1), which were also consulted upon as part of the EIA Scoping exercise.

Table 2.1: Scope of Stakeholder Consultation

Stakeholder Consultation
Manchester City Council Planning Authority
Manchester City Council
Greater Manchester Archaeological Advisory Service
Manchester City Council Environmental Health Officers
Environment Agency
Greater Manchester Ecology Unity (GMEU)
Historic England

Stakeholder Consultation
National Air Traffic Control
Manchester Airport
Network Rail

Non-Significant Effects

2.10. It has been confirmed via the Scoping Opinion that the following disciplines will not give rise to likely significant effects on the environment and therefore do not require inclusion in the Environmental Statement. An explanation for scoping out each discipline set out below is provided in the EIA Scoping Report in Appendix 3.1.

- Agricultural Circumstances
- Aviation
- Traffic and Transport
- Air Quality
- Archaeology
- Ground Conditions
- Water Resources
- Ecology
- Television, FM Radio and DAB Radio Reception

Approach to Technical Studies

2.11. Various technical studies were commenced at an early stage in the process. The findings of the baseline environmental studies played an important role in the design of the Proposed Development by defining the environmental sensitivities, constraints and opportunities associated with the Site.

2.12. Project team reviews, attended by members of the project team, were held throughout the pre-application process. These reviews provided a valuable forum for the exchange of information and ensured that the project team was fully aware of the environmental constraints and opportunities and of the interactions between disciplines. Pre-application engagement was also undertaken with Manchester City Council as the Local Planning and Highway Authority, and Environmental Health.

2.13. The technical studies have been undertaken in accordance with current best practice. Specific guidance used is referenced within each of the respective assessment Chapters.

2.14. The majority of assessments involved consultations with statutory and non-statutory bodies, desk-based research, Site inspections and surveys, impact prediction and mitigation.

2.15. The assessment and conclusions of the ES are based on the description of the Proposed Development provided in Chapter 4.

Structure of Technical Chapters

2.16. Each technical Chapter of the ES has been set out broadly in line with Table 2.2.

Table 2.2: Structure of ES Technical Chapters

Technical Chapter Subheading	Summary of information
Introduction	Each of the technical Chapters begins with an introduction providing context to the EIA completed.
Asssumptions and Limitations	This section sets out any assumptions made in the assessment including potential limitations to the information used.
Policy Context	This section includes a summary of legislation and of national and local policies relevant to the environmental discipline and explains its purpose in the context of the Proposed Development and the ES.
Assessment Methodology and Significance Criteria	This section describes the method or approach employed in the assessment of impacts, the criteria against which the significance of effects has been evaluated, the sources of information used and any technical difficulties encountered. Relevant legislation is also identified.
Baseline Conditions	This section describes and evaluates the baseline environmental conditions i.e. the current situation and anticipated changes over time assuming the Site remains unchanged. This is a critical part of the EIA process as it provides a measure against which potential environmental effects can be assessed.
Identification and Evaluation of Significant Impacts	This section identifies the likely significant effects on the environment resulting from the Proposed Development. A description of the likely effects of the Proposed Development and an assessment of their predicted significance is provided. The assessment of effect significance has been undertaken using appropriate national and international quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical Chapters presented.
Cumulative Effects	This section considers the cumulative effects of the Proposed Development identified within the vicinity of the Site. Any likely significant effects on the environment arising in this respect are set out in this section. There are two distinct types of cumulative effects: Type 1 - Cumulative effects are the interactions between effects of the Proposed Development on a single receptor. Type 2 - Cumulative effects are those that arise from incremental changes caused by other consented or reasonably foreseeable activities ('committed developments') together with the Proposed Development.
Mitigation Measures	One of the main aims of the EIA process is to develop suitable mitigation measures to avoid, reduce or compensate for any significant adverse effects of a project. This section of each technical Chapter describes the measures which would be implemented to mitigate potential adverse effects. Where possible, enhancement measures have also been proposed.
Residual Effects	The residual effects, i.e. the remaining effects of the Proposed Development assuming implementation of the proposed mitigation measures, have been estimated and presented. The methods used to make these estimates are described and proposed methods of treatment for any residual effects have been identified and quantified where possible.
Monitoring	This section outlines the methods of monitoring that would take place during the operational phase of the proposed development. If none is recommended this has been stated.
Summary	Each technical Chapter concludes with a summary outlining the potential residual effects of the Proposed Development.

Magnitude

2.17. The methodology for determining the scale, or magnitude, of effect is set out in Table 2.3.

Table 2.3: Methodology for Assessing Magnitude

Magnitude of Impact	Criteria for Assessing Effect
Major	Total loss or major/substantial alteration to key element/features of the baseline (pre-development) conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstance/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation

Sensitivity

2.18. The sensitivity of a receptor is based upon the relative importance of the receptor using the scale in Table 2.4.

Table 2.4: Methodology for Assessing Sensitivity

Sensitivity	Examples of Receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or no local importance.

Significance

2.19. The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. Table 2.5 below shows how magnitude and sensitivity interact to derive effect significance.

Table 2.5: Methodology for Assessing Significance

Magnitude	Sensitivity		
	High	Medium	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate or Minor Adverse/Beneficial
Moderate	Major - Moderate Adverse/Beneficial	Moderate Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate or Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor Adverse/Beneficial - Negligible
Negligible	Negligible	Negligible	Negligible

2.20. The above magnitude and significance criteria have been provided as a guide for technical specialists to assess impact significance. Where discipline specific methodology has been applied that differs from the generic criteria above, this has been clearly explained within the given Chapter under the heading of 'Assessment Methodology and Significance Criteria'.

2.21. For the purposes of this Environmental Statement, an effect will be potentially 'significant' if it is classed as either 'moderate' or 'major' (bold text in Table 2.5).

Baseline Conditions

2.22. Each technical Chapter includes a section which describes and evaluates the baseline environmental conditions (i.e. the current situation and anticipated changes over time assuming the Site remains unchanged). Baseline data has been obtained from a variety of sources, including published documents, maps, historical information and Site survey data.

2.23. The method used to obtain baseline information, where relevant and possible, has been clearly identified within each technical Chapter and agreed in advance with statutory consultees.

Mitigation

2.24. Any adverse environmental effects have been considered for mitigation at the design stage and, where practicable, specific measures have been put forward. Measures have been considered based on the following hierarchy of mitigation:

- Avoidance;
- Reduction;
- Compensation;
- Remediation;
- Enhancement.

2.25. Where the effectiveness of the mitigation proposed has been considered uncertain, or where it depends upon assumptions of operating procedures, data and/or professional judgement has been introduced to support these assumptions.

2.26. Mitigation recommended during the demolition and construction phase would be set out in the Demolition Management Plan and the Construction Management Plan to be agreed with MCC prior to the commencement of work and implemented throughout the duration of the works. Outline mitigation measures to be included in these future detailed plans are set out in Chapter 5: Demolition and Construction Methodology and Programme and are cross referred to in the relevant chapters. It is anticipated that condition be attached to any subsequent consent that require the submission and approval of detailed Demolition Management Plan prior to demolition works and a Construction Management Plan prior to below ground works.

2.27. Mitigation to be implemented during the operational phase would be secured through planning conditions and obligations, which are explicitly referenced in each chapter.

Residual Effects

2.28. The likely significant effects on the environment, assuming the successful implementation of mitigation measures proposed, have been estimated within each Chapter. These are termed 'residual effects' and are considered in Chapter 15 of this Statement.

Cumulative Effects

2.29. A search of Manchester City Council's planning applications database and knowledge of the area has identified schemes for which cumulative effects are considered more likely, this includes other reasonably foreseeable schemes, i.e those contained within the Development Plan or other material considerations. A full list, as of October 2024 is contained within the Scoping Report at Appendix 3.3, to which agreement has been provided from the Local Planning Authority as part of the Scoping Opinion process.

2.30. The ES considers the potential for likely significant effects on the environment resulting from consented or reasonably foreseeable activities or developments in the area, which could lead to potentially significant cumulative effects in conjunction with the Proposed Development ('Committed Developments'). Each technical Chapter has assessed the potential for likely significant effects on the environment, as a result of the above committed developments, together with the Proposed Development, which are known as Type 2 cumulative effects.

2.31. In addition, Chapter 16 assesses the Type 1 Cumulative effects. Type 1 cumulative effects are also known as 'inter-project' effects, which are the combined effects arising from the development upon a set of defined sensitive receptors.

Assumptions and Limitations

2.32. The principal assumptions that have been made and any limitations that have been identified in preparing the ES are set out in each technical Chapter. General assumptions include the following:

- All of the principal land uses adjoining the Site remain. Where redevelopment proposals have been granted Planning Permission, the effect of those proposals are considered as part of the Cumulative Impacts;
- Information received from third parties is complete and up to date;
- The various stages of the Proposed Development will satisfy minimum environmental standards, consistent with contemporary legislation, practice and knowledge;
- Assessments are based upon, and conclude, the 'worst case' effects that would arise from the application as defined by the description of development set out in Chapter 4, Site Surroundings and Description of the Proposals;

- Construction and demolition methods and phasing will follow the timetable and methods set out in Chapter 5, Construction Management;
- Conditions will be attached to the Planning Permission that will control disturbance during the Proposed Development; and,
- Necessary off-site services infrastructures for the Proposed Development will be provided by statutory undertakers.

Objectivity

2.33. The technical studies undertaken with the ES have been progressed in a transparent, impartial, and unbiased way with equal weight attached, as appropriate, to beneficial and adverse effects. Where possible, this has been based upon quantitative and accepted criteria together with the use of value judgements and expert interpretations.

2.34. The assessment has been explicit in recognising areas of limitation within the ES and any difficulties that have been encountered, including assumptions upon which the assessments are based. Where appropriate, the assessment of significance has been given confidence levels.

3. Alternatives and Design Evolution

Introduction

3.1. Regulation 18(3) and Paragraph 2 of Schedule 4 of the EIA Regulations requires the Applicant to provide an outline of the main alternatives studied and an indication of the main reasons for the choice made, considering the environmental effects.

3.2. Additionally, Schedule 4, Paragraph 2 of the EIA Regulations states that an ES should include: "*a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) 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".*

3.3. In considering the evolution of the Proposed Development, all aspects have been evaluated in response to several longstanding strategic objectives and established principles, embedded in local planning policy and guidance, as well as within the suite of planning applications and major development proposals that have come forward within the Site overall to date.

3.4. This Chapter considers the following four options in the context of these requirements and the existing Development Brief:

- The 'do nothing' alternative where the Proposed Development is not progressed.
- Alternative Locations for the Proposed Developments.
- Alternative Technologies.
- Alternative Designs (including size and scale) for the Proposed Development.

3.5. The Design and Access Statement, prepared by Sheppard Robson sets out the extensive design evolution that has taken place at the Site over a number of years. The current proposals are the product of an iterative design process over the past twelve months. The design team has engaged closely with Manchester City Council, Historic England and other key stakeholders throughout this period to ensure that the optimum development proposal was produced on Site.

The "do nothing" Alternative

3.6. The "do nothing" scenario refers to the option of leaving the Site in its existing state as two-vacant buildings intersected by Rowendale Street.

3.7. In its current state, the Site does not contribute to the local area and is therefore not maximising its economic and regeneration potential. From a townscape perspective, as a vacant building, the Site does not provide any activity, vitality or natural surveillance within the local area.

3.8. To that extent, a 'do nothing' option has not been considered as an alternative as it would represent a significant missed opportunity to deliver the redevelopment of the Site that will secure residential accommodation for the City along with significant economic benefits. A number of key benefits would also be missed should the Site not be redeveloped, as set out below:

- Redeveloping urban/brownfield land for housing is a national, regional and local priority and redeveloping this brownfield site will ensure its most efficient use through providing high density residential development. It will also an attractive environment encouraging further investment in the surrounding area.
- Employment opportunities will be generating during both construction and operation, including opportunities to encourage and develop skills, internships and apprentices among varied and specialised trade contractors during the construction phase.
- The proposed residential led development will help to meet the recognised demand for City Centre living in Manchester City Centre. The proposals maximise the contribution of the site providing 364 homes in order to support residential demand in the city centre. There are also a range of accommodation types being provided in order to meet the varying demand for city centre living. This will consist of 1 bed, 2 bed and 3 apartments.
- Forecasted economic growth of Manchester indicates that employment opportunities will be concentrated in the City Centre. Suitable housing is needed to support these jobs and to retain existing skill sets. The creation of residential homes in a mix of sizes will promote a mix of families, young professionals and retirees to live and work in the City Centre, in turn encouraging expenditure.
- The proposals include new high-quality public realm comprising hard and soft landscape including rain gardens, associated seating and lighting. The provision of new public realm will bring a suite of environmental benefits including increasing biodiversity, providing a form of sustainable urban drainage, and improving air quality.

Alternative Locations

3.9. The Site's location represents the ideal location for residential accommodation. It's City Centre location ensures easy access via sustainable transport, mainly the Metrolink. The Deansgate Interchange, located nearby, is a key gateway to the City Centre, offering residents convenient and sustainable transportation with regular services throughout Manchester and the Greater Manchester region. In addition, the Site is conveniently situated near numerous services and amenities, enabling residents to easily walk to various destinations from the Proposed Development. The entirety of Manchester City Centre is within a 5km walking distance, granting access to extensive retail, employment, and leisure opportunities.

3.10. Development of this Site provides other benefits including the creation of an active street frontage with the main entrance and landscaping features looking out onto Whitworth Street West enlivening the street scene and character of the area; whilst also providing natural surveillance to the street.

3.11. The Site is considered suitable for the form of development proposed, especially given its locational characteristics and its clearly defined role (defined by its planning policy and regeneration context and site history) as a key regeneration site for the city centre. No other alternative locations are considered more suitable or appropriate to accommodate the Development.

Alternative Uses

3.12. Planning permission was granted in 2020 for a seven-storey mixed-use building comprising flexible units for retail, food and drink use at ground floor level with a hotel at upper storeys. This development was however never delivered, and the permission lapsed in 2023.

3.13. It is felt that due to its location within the city centre and proximity to amenities, sustainable transport infrastructure and nearby office developments such as those within the First Street regeneration area that the Site is also suitable for residential development.

3.14. From a wider planning perspective, the development will provide much needed accommodation within the City Centre that will supplement the quality and type of residential development available within the City Centre market which has seen a marked increase in demand over recent years. The demand for housing within the City Centre is reflected within Local Policy with both the Core Strategy (2024 as amended, Policy CC1 and CC3) and Places for Everyone (2024, Policy JP-Strat2;City Centre) recognising the important role of the City Centre in providing high density housing to support the growing demand.

3.15. The Manchester Housing Strategy (2022-2032) has specifically responded to this growing demand setting an ambitious target of delivering 36,000 new homes between 2022 and 2032, a large proportion of which located within and surrounding the City Centre.

3.16. Proposals will deliver 364 apartments in total, which will contribute towards Manchester's aspiration to meet residential demand within the City Centre.

3.17. The quality and mix of the product and the generously proportioned apartments, designed to the Urban Land Institute's 'Build to Rent' guidance, will appeal to City Centre residents and tenants who due to a number of factors are unable to or choose not to enter the housing market. The Private Rented Sector product, owned by a single investor will provide an alternative to the existing private rented residential stock in the city. It will provide an integrated management and maintenance strategy that will ensure the building remains a high-quality environment in the long term, in addition to high quality facilities and services for residents and shared amenity space that will assist in creating a sustainable City Centre residential community.

3.18. On this basis, residential uses are considered an appropriate use for the Site.

Alternative Designs

3.19. A range of design options were considered and evaluated by Sheppard Robson, as detailed within the supporting Design and Access Statement. This included consideration of different configurations, massing and materials to achieve a high-quality design that comprises the required number of residential units.

3.20. Key Considerations that assisted development and ensured development viability included:

- Responding to the close proximity of the railway line and ensuring a 3m offset from the Network Rail asset, whilst optioneering the location of the building footprint through microclimate studies and public realm options. Three positions were explored for the proposed building footprint, including locating this to the far east or west and then in the chosen position, central to the Site. The central location was considered the most suitable option as this enabled greater separation distances between the Proposed Development and adjacent sites (acknowledging the reasonable likelihood of high-rise developments coming forward on these adjacent sites I the future). This separation minimised any potential overshadowing impacts from the Proposed Development on Whitworth Street West, and external seating areas at Deansgate Locks. This placement also enabled two new areas of public realm either side of the building to support improved linkages from Whitworth Street West towards Knott Mill through a more attractive, active and safe interface with Bugle Street and Cameron Street.
- Responding to nearby heritage assets, the existing character of Whitworth Street West and the tall building cluster around the Deansgate Transport Hub. Work has also been undertaken in order to respond to the character of the local area within the design including exploring various options for the colonnade design as well as façade composition and materials.

- Materiality. As part of façade development, a series of material options were considered and tested with planning officers, including brick, metal, glass and terracotta. The results of this optioneering led to a final preferred material of terracotta, which is considered to deliver a high-quality and cohesive façade design that is characterful of the surrounding area. Terracotta cladding was also chosen for its versatility and ability to create visually appealing designs. The manufacturing process allows for the creation of numerous shapes and forms, enabling a unique façade composition.

3.21. The design of the Proposed Development has evolved through an extensive and detailed process of design, modelling, testing and evaluation in conjunction with the project team and through extensive consultation. A variety of options have been considered to establish the high-level scheme principles and the detailed design components for the project to achieve a refined and considered architectural design response.

3.22. The design has been the subject of detailed pre-application discussions with a range of stakeholders, including ongoing discussions with Historic England, plus a process of public consultation.

3.23. The accompanying planning application is supported by a Planning and Tall Building Statement which considers the guidance set out by Historic England as well as Manchester City Council's tall building policy (Core Strategy Policy EN2). The Statement sets out the rationale for having a Tall Building on the Site and demonstrates through a Visual Impact Assessment that there are no major adverse impacts on key views within the area.

3.24. The design of the building has evolved and taken into consideration a wide range of technical issues. For the reasons set out above it is considered that the current design is appropriate to this site.

3.25. Further information regarding the design evolution and justification for the Development is provided within the Design and Access Statement (DAS) which is submitted in support of the planning application.

Summary

3.26. Where possible, alternative options have been considered throughout the design process. The above has set out why the Site is considered suitable for the Proposed Development.

3.27. The Proposed Development builds on the significant progress to date in this area to continue to deliver at pace and scale with new high quality residential development and supporting. Where possible, alternative options have been considered throughout the design process and the above summary has set out why the Site is considered suitable for the Proposed Development.

3.28. The Proposed Development has been influenced by pre-application consultation with key stakeholders including local landowners, residents, businesses, statutory consultees, as well as with MCC. On this basis, Regulation 18(3) and Paragraph 2 of Schedule 4 of the EIA Regulations has been considered.

4. Site Surroundings and Description of Proposals

4.1. This Chapter includes a description of the Site, its surrounding context, a more detailed description of the Proposed Development.

Site Description

4.2. The Site comprises circa 0.17 hectares of brownfield land located within Manchester City Centre at 2 – 4 Whitworth Street West. A Site Location Plan is provided in Appendix 1.1.

4.3. The Site is bound by Whitworth Street West to the north, with the Grade II listed railway viaduct and Deansgate Station platform immediately to the south and at first floor level to the existing buildings. Rowendale Street bisects the Site travelling under the railway viaduct providing vehicle and pedestrian links to Hewitt Street to the south. The Site is bound by Cameron Street to the east and Bugle Street to the west, which also provide vehicle and pedestrian access into the Knott Mill area, characterised by a mix of employment and residential buildings. Beyond Bugle Street is a live music venue (Rebellion) and Deansgate Station is beyond this.

4.4. The Site currently comprises two buildings. 2 Whitworth Street West is a four-storey, red-brick building which is vacant. 4 Whitworth Street West is a three-storey red brick building which is also vacant.

4.5. Whitworth Street West separates the Site from Deansgate Locks and the associated outdoor seating areas and the Deansgate Castlefield Metro Station located to the north and adjacent to the Rochdale Canal.

4.6. The Site is located within the Deansgate Ward, an area that has witnessed significant investment and regeneration over the last 20 years.

4.7. The Site presents a strategically important location for the city and within a cluster of high-rise buildings within the southern gateway of the City Centre, close to key public transport hubs, to the south of the Civic Quarter and to the north of Knott Mill.

4.8. It is also located within the Whitworth Street West Strategic Regeneration Framework area (2008). The Site is also adjacent to the Knott Mill Masterplan area and is part of the zone of interest of the Masterplan. It is also located within the Whitworth Street West Strategic Regeneration Framework area (2008).

4.9. The Great Northern Manchester Central and Castlefield Quay Strategic Regeneration Framework (2017) area is located to the north of the Rochdale Canal and Whitworth Street West.

Site and Surroundings

4.10. Located on the southern edge of the City Centre, the Site sits amongst a broad range of uses:

- Residential uses including apartments located to the south within the Knott Mill area and along Hewitt Street, Axis Tower and Hacienda apartments to the north east, and Viadux Phase 1 to the north.

- Entertainment, commercial and office uses located to the north at Deansgate Locks and associated outdoor seating areas with Manchester Central beyond this, and Rebellion to the immediate west of the Site and Bugle Street. City Road Inn Public House is located east of 10-12 Whitworth Street West. Commercial and industrial uses are also located within the viaduct arches along Hewitt Street and there are further commercial uses within the Knott Mill area.
- The site, located west of Bugle Street near Deansgate Station and the Deansgate/Castlefield Metrolink, benefits from proximity to key transport infrastructure, including Whitworth Street West, a major bus route through Manchester City Centre.
- Situated within a cluster of tall buildings and adjacent to the Deansgate Castlefield Interchange, the site aligns with the Knott Mill Masterplan for large-scale development, making it suitable for a high-rise development. Its location outside of a conservation area further supports this suitability.

4.11. The surrounding context of the Site along Whitworth Street West has changing significantly for example permission was granted in 2016 for a 35 Storey residential development at 10-12 Whitworth Street West. The consent has since expired recently, but demonstrates the intent for the area. In addition, Hotspur Press which was approved in May 2024 will comprise a 36 storey purpose built student accommodation development providing an additional 578 bedspaces. This development builds on the vision as set out within the Whitworth Street West Development Framework as an ideal place to for landmark developments within the City.

4.12. The southern portion of the City Centre more generally is also continually changing and evolving as planning permissions are implemented and developments come forward, most notably this includes the recently approved mixed use proposals at Great Northern (up to 34 Storeys), the new hotel under construction at 325 Deansgate (22 Storeys) and ongoing development at the First Street and New Jackson neighbourhoods.

Site Specific Environmental Designations

Air Quality

4.13. The Site is located within the Greater Manchester Air Quality Management Area (AQMA), referring to an area where air pollution levels are, or are likely to, exceed national air quality objectives.

Ecology

4.14. The Site is not located within a statutory or non-statutory nature conservation site and no record of protected species have been found at the Site. The Site has no value in terms of the existing biodiversity with a Biodiversity Value calculated at 0 (zero) habitat biodiversity units.

Flood Risk

4.15. The Environment Agency Flood Map for the area indicates that the Site is located within Flood Zone 1 and is therefore at low risk of flooding. The Site is located within a Critical Drainage Area (CDA) meaning a Flood Risk Assessment has been prepared in support of this application. The nearest watercourse to the Site is the Rochdale Canal located 23m north of the Site.

Heritage

4.16. The Site is not located within a conservation area. The following conservation areas lie to the north, and west of the Site: St Peter's Square Conservation area (402m); Albert Square Conservation Area (505m); Deansgate Conservation Area (400m); St John Street Conservation Area (368m); and Castlefield Conservation Area (124m). Whitworth Street Conservation area is located to the east of the Site (537m).

4.17. The two existing vacant buildings on the Site are not listed. According to an assessment from the Heritage Consultant, Katheryn Sayers & Associates, neither is considered to meet the threshold to be considered non-designated heritage assets. The Castlefield Viaduct, which forms the southern part of the Site is Grade II Listed. The roadway underneath the Viaduct to which the Site relates, does not form part of the Grade II listed structure.

4.18. As outlined within the archaeological scoping assessment, the Site has potential to contain archaeological remains associated with the Roman and industrial period.

4.19. There are 75 listed buildings within a 500m radius of the Site, including 0 Grade I Listed, 7 Grade II* Listed, and 68 Grade II Listed buildings.

Planning History

4.20. The Site previously received Planning Permission (Ref: 126308/FO/2020) in 2020 for a Travelodge hotel with ground floor retail.

4.21. The site immediately adjacent to the Site has achieved Planning Permission (Ref. 111003/FO/2016/C1, as amended) for the demolition of the building at 10 - 12 Whitworth Street West, and the redevelopment of the site for a new 35 storey residential building comprising 327 apartments, with associated highways, public realm and associated works. The Consent has since expired, however it is considered that there is a reasonable prospect of similar proposals coming forward for the Site in the future.

Proposed Development

4.22. The Proposed Development comprises the demolition of the two existing buildings on-site and the erection of a 44-storey residential building of up to 364 units with supporting amenity spaces and landscaping. The development will be delivered in a single phase.

Table 2.1 – Development Parameters

	Maximum development parameters (including 10% over expected development parameters)
Site Area (ha.)	0.17
Height	136.5m (height from ground level) Circa 170.3m AOD 44 storeys (inc. level 00)
Residential Units (Use Class C3)	364
Residents Private Amenity Space	718
Parking	No car parking is proposed.

	182 cycle parking spaces.
Public Realm (sq.m)	706

5 Construction Methodology and Phasing

Introduction

5.1 This chapter has been prepared by Glenbrook WWS Limited to outline the approach to managing the risk and impact associated with the works to construct the proposed development at 2-4 Whitworth Street West. It provides an overview of the anticipated site and construction activities, including:

- Site access and logistics.
- Site establishment.
- Construction operations.
- Control and management of construction activities.
- Waste management.

5.2 It is supported by technical appendices as follows:

- Appendix 5.1 Outline Demolition & Construction Management Plan (OD&CMP)

5.3 Assessments of suitable sub-contractors for the project will be undertaken to establish their capability & suitability with management procedures being implemented to ensure successful project delivery. In executing the works, the appointed sub-contractors will implement the appropriate Risk Assessments and Method Statements (RAMS) to ensure the works are executed in a safe and suitable manner and in accordance with the CDM 2015 regulations.

5.4 Assessments of suitable sub-contractors for the project will be undertaken to establish capability/ suitability and management procedures to be implemented to ensure successful project delivery. In executing the works, the appointed sub-contractors will implement the appropriate Risk Assessments and Method Statements (RAMS) to ensure the works are executed in a safe and suitable manner and in accordance with the CDM 2015 regulations.

5.5 Whilst defining the obligations and limitations placed on the Contractor when executing the works, this will form the basis for the Construction Phase Health & Safety Plan (CPHSP). The CPHSP will identify key project specific risks associated with the execution of the works and measures implemented place to reduce or mitigate these risks.

5.6 A further detailed Demolition Construction Management Plan and Construction Management Plan will be prepared by the appointed Contractors in due course and updated as appropriate to reflect comments received and the wording of any planning conditions attached to any future permissions. These documents will form a primary mechanism for maintaining the communicative relationship with Manchester City Council and other third parties in understanding the nature of the proposed development and the associated construction activities. Where comments or third-party approvals affect said plans, the plan will be reviewed and updated as appropriate prior to submission to the Local Planning Authority.

5.7 Both the Demolition Construction Management Plan and Construction Management Plan will be periodically updated as required advising of any proposed changes / improvements to the construction methodology.

Overview of the Works

5.8 The primary construction activities related to the Proposed Development are set out in detail in this Chapter and the supporting Appendix 5.1 (Volume 2), and can be summarised as follows: -

- Demolition of the existing 2 and 4 Whitworth Street West & stopping up of Rowendale Street
- Construction of the Proposed Development, comprising the construction of 364 units of 44 storeys including 3 stories of amenity and back of house.
- Public Realm and associated landscaping works.

Programme

5.9 The current master programme is a development-based programme with the following key dates:

- The Planning Submission Q4 2024
- Start on Site Q3 2026
- Completion Q3 2029

5.10 Subject to planning, the demolition works will be completed in advance of the main construction works. The demolition works are due to commence Q3 2026, with a duration of circa 16 weeks. The main construction works will then follow with a view to completing Q3 2029.

5.11 A detailed programme of construction activities and sequencing will be provided by the Contractors as part of the detailed demolition construction management plan and the construction management plan.

The Works

Demolition works

5.12 Given the location and proximity of the project to the viaduct and railway the demolition will adopt a top-down methodology deconstructing the building floor by floor. This method provides a more robust level of control in terms of the structural integrity of the respective building, whilst also protecting those working in and around the demolition site, including the residents living close by. This method also affords additional control in reducing vibration, noise and dust migration.

5.13 The method of top-down demolition will involve a clad scaffold being erected around the buildings and machinery being tracked or lifted onto the working level. The sequencing of the demolition will generally comprise of;

- Soft strip
- Installation of scaffold
- Installation of back propping to all floors
- Hand / remote floor by floor demolition / deconstruction

- Hand demolition of the exterior walls
- Remove prop's floor by floor following demolition
- Top 3 levels of scaffolding removal floor by floor
- Strike scaffolding at 1st floor level and remove from site
- Mechanical demolition of the ground to first floor
- Reduce the height of the ground floor/basement walls to below ground level
- Inspection
- Remove plant and work equipment from the site
- Hand-over to the Principal Contractor for the construction phase

Substructure

5.14 The piling rig and concrete agitator will be delivered and operate within the site boundary, working on the pile mat. Once the piling works have been completed, excavation of the ground floor pile assisted raft will begin as will the installation the cast in drainage runs.

5.15 Drainage runs outside of the main raft bases will be cast as the first activity to allow them to be backfilled for storage and transport movement purposes.

5.16 Once the ground floor slab has been cast, the Contractor will begin setting up for the columns and core.

Jump / Slip formed core

5.17 The Contractor will erect the core. During the pre- construction period they will design and procure the equipment, ensuring that the structural stability of the core is maintained in its temporary condition. The rig will be fully encapsulated to ensure that no materials fall out or blow off the structure.

5.18 As the core progresses, The Contractor will install the pre-cast stairs to gain permanent access up the building. A hoist will be progressively installed to feed personnel and light materials to the top of the construction work face.

Floor Construction

5.19 Work will commence on the construction of the main floor construction. When the structure is up to finished level, the Contractor will then use the tower crane to install and lift into place the Building Maintenance Unit (BMU).

Building Façade

5.20 The unitised curtain walling will commence when the structure is sufficiently advanced. A team will work ahead of the installation, fitting brackets to line and level into the channels cast into the floor slab.

5.21 The Contractor will load out the curtain walling frames using the main hoists that will be distributed on to each floor plate or via crane onto loading platforms at floor level.

5.22 The facade will be installed using the method of positioning the individual curtain walling panels on a sliding table, connecting on to the overhead floor crane and pushing the units out over the floor edge, turning the panels and connecting them to the lower floor, whilst securing them using the overhead fixing bracket. The

process will be repeated until the whole elevation is complete. For the larger end glass panels, the Contractor will need to utilise the Tower Crane to lift them in to position.

5.23 The unitised curtain walling system will be designed to leave out the bay where the hoists need to access the building. The intention is to strip out the landing bridges when the floor has been sufficiently loaded out and substantially complete, then infill the unitised windows and panels on that floor, to allow the final fit out of the last unit.

Lift Installation

5.24 When The Contractor has completed the core structure and sufficiently advanced the core area floor slabs, they will commence with the installation of the passenger lifts. Owing to access restrictions and handling of materials we will fit out each lift shaft, before commencing the next and so on.

5.25 By completing the lifts early, The Contractor will obtain beneficial use of the lifts progressively. This will mean that the upper floors of the project will be serviced by the two high speed lifts as well as a minimum of two passenger lifts.

Fit Out

5.26 Once a floor has become fully watertight floor, The Contractor will complete the high-level corridor services, including any temporary electrics, power and lighting.

5.27 The first fix will commence with the metal stud walls, one side of plasterboard and the noggin brackets that carry the electrical back boxes as well as any structural supports required for door frames, kitchen units etc.

5.28 The completed first side boarded apartment will be handed over to the mechanical and electrical contractor for their first fix works to all services as well as ventilation and ductwork, electrical, comms and control wiring, sprinkler pipework and all pipework including all testing prior to handing back for second side boarding and ceiling works.

5.29 The apartments will be plastered, and mist coated when dry. The walls will be snagged and repaired where necessary ahead of second fix joinery, kitchen installation and final decorations.

5.30 Final fix electrical and lighting will be followed by floor finishes, builders clean and commissioning of services. The team will instigate an inspection and snagging process with the client team to clear all defects before final sparkle clean and lock up of the completed apartment.

5.31 As the accommodation is completed, the Contractor will finish the corridor fit out, including lift architraves etc. and protect any finished surfaces necessary.

5.32 From completion of the apartments, the Contractor and appropriate parties will instigate an inspection process to ensure the integrity of the apartments up until overall final project practical completion.

Health and Safety

5.33 Health and Safety is of paramount importance to ensure safe working conditions for site operatives. Activities pertaining to the works will be reviewed and assessed at every stage of the construction process ensuring the appropriate RAMS are in place and always adhered to.

5.34 The Contractors will undertake the Principal Designer and Principal Contactor roles for the duration of the works.

5.35 Work will be undertaken in accordance with Health and Safety at Work Act 1974 and other legislative requirements including (but not limited to) the Manual Handling Operations Regulations 1992 and the

working at Height Regulations 2005. Designer's risk assessments will be provided to the Contractor to provide a greater understanding of any design considerations or assumptions in the preparation of the RAMS.

5.36 Trained first aid personnel will be available and clearly identifiable on site. The Contractor will develop a site fire plan, identifying evacuation procedures and muster points. Trained fire marshals will be clearly identifiable.

Construction Activities & Traffic Management

Site Access

5.37 The site is served primarily from Whitworth Street West with additional access available on Hewitt Street, Cameron Street and to a lesser extent Bugle Street. A full Traffic Management Plan will be developed with the Main Contractor to address the following issues:

- Integration & calming of traffic management scheme with surrounding construction developments
- Access, egress, drop off and turning areas.
- Temporary and/or permanent alterations to local traffic routes (both vehicular and pedestrian).
- Additions, alterations and positions of any temporary signage, road markings or protection barriers.
- Pedestrian access around site and relevant protection, lighting and signage schemes.
- Temporary suspension / relocation of any parking bays or bus stops.
- Segregation of plant, materials and pedestrians on site and safe access routes between welfare and site
- The provision of car parking, offsite and public transport strategy for staff and operatives
- Loading bays, hoist positions and tower crane areas.
- Any other measures to ensure the safe integration of pedestrians, cyclists and road users both on, off and surrounding the development.

5.38 In preparation of the above document a protocol of timed and booked deliveries, off peak deliveries and prefabrication will be incorporated.

Deliveries and Parking

5.39 Delivery routes are expected via Whitworth Street West & Hewitt Street where appropriate. The Main Contractor will endeavour to deliver outside of peak traffic hours to minimise local disruption and the normal workings of the surrounding properties. There will be limited or no key staff parking within the compound area.

5.40 Site personnel will be encouraged to utilise the extensive public transport options available to them. Any personnel who must attend by car will be asked to avoid parking in residential areas and instead utilise nearby formal carparking areas.

5.41 The Site will operate a strict vehicle one-way access regime, with only one vehicle being allowed into site at any time, the rest will be held off site and called in to site when the space is available. No vehicle holding will

be allowed in the adjacent streets. The final traffic management plans are subject to agreement with MCC Highways.

Plant and Equipment

5.42 Tower cranes, MEWP's, Mast climbers and mobile cranes will be utilised for the construction of the Proposed Development. Where practical, construction techniques and the associated plant and equipment will be selected to minimise acoustic intrusions on surrounding areas.

5.43 We have developed our lifting strategy around a two-tower crane approach to the project, within the site boundaries.

5.44 TC 1 to construct frame and floor plates until level 6-7 and the core and then TC2 will be installed and supported off the core, no oversailing will be required apart from a small amount on the Highways, which will be concluded with the requisite Oversailing license from MCC. Road Closures and extended working hours will be required to rig and de-rig the cranes and this will be agreed with MCC once exact dates are known.

5.45 The Contractors will develop a detailed schedule of plant and equipment to confirm these assumptions in due course.

Operating Hours

5.46 Site operating hours will adhere with Manchester City Council's (MCC) 'Environmental Protection Information for Developers'.

5.47 These are anticipated to be 07.30am – 6.00pm Monday to Fridays and 08.30am – 2.00pm Saturdays. No works are planned for Sundays or Bank Holidays.

5.48 Some specific operations may require works outside of these hours, for example tower crane erection and dismantling, which will be arranged by agreement with the Environmental Health Officer (EHO) and residents through a series of neighbourly engagements. The frequency of these will vary and respond to demand.

5.49 Access to the Site will only be permitted a maximum of 30 minutes prior to the working day. Any noisy works will be kept to a minimum for the first half hour of each day. Glenbrook WWS Limited acknowledge the close proximity of neighbouring properties and will endeavour to ensure the working hours are adhered to in order to protect their amenity.

Site Setup and Operations

5.50 The following site setup and operational requirements apply to the Proposed Development and will be developed in further detail by the Contractors.

Site Establishment

5.51 The development will be serviced from offices and welfare accommodation that is still yet to be determined. The welfare provisions will be suitably sized for the anticipated quantum of operatives and will be located within close proximity to the site. The final agreed location will form part of both the Demolition Management Plan and Construction Management Plan. Similarly, it is envisaged that material storage will be arranged off site.

5.52 The following will be provided for the works as temporary facilities:

- Project offices.

- Meeting and conference facilities.
- Induction and training centre.
- Canteen and rest area.
- Toilets and washroom facilities

5.53 Material storage and waste segregation will be managed by the Contractors to prevent cross contamination of materials whilst promoting recycling and reducing waste to landfill. All flammables waste streams and those with potential environmentally adverse impacts will be appropriately contained and managed by the Contractors. For further information Appendix 5.1 provides additional detail on the waste segregation categorisation.

5.54 Fuel and oil will be stored in accordance with the Control of Substances Hazardous to Health (England) Regulations 2002 with refuelling and transfer of fuel oils undertaken in designated areas of hardstanding by trained personnel, equipped with the appropriate spill kits and emergency action plans.

Site and Boundary Fencing

5.55 The Site is secured to all site boundaries by a full hoarding. This will be retained throughout the development to maintain segregation of the works and the protection of the public.

5.56 This hoarding will be used to the perimeter of the Site and sealed to the ground to further reduce dust arising and further prevent materials and debris leaving the Site and potentially entering water bodies.

5.57 Site hoardings will be utilised to inform others of the Proposed Development and coloured and designed as appropriate.

Access and Points

5.58 The method of delivery for plant and materials, and removal of waste from the Site will be defined by the Contractors using key access roads into the Site and surrounding areas.

5.59 Turnstiles to secure the Site from unauthorised access will be in place at all pedestrian access points. Banksman will be present at all vehicular access points.

5.60 Details of the proposed site access arrangements are identified within the Outline Demolition and Construction Management Plan Appendix 5.1.

Housekeeping

5.61 Throughout the project we will encourage & enforce good housekeeping. A strategy will be developed and incorporated into the Site Rules which will be sent to suppliers and supply chain partners alike. The strategy will also form an essential part of the supply chain / suppliers pre-order interview.

5.62 The Contractor will ensure that all operatives engaged on the works are familiar with the work in progress, skilled at their task, aware of their duties and responsibilities to others and knowledgeable of the Site Rules. All persons working on site will attend the site safety induction and commit to the site rules

5.63 The Contractors will maintain a high level of site cleanliness to:

- Reduce potential Health and Safety issues arising from poor working conditions.
- Improve working conditions and operational productivity.

- Reduce waste material on site.
- Remove the potential for waste material inadvertently leaving site (wind conditions etc.).

5.64 In maintaining the cleanliness of the Site, the Contractor will also ensure:

5.65 The appropriate behaviour of the works force (including subcontractors) is appropriate both on and off-site.

- Waste is removed from the Site at regular intervals to prevent local wildlife being attracted onto site and the potential for fire hazards on site.

5.66 Cleanliness of adjacent roads affected by the works are maintained (wheel washing, road sweepers etc.).

- No fires are permitted on site.

Wheel Wash Facilities and Road Sweeping

5.67 A road sweeping regime will be implemented and tailored to suit on site activities on an appropriate basis. Where required, appropriate wheel and vehicle wash facilities will be provided to ensure delivery wagons leave the Site clean and tidy.

Lighting of the Site

5.68 To minimise light spill from the Site and reduce the impact of the localised townscape and ecology, directional lighting will be used to illuminate the Site. Localised task lighting will be provided as required by the Contractor to execute the Proposed Development. All tower cranes will have air-craft warning lights fixed to the upper part of the crane and jib.

Materials

5.69 In the selection of materials, consideration will be given to the embodied carbon footprint and its recyclability and recycled values / content. The Contractor will employ procurement procedures, ensuring the environmental impact of materials are considered in their selection.

5.70 The use of local supply chains will be promoted to reduce the transportation impact of materials to and from site, whilst investing capital into the local economy and supply chains.

5.71 All timber used on site will be FSC or PEFC compliant and obtained from sustainable sources.

Waste

5.72 Prior to commencing the works, the Contractors will establish a Construction Waste Management Plan (CWMP) with the intent to reduce and minimise any waste needing to go to landfill. The CWMP will identify:

The various waste streams generated by the construction of the Proposed Development.

- Methods of waste segregation.
- Estimated quantity of each waste type.
- The waste management action for eradicating waste in the first case and, where not possible, implementing the re-use, reduce, recycle, and disposal for each waste type.

5.73 The Contractor will:

- Review the CWMP.

- Record quantities and types of waste produced.
- Record the types and quantities of waste that have been:
    - Reused (on or off site).
    - Recycled (on or off site).
    - Sent of other forms of recovery (on or off site).
    - Sent to landfill.
    - Otherwise disposed of.
- Update the plan to reflect the progress of the project.

Construction Methodology

5.74 At this stage of design development, the structure of the Proposed Development can be summarised as follows:

- Pile substructure with pile caps and ground floor slab
- Concrete frame and façade
- Completion of all construction works up to completion of the development.

5.75 A detailed programme of construction activities and sequencing will be provided by the Contractor for both the Demolition Construction Management Plan and Construction Management Plan. At the time of submission of the Environmental Chapter the following overall durations are proposed;

5.76 Demolition – 16 weeks

- Overall construction period 3 years

Control Measures

Personnel Protection

5.77 In maintaining a safe site, the Contractor will implement a Health & Safety regime for all site operatives and site visitors to ensure a standardised ethos to safety through the implementation of appropriate PPE. The Principal Contractors will review operation specific Risk Assessments and Method Statements (RAMS), ensuring process specific measures are implemented as appropriate.

Protection of Environmental Features

5.78 Measures for protection will be identified during completion of an Environmental Risk Assessment.

Noise and Vibration

5.79 Noise and vibration of site activities will be kept to a minimum as far as reasonably practical for the duration of the works and particularly during the first operating hour of the Site. Where the Contractor is required to operate the Site outside of these times, this will only be permitted following consultation and agreement with Manchester City Council's Environmental Health Officer. The Contractors will prepare a specific Management Plans for the control and monitoring of noise and vibration relating to the works, identify noise generating plant and equipment used on site (including type, size and quantity).

5.80 The Contractor will make the necessary Section 61 Control of Pollution Act 1974 applications to the local authority at least 28 days prior to the works, obtaining the relevant consents prior to undertaking the works. Works will be executed in accordance said consents.

5.81 In addition to any restrictions, limitation and or obligations imposed by the Section 61 consent, the Contractor will comply with the requirements of the statutory code of practise BS: 5228.

Air Quality

5.82 Prior to the commencement of the works, the Contractor will undertake an air quality assessment and management plan identifying the management and monitoring of dust, smoke, and other airborne pollutants.

5.83 Following completion of the air quality assessment, the Contractor will make all necessary applications pertaining to the works, seeking consent from the relevant Pollution Control Authority (Local Authority and/or Environment Agency) in accordance with the Environmental Protection Act 1990 and Pollution Prevention Control Act 1999.

Site Deliveries

5.84 Selection of appropriate vehicles sizes relative to the delivery load will be managed by the Contractor to minimise vehicle pollutants. Where possible these will be coordinated with deliveries to nearby sites to minimise vehicles mileage to and from distribution centres

5.85 Vehicles carrying loose material to and from site will be sheeted to prevent spillage and reduce dusty emissions during transit.

5.86 Implementation of these measures is the responsibility of the Contractor. The Contractor records and reports activities in relation to these measures and any subsequent corrective measures employed, ensuring records are available at all times.

Construction Vehicles

5.87 All vehicles regularly used on Site will comply with the relevant emissions standards/ legislation and will be serviced in accordance with the manufacturer's recommendations. Vehicles also using public highways will comply with all MOT requirements. The Contractor shall provide all MOT and service documentation for Local Authority inspection upon request and a running log of:

- Any complaints relating to emissions alleged because of construction activities, received from either a resident or local business;
- The date and vehicle identification number of any construction vehicle observed to be carrying material that has the potential to release dust and does not have the appropriate sheeting measures in place; and
- The date and location of any cleaning of paved areas and roads

5.88 The Contractor will ensure no construction plant or vehicle engines are left running when not in use except when there is a valid operational reasoning or justification. The Contractor is encouraged to use low pollutant vehicles or 'green' vehicles in the execution of the works.

5.89 All construction vehicles tracking the site will adhere to the site speed limit and route controls.

Dust Suppression

5.90 The Contractor will employ dust suppression systems as appropriate during the works to reduce the quantity of airborne pollutants, providing suitable water bowsers and/or sprays for the task. To limit the generation of dust on and off site, the Contractor will employ appropriate dampening and wheel wash measures for all vehicles trafficking site. Unloading of loose material (spoil) will adhere to the control drop height to control dust release. Smaller handheld tools will be fitted with localised dust collectors or dust suppression systems.

5.91 To reduce any windblown dust arising from stacked materials, the Contractor ensures stacked materials are profiled to minimise wind and rain impact and subsequent erosion. Earth mounds will be kept sufficiently damp to further limit wind impact. Where appropriate, seeding of earth mounds will be encouraged. Where possible, stacked materials with the potential to create dust emissions will be located away from site boundaries.

Hard Standings

5.92 The use of existing hard standings will be promoted to reduce site churn and airborne dust during site operations. Extensions of existing hardstanding will be promoted in favour of new hardstanding. Hardstanding will be incorporated within the permanent works where practical.

Water Quality and Drainage

5.93 In executing the works, the Contractor will adopt good construction management practices to reduce the risk of accidental discharge and contamination of rivers, streams, ponds and ground water. These practises will be incorporated into the CMP and include:

- The extent and status of all ground water to the land below the works and any temporary works and land use for the removal of material from site.
- Comply with the 'Policy and Practice for the Protection of Groundwater Environment Agency TSO 1998'.
- Control of sediment and loads to surface water systems.
- The Pollution Control and contingency plan to identify the requirements for pollution control and emergency procedures for the works
- Measures for minimising water consumption during the construction process.
- Details of the construction phase drainage strategy during the works (using permanent drainage systems where possible).

Nearest Water Course – Rochdale Canal

5.94 The Rochdale Canal is the nearest water course to the Proposed Development, with a section passing roughly 20m north of the site boundary at Deansgate locks.

5.95 It is not anticipated that the site will have any bearing on the Canal, nor are they expected to impact on site.

Unexploded Ordinance

5.96 Following a desktop review of the location it has been confirmed that the site lies within an area of low risk. A Stage 2 Detailed Risk Assessment is not considered necessary however the possibility of UXO remaining on site cannot be completely ruled out at desktop stage. Therefore, a UXO safety briefing to all personnel conducting works relating to the ground will be provided.

Vapour / Ground Gases

5.97 Prior to execution of the Works, an assessment of the potential and extent of any ground gasses associated with the Works will be undertaken. If deemed necessary, the design will ensure appropriate gas protection measures are implemented to protect the building and its occupants and are addressed in connection with undertaking the Works to ensure safety of all site operatives. The control measures implemented for entering and working within confined spaces will be clearly identified within all RAMS.

Archaeology and Cultural Heritage

5.98 Following consultation with Greater Manchester Archaeological Advisory Service (GMAAS),in their capacity as archaeological advisor to Manchester City Council, it is anticipated that, in the first instance, an archaeological evaluation will be required (in the form of trial trenching or a strip, map and record) to establish the presence or absence of buried archaeological remains and, if present, their extent and significance.

5.99 The exact scope and extent of any such further investigation of the Site will be determined by GMAAS. Should significant archaeological remains be encountered during the archaeological evaluation, further excavation may be required to offset the harm of the development to the buried archaeological resource, in line with the guidance provided by the National Planning Policy Framework. The scope and extent of any such further investigation will be determined by the Greater Manchester Archaeological Advisory Service (GMAAS), in their capacity as archaeological advisor to Manchester City Council .

Pollution Control and Contingency

5.100 An environmental emergency plan will be developed by the Contractor to reflect construction activities and will form part of the Environmental Management Plan.

5.101 Measures will be developed by the Contractor to minimise and control site runoff to prevent contamination. These measures will take account of the Environment Pollution Prevention Guidelines:

- PPG1 General guide to the prevention of pollution
- PPG5 Works and maintenance in or near water
- PPG6 Working at construction and demolition site
- PPG18 Managing fire-water and major spillage
- PPG21 Pollution incident response planning
- PPG22 Dealing with spillages on highways

Definition of a Pollutant

5.102 Pollutants are substances that pollute the environment which renders the air, soil, water, or other natural resource harmful or unsuitable for a specific purpose. Environmental incidents occur when an activity or event causes or has the potential to cause harm to people or damage to property and or the environment.

Pollution Prevention

5.103 Works will be undertaken in close proximity to the existing drainage networks. Works may also affect the existing ground water table. Appropriate prevention methods will be implemented throughout the duration of these works.

Concrete and Cementitious Materials

5.104 Concrete and cementitious based materials are alkaline and are potential pollutants. To reduce the risk of any runoff entering watercourse, mixing will be undertaken a minimum of 15 meters away from watercourses. Wash from concrete and cement works will not be discharged into a watercourse.

Oils and Fuels

5.105 All oil and fuel will be stored in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001, ensuring safe storage of material and controlled access at all times and:

- Storage areas are not located within 10 meters of a watercourse or highway gully.
- Mobile bowsers are bunded and comply with the requirements of Control of Pollution (Oil Storage) (England) Regulations 2001.
- Storage drums are contained within bunded areas with a minimum of 25% of the total volume of the volume contained within the bund or, 110% of the largest container, whichever is the greater.
- Refuelling of plant and equipment is undertaken by trained operatives.
- Plant is regularly checked for leaks and is regularly maintained.
- Drip trays are placed below any standing plant and equipment.
- Static combustion engine plant (e.g. compressors etc.) are fully integrally bunded or placed on drip trays.
- Spill kits are provided within close proximity to oil and fuel storage areas, ensuring operatives are trained in their use.

5.106 The use of non-toxic biodegradable fluids and oils is encouraged and must be used in all sensitive locations or areas of increased pollution risk.

Plant Maintenance

5.107 Maintenance of any plant will be undertaken at least 15 meters from any watercourse or drain. Spill kits must be available and on hand during all maintenance operations with drip trays to contain any leakage of oil or fuels.

5.108 Any plant or equipment considered a pollutant risk will be repaired or removed from site.

Excavated Spoil

5.109 Excavated spoil will be removed from site as works progress. Where practical materials will be reused on site. Removed materials will be treated off site or disposed of as appropriate.

Construction Waste Materials

5.110 Waste materials will be controlled in accordance with the CWMP and secured to prevent cross contamination of waste streams or pollution of any water courses. Any liquid waste will be secured in a suitably lined container within a bunded area.

Trade Effluent

5.111 Trade effluent (toilets etc.) will be connected to a foul water drainage system for the duration of the works. Where temporary chemical recirculating toilets are used, their use will be limited as far as reasonably practical and appropriately secured/ weighted to prevent spills. Emptying and refilling will be undertaken by a licensed contractor.

Notification Procedures

5.112 Procedures for the notification and reporting of spillages, pollutants or environmental incidents will be clearly set out within the Contractor's CMP and reinforced through site inductions and toolbox talks.

5.113 The procedure will include details of the recording and reporting process of incidents and details of those notified.

5.114 Contact details for key on site personnel and emergency response persons responsible for environmental protection will be displayed in key locations around the Site and include details of:

- Contractor's Project Manger
- Construction Site Manger
- Contractor's Environmental Manager
- Employer's Project Manager
- Community Liaison Officer
- Emergency Services
- Environment Agency

5.115 The Contractor will promote a system of good working practices, actively encouraging suggestions from operatives to improve operational procedures to reduce the risk of environmental incidents, and anonymous reporting of works not being undertaken in accordance with the CMP.

Communications

Project Communications

5.116 To ensure the Health and Safety, Operational and Environmental requirements of the project are communicated effectively and efficiently, this CMP and DMP will be distributed to all members of the project team (incl. sub-contractors). Control and mitigation measures associated with key activities or potentially environmentally sensitive operations will be agreed and regularly reviewed between the Contractor and Employer. The Contractor will ensure copies of the following are available on site for review at all times:

- the updated demolition and construction management plans
- the project, Employer and any company environmental policies.
- the list of key contacts associated with the works.

5.117 During the construction phase of the works, regular internal meetings will occur to identify:

- Progress over the period.

- Works planned over the next period.
- Inductions and training undertaken over the period.
- Health and safety issues incurred (incl. near misses etc.)
- Records on inspections and audits, with a schedule of non-conformances issued.
- Feedback from Community liaisons, copes of any complaints received, and mitigation measures implemented.
- Visits and inspections by third parties, including statutory bodies and H&S monitoring officers.
- Records and compliance with the environmental performance and objectives.

5.118 Internal and external communication methods will be defined by the Contractor, maintaining dialogue through the Community Liaison Officer as appropriate. External communications will be coordinated with the Employer's Project Manager to ensure effective and appropriate communications.

Community Liaisons

5.119 Neighbours will be kept well informed before and during the construction phase through various means: A member of the Contractor team will be designated as the Community Liaison Officer responsible as a single-point contact to ensure good neighbour relations.

5.120 A regular residents' meeting will be established at a frequency agreed with the residents to bring them up to speed with project progress and key elements of the work. It also provides an open discussion for residents to voice concern or highlight issues.

5.121 Newsletters will be widely distributed to identify completed works and focus on forthcoming activities to give neighbours early notice of such works. Information displays in prominent locations will contain various project-specific information.

5.122 A 24-hour emergency contact number will be established to allow concerns to be raised, these will be actively dealt with by the Contractors Community Liaison Officer until the issue is resolved.

Compliance

5.123 Successful implementation of the DMP & CMP relies on regular review and updates in response to evolving site conditions. The Contractor will define appropriate measures and procedures to review activities against both the DMP and CMP and legal/ statutory requirements and any measures implemented in response to complaints, compliments and inquiries procedure (CCIs).

Recording

5.124 The Contractor maintains a register of compliance issuing Non-Conformance Reports (NCR's) identifying actions or works not undertaken in accordance with the CMP, method statements or legislative requirements and obligations. The NCR will be accompanied with the appropriate Corrective Action Report (CAR) detailing:

- Action owner(s).
- Corrective measures required.
- Monitoring/ inspection and signoff procedures to be implemented.

- Timescales for close out.
- 3rd party approvals upon completion of the corrective measures.

5.125 As part of the CAR process, a lessons learnt workshop will be conducted to prevent reoccurrence of the event.

Monitoring

5.126 Environmental monitoring of the works will be undertaken during the construction phase to evaluate the environmental impact of the works. This information will be assessed in conjunction with the CMP and improvements/ revisions to the CMP made where appropriate.

5.127 A programme of environmental monitoring will be established by the Construction Environmental Manager to suit the construction programme and works on site. Monitoring will be undertaken and assessed against the legal/ legislative requirements, consents and project targets/ requirements.

Review Process

5.128 Records of waste management and environmental aspects pertaining to the works will be mainlined in accordance with the CMP or respective organisational requirements (whichever is the greater). Records are to be maintained in both digital and hard copies to protect against damage, deterioration or loss and made available to the Employer's Project Manager upon request. Disposal will be upon express consent of the Employer's Project Manager.

Complaints, Compliments and Inquiries

Procedures

5.129 A CCI will be implemented to ensure members of the public wishing to complain, provide feedback or make inquiries can do so. Contact details will be published for use by members of the public with the public actively encouraged to engage as part of the Community Liaison. Liaisons with local councillors, Town/ Parish Councils and the local authority (incl. environmental health) will be undertaken to address any concerns or issues raised directly to councillors by the general public.

5.130 Any CCI's received will be recorded and reported to the Employer's Project Manager and include:

- Parties affected/ reporting
- Timing
- Location
- On site activities being undertaken

5.131 All complete with details of any reactive measures implemented where appropriate.

Reporting

5.132 Any CCIs raised will be reported at internal progress meetings to ensure appropriate measures are being implemented, improving the impact on the community during the construction phase.

5.133 The Environmental Health Team at MCC may be the first contact for residents affected by the works. Ongoing dialogue will be undertaken with the Environmental Health Team to ensure responses to any complaints can be provided swiftly.

5.134 Due to the nature of the proposals and proximity of adjacent residents, the works may be subject to a Section 61 application under the Control of Pollution Act 1974 prior to commencing the works. The Contractor will agree any mitigation measures in connection with this application with the Local Authority, obtaining the required permits/ licenses prior to commencing the works.

Feedback

5.135 To validate the CCI process, feedback on any CCIs raised will be provided as part of the community liaison process. Feedback sessions will identify:

- Details of the CCI.
- Assessment undertaken.
- Mitigation measures implemented.

5.136 Any additional beneficiary measures and options will be discussed with the community to further improve the impact of the community during the construction phase.

6. Climate Change

Introduction

6.1 This Chapter of the ES has been prepared by Mainer Associates Ltd and asseses the impacts the Proposed Development will likely have on the climate.

6.2 The chapter will also explore how these impacts have been assessed including the specific methodology used, the baseline conditions the project will be assessed against and a summary of the likely significant effect. It will also explore the mitigation measures that will be needed to minimise, avert or offset any significant negative impacts identified by the analysis. In addition, this Chapter will determine what monitoring methods will be needed to keep track of any likely residual effects.

6.3 This Chapter is accompanied by the following appendices:

- The Sustainability and Circular Economy Statement Prepared by Mainer Associates
- The Energy and Environmental Standards Statement Prepared by Futureserv

Table 6.1 Technical Competence in Climate Change

	Lead Author	Reviewer
Name	Jacob Smith	Ben Wells
Company	Mainer Associates Ltd	Mainer Associates Ltd
Qualifications/Accreditations relevant to technical area	BSc Ecological and Environmental Sciences, MSc Environment & Development, One Click LCA certified	BSc MSc, BREEAM AP, PIEMA & Fitwel Ambassador
Does the practitioner hold any IEMA qualification?	N/A	PIEMA
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	2	20
Number of EIA's delivered to date	N/A	N/A

Assumptions and Limitations

6.4 The assessment of construction stage GHG emissions will be based on assumptions and a typical benchmark. As this assessment is based on early-stage design's, detailed data is not available for all the building elements and life cycle stages required to accurately assess the Embodied and Whole

Life Carbon of the Proposed Development. As such, the GHG emission quantities that will be calculated and assessed are only estimations of the true Embodied and Whole Life Carbon. The actual quantity of GHG emissions is likely to be different to this as will vary depending on the construction materials, construction methods etc.

6.5 Operational regulated GHG emissions will be calculated using an assessment based on the estimated demand figures with an analysis of typical loading profiles, normal working practices, and impact of external climate conditions. The energy data used has been extracted from the Energy and Environmental Standards Statement produced by Furureserv.

6.6 Actual Operational GHG emissions are likely to be different to the estimations provided, depending on both detailed design and operational use of the buildings. It is not possible to fully understand, at this time, how energy use and emissions will vary, but it has been assumed that energy use will remain the same, year on year, throughout the assessment period. Unregulated energy use could vary substantially when the proposed development is operational, but it is not possible to accurately predict this energy use.

6.7 This assessment is based on data provided by other parties involved in the Proposed Development including AKT II and Sheppard Robinson. Therefore, the accuracy of the GHG emission quantities is in part determined by the information provided to us by them and the most up-to date information they have access too. Due to the early stage of the development, this data will likely not reflect the true value as the materials quantities and design are not finalised or no available at this stage (such as the M&E quantities).

6.8 To account for the uncertainty in the GHG emission quantities at this stage in the design process, this assessment will follow the RICS 2nd edition Whole life carbon assessment for the built environment (2023) guidance on addressing uncertainty. As per the guidance, contingency factors are applied at each RIBA Stage, to all life cycle module results. For Stage 2, this assessment includes a 15% contingency factor which is included in the reported results.

6.9 In addition, the following assumptions have been made in order to complete the assessment in line with RICS v2 (2023) Guidance:

- It is assumed that the operational lifespan of the Proposed Development will be 60 years, as this is the average lifespan for a development of this type and is a RICS v2 Edition requirement.
- Material service lives, transport distances, end-of-life scenarios and waste percentages used in the assessment are RICS v2 (2023) default values.
- The demolition area has been estimated and included in the assessment.
- B1 emissions resulting from refrigerant use and leakages are not included in the assessment due to lack of information at this stage; this will be compensated for by the contingency factor.
- Due to the Early Stage of the design, detailed M&E quantities are not available. As such, per m2 estimates have been included in the assessment.

Relevant Legislation, Policy and Guidance

Legislation

6.10 The following pieces of legislation are applicable to the Proposed Development:

Climate change Act 2008

6.11 Climate change Act 2008 (2050 Target Amendment) Order 2019 introduced a net zero target for at least 100% reduction in GHG emissions (compared to 1990 levels) in the UK by 2050:

- The Climate Change Act 2008 sets up a framework for the UK to achieve its long-term goals of reducing greenhouse gas emissions by 34% over the 1990 baseline by 2020 and by 80% by 2050 and to ensure steps are taken towards adapting to the impact of climate change. The Act introduced a system of carbon budgeting which constrains the total amount of emissions in a given time period and sets out a procedure for assessing the risks of the impact of climate change for the UK, and a requirement on the Government to develop an adaptation programme.
- The Climate Change Act introduced new powers and duties on climate change adaptation and mitigation. Through amendment of the Climate Change Act, the UK committed to achieving net-zero emissions by 2050.
- The Climate Change Act sets out the carbon budget for the period 2023-27 as 1,950 million tonnes of carbon (MtCO2e); a 50% reduction in emissions when compared to 1990 levels.

Planning and Energy Act 2008:

- Allows local councils to set targets for on-site renewable energy, low carbon electricity and energy efficiency standards in their areas on influence. This allows local planning bodies to ensure a development in their area complies with energy efficiency standards which are beyond those required by building regulations.

The Carbon Plan: Delivering our low carbon future (2011):

- Established how the UK will achieve decarbonisation within the energy policy framework; to transition to a low carbon while maintaining energy security and minimising consumer costs,

Policy Framework

National Planning Policy

National Planning Policy Framework 2024:

6.12 National Planning Policy Framework (NPPF) 2024 describes ways in which the challenge of climate change can be met. Section 14 of the NPPF highlights that planning plays a key role in mitigation against climate change. It states that "*new development should be planned for in ways that:*

- *Avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and*
- *Can help to reduce greenhouse gas emissions, such as through its location, orientation, and design. Any local requirements for the sustainability of buildings should reflect the government's policy for national technical standard Local Plan and supplementary guidance."*

Local Planning Policy

Manchester Core Strategy 2013-2027 (2012)

Policy EC1: Employment and Economic Growth in Manchester

6.13 Development proposals should have regard to:

- Climate change resilience demonstrating how CO2 emissions will be minimised with an aim of zero carbon emissions, through energy efficiency, renewable energy and contributing to low and zero carbon decentralised energy infrastructure;
- Ensuring design makes the best possible use of a site or building in terms of efficient use of space, enhancing the sense of place of the wider area and minimising detrimental impacts on adjacent uses, considers the needs of users/employees of a site/building for access via walking, cycling and public transport and reduction of opportunities for crime by applying current best practice in security design;
- Flood risk through the Manchester- Salford- Trafford Strategic Flood Risk Assessment (SFRA).

Policy C2: District Centres

6.14 Development will support thriving district centres, with distinct local character, providing a good range of accessible key services, including retail, health facilities, public services, leisure activities and financial and legal services. Housing will also be considered an appropriate use within District Centres, providing it supports the vitality and viability of the centre. In delivering this vision provision will be made by 2027 for approximately:

- 20,000 square metres net convenience retail floorspace ; and
- 15,000 square metres net comparison retail floorspace.

6.15 The delivery of this floor space should respect the network of centres across the city and in neighbouring in neighbouring districts. Development within this overall capacity which has the potential to impact on the current or future vitality and viability of other centres in Manchester or other districts will only be acceptable if there is no prospect of the affected centres accommodating growth themselves. The Core Strategy sets a framework for the delivery of the identified capacity. The identification of specific sites, particularly those which require an extension to existing District Centre boundaries, will be addressed through a subsequent Development

6.16 Development in District Centres should:

- Prioritise delivery of key 'visitor' services, including retail, public and commercial services and food and drink. The Council will ensure that retail remains the principal use in Primary Shopping Areas, but also ensure that provision is made in District Centres for commercial and service uses, leisure and community facilities and other uses which make a positive contribution to vitality and viability of centres. Subject to impact on overall character and local amenity, the Council will support development which extends the time during which District Centres are active;
- Promote the development of employment which provides opportunities for local people;

- Promote the efficient use of land, particularly through considering options for multi-storey development. New development should positively contribute to the reuse and regeneration of land and premises, together with wider regeneration and investment strategies;

- Contribute positively to the diversity and mix of uses within centres without undermining their primary retail function. Development should also promote a range of retailers and shop formats;

- Promote choice and competition particularly where development will support the independent sector;

- Remedy deficiencies in areas with poor access to facilities.

- New development should respect and enhance the character of existing centres.

- New development should deliver improvements to the quality and accessibility of the center environment. Opportunities should be taken to adopt sustainable building design and practices to assist in adapting to climate change

Policy EN4: Reducing CO2 Emissions by Enabling Low and Zero Carbon Development

6.17 Wherever possible new development and retrofit projects, including energy generation plant, must be located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.

6.18 Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings.

6.19 Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing / potential decentralised energy schemes.

6.20 The use of building materials with low embodied carbon in new development and refurbishment schemes.

Policy EN5: Strategic Areas for low and zero carbon decentralised energy infrastructure

6.21 Within Manchester it is considered that the following strategic areas, indicated on the key diagram, will have a major role to play in achieving an increase in the level of decentralised, low and zero carbon energy supplies available:

- The Regional Centre, which also includes the Oxford Road Corridor and Eastlands

- District Centres and associated major development sites

- Airport Strategic Site

- Strategic housing location

- Strategic employment locations

6.22 Within these areas new development, regeneration, and retrofit projects, will be expected to take place in the context of more detailed proposals for decentralised low and zero carbon energy infrastructure in the form of energy proposals plans. The Council will work with all relevant stakeholders, which may include developers, landowners, residents, community groups, private sector partners, utilities companies, neighbouring authorities, and other public sector bodies, as appropriate, to bring forward such plans.

6.23 Where investment or development is being undertaken into or adjacent to a public building/asset or district heating network, full consideration shall be given to the potential role that these can have in providing an anchor load within a decentralised energy network or in creating opportunities for CO2 reduction funded by contributions.

Policy EN6: Target Framework for CO2 reductions from low or zero carbon energy supplies

6.24 The energy statement will be required to be submitted at the outset of any proposed development (outline application or before). Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO2 mitigation, subject to the energy statement incorporating evidence such as modelling to demonstrate compliance.

Policy EN8: Adaptation to Climate Change

6.25 All new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:

- Reduction in urban heat island effect through the use of Green Infrastructure such as green roofs, green walls, increased tree cover and waterways
- The need to control overheating of buildings through passive design

6.26 Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO2 mitigation under Policy EN6, subject to sufficient evidence to quantify their contribution to compliance.

Policy EN14: Flood Risk

6.27 In line with the risk-based sequential approach contained within PPS25, development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA).

6.28 In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25, an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA.

6.29 In CDAs, evidence to justify the surface water run-off approach / rates will be required.

6.30 The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will

be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.

Policy PA1: Developer Contributions

6.31 Where needs arise as a result of development, the Council will seek to secure planning obligations in line with Circular 5/2005, Community Infrastructure Levy regulations or successor regulations/guidance. Through such obligations, the Council may seek contributions for the following with priority assessed on a site by site basis:

- Affordable housing
- Education
- Health and wellbeing facilities
- Community facilities
- Provision of Green Infrastructure including open space
- Public realm improvements
- Protection or enhancement of cultural heritage
- Protection or enhancement of environmental value
- Safety and security improvements
- Training and employment initiatives
- Highway improvements, traffic management, sustainable transport and disabled people's access
- Climate change mitigation / adaptation
- Where development has a significant impact on the Strategic Road Network developer contributions would be sought through section 278 agreements.
- The nature and scale of any planning obligations sought will be related to the form of development and its potential impact upon the surrounding area. Where appropriate, any such provision will be required to be provided on site. Where this is not possible, a commuted sum payment is likely to be sought. In determining the nature and scale of any planning obligation, specific site conditions and other material considerations including viability, redevelopment of previously developed land or mitigation of contamination may be taken into account. The timing of provision of infrastructure and facilities will be carefully considered in order to ensure that appropriate provision is in place before development is occupied.
- These issues will be addressed in accordance with guidance in Strategic Regeneration Frameworks and local circumstances.

Greater Manchester Combined Authority, Places for Everyone Joint Development Plan (2024)

6.32 The plan contributes to the achievement of many of the United Nations Sustainable Development Goals and puts focus on how Greater Manchester will tackle climate change. Chiefly, it replaces some of the text within the Manchester Core Plan (2012) with more upto date requirements. Notably in respect of Policy EN 4, the Places for Everyone Joint Development Plan (2024) sets more stringent requirements in respect of energy and sustainability to respond to the declaration of a climate emergency and the net zero ambition.

6.33 The most significant planning policies are as follows:

- JP-S1: Sustainable Development - Which acts as an overarching framework policy to ensure the implementation of policies that directly address Greater Manchester's Vision for Climate Change.

- JP-S2: Carbon and Energy - Establishes de-carbonisation methods for new and existing developments with the aim or delivering net zero by 2038. These include operational energy targets and the promotion of assessing long term life cycle carbon impacts.

6.34 There is an expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable;

- Be net zero carbon which applies:
    - from adoption– to regulated operational carbon emissions;
    - from 2028 - to all emissions 'in construction'.

6.35 From 2025 development should also calculate and minimise carbon emissions from unregulated emissions alongside regulated emissions. Development proposals should set out how this has been achieved in an energy statement in accordance with the energy hierarchy, which in order of importance seeks to:

- Minimise energy demand;
- Maximise energy efficiency;
- Use renewable energy;
- Use low carbon energy; and
- Utilise other energy sources.

6.36 From 2025 any residual carbon emissions that cannot be fully mitigated on-site should be offset, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund. As an interim measure, development should be consistent with the 2022 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies.

6.37 Development will be expected to incorporate adequate electric vehicle charging points, in line with Part S of the Building Regulations, unless superseded by relevant Local Plan policies, to future proof

for the likely long-term demand, taking account of the potential maximum energy demand for the site;

6.38 Where practicable, development will prioritise connection to a renewable energy/heating/cooling network in the first instance or a low carbon energy/heating/cooling network that is adaptable to non-fossil fuels at a later date.

6.39 Residential developments will be expected to achieve energy demand reductions in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation.

6.40 For renewable energy generation priority should be given to PV installation where technically feasible, alternative technologies will be appropriate where the equivalent generation is evidenced.

6.41 Applications should include a detailed energy statement to demonstrate via site relevant evidence how the development has sought to maximize reductions in carbon emissions in line with relevant policy targets, including the minimisation of overheating risks and appropriate measures for post occupancy evaluation.

6.42 Whole life cycle emissions should be considered where possible. Districts may set out specific carbon emission reduction and energy demand targets within Local Plans.

JP-S3: Heat and Energy Networks

6.43 This policy encourages the connection of developments to district heating schemes, where they exist and is feasible to utilize them.

JP-S6: Resource Efficiency

6.44 This policy focuses on the shift towards a circular economy within the city.

6.45 This policy focuses on the shift towards a circular economy within the city.

Planning Guidance

6.46 Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022) assists Greenhouse gas (GHG) practitioners in assessing a development's emissions, climate change mitigation and reporting. It provides guidance on the evaluation of the significance of the Proposed Developments GHG emissions.

6.47 Environmental Impact Assessment Guide to Climate Change Resilience & Adaptation (2020) provides a framework for the effective consideration of climate change resilience and adaptation within the Environmental Impact Assessment process.

6.48 RICS guidance on Whole Life Carbon Assessment for the Built Environment, 2nd Edition (2023), sets out a recognised and standardised methodology for undertaking a Whole Life Carbon Assessment (WLCA). Following this guidance and methodology ensures this assessment is able to, as accurately as possible, examine the embodied, operation and whole life carbon of the Proposed Development.

6.49 British Standard BS EN15978:2011 (Sustainability of construction works – Assessment of environmental performance of buildings – Calculation method) is a European Standard for quantifying and reporting various environmental information of a building.

6.50 RIBA 2030 Climate Challenge - version 2 (2021), is a set of voluntary performance targets for Embodied Carbon, operational energy and water use. The targets have been developed to align with a challenging but possible trajectory needed to achieve a net zero carbon UK building stock by 2050.

6.51 UKNZCBS Pilot Version (2024), is a newly created set of carbon performance requirements for net zero carbon aligned buildings that could enable the UK real estate sector to stay within its share of the national carbon and energy budgets.

Assessment Methodology and Significance Criteria

Scenarios Tested

6.52 The baseline scenario for this assessment, in relation to climate change, is one where the Proposed Development does not proceed and the site remains as it is currently. This is due to the buildings currently on the Site being vacant and having no significant Green House Gas emissions associated with them, hence Scenario 1 (site in current state) is the baseline for this assessment.

6.53 Scenario 2 will be assessed, utilising the above methodologies, which comprises of the Baseline + the Proposed Development. Due to the cumulative impacts of climate change across the globe, assessing Scenario 3 (which is defined as Baseline + the Proposed Development + Type 2 cumulative effects) would present a more robust assessment. However, assessing the cumulative effect of the Proposed Development and all other future developments in the area on climate would not be feasible given the quantity of data and collaboration required. As such, the Climate Studies produced as part of this application will represent the Proposed Development only and will therefore assesses Scenario 2.

6.54 However, Type 1 cumulative effects will still be included in the assessment due to the nature of climate change and how effect significance is assessed within this discipline. Furthermore, there are multiple likely significant effects acting upon the 'Embodied Carbon emissions' receptor. These include:

- Emissions associated with the manufacture of construction materials, transport of materials to the construction site, on-sit works and the disposal; of construction waste (Life Cycle Stages A1-A5)
- Climate change as a result of the greenhouse gasses produced in operation (Life Cycle Sages B4-B5)
- Emissions associated with decommissioning, deconstruction and demolition (Life Cycle Stages C1-C4)

6.55 As such, interactions between these effects within the bounds of the development are possible. Therefore, the Type 1 cumulative effects (Effect interactions) have been included in order to wholly assess the climactic effects of the proposed development.

The Study Area

6.56 Given the receptor of the carbon emissions associated with the Proposed Development is the global climate, the study area is not limited by geographical area but encompasses any increase or decrease in GHG emissions as a result of the Proposed Development (IEMA, 2022).

Source of Effect

6.57 IEMA (2022) guidance for assessing greenhouse gas emissions confirms that the receptor should always be considered as sensitive given that the severity of the consequences of global climate and the fact that all emissions are part of a cumulative contribution to climatic change. This includes emissions associated with:

- Emissions associated with the manufacture of construction materials, transport of materials to the construction site, on-sit works and the disposal; of construction waste (Life cycle Stages A1-A5)
- Climate change as a result of the greenhouse gasses produced in operation (Life Cycle Sages B4-B5)
- Emissions associated with buildings' (operational) energy use (Life Cycle Stage B6)
- Emissions associated with decommissioning, deconstruction and demolition (Life Cycle Stages C1-C4)

6.58 This means that any GHG emissions from the Proposed Development, either through embodied or operational carbon emissions will contribute to climate change. This includes emissions of any GHG throughout all the lifecycle stages of the project either directly on site or indirectly through materials used in the Proposed Development or energy used in construction and operation.

Significance Criteria

6.59 IEMA 2nd Edition guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022) will be used as a basis for assessing the significance of both construction and operational impacts.

Receptors and receptor Sensitivity

6.60 Determining which receptors will likely be affected by a change caused by the Proposed Development presents a challenge with regards to GHG emissions. GHG emissions have a global effect and as such, identifying a specific receptor to attribute any effects to is not feasible. Therefore, IEMA (2022) recommends that the receptor of the effects resulting from the Proposed Development should be the global climate.

6.61 Furthermore, the global climate being the receptor of any likely significant GHG emissions from the development makes determining receptor sensitivity in the conventional way more difficult. Given the severity of the consequences of climate changes as well as their extent, i.e. worldwide, the IEMA guidance (2022) recommends that the receptor sensitivity should be determined as high.

Magnitude

6.62 Given that the sensitivity of the global atmosphere as a receptor is high and the severity of the potential impacts, examining the magnitude of the GHG emissions is not sufficient as the production of any amount of GHG's could produce a significant effect (IEMA, 2022). Therefore, we must assess the magnitude of GHG emissions in the context of how the Proposed Development is able to contribute towards achieving a net zero by 2050 trajectory.

Significance

6.63 IEMA (2022) provides 5 levels of GHG emissions significance which are determined not only based on if the project emits GHG's but also the relative significance of the emission towards the UK's net zero compatible trajectory. The levels of significance are listed below in Table 1.1.

6.64 To provide this context, we followed the IEMA (2022) guidance by using our professional judgement to determine how this could be done best. It was determined that comparison of the Embodied, Operational and Whole Life Carbon emissions with the RIBA Climate Challenge v2 (2021) would be most appropriate. This is because it will help determine if the Proposed development helps or hinders the shift to a UK net zero trajectory.

6.65 As such, the significance criteria for this assessment of the Proposed Development will be accordance with the RIBA Climate Challenge as described in Table 6.2

Table 6.2 Levels of significance as defined in IEMA guidance with inclusion of RIBA Climate Challenge v2 goals as examples

Level of significance	Description	Criteria for Assessing Impact significance
Major Adverse	The project's GHG impacts are not mitigated or are only compliant with regulatory minimum requirements. The project does not provide further reductions required by existing local and national policy. A major adverse project will not make a meaningful contribution to the UK's trajectory towards net zero.	The project's GHG emissions are in line with the 'Business as Usual' thresholds set out within the RIBA 2030 Climate Challenge.
Moderate Adverse	The project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.	The project's GHG emissions are in line with the '2025' targets set out within the RIBA 2030 Climate Challenge.
Minor Adverse	The project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.	The project's GHG emissions are in line with the '2030' targets set out within the RIBA 2030 Climate Challenge.
Negligible	The project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.	The project's GHG emissions exceed the '2030' targets set out within the RIBA 2030 Climate Challenge.

6.66 Table 6.3 provides the quantitative RIBA 2030 climate challenge boundaries utilised to determine significance.

Table 6.3 RIBA Climate Challenge (2021) target metrics for domestic/residential developments and associated IEMA aligned levels of significance.

Level of Significance	Operational Energy Target (RIBA, 2021) (kWh/m2/yr)	Embodied Carbon Target (RIBA, 2021) (KgCO2e/m2)
Major Adverse	120 - 60	1200 - 800
Moderate Adverse	< 60	< 800
Minor Adverse	≤ 35	≤ 625
Negligible	< 35	< 625

6.67 In line with the IEMA (2022) guidance, only Major adverse and Moderate adverse effects will be deemed significant. Therefore, effects that are Minor Adverse and Negligible will not be considered significant.

6.68 In addition to the above significance criteria, this assessment will compare the both the Upfront Embodied Carbon emissions and Operational Energy to newly established emission criteria in the form of the pilot version of the UK Net Zero Carbon Building Standard (2024). The limits are set out below in Table 6.4. However, it should be noted that as these comparisons do not determine significance as the standard is still only in the pilot phase. Nevertheless, the comparison to the pilot limits provides useful insight into how the Proposed Development aligns with new and future carbon standards.

Table 6.4 Table 6.3. UK Net Zero Carbon Building Standard (2024) Pilot Upfront Carbon and Operational Energy Limits.

Year	Operational Energy Limits for Flats (kWh/m2GIA/yr)	Upfront Carbon (A1-A5) Limits for Flats (KgCO2e/m2)
2025	40	565
2026	40	525
2027	40	490
2028	39	450
2029	39	420
2030	39	380

Baseline Conditions

6.69 The Baseline Scenario in relation to climate change is one where the Proposed Development does not proceed, and the site remains as it is currently.

6.70 The existing baseline for climate change resilience is set as the current climate environmental conditions in the location of the Proposed Development. Historic climate data obtained from the Met Office website (accessed September 2023) recorded by the closest meteorological station to the Proposed Development (Woodford Station) for the 30-year climate periods of 1981- 2010 and 1991-2020 is summarised in the below Table 6.5 and shows an increase in the average annual maximum daily temperature.

Table 6.5 Historic Climate Data Recorded by the Woodford Meteorological Station				
Climate Period	1981 – 2010		1991 – 2020	
Climatic Factor	Month	Figure	Month	Figure
Average annual maximum daily temperature (°c)	-	13.2	-	13.6
Warmest month on average (°c)	July	20.2	July	20.7
Coldest month on average (°c)	January	6.9	January	7.1
Mean annual rainfall levels (mm)	-	867.05	-	868.40
Wettest month on average (mm)	October	98.83	December	98.98
Driest month on average (mm)	February	51.46	March	52.53

6.71 The Met Office baseline climate averages for the NW England and N Wales District (Met Office website, accessed September 2023) identify gradual warming between 1961 and 2010. Information on mean maximum annual temperatures (°C) and average annual rainfall (mm) is summarised in the below Table 6.6.

Table 6.6 Historic Climate Data for the NW England and N Wales District		
Climate Period	Mean Maximum Annual Temperatures (°C)	Mean Annual Rainfall (mm)
1961 – 1990	11.75	1260.08
1971 – 2000	12.04	1274.77
1981 – 2010	12.35	1304.57
1991 – 2020	12.66	1337.87

6.72 UK Climate Projections published in 2018 (UKCP18) have been developed by the UK Climate Impacts Programme (UKCIP) to provide projections for future climate scenarios and trends. Table 6.7 below provides a summary of predications for summer and winter changes by the 2070s (Met Office, 2018).

Table 6.7 Future Climate Estimates Under a High Emissions Scenario (England)			
Summer Rainfall Change	Winter Precipitation Change	Summer Temperature Change	Winter Temperature Change
57% drier to 3% wetter	2% drier to 33% wetter	1.1°C warmer to 5.8°C warmer	0.7°C warmer to 4.2°C warmer

Identification and Evaluation of Likely Significant Effects

Construction Phase

6.73 The Proposed Development will generate GHG emissions during the construction phase which will be associated with manufacture and transport of construction materials, the on-site works,

disposal of construction waste as well as the demolition of the existing buildings on site and the disposal of the associated waste (i.e. Life Cycle Stages A1-A5). In addition, the Proposed Development will create GHG emissions during its end-of-life stages due decommissioning, deconstruction and demolition at the end of the buildings service-life (i.e. Life Cycle Stages C1-C4) which are related to the construction Phase emissions and material choices.

6.74 Table 6.8 provides the Embodied Carbon emissions associated with Life cycle Stages A1-A5 and C1-C4.

Table 6.8 Embodied Carbon emissions for the Proposed Development during the construction (A1-A5) and end-of-life project phases (C1-C4).

Project Life Cycle Stages	Embodied Carbon (tCO2e)	Embodied Carbon (kgCO2e/m2)
A1 - A5	16,481	501.04
C1 - C4	1,025	31.15

6.75 The Embodied Carbon emissions associated with the Proposed Developments construction phase have been estimated as approximately 16,481 tCO2e (501.04 kgCO2e/m2). In addition, the estimated GHG emissions associated with the end-of-life stage is approximately 1,025 tCO2e (31.15 kgCO2e/m2).

6.76 These values have been calculated using information provided by the design team and following RICS v2 (2023) guidance. Given the early design stage of this development, these quantities are estimates and likely to change as more accurate and complete data is available.

Operational Phase

6.77 The Proposed Development will emit GHGs during the operational phase through emissions associated with the buildings' operational energy use (Life Cycle Stage B6) and through embodied emissions as a result of maintenance, repair, replacement and refurbishment works (Life Cycle Stages B2-B5 i.e. In-use Phase). The emissions have been estimated and assessed separately.

6.78 The Embodied Carbon emissions associated with the In-use Phase of the Proposed Development was estimated by following the RICS v2 (2023) guidance and information provided by the design team. The estimated Embodied Carbon associated with the in-use phase was approximately 4,247 tCO2e (129.12 kgCO2e/m2), as seen in Table 6.9.

Table 6.9 Embodied Carbon emissions associated with the Proposed Developments In-use phase (B2-B5).

Life Cycle Stages	Embodied Carbon (tCO2e)	Embodied Carbon (kgCO2e/m2)
B2 - B5	4,247	129.12

6.79 The operational carbon emissions association with the Proposed Development was estimated using the Dwelling Primary Energy Rate (DPER) calculated by Futureserv who produced a preliminary SAP calculation. The DPER was estimated as 37.56 kWh/m2/yr. Table 6.10 provides annual operation energy use for the Proposed Development across the whole building.

Table 6.10 Annual operational energy use for the Proposed Development

Energy Consumption/DPER (kWh/m2/yr)	Proposed Development GIA (m2)	Total Annual operational energy of the Proposed Development (kwWh/yr)
37.56	32,893	1,235,461.08

6.80 The carbon emissions associated with the operational energy use over the whole life cycle (60 years) have been calculated based on the annual operational energy for the Proposed development in line with RICS v2 (2023). As per the RICS v2 (2023) guidance, the decarbonisation of the grid electricity whereby the UK grid will continue to get less carbon intensive into the future. These calculations were undertaken using carbon factors based on data published by the UK government.

6.81 The whole life operational carbon emissions from energy use are estimated to be 4,823 tCO2e (146.62 kgCO2e/m2) for the Proposed Development, as shown in Table 6.11.

Table 6.11 Whole Life Operational Carbon emissions associated with the Proposed Development (B6).

Life Cycle Stages	Embodied Carbon (tCO2e)	Embodied Carbon (kgCO2e/m2)
B6	4,823	146.62

Significance of effects

6.82 In order to assess the significance of the effects embodied and operational carbon generated by the Proposed Development, they will be compared to the RIBA Climate Challenge (2021) target metrics for domestic/residential developments (see Table 6.2). To address new carbon metrics and certifications, the Proposed Developments upfront and operational carbon emissions will be of compared to the established emission criteria in the form of the pilot version of the UK Net Zero Carbon Building Standard (2024) (see Table 6.3).

6.83 To assess the significance of the Whole life Embodied Carbon Emissions produced by the Proposed Development against the RIBA 2030 climate challenge targets (2021), the cumulative effects of the emissions associated with the demolition of the existing buildings as well as the Construction (Table 6.7), In-use (Table 6.8) and End-of-life (Table 6.7) stages of the Proposed Development must be calculated. Moreover, combined these figures make-up the Whole Life Embodied Carbon emissions as it includes Life cycle stage A1 - A5, B2 - B5 and C1 - C4.

6.84 The total whole life Embodied Carbon emissions for the Proposed Development were estimated as 661.32 kgCO2e/m2. When compared to the RIBA Climate Challenge 2030 target of <625 kgCO2e/m2 (Table 6.2), we can see that the current estimates are greater than the target. This means that the significance of effect of the Embodied Carbon emissions including the emissions from the demolition of the existing buildings as well as construction, in-use and end-of-life stages of the Proposed Development are likely to be Moderate Adverse.

6.85 The operational energy estimated to be used by the Proposed Development was 37.56 kWh/m2/yr. This exceeds the RIBA Climate Challenge 2030 target of 35 kWh/m2/yr. As such, the significance of effect for the operational carbon emissions is likely to be Moderate Adverse.

6.86 When compared to the UK Net Zero Carbon Building Standard (2024) pilot version emission criteria (Table 6.3) we can see that the Proposed Development's operational energy estimate meets the targets. In addition, the Proposed Developments Upfront Carbon (A1-A5) emissions of 501.04 kgCO2e/m2 meets the UK Net Zero Carbo Building Standard limit for 2025 and is only slightly over the 2027 limit. This shows that the Proposed Development is meeting the 2025 limits for what the pilot version of the UK Net Zero Carbon Building Standard considers a 'Net Zero Carbon Aligned Building'. It should be noted that currently, the UK Net Zero Carbon Building Standard (2024) does not yet contain limits for the In-use (B2-B5) and End-of-life (C1-C4) stages of the building.

Cumulative Effects

6.87 Scenario 2 will be assessed, which comprises of the Baseline + the Proposed Development. Due to the cumulative impacts of climate change across the globe, assessing Scenario 3 (which is defined as Baseline + the Proposed Development + Type 2 cumulative effects) would present a more robust assessment. However, assessing the cumulative effect of the Proposed Development and all other future developments in the area on climate would not be feasible given the quantity of data and collaboration required. As such, the Climate Studies produced as part of this application will represent the Proposed Development only and will therefore assesses Scenario 2.

6.88 However, Type 1 cumulative effects will still be included in the assessment due to the nature of climate change and how effect significance is assessed within this discipline. Furthermore, there are multiple likely significant effects acting upon the 'Embodied Carbon emissions' receptor. These include:

- Emissions associated with the manufacture of construction materials, transport of materials to the construction site, on-sit works and the disposal; of construction waste (Life Cycle Stages A1-A5)
- Climate change as a result of the greenhouse gasses produced in operation (Life Cycle Sages B4-B5)
- Emissions associated with decommissioning, deconstruction and demolition (Life Cycle Stages C1-C4)

6.89 As such, interactions between these effects within the bounds of the development are possible. Therefore, the Type 1 cumulative effects (Effect interactions) have been included in order to wholly assess the climactic effects of the proposed development.

Inter-relationships Between Impacts

6.90 The Embodied Carbon emission value for the Proposed Development is made up of GHG emissions from the construction, in-use and end-of-life phases for the project. In addition, the industry standards for assessing if a development is in line with the UK Net Zero compatible trajectory assesses against an Embodied Carbon metric. The combination of how Embodied Carbon is measured and assessed for significance means that it is inherently a Type 1 cumulative effect. Therefore, it has been assessed as such in this report and it has been determined that it is likely to be of moderate adverse significance.

Mitigation Measures

Construction Phase

6.91 At this early design stage of the Proposed Development, there are several key opportunities for reducing emissions based on this GHG assessment.

Material selections

6.92 The first and most significant opportunity to reduce Embodied Carbon emissions in the construction phase is through material selections. Each material specified and eventually installed on site will have Embodied Carbon implications across building life cycle stages A1-A5. By

specifying and procuring materials with a lower Embodied Carbon, the design team can actively reduce the Proposed Development's carbon emissions.

6.93 Whilst the materiality of the building's external appearance and structural strategies become fixed after this project phase, there are still ample of opportunities to design-out Embodied Carbon at the next design stages. This could be done through material efficiencies, which could be a key mitigation measure effective in reducing mass of material required to deliver the building to the specified performance requirement. This would need to be carried out at and during subsequent design phases up to tender.

6.94 Furthermore, focus could be given to product specification appraisal to lower the Embodied Carbon intensity of the specified products. This could be done through regular design team and engagement with the Carbon Consultant. Effectiveness of this mitigation measure would be realised through the extent of engagement and the extent of products included within specifications that have been directly influenced and informed by the Embodied Carbon appraisals undertaken.

6.95 The Whole Life Embodied Carbon Assessment completed at Stage 2 has identified key materials that contribute most significantly to both upfront Embodied Carbon up to practical (A1-A5), and whole-life Embodied Carbon (A1-A5, B1-B5, and C1-C4), which covers material replacements. These would form the focus of the Embodied Carbon mitigation strategies at next design stage, 2 examples are given here.

6.96 The first example of the potential materials considerations is the concrete structure. The majority of the Proposed Development's structure is reinforced concrete. Reinforced concrete is a carbon intensive material and as such efforts should be made to reduce its impact by considering the following:

- Specifying concrete mixes that feature agreed levels of cement replacement that can be practically implemented on site, without incurring unacceptable increases to the program. An example of this is Ground Granulated Blast-furnace Slag (GGBS) cement replacement which can significantly reduce Embodied Carbon, particularly on buildings that have a concrete frame.

- Specifying the use of recycled aggregates can be done up to 20% for many concretes. This can reduce the Embodied Carbon by limiting stage A1 emissions. However, the sustainability of this is dependent on local availability.

- The concrete reinforcement is also a significant contributor to Embodied Carbon and should be procured with the highest possible recycled content as is practically possible.

6.97 Decisions on the above considerations for the concrete framing will depend on availability for procurement, locality and strength considerations.

6.98 The second key example is glazing, which has been identified as a significant contributor towards upfront and whole-life carbon. The design team could work towards challenging the eventual glass contractor to utilise UK based glass manufacturers. This would not only minimise transport Embodied Carbon (stages A2 and A4) but could also engender the use of higher percentage recycled content within the panels. As such, leading to reductions in Embodied Carbon.

6.99 These options are also further explored in the Sustainability and Circularity report, appended to this document, and provide significant opportunity to contribute towards economic circularity whilst lowering Embodied Carbon.

Carbon Monitoring programme

6.100 In addition to the above, an overarching mitigation measure and combined monitoring programme could be undertaken. By completing Whole-life Carbon Assessments at later project stages and gateways, the carbon consultant will be able to more accurately assess the Proposed Developments Embodied Carbon. In addition, the Carbon Consultant will be able to conduct more specific material options and quantify any carbon savings as well as their contribution towards the Embodied Carbon mitigation. Monitoring the overarching effectiveness would be documented and reporting in Whole-life Embodied Carbon Assessment completed at key project stages and gateways.

6.101 Moreover, the overarching mitigation measure and monitoring strategy to engender the reduction of Embodied Carbon would be through Mainer Associates Embodied Carbon Work Package Procurement Mitigation Strategy.

6.102 This would begin once a Whole Life Carbon Assessment is conducted at tender stage. Once concluded, the resulting Embodied Carbon results for each building element and work package would be calculated. Using these results, the client would be consulted to agree and set out enforceable Embodied Carbon limits for the project. In addition, contractual Embodied Carbon limits for each work package and sub-contractor could be established. The established carbon limits would challenge the supply chain to remain within or better the Embodied Carbon allowance allocated to their package of works.

6.103 This strategy will also monitor the progress, performance, and effectiveness of the Embodied Carbon mitigation. This will be done through and agreed data collection method, which itself feeds into the Embodied Carbon Package Procurement mitigation strategy.

6.104 Sub-contractors will be obliged to submit data on their offered work packages to be processed by the Carbon Consultant and checked against their Embodied Carbon allowances. This process will allow Embodied Carbon performance to be monitored prior to materials being installed or procured. In addition, the process would support decision making as to which sub-contractors should be selected. Furthermore, this allows for more specific mitigation planning where offers are over the stipulated limits.

6.105 Once in construction and the supply chain is confirmed, the chosen sub-contractors would use the agreed upon data collection methods. This will allow the carbon consultant to update the data based on installed products and quantities, allowing the monitoring and understand of actual Embodied Carbon performance.

Operational Phase

6.106 There is potential for the mitigation of the GHG emissions during the Operational Phase within both In-Use Project Phase (Life cycle stages B1-5) and operational energy (B6)

6.107 Within the In-Use Project Phase, the replacement and repair of building materials are responsible for the majority of the carbon emissions. This can be mitigated in several ways. Similarly to the mitigation of Construction Phase Embodied Carbon Emissions, material selection can help reduce In-Use carbon emissions.

6.108 By prioritising materials with higher percentage recycled content, or more generally a lower Embodied Carbon content, the Proposed Development will be able to reduce the B4 (replacement) Embodied Carbon emissions. This is because when materials are replaced, their Embodied Carbon is doubled as the new material contains Embodied Carbon equal to what it is replacing. As such, the Embodied Carbon emissions will be reduced if a lower Embodied Carbon product is specified.

6.109 In addition, specifying materials with longer service lives will also reduce the In-Use Embodied Carbon Emissions. This means that materials require replacement less often over the Proposed Development lifecycle and as such, their specification will reduce the Whole-Life Embodied Carbon emissions of the Development.

6.110 Similarly to the Construction Phase, by completing Whole-life Carbon Assessments at later project stages and gateways the Carbon Consultant will be able to conduct more specific material options and quantify any carbon savings. The mitigation of Operational Energy carbon emissions is possible to some extent by ensuring the following. As detailed in The Energy and Environmental Standards Statement Prepared by Futureserv, the design has been developed in-line with the following Energy Hierarchy:

- Be Lean - Demand Reduction by adopting passive measures such as improved U-values and air tightness. In addition, ensuring G-values are appropriate for reducing heat gain and losses.
- Be Clean - Increase efficiencies across lighting, hot water, heat recovery and motors. In addition, utilizing combined natural and mechanical heat recovery ventilation systems.
- Be Green - Renewable Energy generation and Low/zero carbon energy generation should be adoption to reduce energy demand.

6.111 In addition to the high level Low/Zero carbon (LZC) technology assessment undertaken by Futureserv, a more specific assessment should be undertaken at later project phases. This would ensure that all potential LZC technologies are assessed for their potential use in the projects. In addition, it would assess the extent to which their deployment would help reduce operational carbon emissions.

6.112 By following this Energy hierarchy as the M&E designs continue to be developed, the Proposed Development will be able to potentially reduce its operational energy emissions.

Residual Effects

Construction Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Moderate Adverse impacts of GHG emissions produced during project construction phase (Life Cycle Stages A1-A5).	Embodied Carbon Emissions	Optimising material usage, specification of lower Embodied Carbon materials and/or where possible materials	Through Whole-life carbon assessments, material assessments and option appraisals across phases of the Proposed Development.	Minor Adverse - Permanent

		with high recycled content.	In addition, utilising the Mainer Associates Embodied Carbon Work Package Procurement Mitigation Strategy to ensure that Embodied Carbon limits are developed, set and adhered to throughout the project phases.	

Operational Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Moderate Adverse impacts of GHG emissions produced during the In-Use phase of the project (Life Cycle Stages B1-B5).	Embodied Carbon Emissions	Specifying materials with lower Embodied Carbon emissions and longer services lives.	Through Whole-life carbon assessments, material assessments and option appraisals across phases of the Proposed Development. In addition, utilizing the Mainer Associates Embodied Carbon Work Package Procurement Mitigation Strategy to ensure that Embodied Carbon limits are developed, set and adhered to throughout the project phases.	Minor Adverse - Permanent
Moderate Adverse impacts of GHG emissions produced by operational energy consumption (Life Cycle Stage B6).	Operational Energy Emissions	Installing energy efficient technology across the site and ensuring Low/Zero Carbon technologies are installed where possible.	Further developing the projects Energy designs in line with the Energy hierarchy to further lower the operational energy emissions of the development. Undertake more specific Low/Zero Carbon technology appraisal for the development.	Minor Adverse - Temporary

Monitoring

6.113 During the operational phase of the Proposed Development, monitoring energy use across the site should be undertaken. This will allow a carbon consultant to accurately assess the GHG emissions associated with energy consumption during the operation of the building as this may differ from estimates calculated at earlier stages. This operational energy monitoring would be done through a stringent metering and reporting strategy that was agreed with and verified by a carbon consultant, ensuring operational energy emissions are wholistic reported.

6.114 A monitoring programme such as this would enable the design team to ensure that the operational carbon emissions are below any committed to or contractually required rates. In addition, ensuring that the GHG emissions are below the RIBA 2030 targets and their effect significance as minor adverse or lower.

6.115 The Proposed Development could also make efforts to futureproof its movement towards being Net Zero Carbon. This could be done by planning for and aligning the Proposed Developments energy reporting strategy to the requirements of the pilot version of the UK Net Zero Carbon Building Standard (2023). The newly proposed standard sets stringent and verifiable requirements for the operational emissions of a development over a set length of time. Once this monitoring has been undertaken and requirements met, the building can be certified as a Net Zero Carbon compliant Building.

Reference List

6.116 This ES Chapter has been prepared in reference to the following:

Greater Manchester Combined Authority (GMCA), 2024: Places for Everyone Joint Development Plan Document for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan. Version Presented to Council meetings for Adoption with effect from 21 March 2024. Available at: https://www.greatermanchester-ca.gov.uk/media/9578/places-for-everyone-joint-development-plan-document.pdf

The Climate change act, 2008 (2050 Target Amendment) Order 2019, Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111187654.

Planning and Energy Act, 2008, Available at: https://www.legislation.gov.uk/ukpga/2008/21/contents.

The Carbon Plan: Delivering our low carbon future, 2011, Available at: www.gov.uk/government/publications/the-carbon-plan-reducing-greenhouse-gas-emissions--2.

National Planning Policy Framework, 2024, Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2National Planning Policy Framework, 2024, Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

IEMA (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2nd Edition. Available at: https://www.iema.net/preview-document/assessing-greenhouse-gas-emissions-and-evaluating-their-significance.

Royal Institution of Chartered Surveyors (RICS), 2023: Whole Life Carbon Assessment for the Built Environment, Professional Standard, Global, 2nd Edition. Royal Institute of Chartered Surveyors, London, UK. ISBN 978 1 78321 503 4.

Royal Institute of British Architects (RIBA), 2021: RIBA 2030 Climate Challenge - version 2. Royal Institute of British Architects, London, UK.

UK Net Zero Carbon Buildings Standard (UKNZCBS), 2024: Pilot version, Available at: https://www.nzcbuildings.co.uk/pilotversion.

IPCC, 2022: Annex II: Glossary [Möller, V., R. van Diemen, J.B.R. Matthews, C. Méndez, S. Semenov, J.S. Fuglestvedt, A. Reisinger (eds.)]. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 2897–2930, doi:10.1017/9781009325844.029

7. Daylight, Sunlight & Overshadowing

Introduction

7.1 This Chapter of the ES has been prepared by GIA and asseses the likely significant effects of the Proposed Development with respect to daylight and sunlight. This chapter also describes the methods used to assess the effects; the baseline conditions against which the assessments have been undertaken; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.

7.2 This Chapter is accompanied by the following appendices:

- Appendix 7.1 – Drawings of the Baseline and Proposed Assessment Scenarios;
- Appendix 7.2 – Daylight and Sunlight Results for Baseline v Proposed;
- Appendix 7.3 - Overshadowing Results for Baseline v Proposed;
- Appendix 7.4 – Drawings of the Baseline and Proposed + Cumulatives Assessment Scenarios;
- Appendix 7.5 – Daylight and Sunlight Results for Baseline v Proposed + Cumulatives; and
- Appendix 7.6 - Overshadowing Results for Baseline v Proposed + Cumulatives.

7.3 The authors of this Chapter have the following qualifications and experience:

Table 7.1 **Technical Competence in Daylight, Sunlight & Overshadowing**

	Lead Author	Reviewer
Name	Nicola Hensey	Michael Beatty
Company	GIA	GIA
Qualifications/Accreditations relevant to technical area	LLB (Hons)	BSc (Hons) MRICS
Does the practitioner hold any IEMA qualification?	No	No
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	16	10
Number of EIA's delivered to date	32	16

Assumptions and Limitations

7.4 Where actual room layouts were available on the planning portal, these have been considered in regard to the modelling of the internal layouts within the existing surrounding properties. Where layout information was not available, assumptions have been made as to the use and internal configuration of the rooms (from external observations during a site inspection) behind the fenestration observed.

7.5 In such cases a standard 4.2 metre (m) (14ft) room depth has been assumed, unless the building form dictated otherwise. This is common practice where access to buildings for surveying is unavailable. Obtaining these room layouts enables precise evaluation of the diffuse levels of daylight within each of the rooms via the NSL.

7.6 Floor levels have been assumed for adjoining properties assessed, where access has not been obtained. This dictates the level of the working plane which is relevant for the NSL assessments.

Relevant Legislation, Policy and Guidance

Legislation

7.7 There is no legislation that governs daylight and sunlight, with the criteria for assessment relating to daylight and sunlight covered by national and local policy in addition to BRE guidance as set out below.

National Planning Policy

National Planning Policy Framework (2024)

7.8 The National Planning Policy Framework 2024 stipulates at paragraph 130 (c) that:-

"Local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)".

Planning Practice Guidance - Effective Use of Land

7.9 The Planning Practice Guidance (PPG) – Effective Use of Land, published on 22 July 2019 and regularly updated as a 'live' resource, Paragraph: 006 Reference ID: 66-006-20190722 states that:

"Where a planning application is submitted, local planning authorities will need to consider whether the Proposed Development would have an unreasonable impact on the daylight and sunlight levels enjoyed by neighbouring occupiers, as well as assessing whether daylight and sunlight within the development itself will provide satisfactory living conditions for future occupants."

7.10 Paragraph 007 Reference ID: 66-007-20190722 also states:

"All developments should maintain acceptable living standards. What this means in practice, in relation to assessing appropriate levels of sunlight and daylight, will depend to some extent on the context for the development as well as its detailed design. For example, in areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings."

Local Planning Policy

Manchester Core Strategy (2012 – 2027)

7.11 Policy DM1 – Development Management – States that all developments should have regard to the effects on amenity including privacy, light, noise, vibration, air quality and odours.

7.12 Policy EN2 – Tall Buildings – States that, by their very size, tall buildings can have a significant impact on the local environment and its micro-climate. It is therefore expected that this impact be modelled and that submissions for tall buildings also include appropriate measures to create an attractive, pedestrian friendly local environment.

Guide to Development in Manchester Supplementary Planning Document and Planning Guidance (Adopted April 2007)

7.13 The SPD sets out a series of design principles which should be considered and implemented where necessary, those measures relevant to this assessment are:

- Minimise reliance on energy-using equipment for heating, cooling, lighting and natural ventilation.
- Site layout and building design principles should maximise the capture and use of daylight and passive solar energy, whilst avoiding excessive solar gain in the summer.

Guidance

Building Research Establishment (BRE) 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice', Third Edition, 2022

7.14 The Building Research Establishment (BRE) Guidelines 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2022, 3rd edition' provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. It is intended for use by building designers, developers, consultants and Local Planning Authorities (LPAs). The advice it gives is not mandatory and should not be used as an instrument of planning policy, it states:

"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."

7.15 It also states:

"The advice is 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. 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" (para.1.6).

7.16 In addition, the BRE Guidelines state (para. 1.3) that:

"…it is intended to be read in conjunction with the interior daylighting recommendations in BS EN 17037 Daylighting in Buildings, and in the CIBSE publication LG 10 Daylighting – a guide for designers".

Assessment Methodology and Significance Criteria

Scenarios Tested

7.17 The following scenarios have been assessed and are reported within this Chapter:

- Existing Baseline (Site as it is today);
- Existing Baseline with Proposed Development; and
- Existing Baseline with Proposed Development + Cumulatives

The Study Area

7.18 The BRE Guidelines suggest that residential properties have the highest requirement for daylight and sunlight and states that:

"the guidelines are intended for use for rooms in adjoining dwellings where light is required, including living rooms, kitchens and bedrooms."

7.19 The scope of residential properties and areas of amenity space that have been assessed has been determined through professional judgement, considering their orientation and proximity to the Proposed Development.

7.20 The following properties are defined as receptors and will be considered due to their proximity to the Site, and their use:

- Hill Quays
- Riverside Mews
- The Rhine
- The Nile
- 30 City Road East
- 14 Albion Wharf
- The Hacienda
- 326-330 Deansgate
- The Ropeworks
- 21 Little Peter Street
- 8-16 Bridgewater St
- 20 Southern St
- 18-12 Southern St
- 8-10 Southern St
- Deansgate Quay
- 357-361 Deansgate
- Ropeworks Apartments Block 1
- Lumiere Building

- The Danube
- Axis Tower
- Viadux - Phase 1
- Beetham Tower Residential
- StayCity Aparthotel, Deansgate

7.21 These properties are identified in the drawings contained at Appendix 7.1.

7.22 The only areas relevant for assessment in overshadowing terms is the Deansgate Locks Social Terrace and the canal and towpath which are identified in the drawings contain in Appendix 7.3

7.23 The assessment has considered other residential properties and areas of amenity space which may have a view of the completed Proposed Development but, due to the distance and orientation from the Proposed Development, their daylight and sunlight amenity levels are unlikely to be adversely affected. They have not, therefore, been assessed in detail.

Source of Effect

7.24 The assessment of daylight and sunlight effects is based principally on the amount of visible sky before and after the construction of a new development.

7.25 The Building Research Establishment (BRE) recommends the following assessment methodologies:

- Daylight
- Vertical Sky Component (VSC); and
- No Sky Line (NSL) Method.
- Sunlight
- Annual Probable Sunlight Hours (APSH).
- Overshadowing
  - Sun Hours on Ground (SHOG).

7.26 The technical analyses carried out to inform the daylight, sunlight and overshadowing assessments have been undertaken by creating a digital three-dimensional (3D) model of the existing Site and Proposed Development.

7.27 The 3D model uses Waldram Diagrams to establish the VSC and 3D geometric calculations for daylight distribution (NSL).

Daylight

Vertical Sky Component (VSC)

7.28 The VSC method of assessment is defined in the BRE Guidelines as the:

"ratio of that part of illuminance at a point on a given vertical plane that is received directly from a CIE standard overcast sky, to illuminate on a horizontal plane due to an unobstructed hemisphere of this sky".

7.29 This ratio is the percentage of the total unobstructed view that is available, once obstructions (e.g. the Proposed Development), are placed in front of the point of view.

7.30 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. The VSC has been calculated using a 'Waldram Diagram'.

7.31 The Waldram Diagram is effectively a snapshot taken from that point of the sky in front of the window, together with all relevant obstructions to it, i.e. the buildings. For calculation purposes, trees may be ignored unless they form dense continuous belts.

7.32 Due to the limitations of peripheral vision, the maximum VSC value is almost 40% for a completely unobstructed vertical wall or window. In terms of assessment criteria, the BRE Guidelines state that:

7.33 Paragraph 2.2.7 of the BRE Guidelines states:-

"If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. This value of VSC typically supplies enough daylight to a standard room…If the VSC, with the new development in place, is both less than 27% and less than 0.80 times its former value, occupants of the existing building will notice the reduction in the amount of skylight."

No Sky Line (NSL)

7.34 The BRE Guidelines provide that where room layouts are known, the effect on the daylight distribution can be calculated by plotting the NSL. In terms of the surrounding receptors, it has not been possible to obtain room layouts for all of the properties and therefore layouts have been assumed where information is not available.

7.35 The NSL method is a measure of the distribution of daylight at the 'working plane' within a room. The 'working plane' means a horizontal 'desktop' plane 0.85m in height for residential properties.

7.36 Paragraph 2.2.10 of the BRE Guidelines states:-

"Where room layouts are known…the impact on the daylighting distribution in the existing building should be found by plotting the no sky line in each of the main rooms…The no sky line divides points on the working plane which can and cannot see the sky"

7.37 Paragraph 2.2.11 of the BRE Guidelines states:-

"If, following construction of a new development, the no sky line moves so that the area of the existing room, which does receive direct skylight, is reduced to less than 0.80 times its former value this will be noticeable to the occupants…"

7.38 Paragraph 2.2.11 therefore implies that an NSL of at least 80% would be considered satisfactory.

7.39 Paragraph 2.2.12 of the BRE Guidelines states:-

"If an existing building contains rooms lit from one side only and greater than 5m deep, then a greater movement of the no sky line may be unavoidable."

Diffuse Daylight

7.40 Paragraph 2.2.23 of the BRE Guidelines states:-

"…the diffuse daylighting of the existing building may be adversely affected…if either:

- the VSC measured at the centre of an existing main window is less than 27%, and less than 0.80 times its former value
- the area of the working plane in a room which can receive direct skylight is reduced to less than 0.80 times its former value."

7.41 This assessment process is summarised in Figure 20 of the BRE Guidelines, Decision Chart: diffuse daylight in existing buildings, which can be seen in Figure 9.1

Sunlight

Annual Probable Sunlight Hours (APSH)

7.42 Sunlight is measured using a sun indicator which contains 100 spots, each representing 1% of APSH. Therefore, where no obstruction exists the total annual probable sunlight hours for Manchester would amount to1392 hours, and each spot equates to 13.92 hours of the total annual sunlight hours.

7.43 The number of spots is calculated for the Baseline and Proposed Development scenarios during the year and also during the winter period, and a comparison made between the two. This provides a percentage of APSH for each of the time periods for each window assessed.

7.44 Paragraph 3.2.3 of the BRE Guidelines states:-

"To assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south…Normally loss of sunlight need not be analysed to kitchens and bedrooms, except for bedrooms that also comprise a living space, for example a bed sitting room in an old people's home"

7.45 Regarding existing surrounding receptors, the BRE Guidelines provide that a window may be adversely affected if a point at the centre of the window receives less than 25% of the APSH, including at least 5% of the APSH during the winter months (21 September to 21 March), or less than 0.8 times its baseline sunlight hours during either period, or if there is a reduction in total APSH which is greater than 4%.

7.46 As is often the case, it is not possible to determine the room uses within each of the neighbouring properties, nor is it clear which window should be considered as the 'main windows'. Therefore, unless the rooms use is known through plans, all the rooms with windows facing the Site and within 90 degrees of due south have been considered in the assessment.

Overshadowing

Sun Hours on Ground (SHOG)

7.47 The method for assessing SHOG is the 'sun-on-ground indicator'. The assessment applies to both to new and existing gardens/amenity areas, which are affected by new developments. The BRE Guidelines suggest that the Spring Equinox (21st March) is a suitable date for the assessment. Using specialist software, the path of the sun is tracked to determine where the sun would reach the ground and where it would not.

7.48 The BRE Guidelines recommend that at least half of a garden or 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).

Summary of Criteria for Daylight and Sunlight

7.49 The following table provides a summary of the criteria set out within the BRE Guidelines for daylight, sunlight and overshadowing.

Table 7.2 Summary of Daylight, Sunlight and Overshadowing Assessment Criteria

Method	BRE Assessment Criteria
VSC	A window may be adversely affected if its VSC measured at the centre of the window is less than 27% and less than 0.8 times is former value.
NSL	A room may be adversely affected if the daylight distribution (NSL) is reduced beyond 0.8 times its existing area.
APSH	A window may be adversely affected if a point at the centre of the window received for the whole year, less than 25% of the APSH including at least 5% of the APSH during the winter months (21 September to 21 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 total APSH which is greater than 4%.
SHOG	An area of outdoor amenity space may be adversely affected if less than 50% of its total area is unable to benefit from at least 2 hours of sunlight on 21st March and if the reduction in sunlight is greater than 20% of the baseline level.

Significance Criteria

Daylight and Sunlight

7.50 For daylight and sunlight, the BRE Guidelines outline the approach within the accompanying Appendix H. In terms of assigning significance criteria to assess the effects, Appendix H states th4e following:

"Adverse impacts occur when there is a significant decrease in the amount of skylight and sunlight 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."

"Where the loss of skylight or sunlight 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 or limited area of open space 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 or open space are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space."

"Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse. 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 or sunlight;*
- *The affected building only has a low level of requirement for skylight or sunlight; and*
- *There are particular reasons why an alternative, less stringent, guideline should be applied.*

7.51 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 or sunlight, e.g. a living room in a dwelling".*

7.52 Beneficial impacts occur when there is a significant increase in the amount of skylight and sunlight reaching an existing building. Beneficial impacts should be worked out on the same principals as adverse impacts.

7.53 The BRE Guidelines do not provide any guidance on what constitutes a moderate adverse impact. Best practice guidance and professional judgment will be used to determine any impacts based on the guidance set out in Appendix H of the BRE Guidelines. Potential effects will be identified as beneficial, adverse, or negligible, and their magnitude of effects will be set out as Minor, Moderate and Major.

7.54 The initial numerical criteria for determining the magnitude of change are based on percentage alterations, as follows:

Table 7.3 Daylight and Sunlight Magnitude of Change

Magnitude	Percentage Alteration from Baseline
Negligible	0-20%
Minor	20.1%-30%
Moderate	30.1%-40%
Major	40%+

7.55 Appendix F of the BRE guidelines provides an alternate baseline VSC value for city centre regions of 18% rather than the 27% referenced through the body of the document which is the level of VSC to be expected in an environment where the neighbouring construction angle is around 25 degrees i.e. a more suburban location.

7.56 18% is 67% of 27%. 67% of the BRE target value for NSL (80%) is 53.6% Therefore, as the Proposed Development is in a more urban location, if the changes in VSC and/or NSL should breach the standard BRE guidelines beyond a minor extent, the magnitude of change is still considered to be of minor significance provided that the windows either experience no change or retain 18% VSC and the rooms retain at least 53.6% NSL.

Sensitivity of Identified Daylight & Sunlight Receptors

7.57 It is important that the location and nature of the Site and surrounding are considered when determining the significance of any impacts identified. The BRE Guide is very clear that the targets provided are not mandatory. The location of the development could be deemed to be special circumstances in which the planning authority may wish to use different target values. This scope

and view should also be followed through to the sensitivity of the surrounding receptors. There should be an expectation that a higher degree of obstruction is inevitable in an area with modern high-rise buildings. This point is also made in the NPPF and NPPG.

7.58 For these reasons, the surrounding receptors may have a lower sensitivity to change in an urban location than those located in suburban, less dense areas. Sensitivity classification is assigned on how the proposed receptor is able to accommodate or adapt to the effect of the development. The existing residential receptors surrounding the Site are in a developing city centre location where there is an expectation for a higher density of development. The Site is currently undeveloped. As such, the Site is underdeveloped given the dense, urban location, and the surrounding receptors are therefore receiving higher levels of daylight and sunlight than would typically be expected in a city centre location.

7.59 All of the daylight and sunlight sensitive receptors are therefore considered to be of medium sensitivity.

Significance of Daylight & Sunlight Effects

7.60 The significance of any identified environmental effects is determined by the assessment of their magnitude against their sensitivity. The table below illustrates how the sensitivity of the receptors and the magnitude of any effect combine to confirm significance.

Table 7.4 Daylight and Sunlight Significance of Effect

Magnitude	Sensitivity		
	High	Medium	Low
Major	Major Adverse / Beneficial*	Major Adverse / Beneficial*	Moderate-Minor Adverse / Beneficial
Moderate	Moderate Adverse / Beneficial*	Moderate Adverse / Beneficial*	Minor Adverse / Beneficial
Minor	Moderate-Minor Adverse / Beneficial	Minor Adverse / Beneficial	Minor-Negligible
Negligible	Negligible	Negligible	Negligible
Key	* Significant in terms of EIA regulations		

7.61 When assigning significance criteria for daylight and sunlight effects, professional judgement has been used. Consideration has been given to the proportion of rooms/windows affected, as well as the percentage alterations, absolute changes, sensitivity of the receptor, and any other relevant factors. There may be mitigating factors such as location and nature of development, balconies, overhangs, or design features which may also affect the determination of assigning the criteria.

Significance of Effects in Context to the Locality

7.62 The context of the Site and surrounding area is key to understanding the sensitivity of the surrounding receptors and significance of daylight and sunlight effects.

7.63 It is well established that the published targets within the BRE Guide are based on low rise, suburban development. The PPG – Making Effective Use of Land - Paragraph 007 Reference ID: 66-007-20190722 states:

"All developments should maintain acceptable living standards. What this means in practice, in relation to assessing appropriate levels of sunlight and daylight, will depend to some extent on the context for the development as well as its detailed design. For example, in areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings."

7.64 This is a key point to consider in respect of the Proposed Development and its impact on surrounding properties, particularly as it is situated in Manchester City Centre. The Manchester Core Strategy 2012-2027 sets out development principles for the city centre in Policy CC 6 (p60), which states the following:

"City Centre development will generally be high-density. It is a location where land should be used to its maximum efficiency. The appropriate scale, massing and height of development in the City Centre will significantly exceed what is appropriate elsewhere in the City."

7.65 This approach is also acknowledged in the BRE Guide, which states:

"…in special circumstances the developer or planning authority may wish to use different target values… in a historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings".

7.66 It would therefore be unrealistic for the surrounding residential properties to expect to maintain similar levels of daylight as those currently experienced, as the Site is currently relatively undeveloped.

Baseline Conditions

Daylight and Sunlight

7.67 In accordance with the scoping agreed with MCC, the Existing Baseline assumes the completion of the following currently under construction buildings in view of their proximity to the Site:

- Viadux 1 residential tower (assessed);
- Staycity Deansgate (assessed);

7.68 Drawings of this assessment scenario can be found in Appendix 7.1.

7.69 A total of 2717windows facing the Site serving 1430 rooms within 22 buildings were assessed for VSC and NSL (daylight) and 625 rooms containing a living room element were assessed for APSH (sunlight) within the 20 buildings which are material for consideration in sunlight terms i.e. their windows are orientated to within 90 degrees of due south.

7.70 The full Baseline daylight and sunlight results can be found in Appendix 7.2 and are summarised in Table 7.5 below.

Table 7.5 Baseline levels of VSC, NSL & APSH within the surrounding sensitive receptors

Address	Total No. Windows That Meet VSC Criteria		Total No. Rooms That Meet NSL Criteria		Total No. Rooms That Meet APSH Criteria	
	Total	Pass	Total	Pass	Total	Pass
Hill Quays	192	55	95	69	59	24
Riverside Mews	47	17	33	19	2	0
The Rhine	83	14	62	50	14	0
The Nile	183	36	127	75	25	8
30 City Road East	36	6	33	15	0	0
14 Albion Wharf	8	4	7	4	0	0
The Hacienda	127	71	61	57	32	24
326-330 Deansgate	8	2	2	2	2	2
The Ropeworks	20	2	8	8	0	0
21 Little Peter Street	43	10	22	16	3	3
8-16 Bridgewater St	13	1	8	8	5	5
20 Southern St	11	2	9	4	9	9
18-12 Southern St	9	0	6	0	5	5
8-10 Southern St	12	4	6	2	2	2
Deansgate Quay	81	25	43	42	17	12
357-361 Deansgate	44	21	36	20	5	1
Ropeworks Apartments Block 1	208	13	88	62	8	4
Lumiere Building	130	52	89	53	10	8
The Danube	101	7	74	22	13	0
AXIS TOWER	318	300	262	245	131	128
Viadux - Phase 1	342	341	152	152	76	76
Beetham Tower Residential	279	203	105	96	105	105
StayCity Aparthotel, Deansgate	422	249	102	98	102	102
TOTALS	2717	1435	1430	1119	625	518

7.71 Out of the 2717 windows assessed for VSC skylight, 1435 (53%) meet or exceed the BRE recommended criteria. For NSL, 1119 (78%) of the 1430 rooms assessed meet the BRE recommended criteria. For sunlight, 518 (89%) of the 625 rooms assessed meet the BRE criteria for both Winter and Annual APSH.

Overshadowing

7.72 The full Baseline overshadowing results can be found in Appendix 7.3 and are summarised in Table 7.6 below.

Table 7.6 Baseline levels of SHOG within the surrounding sensitive receptors

Area Name	Area benefitting from 2 hours of SHOG on 21st March	Meets SHOG Criteria?
Deansgate Locks Social Terrace	98.82%	Yes
Canal and Towpath Area 1	44.01%	No
Canal and Towpath Area 2	45.33%	No

7.73 Overall, there is a reasonable level of baseline daylight, sunlight and overshadowing compliance considering the city centre context of the Site and the height and density in the immediate locality.

7.74 If the Proposed Development was not constructed, the baseline daylight, sunlight and overshadowing levels would remain the same as there are no 'natural' factors that would influence baseline conditions, only human induced changes (i.e., development). The Site is, however, seen as a redevelopment opportunity and so, in reality, it would be unlikely for the baseline to remain as it is indefinitely. With respect to human induced changes, any development of the Site could influence the baseline conditions of varying degrees, as any drivers for change in baseline conditions would be linked to massing and layout of the surrounding context.

Identification and Evaluation of Likely Significant Effects

Construction Phase

7.75 Owing to the evolving and changing nature of construction activities, the assessment of potential effects during construction of the Proposed Development on daylight, sunlight and overshadowing to surrounding properties and areas of amenity space have not been modelled.

7.76 Since the potential daylight, sunlight and overshadowing effects relating to construction works will vary throughout the construction programme and gradually increase to the potential effects identified for the completed Proposed Development, the interim construction effects will not be assessed quantitatively as it is considered that the completed Proposed Development represents the worst-case assessment in terms of likely daylight and sunlight.

7.77 During the construction phase, the daylight, sunlight and overshadowing effects will gradually change from negligible in the baseline position to that described below in the Operational Phase with the Proposed Development in place. For these reasons, the Construction Phase will not be discussed further in this report.

Operational Phase

Daylight & Sunlight

7.78 The outputs of the computer modelling for both daylight and sunlight is provided in full within Appendix 7.2, with the key metrics provided in Tables 7.7 to 7.10 below.

7.79 The breakdown of the Existing Baseline results compared to the Proposed Development for each of the individual buildings forming part of this assessment are discussed in more detail below.

Table 7.7 Summary of VSC Results

Address	Total No. of windows	No. of windows that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
Hill Quays	192	160	24	7	1
Riverside Mews	47	47	0	0	0
The Rhine	83	82	1	0	0
The Nile	183	180	3	0	0
30 City Road East	36	36	0	0	0
14 Albion Wharf	8	7	0	1	0
The Hacienda	127	127	0	0	0
326-330 Deansgate	8	8	0	0	0
The Ropeworks	20	9	2	8	1
21 Little Peter Street	43	10	29	3	1
8-16 Bridgewater St	13	13	0	0	0
20 Southern St	11	11	0	0	0
18-12 Southern St	9	9	0	0	0
8-10 Southern St	12	12	0	0	0
Deansgate Quay	81	81	0	0	0
357-361 Deansgate	44	40	1	1	2
Ropeworks Apartments Block 1	208	123	64	18	3
Lumiere Building	130	130	0	0	0
The Danube	101	100	1	0	0
AXIS TOWER	318	318	0	0	0
Viadux - Phase 1	342	322	20	0	0
Beetham Tower Residential	279	279	0	0	0

Address	Total No. of windows	No. of windows that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
StayCity Aparthotel, Deansgate	422	412	10	0	0
TOTALS	2717	2516	155	38	8

Table 7.8 Summary of NSL Results

Address	Total No. of Rooms	No. of rooms that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
Hill Quays	95	91	4	0	0
Riverside Mews	33	33	0	0	0
The Rhine	62	62	0	0	0
The Nile	127	126	1	0	0
30 City Road East	33	33	0	0	0
14 Albion Wharf	7	7	0	0	0
The Hacienda	61	61	0	0	0
326-330 Deansgate	2	2	0	0	0
The Ropeworks	8	8	0	0	0
21 Little Peter Street	22	20	2	0	0
8-16 Bridgewater St	8	8	0	0	0
20 Southern St	9	9	0	0	0
18-12 Southern St	6	6	0	0	0
8-10 Southern St	6	6	0	0	0
Deansgate Quay	43	43	0	0	0
357-361 Deansgate	36	34	0	0	2
Ropeworks Apartments Block 1	88	87	1	0	0
Lumiere Building	89	89	0	0	0
The Danube	74	71	3	0	0
AXIS TOWER	262	262	0	0	0
Viadux - Phase 1	152	152	0	0	0
Beetham Tower Residential	105	105	0	0	0

Address	Total No. of Rooms	No. of rooms that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
StayCity Aparthotel, Deansgate	102	102	0	0	0
TOTALS	1430	1417	11	0	2

Table 7.9 Summary of Annual Sunlight Results

Address	Total No. of rooms	No. of rooms that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
Hill Quays	59	59	0	0	0
Riverside Mews	2	2	0	0	0
The Rhine	14	14	0	0	0
The Nile	25	25	0	0	0
The Hacienda	32	32	0	0	0
326-330 Deansgate	2	2	0	0	0
The Ropeworks	0	0	0	0	0
21 Little Peter Street	3	3	0	0	0
8-16 Bridgewater St	5	5	0	0	0
20 Southern St	9	9	0	0	0
18-12 Southern St	5	5	0	0	0
8-10 Southern St	2	2	0	0	0
Deansgate Quay	17	17	0	0	0
357-361 Deansgate	5	5	0	0	0
Ropeworks Apartments Block 1	8	8	0	0	0
Lumiere Building	10	10	0	0	0
The Danube	13	13	0	0	0
AXIS TOWER	131	131	0	0	0
Viadux - Phase 1	76	76	0	0	0
Beetham Tower Residential	105	105	0	0	0
StayCity Aparthotel, Deansgate	102	102	0	0	0

Address	Total No. of rooms	No. of rooms that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
TOTALS	625	625	0	0	0

Table 7.10 Summary of Winter Sunlight Results

Address	Total No. of rooms	No. of rooms that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
Hill Quays	59	59	0	0	0
Riverside Mews	2	2	0	0	0
The Rhine	14	14	0	0	0
The Nile	25	25	0	0	0
The Hacienda	32	32	0	0	0
326-330 Deansgate	2	2	0	0	0
The Ropeworks	0	0	0	0	0
21 Little Peter Street	3	3	0	0	0
8-16 Bridgewater St	5	5	0	0	0
20 Southern St	9	9	0	0	0
18-12 Southern St	5	5	0	0	0
8-10 Southern St	2	2	0	0	0
Deansgate Quay	17	17	0	0	0
357-361 Deansgate	5	5	0	0	0
Ropeworks Apartments Block 1	8	8	0	0	0
Lumiere Building	10	10	0	0	0
The Danube	13	13	0	0	0
AXIS TOWER	131	131	0	0	0
Viadux - Phase 1	76	76	0	0	0
Beetham Tower Residential	105	105	0	0	0
StayCity Aparthotel, Deansgate	102	102	0	0	0
TOTALS	625	625	0	0	0

7.80 In situations where the construction of the Proposed Development would result in VSC, NSL and APSH alterations to the windows and rooms within a property which are all within the BRE guidelines, the effect of the Proposed Development upon the daylight and sunlight amenity to that property is considered to be negligible.

7.81 Of the 22 properties assessed, the effect of the Proposed Development upon the daylight and sunlight amenity within the 12 properties listed within Table 7.11 would be negligible (not significant).

Table 7.11 Properties with a Negligible Daylight and Sunlight effect

Properties with a Negligible Daylight and Sunlight effect	
Riverside Mews	18-12 Southern St
30 City Road East	8-10 Southern St
The Hacienda	Deansgate Quay
326-330 Deansgate	Lumiere Building
8-16 Bridgewater St	Axis Tower
20 Southern St	Beetham Tower Residential

7.82 In accordance with the significance criteria described above, the effect upon the daylight amenity within the below properties is considered to be minor adverse (not significant). The sunlight effect upon these properties is negligible (not significant)

- The Rhine
- The Nile
- The Danube
- Viadux Phase 1
- StayCity Aparthotel, Deansgate

7.83 The remaining five properties are discussed in detail below:-

Hill Quays

7.84 A total of 192 windows serving 95 rooms were assessed for daylight within this building.

VSC

7.85 160 (83%) of the 192 windows assessed would meet the BRE's criteria and so experience a negligible magnitude of VSC change.

7.86 Based on the initial numerical criteria for determining the magnitude of change detailed in Table 7.2, the magnitude of VSC change to 24 (13%) of the 32 affected windows is minor. The magnitude of VSC change to seven (4%) of the remaining eight affected windows is moderate. The magnitude of VSC change to the remaining room is major.

7.87 The window which experiences a major magnitude of VSC change has a very low baseline value. The 0.1% absolute VSC change therefore disproportionately presents itself as a major magnitude of percentage of baseline change when, in reality, the change is unlikely to be noticeable.

7.88 With the exception of one window which achieves 27.8%, the baseline VSC values of the remaining seven windows are all below the BRE recommended 27% (5.8 % to 24.7%) and so the small (1.9% to 8.4%) absolute VSC changes disproportionately present themselves as moderate magnitude of percentage of baseline changes.

7.89 In view of the small number of windows affected beyond a minor extent (5%) and the small absolute VSC changes that they will experience with the Proposed Development in place, the overall VSC effect upon the windows in this property is considered to be minor adverse (not significant)

NSL

7.90 91 (96%) of the 95 rooms assessed would meet BRE's criteria and so experience a negligible magnitude of NSL change.

7.91 The magnitude of NSL change to the remaining four (4%) rooms is minor.

7.92 The overall NSL effect upon the rooms within this property is considered to be minor adverse (not significant)

Diffuse Daylight

7.93 Any changes in diffuse daylight (VSC & NSL) to 64 (67%) of the 95 rooms assessed will be fully BRE compliant. The effect upon diffuse daylight within these 64 rooms is therefore considered to be negligible (not significant).

7.94 In accordance with the significance criteria described above, 24 (25%) of the remaining 31 rooms will experience changes in VSC and/or NSL which are minor. The effect upon the diffuse daylight within these 24 rooms is therefore considered to be minor adverse (not significant).

7.95 The windows serving three of the remaining seven rooms have very low (0.1% to 6.8%) baseline VSC levels against the BRE recommended 27%. The small absolute VSC changes of 0.1% to 2.4% therefore disproportionately present themselves as moderate magnitude of percentage of baseline changes when, in reality, the changes are unlikely to be noticeable. The changes in NSL to the rooms served by these windows are fully BRE compliant with the rooms retaining NSL to between 88.6% and 92.2% of the rooms' areas. The effect upon the diffuse daylight within these three rooms is therefore considered to be minor adverse (not significant).

7.96 The remaining four rooms are all served by three windows of which one will experience a moderate magnitude of VSC change. The windows which will experience this change all have baseline VSC values that are below the BRE recommended 27% (8.6 % to 24.7%) and so the small (2.6% to 7.8%) absolute VSC changes disproportionately present themselves as moderate magnitude of percentage of baseline changes. As there are two other windows serving these four rooms, the changes in NSL are fully BRE compliant with all rooms retaining NSL to between 93.9% and 100% of the rooms' areas. The effect upon the diffuse daylight within these four rooms is therefore considered to be minor adverse (not significant).

7.97 The overall effect of the Proposed Development upon the diffuse daylight within this property is considered to be minor adverse (not significant).

Sunlight

7.98 Any changes to the sunlight amenity within the 59 rooms material for assessment will be fully BRE compliant. The effect upon sunlight amenity within this property is therefore considered to be negligible (not significant).

14 Albion Street

7.99 A total of eight windows serving seven rooms were assessed for daylight within this building.

VSC

7.100 Seven (88%) of the eight windows assessed would meet the BRE's criteria and so experience a negligible magnitude of VSC change.

7.101 Based on the initial numerical criteria for determining the magnitude of change detailed in Table 7.2, the magnitude of VSC change to the remaining room is moderate.

7.102 The window which will experience a moderate magnitude of VSC change has a very low (12.5%) baseline VSC value against the BRE recommended 27%. The 3.9% absolute VSC change therefore disproportionately presents itself as a moderate magnitude of percentage of baseline change.

7.103 In view of the single window affected beyond a minor extent and the small absolute VSC change that it will experience with the Proposed Development in place, the overall VSC effect upon the windows in this property is considered to be minor adverse (not significant)

NSL

7.104 All of the seven rooms assessed would meet BRE's criteria and so experience a negligible magnitude of NSL change.

7.105 The overall NSL effect upon the rooms within this property is considered to be negligible (not significant)

Diffuse Daylight

7.106 Any changes in diffuse daylight (VSC & NSL) to six (86%) of the seven rooms assessed will be fully BRE compliant. The effect upon diffuse daylight within these six rooms is therefore considered to be negligible (not significant).

7.107 The window serving the remaining room has a low (12.5%) baseline VSC level against the BRE recommended 27%. The 3.9% absolute VSC change therefore disproportionately presents itself as a moderate magnitude of percentage of baseline change. The change in NSL to this room will be fully BRE compliant with the room retaining NSL to 85.5% of its area. The effect upon the diffuse daylight within this room is, therefore, considered to be minor adverse (not significant).

7.108 The overall effect of the Proposed Development upon the diffuse daylight within this property is considered to be minor adverse (not significant).

Sunlight

7.109 This property is not material for consideration in sunlight terms as none of its windows are orientated to within 90 degrees of due south.

The Ropeworks

7.110 A total of 228 windows serving 96 rooms were assessed for daylight within this building.

VSC

7.111 132 (58%) of the 228 windows assessed would meet the BRE's criteria and so experience a negligible magnitude of VSC change.

7.112 Based on the initial numerical criteria for determining the magnitude of change detailed in Table 7.2, the magnitude of VSC change to 66 (29%) of the 96 affected windows is minor. The magnitude of VSC change to 26 (11%) of the remaining 30 affected windows is moderate. The magnitude of VSC change to the remaining four (2%) room is major.

7.113 The four windows which experience a major magnitude of VSC change all have very low (7.8% to 13.9%) baseline values. The small (3.1% to 5.9%) absolute VSC changes therefore disproportionately present themselves as major magnitude of percentage of baseline changes. These affected windows are also only one of a multiple number of windows serving a room where the other windows will experience much lower magnitudes of VSC change with the magnitude of change to some of those windows being negligible.

7.114 The baseline VSC values of the remaining 26 windows are all below the BRE recommended 27% (7.2 % to 24.7%) and so the small (2.3% to 9.4%) absolute VSC changes disproportionately present themselves as moderate magnitude of percentage of baseline changes. These affected windows are also only one of a multiple number of windows serving a room where, in most cases, the other windows will experience much lower magnitudes of VSC change with the magnitude of change to some of those windows being negligible.

7.115 In view of the small number of windows affected beyond a minor extent (13%) and the small absolute VSC changes that they will experience with the Proposed Development in place, the overall VSC effect upon the windows in this property is considered to be minor adverse (not significant)

NSL

7.116 95 (99%) of the 96 rooms assessed would meet BRE's criteria and so experience a negligible magnitude of NSL change.

7.117 The magnitude of NSL change to the remaining room is minor.

7.118 The overall NSL effect upon the rooms within this property is considered to be minor adverse (not significant)

Diffuse Daylight

7.119 Any changes in diffuse daylight (VSC & NSL) to 52 (54%) of the 96 rooms assessed will be fully BRE compliant. The effect upon the diffuse daylight within these 52 rooms is therefore considered to be negligible (not significant).

7.120 In accordance with the significance criteria described above, 27 (28%) of the remaining 44 rooms will experience changes in VSC and/or NSL which are minor. The effect upon the diffuse daylight within these 27 rooms is therefore considered to be minor adverse (not significant).

7.121 The remaining 17 (18%) rooms are all served by multiple windows of which at least one will experience a magnitude of VSC changes that is greater than minor. The windows experiencing these greater magnitudes of VSC change all have low baseline VSC levels (7.2% to 25.1%). The small (2.4% to 9.4%) absolute VSC changes therefore disproportionately present themselves as moderate and major magnitude of percentage of baseline changes. These affected windows are also one of a multiple number of windows serving the room where, in most cases, the other windows will experience much lower magnitudes of VSC change with the magnitude of change to some of those windows being negligible. With the exception of one, which will be minor, the changes in NSL to these rooms will be fully BRE compliant with the rooms retaining NSL to between 34% and 99.4% of their areas with, for context, the average being 87%. The effect upon the diffuse daylight within these 17 rooms is, therefore, considered to be minor adverse (not significant).

7.122 The overall effect of the Proposed Development upon the diffuse daylight within this property is considered to be minor adverse (not significant).

Sunlight

7.123 Any changes to the sunlight amenity within the eight rooms will be fully BRE compliant. The effect upon sunlight amenity within this property is therefore considered to be negligible (not significant).

21 Little Peter Street

7.124 A total of 43 windows serving 22 rooms were assessed for daylight within this building.

VSC

7.125 10 (23%) of the 43 windows assessed would meet the BRE's criteria and so experience a negligible magnitude of VSC change.

7.126 Based on the initial numerical criteria for determining the magnitude of change detailed in Table 7.2, the magnitude of VSC change to 29 (67%) of the 33 affected windows is minor. The magnitude of VSC change to three (7%) of the remaining four affected windows is moderate. The magnitude of VSC change to the remaining window is major.

7.127 The four windows which experience the greater magnitudes of VSC change all have very low (12% to 16.4%) baseline values. The small (5% to 5.5%) absolute VSC changes therefore disproportionately present themselves as moderate and major magnitude of percentage of baseline changes.

7.128 In view of the small number of windows affected beyond a minor extent (9%) and the small absolute VSC changes that they will experience with the Proposed Development in place, the overall VSC effect upon the windows in this property is considered to be minor adverse (not significant)

NSL

7.129 20 (91%) of the 22 rooms assessed would meet BRE's criteria and so experience a negligible magnitude of NSL change.

7.130 The magnitude of NSL change to the remaining two rooms is minor.

7.131 The overall NSL effect upon the rooms within this property is considered to be minor adverse (not significant)

Diffuse Daylight

7.132 Any changes in diffuse daylight (VSC & NSL) to one (5%) of the 22 rooms assessed will be fully BRE compliant. The effect upon the diffuse daylight within this room is therefore considered to be negligible (not significant).

7.133 In accordance with the significance criteria described above, 19 (86%) of the remaining 21 rooms will experience changes in VSC and/or NSL which are minor. The effect upon the diffuse daylight within these 19 rooms is therefore considered to be minor adverse (not significant).

7.134 The windows serving the remaining two (9%) rooms all have low baseline VSC (12% to 16.4%) baseline values. The small (5% to 5.5%) absolute VSC changes therefore disproportionately present themselves as moderate and major magnitude of percentage of baseline changes. Both rooms are, however served by two windows and, therefore, the rooms will have an NSL magnitude of change of no great than minor and retain NSL to between 58.5% and 68.5% of the rooms' areas. The effect upon the diffuse daylight within these two rooms is therefore considered to be minor adverse (not significant).

7.135 The overall effect of the Proposed Development upon the diffuse daylight within this property is considered to be minor adverse (not significant).

Sunlight

7.136 Any changes to the sunlight amenity within the three rooms will be fully BRE compliant. The effect upon sunlight amenity within this property is therefore considered to be negligible (not significant).

357-361 Deansgate

7.137 A total of 44 windows serving 36 rooms were assessed for daylight within this building.

VSC

7.138 40 (91%) of the 44 windows assessed would meet the BRE's criteria and so experience a negligible magnitude of VSC change.

7.139 Based on the initial numerical criteria for determining the magnitude of change detailed in Table 7.2, the magnitude of VSC change to one (2%) of the four affected windows is minor. The magnitude of VSC change to one (2%) of the remaining four affected windows is moderate. The magnitude of VSC change to the remaining two (5%) windows is major.

7.140 The three windows which experience the greater magnitudes of VSC change all have very low (0.2% to 5.3%) baseline values. The small (0.2% to 1.6%) absolute VSC changes therefore disproportionately present themselves as moderate and major magnitudes of percentage of baseline changes which, in reality, are unlikely to be noticeable.

7.141 In view of the small number of windows affected beyond a minor extent (7%) and the small absolute VSC changes that they will experience with the Proposed Development in place, the overall VSC effect upon the windows in this property is considered to be minor adverse (not significant)

NSL

7.142 34 (94%) of the 36 rooms assessed would meet BRE's criteria and so experience a negligible magnitude of NSL change.

7.143 The magnitude of NSL change to the remaining two rooms is major. The rooms both have very low (1.2%) baseline values. The small (0.2 sqm) absolute NSL changes therefore disproportionately present themselves as major magnitudes of percentage of baseline changes which, in reality, are unlikely to be noticeable.

7.144 The overall NSL effect upon the rooms within this property is considered to be minor adverse (not significant)

Diffuse Daylight

7.145 Any changes in diffuse daylight (VSC & NSL) to 32 (89%) of the 36 rooms assessed will be fully BRE compliant. The effect upon the diffuse daylight within this room is therefore considered to be negligible (not significant).

7.146 In accordance with the significance criteria described above, one (3%) of the remaining four rooms will experience changes in VSC and/or NSL which are minor. The effect upon the diffuse daylight within this room is therefore considered to be minor adverse (not significant).

7.147 The windows serving the remaining three (8%) rooms all have low baseline VSC (0.2% to 5.3%) baseline values. The small (0.2% to 1.6%) absolute VSC changes therefore disproportionately present themselves as moderate and major magnitudes of percentage of baseline changes which, in reality, are unlikely to be noticeable. One of the rooms will experience no change in NSL. The other two rooms have very low (1.2%) baseline values. The small (0.2 sqm) absolute NSL changes therefore disproportionately present themselves as a major magnitude of percentage of baseline changes which, in reality, are unlikely to be noticeable.

7.148 The overall effect of the Proposed Development upon the diffuse daylight within this property is considered to be minor adverse (not significant).

Sunlight

7.149 Any changes to the sunlight amenity within the five rooms will be fully BRE compliant. The effect upon sunlight amenity within this property is therefore considered to be negligible (not significant).

Overshadowing

7.150 The outputs of the computer modelling for overshadowing is provided in full within Appendix 7.3, with the key metrics provided in Table 7.12 below.

7.151 The breakdown of the Existing Baseline results compared to the Proposed Development for each of the areas of amenity space forming part of this assessment are discussed in more detail below.

Table 7.12 Summary of SHOG Assessment Results

Area Name	Area benefitting from 2 hours of SHOG on 21st March (Baseline)	Area benefitting from 2 hours of SHOG on 21st March (Proposed)	Change in SHOG	Meets SHOG Criteria?
Deansgate Locks Social Terrace	98.82%	98.70%	0.12%	Yes

Area Name	Area benefitting from 2 hours of SHOG on 21st March (Baseline)	Area benefitting from 2 hours of SHOG on 21st March (Proposed)	Change in SHOG	Meets SHOG Criteria?
Canal and Towpath Area 1	44.01%	38.90%	11.6%	Yes
Canal and Towpath Area 2	45.33%	44.61%	1.59%	Yes

7.152 Any changes to the level of shadow falling upon all of the areas of amenity space listed in Table 7.12 will be fully BRE compliant.

7.153 The overall effect of the Proposed Development in overshadowing terms is considered to be negligible (not significant).

Cumulative Effects

7.154 This section reports upon the effects of the Proposed Development in combination with the following consented neighbouring developments:

- Deansgate South (7)
- Vision Tower (11);
- Bridgewater House (12);
- 1 City Road (13);
- Land Bounded by Deansgate, Great Bridgewater Street, Watson Street & Peter Street (14);
- Land Bounded by Trumpet Street, Albion Street & Great Bridgewater Street (15); and
- Viadux Phase 2 (20).

7.155 Drawings of the assessment scenario can be found within Appendix 7.4

Operational Phase

Daylight & Sunlight

7.156 The outputs of the computer modelling for both daylight and sunlight is provided in full within Appendix 7.5, with the key metrics for the effects upon the non-cumulative developments being assessed provided in Tables 7.13 to 7.16 below.

7.157 The same 2717 windows facing the Site serving 1430 rooms within 22 buildings were assessed for VSC and NSL (daylight) and 625 rooms containing a living room element were assessed for APSH (sunlight) within the 20 buildings which are material for consideration in sunlight terms i.e. their windows are orientated to within 90 degrees of due south.

Table 7.13 Summary of VSC & NSL Daylight Results – Proposed Development Only

	VERTICAL SKY COMPONENT					NO SKY LINE				
	WINDOW					ROOM				
			LOSS (%)					LOSS (%)		
ADDRESS	TOTAL	PASS	20-30	30-40	40+	TOTAL	PASS	20-30	30-40	40+
Hill Quays	192	160	24	7	1	95	91	4	0	0
Riverside Mews	47	47	0	0	0	33	33	0	0	0
The Rhine	83	82	1	0	0	62	62	0	0	0
The Nile	183	180	3	0	0	127	126	1	0	0
30 City Road East	36	36	0	0	0	33	33	0	0	0
14 Albion Wharf	8	7	0	1	0	7	7	0	0	0
The Hacienda	127	127	0	0	0	61	61	0	0	0
326-330 Deansgate	8	8	0	0	0	2	2	0	0	0
The Ropeworks	20	9	2	8	1	8	8	0	0	0
21 Little Peter Street	43	10	29	3	1	22	20	2	0	0
8-16 Bridgewater St	13	13	0	0	0	8	8	0	0	0
20 Southern St	11	11	0	0	0	9	9	0	0	0
18-12 Southern St	9	9	0	0	0	6	6	0	0	0
8-10 Southern St	12	12	0	0	0	6	6	0	0	0
Deansgate Quay	81	81	0	0	0	43	43	0	0	0
357-361 Deansgate	44	40	1	1	2	36	34	0	0	2
Ropeworks Apartments Block 1	208	123	64	18	3	88	87	1	0	0
Lumiere Building	130	130	0	0	0	89	89	0	0	0
The Danube	101	100	1	0	0	74	71	3	0	0
AXIS TOWER	318	318	0	0	0	262	262	0	0	0
Viadux - Phase 1	342	322	20	0	0	152	152	0	0	0
Beetham Tower Residential	279	279	0	0	0	105	105	0	0	0
StayCity Aparthotel, Deansgate	422	412	10	0	0	102	102	0	0	0

	VERTICAL SKY COMPONENT WINDOW					NO SKY LINE ROOM				
			LOSS (%)					LOSS (%)		
ADDRESS	TOTAL	PASS	20-30	30-40	40+	TOTAL	PASS	20-30	30-40	40+
TOTALS	2717	2516	155	38	8	1430	1417	11	0	2

Table 7.14 Summary of VSC & NSL Daylight Results – Proposed Development & Cumulative Schemes

	VERTICAL SKY COMPONENT WINDOW					NO SKY LINE ROOM				
			LOSS (%)					LOSS (%)		
ADDRESS	TOTAL	PASS	20-30		40+	TOTAL	PASS			40+
Hill Quays	192	127	15		33	95	82			6
Riverside Mews	47	46	1		0	33	32			0
The Rhine	83	67	15		0	62	62			0
The Nile	183	142	9		21	127	126			0
30 City Road East	36	35	0		1	33	31			0
14 Albion Wharf	8	0	0		8	7	0			4
The Hacienda	127	59	27		18	61	61			0
326-330 Deansgate	8	6	1		0	2	2			0
The Ropeworks	20	0	3		17	8	3			0
21 Little Peter Street	43	3	22		8	22	16			2
8-16 Bridgewater St	13	13	0		0	8	8			0

ADDRESS	VERTICAL SKY COMPONENT WINDOW TOTAL	PASS	LOSS (%) 20-30		40+	NO SKY LINE ROOM TOTAL	PASS	LOSS (%)		40+
20 Southern St	11	11	0		0	9	9			0
18-12 Southern St	9	9	0		0	6	6			0
8-10 Southern St	12	12	0		0	6	6			0
Deansgate Quay	81	62	7		1	43	39			0
357-361 Deansgate	44	33	8		2	36	30			2
Ropeworks Apartments Block 1	208	0	14		174	88	8			71
Lumiere Building	130	129	1		0	89	89			0
The Danube	101	90	8		2	74	69			0
AXIS TOWER	318	73	30		134	262	71			127
Viadux - Phase 1	342	144	23		84	152	152			0
Beetham Tower Residential	279	279	0		0	105	105			0
StayCity Aparthotel, Deansgate	422	118	156		1	102	100			0
TOTALS	2717	1458	340		504	1430	1107			212

7.158 The reason for the decrease in compliance levels is due to the additional effect of the cumulative schemes listed at paragraph 7.153

Table 7.15 Summary of APSH Sunlight Results – Proposed Development Only

	ANNUAL PROBABLE SUNLIGHT HOURS							
	ROOM							
			ANNUAL (%)			WINTER (%)		
ADDRESS	TOTAL	PASS	20-30	30-40	40+	20-30	30-40	40+
Hill Quays	59	59	0	0	0	0	0	0
Riverside Mews	2	2	0	0	0	0	0	0
The Rhine	14	14	0	0	0	0	0	0
The Nile	25	25	0	0	0	0	0	0
30 City Road East	0	0	0	0	0	0	0	0
14 Albion Wharf	0	0	0	0	0	0	0	0
The Hacienda	32	32	0	0	0	0	0	0
326-330 Deansgate	2	2	0	0	0	0	0	0
The Ropeworks	0	0	0	0	0	0	0	0
21 Little Peter Street	3	3	0	0	0	0	0	0
8-16 Bridgewater St	5	5	0	0	0	0	0	0
20 Southern St	9	9	0	0	0	0	0	0
18-12 Southern St	5	5	0	0	0	0	0	0
8-10 Southern St	2	2	0	0	0	0	0	0
Deansgate Quay	17	17	0	0	0	0	0	0
357-361 Deansgate	5	5	0	0	0	0	0	0
Ropeworks Apartments Block 1	8	8	0	0	0	0	0	0
Lumiere Building	10	10	0	0	0	0	0	0
The Danube	13	13	0	0	0	0	0	0
AXIS TOWER	131	131	0	0	0	0	0	0
Viadux - Phase 1	76	76	0	0	0	0	0	0

	ANNUAL PROBABLE SUNLIGHT HOURS ROOM							
			ANNUAL (%)			WINTER (%)		
ADDRESS	TOTAL	PASS	20-30	30-40	40+	20-30	30-40	40+
Beetham Tower Residential	105	105	0	0	0	0	0	0
StayCity Aparthotel, Deansgate	102	102	0	0	0	0	0	0
TOTALS	625	625	0	0	0	0	0	0

Table 7.16 Summary of APSH Sunlight Results – Proposed Development & Cumulative Schemes

	ANNUAL PROBABLE SUNLIGHT HOURS ROOM							
			ANNUAL (%)			WINTER (%)		
ADDRESS	TOTAL	PASS	20-30	30-40	40+	20-30	30-40	40+
Hill Quays	59	59	0	0	0	0	0	0
Riverside Mews	2	2	0	0	0	0	0	0
The Rhine	14	14	0	0	0	0	0	0
The Nile	25	17	0	0	5	0	0	8
30 City Road East	0	0	0	0	0	0	0	0
14 Albion Wharf	0	0	0	0	0	0	0	0
The Hacienda	32	31	0	0	1	0	0	0
326-330 Deansgate	2	2	0	0	0	0	0	0
The Ropeworks	0	0	0	0	0	0	0	0
21 Little Peter Street	3	3	0	0	0	0	0	0
8-16 Bridgewater St	5	5	0	0	0	0	0	0
20 Southern St	9	9	0	0	0	0	0	0
18-12 Southern St	5	5	0	0	0	0	0	0
8-10 Southern St	2	2	0	0	0	0	0	0

	ANNUAL PROBABLE SUNLIGHT HOURS ROOM							
			ANNUAL (%)			WINTER (%)		
ADDRESS	TOTAL	PASS	20-30	30-40	40+	20-30	30-40	40+
Deansgate Quay	17	16	0	0	0	0	1	0
357-361 Deansgate	5	5	0	0	0	0	0	0
Ropeworks Apartments Block 1	8	8	0	0	0	0	0	0
Lumiere Building	10	10	0	0	0	0	0	0
The Danube	13	13	0	0	0	0	0	0
AXIS TOWER	131	128	0	0	3	0	0	2
Viadux - Phase 1	76	76	0	0	0	0	0	0
Beetham Tower Residential	105	105	0	0	0	0	0	0
StayCity Aparthotel, Deansgate	102	102	0	0	0	0	0	0
TOTALS	625	612	0	0	9	0	1	10

7.159 The reason for the decrease in compliance levels is due to the additional effect of the cumulative schemes listed at paragraph 7.153

Overshadowing

7.160 The outputs of the computer modelling for overshadowing is provided in full within Appendix 7.6, with the key metrics provided in Tables 7.17 and 7.18 below.

7.161 The same three areas of amenity space were assessed for changes in SHOG.

Table 7.17: Summary of SHOG Assessment Results - Proposed Development Only

Area Name	Area benefitting from 2 hours of SHOG on 21st March (Baseline)	Area benefitting from 2 hours of SHOG on 21st March (Proposed)	Change in SHOG	Meets SHOG Criteria?
Deansgate Locks Social Terrace	98.82%	98.70%	0.12%	Yes
Canal and Towpath Area 1	44.01%	38.90%	11.6%	Yes
Canal and Towpath Area 2	45.33%	44.61%	1.59%	Yes

Table 7.18: Summary of SHOG Assessment Results - Proposed Development & Cumulative Schemes

Area Name	Area benefitting from 2 hours of SHOG on 21st March (Baseline)	Area benefitting from 2 hours of SHOG on 21st March (Proposed)	Change in SHOG	Meets SHOG Criteria?
Deansgate Locks Social Terrace	98.82%	98.50%	0.32%	Yes
Canal and Towpath Area 1	44.01%	30.84%	29.93%	No
Canal and Towpath Area 2	45.33%	40.20%	11.32%	Yes

7.162 The reason for the decrease in compliance levels is due to the additional effect of the cumulative schemes listed at paragraph 7.153

Mitigation Measures

Daylight & Sunlight

7.163 Daylight impacts to the surrounding properties are negligible to minor adverse. Sunlight impacts to the surrounding properties are negligible. Overall, this is considered to result in non-significant effects. Given the context of the Site and nature of effects, no further mitigation is considered necessary.

Overshadowing

7.164 Overshadowing impacts to the surrounding areas of amenity space are negligible and so considered to result in non-significant effects. Given the context of the Site and nature of effects, no further mitigation is considered necessary.

Residual Effects

Operational Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Adverse reduction in daylight amenity	Hill Quays	None	n/a	Minor Adverse (Permanent)
	Riverside Mews	None	n/a	Negligible (Permanent)
	The Rhine	None	n/a	Minor Adverse (Permanent)
	The Nile	None	n/a	Minor Adverse (Permanent)
	30 City Road East	None	n/a	Negligible (Permanent)
	14 Albion Wharf	None	n/a	Minor Adverse (Permanent)
	The Hacienda	None	n/a	Negligible (Permanent)
	326-330 Deansgate	None	n/a	Negligible (Permanent)
	The Ropeworks	None	n/a	Minor Adverse (Permanent)
	21 Little Peter Street	None	n/a	Minor Adverse (Permanent)
	8-16 Bridgewater St	None	n/a	Negligible (Permanent)
	20 Southern St	None	n/a	Negligible (Permanent)
	18-12 Southern St	None	n/a	Negligible (Permanent)
	8-10 Southern St	None	n/a	Negligible (Permanent)
	Deansgate Quay	None	n/a	Negligible (Permanent)
	357-361 Deansgate	None	n/a	Minor Adverse (Permanent)
	Ropeworks Apartments Block 1	None	n/a	Minor Adverse (Permanent)
	Lumiere Building	None	n/a	Negligible (Permanent)
	The Danube	None	n/a	Minor Adverse (Permanent)
	AXIS TOWER	None	n/a	Negligible (Permanent)
	Viadux - Phase 1	None	n/a	Minor Adverse (Permanent)
	Beetham Tower Residential	None	n/a	Negligible (Permanent)
	StayCity Aparthotel, Deansgate	None	n/a	Minor Adverse (Permanent)
Adverse reduction in sunlight amenity	Hill Quays	None	n/a	Negligible (Permanent)
	Riverside Mews	None	n/a	Negligible (Permanent)
	The Rhine	None	n/a	Negligible (Permanent)
	The Nile	None	n/a	Negligible (Permanent)
	30 City Road East	None	n/a	Negligible (Permanent)
	14 Albion Wharf	None	n/a	Negligible (Permanent)
	The Hacienda	None	n/a	Negligible (Permanent)
	326-330 Deansgate	None	n/a	Negligible (Permanent)

	The Ropeworks	None	n/a	Negligible (Permanent)
	21 Little Peter Street	None	n/a	Negligible (Permanent)
	8-16 Bridgewater St	None	n/a	Negligible (Permanent)
	20 Southern St	None	n/a	Negligible (Permanent)
	18-12 Southern St	None	n/a	Negligible (Permanent)
	8-10 Southern St	None	n/a	Negligible (Permanent)
	Deansgate Quay	None	n/a	Negligible (Permanent)
	357-361 Deansgate	None	n/a	Negligible (Permanent)
	Ropeworks Apartments Block 1	None	n/a	Negligible (Permanent)
	Lumiere Building	None	n/a	Negligible (Permanent)
	The Danube	None	n/a	Negligible (Permanent)
	AXIS TOWER	None	n/a	Negligible (Permanent)
	Viadux - Phase 1	None	n/a	Negligible (Permanent)
	Beetham Tower Residential	None	n/a	Negligible (Permanent)
	StayCity Aparthotel, Deansgate	None	n/a	Negligible (Permanent)
Adverse increase in shadow	Deansgate Locks Social Terrace	None	n/a	Negligible (Permanent)
	Canal and Towpath Area 1	None	n/a	Negligible (Permanent)
	Canal and Towpath Area 2	None	n/a	Negligible (Permanent)

Monitoring

7.165 None required.

Reference List

7.166 This ES Chapter has been prepared in reference to the following:

Ministry of Housing, Communities & Local Government (2024). National Planning Policy Framework. 2024.

Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2021). Planning Policy Guidance. 2021.

Manchester City Council (2012). Manchester Core Strategy (2012 – 2027).

Manchester City Council (2007). Guide to Development in Manchester Supplementary Planning Document and Planning Guidance Adopted April 2007.

Building Research Establishment (BRE) (2022). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice, Third Edition.

Commission Internationale De L'Eclairage (CIE), CIE 146:2002 & CIE 147:2002 - Collection on Glare, CIE, 2002

8. Heritage

Introduction

8.1 This Chapter of the ES has been prepared by Kathryn Sather of Kathryn Sather & Associates and asseses Heritage.

8.2 This Chapter is accompanied by the following appendices:

- Appendix 8.1 - Heritage Statement prepared for the site by Kathryn Sather & Associates dated November 2024

8.3 The authors of this Chapter have the following qualifications and experiences:

Table 8.1 Technical Competence in Heritage

	Lead Author	Reviewer
Name	Kathryn Sather	Jeannie Willan
Company	Kathryn Sather & Associates	Kathryn Sather & Associates
Qualifications/Accreditations relevant to technical area	BA in Mathematics and Fine Arts MSc in Historic Preservation MCIFA (Member of the Chartered Institute for Archaeologists)	B.A.Hons in German and Spanish M.B.A. MSc in Architectural Conservation
Does the practitioner hold any IEMA qualification?	No	No
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	34	20
Number of EIA's delivered to date	1	1

Assumptions and Limitations

8.4 Survey of the identified heritage assets within the study area was from publicly accessible areas. As such the study is limited to assessment from ground level.

8.5 Assessment of below ground archaeology does not form part of this assessment.

Relevant Legislation, Policy and Guidance

Legislation

Planning (Listed Buildings and Conservation Areas) Act 1990

8.6 The Site is adjacent to one listed building, and within the setting of a number of listed buildings. Section 66 of the Act requires the Local Planning Authority to "have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses," when considering whether to grant planning permission.

8.7 As the Site is also within the setting of a Conservation Area, Section 72 of the Act is of relevance as it requires the Local Planning Authority to pay special attention to the 'desirability of preserving or enhancing the character and appearance' of the designated area. Consequently, it is important to consider the Site as a contributor to the townscape character of the Conservation Area and the impact of the Proposed Development on this aspect of the wider historic environment.

Policy

National Planning Policy Framework (2024) and National Planning Practice Guidance

8.8 Chapter 16 of the NPPF, 'Conserving and enhancing the historic environment', provides the policy framework for the conservation of the historic environment. Paras 207-211 relating to 'proposals affecting heritage assets' and 'considering potential impacts' are reproduced in the accompanying Heritage Statement.

8.9 Updates to the Planning Practice Guidance on July 23, 2019 have clarified national guidance to Local Authorities on the identification of non-designated heritage assets. This is set out in para 39 and 40 of the NPPG and reproduced in the accompanying Heritage Statement.

8.10 The policies in the NPPF constitute the Government's view of what sustainable development in England means in practice. In these terms development proposals, which fail to give due weight to the conservation of heritage assets are deemed not to be sustainable development and consequently should not be supported. This is because one of the key dimensions of sustainability is protecting and enhancing our historic environment (NPPF paragraph 8).

8.11 The focus of the Government's planning policy guidance is to ensure that account is always taken of the desirability of sustaining and enhancing the significance of heritage assets and for new development to make a positive contribution to local character and distinctiveness (NPPF paragraph 196).

8.12 The NPPF stresses that "great weight" should be given to the conservation of designated heritage assets (NPPF paragraphs 212 to 221), emphasising the need to avoid substantial harm, in terms of demolition, alteration or the compromise of its setting. It will be clear that the redevelopment of a site adjacent to heritage assets could affect the setting of them, and that could be either beneficial or harmful. The fundamental objective is to ensure that the balance of the impact on the heritage assets is demonstrably beneficial, minimising any negative impact on their significance.

Local Planning Policy

Manchester Unitary Development Plan 1995 (Extant Policies)

8.13 One of the objectives of this plan was 'to protect and enhance Manchester's Victorian, Edwardian and Georgian architectural and historic heritage'. Policy DC19 on Listed Buildings within the citywide Developmental Control Policies remains valid and is reproduced in the accompanying Heritage Statement.

Manchester Local Development Framework (LDF) 2012

8.14 The Core Strategy includes a number of policies relating to the historic environment including Policy CC9: Design and Heritage and Policy EN3: Heritage. These are reproduced in the accompanying Heritage Statement.

Places for Everyone Joint Development Plan Document for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan 2022 To 2039 (Adopted 21 March 2024)

8.15 Places for Everyone (PfE) is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. It has been published by the GMCA on behalf of the nine districts. The plan is a joint development plan of the nine districts which will determine the kind of development that takes place in their boroughs, maximising the use of brownfield land and urban spaces while protecting Green Belt land from the risk of unplanned development.

8.16 Policy JP-P2: Heritage, sets out the aims to 'proactively manage and work with partners to positively conserve, sustain and enhance our historic environment and heritage assets and their settings. Opportunities will be pursued to aid the promotion, enjoyment, understanding and interpretation of heritage assets, as a means of maximising wider public benefits and reinforcing Greater Manchester's distinct character, identity and sense of place'.

Guidance

Historic England Guidance

8.17 Several Historic England documents provide relevant guidance. These include: The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning:3 (2nd ed) (2017); Local Heritage Listing: Identifying and Conserving Local Heritage, Historic England Advice Note 7 (2nd ed) (2021); Conservation Area Designation, Appraisal and Management: Historic England Advice Note 1 (2nd ed) (2019); Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning:2 (2015); Statements of Heritage Significance: Analysing Significance in Heritage Assets, Historic England Advice Note 12 (2019); Tall Buildings: Historic England Advice Note 4 (2022).

CIfA/ IHBC/ IEMA Guidance

8.18 The impact of the Proposed Development has been assessed using a cultural heritage impact assessment methodology based upon the CIfA/ IHBC/ IEMA guidance, Principles of Cultural Heritage Impact Assessment in the UK of July 2021, a methodology commonly used to assess heritage impact which is endorsed by several professional heritage organisations. Relevant paragraphs are reproduced in the accompanying Heritage Statement.

Assessment Methodology and Significance Criteria

Scenarios Tested

8.19 The scenarios tested include: Scenario 1: Existing Site (existing baseline of August 2024), Scenario 2: Baseline + Proposed Development and Scenario 3: Baseline + Proposed Development + cumulative.

The Study Area

Site Description

8.20 The Site abuts and includes the Grade II listed Manchester South Junction and Altrincham Railway Viaduct. Beyond the railway viaduct, the Site does not contain any other statutory designated

heritage assets such as Listed Buildings, Scheduled Monuments, or any Registered Parks and Gardens and it does not fall within a Conservation Area. There are two existing buildings on the Site, 2-4 Whitworth Street West. The Site is bounded by Whitworth Street West to the north, a listed railway viaduct to the south, Bugle Street to the west, beyond which is the Grade II listed Deansgate Station, and the former Cameron Street to the east, which is now connected to the vacant site further to the east. A narrow road, Rowendale Street, separates the two buildings on the site and continues through the railway viaduct to connect with Hewitt Street to the south of the viaduct.

8.21 2 Whitworth Street West was built in 1909 of traditional brick load bearing construction with some steel columns, and a concrete roof and floors, to designs of Henry McCulloch. Research documents use of the four storey building as a warehouse initially. 4 Whitworth Street West was built in 1914 as a warehouse, office, workshop and garage, to designs of Cyril Eyres Ainley. There is a single storey garage structure to the rear, parallel with the viaduct, and a three storey warehouse and office range to Whitworth Street. The building is constructed from load bearing brick, with a partial internal concrete frame. Both buildings have been vacant for some time.

8.22 Beyond The Site, a wider study area was identified through the preparation of a Zone of Visual Impact, see Figure 8.2, from which twelve viewpoints were selected in consultation with MCC and HE. Eight of these viewpoints were identified as having heritage significance for further assessment within the Heritage Statement.

Source of Effect

Methodology

8.23 A Heritage Assessment is appended. The Statement provides a detailed and robust baseline assessment of the identified designated heritage assets surrounding the Site and assesses their significance and considers to what extent their setting contributes to an appreciation of this.

8.24 The Heritage Assessment has been prepared in accordance with or in reference to best practice including the following national guidance and professional standards as appropriate:

- Greater Manchester Combined Authority. Places for Everyone – Joint Development Plan, Document 2022-2039, March 2024
- Historic England Conservation Area Designation, Appraisal and Management (2019)
- Historic England Local Heritage Listing: Identifying and Conserving Local Heritage. Historic England Advice Note 7 (2nd ed) (2021)
- Historic England Managing Significance in Decision-Taking in the Historic Environment: Historic
- Environment Good Practice Advice in Planning 2 (2015)
- Historic England Statements of Heritage Significance: Analysing Significance in Heritage Assets: Historic England Advice Note 12 (2019)
- Historic England Tall Buildings: Historic England Advice Note 4. Swindon. Historic England (2022)
- Historic England The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (2nd ed) (2017)
- ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (2011)

- IEMA, IHBC & CIfA. Principles of Cultural Heritage Impact Assessment in the UK (2021)
- Manchester City Council Core Strategy 2012-2027 and Addendum March 2024
- National Planning Policy Framework (NPPF) Chapter 16 Conserving and enhancing the Historic Environment 2024

8.25 The Heritage Statement considers the potential impact of the Proposed Development on the setting (through indirect visual impact) of sensitive to receptors. The sensitive receptors have been identified through review of the completed background reports, followed by a site survey and further historic research. Identification of sensitive receptors also includes reference to the receptors identified in the TVIA and associated Zone of Visual Influence.

8.26 The visual baseline established locations from which the Site is visible and from which views have the potential to be affected by the Proposed Development (views were agreed in discussion with MCC and Historic England). The viewpoint locations are informed by Zone of Visual Influence Studies (produced by Layer), site surveys and VU.CITY analysis (July 2024). Of the total of 12 views prepared, a total of 8 views were identified as key heritage views for the heritage assessment. The proposed representative viewpoint locations are provided in Figure 8.2 which were shared and agreed with MCC and with HE.

8.27 The assessment methodology for likely significant effects follows the significance criteria, which is largely in accordance with the specific heritage impact assessment guidance in the ICOMOS and IEMA guidance. The assessment of likely significant effects to sensitive receptors considers the sensitivity of the receptor (on a scale of high, medium, low and neutral) and the magnitude of change (on a scale of large, medium, small and neutral) to determine the level of effect on a scale of major, moderate, minor and neutral. These effects can be beneficial or adverse. Significant effects have been determined following this through professional judgment.

8.28 In order to assess the potential magnitude and significance of effect of the visual impact of the Proposed Development, the following criteria is considered:

- The sensitivity and proximity of receptors (i.e. heritage assets);
- The nature of the existing views;
- The degree of change to existing views and the visibility of the Proposed Development; and
- The availability and amenity of alternative views.

8.29 The assessment of heritage effects within the Heritage Statement has been informed by Accurate Visual Representations ('AVRs') which provide an accurate representation of how the Proposed Development will appear in its local and wider townscape setting and in conjunction with heritage assets in the setting of the Site.

8.30 In terms of visual impact, the scenarios considered are as follows:

- Scenario 1: Existing site (existing baseline as of August 2024);
- Scenario 2: Baseline + Proposed Development;
- Scenario 3: Baseline + Proposed Development + cumulative.

8.31 Potential effects associated with the construction and operational phases of the Proposed Development will relate to indirect temporary visual impacts and indirect permanent visual impacts respectively.

Significance Criteria

8.32 Principles of Selection for Listed Buildings (Department for Digital, Culture, Media and Sports: November 2018) sets out the statutory criteria and general principles that the Secretary of State applies when deciding whether a building is of special architectural or historic interest and should therefore be added to the National Heritage List for England. The listing criteria are based on architectural and historic interest, age and rarity, aesthetic merits, selectivity and national interest.

8.33 Historic England's Statements of Heritage Significance: Analysing Significance in Heritage Assets, Advice Note 12 (2019) advises that the significance of a heritage asset is assessed by considering the archaeological interest, historic interest, artistic and architectural interest of the heritage asset.

8.34 The July 2021 'Principles of Cultural Heritage Impact Assessment in the UK' document, published jointly by CIfA, IHBC and IEMA, sets as a prerequisite the need to identify the significance of the asset, through an analysis of what is valued about the asset, leading to a statement of cultural significance and to place this in a framework which communicates its relative importance, relating this to the level of protection that the asset merits in planning policy and cultural heritage legislation. This can then be related to a framework for importance based on the English listing categories. The framework for assessing the level of significance of the assets is high for Grade I and Grade II*, medium for Grade II/Conservation Areas and low for non-designated heritage assets.

8.35 Evaluation of significance has been informed primarily by the designation of the assets at an international, national, regional or local level as well as their ability to contribute to an understanding of the past. This value rating had also been applied when considering sensitivity of views containing heritage assets. Indicative definitions for each of these ratings are outlined in Table 8.2:

Table 8.2 Significance Criteria for determining the value of heritage assets

Significance	Definition
High	Grade I and Grade II* listed buildings Other buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade Conservation Areas containing very important buildings
Medium	Grade II listed buildings Historic buildings that can be shown to have exceptional qualities in their fabric or historical associations Conservation areas containing buildings that contribute significantly to its historic character
Low	Locally listed buildings Historic buildings of modest quality in their fabric or historical association

Assessment of Effects and Evaluation of the Magnitude of Impact

8.36 Impacts may be beneficial or adverse. If the Proposed Development will enhance heritage values or the ability to appreciate them, then the impact on heritage significance will be deemed to be beneficial; however, if they fail to sustain heritage values or impair their appreciation then the impact will be deemed to be adverse

8.37 Table 8.3 below summaries the factors to be taken into account when assessing the magnitude of impact. The criteria are not intended to be prescriptive and the weighting to be accorded to each requires professional judgement.

Table 8.3 Criteria for determining magnitude of impact

Rating	Factors in the Assessment of Magnitude of Impact
Major Beneficial	The development considerably enhances the heritage values of the heritage assets, or the ability to appreciate those values.
Moderately Beneficial	The development enhances to a clearly discernible extent the heritage values of the heritage assets, or the ability to appreciate those values
Minor Beneficial	The development enhances to a minor extent the heritage values of the heritage assets, or the ability to appreciate those values.
Negligible	The development does not affect the heritage values of the heritage assets in the view, or the ability to appreciate those values.
Minor Adverse	The development erodes to a minor extent the heritage values of the heritage assets, or the ability to appreciate those values.
Moderate Adverse	The development erodes to a clearly discernible extent the heritage values of the heritage assets, or the ability to appreciate those values.
Major Adverse	The development severely erodes the heritage values of the heritage assets, or the ability to appreciate those values.

Significance of Effect

8.38 Derived by combining the significance rating of the resource with the magnitude of impact for each asset, Table 8.4 below illustrates how information on the significance of the asset and the magnitude of the impact has been combined to arrive at an assessment of the significance of effect. The matrix is not intended to 'mechanise' judgment of the significance of effect but act as a check to ensure that judgments regarding value, magnitude of impact and significance of effect are reasonable and balanced.

Table 8.4 Significance of effect matrix

	Significance			
		High	Moderate	Low
Magnitude of Impact	Major	Major	Major-Moderate	Major - Minor
	Moderate	Moderate	Moderate - Minor	Minor
	Minor	Moderate - Minor	Minor - Negligible	Negligible
	Negligible	Negligible	Negligible	Negligible

Assumptions and Limitations

8.39 Survey of the identified heritage assets within the study area, was from publicly accessible areas. As such the study is limited to assessment from ground level.

8.40 Assessment of below ground archaeology does not form part of this assessment.

Baseline Conditions

Historic Context of the Site

8.41 2 Whitworth Street West was built in 1909 of traditional brick load bearing construction with some steel columns, and a concrete roof and floors, to designs of Henry McCulloch. Research documents the use of the four storey building as a warehouse initially. 4 Whitworth Street West was built in 1914 as a warehouse, office, workshop and garage, to designs of Cyril Eyres Ainley. There is a single storey garage structure to the rear, parallel with the viaduct, and a three storey warehouse and office range to Whitworth Street West. The building is constructed from load bearing brick, with a partial internal concrete frame. Both buildings have been vacant for some time.

8.42 Greens map of Manchester dating to 1787-94 shows that the site of the buildings was partially developed. To the north was Gaythorn Street (running from east-west) developed with structures. Extending southwards from Gaythorn Street were Malkin Street to the western boundary of the site of the buildings, and Bettys Row to the centre. Both streets were developed with what appears to be terraced residential development, with areas of garden or allotment to the eastern side of Betty's Row, occupying much of the site of 4 Whitworth Street West. In between Betty's Row and Malkin Street there is a single row of smaller terraced residences with slender alley way behind.

8.43 The 1st edition of the OS, surveyed in 1845, shows the area surrounding the site of the buildings had been more intensely developed and the road layout had altered quite substantially by this time. By 1850 the viaduct to the south of the site appears, carrying the Manchester South Junction and Altrincham Railway, with Knott Mill Station to the west of the site of the buildings, cutting through the areas of housing. The addition of the viaduct changed the line of the street to the rear of the site. Cheetham Street (to the east of #4) had been laid and was lined with a continuous row of what appears to be back-to-back housing, with no outbuildings, just long slender yards called Three Tuns Court and Mason's Court to the rear. To the west side of these court yards were further small residences and outbuildings. Betty's Row had been re-named Rowe Street, and the east side of the road was still lined with larger terraced properties with associated outbuildings. To the northern end was Stewart Court, an area that was previously garden. To the west side of what was now Rowe Street was further terraced housing. To the west of this was an alley way, then a row of smaller scale residences, which fronted onto an alley called Back Mount Street. To the west of the site of 2 Whitworth Street West, Malkin Street had been re-named Mount Street. The southern end of the road appears to be in the same form as the 18th century map, showing larger scale terraced houses without buildings. Further northwards, towards Gaythorn Street, there had been some re-development. A continuous row of larger buildings now faced onto the street and the terraced houses along east side of Mount Street had been replaced with smaller residences, including back-to-back houses.

8.44 Between 1891 and 1896 Mount Street was re-named Bugle Street, but the form of the development remained unchanged from the mid-19th century. The 1908 plan shows the proposal site as two undeveloped plots - the housing has been demolished. Gaythorn Street has been renamed Whitworth Street West and the street has been widened.

8.45 Historic building control records show that 2 Whitworth Street West was designed by Henry Cox McCulloch and A. G. Andrew, architects and surveyors of 2 Victoria Street, Manchester as a warehouse for merchant Llewelyn Andrew in 1909. 4 Whitworth Street West was designed by architect Cyril E. Ainley of 8 Exchange Square in 1914 as offices and garage for Halley's Industrial Motors Ltd.

8.46 By 1923 both numbers 2 and 4 Whitworth Street West had been developed. In that year Alfred Herbert Ltd. tool makers of Coventry with a world-wide exporting business, moved the Manchester branch office from Cross Street to Wrendal House, suggesting that the conclusion of the construction was during the inter-war period. The plan of the buildings has then remained unchanged from this period onwards.

Significance of the Existing Buildings and Rowendale Street

8.47 In 2020, Historic England determined that the two buildings at 2-4 Whitworth Street West do not have sufficient architectural or historic interest to be considered nationally significant, nor are the buildings contributing to the group value of the other heritage assets in the immediate vicinity, with the rejection decided at the initial assessment. The previous Heritage Assessment and a Peer Review, both from 2020, concluded that the existing buildings did not meet the criteria to be

considered as non-designated heritage assets, submitted and approved under planning permission 126308/FO/2020.

8.48 Rowendale Street, which is proposed to be infilled in the Proposed Development, does not qualify as a non-designated heritage asset, and is not sited within a Conservation Area. The short street, which has been truncated from an earlier street, named Betty's Row and later Rowe Street, does not retain any significant historic interest.

Heritage Assets in the Vicinity, Significance Levels and Settings

8.49 There are six Grade II listed and 3 Grade II* structures and a Conservation Area in the immediate vicinity, and the Site falls within the wider settings of five other Conservation Area and a large range of other listed buildings. The HER search results included both a 250m and a 500m radius. The sensitive receptors and the significance levels have been identified in the table below (Table 8.5). A detailed assessment of significance of the nine closest heritage assets and Castlefield Conservation Area is included in section 6 of the Heritage Statement.

8.50 The settings of the nearest heritage assets are assessed in detail in the Heritage Statement. Section 7 assesses the significance and setting of Castlefield Conservation Area, as well as assessing the contribution of the Site to the setting of the Conservation Area. Section 6 assesses the settings of the nearest heritage assets in detail, and also assesses the contribution of the Site to the setting of the heritage assets.

Figure 8.1 – Heritage Context

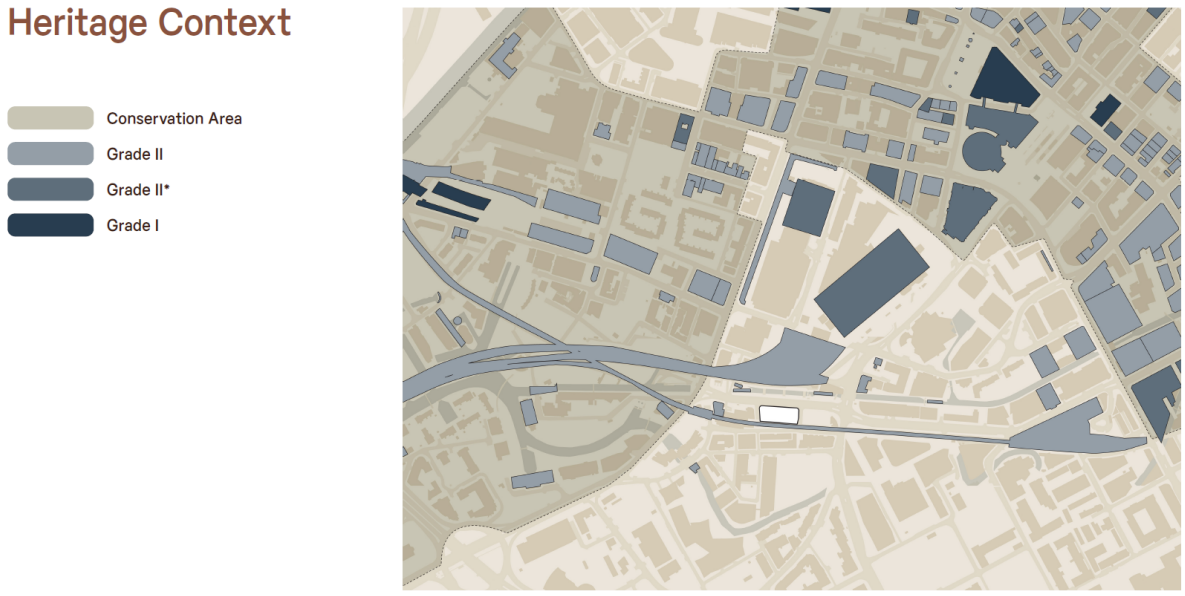


Table 8.5 Heritage Assets in the Vicinity with national listings and level of Significance

Heritage Asset	National Listing - Level	HER Number	Distance From Site
Manchester South Junction and Altrincham Railway Viaduct	Grade II - Medium	11681.1.0	2m

Rochdale Canal Lock Number 91	Grade II - Medium	12089.9.0	30m
Castlefield Railway Viaduct	Grade II - Medium	8385.1.0	35m
Rochdale Canal Lock Number 90	Grade II - Medium	12089.8.0	45m
Rochdale Canal Lock Keepers Cottage	Grade II - Medium	8586.1.0	45m
Deansgate Station	Grade II- Medium	15574.1.0	60m
Castlefield Conservation Area (to the west end of Whitworth Street West	Conservation Area - Medium	8385.1.0	103m
Albion Wharf (13-17 Albion Street)	Grade II - Medium	8268.1.0	105m
The Britons Protection Public House	Grade II- Medium	8412.1.0	150m
Manchester Central	Grade II* - High	129.1.0	169m
Former Congregational Chapel	Grade II - Medium	8379.1.0	176m
Deansgate Goods Station and Attached Carriage Ramp	Grade II* - High	8650.1.0	310m
Midland Hotel	Grade II* - High	8537.1.0	407m

Identification and Evaluation of Likely Significant Effects

8.51 Heritage assets are susceptible to numerous forms of development and non-development impacts both during the construction process and as a consequence of the operational life of the Proposed Development. The potential effects in relation to the current Proposed Development have been deemed to relate to impacts on the setting of the identified heritage assets. It is not anticipated that the Proposed Development will result in any physical impacts on any of the identified heritage assets, except for the gates proposed at either end of the Proposed Development between the rear elevation and the north elevation of the Manchester South Junction and Altrincham Railway Viaduct.

8.52 Detailed evaluation of the impacts on the settings of the identified heritage assets are provided within the Section 9 of the Heritage Statement within Volume 2, Appendix 8.1. The two scenarios, Scenario 2: Baseline + Proposed Development and Scenario 3: Baseline + Proposed Development + cumulative are assessed below. The Heritage Statement sets out the detailed heritage impact assessment. Section 9.4 of the Heritage Statement assesses the impacts on the 8 key heritage views, including both scenarios.

Construction Phase

8.53 Due to the proximity of the Manchester South Junction and Altrincham Railway Viaduct, Deansgate Station, Castlefield Railway Viaduct and Rochdale Canal Lock Keepers Cottage to the Site, the potential effects of the demolition and construction phase will result in localised temporary minor adverse impacts.

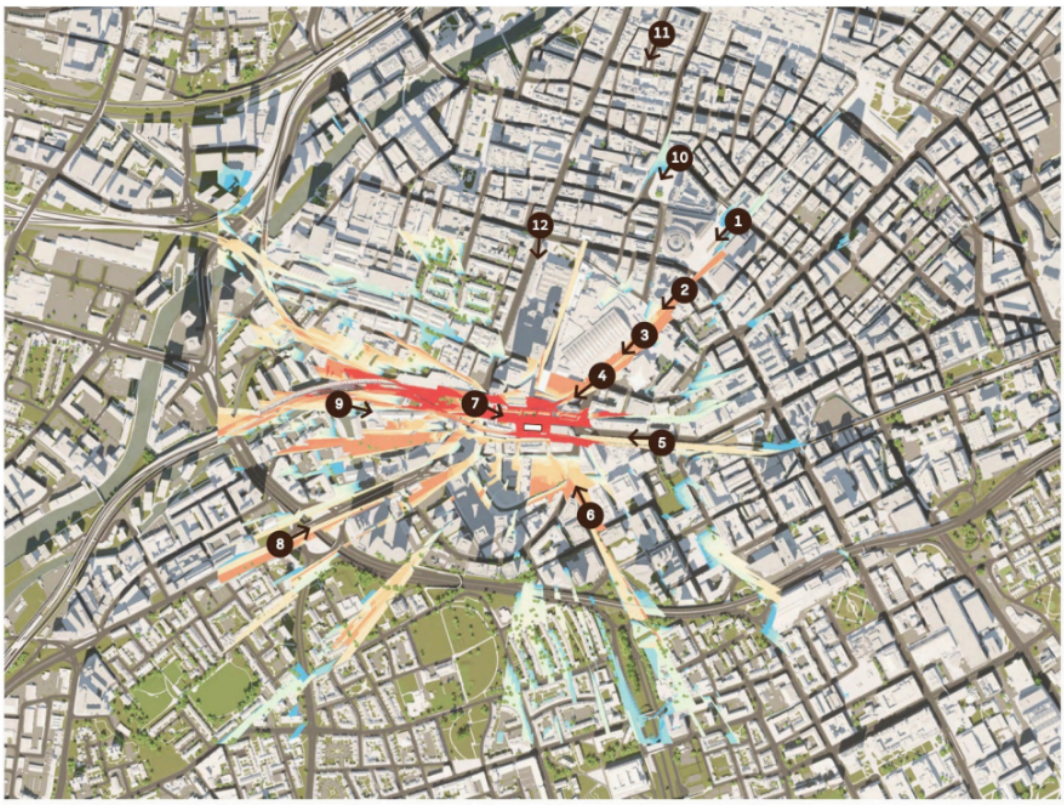
8.54 It has been assessed that 2 and 4 Whitworth Street West do not qualify to be considered as non-designated heritage assets in section 5 of the Heritage Statement. Likewise, Rowendale Street has been assessed that it is not a non-designated heritage asset in its own right, but is within the setting of other heritage assets. For these reasons, the demolition of the existing structures and the infilling of Rowendale Street are assessed as alterations to the settings of the heritage assets in the vicinity. However, mitigation measures of recording prior to demolition have been identified for these elements.

Operational Phase

8.55 The potential effects of the Proposed Development are considered in full within the Heritage Impact Assessment in Section 9 of the Heritage Statement and summarised in Table 8.6.

8.56 The ability to appreciate a very small section of the Manchester South Junction and Altrincham Railway Viaduct will not adversely affected by the Proposed Development as the existing arch to Rowendale Street will be hidden from the public. However, this is not a significant effect considering that the railway viaduct is an imposing 1 3/4 mile long structure which has a conspicuous presence in the streetscape and forms the backdrop to the structures in the area. The viaduct will remain prominent, and the new development will not be a distraction or appear overly dominant within the setting of the viaduct. The direct impacts on the Manchester South Junction and Altrincham Railway Viaduct, due to the installation of gates, will not have any effect on the significance of the viaduct.

Figure 8.2 Zone of Visual Influence and Viewpoints

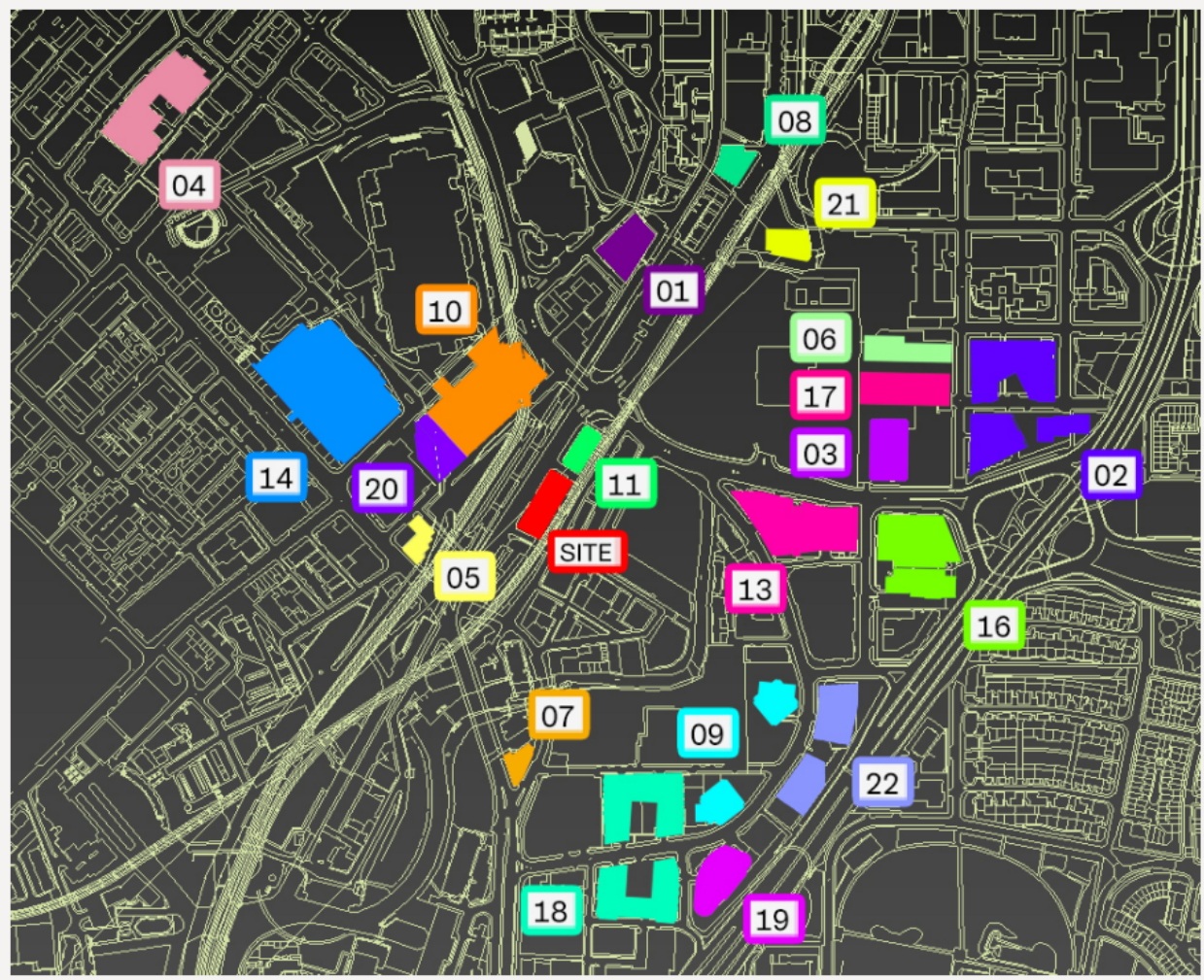


Cumulative Effects

8.57 Cumulative effects are the combination of the effects arising from the Proposed Development and other committed developments in the vicinity.

8.58 There are 21 committed developments including those where work has commenced, and those with recent planning permissions as well as those expected to come forward in the near future, within a 500 metre radius. The full list of committed developments is included in Appendix 3.3 Committed Developments.

Figure 8.3 Committed Schemes



8.59 Below is the list of 5 sites with cumulative effects in close proximity to the Proposed Development.

- StayCity Deansgate - 125804/FO/2019 - Construction Commenced August 2023
- Viadux Phase 1 & 2- 133998/JO/2022 - Construction Commenced October 2020 Phase 1 residential development approaching completion. Phase 1 Office Development Implemented.
- Vision Tower - 111003/FO/2016/C1 - commenced 2/2024 but halted
- Apex Tower - 133172/FO/2022 - Application submitted - awaiting determination.
- Viadux Phase 2 - 139715/FO/2024 - Application to be determined prior to this development coming forward

8.60 The above listed developments are likely to extend a cluster of tall buildings within the vicinity of the Proposed Development. These will partially mask existing views of the Manchester South Junction and Altrincham Railway Viaduct, but some of these views are only due to the demolition of structures at 10-12 Whitworth Street West prior to redevelopment.

8.61 The other sites and the Proposed Development will have a localised, temporary, minor adverse impact to the settings of the listed buildings, Rochdale Canal Lock Keepers Cottage and Deansgate Station. The overall significance of effect will be a temporary minor adverse in all cases.

8.62 As set out in detail in the Section 9 of the Heritage Statement, it is assessed that there will be no permanent adverse impact on the settings of the heritage assets identified due to the cumulative effect of the committed developments identified above. The erection of the buildings on the sites identified above would have a positive cumulative effect alongside the Proposed Development by establishing a cohesive streetscape in this location and a clustering of contemporary development which would form a landmark within the wider townscape.

Mitigation Measures

Construction Phase

8.63 The demolition and construction phase may cause temporary adverse impacts on the settings of the heritage assets in the immediate area due to vibration, noise and dust. The Construction Methodology and Programme, Chapter 5, details the protective measures that will be put in place to ensure any potential adverse impacts of the demolition and construction phase will be minimised. Recommended measures include:

- Regular cleaning of roads and the public realm surrounding the Site;
- Edge protection to be affixed whilst concreting operations are in place;
- Implementation of a traffic management plan;
- Vibration monitoring

8.64 Additionally, mitigation measures area recommended in relation to the demolition of 2-4 Whitworth Street West and the infilling of Rowendale Street. These mitigation measures include:

- A photographic recording of Rowendale Street prior to any demolition works will document the street prior to infilling the street;
- A photographic recording of 2 and 4 Whitworth Street West will document the structures prior to demolition;

Operational Phase

8.65 Heritage considerations have been integral to the design of the proposals. Enlisting appropriate specialists and consulting with the local authority and Historic England has informed the design and assessment process to ensure potential adverse impacts on the identified heritage assets are minimised.

8.66 Mitigation for instances of adverse harm are accrued by the public benefits of the Proposed Development.

Residual Effects

Construction Phase

8.67 Overall, the Proposed Development will have a temporary minor adverse effect on the identified Heritage resource as a whole.

8.68 A summary of the potential and residual effects is set out below in Table 8.6.

Table 8.6 Summary of potential and residual effects in the construction phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Minor Adverse	Manchester South Junction and Altrincham Railway Viaduct (direct to structure and setting)	Construction methodology and programme	Construction methodology and programme	Minor Adverse (Temporary)
Minor Adverse	Castlefield Railway Viaduct (setting)	Construction methodology and programme	Construction methodology and programme	Minor Adverse (Temporary)
Minor Adverse	Rochdale Canal Lock Keepers Cottage (setting)	Construction methodology and programme	Construction methodology and programme	Minor Adverse (Temporary)
Minor Adverse	Deansgate Station (setting)	Construction methodology and programme	Construction methodology and programme	Minor Adverse (Temporary)

Operational Phase

8.69 Consideration to the mitigating impacts on the identified heritage assets has been made throughout the development of the proposals. Consequently, the residual effects will be the same as the potential effects discussed. Overall, the effect of the Proposed Development on the identified Heritage resource as a whole would be neutral.

8.70 This assessment of the potential impact on the heritage assets in the wider setting follows the Heritage Impact Assessment excerpted in Appendix 8.1. This guidance states:
'An impact is a change in a cultural heritage asset or the experience of an asset in its setting that affects its cultural significance. This impact could be a positive or negative outcome. It is not a measure of the reach or extent of the proposal. Therefore, it is essential that the CHIA presents an understanding of how the proposed change relates to cultural significance and not the cultural heritage asset in its entirety.'

8.71 The main point of consideration is that a change is not necessarily an adverse impact. The construction of the Proposed Development will certainly be a change within the settings of the heritage assets, and will be more or less prominent in the chosen viewpoints which include these heritage assets. However, to be considered an adverse impact, the Proposed Development would need to have an effect on the cultural significance of these heritage assets. Although the proposed development will be a tall building, it will be viewed in a cluster of existing and consented tall buildings. The views are assessed in consideration of the cultural significance of the heritage

assets, and the potential impact on the additional tall building within the view, following the national guidance.

8.72 In the pre-application response, Historic England stated: 'The height of the proposed building and its proximity to the Manchester South Junction and Altrincham Railway Viaduct means that it will tower over the railway viaduct structure and dominate it, accentuated by the thin shape of the site. It will serve to further sever the viaduct from the other railway infrastructure in the area and alter the character of the area.'

8.73 Both railway viaducts are lengthy and imposing structures which have a conspicuous presence in the streetscape and form the backdrop to the structures in the area. Although the proposed development rises to 44 floors, the two viaducts will remain prominent, and the new development will not be a distraction or appear overly dominant within the settings of the viaducts. Considering the Manchester South Junction and Altrincham Railway Viaduct in particular, this assessment refutes this comment from Historic England. Although the tower is sited adjacent to the viaduct, the viaduct is itself 1¾ miles long, and the assessment of impact on the setting needs to consider the impact on the listed structure as a whole, not just a very small section of it. The tower will certainly be highly visible within views of the viaduct in the local area, but the proposed development will not dominate the viaduct as a whole. The area has a number of tall buildings, with more approved but not yet constructed. The proposed development, although visible, will not harm the cultural significance of the viaduct. Additionally, the historic functional relationships between the railway infrastructure, such as Deansgate Station and the Castlefield Viaduct will still be understandable and the experience of these historic structures within their settings will not be adversely impacted. The character of the area will remain one of imposing railway viaducts either side of Whitworth Street West.

8.74 The Proposed Development will add a new feature to the skyline signifying presence and activity within a key gateway site. It will encourage movement through the surrounding area which will help to revitalise the area. In particular, the use of terracotta, a significant historic material along Whitworth Street West and in central Manchester generally, is a sympathetic and contextual choice which is beneficial and mitigating factor of the Proposed Development.

8.75 A summary of the potential and residual effects is set out below in Table 8.7.

Table 8.7 Summary of potential and residual effects in the operational phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Neutral	Manchester South Junction and Altrincham Railway Viaduct (direct to structure and setting)	n/a	n/a	Neutral (Permanent)
Neutral	Castlefield Railway Viaduct (setting)	n/a	n/a	Neutral (Permanent)

Neutral	Rochdale Canal Lock Keepers Cottage (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Deansgate Station (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Rochdale Canal Lock Number 91 (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Rochdale Canal Lock Number 90 (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Albion Wharf, 13-17 Albion Street (setting)	n/a	n/a	Neutral (Permanent)
Neutral	The Britons Protection Public House (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Manchester Central (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Former Congregational Chapel 9 (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Deansgate Goods Station and Attached Carriage Ramp	n/a	n/a	Neutral (Permanent)
Neutral	Midland Hotel (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Castlefield Conservation Area (to the west end of Whitworth Street West	n/a	n/a	Neutral (Permanent)

Monitoring

8.76 N/A

Reference List

8.77 This ES Chapter has been prepared in reference to the following:

Greater Manchester Combined Authority. Places for Everyone – Joint Development Plan, Document 2022-2039, March 2024

Historic England Conservation Area Designation, Appraisal and Management (2019)

England Local Heritage Listing: Identifying and Conserving Local Heritage. Historic England Advice Note 7 (2nd ed) (2021)

Historic England Managing Significance in Decision-Taking in the Historic Environment: Historic

Environment Good Practice Advice in Planning 2 (2015)

Historic England Statements of Heritage Significance: Analysing Significance in Heritage Assets: Historic England Advice Note 12 (2019)

Historic England Tall Buildings: Historic England Advice Note 4. Swindon. Historic England (2022)

Historic England The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (2nd ed) (2017)

ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (2011)

IEMA, IHBC & CIfA. Principles of Cultural Heritage Impact Assessment in the UK (2021)

Manchester City Council Core Strategy 2012-2027

National Planning Policy Framework (NPPF) Chapter 16 Conserving and enhancing the Historic Environment 2024

9. Human Health

Introduction

9.1 This Chapter of the ES has been prepared by Enfusion and assesses the likely impacts of the Proposed Development upon human health for the Site and surrounding area.

9.2 This Chapter is accompanied by the following appendices:

- N/A

9.3 The author of this Chapter has the following qualifications and experience.

	Lead Author	Reviewer
Name	Barbara Carroll	
Company	Enfusion	
Qualifications/Accreditations relevant to technical area	BSc MSc CEnv FIEMA	
Does the practitioner hold any IEMA qualification?	FIEMA	
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	>25 years Co-author of The EIA Handbook (third edition, 2019) Environmental Impact Assessment Handbook - CIP Books (cip-books.com)	
Number of EIA's delivered to date	>75 (various inputs - specialist, review, coordination)	

Assumptions and Limitations

9.4 This Health Chapter considers the findings relevant to human health of each technical impact assessment scoped into the Environmental Statement – Townscape & Visual Impact (Chapter 6) & Heritage (Chapter7); Noise & Vibration (Chapter 8); Daylight, Sunlight & Overshadowing (Chapter 9); Solar Glare (Chapter 10); Wind Microclimate (Chapter 11); Climate Change (Chapter 12); and Socioeconomics (Chapter 14) – and, as such, any key assumptions or limitations associated with each technical impact assessment are addressed within the individual chapters. The overall approach for collating, assessing, and reporting impacts on human health and well-being is considered to be appropriate and proportionate such that there are no limitations. The assessment, set out in this ES Chapter, is desk-based and with professional judgment using published information.

Relevant Legislation, Policy and Guidance

Legislation

9.5 N/A

Policy

National Planning Policy Framework (revised 2024)

9.6 The NPPF acknowledges the importance of considering health impacts during the planning process and covers many issues that are directly related to the determinants of health. The NPPF identifies the three overarching objectives – economic, social, and environmental – that are *interdependent and need to be pursued in mutually supportive ways* in order to achieve sustainable development (paragraph 8). The social objective should support "*strong, vibrant and healthy communities… by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being."*

9.7 Chapter 8 covers promoting healthy and safe communities, acknowledging that planning policies and decisions should aim to achieve healthy, inclusive, and safe places which:

> "a) *promote social interaction, including opportunities for meetings between people who might not otherwise come into contact with each other – for example through mixed-use developments, strong neighbourhood centres, street layouts that allow for easy pedestrian and cycle connections within and between neighbourhoods, and active street frontages*.
> "b) *are safe and accessible, so that crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion – for example through the use of clear and legible pedestrian routes, and high quality public space, which encourage the active and continual use of public areas*; and
> "c) *enable and support healthy lifestyles, especially where this would address identified local health and well-being needs – for example through the provision of safe and accessible green infrastructure, sports facilities, local shops, access to healthier food, allotments and layouts that encourage walking and cycling*." (paragraph 96).

9.8 Social, recreational, and cultural facilities and services should 'support the delivery of local strategies to improve health, social and cultural wellbeing for all sections of the community (paragraph 98). It is important that sufficient choice of school places is available to meet the needs of existing and new communities (paragraph 100). Public safety should be promoted and "*take into account wider security and defence requirements*" (paragraph 102).

9.9 "*Access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and wellbeing of communities*" (paragraph 103). Sustainable transport should be promoted and this "*can help improve air quality and public health*" (paragraph 110). "*An effective use of land should be promoted in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions*" (paragraph 124). "*Developments should create places that are safe, inclusive, and accessible and which promote health and wellbeing…"* (paragraph 135). *"New development must be appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health…"* (paragraph 198).

Public Health England (PHE, now OHID) Strategy (2020-2025)

9.10 This document sets out how PHE intends to protect and improve the public's health and reduce inequalities during 2020 to 2025. The Strategy recognises that the longer term, societal drivers of change represent the principal challenge facing the public's health. However, there are opportunities now, including "*place-based approaches"*. The ten

priorities include *healthier diets, healthier weight*; *cleaner air;* and *better mental health"* with the aim to incorporate the reduction of health inequalities into each of the ten priorities. The purpose of PHE is to protect and improve the nation's health and reduce health inequalities. This is guided by aims – "*to keep people safe; to prevent poor health; to narrow the health gap; and the support a strong economy".*

Fair Society, Healthy Lives (Marmot Review 2010, and 2020)

9.11 The review sets out a framework for action under two policy goals: to create an enabling society that maximises individual and community potential; and to ensure social justice, health and sustainability are at the heart of all policies. There are six policy objectives:

- giving every child the best start in life
- enabling all children, young people and adults to maximize their capabilities and have control over their lives
- creating fair employment and good work for all
- ensuring a healthy standard of living for all
  creating and developing sustainable places and communities
- strengthening the role and impact of ill-health prevention

9.12 The Marmot Review 10 Years On found that over the last decade health inequalities have widened overall. The more deprived the area, the shorter the life expectancy.

Sub-Regional Planning Policy

Greater Manchester Joint Development Plan (JDP) (adopted March 2024)

9.13 The Vision for Greater Manchester (GM) includes to make Greater Manchester as "a place where people live healthy lives"; and Strategic Objectives include No 10 "Promote the health and wellbeing of communities":

- Ensure new development is properly served by health care services that meet the needs of communities
- Improve access to healthy food options for all communities
- Reduce the health impacts of air pollution through accessibility of sustainable travel such as public transport, cycling and walking
- Maximise the health benefits of access to the natural environment and green spaces;
- Coordinate with and support the delivery of local and Greater Manchester wide health strategies

9.14 The overall Strategy and many of the policies in the plan support improvements in health and wellbeing, and reductions in health inequalities, such as by "promoting a successful economy; increasing supply of high quality and affordable homes; enabling people to adopt healthier lifestyles; and reducing risks to human health". The JDP recognises that addressing health inequalities will require a diverse range of coordinated measures. The JDP supports improvements in health and wellbeing including through promoting a

successful economy, enabling people to adopt healthier lifestyles, and reducing the risks to human health.

9.15 Policy JP-P6 Health – To help tackle health inequality new development will be required, as far as practicable, to:

A. *Maximise its positive contribution to health and wellbeing, whilst avoiding any potential negative impacts of new development;*

B. Support healthy lifestyles, including through the use of active design principles making physical activity an easy, practical and attractive choice; and

C. Be supported by a Health Impact Assessment for all developments which require to be screened for an Environmental Impact Assessment…

9.16 The Policy supporting text advises that as well as being of great importance in its own right, "health also has a significant impact on the ability of people to enjoy the immense range of opportunities across Greater Manchester and to make a positive economic contribution". The text recognises that improvements in health require a range of coordinated measures, many of which are beyond the scope of the GMJDP. The JDP supports improvements in health and wellbeing, and reductions in health inequalities throughout its policies and proposals, such as by:

- Promoting a successful economy
- Increasing the supply of high quality and affordable homes
- Enabling people to adopt healthier lifestyles, including through development of a high-quality green infrastructure; encouraging provision of wide range of recreation and sports facilities; food growing opportunities; and increasing the proportion of trips made by walking and cycling
- Reducing the risks to human health, including flood risk; reducing air pollution; providing cooling and shading to combat high temperatures; promoting high levels of fire safety; and designing places to minimise opportunities for crime, terrorism, and anti-social behaviour

9.17 The policy supporting text does not suggest any particular kind of HIA but rather advises that HIAs "should aim to enhance the positive aspects of a proposal while avoiding or minimising any negative impacts, with particular emphasis on disadvantaged sections of communities that may be affected.

Local Planning Policy

Manchester City Council (MCC) Core Strategy (adopted 2012)

9.18 MCC's Core Strategy is the key document in Manchester's Local Development Plan. It is founded on a Vision to 2027 that includes "an increased and sustainable healthy population…". Policies relevant to health are as follows:

- Policy SP1 Spatial Principles includes requirement that development should make a positive contribution to neighbourhoods including "*making a positive contribution to the health, safety and wellbeing of residents*'

- Policy EC1 Employment and Economic Growth in Manchester requires development proposals to make the best possible use of a site in terms of efficient use of space and including application of best practice in security design.
- Policy EN4 seeks to reduce CO_2 emission and reduce fuel poverty by enabling low and zero carbon development.
- Policy EN8 Adaptation to Climate Change includes requirements to minimise flood risk and reduce urban overheating.
- Policy EN9 Green Infrastructure provides guidance on provision of new, and improvements to, the quality and accessibility of existing green infrastructure assets.
- Policies EN10 and EN11 safeguard and create new open space, sport and recreation facilities.
- Health is further protected through Policies EN14 Flood Risk, EN16 Air Quality, EN17 Water Quality, and EN18 Contaminated Land & Ground Stability
- Policy T1 Sustainable Transport requires "*delivery of a sustainable, high quality, integrated transport system to encourage modal shift away from car travel… and to prepare for carbon free modes of transport"*.
- Policy T2 will actively manage the pattern of development to ensure that there are accessible areas of opportunity and need.
- Policy T3 supports proposals that contribute to an economically and environmentally sustainable transport network through strategic integration of strategic transport projects. Progression towards sustainable transport will promote healthier living and well-being.
- Policy *DM1 Development Management requires that all development should have regard to specific issues including "Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation*"; Accessibility: *buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes*"; "*Community safety & crime prevention*"; and "*Design for Health.*

Our Manchester Strategy, Forward to 2025

9.19 The Strategy sets out the future envisaged for the city and the priorities were reset following wide consultation during 2020. Communities want to see a renewed focus on the six themes, including "Health – tackling physical and mental inequalities and ensuring fair access to integrated services".

Manchester's Building Back Fairer (Marmot) Framework (2022-2027)

9.20 The Framework sets out the interactivities between the eight identified themes and the four ways that community groups and trusted organisations need to be involved. The eight themes are:

- Communities & power
- Early years, children & young people
- Poverty, income & debt

- Work & employment
- Prevention of ill health & preventable deaths
- Homes & housing
- Places, transport & climate change
- Systematic & structural racism & discrimination

Making Manchester Fairer (2022-2027)

9.21 This plan recognises that poor quality health is harmful to physical and mental inequalities and widens health inequalities. Unaffordable housing contributes to poverty and can lead to homelessness. It further recognises that homelessness often results from a combination of events. Eight themes are identified and include "Improving housing and creating safe, warm and affordable homes."

Other Relevant Policy & Strategy

Greater Manchester (GM) Population Health Plan (2017-21)

9.22 Sets out the approach by the GM Health & Social Care Partnerships to delivery of a radical upgrade in population health across the city region. This strategic framework has been developed with Plan Objectives, as follows:

- Person & community centred approaches
- Start well
- Live well
- Age well
- System reform

Manchester City Council Population Health Plan (2018-2027)

9.23 The plan focuses on getting results in five crucial aspects of life:

- The first 1,000 days of a child's life
- Work and its positive impact on health
- Making social connections and changes that matter
- An age-friendly Manchester
- Action on preventable early deaths

9.24 An 11-point plan covers key factors – including the impact of housing. The plan recognises that "Better housing can help to prevent physical illness and reduce stress, and good heating and insulation helps to keep people well in winter. A good physical environment makes us more active and helps us access the services we need. Good-quality air prevents chest conditions getting worse, and reducing long-term exposure to pollution has many positive health benefits". It also recognises the harm that social isolation can have on mental health and wellbeing.

Guidance

Public Health England (PHE) Spatial Planning for Health (2017)

9.25 This report provides evidence of links between spatial planning and health, focusing on five key built environment topics – neighbourhood design, housing, healthier food, natural and sustainable environment, and transport.

Public Health England (PHE) Health Impact Assessment in Spatial Planning (2020)

9.26 This document provides a guide for local authority public health and planning teams setting out process and practice with regard to the wider determinants of health and wellbeing for plan-making and the planning application process. It identifies eight categories of health and wellbeing outcomes in planning: reduce health inequalities; improve mental health and wellbeing; improve diet and weight; improve musculoskeletal health; improve respiratory health; improve cardiovascular health; protect environmental health; and provide access to health and care infrastructure and services. The guide is mostly associated with the plan-making and associated strategic environmental assessment processes. It does include an annex on integrating HIA in EIA and this does confirm the importance of a proportionate and justified approach".

Institute of Environmental Management and Assessment (IEMA) Effective Scoping of Human Health in EIA; Determining Significance for Human Health in EIA (November 2022)

9.27 Provides a framework that supports a proportionate approach that can apply to all scales and sectors of EIA. It confirms that a wider determinants approach should be taken by EIA scoping. An EIA health chapter is required when other EIA technical topics have been scoped in to assess likely significant effects on human receptors, or there is a likely significant change for the health of a group of individuals due to the proposed project and in a wider determinant of health not covered by other technical EIA topics.

Assessment Methodology and Significance Criteria

Scenarios Tested

- Scenario 1: Existing Site (Baseline)
- Scenario 2: Baseline + Proposed Development
- Scenario 3: Baseline + Proposed Development + Cumulative

The Study Area

9.28 The geographical scope is determined by receptor groups that are likely to be significantly affected by the proposed development. The scope of the Human Health Chapter is in part dependent upon the study areas and potential receptors identified in the other technical assessments (noise, solar glare, daylight/sunlight/overshadowing, wind microclimate, climate change and socio-economic). Thus, the study area comprises the Proposed Development Site with local surrounds in the City Centre and the wider study area of Manchester City and Greater Manchester – as applicable to each of the factors relevant to human health and wellbeing for the proposed project. The Site is located within the Deansgate Ward.

Source of Effect

9.29 Health Impact Assessment (HIA) and health in EIA are separate processes, and there is no standard methodology for assessing health in EIA. The coverage of health in EIA need not be so comprehensive as the HIA that is used to inform detailed project design, but guidance documents for good practice in HIA can inform EIA practice in relation to human health and well-being. It is important that health in EIA is proportionate, balanced, and relevant. The approach here is proportionate - based on consultation responses, professional experience, and assessment of impacts against relevant baseline information. This is a Human Health assessment as part of an EIA; it is not a HIA.

9.30 Shaping Neighbourhoods: For Local Health and Global Sustainability (2003, 2010 & 2021) sets out the complexities of planning for health due to the multiple determinants and the need for cross-sectoral understanding and collaboration. This guide established a health map demonstrating the linkages between the global ecosystem, the natural and built environments, the local economy with communities, people, and their lifestyles. It explains the likely interactions between different sectors and seeks a common language for spatial planning and public health practitioners.

9.31 The complexities of investigating health impacts are recognised by Public Health England (PHE) and the Wider Determinants of Health tool is an ongoing project that provides resources for categories of factors that affect health, as follows: built and natural environment; work and the labour market; vulnerability; income; crime; education.

9.32 The London Healthy Urban Development Unit (HUDU) 'Healthy Urban Planning Checklist' (2017) provides a useful checklist that was developed for London but is applicable to development proposals in urban city centres elsewhere in the UK. The checklist aims to promote healthy urban planning by ensuring that the health and wellbeing implications of local plans and major planning applications are consistently taken into account, through providing a set of themes and planning issues that can be used to assess development proposals. It can be used to help screen possible health impacts for a health impact assessment. Changes in certain determinants caused by development projects may affect the health and wellbeing of existing and new residents. The checklist is divided into four themes – healthy housing; active travel; healthy environment; and vibrant neighbourhoods. This HUDU checklist recognises that health and wellbeing can be affected by multiple determinants as shown in Figure 13.1.

9.33 The HUDU has further developed the checklist into a rapid HIA tool (London HUDU, 2019) that uses existing evidence to quickly assess the impacts of a development plan or proposal and recommend measures to address any negative impacts and maximise benefits. The tool is based on eleven topics or broad determinants of health and wellbeing focused on the built environment and issues influenced by planning decisions.

9.34 For the purposes of this Human Health (HH) assessment, we have applied the HUDU checklist and eleven topics to the Proposed Development in order to help determine the scope of the assessment by identifying the relevant topics. Applicable criteria/questions for each of the scoped topics were considered at the assessment stage in order to assess potential health impacts and the need for any mitigation or enhancement. Existing information and evidence were used, and impact assessment undertaken using professional judgment.

9.35 Housing design and affordability are key factors – provision of good quality residential development is known to have positive effects on health and wellbeing. This HH considers the findings from the EIA chapter on Townscape & Visual Impact (TVIA). The interaction

with heritage and the historic environment can be a positive factor in supporting individual and community wellbeing – summary findings of studies will be considered with regard to human wellbeing.

9.36 Access to health and social care services and other social infrastructure is directly important for health. This health assessment considers the proximity, accessibility, and capacity (where possible) of health and medical centres and dentists in the vicinity of the Proposed Development. It considers the proximity and accessibility of gyms, leisure centres, sports/recreational and cultural facilities nearby since such activities are important contributors to health and wellbeing. Searches were made through web-based sources and using Google Maps to measure approximate distances by walking and/or public transport from the centre of the development area to the facility. The walkable zone was defined as a distance of about 1 mile from the site and equivalent to about 10-20 minutes' walk.

9.37 Access to open space and nature is a key factor. The proximity of open spaces and walking/cycling routes is investigated since access to open space and healthy modes of transport strongly contributes to healthier lifestyles and wellbeing. Does the proposal provide links between open and natural spaces and the public realm? Are the open spaces safe and accessible? Does the proposal set out how any new space will be managed and maintained?

9.38 Air quality, noise and neighbourhood amenity are important factors for health and wellbeing. Summary findings from the technical studies for air quality and noise are considered and their implications for health and wellbeing incorporated into this HH chapter.

9.39 Accessibility and active travel is well established as a major factor in health and wellbeing. Summary findings from the transport & traffic assessment technical study are considered and their implications for health and wellbeing incorporated into this HIA. Effects were not considered to be significant enough for these topics to be scoped into the EIA. The Proposed Development is located in the Manchester City Centre and richly served by a range of sustainable transport modes.

9.40 Crime reduction and community safety is a key factor in health and wellbeing for communities and this HH considers those elements of the development proposals that contribute to safety.

9.41 Access to healthy food is another direct factor in health, such as accessibility to a range of retail and smaller food shops, including for affordability. Provision of allotments and encouragement of community gardens for food is not often within the scope or viability of proposed development projects.

9.42 Access to work and training is known to affect health and wellbeing. Whilst provision of training is beyond the scope of the Proposed Development, the location of the new homes close to a wide range of employment opportunities are considered within this HH chapter.

9.43 Social cohesion and inclusive design are key factors for health and wellbeing. This HH chapter considers the implications of the design and project proposals in this respect for the new communities; it also considers connectivity with the nearby existing residents and communities.

9.44 Minimising use of resources – does the proposal make best use of existing land? Does the proposal encourage recycling, including building materials? Does the proposal incorporate sustainable design and construction techniques?

9.45 Climate change is an increasingly vital factor in considering environmental sustainability and a healthy environment – and consequently, health and wellbeing for people and communities. Does the proposal ensure that buildings and public spaces are designed to respond to winter and summer temperatures? This is a concern for tall buildings and city centre locations - such risks were considered to be of likely significance and scoped into the supporting EIA. This HH considers the findings from the EIA chapters on climate change; daylight, sunlight & overshadowing; solar glare; and wind microclimate. Risks associated with flooding and ground contamination were identified as not significant for the EIA and these findings are noted within this HH.

9.46 Overall, the HH chapter aims to consider impacts associated with the construction and the occupational phases. It considers embedded mitigation provided through the design of the project – such as layout, together with specific mitigation for potential negative effects – such as the commitment to a Construction Environmental Management Plan (CEMP) to control and minimise any effects associated with nuisance noise and dust.

9.47 The HH chapter aims to identify any sensitive receptors, such as nearby schools and care homes. The complexities of investigating health impacts are appreciated, including the multifunctionalities and interconnectedness of factors. Therefore, the key findings are then considered within the four themes for healthy urban living - Healthy Housing; Active Travel; Healthy Environment; and Vibrant Neighbourhoods.

9.48 The baseline informing the assessment draws upon local health and wellbeing information and priorities, such as those set out in the Manchester Intelligence Hub, and as reported through Public Health England and the Office for National Statistics (ONS). The key baseline from relevant technical studies undertaken for the EIA, and other planning support studies, is considered, including risks to health/wellbeing such as from air quality, noise, climate change, daylight/sunlight/overshadowing, solar glare, and the wind microclimate.

9.49 Further information on environmental sensitivity that might affect human health and wellbeing has been taken from Defra Magic Mapping. It has not been necessary for this assessment to undertake primary research or surveys and this desk-based approach using published information and professional judgment provides an appropriate level of detail to demonstrate that the requirements of The EIA Regulations – and Policy JP-P6 Health have been addressed.

Significance Criteria

9.50 The recent IEMA guidance (November 2022) suggests categories and wider determinants of health, and those relevant to the Proposed Development were identified, as follows:

Table 13. 1 EIA Wider Determinants of Health

Category	Wider Determinants of Health
Health related behaviours	Physical activity; diet & nutrition
Social environment	Housing; relocation; open space, leisure & play; transport modes & access; community safety; community identity & resilience; social participation, interaction & support
Economic environment	Education & training; employment & income

Bio-physical environment	Climate change mitigation & adaptation; air quality ; land quality ; noise & vibration; radiation
Institutional & built environment	Health & social care facilities; built environment; wider societal infrastructure & resources

9.51 The guide also sets out a generic human health magnitude criteria and significance criteria, as follows:

Table 13. 2 Human Health Magnitude Criteria

Category	Indicative Criteria (narrative based on professional judgment for magnitude change of population or sub-population
High	high exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/ injury outcomes; majority of population affected; permanent change; substantial service quality implications
Medium	low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications
Low	very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications
Negligible	negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication

Table 13.3 Human Health Significance Matrix

		Sensitivity			
		High	Medium	Low	Very Low
	High	Major	Major/Moderate	Moderate/Minor	Minor/Negligible
	Medium	Major/Moderate	Moderate	Minor	Minor/Negligible
	Low	Moderate/Minor	Minor	Minor	Negligible
	Negligible	Minor /Negligible	Minor/Negligible	Negligible	Negligible

9.52 Therefore, a significant effect is reported in this assessment where, based on professional judgment, the Proposed Development is likely to contribute to a material change in health outcomes associated with the health issue being assessed and, in determining this, the following questions have been considered:

- Have significant effects been identified in other assessments undertaken as part of the EIA that are linked to human health (i.e. are environmental or health standards threatened)?
- Are vulnerable groups affected?
- Is the effect reversible or irreversible?
- Does the effect occur over the short (less than one year), medium (one to five years) or long (over five years) term?
- Is the effect permanent or temporary?
- Does it increase or decrease with time?
- Is the effect at an individual, community or population level?

- Are mitigating measures available and is it reasonable to require these?

9.53 Effects that are described as 'minor' or 'negligible' are determined to be 'Not Significant' and effects that are described as 'moderate' or 'major' are determined to be 'Significant'. This takes into account the sensitivities of receptors (high, moderate, low) and as set out previously in Table 2.3 in the EIA Methodology (Chapter 2). The criteria and categories of significance applied in this human health impact assessment are, as follows:

- Major Adverse/Beneficial – important considerations at local or district scale; if adverse, are potential concerns to the project and may become key factors in the decision-making process; changes due to the project have a substantial effect on ability to deliver current health policy and/or ability to narrow health inequalities; changes due to the project could result in a regulatory or statutory threshold being crossed
- Moderate Adverse/Beneficial – modest important local effects that, if adverse, may be key issues for decision-making; changes due to the project have an influential effect on ability to deliver current health policy and/or ability to narrow health inequalities; changes due to the project could result in a regulatory or statutory threshold being approached
- Minor Adverse/Beneficial – Slight, short, or highly localised effects that, if adverse, are unlikely to be important in the decision-making process; changes due to the project have a marginal effect on ability to deliver current health policy and/or ability to narrow health inequalities
- Negligible – no appreciable effects on health factors

9.54 Standardised sectoral thresholds and significance criteria have been used for each of the relevant technical factors that contribute to health and well-being, according to recognised guidance, standards, and assessment methods for townscape & visual impact; noise & vibration; daylight, sunlight, & overshadowing; solar glare; wind microclimate; climate change; and socioeconomics. Then, the overall likely significant effects on human health have been determined in a qualitative way using professional judgment.

Baseline Conditions

9.55 The Proposed Development is located within the Deansgate Ward in Manchester City Centre. The Site is currently with 3-4 storey red-brick buildings that are vacant. It is bound by Whitworth Street West to the north, with the listed railway viaduct and Deansgate Station platform immediately to the south. The Site is bounded by Cameron Street to the east and Bugle Street to the west.

9.56 Population & Life Expectancies: There are some 16, 876 people living in Deansgate Ward according to the ONS Census population estimates (2022) and as reported in the Manchester Intelligence Hub. The working age population is 16,412 with only 184 people aged 65+ and only 280 children under 16 years. The working age population of 97.3% is similar to the adjacent Piccadilly Ward with 95.9% and reflects the demographic of city centre living and working. According to OHID (previously PHE) data (2016-2020), life expectancy at birth for Manchester is 75.6 (males) and 79.7 (females) compared with 79.5 (males) and 83.2 (females) averaged for England. Provisional estimates of life expectancy at birth show the impact of the Covid-19 pandemic. Data are not available for the

Deansgate Ward but life expectancy at birth in the Piccadilly Ward for females is 87.7 (no data for males) which is the highest in the city.

9.57 The size of the fall in life expectancy in Manchester is more than that seen in England overall, widening inequalities in life expectancies between Manchester and the national average. According to PHE data, physically active adults (2022-23) are recorded at 65.0% for Manchester, lower than that averaged for England at 67.1%. Percentage of adults classified as overweight or obese are recorded at 63.3%, slightly lower than the 64.0% averaged for England. The winter mortality (2021-22) at 11.4% was slightly worse than the averaged value of 8.1% for England.

9.58 Health & Inequalities: The Manchester State of the City Report (2023) reports on progress with various matters including reducing health inequalities and self-reported wellbeing. It reports that people with higher levels of wellbeing have lower rates of illness, recover more quickly (and for longer), and generally have better physical and mental health. Individuals in Manchester have overall poorer scores on self-reported life satisfaction than England as a whole. In 2019/20, 5.4% of adults in Manchester had a low life-satisfaction score compared with 4.7% of adults across England as a whole – a difference of 0.7 percentage points. In 2022-23, the self-reported wellbeing was 7.2% for Manchester compared with 5.6% for England.

9.59 In 2021, 13.3% of respondents in Manchester said they had a long-term mental health problem compared with 11% of respondents across England as a whole. Infant deaths (deaths to children aged under one year of age) are an indicator of the general health of the entire population. They reflect the relationship between causes of infant mortality and other determinants of population health, such as economic, social, and environmental conditions. The infant mortality rate in Manchester has improved substantially in recent years. Between the periods 2001–03 and 2011–13, the rate fell by 87%.

9.60 Physical inactivity is the fourth-leading risk factor for global mortality. Data from the Sport England Active Lives Adult Survey for 2022/3 shows that the proportion of adults aged 19 and over in Manchester classed as 'inactive' has fallen slightly from 26.5% in 2019/20 to 25.7% in 2022-23. The proportion of adults across England as a whole classed as 'inactive' has changed over the same time period (from 27.1% in 2019/20 to 26.0% in 2022-23).

9.61 The Index of Multiple deprivation (IMD) is an overall relative measure of deprivation constructed by combining seven domains of deprivation – Income; Employment; Education; Skills & Training; Health & Disability; Crime; Barriers to Housing Services and Living Environment. According to MCC Intelligence Hub information using Ward profiles, the Deansgate Ward has a IMD score (2019) of 24.1 (the least deprived is in the range 15.5-31.1 with 48.4-62.7 indicating the most deprived) indicating that Deansgate is one of the least deprived Wards in the City. Overall, Manchester had a IMD (2019) of 40.0 which is worse than that for the north-west region at 28.1 and averaged for England at 21.7.

9.62 Health Services & Other Social Infrastructure: There is a range of services and community facilities within close proximity (10-20 minute walk, a 1 mile radius) of the site. There are five GP practices/medical centres within the local level of around 1 mile (20-25 minute walk) of the Site. These practices are currently operating at an average of approximately 2,800 patients per FTE GP, which is substantially above the benchmark of 1,800 patients per FTE GP recommended by the HUDU. As of January 2024, there are 2,294 patients per GP in England – an average that has increased by 7% since 2019 (Royal college of General Practitioners). According to the BMA, GP practices across England are experiencing

significant and growing strain with declining GP numbers, rising demand, struggles to recruit and retain staff – with knock-on effects for patients. It should be noted that practices can operate sustainably at higher patient to GP ratios dependent upon specific staffing and funding models, as well as taking into account the demographic profile of the patient population.

9.63 Thus, there is a national and fast-changing situation relating to GP practices, capacities, services and meaningful ratios of GP to patients. The precise numbers of patients and capacities for new patients at GP practices in the vicinity of the Site are not known, although an initial web-based search indicated that some of the GPs appear to be taking on new patients. The Deansgate Ward populations comprise almost entirely of people aged 16-64 (97%) of which the vast majority are under the age of 40 (92% aged between 16-39). On the reasonable assumption that a more elderly patient profile is likely to generate higher demand for primary healthcare services, it is therefore more likely that practices operating locally can sustainably support higher patient to GP ratios. A new build medical centre has recently been developed within the ground and first floor of the Elizabeth Tower residential development (New Jackson Medical Centre) and this provides additional provision.

9.64 There are nine dental practices within around 1 mile radius of the Site. It is not known how many of these dental practices are taking on new patients nor how many of these will take NHS patients. Studies by the BBC and the British Dental Association (BDA) in 2022, found that 9 in 10 practices in England are reporting that they are unable to take on new adult patients on the NHS. The BDA continues to lobby for reform and fair funding for NHS dentistry, and as with GPs, this situation with dentists is national and appears to be somewhat changeable. Again, the likely demographics for working age residents in the Deansgate Ward indicate that the current dental practices may be able to accommodate demand from the increased number of residents.

9.65 Hospitals are located to the south-east and around 1.5 miles distance – with good sustainable transport possibilities. There are no care/retirement/nursing homes within the vicinity. There are several community centres within 1 mile of the Site.

9.66 The Site is located within the Manchester City Centre where there is a rich variety of cultural, health & wellbeing services and facilities available. This includes museums and art galleries, theatres and cinemas, cafes/bars and restaurants. There are some 15 gyms/sports centres within a 1 mile radius of the Site, including some with swimming pools.

9.67 Education: There are three nurseries located within 1 mile of the Site. Within 2 miles walking distance of the Site, there are 25 primary schools; within a 3 mile radius of the Site, there are 24 secondary schools. The phased opening of Crown Street Primary School from September 2024 will begin to provide further capacity.

9.68 Crime: The total reported street crimes for 2018 in the Deansgate Ward was 14,172, similar to adjacent Wards, and at the highest end of the range from 1,343 – 16,552 reported within Manchester.

9.69 Employment & Economy: Total number of people in employment within the Deansgate Ward was 102,000 (2022), the highest in the city with adjacent Piccadilly Ward at 85,000, and reflecting the city centre employment focus. ONS data indicates that in 2023, total employment within Manchester City Centre stood at just over 200,000, with more than

half of this within the Deansgate ward. Within the local area, the composition of the employment structure is weighted heavily towards office-based, professional service economy sectors.

9.70 Open Space & Nature: There a number of open/amenity spaces in proximity to the Site (less than 1 mile) including Piccadilly Gardens, Sackville Gardens, Mayfield Park, Gartside Gardens and All Saints Park. Within less than 0.25 miles, there is walking and cycling access to wider networks of open/green space, for example, the Rochdale Canal and Ashton Canal towpaths, and beyond – such as the Beeway cycle and walking routes, the Manchester Green Trail, the Bridgewater Way, and the GM Ringway. The Ashton Canal Site of Biological Importance (SBI) is located close to the north of the Site, above ground within the Store Street Viaduct. Several of the baseline developments identified (Scenario 1) include a provision of public realm or amenity space, contributing high quality public realm and improved connectivity to the surrounding areas. The Great Jackson Street strategic regeneration framework area includes proposals under development to create a new 0.5 ha public park linking Deansgate and the City Centre.

9.71 Air Quality: As with the majority of Manchester City Centre, the Site is located within the Greater Manchester Air Quality Management Area (AQMA). Local air quality at the Site is and will be affected by local traffic flows. Flood Risk: The site is within Flood Zone 1 and, therefore, at low risk of flooding. Travel: The Site is one of the most accessible in the city, being 0.4 mile a 10 minute walk to the south-west of Manchester Piccadilly Station and with excellent access to rail, Metro, bus services and a wide network of pedestrian and cycling infrastructure. Ground Conditions: The Site is brownfield. These topics were not determined to not be significant enough to be scoped into the EIA and as agreed through the Scoping Opinion with MCC.

9.72 Townscape & Visual Impact; Heritage: The Site is located within the Deansgate area of the Manchester City Centre, approximately 0.4 miles to the south west of Piccadilly railway station. Generally, this part of the city is focused on commercial and retail use, with some hotel and residential uses, with large-scale recreational/leisure facilities north of the railway. Formerly in commercial use, the two buildings on the Site are now vacant. There is much variety within this part of the city and on Whitworth Street itself. The site sits within a cluster of tall buildings established and emerging around the Deansgate transport hub. Twelve viewpoints were selected to represent the experience of different types of visual receptor within the urban area. The Site is not located in any designated Conservation Area (CA) but the Whitworth Street CA is nearby to the east. There are no nationally listed heritage assets on the Site, although there are a number of nearby listed assets.

9.73 Noise & Vibration: Generally, the Site is exposed to high levels of noise, even considering its central urban location, with multiple types of noise source in close proximity. During the daytime, road traffic noise dominates at the northern boundary, with regular passing trams also contributing. During evening and night-time weekend hours, exceptionally high levels of low frequency noise from music at the Rebellion nightclub, and to a lesser extent Deansgate Locks dominates the noise climate. At the southern boundary of the Site, regular passenger trains both stopping at Deansgate station and passing through dominate the noise climate; road traffic noise from the surrounding area contributes to the background noise levels.

9.74 The baseline studies measured the level of ground-borne vibration from individual passing passenger and freight trains on the railway viaduct to the south. Daytime and nighttime

noise monitoring surveys were undertaken. The studies identified four nearby (<100m) residential blocks are potentially sensitive to noise and vibration during construction and operation. Also, the structure of the Rochdale Canal situated some 20m to the north of the Site and risk of sensitivity to vibration during demolition and construction.

9.75 Daylight, Sunlight & Overshadowing and Solar Glare: The Site is currently undeveloped and is located in a city centre, dense urban location. The surrounding receptors are therefore receiving higher levels of daylight and sunlight than would typically be expected in a city centre location. Baseline studies for windows and rooms at identified sensitive receptor locations found that overall, there is a reasonable level of baseline daylight, sunlight and overshadowing compliance considering the city centre context of the Site and the height and density in the immediate locality. The existing state is two low-rise brick buildings with punched windows, thus there is limited opportunity for instances of solar glare from the Site to be experienced.

9.76 Wind Microclimate: 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 baseline studies identified that there are pre-existing wind safety exceedances on Trafford Street to the north of the Site, adjacent to the Axis and Viadux.. Winter comfort conditions range between suitable for sitting, standing and leisure walking, with highly localised regions which are suitable for business walking in the same location as the pre-existing wind safety exceedances. Summer conditions range between suitable for sitting and standing with localised regions suitable for leisure walking

9.77 Climate Change: Greenhouse gas (GHG) emissions occur constantly and widely as a result of human and natural activity. As the site is currently vacant, there are no significant GHG emissions associated with the site in the baseline.

Identification and Evaluation of Likely Significant Effects; Mitigation Measures

Construction Phase

9.78 Socioeconomics - Employment & Economy: During the construction phase a variety of jobs would be supported – on and off Site – temporary, short term and Minor Beneficial (Not Significant). The Proposed Development could lead to an additional £51 million in GVA generated annually across Greater Manchester during the construction period giving rise to a direct, long term and Minor Beneficial (Not Significant) effect.

9.79 Townscape & Visual Impact; Heritage: During the construction phase, sources of townscape and visual effects include site set up and compound, boundary fencing, site clearance, groundworks, access, and contractor parking, plant and equipment. Measures to control construction impacts will be incorporated into a Construction Environmental Management Plan (CEMP). Construction phase townscape temporary impacts range from minor to moderate/major adverse. The majority of the 12 viewpoints experience minor/moderate adverse effects and only one viewpoint experiences a moderate/major level of adverse impact, which is significant in EIA but temporary. Minor adverse temporary effects on nearby heritage assets.

9.80 Noise & Vibration: Noise effects from demolition and construction, including road traffic noise, will be controlled through working practices and techniques agreed through a CEMP. This also includes the identification and use of low vibration techniques. Residual effects during the construction phase will be Negligible.

9.81 Wind Microclimate: During construction, conditions will gradually change from the baseline conditions to conditions for the completed and operational development. Therefore, construction effects can be inferred from the effects due to the completed and operational development.

9.82 Climate Change: There will be some embodied carbon emissions associated with construction materials and their transport to the Site – Minor Adverse (Not Significant).

Operational Phase

9.83 Socioeconomics - Housing: The Proposed Development includes 364 residential apartments (1, 2 & 3 beds), thus offering a range of home types to contribute to the identified housing need with Moderate Beneficial effects towards housing objectives. Good quality housing is associated with better health and wellbeing. Improvements in the stock of housing types will also contribute towards objectives for reducing health inequalities.

9.84 Socioeconomics – Employment & Economy: The net employment generation represents a negligible magnitude of change with reference to total employment levels at the Manchester level and give rise to a Negligible effect. The Proposed Development could generate circa. 42 FTE jobs and the magnitude of change represented by this level of employment generation is Negligible. The increase in local authority revenue would give rise to a Minor Beneficial effect which is Not Significant.

9.85 Healthcare Facilities: There appears to be a national and fast-changing situation relating to GP provision – staffing, capacities, services - and meaningful ratios of GPs and other health professionals to patients; also, for dentists and particularly provision of NHS dentists. Needs and demands are changing. There are a variety of healthcare services and facilities within good accessibility of the Site. Given the demographic profile of the existing local resident population, it is likely that residents living at the Proposed Development and nearby baseline developments will generate a generally lower level of demand for primary healthcare services. Effects are considered to be Negligible.

9.86 Educational Facilities: Effects with regard to primary education are considered to be Minor Adverse (Not Significant) and for secondary education to be Negligible.

9.87 Crime: There is likely to be less risk of crime since there will be new occupied buildings with security measures rather than a vacant site – Minor Beneficial (Not Significant).

9.88 Open Space, Recreation & Amenity: An uplift in resident population will increase demand and usage of nearby open space and recreation facilities. However, it assessed that the magnitude of change associated with the Proposed Development will give rise to a Negligible effect.

9.89 Townscape & Visual Impact & Heritage: During the operational phase, effects at the viewpoints mostly range from Neutral to Minor/Moderate with only one viewpoint in Whitworth Street predicted to have Moderate/Major Adverse effects. Only one viewpoint experiences a moderate/major level of visual impact. Townscape effects ranged between Minor Beneficial and Minor/Moderate Adverse. The Proposed Development with 44 storeys is located in the context of Petersfield and in proximity to other tall residential blocks. It is therefore in keeping with its surroundings and the effect is neutral.

9.90 The Proposed Development creates high quality public realm with more space for pedestrians and opportunity to engage with the streetscape. Once complete, the building

will present an active frontage onto adjoining streets, enhanced by new public realm with soft landscape including trees and rain gardens, feature archways and seating areas. These changes are an enhancement on the baseline position and therefore of benefit to public realm and site character. Effects on nearby heritage assets and Conservation Area settings were found to be Neutral.

9.91 Noise & Vibration: Assuming the building plant noise limits are adopted and adhered to, there would be Negligible residual effects at all the identified sensitive receptors.

9.92 Daylight, Sunlight & Overshadowing: Daylight impacts to the surrounding properties are Negligible to Minor Adverse and sunlight impacts to the surrounding properties are Negligible. Overshadowing impacts to the surrounding areas of amenity space are Negligible.

9.93 Solar Glare: The overall effect in terms of solar glare would range from being temporary negligible effects during demolition, then gradually changing to post mitigation residual effects of negligible to permanent, negligible/minor adverse, moderate adverse and significant, once the Proposed Development is complete. The studies assessed viewpoints at 9 road locations and along nearby rail/tram routes. For most road users at nearby junctions and train/tram drivers on nearby tracks, effects are likely to be Negligible – Minor Adverse which is Not Significant. For road users at one location - Collier Street Car Park pedestrian crossing – effects are likely to be Minor-Moderate Adverse which is significant. For train/tram drivers at 6 viewpoints travelling eastwards, effects are likely to be Minor Adverse which is Not Significant; at another 5 viewpoints, effects are likely to be Moderate Adverse but would only occur momentarily when at each of the precise viewpoints assessed and between just one hour of the day, on sunny days for just four months of the year.

9.94 Wind Microclimate: The Proposed Development does not introduce any wind safety risks, and wind conditions would be suitable (or otherwise consistent with the existing conditions) for all local thoroughfares, roadways, building entrances, bus stops, tram stop platforms, existing ground floor amenity spaces, proposed ground floor amenity spaces and the proposed terraces on level 2. For the platforms of Deansgate Railway Station, there would be a slight increase in windiness, and this would be reduced in extent by the inclusion of future committed developments.

9.95 Climate Change: There will be some greenhouse gas emissions associated with embodied carbon and operational energy emissions. These have been reduced through embedded design to Minor Adverse effects which are Not Significant.

Cumulative Effects

9.96 Socioeconomics: Moderate Beneficial effects are indicated with regard to temporary construction employment and additional jobs generated. For the operational phase, cumulative effects are likely to be Moderate Beneficial for local authority revenue. Effects on primary healthcare facilities and primary/early years and secondary education are considered to be Negligible. Cumulative effects on open/amenity space are considered to be Negligible.

9.97 TVIA: Cumulative assessment identifies in combination moderate adverse effects for viewpoints 2, 3, 4, 6, 7 and 12 – out of 12 viewpoints; cumulative effects on the other viewpoints were not significant.

Residual Effects

9.98 Post-mitigation residual effects are summarised in the tables 13.5-13.6, as follows:

Table 13.5 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the construction phase.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Construction Phase				
Socioeconomics: Employment	Workers & local economy	N/A	N/A	Minor Beneficial Not Significant
TVIA	Workers & residents	Screening	CEMP	Range from minor neutral to one instance of moderate/major adverse (temporary) (view 7)
Noise & Vibration – demolition & construction; road traffic	Workers, nearby residents	Screening & working practices	CEMP following Best Practicable Means	Negligible
Vibration	Rochdale Canal	None	N/A	Negligible
Wind Microclimate	Passers by	Screening & practices to reduce nuisance wind	CEMP	Negligible

Table 13.6 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the operational phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Operational Phase				
Socioeconomics: Employment	Workers & local economy	N/A	N/A	Negligible
Socioeconomics: LA income	MCC rates & tax	N/A	N/A	Minor Beneficial (Not Significant)
Socioeconomics: Healthcare	Residents	N/A	N/A	Negligible
Socioeconomics: educational	Residents	N/A	N/A	Negligible – Minor Adverse (Not Significant)
Socioeconomics: Open Space & Amenity	Residents & visitors	N/A	N/A	Negligible
Housing	Residents	N/A	N/A	Moderate Beneficial

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Townscape Character	Residents & visitors	N/A	N/A	Minor beneficial (3) Neutral (1) Minor Adverse (1)
Views	Residents & visitors	N/A	N/A	Neutral (6) Minor / Moderate Adverse (5) Moderate / Major Adverse (1)
Noise – building plant	Nearby residents	Typical plant noise controls	Planning conditions	Negligible
Noise – environmental & entertainment	Residents	Triple glazing and façade linings. Noise emission reduction measures applied to Rebellion	Planning conditions	Negligible
Noise – overheating control	Residents	Design measures to control duration of vent panel openings	Design	Negligible
Railway Vibration and Ground-borne Noise	Residents	N/A	N/A	None
Daylight, Sunlight & Overshadowing	Residents & visitors; amenity space	N/A	N/A	Negligible to Minor - Not Significant
Solar Glare	Nearby road users & train/tram drivers	Glazing Specifications should be low reflectance to areas of elevations specified	Planning condition	Minor to Moderate Adverse
Wind Microclimate	Residents, visitors	N/A	N/A	Negligible – Minor Adverse Not Significant
Climate Change – greenhouse gas emissions	Embodied carbon & operational energy	Specifying materials with lower Embodied Carbon emissions & installing energy efficient technology	Whole-life carbon assessments, material assessments and option appraisals	Minor Adverse – Not Significant

References

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PHE Strategy (2020 – 2025) https://www.gov.uk/government/publications/phe-strategy-2020-to-2025

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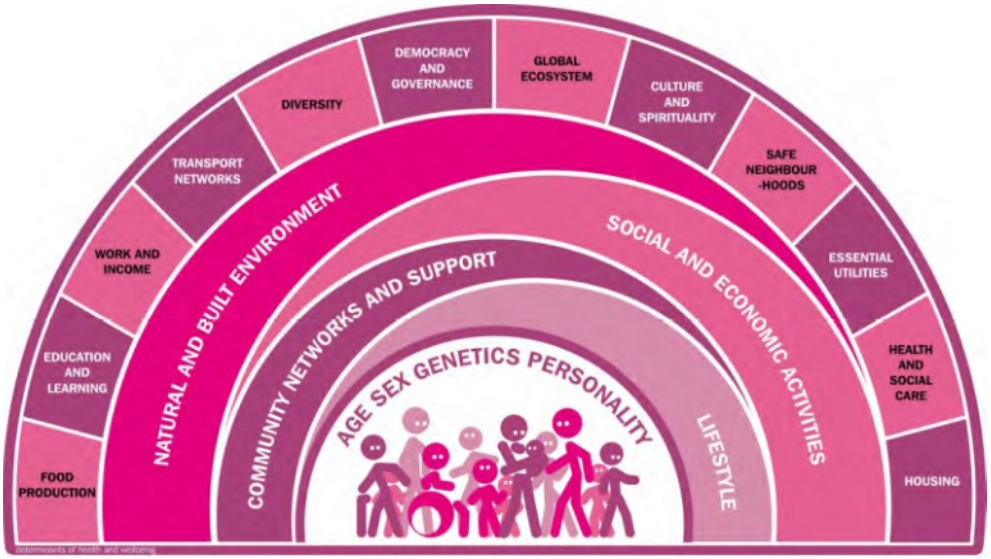
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and the Office for National Statistics (ONS) https://www.ons.gov.uk/

Manchester State of the City Report 2023
https://www.manchester.gov.uk/info/200088/statistics_and_intelligence/8551/state_of_the_city_report

Sport England https://activelives.sportengland.org/

Defra Magic Mapping https://magic.defra.gov.uk/MagicMap.aspx

Figure 9.1



The Determinants of Health and Wellbeing (London HUDU, developed from Barton & Grant 2007)

Not to Scale	Date: October 2024

10. Noise and Vibration

Introduction

10.1 This Chapter of the ES has been prepared by Hilson Moran Partnership Ltd and asseses Noise and Vibration.

10.2 This Chapter is accompanied by the following appendices:

- Appendix 10.1: Glossary of Acoustic Terms
- Appendix 10.2: Baseline Survey
- Appendix 10.3: Demolition and Construction Noise and Vibration Assessment
- Appendix 10.4: Consultation
- Appendix 10.5: Overheating Analysis Report

10.3 The authors of this Chapter is a Technical Manager at Hilson Moran, who has over ten years industry experience working as an acoustic consultant across a broad range of market sectors, including residential, commercial, education and healthcare projects. The author has been involved in preparing and reviewing Noise and Vibration Chapters for EIAs on many of these projects, and clearly demonstrates a practical understanding of the factors affecting acoustics in relation to construction and the built environment. The author holds an MSc degree in Environmental and Architectural Acoustics from London South Bank University, and also holds a corporate membership (MIOA) with the Institute of Acoustics (IOA).

Table 10.1 Technical Competence in Noise and Vibration

	Lead Author	Reviewer
Name	Jerry Rees	Jack Richardson
Company	Hilson Moran Partnership Ltd	Hilson Moran Partnership Ltd
Qualifications/Accreditations relevant to technical area	BSc(Hons), MSc, MIOA	
Does the practitioner hold any IEMA qualification?	No	No
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	10	10
Number of EIA's delivered to date	15	3

Assumptions and Limitations

10.4 Certain limitations and assumptions have necessarily been included within this assessment for the reasons set out below.

Demolition and Construction Noise and Vibration

10.5 The calculation methods used allow accurate noise levels to be determined for various demolition and construction activities. However, the value of any such predictions is necessarily limited by the number of assumptions that are made regarding the number and type of plant utilised, their location and detailed operating arrangements.

10.6 Some of this information would be clarified as details of the demolition and construction works are specified and resources are mobilised. Other information, such as exactly where the demolition and construction machinery operate and for how long would remain uncertain, even after works have commenced. Available information (e.g. suitable areas for equipment and associated acoustic mitigation methods) will be set out in a detailed construction management plan, but onsite constraints will always influence operations to some degree.

10.7 As a consequence, the anticipated available information will be sufficient to perform a generic demolition and construction phase noise assessment, focusing on key activities operating at locations nearest sensitive receptors, with the aim of identifying whether a significant, albeit temporary, noise effect is likely to arise.

Building Services Plant Noise

10.8 At this stage the number, location, specific type and configuration of building services plant and equipment connected with the Proposed Development are not yet fixed. As a consequence, it is not possible to undertake accurate predictions and determine whether appropriate standards might be met. Instead, appropriate plant noise emission limits have been set to prevent noise creep.

Relevant Legislation, Policy and Guidance

10.9 This section sets out legislation, national and local policy and guidance of relevance to the technical assessment in this chapter.

Legislation

Control of Pollution Act 1974

10.10 The Control of Pollution Act 1974 (1) gives local authorities special powers for controlling noise and vibration arising from demolition and construction works. These powers may be exercised either before or after works have been started.

10.11 Section 60 enables the local authority of an area in which works are scheduled or currently underway, to serve a notice of its requirements for the control of construction site noise/vibration on the person who appears to the local authority to be undertaking the works.

10.12 Section 61 provides a mechanism for the contractor or developer to take the initiative in approaching the local authority to ascertain its noise/vibration requirements before construction work starts.

10.13 The Act also covers Noise Abatement Zones, Codes of Practice and Best Practicable Means (BPM) regarding noise pollution.

Environmental Protection Act 1990, Part III

10.14 Section 79 of the Environmental Protection Act 1990 (2) defines statutory nuisances and the requirement for local authorities to inspect their area for statutory nuisances, taking such steps as are reasonably practicable to investigate any complaint of a statutory nuisance.

10.15 Section 80 of the act gives local authorities the right, where a statutory nuisance exists or is likely to be caused, to serve an abatement notice requiring the abatement, prohibition, or restriction of the nuisance.

10.16 Section 82 of the act allows a person aggrieved by a statutory nuisance to make a complaint to a Magistrates Court in an attempt to seek an abatement notice served on the person responsible for the nuisance.

Policy

10.17 Planning policy at the national, regional, county and local level relevant to the Proposed Development is discussed below.

National Planning Policy

National Planning Policy Framework, December 2024

10.18 The National Planning Policy Framework (NPPF) (2024) seeks to contribute to and enhance the natural and local environment, including preventing new and existing developments from contributing to, and/or, being put at an unacceptable risk from noise pollution. In support of this, paragraph 187 of the NPPF states that:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans".*

Noise Policy Statement for England, March 2010

10.19 The Noise Policy Statement for England (NPSE) (4) was published in March 2010 by the Department for Environment, Food and Rural Affairs (DEFRA) and forms the overarching statement of noise policy for England. It sets out the long-term vision of Government noise policy, which is to:

> "*Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*."

10.20 The policy aims, through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development, to:

- Avoid significant adverse effects on health and quality of life;

- Mitigate and minimise adverse effects on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life.

10.21 The NPSE sets out three terms with regard to noise effects:

- No Observed Effect Level (NOEL) – the level below which no effect can be detected and below which no detectable effect on health and quality of life due to noise can be established;
- Lowest Observed Adverse Effect Level (LOAEL) – the level above which adverse effects on health and quality of life can be detected; and
- Significant Observed Adverse Effect Level (SOAEL) – the level above which significant adverse effects on health and quality of life occur.

10.22 The above terms are not defined numerically in terms of absolute levels within the NPSE which acknowledges that these will change depending on, but not limited to, the noise source, the receiver type and the time of day/day of week.

Local Planning Policy

Manchester Local Plan

10.23 The Manchester Local Plan guides development within Manchester and includes various documents detailing general and specific policies for Manchester and the wider area.

10.24 The Places for Everyone Joint Development Plan (5) was adopted in 2024. It contains policy JP-C8 which includes a requirement for Construction Management Plans to be produced for developments, where appropriate, to mitigate noise impacts on the surrounding area.

10.25 The Core Strategy 2012 to 2027 includes Policy DM 1, which states the following with regards to new development:

> "*All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document: …*
>
> *…Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.*"

10.26 The Core Strategy was updated following the adoption of Places for Everyone Joint Development Plan in March 2024, but none of the existing policies referring to noise were affected.

10.27 In addition to the above documents, the Local Plan includes a series of Development Control Policies. DC26 Development and Noise details requirements for the control of noise in new development. The policy aims to reduce noise impact on people by assessing both the noise generated by new developments and the exposure of new developments to existing noise sources. New noise-sensitive developments such as housing will only be provided if they are not exposed to high noise levels or if the noise can be mitigated. Applicants must provide an impact assessment and propose mitigation measures if their developments might be affected by or generate significant noise.

Guidance

Manchester City Council Planning and Noise Technical Guidance

10.28 In addition to the policies provided in the Manchester Local Plan, MCC provide guidance on what they generally require in terms of criteria for specific uses and types of noise and vibration with regards to planning in the Planning and Noise Technical Guidance (6). Consultation was undertaken with the Environmental Protection team at MCC (provided in Appendix 10.4: Consultation) to clarify the required criteria relevant to the Proposed Development, where they confirmed that the following criteria from the MCC Technical Guidance is applicable.

- Environmental noise ingress – 35 dB $L_{Aeq,16hr}$ in living rooms during the day, 30 dB $L_{Aeq,8hr}$ in bedrooms at night, and also not to exceed 45 dB L_{AFmax} more than 10 times in bedrooms at night. There is also a target of 55 dB L_{Aeq} to be achieved in external amenity areas during the daytime, although it is noted that this isn't always achievable in higher noise areas where development is desirable, such as city centres, and that this shouldn't prohibit development.
- Entertainment noise ingress – internal noise levels in the 63 Hz and 125 Hz octave centre frequency bands so as not to exceed 47 dB and 41 dB ($L_{eq,5min}$) respectively.
- Railway vibration ingress – the MCC Technical Guidance doesn't include specific criteria but references BS 6472-1:2008 (BS 6472-1) (7). Based on this it was agreed to assess vibration against the low probability of adverse comment VDV levels of 0.2 $m/s^{1.75}$ during the day, and 0.1 $m/s^{1.75}$ at night, from Table 1 of BS 6472-1. It was also agreed to assess ground-borne noise in terms of its contribution to the overall L_{AFmax} levels, against the criteria defined above for environmental noise ingress.
- Building services noise - a rating level (as defined in BS 4142:2014+A1:2019 (BS 4142) (8) of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at receptors.

10.29 MCC also confirmed that they expect an assessment of noise ingress during the use of overheating controls, following the Acoustics Ventilation and Overheating (AVO) Guide (9) and complying with Building Regulations Approved Document O (ADO) (10).Where detailed guidance is not contained in the MCC Technical Guidance, the most appropriate Standards and guidance have been adopted in the prediction and assessment of noise and vibration impacts.

Demolition and Construction Noise and Vibration Guidance

10.30 Guidance relating to the prediction and assessment of demolition and construction phase noise and vibration impacts has been taken from the following documents:

- British Standards (BS) 5228-1+2:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' (BS 5228-1 and BS 5228-2) (11+12) provide guidance on the assessment of noise and vibration impacts during the redevelopment of a site, including procedures for estimating noise levels from construction activities and vibration attributable to vibrating rolling and piling activities respectively. The guidance does not define acceptable limits. However, it does provide potential methods for assessing the significance of noise and vibration impacts and the methods for assessing the significance of impacts which the guidance indicates should be defined on a site-specific basis. BS 5228 also provides guidance on minimising potential impacts through the use of mitigation and the adoption of Best Practicable Means (BPM).
- Advisory Leaflet 72 'Noise Control on Building Sites' (13) sets out advice on the control and management of construction noise. Appropriate noise limits are also suggested at residential locations during daytime hours (07:00-19:00). The leaflet states that noise outside the nearest occupied room should not exceed: (a) 75 dB(A) in urban areas near

to main roads in heavy industrial areas, or, (b) 70 dB(A) in rural, suburban and urban areas away from main roads traffic and industrial noise.

- BS 7385-2:1993 'Evaluation and Measurement for Vibration in Buildings' (14) provides guidance on the measurement of vibration in buildings and the assessment of the potential of cosmetic or structural damage. Table 1 within BS 7385-2:1993 provides the vibration limits above which cosmetic damage could occur.

10.31 The following documents are relevant in predicting and assessing demolition and construction traffic noise affecting nearby receptors:

- Department of Transport / Welsh Office Memorandum Calculation of Road Traffic Noise (CRTN) (15), 1988 describes procedures for predicting and measuring noise from road traffic noise in terms of the L_{A10} (the noise level exceeded for 10% of the time) and is suitable for environmental assessments of development proposals where changes in road traffic noise may have a significant effect.
- IEMA 'Environmental Assessment of Traffic and Movement Rev07' (16) provides guidance on the impact assessment of traffic noise. The guidance note refers to the scoping section of the DMRB LA 111 document (see below) rather than defining it separately.
- The Design Manual for Roads and Bridges (DMRB) document 'LA 111 – Noise and Vibration', (LA 111) (17) assesses scoping of road links by stating that assessments should take place where road links have the potential to experience a short-term basic noise level (BNL) change of more than 1.0 dB(A) as a result of the project.

Operational Noise and Vibration Guidance

10.32 The following documents are appropriate to the measurement of baseline noise levels and assessing noise of an industrial nature emanating from existing, new, or proposed buildings:

- BS 7445-1:2003 'Description and Measurement of Environmental Noise' (18) defines parameters, procedures and instrumentation required for noise measurement and analysis.
- BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature for the purposes of: (a) investigating complaints, (b) assessing sound from proposed, new, modified or additional sources of sound of an industrial/commercial nature, and, (c) assessing sound at proposed new residential premises, with a view to determining the likelihood and degree of adverse impact, having regard to the context in which the sound occurs.
- National Planning Practice Guidance (NPPG) (19) was released in March 2014 by the Department for Communities and Local Government (DCLG) and is a web-based resource to support the NPPF. NPPG 'Noise' outlines qualitatively when noise could be a concern, stating: "*Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment...*"

10.33 Advice is provided concerning noise exposure and its effects and puts into context the advice stated within the NPSE. Table 10.2 presents the qualitative guidance concerning the Noise Exposure Hierarchy, based on the likely average response, as set out in NPPG and with reference to the NPSE.

Table 10.2 Noise Exposure Hierarchy Based on the Likely Average Response

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect Lowest Observed Adverse Effect Level (LOAEL)	No specific measures required
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television, speaking more loudly; where there is no alternative, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during noticeable periods of intrusion, where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep; disruptive/premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect (SOAEL)	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite,	Unacceptable Adverse Effect	Prevent

Perception	Examples of Outcomes	Increasing Effect Level	Action
	significant, medically definable harm, e.g. auditory and non-auditory.		

10.34 The Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Noise Assessment' (20) addresses the key principles of assessing noise effects and are applicable to all development proposals where noise effects may occur.

10.35 The guidance provides advice with regards to the collection of baseline noise data, prediction of noise levels and how noise should be assessed. The guidance recognises that the effect associated with a particular noise source 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. However, it stops short of providing specific assessment criteria which developments should achieve but instead suggests that the methodology adopted should be selected on a site-by-site basis with reference to relevant national and local standards.

10.36 World Health Organisation (1999) 'Guidelines for Community Noise' (WHO Guidance) (21) provides guidance on desirable levels of noise structured according to specific environments to ensure the critical effects of noise on sleep, annoyance and speech interference are guarded against. One of the tenets of the WHO guidelines is the protection of the most vulnerable and sensitive of the population, with the WHO guideline values for environmental noise set at the level of the lowest adverse health effect below which the occurrence rates of particular 'effects' can be assumed to be negligible. The WHO recommends specific internal noise levels that will provide an acoustic environment that is conducive to uninterrupted speech and sleep, which align with those required by the MCC Technical Guidance.

10.37 BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233) (22) builds on the WHO guidelines, providing guidance for the control of noise in and around both new and refurbished buildings. The guidelines recommend internal ambient noise criteria for a range of indoor spaces including residential land uses. The indoor ambient noise levels for unoccupied spaces relevant to this assessment align with those required by the MCC Technical Guidance.

10.38 When considering external amenity spaces such as gardens, balconies and terraces, the guidance provided in BS 8233 states:

> *"For traditional external areas that are used for amenity space, such as gardens or patios it is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise 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."*

10.39 It goes on to state:

"Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB LAeq,T or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."

10.40 ProPG: Planning & Noise – New Residential Development, May 2017 (ProPG) (23) provides guidance on a recommended approach to the management of noise within the planning system in England. The aim of ProPG is to ensure good acoustic design forms part of a holistic design process that creates places that are both comfortable and attractive to live in, where acoustics is considered integral to the living environment.

10.41 The Acoustics, Ventilation and Overheating guide (AVO) aims to help better co-ordinate the design of acoustics and ventilation within residential development. It is a common occurrence that modern buildings overheat, due to a focus on thermal efficiency in the past decade. During mitigation against overheating, people may be subjected to high noise levels for long periods of time, for example from noise ingress via opened windows or other façade openings. The guide provides a method of assessing risk of adverse noise impact during periods of overheating, when cooling measures are relied upon. The document does not provide design solutions that could be adopted to mitigate noise impact where required.

10.42 Building Regulations Approved Document O gives requirements for mitigating overheating in residential buildings. It also requires consideration of the impact of controlling overheating in terms of night-time noise ingress and gives limits to achieve during periods of overheating control.

10.43 BS 6472-1:2008 'Guide to Evaluation of Human Exposure to Vibration in Buildings' (BS 6472-1) provides guidance on the measurement and assessment of vibration within buildings resulting from sources such as road and rail traffic or building services systems that may cause adverse disturbance to human occupants. BS 6472-1 also introduces the concept of Vibration Dose Values (VDVs) for intermittent vibration assessment and reference curves for continuous vibration assessment. Present knowledge indicates the VDV indices to correspond most closely to the response of people to vibration inside a building. The VDV relates to the level and duration of vibration and effectively accumulates the vibration energy received over the daytime or night-time period in question. The criteria are presented as ranges to reflect the differing susceptibility to vibration evident among members of the population due to social and cultural factors, psychological attitudes and expected degree of intrusion.

Assessment Methodology and Significance Criteria

Scenarios Tested

10.44 The assessment of impact from demolition and construction traffic noise from the Proposed Development includes traffic flow data for the following scenarios:

- Baseline (Scenario 1)
- Baseline (Scenario 1) + peak demolition and construction traffic flows (2027)

10.45 The assessment of impacts of all other effects considers the following scenarios:

- Baseline (Scenario 1)
- Baseline levels plus Proposed Development (Scenario 2)

10.46 The assessment of cumulative effects considers the following scenarios:

- Baseline (Scenario 1)
- Baseline scenario plus the Proposed Development plus cumulative schemes (Scenario 3)

The Study Area

10.47 Sensitive receptors, in the context of noise and vibration are typically residential premises but can also include schools, places of worship, recreational areas or any other property likely to be adversely affected by an increase in noise level (BS 5228-1, LA 111).

10.48 The assessment of impact of existing environmental and entertainment (nightclub/bar) noise ingress, overheating control noise ingress, and railway vibration and ground-borne noise will consider the Proposed Development itself as the sole receptor.

10.49 The assessment of impact from noise and vibration during demolition and construction, and operational building services plant considers the Site plus the most proximate sensitive properties in each direction, which represents an area approximately 100 m from the boundary of the Site. This is considered appropriate as the properties most proximate will be the ones most affected by noise and vibration from the Site, so they represent the worst-case impacts. Existing sensitive receptors (SRs) identified for consideration in these assessments are detailed in Table 10.3 and illustrated in Figure 10.1. These were agreed as part of the scoping exercise for the application.

10.50 In addition to the above, in a response to the Scoping Report the Canal and River Trust identified a risk that vibration from the Proposed Development could damage the nearby retaining wall that supports Whitworth Street above Rochdale Canal, which lies in a cutting 20 m north of the Site boundary. The assessment of demolition and construction vibration has therefore also considered this as a receptor, noted as SR E in Table 10.3.

Table 10.3 Sensitive Receptors

Receptor Location	Description / Name	Type of Receptor	Approximate Distance to Site Boundary	Effects Assessed
SR A	Axis Tower	Residential	Approximately 45 m from the north-eastern corner of the Site boundary	Noise and vibration

Receptor Location	Description / Name	Type of Receptor	Approximate Distance to Site Boundary	Effects Assessed
SR B [1]	Viadux One (in construction)	Residential	Approximately 75 m from the northern Site boundary	during demolition and construction, and operational building services plant
SR C [1]	Staycity Deansgate	Residential (Apart-Hotel)	Approximately 80 m from the north-western Site boundary	
SR D	Ropeworks, 33 Little Peter Street	Residential	Approximately 20 m from the southern Site boundary	
SR E	Rochdale Canal	Structural	Approximately 20 m from the northern Site boundary	Demolition and construction vibration

Notes: [1] These SRs are under construction, so noise and vibration effects will only be realised upon occupation.

10.51 The assessment of road traffic noise during demolition and construction also includes impacts on roads used by a wider area and additional sensitive properties. SRs relevant to the demolition and construction road traffic noise assessment are shown in Figure 10.2. These cover a much wider area due to the extent of roads assessed and include residential (including student accommodation) and educational properties off the following roads:

- A57(M)
- Chester Road (A56)
- Princess Road (A5103)
- Whitworth Street West (B6469)

Receptor Sensitivity

10.52 The sensitivity of a receptor is based on relative importance of the receptor using the scale in the table below. For the assessment of noise and vibration effects, the majority of SRs identified are residential or educational uses, which would be defined as High sensitivity. SR E (the retaining wall of Rochdale Canal) would be considered to have Low sensitivity, as it is only structural damage that would result in an impact and this would only occur at a much higher level of vibration than would illicit a human response.

Table 10.4 Methodology for Determining Sensitivity

Sensitivity	Examples of receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.

Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or no local importance.

Source of Effect

Defining the Effect

10.53 The nature of noise and vibration effects is such that increases in noise and/or vibration, or noise and/or vibration emitted above credited guideline levels, are adverse and decreases are beneficial.

Defining the Magnitude of Impact, Scale and Significant of Effects

10.54 The significance of an environmental impact is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. The impact Significance Matrix is set out in the table below, where Negligible or Minor impacts are considered Not Significant, while Moderate and Major impacts are considered Significant.

Table 10.5 Impact Significance Matrix

Magnitude	High	Sensitivity Moderate	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial
Moderate	Major Adverse/Beneficial	Moderate Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Minor Adverse/Beneficial	Minor Adverse/Beneficial	Negligible
Negligible	Negligible	Negligible	Negligible

Geographic Extent of Effect

10.55 Effects can also be classified according to the geographical extent of the effect as follows:

- 1. Local – the EIA Site and its immediate surroundings;
- 2. District – the wider area of the borough;
- 3. Regional – the region, i.e. Greater Manchester; and
- 4. National – namely England.

10.56 In respect of noise and vibration effects, they are confined to a local and district level only.

Effect Duration

10.57 Noise effects can vary in duration and are classified as follows:

- 1. Short term – the period over which the effect is experienced is temporary and lasts for the period of demolition or construction or less;
- 2. Medium term – the effect occurs for longer than the full period of construction (such as extended but not permanent changes to road traffic flows and therefore noise); and
- 3. Long term – the effect remains for a substantial time, perhaps permanently, after construction as a result of the completion and operation of the Proposed Development (such as permanent changes to road traffic flows and therefore noise).

Demolition and Construction Phase

10.58 The demolition and construction programme is anticipated to be undertaken over the course of approximately 3 years. At this stage, planning for demolition and construction is broad and may be subject to modification with further detailed construction planning. However, reasonable assumptions have been made based on similar developments and the professional judgement of the project team and as such, information on anticipated construction plant and equipment is provided in Appendix 10.3: Demolition and Construction Noise and Vibration Assessment, which has been used to form the basis of the demolition and construction noise assessment.

10.59 The demolition and construction sequences of works which are the most likely to give rise to significant noise effects can be divided into four specific activities:

- Demolition
- Substructure
- Superstructure
- Landscaping / External Works

10.60 Noise levels associated with these works have been estimated based upon the available information and typical source noise levels contained within BS 5228-1.

10.61 To assess the potential for likely significant effects of noise from typical demolition and construction works on existing SRs surrounding the Site, the 'ABC Method' provided in BS 5228-1 has been used. This method defines category 'threshold values' which are determined by the time of day and existing monitored ambient noise levels at SRs. The ABC Method then requires noise likely to be generated by demolition and construction activities (known as the 'site noise level') to be compared with each SR threshold value. If the total noise level exceeds the 'threshold value', a significant effect is deemed likely to occur. The scale and nature of the effect and whether the effects are significant or not are defined in the Significance Criteria section of this ES chapter.

10.62 Noise levels typical of a 10-hour working day during each stage of the demolition and construction programme have been predicted. Predictions have been based upon a situation where the demolition and construction works at the Site are at locations nearest to each SR and in the absence of mitigation to provide the 'greatest' (or 'worst') environmental effect that might reasonably be expected.

10.63 Full details of the predictions and assumptions of the assessment of likely noise associated with the demolition and construction works including further details on the ABC Method are contained within Appendix 10.3: Demolition and Construction Noise and Vibration Assessment.

Demolition and Construction Vibration

10.64 Two aspects of demolition and construction vibration require consideration: the potential for demolition and construction vibration to cause disturbance to humans and the potential for demolition and construction vibration to cause damage to buildings and other structures.

10.65 There are currently no British Standards that provide a methodology for predicting levels of vibration from demolition and construction activities other than BS 5228-2, which relates to percussive, or vibratory, rolling and piling only. BS 5228-2 provides historic measured levels of vibration which have been used to determine a calculation of the change in vibration level with distance for piling activities. Distances are assumed from the nearest proposed building line of the Proposed Development to the boundary of the SR. This calculation has been adopted to predict the levels of vibration at SRs and compare the levels to thresholds of vibration perception and the potential for vibration to cause damage to buildings or structures. Further details on the vibration propagation predictions are contained within Appendix 10.3: Demolition and Construction Noise and Vibration Assessment.

10.66 As stated in BS 5228-2 and as generally accepted, the threshold of vibration perception for humans is typically in the peak particle velocity (PPV) range 0.14 mm/s to 0.3 mm/s at frequencies between 8 Hz and 80 Hz in residential environments, with complaints likely at 1 mm/s.

10.67 It is commonly considered that if vibration can be felt, then the vibration will cause damage to property / structure; however, vibration levels at least an order of magnitude higher than those that elicit negative human response are required to cause damage to buildings or structures. A limit of 12.5 mm/s is commonly adopted in-line with the guidance provided in BS 5228-2 when considering the potential for cosmetic building damage to arise. Whilst mindful of relevant building damage criteria, the vibration assessment concentrates principally upon the potential for human disturbance, with the view that if vibration is controlled in terms of human disturbance, it will also be controlled for potential building / structure damage.

Demolition and Construction Traffic Noise

10.68 Noise level changes arising from demolition and construction traffic have been determined using the calculation methodology detailed within CRTN and based on construction routings and estimated demolition and construction traffic data provided within the Transport Assessment which is being submitted alongside the Planning Application.

Operational Phase

Building Services Noise

10.69 The significance of sound of an industrial and/or commercial nature depends upon a number of factors including the margin by which a sound exceeds the background sound level, its absolute level, the character of the specific sound source, the time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood.

10.70 BS 4142 provides an assessment and rating method to assess adverse effects from a range of industrial and/or commercial noise sources, including fixed building services plant. The measured or predicted noise level from the source in question, the 'specific noise' level ($L_{Aeq,T}$), immediately outside the dwellings is compared with the 'background noise' level ($L_{A90,T}$). Where the sound contains certain acoustic features at the assessment location (e.g. tones, impulses, intermittency etc.), then a scaled character correction is added to the specific noise level to obtain the 'rating noise' level ($L_{Ar,Tr}$). The scale of effect is dependent on the context, having consideration to pertinent

factors such as the sensitivity of the receptor, the absolute level of the sound, and the character of the sound.

10.71 At this stage in the design of the Proposed Development specific details of the type, number, and configuration of noise-generating building services plant are not fixed and would not be until the detailed technical design stages of the development. As a consequence, it is not possible to undertake predictions with a reasonable degree of accuracy to determine the scale of the likely noise effect. Instead, and in line with standard planning practice for noise assessments, suitable limits to which plant should adhere have been set based on the results of the baseline noise survey and rated in accordance with BS 4142, subject to the approval of MCC.

Environmental and Entertainment Noise Ingress

10.72 Following the introduction of the NPPF there is no specific guidance within England for the assessment of the suitability of a site for noise sensitive development, such as a residential use. Assessment of environmental noise ingress to proposed apartments has been undertaken in line with relevant and credited guidance on noise, notably, BS 8233, ProPG, WHO Guidelines and MCC Technical Guidance, utilising baseline noise surveys and acoustic modelling to determine expected sound levels in external areas and at the building envelopes.

Overheating Control Noise Ingress

10.73 Modern homes can suffer from overheating during the summer months. There are many contributing factors that dictate the extent to which a new building overheats, including airtightness, solar gains, and internal occupancy levels. It is not always practicable or desirable to fully mechanically cool residential premises during such periods, therefore openable windows are often used to mitigate periods of overheating. The AVO Guide presents guidance on the approach for assessing the risk to occupants from increased internal noise levels arising from the mitigation of overheating (dependent upon the adopted cooling strategy), while ADO provides requirements for internal noise levels due to overheating controls at night-time only.

10.74 The monitored and modelled noise levels have been used to assess the potential implications to the Proposed Development where overheating is a concern in line with the AVO Guide and ADO.

Railway Vibration and Ground-borne Noise Ingress

10.75 Assessment of site suitability in terms of residential amenity to vibration has been undertaken considering criteria confirmed in consultation with MCC and defined within the MCC Technical Guidance, and using methodologies defined by BS 6472-1 and ANC Guidelines on ground-borne noise (24). The MCC Technical Guidance refers to BS 6472-1 with regards to vibration.

10.76 To quantify the level of vibration and related effects on the Proposed Development correction factors were applied to measured baseline vibration levels to account for propagation of vibration from the ground to the proposed building and into apartments.

Significance Criteria

Demolition and Construction Phase

Demolition and Construction Noise

10.77 Based on the guidance provided in BS 5228-1, the criterion considered in this ES chapter for the onset of potentially significant demolition and construction noise effects at SRs is set in line with the ABC thresholds which enable definition of a magnitude of effect. A semantic scale adopted for the description of demolition and construction noise effects is presented in Table 10.6 based on the degree to which the predicted site noise level at the SR in question exceeds the threshold value.

Table 10.6 Criteria for the Assessment of Demolition and Construction Noise Effects

Scale and Nature of Effect	Level of Demolition and Construction Noise Above Threshold Value, dB (Magnitude of Impact)	Definition
Neutral	≤ 0.9 (None)	No effect
Negligible	1.0 to 2.9 (Negligible)	The effect is not of concern (not significant).
Minor Adverse	3.0 to 4.9 (Low)	The effect is not desirable but of limited concern (not significant).
Moderate Adverse	5.0 to 9.9 (Medium)	The effect gives rise to some concern but is likely to be tolerable depending on scale and duration (not significant).
Major Adverse	≥ 10.0 (High)	The effect gives rise to serious concern and it should be considered unacceptable – considered to be a significant effect.

Demolition and Construction Vibration

10.78 Based on the guidance provided in BS 5228-2 and BS 6472-1, Table 10.7 presents the descriptors of magnitude of vibration impact and the scale of resultant effects for vibration on human receptors. Significant negative impacts are considered to occur when demolition and construction vibration levels increase above the specified moderate adverse effect threshold (depending on the nature of the activity, its duration, and the number of receptors likely to be affected).

Table 10.7 Criteria for the Assessment of Demolition and Construction Vibration Effects

Scale and Nature of Effect	Level of Vibration, mm/s (Magnitude of Impact)	Definition
Neutral	≤ 0.13 (None)	No effect
Negligible	0.14 to 0.9 (Negligible)	The effect is not of concern (not significant).
Minor Adverse	1.0 to 3.0 (Low)	The effect is not desirable but of limited concern (not significant).
Moderate Adverse	3.0 to 5.0 (Medium)	The effect gives rise to some concern but is likely to be tolerable depending on scale and duration (not significant).
Major Adverse	≥ 5.0 (High)	The effect gives rise to serious concern and it should be considered unacceptable – considered to be a significant effect.

Demolition and Construction Traffic Noise

10.79 The criteria for the assessment of short-term traffic noise changes arising from demolition and construction works have been taken from Table 3.54a of the DMRB and are provided in Table 10.8.

Table 10.8 Criteria for the Assessment of Demolition and Construction Traffic Noise Effects

Scale and Nature of Effect	Magnitude of Change in Noise Level, dB (Magnitude of Impact)	Definition
Neutral	0.0 (None)	No effect
Negligible	0.1 to 2.9 (Negligible)	The effect is not of concern (not significant).
Minor Adverse	3.0 to 4.9 (Low)	The effect is not desirable but of limited concern (not significant).

Scale and Nature of Effect	Magnitude of Change in Noise Level, dB (Magnitude of Impact)	Definition
Moderate Adverse	5.0 to 9.9 (Medium)	The effect gives rise to some concern but is likely to be tolerable depending on scale and duration (not significant).
Major Adverse	≥ 10.0 (High)	The effect gives rise to serious concern and it should be considered unacceptable – considered to be a significant effect.

Operational Phase

Building Services Noise

10.80 When assessing the scale and nature, and ultimately the significance of the likely effects of noise from fixed building services plant on nearby SRs, the criteria presented in Table 10.9 have been used. These criteria are based on the likelihood of adverse impact, as provided in BS 4142.

Table 10.9 Criteria for the Assessment of Building Services Noise Effects

Scale and Nature of Effect	Difference in Rating Noise Level to Background Noise Level, dB (Magnitude of Impact)	Definition
Neutral	< -10 (None)	No effect
Negligible	-10 to -5 (Negligible)	The effect is not of concern (not significant).
Minor Adverse	-5 to 0 (Low)	The effect is not desirable but of limited concern (not significant).
Moderate Adverse	0 to 5 (Medium)	The effect gives rise to some concern but is likely to be tolerable depending on scale and duration – considered to be a significant effect.

Scale and Nature of Effect	Difference in Rating Noise Level to Background Noise Level, dB (Magnitude of Impact)	Definition
Major Adverse	≥ 5.0 (High)	The effect gives rise to serious concern and it should be considered unacceptable – considered to be a significant effect.

Environmental and Entertainment Noise Ingress

10.81 The assessment of noise ingress to the Proposed Development is not an effect assessment (i.e. there are no existing residents on the Site who would experience a change in ambient noise levels as a result of the occupancy of the Proposed Development, or otherwise), and so it is not appropriate to attach a scale of significance to this particular component of the assessment. However, provided conditions are considered acceptable with suitable design mitigation measures in place, the residual effect would be negligible.

10.82 When considering the amenity of future occupants of the Proposed Development, the most relevant and credited guidance covering desirable levels of environmental noise for indoor and outdoor environments are the WHO guidelines and BS 8233:2014. These documents are referred to in the MCC Technical Guidance, which defines the following criteria for environmental and entertainment noise ingress. These have been confirmed as applicable to the Proposed Development in consultation with MCC (as provided in Appendix 10.4: Consultation).

Table 10.10 Criteria for the Assessment of Environmental and Entertainment Noise Ingress

Type of Noise	Location	Noise Level, dB $L_{Aeq,T}$	
		Daytime (07:00-23:00)	Night-time (23:00-07:00)
Environmental	Living Rooms	35	-
	Dining Rooms	40	-
	Bedrooms	35	30 & 45[1+2]
	Gardens and terraces	55 dB L_{Aeq}[3]	
Entertainment	Habitable Rooms	47 dB $L_{eq,5mins}$ at 63 Hz and 41 dB $L_{eq,5mins}$ at 125 Hz	

Notes: [1] The MCC Technical Guidance states that individual noise events should not normally exceed 45 dB L_{AFmax} by more than 10 times at night. [2] As environmental noise ingress and ground-borne noise are assessed separately through different calculation methods, it is considered appropriate to apportion each with a lower limit, so that when combined the overall limit of 45 dB L_{AFmax} is met. Consequently, a level of 42 dB L_{AFmax} is targeted for environmental noise ingress at the apartments most affected by ground-borne noise. [3] BS 8233 does suggest that this value isn't always achievable in higher noise areas where development is desirable, such as city centres, and that this shouldn't prohibit development. Where this is the case noise levels in external amenity areas should be reduced as far as practicable.

Overheating Control Noise Ingress

10.83 ADO requires noise to be considered when defining a residential building's overheating strategy, and states that the overheating strategy should take account of the likelihood that windows will be closed during sleeping hours if noise within bedrooms exceeds the following limits:

- 40 dB $L_{Aeq,T}$, averaged over 8 hours (between 23:00 and 07:00).
- 55 dB L_{AFmax}, more than 10 times a night (between 23:00 and 07:00).

10.84 ADO does not refer to noise during daytime hours. The AVO Guide does give guidance for consideration of daytime noise levels, however.

10.85 The AVO Guide provides a two-stage assessment, the first of which looks at the predicted or measured external noise levels and is suitable for early-stage assessments. The degree of impact predicted at this stage determines the necessity for a subsequent detailed assessment (referred to as a Level 2 assessment) and provision of mitigation measures (such as passive attenuated façade vents, or active cooling systems).

10.86 A Level 2 assessment has been used to determine how long ventilation openings can be open over a 16-hour daytime period while achieving noise levels below a limit of 50 dB $L_{Aeq,16hr}$, above which noise is stated in the AVO Guide as causing a material change in behaviour.

Railway Vibration and Ground-borne Noise Ingress

10.87 Ground-borne vibration from trains can manifest itself in buildings as both tactile vibration (vibration you can feel) and ground-borne noise (vibration you can hear). Both of these effects require consideration in the assessment of the suitability of a site for residential use.

10.88 Tactile vibration can be assessed in accordance with the methodology in BS 6472-1, which provides procedures for assessing the potential human response to tactile vibration.

10.89 Vibration is assessed in terms of the equivalent 'VDV in $m/s^{1.75}$). The guide VDVs set out in BS 6472-1 for evaluating the various probabilities of adverse comment within residential properties are presented in Table 10.11.

Table 10.11 Criteria for the Assessment of Vibration Effects

Period	VDV Levels ($m/s^{1.75}$) Above Which Adverse Comment May Occur			
	Adverse Comment Not Expected (Negligible)	Low Probability of Adverse Comment (Minor Adverse Effect)	Adverse Comment Possible (Minor Adverse Effect)	Adverse Comment Probable (Major Adverse Effect)
Daytime (07:00 to 23:00)	≤0.2	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Night-time (23:00 to 07:00)	≤0.1	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

10.90 There is currently no international or British Standard which provides guidance for assessing the impact of ground-borne noise from railways on the occupants of a building. The MCC Technical Guidance highlights that ground-borne noise may need to be considered but stops short in providing criteria. Through consultation with MCC it has been agreed to consider the effects of ground-borne noise in terms of its contribution to the overall L_{AFmax} levels, with the criteria defined above for environmental noise ingress. As ground-borne noise and environmental noise ingress are assessed separately through different calculation methods, it is considered appropriate to apportion each with a lower limit, so that when combined the overall limit of 45 dB L_{AFmax} is met. Consequently, a level of 42 dB L_{AFmax} is targeted for ground-borne noise.

Baseline Conditions

Defining the Baseline

Baseline Noise Survey

10.91 A baseline environmental noise survey was undertaken between Wednesday 15th May and Tuesday 21st May 2024 to establish and quantify the existing noise environment at, and within the vicinity of, the Site. The results of the survey have been used to inform the assessment of effects during both the demolition and construction, and operational phases.

10.92 Noise monitoring comprised continuous long-term monitoring at key locations at the Site, together with supplementary attended short-term noise monitoring at various positions across the Site and in the wider area to allow the spatial variation in noise level to be determined (see Figure 10.3).

10.93 The Site is located in proximity to a series of nightclubs and bars, which require specific consideration in terms of noise as they are classed as entertainment use. These are listed below:

- Rebellion – Live music venue and nightclub located approximately 10 m from the western boundary of the Site;
- Ark – Nightclub located within Deansgate Locks approximately 30 m from the northern boundary of the Site;

- Popworld – Nightclub located within Deansgate Locks approximately 30 m from the northern boundary of the Site; and
- Revolution – Bar/nightclub located within Deansgate Locks approximately 30 m from the northern boundary of the Site. While this was operating at the time of the surveys it is understood that this bar is now permanently closed.

10.94 There is a further bar (Lock 91) to the west of the venues listed above but this is relatively distant to the Site and noise from its operation was not observed at the Site relative to other noise sources in the area.

10.95 Specific attended noise measurements were made on the evening of Friday 17th May 2024 to capture noise from the bars/nightclubs. The date was chosen specifically to align with scheduled events at the Rebellion nightclub, which included a live band playing at the venue, and then a subsequent DJ set from 23:00 onwards. The measurements were taken in relative proximity to each nightclub so that their contribution to the overall noise levels measured at the Site could be determined.

10.96 Generally, the Site is exposed to high levels of noise, even considering its central urban location, with multiple types of noise source in close proximity. During the daytime, road traffic noise from Whitworth Street West and surrounding roads dominates at the northern boundary of the Site, with regular passing trams also contributing, albeit at distance from the Site. During evening and night-time weekend hours, high levels of low frequency noise from music at the Rebellion nightclub, and to a lesser extent Deansgate Locks, dominates the noise climate.

10.97 At the southern boundary of the Site, regular passenger trains both stopping at Deansgate station and passing through dominate the noise climate. Occasional freight trains also influence the noise climate for short periods, but these are infrequent. Road traffic noise from the surrounding area contributes to the background noise levels.

10.98 For detailed information on the noise monitoring locations, survey methodologies and instrumentation used, please refer to Appendix 10.2: Baseline Survey.

Baseline Noise Monitoring Results

10.99 A summary of the measured daytime (07:00 to 23:00) and night-time (23:00 to 07:00) noise levels at each monitoring location is presented in Table 10.12, with the full results displayed graphically in time-history format in Appendix 10.2: Baseline Survey.

10.100 Weather conditions, whilst not actively measured during the survey period, were monitored remotely throughout. Weather conditions were ideal for the measurement of noise, with low wind speeds prevailing (<4 ms^{-1}). There were small amounts of rain on Wednesday 15th and Thursday 16th May, however the data was reviewed at these times and is still considered suitable.

Table 10.12 Summary of Baseline Noise Monitoring Results – Façade Values

Monitoring Location	Period	Duration	$L_{Aeq,T}$ dB	$L_{A90,15min}$ dB		$L_{AFmax,30s}$ dB
			Ave[1]	10th%ile[2]	Ave[3]	Range (10th Largest)[4]

LT1	Day	16 hours	65	54	57	71 – 102
	Night	8 hours	64	49	55	67 – 106 (86)
LT2	Day	16 hours	67	49	51	56 – 105
	Night	8 hours	62	42	46	51 – 96 (86)
ST1	Day	15 mins	67	57[5]		90[6]

Notes: [1] Logarithmic average over the day/night survey periods; [2] 10th percentile of the $L_{A90,15min}$ values over the day/night survey period; [3] Arithmetic average over the day/night survey periods; [4] Maximum of the 10th largest measured L_{AFmax} levels for each night-time survey period; [5] L_{A90} over the short-term measurement period; [6] Maximum value over the short-term survey period. All figures rounded to nearest whole decibel.

10.101 Table 10.13 presents the measured entertainment noise levels, including the overall levels at each position, and the measured levels in the 63 Hz and 125 Hz octave frequency bands, which are specifically limited for entertainment noise by MCC guidance.

Table 10.13 Summary of Entertainment Noise Monitoring Results – Free-field Values

Monitoring Location	Date and Time	Duration	$L_{Aeq,T}$ dB	Measured Low Frequency Noise Levels, L_{eq} dB	
				63 Hz	125 Hz
E1	17/05/24 21:15:19	5-mins	64	76	67
E2	17/05/24 21:15:23	10-mins	62	73	69
E3	17/05/24 21:21:42	5-mins	70	86	78
E4	17/05/24 23:16:19	5-mins	66	78	68
E5	17/05/24 23:23:22	5-mins	68	82	71
E6	17/05/24 23:16:25	10-mins	67	83	69
E7	17/05/24 23:34:22	5-mins	66	89	69

E8	17/05/24 23:40:36	1-min, 33s	75	98	82

Noise Model

10.102 Owing to the complexity of the interaction between the Proposed Development, existing building structures and noise sources, a three-dimensional noise model of the Site has been prepared using the acoustic software package CadnaA. The model has been used to predict and help illustrate the levels of noise at the different residential building façades and external amenity areas of the Proposed Development. The model was constructed using architectural plans and elevations. The results of the model were calibrated by comparing modelled results with monitored noise levels to give confidence in the accuracy of the modelling results.

10.103 The model was calibrated using the existing Site layout and baseline measured noise levels presented in the Baseline Noise Monitoring Results section above. The likely noise levels on the Proposed Development were then assessed by removing the buildings to be demolished and adding in the proposed building to the model.

10.104 Predicted noise levels have subsequently been used to assess the impact on the occupants of the Proposed Development, whilst establishing outline sound insulation performance requirements of the different building envelope elements and ventilation systems to control the ingress of external noise in order that credited indoor guideline values are met.

10.105 Noise modelling images showing predicted daytime (07:00-23:00 hour) and night-time (23:00-07:00 hour) ambient (L_{Aeq}) levels of environmental noise on the Proposed Development are presented as Figure 10.4 and Figure 10.5, respectively. Modelling images showing the predicted levels of entertainment noise (L_{Aeq}) at 63 Hz and 125 Hz are presented as Figure 10.6 and 10.7, respectively.

Baseline Vibration Survey

10.106 Attended baseline vibration surveys were undertaken on Thursday 18th, Tuesday 23rd and Monday 29th April 2024 at the Site to measure the level of ground-borne vibration from individual passing passenger and freight trains on the railway viaduct to the south. The vibration measurement locations are indicated in Figure 10.3 and described in Appendix 10.2: Baseline Survey.

Baseline Vibration Monitoring Results

10.107 The measured vibration dose values (VDV) attributable to individual train passes have been derived from the measured acceleration levels and are presented in Table 10.14.

Table 10.14: Summary of Measured Vibration Levels

Monitoring Location	Train Type	Measured W_b Weighted Vibration Dose Value ($m/s^{1.75}$) in the Vertical z-axis during Individual Train Passes
V1	Passenger	0.027
	Freight	0.069

V2	Passenger	0.017
V3	Passenger	0.016

10.108 Tactile vibration was not perceived at any point during the attended noise and vibration surveys, although some low frequency noise was observed from the viaduct during the passing of several passenger and freight trains, which may be attributable to ground-borne noise.

Evolution of the Baseline

10.109 Baseline vibration conditions established via site survey and analysis are unlikely to change significantly over the time period leading up to the opening year of the Proposed Development without substantial changes to the railway network and rolling stock. Where changes to these are to occur the likelihood is that vibration emissions would reduce due to emerging technologies, so assessing against the measured baseline vibration levels represents a worst-case assessment.

Identification and Evaluation of Likely Significant Effects

Demolition and Construction Phase

10.110 There is no primary mitigation relevant to assessment of noise and vibration impacts from the demolition and construction stage. Tertiary mitigation which has been evaluated as part of the demolition and construction stage assessment is outlined below.

10.111 The demolition and construction stage will be governed by the application of Demolition Management Plan (DMP) and Construction Environmental Management Plan (CEMP), as required by the Places for Everyone Joint Development Plan policy JP-C8, which will provide the commitments proposed to manage/control noise and vibration impacts. This will be developed and agreed with MCC once a contractor has been appointed for the works. The DMP and CEMP is expected to include the following measures:

- Working hours will be in line with the LA planning requirements. These are anticipated to be 07.30 – 18.00 Mondays to Fridays and 08.00 – 14.00 Saturdays. No work on Sundays or Bank holidays.
- Methods, machinery, and equipment to be used that will have a lower vibration level impact.
- Machines and equipment to be deployed that have been recently serviced and will be routinely serviced during the project to minimise the amount of noise and vibration from those machines and equipment.
- Attitude of operatives to the making of noise to be addressed, to have an understanding that work activities have an effect on those around – not just operatives but also residents and the public. This will be achieved though toolbox talks and daily activity briefings.
- Cast in Halfen brackets to be used for the cladding in lieu of post drilling into concrete.
- Screens will be used surrounding the concrete slabs and proprietary formwork wrapping the stair and lift core to minimise noise break out from concreting activities.
- Acoustic screens used to shield metal pipe cutting or concrete cutting activities on site.

- Cutting stations for cutting metal wall studs will be in suitably acoustically sheltered locations.
- Electric forklifts and pallet trucks used in lieu of diesel forklifts where available.
- All site operatives will be inducted on the potential impact of site activities on the surrounding community. This should cover principles of BPM pertaining to all site activities, highlight any particularly sensitive or high impact activities and precautions to be taken.
- No shouting.
- Stereos will not be permitted on site.
- All contractors/sub-contractors will demonstrate and undertake best working practices to avoid exceeding noise or vibration limits which have been agreed with MCC control limits.
- Sub-contractors shall highlight in their method statement and/or risk assessment any activities that will create significant noise and vibration levels. Sub-contractors will demonstrate how they will mitigate/ manage the emissions.
- All plant and equipment will be switched off when not in use, or where this is not practicable, throttled down to a minimum.
- Wherever practicable, all plant and equipment should be powered by mains electricity in preference to locally powered sources such as diesel generators.
- All compressors and generators shall be models fitted with properly lined and sealed acoustic covers or enclosures which remain closed when in use.
- Noisy plant or equipment should be sited as far away as possible from noise sensitive buildings. Wherever practicable, the use of barriers in the form of acoustic barriers or enclosures will be employed.
- All vehicles, plant and machinery used during operations shall be fitted with effective exhaust silencers and all parts of the machinery, plants and vehicles will be maintained in good working order and repair in accordance with the manufacturer's recommendations.
- Screening from existing features will be maximised or the use of full or partial enclosures will be employed for fixed plant. Fixed or semi-static plant will be located and orientated away from noise sensitive receptors where feasible to do so.
- Identification and use of low noise and vibration techniques. Where construction plant is used which is known to generate significant levels of noise and vibration then it will be used with consideration, and the construction process closely monitored to minimise noise and vibration impacts on and off the site.
- Vibratory compaction equipment will be used in a mode which minimises the incident vibration at nearby residential and other sensitive properties. Consideration will be given to engaging concentric weights only when running at speed to avoid run up, run down resonances, the use of smaller equipment, or turning off the mechanical vibration on vibratory rollers and undertaking more passes for areas where there is a particular risk that disruption may occur at neighboring properties.

- Noisy works will be controlled utilising the hierarchy of risk control and measured using noise monitoring equipment to ensure safe levels are not compromised and noisy work hours are not breached. In all noisy work cases substitution of equipment for machines or processes which reduce the noise levels to acceptable levels and therefore minimise the impact on both site personnel and the general public. Where this is not possible, engineering controls will be employed utilising such control measures as baffles and 'noise screens.
- And at all times the noise from building sites webpage will be referred to for further information/guidance and also IAQM/EPUK Construction Guidance on controlling emissions.

Demolition and Construction – Noise

10.112 The calculated reasonable 'worst-case' noise predictions in dB $L_{Aeq,10hr}$ for the principal demolition and construction works at the nearest affected SRs are presented in Table 10.15. The predictions have been made assuming the inherent mitigation identified above, to understand a reasonable 'worst case' scenario. Full details of the demolition and construction noise assessment are provided within Appendix 10.3: Demolition and Construction Noise and Vibration.

Table 10.15: Demolition and Construction Noise Effects

Sensitive Receptor	Assessment Parameter	Demolition and Construction Stage			
		Demolition	Substructure	Super-structure	Landscaping
SR A	Predicted Noise Level	63 dB $L_{Aeq,10hr}$	65 dB $L_{Aeq,10hr}$	65 dB $L_{Aeq,10hr}$	54 dB $L_{Aeq,10hr}$
	Effect Nature, Scale, Duration and Geographic Extent	Negligible	Negligible	Negligible	Negligible
SR B	Predicted Noise Level	59 dB $L_{Aeq,10hr}$	60 dB $L_{Aeq,10hr}$	60 dB $L_{Aeq,10hr}$	49 dB $L_{Aeq,10hr}$
	Effect Nature, Scale, Duration and Geographic Extent	Negligible	Negligible	Negligible	Negligible
SR C	Predicted Noise Level	58 dB $L_{Aeq,10hr}$	60 dB $L_{Aeq,10hr}$	60 dB $L_{Aeq,10hr}$	49 dB $L_{Aeq,10hr}$
	Effect Nature, Scale, Duration and	Negligible	Negligible	Negligible	Negligible

	Geographic Extent				
SR D	Predicted Noise Level	70 dB $L_{Aeq,10hr}$	71 dB $L_{Aeq,10hr}$	71 dB $L_{Aeq,10hr}$	61 dB $L_{Aeq,10hr}$
	Effect Nature, Scale, Duration and Geographic Extent	Negligible	Negligible	Negligible	Negligible

10.113 The highest noise levels tend to originate from plant associated with breaking and cutting activities. In practice, demolition and construction noise levels would tend to be lower owing to greater separation distances and additional screening effects. Noise would also tend to reduce at times over a full working day owing to periods of inactivity. At all SRs Negligible effects are predicted during all demolition and construction stages. The effects of demolition and construction noise would therefore be Not Significant.

Demolition and Construction – Vibration

10.114 The predicted levels of vibration during worst-case piling activities (which would occur during works to the substructure) are detailed in Table 10.16, alongside the resulting effects expected.

Table 10.16: Demolition and Construction Vibration Effects

Sensitive Receptor	Assessment Parameter	Development Stage
		Substructure
SR A	Predicted Vibration Level	4.66 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Adverse, Moderate, Short-Term, Local
SR B	Predicted Vibration Level	1.84 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Adverse, Minor, Short-Term, Local
SR C	Predicted Vibration Level	1.57 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Adverse, Minor, Short-Term, Local
SR D	Predicted Vibration Level	9.80 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Adverse, Major, Short-Term, Local

SR E	Predicted Vibration Level	10.76 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Adverse, Major, Short-Term, Local

10.115 The vibration levels predicted are a worst-case based on percussive impact bored piling or driven sheet steel piling (whichever is greater) at the nearest point of the proposed building to the SR. In practice, construction vibration levels would tend to be lower owing to greater separation distances and intervening ground effects.

10.116 The potential effect of demolition and construction vibration generated by the Proposed Development is short-term, local and Moderate to Major Adverse, therefore Significant at SRs A, D and E. Mitigation is discussed in the Mitigation Measures section of this ES chapter. Short-term, local and Minor Adverse effects and Not Significant are predicted at SRs B and C.

Demolition and Construction – Traffic Noise

10.117 Demolition and construction traffic flow data provided by Curtins shows an anticipated peak in demolition and construction vehicle movements of 70 two-way vehicle movements spread over a 10-hour working day.

10.118 Comparison of the peak in demolition and construction vehicle movements against the baseline traffic flows along the construction route reveals demolition and construction traffic accounts for less than 1% as a proportion of existing base flows. This equates to an increase in Proposed Development related traffic noise of less than 0.1%, which is not large enough to cause any discernible effect. As such, the likely impact of demolition and construction traffic noise generated by the Proposed Development on existing SRs is concluded to be Negligible (Not Significant).

Operational Phase

10.119 The building façade make-up and its overall sound insulation performance will dictate the level of internal noise levels within the building from external noise ingress. An assessment of external noise ingress has been undertaken to give an indication of the required sound insulation performance of the façade for comparison against that proposed.

10.120 In more typical noise environments, it is often the glazing that dictates the overall performance of the façade, as this usually has the lowest performance out of the façade elements. In this case however, where low-frequency noise is a specific consideration and noise levels from the various sources are very high at the Site, all façade elements require detailed consideration, and all will influence the internal noise levels. As a consequence, the overall façade performance requirement at the worst affected façade location is set out below.

10.121 The overall performance of the façade (assessed for the worst-affected bedroom) should achieve the sound reduction performance shown in Table 10.17. It must be noted that the low-frequency value (at 63 Hz) is critical in achieving a suitable performance, and it shouldn't be just the overall R_w or R_w+C_{tr} values that are considered. The performance given is for the worst-case apartment, and lower performance requirements, and consequently reduced glazing and lining specifications, will be appropriate at façades less affected by noise.

Table 10.17: Overall Façade Performance Requirement – Worst Case Façade

Octave Band Sound Reduction (R dB)								R_w dB	R_w+C_{tr} dB
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz		
30	40	41	46	52	58	58	58	51	47

10.122 To achieve the façade sound insulation performance defined in Table 10.17 the following façade specifications are currently proposed.

10.123 The glazing performance is specified to achieve a sound insulation performance of 47 dB R_w+C_{tr}. This is understood to be achievable with an acoustically lined triple glazing solution 16.76/16/5/14/12.76 mm, which is expected to achieve low frequency performances of 29 dB R and 37 dB R at 63 and 125 Hz respectively.

10.124 Opaque sections are proposed to be clad with either ceramic backed double glazing, or terracotta facing. The terracotta clad sections will back onto the building columns, and so no additional internal linings would be required to meet the overall façade sound insulation performance necessary. The ceramic backed double-glazed sections back onto 300 mm of lightweight insulation material. Internal linings will be required to achieve a suitable sound insulation performance at lower frequencies at these sections, particularly in the control of noise from the nearby nightclubs and the adjacent railway viaduct. These are specified as plasterboard linings on metal studs to the inside of the insulation, with a steel sheet between the studs and the insulation providing additional mass. This construction is expected to achieve low frequency performances of 34 dB R and 33 dB R at 63 and 125 Hz respectively.

10.125 At façades less affected by noise (i.e. at apartments above Level 9 on the eastern and southern façades and above level 24 on the northern and western façades of the building) lower performing façade specifications will be suitable, which will be defined through the ongoing design process. The performance of each element will also depend on any changes to the room areas, material dimensions and material requirements of all façade elements.

10.126 The above specifications are considered inherent in the design of the building and are considered to be primary mitigation for the purposes of the assessment of effects in this ES Chapter

Building Services Plant Noise

10.127 Any items of fixed plant associated with the operation of the Proposed Development would have the potential to generate noise. Accordingly, suitable limits to which plant should adhere have been set based on consultation with MCC.

10.128 If maximum plant noise levels are not set and the stipulated noise levels not achieved, the likely effect on SRs would be a permanent, local adverse effect up to moderate significance.

10.129 Based on the measured baseline noise levels presented in Table 10.18, and the standard plant noise policy of MCC, building services should adhere to external noise limits presented in Table 10.18.

Table 10.18: Plant Noise Emission Limits

Sensitive Receptor	Period	10^{tho}%ile Background Noise Level (dB $L_{A90,15min}$)	Plant Noise Emission Limit at 1 m from Façade (dB $L_{Ar,Tr}$)
SR A	Daytime (07:00-23:00)	54	49
	Night-time (23:00-07:00)	49	44
SR B	Daytime (07:00-23:00)	54	49
	Night-time (23:00-07:00)	49	44
SR C	Daytime (07:00-23:00)	54	49
	Night-time (23:00-07:00)	49	44
SR D	Daytime (07:00-23:00)	49	44
	Night-time (23:00-07:00)	42	37

Notes: [1] Note that these are rating level limits, so plant noise will need to be corrected for acoustic characteristics as defined in BS 4142.

10.130 The plant noise limits apply to the total contribution of noise from all new plant items associated with the Proposed Development that may run during any particular period and are to be met 1 m from the nearest habitable window of the SRs.

10.131 For the emission limits to be met by the cumulative total level of noise generated by all building services plant, careful attention would need to be paid to plant selection, installation, and noise attenuation, which would be addressed prior to installation of plant.

10.132 Assuming the plant noise limits are adopted and adhered to, there would be Negligible (Not Significant) effects at all SRs.

Environmental and Entertainment Noise Ingress

Environmental Noise

10.133 The façade specifications identified as primary mitigation will be suitable in attenuating environmental noise to a level commensurate with the requirements of MCC. There will consequently be Negligible and Not Significant effects on the Proposed Development due to environmental noise ingress.

Entertainment Noise

10.134 The noise surveys showed that levels of music noise from the Rebellion nightclub during DJ sets on Friday and Saturday nights are such that mitigation will be required capable of attenuating it to a level compliant with MCC's entertainment noise limits in the apartments. To control this a condition will need to be applied to the consent for the Proposed Development requiring details of the mitigation and consequent attenuation afforded. In the absence of such mitigation there will be long-term, local, Major Adverse, and Significant effects in apartments within the Proposed Development due to entertainment noise ingress. Appropriate condition wording is proposed in the mitigation section below.

10.135 External amenity areas are to be located on the Level 2 terrace at the northern façade. Environmental noise levels at the Site are prohibitive in achieving the criteria defined by MCC and BS 8233 and WHO guidance, however BS 8233 does note that these levels are not always achievable in higher noise areas where development is desirable, such as city centres, and that this shouldn't prohibit development. The use of solid, imperforate balustrades to the terrace would assist in reducing noise in the external amenity areas, but there are limitations in the improvements available. In such cases development should be designed to achieve the lowest practicable levels in the external amenity spaces, which the solid balustrades would allow. In the context of the building location (busy urban area) noise from the surroundings would be expected from the users and the external amenity areas are not primarily intended to be used for relaxation. There will consequently be Negligible and Not Significant effects on external amenities of the Proposed Development due external amenity noise.

Overheating Control Noise Ingress

10.136 The overheating strategy assumes windows will be closed throughout the night (23:00 to 07:00) for all residential apartments and mechanical ventilation relied upon, thereby achieving the requirements of ADO in terms of noise ingress.

10.137 Table 10.19 shows the amount of time that proposed living room and bedroom overheating vent panels could be open during the daytime (07:00 to 23:00) to support the overheating mitigation in line with the AVO Guide. The times shown are based on a vent panel of 500 x 2,300 mm opening section, with 50% free area. For the purposes of the calculation, it is assumed that the ratio of vent panel area to floor area is the same for living rooms and bedrooms, i.e. there will be a corresponding number of vent panels in the larger living rooms so the overall sound transmission through the façade would be the same.

Table 10.19: Maximum Daytime Durations of Overheating Vent Panel Openings

Apartment Floor	Maximum duration (hours) that vent panels could be fully open during the daytime (07:00 to 23:00) to control overheating			
	North Façade	East Façade	South Façade	West Façade
Up to Level 5	2.5	2.5	2.5	2.5
Up to Level 10	5	2.5	2.5	5
Up to Level 15	8	5	5	8
Up to Level 20	13	6	6	13

Up to Level 25	16	10	10	16
Up to Level 30	16	13	13	16
Above Level 30	16	16	16	16

10.138 Where the vent panels proposed are open for durations up to the maximum times shown in Table 10.19, the internal noise levels will meet the criteria defined by the AVO Guide for daytime hours. The overheating control strategy is detailed in the report provided in Appendix 10.5: Overheating Analysis Report. There will consequently be a Negligible and Not Significant effect on the Proposed Development due to noise ingress from overheating controls.

Railway Vibration and Ground-borne Noise Ingress

10.139 The overall eVDV for the 16-hour daytime period (VDV_{day}) and 8-hour night-time (VDV_{night}) period has been predicted within the closest residential room space to the railway viaduct based on worst-case attenuation factors (due to coupling between the ground and the building foundations) and amplification factors (due to resonance of the floor span) taken from ANC Guidelines. The calculations account for the following regularity of trains, which are based on train timetables reviewed on Monday 29th April 2024:

- Daytime (07:00 to 23:00) – 378 Passenger (10 second pass-by time), 41 Freight (120 second pass-by time)
- Night-time (23:00 to 07:00) – 82 Passenger (10 second pass-by time), 24 Freight (120 second pass-by time)

10.140 It should be noted that in practice the number of freight trains is typically much lower than shown, as many of the listed freight trains do not run every time they are timetabled.

10.141 The predicted VDVs within the third-floor residential apartments have been compared to the BS 6472-1 likelihood of adverse comment criteria. The assessment results are presented in Table 10.20.

Table 10.20: Vibration Dose Values and Corresponding Effect

Location	Period	Predicted eVDV ($m/s^{1.75}$)	BS 6472-1:2008 Semantic Rating	Effect
Third Floor Apartment at Northern Façade	Daytime	0.12	Adverse Comment Not Expected	Negligible
	Night-time	0.10	Adverse Comment Not Expected	Negligible

10.142 Vibration levels as detailed in Table 10.19 in rooms most proximate to the railway lines for a worst-case assessment, fall below the threshold criteria for 'low probability of adverse comment' set out in BS 6472-1. No specific mitigation is therefore required to control tactile vibration at the Proposed Development, and there will therefore be Negligible, and Not Significant, effects.

10.143 Predictions of the ground-borne noise within the worst affected residential apartments of the Proposed Development have been made using guidance provided by the ANC Guidelines. The transfer functions take into account the coupling of the soil to building foundations, the vertical attenuation through the structure (where appropriate) and the resonance of the floor system in 1/3 octave frequency bands.

10.144 The ground-borne noise levels during the highest measured train passes for both passenger and freight trains, with the worst-case transfer functions applied, are presented in Table 10.21.

Table 10.21: Vibration Dose Values and Corresponding Effect

Location	Train Type	Predicted Ground-Borne Noise Level
Third Floor Apartment at Northern Façade	Passenger	35 dB L_{AFmax}
	Freight	40 dB L_{AFmax}

10.145 The predicted worst-case ground-borne noise levels alone are shown to be below the target criteria for peak events at night (42 dB L_{AFmax}). There will therefore be Negligible, and Not Significant, effects due to ground-borne noise on the Proposed Development.

Cumulative Effects

10.146 Only cumulative schemes within 100 m of the Site would have the potential to result in cumulative noise and vibration effects from demolition and construction noise and vibration, demolition and construction traffic noise and operational building services plant noise. Of the cumulative schemes identified only scheme 18 (Vision Tower) and 31 (Viadux Two) are within 100 m of the Site boundary.

Demolition and Construction Phase

10.147 Where demolition and substructure phases overlap, each site will be required to implement measures in line with a CEMP (as per those detailed in the Identification and Evaluation of Likely Significant Effects section of this Chapter) to ensure that off-site noise and vibrations emissions are minimised to an acceptable level. Cumulative effects are therefore unlikely or at worst temporary and controlled to a worst-case level equal to that for the Proposed Development alone.

10.148 Demolition and construction traffic would have the potential to cause cumulative effects should the demolition and construction phases of each development overlap. However, provided the cumulative schemes implement their own Construction and Logistics Plan (CLP), which would include consideration of concurrent demolition and construction schemes to minimise the combined effects of demolition and construction traffic, cumulative residual effects from demolition and construction road traffic noise will be Negligible or at worst Temporary, Local and Minor Adverse and Not Significant if developments overlap.

Operational Phase

10.149 Cumulative schemes would be subject to the same plant noise limiting requirements as the Proposed Development, so the resulting cumulative effects would be Negligible and Not Significant. These are dictated by planning conditions for the cumulative schemes (where approval has been granted).

10.150 There are no uses proposed within the cumulative schemes identified that would be expected to result in changes to the baseline noise environment assessed for the Proposed Development.

Mitigation Measures

Demolition and Construction Phase

Demolition and Construction Vibration

10.151 Upon appointing a contractor, a detailed CLP and CEMP will be developed and agreed with MCC. This plan will include the finalised details for the noise and vibration mitigation measures. Additional measures to be considered in implementing best practicable means so as to control the adverse effects would include but not be limited to:

- Identification and use of low vibration techniques. This would include the use of continuous auger flight piling methods or rotary bored piling, as opposed to percussive methods such as impact bored piling.

Operational Phase

Building Services Plant Noise

10.152 At this stage, the building services design is sufficiently flexible to incorporate noise control measures necessary to comply with the noise emission limits presented above, which align with MCC's planning policy. The mechanical design will be developed during the detailed design of the Proposed Development. As preliminary design advice, it is recommended to incorporate the following measures into the building services design where necessary:

- Selection of high-quality, low-noise building services equipment with night set-back modes, generally situated away from, and shielded from the identified SRs. It should be ensured that the noise output from the selected plant items can be accurately demonstrated by the supplier to allow confidence in subsequent noise emission predictions.
- Orientation of significant external plant items and duct terminations to exploit natural directionality characteristics and direct noise away from SRs.
- All ductwork connecting to the external environment should be provided with in-duct attenuation, appropriately sized to achieve the external noise limits. Emergency/ life-safety systems should also be provided with attenuation.
- Attenuators should be placed as near to the associated fan as practical without compromising the performance of either element. Should significant lengths of ductwork remain exposed between the fan and attenuator, a suitable acoustic lagging product may be required to reduce noise breakout.
- Emergency generator sets should be provided with a proprietary acoustic enclosure, or situated in a purpose built, acoustically treated room to control external noise emissions. Room treatments may include attenuated intake/discharge points, acoustic wall linings and doorsets, and absorptive surface finishes to reduce reverberant noise build-up.
- Roof plant items may require solid acoustic screening to meet the applicable noise emission limits.
- All plant items and connecting ancillary ductwork, pipework, and any other associated elements physically connected to the building structure should be placed on suitable

anti-vibration mounts, selected based on the specific operational characteristics, size and weight of each item of plant, and the specific structure of the building.

Environmental and Entertainment Noise Ingress

10.153 The noise surveys showed that levels of music noise from the Rebellion nightclub during DJ sets on Friday and Saturday nights are such that mitigation is required to attenuate noise ingress to a level compliant with MCC's entertainment noise limits in the apartments. It is anticipated that this would be achieved via either insulation within the façade build-up or attenuation measures at source within the nightclub premises, or a combination of the two. In the event that attenuation is required at source then this could be secured via a Grampian condition attached to the consent. In any event, it is recommended that the following condition be attached to the planning permission:

"No development shall take place, with exception of demolition, unless and until a noise mitigation strategy has been submitted to, and approved in writing by, the City Council, as local planning authority. The noise mitigation strategy shall include full details of any measures to be implemented on neighbouring premises, if required, which shall be fully implemented, prior to the first occupation of any residential units."

Overheating Control Noise Ingress

10.154 The MEP consultant has developed a strategy (see Appendix 10.5: Overheating Analysis Report) that combines natural vent openings with the hours restricted in line with the hours limited in Table 10.18, and additional ventilation in the form of extra purge fans and supply air cooling (peak lopping) where required. Cooling is proposed to be provided by a heat pump built into the MVHR which uses the refrigeration cycle to cool incoming air.

Residual Effects

Demolition and Construction Phase

Demolition and Construction Noise

10.155 No mitigation is required to control demolition and construction noise generated by the Proposed Development and effects will remain as identified, i.e. there would be Negligible and Not Significant residual effects at all SRs.

Demolition and Construction Vibration

10.156 The mitigated Proposed Development demolition and construction vibration levels and the associated nature and scale of the residual effects for the SRs assessed are presented in Table 10.22.

Table 10.22: Demolition and Construction Vibration – Residual Effects

Sensitive Receptor	Assessment Parameter	Development Stage
		Substructure
SR A	Predicted Vibration Level	0.00 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Neutral

SR B	Predicted Vibration Level	0.00 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Neutral
SR C	Predicted Vibration Level	0.00 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Neutral
SR D	Predicted Vibration Level	0.06 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Neutral
SR E	Predicted Vibration Level	0.10 mm/s
	Effect Nature, Scale, Duration and Geographic Extent	Neutral

10.157 The potential residual effect of demolition and construction vibration generated by the Proposed Development is Neutral and Not Significant at all SRs.

Demolition and Construction Traffic Noise

10.158 No mitigation is required to control demolition and construction traffic noise, and effects will remain as identified, i.e. there would be Negligible (Not Significant) residual effects at all SRs.

Demolition and Construction Phase Residual Effects

10.159 The residual effects from the demolition and construction phase of the Proposed Development are presented in Table 10.23.

Table 10.23: Demolition and Construction Phase Residual Effects

Likely Significant Effect	Receptors	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Demolition and Construction Noise	SR A, B, C, D	Adoption of a CEMP following Best Practicable Means	Approval of CEMP submitted with the Application by MCC	Negligible – Not Significant
Demolition and Construction Vibration	SR A, B, C, D, E	Adoption of a CEMP following Best Practicable Means	Approval of CEMP submitted with the Application by MCC	Neutral – Not Significant

Demolition and Construction Traffic Noise	Demolition and construction road traffic noise receptors (Figure 10.2)	Adoption of a CEMP including a Construction Logistics Plan	Approval of CEMP submitted with the Application by MCC	Negligible – Not Significant

Operational Phase

Building Services Plant Noise

10.160 Assuming the plant noise limits are adopted and adhered to, there would be Negligible (Not Significant) residual effects at all SRs.

Environmental and Entertainment Noise Ingress

10.161 Assuming that noise from the Rebellion nightclub is controlled to be reduced by 8 dB at the 63 Hz and 125 Hz octave frequency bands, and that the façade specification identified as primary mitigation is achieved, the criteria are expected to be met and a suitable residential amenity achieved. This is considered to be achievable with bespoke noise control strategies at the nightclub that are coordinated with the operators. There would consequently be Negligible (Not Significant) residual effects at the Proposed Development due to environmental and entertainment noise ingress.

10.162 Effects due to noise in external amenity areas would remain as identified, i.e Negligible and Not Significant.

Overheating Control Noise Ingress

10.163 The strategy adopted to control overheating has been selected to comply with the limitations imposed due to noise restrictions of ADO and the AVO Guide (i.e. in line with the hours shown in Table 10.18), and consequently there would be Negligible (Not Significant) residual effects at the Proposed Development due to overheating control noise ingress.

Railway Vibration and Ground-borne Noise Ingress

10.164 No mitigation is required to attenuate tactile vibration or ground-borne noise so the residual effects will remain as Negligible, and Not Significant.

Operational Phase Residual Effects

10.165 The residual effects from the operational phase of the Proposed Development are presented in Table 10.24.

Table 10.24: Operational Phase Residual Effects

Likely Significant Effect	Receptors)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Building Services Plant Noise	SR A, B, C, D	Typical plant noise controls designed to achieve the plant noise limits.	Planning condition set to achieve the standard MCC plant noise limits identified.	Negligible – Not Significant

Environmental and Entertainment Noise Ingress	Proposed Development	Triple glazing and façade linings. Noise emission reduction measures applied to Rebellion.	Planning conditions set to achieve by design the standard MCC environmental and entertainment noise limits.	Negligible – Not Significant
Overheating Control Noise Ingress	Proposed Development	Design measures to control duration of vent panel openings.	Good design practice.	Negligible – Not Significant
Railway Vibration and Ground-borne Noise Ingress	Proposed Development	None	N/A	Negligible – Not Significant

Monitoring

10.166 During the demolition and construction phase of the Proposed Development a noise and vibration monitoring regime would be adopted and Action Levels established in consultation with MCC, above which consideration would be given to the use of alternative techniques and/or other means of controlling noise and vibration levels. This will include vibration monitoring to consider impacts on Rochdale Canal retaining wall.

10.167 No monitoring is proposed during the operational phase of the Proposed Development.

Reference List

10.168 This ES Chapter has been prepared in reference to the following:

Her Majesty's Stationery Office (1974); 'Control of Pollution Act 1974', HMSO, London.

DEFRA (1990); 'Environmental Protection Act Part III', DEFRA.

Ministry of Housing, Communities & Local Government (2024); 'National Planning Policy Framework', London.

DEFRA (2010); 'The Noise Policy Statement for England', DEFRA, London.

MCC (2024); 'Places for Everyone Joint Development Plan', Manchester.

MCC (2022); 'Planning and Noise Technical Guidance', Manchester.

BSI (2008); 'BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting', BSI.

BSI (2019); 'BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound', BSI.

Association of Noise Consultants (2020); 'Acoustics Ventilation and Overheating Guide', V1.1, ANC.

Ministry of Housing, Communities and Local Government (2021); 'The Building Regulations 2010 – Overheating - Approved Document O', HM Government.

BSI (2014); 'BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise', BSI.

BSI (2014); BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Vibration', BSI.

Department of Environment (1976); 'Advisory Leaflet 72 Noise Control on Building Sites'.

BSI (1993); 'BS 7385-2:1993 Evaluation and Measurement for Vibration in Buildings', BSI.

Department of Transport/ Welsh Office (1988); 'Calculation of Road Traffic Noise', The Stationery Office Ltd, London.

IEMA (2023); 'Environmental Assessment of Traffic and Movement Rev07', IEMA, London.

Highways England (2020); 'LA 111 - Noise and vibration', Highways England.

BSI (2003); 'BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures', BSI.

DCLG (2014); 'National Planning Practice Guidance: Noise'.

IEMA (2004); 'Guidelines for Environmental Noise Assessment', IEMA, London.

WHO (1999); 'Guidelines for Community Noise', Geneva, WHO.

BSI (2014); 'BS 8233:2014 Guidance on sound insulation and Noise Reduction for Buildings', BSI.

ANC, IOA, CIEH (2017); 'ProPG: Planning & Noise – New Residential Development'.

Association of Noise Consultants (2020); 'Measurement and Assessment of Groundborne Noise and Vibration (Red Book)', 3rd ed. ANC.

Figure 10.1



Site and Noise Sensitive Receptor Locations

Not to scale	Date: 21st November 2024

Figure 10.2



Do not scale from this drawing.
Verify dimensions by site measurement.
Read this drawing in conjunction with the latest architectural and structural drawings.
This drawing is based on the following information:-

Approximate Site Boundary

Road Traffic Noise Sensitive Receptor

Rev	Date	Description	Drawn	Checked

H|M

hilsonmoran.com info@hilsonmoran.com

Client
Glenbrook

Project
2-4 Whitworth Street West

Drawing Title
Acoustics
Road Traffic Noise Sensitive Receptor Locations

Scale	Sheet Size	Checked	Approved
NTS	A3	JR	JeR

Status
FOR INFORMATION

Drawing No. Rev

Copyright © 2022 by Hilson Moran

Demolition and Construction Road Traffic Noise Sensitive Receptor Locations

Not to scale	Date: 27th August 2024

Figure 10.3



Approximate Site Boundary

LT# Long Term Environmental Noise Monitoring Position

ST# Short Term Environmental Noise Monitoring Position

E# Entertainment Noise Monitoring Position

V# Vibration Monitoring Position

Rev | Date | Description | Drawn | Checked

H|M

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Client
Glenbrook

Project
2-4 Whitworth Street West

Drawing Title
Acoustics
Noise and Vibration Survey Locations

Scale NTS | Sheet Size A3 | Checked JeR | Approved JR

Status
PLANNING

Drawing No. | Rev

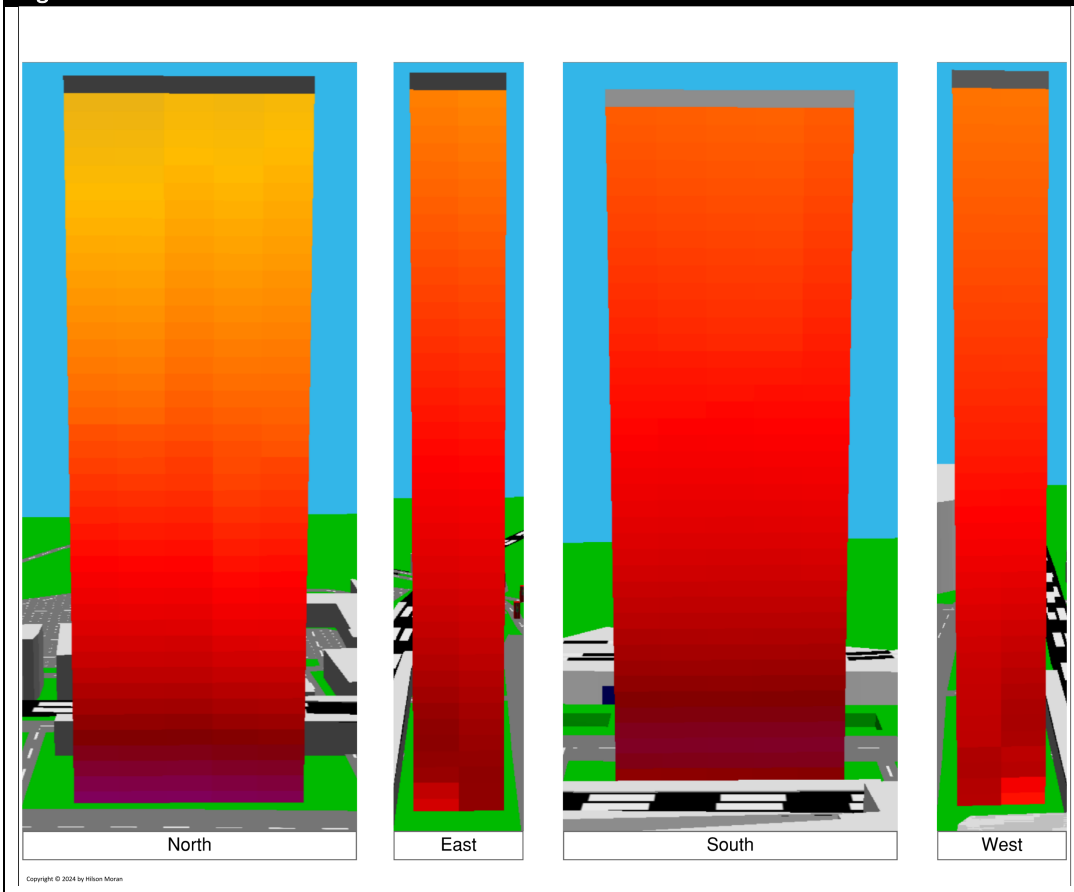
Copyright © 2022 by Hilson Moran

Noise and Vibration Survey Locations

Not to scale

Date: 27th August 2024

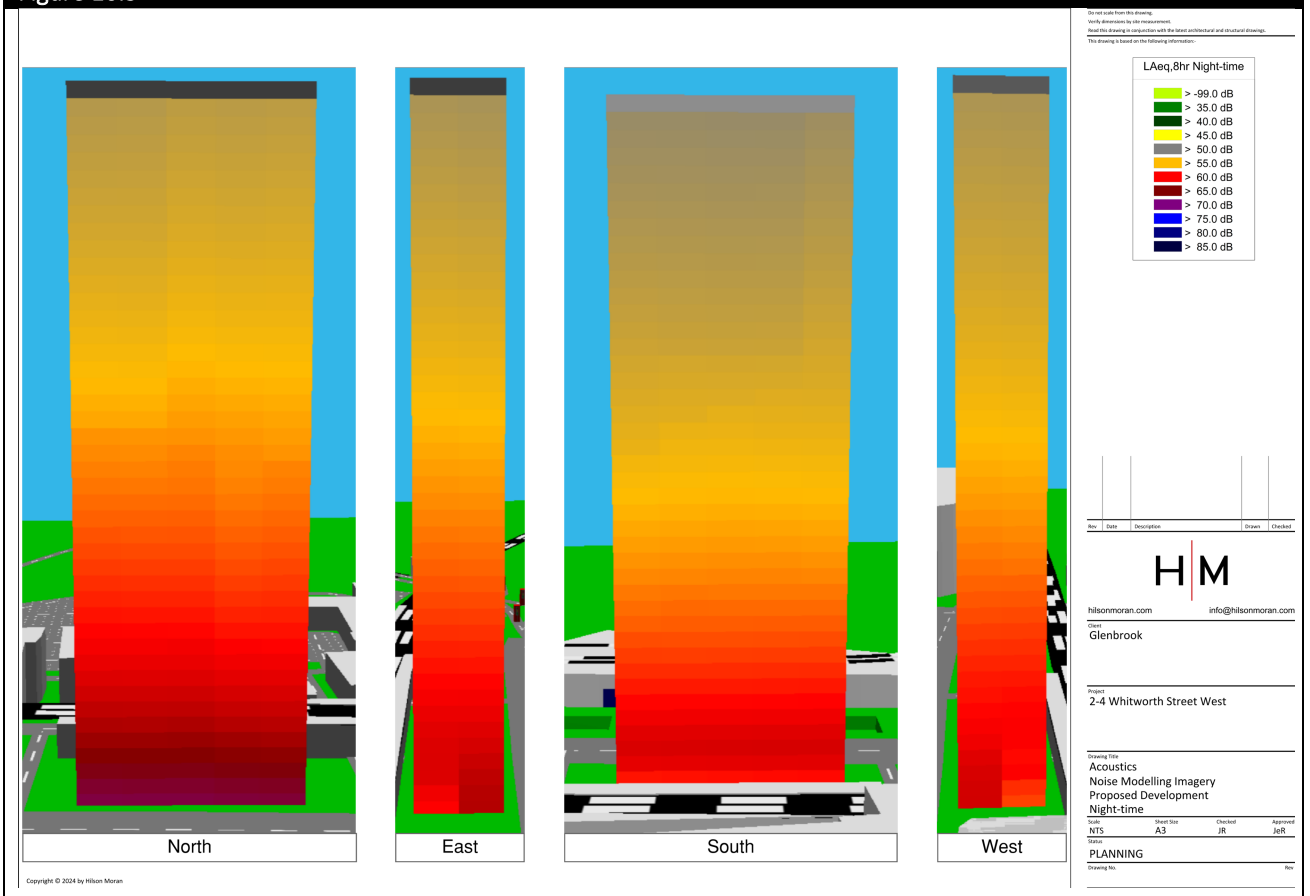
Figure 10.4



Noise Modelling Imagery – Proposed Development – Daytime

Not to scale	Date: 27th August 2024

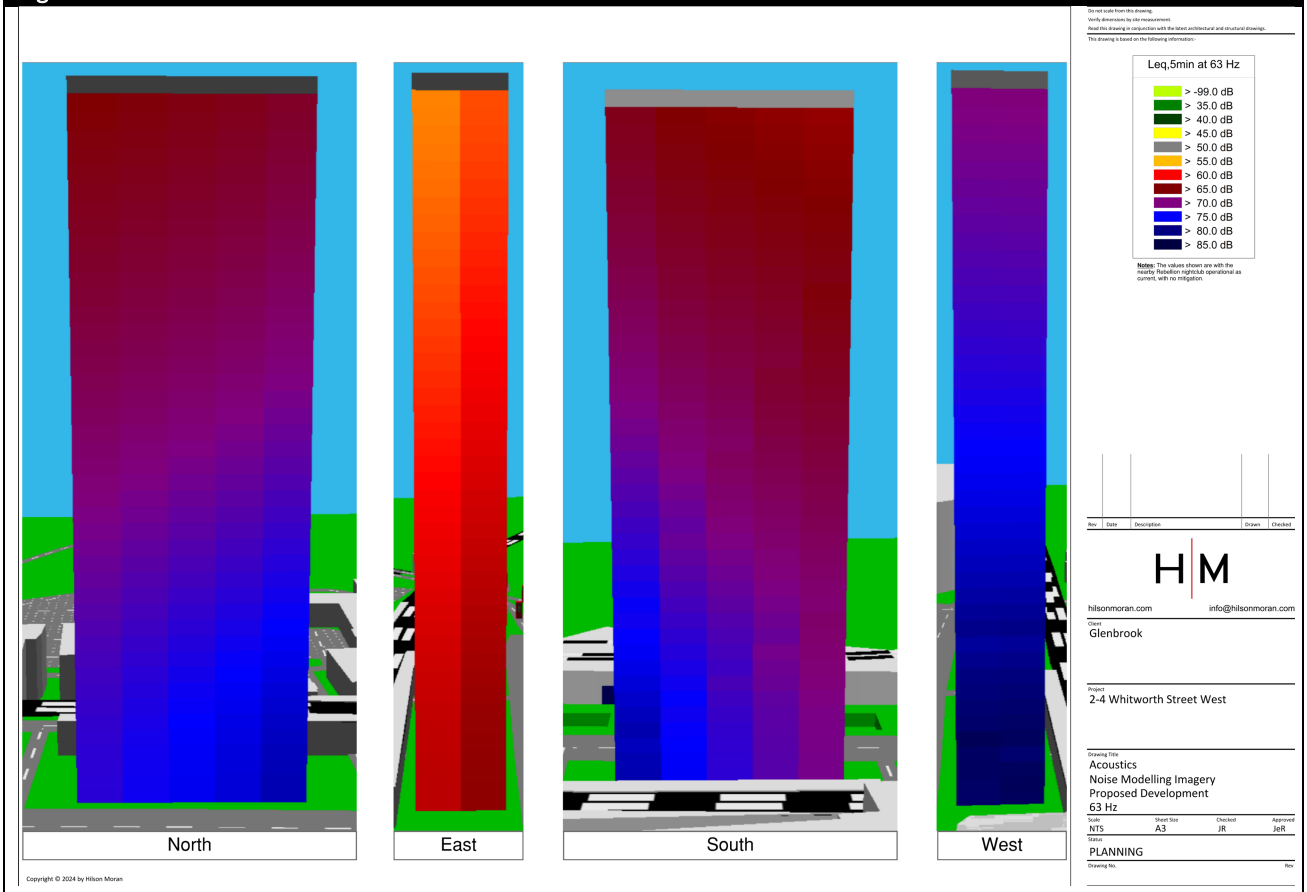
Figure 10.5



Noise Modelling Imagery – Proposed Development – Night-time

Not to scale	Date: 27th August 2024

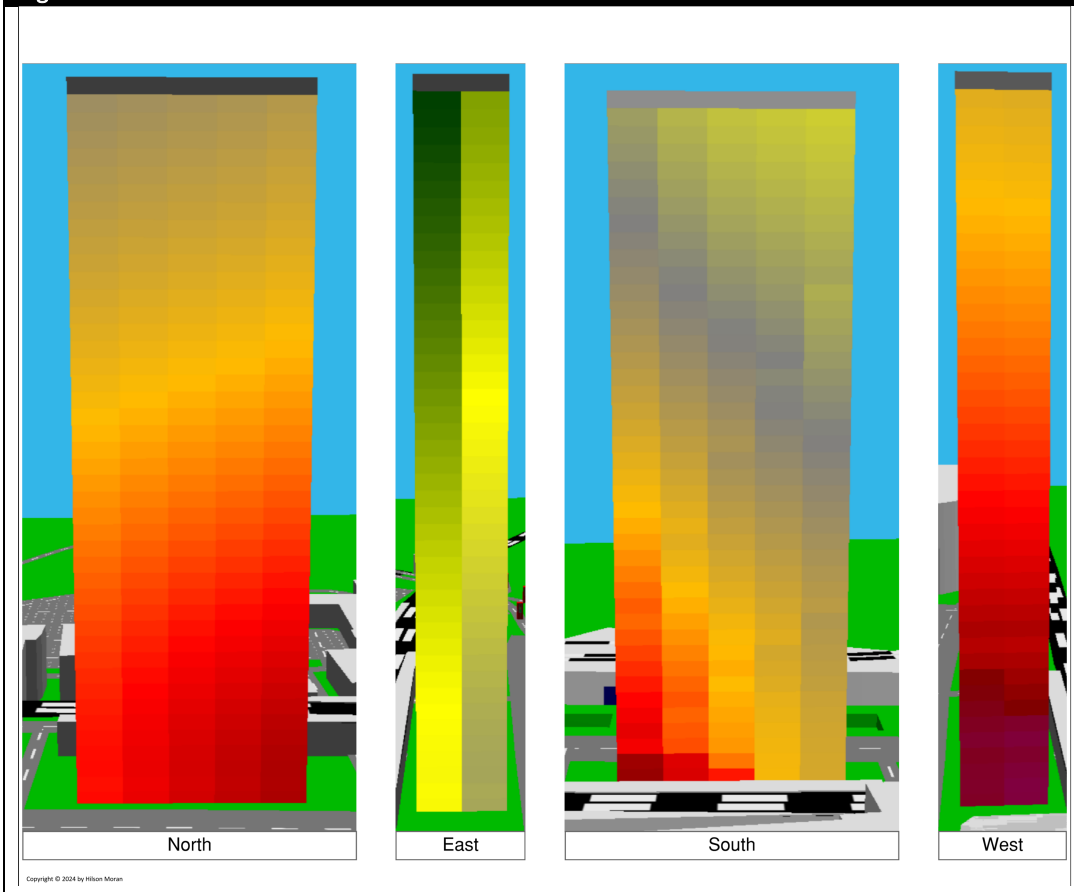
Figure 10.6



Noise Modelling Imagery – Proposed Development – 63 Hz

Not to scale	Date: 27th August 2024

Figure 10.7



Noise Modelling Imagery – Proposed Development – 125 Hz

Not to scale	Date: 27th August 2024

Non-Technical Summary

What is Noise and Vibration?

10.169 Noise is defined as sound that is unwanted. In the context of the Proposed Development this would include noise that is introduced by activities or equipment included within the scheme, and also existing noise from nearby sources such as road, rail, and nightclubs. Where the Proposed Development causes changes to the existing noise environment this would be considered an effect.

10.170 Vibration is the mechanical oscillations of an object relative to an equilibrium. This can cause an adverse effect where a new vibration source introduced by the Proposed Development (whether in construction or operation) is felt at nearby receptors, or where an existing vibration source is felt by users of the Proposed Development. Additionally, vibration can cause structure-borne noise, which is noise re-radiated from the structure through which vibration has transmitted. This can also affect receptors.

10.171 The nature of noise and vibration in the context of the Proposed Development is that an increase in noise or vibration would be considered adverse, and a decrease would be considered beneficial.

What has been assessed?

10.172 Noise and vibration resulting from the construction and operation of the Proposed Development has the potential to cause temporary or permanent disturbance to surrounding sensitive receptors.

10.173 During the construction and demolition of the Proposed Development there is the potential that noise and vibration from the works will impact on the surrounding environment. There is also the potential for construction related road traffic to affect the noise levels on local roads and any surrounding receptors.

10.174 Once the Proposed Development is complete and operational, noise associated with new building services plant due to the Proposed Development has the potential to impact on existing sensitive receptors. The existing and future noise and vibration environment has the potential to impact new residents of the Proposed Development within their homes and amenity areas.

10.175 Baseline noise and vibration surveys were conducted to establish the existing noise and vibration climate at and around the Site as a basis for setting limiting noise emission criteria for noise sources associated with the Proposed Development, and to establish the impacts of existing environmental noise and vibration and changes to environmental noise levels as a result of the Proposed Development.

What is the effect of the Proposed Development of Noise and Vibration?

10.176 The assessments showed that construction activities have the potential to cause temporary vibration disturbance to surrounding sensitive receptors during piling. This can be controlled through the use of low-vibration piling techniques such as continuous flight auger piling or rotary bored methods. Construction noise and construction traffic noise are expected to cause negligible adverse effects on surrounding receptors.

10.177 Residential uses of the Proposed Development may be exposed to elevated environmental noise levels where façades overlook the main roads and railway line running to the north and south of the Site respectively. With the provision of a suitable glazing and ventilation strategy, conditions suitable for residential amenity inside the new residential properties can be achieved. Entertainment noise from nearby nightclubs will require specific mitigation to reduce the noise levels emitted at source to a level where the proposed façade design is suitable. This can be controlled via planning condition and agreement with the operators of the nearby nightclubs.

10.178 Noise levels are elevated in external residential amenity spaces however this is to be expected for an urban environment affected by noise and should not be prohibitive to development. Provisions of imperforate balustrades to the terrace areas will reduce noise levels to a degree.

10.179 The risk of excessive noise ingress due to the control of overheating will be controlled through the use of vent panels and supporting mechanical systems to limit the amount of time that the panels need to be open and minimise impacts on the Proposed Development.

10.180 Vibration from passing trains on the railway lines to the south was measured with site surveys, and levels of vibration and related structure-borne noise was predicted in the proposed apartments. The levels were found to be insignificant and no mitigation is required to achieve suitable levels for the uses proposed.

10.181 Building services introduced by the Proposed Development would be controlled by requiring the acoustic design of services to meet the Council's plant noise limits. There would be no resulting impact on sensitive receptors assuming these limits are complied with.

11. Socio-Economic

Introduction

11.1 This Chapter of the ES has been prepared by CBRE and asseses the likely Socio-Economic impacts of the Proposed Development upon the Site and the surrounding area during the construction and operational phases. This Chapter also outlines the methodology adopted to assess these impacts, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce, or offset any significant negative impacts and the likely residual impacts after these methods have been adopted.

11.2 The authors of this Chapter are Matt Spilsbury and Ben Speakman. Matt Spilsbury has a Masters degree (Distinction) in Planning and Development, and an Honours degree (First Class) in Geography, from Newcastle University and has advised on socio-economic, socio-demographic and housing need and demand matters for almost 20 years, having completed over 15 socio-economic ES chapters for a wide range of projects across England and having prepared economic impact assessments (and related studies) on a vast number of major projects in England and Scotland over the same period. Ben Speakman has a Masters degree in Planning, Growth and Regeneration (MPhil) and an Honours degree in Geography (BA), both from the University of Cambridge. Ben has 1 years' experience advising on socio-economic matters, providing economic impact, housing market need and demand analysis and socio-economic ES chapters in the North West and Midlands.

Table 11.1 Technical Competence in Socioeconomic

	Lead Author	Reviewer
Name	Ben Speakman	Matt Spilsbury
Company	CBRE	CBRE
Qualifications/Accreditations relevant to technical area	BA (Hons) (Cantab) MPhil (Cantab)	MRICS MRTPI
Does the practitioner hold any IEMA qualification?	No	No
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	1	15+
Number of EIA's delivered to date	0	15+

Assumptions and Limitations

11.3 There is no national guidance or policy, nor widely recognised criteria, for the assessment of socio-economic impacts, and therefore, CBRE has drawn on expertise, knowledge of overarching guidance, and experience working in the subject area, to inform a structured approach to quantifying and assessing the scale and nature of potential impacts relative to baseline conditions. Where impacts could not be quantified, a qualitative judgement has been made, based on CBRE's professional experience.

11.4 The most up to date data from official published sources has been used, however there are some limitations in the baseline data. To mitigate, as far as possible, CBRE has clearly referenced the date of data publication and has utilised spatial datasets that permit analysis to be aggregated or disaggregated as closely as possible to the relevant technical study area.

Relevant Legislation, Policy and Guidance

National Policy

National Planning Policy Framework (NPPF) (2024):

11.5 The revised version of the National Planning Policy Framework (NPPF) was published by the UK Government in 2024. The NPPF provides a summary of the Government's planning policies for England and how they should be applied.

11.6 According to the NPPF, the planning system has interdependent objectives, which must be pursued in mutually supportive ways to achieve sustainable development:

- Economic Objective: to help build a strong, responsive, and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth, innovation, and improved productivity; and by identifying and coordinating the provision of infrastructure.

- Social Objective: to support strong, vibrant, and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being.

- Environmental Objective: to protect and enhance our natural, built, and historic environment, including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

11.7 The chapter titled "Building a strong, competitive economy" outlines the expectations of developments. In paragraphs 85-87, the document states that the Government is committed to securing economic growth in order to create jobs and prosperity, building on the country's inherent strengths, and to meeting the twin challenges of global competition and a low carbon future.

11.8 Paragraph 63 states that within this context, the size and type of housing needed for different groups of people (e.g. students, young professionals, families, disabled people) should be assessed and reflected in planning policies.

11.9 Paragraph 98 notes that planning policies should ensure an integrated approach to considering the location of housing, economic uses and community facilities and services, as well as plan positively for the provision and use of shared space, community facilities, (such as local shops, meeting places, sports venues, cultural buildings, public houses and places of worship) and other local services to enhance the sustainability of community and residential environments.

Sub-Regional Policy

Places for Everyone (PfE) (2024)

11.10 Places for Everyone is the long-term plan of nine Greater Manchester districts (all Greater Manchester districts except Stockport) for jobs, new homes, and sustainable growth. The plan sets out a strategic policy framework for the nine districts and identifies land and infrastructure to help these areas meet their local housing and employment needs. The city centre is identified as the most significant economic location in the country outside of London and the need for it to be strengthened is emphasised within the plan.

11.11 Places for Everyone focuses on directing new housing towards previously developed sites within existing urban areas to help address existing derelict and underutilised sites. Policy JP-H 4 (Density of New Housing) ensures that such sites are utilised, particularly in more accessible locations. This also reduces the pressure on greenfield and Green Belt land for development. The reuse of previously developed sites for housing can support wider objectives, as the sites are often situated in relatively sustainable locations which are close to facilities and served by existing infrastructure.

Greater Manchester Housing Strategy (2019)

11.12 A core priority of the Greater Manchester Housing Strategy (2019) is provision of safe, decent, and affordable housing that fits the needs of current and future citizens. The Mayor's Town Centre Challenge has focused attention and brought stakeholders and communities together to plot a new future for town centres across Greater Manchester. Increased town centre living is a central theme, requiring a need to make town and district centres attractive places to live. The utilisation of brownfield sites in and beyond town centres for housing is therefore a vital part of this strategy.

Greater Manchester Local Industrial Strategy (2019)

11.13 The Greater Manchester Local Industrial Strategy (2019) describes a robust, diverse, and growing city-region economy. It outlines an integrated place-based approach to bringing forward strategic regeneration proposals in town centres and strategic sites, which integrates investment in land remediation, housing transport, and other infrastructure to create sustainable employment locations.

Local Policy

Manchester Core Strategy (2012)

11.14 The Manchester Core Strategy details the overall strategic direction for planning for Manchester over the plan period from 2012 to 2027 and aligns with national policies. The policies of the Core Strategy outlines where major development and other forms of investment should be located in order to be sustainable, meet local needs and take advantage of opportunities. The regional centre of Manchester will be the spatial focus for economic and commercial development, retail, leisure, and cultural activity, alongside high-quality city living.

Addendum to Manchester Core Strategy (2024)

11.15 The Addendum to Manchester Core Strategy 2024 lists sections of Core Strategy policies replaced by Places for Everyone policies and is intended to be read alongside the Core Strategy. This realigns the Core Strategy with the broader vision for the growth of the city region.

Investing in Success: An Economic Strategy for Manchester (2023)

11.16 Investing in Success (2023), Manchester's new economic strategy, states that although 22,350 new homes were built between 2011 and 2021, Manchester's economic success has made it a popular place to live, putting immense pressure on the housing market. The strategy notes that there is also a need for the rest of Greater Manchester to build housing in more 'better connected' locations to meet future demand and achieve inclusive economic growth.

Manchester Housing Strategy (2022)

11.17 The Manchester Housing Strategy (2022) notes that the city has experienced rapid population growth and although more homes are being built in the city centre than at any time since the 2008 economic downturn, there is a continued demand for new homes. The Strategy commits to building 32,000 new homes by 2032, 10,000 of which affordable homes and 3,000 in the city centre. A commitment is also made to deliver at least 80% of all homes built by 2032 on brownfield sites, located close to public transport.

Assessment Methodology and Significance Criteria

Scenarios Tested

11.18 The relevant scenarios to be assessed are as follows:

- Scenario 1: Existing Baseline (Site)
- Scenario 2: Baseline + Proposed Development
- Scenario 3: Baseline + Proposed Development + Cumulative

The Study Area

11.19 There is no national guidance or policy that prescribes the definition of an appropriate study area in respect of socioeconomics. The determination of study areas should be linked to the relevant receptors with this informed by reference to the extent of socio-economic effects across an appropriate range of spatial geographical scales.

11.20 The study area comprises the following:

- The Proposed Development's local impact area, which represents the Site's immediate local catchment, and is defined as the Deansgate electoral ward in which the Site is located and the neighbouring Piccadilly ward, which in combination represent Manchester City Centre ('MCC').
- A wider impact area comprises the administrative area of Manchester City Council, against which all effects are assessed, and the Greater Manchester Combined Authority area (comprising the 10 districts within Greater Manchester).
- For some receptors, a smaller study area may be required; for instance, with respect to the demand for social and community infrastructure within close proximity to the Proposed Development (i.e. within a certain distance radius from the Site).

Geographical Study Areas

Effect	Study Area	Justification
Construction Phase (Temporary) Employment uplift	**Wider (Greater Manchester)**	Construction related labour is likely to be drawn from across Greater Manchester.
Net change in direct Operational Employment	**Wider (MCC)**	Employment/economy targets are set at district level.
Uplift in economic performance (GVA Productivity)	**Wider (MCC)**	Employment/economy targets are set at a district level.
Uplift in Household Expenditure	**Wider (MCC)**	Employment/economy targets are set at a district level.
Change in annual fiscal contributions in the form of Council Tax and Business Rates payments	**Wider (MCC)**	Revenue from council tax is collected by MCC. MCC is a participant in the Greater Manchester Trailblazer Deal which secures the 100% business rates retention scheme for all 10 Greater Manchester authorities for a further 10 years, to 2034/35.
Change in demand for healthcare facilities (GP services and dentists) as a result of the uplift in population	**Local (One mile from the Site)**	The Healthy Urban Development Unit ('HUDU') guidance recommends that the impact on GP capacity should be assessed within one mile catchment from the Proposed Development.
Change in demand for early years and primary school Education Places resulting from the uplift in population	**Local (Two mile walking distance from the Site and ward level for childcare provision.)**	The Department for Education ('DfE') statutory walking distance of 2 miles (for children up to age of 8) is used as an indicator in the absence of primary pupil planning being within the public domain. Childcare sufficiency in Manchester is considered at the ward level.
Change in demand for secondary school Education Places as a result of the uplift in population	**Local (Three mile walking distance from the Site)**	The Department for Education statutory walking distance of 3 miles (for children aged of 8-16) is used as an indicator in the absence of primary pupil planning being within the public domain.
Change in demand for the use of / access to the existing Open Space, Recreation and Children's Play space within close proximity to the Site.	**Local (Deansgate ward)**	The benchmark of 6 acres (2.4ha) per 1,000 population provided by Fields in Trust is utilised at a Ward level, in the absence of locally set requirements for the provision of accessible open/green space, as a representative measure of open space, recreation and children's play space facilities that residents living in the Proposed Development would use regularly.

Source of Effect

11.21 The EIA Scoping Report provides more detail on the scope of this Chapter, including any effects which have been scoped out. Socio-economic effects are relevant to both the construction and

operational phases of the Proposed Development. Table 11.3 describes the likely socio-economic effects from the Proposed Development and their relevant receptors.

Table 11.2 Likely Effects and Relevant Receptors

Effect	Description	Receptor
Construction Phase (Temporary) Employment uplift	The construction of the Proposed Development will create temporary employment within the construction sector.	Individuals within the local labour force seeking construction sector employment
Net change in direct Operational Employment	The operation of the Proposed Development could generate direct, on-Site employment as well as further indirect and induced employment within the local economy.	Individuals within the local labour force seeking employment
Uplift in economic performance (GVA Productivity)	The economic output impact of employment generated as a result of the Proposed Development.	The local economy
Uplift in Household Expenditure	The local spending impacts of employment generated as a result of the Proposed Development.	The local economy
Change in annual fiscal contributions in the form of Council Tax and Business Rates payments	The revenue to the local authority generated by the Proposed Development through residential use (Council Tax) and commercial use (Business Rates).	Manchester City Council's public services budget
Change in demand for healthcare facilities (GP services and dentists) as a result of the uplift in population	An increase in resident population could affect the balance of supply of the provision of local primary healthcare services such as GPs and dentist.	Primary healthcare facilities
Change in demand for early years and primary school Education Places resulting from the uplift in population	An increase in resident population could yield pupils of school age who may affect the balance of supply of the provision of local early years childcare and primary schools.	Early years and primary education facilities
Change in demand for secondary school Education Places as a result of the uplift in population	An increase in resident population could yield pupils of secondary school age who may affect the balance of supply of the provision of local secondary schools.	Secondary education facilities
Change in demand for the use of / access to the existing Open Space, Recreation and Children's Play space within close proximity to the Site.	An increase in resident population could affect the balance of supply of the provision of open /amenity space and children's play space.	Users of open space and children's play space

Significance Criteria

11.22 In the absence of industry guidance on assessment of the significance of socio-economic effects, receptor sensitivity is therefore addressed on an individual basis based on professional judgement, reflecting the principles set out in Table 11.4 below.

Table 11.3 Methodology for Determining Sensitivity

Sensitivity	Examples of receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or no local importance.

11.23 The magnitude of socio-economic effects will be determined in accordance with the approach presented in Table 11.5 below. This will also take into account the estimated likely duration of the change from baseline conditions, with this ranging from temporary short-term effects to longer term or permanent effects.

Table 11.4 Methodology for Determining Impact Magnitude

Magnitude of Impact	Criteria for assessing impact
Major	Total loss or major/substantial alteration to key element/features of the baseline (pre-development) conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstance/situation.

11.24 The level, or significance, of effect will be informed by the interface between both the sensitivity of the relevant receptor and the magnitude of change, with changes being beneficial, adverse or neutral and will be informed by professional judgement and experience. The framework for assessment of significance is set out in Table 11.6 below. Effects assessed as moderate or major are considered significant in EIA terms.

Table 11.5 Impact Significance Matrix

Magnitude	High	Sensitivity Moderate	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse -Beneficial	Moderate - Minor Adverse -Beneficial
Moderate	Major Adverse/Beneficial	Moderate Adverse – Beneficial	Minor Adverse/Beneficial
Minor	Minor Adverse/Beneficial	Minor Adverse/Beneficial	Negligible
Negligible	Negligible	Negligible	Negligible

Baseline Conditions

Population

11.25 In the ONS 2021 Census estimates, Manchester City Centre (comprising the Deansgate and Piccadilly wards) had an estimated population of 25,354. In the Deansgate ward specifically, the ONS Census estimated a population of 13,697. It is assumed that the effects of residential developments identified within the Baseline (Scenario 1) are not captured within the 2021 Census-derived figures outlined above. On a worst-case assumption that all residents in these developments are new to the area, the study area baseline population could be increased to approximately 23,000[1].

11.26 The local demographic in Manchester City Centre for the same year is characterised by a high proportion of working age (16-64) residents (95%), which is substantially higher than the rates in Manchester (70%), the North West (62%), and England (63%).

Housing and Housing Targets

11.27 ONS Census 2021 data estimates a total of 12,541 households in the Manchester City Centre, which represents 5.84% of the total households in Manchester (c. 215,000). MCC's Housing Strategy aims to build 36,000 new homes by 2032, 10,000 of which will be affordable, including 3,000 in the city centre.

Employment and Labour Market

11.28 ONS data indicates that in 2023, total employment within Manchester City Centre stood at just over 200,000, with more than half of this within the Deansgate ward. In 2023, City Centre employment accounted for almost half (45%) of Manchester's total employment. It is assumed that the employment effects of the baseline developments (Scenario 1) are not included within the figures presented above. Over and above these figures, the employment generated by the office and commercial floorspace provided within baseline developments (Scenario 1) has the potential to increase employment in the study area by approximately 3,500. Further employment is also

[1] This assumes an average household size of 1.63 persons, based on ONS Census (2021) household size data for Deansgate and Piccadilly wards.

generated by the operational components of the build-to-rent ('BTR') and purpose-built student accommodation ('PBSA') within the baseline developments.

11.29 Within the local area, the composition of the employment structure is weighted heavily towards office-based, professional service economy sectors. A quarter (25%) of total employment is within the 'Professional, scientific and technical' sector (compared with 9.7% across England), with a further 15% accounted for by 'Business administration & support services', 11% in the 'Information & communication' sector, and 11% in the 'Financial & insurance' industry. These professional services account for approximately 61% of all employment in the local area, which is more than double the proportion in the North West (24%) and England (27%). As a subsequent result of this concentration of office-based activities, 'Retail' (6%) and 'Accommodation & food services' (9%) also provide significant employment.

11.30 As at 2023, at the Greater Manchester level, approximately 70,000 jobs are supported by the construction industry. It is assumed that this figure represents the existing baseline position, due to the uncertainty present in both the levels of capital investment and build period for the identified baseline developments (Scenario 1).

11.31 The local area benefits from a low rate of unemployment (3%), which is lower than the wider rates in Manchester (4%) and Greater Manchester (3.2%) but is higher than the regional and national rates at (2.8%) and (2.9%) respectively. The claimant count in the impact area as at October 2024 was 1.2%, which is significantly lower than that of Manchester (7.2%) the North West (4.7%), and England (4.4%). This is complimented by a high proportion of residents in employment (72%), particularly within professional, managerial and technical roles (SOCs 1-3). The proportion of people qualified to NVQ 4+ level (62%) is higher than that in any comparable area and the proportion of those without any formal qualifications (4.2%) is also lower than in Manchester, Greater Manchester, the North West, and England.

Economic Output

11.32 The total economic output of Manchester (measured by Gross Value Added (GVA) in 2022 equated to £31.5 billion, reflecting an average GVA contribution per full time equivalent (FTE) of approximately £75,000 per annum. It is assumed that the economic output associated with identified baseline developments (Scenario 1) is not accounted for in the above figures. On this basis, this collective employment generation has the potential to uplift total study area GVA by approximately £0.7 billion.

11.33 In 2022, the construction sector provided an economic output (Gross Added Value) of over £4 billion in Greater Manchester. This equates to an average GVA contribution per full time equivalent (FTE) construction job of approximately £68,000 per annum.

Local Authority Revenue

11.34 In the context of recent macroeconomic instability, cost of living crisis, and local authority funding challenges, the delivery of essential Council services has come under increasing strain across the country. As such, local authority revenue is critical to the delivery of essential local services.

11.35 Revenue from council tax and business rates support the majority of Manchester City Council's budget for council services across 2024/25, accounting for 79% (£638m) of total budgeted spend. This contributes to the provision of essential local services such as the emergency services, waste collection, local libraries, and public transport.

11.36 Manchester City Council is a participant in the Greater Manchester Trailblazer Deal which secures the 100% business rates retention scheme for all 10 Greater Manchester authorities for a further 10 years, to 2034/35.

Healthcare

11.37 The Site is within 1 mile walking distance of 5 GP practices, the nearest of which is The Arch Medical Practice, which is 0.4 miles away. These practices are currently operating at an average of approximately 2,800 patients per FTE GP, which is substantially above the benchmark of 1,800 patients per FTE GP recommended by the London Healthy Urban Development Unit ('HUDU'). Whilst all of the GP practices within 1 mile of the Site are continuing accepting new patients at November 2024, the data indicates that local GP services are operating beyond the HUDU benchmark. It should be noted that practices can typically operate sustainably at higher patient to GP ratios than the HUDU benchmark based upon their specific staffing, service offer and funding models, as well as taking into account the demographic profile of the patient population. As indicated above, the Deansgate and Piccadilly wards comprise almost entirely (95%) of people aged 16-64, with the vast majority under the age of 40. As younger demographic populations typically generate a lower-than-average level of demand for primary healthcare services, it is therefore more likely that practices operating locally can sustainably support higher patient to GP ratios than the average benchmark.

11.38 In addition, a new build medical centre has recently been developed within the ground and first floor of the Elizabeth Tower residential development (New Jackson Medical Centre). This facility is now operational as a branch site of The Docs Surgery and offers GP, nurse, and pharmacist appointments. New Jackson Medical Centre includes 16 clinical rooms and has the capacity to support a patient population of around 20,000. Whilst not quantifiable, this additional provision would assist in meeting demand and moderate the volume of patients per FTE GP in the local area.

11.39 Further patient demand would be expected to be met through additional GP capacity being added, via funding received from the NHS Greater Manchester Integrated Care Partnership. In terms of local dental provision, there are 9 dentists within 1 mile of the Site, with the nearest, 207 Dental Care, being just 0.3 miles walking distance from the Site.

Education

11.40 In the immediate area of the Deansgate ward, there are no primary schools. However, within 2 miles walking distance of the Site, there are 25 primary schools, the nearest of which are located to the South in the Hulme ward, within one 1 mile walking distance. The demand for primary school places within the local area is high. The schools located within 2 miles walking distance are situated across Manchester and Salford local authorities and the latest data suggests that these schools are operating near full capacity (0.5% surplus places). However, the three schools located closest to the site are currently operating at a surplus of 44 pupil places (4.9%), which exceeds the adopted operating margin of 2% within the Department for Education's Basic Need funding calculations.

11.41 According to MCC's Family Information Service, there are three nurseries located within 1 mile of the Site. The nearest nursery is 'Paintpots Nursery', which is located 0.46 miles from the Site. The latest Manchester Childcare Sufficiency Assessment (2023) shows that the Deansgate ward has a sufficient supply of childcare both for 2 year olds and 3-4 year olds.

11.42 The phased opening of Crown Street Primary School from September 2024 will begin to provide further capacity. The school initially provides 30 reception pupil places and 24 pre-school places

but will accommodate a total of 230 pupils at full capacity, from pre-school to Year 6. The school will primarily serve residents in the New Jackson, Deansgate Square, and surrounding areas of the city centre.

11.43 Within a 3 mile radius of the Site, there are 24 secondary schools across the Manchester, Salford, and Trafford Districts. Collectively, these schools are operating at a surplus of 6.0%. The demand for secondary school places within the Manchester Local Authority area is high. Just 5 out of a total 32 secondary schools had unfilled places for September 2024, meaning approximately 84% of year 7 places were made for the current academic year. The latest data shows that a quarter (24.7%) of all mainstream state schools in Manchester are near or in excess of capacity. Of the seven schools within 2 miles of the Site, three are operated in excess of capacity. The three secondary schools closest to the Site are operating with a surplus of 264 pupil places (7%) and are therefore above the flexibility margin of 2% adopted by the Department for Education's Basic Need funding calculations.

11.44 Whilst the additional population growth arising proposed development may to some increased demand for school places, this effect is likely to be suppressed due to the high proportion of younger working age residents in the city centre area, and the typical demographic residing in the proposed development.

Open Space & Amenity

11.45 The Site is located within walking distance from a number of green spaces, including Hulme Park, All Saints Park, Castlefield Urban Heritage Park, St John's Gardens, Sackville Gardens, Barrack Street Park, and the recently developed Mayfield Park. However, according to Fields in Trust, Manchester City Centre provides just 9.10 sqm of green space per resident, which is significantly lower than the benchmark provision of 2.4ha per 1,000 residents (2.4sqm per person).

11.46 More broadly, the Site is located within a 20 minute walk of Sugden Sports Centre, and also benefits from close proximity to other recreational areas such as the recently regenerated Castlefield Viaduct. Recent development sites within the St. John's and Spinningfields areas to the north and First Street and Great Jackson Street to the south and west are also nearby, offering new public spaces and pedestrianised zones which enhance the living and working experience of the area.

11.47 The central location also provides easy access to a plethora of leisure sites, including the Great Northern complex, an Odeon cinema, Manchester Opera House, and the HOME entertainment complex. The rest of the city centre can be reached by foot and the nearby Deansgate Metrolink station offers easy access to the wider city. Manchester Oxford Road railway station can be accessed in under a 15 minute walk, providing train services beyond Manchester.

11.48 In 2022, MCC adopted the Manchester Blue and Green Infrastructure Strategy, which responds to commitments made in the City's Local Plan and Climate Change Action Plan and demonstrates the Council's commitment to Green Spaces, with plans to spend £12.5 million on a large-scale Capital Park Investment Programme between 2021-25.

11.49 Several of the baseline developments identified (Scenario 1) include a provision of public realm or amenity space, contributing high quality public realm and improved connectivity to the surrounding areas. The Great Jackson Street strategic regeneration framework area includes proposals under development to create a new 0.5 ha public park as part of The Blade and Three60 development. This will connect the public realm delivered through the Deansgate Square

development (0.4 ha riverside walkway) to Hulme Park to the south and the public spaces of the City Centre to the north.

Receptor Sensitivity

11.50 Table 11.7 summarises the sensitivity of each of the receptors identified in the baseline.

Table 11.6 Receptor Sensitivity

Receptor	Sensitivity	Study Area	Justification
Individuals in the labour market seeking construction employment	**Moderate**	**Wider (Greater Manchester)**	A proportion of the temporary construction employment generated by the construction stage activity is likely to be filled by unemployed people (both skilled and unskilled) from across Greater Manchester. The unemployment rate and claimant rate for Greater Manchester is slightly higher than the regional (North West) average.
Individuals in the labour market seeking employment	**High**	**Wider (MCC)**	Employment growth locally will boost overall economic growth and the wider prosperity of the city centre which is a strategic priority both at a MCC and Greater Manchester level. In Manchester, both the unemployment and claimant rates are higher than the Greater Manchester, regional and national rates.
Local economy	**High**	**Wider (MCC)**	Employment growth locally will boost overall economic growth and the wider prosperity of the city centre which is a strategic priority both at a MCC and Greater Manchester level. Direct employment will contribute to GVA effects across the local economy and local household spending will support further additional employment with subsequent GVA effects across the local economy.
Local economy	**High**	**Wider (MCC)**	Local household spending will support additional employment with subsequent GVA effects across the local economy.
Manchester City Council total Business Rates and Council Tax revenue	**High**	**Wider (MCC)**	Local authority revenue is essential in the delivery of local services and has experienced lower receipts in recent years due to the impact of the COVID-19 pandemic.
Primary healthcare facilities	**Low**	**Local (One mile from the Site)**	Whilst the ratio of registered patients per FTE GP is currently above benchmark levels, the younger local demographic within the study area typically places less demand on the NHS and suggests that the local practices may be able to operate at higher levels of patients per GP (and dentist) for longer, which is reflected by existing GP practices continuing to accept new patients (i.e. not deemed to be at maximum capacity). In addition, new primary healthcare facilities that have recently been developed within the study area

			will also boost local capacity to meet current and future needs.
Primary education and early years facilities	Moderate	Local (Two mile walking distance from the Site and ward level for childcare provision)	The surplus capacity of primary schools located within a 2 mile walking distance is limited (0.5%). When considered schools located within 1 mile, this increases to 4.9%. The Deansgate ward has a number of early years providers and the latest childcare sufficiency assessment indicates that there is sufficient childcare provision within the ward. Primary school provision (including early years) is expanding within close proximity to the Proposed Development via Crown Street Primary School, which began a phased opening in September 2024.
Secondary education facilities	Low	Local (Three mile walking distance from the Site)	Within 3 miles walking distance of the Site, there is a 6.0% surplus in secondary school capacity. This rises to 7.0% when focusing on the three schools closest to the Site.
Users of open/amenity space and children's play space	Low	Local (Deansgate ward)	Considering the situation of the Site within Manchester city centre, the range of publicly accessible open / amenity spaces and children's play spaces within proximity is reasonable. Additional public realm will also be delivered by Baseline developments.

Identification and Evaluation of Likely Significant Effects

11.51 The assessment presented in this section relates to Scenario 2 (Existing Baseline plus Proposed Development)

Construction Phase

Temporary Construction Employment

11.52 The construction phase will support employment opportunities within the construction sector, both on-Site and off-Site.

11.53 Based upon a Cost Estimate prepared by Quartz Project Services, at September 2024, the total construction cost for the Proposed Development is c£105.3m. Inclusive of additional costs, such as contingency, professional fees, and investment agent and legal fees, CBRE consider the total capital investment of the Proposed Development to equate to c£118.6m. This would lead to an average labour requirement of approximately 200 FTEs per annum across a 3 year construction period.

11.54 This employment is likely to include a varied nature of job-types and occupations, both on-Site and off-Site through direct and indirect supply chain employment, as well as induced effects. On-Site work will include a range of jobs, from highly skilled professions such as site surveyors to lower skilled supply chain jobs like labourers. Off-Site employment could be expected to support employment across a wide supply chain ranging from building material suppliers to consultants and architects.

11.55 Some workers will live locally and their expenditure on household goods and services will support employment in local businesses. However, it is likely that construction workers could also be drawn from within the wider region, depending on the roles available and the contractors selected. Their expenditure in the economy will create induced effects on the labour market.

11.56 The construction sector currently supports circa. 65,000 FTE jobs across Greater Manchester. Therefore, the estimated annual construction jobs supported during the construction period could be expected to represent 0.3% of all sub-regional employment in the construction sector. Given the small percentage contribution, construction activity is not expected to stimulate a noticeable change in the baseline conditions at the sub-regional level, and thus, the magnitude of the impact is assessed to be minor.

11.57 With the sensitivity of the receptor assessed as Moderate, this would give rise to a direct, long term and Minor Beneficial (not significant) effect.

Temporary Employment and the Economy:

11.58 Through the application of a GVA per job benchmark applied to the net average labour requirement generated during the construction period, the Proposed Development could lead to an additional £51 million in GVA could be generated annually across Greater Manchester during the construction period, of which circa £42m per annum would be generated locally in Manchester.

11.59 The total value of Greater Manchester's economy in GVA terms in 2021 was c.£79 billion. Therefore, the Proposed Development could be expected to contribute circa 0.05% uplift in productivity in the sub-region.

11.60 With the sensitivity of the receptor (the local economy) assessed as High, this would give rise to a direct, long term and Minor Beneficial (not significant) effect.

Operational Phase

Employment and the Local Economy:

11.61 CBRE understands that the Proposed Development shall be delivered as an operational Build-to-Rent ('BTR') scheme, including 7,500 sqft of amenity space across floors 1-3. A small positive contribution to the district employment levels is likely as a result of this operational aspect.

11.62 In the absence of a detailed operational cost and employment breakdown, CBRE has relied upon operational estimates from comparable developments in Manchester and Salford as benchmarks. On this basis, CBRE estimates a total operational cost budget for the Proposed Development of approximately £1 million per annum. A further £250,000 per annum property management fee is also considered reasonable.

11.63 Based on this operational benchmarking and reflecting CBRE's knowledge of comparable development operations, CBRE estimates that the Proposed Development will generate a net additional 9 FTE roles across Greater Manchester, of which 3 net additional FTE roles will be created locally in Manchester.

11.64 Whilst the sensitivity of the receptor is High, this level of net employment generation represents a negligible magnitude of change with reference to total employment levels at the Manchester and Greater Manchester (i.e. wider) impact (study) areas.

11.65 Applying the adjusted GVA per job (£76,975) to the net additional FTE employment impact generated by the operation of the Proposed Development (upon completion) indicates that an additional £900,000 in GVA could be generated annually across the Greater Manchester economy (in today's prices) once fully operational. This is inclusive of £600,000 generated locally in the Manchester economy.

11.66 Through the application of a GVA per job benchmark applied to the net additional FTE employment generated during the operational phase, the Proposed Development could lead to an additional £700,000 in GVA could be generated annually across Greater Manchester.

11.67 The total value of Greater Manchester's economy in GVA terms in 2021 was c.£79 billion. Therefore, the Proposed Development could be expected to contribute circa 0.0009% uplift in productivity in the sub-region.

11.68 With the sensitivity of the receptor (the local economy) assessed as High, this would give rise to a direct, long term Negligible effect.

Expenditure in the Local Economy:

11.69 For the purposes of estimating the levels of expenditure to be generated by residents living within the Proposed Development, it is assumed that the accommodation will operate at full occupancy levels. Based on ONS household expenditure data it is estimated that the annual household spend on retail goods and services (excluding housing and utilities costs) in the North West equates to £16,890. When applied to the total number of households provided, the Proposed Development generates an annual expenditure of £6.2m.

11.70 The national estimated revenue per FTE worker in the retail sector (at 2023) equates to approximately £205,000. On this basis, the estimated annual household expenditure of £6.2m could directly support 30 FTE jobs. Therefore, through both direct on-Site and indirect off-Site employment, the Proposed Development could generate circa. 42 FTE jobs. The magnitude of change represented by this level of employment generation is negligible in the context of the total employment levels at the district level.

11.71 Given the sensitivity of the receptor (individuals seeking employment) is high, this would generate a direct, long term and negligible (not significant) effect.

Local Authority Revenue

11.72 Based on the quantity of new homes provided by the Proposed Development, it is estimated that, upon completion and full occupation, an additional £669,192[2] in Council Tax annual revenues would be generated. This represents less than 1% of Manchester City Council's total revenue received from Council Tax in the previous financial year.

11.73 An additional £36,545 of GMCA Precept Income would also be generated through the Proposed Development.

[2] Calculated upon the Band C, 2024/25 Council Tax rate for Manchester

11.74 The effect of local authority revenue is considered to represent a minor magnitude of change. With the sensitivity of the receptor identified as high, this would give rise to a direct, long term and minor beneficial (not significant) effect.

Primary Healthcare Facilities

11.75 The Proposed Development is expected to yield a maximum population of approximately 768 people. If assuming a worst-case scenario whereby all residents were additional to the study area and not already registered with local GPs, this would generate an increase in the number of registered patients per FTE GP of approximately 1%.

11.76 The extent to which this increase in population is attributable to existing residents already registered with local GPs in the area cannot be estimated or accounted for based on available data sources. The youthful demographic resident population profile of the local study area, including in baseline developments nearby, which would be expected to be consistent with those residing in the Proposed Development, would be expected to generate lower levels of demand for primary healthcare services. The worst-case percentage demand uplift is therefore considered an unlikely outcome.

11.77 As such, the magnitude of change is considered to be Minor. As the sensitivity of the receptor is low, this would lead to a direct, long-term and negligible (not significant) effect.

Primary and Early Years Education

11.78 The Department for Education's Pupil Yield Data Dashboard offers a method for estimating pupil yields from new residential developments. At the level of Manchester, 0.14 primary aged pupils are generated per resident. When applied to the estimated total population yield from the Proposed Development when fully occupied, an estimated 108 primary aged pupils are generated. This is presented as a worst-case scenario, given it is highly unlikely that all residents will be new to this study area.

11.79 On this basis, the addition of 108 pupils to the primary school roll within the study area (2 mile walking distance) would result in a deficit of 64 pupil places against existing capacity. However, this will be offset by the additional capacity generated at Crown Street Primary School, once fully operational.

11.80 The pupil yield in Manchester for early years education is 0.03 pupils per resident. This generates an additional 16 early years pupils within the study area. It is likely that this level of increased demand could be accommodated by the existing provision within the local area.

11.81 It should be noted that, in assessing the magnitude of change, the application of district-wide pupil yield benchmarks will likely overestimate the number of school-aged children that a city centre development providing predominantly 1 and 2-bedroom accommodation will generate. The city centre has, and continues to, experience strong levels of population growth driven by young people drawn by central living in close proximity to Manchester's employment opportunities. This demographic cohort typically would not lead to high levels of demand for school places. Having said this, the continued attractiveness of the city centre as a place to live and work and the ongoing growth of residential numbers is expected to result in some additional demand for early years and subsequent primary school places as more residents choose to remain in the area upon starting a family.

11.82 Reflecting this, the magnitude of change with respect to primary and early years education is assessed as being minor. With the sensitivity of the receptor assessed as medium, the Proposed Development would result in a direct, long-term and minor adverse (not significant) effect.

Secondary Education

11.83 In terms of secondary aged pupils, 0.07 pupils are generated per resident at a Manchester level. When applied to the estimated total population yield from the Proposed Development when fully occupied, an estimated 40 secondary aged pupils are generated. In accordance with the analysis and commentary for early years and primary education impacts, this is presented as a worst-case scenario, given it is highly unlikely that all residents will be new to the area.

11.84 An increase of 40 pupils to the secondary school roll within the study area (3 mile walking distance) would continue to result in surplus capacity remaining above the recommended margin to maintain both operational flexibility and parental choice.

11.85 Therefore, the magnitude of change is assessed as negligible. With the sensitivity of the receptor assessed as low, the Proposed Development would give rise to a direct, long-term, and negligible (not significant) effect.

Open Space and Play Space Provision

11.86 An increase in the resident population will increase demand and usage of nearby open and green space and children's play spaces. The Proposed Development will bring forward approximately 7,750 sqft of internal amenity space (13.6 sqft/person) but external amenity space is not incorporated.

11.87 Whilst enhancing the living conditions of residents of the Proposed Development, the delivery of this amenity space does not contribute to the provision of publicly accessible outdoor space for the local population more generally. The Proposed Development will not make any contribution towards the provision of play space.

11.88 It is assessed that the magnitude of change associated with the open space, amenity space, and play space provision is minor. With the sensitivity of the receptor assessed as low, the Proposed Development would give rise to a direct, long-term, and negligible (not significant) effect.

Cumulative Effects

11.89 When considering Socio-Economics, all committed developments identified have the potential to interact with the Proposed Development. As such, all are assessed here.

11.90 Collectively, the committed developments have the potential to deliver:

- 6,000 new homes;
- 4,000 student bedspaces;
- 140,000 sqm of office floorspace;
- 12,000 sqm of retail floorspace; and
- New public realm and amenity space

11.91 The assessment of cumulative effects applies a consistent methodology to the main assessment above (i.e. Scenario 2) and addresses the scale of cumulative impact relative to the baseline position alongside the Proposed Development.

11.92 Table 11.8 addresses the cumulative effects of the Proposed Development, alongside committed developments (Scenario 3). It is assumed that any mitigation required to meet the needs arising from committed developments will be subject to negotiations for each scheme to provide adequate on- and off-site provision and/or financial contributions.

Table 11.7 Cumulative Assessment

Effect	Comment	Magnitude of Change	Assessment of Significance
Temporary Construction Employment	Whilst not quantified, it is reasonable to assume that the scale of development across the committed developments identified alongside the Proposed Development would lead to a substantial increase in the requirement for construction labour at the sub-regional level (Greater Manchester). This could generate increased demand for labour and result in higher employment opportunities within the construction sector. The RICS reports that the construction sector is continuing to improve, with expected growth in workloads and a pick-up in activity looking forwards. Given the scale of construction activity across the cumulative developments (alongside the committed baseline), in comparison with the overall level of construction activity across Greater Manchester, the magnitude of impact is assessed as moderate.	Moderate	Direct, short term, Moderate Beneficial (significant)
Employment and the Local Economy	An estimated potential c.6,640 net additional jobs that the committed baseline and cumulative developments could generate represents approximately 1.5% of the total employment at the Manchester level. This represents a minor magnitude of change.	Minor	Direct, long term, Moderate Beneficial (significant)
Local Authority Revenue	The local authority revenue generated by all committed developments cannot be accurately estimated. However, it is likely that the committed developments would contribute to a considerable uplift in public revenue to Manchester City Council through both business rates and council tax income, given the quantum of the new commercial floorspace and homes to be delivered. This is considered to represent a moderate magnitude of change.	Moderate	Direct, long term, Moderate Beneficial (significant)
Primary Healthcare Facilities	Alongside the Proposed Development, the committed developments could lead to an increase in population of approximately 14,000. Assuming that all residents are new to the area and not registered at local GP practices, in a worst-case scenario, this would lead to an increase in the number	Negligible	Direct, long term, Negligible (not significant)

	of registered patients per FTE GP of approximately 18%. GP services are operating above benchmark rates, but continue to permit new patient registrations. A new facility is also opening to increase supply. Should the need for patient spaces exceed supply, this will be met through NHS funding of additional GP provision. On this basis, the magnitude of change reflects the impact of the Proposed Development in isolation and is therefore negligible.		
Primary and Early Years Education	In addition to the Proposed Development, applying relevant pupil yields to the estimated additional population increase, the committed developments could contribute to approximately 2,000 primary school age children and 420 early years children. These represent extreme worst cases and, when considering the type of residential development coming forward in the local area, the demand for early years and primary education facilities is not expected to be high. It will be for Manchester City Council and the Local Education Authority to monitor cumulative need versus supply as pipeline developments are delivered. For the purposes of this assessment, it has been assumed that each residential development will mitigate its own impacts via provision of financial contributions, subject to a demonstrable need and financial viability. On this basis, the magnitude of the change reflects the impact of the Proposed Development in isolation and is therefore negligible.	Negligible	Direct, long term, Negligible (not significant)

Secondary Education	In addition to the Proposed Development, applying the relevant pupil yields to the estimated population increase, the committed developments could lead to a further circa. 1,000 secondary school age children. This represents an extreme worst case and, when considering the type of residential development coming forward in the local area, the demand for secondary education facilities is not expected to be high. It will be for Manchester City Council and the Local Education Authority to monitor cumulative need versus supply as pipeline developments are delivered. For the purposes of this assessment, it has been assumed that each residential development will mitigate its own impacts via provision of financial contributions, subject to a demonstrable need and financial viability. On this basis, the magnitude of the change reflects the impact of the Proposed Development in isolation and is therefore negligible.	Negligible	Direct, long term, Negligible (not significant)
Open/Amenity Space and Play Space	The extent of potential additional public realm and amenity space provision arising from the committed developments is not quantified. However, most, if not all, developments will include a provision of internal amenity space and some will deliver external amenity space. In some cases, new areas of public realm will be delivered, that will enhance the quality of, and connectivity between, public spaces in the area. For the purposes of this assessment, it is assumed that each residential development will provide amenity space to meet the needs of its own residents. The extent to which play space is delivered within committed developments is not assessed.	Minor	Direct, long term Negligible (not significant)

	On this basis, the magnitude of change reflects the impact of the Proposed Development in isolation and is therefore, minor.	

Mitigation Measures

Construction Phase

11.93 No significant adverse effects are identified during the construction phase.

Operational Phase

11.94 No significant adverse effects are identified during the operational phase.

Residual Effects

Construction Phase

Table 11.8 Construction Phase Residual Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Change in employment during the construction stage	Individuals seeking construction employment	N/A	N/A	Direct, temporary (short term), Minor Beneficial (not significant)
Change in economic performance (GVA)	The local economy	N/A	N/A	Direct, temporary (short term), Minor Beneficial (not significant)

Operational Phase

Table 11.9 Operational Phase Residual Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Change in direct operational employment and change in economic performance (GVA and spend)	Individuals seeking employment and the local economy	N/A	N/A	Direct, long term, Negligible (not significant)
Change in annual fiscal contributions in the form of business rates and	Manchester City Council total business rates and council tax	N/A	N/A	Direct, long term, Minor Beneficial (not significant)

council tax contributions	revenue and GMCA business rates precept revenue			
Change in demand for healthcare facilities (GP services and dentists) resulting from the uplift in population	Primary healthcare facilities	N/A	N/A	Direct, long term, Negligible (not significant)
Change in demand for early years and primary school places resulting from the uplift in population	Primary education and early years facilities	N/A	N/A	Direct, long term, Minor Adverse (not significant)
Change in demand for secondary school places resulting from the uplift in population	Secondary education facilities	N/A	N/A	Direct, long term, Negligible (not significant)
Change in demand for the use of existing open space and amenity space and children's play space within close proximity to the Site.	Users of open/amenity space and children's play space	N/A	N/A	Direct, long term, Negligible (not significant)

Monitoring

11.95 No monitoring is required during the operational phase.

Reference List

11.96 This ES Chapter has been prepared in reference to the following:

- Department for Education (2022), Pupil Yield Data Dashboard
- Department for Education (2023). Securing Developer Contributions for Education
- Fields in Trust (2023), Green Space Index
- GOV.uk (2024), Get Information about Schools
- GOV.uk (2024), School capacity, Academic year 2022/23 - Explore education statistics
- HCA (2014), Additionality Guide Fourth Edition
- Healthy Urban Development Unit: https://www.healthyurbandevelopment.nhs.uk/our-services/delivering-healthy-urban-development/hudu-model/

- 'Investing In Success' Manchester Economic Strategy (2023)
- LandInsight (2024)
- Manchester City Council (2024), Census 2021 Microsoft Power BI
- Manchester City Council (2022) Manchester Housing Strategy
- Manchester City Council (2024), Our budget 2024/25
- Manchester City Council (2024), The demand for secondary school places
- National Health Service (October 2023) General Practice Workforce Survey
- National Planning Policy Framework (2023)
- NHS (2024), Find a GP
- NHS (2024), Find a dentist
- Nomis (2021), Annual Population Survey
- Nomis (2023), Business Register and Employment Survey
- Nomis (2021), Census 2021, Unemployment
- Nomis (2021), Census 2021, Qualifications
- ONS (2022) Business Register
- ONS (2022), Detailed household expenditure by countries and regions
- ONS (2022), Regional gross value added (balanced) by industry: all ITL regions
- ONS (2024), Retail Sales Index
- ONS (2022), Subregional productivity: labour productivity indices by local authority district
- Places for Everyone Plan, GMCA, (2023)
- RICS (2024), UK Construction Monitor, Q3 2024.

12. Solar Glare

Introduction

12.1 This Chapter of the ES has been prepared by GIA Surveyors Ltd and asseses the likely solar glare impacts of the Proposed Development upon the site and surrounding area. This Chapter also describes the methods used to assess these impacts, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce or offset any significant negative impacts and the likely residual impacts after these methods have been adopted.

12.2 This Chapter assesses the potential solar glare impact to road users and rail/tram drivers only, for sensitive locations within 500m of the Site. Potential solar glare impacts on neighbouring residential amenity are not expected to be significant and an assessment of solar glare to neighbouring buildings is not considered proportionate or necessary. Solar glare effects to occupants of neighbouring buildings are scoped out of the EIA and are not reported upon further within this Chapter.

12.3 This Chapter is accompanied by the following appendices:

- Appendix 12.1 – Solar Glare Methodology. This appendix contains a detailed summary of the assessment methodology used for the solar glare assessment.
- Appendix 12.2 – Solar Glare Assessment. This appendix contains the technical analysis for all relevant viewpoints prepared to support the solar glare assessment.

12.4 The authors of this Chapter has a Masters in Buildings Science (MBSc Dist) from Victoria University of Wellington, NZ and 9 years of UK experience in preparing solar glare for EIA developments. GIA are the largest specialist daylight and sunlight advisor in the UK, with over 30 years of specialisation and expertise, having advised on some of the largest developments within Greater Manchester and the United Kingdom.

Table 12.1: Chapter Authors and their qualifications

	Lead Author	Reviewer
Name	Krystle Stewart	
Company	GIA	
Qualifications/Accreditations relevant to technical area	MBSc (Dist)	
Does the practitioner hold any IEMA qualification?	No	
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	16	

Number of EIA's delivered to date	25

Assumptions and Limitations

12.5 Although great care is taken in identifying typical viewpoints, this does not guarantee that there are no additional sensitive locations where reflected solar glare could present a particular risk. This assessment is based on the assumption that in an urban environment moving traffic represents the biggest risk factor and so viewpoints and focus points are selected accordingly. For practical reasons the area of the assessment is limited to the area surrounding the Proposed Development. The occurrence of reflected solar glare at greater distances is not the subject of this assessment.

12.6 It is also to be noted that the hours presented reflect solar time and therefore do not take Daylight Saving Hours into account. Where times are reported between the last Sunday in March and the last Sunday in October, they would need to be adjusted forward an hour to reflect British Summer Time (BST). For example, where a reflection is recorded at 09:00-10:00 GMT in April, this would correlate to 10:00-11:00 BST.

Relevant Legislation, Policy and Guidance

12.7 There is no legislation, National or Local Planning Policy relevant to Solar Glare.

Guidance

Building Research Establishment (BRE) – Site Layout Planning for Daylight and Sunlight: A guide to good practice (2022)

12.8 The BRE Guidelines includes the following statement with regard to the potential for reflected solar glare from a new development:

"Glare or solar dazzle can occur when sunlight is reflected from a glazed façade. This can affect road users outside and the occupants of adjoining buildings. The problem can occur either when there are large areas of reflective glass or cladding on the façade, or when there are areas of glass or cladding which slope back so that high altitude sunlight can be reflected along the ground. Thus solar dazzle is only a long term problem only for some heavily glazed (or mirror clad) buildings…"

Commission Internationale de L'Eclairage (CIE) 146:2002 & CIE 147:2002 Collection on glare (2002)

12.9 The CIE 146:2002 Collection on glare states:

"Disability glare is glare that impairs vision (CIE, 1987). It is caused by scattering of light inside the eye [...]. The veiling luminance of scattered light will have a significant effect on visibility when intense light sources are present in the peripheral visual field and the contrast of objects to be seen is low."

"Disability glare is most often of importance at night when contrast sensitivity is low and there may well be one or more bright light sources near to the line of sight, such as car headlights, streetlights or floodlights. But even in daylight conditions disability glare may

be of practical significance: think of traffic lights when the sun is close to them, or the difficulty viewing paintings hanging next to windows."

Assessment Methodology and Significance Criteria

Scenarios Tested

12.10 For solar glare, the worst-case scenario is portrayed by the complete and operational Proposed Development, where all reflective facade materials have been installed and any covers, films or hoarding used during construction have been removed.

12.11 As construction progresses, and the facades of the Proposed Development are installed, the potential solar glare effects would be similar to those once the Proposed Development is complete and operational. It is therefore considered that the completed Proposed Development represents the worst-case assessment in terms of likely solar glare effects. The construction scenario has been assessed qualitatively, based on professional judgement.

12.12 A quantitative assessment has been undertaken for the operational phase only. Therefore, the following scenario has been technically assessed and is reported on in detail within this chapter of the ES:

- Scenario 2 (Baseline + Proposed Development).

12.13 For Solar Glare, the worst-case scenario is portrayed by the Proposed Development in isolation. The cumulative effects have not been considered as neighbouring Committed Developments (i.e. those with an extant/valid planning permission) can block sunlight reaching the facades of the Proposed Development and/or obscure the Proposed Development from the viewpoints to be assessed and as a result, lessen the effects. This approach is common practice.

12.14 Baseline Developments (i.e. those with an extant/valid planning permission where construction works have started) that are visible from a sensitive receptor and would in all likelihood be fully built out before commencement of the Works, are included within the surrounding context as their completed form. The following Baseline Developments have been included within the assessment:

- 1. 70 Great Bridgewater Street (Havelock) [ref: 129081/FO/2021]
- 2. Square Garden [ref: 125573/FO/2019 & 138831/FO/2023]
- 3. Plot 9a First Street [ref: 132600/FO/2021]
- 5. StayCity Deansgate [ref: 125804/FO/2019]
- 7. Deansgate South [ref: 129406/FO/2021]
- 10. Viadux Phase 1 [ref: 133998/JO/2022]

The Study Area

12.15 Sensitive receptors are considered road users at junctions and train/or tram drivers on tracks within the surrounding area. Viewpoints at road junctions and on train/or tram lines within 500 metres of the Site where the Proposed Development is visible within the driver's field of view have been identified and assessed. At distances greater than 500m from the Proposed Development, instances of solar glare would be unlikely to occur.

12.16 At each of the identified sensitive road locations, viewpoints are located at the minimum stopping distance for road users and at the driver's eye level with the focal point being a relevant traffic element, such as signals or incoming traffic. For tram and rail drivers, viewpoints are assessed where signals are visible or at representative intervals where the Proposed Development would be visible close to the direct line of sight for a substantial stretch of track.

12.17 The identified road junctions and rail/tram viewpoints assessed are considered most sensitive in relation to solar glare due to a combination of the nature of the use and proximity to the site, and therefore consideration has been given to several viewpoints at traffic junctions and rail/tram lines from which the Proposed Development will be visible. These viewpoints were identified in the scoping report and have been agreed by MCC. The locations assessed are shown in Appendix 12.2, Figure 03:

- CS - Castle Street junction with Bridgewater Viaduct;
- CSCP - Collier Street Car Park pedestrian crossing;
- BS1 - Bridgewater Street junction with Deansgate;
- WS - Watson Street junction Great Bridgewater Street;
- LMS4 - Lower Mosley Street junction with Bishopsgate;
- LMS3 - Lower Mosley Street pedestrian crossing;
- LMS2 - Lower Mosley Street junction with Great Bridgewater Street;
- WSW2 - Whitworth Street West junction with Albion Street;
- MS1 - Medlock Street Junction;
- Tram 1-3 - Southbound trams from St Peter's Square to Deansgate-Castlefield;
- Tram 4-6 - Eastbound trams from Cornbrook to Deansgate-Castlefield;
- Rail 1-2 - Westbound trains from Manchester Oxford Road Station to Deansgate Station;
- Rail 3-7 - Eastbound trains from either Trafford Park (Views 5 and 6) or Salford (View 7)

Source of Effect

12.18 The façade treatment for the Proposed Development is understood to include large areas of glazing which could reflect sunlight within a driver's field of view at sensitive locations, resulting in potential effects in terms of solar glare.

Significance Criteria

12.19 The assessment of solar glare identifies the time of the day and year that solar reflections will be visible from the assessed viewpoints, as well as their relationship to a driver's line of sight. The assessment does not however, measure the intensity of the reflection but merely the occurrence and duration.

12.20 Drivers at each of the relevant road junctions are considered the sensitive receptors, where there are multiple directions of travel potentially affected, each direction of travel at the junction is considered a separate receptor as their effect significance may differ. For train/tram tracks, the train/tram drivers on the stretch of track are considered to be the sensitive receptor. The effect significance will be determined using professional judgement taking into consideration the duration of solar reflections, location of these in relation to a driver's line of sight, type of junction

control and the probability of reflections occurring. The effect significance is given on a per location basis considering all viewpoints assessed for that location as well as any viewpoints that would not be affected by the Proposed Development.

12.21 There are no quantitative criteria within the BRE Guidelines or elsewhere regarding acceptable levels of solar glare. When assessing the overall significance of effect, the following factors could influence the nature, scale and resultant significance of effect:

- Sunlight availability probability;
- Area of façade off which reflections are visible;
- Period of time when reflections are visible;
- Angle at which reflections are visible from line of sight;
- Views of the Proposed Development being obscured for example by trees; and/or
- The time of day at which the solar reflection will occur for example during peak traffic times.

12.22 The factors in the table below will be used to ascertain the possible significance for each view and the factors listed above will then be taken into consideration to determine the overall significance for the designated viewpoint.

Table 12.2 - Criteria Used for Determining the Effect of Solar Glare

Significance Guidance	Possible Factors
Negligible	No reflections are visible or if visible all occur at angles greater than 30° from the driver's line of sight and so, as stated by the CIE, will be of "little significance".
Minor	Solar reflections are visible within 30° to 10° or between 10° to 5° of the driver's line of sight for a short period of time.
Moderate	Solar reflections are visible within 10° and 5° of the driver's line of sight occurring for a long period of time.
Major	Solar reflections are visible within 5° of a driver's line of sight.
Note - mitigating factors such as alternative and unaffected signals/traffic lights and car visor angle may result in the assignment of significance which differs from the above.	

12.23 Effects classified as Moderate or Major in scale are considered to be 'significant'. Effects classified as Minor or Negligible in scale are considered to be 'not significant'.

12.24 All viewpoints assessed for solar glare are considered to be of high sensitivity.

Baseline Conditions

12.25 The solar glare assessment is undertaken on the worst-case scenario. Solar Glare is not a comparative assessment; the fact it may occur in the baseline does not necessarily justify its occurrence as a result of the Proposed Development. Therefore, the assessment considers the effect of the Proposed Development in absolute terms.

12.26 However, it should be noted that the Proposed Development will be located on a Site where its existing state is two low-rise brick buildings with punched windows, thus there is limited opportunity for instances of solar glare from the Site to be experienced. Solar glare from surrounding buildings is not assessed.

Identification and Evaluation of Likely Significant Effects

Embedded Mitigation

12.27 Owing to the proximity of the Site to several sensitive road and tram/rail locations, as well as the highly glazed nature of the Proposed Development, a comprehensive, iterative review process was undertaken to incorporate mitigation strategies within the detailed façade design.

12.28 The iterative review process has run alongside the development of the façades from the early massing stages and has comprised of an initial massing review, whereby the massing was tested to identify which nearby junctions are most sensitive to reflections and identify any facades that would likely require strategies deployed to reduce the area and intensity of any reflections. Then as the façade design progressed, the façade strategies were reviewed to ensure the embedded solar glare mitigation reduced the risk of solar glare as much as practicable.

12.29 Numerous options were explored to break up reflections and / or lower the intensity of any reflections that occurred. This included:

- the use of solid façade elements to break up reflections; and
- use of low reflectance glazing where necessary.

12.30 Therefore, the assessments reported within this ES Chapter have been undertaken on a scheme that has been fine-tuned to address potential solar glare risks as much as possible. However, as with any tall building within a low-rise context, the Proposed Development is visible from some distance and sits within the field of view for drivers at several nearby sensitive locations. It is likely that solar reflections may be unavoidable at all locations, so the façade design has sought to limit the area of reflections and their intensity to minimise the risk of solar reflections resulting in an instance of solar glare being generated by the buildings' facades.

Construction Phase

12.31 The likely effects in relation to solar glare for the surrounding road users and train/tram drivers would vary throughout the demolition and construction works, starting from installation of the first glazed façade panels and gradually increasing as all reflective cladding is installed.

12.32 The effects during the demolition works are considered negligible. As construction works progress, and the facades of the Proposed Development are installed, the potential solar glare effects would be similar to those once the Proposed Development is complete and operational, as presented below. It is therefore considered that the completed Proposed Development represents the worst-case assessment in terms of likely solar glare effects.

12.33 As such, the overall effect in terms of solar glare would range from being temporary negligible effects during demolition, then gradually changing to post mitigation residual effects of negligible to permanent, moderate adverse and significant, once the Proposed Development is complete, as set out in the assessment of the Proposed Development scenario below.

Operational Phase

12.34 The full solar glare assessment is provided in Technical Appendix 12.2.

12.35 The assessment has been undertaken from nearby road locations which are considered sensitive in terms of solar glare. These include traffic junctions, pedestrian crossings and motorway locations.

At locations where there is more than one traffic signal from which the Proposed Development is visible, several viewpoints may be tested (noted by the reference a, b, c etc.) in order to have a better understanding of the likely impact that the Proposed Development might have upon road users' responsiveness. The number of viewpoints tested per location varies according to the number of lanes, direction of travel and number of traffic lights. This is specified in the discussion below, where appropriate.

12.36 Following a review of an extended area of investigation (approximately 500m radius from the Proposed Development), a total of nine road locations and five train/tram lines were assessed. The assessment considers the potential occurrence of solar reflections from the Proposed Development owing to its size and large areas of glazing on the façade at these locations. The duration of solar reflections as well as their proximity to a driver's line of sight have been considered within the discussion below.

12.37 The assessment has been undertaken in a worst-case scenario considering there is no cloud cover, so assuming the sun is shining for all days of the year for the full duration of daylight hours.

12.38 Of the total nine road locations and five train/tram lines, the Proposed Development is visible within one road location viewpoint, Watson Street junction Great Bridgewater Street (WS), but no reflections occur. At this location, the effect is considered to be permanent, Negligible and not significant. This location is not discussed further within the Chapter.

12.39 Four road locations have at least one viewpoint which sees the potential for solar glare within 30° of a drivers' line of sight but greater than 10°. At these five locations, the effect is considered to be permanent, Minor Adverse and not significant. These locations are listed below and are not discussed further within the Chapter:

- CS - Castle Street junction with Bridgewater Viaduct;
- BS1 - Bridgewater Street junction with Deansgate;
- LMS2 - Lower Mosley Street junction with Great Bridgewater Street;
- WSW2 - Whitworth Street West junction with Albion Street;

12.40 At the remaining four road locations and five train/tram line, reflections occur within 10° of a drivers' line of sight which require further consideration.

Collier Street Car Park pedestrian crossing (CSCP)

12.41 Two viewpoints have been assessed at this junction, CSCPa and CSCPb. Viewpoint CSCPa shows the view of drivers looking straight ahead as they approach the pedestrian crossing, whilst viewpoint CSCPb shows drivers looking at the right side traffic lights. There is an alternative traffic lights on the left side of the road.

12.42 Table 10.3 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

12.43 Reflections at viewpoint CSCPa are outside 10° of a drivers' line of sight and so this viewpoint has an initial viewpoint significance of effect of Minor.

Table 12.3 - Summary of Potential Reflections within 10° for drivers approaching Collier Street Car Park pedestrian crossing (CSCP)

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
CSCPb	Western	16:00-17:00 GMT	Mid-February to mid-April and mid-August to mid-October	From 2°	Major
	Northern	05:00-06:00 GMT	Mid-April to mid-August	From 9°	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

12.44 At this location, for the viewpoints assessed:

- Reflections occurring at the main viewpoint looking forward (CSCPa), are outside the direct line of sight and so would not impact driver visibility.
- When reflections are seen behind the right side traffic lights (viewpoint CSCPb), drivers can rely on the alterative traffic lights on the left side to respond safely at this junction.
- The reflections occurring from the northern elevation are at a glancing angle and from very small areas only just within the 10° field of view so are not considered a risk of glare.
- Solid façade elements have been distributed across the western elevation to break up reflections and lower the intensity of any reflections that do occur.
- Low reflectance glazing is proposed to the western elevation to minimize the intensity of reflections that do occur.
- The reflections occur in the late-afternoons during the mid-seasons when the solar intensity is low, therefore any reflections generated would be low intensity.
- The sun path sits within the field of view of a driver at this location. Once implemented the Proposed Development will partially obscure the direct view of the sun in the mornings. Any reflections visible from the Proposed Development would be significantly less intense than a direct view of the sun, as is currently experienced at this location. A large portion of the sun's path would remain visible at this junction with a greater intensity than the reflections that would be generated from the Proposed Development.
- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 10%-40%, with the portion within 5° of a drivers direct line of sight have a probability of just 10-20%.
- This location is situated on a road that feeds a c.120 vehicle short-term car park so is considered to have low traffic volume and only a very small number of cars could be impacted by reflections at this location for the short duration they could occur.

12.45 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 12.3) and the factors outlined above (para 12.21), the overall effect in terms of solar glare to drivers at the Collier Street car park's pedestrian crossing is considered to be permanent, Minor to Moderate Adverse and significant. Given the dynamic nature of traffic movement, the potential effects as reported would only occur momentarily when looking precisely at the affected traffic

lights, 12 metres from the junction and between just two hours of the day, on sunny days for just four months of the year.

Lower Mosley Street junction with Bishopsgate (LMS4)

12.46 Two viewpoints have been assessed at this junction, LMS4a and LMS4b. Viewpoint LMS4a shows the view of drivers looking straight ahead as they approach the junction, whilst viewpoint LMS4b shows drivers looking at the right side traffic lights. There is an alternative traffic lights on the left side of the road.

12.47 Table 12.4 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

12.48 Reflections at viewpoint LMS4a are outside 10° of a drivers' line of sight and so this viewpoint has an initial viewpoint significance of effect of Minor.

Table 12.4 - Summary of Potential Reflections within 10° for drivers at the Lower Mosley Street junction with Bishopsgate (LMS4)

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
LMS4b	Eastern	09:00-10:00 GMT	Mid-January to mid-February and mid-October to mid-November	From 8°	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

12.49 At this location, for the viewpoints assessed:

- Reflections occurring at the main viewpoint looking forward (LMS4a), are well outside the direct line of sight and so would not impact driver visibility.
- When reflections are seen behind the right side traffic lights (viewpoint LMS4b), drivers can rely on the alterative traffic lights on the left side to respond safely at this junction.
- The reflections occurring from the eastern elevation are at a glancing angle and from a very small area within the 10° field of view.
- Solid façade elements have been distributed across the eastern elevation to break up reflections and lower the intensity of any reflections that do occur.
- Low reflectance glazing is proposed to the eastern elevation to minimize the intensity of reflections that do occur.
- The reflections occur in the mornings during the autumn/winter months when the solar intensity is low, therefore any reflections generated would be low intensity.
- The potential reflections occur above the driver's visor line, which would mitigate the effects when deployed.

- The sun path sits within the field of view of a driver at this location. Once implemented the Proposed Development will partially obscure the direct view of the sun in the afternoon. Any reflections visible from the Proposed Development would be significantly less intense than a direct view of the sun, as is currently experienced at this location. A large portion of the sun's path would remain visible at this junction with a greater intensity than the reflections that would be generated from the Proposed Development.
- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 20%.

12.50 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 10.4) and the factors outlined above (para 10.21), the overall effect in terms of solar glare to drivers at the Lower Mosley Street junction with Bishopsgate is considered to be permanent, Minor Adverse and not significant. Given the dynamic nature of traffic movement, the potential effects as reported would only occur momentarily when looking precisely at the affected traffic lights, 12 metres from the junction.

Lower Mosley Street pedestrian crossing (LMS3)

12.51 Two viewpoints have been assessed at this junction, LMS3a and LMS3b. Viewpoint LMS3a shows the view of drivers looking straight ahead as they approach the pedestrian crossing, whilst viewpoint LMS3b shows drivers looking at the right side traffic lights. There is an alternative traffic lights on the left side of the road.

12.52 Table 12.5 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

12.53 Reflections at viewpoint LMS3a are outside 10° of a drivers' line of sight and so this viewpoint has an initial viewpoint significance of effect of Minor.

Table 12.5 - Summary of Potential Reflections within 10° for drivers approaching the Lower Mosley Street pedestrian crossing (LMS3)

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
LMS3b	Eastern	09:00-10:00 GMT	Mid-January to mid-March and mid-September to mid-November	From 7°	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

12.54 At this location, for the viewpoints assessed:

- Reflections occurring at the main viewpoint looking forward (LMS3a), are well outside the direct line of sight and so would not impact driver visibility.

- When reflections are seen behind the right side traffic lights (viewpoint LMS3b), drivers can rely on the alterative traffic lights on the left side to respond safely at this junction.
- The reflections occurring from the eastern elevation are at a glancing angle and from a very small area within the 10° field of view.
- Solid façade elements have been distributed across the eastern elevation to break up reflections and lower the intensity of any reflections that do occur.
- Low reflectance glazing is proposed to the eastern elevation to minimize the intensity of reflections that do occur.
- The reflections occur in the mornings during the autumn/winter months when the solar intensity is low, therefore any reflections generated would be low intensity.
- The potential reflections occur above the driver's visor line, which would mitigate the effects when deployed.
- The sun path sits within the field of view of a driver at this location. Once implemented the Proposed Development will partially obscure the direct view of the sun in the afternoon. Any reflections visible from the Proposed Development would be significantly less intense than a direct view of the sun, as is currently experienced at this location. A large portion of the sun's path would remain visible at this junction with a greater intensity than the reflections that would be generated from the Proposed Development.
- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 20%.

12.55 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 10.5) and the factors outlined above (para 10.21), the overall effect in terms of solar glare to drivers at the Lower Mosley Street pedestrian crossing is considered to be permanent, Minor Adverse and not significant. Given the dynamic nature of traffic movement, the potential effects as reported would only occur momentarily when looking precisely at the affected traffic lights, 12 metres from the junction.

Medlock Street Junction (MS1)

12.56 One viewpoint has been assessed at this location, MS1. This viewpoint shows the view of drivers in the left lane looking at the left side traffic lights. There is an alternative traffic lights on the right side of the road that may be relied upon by drivers and another on the other side of the junction which is primarily for use by stationary vehicles.

12.57 Table 12.6 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view; where they would occur within the field of view of drivers; from which element of the Proposed Development the reflections could occur; and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

Table 12.6 - Summary of Potential Reflections within 10° for drivers at Medlock Street Junction (MS1)

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
MS1	Southern	13:00-15:00 GMT	Mid-January to mid-February and	5°-9°	Moderate

			mid-October to mid-November		
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

12.58 At this location, for the viewpoints assessed:

- The direct view of drivers as they approach this junction would not be impacted by reflections from the Proposed Development.
- When reflections are seen behind the left side traffic lights (viewpoint MS1), drivers can rely on the alterative traffic lights on the other side of the road and the other side of the junction to respond safely at this location.
- The Proposed Development is located c. 475m from this junction, therefore the Proposed Development is visible within only a small portion of the field of view.
- The location is on a bend; therefore, any instances of reflection would only be visible momentarily before the reflection angle changes
- Solid façade elements have been distributed across the eastern elevation to break up reflections and lower the duration and intensity of any reflections that do occur.
- The majority of potential reflections occur above the driver's visor line, which would mitigate most of the effects when deployed.
- The reflections occur outside peak traffic times.
- The reflections occur during the autumn/winter months when the solar intensity is low, therefore any reflections generated would be low intensity.
- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 20%-40%.

12.59 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 10.6) and the factors outlined above (para 10.21), the overall effect in terms of solar glare to drivers at the Medlock Street Junction location assessed is considered to be permanent, Minor Adverse and not significant. Given the dynamic nature of traffic movement, the potential effects as reported would only occur momentarily when looking precisely at the affected traffic lights, 12 metres from the junction.

Southbound trams from St Peter's Square to Deansgate-Castlefield (Tram 1-3)

12.60 Three viewpoints have been assessed along the southbound tramline with reflections occurring within 10° of a driver's direct line of sight on this track. Tram 1 is the view of drivers approaching Oxford Street, Tram 2 shows the view of tram drivers further along the track as they travel next to the Manchester Central and Tram 3 is the view of drivers as they approach the bend in the tracks coming up to the Deansgate-Castlefield stop.

12.61 Table 12.7 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

12.62 Reflections at viewpoints Tram 1 and Tram 2 are outside 10° of a drivers' line of sight and so these viewpoints have an initial viewpoint significance of effect of Minor.

Table 12.7 - Summary of Potential Reflections within 10° for drivers along the Southbound Tramline towards Deansgate-Castlefield

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
Tram 3	Eastern	09:00-10:00 GMT	Mid-November to mid-January	Very thin strip visible 6° and above the 5° visor line.	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

12.63 At this location, for the viewpoints assessed:

- The reflections within 10° occur from only one thin strip within the field of view, and within a very small area of facade, therefore the reflections would only occur for a very short period of time.
- Low reflectance glazing is proposed to the eastern elevation to minimize the intensity of reflections that do occur.
- The reflections occur in the morning during winter when the solar intensity is very low, therefore any reflections generated would be very low intensity.
- The potential reflections occur above the driver's visor line, which would mitigate the effects when deployed.
- There are not understood to be any signals visible within the portion of track where reflections occur within 10°.
- The sun path sits within the field of view of a driver at this location. Once implemented the Proposed Development will partially obscure the direct view of the sun in the afternoon. Any reflections visible from the Proposed Development would be significantly less intense than a direct view of the sun, as is currently experienced at this location. A large portion of the sun's path would remain visible at this junction with a greater intensity than the reflections that would be generated from the Proposed Development.
- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 20%.

12.64 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 10.7) and the factors outlined above (para 10.21), the overall effect in terms of solar glare to tram drivers travelling southbound towards the Deansgate-Castlefield stop is considered to be permanent, Minor Adverse and not significant. Given the dynamic nature of tram movement travelling along a set of tracks, the potential effects as reported would only occur momentarily when at each of the precise viewpoints assessed.

Eastbound trams from Cornbrook to Deansgate-Castlefield (Tram 4-6)

12.65 Three viewpoints have been assessed along the eastbound tramline with reflections occurring within 10° of a driver's direct line of sight on this track. Tram 6 is the view of drivers passing over the Bridgewater Canal, Tram 5 shows the view of tram drivers further along the track as they travel next to the Collier Street car park and Tram 4 is the view of drivers as they approach the Deansgate-Castlefield stop.

12.66 Table 12.8 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

12.67 Reflections at viewpoints Tram 4 and Tram 6 are outside 10° of a drivers' line of sight and so these viewpoints have an initial viewpoint significance of effect of Minor.

Table 12.8 - Summary of Potential Reflections within 10° for drivers on Eastbound Tramline towards Deansgate-Castlefield

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
Tram 5	Northern	05:00-06:00 GMT	Mid-March to mid-April and mid-August to mid-September	From 7°	Moderate
	Western	17:00-18:00 GMT	Mid-February to mid-March and mid-September to mid-October	Thin strip from 8°	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

12.68 At this location, for the viewpoints assessed:

- Reflections within 10° from the western facade only occur from one thin strip within the field of view, and within a very small area of facade, therefore the reflections would only occur for a very short period of time.
- Solid façade elements have been distributed across the northern elevation to break up reflections and lower the intensity of any reflections that do occur.
- The reflections occurring from the northern elevation are at a glancing angle and from very thin strips that would not be capable of reflecting the full intensity of the solar disc, therefore the reflections occurring from the northern elevation would be lower intensity.
- Low reflectance glazing is proposed to both elevations to minimize the intensity of reflections that do occur.
- The reflections occur in the early-morning or evening during the mid-seasons when the solar intensity is low, therefore any reflections generated would be low intensity.

- The majority of the potential reflections occur above the driver's visor line, which would mitigate the majority of effects when deployed.
- Viewpoint Tram 5 is located on a bend in the tracks, where the viewing angle and reflection angle is constantly changing, therefore any reflection occurring would be for an instant, before the angle changes and reflections would no longer be visible at that time.
- The sun path sits within the field of view of a driver at this location. Once implemented the Proposed Development will partially obscure the direct view of the sun in the afternoon. Any reflections visible from the Proposed Development would be significantly less intense than a direct view of the sun, as is currently experienced at this location. A large portion of the sun's path would remain visible at this junction with a greater intensity than the reflections that would be generated from the Proposed Development.
- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 10%.

12.69 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 10.8) and the factors outlined above (para 10.21), the overall effect in terms of solar glare to tram drivers travelling eastbound towards the Deansgate-Castlefield stop is considered to be permanent, Minor to Moderate Adverse and significant. Given the dynamic nature of tram movement travelling along a set of tracks, the potential effects as reported would only occur momentarily when at each of the precise viewpoints assessed and between just one hour of the day, on sunny days for just four months of the year.

Westbound trains from Manchester Oxford Road Station to Deansgate Station (Rail 1-2)

12.70 Two viewpoints have been assessed along the westbound trainline with reflections occurring within 10° of a driver's direct line of sight on this track. Rail 1 is the view of drivers departing Manchester Oxford Road Station and Rail 2 is the view of drivers as they pass over Medlock Street approaching Deansgate Station.

12.71 Table 12.9 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

Table 12.9 - Summary of Potential Reflections within 10° for drivers on Westbound Trainline towards Deansgate Station

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
Rail 1	Eastern	06:00-07:00 GMT	Mid-March to mid-April and mid-August to mid-September	From 3°	Major
Rail 2	Southern	17:00-18:00 GMT	Mid-March to mid-April and mid-August to mid-September	From 7°	Moderate
All other reflections occur outside 10° so are considered Minor Adverse.					
*Prior to consideration of any mitigating factors outlined below.					

12.72 At this location, for the viewpoints assessed:

- Solid façade elements have been distributed across the eastern and southern elevations to break up reflections and lower the intensity of any reflections that do occur.
- The reflections occurring from the southern elevation are at a glancing angle and from very thin strips that would not be capable of reflecting the full intensity of the solar disc, therefore the reflections occurring from the northern elevation would be lower intensity.
- Low reflectance glazing is proposed to both elevations to minimize the intensity of reflections that do occur.
- The reflections occur in the early-morning or evening during mid-seasons when the solar intensity is low, therefore any reflections generated would be low intensity.
- The majority of the potential reflections occur above the driver's visor line, which would mitigate the majority of effects when deployed.
- The reflections located within 5° occur outside peak traffic times.
- The sun path sits within the field of view of a driver at this location. Once implemented the Proposed Development will partially obscure the direct view of the sun in the afternoon. Any reflections visible from the Proposed Development would be significantly less intense than a direct view of the sun, as is currently experienced at this location. A large portion of the sun's path would remain visible at this junction with a greater intensity than the reflections that would be generated from the Proposed Development.
- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 10-30%.

12.73 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 10.9) and the factors outlined above (para 10.21), the overall effect in terms of solar glare to train drivers travelling westbound towards the Deansgate Station is considered to be permanent, Moderate Adverse and significant. Given the dynamic nature of train movement travelling along a set of tracks, the potential effects as reported would only occur momentarily when at each of the precise viewpoints assessed and between just two hours of the day, on sunny days for just two months of the year.

Eastbound trains from Trafford Park (Rail 3-6)

12.74 Four viewpoints have been assessed along the eastbound trainline with reflections occurring within 10° of a driver's direct line of sight on this track. Rail 6 is the view of drivers passing over the Bridgewater Canal, Rail 5 shows the view of drivers further along the track as they travel approach the junction with southbound trains from Salford, Rail 4 shows the view of drivers as they pass over Rochdale Canal and Rail 3 is the view of drivers as they approach the end of the Deansgate Station platform.

12.75 Table 12.10 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance

of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

12.76 Reflections at viewpoints Rail 3, Rail 4 and Rail 6 are outside 10° of a drivers' line of sight and so this viewpoint has an initial viewpoint significance of effect of Minor.

Table 12.10 - Summary of Potential Reflections within 10° for drivers on Eastbound Trainline towards Deansgate Station, from Trafford Park

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
Rail 5	Northern	05:00-07:00 GMT	Mid-March to mid-April and mid-August to mid-September	From 2°	Major
	Western	17:00-18:00 GMT	Mid-February to mid-April and mid-August to mid-October	From 2°	Major
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

12.77 At this location, for the viewpoints assessed:

- Solid façade elements have been distributed across the western elevation to break up reflections and lower the intensity of any reflections that do occur.
- The reflections occurring from the northern elevation are at a glancing angle and from very thin strips that would not be capable of reflecting the full intensity of the solar disc, therefore the reflections occurring from the northern elevation would be lower intensity.
- Low reflectance glazing is proposed to both elevations to minimize the intensity of reflections that do occur.
- The reflections occur in the early morning and evening during mid-seasons when the solar intensity is low, therefore any reflections generated would be low intensity.
- Viewpoint Rail 5 is located on a bend in the tracks, where the viewing angle and reflection angle is constantly changing, therefore any reflection occurring would be for an instant, before the angle changes and reflections would no longer be visible at that time.
- The Proposed Development is located c. 480m from this junction, therefore the Proposed Development is visible within only a small portion of the field of view.
- The sun path sits within the field of view of a driver at this location. Once implemented the Proposed Development will partially obscure the direct view of the sun in the afternoon. Any reflections visible from the Proposed Development would be significantly less intense than a direct view of the sun, as is currently experienced at this location. A large portion of the sun's path would remain visible at this junction with a greater intensity than the reflections that would be generated from the Proposed Development.

- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 10-30%.

12.78 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 12.10) and the factors outlined above (para 12.21), the overall effect in terms of solar glare to tram drivers travelling eastbound towards Deansgate Station from Trafford Park is considered to be permanent, Moderate Adverse and significant. Given the dynamic nature of tram movement travelling along a set of tracks, the potential effects as reported would only occur momentarily when at each of the precise viewpoints assessed and between just three hours of the day, on sunny days for just four months of the year.

Eastbound trains from Salford (Rail 3,4,7)

12.79 Three viewpoints have been assessed along the eastbound trainline with reflections occurring within 10° of a driver's direct line of sight on this track. Rail 7 is the view of drivers as they travel alongside Castlefield Bowl, Rail 4 shows the view of drivers as they pass over Rochdale Canal and Rail 3 is the view of drivers as they approach the end of the Deansgate Station platform.

12.80 Table 12.11 provides a summary of the duration of potential reflections that could occur within a 10° drivers field of view, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 12.21.

12.81 Reflections at viewpoints Rail 3 and Rail 4 are outside 10° of a drivers' line of sight and so this viewpoint has an initial viewpoint significance of effect of Minor.

Table 12.11 - Summary of Potential Reflections within 10° for drivers on Eastbound Trainline towards Deansgate Station, from Salford

Viewpoint	Elevation	Times of day that reflections occur	Times of year that reflections occur	Location within 10° of driver's line of sight	Initial Magnitude of Effect*
Rail 7	Western	Just before 17:00-18:00 GMT	Mid-February to mid-March and mid-September to mid-October	From 7°	Moderate
	Northern	05:00-06:00 GMT	Mid-March to mid-April and mid-August to mid-September	Very thin strips from 9°	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

12.82 At this location, for the viewpoints assessed:

- Solid façade elements have been distributed across the western elevation to break up reflections and lower the intensity of any reflections that do occur.
- The reflections occurring from the northern elevation are at a glancing angle and from very thin strips that would not be capable of reflecting the full intensity of the solar disc, therefore the reflections occurring from the northern elevation would be lower intensity.

- Low reflectance glazing is proposed to both elevations to minimize the intensity of reflections that do occur.
- The reflections occur in the early morning and evening during mid-seasons when the solar intensity is low, therefore any reflections generated would be low intensity.
- The majority of potential reflections occur above the driver's visor line, which would mitigate most of the effects when deployed.
- The sun path sits within the field of view of a driver at this location. Once implemented the Proposed Development will partially obscure the direct view of the sun in the afternoon. Any reflections visible from the Proposed Development would be significantly less intense than a direct view of the sun, as is currently experienced at this location. A large portion of the sun's path would remain visible at this junction with a greater intensity than the reflections that would be generated from the Proposed Development.
- The probability of the sun shining at the times of day and year when reflections occur within 10° of a driver's line of sight is 10-30%.

12.83 Based on professional judgement, in consideration of the initial magnitude of potential effects (Table 12.8) and the factors outlined above (para 12.21), the overall effect in terms of solar glare to train drivers travelling eastbound towards Deansgate Station is considered to be permanent, Minor to Moderate Adverse and significant. Given the dynamic nature of tram movement travelling along a set of tracks, the potential effects as reported would only occur momentarily when at each of the precise viewpoints assessed and between just one hour of the day, on sunny days for just four months of the year.

Summary

12.84 Table 12.12 provides a summary of the overall solar glare effects ascribed to each assessed location following the assessment outlined above.

Table 12.12 - Summary of Overall Solar Glare Effects at Assessed Locations

Assessed Location	Assessed Location Description	Overall Solar Glare Effect	Significance
CS	Castle Street junction with Bridgewater Viaduct	Minor Adverse	Not Significant
CSCP	Collier Street Car Park pedestrian crossing	Minor-Moderate Adverse	Significant
BS1	Bridgewater Street junction with Deansgate	Minor Adverse	Not Significant
WS	Watson Street junction Great Bridgewater Street	Negligible	Not Significant
LMS4	Lower Mosley Street junction with Bishopsgate	Minor Adverse	Not Significant
LMS3	Lower Mosley Street pedestrian crossing	Minor Adverse	Not Significant
LMS2	Lower Mosley Street junction with Great Bridgewater Street	Minor Adverse	Not Significant
WSW2	Whitworth Street West junction with Albion Street	Minor Adverse	Not Significant

MS1	Medlock Street Junction	Minor Adverse	Not Significant
Tram 1-3	Southbound trams from St Peter's Square to Deansgate-Castlefield	Minor Adverse	Not Significant
Tram 4-6	Eastbound trams from Cornbrook to Deansgate-Castlefield	Minor-Moderate Adverse	Significant
Rail 1-2	Westbound trains from Manchester Oxford Road Station to Deansgate Station	Moderate Adverse	Significant
Rail 3-6	Eastbound trains from Trafford Park	Moderate Adverse	Significant
Rail 3,4 & 7	Eastbound trains from Salford	Minor-Moderate Adverse	Significant

Mitigation Measures

Construction Phase

12.85 It is not necessary to include temporary mitigation measures during the construction phase. All mitigation embedded within the design of the facades and mitigation measures recommended for the Operational Phase would apply to the construction phase also.

Operational Phase

12.86 As detailed in para 12.29 of this Chapter, the design has evolved with solar glare effects in mind through the inclusion of solid façade elements to break up potential reflections. As such, potential effects have been mitigated by design to be lower intensity, reducing the potential for the reflections to result in an occurrence of solar glare.

12.87 Permanent, significant adverse effects are predicted to occur for a driver at one road location and four tram/rail line. Given the location of the Site and scale of the development, potential for reflections from the Proposed Development are unavoidable. It should be noted that the assessment considers a scenario whereby the sun shines on every day of the year to consider all potential circumstances in which reflections will occur (i.e. 'worst case'). According to the sunlight availability protractor, based on UK weather data, the sunshine probability will be significantly reduced and therefore the likelihood of the instances of reflections are reduced accordingly. The probability of the sun shining during the times of the year when significant potential reflections are expected to occur ranges from 10% to 30%.

12.88 Furthermore, the assessment does not include the sun itself within any viewpoints which would also cause very intense glare to drivers at many of the affected viewpoints. For the majority of viewpoints, the sun would be directly visible at other times of the day if the Proposed Development were not present as seen in the solar glare assessment in Appendix 12.2. In comparison, the reflections from the Proposed Development would appear less intense and would not cause significantly worse effects when compared with a direct view of the sun.

12.89 The assessment has been based on a worst-case scenario that assumes highly reflective glazing. Through the evolution of the façade design, the design team have allowed for the potential for low-reflectivity glazing to be used in specific areas where high-intensity reflections may occur. It is

recommended that low-reflectance glazing is specified on the following facades, subject to further detailed testing in due course. The further detailed testing would establish the appropriate Visible Light Reflectance (VLR) of glazing to be specified in order to mitigate the significant effects as much as is practically possible. Low VLR glazing is recommended for the following areas of façade as is to be determined by further detailed testing:

- Northern Elevation - full height;
- Eastern Elevation - full height;
- Southern Elevation - up to Level 20; and
- Western Elevation - full height.

12.90 Implementing VLR glazing in the areas identified would minimise the potential for glare and the significant effects that have been reported. The impact at two locations, where all reflections occur outside the most sensitive 5° would be reduced to Minor Adverse and not significant through the use of appropriate low VLR glazing. The other three locations have reflections that occur within 5° of a driver's line of sight and would remain significant but the potential for the reflections to be considered an instance of glare are reduced.

12.91 Due to the design of the facades already including extensive mitigation and the effectiveness of low VLR glazing at minimising the potential for an instance of solar glare occurring, there are no further façade design mitigation measures proposed.

12.92 Significant residual effects would remain at one road location and two train tracks. Regarding the road location, CSCP, given the dynamic nature of traffic movement, the potential effects as reported would only occur momentarily when looking precisely at the affected traffic light, 12 metres from the junction and between just two hours of the day, on sunny days for just four months of the year. Given the momentary nature of the reflections, the low traffic volume at this location and speed vehicles would be travelling at, the effects are not considered to present a safety concern.

12.93 Regarding the two train tracks where significant effects are reported, given the dynamic nature of train movement travelling along a set of tracks, the potential effects as reported would only occur momentarily when at each of the precise viewpoints assessed (Rail 1, 2 and 5) and for a short duration of the day and year. Given the momentary nature of the reflections and the inclusion of low VLR glazing that will ensure the reflections are low intensity, the effects are not considered to present a safety concern.

Residual Effects

Construction Phase

12.94 The likely effects in relation to solar glare for the surrounding road users and train/tram drivers would vary throughout the demolition and construction works, starting from installation of the first glazed façade panels and gradually increasing as all reflective cladding is installed. Once the glazed façade elements have been installed, the potential solar glare effects would be similar to those once the Proposed Development is complete and operational therefore the overall effect in terms of solar glare would range from being temporary negligible effects during demolition, then gradually changing to post mitigation residual effects of negligible to permanent, moderate adverse and significant, once the Proposed Development is complete.

Operational Phase

12.95 The likely significant effects of solar glare from the Proposed Development described above are considered a worst-case scenario. All solar glare effects are considered moderate to high sensitivity depending on the whether it is a controlled junction or not, and the effects are permanent and long term, therefore the residual effects are the same as during the operational stage.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Negligible or Minor adverse and not significant effects on Solar Glare	Road users at nearby road junctions	Embedded in the design, no further mitigation needed.	N/A	Negligible or Minor adverse and not significant effects on Solar Glare
	Train/Tram Drivers on nearby tracks			
Minor to Moderate adverse and significant effects on Solar Glare	Road users at Collier Street Car Park pedestrian crossing (CSCP)	Para 12.89: Proposed Glazing Specifications should be low reflectance to areas of elevations specified, as required by further detailed testing.	Planning Condition	Minor to moderate adverse and significant effects on Solar Glare
	Tram Drivers travelling Eastbound (Tram 4-6)			Minor adverse and not significant effects on Solar Glare
	Train Drivers travelling Eastbound (Rail 3,4,7)			Minor adverse and not significant effects on Solar Glare
Moderate adverse and significant effects on Solar Glare	Train Drivers travelling Westbound (Rail 1-2)			Moderate adverse and significant effects on Solar Glare
	Train Drivers travelling Eastbound (Rail 3-6)			Moderate adverse and significant effects on Solar Glare

Monitoring

12.96 None required.

Reference List

12.97 This ES Chapter has been prepared in reference to the following:

Building Research Establishment (BRE) (2022). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice, Third Edition.

Commission Internationale De L'Eclairage (CIE), CIE 146:2002 & CIE 147:2002 - Collection on Glare, CIE, 2002.

13. Townscape & Visual Impact

Introduction

13.1 This Chapter of the ES has been prepared by Layer.studio and assesses the likely townscape and visual impacts of The Proposed Development upon The Site and surrounding area. This Chapter also describes the methods used to assess these impacts, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce or offset any significant negative impacts and the likely residual impacts after these methods have been adopted.

13.2 This Chapter is accompanied by the following appendices:

- Appendix 13.1 Methodology and Criteria Tables
- Appendix 13.2 Visual Baseline and Assessment
- Appendix 13.3 Townscape Baseline and Assessment
- Appendix 13.4 Visualisation Methodology

13.3 The authors of this Chapter have the following qualifications and experience.

Table 13.1 Technical Competence in Townscape and Visual Impact

	Lead Author	Reviewer
Name	Cath Lester	Simon Tugby
Company	Layer.studio	Layer.studio
Qualifications/Accreditations relevant to technical area	Member of the Landscape Institute	Member of the Landscape Institute
Does the practitioner hold any IEMA qualification?	No	No
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	20+ years	20+ years
Number of EIA's delivered to date	30+ TVIA/LVIAs, of which circa 5% were as part of an EIA.	10+

Assumptions and Limitations

13.4 Viewpoint visualisations are verified and generated using a robust methodology (Appendix 13.4) but photos are taken from publicly accessible locations.

13.5 Viewpoints are representative. They have been selected to represent the experience of different types of visual receptor as documenting every viewpoint in a built-up urban area is unfeasible.

13.6 Long term refurbishment of the Town Hall and Albert Square means that viewpoint 10 includes temporary hoarding and construction infrastructure in the foreground.

13.7 Photography is taken in late summer/early autumn when trees are still in leaf. The assessment commentary therefore describes how views may change when vegetation loses its foliage during winter.

13.8 As noted in the "Guidance" section below, the assessment follows industry best practice guidance. Where subjective judgments are required, they are discussed between the author and other qualified professionals to cross check approach and outcome. This prevents working in isolation and makes for well-considered, robust reporting.

Relevant Legislation, Policy and Guidance

Legislation

13.9 The European Landscape Convention provides a foundation for closer co-operation on landscape issues across Europe and was ratified in the UK on the 21st November 2006, and became binding on 1st March 2007. The convention identifies the need to recognise landscape in law; to develop and promote landscape policies dedicated to the protection, management and creation of landscapes; and to establish procedures for the participation of the general public and other stakeholders in the evolution and implementation of landscape policies. It also encourages the integration of landscape into all relevant areas of policy, including cultural, economic and social policies.

13.10 The ELC defines landscape as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’. It recognises that landscape has important cultural, ecological, environmental and social dimensions and is a key element of achieving sustainable development. In paragraph 2.5 GLVIA3 notes that the definition above applies to “the landscape of villages, towns and cities (townscapes)”.

Policy

European

The European Landscape Convention

13.11 The European Landscape Convention (ELC 2000) provides a foundation for closer co-operation on landscape issues across Europe which was ratified in the UK on the 21 November 2006, and became binding on 1 March 2007. The ELC is a convention of the Council of Europe and not the European Union (EU) which means Brexit does not affect the status of this convention and as of 31 January 2020, the UK remains a signatory. The convention identifies the need to recognise landscape in law, to develop and promote landscape policies dedicated to the protection, management and creation of landscapes, and to establish procedures for the participation of the general public and other stakeholders in the evolution and implementation of landscape policies. It

also encourages the integration of landscape into all relevant areas of policy, including cultural, economic and social policies.

13.12 The ELC 2000 defines landscape as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and /or human factors'. In the context of this document, the use of the word 'landscape' is more appropriately termed 'townscape' though the constituent factors remain consistent. The Landscape Institute fully supports the spirit and intent of the ELC 2000 and whilst it is not a directive of the European Union – rather it is a Convention of the Council of Europe – the Landscape Institute regularly highlights to government, the continued need to ensure compliance with the ELC 2000.

National

National Planning Policy Framework (2024)

13.13 The National Planning Policy Framework (2024) (subsequently referred to as the Framework) replaces the Framework of 2023 and 2019. It sets out the Government's planning policies for England and how these should be applied. In ensuring that the planning system contributes to achieving sustainable development para.9 of the Framework states that 'Planning policies and decisions should play an active role in guiding development towards sustainable solutions but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area'.

13.14 Under the Section 3 Plan Making, it is says that 'Strategic Policies should set out an overall strategy for the pattern, scale and design quality of places and make provision for' and in para.20(d) 'conservation and enhancement of the natural, built and historic environment, including landscapes and green infrastructure and planning measures to address climate change mitigation and adaption'.

13.15 Section 8 Promoting healthy and safe communities, refers to the needs for 'healthy, inclusive and safe places' referring to 'accessible green infrastructure...and layouts that encourage walking and cycling' in para.96(c). Under Section 9 Promoting sustainable transport, para. 109(e) reaffirms that *'opportunities to promote walking, cycling and public transport use are identified and pursued'* and under 109(b) that '*patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places'*.

13.16 Section 11 Making effective use of land states in para.123 that 'Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously developed or 'brownfield' land'. In para.124a it states that planning policies and decisions should 'encourage multiple benefits from both urban and rural land, including through mixed use schemes and taking opportunities to achieve net environmental gains…'.

13.17 Section 12 Achieving well-designed places, para.131 states that *'The creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities'*. Para.134 states design guides and codes '*should be based on effective community engagement and reflect local aspirations for the development of their area, taking into account the guidance contained within the National Design Guide and the National Model Design Code'*. In para. 135 '*planning policies and decisions should ensure that developments a) function well and add to the overall quality of the area…' b) 'are visually attractive as a result of good architecture, layout*

and appropriate and effective landscaping', c) 'are sympathetic to local character and history, including the surrounding built environment and landscape setting…' and d) 'establish or maintain a strong sense of place, using the arrangement of streets, spaces, building types and materials create attractive, welcoming and distinctive places to live, work and visit'.

13.18 In para. 136 specific reference is made to trees stating that '*Trees make an important contribution to the character and quality of urban environments and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined' [unless, in specific cases, there are clear, justifiable and compelling reasons why this would not be appropriate] that opportunities are taken to incorporate trees elsewhere in developments…and that existing trees are retained wherever possible'.*

13.19 Section 15 Conserving and enhancing the natural environment states in para.187 that Planning policies and decisions should contribute to and enhance the natural and local environment including under para. 187 (d) '*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;' and f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate'*. In para. 198 it is stated that planning policies and decisions should also ensure that '*new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or wider areas to impacts that could arise from the development'.* In addition, para 198(c) says that policies and decisions should '*limit the impact of light pollution from artificial light on local amenity…'*

13.20 Within Section 16 Conserving and enhancing the historic environment under the heading of 'Considering potential impacts', para.213 states '*Any harm to, or loss of the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification'*.

National Planning Practice Guidance

13.21 Planning Practice Guidance (PPG) is provided by the Government under a number of categories including Design, Historic Environment, Light Pollution, Natural Environment and EIA. The National Design Guide sets out 10 characteristics of good design namely: context; identity; built form; movement; nature; public spaces; uses; homes and building; resources; and lifespan.

Local

13.22 Local planning policies have been reviewed to understand the context for development and establish the beeline townscape. An understanding of policy requirements supports the iterative design process and can feed into the evolution of strategies for mitigation, if required. Extracts from key documents are listed below along with a reflection on the relevance to this application.

Places for Everyone (PfE) (2024)

13.23 Places for Everyone is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. It has been published by the GMCA on behalf of the nine districts. Policies of relevance are as follows:

13.24 Policy JP-Strat2: City Centre – "The City Centre will continue to provide the primary focus for business, retail, leisure, culture and tourism activity in Greater Manchester, but the increasingly important residential role of the City Centre will be expanded. Development will generally be high density……. Improvements in the public realm, walking and cycling facilities, and green infrastructure will help to enhance the local character and environmental quality of the City Centre……."

Core Strategy (2012)

13.25 Manchester's Core Strategy was adopted on the 11 July 2012 and is the key document in the Manchester Local Plan. It was updated in March 2024, after the Places for Everyone joint development plan was adopted. It sets out the long term strategic policies for Manchester's future development and will form the framework that planning applications will be assessed against. Relevant policies are:

- CC 3 Housing
- CC 6 City Centre High Density Development.
- CC 9 Design and Heritage
- EN2 Tall Buildings
- EN3 Heritage

Guidance

13.26 The assessment has been based on key accepted methodologies for landscape/townscape character and visual impact assessment contained in Guidelines for Landscape and Visual Impact Assessment, third edition, Landscape Institute and the Institute for Environmental Management and assessment, 2013. This document is subsequently referred to as GLVIA3.

13.27 In addition, the following guidance documents have also been consulted:

- Technical Advice Note 06/19 Visual Representation of Development Proposals, The Landscape Institute
- Technical Advice Note 05/17 Townscape Character Assessment, The Landscape Institute

Assessment Methodology and Significance Criteria

Scenarios Tested

- Scenario 1: Baseline (The Site as of August 2024);
- Scenario 2: Baseline + Proposed Development;
- Scenario 3: Baseline + Proposed Development + cumulative (as presented in Section X).

The Study Area

13.28 The study area has been derived through data analysis involving:

- Review of existing townscape character studies and policy;
- Review of planning designations around The Site;

- Generation of a Zone of Theoretical Visibility (ZTV) using VUCITY software;
- Identification of transit corridors, cycling routes and public rights of way;
- Exploration into urban grain, land use and building heights.

13.29 A resulting study area of 500m measured from the centre of The Site is deemed to be appropriate for this TVIA and is shown in the appendices. This decision is based on Layer.studio's experience writing TVIAs and their knowledge of Manchester.

Source of Effect

13.30 The Proposed Development is taller and has a larger footprint than existing. This may have an impact on visual receptors (people) who observe the change as a resident, person at work or visitor to the city as a pedestrian, cyclist or motorist.

13.31 Changes to the built form and the stopping off of Rowendale Street may impact the townscape character, street network and the way people move around The Site and its vicinity.

Significance Criteria

13.32 As recognised by GLVIA3, the effects of The Proposed Development have been examined in terms of:

- Effects on the townscape: Meaning the assessment of the potential effects of development upon the physical nature and features of the townscape as well as townscape character and quality; and
- Effects on visual amenity: Examined through a selection of representative viewpoints to demonstrate the experience of different types of visual receptor.

13.33 The assessment provides a series of tables setting out the criteria and definitions used to assist in assessing the landscape and visual effects and to make the process as transparent as possible. These can be found in Appendix 13.1. Ultimately, however, the assessment relies on professional judgement and the tables and matrices utilised are a tool to assist in this process. Through experience, Layer.studio have determined that the author should not consider the effects of a proposed development in isolation based solely on their own judgement, but instead debate the extent of effects as part of an open forum with colleagues. This promotes well rounded decision making in terms of assessing the impact on townscape character and visual receptors.

13.34 The main objectives of the TVIA are to:

- Identify and describe the current townscape of the study area;
- Determine the sensitivity of the townscape and identify potential effects;
- Identify potential visual receptors to The Proposed Development;
- Evaluate the degree of change and the sensitivity to the type of changes proposed;
- Identify likely adverse or beneficial townscape and visual effects;
- Identify likely significant townscape and visual effects distinguishing between those that are temporary or permanent, short, medium or long term;

- Consider how any adverse effects may be mitigated; and
- Consider any remaining residual effects

13.35 To achieve these objectives, the assessment is undertaken in three key stages consisting of:

- A thorough desktop study covering an overview of the relevant planning policy context from European, national to local level, plus a more detailed review of the topography and surrounding features to determine the potential visibility of The Proposed Development. The establishment of baseline townscape and visual conditions including any changes likely to occur independently of The Proposed Development, as well as determining the value attached to the different resources.
- Initial desktop findings are then tested in the field to further understand the receiving townscape and to reassess the effect upon visual receptors from viewpoints.
- The assessment is then undertaken to determine the potential townscape and visual effects of The Proposed Development. The assessment considers impacts during construction and on completion, once operational. Residual effects consider the effects post completion with mitigation in place.

13.36 The TVIA has been completed as part of an iterative design process with a team of multi-disciplinary professionals. This has included the consideration of mitigation measures to avoid and reduce where possible, any adverse townscape or visual effects resulting from The Proposed Development.

13.37 A comprehensive methodology is set out within Appendix 13.1.

Baseline Conditions

13.38 This section describes receptors that could be impacted by the proposed development and should be read in conjunction with Appendix 13.2 and 13.3, where judgements on value and susceptibility are also noted.

Urban Grain (refer to Appendix 13.3, figure 13.3)

13.39 In the vicinity of The Site, urban grain reflects the alignment of the rail and canal corridors, whereby Whitworth Street and therefore buildings that front it, follow an east/west arrangement on limited plots that make the most of available space. This tight grain continues onto Little Peter Street and then begins to dissipate within the Knot Mill Masterplan area. Building footprints then increase within the nearby Great Jackson Street and First Street Framework Areas.

13.40 Directly north of The Site, Manchester Central and Great Northern Warehouse serve as notable buildings with large footprints.

Land use (refer to Appendix 13.4)

13.41 Generally, this part of the city is focused on commercial and retail use, with some hotel and residential uses with Manchester Central and Great Northern Warehouse offering more large-scale recreational/leisure facilities north of the railway. Formerly in commercial use, the two buildings on The Site are now vacant.

13.42 To the north, beyond The Site boundary, the Deansgate Locks development offers commercial/retail use within the railway arches of Deansgate Viaduct and overlooks the Bridgewater Canal. Bookended by the listed Lock Keeper's Cottage and Lock 91 in the west and Lock 90 in the east, the canal corridor hosts a number of listed buildings connected to Manchester's industrial heritage. Axis tower brings residential uses to the eastern end the locks.

13.43 To the northeast of The Site, where Whitworth Street meets Lower Mosely Street, residential use presents itself through the Viadux tower.

13.44 Immediately west of The Site, across Bugle Street is nightclub Rebellion, beyond which is Deansgate train station, the platform of which, extends eastwards alongside the southern boundary of The Site.

13.45 To the south, the railway line separates The Site from Hewitt Street, Little Peter Street and the wider Knott Mill Masterplan area, currently in mixed use for residential, commercial and retail.

Building Height (refer to Appendix 13.3, figure 13.5)

13.46 There is much variety within this part of the city and on Whitworth Street itself. High rise development over the last decade has altered Manchester's skyline meaning that the historic, low rise built form of up to circa seven storeys, is now experienced with the backdrop of towers such as Viadux (40 storey) and Axis (27 storey), thus creating a cluster of tall buildings on a key gateway into the City Centre, clustered around Deansgate transport hub.

Public realm and streetscape (refer to Appendix 13.3, figures 13.6 & 13.7)

13.47 In terms of connectivity, rail viaducts run along the southern edge of the city on an east-west axis and function as primary public transport routes for people travelling into and out of the City Centre. Deansgate tram stop and train station are located immediately north and south of The Site to the south, forming major points of arrival into the city.

13.48 With only narrow cobbled streets and limited footways, The Site does not currently offer any usable public realm where people can dwell. Permeability is however possible between Whitworth Street West and Knott Mill through The Site at Rowendale Street and adjacent to The Site along Bugle Street and Cameron Street

13.49 Whitworth Street itself has a wide, often congested, carriageway that accommodates on street parking. Although pavements are wide, they lack quality, which in proximity to public transport hubs, presents a poor impression to visitors who alight the Metrolink and train locally. With mature trees and furniture, the northern side of the street is a more attractive prospect for pedestrians but it similarly lacks quality of finish.

13.50 Larger areas of public realm where people may choose to dwell are located in the vicinity of HOME Manchester at Tony Wilson Place, to the north of Manchester Central on Windmill Street and at Castlefield.

Site Character (refer to Appendix 13.3, figure 13.2)

13.51 The Site comprises the building footprint of numbers 2 and 4 Whitworth Street West plus the adjoining pavements. The plots are separated by Rowendale Street, a cobbled highway that passes under a railway arch connecting Whitworth Street West and Hewitt Street. Bugle Street and Cameron Street flank The Site to the west and east respectively but these highways are surfaced

with macadam. Pavements along Whitworth Street West are wide and surfaced with pre cast concrete slabs and brick edging.

Visual amenity

13.52 Owing to its city centre location on a cross-city road, close to the transport hubs of Deansgate Metrolink and train stations, many people pass by The Site and experience a transient view of The Site. The proposal is also located in proximity to residential windows and a number of listed buildings and structures frequently experienced by visitors. Receptors subject to this reporting are:

- 1. St Peter's Square
- 2. Midland Hotel Lower Moseley St
- 3. Manchester Central
- 4. Briton's Protection
- 5. Whitworth Street- East
- 6. Medlock Street
- 7. Whitworth Street- West
- 8. St George's Church Chester Rd
- 9. Castlefield
- 10. Albert Square
- 11. St Ann's Square
- 12. Deansgate/Quay Street

13.53 Viewpoint locations are illustrated in Appendix 13.2, figure 13.1.

Identification and Evaluation of Likely Significant Effects

Construction Phase

13.54 Construction of The Proposed Development will include the following activities that could have an impact on townscape and visual receptors that were identified in the previous section:

- Site clearance including the demolition of buildings on 2 and 4 Whitworth Street West.
- Erection of site hoardings to The Site perimeter, either at the back of pavement to Whitworth Street West, or alongside the highway on adjoining side streets.
- Closure of Rowendale Street to pedestrians and motorists.
- Crane construction and subsequent activity of the crane.
- Construction of a tall building
- Changes to ground level public realm.
- The coming and going of construction traffic.
- Lighting to enable works to continue after dark.
- Disruption to public footway to southern side of Whitworth Street West.

13.55 Potential visual effects are outlined in Appendix 13.2 and townscape effects detailed in Appendix 13.3. The assessment is summarised in the following table:

Receptor	Value	Susceptibility	Sensitivity	Magnitude	Significance	Nature of effect
Townscape						
Urban grain	Medium	Medium	Medium	Minor	Minor/moderate	Adverse
Land use	Medium	Medium	Medium	Minor	Minor/moderate	Adverse
Building height	Medium	Medium	Medium	Minor	Minor/moderate	Adverse
Public realm & streetscape	Low	Low	Low	Minor	Minor	Adverse
Site character	Low	Low	Low	Minor	Minor	Adverse
Viewpoints						
1) St Peter's Square	High	High	High	Negligible	Minor/moderate	Neutral
2) Midland Hotel, Lower Mosely Street	Medium	Medium	Medium	Minor	Minor/moderate	Neutral
3) Manchester Central	Medium	Medium	Medium	Minor	Minor/moderate	Neutral
4) Briton's Protection	Medium	Medium	Medium	Negligible	Minor	Neutral
5) Whitworth Street East	Low	Low	Low	Moderate	Minor/moderate	Adverse
6) Medlock Street	Low	Low	Low	Moderate	Minor/moderate	Adverse
7) Whitworth Street West (daytime and nighttime view)	Medium	Medium	Medium	High	Moderate/major	Adverse
8) Church of St George, Chester Road	Low	Medium	Low/medium	Minor	Minor	Neutral
9) Castlefield	Medium	Medium	Medium	Minor	Minor/moderate	Adverse
10) Albert Square	High	High	High	Negligible	Minor/moderate	Neutral
11) St Ann's Square	Medium	High	High	Nil	n/a	n/a

12) Deansgate/Quay Street	Medium	Medium	Medium	Minor	Minor/moderate	Neutral

13.56 Key findings are described below:

13.57 Construction phase townscape impacts range from minor - minor/moderate adverse. The majority of viewpoints experience a minor/moderate level of impact and only one viewpoint experiences a moderate/major level of impact.

13.58 Urban grain will change as existing buildings are demolished and two plots are compressed into one. Similarly, land use will quickly change from the baseline position to an active construction site. Buildings heights will fluctuate as demolition and building works proceed. Public realm and the streetscape will be disrupted while construction takes place and space is utilised to facilitate construction on what is a constrained city centre plot.

13.59 The effect on visual receptors is heavily dependent on proximity to The Site and varies from minor to moderate/major adverse. The effect on visual receptors is heavily dependent on proximity to The Site and varies from minor to moderate/major adverse. From more distant locations, demolition and early construction will not be visible as intervening buildings prevent views of activity at low level. As the building rises out of the ground, its height makes it visible from more distant viewpoints.

13.60 The viewpoint that will experience the greatest (daytime) magnitude of change is number 7 as this is located on Whitworth Street West, close to The Site and with visibility to every level of The Proposed Development. Viewpoints 5) Whitworth Street East and 6) Medlock Street will also experience views of construction once it progresses above approximately level 6 and clears existing buildings in the foreground.

Operational Phase

13.61 On completion of the construction phase and commencement of building operation, the following may have an impact on townscape and visual receptors:

- Presence of a single 44 storey tower in place of two lower rise buildings.
- New ground level public realm.
- Closure of Rowendale Street to pedestrians and motorists.
- Gated service access off Hewitt Street.

13.62 Potential visual effects are outlined in Appendix 13.2 and townscape effects detailed in Appendix 13.3. The assessment is summarised in the following table:

Receptor	Value	Susceptibility	Sensitivity	Magnitude	Significance	Nature of effect
Townscape						
Urban grain	Medium	Medium	Medium	Minor	Minor	Adverse
Land use	Medium	Medium	Medium	Minor	Minor/moderate	Beneficial
Building height	Medium	Medium	Medium	Moderate	Moderate	Neutral
Public realm & streetscape	Low	Low	Low	Minor	Minor	Beneficial
Site character	Low	Low	Low	Minor	Minor	Beneficial
Viewpoints						
1) St Peter's Square	High	High	High	Negligible	Minor/moderate	Adverse
2) Midland Hotel, Lower Mosely Street	Medium	Medium	Medium	Minor	Minor/moderate	Neutral
3) Manchester Central	Medium	Medium	Medium	Minor	Minor/moderate	Neutral
4) Briton's Protection	Medium	Medium	Medium	Negligible	Minor	Neutral
5) Whitworth Street East	Low	Low	Low	Minor	Minor/moderate	Adverse
6) Medlock Street	Low	Low	Low	Moderate	Minor/moderate	Adverse
7) Whitworth Street West	Medium	Medium	Medium	High	Moderate/major	Adverse
8) Church of St George, Chester Road	Low	Medium	Low/medium	Minor	Minor	Neutral
9) Castlefield	Medium	Medium	Medium	Minor	Minor/moderate	Adverse
10) Albert Square	High	High	High	Negligible	Minor/moderate	Neutral
11) St Ann's Square	Medium	High	High	Nil	n/a	n/a

12) Deansgate/Quay Street	Medium	Medium	Medium	Minor	Minor/moderate	Neutral

13.63 Key findings are described below:

13.64 Operational phase townscape impacts range from minor/moderate adverse to minor/moderate beneficial. The majority of viewpoints experience a minor/moderate level of impact and only one viewpoint experiences a moderate/major level of impact.

13.65 The amalgamation of two plots into one makes urban grain coarser resulting in a minor adverse significance of effect. Incorporation of a colonnade does however mean that the ground floor footprint is small than those above and reduces the significance from the construction phase. It is also noted that the new footprint, although larger than the baseline position, it remains congruous with the Petersfield area and Hewitt Street.

13.66 Following on from the temporary nature of a construction site, once operational the Site will host residential land use which is precedented elsewhere in Petersfield and is more congruous with land uses in the neighbouring areas of Castlefield and First Street.

13.67 Inside the Site boundary, Proposed Development is taller than the baseline position. Proposed Development is however located in the context of Petersfield and in proximity to other tall residential blocks. It is therefore in keeping with its surroundings and the effect is neutral.

13.68 Proposed Development creates high quality public realm with more space for pedestrians and opportunity to engage with the streetscape. Once complete, the building will present an active frontage onto adjoining streets, enhanced by new public realm with soft landscape including trees and rain gardens, feature archways and seating areas. These changes are an enhancement on the baseline position and therefore of benefit to public realm and site character.

13.69 The effect on visual receptors follows the same trend as during the construction phase in that significance of effect is heavily dependent on proximity to The Site and varies from minor to moderate/major adverse.

13.70 From more distant locations, only the upper parts of The Proposed Development will be visible. From these locations, the change is either minor due to the context of other tall buildings or, change is negligible due to the quantity of intervening buildings that screen much of Proposed Development from view.

13.71 The viewpoint that will experience the greatest magnitude of change is number 7 as this is located on Whitworth Street West, close to The Site and visibility to every level of The Proposed Development. Viewpoints 5) Whitworth Street East and 6) Medlock Street will experience a moderate magnitude of change as much of the new building is visible above existing buildings in the foreground.

Cumulative Effects

13.72 A total of 21 committed developments, within a radius of 500m from The Site have been subject to the cumulative visual assessment, which is included in Appendix 13.2. More specifically, committed developments are listed below and illustrated on page 4 of Appendix 13.4.

- 1) 70 Great Bridgewater Street (Havelock) 129081/FO/2021
- 2) Square Gardens 125573/FO/2019 & 138831/FO/2023
- 3) Plot 9a First Street 132600/FO/2021
- 4) St. Michaels 114664/FO/2016 & 137873/JO/2023 (Amendment App)
- 5) StayCity Deansgate 125804/FO/2019
- 6) Plot 10b First Street 136170/FO/2023
- 7) Deansgate South 129406/FO/2021
- 8) Barclay House 118033/P3OPA/2017&1 28804/FO/2020
- 9) Contour 132199/FO/2021
- 10) Viadux Phase 1 133998/JO/2022
- 11) Vision Tower 111003/FO/2016/C1
- 12) Bridgewater House Great Jackson Street 134694/FO/2022
- 13) 1 City Road 128002/FO/2020
- 14) Land Bounded by Deansgate, Great Bridgewater Street, Watson Street & Peter Street 135565/FO/2022
- 15) Land Bounded by Trumpet Street, Albion Street & Great Bridgewater Street 133172/FO/2022 & 133176/FO/2022
- 16) One Medlock Street 135419/FO/2022 & CDN/24/0491
- 17) First Street Plot 10a 136043/FO/2023
- 18) The Green 137226/FO/2023
- 19) The Lighthouse 137227/FO/2023
- 20) Viadux Phase 2 139715/FO/2024
- 21) Hotspur House 138805/FO/2023
- 22) Park Place 129273/FO/2021

13.73 Committed development numbers 1, 5, 8, 10, 11, 14 and 20 are located in Petersfield, the same area as Proposed Development. Based on proposed height, other notable committed developments are located in the Great Jackson Street and Castlefield areas.

13.74 The visual cumulative assessment identifies in combination effects for viewpoints 2, 3, 4, 6 and 12.

13.75 Viewpoints 2 and 3 are located on Lower Mosley Street, looking south west towards The Site and beyond to the Great Jackson Street area. Consequently, the committed development proposed in this area is visible in the distance and forms a backdrop of tall buildings in these views. Considered cumulatively, these developments have a greater magnitude of change and are therefore significance also increases. Tall residential buildings are however congruent with the strategic

regeneration framework. It is also noted that much of The Proposed Development will be screened from view if committed development in the Petersfield area is constructed first.

13.76 In combination effects within viewpoint 4 are significant because of committed Development 8) Viadux, being constructed in the foreground and closing the skyline gap with Axis. To the left of this, committed development 28) Apex will tower above The Briton's Protection. When combined with 5) Contour and 18) Vison, the magnitude of change increases. If constructed first, Viadux will screen views of The Proposed Development.

13.77 Viewpoint 6 will experience in combination effects as committed development 13) City Road will result in new built form filling the left side of the view.

13.78 In combination effects on viewpoint 12 result from committed development 14) Land bounded by Deansgate, Great Bridgewater Street, Watson Street and Peter Street being located central to the middle distance above the listed Former Entrance to Deansgate Goods Station. In addition, other committed development in the Great Jackson Street area increases the number of tall buildings that can be seen beyond the end of Deansgate. If constructed first, committed development 14 will screen views of The Proposed Development.

Mitigation Measures

Construction Phase

13.79 In advance of a comprehensive construction phase management plan, it is expected that the following operations and activities will be completed to minimise impact:

- Site compound to be located at back of path so that a pedestrian route along Whitworth Street West is maintained.
- Solid site hoarding will screen the workings of a construction site from view.
- Lighting will be strategically placed to minimise "spill" towards sensitive receptors
- Construction traffic will be managed to minimise disruption on adjoining streets

Operational Phase

13.80 As the project has evolved and been refined, the following considerations have been embedded into the design of the built form and external surroundings to The Proposed Development:

- Colonnade design means ground floor footprint is smaller than those above, therefore creating space for public realm and enhancements to the street scene.
- Resident's amenity space is located on the ground floor to activate frontage onto Whitworth Street West.
- The base of the Proposed Development reflects the form and colour of existing buildings, paying homage to the baseline position both in terms of height and character.
- Soft landscape will front onto Whitworth Street West, Bugle Street and Cameron Street. Enhanced pedestrian links between Whitworth Street West and Hewitt Street.
- Materials palette for the building and public realm reflect the colour and texture of the demolished 2-4 Whitworth Street West and complements materials of the listed buildings nearby.

13.80.1. For clarity, no additional mitigation is proposed beyond what is embedded into the design.

Residual Effects

13.80.2. As required by the EIA Regulations (2017), "moderate or above" are deemed to be significant and so relevant townscape and visual receptors are reported below.

Construction Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Moderate/major adverse	Viewpoint 7) Whitworth Street West	none	n/a	Moderate/major adverse. Significant. Temporary

Operational Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/permanent)
Moderate/major adverse	Viewpoint 7) Whitworth Street West	none	n/a	Moderate/major adverse. Significant. Permanent
Moderate neutral	Building height	Architectural design and materials palette reflects local vernacular	Responsibility of building contractor	Moderate adverse. Significant. Permanent

Monitoring

13.81 Not required

Reference List

13.82 This ES Chapter has been prepared in reference to the following:

Guidelines for Landscape and Visual Impact Assessment, third edition, Landscape Institute and the Institute for Environmental Management and assessment, 2013.

Technical Advice Note 06/19 Visual Representation of Development Proposals, The Landscape Institute.

13.82.1. Technical Advice Note 05/17 Townscape Character Assessment, The Landscape Institute.

14. Wind Microclimate

Introduction

14.1 This Chapter of the ES has been prepared by GIA and assesses Wind Microclimate.

14.2 This Chapter is accompanied by the following appendices:

- Appendix 14.1 - Detailed Wind Microclimate Methodology (CFD and Climate Analysis)

Table 14.1: Technical Competence in Wind Microclimate

	Lead Author	Reviewer
Name	Jon Winchester	Chris Harley
Company	GIA	GIA
Qualifications/Accreditations relevant to technical area	BSc (Hons), MSc, PhD	MEng, Phd
Does the practitioner hold any IEMA qualification?	No	`No
Company hold IEMA QMark?	No	
Years technical experience (in technical area)	12	11
Number of EIA's delivered to date	39	22

Assumptions and Limitations

14.3 The accuracy of the results is dependent upon the accuracy of the architectural CAD used to construct the model.

14.4 There is an inherent assumption that on-site wind speeds will scale linearly with the measured wind speeds at the airport (Manchester International).

14.5 It is assumed that, during the construction process, wind conditions will gradually change from the Baseline Conditions to the conditions for the Completed Proposed Development.

14.6 It is assumed that on-site activity during construction will be able to withstand a higher category of pedestrian comfort level that for the Completed Proposed Development.

Relevant Legislation, Policy and Guidance

Policy

National Planning Policy

National Planning Policy Framework (2024)

14.7 The National Planning Policy Framework (NPFF) was revised December 2024 by the Department for Levelling Up, Housing & Communities (DLUHC). The relevant paragraphs are as follows:

14.8 Paragraph 135 of the National Planning Policy Framework states that:

"Planning policies and decisions should ensure that developments:

a) will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development;
b) are visually attractive as a result of good architecture, layout and appropriate and effective landscaping;
c) are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities);
d) establish or maintain a strong sense of place, using the arrangement of streets, spaces, building types and materials to create attractive, welcoming and distinctive places to live, work and visit;
e) optimise the potential of the site to accommodate and sustain an appropriate amount and mix of development (including green and other public space) and support local facilities and transport networks; and
f) create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion and resilience."

14.9 There is no specific planning policy guidance dealing with microclimate in terms of pedestrian comfort set out in the draft revised NPPF (July 2024).

National Planning Practice Guidance (2021)

14.10 The NPPG identifies the potential for tall and large buildings to affect the wind microclimate. The National Design Guide (2021) states in Paragraph 71 that: "*Proposals for tall buildings (and other buildings with a significantly larger scale or bulk than their surroundings) require special consideration. This includes their […] environmental impacts, such as […] wind. These need to be resolved satisfactorily"*

Local Planning Policy

Greater Manchester Combined Authority Joint Development Plan "Places for Everyone" (2021)

14.11 Policy JP-P-1 "Sustainable Places" states that "*all development […] should be consistent with: […] comfortable and inviting, with indoor and outdoor environments: […] addressing microclimate issues such as sunlight, indoor air quality, overheating, shade, wind and shelter".*

Manchester Core Strategy (2012 – 2027)

14.12 Policy EN2 – Tall Buildings – States that, by their very size, tall buildings can have a significant impact on the local environment and its micro-climate. It is therefore expected that this impact be modelled and that submissions for tall buildings also include appropriate measures to create an attractive, pedestrian friendly local environment.

Guidance

Guidance on Tall Buildings, 2007

14.13 English Heritage and the Commission for Architecture and the Built Environment (CABE) produced a revised and updated version of their joint guidance on tall buildings . The final version was released in July 2007 and in section Criteria for evaluation, state that:

14.14 "… planning permission for tall buildings should ensure therefore that the following criteria are fully addressed: […] The effect on the local environment, including microclimate".

Historic England Advice Note 4: Tall Buildings, 2015

14.15 The Historic England Advice Note 4: Tall Buildings (2015) states in Section 4.7:

14.16 "Planning applications for tall buildings are likely to require an environmental impact assessment (EIA), which would be expected to address matters in respect of both the proposed building and its cumulative impact, including: […] e. Other relevant environmental issues, particularly sustainability and environmental performance, e.g. the street level wind environment."

The Lawson Comfort Criteria

14.17 The Lawson Comfort Criteria ('the Lawson Criteria') [3] has been used to assess pedestrian comfort within the application site and surrounding area, in line with industry standards.

Assessment Methodology and Significance Criteria

Scenarios Tested

14.18 Testing was undertaken using high-resolution Computational Fluid Dynamics (CFD), using a full-scale digital model of the site and surrounding area.

14.19 The following scenarios were tested:

- Scenario 1: Existing Site (baseline scenario) with the existing surrounding buildings (including developments which have started on site);
- Scenario 2: Existing Site (future baseline scenario) with the cumulative surrounding buildings (including developments which have started on site and also developments which have not yet started on site at the time of the assessment);
- Scenario 3: Proposed Development with the existing surrounding buildings (including developments which have started on site, i.e. the existing baseline scenario plus the Proposed Development); and
- Scenario 4: Proposed Development with cumulative surrounding buildings (including developments which have started on site and also developments which have not yet started on site at the time of the assessment, i.e. the future baseline scenario plus the Proposed Development).

14.20 The "future baseline" scenario (Scenario 2) is not being directly assessed in other EIA disciplines other than wind but is included in the wind scenario to assess and provide evidence that any exceedances of the safety/comfort criteria (in the presence of cumulative schemes) are not introduced nor worsened by the introduction of the Proposed Development. i.e. they would

already exist should all other cumulative schemes be built out and are not related to the Proposed Development.

14.21 All scenarios were tested in the absence of hard or soft landscaping, to ensure conservative results. While the submitted design for the Proposed Development includes landscaping, this was not included as part of the wind microclimate testing in order to establish a "worst case" wind environment.

14.22 The following committed developments were considered to be sufficiently advanced (i.e. with a status of "under construction" "or "complete" in the appended Committed Developments table) to be considered part of the existing baseline, and were included within all scenarios:

- 70 Great Bridgewater Street (Havelock) (129081/FO/2021)
- Plot 9a First Street (132600/FO/2021)
- StayCity Deansgate (125804/FO/2019)
- Plot 10b First Street (136170/FO/2023)
- Deansgate South (129406/FO/2021)
- Barclay House (118033/P3OPA/2017&128804/FO/2020)
- Contour (132199/FO/2021)
- Viadux Phase 1 (115871/FO/2017)

14.23 The following committed developments were only included as part of the cumulative surrounds (i.e. the future baseline), for Scenarios 3 and 4.

- Vision Tower (111003/FO/2016/C1)
- Bridgewater House Great Jackson Street (133694/FO/2022)
- 1 City Road (128002/FO/2020)
- Land Bounded By Deansgate, Great Bridgewater Street, Watson Street & Peter Street (135565/FO/2022)
- Land Bounded By Trumpet Street, Albion Street & Great Bridgewater Street (133172/FO/2022 & 133176/FO/2022)
- One Medlock Street (135419/FO/2022, CDN/24/0491)
- First Street Plot 10a (136043/FO/2023)
- The Green (137226/FO/2023)
- The Lighthouse (137227/FO/2023)
- Viadux Phase 2 (139715/FO/2024)
- Hotspur House (138805/FO/2023)

14.24 It should be noted that the Viadux office development (phase 2 of 115871/FO/2017) has not been considered as part of either the existing baseline or the future baseline, as this development has been superseded by Viadux Phase 2 (139715/FO/2024).

14.25 All other committed developments were scoped out of the assessment on grounds of distance from the Site.

The Study Area

14.26 The study area for this assessment comprises 400 m radius from the centre of the application site. This is the industry standard value for the UK.

Source of Effect

14.27 The Proposed Development would have the potential to cause effects on sensitive receptors by creating unsuitable wind conditions due to a combination of downdrafts, corner accelerations and channelling between buildings.

14.28 In order to measure wind effects, 3D models of the Proposed Development, existing surroundings and nearby cumulative schemes, as appropriate, were created and tested in CFD.

14.29 CFD has been chosen as a method for this study as physical limitations on the number of probes associated with wind tunnel testing would restrict the potential coverage of the Site and surrounding area, and could cause significant wind effects to be missed. GIA's High resolution CFD is used to ensure that accurate and conservative results were obtained.

14.30 GIA's CFD methods have been extensively correlated to physical data to ensure accuracy, and also allows for a greater level of detail (such as terrain undulations and fine building details) to be captured by the model, as well as allowing the ability to test at full scale.

14.31 The testing was performed from 18 wind angles, representing all wind directions and spaced so that no individual wind angle is representative of more than 10% of annual winds. Mean wind speeds and turbulence levels (to allow the calculation of gust speeds) were measured at 1.5m above ground level and any raised areas which are accessible to pedestrians, for all wind directions.

14.32 The measured mean and gust-equivalent-mean wind speeds were combined with wind statistics, based upon 30 years of wind climate data from Manchester Airport and used to undertake a statistical analysis of the wind climate prevailing across the area.

Lawson Comfort Criteria

14.33 The CFD results were "graded" against the Lawson Comfort Criteria and the Lawson Safety Criteria. The commonly used London Docklands Development Corporation (LDDC) method of the Lawson Criteria is set out in Table 14.2 and Table 14.3 below.

Table 14.2: Lawson Comfort Criteria (LDDC Variant)

Comfort Category	Mean Wind Speed (5% exceedance)	Description
Sitting	4 m/s	Acceptable for outdoor sitting use (e.g. cafes, benches, balconies)
Standing	6 m/s	Acceptable for main building entrances, pick-up / drop-off points and bus stops
Walking (leisure)	8 m/s	Acceptable for strolling
Walking (business)	10 m/s	Acceptable for external pavements, walking purposefully without lingering
Uncomfortable	>10 m/s	Not comfortable for regular pedestrian access

Table 14.3 Lawson Safety Criteria (LDDC Variant)

Safety Category	Mean Wind Speed (0.025% exceedance)	Description
No Safety Exceedance	<15 m/s	
S15 (Distress)	>15 m/s	Unsafe for frail individuals, or cyclists
S20 (Safety)	>20 m/s	Wind conditions considered unsafe for all users

Target Conditions

14.34 For a typical mixed-use urban area within which the site is located, the desired wind microclimate would typically need to have areas acceptable for sitting, standing (including at entrances of buildings) and walking use.

14.35 The target is for the majority of thoroughfares to be suitable for leisure walking. Localised regions of business walking can be tolerated as a transitory pedestrian will pass through them relatively quickly, but an extensive region of business walking is not acceptable.

14.36 Within roadways, business walking is acceptable as these areas will only be used by people undertaking high energy activities such as cycling or brisk walking to cross the road. Uncomfortable conditions are not acceptable in pedestrianised areas.

14.37 The areas immediately outside any building entrances should be suitable for standing use during the windiest season to provide a "buffer" between the still conditions in interior spaces and the general thoroughfare.

14.38 Bus stops, tram stops or railway platforms would be targeted to be suitable for standing, as pedestrians would be expected to dwell in these spaces for a longer duration than a general thoroughfare. There are, however, none of these locations within the study area.

14.39 Amenity areas are targeted to be suitable for a mixture of standing and sitting in summer conditions.

Strong Winds

14.40 Any areas which show up as either subject to strong winds (defined as when there is either a distress exceedance or a safety exceedance in accordance with Table 14.2) or uncomfortable (during the windiest season) will require mitigation, unless they are in locations where pedestrian access can be controlled in the event of strong winds. This applies to all thoroughfares (for pedestrians) and roads (for cyclists) around the Proposed Development.

Identification of Sensitive Receptors

14.41 The following sensitive receptors have been identified and are shown in Figure 14.3:

- Throughfares around the Site (targeted to be suitable for leisure walking in winter);
- Roadways around the Site (targeted to be suitable for business walking in winter);

- Entrances to the Proposed Development (marked E, targeted to be suitable for standing in winter);
- Existing off-Site entrances (marked O, targeted to be suitable for standing in winter);
- Bus stops on Whitworth Street West to the north west of the Site and Medlock Street to the south east (marked B, targeted to be suitable for standing in winter);
- The platforms of Deansgate Railway Station (marked DRS, targeted to be suitable for standing in winter);
- The platforms of Deansgate Tram Stop (marked DTS, targeted to be suitable for standing in winter);
- Existing amenity in Deansgate Locks and First Street (marked A1, targeted to be suitable for a mix of sitting and standing in summer);
- Proposed amenity at the east and west sides of the Site (marked A2, targeted to be suitable for a mix of sitting and standing in summer); and
- A second floor terrace within the Proposed Development (targeted to be suitable for a mix of sitting and standing in summer);

Significance Criteria

14.42 A significant effect is defined as any effect where:

- Conditions at an existing receptor which were suitable for the intended use (in accordance with the Lawson Comfort Criteria) in the baseline are made unsuitable by the inclusion of the Proposed Development;
- Conditions at an introduced receptor are not suitable for the intended use (in accordance with the Lawson Comfort Criteria); or
- The inclusion of the Proposed Development causes the introduction of a wind safety risk due to strong winds (in accordance with the Lawson Safety Criteria).

14.43 An increase in windiness relative to the baseline will be considered not significant if the wind speed is not expected to exceed the limit for the pedestrian activity being undertaken in that area.

14.44 Any significant adverse effects would require mitigation. Should mitigation measures be required to provide wind conditions within a particular area / space to be suitable for their intended use, or are required to mitigate against predicted strong winds, the areas identified requiring suitable mitigation measures will be developed in consultation with the Applicant and the Design Team. Where necessary, mitigation measures will be tested through additional rounds of CFD studies. Following mitigation, the scale of any residual effects will be identified.

14.45 Effect magnitude is defined by the severity of the deviation from the standards set out by the Lawson criteria. Exceedances of the safety criteria are deemed to be the most critical, given their potential effect on pedestrians' wellbeing, i.e. they may be unduly exposed to the potential for harm. Such effects are thus deemed to have a major impact magnitude. Where the comfort criteria are not met, i.e. where the conditions are too windy for a particular receptor to be sufficiently comfortable for existing or planned pedestrian uses and thus inconvenient but not unsafe, the magnitude of such effects is determined by the number of categories by which the target condition is exceeded (minor for one category up to major for three categories over the target). Effects where the comfort conditions are consistent with the target conditions are considered negligible.

14.46 Any adverse effects which make conditions one, two or three categories windier than the target, or introduce wind safety risks (i.e. minor, moderate of major adverse effects in Table 14.4 are

considered to be significant in EIA terms and would require mitigation. Negligible or beneficial effects (of and magnitude) are not considered significant in EIA terms as they would not require mitigation.

Table 14.4: Criteria for Magnitude of Wind Impacts

Magnitude of Impact	Criteria for assessing impact
Major Adverse	Wind conditions which are three categories windier than the target conditions (unless consistent with the baseline conditions) OR Wind safety risks due to strong winds are introduced by the inclusion of the Proposed Development
Moderate Adverse	Wind conditions which are two categories windier than the target conditions (unless consistent with the baseline conditions)
Minor Adverse	Wind conditions which are one category windier than the target conditions (unless consistent with the baseline conditions)
Negligible	Wind conditions which are consistent with the target conditions OR Wind conditions which are consistent with the baseline conditions
Minor Beneficial	Wind conditions which are one category calmer than the target conditions (unless consistent with the baseline conditions)
Moderate Beneficial	Wind conditions which are two categories calmer than the target conditions (unless consistent with the baseline conditions)
Major Beneficial	Wind conditions which are three categories calmer than the target conditions (unless consistent with the baseline conditions) OR Wind safety risks due to strong winds are eradicated by the inclusion of the Proposed Development

Baseline Conditions

Scenario 1: Existing Site with Existing Surrounds (Baseline)

14.47 To ascertain baseline conditions, a CFD scenario was tested incorporating the existing buildings on Site within the existing surrounds.

14.48 The existing surrounds incorporated the following committed developments which were considered sufficiently advanced (and in close enough proximity to the Site) to be included within the baseline:

- 70 Great Bridgewater Street (Havelock) (129081/FO/2021)
- Plot 9a First Street (132600/FO/2021)
- StayCity Deansgate (125804/FO/2019)
- Plot 10b First Street (136170/FO/2023)
- Deansgate South (129406/FO/2021)
- Barclay House (118033/P3OPA/2017&128804/FO/2020)
- Contour (132199/FO/2021)
- Viadux Phase 1 (133998/JO/2022)

14.49 The status of the above developments is as described in the list of committed developments which was submitted to, and agreed with, MCC in advance of the application submission.

14.50 Wind safety at ground level for Scenario 1 is shown in Figure 14.2

14.51 Winter Comfort at ground level for Scenario 1 is shown in Figure 14.3

14.52 Summer Comfort at ground level for Scenario 1 is shown in Figure 14.4

14.53 There are pre-existing wind safety exceedances on Trafford Street to the north of the Site, adjacent to the Axis (marked 1 on Figure 14.2) and Viadux (marked 2). This poses a risk to the safety of pedestrians and cyclists in these locations.

14.54 Winter comfort conditions range between suitable for sitting, standing and leisure walking, with highly localised regions which are suitable for business walking in the same location as the pre-existing wind safety exceedances. Summer conditions range between suitable for sitting and standing with localised regions suitable for leisure walking.

14.55 Conditions are windier to the north and west of the Site, and calmer to the south east.

14.56 Conditions for thoroughfares are suitable for a mix of sitting, standing and leisure walking (with only highly localised regions suitable for business walking). This is suitable for the intended use.

14.57 Conditions for roadways are suitable for a mix of sitting, standing, leisure walking and business walking. This is suitable for the intended use.

14.58 Conditions for the entrance to 19 Albion Street (marked O and circled in results figures) are suitable for leisure walking in winter. This is one category windier than the target condition.

14.59 Conditions for all other existing off-Site entrances (marked O in results figures) are suitable for sitting or standing in winter. This is suitable for the intended use.

14.60 Conditions for the bus stops on Whitworth Street West and Medlock Street (marked B in results figures) are suitable for standing in winter. This is suitable for the intended use.

14.61 Conditions for the platforms of Deansgate Railway Station (marked DRS in results figures) are suitable for a mix of sitting and standing in winter. This is suitable for the intended use.

14.62 Conditions for the platforms of Deansgate Tram Stop (marked DTS in results figures) are suitable for a mix of standing and leisure walking in winter. This ranges between suitable for the intended use and one category windier than the target.

14.63 Conditions for the existing off-site amenity (marked A1 in results figures) are suitable for a mix of sitting and standing in summer. This is suitable for the intended use.

Future Baseline

Scenario 2: Existing Site with Cumulative Surrounds (Future Baseline)

14.64 To ascertain future baseline conditions, a CFD scenario was tested incorporating the existing buildings on Site within the cumulative surrounds.

14.65 In addition to the committed developments which were included in the baseline scenario (Scenario 1) The cumulative surrounds also incorporated the following committed developments:

- Vision Tower (111003/FO/2016/C1)
- Bridgewater House Great Jackson Street (133694/FO/2022)
- 1 City Road (128002/FO/2020)
- Land Bounded By Deansgate, Great Bridgewater Street, Watson Street & Peter Street (135565/FO/2022)
- Land Bounded By Trumpet Street, Albion Street & Great Bridgewater Street (133172/FO/2022 & 133176/FO/2022)
- One Medlock Street (135419/FO/2022, CDN/24/0491)
- First Street Plot 10a (136043/FO/2023)
- The Green (137226/FO/2023)
- The Lighthouse (137227/FO/2023)
- Viadux Phase 2 (139715/FO/2024)
- Hotspur House (138805/FO/2023)

14.66 Wind safety at ground level for Scenario 2 is shown in Figure 14.11

14.67 Winter Comfort at ground level for Scenario 2 is shown in Figure 14.12

14.68 Summer Comfort at ground level for Scenario 2 is shown in Figure 14.13

14.69 There are future baseline wind safety exceedances on the northern platform of Deansgate Tram Stop (marked 1 on Figure 14.11), the corner of Whitworth Street West and Albion Street (marked 2) and behind the Vision development that neighbours the Site to the east (marked 3). This poses a risk to the safety of pedestrians and cyclists in these locations.

14.70 Winter comfort conditions range between suitable for sitting, standing and leisure walking, with highly localised regions which are suitable for business walking in the same location as the pre-

existing wind safety exceedances. Summer conditions range between suitable for sitting and standing with localised regions suitable for leisure walking.

14.71 Conditions are windier to the north and east of the Site, and calmer to the south.

14.72 Conditions for thoroughfares are suitable for a mix of sitting, standing and leisure walking (with only highly localised regions suitable for business walking). This is suitable for the intended use.

14.73 Conditions for roadways are suitable for a mix of sitting, standing, leisure walking and business walking. This is suitable for the intended use.

14.74 Conditions for the entrance to 19 Albion Street (which was identified unsuitable in the baseline conditions for Scenario 1) would be suitable for standing in winter for the future baseline (once cumulative schemes are built out). This is suitable for the intended use.

14.75 Conditions for all other principal off-Site entrances (marked O in results figures) are suitable for sitting or standing in winter. This is suitable for the intended use.

14.76 Conditions for the bus stops on Whitworth Street West and Medlock Street (marked B in results figures) are suitable for standing in winter. This is suitable for the intended use.

14.77 Conditions for the platforms of Deansgate Railway Station (marked DRS in results figures) are suitable for a mix of sitting and standing in winter. This is suitable for the intended use.

14.78 Conditions for the platforms of Deansgate Tram Stop (marked DTS in results figures) are suitable for a mix of standing and leisure walking in winter. This ranges between suitable for the intended use and one category windier than the target.

14.79 Conditions for the existing off-site amenity (marked A1 in results figures) are suitable for a mix of sitting and standing in summer. This is suitable for the intended use.

Identification and Evaluation of Likely Significant Effects

Construction Phase

14.80 For introduced receptors (proposed entrances, introduced amenity spaces and the level 2 terrace) construction phase effects are not relevant as the receptors will only become operational once the Proposed Development is complete.

14.81 During construction, conditions will gradually change from the baseline conditions to conditions for the completed and operational development. Therefore, construction effects can be inferred from the effects due to the completed and operational development.

14.82 Operational Winds effects (as described in the results of Scenario 3 in the next section) on thoroughfares, roadways, off-site entrances, the southern platform of Deansgate Railway Station, the platforms of Deansgate Tram Stop, bus stops and off-site amenity spaces for the completed and operational development are negligible, so all demolition and construction wind effects will also be negligible (not significant).

14.83 As construction commences, the wind conditions on the northern platforms of Deansgate tram stop would be consistent with the baseline. As construction progresses, the wind conditions on this platform would gradually increase until (once the tower reaches a certain point) they would become suitable for leisure walking in winter. This is as described for the results of Scenario 3 below, meaning wind conditions would be one category windier than the target condition. The

minor scale of the operational effects (only one category above the target), coupled with the fact that conditions would only become too windy on these platforms for the very last stages of construction, would mean that construction phase effects on this platform would also be negligible (not significant).

Operational Phase

Scenario 3: Proposed Development with Existing Surrounds

14.84 To ascertain operational effects, a CFD scenario was tested incorporating the Proposed Development on Site within the existing surrounds.

14.85 Wind safety at ground level for Scenario 3 is shown in Figure 14.5

14.86 Winter Comfort at ground level for Scenario 3 is shown in Figure 14.6

14.87 Summer Comfort at ground level for Scenario 3 is shown in Figure 14.7

14.88 Wind safety at terrace level for Scenario 3 is shown in Figure 14.8

14.89 Winter Comfort at terrace level for Scenario 3 is shown in Figure 14.9

14.90 Summer Comfort at terrace level for Scenario 3 is shown in Figure 14.10

14.91 There are pre-existing wind safety exceedances (which were present in the baseline) on Trafford Street to the north of the Site, adjacent to the Axis (marked 1 on Figure 14.5 and Viadux (marked 2), but no wind safety exceedances have been introduced. The Proposed Development is not creating any wind safety risks, which is a negligible wind effect (not significant).

14.92 Winter comfort conditions range between suitable for sitting, standing and leisure walking, with highly localised regions which are suitable for business walking in the same location as the pre-existing wind safety exceedances. Summer conditions range between suitable for sitting and standing with localised regions suitable for leisure walking.

14.93 The inclusion of the Proposed Development has made conditions windier to the south west of the Site along the railway line, and calmer to the east on Whitworth Street West.

14.94 Conditions for thoroughfares are suitable for a mix of sitting, standing and leisure walking (with only highly localised regions suitable for business walking). This is suitable for the intended use and is a negligible wind effect (not significant).

14.95 Conditions for roadways are suitable for a mix of sitting, standing, leisure walking and business walking. This is suitable for the intended use and is a negligible wind effect (not significant).

14.96 Conditions for the entrances to the Proposed Development (marked E on results figures) are suitable for sitting in winter. This is one category calmer than the target condition and is a minor beneficial wind effect (not significant).

14.97 Conditions for the entrance to 19 Albion Street (marked O and circled in results figures) are suitable for leisure walking in winter. This is one category windier than the target condition, but is consistent with the baseline conditions so is a negligible wind effect (not significant).

14.98 Conditions for all other existing off-Site entrances (marked O in results figures) are suitable for sitting or standing in winter. This is suitable for the intended use and is a negligible wind effect (not significant).

14.99 Conditions for the bus stops on Whitworth Street West and Medlock Street (marked B in results figures) are suitable for standing in winter. This is suitable for the intended use and is a negligible wind effect (not significant).

14.100 Conditions for the platforms of Deansgate Railway Station (marked DRS in results figures) are suitable for a mix of sitting and standing on the southern platform and for leisure walking on the northern platform in winter. This is between suitable for the intended use and one category windier than the target condition so ranges from a negligible wind effect (not significant) to a minor adverse wind effect (significant). It should be noted that the exceedance of the target category for this platform is only experienced during the winter months (December to February) and ranges from 6% of the season at the western end to 7% at the eastern end. This equates to five to six days per year when the wind speeds will exceed the comfortable limit for standing on the platform. Given the minor nature of this exceedance, wind mitigation measures are not proposed.

14.101 Conditions for the platforms of Deansgate Tram Stop (marked DTS in results figures) are suitable for a mix of standing and leisure walking in winter. This ranges between suitable for the intended use and one category windier than the target, but the extent of the platform which is suitable for standing is not fundamentally altered relative to the baseline so this is a negligible wind effect (not significant).

14.102 Conditions for the existing off-Site amenity (marked A1 in results figures) are suitable for a mix of sitting and standing in summer. This is suitable for the intended use and is a negligible wind effect (not significant).

14.103 Conditions for the proposed ground level amenity (marked A2 in results figures) are suitable for a mix of sitting and standing in summer. This is suitable for the intended use and is a negligible wind effect (not significant).

14.104 Conditions for the proposed level 2 terrace are suitable for a mix of sitting and standing in summer. This is suitable for the intended use and is a negligible wind effect (not significant).

Cumulative Effects

Construction Phase

14.105 For introduced receptors (proposed entrances, introduced amenity spaces and the level 2 terrace) construction phase effects are not relevant as the receptors will only become operational once the Proposed Development is complete.

14.106 During construction, conditions will gradually change from the future baseline conditions to conditions for the completed and operational development. Therefore, cumulative construction effects can be inferred from the cumulative effects due to the completed and operational development.

14.107 Cumulative operational wind effects (as described in the results of Scenario 4 in the next section) on thoroughfares, roadways, off-site entrances, the southern platform of Deansgate Railway Station, the platforms of Deansgate Tram Stop, bus stops and off-site amenity spaces for the completed and operational development are negligible, so all cumulative demolition and construction wind effects will also be negligible (not significant).

14.108 As construction commences, the wind conditions on the northern platforms of Deansgate tram stop would be consistent with the future baseline. As construction progresses, the wind conditions on this platform would gradually increase until (once the tower reaches a certain point) they would become suitable for leisure walking in winter. This is as described for the results of Scenario 4 below where the wind conditions will be one category windier than the target condition. The minor scale of the operational effects (only one category above the target), coupled with the fact that conditions would only become too windy on these platforms for the very last stages of construction, would mean that cumulative construction phase effects on this platform would also be negligible (not significant).

Operational Phase

Scenario 4: Proposed Development with Cumulative Surrounds

14.109 To ascertain operational effects, a CFD scenario was tested incorporating the Proposed Development on Site within the existing surrounds.

14.110 Wind safety at ground level for Scenario 4 is shown in Figure 14.14

14.111 Winter Comfort at ground level for Scenario 4 is shown in Figure 14.15

14.112 Summer Comfort at ground level for Scenario 4 is shown in Figure 14.16

14.113 Wind safety at terrace level for Scenario 4 is shown in Figure 14.17

14.114 Winter Comfort at terrace level for Scenario 4 is shown in Figure 14.18

14.115 Summer Comfort at terrace level for Scenario 4 is shown in Figure 14.19

14.116 There are wind safety exceedances (which were also present in the future baseline) on the northern platform of Deansgate Tram Stop (marked 1 on Figure 14.14) and the corner of Whitworth Street West and Albion Street (marked 2)) but no wind safety exceedances have been introduced. The future baseline wind safety exceedance behind the Vision development that neighbours the Site to the east (marked 3) has been eradicated. Therefore, the Proposed Development is not creating any wind safety risks and has eradicated a safety risk which would otherwise have occurred in future. This ranges between a major beneficial wind effect (not significant since beneficial) and a negligible wind effect (not significant).

14.117 Winter comfort conditions range between suitable for sitting, standing and leisure walking, with highly localised regions which are suitable for business walking in the same location as the pre-existing wind safety exceedances. Summer conditions range between suitable for sitting and standing with localised regions suitable for leisure walking.

14.118 As with the existing surrounds, the inclusion of the Proposed Development has made conditions windier to the south west of the Site and calmer to the east. The significance of these changes in conditions is outlined below.

14.119 Conditions for thoroughfares are suitable for a mix of sitting, standing and leisure walking (with only highly localised regions suitable for business walking). This is suitable for the intended use and is a negligible wind effect (not significant).

14.120 Conditions for roadways are suitable for a mix of sitting, standing, leisure walking and business walking. This is suitable for the intended use and is a negligible wind effect (not significant).

14.121 Conditions for the entrances to the Proposed Development (marked E on results figures) are suitable for sitting in winter. This is one category calmer than the target condition and is a minor beneficial wind effect (not significant).

14.122 Conditions for all principal off-Site entrances (marked O in results figures) are suitable for sitting or standing in winter. This is suitable for the intended use and is a negligible wind effect (not significant).

14.123 Conditions for the bus stops on Whitworth Street West and Medlock Street (marked B in results figures) are suitable for standing in winter. This is suitable for the intended use and is a negligible wind effect (not significant).

14.124 Conditions for the platforms of Deansgate Railway Station (marked DRS in results figures) are suitable for a mix of sitting and standing on the southern platform and for a mix of standing and leisure walking on the northern platform in winter. The extent of the exceedance of the standing threshold in winter is reduced relative to the scenario with the existing surrounds (Scenario 3), and as with the existing surrounds equates to less than 6 days per year for which the threshold wind speed is exceeded. Given the minor nature of this exceedance, wind mitigation measures are not proposed. This is between suitable for the intended use and one category windier than the target condition so ranges from a negligible wind effect (not significant) to a minor adverse wind effect (significant).

14.125 Conditions for the platforms of Deansgate Tram Stop (marked DTS in results figures) are suitable for a mix of standing and leisure walking in winter. This ranges between suitable for the intended use and one category windier than the target, but the extent of the platform which is suitable for standing is not fundamentally altered relative to the baseline so this is a negligible wind effect (not significant).

14.126 Conditions for the existing off-Site amenity (marked A1 in results figures) are suitable for a mix of sitting and standing in summer. This is suitable for the intended use and is a negligible wind effect (not significant).

14.127 Conditions for the proposed ground level amenity (marked A2 in results figures) are suitable for a mix of sitting and standing in summer. This is suitable for the intended use and is a negligible wind effect (not significant).

14.128 Conditions for the proposed level 2 terrace are suitable for a mix of sitting and standing in summer. This is suitable for the intended use and is a negligible wind effect (not significant).

Mitigation Measures

Construction Phase

14.129 No wind mitigation measures are proposed for the construction phase.

Operational Phase

14.130 No wind mitigation measures are proposed for the operational phase.

Residual Effects

Construction Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Negligible effects on wind microclimate	General Thoroughfares	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Roadways	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Off-Site Building Entrances	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Bus Stops	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Railway Platforms	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Tram Stop Platforms	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Existing Off-Site Ground Level Amenity	None	N/A	Negligible temporary effects on wind microclimate

Operational Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Negligible effects on wind microclimate	General Thoroughfares	None	N/A	Negligible permanent effects on wind microclimate

Negligible effects on wind microclimate	Roadways	None	N/A	Negligible permanent effects on wind microclimate
Minor Beneficial effects on wind microclimate	Building Entrances to the Proposed Development	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Off-Site Building Entrances	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Bus Stops	None	N/A	Negligible permanent effects on wind microclimate
Negligible to Minor Adverse effects on wind microclimate	Railway Platforms	None	N/A	Negligible to Minor Adverse permanent effects on wind microclimate
Negligible effects on wind microclimate	Tram Stop Platforms	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Existing Off-Site Ground Level Amenity	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Proposed Ground Level Amenity	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Proposed Level 2 Terrace	None	N/A	Negligible permanent effects on wind microclimate

Monitoring

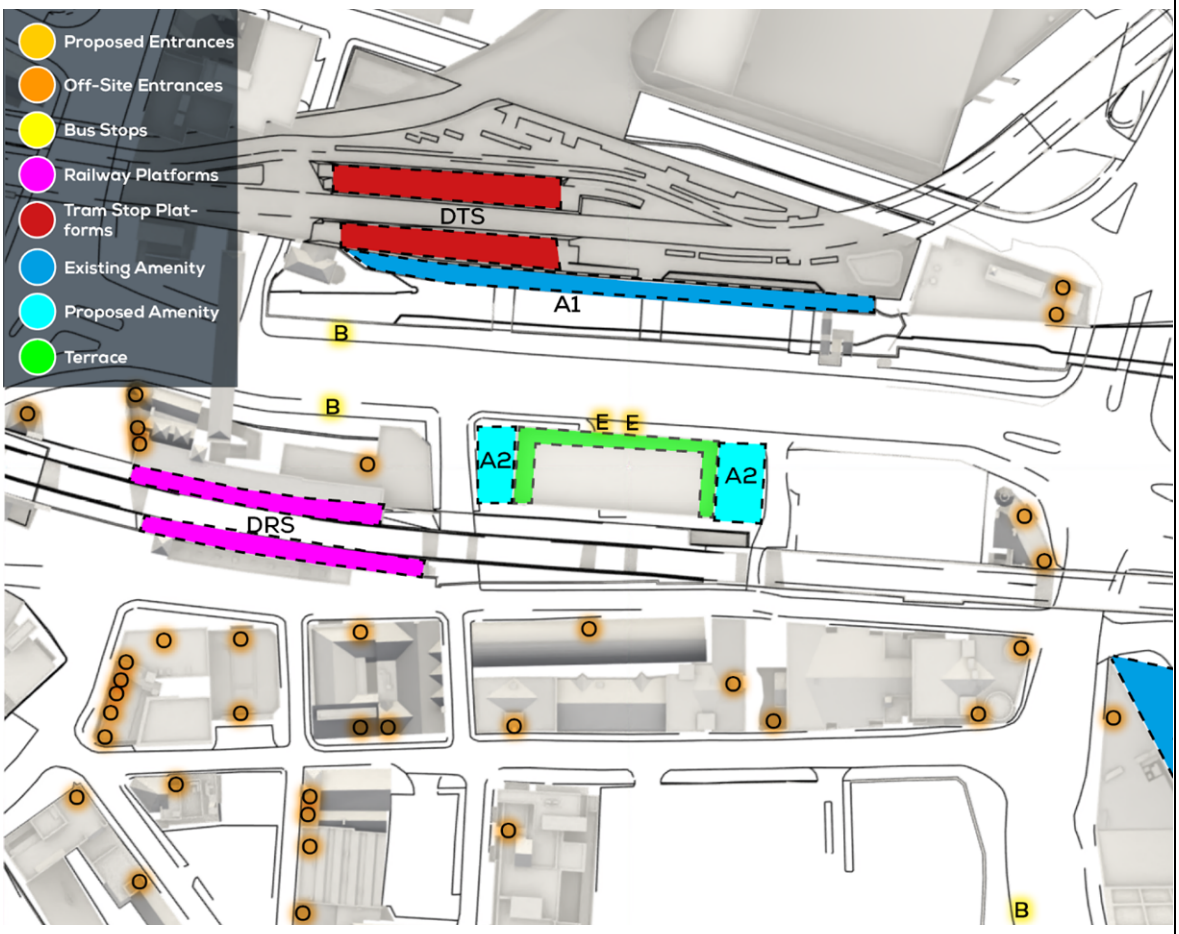
14.131 No monitoring is recommended for wind microclimate.

Reference List

14.132 This ES Chapter has been prepared in reference to the following:

(1) Department for Levelling Up, Housing & Communities (DLUHC), National Planning Policy Framework (NPFF). 2024
(2) Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. Planning Practice Guidance. 2021.
(3) Greater Manchester Combined Authority Joint Development Plan "Places for Everyone". 2021
(4) Manchester City Council, Manchester Core Strategy (2012 – 2027)
(5) English Heritage and the Commission for Architecture and the Built Environment (CABE), Guidance on Tall Buildings.2007
(6) Historic England Advice Note 4: Tall Buildings, 2015
(7) Lawson, T.V. Building Aerodynamics. Imperial College Press, 2001.

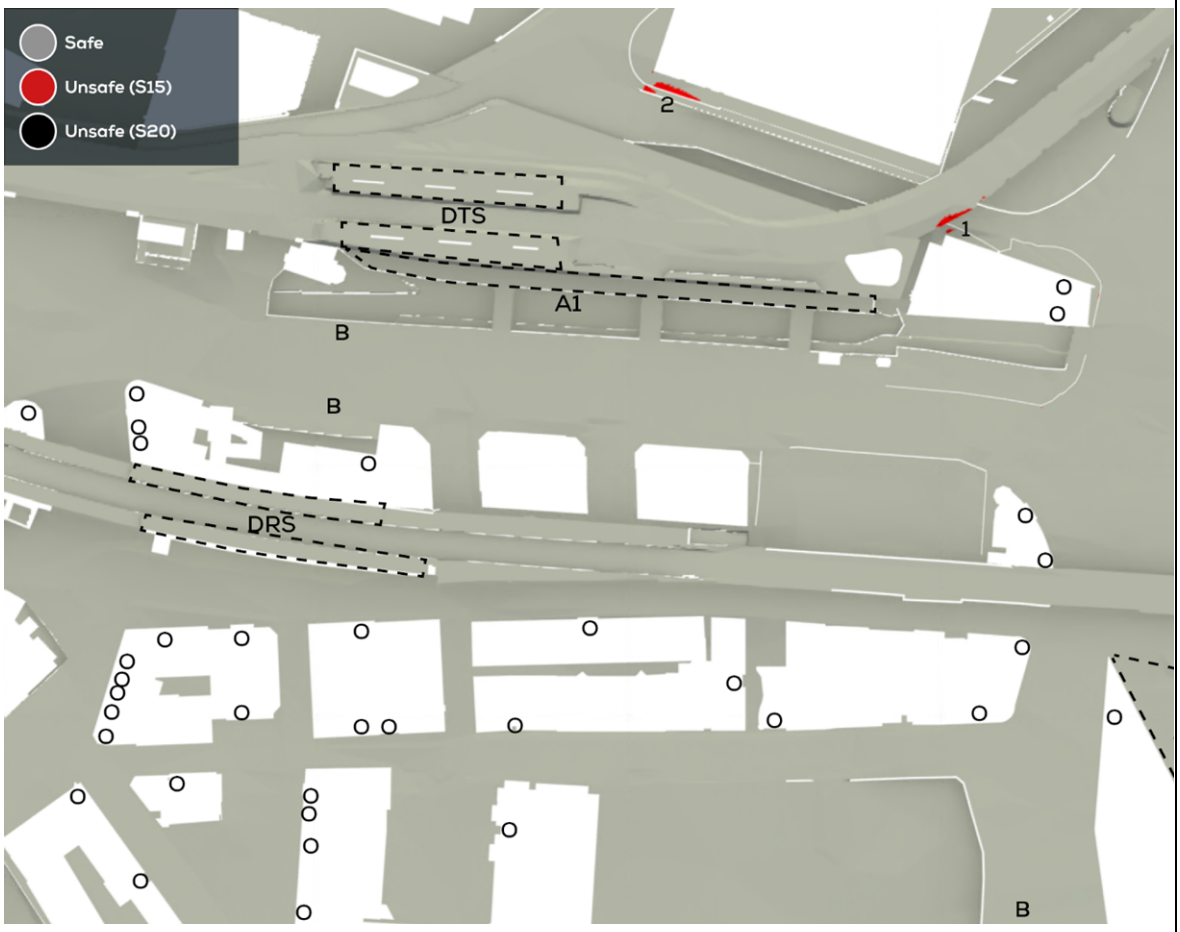
Figure 14.1



Sensitive Wind Receptors

To Scale	Date: 13/11/2024

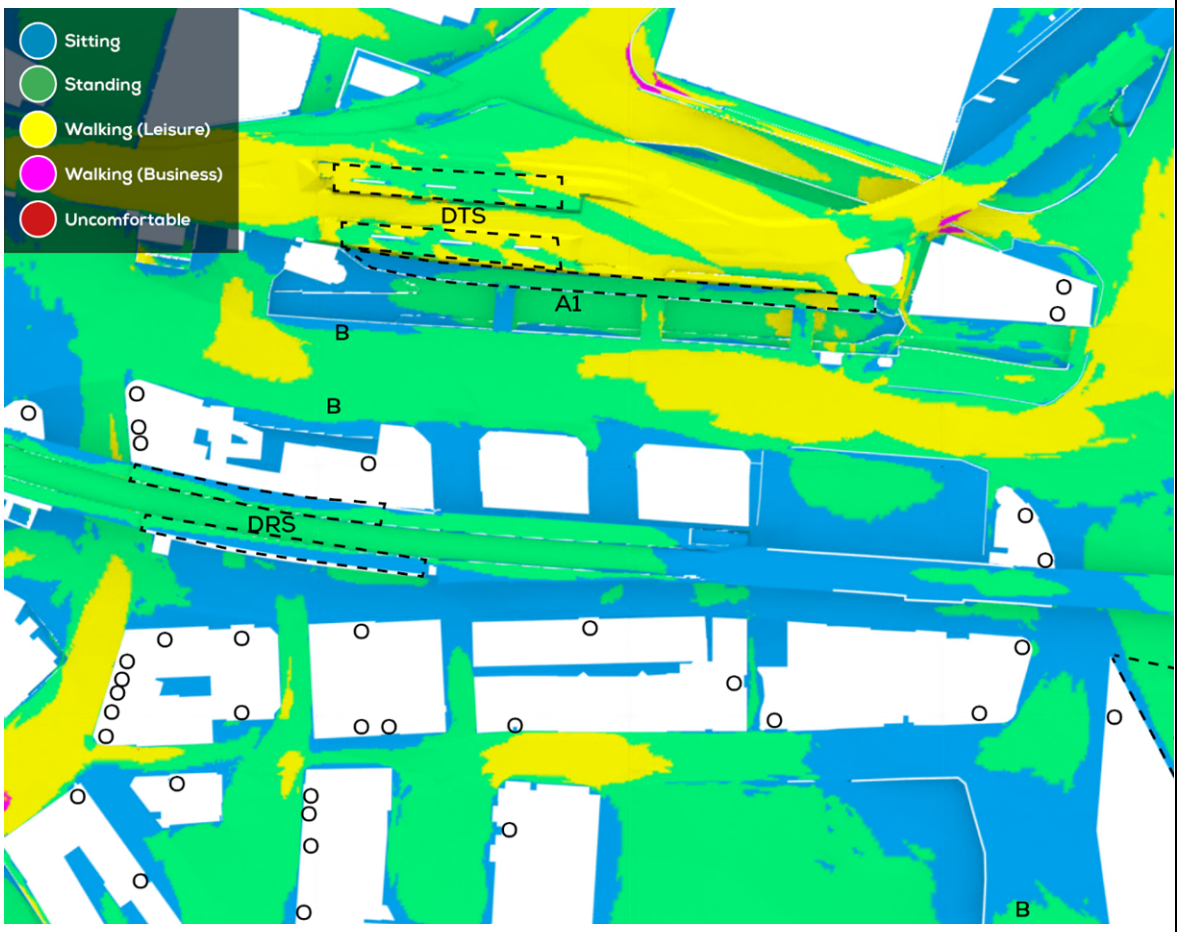
Figure 14.2



Wind Safety at Ground Level for Scenario 1 (Existing Site with Existing Surrounds)

To Scale	Date: 13/11/2024

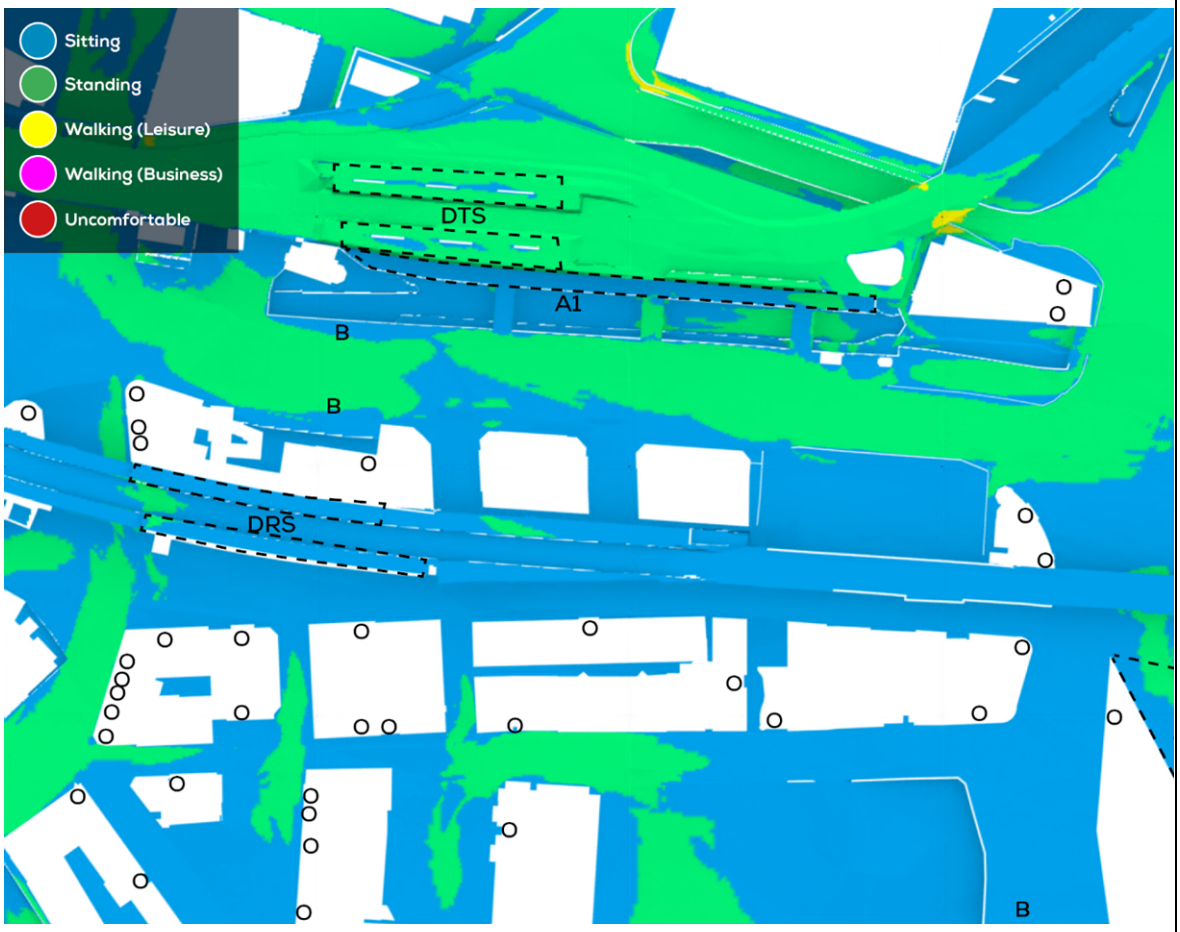
Figure 14.3



Winter Comfort at Ground Level for Scenario 1 (Existing Site with Existing Surrounds)

To Scale	Date: 13/11/2024

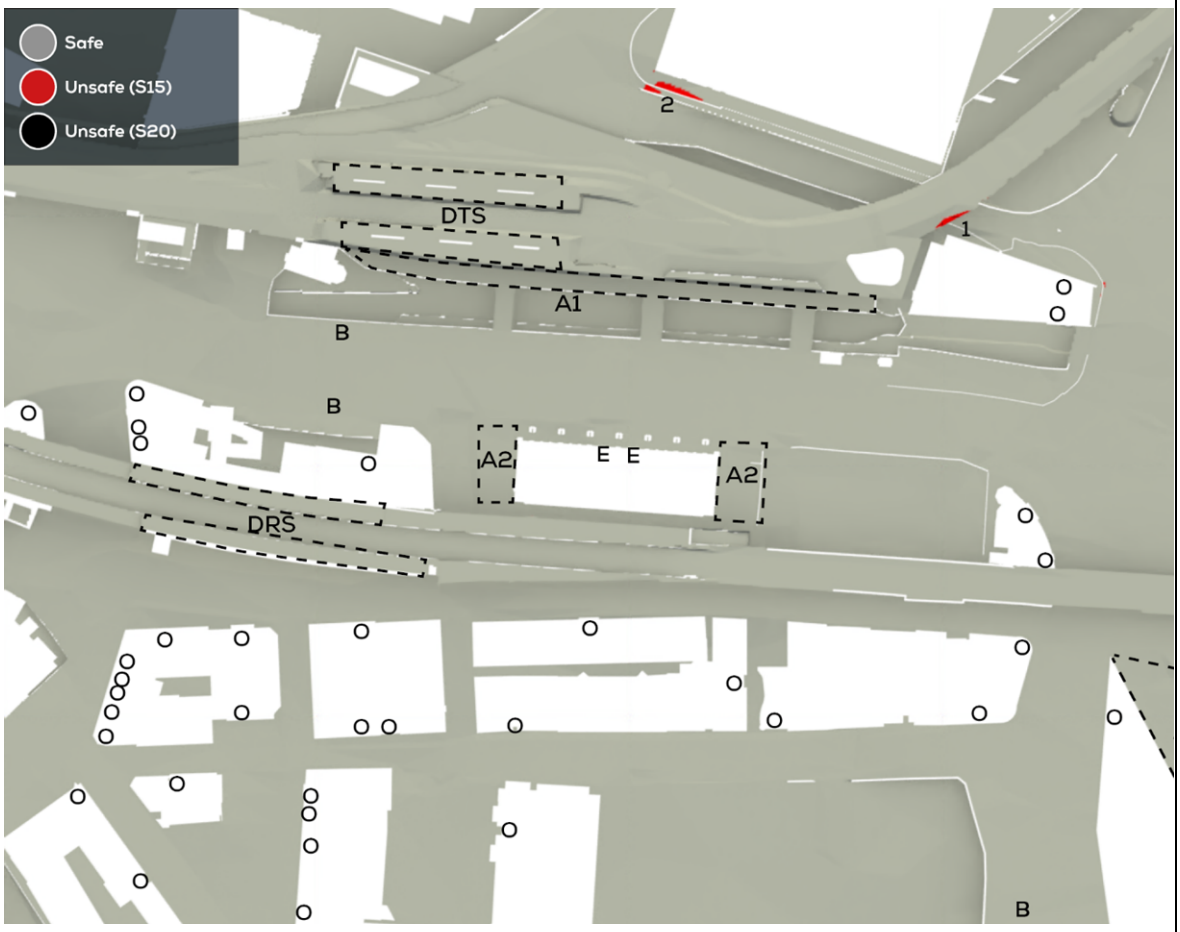
Figure 14.4



Summer Comfort at Ground Level for Scenario 1 (Existing Site with Existing Surrounds)

To Scale	Date: 13/11/2024

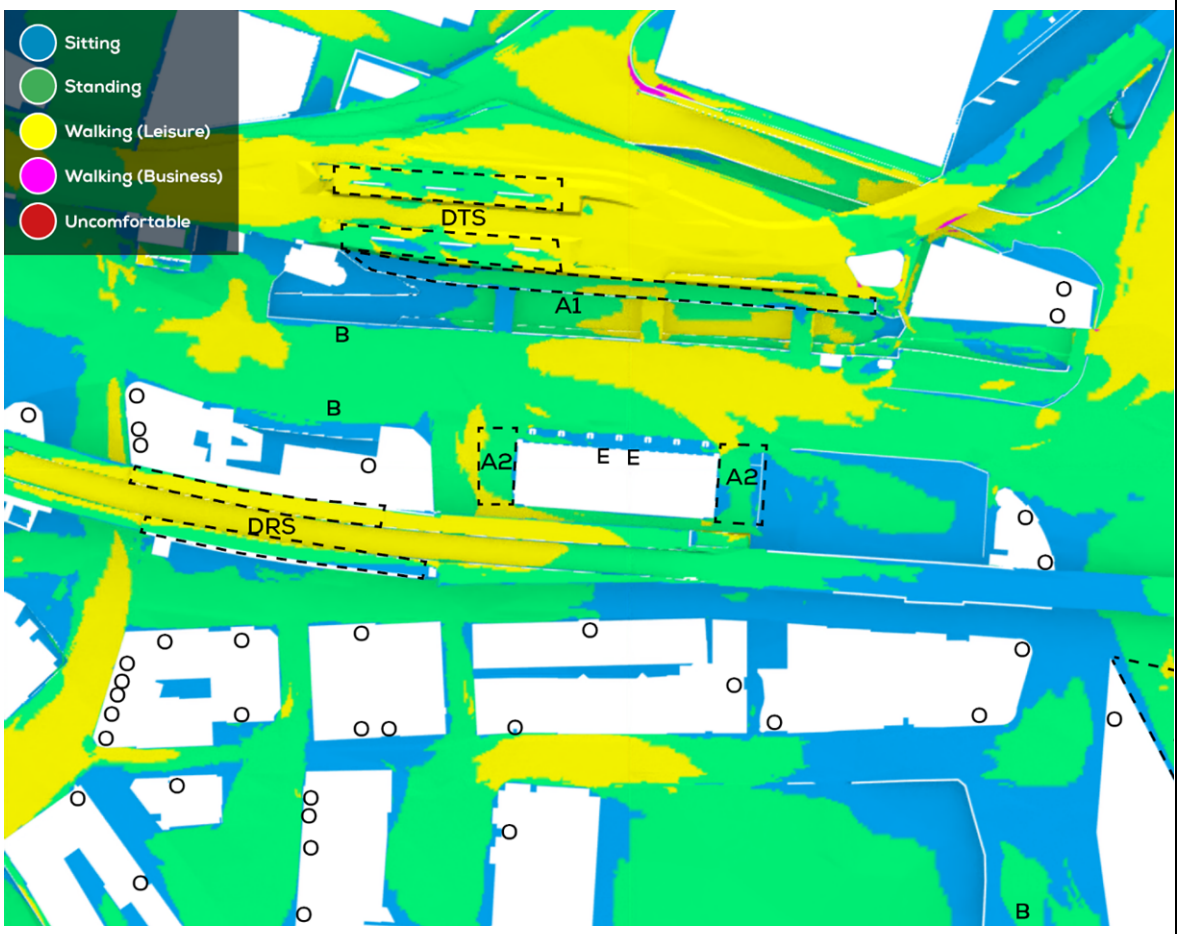
Figure 14.5



Wind Safety at Ground Level for Scenario 3 (Proposed Development with Existing Surrounds)

To Scale	Date: 13/11/2024

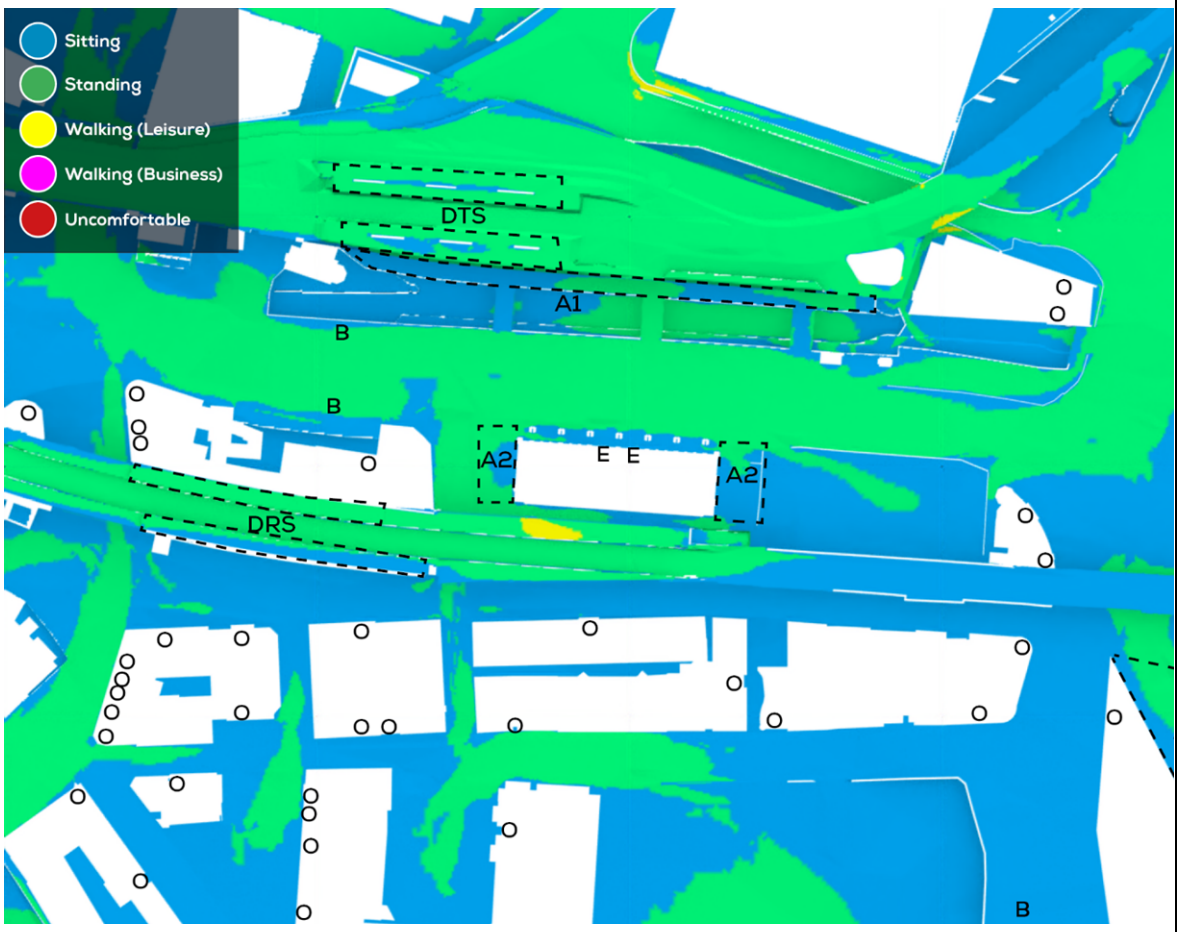
Figure 14.6



Winter Comfort at Ground Level for Scenario 3 (Proposed Development with Existing Surrounds)

To Scale	Date: 13/11/2024

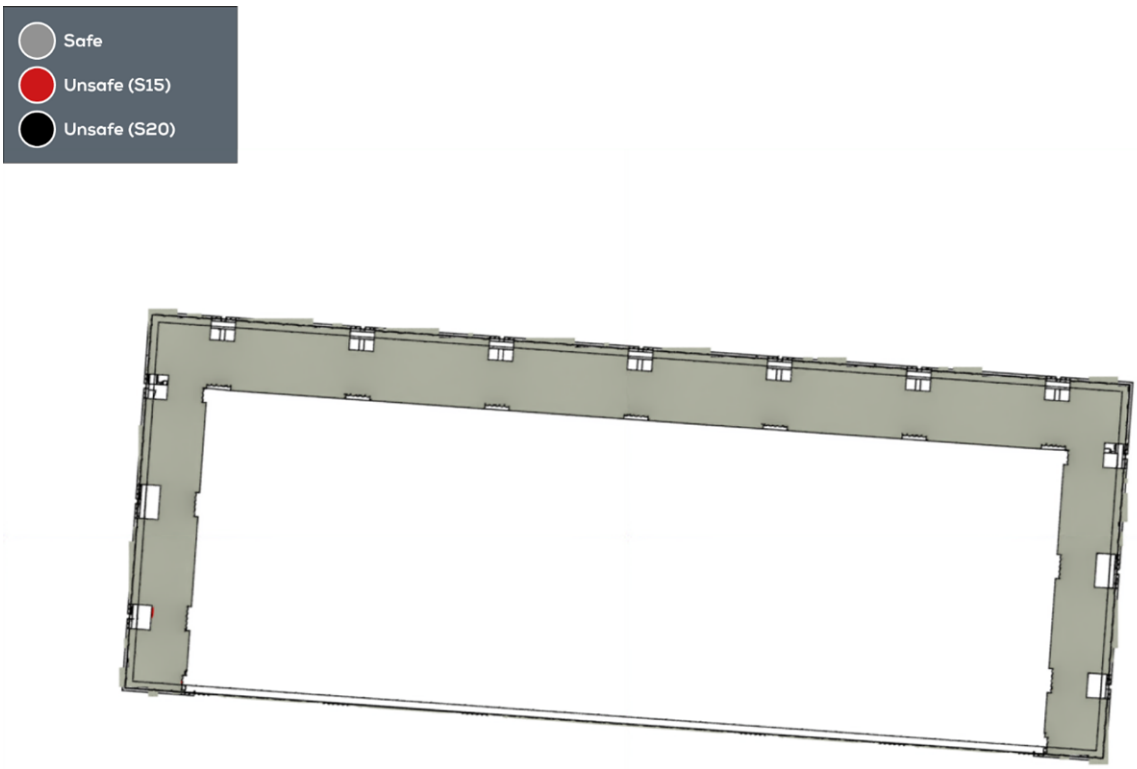
Figure 14.7



Summer Comfort at Ground Level for Scenario 3 (Proposed Development with Existing Surrounds)

To Scale	Date: 13/11/2024

Figure 14.8



Wind Safety at Terrace Level for Scenario 3 (Proposed Development with Existing Surrounds)

To Scale	Date: 13/11/2024

Figure 14.9



Winter Comfort at Terrace Level for Scenario 3 (Proposed Development with Existing Surrounds)

To Scale	Date: 13/11/2024

Figure 14.10



Summer Comfort at Terrace Level for Scenario 3 (Proposed Development with Existing Surrounds)

To Scale	Date: 13/11/2024

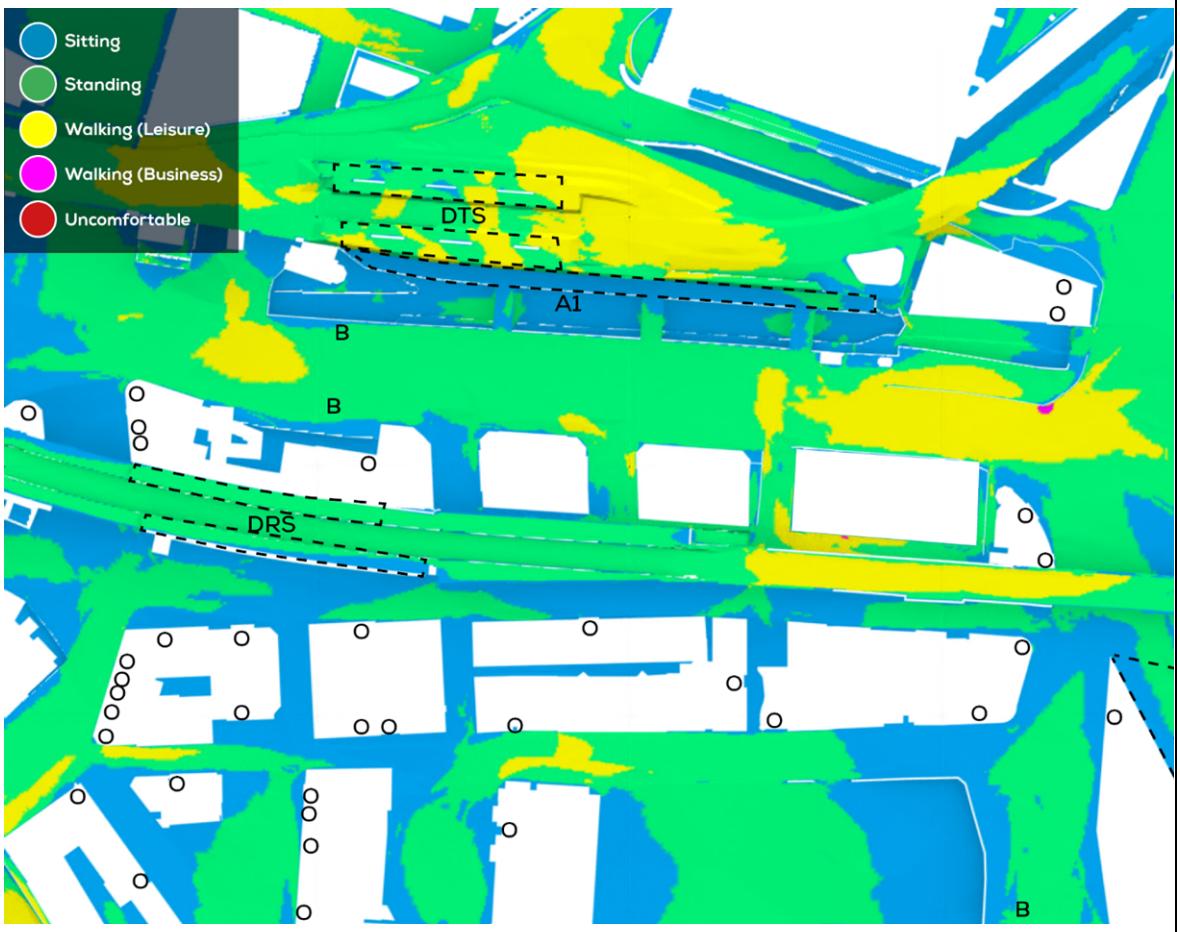
Figure 14.11



Wind Safety at Ground Level for Scenario 2(Existing Site with Cumulative Surrounds)

To Scale	Date: 13/11/2024

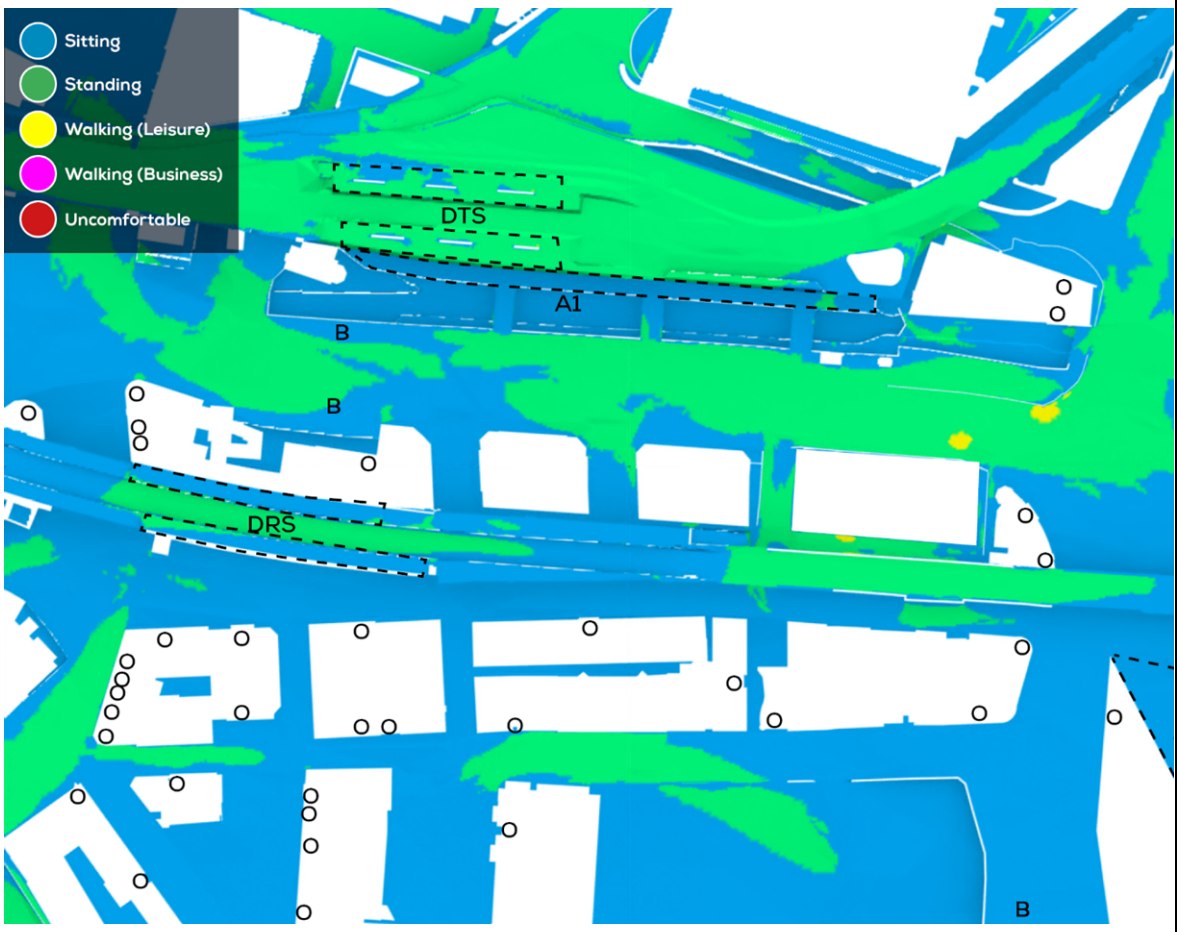
Figure 14.12



Winter Comfort at Ground Level for Scenario 2 (Existing Site with Cumulative Surrounds)

To Scale	Date: 13/11/2024

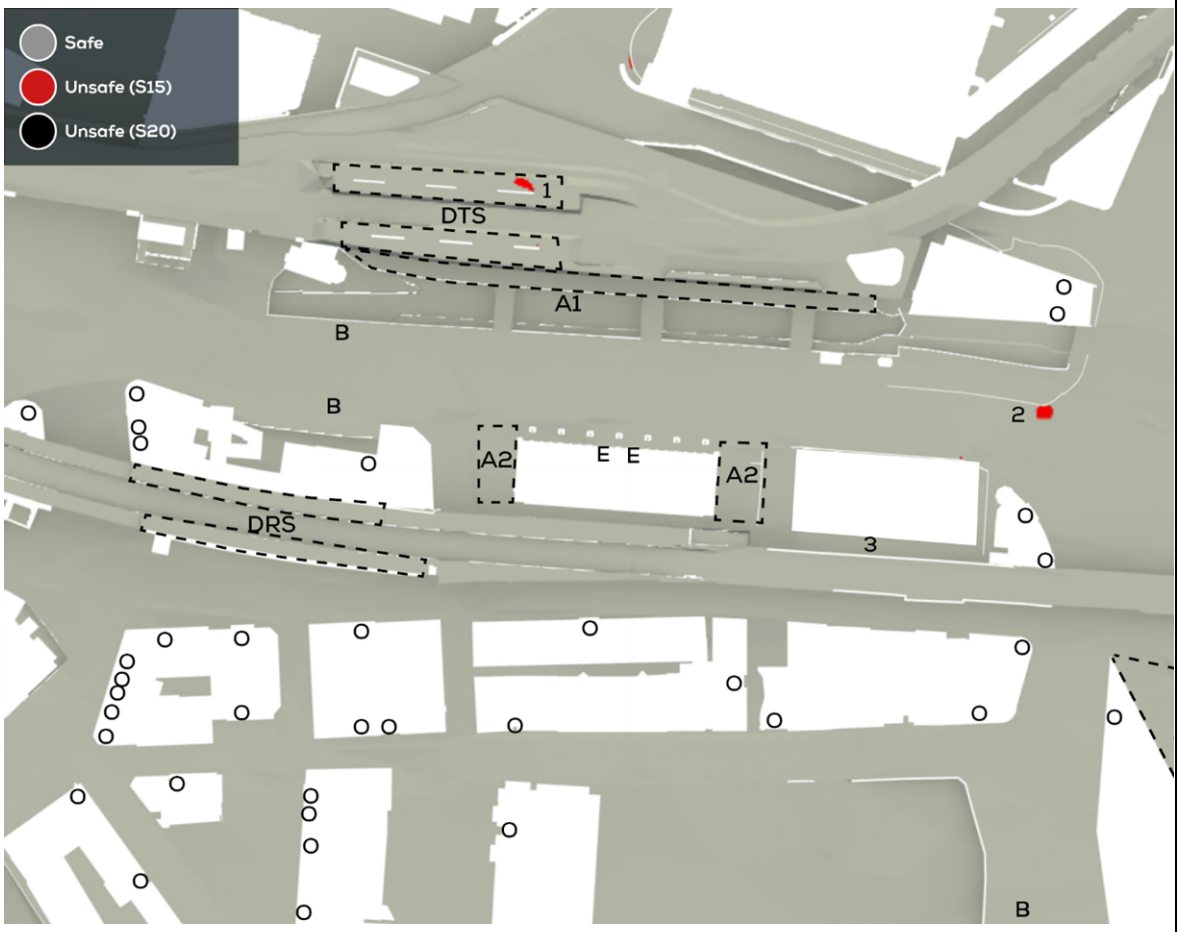
Figure 14.13



Summer Comfort at Ground Level for Scenario 2 (Existing Site with Cumulative Surrounds)

To Scale	Date: 13/11/2024

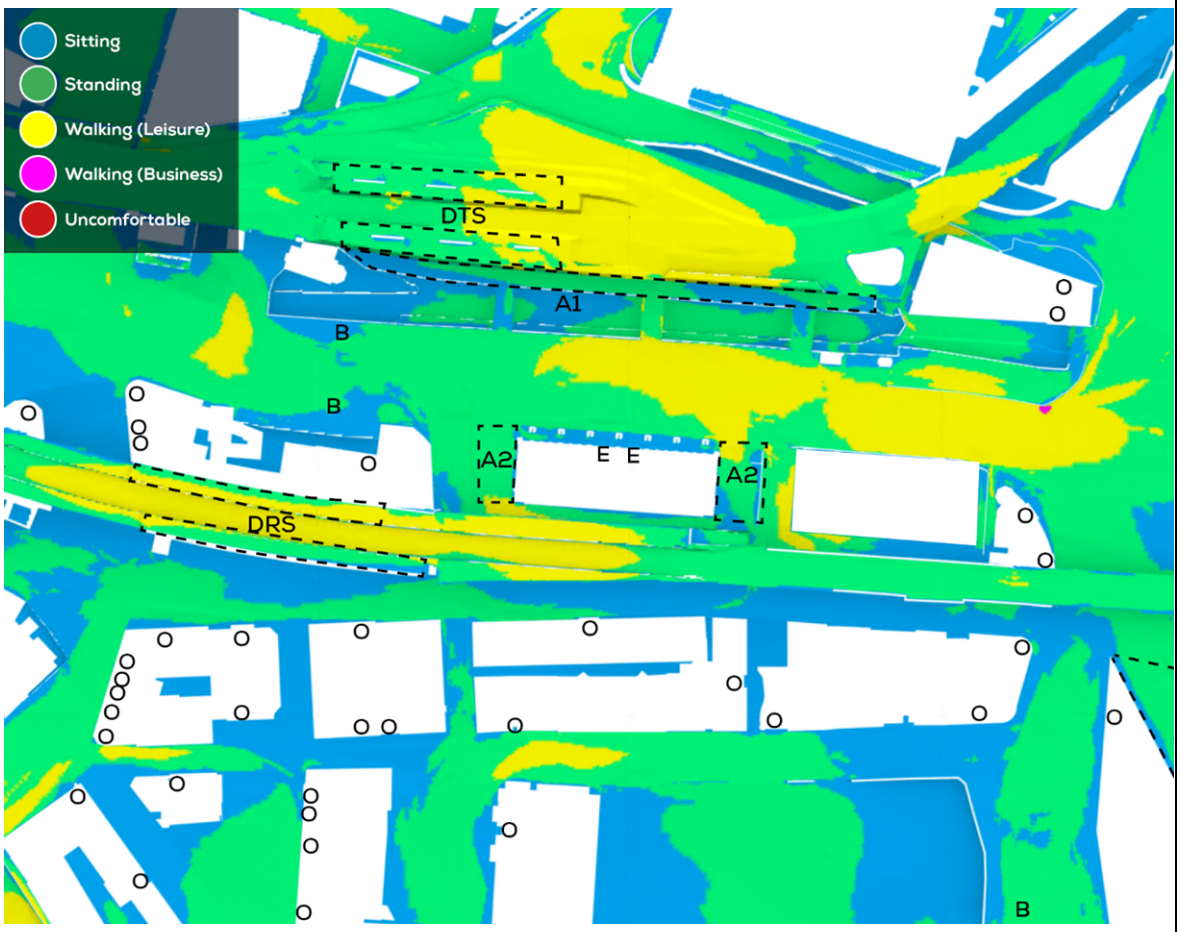
Figure 14.14



Wind Safety at Ground Level for Scenario 4 (Proposed Development with Cumulative Surrounds)

To Scale	Date: 13/11/2024

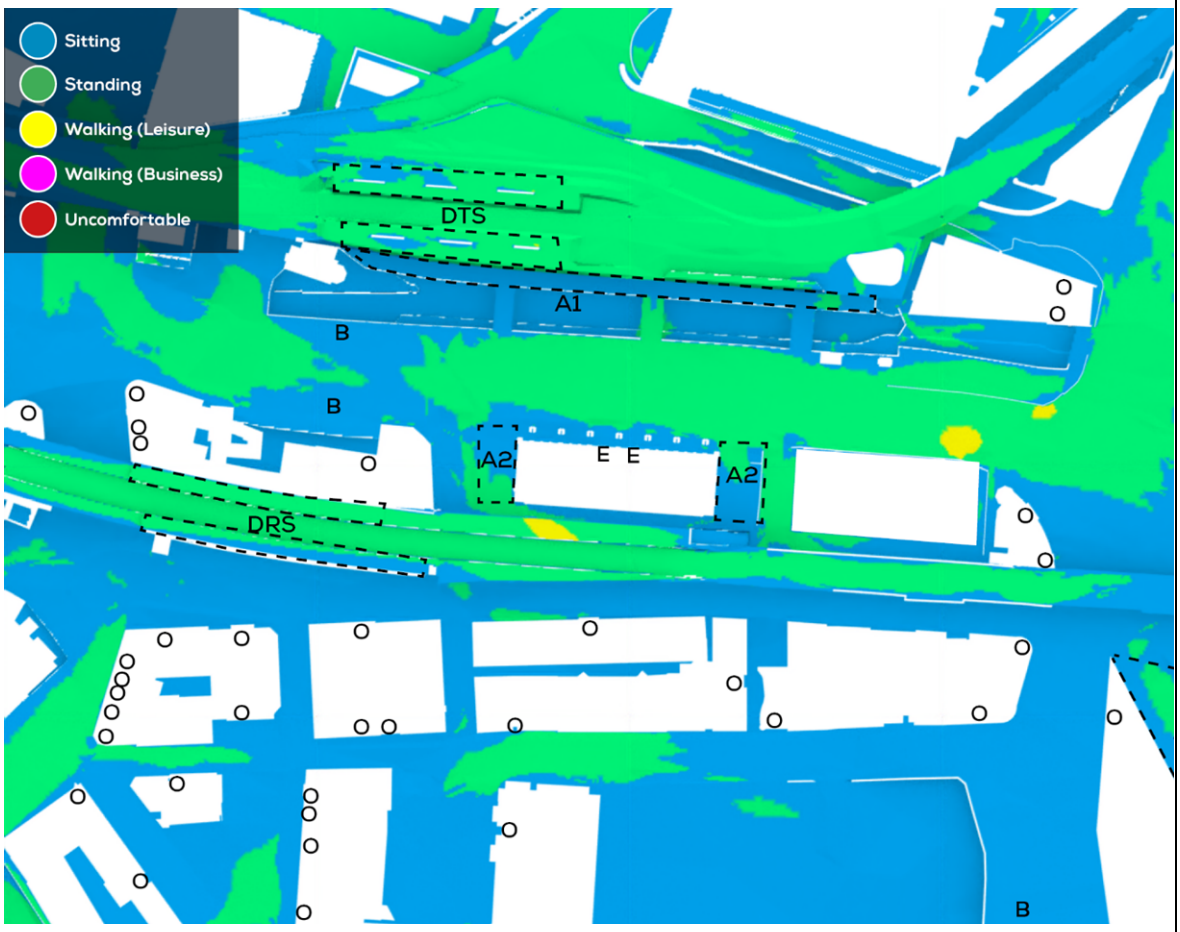
Figure 14.15



Winter Comfort at Ground Level for Scenario 4 (Proposed Development with Cumulative Surrounds)

To Scale	Date: 13/11/2024

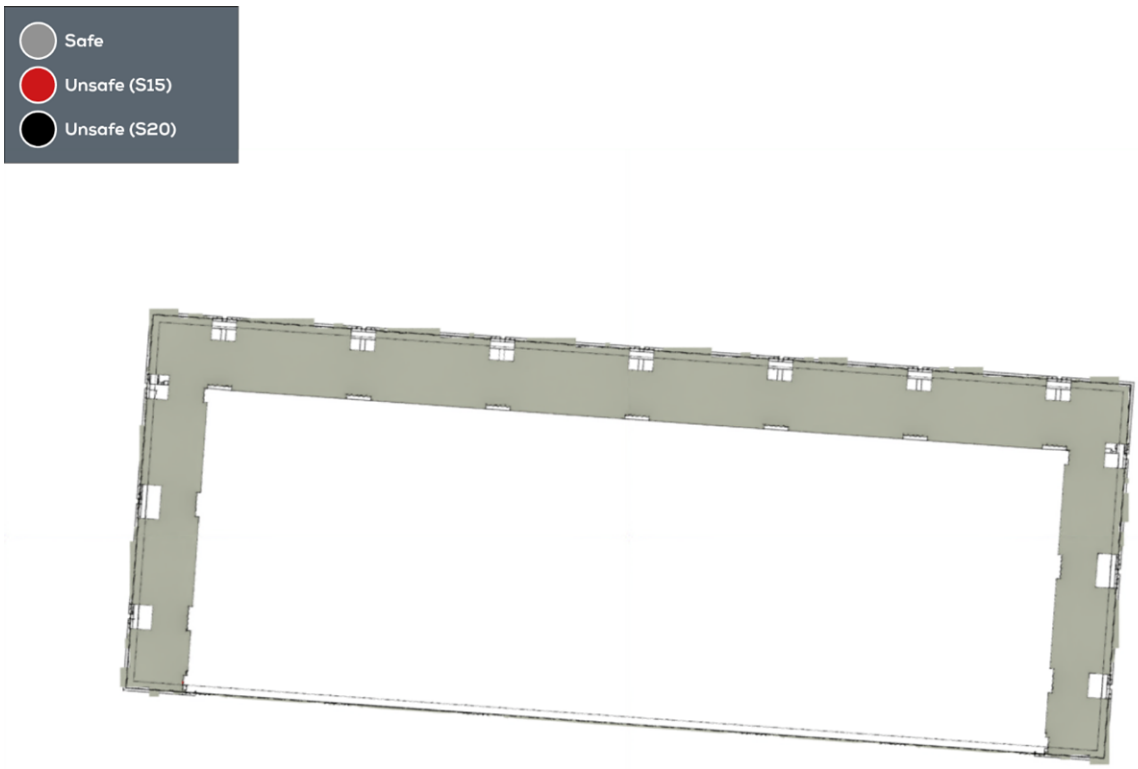
Figure 14.16



Summer Comfort at Ground Level for Scenario 4 (Proposed Development with Cumulative Surrounds)

To Scale	Date: 13/11/2024

Figure 14.17



Wind Safety at Terrace Level for Scenario 4 (Proposed Development with Cumulative Surrounds)

To Scale	Date: 13/11/2024

Figure 14.18



Winter Comfort at Terrace Level for Scenario 4 (Proposed Development with Cumulative Surrounds)

To Scale	Date: 13/11/2024

Figure 14.19



Summer Comfort at Terrace Level for Scenario 4 (Proposed Development with Cumulative Surrounds)

To Scale	Date: 13/11/2024

15. Summary of Residual Effects

Introduction

15.1. This chapter summarises the residual effects that are set out in each individual relevant chapter.

Climate Change

Construction Phase

Table 15.1 Significance of Construction Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Moderate Adverse impacts of GHG emissions produced during project construction phase (Life Cycle Stages A1-A5).	Embodied Carbon Emissions	Optimising material usage, specification of lower Embodied Carbon materials and/or where possible materials with high recycled content.	Through Whole-life carbon assessments, material assessments and option appraisals across phases of the Proposed Development. In addition, utilising the Mainer Associates Embodied Carbon Work Package Procurement Mitigation Strategy to ensure that Embodied Carbon limits are developed, set and adhered to throughout the project phases.	Minor Adverse - Permanent

Operational Phase

Table 15.2 Significant Operation Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Moderate Adverse impacts of GHG emissions produced during the In-Use phase of the project (Life Cycle Stages B1-B5).	Embodied Carbon Emissions	Specifying materials with lower Embodied Carbon emissions and longer services lives.	Through Whole-life carbon assessments, material assessments and option appraisals across phases of the Proposed Development.	Minor Adverse - Permanent

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
			In addition, utilizing the Mainer Associates Embodied Carbon Work Package Procurement Mitigation Strategy to ensure that Embodied Carbon limits are developed, set and adhered to throughout the project phases.	
Moderate Adverse impacts of GHG emissions produced by operational energy consumption (Life Cycle Stage B6).	Operational Energy Emissions	Installing energy efficient technology across the site and ensuring Low/Zero Carbon technologies are installed where possible.	Further developing the projects Energy designs in line with the Energy hierarchy to further lower the operational energy emissions of the development. Undertake more specific Low/Zero Carbon technology appraisal for the development.	Minor Adverse - Temporary

Daylight, Sunlight and Overshadowing

Construction Phase

15.2. Owing to the evolving and changing nature of construction activities, the assessment of potential effects during construction of the Proposed Development on daylight, sunlight and overshadowing to surrounding properties and areas of amenity space have not been modelled.

15.3. Since the potential daylight, sunlight and overshadowing effects relating to construction works will vary throughout the construction programme and gradually increase to the potential effects identified for the completed Proposed Development, the interim construction effects will not be assessed quantitatively as it is considered that the completed Proposed Development represents the worst-case assessment in terms of likely daylight and sunlight.

15.4. During the construction phase, the daylight, sunlight and overshadowing effects will gradually change from negligible in the baseline position to that described in the Operational Phase with the Proposed Development in place.

Operational Phase

Table 15.3 Significance of Operational Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Adverse reduction in	Hill Quays	None	n/a	Minor Adverse (Permanent)
	Riverside Mews	None	n/a	Negligible (Permanent)
	The Rhine	None	n/a	Minor Adverse (Permanent)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
daylight amenity	The Nile	None	n/a	Minor Adverse (Permanent)
	30 City Road East	None	n/a	Negligible (Permanent)
	14 Albion Wharf	None	n/a	Minor Adverse (Permanent)
	The Hacienda	None	n/a	Negligible (Permanent)
	326-330 Deansgate	None	n/a	Negligible (Permanent)
	The Ropeworks	None	n/a	Minor Adverse (Permanent)
	21 Little Peter Street	None	n/a	Minor Adverse (Permanent)
	8-16 Bridgewater St	None	n/a	Negligible (Permanent)
	20 Southern St	None	n/a	Negligible (Permanent)
	18-12 Southern St	None	n/a	Negligible (Permanent)
	8-10 Southern St	None	n/a	Negligible (Permanent)
	Deansgate Quay	None	n/a	Negligible (Permanent)
	357-361 Deansgate	None	n/a	Minor Adverse (Permanent)
	Ropeworks Apartments Block 1	None	n/a	Minor Adverse (Permanent)
	Lumiere Building	None	n/a	Negligible (Permanent)
	The Danube	None	n/a	Minor Adverse (Permanent)
	AXIS TOWER	None	n/a	Negligible (Permanent)
	Viadux - Phase 1	None	n/a	Minor Adverse (Permanent)
	Beetham Tower Residential	None	n/a	Negligible (Permanent)
	StayCity Aparthotel, Deansgate	None	n/a	Minor Adverse (Permanent)
Adverse reduction in sunlight amenity	Hill Quays	None	n/a	Negligible (Permanent)
	Riverside Mews	None	n/a	Negligible (Permanent)
	The Rhine	None	n/a	Negligible (Permanent)
	The Nile	None	n/a	Negligible (Permanent)
	30 City Road East	None	n/a	Negligible (Permanent)
	14 Albion Wharf	None	n/a	Negligible (Permanent)
	The Hacienda	None	n/a	Negligible (Permanent)
	326-330 Deansgate	None	n/a	Negligible (Permanent)
	The Ropeworks	None	n/a	Negligible (Permanent)
	21 Little Peter Street	None	n/a	Negligible (Permanent)
	8-16 Bridgewater St	None	n/a	Negligible (Permanent)
	20 Southern St	None	n/a	Negligible (Permanent)
	18-12 Southern St	None	n/a	Negligible (Permanent)
	8-10 Southern St	None	n/a	Negligible (Permanent)
	Deansgate Quay	None	n/a	Negligible (Permanent)
	357-361 Deansgate	None	n/a	Negligible (Permanent)
	Ropeworks Apartments Block 1	None	n/a	Negligible (Permanent)
	Lumiere Building	None	n/a	Negligible (Permanent)
	The Danube	None	n/a	Negligible (Permanent)
	AXIS TOWER	None	n/a	Negligible (Permanent)
	Viadux - Phase 1	None	n/a	Negligible (Permanent)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
	Beetham Tower Residential	None	n/a	Negligible (Permanent)
	StayCity Aparthotel, Deansgate	None	n/a	Negligible (Permanent)
Adverse increase in shadow	Deansgate Locks Social Terrace	None	n/a	Negligible (Permanent)
	Canal and Towpath Area 1	None	n/a	Negligible (Permanent)
	Canal and Towpath Area 2	None	n/a	Negligible (Permanent)

Heritage

Construction Phase

Table 15.4 Significance of Construction Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Minor Adverse	Manchester South Junction and Altrincham Railway Viaduct (direct to structure and setting)	Construction methodology and programme	Construction methodology and programme	Minor Adverse (Temporary)
Minor Adverse	Castlefield Railway Viaduct (setting)	Construction methodology and programme	Construction methodology and programme	Minor Adverse (Temporary)
Minor Adverse	Rochdale Canal Lock Keepers Cottage (setting)	Construction methodology and programme	Construction methodology and programme	Minor Adverse (Temporary)
Minor Adverse	Deansgate Station (setting)	Construction methodology and programme	Construction methodology and programme	Minor Adverse (Temporary)

Operational Phase

Table 15.5 Significance of Operational Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Neutral	Manchester South Junction and Altrincham Railway Viaduct (direct to structure and setting)	n/a	n/a	Neutral (Permanent)
Neutral	Castlefield Railway Viaduct (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Rochdale Canal Lock Keepers Cottage (setting)	n/a	n/a	Neutral (Permanent)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Neutral	Deansgate Station (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Rochdale Canal Lock Number 91 (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Rochdale Canal Lock Number 90 (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Albion Wharf, 13-17 Albion Street (setting)	n/a	n/a	Neutral (Permanent)
Neutral	The Britons Protection Public House (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Manchester Central (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Former Congregational Chapel 9 (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Deansgate Goods Station and Attached Carriage Ramp	n/a	n/a	Neutral (Permanent)
Neutral	Midland Hotel (setting)	n/a	n/a	Neutral (Permanent)
Neutral	Castlefield Conservation Area (to the west end of Whitworth Street West	n/a	n/a	Neutral (Permanent)

Human Health

Construction Phase

Table 15.6 Significance of Construction Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Construction Phase				
Socioeconomics: Employment	Workers & local economy	N/A	N/A	Minor Beneficial Not Significant
TVIA	Workers & residents	Screening	CEMP	Range from minor neutral to one instance of moderate/major adverse (temporary) (view 7)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Noise & Vibration – demolition & construction; road traffic	Workers, nearby residents	Screening & working practices	CEMP following Best Practicable Means	Negligible
Vibration	Rochdale Canal	None	N/A	Negligible
Wind Microclimate	Passers by	Screening & practices to reduce nuisance wind	CEMP	Negligible

Operational Phase

Table 15.7 Significance of Operational Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Operational Phase				
Socioeconomics: Employment	Workers & local economy	N/A	N/A	Negligible
Socioeconomics: LA income	MCC rates & tax	N/A	N/A	Minor Beneficial (Not Significant)
Socioeconomics: Healthcare	Residents	N/A	N/A	Negligible
Socioeconomics: educational	Residents	N/A	N/A	Negligible – Minor Adverse (Not Significant)
Socioeconomics: Open Space & Amenity	Residents & visitors	N/A	N/A	Negligible
Housing	Residents	N/A	N/A	Moderate Beneficial
Townscape Character	Residents & visitors	N/A	N/A	Minor beneficial (3) Neutral (1) Minor Adverse (1)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Views	Residents & visitors	N/A	N/A	Neutral (6) Minor / Moderate Adverse (5) Moderate / Major Adverse (1)
Noise – building plant	Nearby residents	Typical plant noise controls	Planning conditions	Negligible
Noise – environmental & entertainment	Residents	Triple glazing and façade linings. Noise emission reduction measures applied to Rebellion	Planning conditions	Negligible
Noise – overheating control	Residents	Design measures to control duration of vent panel openings	Design	Negligible
Railway Vibration and Ground-borne Noise	Residents	N/A	N/A	None
Daylight, Sunlight & Overshadowing	Residents & visitors; amenity space	N/A	N/A	Negligible to Minor - Not Significant
Solar Glare	Nearby road users & train/tram drivers	Glazing Specifications should be low reflectance to areas of elevations specified	Planning condition	Minor to Moderate Adverse
Wind Microclimate	Residents, visitors	N/A	N/A	Negligible – Minor Adverse Not Significant
Climate Change – greenhouse gas emissions	Embodied carbon & operational energy	Specifying materials with lower Embodied Carbon emissions & installing energy efficient technology	Whole-life carbon assessments, material assessments and option appraisals	Minor Adverse – Not Significant

Noise and Vibration

Construction Phase

Table 15.8 Significance of Construction Phase Effects

Likely Significant Effect	Receptors	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Demolition and Construction Noise	SR A, B, C, D	Adoption of a CEMP following Best Practicable Means	Approval of CEMP submitted with the Application by MCC	Negligible – Not Significant
Demolition and Construction Vibration	SR A, B, C, D, E	Adoption of a CEMP following Best Practicable Means	Approval of CEMP submitted with the Application by MCC	Neutral – Not Significant
Demolition and Construction Traffic Noise	Demolition and construction road traffic noise receptors (Figure 10.2)	Adoption of a CEMP including a Construction Logistics Plan	Approval of CEMP submitted with the Application by MCC	Negligible – Not Significant

Operational Phase

Table 15.9 Significance of Operational Phase Effects

Likely Significant Effect	Receptors)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Building Services Plant Noise	SR A, B, C, D	Typical plant noise controls designed to achieve the plant noise limits.	Planning condition set to achieve the standard MCC plant noise limits identified.	Negligible – Not Significant
Environmental and Entertainment Noise Ingress	Proposed Development	Triple glazing and façade linings. Noise emission reduction measures applied to Rebellion.	Planning conditions set to achieve by design the standard MCC environmental and entertainment noise limits.	Negligible – Not Significant
Overheating Control Noise Ingress	Proposed Development	Design measures to control duration of vent panel openings.	Good design practice.	Negligible – Not Significant
Railway Vibration and Ground-borne Noise Ingress	Proposed Development	None	N/A	Negligible – Not Significant

Socio-Economic

Construction Phase

Table 15.10 Significance of Construction Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Change in employment during the construction stage	Individuals seeking construction employment	N/A	N/A	Direct, temporary (short term), Minor Beneficial (not significant)
Change in economic performance (GVA)	The local economy	N/A	N/A	Direct, temporary (short term), Minor Beneficial (not significant)

Operational Phase

Table 15.11 Significance of Operational Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Change in direct operational employment and change in economic performance (GVA and spend)	Individuals seeking employment and the local economy	N/A	N/A	Direct, long term, Negligible (not significant)
Change in annual fiscal contributions in the form of business rates and council tax contributions	Manchester City Council total business rates and council tax revenue and GMCA business rates precept revenue	N/A	N/A	Direct, long term, Minor Beneficial (not significant)
Change in demand for healthcare facilities (GP services and dentists) resulting from the uplift in population	Primary healthcare facilities	N/A	N/A	Direct, long term, Negligible (not significant)
Change in demand for early years and primary school places resulting from the uplift in population	Primary education and early years facilities	N/A	N/A	Direct, long term, Minor Adverse (not significant)
Change in demand for secondary school places resulting from the uplift in population	Secondary education facilities	N/A	N/A	Direct, long term, Negligible (not significant)
Change in demand for the use of	Users of open/amenity space	N/A	N/A	Direct, long term, Negligible (not significant)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
existing open space and amenity space and children's play space within close proximity to the Site.	and children's play space			

Solar Glare

Construction Phase

15.5. The likely effects in relation to solar glare for the surrounding road users and train/tram drivers would vary throughout the demolition and construction works, starting from installation of the first glazed façade panels and gradually increasing as all reflective cladding is installed. Once the glazed façade elements have been installed, the potential solar glare effects would be similar to those once the Proposed Development is complete and operational therefore the overall effect in terms of solar glare would range from being temporary negligible effects during demolition, then gradually changing to post mitigation residual effects of negligible to permanent, moderate adverse and significant, once the Proposed Development is complete.

Operational Phase

Table 15.12 Significance of Operational Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Negligible or Minor adverse and not significant effects on Solar Glare	Road users at nearby road junctions	Embedded in the design, no further mitigation needed.	N/A	Negligible or Minor adverse and not significant effects on Solar Glare
	Train/Tram Drivers on nearby tracks			
Minor to Moderate adverse and significant effects on Solar Glare	Road users at Collier Street Car Park pedestrian crossing (CSCP)	Para 10. 89: Proposed Glazing Specifications should be low reflectance to areas of elevations specified, as required by further detailed testing.	Planning Condition	Minor to moderate adverse and significant effects on Solar Glare
	Tram Drivers travelling Eastbound (Tram 4-6)			Minor adverse and not significant effects on Solar Glare
	Train Drivers travelling Eastbound (Rail 3,4,7)			Minor adverse and not significant effects on Solar Glare
Moderate adverse and significant effects on Solar Glare	Train Drivers travelling Westbound (Rail 1-2)			Moderate adverse and significant effects on Solar Glare
	Train Drivers travelling Eastbound (Rail 3-6)			Moderate adverse and significant effects on Solar Glare

Townscape and Visual Impact

Construction Phase

Table 15.13 Significance of Construction Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Minor – moderate/adverse	Townscape Receptors	none	n/a	Minor – minor/moderate adverse (temporary) (not significant)
Minor neutral – one instance of moderate/major adverse (View 7)	Views	None	n/a	Minor neutral – one instance of moderate/major adverse (View 7) (permanent) (significant)

Operational Phase

Table 15.14 Significance of Operational Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Minor/moderate beneficial – minor adverse	Townscape receptors	none	n/a	Minor/moderate beneficial – minor adverse (permanent) (not significant)
Minor neutral – one instance of moderate / major adverse (View 7)	Views	Architectural design and materials palette reflects local vernacular	Responsibility of building contractor	Minor neutral – one instance of moderate / major adverse (View 7) (permanent) (significant)

Wind

Construction Phase

Table 15.15 Significance of Construction Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Negligible effects on wind microclimate	General Thoroughfares	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Roadways	None	N/A	Negligible temporary effects on wind microclimate

Negligible effects on wind microclimate	Off-Site Building Entrances	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Bus Stops	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Railway Platforms	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Tram Stop Platforms	None	N/A	Negligible temporary effects on wind microclimate
Negligible effects on wind microclimate	Existing Off-Site Ground Level Amenity	None	N/A	Negligible temporary effects on wind microclimate

Operational Phase

Table 15.16 Significance of Operational Phase Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Negligible effects on wind microclimate	General Thoroughfares	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Roadways	None	N/A	Negligible permanent effects on wind microclimate
Minor Beneficial effects on wind microclimate	Building Entrances to the Proposed Development	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Off-Site Building Entrances	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Bus Stops	None	N/A	Negligible permanent effects on wind microclimate
Negligible to Minor Adverse effects on wind microclimate	Railway Platforms	None	N/A	Negligible to Minor Adverse permanent effects on wind microclimate
Negligible effects on wind microclimate	Tram Stop Platforms	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Existing Off-Site Ground Level Amenity	None	N/A	Negligible permanent effects on wind microclimate
Negligible effects on wind microclimate	Proposed Ground Level Amenity	None	N/A	Negligible permanent effects on wind microclimate

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Negligible effects on wind microclimate	Proposed Level 2 Terrace	None	N/A	Negligible permanent effects on wind microclimate

Planning Conditions or Obligations

15.6. The above includes reference to a mitigation measures that will be required to be secured on any subsequent planning approval. To further assist, the below provides a summary of potential mechanisms to secure the proposed mitigation measures identified as part of the ES.

15.7. Where inherent mitigation is included in the design of the Proposed Development, and as such will be included as the proposals, it is anticipated that suitably worded planning conditions requiring the Proposed Development to be constructed in accordance with the approved plans or details would be appropriate.

15.8. A suitably worded planning condition could be appropriate to secure the submission of a Construction Management Plan(s) for the construction phase of the Proposed Development in line with Chapters 2, 5, 10, and 13 of the ES.

15.9. It has been anticipated that suitably worded planning conditions may be required where necessary in relation to the following measures:

15.10. Chapter 6 (Climate Change) – Optimising material usage, specification of lower Embodied Carbon materials and/or where possible materials with high recycled content and longer services lives;

15.11. Chapter 6 (Climate Change) - Through Whole-life carbon assessments, material assessments and option appraisals across phases of the Proposed Development;

15.12. Chapter 6 (Climate Change) - Utilising the Mainer Associates Embodied Carbon Work Package Procurement Mitigation Strategy to ensure that Embodied Carbon limits are developed, set and adhered to throughout the project phases;

- Chapter 6 (Climate Change) - Installing energy efficient technology across the site and ensuring Low/Zero Carbon technologies are installed where possible;
- Chapter 6 (Climate Change) - Further developing the projects Energy designs in line with the Energy hierarchy to further lower the operational energy emissions of the development;
- Chapter 6 (Climate Change) - Undertake more specific Low/Zero Carbon technology appraisal for the development;

15.13. Chapter 8 (Heritage) – Construction methodology and Programme;

- Chapter 10 (Noise and Vibration)– Noise mitigation measures to control ingress to future apartments;
- Chapter 10 (Noise and Vibration)– typical plant noise controls;
- Chapter 10 (Noise and Vibration)– Design measures to control duration of vent panel openings;
- Chapter 12 (Solar Glare) – Glazing Specifications should be low reflectance to areas of elevations specified;
- Chapter 13 (TVIA) - Architectural design and materials palette reflects local vernacular.
- Mitigation identified in Chapter 9 (Human Health) are identified above.

16. Type 1 Cumulative Effects

Introduction

16.1. This Chapter gives consideration to 'Type 1' cumulative effects. The assessment is informed by the results of the technical assessments as set out in Chapters 6 to 14 inclusive of the ES.

16.2. Type 1 cumulative effects are also known as 'inter-project' effects, which are the combined effects arising from the Proposed Development upon a set of defined sensitive receptors.

16.3. Type 2 cumulative effects are considered within the ES technical chapters. The technical chapters also had regard to the potential for Type 1 cumulative effects, however for robustness the results of a standalone assessment of these is provided below.

Legislation Policy and Guidance

Legislation

16.4. There is no legislation outlining how cumulative effects should be assessed or determined as significant. However, there is a requirement in Part 1, Schedule 4 of the EIA Regulations to consider cumulative effects. Cumulative is not defined in the EIA Directive or Regulations however a dictionary definition is 'increasing by one addition after another'.

16.5. The EIA Regulations require 'a description of the likely significant effects', including cumulative effects.

16.6. In the context of this assessment, 'cumulative effects' refers to the interactions between different likely residual effects resulting from the Proposed Development (Type 1). Both positive and negative effects are considered across the construction and operational phases.

Policy

16.7. As this Chapter considers the cumulative effects of the technical areas within the ES, all relevant policy has already been reviewed within the individual technical chapters.

Guidance

16.8. A number of guidance documents which relate to assessing cumulative effects have been used to inform the assessment and include:

- European Commission (EC) Environment DG (May 1999), 'Study on the Assessment of Indirect and Cumulative Impacts as well as Impact Interaction', Hyder Consulting; and
- Institute of Environmental Management and Assessment (1992), Guidelines for the Environmental Assessment of Road Traffic.

16.9. The EC guidelines 'are not intended to be formal or prescriptive, but are designed to assist EIA practitioners in developing an approach which is appropriate to a project'.

16.10. Paragraph 24 of the National Planning Practice Guidance (NPPG) (Reference ID: 4-024-20170728) outlines the consideration to be given to cumulative effects in the context of EIA:

"Each application (or request for a screening opinion) should be considered on its own merits. There are occasions, however, when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a Proposed Development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development."

Assessment Methodology and Significance Criteria

Methodology

16.11. This assessment is primarily concerned with where there is a likelihood of significant Type 1 cumulative effects occurring, in accordance with EIA practice and the NPPG guidance.

16.12. The assessment is based on experience and professional judgement, drawing upon relevant guidance set out above and the residual environmental effects identified within the results of the EIA technical assessments. The assessment has been undertaken by suitably qualified and experienced EIA practitioners.

16.13. The assessment has primarily focused on sensitive receptors identified within close proximity to the Site (e.g. local residents and businesses located in close proximity to the Site), likely cumulative effects, and their capacity to accommodate changes that will occur as a result of the combined residual environmental effects.

16.14. Relevant guidance has been reviewed, and an approach has been developed which uses the residual environmental effects identified within the ES. An exercise which tabulates the residual effects against receptors or receptor groups has then been carried out in order to identify the potential for Type 1 cumulative effects.

16.15. Negligible or neutral residual effects have been excluded from the assessment as, by their nature, they are considered to be imperceptible. Therefore, only minor, moderate or major effects have been given consideration during the assessment.

16.16. For the purposes of the assessment, receptor groups have been identified as those surrounding the Site and those identified within the individual technical assessments.

Significance Criteria

16.17. The following terms have been used to define the significance of the effects identified:

16.18. Major effect: where the Proposed Development could be expected to have a very significant effect (either positive or negative) cumulatively;

- Moderate effect: where the Proposed Development could be expected to have a noticeable effect (either positive or negative) cumulatively;
- Minor effect: where the Proposed Development could be expected to result in a small, barely noticeable effect (either positive or negative) cumulatively; and
- Negligible: where no discernible effect is expected as a result of the Proposed Development cumulatively.

16.19. The significance level attributed to each effect has been assessed based on the magnitude of change due to the combination of residual effects and the sensitivity of the affected receptor/receiving environment to change, as outlined in Chapter 2 of the ES. Magnitude of change is assessed on a scale of major, moderate, minor and negligible and the sensitivity of the affected receptor/receiving environment is assessed on a scale of high, medium, low and negligible.

Limitations and Assumptions

16.20. Due to the reliance on qualitative data and subjective opinion, there are limitations related to the range and depth in which the cumulative effects have been investigated. It must be realised that analysing the cumulative effects of developments is often speculative and cannot be predicted as clearly as individual effects such as the effects upon traffic of a development, which relies heavily upon quantitative data to inform the assessment.

16.21. As a result, a number of assumptions have been made throughout in terms of the outcome of the accumulation of effects and based upon professional judgement. This section and the assessment process of identifying the likely significant Type 1 cumulative effects have, however, provided a reasoned consideration of and insight into the potentially significant Type 1 cumulative effects of the Proposed Development.

Identification of Likely Significant Type 1 Cumulative Effects

Construction Phase

16.22. Based on the methodology detailed above, Table 16.1 presents the results of the review of the potential for interactions of individual effects during the construction phase of development. The potential effect interactions are then discussed further.

Table 16.1; Type 1 Cumulative Effects Construction Phase

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Cumulative Effects
Humans	Socio-economic – positive change in employment during the construction stage to increase expendable income	Minor beneficial (Not significant) Temporary and Short-Term
The Economy	Socio-Economic: Job creation and supply chain leading to increase in tax revenues and GVA	Minor beneficial (Not significant) Temporary and Short-Term
Views, Visual Setting Townscape	TVIA: Adverse effects on visual setting during the construction period.	Minor/moderate adverse (significant) of impact on the townscape and visual receptors
Historic Environment	Heritage above ground: physical impact on the surrounding heritage assets – namely: Direct impact to the the structure and setting of the Manchester South Junction and Altrincham Railway Viaduct; Impact to the setting of the Castlefield Railway; Impact to the setting of Rochdate Cnaal Lock Keepers Cottage; Impact to the setting of Deansgate Station.	Minor adverse (Temporary)
The climate	Climate change: Embodied CO2eq emissions affecting contributions to the carbon budgets during the construction phase.	Minor adverse

16.23. Table 16.1 shows that there is unlikely to be in-combination operational phase Type 1 cumulative effects to arise. This is due to the extensive technical assessments throughout the design process and the identified mitigation in-built into the design.

Operational Phase

16.24. Based on the methodology detailed above, Table 16.2 presents the results of the review of the potential for interactions of individual effects during the operational phase of development. The potential effect interactions are then discussed further.

Table 16.2: Type 1 Cumulative Effects – Operational Phase

Sensitive Receptor Group	Operational Phase Residual Effects	Likely Significant Cumulative Effects
Humans	Daylight, Sunlight and overshadowing: Adverse reduction in daylight amenity at 11 local receptors. Solar Glare: Adverse effects on Solar Glare for road users at nearby road junctions and Train/Tram Drivers on nearby tracks Townscape and built heritage: well-being through the enjoyment of townscape and heritage assets.	Minor-moderate adverse
Local Highways, Public Transport	Solar Glare: Adverse effects on Solar Glare for road users at nearby road junctions and Train/Tram Drivers on nearby tracks causing a risk to drivers and users of the road network	Minor-moderate adverse
The economy	Socio-economic: Change in direct operational employment and change in economic performance (GVA and spend) Change in annual fiscal contributions in the form of business rates and council tax contributions Housing: Further housing provision within the city centre to meet demand.	Minor-moderate beneficial
The climate	Climate Change: Embodied CO2eq emissions affecting contributions to the carbon budgets during the in-use phase of the project. Operational CO2eq emissions affecting climate change during the operational energy consumption.	Moderate adverse
Local Healthcare and Education Facilities	Socio-Economic: Change in demand for early years and primary school places arising from the uplift in population.	Minor adverse
Views, Visual Setting, Heritage and Townscape	TVIA: Visual impact on identified views.	Moderate adverse

16.25. Table 16.2 shows that there is unlikely to be in-combination operational phase Type 1 cumulative effects to arise. This is due to the extensive technical assessments throughout the design process and the identified mitigation in-built into the design.

Mitigation Measures

16.26. Where relevant, the individual residual effects which contribute to the potential cumulation have been considered within the ES and mitigated where necessary and feasible.

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