Deloitte.

Block C, Plot 11, First Street
Environmental Statement: Volume 1

January 2024

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1. Introduction

Introduction

1.1 This Environmental Statement ('ES') has been prepared in support of a Full Planning Application submitted on behalf of Downing Living (Manchester South) Limited Partnership Incorporated (hereinafter 'Downing') (the 'Applicant') to Manchester City Council ('MCC') as the Local Planning Authority ('LPA').

The Site

1.2 The Site, is shown in Appendix 1.1, comprises a parcel of vacant land, which has historically been used as surface level car parking. There is landscaping along the southern and western boundaries of the Site.

1.3 The Site is located within Manchester City Centre, and the Regional Centre. The Site and its immediate surrounding area have been a regeneration priority for Manchester City Council for over a decade, and the Site forms part of the *"First Street Development Framework (FSDF)"*.

1.4 The Site is bound to the north and northeast by land that is currently being redeveloped to deliver a co-living scheme of up to 45 storeys (pursuant to Planning Permission Ref. 125573/FO/2019); to the east by Newcastle Street (beyond which is surface level car parking and two PBSA developments operated by Unite (Parkway Gate and New Medlock House); to the south by Mancunian Way; and to the east by Medlock Street.

1.5 Planning Permission Ref. 125573/FO/2019, as approved in March 2021, was for the phased redevelopment of Plot 11 (three phases, A, B and C), to deliver a co-living development of up to 45 storeys. This Site formed part of Phase C and was anticipated to deliver a co-living building of up to 17 storeys, comprising 322 bedspaces as well as communal facilities. Construction works in relation to Phases A and B are underway, with Phase A (Building D) expected to be completed in March 2025, and Phase B (Buildings A/B) expected to be completed in August 2024. No works in relation to Phase C have commenced.

1.6 Further details of the Site are set out in Chapter 3 of this Environmental Statement.

The Proposals

1.7 The description of the Proposed Development as detailed within the Application form is as follows:

"Erection of a 28-storey (+ ground) building comprising purpose-built student accommodation (Sui Generis) and other associated works including public realm, secure cycle parking and servicing arrangements."

1.8 Further details on the proposals are set out in Chapter 3 of this Environmental Statement.

Requirements for EIA

1.9 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.

1.10 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, so as to identify the likely significant effects on the environment. Broadly, the assessment compares the existing situation at the start of the work (baseline), with the situation during construction, and when the Proposed Development is operational.

1.11 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (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 (EIA Regulation Schedule 3).

1.12 The Proposed Development is considered to fall under the category of 'urban development projects' (EIA Regulations Schedule 2, 10, (b) (ii)), as the development includes more than 150 dwellings.

1.13 The indicative thresholds and criteria state that: *"In addition to the physical scale of such developments, consideration should be given to the potential increase in traffic, emissions and noise. EIA is unlikely to be required for the redevelopment of land unless the new development is on a significantly greater scale than the previous use, or the types of impact are of a markedly different nature or there is a high level of contamination".*

1.14 A formal EIA scoping request was submitted to Manchester City Council on 3 November 2023 requesting formal confirmation of the proposed scope of the Environmental Impact Assessment required in respect of the Proposed Development.

1.15 The Scoping Opinion was received on 03 January 2024, and is included at Appendix 2.3.

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

- A description of the development, including in particular *(included in 'Site, Surroundings and Description of Proposals' chapter)*:
    a) a description of the location of the development;
    b) a description of the physical characteristics of the whole development, including, where relevant, demolition works, and the land-use requirements during the construction and operational phases;
    c) a description of the main characteristics of the operational phase of the development; and,
    d) an estimate, by type and quantity, of expected residues and emissions during the construction and operation phases.
- A description of the reasonable alternatives studied, 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 *(included in 'Alternatives and Design evolution' chapter)*.
- A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the

development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge *(included in the 'Site, Surroundings and Description of Proposals' and relevant technical chapters)*.

- A description of the factors specified in regulation 4(2) of the EIA Regulations likely to be significantly affected by the development *(included in the relevant technical chapters)*.

- Where relevant, a description of the likely significant effects of the development on the environment resulting from, inter alia *(included in the relevant technical chapters)*:

    a) the construction and existence of the development, including, where relevant, demolition works;

    b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;

    c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

    d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

    e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

    f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; and,

    g) the technologies and the substances used.

- A description of the likely significant effects on the factors specified in regulation 4(2) of the EIA Regulations that covers the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development *(included in the relevant technical chapters and the 'type 1 cumulative impacts' chapter)*.

- A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved *(included in the relevant technical chapters)*.

- A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis) *(included in the relevant technical chapters and the 'residual impacts' chapter)*.

- A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents

and/or disasters which are relevant to the project concerned *(included in the relevant technical chapters)*.

- A non-technical summary of the information *(See Volume 3: Non-Technical Summary)*.
- A reference list detailing the sources used for the descriptions and assessments included *(included at the end of each chapter)*.

Project Team

1.17 This ES has been prepared by Deloitte, with technical input from the Consultants. Table 1.1 sets out the parties responsible for the technical content within Chapter 6-16 of this ES. Further details for each technical consultant (including their qualifications) can be found within the introduction of each respective technical chapter of the ES.

Table 1.1: EIA Technical Team

Expertise	Consultant
EIA Coordination and Town Planning	Deloitte LLP
Architecture and Design	Simpson Haugh
Air Quality	RPS
Construction Management	Downing Construction
Climate Change	Ramboll
Human Health	Enfusion
Noise and Vibration	Acoustic Engineering Consultants Ltd.
Socio-Economic Issues	Ekosgen
Sunlight, Daylight, Overshadowing and Solar Glare	GIA
Townscape and Visual Impact	OPEN
Wind Microclimate	Architectural Aerodynamics
Ground Conditions	GRM

Organisation of the Environmental Statement

1.18 This ES comprises 16 chapters and is supported by figures (located at the back of 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 (Volume 3).

1.19 Figures have been referenced using the chapter numbers 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 constrained separately in Volume 2.

1.20 Table 1.2 sets out the structure of the ES[1]:

[1] *Although we have read the Consultants' reports for consistency and provide our observations based on our knowledge and experience, we accept no liability or responsibility for the Consultants' Reports and the technical content within Chapters 6-13 of this ES.*

Table 1.2: ES Structure

Chapter	Chapter Title	Description
Volume 1: Main chapters and supporting figures		
1.	Introduction	Introduction to the ES, EIA requirements, details of project team, ES organisation and availability.
2.	EIA Methodology	Methods used to prepare each chapter, description of ES structure and content, generic significance criteria, scoping and consultation.
3	Site, Surroundings and Description of Proposals	Site description and details of the Proposed Development.
	Alternatives and Design Evolution	Outline of the main alternatives considered by the Applicant.
5.	Construction Phasing and Methodology	Description of the construction and operational phase of the project and an outline of the construction programme.
6	Air Quality	To assess the potential air quality impacts associated with the Proposed Development due to changes in traffic flows, construction etc. It also includes a cumulative assessment of impacts.
7	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 impact of this contribution towards climate change. Mitigation measures required to minimise the contribution towards climate change.
8	Human Health	To assess the likely significant effects of the Proposed Development on human health.
9	Noise and Vibration	To assess the likely significant effects of the Proposed Development in relation to noise and vibration.
10	Socio-Economic	To assess the likely socio-economic impacts of the Proposed Development upon the Site and surrounding area.
11	Daylight, Sunlight, Overshadowing and Solar Glare	To assess the impact of the Proposed Development upon levels of daylight and sunlight, enjoyed by neighbouring residential uses. To assess impacts upon overshadowing and solar glare.
12	Townscape and Visual Impact	To assess the likely significant effects of the Proposed Development in relation to townscape and visual impact.
13	Wind Microclimate	To assess the likely significant effects of the Proposed Development in relation to environmental wind.
14	Ground Conditions	To assess the likely significant effects of the Proposed Development in relation to contamination.
15	Residual Impacts	Summary of the effects that remain after mitigation.
16	Type 1 Cumulative Effects	Assessment of effects and interaction of effects.
Volume 2: Technical Appendices • Appendix 1.1: Site Location Plan • Appendix 2.1: ES Scoping Report • Appendix 2.2: Committed and Cumulative Development Schedule • Appendix 2.3: Scoping Opinion • Appendix 5.1: Construction Management Plan • Appendix 5.2: Tender Programme • Appendix 5.3: Details of First Street Developer and Contractor Forum • Appendix 6.1: Air Quality Assessment Methodology		

Chapter	Chapter Title	Description
		• Appendix 6.2: Air Quality Mitigation • Appendix 6.3: Air Quality Model Verification • Appendix 7.1: Climate Change Resilience Assessment • Appendix 7.2: In-Combination Climate Change Impact Assessment • Appendix 7.3: Whole Life Carbon Assessment • Appendix 9.1: Noise Measurement Procedure and Noise Level Data • Appendix 11.1: Drawings of the Baseline and Proposed Scenarios (Sunlight, Daylight, Overshadowing and Solar Glare) • Appendix 11.2: Daylight and Sunlight Analysis Results • Appendix 11.3: Overshadowing Analysis Results • Appendix 11.4: Solar Glare Assessment Appendix 13.1: Wind Microclimate Report
Volume 3: Non-Technical Summary		

Other Documents

1.21 Together with the ES, the following documents in Table 1.3 are submitted to MCC in support of the Proposed Development.

Table 1.3: List of Documentation submitted with the Planning Application

Document	Author
Application Site Boundary and Location Plan	Simpson Haugh
Existing and Proposed Site plans, sections, and elevations (including drawing schedule)	Simpson Haugh
Landscape Strategy and Drawings	Open
Accommodation Schedule (in Design and Access Statement)	Simpson Haugh
Arboricultural Impact Assessment	Urban Green
Design and Access Statement	Simpson Haugh
Broadband Connectivity Assessment	Pager Power
Crime Impact Statement	Greater Manchester Police: Design for Security
Student Management Strategy	Downing
Ecological Extended Phase 1 Desktop	Penny Anderson Associates
Energy Statement and Environmental Standards Statement	Element
BREEAM Pre-Assessment	Element
Flood Risk and Drainage Strategy	AJP
Gateway One Fire Statement	Design Fire Consultants

Document	Author
Local Labour Benefit – Statement of Intent	Downing
Statement of Consultation	Deloitte
TV Reception Survey	Pager Power
Transport Statement	Sanderson Consult
Travel Plan	Sanderson Consult
Mechanical and Ventilation Statement	Abacus
Waste Management and Servicing Strategy (including MCC's Waste Pro-Forma)	Sanderson Consult
Heritage Statement	Deloitte

Environmental Statement Availability

1.22 The ES is available for public viewing on MCC's Public Access website at the following address: http://pa.manchester.gov.uk/online-applications/ once the application has been submitted and validated.

1.23 The ES may be purchased in volumes, the costs of 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 Electronic Copy (Volumes 1, 2 and 3) of the ES - £15

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

Block C, Plot 11, First Street South Team – Planning and EIA

Deloitte LLP

The Hanover Building,

Corporation Street

Manchester

M4 4AH

Updates to the ES in January 2024

1.25 In accordance with the requirements of the EIA Regulations and related case law, a comprehensive revision and update to the original ES has been undertaken. Each chapter of this ES has been reviewed and updated in consideration of the following matters:

- Receipt of EIA Scoping Opinion from MCC, including the following requested changes:

- Updates to paragraph references following update to the National Planning Policy Framework in December 2023;
- Consideration of Plot 10a and 10b, First Street as cumulative rather than committed development;
- Scoping in of Ground Conditions as a standalone Chapter (Chapter 14); and,
- Clear identification of respective scenario for each table and appendix title, within each consultant chapter

1.26 For clarity and completeness and to avoid a paper trail, rather than prepare an addendum to the Block C ES, a full update has been undertaken. This ES replaces the previously submitted ES in its entirety. This ensures that adequate information is available and before MCC to assess the potential for likely significant environmental effects as a result of the Proposed Development.

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.

2.2 It is accompanied by the following technical appendices:

- Appendix 2.1: ES Scoping Report
- Appendix 2.2: Committed Developments
- Appendix 2.3: Scoping Opinion

Legislation and Guidance

2.3 The ES has been prepared to comply with the EIA Regulations.

2.4 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.htm
    - 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)

2.5 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)

2.6 The ES has also had regard to the National Planning Policy Framework 2023 (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.

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

- Manchester City Council Core Strategy (2012)
- Saved Unitary Development Plan Policies (1995)

2.8 Any additional planning policy or guidance documents considered relevant to specific disciplines have been identified within the relevant technical chapters.

Screening, Scoping and Consultation

2.9 An EIA Scoping Opinion Request was issued to Manchester City Council ('MCC') on 3 November 2023. A Scoping Opinion was received on 3 January 2024. As part of this process, the following disciplines were found to not give rise to likely significant effects on the environment and would therefore not require inclusion in the ES:

- Agricultural Circumstances - The Site is entirely on brownfield land so there would be no effects with respect to agriculture.
- Archaeology - Greater Manchester Archaeological Advisory Service (GMAAS) has confirmed that archaeological interest in the site had been removed by virtue of previous archaeological investigations and that no further archaeological works are required at Plot 11.
- Aviation - It is considered, from professional experience of similar scale developments within this area of MCC, and based on conclusions reached with regards to the 2021 Planning Permission (which comprised up to 45 storeys), that the Proposed Development will not give rise to aviation conflicts which cannot be resolved via appropriate mitigation to avoid any residual impacts arising.
- Ecology and Nature Conservation - Based on existing surveys and assessments undertaken in 2019, it is considered that the potential significant impacts on ecology and nature conservation can be scoped out of the EIA. A standalone Phase 1 Habitat Survey (alongside a Biodiversity Net Gain Assessment) will be submitted as part of the planning application.
- Transport - The 2019 EIA Screening and Scoping Report (submitted in relation to the 2021 Planning Permission) referenced the findings from the 2016 ES, and scoped out Transport for the ES associated with the 2021 Planning Permission. The current PBSA proposals on the Site are commensurate with the consented use, in transport terms. A standalone Transport Statement is submitted in support of the Application.
- TV Reception - It is not standard practice to include the potential impact of this type of development on television reception.
- Built Heritage - The impact of the proposals on the significance of the identified heritage assets is likely to be negligible to low and therefore this discipline has been scoped out of the EIA. However, a tightly scoped Heritage Assessment proportionate to the limited potential impact of the Proposed Development has been prepared.
- Water Resources - The Site comprises less than 1ha (with a site area 0.23 ha), and is located within Flood Zone 1. This means that the chance of flooding is less than 0.1% (or 1 in 1000). On the basis that the Site is located within a Critical Drainage Area, the Application is supported by a Sustainable Drainage Strategy.

2.10 Further information detailing why each of these technical topics were scoped out of the EIA process can be found in Appendix 2.1.

Approach to Technical Studies

2.11 Various technical studies were commenced at an early stage in the development process. The findings of the baseline environmental studies have 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 Design 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 design team was fully aware of the environmental constraints and opportunities and of the interactions between disciplines. Meetings were also held with MCC as the Local Planning Authority as well as pre-application discussions with technical consultees as demonstrated within the Statement of Consultation and the EIA Scoping Report.

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 3.

Structure of Technical Chapters

2.16 Each technical chapter of the ES (Chapters 6-14) has been set out broadly in line with Table 2.1; any variation from this structure is explained within the chapter. For all chapters, consideration has been given to the effects of the Proposed Development, and to the combined effect of the Proposed Development as a whole (see reference to scenarios tested below).

Table 2.1: Structure of ES Technical Chapters

Technical Chapter Structure	
Introduction	Each of the technical chapters begins with an introduction providing context to the EIA completed.
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.
Assumptions and Limitations	This section describes any assumptions and limitations which have been made that are relevant to the environmental disciplines.
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

Technical Chapter Structure	
	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 Key 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.
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.
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. These are addressed in Chapter 15. • Type 2 - Cumulative effects are those that arise from incremental changes caused by other existing or approved ('committed developments') projects together with the Proposed Development.
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.
Summary	Each technical chapter concludes with a brief summary outlining the potential residual effects of the Proposed Development.

2.17 Chapter 5 provides information to allow the construction phase of the Proposed Development to be assessed by the disciplines set out in Chapters 6-14.

Assessment and Evaluation of Significant Effects

2.18 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.

Magnitude

2.19 The methodology for determining the scale, or magnitude of effect as set out in Table 2.2. Where magnitude of effect is different for any specific discipline, this is explained within the relevant chapter.

Table 2.2: Methodology for Assessing Magnitude

Magnitude of Impact	Criteria for Assessing Effect
Major	Total loss or major/substantial alteration to key elements/features of the baseline 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 predevelopment circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

Sensitivity

2.20 The sensitivity of a receptor is based upon the relative importance of the receptor using the scale in Table 2.3.

Table 2.3: 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.
Medium	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 local importance

Significance

2.21 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. Table 2.4 below shows how magnitude and sensitivity interact to derive effect significance.

Table 2.4: Methodology for Assessing Significance

Magnitude	Sensitivity		
	High	Medium	Low
Major	Major *	Major *	Moderate *
Moderate	Major *	Moderate *	Minor
Minor	Moderate *	Minor	Negligible
Negligible	Minor	Negligible	Negligible

2.22 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'.

2.23 The asterisk denotes sensitivity that is generally significant – those without an asterisk are considered to not have an impact that is classed as significant. Effects that are considered to be significant in EIA terms can vary between disciplines and any discrepancies between technical disciplines will be clearly outlined in any chapters included in the EIA.

Baseline Conditions

2.24 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. Given the complex nature of the Site and surroundings, each technical chapter (Chapters 6-14) includes a clear description of what is assumed as the baseline against which the assessment is being made.

2.25 Blocks A, B and D of the Plot 11 First Street development, which are situated in close proximity to the Site, were approved on 9 March 2021 under Planning Permission Ref. 125573/FO/2019 (as amended) as standalone development phases. Planning Permission Ref. 125573/FO/2019 (as amended) has been implemented and Blocks A, B and D are at an advanced stage of construction to be practically completed in advance of works commencing in relation to the Proposed Development. As such, Blocks A, B and D have been treated for the purposes of this Environmental Statement as part of the existing baseline and are assumed to be completed and operational. Please note that whilst some technical chapters may make some qualitative comparisons between the Proposed Development and Block C as approved under Planning Permission Ref. 125573/FO/2019 (as amended), these are contextual comparisons and do not directly inform the environmental assessments for the purpose of the EIA.

2.26 Other relevant committed developments (i.e. developments that have implemented planning permissions under construction), within the surrounding area, have also been included within the existing baseline for the purposes of the Environmental Statement. There is no agreed / standard threshold for selecting such committed developments; therefore, a professional judgement has been taken regarding which schemes to treat as part of the existing baseline for the purposes of the Environmental Statement, taking into consideration, among other things, the scale of the Proposed Development whilst also considering the high-density city centre location.

2.27 Committed developments, which have been treated as forming part of the existing baseline, are highlighted at Appendix 2.2, and can be summarised as follows:

- Plot 9a, First Street (132600/FO/2021)
- First Street South (Plots A, B and D only) (125573/FO/2019)
- Metropolitan University Science and Engineering Building (125799/FO/2019)
- Barclay House (118033/P3OPA/2017)
- Havelock (129081/FO/2021)
- Viadux (115871/FO/2017)
- Staycity Deansgate (125804/FO/2019)
- The Blade and Three60 (126668/FO/2020)
- Plot 10a, First Street (136043/FO/2023)
- Plot 10b, First Street (136170/FO/2023)
- Great Jackson Plot F (132199/FO/2021)
- Vision (111003/FO/2016/C1)
- Deansgate South (129406/FO/2021)

2.28 Plot 10a had been included within the existing baseline as a *"committed development".* However, we now understand that whilst all pre-commencement conditions have been discharged, and the consent could therefore be implemented at any moment, the consent has not yet been implemented. In consideration of this position, and on the basis of comments included within MCC's Scoping Opinion, each technical consultant has conducted a review of their assessments, to establish whether any updates would be required if Plot 10a were to be considered as a *"cumulative"* scheme. In their capacity as professional advisors, each consultant has confirmed that treating Plot 10a as a cumulative scheme would not materially impact upon the outcome of their assessments. Each Technical Chapter of the ES includes an discipline-specific explanation as to why this is the case.

2.29 Whilst Plot 10b is under construction (following lawful implementation), MCC requested in its Scoping Opinion that consideration be given as to whether the results of the ES would differ if Plot 10b was also to be treated as a cumulative scheme. Following a review exercise , each consultant has confirmed that treating Plot 10b as a cumulative scheme would not materially impact upon their assessments. This is also confirmed, and explained, within each discipline-specific Technical Chapter.

2.30 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

2.31 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 reflected in the NPPF:

- Avoidance.
- Reduction.
- Compensation.
- Remediation.

- Enhancement.

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

2.33 Detailed mitigation recommended during the construction phase will be set out in the Construction Environmental Management Plan (CEMP) to be secured by a suitably worded planning condition and to be agreed with MCC prior to the commencement of work and implemented throughout the duration of the construction works of the Proposed Development. An outline scope of the mitigation measures proposed to be included in a future CEMP are set out in Chapter 5: Construction Methodology and Programme.

2.34 Mitigation measures to be implemented during the operational phase of the Proposed Development will be secured through approved documents, and suitably worded planning conditions and obligations.

Residual Effects

2.35 The likely significant effects on the environment, assuming the implementation of the mitigation measures proposed, have been estimated within each chapter. These are termed 'residual effects'.

Cumulative Effects

2.36 Each Chapter (and corresponding technical report) considers the cumulative effect of the Proposed Development, alongside the committed developments (referenced above) (Appendix 2.2), as relevant.

2.37 The cumulative developments forming part of the cumulative effects assessment include:

- Approved but unimplemented projects;
- Plans or projects for which an application has been made and which are under consideration by the consenting authorities; and,
- Certain projects which are reasonably foreseeable, i.e., projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative effects.

2.38 A search of MCC's planning applications database and knowledge of the area, applying the above criteria, has identified a number of schemes for which cumulative effects are considered likely. A full list, as of 17th October 2023, is contained at Appendix 2.2, and can be summarised as follows:

- One City Road (128002/FO/2020)
- Park Place (129273/FO/2021)
- Travelodge Deansgate Locks (126308/FO/2020)
- Bridgewater House (134694/FO/2022)
- One Medlock Street (135419/FO/2022)
- Great Jackson Street - Crown Street Plot D (The Lighthouse) (137227/FO/2023)
- Great Jackson Street – Plot C and E (The Green) (137226/FO/2023)

- Student Castle (121252/FO/2018)

2.39 Each technical chapter (Chapters 6-14) has assessed the potential for likely significant effects on the environment as a result of the above cumulative developments, together with the Proposed Development.

2.40 In addition, Chapter 15 assesses the Type 1 Cumulative effects (i.e. cumulative effects arising from multiple impacts on the same receptor).

Delivery & EIA Scenario Testing

2.41 It is anticipated that the Proposed Development will be delivered in one phase.

2.42 It is anticipated that the construction of the Proposed Development would take place following the completion of Blocks A/B, and D.

2.43 At present, Blocks A and B are due to be completed in August 2024, and Block D is due to be completed in March 2025.

2.44 Based on these timeframes, the intention is that construction in relation to the Proposed Development will commence in Q2 2025. It is anticipated that the Proposed Development would then be complete and operational by Q3 2027. The technical team has based their assessments on these timescales.

Assumptions and Limitations

2.45 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 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;
- Baseline conditions have been established from a variety of sources, including historical data, but due to the dynamic nature of certain aspects of the environment, conditions will change during the Proposed Development;
- 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 3, 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 and Phasing.
- Conditions will be attached to the Planning Permission that will control disturbance during the Proposed EIA Development; and
- Necessary off-Site services infrastructure for the Proposed Development will be provided by statutory undertakers.

Objectivity

2.46 The technical studies undertaken within 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.

3. Site, Surroundings and Description of Proposals

3.1 This Chapter includes a description of the Site, its context in relation to the surrounding area and the Site's suitability for the Proposed Development.

Site Description

3.2 The Site comprises a parcel of brownfield land, measuring approximately 0.23 hectares.

3.3 Having previously been used as a surface-level car park, the Site is now vacant, save for the temporary placement of a Site compound (used in relation to the construction of Blocks A/B, and D (to the north and northeast)). In its current state, the Site is predominantly comprised of hardstanding with a minimal amount of vegetation.

3.4 The Site is located within Manchester City Centre, and within Plot 11 of the First Street Development Framework Area.

3.5 The Site is bound to the north and northeast by land that is currently being redeveloped to deliver a co-living scheme of up to 45 storeys (pursuant to Ref. 125573/FO/2019); to the east by Newcastle Street (beyond which is surface level car parking and two PBSA developments operated by Unite (Parkway Gate and New Medlock House); to the south by Mancunian Way; and to the east by Medlock Street.

3.6 The Site can be accessed by vehicle via Newcastle Street.

Surrounding Uses

3.7 The Site forms part of the First Street Development Framework (FSDF) area and has been one of MCC's key regeneration priorities for over a decade. The regeneration initiative includes three distinct development areas of First Street: First Street North (FSN), First Street Central (FSC) and First Street South (FSS).

3.8 The Site, alongside Blocks A/B and D (currently under construction pursuant to Planning Permission Ref. 125573/FO/2019 (as amended)), are located within Plot 11, FSS. Blocks A/B, and D, Plot 11, upon completion, will provide 1,894 co-living bedspaces (alongside communal areas), across buildings of up to 45 storeys.

3.9 Immediately to the north of the Plot 11 Site is FCS, comprising Plots 9 and 10 of the First Street Masterplan. In 2022, Plot 9a received planning permission (Ref.18132600/FO/2021) for a nine storey 'net-zero' office building, which is now being brought forward by Ask. In June 2022, it was announced that the Government Property Agency (GPA) will occupy the Plot 9a building once complete. Plot 9b remains a vacant future development Site. Plot 10 is split into two separate plots, Plot 10a and 10b. Plot 10a received planning permission (Ref. 136043/FO/2023) earlier this year for an office development (which is also being brought forward by Ask). Plot 10b subsequently received planning permission (Ref. 136170/FO/2023) for a 14 storey PBSA development comprising 576 bedspaces as

well as a new 'food-hall' on the ground floor, helping to activate this part of the City Centre. Construction on Plot 10b started in September 2023, and the development is due to accommodate its first student intake in 2026/27.

3.10 Further north of the Site is FSN, which is now complete. Centred around Tony Wilson Place, FSN is now a cultural hub for the city including HOME (a contemporary art, film, and theatre complex) alongside a wider mix of uses including PBSA, a multi-storey car park ('MSCP') and a range of carefully curated food and drink operators, as well as new public spaces.

3.11 Immediately to the east of the Site is Unite Student accommodation (New Medlock House and Parkway Gate). Further beyond to the east, there is a cluster of converted mills (Macintosh Mill, Chorlton Mill and Cambridge Mill), and a diverse mix of uses, including PBSA, retail, residential and food and beverage units.

3.12 To the west of the Site is Medlock Street, beyond which is a Premier Inn and Canvas Student Accommodation (a PBSA development comprising 807 beds, previously approved under Ref. 118683/FO/2017). Resolution to grant planning permission (Ref. 135419/FO/2022) was secured at Planning Committee on 1st June 2023 for a new PBSA and office scheme at One Medlock Street / Former Premier Inn Site. The scheme will deliver a 38 storey PBSA scheme (1,014 bedspaces) alongside a 13-storey office building.

3.13 The Site is located to the north of Mancunian Way, and the lower-density residential area of Hulme. Within Hulme, the nearest residential properties are located at Loxford Court, approximately 60m to the south of the Site. There is a pedestrian route running from Hulme (at the junction of Clarendon Street and Newcastle Street), under Mancunian Way, to Plot 11.

Accessibility

3.14 The Site is in a highly accessible location by a variety of modes of transport. It is located within easy walking distance of the city core with all the shops, restaurants, attractions, amenities and facilities that the city centre has to offer.

3.15 Deansgate transport hub – comprising Deansgate Castlefield Metrolink Station and Deansgate Railway Station – is located 400m north-west of the Site. Oxford Road Station is located 430m north-east of the Site. Regular bus routes run along Medlock Street and Cambridge Street immediately adjacent to the Site.

3.16 For further details on transport, please refer to the Transport Assessment and Framework Travel Plan prepared by Sanderson Associates.

Planning History

3.17 In March 2021, Planning Permission (Ref. 125573/FO/2019) was granted for the *"Construction of four buildings of heights varying from 10 storeys to 45 storeys together comprising Co-living bedspaces (use class sui generis) and associated amenity facilities, with ground floor commercial units (Use classes A3 (Café / Restaurant and D2 (Gym)), private amenity space and public realm comprising hard and soft landscaping, car parking and cycle facilities and other associated works."* This planning permission was subsequently amended under Non-Material Amendment Applications Ref. 132553/NMC/2021, 132804/NMC/2022, 135358/NMC/2022, 135526/NMC/2022 and 128391/NNC/2023 (together the *"2021 Planning Permission"*).

3.18 The 2021 Planning Permission is for the phased delivery of a co-living scheme, comprising:

Phase A: Block D

- 45 storeys
- 707 bedrooms
- Communal facilities, including: a bike store, plant, substation, car park, management suite and bin store, First Floor and "sky lounge" (Floor 44) amenity areas (lounge/ kitchen/dining area) (3,146 sq. m.) and external first floor and external private terrace and garden areas (1,636 sq. m.).

Phase B: Blocks A / B

- Block A - part-10, part-18 and part-22 storeys, Block B: part-18, part-22 and part-26 storeys.
- 1,187 bedrooms (396 in Block A, and 791 in Block B)
- Communal facilities, including a café, health and wellbeing space, bike store, plant, bin store, substation, laundry, management suite, Ground and First Floor shared amenity areas (lounge/kitchen/dining area) (5,562 sq. m) and external private terrace and garden areas (2,470 sq. m.).

Phase C: Block C

- Part-10, part-13 and part-17 storeys.
- 322 bedrooms
- Communal facilities, including amenity space, bike store, plant, substation, bin store and management suite; Ground and First Floor shared amenity areas (lounge/ kitchen/ dining area) (1,157 sq. m.)

3.19 The 2021 Planning Permission has been implemented, and construction works in relation to Phases A (Block D) and B (Blocks A/B) are underway. The Applicant has not carried out any works in relation to Block C, and now intends to submit a separate Full Planning Application for a larger and remodelled building, as compared to what was originally approved. In addition, the Applicant now proposes the building to be for purpose-built student accommodation (PBSA).

Site Allocations

3.20 Under the provisions of the MCC Proposals Map (2012), the Site is allocated to be within:

- Manchester City Centre; and
- A Regional Centre

Site Specific Environmental Designations

Air Quality

3.21 The Site is situated in the Greater Manchester Combined Authority Air Quality Management Area (AQMA). For further details on air quality, please refer to the Air Quality Assessment prepared by RPS.

Ecology

3.22 There are no statutory or non-statutory ecological designations within the Site. For further details on ecology, please refer to the Ecological Assessment prepared by Penny Anderson.

Flood Risk

3.23 The Site is located within Flood Zone 1, and therefore the chance of flooding is less than 0.1% (or less than 1 in 100).

3.24 The Site is located within the Critical Drainage Area prescribed by Manchester, Salford and Trafford Councils Strategic Flood Risk Assessment.

3.25 For further details regarding flood risk and drainage, please refer to the Drainage Strategy prepared by AJP.

Heritage

3.26 The Site is not located within a Conservation Area and does not contain any designated or non-designated heritage assets.

3.27 There are 33 heritage assets (including the Whitworth Street Conservation Area and the Castlefield Conservation Area) located within a 500 metres buffer zone. The radius of 500m was chosen to reflect the built up, urban nature of the Site, whilst ensuring assets within a close range that have the potential to be affected, are considered.

3.28 For further details on heritage and the nearby heritage assets, please refer to the Heritage Statement prepared by Deloitte LLP.

Proposed Development

3.29 The description of development for the Proposed Development is:

"Erection of a 28-storey (+ ground) building comprising purpose-built student accommodation (Sui Generis) and other associated works including public realm, secure cycle parking and servicing arrangements."

3.30 Table 3.1 sets out the application proposals:

Table 3.1: Methodology for Assessing Sensitivity

Parameters for Development	
Student Accommodation	*555 student bedspaces (Use Class Sui Generis), split between:* • *300 standard studios* • *227 standard cluster bedrooms (x1 seven bed cluster, x14 eight bed clusters and x12 eight-bedroom clusters)*
Maximum Height	*Ground + 28 storeys (+120.625m AOD or +85.725m)*
Car Parking	*2 accessible car parking spaces.*

Parameters for Development	
Cycle Parking	*86 secure cycle parking spaces each with bicycles for hire within the building for use by residents and 12 visitor spaces (Sheffield stands) within the public realm. An additional 30 spaces will be provided for those with their own personal bikes.*

Layout

3.31 As compared to the 2021 Planning Permission, Block C has been slightly reorientated, and its footprint has been reduced. This results in the following betterments:

- Improved public realm –The revised Block C footprint allows for a significant increase to the size (uplift of 220 sq. m.) and layout of the FSS public park.
- Enhanced connectivity – Through the revised layout, a stronger connection through to Hulme via Newcastle Street is established. The enhanced public park will provide a key entry marker to the City Centre.
- Reduced visual impact – The reorientation of the building towards Hulme helps to minimise any potential visual impact. The silhouette of Block C sits within that of Block D behind from key views along Newcastle Street.
- Creation of a distinctive, visual marker – Block C will act as a *"gateway building"* into the FSS development, marking the key crossing / route from Hulme to the City Centre and reinforcing Newcastle Street as a key pedestrian route.

3.32 The layout of Block C will allow the development to fit in cohesively with the wider Plot 11 development, and ensure the delivery of a high-quality, and functional public realm.

Scale and Massing

3.33 The proposal is for a 28 storey (+ ground) tower sitting at +120.625m AOD or +85.725m tall. For reference, the remainder of the Plot 11 Blocks are as follows:

- Block A - 22 Storeys (+104.975m AOD)
- Block B - 26 Storeys (+116.675m AOD)
- Block D - 45 Storeys (+172.700m AOD)

3.34 The Design and Access Statement prepared by Simpson Haugh sets out the detailed development of the design proposals. As part of this, a sequence of building forms, heights and layouts were examined and tested against the accommodation and brief requirements.

3.35 The scale and massing of the building was interrogated in depth during pre-application discussions with MCC. As part of this process, a detailed series of massing iterations were presented to ensure that the proposed scale and massing responded to the surrounding context. The Proposed Development underwent detailed assessment to ensure the massing was appropriate for its context.

3.36 A Townscape and Visual Impact Assessment has been undertaken, as detailed in Section 6. The initial Zone of Visual Influence (SVI) was used to understand where the emerging scale and massing may be visible from and help to identify key views. From these views, a series of massing models and wirelines

were used to help to further refine the proposals and ensure the proposed scale and massing is appropriate and responds to the surrounding context.

Appearance and Materiality

3.37 The podium will be clad in a green glazed brick, which is currently used sparingly on the lower sections of the ground floor of Blocks A, B and D. The tower will sit on the podium as a reflective volume, similar to the rest of Plot 11, with a glazed unitised facade.

3.38 The material proposal defines the podium as one element, a solid 'grounded' base that takes its tones from the landscape and Blocks A, B & D. Whilst sitting in harmony with the overall architectural composition of Plot 11, introducing a different materiality adds texture and diversity to the streetscape, whilst also highlighting the fact that Block C has a different use as compared to the wider co-living development.

3.39 Strong horizontal banding is introduced by way of ceramic fritting to help reinforce the steps in plan. Each glazed panel carries a common repeating ceramic frit pattern in a bold white colour. Where natural ventilation is need, an anodized metal panel is proposed. The opening door behind is proposed to be a glazed opening element to increase light and views out. The same pattern used for the fritting is proposed for the vent panel covers, helping to unify the facades.

3.40 The white banding produced by the frit patten wraps around the buildings on all sides, unifying the massing and giving the building a distinctive character when viewed from afar. When the frit reaches the northern facade of Block D a change in colour is introduced to the lighter frit, this is to maximise the reflections and light entering the centre of the overall masterplan and into the public square.

3.41 The use of glass differentiates these new modern buildings from the nearby Macintosh Mill complex. The glass will be highly reflective, picking up the changes in the skyscape over the course of a day and year.

3.42 The glass will provide clear views for occupants, and the white frit pattern would give the building a further contemporary edge.

Landscaping Strategy

3.43 The landscaping strategy, designed by OPEN, is a continuation of the aesthetic and quality of the wider Plot 11. It is characterised by generous footways, a new park and green infrastructure.

3.44 The wider landscape concept for the original Plot 11 masterplan was to create a 'green wedge' rising from Medlock Street and Princess Parkway, with a series of residential buildings clustered around this public green. The Block C proposals develop this concept and provide a finer grain of detail and functionality to the green wedge.

3.45 The development of Newcastle Street as a primary north to south pedestrian and cycle corridor is a key spatial concept for the wider masterplan and these proposals continue this concept and materiality. Organic planting, wildflower meadows, meandering footpaths and woodland glade spaces (informed by the green infrastructure on adjacent Medlock Way and Princess Parkway) transition to a formal public park within the core of the Plot 11 development.

3.46 The proposed orientation of Block C allows for an overall net increase in the size of the public park, as compared to the 2021 Planning Permission (220 sq. m increase), as well as the creation of a more functional and usable layout, and an increase in the total number of trees (from 33 to 38).

3.47 An area of green open space is retained and enhanced at the southern end of Newcastle Street. This, along with the extended public realm, form an open and attractive arrival space for pedestrians and cyclists crossing beneath the Mancunian Way from Hulme. New tree planting is proposed here alongside the retention of an existing mature tree.

3.48 At first floor level, the proposed terrace podium provides amenity for residents and contributes visually to the surrounding streetscape. Residents of the building will have access to this shared space, which will cater for a variety of uses including communal events, external working, eating and socialising.

3.49 Please refer to OPEN Landscape Design and Access Statement for full details of the Landscape and Public Realm proposals.

Waste and Servicing

3.50 Vectos has undertaken the necessary calculations to forecast waste creation from the Proposed Development. This has fed into the requirements for bin capacity, including waste recycling proportions.

Waste Strategy

3.51 A dedicated loading bay is being provided along Newcastle Street to the east of the Site boundary which is sufficient to accommodate a large refuse vehicle. The external waste transfer route is therefore of a minimal distance from the bin store located to the south of the ground floor on the southern elevation.

3.52 Internally, it is expected that residents will transfer waste in sacks between their respective unit and the cluster kitchens via the lift / stairs if appropriate, before depositing waste sacks in the appropriate refuse container located in the ground floor refuse store the building management team will bring out to the collection point on the collection days.

3.53 A dedicated refuse store is located on the ground floor to the south which can accommodate 17no. 1,100 litre euro bins with additional space for ad-hoc waste and adequate room provided to manoeuvre all refuse containers sufficiently.

Servicing Strategy

3.54 As highlighted above, a dedicated loading bay is being provided along Newcastle Street to the east of the building. Given that Block C will contain purpose-built student accommodation, typical deliveries will be post and courier, online food shopping, along with occasional household and furniture items.

3.55 All deliveries at the development will be undertaken between the hours of 07:00 and 20:00.

3.56 Typically, most deliveries are small consignments and evidence from other sites show that 40% of all deliveries take less than 5 minutes. Larger deliveries tend to take longer and for this Site we expect that a large delivery consignment would take no more than 20 minutes to serve the Site. As the volume of deliveries at peak times is likely to be relatively low there is no specific need to schedule the timing of deliveries to a detailed extent.

3.57 Block C will benefit from a post box system where general post and small parcels can be left for occupiers to collect, with drivers pulling up on street in areas permitted for loading and walking the goods in through the main entrance. For larger items, if the occupier is in then the driver will be permitted to take larger items to their apartment.

3.58 If the occupier is away, then the goods will be left at the concierge by arrangement. It is expected that the delivery drivers would have their own handling equipment for larger items.

Parking

3.59 There are no car parking spaces proposed within the development other than two dedicated accessible spaces situated along Newcastle Street.

3.60 A total of 86 secure cycle parking spaces (offered as part of a *"bicycles for hire"* scheme) will be provided within the building for use by residents. An additional 30 cycle parking spaces will be provided for residents to store their own personal bikes. 12 visitor cycle parking spaces (in the form of 6 Sheffield Stands) are to be located within the public realm.

Move In and Move Out Strategy

3.61 Upon being advised of their success in being a granted a tenancy, the residents will be required to contact the management team to agree an appointment move in date and time. During this discussion, all residents will be notified that there is limited temporary onsite private parking/unloading areas available.

3.62 Should a resident be able to demonstrate that they have no other means than by the use of a car for the moving in process, and then they will be allocated a short period to allow them to off load. Each resident will be allocated a specific time slot in which they must arrive to take occupancy of their apartment.

3.63 During the off-loading process at check in, the resident will move their baggage/items into a secure dedicated storage area at the ground level of the accommodation. The residents will not be allowed to offload their belongings immediately into their allocated bedroom or apartment. This requirement will limit the amount of time taken to off load any vehicles, and upon completion of offloading, the vehicle must be immediately moved away from Site. Information will be provided to residents on public car parks within the locality that can be used for longer periods of parking post drop off.

3.64 Similar arrangements will be in place for moving out occasions and communicated to building users towards the end of their tenancy.

Accessibility

3.65 The design of the development has been developed with an inclusive approach to allow easy, safe and secure access to all areas of the landscape and building. As part of the process the design time have given due regard to Equality Act, Building Regulations and MCC's Design for Access 2.

3.66 For further details of the Proposed Development, please refer to Chapter 4 of the Planning Statement, prepared by Deloitte and the Design and Access Statement prepared by Simpson Haugh + Partners, submitted as part of this Application.

4. Alternatives and Design Evolution

4.1 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, taking into account the environmental effects.

4.2 The form of the Proposed Development has been influenced by a range of factors, including location, surrounding land use and input from MCC, Statutory and Non-Statutory Consultees and other stakeholders.

4.3 This chapter reviews the principal land use and siting options explored and the reasoning for the selection of the current design for the Proposed Development which forms the subject of assessment within the ES.

4.4 This chapter considers the following four options in the context of the existing Development Brief:

- The 'do nothing' alternative where the Proposed Development is not progressed.
- Alternative locations for the Proposed Development.
- Alternative Uses for the Site.
- Alternative Scale and Massing for the Proposed Development

The 'Do Nothing' Alternative

4.5 The 'do nothing' scenario refers to the option of leaving the Site in its current state, as described above in Section 3.

4.6 The Site is located within a highly strategic and sustainable location within the heart of Manchester City Centre. There is a clear opportunity to make more efficient use of this land.

4.7 The Site has been vacant for a long period of time, having previously been used as surface-level car parking. Whilst the Site currently comprises a construction compound, used in conjunction with the construction works taking place across the remainder of Plot 11, this is a short-term use, with Phase A (Block D) due to be completed in March 2025, and Phase B (Buildings A/B) expected to be completed in August 2024. Given the underutilised nature of the Site, and owing to its location within a highly strategic and sustainable area within the heart of Manchester City Centre, there is a clear opportunity to make more efficient use of the Site.

4.8 The Site currently provides little by way of urban greening, landscaping or biodiversity, and there is an opportunity to enhance permeability through Plot 11 and improve connectivity across this part of the City Centre.

4.9 The Site is located within the First Street Development Framework (FSDF) area and has been identified as a pivotal development Site that will help to meet the regeneration ambitions sought by MCC within

this part of the City Centre. The Site falls within the FSS character area, which is signposted for high-quality residential uses.

4.10 The proposed PBSA use is therefore highly suitable for this location and will directly support the regeneration ambitions set out by the FSDF.

4.11 In consideration of the above, the 'do nothing' scenario has been discounted due to the established need for regeneration of this part of the City Centre, and demand for strategically located and high quality PBSA.

Consideration of Alternative Locations

4.12 The proposed PBSA use is highly compatible within this location –in close proximity to the Oxford Road Corridor, the University of Manchester and Manchester Metropolitan University, and within an allocated regeneration area. The Proposed Development will support the success and vitality of the wider regeneration area.

4.13 Located within the City Centre, the Site is within a highly strategic location and is well served by multiple modes of sustainable transportation methods. For instance, Manchester Oxford Road Station is located just 400m to the north; Deansgate Train Station is just 500m to the north west; and Hulme Tram Stop just 230m to the north west. These links provide access to a number of locations throughout Greater Manchester and beyond.

4.14 Furthermore, it should also be recognised that the Site is the only available land in the Applicant's control within the general locality.

4.15 Therefore, this Chapter does not consider alternative Sites within the context of the planning application as there is an identified need to redevelop this specific Site as a key contributor to the realisation of the regeneration area.

Consideration of Alternative Uses for the Site

4.16 As mentioned above, the Site is strategically located within the City Centre and close to both universities campuses, making the Site highly suitable for PBSA. Furthermore, the principle of residential use has already been established by virtue of the extant Planning Permission.

4.17 Furthermore, as detailed in Section 2 of the Planning and Tall Building Statement, there is an established and undisputed need for new PBSA within Manchester.

4.18 On 13 November 2019, the Executive Report on Consideration of Policy H12: Purpose Built Student Accommodation Within the Changing Market Context (13 November 2019) was published. It sets out that there is an increasing scarcity of land within the City Centre, including within the Oxford Road Corridor. As such, there is a need for the finite amount of land to be used strategically to support the economic growth of the Corridor. The report goes on to highlight that there are an increasing number of international students who are typically choosing to live in the City Centre due to rising lifestyle expectations, property type and management; however, there has been a limited number of PBSA schemes delivered, resulting in increasing pressure on the traditional rental market, coupled at a time with an increasing number of non-student residential growth. These trends have contributed to increasing rental levels across the City and high levels of council tax exemptions in traditional market housing stock. The Report therefore suggests that a refreshed approach to PBSA is required to ensure that the right mix of PBSA is delivered in the right parts of the City, in order to cater to the demands of the evolving student population and wider economic growth of Manchester. The Report concludes

that the Oxford Road Corridor is the appropriate location for such new PBSA where students have easy access to the city's university campuses.

4.19 The conclusions of the November 2019 were subsequently reiterated and approved in the Executive Report dated 9 December 2020 titled "Purpose Student Accommodation in Manchester". In responding to consultation comments received in relation to the November report, Officers noted that there is a need to provide balanced neighbourhoods that respond to all forms of housing need, including PBSA located in the Oxford Road Corridor, in close proximity to the universities.

4.20 This need for well-located PBSA has been further established at the Economic Scrutiny Committee which met on the 23 May 2023 to discuss issues that have arisen since the December 2020 Report was published; and agree a pipeline of schemes to address the projected shortfall of accommodation up to 2030. The Report presented identifies 20 sites which could potentially support circa 12,500 PBSA bedspaces. The list of sites was compiled based on initial appraisals (of suitability, availability and deliverability), and through discussions with the University of Manchester and Manchester Metropolitan University. Overall, through demonstrating a sufficient pipeline of sites within the preferred locations identified by the Council, the report was able to strengthen the Council's position on PBSA and ultimately Policy H12 of the Core Strategy.

4.21 In terms of demand, the report however highlights that based on MCC's projections that demand for PBSA could be between 5440 bedspaces (representing a 1% growth per annum) and 11320 (representing 2% growth per annum) up to 2030. This would therefore equate to the need for 750 new bedspaces per annum up to 2030.

4.22 First Street's locational characteristics provide a unique opportunity to address PBSA demand through delivering high quality student accommodation within a highly accessible location close to the amenities of the City Centre and within walking distance to Manchester's universities. This area is well served by public transportation including Manchester's Oxford Road and Piccadilly Stations and the Metrolink. Manchester Oxford Road is a key transport corridor providing direct access to university's main campuses.

4.23 The FSDF is clear that this Site, within FSS, should help to deliver a high-quality residential neighbourhood. Whilst other, alternative residential uses (including standard residential housing, and co-living (as per the extant consent)) were considered for Block C, the overriding strategic need for PBSA within this specific location is clear. It is on the basis of need, and the ambition to deliver a truly balanced and mixed community, that the Applicant has concluded that PBSA would be the most appropriate use for the Site.

4.24 To note, commercial uses (including office) were also considered, but discounted on the basis of MCC's strategic objectives for FSS and given that office needs for the FSDF area are being met by neighbouring plots.

4.25 As detailed within the Design and Access Statement submitted in support of this application, the proposed development has been designed in a way which allows for easy adaptation to standard residential accommodation, should the balance of needs change in the future. The idea is that the proposed building could be re-purposed for standard residential use, rather than be demolished if the demand for PBSA falls (subject to obtaining planning permission).

4.26 In consideration of the above, by virtue of the Site's location and the identified need for PBSA, the proposed use is considered the most appropriate form of development.

Consideration of Alternative Scale and Massing

4.27 Different scales and massing options have been considered for the Proposed Development, the aim of which is to maximise the suitable use of the Site to create a viable scheme and minimise any negative impacts on adjacent land uses and the environment, whilst providing public benefits, including high quality public realm. `Please find below a summary of the design evolution of the scheme. Full details can be found within Section 3 of the Design and Access Statement.

4.28 The starting point for considering the design of the proposed development was understanding whether the extant planning permission (a 17-storey stepped form) for Block C could be adapted to accommodate PBSA. We quickly understood this to be unviable, owing to changes in emerging Building Regulations that would require additional staircases within the taller element of the building.

4.29 The alternative options were then considered to be: (1) introducing a new form / typology, or (2) designing a building to match Block D (immediately to the north).

4.30 In testing of alternative forms and typologies, these felt too disparate from Blocks A/B/D and failed to feel part of the same collective of buildings. It was therefore decided that introducing a new typology was not the right strategy.

4.31 Therefore, the approach taken was to use a similar form to Block D. It was considered that a slender curved tower form would work well in addressing the roundabout and in achieving the goals of the revised Block C brief in creating a distinctive marker building. Blocks C and D would now act as a pair, fronting Medlock Street, and acting as an arrival point into the city from Hulme and the Princess Parkway / Mancunian Way. Blocks A and B would similarly act as a pair, with broken-up stepped forms, and height dropping towards the more historic settings of Macintosh Mills to the east.

4.32 Upon choosing a curved tall building to match Block D, the height of the development was largely informed by studies of the surrounding area (in terms of determining what would be contextually appropriate) and perceived impacts upon Hulme residents. The range of 25-30 storeys was explored as this scale would allow for a sufficient step down in heights towards Hulme, whilst also still providing a significant building marker that achieves the aims of establishing Block C as a Gateway Site at the Newcastle Street crossing. Key massing views were established early in the process to determine what height would be appropriate. A clear aim was to allow Block C to sit within the silhouette of Block D, and for the whole Plot 11 to read cohesively.

4.33 Following the selection of the preferred massing typology, a series of technical studies (including wind microclimate and daylight and sunlight analysis) were conducted to ensure that the scheme would be technically sound. It was established that a curved form would produce better wind results than other massing forms, in terms of ensuring pedestrian safety within the surrounding area. The podium level, and specifically the way in which it protrudes, was largely informed by initial desktop wind studies.

4.34 The Design and Access Statement, submitted alongside this application, provides more information regarding the detailed development of the design proposals. The Design and Access Statement sets out a sequence of building forms, heights and layouts were examined and tested against the accommodation and brief requirements. Throughout this process the scale and proportion of the proposed development, and its relationship with the wider Plot 11 development, was assessed and evaluated.

4.35 It should be noted that, owing to the fact that reasonable main alternatives were considered at an early stage as set out above, detailed schemes for each option were not then developed. .

Summary

4.36 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.

4.37 In consideration of the above, it can be concluded that there is a clear opportunity to make more efficient use of a parcel of brownfield, situated within a highly accessible location within the City Centre.

4.38 The Proposed Development is the most optimum solution for the Site. There is a clear and evident need for high-quality PBSA across Manchester, and this Site is well-placed to accommodate such need – being in close proximity to the Oxford Road Corridor, the University of Manchester and Manchester Metropolitan University.

4.39 Throughout this design process, environmental constraints and opportunities have been considered from the outset to arrive at the most appropriate solution for the Proposed Development. Technical studies relating to wind microclimate, and daylight, sunlight and overshadowing, have largely informed the Proposed Development. Best endeavours have been taken to ensure that the Proposed Development provides high-quality accommodation, whilst protecting neighbouring residential amenity.

4.40 Furthermore, the proposed use responds to identified regeneration priorities and the need for economic growth within this part of the City Centre, and Manchester as a whole. The proposed height, scale and massing has been informed by the extant planning permission and wider Site context.

4.41 The above process has been informed by the FSDF and the desire to create a positive relationship with the wider masterplan Site (and particularly Blocks A/B and D, Plot 11). The Proposed Development has also been influenced by pre-application consultation with key stakeholders including local landowners, residents, businesses, statutory consultees, as well as with MCC.

5. Construction and Phasing

Introduction

5.1 This Chapter describes the proposed construction programme and key activities that will be undertaken at Block C. The following appendices are submitted in support of this ES Chapter.

- Appendix 5.1 – Construction Management Plan
- Appendix 5.2 – Tender Programme
- Appendix 5.3 – Details of First Street Developer and Contractor Forum

5.2 The main aim throughout the construction period is to minimise the impact on surrounding properties and roadways for the duration of the work. Close collaboration with project teams of all construction projects will be maintained at all times to achieve this aim.

5.3 It is important to note that construction works in relation to Blocks A/B and D are due to be complete by Q2 2025, in advance of construction commencing in relation to the Proposed Development. As such, the impacts of overlapping construction programmes have not been assessed.

5.4 The following narrative explains this methodology and timescales envisaged at the time of the planning application. More detailed proposals will be developed prior to commencement on-site. This will include the preparation of a detailed Construction Environment Management Plan, which will provide further details in relation to Construction Management, Construction Phase Health and Safety, Environmental Management as well as Site Waste Management, Logistics and Traffic Management.

First Street: Construction Impacts

5.5 The Applicant, alongside landowners across First Street, has recently established a local landowner forum, to facilitate monthly inspections of development sites, and to ensure that construction works are being carried out in accordance with agreed Construction Management Plans.

5.6 Monthly inspections will take place around and within the perimeter of the FSDF area and along Hulme Street).

5.7 Inspections will pay particular attention to vehicular access and egress points. Monthly inspections will be carried out utilising Ask's (adjacent landowner) Health & Safety Consultant - Safer Sphere. It will be carried out in the few days prior to the monthly coordination meetings, and we will use the inspection reports to monitor and enforce their recommendations with the wider contractor teams as required (including Downing, alongside Renaker, BAM, Bethells and Ask).

5.8 Furthermore, collectively, all landowners within First Street are committed to meeting the Construction Management Plans in place, in relation to each plot. We will seek to ensure that all obligations are being adhered to and will report to MCC where we identify that a contractor is failing to do so.

5.9 For more information regarding how construction is being managed and monitored across First Street, please refer to Appendix 5.3.

Construction Programme

5.10 As detailed within Appendix 5.2, it is anticipated that works in relation to Block C would commence in March 2025, and that the construction programme would span a period of approximately two years and 5 months. During this period, there will be elements of piling, frame construction, façade cladding and internal fit out.

5.11 The programme is based upon normal working hours in line with Manchester City Council Guidance of 7.30hrs to 1800hrs Monday to Friday and 0800hrs to 1400hrs on Saturdays. 5.9. On Sundays and Bank holidays, noisy working will generally not be planned. On some occasions there are certain operations that maybe required to proceed during these periods, for example tower crane erection and dismantling. These will be infrequent and will be agreed with the Environmental Health Officer (EHO) and local residents through a series of neighbourly engagements. The frequency of these will vary and respond to demand. Access to the Site will be permitted 30 minutes prior to working day commencing with noise being kept to a minimum for the first half hour of each day.

5.12 The Applicants acknowledge the close proximity of the neighbouring properties and as such will endeavour at all times to ensure the working hours are adhered to in order to protect their amenity.

Construction Methodology

5.13 The following is a brief overview of the methodology to be adopted for the construction and fit out of the Proposed Development. The section also considers general logistics as well as traffic management for the movement of material to the disposal of waste.

Site Logistics

5.14 The Site has been cleared previously and was most recently used for surface level car parking.

5.15 Vehicular access will be from the Cambridge Street junction on the Mancunian Way, along Cambridge Street, turning into Chester Street and then into Newcastle Street and onto Site. There will be Entry and Exit gates for vehicular traffic, which will be manned at all times when the gates are open.

5.16 An application will be made to Manchester City Council to temporarily close Newcastle Street to general traffic, and to construct a temporary access from Newcastle Street onto Medlock Street for the duration of the works. This will enable a one-way system for vehicular traffic through the Site which will avoid vehicles having to turn around or back down Chester Street.

5.17 There will be a separate security gate for pedestrians (both Site operatives and visitors) with a designated and clearly defined pathway leading to the welfare compound, to ensure that traffic and pedestrian segregation can be maintained at all times.

5.18 To minimise the impact on neighbours, passing members of the public and to mitigate environmental impact, all our deliveries will be arranged via pre-booking system with the Principal Contractor Site Management Team. Any vehicles arriving at Site outside of the arranged schedule will be turned away and will require re-booking.

5.19 Provision for cleaning Site traffic wheel deposits will be in place to ensure surrounding roads are kept clean.

Construction Works

5.20 Construction works will generally comprise the following:

- Demolition and Site clearance – to remove any existing service pipes, cables and other underground constructions which are likely to affect the works.
- Piling and Substructure works
- Concrete frame works.
- Façade works.
- Mechanical, electrical and plumbing works
- Finishing works – including partitioning, plastering, decoration, floor finishes, joinery, fitted furniture etc.

Traffic Management Plan

5.21 The following main control measures which will be adopted in respect of traffic management:

- Where deemed required by Downing Construction Limited [(the "Principal Contractor") management, Transport will be sheeted/fitted with dust covers during muck removal & material deliveries. The appropriate safety measures will be in place to ensure sheeting is fitted and used safely and correctly.
- Vehicles will be in line with the FORS accreditation scheme to ensure operators are achieving exemplary levels of best practice in safety, efficiency, and environmental protection.
- Dust suppression (Watering/Mist Spray) during vehicle loading procedures will be applied.
- Water suppressed road cleaning measures will be provided on and around the Site. It is anticipated that this will be more necessary during ground works, however, it will be maintained throughout the duration of the works as required.
- Existing drainage systems to be maintained and cleaned by the Principal Contractor to prevent any environmental impact from proposed procedures.
- Plant & vehicle selection will be assessed to maintain noise levels to a minimum.
- Vehicles will turn off engines during loading process (reduction of noise & emissions)
- Material loading and waste removal process will be coordinated & arranged to reduce noise levels, and to limit multi vehicle attendance.
- Vehicles attending Site will be coordinated by the Principal Contractor (pre-booked only) to enable minimum attendance at any one time (Haulage vehicles will not be allowed to park up and wait around the Site perimeter or within Site, unless immediately loading/unloading).
- Placement of construction Site traffic signage on approach roads.

- As there will be no parking available for contractors, as part of the Site induction, advice will be given to all operatives on the local public transport links and the location of the nearest available car parks.

5.22 Trained and competent traffic marshals will control all vehicular movement in and around the Site. Deliveries will be scheduled to avoid busy rush hour periods. The Principal Contractor will consult with our neighbours throughout the construction phase.

5.23 A fully developed traffic management and access plan will be formulated as part of the Construction Phase Plan. This will provide further information in relation to the above measures and identify key personnel for its implementation.

Deliveries

5.24 Due to the scale of the development, there is limited space on Site for the storage of materials. Consequently, materials will be delivered on a 'just-n-time' basis.

5.25 All deliveries will be arranged via pre-booking system with the Principal Contractor Site Management Team. Any vehicles arriving at Site outside of the arranged schedule will be turned away and will require re-booking. Deliveries will be scheduled to avoid busy rush hour periods.

Parking

5.26 Parking will not be available on Site, and all operatives will be encouraged to use public transport where possible. As part of the Site induction, advice will be given to all operatives on the local public transport links and the location of the nearest available car parks.

Health and Safety

5.27 The Principal Contractor will have an on-going process of monitoring health and safety standards throughout its organisation. Initially, risk will be mitigated where possible during the design development stage. Once works commence, the Site Team will be responsible for the environmental and health and safety management on Site. By referring to the Risk Assessment and Method Statement documentation; by carrying out regular inspections and implementing toolbox talks, etc. The Team will be able to monitor the effectiveness of risk control measures. Site managers will also undertake regular reviews of safety on Site, including any accidents or incidents and any matters raised will be dealt with accordingly.

5.28 Health and safety is also incorporated as a fundamental aspect of the overall project review, which will occur, and this monitoring and review process will be supported by the Principal Designer (CDM) who is Project Four Construction Safety.

Site Security and Safety

5.29 A 2.4m high solid hoarding exists at present. If necessary, lengths of the existing hoarding will be replaced, repaired or adapted to maintain the Site boundary and provide secure access to the Site. Signage will be installed with 'Downing Students' branding and advisory construction warnings.

5.30 All operatives and visitors will be required to sign in/out with a facial recognition system, which will log all egress / ingress and act as an accurate personnel record. Traffic marshals will control the vehicular gates during Site opening times. An out of hours security firm will patrol the Site and its perimeter on

an hourly basis outside Site opening times. CCTV will be installed to main entrances and monitored by the Principal Contractor.

Environmental Management

5.31 As referenced above, prior to the commencement of development, a Construction Environmental Management Plan will be developed to address and monitor the following issues, in detail:

- Applicable environmental legislation.
- Pollution.
- Nuisance (Noise, vibration, dust, emission and light).
- Public relations.

Nuisance (Noise, Vibration and Dust)

Noise and Vibration

5.32 The following measures, to mitigate adverse impacts in terms of noise and vibration, will be followed (as incorporated into the Construction Management Plan):

- As part of the pre-planning process of work activities, those works, which may bring about excessive noise will be pre-assessed, including the impact upon construction operatives and residents / neighbours in nearby premises.
- The requirements described within The Noise at Work Regulations 2005 and the British Standard BS 5228 Noise and Vibration Control on Construction and Open Sites will be adhered to fully.
- In brief, the Principal Contractor will limit as much as is practical excessive noisy operations and where this is unavoidable measures will be taken, such as in the selection of plant and equipment or work processes, which does not emit excessive noise levels, or equipment, which is fitted with silencing/anti-vibration equipment.
- Any noisy equipment will be sited as far away from occupied premises as possible and turned off when not in use. Safe routes will be set up to avoid areas where excessive noise is generated, and enclosures/barriers will be erected where practical to isolate noisy areas.
- The above measures will be considered as part of the assessment process, to identify noisy activities; estimate likely exposure to noise by construction operatives and any other persons likely to be affected; identify measures required to eliminate or reduce noise exposure; and make persons likely to be affected by noise aware of the risks and controls which are being taken.
- Full liaison will occur with affected residents/neighbours as part of the pre-planning of construction work activities and every effort will be made to minimise the impact upon their work activities as described above and also to work in cooperation with tenants regarding any specific requirements they may have, including restricting high-level noise during key times.

- Noise monitoring will occur during potential noisy activities and where the action levels are exceeded as identified within the Noise at Work Regulations, then appropriate action will be taken.
    - Lower exposure action level is a daily or weekly exposure of 80db and a peak sound pressure of 135db.
    - Upper exposure action level is a daily or weekly exposure of 85db and a peak sound pressure of 137db.
- Dialogue will also occur with the local authority regarding any restrictions they have and ensuring minimal impact upon neighbours.

Dust

5.33 Dust is created on the Site during most stages of construction and will be managed throughout the Construction Phase. As per industry standards, the following measures will be taken to minimise and control dust:

- The majority of dust escaping to outside locally is created from the use of waste chutes. For that reason, the Principal Contractor will not use waste chutes, waste shall be transported in bins via the hoists.
- Good housekeeping will reduce the amount of dust created. The Principal Contractor in conjunction with its sub-contractors shall ensure dust generated from Site activities does not become a risk to others and to achieve this, will assess the dust risk for each work package; ensure adequate controls are in place; and review these controls on a regular basis.
- Measures will be taken to eliminate, or at least minimize, dust generation with consideration given to material usage, type of work equipment used, and work methods applied. Where dust creation is unavoidable, dampening down techniques will be applied.
- To reduce spread and movement of dust and muck off Site we will install a wheel wash at the Clay Pit Lane exit to reduce dust being taken off Site.

5.34 For more information regarding dust mitigation, please refer to Chapter 6 (Air Quality) of this ES, and Appendix 6.2 (Mitigation During Construction).

Public Relations

5.35 The Principal Contractor will communicate with neighbours regarding the proposed works and in particular any elements that may impact upon their day-to-day undertakings. This will be done initially at pre-commencement update via letter drop/bulletin. Once the project has started, we expect to produce a quarterly newsletter for local residents and businesses.

5.36 These updates/newsletters will also be displayed on hoarding outside the project so that not only residents can see updates but people visiting the area can see what the project is all about.

Waste Management Strategy

5.37 In accordance with the *"Site Waste Management Plan Regulations 2008",* a Site Waste Management Plan (SWMP) will be developed by the Principal Contractor and agreed with Manchester City Council.

Operational Waste Removal

5.38 The Principal Contractor will produce and define a waste management hierarchy of control. This will include:

- Reduction of waste generated.
- Re-use of materials where possible
- Recycling of materials
- Disposal of remaining waste at a suitable facility.

5.39 Waste produced during the construction process is to be cleared on a regular (ideally daily) basis. On each floor of the buildings, a series of bins will be deposited within easy reach of the workstations. Contractors are to deposit waste in these bins during the day. The bins will then be transported to the skip via the hoists, to reduce manual handling to the minimum. Because of space limitations on this Site, it is not envisaged that many skips can be positioned on Site. Therefore, to reduce the amount of waste for landfill, waste is to be segregated at the waste transfer station.

Summary

5.40 The Construction Design and Management Regulations 2015 will apply to this project and all appropriate controls and systems will be in place to comply with the Regulations and associated guidance.

5.41 Every stage of the project will be risk assessed and appropriate controls applied, sub-contractors will be pre-vetted and will be subject to extensive pre-contract requirements of information transfer and risk assessment.

5.42 The Principal Contractor will be responsible for developing a Construction Phase Plan (as part of the Construction Environmental Management Plan), which will take account of all known risks, which have been identified at pre-construction stage by the Principal Designer/CDM Consultant, the Design Team and also through Site investigations.

5.43 The Construction Phase Plan will describe arrangements and procedures for managing these key risk areas in more detail, as well as any future risk, and also the resources, including personnel, which will be applied to the scheme, recognise the aspects and impacts of environmental considerations and which will ensure the Health and Safety of all those working on or affected by the project works.

5.44 The Principal Contractor will have an on-going process of monitoring health and safety standards throughout its organisation. Initially, risk will be mitigated where possible during the design development stage. Once works commence, the Site Team will be responsible for the environmental and health and safety management on Site. By referring to the Risk Assessment and Method Statement documentation; by carrying out regular inspections and implementing toolbox talks, etc. the Team will be able to monitor the effectiveness of risk control measures. Site managers will also undertake regular reviews of safety on Site, including any accidents or incidents and any matters raised will be dealt with accordingly.

5.45 Health and safety is also incorporated in the overall project review, which will occur, and this monitoring and review process will be supported by the Principal Designer (CDM) who is Project Four Construction Safety.

5.46 The Principal Contractor will communicate with all relevant parties upon commencement of works, including neighbours to ensure there is effective coordination throughout all stages of construction.

6. Air Quality

Introduction

6.1 This Chapter of the ES has been prepared by RPS and assesses the likely Air Quality impacts of the Proposed Development on the surrounding area and the suitability of the Site for its proposed uses. 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.

6.2 This Chapter is accompanied by the following appendices:

- Appendix 6.1: Assessment Methodology
- Appendix 6.2: Mitigation Measures
- Appendix 6.3: Model Verification

6.3 The authors of this Chapter are Kathryn Barker and Jinho Looi. Kathryn Barker holds a Masters in Environmental Pollution Control (MSc) from the University of Southampton and has 8 years of experience in Air Quality and is a full Member of the Institute of Air Quality Management (IAQM) and Institute of Environmental Sciences. Jinho Looi holds a Masters in Natural Sciences (MSci) from the University of Cambridge and has 1 year of experience working in Air Quality and is an Associate Member of the Institute of Air Quality Management (IAQM) and Institute of Environmental Sciences.

Assumptions and Limitations

6.4 All air quality assessment tools, whether models or monitoring measurements, have a degree of uncertainty associated with the results. The choices that the practitioner makes in setting-up the model, choosing the input data, and selecting the baseline monitoring data will decide whether the final predicted impact should be considered a central estimate, or an estimate tending towards the upper bounds of the uncertainty range (i.e., tending towards worst-case). Details of the assumptions and limitations can be found in Appendix 6.1.

6.5 The analysis of the component uncertainties indicates that, overall, the predicted total concentration is likely to be towards the top of the uncertainty range rather than being a central estimate. The actual concentrations that will be found when the development is operational are unlikely to be higher than those presented within this report and are more likely to be lower.

Relevant Legislation, Policy and Guidance

Legislation

Air Quality Standards Regulations

6.6 The Air Quality Standards Regulations 2010 [2], amended by The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 [3], sets limit values for ambient air concentrations for the main air pollutants: particulate matter (PM^{10} and $PM^{2.5}$), nitrogen dioxide (NO^2), sulphur dioxide (SO2), ozone (O3), carbon monoxide (CO), lead (Pb) and benzene, certain toxic heavy metals (arsenic, cadmium and nickel) and polycyclic aromatic hydrocarbons (PAHs).

6.7 These limit values are legally binding on the Secretary of State. The Government and devolved administrations operate various national ambient air quality monitoring networks to measure compliance and develop plans to meet the limit values.

UK Air Quality Strategy

6.8 The Environment Act 1995, as amended by the Environment Act 2021, established the requirement for the Government and the devolved administrations to produce a National Air Quality Strategy (AQS) for improving ambient air quality, the first being published in 1997 and having been revised several times since, with the latest published in 2007 [4]. The Strategy sets UK air quality standards[♦] and objectives for the pollutants in the Air Quality Standards Regulations plus 1,3-butadiene and recognises that action at national, regional and local level may be needed, depending on the scale and nature of the air quality problem. There is no legal requirement to meet objectives set within the UK AQS except where equivalent limit values are set within the Air Quality Standards Regulations.

6.9 The 1995 Environment Act also established the UK system of Local Air Quality Management (LAQM), that requires local authorities to go through a process of review and assessment of air quality in their areas, identifying places where objectives are not likely to be met, then declaring Air Quality Management Areas (AQMAs) and putting in place Air Quality Action Plans to improve air quality. These plans also contribute, at local level, to the achievement of the limit values in the Air Quality Standards Regulations.

6.10 The limit values and objectives relevant to this assessment are summarised in Table 6.1. Where the limit values and the AQS objectives differ, the more stringent has been used.

Table 6.1: Summary of Relevant Air Quality Limit Values and Objectives

Pollutant	Averaging Period	Objectives/Limit Values	Not to be Exceeded More Than
Nitrogen Dioxide (NO^2)	1 hour	200 µg.m-3	18 times per calendar year
	Annual	40 µg.m-3	-
Particulate Matter (PM^{10})	24 Hour	50 µg.m-3	35 times per calendar year
	Annual	20 µg.m-3	-

[2] Defra, 2010, The Air Quality Standards Regulations.

[3] The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020

[4] Defra, 2007, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 2.

♦ Standards are concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. Standards, as the benchmarks for setting objectives, are set purely with regard to scientific evidence and medical evidence on the effects of the particular pollutant on health, or on the wider environment, as minimum or zero risk levels.

Pollutant	Averaging Period	Objectives/Limit Values	Not to be Exceeded More Than
Particulate Matter ($PM^{2.5}$)	Annual	10 µg.m-3 to be met by 31st December 2040[+]	-

6.11 On 14 January 2019, Defra published the 'Clean Air Strategy 2019'. The report sets out actions that the Government intends to take to reduce emissions from transport, in the home, from farming and from industry.

Policy

National Planning Policy

National Planning Policy Framework

6.12 The National Planning Policy Framework (NPPF) [5] is a material consideration for local planning authorities and decision-takers in determining applications. At the heart of the NPPF, is a presumption in favour of sustainable development, subject to caveats where a plan or project affects a habitats Site. For determining planning applications, this means approving development proposals if they accord with an up-to-date local development plan, unless material considerations indicate otherwise. If the development plan does not contain relevant policies, or the policies are out of date, then planning permission should be granted unless the application of policies in the NPPF that protect areas or assets of particular importance provides a clear reason for refusing the development, or any adverse impacts would significantly outweigh the benefits.

6.13 The NPPF sets out three overarching objectives to achieve sustainable development. The relevant objective in the context of this air quality assessment is:

"An 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" (Paragraph 8c)

6.14 Under the heading 'Promoting sustainable transport', the NPPF states:

"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making." (Paragraph 109)

6.15 Under the heading 'Conserving and enhancing the natural environment', the NPPF states:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

[+] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 sets out an annual-mean PM2.5 target of 10 µg.m-3 to be met by the end of 2040. As the proposed opening year of the development is before 2040 this lower target has not been considered further.

[5] Communities and Local Government, December 2023, National Planning Policy Framework

…

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; …" (Paragraph 180)

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan." (Paragraph 186)

National Planning Practice Guidance

6.16 The National Planning Practice Guidance (NPPG) was issued on-line on 6 March 2014 and is updated periodically by government as a live document. The last major update was on 1 November 2019. The Air Quality section of the NPPG describes the circumstances when air quality, odour and dust can be a planning concern, requiring assessment.

6.17 The NPPG advises that whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity. The NPPG states that when deciding whether air quality is relevant to a planning application, considerations could include whether the development would:

"Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;

Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;

Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;

Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;

Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."

6.18 The NPPG provides advice on how air quality impacts can be mitigated and notes *"Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented. Planning conditions and obligations can be used to secure mitigation where the relevant tests are met."*

Local Planning Policy

6.19 The MCC Core Strategy Development Plan Document was adopted in 2012, setting out policies for the years 2012 to 2027, and is the key document in Manchester's Local Development Framework. Key policies regarding air quality within the document are summarised below:

Policy EN 16:

"The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant. When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas."

Assessment Methodology and Significance Criteria

Approach

6.20 Neither the NPPF nor the NPPG is prescriptive on the methodology for assessing air quality effects or describing significance; practitioners continue to use guidance provided by Defra and non-governmental organisations, including Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM). However, the NPPG does advise that "Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific. The scope and content of supporting information is best discussed and agreed between the local planning authority and applicant before it is commissioned." It lists several areas that might be usefully agreed at the outset.

6.21 This air quality assessment covers the elements recommended in the NPPG. The approach is consistent with the EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality document [6], the IAQM Guidance on the assessment of dust from demolition and

[6] EPUK & IAQM, January 2017, Land-Use Planning & Development Control: Planning for Air Quality

construction [7], and, where relevant, Defra's Local Air Quality Management Technical Guidance: LAQM.TG22 [8]. It includes the key elements listed below:

- assessment of the existing air quality in the study area (existing baseline) and prediction of the future air quality without the development in place (future baseline), using official government estimates from Defra, publicly available air quality monitoring data for the area, and relevant Air Quality Review and Assessment (R&A) documents;
- a qualitative assessment of likely construction-phase impacts with mitigation and controls in place; and
- a quantitative prediction of the future operational-phase air quality impact with the development in place (with any necessary mitigation), encompassing the impacts on future occupants of the development from their exposure to the prevailing levels of air pollution, which can be a factor in the suitability of the Site for its proposed uses.

6.22 In line with the guidance set out in the NPPG, the Environmental Health Department at Manchester City Council was consulted as part of the extant planning permission (the 2021 Planning Permission), and the scope and methodology for the assessment was agreed on 11th November 2019. Given that best practice guidance has not changed since the previous consultation, the approach adopted in this chapter is considered by the authors of this chapter to be acceptable.

6.23 The development is car free (save for 2no. blue badge bays on Chester Street) and heat and power will be supplied by air source heat pumps. On that basis there are minimal emissions to air during the operational phase the impact of these emissions has not been considered further (see below para 6.26).

6.24 The detailed methodology for the assessment is provided in Appendix 6.1.

Scenarios Tested

6.25 The following scenarios have been tested:

- Scenario 1: Existing Site (baseline) with committed and cumulative developments;
- Scenario 2: Scenario 1 plus Proposed Development; and
- Scenario 3: Scenario 2 plus mitigation.

6.26 Blocks A, B and D are considered within these scenarios through the "growthed traffic flows" provided by the project's transport consultants.

6.27 The approach adopted in this Chapter deviates from the standard approach referenced in Chapter 2, in order to be consistent with the methodology recommended in the *"EPUK & IAQM Land-Use Planning & Development Control: Planning For Air Quality and IAQM Guidance on the assessment of dust from demolition and construction document."*

6.28 Concentrations of NO^2, PM^{10} and $PM^{2.5}$ have been predicted for the first year that the development is expected to be fully operational, 2027, to consider the effects of air quality on future residents of the Proposed Development. Traffic in 2027 would be expected to be the most conservative year

[7] IAQM, 2023, Guidance on the assessment of dust from demolition and construction

[8] Defra, 2022, Local Air Quality Management Technical Guidance, 2022 (LAQM.TG22)

with regards to concentrations of these pollutants, as background concentrations are likely to reduce over time as cleaner vehicle technologies form an increasing proportion of the fleet. If the construction timetable slips, it would likely improve the air quality experienced by new residents of the development.

6.29 As outlined in paragraph 6.23, the development will generate minimal emissions to air and therefore Scenario 1 and Scenario 2 are assumed to be the same.

6.30 Scenario 3 has been considered qualitatively in the residual effects section.

6.31 The Proposed Development has not been tested in isolation specifically as the development will not generate significant emissions to air. The assessment has focussed on comparing the predicted air quality concentrations at the Proposed Development with relevant air quality objectives and standards which will also include existing sources of pollution. Committed and cumulative schemes are considered in the traffic data modelled. Therefore, the inclusion of Plot 10a and 10b as cumulative schemes instead of a committed development as part of the baseline will have no impact on the results presented in this chapter.

The Study Area

6.32 The assessment study area differs between the construction and operational phases. The study areas in each case are described in detail within the methodology that follows, referencing the relevant guidance documents. An overview is provided below.

6.33 With respect to dust, the 2023 IAQM guidance on the assessment of dust from demolition and construction sets out 350 metres as the distance from the Site boundary or 50 metres from the centre-line of the Site traffic routes up to 500 metres from the entrance, within which there could potentially be nuisance dust and PM^{10} effects on human receptors [9]. These distances are set to be deliberately conservative.

6.34 With respect to the suitability of the Site for its proposed use, the study area includes the main road within 200 m of the Site boundary.

Source of Effect

6.35 For the construction phase, the most important consideration is dust and suspended particulate matter. Without appropriate mitigation, dust could cause temporary soiling of surfaces, particularly windows, cars and laundry and suspended particulate matter could have an impact on human-health.

6.36 For the operational phase, the most important consideration is future air quality concentrations of traffic-related emissions on the health of future occupants of the development.

Significance Criteria

6.37 The EPUK & IAQM guidance considers an exceedance of an air quality objective at a building façade to be significant adverse effect unless provision is made to reduce the resident's or occupant's exposure by some means. To confirm, The EPUK & IAQM guidance (EPUK & IAQM, January 2017, Land-Use Planning & Development Control: Planning For Air Quality) covers operational phase

[9] IAQM, 2023, Guidance on the assessment of dust from demolition and construction

significance criteria. IAQM dust guidance (IAQM, 2023, Guidance on the assessment of dust from demolition and construction) covers construction phase significance.

Baseline Conditions

Overview

6.38 The background concentration often represents a large proportion of the total pollution concentration, so it is important that the background concentration selected for the assessment is realistic. National Planning Practice Guidance and EPUK & IAQM guidance highlight public information from Defra and local monitoring studies as potential sources of information on background air quality. LAQM.TG22 recommends that Defra mapped concentration estimates are used to inform background concentrations in air quality modelling and states that: "Where appropriate these data can be supplemented by and compared with local measurements of background, although care should be exercised to ensure that the monitoring Site is representative of background air quality".

6.39 For this assessment, the background air quality has been characterised by drawing on information from the following public sources:

- Defra maps [10], which show estimated pollutant concentrations across the UK in 1 km grid squares; and
- published results of local authority Review and Assessment (R&A) studies of air quality, including local monitoring and modelling studies.

6.40 A detailed description of how the baseline air quality has been derived for this Proposed Development Site is summarised in the following paragraphs.

Review and Assessment Process

6.41 Manchester City Council (MCC) has designated an AQMA for an area covering Manchester City Centre, the area around Manchester Airport and the main arterial traffic routes due to high levels of NO^2 and PM^{10} attributable to road traffic emissions. The Site is within the designated AQMA.

6.42 The 2016 - 2021 Greater Manchester Air Quality Action Plan sets out the latest measures that Manchester City Council are implementing to improve air quality. Under the heading 'Development Control and Planning Regulation', the Action Plan provides the following measures:

- Construction Management Guidance: Greater Manchester (GM) councils to adopt the IAQM Guidance on the Assessment of Dust from Demolition and Construction sites – to ensure appropriate mitigation controls are conditioned.
- Development Planning Guidance: GM councils to adopt the most recent IAQM air quality planning guidance, to help ensure that planning applications consider impacts consistently, and opportunities to improve air quality are realised.

[10] Drawn from Defra Maps at http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

- Cumulative Development Database: A centralised database of planning applications and air quality assessments will be managed by Transport for Greater Manchester (TfGM), to better understand and manage the cumulative effects of several developments.

- Clean Air Zone Appraisals: TfGM will undertake an appraisal of the effects of charging Clean Air Zones (CAZs).

- 20mph Zones: Review the effects of 20mph zones on air quality.

- Encouraging Travel Planning: TfGM will work with the local authorities to encourage travel planning measures in businesses and individuals to affect a significant modal shift.

- Taxi & Private Hire Licensing: Seek to standardise the minimum emission requirements for taxis.

- Green Infrastructure: Investigate the potential of green infrastructure in improving air quality.

6.43 Instructed by the UK government the Greater Manchester Clean Air Plan (GM CAP) aims to bring levels of NO^2 on local roads within legal limits as soon as possible. However, on the 8 February 2022, a new Direction was issued changing some of the strategies that had been planned to be implemented including a Class C charging Clean Air Zone (CAZ). The Previous GM CAP has now been deemed to no longer be the right solution to achieve compliance and a New GM CAP is currently in progress.

Local Urban Background Monitoring

6.44 Monitors at urban background locations measure concentrations away from the local influence of emission sources and are therefore broadly representative of residential areas within large conurbations. Monitoring at local urban background locations is considered an appropriate source of data for the purposes of describing baseline air quality for this Proposed Development Site.

6.45 There is one local monitoring station where concentrations are measured using continuous automatic instruments. MCC monitors NO^2, PM^{10}, and $PM^{2.5}$ at the Manchester Piccadilly urban background location. The most recent (pre-pandemic) measured annual-mean concentrations are presented in Table 6.3.

Table 6.3: Automatically Monitored Urban Background Annual-Mean Concentrations (Scenario 1)

Monitor Name	Approximate Distance from the Application Site (km)	Pollutant	Concentration (µg.m-3)		2018	2019
Manchester Piccadilly (MAN3)	1.3	NO^2		36	35	36
		PM^{10}		20	21	20
		$PM^{2.5}$		8	11	12

6.46 In addition, MCC manually monitors NO^2 concentrations at a number of urban background locations using passive diffusion tubes and the most recent (pre-pandemic) measured annual-mean concentrations within 3 km are presented in Table 6.4.

Table 6.4: Passively Monitored Urban Background Annual-Mean NO^2 Concentrations (Scenario 1)

Monitor Code	Monitor Name	Approximate Distance from the Application Site (km)	Concentration (µg.m-3)		
			2017	2018	2019
MA77NO	Hewitt Street	0.39	38.8	41	43.7
MA72NO	Lockton Close	0.98	34.6	33.4	32.8
MA26ANO	Chethams School	1.71	35.5	33.4	33
MA78NO	Rostron Avenue	2.51	38.3	33.2	33
SA25NO	Wythop Gardens	2.63	30.8	29.2	30.2

6.47 The closest monitor to the Site is MAN77 on Hewitt Street, close to the junction with Medlock Street. This monitoring location is only 10 m from Medlock Street. As the traffic flow data provided for the assessment includes Medlock Street, if measurements at this location were used to inform the background concentration within the model, there would be some double counting of the modelled contribution from Medlock Street. Measurements at MAN77 have therefore not been considered as appropriate background concentrations.

Defra Mapped Concentration Estimates

6.48 Defra's total annual-mean NO^2 concentration estimates have been collected for the 1 km grid squares of the monitoring sites and the Proposed Development and are summarised in Table 6.5.

Table 6.5: Defra Mapped Annual-Mean Background NO^2 Concentration Estimates (Scenario 2)

Monitor Code	Monitor Name	Approximate Distance from the Application Site (km)	Concentration (µg.m-3) Range of Monitored	Estimated Defra Mapped
-	Application Site	-	-	27.3
MA72NO	Lockton Close	0.98	32.8 - 34.6	29.7
MAN3	Manchester Piccadilly	1.30	35 - 36	30.4
MA26ANO	Chethams School	1.71	33 - 35.5	29.3
MA78NO	Rostron Avenue	2.51	33 - 38.3	19.9
SA25NO	Wythop Gardens	2.63	29.2 - 30.8	23.7

6.49 Similarly, the Defra total annual-mean PM^{10} concentration estimates have been collected for the grid square of the monitoring sites and the Proposed Development and are summarised in Table 6.6.

Table 6.6: Defra Mapped Annual-Mean Background PM^{10} and $PM^{2.5}$ Concentration Estimates (Scenario 2)

Monitor Code	Monitor Name	Pollutant	Approximate Distance from the Application Site (km)	Concentration (µg.m-3) Range of Monitored	Estimated Defra Mapped
-	Application Site	PM^{10}	-	-	13.8
MAN3	Manchester Piccadilly	PM^{10}	1.30	20 - 21	13.9
-	Application Site	$PM^{2.5}$	-	-	8.9
MAN3	Manchester Piccadilly	$PM^{2.5}$	1.30	8 - 12	9.0

Appropriate Background Concentrations for the Proposed Development

6.50 For NO^2, the Defra mapped background concentration estimates are generally smaller than the range of the results from monitoring and the use of these data would not be conservative. The MA72NO monitor is the closest representative monitoring location to the Site. The background annual-mean NO^2 concentration has been derived from an average of the 2017 - 2019 range, 33.6 µg.m-3, monitored at MA72NO.

6.51 For PM^{10}, the Defra mapped background concentration estimate is lower than the range of results from monitoring. The background annual-mean PM^{10} concentration at the Site has been derived from the highest value, 21 µg.m-3, in the 2017 - 2019 range of data at the MAN3 Automatic monitor.

6.52 For PM2.5, the Defra mapped background concentration estimate is within than the range of results from monitoring. The background annual-mean $PM^{2.5}$ concentration at the Site has been derived from the Defra mapped background concentration of 8.9 µg.m-3.

6.53 Historically the view has been that background traffic related NO^2 concentrations in the UK would reduce over time, due to the progressive introduction of improved vehicle technologies and increasingly stringent limits on emissions. However, the results of recent monitoring across the UK suggest that background annual-mean NO^2 concentrations have not decreased in line with expectations. Inspection of the results of local monitoring presented here indicates suggest that there is no trend over time for concentrations of PM^{10} in the vicinity of the Site. However, the results do suggest that there is a decrease over time for concentrations of NO^2 and PM2.5 in the vicinity of the Site.

6.54 To ensure that the assessment presents conservative results, no reduction in the background has been applied for future years.

6.55 Table 6.7 summarises the annual-mean background concentrations for NO^2, PM^{10} and $PM^{2.5}$ used in this assessment.

Table 6.7: Summary of Background Annual-Mean (Long-term) Concentrations used in the Assessment (Scenario 2)

Pollutant	Data Source	Concentration (µg.m-3)
NO^2	Concentration measured at MA72NO	33.6
PM^{10}	Concentration measured at MAN3 in 2018	21
$PM^{2.5}$	Defra Mapped Background (2018)	8.9

Identification and Evaluation of Likely Significant Effects

Construction Phase

Construction Dust

6.56 An Construction Management Plan (Appendix 5.1) has been prepared and the type of activities that could cause fugitive dust emissions are earthworks; handling and disposal of spoil; wind-blown particulate material from stockpiles; handling of loose construction materials; and movement of vehicles, both on and off site.

6.57 The level and distribution of construction dust emissions will vary according to factors such as the type of dust, duration and location of dust-generating activity, weather conditions and the effectiveness of suppression methods.

6.58 The main effect of any dust emissions, if not mitigated, could be annoyance due to soiling of surfaces, particularly windows, cars and laundry. However, it is normally possible, by implementation of proper control, to ensure that dust deposition does not give rise to significant adverse effects, although short-term events may occur (for example, due to technical failure or exceptional weather conditions). The following assessment, using the IAQM methodology, predicts the risk of dust impacts and the level of mitigation that is required to control the residual effects to a level that is *"not significant".*

Risk of Dust Impacts

Source

6.59 There will be no demolition or crushing activities so demolition has been scoped out.

6.60 The Site area is 2,341 m^2. As this is below 18,000 m^2, the dust emission magnitude for the earthworks phase is classified as small.

6.61 The total volume of the buildings to be constructed would be between 12,000 and 75,000 m^3 and the dust emission magnitude for the construction phase is classified as medium.

6.62 The maximum number of outwards movements in any one day is between 20 and 50 HDVs so the dust emission magnitude for track out would be classified as medium.

Table 6.8: Dust Emission Magnitude for Earthworks, Construction and Track out

Earthworks	Construction	Track out
Small	Medium	Medium

Pathway and Receptor - Sensitivity of the Area

6.63 All earthworks and construction activities are assumed to occur within the Site boundary. As such, receptors at distances within 20 m, 50 m, 100 m, 200 m and 350 m of the Site boundary have been identified and are illustrated in Figure 6.4. The sensitivity of the area has been classified and the results are provided in Table 6.9 below.

6.64 The IAQM Guidance on the assessment of dust from demolition and construction sets out 350 m as the distance from the Site boundary and 50 m from the Site traffic routes up to 500 m of the entrance, within which there could potentially be nuisance dust and PM^{10} effects on human receptors. Footnote A of Table 6.1.4 of Appendix 6.1, in accordance with IAQM guidance, describes the methodology applied. Only a distance of up to 50 m was required to determine the sensitivity of the local area and an increase in scoping distance would have no impact on our results.

Table 6.9: Sensitivity of the Surrounding Area for Earthworks and Construction (Scenario 1)

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Dust Soiling	High	More than 100 residential receptors at the student accommodation blocks on Chester Street to the east of the Site, within 50 m of the Site boundary.
Human Health	Low	More than 100 residential receptors at the student accommodation on Chester Street to the east of the Site, within 50 m of the Site boundary. Background PM^{10} concentration for the assessment of 21 µg.m-3, is below 24 µg.m-3.

6.65 The Dust Emission Magnitude for track out is classified as medium and track out may occur on roads up to 200 m from the Site. The major routes within 200 m of the Site are Chester Road, Hulme Street, Wilmott Street, and Cambridge Street. The sensitivity of the area has been classified and the results are provided in Table 6.10.

Table 6.10: Sensitivity of the Surrounding Area for Track out (Scenario 1)

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Dust Soiling	High	More than 100 residential receptors at the student accommodation blocks on Chester Street and Cambridge Street to

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
		the south east of the Site, within 20 m of roads expected to be used by construction vehicles.
Human Health	Medium	More than 100 residential receptors at the student accommodation blocks on Chester Street and Cambridge Street to the south east of the Site, within 20 m of the roads expected to be used by construction vehicles. Background PM^{10} concentration for the assessment of 21 µg.m-3, is below 24 µg.m-3.

Overall Dust Risk

6.66 The Dust Emission Magnitude has been considered in the context of the Sensitivity of the Area (Tables 6.1.4 and 6.1.5) to give the Dust Impact Risk. **Table 6.11** summarises the Dust Impact Risk for the three activities.

Table 6.11: Dust Impact Risk for Earthworks, Construction and Track out (Scenario 1)

Source	Earthworks	Construction	Track out
Dust Soiling	Low	Medium	Medium
Human Health	Negligible	Low	Medium
Risk	Low	Medium	Medium

6.67 Taking the Site as a whole, the overall risk is deemed to be medium. The mitigation measures appropriate to a level of risk for the Site as a whole and for each of the phases are set out in **Appendix 6.2.**

6.68 Provided this package of mitigation measures is implemented, the residual construction dust effects will not be significant. The IAQM dust guidance states that *"For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'."* The IAQM dust guidance recommends that significance is only assigned to the effect after the activities are considered with mitigation in place.

Operational Phase

Assessment of Air Quality Impacts on Surrounding Area

6.69 The EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality document provides the following threshold criteria for determining when an air quality assessment should be undertaken for sites inside an AQMA:

- An increase in annual average daily Light Duty Vehicle (LDV) flows by more than 100; or

- An increase in annual average daily HDV flows by more than 25.

6.70 The project's transport consultants, Sanderson Associates, have forecast that the total annual average daily vehicle movements generated by the development will be well below 100 on all roads. The development is expected to generate a 0 HGVs per day as an annual average as HGVs will not visit every day.

6.71 It is therefore highly unlikely that the above EPUK & IAQM thresholds will be exceeded.

6.72 The EPUK & IAQM continues by stating that "If none of the criteria are met then there should be no requirement to carry out an air quality assessment for the impact of the proposed development on the local area, and the impacts can be considered to have insignificant effects."

6.73 Based on this, the Proposed Development is not likely to have a significant air quality effect on the surrounding area.

Assessment of New Population Exposure (Site Suitability)

6.74 This section of the Chapter summarises the operational-phase air quality impacts on future occupants of the development from their exposure to the prevailing levels of air pollution, which can be a factor in the suitability of the Site for its proposed uses.

6.75 Table 6.12 presents the maximum annual-mean NO^2, PM^{10} and $PM^{2.5}$ concentrations predicted at a range of heights at the façades of proposed receptors.

Table 6.12: Predicted Annual-Mean NO^2, PM^{10} and $PM^{2.5}$ Concentrations (µg.m-3) at Proposed Receptors (Scenario 2)

Receptor ID	Receptor Name	NO^2	PM^{10}	$PM^{2.5}$	No. of days where daily-mean PM^{10} > 50 µg.m-3
A0	Gym	40.0	23.0	10.0	8
B0	Plant	40.6	23.3	10.2	8
C0	Plant	41.7	23.9	10.5	7
D0	Refuse/Plant	41.9	24.0	10.6	7
E0	Office	40.8	23.5	10.3	6
F0	Lobby	39.9	23.0	10.0	9
G0	Sub Station	39.2	22.7	9.9	8
A1	Lounge	39.6	22.7	9.9	7
B1	Studio	40.2	22.9	10.0	7
C1	Cluster Bedroom	40.9	23.2	10.2	6
D1	Cluster Kitchen	41.1	23.3	10.2	10
E1	Clustered Bedroom	40.5	23.1	10.1	9
F1	Cycle Store	39.7	22.8	9.9	8
G1	Study	39.0	22.5	9.8	7
A2	Studio	38.9	22.4	9.7	6

Receptor ID	Receptor Name	NO^2	PM^{10}	$PM^{2.5}$	No. of days where daily-mean PM^{10} > 50 µg.m-3
B2	Acc Studio/Studio	39.6	22.6	9.8	10
C2	Cluster Bedroom	40.8	22.8	10.0	9
D2	Cluster Kitchen	41.2	22.9	10.0	8
E2	Cluster Bedroom	40.2	22.7	9.9	7
F2	Acc Cluster Bedroom	39.2	22.5	9.8	7
G2	Studio	38.5	22.3	9.7	9
A3	Studio	38.3	22.1	9.6	8
B3	Acc Studio/Studio	38.9	22.3	9.7	8
C3	Cluster Bedroom	40.1	22.5	9.8	7
D3	Cluster Kitchen	40.5	22.6	9.9	6
E3	Cluster Bedroom	39.5	22.4	9.7	8
F3	Acc Cluster Bedroom	38.6	22.2	9.6	8
G3	Studio	37.9	22.1	9.5	7
A4	Studio	37.5	21.9	9.4	7
B4	Acc Studio/Studio	37.9	22.0	9.5	6
C4	Cluster Bedroom	38.5	22.1	9.6	8
D4	Cluster Kitchen	38.7	22.1	9.6	7
E4	Cluster Bedroom	38.3	22.1	9.5	7
F4	Acc Cluster Bedroom	37.7	22.0	9.5	6
G4	Studio	37.3	21.9	9.4	6
Lounge	Lounge	39.5	22.8	9.9	8
Maximum	-	41.9	24.0	10.6	10
Minimum	-	37.3	21.9	9.4	6

6.76 The annual, daily and hourly-mean AQS objectives apply at the façades of all residential bedrooms and lounges.

6.77 As there are no highly sensitive receptors expected to reside within B0 (Plant), C0 (Plant), D0 (Refuse/Plant) the exceedance of 40 µg.m-3 is not significant (the daily and hourly-mean AQS objectives would not apply here). We have modelled these positions purely for completeness.

6.78 Only the daily and hourly-mean AQS objective applies at the Gym (A0), Office (E0), Lobby (F0), and Cluster Kitchens (D1, D2, D3, D4). The approaches used to predict the concentrations for these different averaging periods are described below. Receptors where the annual mean applies are highlighted. The predicted annual-mean NO^2 concentrations range between 37.3 and 41.9 µg.m-3. For all but six receptors where the annual-mean AQS objective applies, the predicted annual-mean NO^2 concentrations are below the annual-mean AQS objective of 40 µg.m-3. Furthermore, as the annual-mean NO^2 concentration is predicted to be less than 60 µg.m-3 at all receptors, the hourly-mean AQS objective is expected to be met everywhere.

6.79 There are six receptors where the annual-mean NO^2 concentrations are predicted to exceed the AQS objective of 40 µg.m-3: receptors B1, C1, E1, C2, E2, and C3 and mitigation measures will be required. Suitable mitigation measures are discussed In Appendix 6.2.

6.80 The predicted annual-mean PM^{10} concentrations range between 21.9 and 24.0 µg.m-3, well below the annual-mean AQS objective of 40 µg.m-3 at all receptors. Furthermore, as the annual-mean PM^{10} concentration is predicted to be less than 31.5 µg.m-3, the daily-mean AQS objective for this pollutant is expected to be met.

6.81 Predicted annual-mean $PM^{2.5}$ concentrations range between 9.4 and 10.6 µg.m-3. Predicted concentrations at all receptors are below the annual-mean AQS objective of 20 µg.m-3.

Significance of Effects

6.82 It is generally considered good practice that, where possible, an assessment should communicate effects both numerically and descriptively. Professional judgement by a competent, suitably qualified professional is required to establish the significance associated with the consequence of the impacts.

6.83 The AQS objectives for PM^{10} and $PM^{2.5}$ are likely to be met at the facades of the Proposed Development. However, the AQS objective for NO^2 will be exceeded at several locations on the ground, first, second, and third floor. Suitable mitigation measures are discussed In Appendix 6.2. With the effective implementation of recommended mitigation measures, the resulting air quality effect is considered to be *"not significant"* overall.

Sensitivity and Uncertainty

6.84 An analysis of the sources of uncertainty in the results of the assessment is given in Appendix 6.1. The conclusion of that analysis was that, overall, the predicted total concentration is likely to be towards the top of the uncertainty range rather than being a central estimate. The actual concentrations that will be found when the development is operational are unlikely to be higher than those presented within this report and are more likely to be lower.

Cumulative Effects

Construction Phase

6.85 During the construction phase, there is the potential for cumulative effects where two or more proposed developments are within 700 m of each other; and then only for receptors within 350 m of both developments. Cumulative effects would then only be experienced if construction works on multiple schemes were to take place simultaneously. It has been identified that there are nine committed developments within 700 m of the Proposed Development.

6.86 With the effective implementation of appropriate mitigation measures at all construction sites within 700 m of the Proposed Development, the risk of cumulative dust effects is minimal and as a result no significant effects are anticipated during the construction phase. Cumulative effects are assessed as 'negligible' and "not significant".

Operational Phase

6.87 The transport consultants have confirmed that the traffic data has been supplemented with TEMPRO growth forecasts derived from the National Trip End Model which uses economic growth predictions specific to an area (in this case Central Manchester) to derive traffic growth. If individual trips were added from specific developments, it would introduce a degree of double counting, as most of these developments would be contributing to the economic and employment growth figures which are fed into the national model. Cumulative effects have therefore been considered in the traffic data modelled.

Mitigation Measures

Construction Phase

6.88 The IAQM dust guidance lists mitigation measures for low, medium and high dust risks. As summarised in Table 6.11, the predicted dust impact risk is classified as medium in the absence of dust controls and mitigation. The general Site measures described as 'highly recommended' for medium risks are listed in Appendix 6.2.

Operational Phase

6.89 The predicted pollutant concentrations at proposed sensitive receptors are below the relevant AQS objectives at all locations except at receptors B1, C1, E1, C2, E2, and C3, located on the first, second, and third floors of the proposed Block C. Suitable mitigation measures are discussed In Appendix 6.2 and include the:

- Provision of air-tight (hermetically sealed) windows at all bedspaces on the first floor and at certain bedspaces on the second and third-floor level. The specification of the windows should not preclude the windows from being open, at the residents' discretion, to allow rapid ventilation; and

- Provision of mechanical ventilation at all bedspaces on the first floor and at certain bedspaces on the second and third-floor level. Ventilation air should be supplied from an intake point on the building as far away as practicable from the major pollution sources. The intake is commonly specified to be at roof level at the rear of the property. If possible, the intakes should be located at an elevated point where the AQS objective is predicted to be achieved. If no such intake location is possible, then the intake should incorporate NO2 filters to European Standard EN 13779.

6.90 To note, the above mitigation measures are consistent with those approved in relation to the extant planning permission.

6.91 Further guidance is provided in Appendix 6.2 (Mitigation)

Residual Effects

Construction Phase

6.92 Provided the package of mitigation measures is implemented, the residual construction dust effects will not be significant. The IAQM dust guidance states that *"For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'."* The IAQM dust guidance recommends that significance is only assigned to the effect after the activities are considered with mitigation in place.

Table 6.13: Residual Effects (Construction) (Scenario 3)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Impact of suspended particulate matter on human-health and deposited dust (nuisance)on human-health and nuisance	Receptors within 350 m	The mitigation measures are set out in **Appendix 6.2**.	Construction Environmental Management Plan	Not significant and temporary

Operational Phase

6.93 As set out earlier in the Chapter, it is generally considered good practice that, where possible, an assessment should communicate effects both numerically and descriptively. Professional judgement by a competent, suitably qualified professional is required to establish the significance associated with the consequence of the impacts.

6.94 Regarding future occupants of the Proposed Development, the AQS objectives for PM^{10} and $PM^{2.5}$ are likely to be met at the façades of all buildings and all levels. The AQS objectives for NO^2 are likely to be met at the façades of all floors above the third floor. At the first, second, and third floor mitigation measures in some of the homes have been recommended to reduce the exposure of future occupants to NO^2 and improve the suitability of the development for its proposed use. With effective implementation of the recommended mitigation measures, future occupants of the development will be exposed to acceptable air quality and the Site is deemed suitable for its proposed future use in this respect.

6.95 Using professional judgement, the overall residual air quality effect is considered to be *"not significant".*

Table 6.13: Residual Effects (Operational) (Scenario 3)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Impact of concentrations of NO^2, PM^{10} and $PM^{2.5}$ on existing receptors.	Existing receptors	None.	None.	Not significant and permanent.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Impact of concentrations of NO^2, PM^{10} and $PM^{2.5}$ on human-health of future occupants of the development.	Future occupants of the development	Provision of air-tight (hermetically sealed) windows and mechanical ventilation at all bedspaces on the first floor and at certain bedspaces on the second and third-floor level of the Proposed Development.	Included in design of development	Not significant and permanent.

Monitoring

6.96 No monitoring is recommended for the Proposed Development.

Reference List

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

- Included as footnotes throughout.

7. Climate Change

Introduction

7.1 This Chapter of the ES has been prepared by Ramboll and assesses the likely climate change impacts of the Proposed Development upon the Site and surrounding area. This Chapter also describes the methodology 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. This Chapter is accompanied by three technical appendices, as follows:

- Appendix 7.1: Climate Change Resilience (CCR) Assessment
- Appendix 7.2: In-Combination Climate Change Impacts (ICCI) Assessment
- Appendix 7.3: Whole Life Carbon Assessment

7.2 The authors of this Chapter are Sarah Pattinson, Emilia Gabriel and Natalia Fernandez Ferro. Sarah has a Masters in Physical Geography from Durham University and 4 years' experience in EIA, Environmental Statement production, greenhouse gas and climate change risk assessments and carbon reporting. Emilia has an honours degree in Ecological Science and has 8 years' experience working within the environment and sustainability sector. Natalia has a Masters in Quality Control from the University of Oviedo and over 20 years' consultancy experience in the sustainability and climate industry, specialising in carbon management, climate change, material resources and waste.

Assumptions and Limitations

Climate Change Resilience

7.3 The CCR assessment has relied on freely available climate baseline and future climate projections data from the Met Office and United Kingdom Climate Projections 18 (UKCP18). It has been assumed that these data sets have been reported correctly at the time of writing this Chapter.

7.4 Climate projections can be used to determine likely future trends in climate conditions in the locality of the Proposed Development through its lifetime. The climate trends are based on a range of greenhouse gas (GHG) emissions scenarios which are subject to a degree of uncertainty. How the climate would react to different levels of emissions is also uncertain. There are three key sources of uncertainty within climate projections:

- Natural climate variability: either from natural external influences on climate (e.g., change in atmospheric particulates due to volcanic activity), or changes in the energy received from the sun;
- Incomplete understanding of earth system processes and their imperfect representation in climate models (modelling uncertainty); and
- Uncertainty in future man-made emissions of GHGs and other pollutants.

7.5 However, the CCR assessment has been undertaken using data for the high emissions scenario (RCP 8.5) which provides a more conservative assessment of potential climatic changes.

7.6 End of life has not been considered separately within the CCR assessment due to the short-term nature of this phase and the similarity of end-of-life effects to those identified for the operational phase. Instead, end of life been considered within the future baseline for the operational phase CCR assessment.

In-Combination Climate Change Impacts

7.7 The ICCI assessment has relied on the effects identified in other relevant ES chapters and professional judgement.

Greenhouse Gas Emissions

7.8 The GHG emissions assessment presented in this Chapter considers the construction, operational and end of life GHG emissions. It has been assumed that the design life of the Proposed Development is 60 years.

7.9 GHG emissions associated with the construction materials (A1-A3), transport to the Site (A4), construction and installation processes (A5), maintenance and repairs (B2-B3), replacement (B4), operational energy use (B6), end of life (C1-C4) and benefits and loads beyond the system boundary have been sourced from Whole Life Carbon Assessment (Appendix 7.3). This appendix also provides an overview of the building elements that have been scoped in and out of the lifecycle assessment as per the RICS Professional Statement 'Whole life carbon assessment for the built environment'[11].

7.10 Furthermore, the assumptions for the GHG emissions assessment have been detailed within Appendix A of the Whole Life Carbon Assessment (Appendix 7.3).

Relevant Legislation, Policy and Guidance

Legislation

7.11 A review of relevant legislation and policy has been undertaken to ensure that the Proposed Development complies with national, regional and local legislation and policy.

International Legalisation

The Paris Agreement

7.12 The Paris Agreement[12] builds upon the United National Framework Convention on Climate Change (UNFCCC). The Paris Agreement is a legally binding international treaty on climate change that was adopted by 196 Parties at COP 21 on 12 December 2015 and entered into force on 4 November 2016. The Paris Agreement aims to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels.

[11] RICS Professional Statement, 2017. Whole life carbon assessment for the built environment, Table 3.

[12] UNFCC, 2015. Paris Agreement. Available at: https://unfccc.int/process-and-meetings/the-paris-agreement [Accessed 27/10/2023].

Kyoto Protocol

7.13 The Kyoto Protocol[13] to the UNFCCC was adopted on 11 December 1997 and ratified on 16 February 2005. There are 192 Parties signed up to the Kyoto Protocol. The Protocol commits industrialized countries and economies in transition to limit and reduce GHG emissions in accordance with agreed individual targets. The Protocol binds developed countries such as the United Kingdom (UK) and places a heavier burden on them under the principle of "common but differentiated responsibility and respective capabilities". This is because the Protocol recognizes that they are largely responsible for the current high levels of GHG emissions in the atmosphere.

Policy

National Legislation and Planning Policy

The Climate Change Act

7.14 The Climate Change Act 2008 (2050 Target Amendment) Order (2019)[14] forms the basis for the UK's approach to tackling and responding to climate change. The Climate Change Act 2008 (2050 Target Amendment) Order notes that UK GHG emissions must be reduced by 100%, relative to the 1990 baseline. The Climate Change Act includes UK Carbon Budgets (2019)[15] which set out the five-yearly carbon budgets from 2008 to 2050, to achieve net zero GHG emissions by 2050.

UK's Nationally Determined Contribution under the Paris Agreement (2020)

7.15 The UK's Nationally Determined Contribution (NDC) [16],[17], to the UNFCCC. On 12 December 2020, the UK communicated its new Nationally Determined Contribution (NDC) under the Paris Agreement to the United Nations Framework Convention on Climate Change (UNFCCC). The NDC commits the UK to reducing economy wide GHG emissions by at least 68% by 2030, compared to 1990 levels. As well as the NDC, the UK has published an Adaptation Communication and a Biennial Finance Communication. These are complementary to the NDC and are also required under the Paris Agreement.

UK Climate Change Risk Assessment Report (2022)

7.16 The Independent Assessment of Climate Change Risk (2021)[18] sets out the priority climate change risks and opportunities for the UK. The report draws on an extensive programme of analysis, consultation and consideration by the Climate Change Committee involving over 450 people, 130 organisations and more than 1,500 pages of evidence and analysis. The UK government's third Climate Change Risk Assessment (CCRA)[19] was published on 17 January 2022 and is based on this Independent Assessment of Climate Change Risk. The UK government's second CCRA was published in 2017.

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[13] UNFCC, 1998. Kyoto Agreement. Available at: https://unfccc.int/kyoto_protocol [Accessed 27/10/2023].

[14] Secretary of State, 2019. Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111187654 [Accessed 27/10/2023].

[15] UK Government, 2019. UK Carbon Budgets, House of Commons Library. Available at: www.parliament.uk/commons-library [Accessed 27/10/2023].

[16] UNFCC, 2016. NDC User Guide. Available at: https://unfccc.int/files/focus/indc_portal/application/pdf/ndc_parties_userguide_version_1__may_2016_(2).pdf [Accessed 27/10/2023].

[17] Department for Energy Security & Net Zero, 2020. The UK's Nationally Determined Contribution communication to the UNFCC. Available at: https://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc [Accessed 27/10/2023].

[18] Climate Change Committee, 2021. Independent Assessment of UK Climate Risk. Available at: https://www.theccc.org.uk/publication/independent-assessment-of-uk-climate-risk/ [Accessed 27/10/2023].

[19] Department for Environment, Food and Rural Affairs, 2022. UK Climate Change Risk Assessment 2022. Available at: https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2022 [Accessed 27/10/2023].

National Planning Policy Framework (2023)

7.17 The required National Planning Policy Framework (NPPF)[20] summarises in a single document the Government's planning policies for England and how these are expected to be applied. The NPPF was updated in December 2023, superseding the previous version published in September 2023.

7.18 The NPPF introduces the presumption in favour of sustainable development at the heart of the framework, where Section 2, Paragraph 11 states that local planning authorities should promote a sustainable pattern of development when creating plans and assessing and determining development proposals. Section 14, Paragraph 157 of the NPPF states that:

"The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure."

The Climate Change: Third National Adaptation Programme (2023-2028)

7.19 The Climate Change: Third National Adaptation Programme (2023-2028)[21] (NAP) was produced by the Department for Environment, Food and Rural Affairs (Defra) and launched in 2023. The plan sets out the UK government's response to the third CCRA. It forms part of the five-yearly cycle of requirements laid down by the Climate Change Act 2008, with the aim of driving a dynamic and adaptive approach to building the nation's resilience to climate change.

7.20 The NAP3 represents the beginning of a five-year programme of work to build the "UK government's vision…for a country that effectively plans for and is fully adapted to the changing climate, with resilience against each of the identified climate risks".

7.21 The NAP3 responds to the 61 risks and opportunities identified in the third CCRA impacting multiple sectors of society, including risks to businesses, health and lives, buildings and communities, infrastructure, and the natural environment. Actions included in the NAP3 state the UK Government will:

"Deliver a strategic, whole of society approach to resilience, including new commitments on resilience standards;

Update the NPPF to support both adaptation and mitigation efforts, in addition to recent updates to Building Regulations to reduce excess heat and unwanted solar gains in all new residential buildings; and

Provide dedicated local climate projections service to each upper tier local authority to support local adaptation planning on hazards such as heatwaves, and short-term, localised heavy rainfall."

[20] Department for Levelling Up, Housing and Communities, 2023. The National Planning Policy Framework. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2 [Accessed 27/10/2023].

[21] Department for Environment, Food & Rural Affairs, 2023. The Third National Adaptation Programme (NAP3) and the Fourth Strategy for Climate Adaptation Reporting. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1172931/The_Third_National_Adaptation_Programme.pdf [Accessed 27/10/2023].

A Green Future: Our 25-Year Plan to Improve the Environment (2018)

7.22 The Environmental Improvement Plan (EIP) 2023[22] for England is the first revision of the 25-Year Environment Plan[23]. It builds on the 25-Year Environment Plan vision with a new plan setting out how the UK Government will work with landowners, communities and businesses to deliver each of the Plan's goals for improving the environment and helping the natural world regain and retain good health over the next 25 years. The goals include clean air, minimising waste and mitigation against climate change.

7.23 The plan reiterates the 25-Year Environment Plan goal to 'take all possible action to mitigation climate change, while adapting to reduce its impact.' In order to achieve this, the plan states that the UK Government will:

- *"Publish the third National Adaptation Programme (NAP3) in 2023 that will set out our five-year strategy to build the UK's climate resilience. [Note: NAP3 has now been published - see section above].*
- *Later in 2023 we will update on our progress and plans to reach net zero.*
- *Publish a Land Use Framework in 2023 to setting out how we will balance multiple demands on our land including climate mitigation and adaptation.*
- *Investing in farmers and land managers to mitigate flood risk and other climate change-related impacts in our natural environment, through our new farming schemes.*
- *Continue our role as a global leader in tackling climate change, biodiversity loss and land degradation and push for an integrated approach to international action.*
- *Deliver our commitment to spend £11.6bn of International Climate Finance between 2021 and 2026, including at least £3 billion on solutions that protect and restore nature.*
- *Expand the number of organisations in scope for adaptation reporting on their climate resilience preparedness.*
- *Fund the restoration of over 35,000 hectares of peatlands in England by 2025 through the Nature for Climate Peatland Grant Scheme."*

[22] Department for Environment, Food & Rural Affairs, 2023. Environmental Improvement Plan 2023. Available at: https://www.gov.uk/government/publications/environmental-improvement-plan [Accessed 27/10/2023].

[23] Department for Environment, Food & Rural Affairs, 2018. 25 Year Environment Plan. Available at: https://www.gov.uk/government/publications/25-year-environment-plan [Accessed 27/10/2023].

Regional Planning Policy

Greater Manchester Combined Authority Five-Year Environment Plan (2019)

7.24 The Greater Manchester Combined Authority Five-Year Environment Plan 2019-2024[24] sets out the Great Manchester Combined Authority's long-term environmental vision. The two main aims of the Plan in relation to climate include:

- *"Aim for our mitigation of climate change: For our Manchester city-region to be carbon neutral by 2038 and meet carbon budgets that comply with international commitments; and*
- *Aim for resilience and adaptation to climate change: To be prepared for the impacts of climate change and already be adapting to the future changes from any increase in climate shocks and stresses."*

Local Planning Policy

Manchester City Council Core Strategy (2012)

7.25 The Manchester City Council Core Strategy 2012 – 2027 (2012)[25] is a key document in the Manchester Local Plan[26] that sets the out the long-term strategic policies for Manchester's future development and forms the framework that planning applications will be assessed against.

7.26 The following policies of the Core Strategy are of particular relevance to climate:

7.27 Policy EN 4: All development must follow the principle of the Energy Hierarchy, being designed:

- Wherever possible new developments 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;
- Where possible new developments 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;
- 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; and
- The use of building's materials with low embodied carbon in new development and refurbishment schemes.

7.28 Policy EN 6: Applications for residential development of 10 or more units and all other development over 1,000m2 will be expected as a minimum to meet the target shown below, unless this can be shown not to be viable. This should be demonstrated through an energy statement, submitted as part

[24] Greater Manchester Combined Authority, 2019. Five-Year Environment Plan 2019-2024. Available at: https://www.greatermanchester-ca.gov.uk/what-we-do/environment/five-year-environment-plan/ [Accessed 27/10/2023].

[25] Manchester City Council, 2012. Core Strategy Development Plan Document 2012 – 2027. Available at: https://www.manchester.gov.uk/info/200074/planning/6573/core_strategy_2012-2027 [Accessed 06/10/2023].

[26] Manchester City Council. Local Plan. Available at: https://www.manchester.gov.uk/info/200074/planning/6572/local_plan [Accessed 11/10/2023].

of the Design and Access Statement. Such statement will be expected to set out the projected regulated energy demand and associated CO2 emissions for all phases of the development:

- Network development area: CHP/district heating anchor or connection or where not feasible, a 15% increase on Part L 2010.
- Electricity intense buildings: +10% increase on Part L 2010.
- Micro generation area: +15% increase on Part L 2010.

7.29 Policy EN 8: 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:

- Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rainwater permeability;
- 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; and
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation.

Manchester City Council (MCC) Sustainability Appraisal Report

7.30 The Manchester City Council Sustainability Appraisal Report (2011)[27] promotes sustainable development through better integration of sustainability (economic, social, and environmental) considerations in the preparation and adoption of plans. The Sustainability Appraisal was prepared to fulfil Sustainability Appraisal requirements arising from the Planning and Compulsory Purchase Act 2004[28], and Strategic Environmental Assessment (SEA) requirements arising from the Strategic Environmental Assessment Directive[29].

Manchester City Council Unitary Development Policies

7.31 The Manchester City Council Unitary Development Policies Part 2, Area 15 Didsbury (2012)[30] contains area policies relating to Environmental improvement and Protection, Transport, Employment and Economic Development, and Leisure and Recreation.

[27] Manchester City Council, 2011. Sustainability Appraisal Report. Available at: https://www.manchester.gov.uk/downloads/download/5949/documents_supporting_the_core_strategy [Accessed 06/10/2023].

[28] UK Government, 2004. Planning and Compulsory Purchase Act 2004. Available at: https://www.legislation.gov.uk/ukpga/2004/5/contents [Accessed 11/10/2023].

[29] European Commission, 2001. Strategic Environmental Assessment (SEA) Directive. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001L0042 [Accessed 11/10/2023].

[30] Manchester City Council, 2012. Unitary Development Policies Part 2, Area 15 Didsbury. Available at: https://www.manchester.gov.uk/downloads/download/4975/extant_unitary_development_policies_udp [Accessed 06/10/2023].

Manchester Climate Change Framework 2020-2050

7.32 The Manchester Climate Change Framework 2020 – 2025 (2020)[31] is the Manchester Climate Change Agency and Climate Change partnership's strategy towards making Manchester a thriving, zero carbon, climate resilient city. The strategy includes four objectives to be met by 2025:

- Staying within our carbon budgets;
- Climate adaptation and resilience;
- Health and wellbeing; and
- Inclusive, zero carbon and climate resilient economy.

Guidance

Planning Practice Guidance (2019)

7.33 The Planning Practice Guidance (PPG)[32] was published in March 2014 to provide more-in depth guidance to the NPPF. The PPG aims to make planning guidance more accessible, and to ensure that the guidance is kept up to date.

7.34 PGG: Climate Change (last updated in March 2019) advises how to identify suitable mitigation and climate adaptation measures to incorporate into the planning process. It states, *"effective spatial planning is an important part of a successful response to climate change as it can influence the emission of greenhouse gases… Planning can also help to increase resilience to climate change impact through the location, mix and design of development."*

Assessment Methodology and Significance Criteria

Scenarios Tested

7.35 The following testing scenarios have been considered in this ES Chapter:

- Scenario 1: Existing Site (baseline i.e., the boundary of Block C);
- Scenario 2: Existing Site (baseline) with Proposed Development; and
- Scenario 3: Existing Site (baseline) with Proposed Development and mitigation.

7.36 Scenario 4: Existing Site (baseline) with Proposed Development, mitigation and cumulative development (i.e. those with planning permission, but not under construction) has not been assessed as part of the climate assessment. Further information regarding the reasoning for scoping out is provided in the 'Cumulative Effects' section.

7.37 For the CCR, ICCI and GHG assessments the Proposed Development has been tested in isolation and cumulative and committed developments have not been considered. For the CCR and ICCI assessments, this is because the assessments are limited in their spatial extent to the Site boundary.

[31] The Manchester Climate Change Partnership, 2020. Manchester Climate Change Framework 2020 – 2025. Available at: https://www.manchesterclimate.com/sites/default/files/Manchester%20Climate%20Change%20Framework%202020-25.pdf [Accessed 06/10/2023].

[32] Department for Levelling Up, Housing and Communities, 2019. Planning practice guidance - Climate change. Available at: https://www.gov.uk/government/collections/planning-practice-guidance [Accessed 27/10/2023].

For the GHG assessment, the atmospheric concentration of GHGs and resulting effect on climate change is affected by all sources and sinks globally, anthropogenic, and otherwise. Therefore, effects of GHG emissions from specific cumulative schemes and/or committed projects have not been individually assessed. However, GHG emissions, have been contextualised within the UK and Manchester City Council and relevant sector-based carbon budgets. Therefore, treating Plot 10a and Plot 10b as cumulative schemes does not have an effect on the assessments carried out.

7.38 All assessments in this ES consider all relevant phases of the Proposed Development, i.e., construction and operational phases.

The Study Area

7.39 Due to the nature of a climate change assessment, it is necessary to define a separate study area, for each assessment to ensure proportionate identification of effects and the potential significance of these.

7.40 The study area for the CRR assessment does not extend beyond the boundary of the Site and temporary land take associated with access during the construction phase. This is to capture the risks of the Proposed Development itself from climate change.

7.41 The study area for the ICCI assessment matches that of the relevant environmental discipline. This is to take account of the additive effect of climate change of each discipline cumulatively.

7.42 The study area for the GHG emissions assessment includes emissions associated to the construction, operational and end of life activities within the boundary of the Site, emissions associated with the materials (A1-A3), transport to the Site (A4), construction and installation processes (A5), maintenance and repairs (B2-B3), replacement (B4), operational energy consumption use (B6), end of life (C1-C4) and benefits and loads beyond the system boundary.

Assessment Scope

7.43 For assessing climate within this chapter, a combination of professional judgement, consideration of IEMA guidance[33],[34], and technical experience has been used throughout the assessment.

7.44 Account has been taken of all applicable guidance and policy.

7.45 The Environmental Impact Assessment (EIA) Regulations[35] require an assessment of the likely significant effects of a project on climate and vice versa. A climate assessment in the context of EIA comprises three separate assessments:

- CCR assessment - considers the vulnerability of the Proposed Development to extreme weather and projected climate change;
- ICCI assessment - considers how extreme weather and projected climate change could have an additive effect on impacts identified by other technical disciplines as a result of the Proposed Development; and

[33] IEMA, 2022. Environmental Impact Assessment: Guide to Assessing GHG Emissions and Evaluating Their Significance 2nd Edition.

[34] IEMA, 2020. Environmental Impact Assessment: Climate Change Resilience and Adaptation.

[35] Secretary of State, 2017. The Town and Country Planning (Environmental Impact Assessment) Regulations 2017. Available at: https://www.legislation.gov.uk/uksi/2017/571/contents/made [Accessed 27/10/2023].

- GHG emissions assessment - considers the potential for significant effects to arise from the Proposed Development in terms of GHG emissions during the construction, operational and end of life phases.

7.46 Due to the nature of a climate assessment, it is necessary to define a separate study area, baseline and methodology for each assessment to ensure proportionate identification of effects and the potential significance of these.

7.47 The assessment scope is consistent with the scope outlined as part of the submitted Scoping Opinion request.

Temporal Scope

Climate Change Resilience

7.48 The CCR assessment has considered the impacts of climate change during the construction phase (the Proposed Development works are anticipated to be undertaken over 2 years and 5 months, considered to be short-term) and the operational phase (with an anticipated opening year of 2027 and a 60-year design life, considered to be long-term).

7.49 Adverse effects associated with climate change are likely to be in the medium to long-term and so the focus within this assessment is on the operational phase, although extreme weather events during construction have also been considered. A future baseline has been used to ensure the potential effects associated with climate change are considered over the proposed design life of the Proposed Development (60 years for structures).

In-Combination Climate Change Impacts

7.50 The temporal scope for the ICCI assessment matches that of the relevant technical disciplines. This is to take account of the fact the assessment considers the additive effect of climate change on each relevant technical discipline.

Greenhouse Gas Emissions

7.51 The GHG emissions assessment has considered impacts arising during the construction phase (the development works are anticipated to be undertaken over 2 years and 5 months, considered to be short-term), the operational phase (with an anticipated opening year of 2027 and a 60-year design life, considered to be long-term) and the end-of-life phase (anticipated to be undertaken from 2087 and considered to be short-term).

Baseline Characterisation Method

Desk Study

7.52 In order to establish baseline climate change conditions in the study area, relevant data was reviewed and assessed.

Climate Change Resilience and In-Combination Climate Change Impacts

7.53 For the CCR and ICCI assessments, data has been obtained from the following sources:

- Met Office Historic Climate data[36]; and
- UKCP18 climate projections.[37]

Greenhouse Gas Emissions

7.54 For the GHG assessment, data was obtained from the following sources:

- Local Authority (MCC) and national carbon dioxide emissions statistics;
- UK Carbon Budgets (2019)15; and
- Whole Life Carbon Assessment (**Appendix 7.3**).

Construction Assessment

Climate Change Resilience and In-Combination Climate Change Impacts

7.55 The approach for the construction and end of life phases CCR and ICCI assessment is the same as that for the operational phase and therefore covered below under the Operational Assessment sub-heading to avoid repetition.

Greenhouse Gas Emissions

7.56 The sources of GHG emissions associated with the construction phase of the Proposed Development included within the scope of the assessment are summarised in **Table 7.1** below. GHG emissions have been measured in tCO2e. This is a measure used to compare the emissions from various GHG emissions based upon their global warming potential.

7.57 For each of the items presented in **Table 7.1**, data or reasonable assumptions presented within the Whole Life Carbon Assessment, have been used along with GHG emissions factors to estimate the GHG emissions associated with the construction phase.

Table 7.1: Construction GHG Assessment Scope

Item	Description	Input Data	Emissions Factors
Construction materials (A1-A3)	GHG emissions which are emitted during the extraction and manufacture of materials used in the construction works.	Whole Life Carbon Assessment (**Appendix 7.3**)	OneClickLCA and RICS guidance
Transportation to the Site (A4)	GHG emissions associated with the transportation of materials to the Site		
Construction and installation processes (A5)	GHG emissions from the direct on-Site construction works.		OneClickLCA

[36] Met Office Historic Station Data. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/historic-station-data [Accessed 27/10/2023].

[37] Met Office, 2018. UK Climate Projections 2018 (UKCP18). Available at: https://ukclimateprojections-ui.metoffice.gov.uk/products [Accessed 27/10/2023].

7.58 The GHG assessment provides a professional judgement on whether GHG emissions associated with the construction phase of the Proposed Development are likely to be significant in the context of the UK, Greater Manchester and buildings sector carbon budgets.

Operational Assessment

Climate Change Resilience

7.59 The CCR assessment has considered how current and future climate trends in the study area could affect the Proposed Development. The CCR assessment has comprised:

- Identification of sensitive receptors;
- A review of current climate in the study area and future trends using data from the Met Office and UKCP18 and assessment of projected changes on climate variables;
- A qualitative assessment, based on professional judgement and IEMA guidance, of extreme weather and climate change impacts that could affect the Proposed Development during the construction, operational and end of life phases;
- A summary of design and mitigation measures to improve resilience to extreme weather and future climate trends; and
- Identification of any residual effects.

7.60 The CCR assessment has provided a judgement on whether any projected climate change impacts and associated effects are likely to be significant.

In-Combination Climate Change Impacts

7.61 Climate change may have an additive effect in respect of the individual environmental effects reported for other technical assessments undertaken as part of the EIA. These effects may individually be insignificant, but when combined or added, could result in significant effects requiring additional design and/or mitigation measures.

7.62 All chapters included as part of the ES, as well as the standalone technical planning reports have been considered for the ICCI assessment. This has been completed as a high-level overview providing the following:

- A review of current climate in the study area and future trends using data from the Met Office and UKCP18 and assessment of projected changes on climate variables;
- Review of potential effects associated with the Proposed Development which could be exacerbated by the impacts of climate change;
- Review of design and mitigation measures that have been identified;
- Qualitative assessment, based on professional judgement of the implications of extreme weather and potential future climate change on effects identified by the other technical assessments during the construction and operational phases;
- Additional mitigation that may be required to address the effects of climate change; and

- Identification of any residual effects taking account of climate change.

7.63 The ICCI assessment has provided a qualitative judgement in whether climate change is likely to alter the significance of any of the effects identified in the impact assessment. To ensure the assessment is proportionate, individual negligible effects have not been considered in this assessment.

Greenhouse Gas Emissions

7.64 The GHG emissions assessment has considered the GHG emissions associated with the operation of the Proposed Development based on typical annual consumption.

7.65 The sources of GHG emissions, associated with the operation and the end-of-life phases of the Proposed Development, included within the scope of the assessment are summarised in **Table 7.2.**

7.66 For each of the items presented within **Table 7.2**, data or reasonable assumptions made using professional judgement, have been used along with GHG emissions factors to estimate the GHG emissions associated with the operational phase.

Table 7.2: Operational Proposed Development GHG Assessment Boundaries

Item	Description	Input Data	Emissions Factors
Maintenance (B2)	GHG emissions associated with the maintenance of the main building.	Whole Life Carbon Assessment (**Appendix 7.3**)	OneClickLCA and RICS guidance.
Repair (B3)	GHG emissions associated with the repair of the main building.		
Replacement (B4)	GHG emissions associated with the replacement of the main building.		
Operational energy use (B6)	GHG emissions from regulated energy demands which includes heating, cooling, domestic hot water, auxiliary power (pumps, fans etc.) and lighting. GHG emissions from unregulated energy demands which includes plug-in systems not in the main building heating, ventilation, air conditioning (HVAC) and lighting.		UK Government Greenhouse Gas Reporting: Conversion Factors 2023[38] National Grid ESO Future Energy Scenarios decarbonised grid "Falling Short" scenario
Operational water use (B7)	GHG emissions associated with water consumption.	N/A - Not included due to a lack of information associated at the time of assessment. It is assumed that emissions would be minimal and are unlikely to have a material impact upon the overall assessment.	N/A
End of life (C1-C4)	GHG emissions associated with the processing and transport of waste associated to the end-of-life phase.	Whole Life Carbon Assessment (**Appendix 7.3**)	OneClickLCA and RICS guidance.

[38] UK Government. 2023. Greenhouse Gas Conversion Factors. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023 [Accessed 27/10/2023].

7.67 The GHG assessment provides a professional judgement on whether GHG emissions associated with the operational phase of the Proposed Development are likely to be significant in the context of UK, Greater Manchester and buildings sector carbon budgets.

Assessment Criteria

Climate Change Resilience

7.68 The potential for climate change to affect the Proposed Development includes effects related to more extreme weather events, such as hotter summers, more intense storms, fluvial and surface water flooding, increased energy demand and damage to infrastructure.

7.69 The criteria used to assess if an effect is significant or not is set out in subsequent sub-sections. This is determined by consideration of the sensitivity of the receptor, magnitude of impact and scale of the effect. In considering the significance of an effect, consideration has been given to the duration of the effect, the geographical extent of the effect and the application of professional judgement.

In-Combination Climate Change Impacts

7.70 Climate change can also result in additive effects for the other topics assessed in the EIA. For example, drought conditions could increase the production of dust during construction, worsening local air quality. Similarly, higher temperatures could lead to failure of mitigation planting and re-instatement of soft landscaping features.

7.71 The basis of this assessment is to review the identified effects, the receptors and embedded mitigation measures for each discipline contained within the ES. Professional judgement has been used to assess whether projected climate change could increase the scale of the effects as identified by the disciplines, change the sensitivity of the receptors, or reduce the effectiveness of embedded mitigation measures.

Greenhouse Gas Emissions

7.72 The potential for the Proposed Development to contribute to GHG emissions levels is determined by the construction works of the Proposed Development, the way residential development is used during operation and the end of life of the Proposed Development.

7.73 In line with the updated IEMA guidance, the GHG assessment seeks to evaluate the significance of GHG emissions based on the whole life GHG emissions of the Proposed Development and how these align with the UK's net zero compatible trajectory. Therefore, the crux of significance for the GHG assessment is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050.

Source of Effect

Climate Change Resilience

7.74 The CCR assessment focuses on the sensitivity of receptors to potential climate change impacts. Therefore, the source of the effects on sensitive receptors is from climate change impacts, rather than from the Proposed Development.

In-Combination Climate Change Impact

7.75 The ICCI assessment focuses on the potential for climate change to exacerbate the effects on receptors identified by individual environmental disciplines. Therefore, the source of the effects on sensitive receptors is from the ICCI and from the Proposed Development, as specified by the individual environmental assessments in the ES.

Greenhouse Gas Emissions

7.76 The GHG assessment focuses on GHG emissions associated with the Proposed Development that would be released to the global atmosphere. Therefore, the source of the effects on sensitive receptors would be the release of GHG emissions associated with the Proposed Development, including from the construction, operational and end of life phases.

Significance Criteria

Climate Change Resilience

7.77 In line with IEMA guidance, the sensitivity of receptors to potential climate change impacts should be considered. In determining the sensitivity of receptors, the following factors have been considered as well as the value or importance of the receptor:

- Susceptibility of the receptor (e.g., ability to be affected by a change); and
- Vulnerability of the receptor (e.g., potential exposure to a change).

7.78 Table 7.3 provides the criteria for sensitive receptors to be 'scoped in' to this assessment.

Table 7.3: Summary of Sensitive Receptors

Receptor	Sensitivity
Building and infrastructure receptors (including equipment, materials and building operations)	High
Human health receptors (e.g., construction workers, occupants and Site users)	High
Environmental receptors (e.g., integrity of landscape features, habitats and species)	High

7.79 To ensure a proportionate response, professional judgement has been used in determining sensitivity. The assessment focuses on receptors that are of high sensitivity. For example, human receptors are of high sensitivity because of the importance of their safety and welfare, whilst the Proposed Development itself is of high sensitivity because of the importance of the integrity of the building structures and fabric.

In-Combination Climate Change Impact

7.80 The ICCI assessment has focused on the potential for climate change to exacerbate the effects on receptors identified by individual environmental disciplines. For this reason, the sensitivity of the receptors has been considered the same as that specified by the individual environmental assessments in the ES.

Greenhouse Gas Emissions

7.81 GHG emissions associated with the Proposed Development would be released to the global atmosphere. Therefore, the global atmosphere is considered to be the receptor and is considered to be of high sensitivity. In line with standard practice, the sensitivity of human and natural receptors is not considered within this assessment.

Impact Magnitude Criteria

Climate Change Resilience

7.82 The magnitude of impact has been assessed using professional judgement as a combination of both the probability (likelihood) of the impact and the consequence.

Probability of Climate Impact

7.83 In line with IEMA guidance, the probability of the impact refers to the likelihood of a climate impact occurring and having an impact on the Proposed Development, over its design life. This includes consideration of existing and embedded mitigation measures within the design. The probability of the impact is classified as unlikely, possible (as likely as not) and likely in accordance with the criteria set out in Table 7.4.

Table 7.4: CCR Probability of Impact Criteria

Likelihood Level	Description
Unlikely	The climate impact is not anticipated to occur during the lifetime of the Proposed Development (60 years)
Possible (as likely as not)	The climate impact may occur a limited number of times during the lifetime of the Proposed Development (60 years)
Likely	The climate impact may occur multiple times during the lifetime of the Proposed Development (60 years)

Consequence of Climate Impact

7.84 In line with IEMA guidance, consequence takes into account the geographical extent of the effect, or the number of receptors affected (e. g. scale), the complexity of the effect, degree of harm to those affected and the duration, frequency and reversibility of effect. The consequence of the impact has been classified as very low, low, medium, high and very high in accordance with criteria set out in Table 7.5.

Table 7.5: CCR Impact Consequence Criteria

Consequence Level	Health and Safety	Public Perception	Disruption to Construction/Operation
Very high	Multiple fatalities	Extensive and prolonged negative reporting nationally and/or public disputes with key stakeholders	Site-wide disruption lasting more than one week
High	Single fatality/multiple long-term injuries	Extensive and prolonged negative reporting nationally	Site-wide disruption lasting more than one day but less than one week

Consequence Level	Health and Safety	Public Perception	Disruption to Construction/Operation
		and/or public disputes with key stakeholders	
Medium	Long-term injury or illness, prolonged hospitalisation or inability to work	Prolonged negative local and/or regional report	Partial disruption across elements of the Site/Proposed Development lasting more than one day but less than one week
Low	Lost time injury or medical treatment required, short term impact on persons affected	Negative local media reports and/or localised stakeholder concern over sustained period	Partial disruption across elements of the Site/Proposed Development lasting less than a day
Very low	Minor harm or near miss	Short-term negative local stakeholder reaction, e.g., isolated complaints	Disruption to an isolated section of the Site/Proposed Development lasting less than a day

7.85 Climate change impacts have been assessed on the basis of the likelihood of impact and consequences as presented in matrix shown in Table 7.6.

Table 7.6: CCR Impact Magnitude Criteria

Consequence Level	Likelihood of Impact Unlikely	Possible	Likely
Very high	Medium	High	High
High	Medium	High	High
Medium	Low	Medium	High
Low	Low	Low	Medium
Very low	Low	Low	Medium

In-Combination Climate Change Impacts

7.86 In line with the IEMA guidance, the ICCI assessment has been completed based on the likely environmental effects as identified and defined by the individual environmental assessments in the ES. Additional mitigation measures have been identified to address the potential for climate change to exacerbate these environmental effects.

Greenhouse Gas Emissions

7.87 In line with IEMA guidance, it should be noted that the crux of significance for the GHG assessment is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050. Contextualisation of the carbon footprint of a scheme determines whether or not it supports or undermines the trajectory towards net zero. Therefore, the total GHG emissions associated with the Proposed Development have been compared to the carbon budget for the UK and for Manchester to provide national and regional context, as well as to the buildings sector carbon budgets. Additional mitigation measures have been identified to reduce GHG emissions where necessary.

Scale of Effect Criteria

Climate Change Resilience

7.88 As stated within IEMA guidance, there is no legislative definition of 'significance'. The significance of effects has therefore been assessed using professional judgement on the basis of the value/sensitivity of receptors against the magnitude of impact (see Table 7.6). On the basis that receptors are considered to be of high sensitivity, any impacts that are of high magnitude are 'significant' in EIA terms.

7.89 Additional mitigation has been identified for those climate resilience affects which are considered significant.

In-Combination Climate Change Impacts

7.90 As stated within IEMA guidance, there is no legislative definition of 'significance'. The ICCI assessment describes each potential climate impact and uses professional judgement to determine whether there is potential for climate change to increase the significance of the residual effect.

Greenhouse Gas Emissions

7.91 In line with the updated IEMA guidance, the scale of effects for the GHG assessment has been described as either major, moderate, minor, negligible, or beneficial, as presented in Table 7.7.

Table 7.7: Greenhouse Gas Scale of Effect Criteria

Scale	Description
Major	The project's GHG emissions impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing Manchester City Council's and UK's policy for projects of this type. The project is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
Moderate	The project's GHG emissions 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 Manchester City Council's and UK's policy goals for projects of this type. The project falls short of fully contributing to the UK's trajectory towards net zero.
Minor	The project's GHG emissions impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. The project is fully in line with measures necessary to achieve the UK's trajectory towards net zero.

Nature of Effect Criteria

Climate Change Resilience and In-Combination Climate Change Impacts

7.92 The nature of the effect has been described as either adverse, neutral, or beneficial as follows:

- Beneficial - an advantageous effect to a receptor;
- Neutral - an effect that on balance, is neither beneficial nor adverse to a receptor; or

- Adverse - a detrimental effect to a receptor.

Greenhouse Gas Emissions

7.93 In line with the updated IEMA guidance, the nature of effects for the GHG assessment has been described as either adverse, negligible or beneficial, as follows:

- Adverse – when the project follows a 'business-as-usual' or 'do minimum' approach and is not compatible with the UK's net zero trajectory or follows accepted aligned practice or area-based transition targets. Similarly, a project that is compatible with the budgeted, science-based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that can also be considered to have an adverse effect.

- Negligible – when the project achieves emissions mitigation that goes substantially beyond the UK's GHG reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory and has minimal residual emissions.

- Beneficial – when the project causes GHG emissions to be avoided or removed from the atmosphere. Only projects that actively reverse (rather than only reduce) the risk of severe climate change can be judged as having a beneficial effect.

Baseline Conditions

Existing Baseline

Climate Change Resilience

7.94 To determine the likely future climate conditions there is a need to apply climate projections to understand what local conditions are likely to be during the lifetime of the Proposed Development. Climate projections are a prediction of the response of the climate system to a given concentration of GHG emissions or atmospheric GHG concentration scenarios. Good practice in the UK uses projections based on UKCP18. Therefore, the climate change resilience and ICCI assessments have set out the local climate baseline using Met Office Historic Climate Data and the future baseline using UKCP18.

7.95 This section contains information about average and extreme climate variables. The CCR assessment includes risks associated with changes in seasonal or annual average temperature and rainfall as well as risks associated with extreme events (e.g., intense rainfall events or heatwaves).

7.96 Average monthly climate data for Ringway climate station (nearest possible representative weather station) for the period 1991-2004 is summarised in Table 7.8.

Table 7.8: Average Monthly Climate Data for Ringway Climate Station (Scenario 1)

Month	Maximum temperature (°C.)	Minimum temperature (°C.)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)
January	6.57	1.19	10.39	45.78	68.39
February	7.06	1.20	9.84	66.05	53.44
March	9.42	2.69	5.71	102.76	57.72
April	12.08	4.40	2.07	140.25	54.01
May	15.74	7.37	0.16	186.81	60.26
June	18.48	10.14	0	181.09	65.25
July	19.97	12.08	0	170.25	63.38

Month	Maximum temperature (°C.)	Minimum temperature (°C.)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)
August	19.86	11.96	0	162.65	76.85
September	17.30	10.02	0	125.42	73.28
October	13.72	7.22	1.02	96.88	82.62
November	9.44	3.77	4.62	55.68	80.07
December	7.25	1.89	8.56	42.03	79.99
Annual	13.09	6.17	3.52	114.82	67.89

7.97 Table 7.9 shows the average monthly temperature for the Ringway Climate Station, north-west England and north Wales regions, and for the UK between 1991-2020. It shows that north-west England and Wales regions are slightly colder as compared to UK average, and the area around the Proposed Development is warmer as compared to both the north-west England and north Wales regions and rest of the UK.

Table 7.9: Maximum Average Temperature for Ringway climate station, North-west England/north Wales region and the UK.

Season	Maximum Average temperature (°C.)		
	Ringway climate station	North-west England/north Wales region	UK
Summer	19.43	18.53	18.87
Winter	6.69	6.94	6.95
Annual	13.09	12.66	12.79

Greenhouse Gas Emissions

7.98 The current Site comprises land that has been derelict for an extended period of time therefore emissions are assumed to be zero and have been referred as the “Do Minimum” scenario.

Carbon Budget

7.99 The UK Government has set six-yearly carbon budgets which currently run until 2037. The UK national GHG emission fourth carbon budget of 1,950 Mt CO2e covers the five-year period of 2023-2027. As shown in Table 7.10, this carbon budget covers the entirety of the construction period of the Proposed Development, which is expected to be between March 2025 and August 2027 (2 years and 5 months).

Table 7.10: UK and Greater Manchester third, fourth, fifth and sixth carbon budgets

Carbon Budget	National Carbon budget level (MtCO2e)	Recommended Greater Manchester budget level (MtCO2e)
Fourth (2023-2027)	1,950	4.6
Fifth (2028-2032)	1,725	2.4
Sixth (2033-2037)	965	1.2

7.100 The Tyndall Centre[39] has provided recommended regional budgets for Greater Manchester, to ensure that Greater Manchester meets its target of being carbon neutral by 2038. This has been specified as 4.6 MtCO2e for 2023-2027, and 2.4 MtCO2e for 2028-2032.

7.101 The Climate Change Committee's Sixth Carbon Budget[40] provides data on projected emissions pathways for the buildings sector through to 2050. The Balanced Net Zero Pathway is aligned with reaching net zero by 2050 and is compatible with global efforts to limit the rise in global average temperature to well below 2°C and to pursue efforts to limit warming to 1.5°C, as set out in the Paris Agreement. Therefore, this emissions pathway has been used to calculate a projected carbon budget for the buildings sector, to contextualise the GHG emissions of the Proposed Development. This results in estimated projected carbon budgets of 419 MtCO2e for 2023-2027, 334 MtCO2e for 2028-2032 and 237 MtCO2e for 2033-2037.

Future Baseline

Climate Change Resilience

7.102 Future climate projections are published by the Met Office through the UKCP18 website. Climate projections can be used to determine the likely future climate conditions in the locality of the Proposed Development through its operational life.

7.103 Climate projections take into account uncertainty due to natural variability and an incomplete understanding of the climate system and its imperfect representation in models. The projections do this by giving the probabilities of a range of possible outcomes, as estimated by scientific methodology. Good practice in the UK uses UKCP18 projections and published literature such as UK Climate Change Risk Assessment 2022. UCKP18 includes projections of a range of climate variables for different time slices until the end of the century.

7.104 The probabilistic projections in the UKCP18 provide local low, central and high changes across the UK, corresponding to various probability levels (e. g. 10 %, 50 % and 90 %). There are also a number of Representative Concentrations Pathways (RCPs) available for UKCP18 with each pathway resulting in a different range of global mean temperature increases over the 21st century. IEMA Guidance recommends the use of RCP 8.5 at the 50 % percentile, for the 2080 timeline to ensure a suitably conservative approach.

7.105 Climate change is projected to lead to warmer and wetter winters and hotter and drier summers. However, natural variations, including extreme events such as storms and heat waves, will continue to punctuate these trends. The impacts of climate change across the UK based on the UKCP18 Factsheet projections have been summarised in **Table 7.11.**

[39] Tyndall Centre, 2023. Setting Climate Commitments for greater Manchester. Available at: https://carbonbudget.manchester.ac.uk/reports/ [Accessed 27/10/2023].

[40] Climate Change Committee, 2020. Sixth Carbon Budget 4. Supporting Information, charts and data. Available at: https://www.theccc.org.uk/publication/sixth-carbon-budget/ [Accessed 27/10/2023].

Table 7.11: UKCP18 Projections

Climate Parameter	Description
Temperature	Median warming will be at least 1 to 2°C throughout the year across the whole of the UK. Winter cool days will warm by 1 to 1.5°C across the country, whilst temperatures on warmer winter days increase by less than 1°C. In summer both hot and cool days will warm by 1.5 to 2°C across England.
Precipitation	Changes in precipitation are uncertain but suggest slightly wetter winters and drier summers.
Wind	Wind speed is not available for the UKCP18 probabilistic projections as it did not pass the UKCP credibility checks. However global, regional, and derived projections are available. UKCP18 show a wide spread of future changes in mean surface wind speed[41]. However, there is large uncertainty in projected changes in circulation over the UK and natural climate variability contributes much of this uncertainty. It is therefore difficult to represent regional wind extreme winds and gusts within regional climate models.
Humidity	Climate change will lead to an increase in humidity.

7.106 As shown in Figures 7.1 and 7.2, UKCP18 projections for North West England indicate an increased likelihood of warmer, drier summers for the future assessment period in comparison to the UKCP18 baseline.

7.107 As shown in Figures 7.3 and 7.4, UKCP18 projections for North West England indicate increased likelihood of milder, wetter winters for the future assessment period in comparison to the UKCP18 baseline. However, due to natural variability, some cold and dry winters will still occur.

Greenhouse Gas Emissions

7.108 Regarding operational emissions, the amount of coal in the UK electricity mix has substantially decreased in recent years and low and zero carbon technologies (including photovoltaic, wind and nuclear energy) have been increasingly used to generate a larger portion of the UK's electricity. This has resulted in a reduction of carbon emissions generated from grid supplied electricity. As the grid decarbonises, the lower amounts of emissions created through using on-Site electricity will result in a lower carbon impact.

7.109 In addition, the UK's commitment to becoming net zero carbon by 2050 means that GHG emissions would be dramatically reduced, and any remaining emissions offset, minimising the environmental impact from GHG emissions and contributing to limiting global warming of the planet.

[41] Met Office, 2018. UK Climate Projections 2018 (UKCP18). Factsheet: Wind. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-wind_march21.pdf https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-wind_march21.pdf[Accessed 27/10/2023].

Identification and Evaluation of Likely Significant Effects

Construction Phase

Climate Change Resilience

7.110 The CCR assessment relating to construction has been presented within **Appendix 7.1**. The CCR assessment for the Proposed Development has not identified any significant effects for the construction phase once existing design mitigation measures are taken into account. All effects would be of low magnitude and would therefore be **Not Significant**.

In-Combination Climate Change Impacts

7.111 The ICCI assessment relating to construction have been presented within **Appendix 7.2**. The ICCI assessment for the Proposed Development has identified no new significant effects as a result of climate change during the construction phase given existing design mitigation measures. Accordingly, the conclusion of the assessment is that in-combination climate effects would be **Not Significant**.

Greenhouse Gas Emissions

7.112 The construction GHG emissions have been reported in tonnes of CO2e for the duration of the construction phase in **Table 7.12.**

Table 7.12: Construction GHG Assessment Summary (Scenario 3)

Item	Estimated GHG emissions (tCO2e) during construction phase (Stages A1-A5)
Construction materials (A1-A3)	6,766
Transportation to the Site (A4)	735
Construction and installation processes (A5)	586
TOTAL	8,087

7.113 The construction of the Proposed Development is expected to contribute 0.00042% to the UK's fourth carbon budget for 2023-2027. The GHG emissions associated to the construction stage have not been compared to the Greater Manchester and building sector carbon budgets as this is only applicable to the building energy demand during the operational stage.

7.114 In addition, as outlined within Whole Life Carbon Assessment (**Appendix 7.3**), whole life embodied carbon for the Proposed Development is assessed as a betterment against the Greater London Authority recommended and aspirational benchmarks for residential buildings, in the absence of any such guidance specifically for PBSA. GLA benchmarks have been used as the GLA has more advanced guidance relating to WLCA, as compared to other UK cities.

7.115 Due to the low percentage of construction phase GHG emissions in comparison to the national and projected buildings sector's carbon budgets and betterment of embodied carbon against industry benchmarks, the Proposed Development is assessed as compatible with the budgeted, science-based 1.5 °C trajectory in terms of rate of emissions reduction. As the Proposed Development's GHG emissions impacts have been partially mitigated at this stage and meet the applicable existing and emerging policy requirements, the Proposed Development is considered to be **Minor Adverse (Not Significant).**

Operational Phase

Climate Change Resilience

7.116 In line with IEMA guidance, mitigation (including existing design measures) has been considered within this assessment and a summary of the significance has been provided. The assessment is based on professional judgment and presented in **Appendix 7.1**. The CCR assessment for the Proposed Development has not identified significant effects for the operational phase taking into account embedded mitigation measures. All effects have been considered to be **Not Significant.**

In-Combination Climate Change Impacts

7.117 A summary of potential ICCI and effects during the operational phase is provided in **Appendix 7.2**. The assessment is based on professional judgment informed by a review of individual technical assessments within the ES. The ICCI assessment for the Proposed Development has not identified any significant effects for the operational phase once existing design mitigation measures are taken into account. All effects are therefore considered to be **Not Significant.**

Greenhouse Gas Emissions

7.118 The operational GHG emissions have been reported in tonnes of CO2e for the estimated design life (60 years) of the operational phase. The results of the operational phase GHG assessment of the Proposed Development have been summarised in **Table 7.13.**

Table 7.13: Operational Proposed Development (non-decarbonised grid scenario) GHG Assessment Summary (Scenario 3)

Item	Estimated GHG emissions (tCO2e) for the Expected Design Life (60 years) (Stage B)
Maintenance and repair (B2 - B3)	323
Replacement (B4)	4,362
Operational energy use (B6)	29,952
TOTAL for Proposed Development	34,637

7.119 However, it is expected that GHG emissions would continue to decrease year on year, primarily due to increasing generation of grid electricity from sources that produce fewer GHG emissions and the development of cleaner fuels. The results of the operational phase GHG assessment of the Proposed Development with mitigation measures have been summarised in **Table 7.13.**

Table 7.14: Operational Proposed Development (decarbonised grid scenario) GHG Assessment Summary (Scenario 3)

Item	Estimated GHG emissions (tCO2e) for the Expected Design Life (60 years) (Stage B)
Maintenance and repair (B2 - B3)	323
Replacement (B4)	4,362
Operational energy use (B6)	5,975
TOTAL for Proposed Development	10,660

7.120 When comparing the *"do something"* scenario against the *"do minimum scenario",* i.e., the operational emissions of the existing baseline, the net contribution of the Proposed Development during operation is expected to be the same as the "do something" scenario. This is because the current Site comprises land that has been derelict for an extended period of time, therefore emissions for the *"Do Minimum"* scenario have been assumed to be zero.

7.121 The operation of the Proposed Development (non-decarbonised grid scenario) is expected to contribute 0.00001% towards the UK's carbon budget for 2023-2027, 0.00017% towards the UK's carbon budget for 2028-2032 and 0.00030% towards the UK's carbon budget for 2033-2037.

7.122 The operation of the Proposed Development (non-decarbonised grid scenario) is expected to contribute 0.004% towards Greater Manchester's recommended carbon budget for 2023-2027, 0.007% towards Greater Manchester's recommended carbon budget for 2028-2032 and 0.014% towards Greater Manchester's recommended carbon budget for 2033-2037.

7.123 The operation of the Proposed Development (non-decarbonised grid scenario) is expected to contribute 0.00004% towards the projected buildings sector's carbon budget for 2023-2027, 0.00075% towards the projected buildings sector's carbon budget for 2028-2032 and 0.00105% towards the projected buildings sector's carbon budget for 2033-2037.

7.124 In addition, within the Environmental Standards Statement (Document Ref. 2023.208), which supports this planning application, carbon reduction targets have been stipulated for the Proposed Development. To limit energy demand and GHG emissions from the operation of the building, a number of design features would be integrated to collectively contribute towards the emissions reduction target for the Proposed Development. These measures are anticipated to secure and improve upon the carbon reduction targets sought by the local planning authority for the Proposed Development and are outlined in the Mitigation Measures section.

7.125 The operation of the Proposed Development with mitigation measures (decarbonised grid scenario) is expected to contribute 0.000003% towards the UK's carbon budget for 2023-2027, 0.00005% towards the UK's carbon budget for 2028-2032 and 0.00009% towards the UK's carbon budget for 2033-2037.

7.126 The operation of the Proposed Development (decarbonised grid scenario) is expected to contribute 0.001% towards Greater Manchester's recommended carbon budget for 2023-2027, 0.021% towards Greater Manchester's recommended carbon budget for 2028-2032 and 0.041% towards Greater Manchester's recommended carbon budget for 2033-2037.

7.127 The operation of the Proposed Development (decarbonised grid scenario) is expected to contribute 0.00001% towards the projected buildings sector's carbon budget for 2023-2027, 0.00015% towards the projected buildings sector's carbon budget for 2028-2032 and 0.00021% towards the projected buildings sector's carbon budget for 2033-2037.

7.128 Additionally, the GHG emissions associated to the end of life of the Proposed Development have been estimated to be around 691 tCO2e.

7.129 The IEMA guidance indicates that GHG emissions should be considered as 'significant' if they are not compatible with the budgeted, science-based 1.5 °C trajectory in terms of rate of emissions reduction and do not comply with up-to-date policy and 'good practice' reduction measures.

7.130 Based on the GHG calculations and assuming that the GHG mitigation measures listed in the Mitigation Measures are implemented, the operation of the Proposed Development is assessed as being **Minor Adverse (Not Significant).**

Contextualisation of the Proposed Development GHG emissions against carbon budgets

7.131 The total GHG emissions associated to the construction, operation and end of life phases of the Proposed Development, based on a 60-year design life, are estimated to be 43,415 tCO2e for the non-decarbonised scenario and 19,438 tCO2e for the decarbonised scenario.

7.132 **Table 7.15** shows a contextualisation of the results of the net GHG emissions assessment for all phases of the Proposed Development without mitigation measures (non-decarbonised grid scenario) against the national, regional and sectoral carbon budgets.

Table 7.15: Contextualisation of estimated net GHG emissions for all stages of the Proposed Development (non-decarbonised grid scenario) against the UK, Greater Manchester and building sector carbon budgets. (Scenario 3)

Item	2023-2027 (Fourth Carbon Budget)	2028-2032 (Fifth Carbon Budget)	2033-2037 (Sixth Carbon Budget)
Estimated GHG emissions (tCO2e)	8,253	2,886	2,886
Estimated GHG emissions associated to energy use during operation (tCO2e)	166	2,496	2,496
UK Carbon Budget (tCO2e)	1,950,000,000	1,725,000,000	965,000,000
Estimated GHG emissions as a percentage of UK Carbon Budget	0.0004%	0.0002%	0.0003%
Greater Manchester Carbon Budget (tCO2e)	4,600,000	2,400,000	1,200,000
Estimated GHG emissions as a percentage of Greater Manchester Carbon Budget	0.004%	0.104%	0.208%
Buildings Sector Projected Carbon Budget (tCO2e)	419,000,000	334,000,000	237,000,000
Estimated GHG emissions as a percentage of Buildings Sector Projected Budget	0.00004%	0.00075%	0.00105%

7.133 When comparing the *"do something"* scenario against the *"do minimum scenario",* i.e., the operational emissions of the existing baseline, the net contribution of the Proposed Development (non-decarbonised grid scenario) during construction and operation is expected to contribute 0.0004% towards the UK's carbon budget for 2023-2027, 0.0002% towards the UK's carbon budget for 2028-2032 and 0.0003% towards the UK's carbon budget for 2033-2037.

7.134 The construction and operation of the Proposed Development (non-decarbonised grid scenario) is expected to contribute 0.004% towards Greater Manchester's recommended carbon budget for 2023-2027, 0.104% towards Greater Manchester's recommended carbon budget for 2028-2032 and 0.208% towards Greater Manchester's recommended carbon budget for 2033-2037.

7.135 The construction and operation of the Proposed Development (non-decarbonised grid scenario) is expected to contribute 0.00004% towards the projected buildings sector's carbon budget for 2023-2027, 0.00075% towards the projected buildings sector's carbon budget for 2028-2032 and 0.00105% towards the projected buildings sector's carbon budget for 2033-2037.

7.136 Table 7.16 shows a contextualisation of the results of the net GHG emissions assessment for all phases of the Proposed Development with mitigation measures (decarbonised grid scenario) against the national, regional and sectoral carbon budgets,

Table 7.16: Contextualisation of estimated net GHG emissions for all stages of the Proposed Development (decarbonised grid scenario) against the UK, Greater Manchester and building sector carbon budgets. (Scenario 3)

Item	2023-2027 (Fourth Carbon Budget)	2028-2032 (Fifth Carbon Budget)	2033-2037 (Sixth Carbon Budget)
Estimated GHG emissions (tCO2e)	8,146	888	888
Estimated GHG emissions associated to energy use during operation (tCO2e)	33	498	498
UK Carbon Budget (tCO2e)	1,950,000,000	1,725,000,000	965,000,000
Estimated GHG emissions as a percentage of UK Carbon Budget	0.0004%	0.0001%	0.0001%
Greater Manchester Carbon Budget (tCO2e)	4,600,000	2,400,000	1,200,000
Estimated GHG emissions as a percentage of Greater Manchester Carbon Budget	0.001%	0.021%	0.041%
Buildings Sector Projected Carbon Budget (tCO2e)	419,000,000	334,000,000	237,000,000
Estimated GHG emissions as a percentage of Buildings Sector Projected Budget	0.00001%	0.00015%	0.00021%

7.137 When comparing the "do something" scenario against the "do minimum scenario", the net contribution of the Proposed Development (decarbonised grid scenario) during construction and operation is expected to contribute 0.0004% towards the UK's carbon budget for 2023-2027, 0.0001% towards the UK's carbon budget for 2028-2032 and 0.0001% towards the UK's carbon budget for 2033-2037.

7.138 The construction and operation of the Proposed Development (decarbonised grid scenario) is expected to contribute 0.001% towards Greater Manchester's recommended carbon budget for 2023-2027, 0.021% towards Greater Manchester's recommended carbon budget for 2028-2032 and 0.041% towards Greater Manchester's recommended carbon budget for 2033-2037.

7.139 The construction and operation of the Proposed Development (decarbonised grid scenario) is expected to contribute 0.00001% towards the projected buildings sector's carbon budget for 2023-2027, 0.00015% towards the projected buildings sector's carbon budget for 2028-2032 and 0.00021% towards the projected buildings sector's carbon budget for 2033-2037.

7.140 Due to the low percentage of the construction and operational net GHG emissions in comparison to the national, regional and projected buildings sector's carbon budgets and embedded mitigation measures, the Proposed Development is assessed as compatible with the budgeted, science-based 1.5 °C trajectory in terms of rate of emissions reductions. As the Proposed Development's GHG emissions impacts have been partially mitigated at this stage and meet the applicable existing and emerging policy requirements, the Proposed Development is considered to be Minor Adverse (Not significant).

Cumulative Effects

Climate Change Resilience

7.141 The climate resilience effects identified as a result of the construction and operational phases are limited in their spatial extent to the Site boundary and the Proposed Development in isolation. Therefore, cumulative climate change resilience effects with other schemes have not been considered.

In-Combination Climate Change Impacts

7.142 The Climate Change Chapter of the ES has considered potential in-combination cumulative climate impacts affecting environmental receptors identified by other topic Chapters. It includes consideration of existing potential impacts on environmental receptors that could be intensified by climate change as well as environmental impacts that could potentially emerge in the future.

7.143 The ICCI's resulting from the construction, and operational phases would be limited in their spatial extent to the relevant technical assessments in the ES for the Proposed Development. Therefore, ICCI cumulative effects have not been considered with other cumulative schemes.

Greenhouse Gas Emissions

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

7.145 Therefore, effects of GHG emissions from specific cumulative projects have not been individually assessed. However, GHG emissions, have been contextualised within the UK and Manchester City Council and relevant sector-based carbon budgets.

Mitigation Measures

7.146 This chapter provides details of the proposed mitigation as detailed in other ES chapters for both the construction, operational and end of life phases, as well as any additional mitigation that may be required as a result of the CCR, ICCI and GHG assessments.

Construction Phase

Climate Change Resilience

7.147 Good practice and potentially embedded measures that would be considered during the construction phase have been included within Table 1 of Appendix 7.1 (Climate Change Resilience Assessment). A non-exhaustive list of mitigation measures has also been included below:

- The contractor(s) would conduct a high-level risk assessment of severe weather impacts on the construction and installation processes, considering the UKCP18, to inform any required

mitigation. Any receptors and/or construction related processes and activities potentially sensitive to severe weather events would be considered in the risk assessment.

- The contractor(s) would use a short to medium range weather forecasting service from the Met Office (or other approved meteorological data and weather forecast provider), to inform short to medium term programme management, environmental control, and impact mitigation measures.

- The Principal Contractors' Environmental Management System (EMS) would consider all measures deemed necessary and appropriate to manage severe weather events and would, as a minimum, cover training of personnel and prevention and monitoring arrangements. As appropriate, construction method statements would also consider severe weather events where risks have been identified.

- The contractors would, as far as is reasonably practicable, use construction materials with superior properties that offer increased tolerance to fluctuating temperatures, heavy precipitation, and other extreme weather events such as storms.

- Construction risks have been addressed in more detail in the Construction Management Plan (CMP) (Appendix 5.1). In addition to this, the Principal Contractor would produce a Construction Phase Health and Safety Plan prior to construction works on-Site begin, to address construction risks in more detail.

In-Combination Climate Change Impacts

7.148 Good practice measures that would be considered include minimising dust pollution and airborne contaminants as far as reasonably practicable. This could potentially be achieved through effective transportation and storage of materials, for example dampening down of dusts particularly where material is stockpiled and adopting a monitoring regime.

Greenhouse Gas Emissions

7.149 The Environmental Standards Statement (Document Ref. 2023.208), which supports this planning application, includes a number of mitigation measures to ensure adherence to construction practices that minimise adverse impacts on the environment, for example:

- The key principals of a circular economy have been and would continue to be embedded throughout the design process, in order to maximise the longevity, flexibility and recoverability of the development and to reduce waste and energy consumption throughout both construction and occupation.

- A Site Waste Management Plan would be implemented to reduce the quantity of waste generated and to increase re-use and recycling; and a commitment to minimise waste and pollution.

- Materials with low environmental impact would be selected and local suppliers would be prioritised where possible. Materials with associated Environmental Performance Declarations (EPDs) would be favoured.

- Excavated material (such as soil and substructural elements) from construction works would be used, where practical, for landscaping purposes.

7.150 Other good practice and potential mitigation measures for GHG emissions during the construction phase could include:

- A requirement for energy efficient, low carbon design in buildings/new assets using low carbon materials to reduce GHG emissions. For example, the Whole Life Carbon Assessment (Appendix 7.3) has identified the following measures:
    - Utilise a lower carbon concrete mix for the structural elements, particularly upper floors;
    - Reduce the amount of glazing on the façade, consider recycled glass/higher recycled content of the aluminium framing components for the curtain walls;
    - Consider timber stud partitions instead of metal studs and steel framing systems;
    - Specify carpets with high recycled content to reduce impacts of replacements; and
    - Select durable mechanical electrical and plumbing systems, with regular maintenance plans to extend their life.
- Follow the Publicly Available Specification (PAS) 2080 carbon hierarchy (avoid, switch and improve) for working through and identifying potential opportunities and interventions from early phase.
- Measures to reduce construction waste arisings through sustainable procurement, designing out waste, recycling on-site, reusing landfill materials, balancing the cut and fill. Furthermore, setting waste targets in order to minimise GHG emission associated to the transportation of waste.
- Minimising water use during construction.
- Carbon offset payments for remaining construction emissions to ensure the construction phase is carbon neutral.

Operational Phase

Climate Change Resilience

7.151 Embedded mitigation measures and good practice measures that would be considered during the operational phase have been included in Table 2 of Appendix 7.1 (Climate Change Resilience Assessment). A non-exhaustive list of mitigation measures has also been included below:

- The Drainage Strategy Report for the Proposed Development recommends a cellular attenuation tank, piped systems, vortex flow control device and a green roof with landscaped features for attenuation.
- The Landscape Design Statement (Document Ref. 10474-OPE-00-XX-RP-L-910001 Rev 02) confirms that the Proposed Development would incorporate permeable surfacing for public walkways on the east side of Proposed Development and a rain garden and area of sustainable drainage at the southern boundary of the park.

- Assets would be maintained regularly to detect deterioration and damage caused by extreme weather events such as storms through maintenance and monitoring in contracts.

- Water efficiencies measures have been incorporated within the design of the Proposed Development, including low flow fittings and dual flush WCs.

- Water efficiencies have been built into the Proposed Development through the Environmental Standards Statement (Document Ref. 2023.208) and Drainage Strategy Report (Document Ref. 223-074).

In-Combination Climate Change Effects

7.152 Good practice measures that would be considered include provision of sufficient ventilation measures to prevent overheating, including openable windows for rapid ventilation as well as mechanical ventilation, and selection of climate-resilient species for mitigation planting, including rain gardens to support maintenance of landscaping features.

Greenhouse Gas Emissions

7.153 Within the Environmental Standards Statement (Document Ref. 2023.208), which supports this planning application, carbon reduction targets have been stipulated for the Proposed Development. In order to limit energy demand and GHG emissions from the operation Proposed Development, a number of design features would be integrated to collectively contribute towards the emissions reduction target for the Proposed Development. Embedded measures within the Environmental Standards Statement (Document Ref. 2023.208) include:

- The Proposed Development would be designed and specified in accordance with the principles of the energy hierarchy. This would improve upon the carbon dioxide (CO2) reduction targets and guidance set by Manchester City Council:

    - The proposed scheme has the potential to secure a minimum CO2 reduction rate of 7.28%, thereby improving upon current Part L Volume 2 (2021).

    - The development is expected to achieve a 40.07% reduction in CO2 emissions when assessed against Part L 2010, thereby significantly exceeding the policy requirement of 15% target.

- The proposed material and mechanical specification would provide various benefits including upgraded thermal insulation, efficient mechanical servicing, and low energy lighting.

- The Proposed Development would integrate efficient air source heat pumps and mechanical verification heat recovery system in order to limit the carbon emissions arising from the Proposed Development.

- A water efficiency strategy would be determined for the Site and would include for the provision of 'A' rated appliances as a minimum.

- The Proposed Development would be specified with efficient water fixtures and controls to achieve a calculated daily consumption of <110 litres/person/day.

- A water meter on the mains water supply to the building would be specified to monitor and manage consumption.

- A Refuse Management Strategy has been developed to manage waste and recyclables from the operational phase of the development. Source segregation would encourage the individuals to recycle and divert waste away from landfills.

7.154 Other potential mitigation measures for GHG emissions during the operational phase include:

- Minimise refrigerant charges where possible as leakages result in significant emissions. Off-Site specialist refrigerant management and leakage detection systems could further minimise losses.
- Selection of refrigerants with lower environmental impacts.
- Applying measures to reduce operational waste, such as providing adequate provision for internal and external waste storage and setting waste recycling targets to reduce GHG emissions from the transportation of waste.
- The Applicant to select tenants who have stringent net zero targets and strategies to reduce GHG emissions associated with the Proposed Development.

Residual Effects

Construction Phase

7.155 Table 7.17 presents a summary of receptors, likely significant effects, mitigation measures and residual effects for the construction phase.

Table 7.17: Residual Effects (Construction) (Scenario 3)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Climate Change Resilience				
Heavy rainfall leading to stockpile erosion and siltation of drainage assets	Building	None required	Not applicable	Not Significant, temporary
Heavy rainfall leading to inability to undertake construction activity and programme delays	Building	None required	Not applicable	Not Significant, temporary
Heavy rainfall spreading contaminated soil during ground excavations	Environmental and human health	None required	Not applicable	Not Significant, temporary
Heavy rainfall leading to groundwater flooding, affecting Site personnel undertaking below ground excavations	Human health	None required	Not applicable	Not Significant, temporary
Heatwaves and high temperatures affecting Site personnel welfare	Human health	None required	Not applicable	Not Significant, temporary

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Heatwaves and high temperatures leading to increased dust generation	Human health	None required	Not applicable	**Not Significant**, temporary
Heatwaves and high temperatures leading to inability to undertake construction activity and programme delays	Building	None required	Not applicable	**Not Significant**, temporary
Strong winds leading to damage of stockpiles	Building	None required	Not applicable	**Not Significant**, temporary
Strong winds leading to Site personnel and nearby pedestrian harm	Human health	None required	Not applicable	**Not Significant**, temporary
Strong winds affecting on-Site crane operations	Building	None required	Not applicable	**Not Significant**, temporary
Strong winds leading to damage to Site hoardings	Building	None required	Not applicable	**Not Significant**, temporary
In-combination Climate Change Impact				
Air quality - Extended period of drought could increase exposure of sensitive receptors to dust generated from construction activities	Air quality - sensitive receptors	None required	Not applicable	**Not Significant**, temporary
Air quality - Extended period of drought could reduce availability of water for dust suppression which would reduce the effectiveness of embedded mitigation measures	Air quality - sensitive receptors	None required	Not applicable	**Not Significant**, temporary
Ecology - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Daylight, Sunlight, Overshadowing and Solar Glare - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Drainage - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Ground Conditions -	Ground Conditions -	None required	Not applicable	**Not Significant**, temporary

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Heavy rainfall leading to increase in mobilisation and release of contaminants into nearby surface water	Surface water receptors			
Ground Conditions - Increased frequency and intensity of drought events leading to dust creation and mobilisation/release of contaminated soil, affecting nearby pedestrians	Ground Conditions - human health receptors	None required	Not applicable	**Not Significant**, temporary
Human Health - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Noise and Vibration - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Wind Microclimate - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Greenhouse Gas Emissions				
GHG emissions	Global Climate	Carbon offset payments to ensure the construction is carbon neutral	Payment by developer to reputable offsetting provider	**Minor Adverse (Not Significant)**, permanent

Operational Phase

7.156 **Table 7.18** presents a summary of receptors, likely significant effects, mitigation measures and residual effects for the operational phase.

Table 7.18: Residual Effects (Operational) (Scenario 3)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Climate Change Resilience				
Increased frequency of intense rainfall leading to overwhelming of drainage assets and potential flooding	Building and human health	None required	Not applicable	**Not Significant**, temporary
Wetter winters and increased frequency of	Building	None required	Not applicable	**Not Significant**, temporary

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
intense rainfall leading to elevated groundwater levels and potential flooding				
Increased frequency of intense rainfall leading to river level rise and subsequent flooding	Building and human health	None required	Not applicable	**Not Significant**, temporary
Drought conditions affecting landscape design and planting	Environmental receptors	None required	Not applicable	**Not Significant**, temporary
Increased mean temperatures and heatwaves leading to failure of mechanical and electrical equipment	Building	None required	Not applicable	**Not Significant**, temporary
Increased mean temperatures and heatwaves leading to overheating in residential element	Human health receptors	None required	Not applicable	**Not Significant**, temporary
Drought conditions affecting potable water availability	Building and human health	None required	Not applicable	**Not Significant**, temporary
Windstorm events and extreme winds leading to damage to the development and / or unsafe conditions for users	Building and human health	None required	Not applicable	**Not Significant**, temporary
In-Combination Climate Change Impact				
Air Quality - Increased frequency and intensity of heatwaves could increase the need to ventilate homes through opening windows to avoid overheating, reducing effectiveness of air quality mitigation.	Air Quality - human health receptors	None required	Not required	**Negligible**
Ecology - Increased temperatures, heatwaves and drought conditions could cause vegetation dieback and reduce the effectiveness of mitigation planting, intended to create new habitat.	Ecology - sensitive receptors	None required	Not applicable	**Not Significant**, temporary

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Daylight, Sunlight, Overshadowing and Solar Glare - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Drainage - Increased frequency of intense rainfall leading to surface water flooding of proposed development and surrounding areas	None identified	None required	Not applicable	**Not Significant**, temporary
Ground Conditions - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Human Health - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Noise and Vibration - Increased temperatures and heatwaves could lead to increased frequency of internal noise exceeding thresholds as a result of opening windows in high temperatures.	Noise and Vibration - sensitive receptors	None required	Not applicable	**Not Significant**, temporary
Wind Microclimate - Increased temperatures and heatwaves could cause vegetation dieback and reduce the effectiveness of mitigation planting, intended to mitigate the effects of wind on sensitive receptors.	Wind Microclimate	None required	Not applicable	**Not Significant**, temporary
Greenhouse Gas Emissions				
GHG emissions	Global Climate	The Proposed Development's GHG emissions impacts have been partially mitigated at this stage. They also meet the existing and emerging policy requirements and would fully contribute to	Embedded in design of the Proposed Development and to be implemented by Proposed Development Facilities Management Team.	**Minor Adverse (Not Significant)**

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
		decarbonisation in line with MCC's and UK's policy goals for schemes of this type.		

Monitoring

7.157 No monitoring is recommended for the Proposed Development.

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8. Human Health

Introduction

8.1 This Chapter of the ES has been prepared by Enfusion and assesses the likely Human Health 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.

8.2 The author of this Chapter is a Chartered Environmentalist and a Fellow of the Institute of Environmental Management and Assessment. She has over 25 years of experience of assessing the impacts of plans and projects on environmental factors, including human health and wellbeing. She is the co-author of The EIA Handbook: a practical guide for planners, developers & communities (Third edition, 2019).

Assumptions and Limitations

8.3 The Human Health Chapter considers the findings relevant to human health of each technical impact assessment scoped into the EIA 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 wellbeing is considered to be appropriate and proportionate such that there are no limitations. The assessment is desk-based and with professional judgment using published information.

Relevant Legislation, Policy and Guidance

Policy

National Policy

National Planning Policy Framework (NPPF 2012, updated 2019, revised 2021, updated 2023)

8.4 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 creating a high-quality built environment, with accessible local services that reflect the community’s needs and support its health, social and cultural well-being".

8.5 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).

8.6 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 97). "It is important that sufficient choice of school places is available to meet the needs of existing and new communities" (paragraph 99). Public safety should be promoted and "take into account wider security and defence requirements" (paragraph 101).

8.7 "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 102). Sustainable transport should be promoted and this "can help improve air quality and public health" (paragraph 109). "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 123). "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 191).

Public Health England (PHE) Strategy 2020-2025 (2019)

8.8 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".

Sub-Regional Planning Policy

Places for Everyone – Joint Development Plan (JDP) (Greater Manchester Councils Publication Draft 2021)

8.9 The Vision for Greater Manchester (GM) to make Greater Manchester as "a place where people live healthy lives"; and Strategic Objectives include No 10 "to promote the health and wellbeing of communities". The overall draft 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.

Local Planning Policy

Manchester City Council (MCC) Core Strategy (adopted 2012)

8.10 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:

8.11 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'.

8.12 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.

8.13 Policy EN4 seeks to reduce CO2 emission and reduce fuel poverty by enabling low and zero carbon development.

8.14 Policy EN8 Adaptation to Climate Change includes requirements to minimise flood risk and reduce urban overheating.

8.15 Policy EN9 Green Infrastructure provides guidance on provision of new, and improvements to, the quality and accessibility of existing green infrastructure assets.

8.16 Policies EN10 and EN11 safeguard and create new open space, sport and recreation facilities.

8.17 Health is further protected through Policies EN14 Flood Risk, EN16 Air Quality, EN17 Water Quality, and EN18 Contaminated Land & Ground Stability

8.18 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".

8.19 Policy T2 will actively manage the pattern of development to ensure that there are accessible areas of opportunity and need.

8.20 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.

8.21 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

8.22 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 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)

8.23 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; and Systematic & structural racism & discrimination.

Guidance

Public Health England (PHE) Spatial Planning for Health (2017)

8.24 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)

8.25 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 & wellbeing; improve diet & weight; improve musculoskeletal health; improve respiratory health; improve cardiovascular health; protect environmental health; and provide access to health & care infrastructure and services. The guide is mostly associated with the plan-making and associated strategic environmental assessment processes. However, it does include an annex on integrating HIA in EIA and it 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)

8.26 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. The guidance suggests five categories for the wider determinants of health - Health-related behaviours; social environment; economic environment; bio-physical environment; and institutional & built environment.

Assessment Methodology and Significance Criteria

Scenarios Tested

8.27 The Human Health assessment (the HH Assessment) considers the worst-case scenario of the Baseline + Committed and Cumulative Developments + Proposed Development + Mitigation = Scenario 3. The Proposed Development has been tested in isolation within this Chapter. Treating Plot 10a as a cumulative scheme would not impact upon this technical analysis since overall the HH assessment considers the worst-case scenario. In addition, treating Plot 10b as a cumulative scheme would also not impact upon this technical analysis since overall the HH considers the worst-case scenario.

The Study Area

8.28 Each technical topic relevant to health and wellbeing defines its own study area according to appropriate regulations, standards and guidance. Overall, the health impact assessment considers the Site and surrounding area.

Assessment Methodology

8.29 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, in line with the Scoping Report, 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.

8.30 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.

8.31 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 & natural environment; work & the labour market; vulnerability; income; crime; education.

8.32 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 8.1.

8.33 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.

8.34 For the purposes of this Human Health (HH) impact 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.

8.35 Housing design and affordability are key factors – provision of good quality residential development is known to have positive effects on health and wellbeing.

8.36 Access to health and social care services and other social infrastructure is directly important for health. This HH impact 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 proposed development area to the facility.

8.37 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 also contributes to healthier lifestyles and wellbeing.

8.38 Air quality, noise and neighbourhood amenity are important factors for health and wellbeing. Summary findings from the technical studies for air quality and noise in the EIA are considered and their implications for health and wellbeing incorporated into this HIA.

8.39 Accessibility and active travel are well established as factors in health and wellbeing. Summary findings from the technical studies for transport and informing the air quality studies are considered and their implications for health and wellbeing incorporated into this health impact assessment.

8.40 Crime reduction and community safety is a key factor in health and wellbeing of communities and this health impact assessment considers those elements of the development proposals that contribute to safety.

8.41 Access to healthy food is a direct factor in health and consideration is given to accessibility to a range of food stores with a mix of affordable shops. Provision of allotments or community gardens for growing food is beyond the scope of the development proposal.

8.42 Access to work, education and training is known to affect health and wellbeing.

8.43 Social cohesion and inclusive design are key factors for health and wellbeing. This HH impact assessment considers the implications of the design and project proposals in this respect, including connectivity and the potential for non-cohesion with existing communities.

8.44 Minimising use of resources and addressing the effects of climate change are key factors in considering environmental sustainability and a healthy environment – and consequently, health and wellbeing for people and communities. Risks associated with flooding and ground contamination have been determined to be very low and were scoped out of the EIA and therefore are not considered to be significant for health and wellbeing. Risks associated with extreme weather conditions and climate change are considered within this HH impact assessment.

8.45 Overall, the HH assessment 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, and building standards, 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.

8.46 This Health chapter considers the direct implications for health such as the provision of residential accommodation. Also, direct effects such as those arising through pollution, air quality, climate change, and safety risks, as well as accessibility to healthcare facilities and sustainable transport (public, cycling and walking) for healthy living. It further considers the wider implications for health and well-being, such as disturbance/nuisance, provision of and accessibility to open space, green infrastructure, amenity, cultural, leisure, and recreational facilities.

8.47 The summary findings of the Socio-Economic (Chapter 10) and Townscape/Visual Impact (Chapter 12) studies are integrated into the implications for the themes for healthy urban living since these topics are key contributors to improvements in health and wellbeing.

8.48 The key findings from the Air Quality (Chapter 6); Climate Change (Chapter 7); Noise & Vibration (Chapter 9); Daylight, Sunlight & Overshadowing (Chapter 11); Wind Microclimate (Chapter 13); Ground Conditions (Chapter 14) assessments are considered in order to integrate within this Health chapter the key impacts associated with any pollution and future climate change effects that can affect human health and wellbeing.

8.49 Each technical impact assessment is subject to its own standards, regulations, and methods of assessment. The key findings from each are considered and integrated into the themes of - Healthy Housing; Active Travel; Heathy Environment; and Vibrant Neighbourhoods. Thus, any significant impacts for human health are clearly presented in a separate chapter.

8.50 This chapter on health is not a Health Needs Assessment and does not attempt to quantify health care contributions. It should also be noted that certain health issues are not scoped into the EIA due to their coverage within other permitting or risk management processes. For example, health & safety, emergency planning, and building requirements are addressed by other relevant regulation and this does not require further consideration beyond noting that it helps mitigate community healthcare implications.

8.51 The geographical scope is determined by receptor groups that are likely to be significantly affected by the proposed development. The scope of the Health Chapter is in part dependent upon the study areas and potential receptors identified in the other technical assessments (including air quality, climate change, sunlight, noise, socio-economic, transport, water and wind). Thus, the study area comprises the proposed development Site with local surrounds and the wider study area of Manchester City – as applicable to each of the factors relevant to human health and wellbeing for the Proposed Development. The scope of the human health impact assessment chapter is as outlined above and is undertaken in consideration of the Proposed Development as part of a wider strategic development.

8.52 Receptors were identified by the technical assessments, as follows: construction workers; existing residents, businesses, communities around the Site, and including any sensitive receptors such as hospitals, nurseries, schools, care homes; future users and visitors of the Site; and pedestrians in the vicinity of the Site.

8.53 The Institute of Environmental Management & Assessment (IEMA) paper on Health in EIA (2017) explains the complexities associated with defining significance for population and human health. This guidance notes that there is an absence of specific significance criteria or defined thresholds for determining significance for population and health in UK EIA practice. Given the multitude of factors that contribute to an individual's health outcomes, it is difficult to draw a quantified conclusion regarding the contribution of a particular development to an increase or decrease in the number of additional cases of a particular physical or mental health outcome.

8.54 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 8.1: 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

8.55 The guide also sets out a generic human health magnitude criteria and significance criteria, as follows:

Table 8.2: 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 8.3: Human Health Significance Matrix

Magnitude	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

8.56 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?

8.57 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 2.4 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

8.58 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 air quality; climate change; noise & vibration; socioeconomics; daylight, sunlight, & overshadowing; townscape & visual impact; traffic & transport; water resources; and wind microclimate. Then, the overall likely significant effects on health have been determined in a qualitative way using professional judgment.

Baseline Conditions

8.59 The baseline informing the assessment draws upon local health and wellbeing information and priorities, such as those set out in the Manchester City Joint Strategic Needs Assessment (JSNA 2022), published local authority health profiles through Public Health England (PHE, 2018-2021), and as reported by Manchester City Council, for example, through the MCC Intelligence Hub. The key baseline from the other technical topics is considered, including risks to health/wellbeing such as from air quality, noise, and risks associated with the effects of climate change. The key baseline information from the townscape and socio-economic studies has been considered. 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.

Population

8.60 The Site is located within the Manchester City Centre with established residential and co-living communities adjacent and nearby, and easy accessibility to a wide range of services and facilities. The Census 2021 took place during a period of rapid change with Covid-19, including how people perceived their health status and changes to patterns of working. Deansgate has the highest proportion with good or very good health at 93% (12,765 people); it also has the highest proportion with no limitation for day-to-day activities at 90% (12,295 people) and the fewest households with disabled residents at 14% (890 households). While driving a car or van remains the most common travel to work method since the previous census in 2011, working from home has become the second most common with Deansgate, Chorlton, Piccadilly, and Didsbury West all having over 50% of their population working from home.

8.61 Over half of households in Deansgate, Piccadilly and Ancoats & Beswick are private rented with Deansgate having the highest at 73%. There is a range of accommodation types with 32.8% as flats within the Ward. Deansgate has the smallest number of people living in residential households (10,148), and the third highest number of residents living in communal establishments (3,543). Manchester has one of the largest student populations in Europe, with over 120,000 students across Greater Manchester's five universities.

8.62 The total student population is the largest concentration outside of London, with a growing proportion of international students. The student population that the Proposed Development is most likely to target is likely in attendance of the University of Manchester (UoM) and Manchester Metropolitan University (MMU), both of which have experienced increases in student numbers in the last 5 years.

8.63 Government (Office for Health Improvement & Disparities OHID) data for Local Health (2021) reports population by age group % 2020 by Ward and compared with Manchester and England. The Site is located within the Deansgate Ward which shows a low residency of young people aged 5 to 15 years at 1.8% compared to 13.7% for Manchester. Similarly, the population of older people aged 65 years and over is low at 1.9% compared to 9.3% for Manchester and 18.5% for England. The key demographic relates to the population aged 16 to 24 years with 43.8% for Deansgate Ward, compared to 17.5% for Manchester and 10.5% for England.

8.64 The OHID data reports an IMD score (2019) for Deansgate at 21.8 - compared to 40.0 for Manchester and 21.7 for England - and comparable to other adjacent city centre Wards of Hulme and Piccadilly. 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. Long-term health conditions and morbidity (%, 2011) for Deansgate at 4.0 is low, compared with 17.8 for Manchester and 17.6 for England. Overcrowded houses (%, 2011) are reported at 43.6 for Deansgate, compared to 16.4 for Manchester and 8.7 for England. Unemployment is low at 1.1% compared to 7.4% for Manchester and 5.0% for England. The number of households in fuel poverty is the lowest at 466 and again, similar to other adjacent city centre Wards.

Employment

8.65 Total employment in Manchester stood at 431,850 in 2022 with all sector productivity (measured by GVA per FTE) standing at c.£87,000. This is lower in comparison to the English national average of £86,670, but above the Greater Manchester (c.£73,880) and North West (c.£74,300) averages. Across the Manchester region 39% of employment is made up of employment within sectors that broadly reflect the office-based service economy. Manchester has a lower proportion of employment in the construction sector (2.1%) than Greater Manchester (4.9%), the North West (5.2%) and nationally, the sector is therefore underrepresented locally. A review of the committed baseline schemes indicates that these would generate a large number of on-site employment through a combination of commercial uses (e.g., retail, office, leisure and hotel uses).

Housing

8.66 There were c.26,800 total PBSA beds available to students in Manchester for the 2022/23 academic year, owned or leased by either UoM, MMU or the private sector. The Manchester market is characterised by its legacy of older bed spaces due to limited development over the last decade. Evidence suggests that around 750 additional bedspaces are needed to be delivered each year through to 2030 in order to keep pace with demand. In addition, there is an acknowledged demand amongst students for good quality and affordable city centre accommodation, driven in particular by growth in numbers of international students.

Healthcare Facilities

8.67 Within 1 km of the Site there are 2 GP Practices operating within the NHS Manchester Clinical Commissioning Group CCG area. Together, these GPs have an overall FTE GP ratio of 2,071:1 which is above the commonly accepted benchmark ratio from the HUDU of 1,800:1. A new build medical centre was recently opened across the ground and first floor of the Elizabeth Tower residential development (New Jackson Medical Centre), and this is also operating at 2,411:1 and thus beyond the HUDU ratio. However, considering the large student population, there is the provision of student specific healthcare at Manchester universities. Specifically, the University of Manchester and Manchester Metropolitan University play a role in coordinating the provision of primary healthcare services for

students. UoM launched a new GP service on campus for the 2022/23 year, and MMU provides a range of health services through its Mental Health & Wellbeing service.

Open Space, Recreation & Amenity

8.68 There are a number of leisure facilities including gyms / health clubs and sports centres within the vicinity of the Site. The nearest leisure centre is Sugden Sports Centre, approximately a 14-minute walk away. Being a city centre there are numerous entertainment sites within close proximity to the proposed development. It is a close walk into the rest of the city centre and easy access to the rest of the city. There are a number of open/amenity spaces in close proximity to the Site, including Hulme Park, All Saints Park, Castlefield Urban Heritage Park, and St John's Gardens. Of the committed baseline schemes identified, eight of these include some form of public realm or amenity space provision. These will deliver new, high quality public realm that will also improve connectivity between public spaces within Deansgate Ward and across the wider City Centre.

Townscape & Visual Impact

8.69 The Site is currently vacant land surrounded by boundary hoardings. North of the Proposed Development is the City Centre containing a rich historic legacy of conservation areas, listed buildings, and street patterns. This area has been through extensive redevelopment and First Street North is a distinctive new neighbourhood acting as a prosperous hub for the city. To the east is a mix of commercial and renovated industrial buildings. To the south-east is a variety of large scale buildings, and to the south, it is dominated by the A57.

Air Quality

8.70 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 proposed development Site is and will be affected by local traffic flows; the Site is close to major roads that generate significant road traffic emissions. MCC monitors NO_2, PM_{10} and $PM_{2.5}$ at the Manchester Piccadilly local urban background location. The studies also investigated the Defra mapped background concentrations. It has been thought that background traffic related NO2 concentrations in the UK would reduce over time, due to the progressive introduction of improved vehicle technologies and increasingly stringent limits on emissions. However, the results of recent monitoring across the UK suggest that background annual-mean NO_2 concentrations have not decreased in line with expectations. There is no trend over time for concentrations of PM_{10}, but there is a decrease over time for concentrations of NO_2 and $PM_{2.5}$ in the vicinity of the Site.

Climate Change

8.71 Greenhouse gas (GHG) emissions occur constantly and widely as a result of human and natural activity, including energy consumption (fuel, power), industrial processes, land use and land use change. The area around the Proposed Development is warmer as compared to both the north-west England and north Wales regions and rest of the UK. Climate change is projected to lead to warmer and wetter winters and hotter and drier summers. However, natural variations, including extreme events such as storms and heat waves, will continue to punctuate these trends. The current use of the Site is vacant land and therefore, greenhouse gas emissions are assumed to be zero.

Noise & Vibration

8.72 Noise levels were measured at 5 locations around the Site to establish the background noise. The dominant noise source during both daytime and night time was road traffic on the surrounding roads,

including the Mancunian Way. The dominant noise source during both daytime and night- time was road traffic on the surrounding roads, including the Mancunian Way. Receptors potentially sensitive to noise were identified around the Site – external to the residential blocks A&B, D and Unite Students (New Medlock House). Surveys were undertaken to establish the baseline noise environment at the existing local buildings and for assessing the noise levels able to impact upon the façades of the Proposed Development.

Sunlight, Daylight & Overshadowing:

8.73 The studies investigated the Site and assumed the completion of buildings currently under construction. Overall, there was found to be a reasonable level of baseline daylight and sunlight compliance considering the city centre context of the Site and the height and density in the immediate locality. All areas meet the BRE recommendations with regard to overshadowing. There is limited opportunity for instances of solar glare from the Site to be experienced.

Wind Microclimate

8.74 Studies investigated the existing Site and surrounds and found that there are no exceedances of the safety criteria for pedestrian activity throughout the year. Wind comfort conditions for the majority of the of the areas were found to be suitable for at least strolling or better throughout the years. During summer, most of these areas improve to short-term standing or better. Thus, all entrances and thoroughfares are suitable for their intended uses.

Ground Conditions

8.75 The Site is currently a vacant parcel of land, covered with hardstanding and used as car parking associated with the wider construction site for Blocks A, B and D. Given the presence of intact hardstanding, it is unlikely that the previous developments at the Site and surrounding areas would have significantly impacted the Site. At the time of the ground investigation there were existing structures on the Site including site cabins and construction material storage containers around the areas of car parking. Buried obstructions have been encountered across the Site, including brick and concrete structures and buried basements across the wider development area.

Identification and Evaluation of Likely Significant Effects

Construction Phase

8.76 Air Quality: During the construction phase, there is the potential for dust soiling and risk to human health and wellbeing from dust emissions associated with earthworks, construction material and movement of construction vehicles (on and off-site). There will be no demolition or crushing activities and the Site is already cleared. Detailed mitigation measures will be set out in the Construction Environmental Management Plan (CEMP) to control and reduce vehicle emissions and dust through various procedures and practices. This will reduce the likely effects to Not Significant.

8.77 Climate Change: Climate change resilience effects, including in-combination, are predicted to be Negligible; greenhouse gas emissions are considered to be Minor Adverse which is Not Significant.

8.78 Noise & Vibration: During the construction phase, there will be noise impacts associated with fixed and mobile plant, concreting; also, vibration impacts, for example, associated with piling. Noise effects associated with piling and concreting were found to be range between Minor, Moderate and Major Adverse for Blocks A&B; Negligible to Moderate (one location) for Block D; and Negligible for Unite Students. For vibration, there is the potential for minor to moderate adverse impacts in terms of

human perception; risk of damage to buildings is **Negligible**. A Noise & Vibration Management as part of the overall CEMP will implement various controls to construction practices such that noise and vibration effects will be minimised to **temporary Minor to Moderate Adverse** for residents at times.

8.79 **Socioeconomics:** Employment: The period of construction works will support a number of on-Site and off-Site varied employment opportunities, locally and from across the subregion. The estimated annual construction jobs supported during the period of works could be expected to represent 0.42% of all regional employment in the construction sector and such minor beneficial effects are **Negligible**.

8.80 **Sunlight, Daylight & Overshadowing**: During construction, the effects will gradually accrue until they reach the likely effects on completion. It is considered that the completed Proposed Development represents the worst-case assessment in terms of likely daylight, sunlight and overshadowing.

8.81 **Townscape & Visual Impact**: The TVIA identified 6 Townscape Character Areas for investigation and 14 viewpoints to illustrate potential significant effects for visual receptors. 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) and are likely to include positioning of compounds and stockpiles to limit impacts, high quality site hoarding, and good site management, maintenance and housekeeping. During the construction phase, effects will vary from Negligible to Major-Moderate according to the location of the viewpoint – these effects will be temporary. Overall, there will be significant temporary residual effects for residents of the closest area in Hulme to the south, pedestrians and road users within the immediate surroundings, and the immediate surroundings for the closest streets to the east and west.

8.82 **Wind Microclimate**: During construction, the effects will gradually transition from the existing condition until they reach the likely effects on completion. As such, no significant environmental effects are expected.

8.83 **Ground Conditions**: During construction, there is the potential for inhalation of soil/soil dust and asbestos fibres, ingestion of, and dermal contact with contaminated soil and soil dust. It is considered that the use of suitable Personal Protective Equipment (PPE) and adoption of appropriate working protocols will mitigate any potential adverse effects from either dust inhalation/ingestion or contact with contaminated soil for site workers – all managed through a CEMP to be secured by a suitably worded planning condition. Asbestos has not been recorded within the Block C Site but has been identified across the adjacent parcels and the potential for asbestos to be present will need to be considered during the production of any site specific risk assessments for site workers. Overall, it is considered that the residual effects are temporary and **Negligible**. Any contaminated made ground will have a clean growth capping delivered through the Remedial Strategy that will prevent any risk of environmental pathways and risk to human receptors – thus, **Major Beneficial** effects through remediation of previously developed land.

Operational Phase

8.84 **Air Quality**: The development is car-free (except for 2 blue badge bays on Chester St); the total annual average daily vehicle movements generated by the development will be well below the guidance threshold (HGVs will not visit every day). Therefore, air quality effects from vehicle emissions are likely to be **Not Significant**. Heat and power will be supplied by air source heat pumps with minimal emission to air such that these impacts were considered no further.

8.85 Studies investigated air quality impacts on future occupants of the development from their exposure to the prevailing levels of air pollution. Modelling studies considered NO2, PM10 and PM2.5 concentrations predicted at a range of heights at the facades of proposed receptors. The AQS objectives for PM10 and PM2.5 are likely to be met at the facades of the Proposed Development. However, the AQS objective for NO2 will be exceeded at several locations on the ground, first, second and third floors. Mitigation measures to be implemented into the design of the building will reduce these effects to **Not Significant.**

8.86 **Climate Change**: The technical studies investigated the risk assessment of the impacts on climate change on the proposed development over its projected life cycle (assumed to be 60 years). Mitigation measures were developed as integral to the project design to reduce the significance of potential risks of adverse effects and include encouragement of sustainable modes of transport. Climate change resilience studies with regard to the resilience of the building and its residents did not identify significant effects such that effects are **Not Significant**. Also, in-combination effects with other technical studies found to be **Not Significant**. The greenhouse gas emissions over the operational lifetime are assessed as **Minor Adverse** which is **Not Significant.**

8.87 **Noise & Vibration**: During the occupational phase, there will be noise from the building services plant. There will be no significant change in road traffic and associated noise such that this was not considered further. Appropriate location, selection, and screening for operating plant will be developed at detailed design and reduce potential noise effects to **Negligible** for nearby residents. Noise levels affecting various building elevations of the Proposed Development could be considered high, but typical for a city centre location overlooking an internal ring road. Acoustic glazing and provision of mechanical ventilation systems to meet with MCC requirements will be developed during detailed design and reduce effects to **Negligible** for the new residents.

8.88 **Socioeconomics - Employment**: The Proposed Development has the potential to make a positive contribution to the Manchester (local) economy primarily as a result of the levels of additional student expenditure linked to the provision of 555 student bedspaces. Also, a small number of jobs associated with the building. The combined employment effect generated through on and off-Site employment and through student expenditure is estimated at 41 FTE jobs. Student expenditure makes an important, and often overlooked contribution to the economy. The presence of students in any particular area often coincides with the presence of retail and retail services which can add to the vibrancy and vitality of high streets and increase weekend and evening activity in an area which is traditionally quieter at these times. Therefore, the combined employment effect generated through on and off-Site employment and through student expenditure is considered to be **Minor Beneficial** which is significant.

8.89 **Socioeconomics - Housing:** An additional 555 bedspaces represents 2.1% of the reported supply of 26,800 bedspaces in the study area and nearly 75% of MCC's projected annual supply requirement to keep pace with demand for student accommodation in Manchester. The addition of new, high quality PBSA in a city centre location represents an important contribution to addressing the identified need. Therefore, in making a judgement on both quantity and quality considerations, and taking into account the high sensitivity of the student housing situation, effects are considered to be Major Beneficial in the long term and at the District level.

8.90 **Socio-economics – Healthcare Facilities:** Whilst such an increase in population could place additional demands on GPs already overloaded, the reality is that many students will access university facilities or remain registered with their home GPs. Therefore, the change is considered to be **Negligible,** and

effects predicted to be **Negligible**. A similar situation and effects could be assumed with regard to dentists.

8.91 **Socioeconomics - Open Space & Leisure Facilities**: An uplift in the student population as a result of the Proposed Development will increase demand and usage of nearby open and green spaces and recreational / leisure facilities. The Proposed Development will bring forward 1,352 sq. m (0.14 ha) of public realm / amenity space within the building's curtilage as well as providing 422 sq. m of internal amenity space and 144 sq. m of external amenity space within the building itself. Whilst an improvement in local provision, the overall level of provision at the Ward level significantly falls below the Fields in Trust Green Space Index standard, though not uncommon for a city centre location. With the Site occupying a city centre location in close proximity to an array of leisure and recreational facilities, it is judged that the impact of additional students within the local area can be supported by the existing range of services provided. It is also reasonable to assume that additional students could support the viability and vitality of local facilities. **Negligible** effects.

8.92 **Sunlight, Daylight & Overshadowing**: The studies identified 9 buildings nearby with residential properties where windows and rooms were modelled for daylight and sunlight changes with the Proposed Development. A total of 1546 windows facing the Site serving 829 rooms within 9 buildings were assessed for daylight, and 419 rooms were assessed for sunlight within the 4 buildings which are material for consideration in sunlight terms. The overall effects of the Proposed Development upon the daylight and sunlight amenity within the buildings investigated were found to be **Minor Adverse** (**Not Significant**). The effects of the Proposed Development on overshadowing were found to be **Negligible**- **Minor Adverse (Not Significant).** Owing to the proximity of the Site to several sensitive road junctions with regard to solar glare, mitigation strategies have been embedded into the detailed façade design. Modelling studies investigated road locations approximately 500m radius from the Proposed Development. For road users at nearby road junctions, solar glare effects were found to be **Negligible – Minor Adverse**, which is **Not Significant. Minor-Moderate and Moderate Adverse** effects were found for solar glare for road users at certain locations and it is proposed that glazing specifications should be low reflectance to mitigate effects to **Minor Adverse (Not Significant).**

8.93 **Townscape & Visual Impact**: At the occupational phase, potential townscape and visual effects include changes to characters (townscape and Site), building heights, movement and linkages, public realm, and character and amenity of views. Primary mitigation measures have been embedded into the location and design of the Proposed Development through an iterative process involving environmental assessment and consultation. There will be no significant effects on townscape character or designations. Changes to visual amenity are likely to range from **Negligible/Minor Adverse (Not Significant)** through **Moderate** and to **Major/Moderate**. Overall, there will be significant residual effects for residents of the closest area in Hulme to the south, pedestrians and road users within the immediate surroundings, and the immediate surroundings for the closest streets to the east and west.

8.94 **Wind Microclimate**: Studies were undertaken to assess the likely effects for wind for safety, worst-seasonal and summer comfort conditions. With the introduction of the Proposed Development, the wind conditions within the Site and surrounding area generally meet the safety and comfort criteria for all users. Under all scenarios, there are no exceedances to safety criteria. Thus, with conditions meeting the Lawson safety criteria and being suitable for intended uses, residual effects are **Negligible** and **Not Significant.**

8.95 **Ground Conditions**: During occupation, it is considered that there could have been the potential for inhalation of soil/soil dust and asbestos fibres, ingestion of, and dermal contact with contaminated soil. However, any potential contamination within the made ground will be dealt with by embedded

mitigation measures including a 450mm clean capping layer in the soft landscaping areas (mostly no contact due to presence of the building and hardstanding). Therefore, and as such it is considered that potential contamination risks have been mitigated through the project design and the Remedial Strategy such that residual effects are **Major Beneficial** through remediation of previously used land.

Cumulative Effects

Construction Phase

8.96 Cumulative temporary construction employment and local economic performance is likely to be **Moderate Beneficial**. Residual construction dust effects are **Not Significant** – cumulative effects from dust on air quality is only likely if construction works on multiple schemes take place simultaneously.

8.97 It is noted that the Applicant, alongside landowners across First Street, have established a local landowner forum, to facilitate monthly inspections of development sites, and to ensure that construction works are being carried out in accordance with agreed Construction Management Plans.

Operational Phase

8.98 Alongside committed baseline schemes, the cumulative developments will provide c. 3,500 bedspaces, representing around 4.5 years of supply according to the projected annual supply requirement indicated by MCC (750 per annum) to keep pace with demand, and therefore, **Major Beneficial** cumulative effects for student housing. Cumulative effects on healthcare and open space/leisure facilities are considered to be **Negligible**. An estimated 8,200 net additional jobs could be generated by committed baseline and cumulative developments with Moderate Beneficial effects.

8.99 Air quality effects with emissions from vehicles are likely to be **Not Significant**. Wind conditions with regard to safety and comfort, taking into account cumulative effects from relevant other committed developments, were found to be suitable for uses and therefore, **Negligible** effects during the operational phase. Greenhouse gas (GHG) emission impacts and resulting effects are global rather than affecting one localised area – and when contextualised for UK and Manchester carbon budgets are predicted to be **Not Significant**. Overall, daylight, sunlight and overshadowing effects were found to be **Not Significant**; also, cumulative effects with regard to solar glare with proposed mitigation from low reflectance glazing.

Residual Effects

Construction Phase

8.100 Post-mitigation residual effects during the construction phase are summarised in the **Table 8.5**, as follows:

Table 8.5: Residual Effects (Construction Phase) (Scenario 3)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Employment & Economy	Workers	N/A	N/A	**Minor Beneficial (Not Significant), direct**, temporary, short-term

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Air Quality - dust	Human receptor locations within 350m	CEMP details practices & procedures	CEMP	**Not Significant**, temporary
Climate Change Resilience	Workers, nearby residents & visitors	None required	N/A	**Not Significant,** temporary
Climate Change (GHG)	Global	None required	N/A	**Not Significant,** temporary
Noise & Vibration	Workers; existing residential	Noise & Vibration Management Plan (NVMP)	NVMP as part of overall CEMP	**Minor to Moderate at times**, temporary
Wind Microclimate	People on foot, seated, or on bicycle	Not required	N/A	**Negligible**
Ground Conditions: dust	Workers	CEMP details practices & procedures	CEMP	**Negligible**
Ground Conditions: contaminated soils	Site users	Capping with clean growth medium	Remedial Strategy	**Major Beneficial**

Operational Phase

8.101 Post-mitigation residual effects during the occupational/operational phase are summarised in the **Table 8.6**, as follows:

Table 8.6: Residual Effects (Operational) (Scenario 3)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Employment & Economy	Local workers & economy	N/A	N/A	**Minor Beneficial (Not Significant)**, direct, long-term, permanent
Housing	Students	N/A	N/A	**Major Beneficial (Significant)**, direct, long-term, permanent
Healthcare Provision	Residents	N/A	N/A	**Negligible**

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Open space; recreation & amenity	Residents & visitors	N/A	N/A	**Negligible**
Air Quality - emissions NO_2, PM_{10} & $PM_{2.5}$	Human receptor locations – existing	None	None	**Not Significant**, permanent
Air Quality - emissions NO_2, PM_{10} & $PM_{2.5}$	Human receptor locations – future occupants of new development	Provision of airtight (hermetically sealed) windows & mechanical ventilation at all residential homes on the first floor & at certain homes on the second & third-floor level	Included in design	**Not Significant**, permanent
Climate Change Resilience	Residents & visitors; nearby residents	None required	N/A	**Not Significant**
Climate Change – GHG emissions	Global climate - human health	None required	N/A	**Minor Adverse (Not Significant)**
Noise from building services plant	Existing & New Residents	Appropriate location, selection, screening and/or attenuation of building services plant	Included in design	**Negligible**
Sunlight, daylight & overshadowing	Surrounding residential	None required	N/A	**Minor Adverse (Not Significant)**
Solar Glare	Road users at nearby junctions	Embedded in design	N/A	**Minor Adverse (Not Significant)**
Solar Glare	Road users at 6 locations	Proposed glazing specifications should be low reflectance	Planning Condition	**Minor Adverse (Not Significant)**
Townscape & Visual	Residents & visitors; local neighbourhood	**Incorporated into design**	**n/a**	**Significant**

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Wind Microclimate	Persons on foot, seated or on bicycle	Not required	N/A	**Negligible**
Ground Conditions: contaminated soils	Residents & visitors	Capping with clean growth medium	Remedial Strategy	**Major Beneficial**

Summary for Healthy Urban Living

Social Environment & Health Related Behaviours

8.102 The Proposed Development would deliver 555 high quality student bedspaces in close proximity to the universities and with access to relevant support services and facilities. Overall, moderate beneficial effects for housing objectives; the provision of centrally located student housing may also release other accommodation with further beneficial effects. The building has been designed as an element of a wider strategic framework such that risks of non-cohesion or isolation have been minimised; community cohesion is promoted including with communal and amenity areas, landscaping and public realm with overall beneficial effects for the social environment. Security measures 24 hours are proposed to control access, and these will protect usage for the residents. Reported street crimes are similar to adjacent Wards and at the higher end of the range for all Wards. There is likely to be less risk of crime since there will be a new occupied building with security measures rather than a vacant previously used Site.

8.103 The location has strong sustainable transport provision and connectivity. The Proposed Development is car-free (except for 2 accessible car parking spaces), providing 83 bicycles for residents as part of a free to hire scheme plus 12 short stay visitor spaces located in the public realm – this will encourage and support sustainable movement with concomitant positive effects for health and wellbeing. A servicing and deliveries layby is proposed on Newcastle Street, together with waste management proposals that will minimise inconvenience or amenity nuisance to residents. The city centre location is rich in choice and accessibility to shops, bars, restaurants, gyms, museums, and diverse cultural facilities and services such that positive effects for the social environment are indicated. Community identity, social interaction and safety will be encouraged through the proposed development and the active use of the Site. The close proximity to and availability of a wide range of food supplies, including affordable healthy food options, can support healthy diet and nutrition for residents.

Economic Environment

8.104 The provision of student accommodation will generate a small number of jobs connected to the management and maintenance of the facility. Student expenditure makes an important contribution to the economy. The provision of high-quality accommodation can have a substantial bearing on decision making and attracting students to particular universities. Students spend money off campus on a variety of goods and services including food, clothing, bars and cafes, which can add to the

vibrancy and vitality of high streets and increase weekend and evening activity in an area which is traditionally quieter at these times. Therefore, the combined effects from additional students will be moderate beneficial.

Bio-Physical Environment

8.105 Any associated risk to human health has been considered through ground condition studies and found to be not significant. The remediation of previously developed land will remediate any risk from contaminated land with major beneficial effects. There is low risk to human health and wellbeing from flooding. The Site is 25m from the Rochdale Canal and it is within Flood Zone 1 indicating low risk of flooding from the sea and rivers. A Flood Risk Assessment investigated flooding from all sources, including groundwater and sewers, and concluded the risk to be low.

8.106 During construction, risks to their health and safety for construction personnel and the public are minimised through the implementation of a Construction Phase Health & Safety Plan that is monitored and periodically reviewed. Site security and safety is secured through perimeter fencing and various activities to ensure that the Site is safe from unauthorised access. The potential risks to health for workers and nearby residents from dust and particulates are controlled through the implementation of the CEMP such that residual effects on human health are **Negligible**. Waste will be segregated, and waste generated during construction will be cleared on a daily basis to a main holding skip, thus minimising risks to health and safety. The contractor will ensure that regular contact is made with local residents, and community groups so that they are kept up to date with the general progress on the Site and this will help ameliorate any concerns for wellbeing.

8.107 During operation, pollution from vehicle exhausts is the main source of air quality effects in the vicinity of the Site. The risk for emissions of NO2 and particulate matter with their effects on human health have been shown to be not significant with regard to both existing residents nearby and the future occupants of the building. The potential for noise effects on nearby residents and the new residents of the Proposed Development have been investigated and mitigated through design. The design of the buildings and their orientation, location within the area, has been developed to minimise adverse impacts on the townscape. The effects of the Proposed Development are limited because of the presence of Blocks A, B & D in the adjacent townscape. There will be no significant effects on townscape character or designations. Some significant effects are predicted on views arising from the Proposed Development for some people when in close proximity.

8.108 Changes to daylight or sunlight, and the wind microclimate can adversely affect health and wellbeing with regard to a healthy environment. Overall, effects on sunlight and daylight amenity, and overshadowing, as well as with regards to solar glare for road drivers, were found to be not significant and typical for a city centre development. The risk to safety and comfort from changes in the wind microclimate has been shown to be **Negligible**.

8.109 Access to open and green space is well-known to have positive effects for health and wellbeing. The current Site is ecologically poor quality. The proposed landscaping with trees, amenity grassland and rain garden, together with shrubs and sedum for the roof terrace, has been estimated to provide around a 70% positive net gain in biodiversity. The change from a cleared previously developed Site to landscaped and amenity areas with a new quality designed building will have positive effects for existing nearby residents and their visitors. For potential townscape and visual effects, mitigation measures have been embedded into the location and design of the proposed development such that impacts on townscape character and viewpoints were found to be negligible or beneficial. In general, the TVIA studies found that localised significant effects are mitigated by the design quality of the

Proposed Development and its positive contribution to place making. The Proposed Development will improve the visual amenity of the Site that is currently vacant land, improve gateway views, and make a positive contribution to the development of a distinctive townscape.

8.110 Over the 60-year life of the building, there will be changing effects on climate with potential associated risks for human health with more extreme weather conditions. Mitigation measures and future trends, particularly the transition to sustainable transport, should limit such effects in the longer term and contribute to a healthier environment. Mitigation measures have been integral to the building design, construction and operation, including planting and the public realm, to reduce the likely risks associated with health and wellbeing from the predicted changes in weather. Resilience to climate change has been integral to the building design. Effects on climate change from greenhouse gas emissions are global and have been found to be not significant with regard to carbon budgeting.

Institutional & Built Environment

8.111 The Proposed Development will provide high quality student accommodation that will contribute to identified need, in a sustainable city centre location and compatible with the wider societal infrastructure.. There is a PBSA management team for the building and its residents.

Monitoring

8.112 No monitoring is necessary.

Reference List

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

- Public Health England (PHE) Strategy 2020-2025 (2019) https://www.gov.uk/government/publications/phe-strategy-2020-to-2025
- Greater Manchester Councils Places for Everyone – Joint Development Plan (Publication Draft 2021) https://www.greatermanchester-ca.gov.uk/what-we-do/planning-and-housing/places-for-everyone/
- Manchester City Council Our Manchester Strategy, Forward to 2025 https://www.manchester.gov.uk/info/100004/the_council_and_democracy/8148/our_manchester_strategy-_forward_to_2025
- Our Public Health England (PHE) Spatial Planning for Health (2017) https://www.gov.uk/government/publications/spatial-planning-for-health-evidence-review
- Public Health England (PHE) Health Impact Assessment in Spatial Planning (2020) https://www.gov.uk/government/publications/health-impact-assessment-in-spatial-planning
- Institute of Environmental Management and Assessment (IEMA) Effective Scoping of Human Health in EIA; Determining Significance for Human Health in EIA (November 2022) https://www.iema.net/resources/blog/2022/11/17/launch-of-the-eia-guidance-for-considering-impacts-on-human-health

- MCC Manchester's Building Back Fairer (Marmot) Framework (2022-2027) https://democracy.manchester.gov.uk/documents/s34506/104318%20Marmot%20Report_Building%20Back%20Fairer%20in%20Manchester_V8.pdf

- London Healthy Urban Development Unit (HUDU) 'Healthy Urban Planning Checklist' (2017) & Rapid HIA Toolkit (2019) https://www.healthyurbandevelopment.nhs.uk/wp-content/uploads/2017/05/HUDU-Rapid-HIA-Tool-3rd-edition-April-2017.pdf

- MCC Census Data 2021 https://www.manchester.gov.uk/info/500388/census_2021/8622/census_2021_-_overview/5

- Office for Health Improvement & Disparities https://localhealth.org.uk/#c=report&chapter=c01&report=r01&selgeo1=ward_2021.E05011361

- MCC Intelligence Hub https://www.manchester.gov.uk/info/200088/statistics_and_intelligence/7611/intelligence_hub

9. Noise and Vibration

Introduction

9.1 This Chapter of the ES has been prepared by Paul Knowles of Acoustic and Engineering Consultants Limited (AEC) and assesses Noise and Vibration.

9.2 The author of this Chapter is Paul Knowles. Paul Knowles has a BSc in Environmental Analysis from the University of Huddersfield and a Diploma in Acoustics and Noise Control from the Institute of Acoustics. Paul has 15 years of experience in assessing noise and vibration for EIA developments. AEC was formed in 1992 and has provided acoustic consultancy services on large developments in Greater Manchester, London and other major cities in the north of England.

Assumptions and Limitations

9.3 It is assumed that there is no significant increase or decreased (+/-10%) in the traffic flow on the local network directly due to The Proposed Development, or significant changes in average traffic speeds or the percentage of Heavy Goods Vehicles.

9.4 It is assumed that there are no noisy ground floor commercial uses (e.g., commercial gym, bar, night-club etc).

9.5 Other additional assumptions and limitations of the assessments are identified below where relevant.

Relevant Legislation, Policy and Guidance

Legislation

9.6 Relevant legislation which references noise includes the 1974 Control of Pollution Act and the 1990 Environmental Protection Act. Noise policy in the UK is also determined by the 2010 Noise Policy Statement for England (NPSE) and the 2023 National Planning Policy Framework (NPPF), all of which are discussed in this ES Chapter, as well as Manchester City Council's Local Policy and Core Strategy (2012) and Saved Policies of the UDP (1995).

9.7 Control of Pollution Act, 1974 – Section 60 of the Control of Pollution Act states that Local Authorities can serve a notice imposing requirements as to the way in which the works are to be carried out and if it deems necessary specify the following:

- the plant or machinery which is, or is not, to be used;
- the hours during which the works may be carried out; and
- the level of noise which may be emitted from the premises in question or at any specified point on those premises or which may be so emitted during specified hours and provide for any change of circumstances.

9.8 If the notice is not complied with, the Act includes the power to prosecute the person who “without reasonable excuse contravenes any requirement of the notice”.

9.9 Environmental Protection Act, 1990 – Where it is it deemed that a Site is generating unnecessary and objectionable noise the Environmental Protection Act provides the powers for a Local Authority to a serve a Noise Abatement Notice.

Policy

National Planning Policy

9.10 Current national planning policies are set out in the National Planning Policy Framework (NPPF) published by the Department for Communities and Local Government, dated 20 December 2023, which replaces the previous versions published in March 2012, revised in July 2018, updated in February 2019 and revised most recently in December 2023.

9.11 The planning policies which relate specifically to noise are reproduced below:

"180. 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.

185. 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 the wider area to impacts that could arise from the development. In doing so they should:

(a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life65;

(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

193. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed".

9.12 Further to the above, the Governments 'Planning Practice Guidance' (PPG) published on 6 March 2014 and most recently updated in September 2023 states:

"Noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic

environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset".

9.13 In addition, the guidance indicates that, whilst noise can override other planning concerns, it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users, and its surroundings, as these can have an important effect as to whether or not noise is likely to pose a concern.

9.14 The terms 'significant adverse' and 'adverse' above are referenced to the Noise Policy Statement for England (NPSE), published by Department for Environment, Food and Rural Affairs (DEFRA) dated March 2010. One of the main aims of this policy is also to avoid significant adverse effects on health and quality of life.

9.15 With respect to the two terms above, the explanatory note for the NSPE introduces two concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO). They are:

"NOEL – No Observed Effect Level - This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur. "

9.16 National Planning Practice Guidance (NPPG), an online resource, brings together the aims of the NPPG and NPSE and tries to indicate how the likely perception and average response to noise relates to the effect levels. This is summarised in the Table 9.1, below, replicated from the online NPPG.

Table 9.1: National Planning Practice Guidance – Noise

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Adverse Effect Level			
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	No specific measures required
Lowest Observed Adverse Effect Level			
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 ventilation, having to close windows for some of the time because of the noise.	Observed Adverse Effect	Mitigate and reduce to a minimum

Perception	Examples of Outcomes	Increasing Effect Level	Action
	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.		
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g., avoiding certain activities during 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, 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	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, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

9.17 None of the policy documents provide noise level values for the different effect levels, instead stating that *"The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation."*

9.18 These factors include:

- The source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;

- for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise; and

- the spectral content of the noise (i.e., whether or not the noise contains particular high or low frequency content) and the general character of the noise (i.e., whether or not the noise contains particular tonal characteristics or other particular features). The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.

9.19 More specific factors to consider when relevant:

- where applicable, the cumulative impacts of more than one source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration; and,

- consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed

mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary.

Local Planning Policy

9.20 The Manchester Local Plan guides developments within Manchester's Core Strategy was adopted on 11 July 2012 and Section 26 "Development and Noise" of the Development Control Policies (saved Unitary Development Plan Policies). These documents identify the need to consider and assess noise in terms of controlling noise generating developments and considering the potential impact of existing noise on proposed noise sensitive developments.

9.21 MCC has outlined their requirements in relation to noise in their document 'Planning & Noise Technical Guidance' (PNTG) which was issued in December 2015 and updated in October 2022. In regard to residential developments, PNTG states that the following internal noise levels should be achieved within residential properties:

- "Bedrooms (night-time - 23.00 - 07.00). dB LAeq,8h (individual noise events should not normally exceed 45 dB LAmax, F by more than 15 times)
- Living Rooms (daytime - 07.00 - 23.00) 35 dB LAeq,16h"

9.22 It should also be noted that, regarding ventilation and overheating, MCC states:

"Occupants should be provided with a supply of fresh air in habitable rooms without having to open the windows (whilst also having the option to do this for purge ventilation, or at the occupant's discretion)."

9.23 In terms of noise emissions from building services plant, MCC require the following:

"Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating noise level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location."

9.24 In relation to vibration, PNTG states that *"A vibration assessment (which is usually based on BS 6472: 2008) may be required where railway/tram lines are within 75m of the proposed development site."*

9.25 BS 6472:2008 introduces a 'vibration dose value' (VDV), which is a measure of vibration exposure, weighted for human perception, over a specified time period. The standard also identifies the vibration dose values above which various degrees of adverse comment may be expected in residential buildings. This data is reproduced in Table 9.2 below.

Table 9.2: Vibration Dose Values Relating to Various Degrees of Adverse Comment in Residential Buildings

Periods	Low probability of adverse comment, (m/s-1.75)	Adverse comment possible (m/s-1.75)	Adverse comment probable (m/s-1.75)
Daytime 0700 – 2300h	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Night-Time 0700 – 2300h	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

Guidance

9.26 The main assessment guidance referenced in this study are listed below:

- British Standard 7445: 1991 'Description and measurement of environmental noise' (BS7445). This document provides guidance for when undertaking environmental noise measurements;

- British Standard 5228: 2009 'Code of practice for noise and vibration control on construction and open sites. Part 1: Noise' (BS5228-1). This document provides noise levels from typical construction activities, assessment methodologies for predicting noise levels and determining of significant effects, and provides best practice noise control/mitigation advice;

- British Standard 5228: 2009 'Code of practice for noise and vibration control on construction and open sites. Part 2: Vibration' (BS5228-2). This document provides noise levels from typical construction activities, assessment methodologies for the determining of significant effects and best practice vibration control/mitigation advice;

- British Standard 6472: 2008 'Guide to evaluation of human exposure to vibration in buildings' (BS6472). This document provides guideline limits for ground-borne vibration affecting people in buildings.

- BS 7385: Part 2:1993: 'Evaluation and Measurement for Vibration in Buildings - guide to damage levels from ground-borne vibration'. This sets thresholds in terms of vibration velocity, for the on-set of potential cosmetic and structural damage to buildings due to high levels of vibration.

- International Organization for Standardization 9613-2: 1993 Acoustics – 'Attenuation of sound during propagation outdoors - Part 2: General method of calculation' (ISO 9613-2). This document provides a calculation methodology for predicting external noise levels.

- British Standard 4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (BS4142). This document provides an assessment methodology for assessing the likelihood of complaints from industrial and commercial noise affecting residential areas;

- World Health Organisation – 'Guidelines for Community Noise' 1999 (WHO). This document provides guidance as to what could be considered to be acceptable noise levels inside and outside residential buildings, in order to minimise risk of adverse effects of noise on outside amenity and health and wellbeing.

- British Standard 8233:2014 – 'Guidance for sound insulation and noise reduction for buildings' (BS8233). This document provides recommendations for internal noise levels in various noise sensitive buildings and assessment methods for predicting the sound insulation performance of building envelopes;

- MCC – PNTG. This document provides guidance on the Local Authority's requirements for noise emitted from the Site and noise levels breaking into the residential aspect of the proposed scheme.

Assessment Methodology and Significance Criteria

Scenarios Tested

9.27 The following scenarios will need to be considered within the EIA:

- Scenario 1: Existing baseline (i.e., Site with committed developments);
- Scenario 2: Existing Site (baseline) with Proposed Development;
- Scenario 3: Existing Site (baseline) with Proposed Development and mitigation;
- Scenario 4: Existing Site (baseline) with Proposed Development, mitigation and cumulative development.

9.28 Whilst this Chapter has been prepared on the basis that Plot 10a is a "committed development" and therefore included within the existing baseline, treating Plot 10a as a "cumulative" scheme would not materially impact upon this assessment. Based on AEC's experience, during the operational phase of the development at Plot 10a, noise from an office development would be limited to that emitted by any mechanical services plant. There are no elevations on the adjacent noise sensitive buildings which would have direct line of sight of both Plot 10a and the Proposed Development during the construction phase or operational phases.

9.29 Therefore, as both the Plot 10a scheme and the Proposed Development will implement strategies to control noise during the constriction phase, such as selecting construction techniques and equipment which do not emit high noise levels or by localised screening, it is considered that the assessment of noise in this Chapter would not need to be updated if Plot 10a was treated as a cumulative scheme. Noise relating to mechanical services plant associated with the Proposed Development and the proposed Plot 10a office development, would be adequately controlled independently, through the selection of specific units or attenuation in the form of acoustic silencers or screening, and there would be no cumulative increase in noise levels.

9.30 Following a review of the proposals for the scheme to be developed on Plot 10b, the potential main noise sources during the operational phase of the building would be noise breaking out of the ground floor Market Hall and from any mechanical services plant. There are no elevations of the adjacent noise sensitive buildings which would have direct line of sight of both Plot 10b and the Proposed Development during the construction phase or operational phase. Therefore, as both the Plot 10b scheme and the Proposed Development will implement strategies to control noise during the construction phase, such as selecting construction techniques and equipment which do not emit high noise levels or by localised screening, it is considered that the assessment of noise in this Chapter would not need to be updated if Plot 10a was treated as a cumulative scheme. During the operational phase it is expected that noise from the Market Hall will be controlled via enhanced glazing and restrictions on operating hours. Noise relating to mechanical services plant associated with the Proposed Development and the proposed Plot 10a office development, would be adequately controlled independently, through the selection of specific units or attenuation in the form of acoustic silencers or screening, and there would be no cumulative increase in noise levels.

The Study Area

9.31 The study area for noise and vibration is identified within **Figure 9.1**. Residential receivers are by far the most noise sensitive and the nearest (and hence most sensitive) are:

- Blocks A/B and D of this development
- Unite Students – New Medlock House

Source of Effect

9.32 There are two sources of noise which may impact on the nearest noise sensitive receptors, construction noise during the construction phase and noise from building services plant during the operational phase.

9.33 In relation to vibration, this would only potentially have an impact during the construction phase.

Significance Criteria

Construction Noise

9.34 The magnitude and significance of effects due to construction noise is determined differently to planning policy guidance and is based on "Example method 2 – 5dB change" as presented in section E.3.3 of BS5228-1. This method reflects a conventional approach within EIA methodologies.

9.35 This method states that noise levels generated by construction activities are deemed to be significant if the 'total noise' (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB LAeq, from construction noise alone, for the daytime (0700-1900h), evening (1900-2300h) and night-time (2300-0700h) periods, respectively.

9.36 There is no recognised guidance to determine if any predicted significant adverse effects are of 'minor', 'moderate' or 'major' significance, consistent with the EIA terminology adopted. However, the following approach could be taken where there is a +5dB change or greater in the daytime ambient noise level:

- Total Noise 65-70dB(A) – Minor Significance
- Total Noise 70-75dB(A) – Moderate Significance
- Total Noise >75dB(A) – Major Significance

9.37 It is also suggested that, depending on the magnitude of the changes and/or if the effect is for a short or long duration, the reported effects can move to adjacent bands. I.e., piling noise may be >75dB but may only occur over a single week, therefore, this could be considered as of 'moderate' significance.

Construction Vibration

9.38 The threshold of perception depends on the frequency. The human body is most sensitive to vibration in the frequency range 1-80 Hz. The threshold of perception is typically taken to be 0.3 mms-1 peak particle velocity at frequencies between 8 Hz and 80 Hz.

9.39 BS 6472:1992 contains guidance relating to human exposure to vibration. A methodology is presented for assessing the human response to vibration in terms of the vibration dose value (VDV).

9.40 Experience shows that disturbance or annoyance from vibration in residential situations is likely to arise when the magnitude of vibration is only slightly in excess of the threshold of perception.

9.41 For building damage criteria, Table 1 of BS 7385: Part 2:1993: 'Evaluation and Measurement for Vibration in Buildings - guide to damage levels from ground-borne vibration', sets out limits for primarily transient vibration above which cosmetic damage could occur. This is reproduced in Table 9.3, below.

Table 9.3: Vibration levels above which cosmetic damage could occur

Building Type	Peak Particle Velocity (mm/s)	
	4Hz to 15Hz	15Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50mm/s at 4Hz and above	
Unreinforced or light framed structures. Residential or light commercial type buildings.	15mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

9.42 It is assumed that all buildings surrounding the Site are constructed from reinforced concrete and are not a structurally vulnerable condition. Taking the above into consideration, the following significance criteria is provided in Table 9.4 below.

Table 9.4: Significance Criteria, Vibration

Peak Particle Velocity (mm/s)		Significance Criteria
Human Perception	Building Damage	
≥10	≥15	Major (SOAEL)
0.3-10	5 - 15	Minor-Moderate (LOAEL)
<0.3	<5	Negligible (NOEL)

9.43 Any predicted vibration effects which are significantly above the thresholds of perception and above the thresholds for cosmetic damage, would be considered as being of minor to major adverse significance, depending on the duration of the effects and the sensitivity of the receptor(s).

9.44 AEC must be informed of other sensitive structures, underground services, or particular ground conditions where vibration could cause issues.

Building Services Plant

9.45 The assessment of noise from any building services plant is presented in BS4142, which compares the 'rating' noise level (dBLAr,Tr) from a specific noise source with the background noise level (dBLA90,T) without the noise source operating.

9.46 A 'rating' noise level is obtained from applying a character correction to the 'specific' noise level (dBAeq,T) of the source if the noise has a defined acoustic character such as being tonal, impulsive, distinctive or intermittent in nature.

9.47 The impact of the noise source is dependent upon the margin by which the 'rating level' of the specific noise source exceeds the background noise level, the resulting difference is then used to determine the likelihood of impact, as presented in Table 9.5, below. BS4142 states *"Typically, the greater this difference, the greater the magnitude of impact".*

Table 9.5: BS4142 Assessment Parameters

Difference between rating and background noise level	Assessment
+10dB or more	Significant adverse impact
+5dB - +10dB	Adverse impact
< 0dB - +5dB	Negligible / Low impact

9.48 Further to this, when the industrial/commercial noise level is 10dB lower than the background noise level, it should practically be inaudible. On this basis, the significance criteria detailed in Table 9.6, below, are proposed for building services noise.

Table 9.6: Plant Noise Significance Criteria

Difference between rating and background noise level	Significance Assessment
≥+5dB	Moderate to Major (SOAEL)
0.1dB to +4.9dB	Minor to Moderate (LOAEL)
-4.9dB to ≥0dB	Negligible to Minor (LOAEL)
≤-5dB	Negligible (NOEL)

9.49 As stated above, MCC require that the 'rating' noise level from building services plant does not exceed a level 5dB below the existing background noise level at the nearest noise sensitive residential property (Negligible).

Baseline Conditions

9.50 A daytime attended noise level survey was undertaken by AEC between 1000 and 1430h on Wednesday 10 July 2019. Attended night-time noise levels were measured between 2300h on Friday 12 July and 0100h on Saturday 13 July 2019. Unattended noise level measurements were

also undertaken at high level at a location representative of Block C between 1500h on Friday 26 and 1900h on Tuesday 29 May 2023. Full details are provided in **Appendix 9.1.**

9.51 Attended noise levels were measured at 5 locations (identified as A to E on **Figure 9.1**) around the development Site and the unattended measurements were undertaken at a location representative of Block C (identified as L on **Figure 9.1**). The dominant noise source during both the daytime and night-time periods was road traffic on the surrounding roads, including the Mancunian Way A57(M).

9.52 A summary of free-field daytime and night-time noise levels measured at Locations A to E and Location L are presented in **Tables 9.7** and **9.8** respectively, below.

Table 9.7: Summary of Free-Field Noise Levels at Measurement Locations A to E (Scenario 1)

Location (Figure X.1)	Daytime (0700-2300h)				Night-Time (2300-0700h)		
	LAeq	LA10	LA90	LAmax, F	LAeq	LA90	LAmax, F
A	74	76	70	86	72	65-68	88
B	65	66	63	83	63	60	80
C	61	62	59	77	59	54-56	66
D	63	66	61	67	61	57	75
E	63	64	60	69	60	57	66

Table 9.8: Summary of Free-Field Noise Levels at Measurement Location L (Scenario 1)

Location (Figure X.1)	Date/Period	Daytime (0700-2300h)			Night-Time (2300-0700h)		
		LAeq	LA90	LAmax, F	LAeq	LA90	LAmax, F
L	Friday 26 May	72	68	93	69	63	94
	Saturday 27 May	72	69	97	69	61	90
	Sunday 28 May	71	68	98	69	58	86
	Monday 29 May	71	68	93	-	-	-

Identification and Evaluation of Likely Significant Effects

Construction Phase

Construction Noise

9.53 AEC has provided an initial assessment of the potential construction noise impacts based on AEC's experience of similar developments. This is generally in line with the CMP as issued by the Principal Contractor (Appendix 5.1).

9.54 Construction activities are a potential, albeit temporary, source of noise. BS 5228 provides methodologies for the assessment and control of noise from construction operations. The Standard contains detailed information on noise reduction measures and promotes the BPM approach to control noise and minimise the impact on local residents and construction workers.

9.55 For construction noise, it is not possible at the planning application stage to predict detailed noise effects given the uncertainty as to construction methods, processes and plant. However, indicative noise levels have been calculated at the closest noise sensitive receivers for assumed plant and processes.

9.56 As the Site has already been cleared as part of the wider development on the Site, the earthworks and Site clearance phase has already been completed and does not need including in this document. Calculations have been undertaken for two of the construction stages expected to cause the highest levels of noise including:

- Rotary bored piling; and
- Concreting.

9.57 The number of deliveries has not been outlined in the CMP, and therefore, potential effects cannot be assessed. However, based on the CMP all deliveries will be allocated a time slot and it is assumed that these will be during the typical daytime operating hours of the Site.

9.58 For construction activities, the distance has been calculated from the centre of the Site to the nearest dwelling, both to indicate 'average' noise levels over the Site.

9.59 For all activities, as the buildings immediately surrounding the Site are at least 10 storeys high, other than localised barriers to specific items of stationary plant (such as a generator), acoustic screening around the development Site would not have any impact on the noise levels external to the nearest noise sensitive receptors.

9.60 Based on noise levels of construction activities detailed in BS 5228 - 1, the potential noise impact from construction activities has been calculated external to the Blocks A&B and D and Unite Students – New Medlock House, and are presented in Tables 9.9 to 9.11, respectively.

Table 9.9: Example Construction Noise Level Assessment external to Blocks A&B (Scenario 2)

Scenario	Activity	dBLAeq @ 10m	Distance to receiver, m	Corr, dB	No. Items	Item Cor, dB	% On Time	On Time Corr, dB	Activity Noise Level dBLAeq
Piling	Rotary bored	80	20	-6	1	0	25	-6	68
Concreting	Pump	80	20	-6	1	0	50	-3	71
	Power float	75	20	-6	2	3	25	-6	66
	Vibrators	85	20	-6	2	3	10	-10	72

Table 9.10: Example Construction Noise Level Assessment external to Block D (Scenario 2)

Scenario	Activity	dBLAeq @ 10m	Distance to receiver, m	Corr, dB	No. Items	Item Cor, dB	% On Time	On Time Corr, dB	Activity Noise Level dBLAeq
Piling	Rotary bored	80	30	-10	1	0	25	-6	64
Concreting	Pump	80	30	-10	1	0	50	-3	67
	Power float	75	30	-10	2	3	25	-6	62
	Vibrators	85	30	-10	2	3	10	-10	68

Table 9.11: Example Construction Noise Level Assessment external to Unite Student - New Medlock House (Scenario 2)

Scenario	Activity	dBLAeq @ 10m	Distance to receiver, m	Corr, dB	No. Items	Item Cor, dB	% On Time	On Time Corr, dB	Activity Noise Level dBLAeq
Piling	Rotary bored	80	25	-8	1	0	25	-6	66
Concreting	Pump	80	25	-8	1	0	50	-3	69
	Power float	75	25	-8	2	3	25	-6	64
	Vibrators	85	25	-8	2	3	10	-10	70

9.61 Existing daytime ambient noise levels at locations representative of Blocks A& B, Block D and Unite Students - New Medlock House were 63dBLAeq,T, 68dBLAeq,T and 72dBLAeq,T, respectively.

9.62 Based on the above example activities, the following assessment of significant noise effects at the two assessment locations based on the BS5228-1 '5dB Change' method are presented in Tables 9.12 to 9.14, below.

Table 9.12: Example Construction Noise Assessment Effects at Blocks A&B (Scenario 2)

Scenario	Activity	Activity Noise Level @ Receptors dBLAeq, day	Baseline Noise Levels dBLAeq, day	Resultant Noise Level @ Receptors dBLAeq, day	Increase (dB)	Assessment of Significance
Piling	Rotary bored	68	63	69	6	Moderate
Concreting	Pump	71	63	72	9	Moderate / Major
	Power float	66	63	68	5	Minor
	Vibrators	72	63	73	10	Major

Table 9.13: Example Construction Noise Assessment Effects at Block D (Scenario 2)

Scenario	Activity	Activity Noise Level @ Receptors dBLAeq, day	Baseline Noise Levels dBLAeq, day	Resultant Noise Level @ Receptors dBLAeq, day	Increase (dB)	Assessment of Significance
Piling	Rotary bored	64	65	67.7	2.7	Negligible
Concreting	Pump	67	65	69.4	4.4	Negligible
	Power float	62	65	66.9	1.9	Negligible
	Vibrators	68	65	70.1	5.1	Moderate

Table 9.14: Example Construction Noise Assessment Effects at Unite Students - New Medlock House (Scenario 2)

Scenario	Activity	Activity Noise Level @ Receptors dBLAeq, day	Baseline Noise Levels dBLAeq, day	Resultant Noise Level @ Receptors dBLAeq, day	Increase (dB)	Assessment of Significance
Piling	Rotary bored	66	72	73.0	1	Negligible
Concreting	Pump	69	72	73.8	1.8	Negligible
	Power float	64	72	72.6	0.6	Negligible
	Vibrators	70	72	74.1	2.1	Negligible

9.63 Based on the 5dB change assessment method, noise levels external to Block A&B during piling and concreting during certain activities are expected to generate adverse impacts of up to Moderate/Major significance, at times, during construction. In relation to Unite Students - New Medlock House, it anticipated that noise during the construction phase would have a **Negligible** impact.

Construction Vibration

9.64 Vibration during construction work may arise from activities such as piling (e.g., for building foundations), ground improvement and road construction. Selection of plant and methods will need to consider the possible effects of vibration on nearby buildings and their occupants.

9.65 The nearby buildings which may be affected are the buildings on Chester Street and Medlock Street. The nearest receptor to the development Site is Blocks A&B which is around 25m from the centre of the development. Therefore, this assessment is based on these blocks only, which is the worst-case assessment. Activities carried out at a greater distance would result in lower vibration levels.

9.66 Ground-borne vibration from construction work has broadly two potential impacts; cosmetic/structural damage and human sensitivity.

9.67 Structural damage to buildings by vibration is extremely rare and, if at all, only occurs when receiving buildings or structures are located very close (e.g., at least within around 10m) to very intensive vibration generating activities and/or are vulnerable due to their structural condition.

9.68 As most of the buildings surrounding the Site are relatively new, it is considered highly unlikely that vibration would cause any structural damage impacts to these buildings. However, this will need to be reviewed as more detailed information is available regarding construction methods etc.

9.69 In terms of the impact on humans, perceptible vibration can give rise to complaints of disturbance over a wider area from the works. Depending on details of any proposed vibration causing activities, it is possible that certain activities such as impact piling/compacting, occurring close to the existing residential buildings, could give rise to perceptible vibration.

9.70 It is not possible to provide any detailed vibration assessment without full details of the plant and methods to be used. However, an indicative assessment, based on guidance in BS5228-2, is provided in Table 9.15, below.

Table 9.15: Assessment of Potential Vibration Impact during Construction (Scenario 2)

Activity	Estimated Vibration Level at Receptor, mm/s	Significance
Piling (CFA)	<5	Minor to Moderate
Piling (Rotary)	<5	Minor to Moderate
Compacting	<5	Minor to Moderate

9.71 In terms of human perception, at this initial stage there is potential for minor to moderate adverse impacts. However, in terms of damage to buildings the impacts are Negligible.

Operational Phase

Building Services Plant

9.72 At this stage the building services plant has not been specified in any detail, and therefore, noise from this source cannot be quantified exactly. However, there are many tried and tested mitigation measures for building services plant, and as such, noise level limits can be presented in a suitably worded planning condition.

9.73 As existing night-time background noise levels are relatively high (≥54dBLA90 at Location C, the quietest location), achieving the MCC requirement would require noise from all building services plant to not exceed 49dBLAr,Tr at the nearest noise sensitive receptors.

9.74 Controlling noise from this source to the limit presented above is not onerous provided screening is considered where necessary, and therefore, noise from the building services plant associated with the development will have no significant adverse effect.

Cumulative Effects

9.75 Following a review of the committed developments and sites that have a reasonable prospect of achieving Planning Permission, all of the 20 sites are a significant distance and acoustically screened from the Proposed Development such that they have not been considered further.

9.76 The only committed developments that are located in the immediate area are Phases 1 (Block D) and 2 (Blocks A & B) of Plot 11, First Street.

9.77 These committed developments will have to adhere to the noise and vibration requirements as stated in MCC's 'Planning & Noise Technical Guidance'. Therefore, noise and vibration from sources associated with these schemes would be suitably controlled and there would not be an increased in noise and vibration levels affecting existing buildings.

9.78 During the construction phase of Block A&B and Block D the CEMP for each scheme will need to be adhered with. This will control the noise and vibration emitted from the sites. In any case, as detailed within Chapter 5 of this ES, construction works in relation to the Site will not commence prior to the completion of Blocks A&B, and D. Therefore, there are no anticipated cumulative effects.

9.79 Noise emitted from sources associated with Blocks A&B and Block D has been designed to meet the noise level limits presented in the MCC document. The building services plant associated with Block C will be specified taking into account the contribution of noise from the other blocks.

Mitigation Measures

Construction Phase

Construction Noise & Vibration

9.80 Noise from construction activities would be minimised in line with the contractor's construction environmental management plan (CEMP) which will outline all best practicable means (BPM) measures to be implemented on Site, as required by the control of pollution act (CoPA). Typical BPM measures that could be applied during the construction stage to minimise the potential impact of noise from Site may include, but are not limited to, the following.

9.81 On-Site operations being undertaken in line with MCCs required working hours for construction sites of 0800 to 1800h Monday to Friday and 0900 to 1300h on Saturdays.

9.82 It is envisaged, however, that late working will be required during the concrete frame construction or when installing and dismantling the tower cranes due to safety and welfare of the staff on Site. These works will have to be conducted when the Site is closed to all but the teams carrying out the works and will only be undertaken if entirely necessary. Noisy works will be limited during these hours and local residents and stakeholders will be notified and kept up to date with activities and working hours during these periods through neighbourhood engagement and regular leaflet drops. In advance of these periods, MCC and the relevant Environmental Health Officer (EHO) will be notified, and Site will engage residents and coordinate these works in a timely manner suitable to all.

9.83 It should be noted that in relation to assessment of construction noise presented above, the noise data provided in BS5228 is considered to be representative of older machinery. Therefore, based on the implementation of BPM in the contractors CEMP, the resultant noise levels in the outlined assessment are likely to reduce in the order of ≈3dB.

9.84 If short term, temporary working is required during the evening, night-time and/or Sunday periods, then this would need to be agreed with MCC under CoPA. A noise and vibration management plan and possibly a prior CoPA Section 61 agreement with MCC could be considered.

9.85 Applying for consent under Section 61 would require the developer to provide details of the proposed working times, location, methods, plant and any steps to mitigate noise for each element of the project in advance of the work. A Section 61 agreement must be completed prior to the start of the construction work and if the Local Authority approves the agreement, they cannot legally sere the contractor with any Section 60 notices throughout the construction programme, provided that the agreement is adhered to.

9.86 In relation to the potential impact of vibration emitted during the construction phase, BPM approach to vibration control is the same as that described above for construction noise (the Control of Pollution Act explicitly applies to vibration as well as noise).

Operational Phase

Building Services Noise

9.87 At this stage a limit of exceed 49dBLAr,Tr at the nearest noise sensitive receptors has been set at the nearest residential properties based on the existing night-time background (LA90) noise levels. Standard mitigation measures are likely to be required to meet this limit and they could include one or more of the following: appropriate locating of all equipment away/screened from residential receptors; appropriate selection of quiet operating plant; atmosphere side attenuation of plant and/or acoustic screening/parapets.

9.88 This will be developed during the detailed design stages of the proposed development.

Site Suitability

Noise Break-in to Proposed Bedrooms

9.89 Based on the measured noise levels identified in **Table 9.7** the noise levels affecting the various building elevations have been determined, and are presented in **Table 9.16**, below.

Table 9.16: Anticipated External Daytime and Night-Time Noise Levels (Scenario 4)

Block	Elevation (≈ Orientation)	Noise Level, dB Day 0700-2300h, LAeq, 16h	Night 2300-0700h LAeq, 8h	LAmax
C	Northern	≤66	≤64	≤85
	Eastern	≤69	≤64	≤85
	Southern	≤77	≤73	≤90
	Western	≤73	≤72	≤89

9.90 The noise levels presented in **Table 8.15** could be considered very high. However, it is standard practice to incorporate mitigation measures in the form of glazing and ventilation to control external to acceptable internal noise levels limits and this is discussed below.

9.91 The above single figure noise levels are the highest noise levels determined each elevation. Due to the size and orientation of the elevations noise levels will vary at different points across the Site.

9.92 The noise levels presented in **Table 9.16** are typical for a city centre location overlooking an internal ring road. As would be expected for a residential development in a city centre location, windows to all habitable rooms will need to remain closed and ventilation provided by alternative means. However, windows could be opened at the residents' discretion to allow rapid ventilation.

9.93 As agreed with the Design Team, the external envelope of the building will be designed in order to achieve the required internal noise level limits as presented in MCC's document PNTG. This will include enhanced acoustic glazing and the provision of mechanical ventilation systems. These will be developed during the detailed design stages.

Residual Effects

Construction Phase

9.94 Once the construction programme has been finalised, and required equipment fully specified. The residual effects during construction will be subject to a further detailed assessment. At this stage, there are only two activities which would cause a moderate adverse effect. Following the implementation of BPM it may be possible to reduce the impact of noise from these sources to a minor significance. This would be detailed further in an agreed noise management plan for the construction stage, which would be included within the Construction Environmental Management Plan.

Table 9.17: Residual Effects (Construction Phase) (Scenario 4)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Minor and Moderate adverse noise disturbance effects on residents	Existing Residential	Best Practicable Means mitigation. Quiet plant/methods. Noise and Vibration Management Plan (NVMP)	Noise & Vibration Management Plan	Temporary Minor and Moderate adverse noise disturbance effects on residents at times.

Operational Phase

9.95 With correctly proposed and implemented mitigation measures, the Residual Effects from operational noise would be **Negligible.**

Table 9.18: Residual Effects (Operational) (Scenario 4)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Minor adverse noise annoyance effects from	Existing Residential properties.	Appropriate location, selection,	Negligible	**Negligible**, permanent.

building services plant		screening and/or attenuation of building services plant.		

Monitoring

9.96 Noise levels will be measured of the building services plant to ensure that noise from the units specified meet the agreed noise level limits.

10. Socio-Economic

Introduction

10.1 This Chapter of the ES has been prepared by ekosgen and assesses likely Socio-Economic impacts of the proposals upon the Site and surrounding area during construction and operational phases. 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.

10.2 The authors of this Chapter are Zoe Crampton and Will Christiansen. Zoe Crampton has an honours degree in Geography (BA Hons) from the University of Birmingham, and over 20 years' experience in advising on socio-economic matters, having completed over 50 socio-economic ES chapters for a wide range of residential, commercial and mixed-use projects. Will Christiansen has a Masters degree in Real Estate (MSc) and honours degree in Geography (BSc) from Northumbria University and Durham University, respectively. Will has 6 years' experience advising on socio-economic matters and has prepared approximately 25 socio-economic ES chapters. ekosgen is a leading economic development consultancy, with expertise in social and economic impact assessment. Since the company's establishment in 2002, we have provided socio-economic advice to support planning applications for a wide range of development schemes in Manchester and further afield.

Assumptions and Limitations

10.3 There is not a recognised criteria for the assessment of socio-economic impacts, and therefore ekosgen, drawing on their expertise, knowledge of overarching guidance and experience of working in the subject area, have taken a structured approach to quantifying and assessing the scale and nature of potential impacts relative to baseline conditions. In cases where impacts could not be quantified, a qualitative judgement has been made, drawing on professional experience.

10.4 The most up to date data from official published sources has been used, however there are some limitations in the baseline data. Where this is the case, ekosgen have gathered data most closely aligning to the chosen Study Area and clearly stated what geography the data collected refers to.

Relevant Legislation, Policy and Guidance

Policy

10.5 This considers the national, sub-regional and local planning documents and policies of relevance to this chapter.

National Policy

10.6 In December 2023, Government published a revised National Planning Policy Framework (NPPF). The NPPF outlines the Government's planning policies for England and how these should be applied and *"provides a framework within which locally prepared plans for housing and other development can be produced".*

10.7 The NPPF overarching interdependent objectives outline how to achieve sustainable development:

"A) an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types 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;

B) a 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; and

C) an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimizing waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

10.8 The NPPF acknowledges the necessity to deliver a sufficient supply of homes as well as highlighting the need to *"ensure an integrated approach to considering the location of housing, economic uses and community facilities and services".*

10.9 Paragraph 66 of the NPPF also refers to a need to provide specialist accommodation for a group of people with specific needs (such as purpose-built accommodation for the elderly or students).

Sub-Regional Policy

10.10 The emerging Places for Everyone Plan is the new long-term join development plan for nine Greater Manchester districts. Once adopted, the Places for Everyone Plan will serve as a Development Plan Document, setting out the need to maximise the potential of Greater Manchester's key growth locations whilst also securing investment that raises the competitiveness of northern boroughs to deliver inclusive growth across the sub-region by ensuring that employment growth opportunities are well connected and accessible to all residents.

10.11 The Plan highlights that *"the universities and the knowledge economy are other important assets for us, with a high concentration of students, research activity and scientific institutions. This activity is primarily focused within the City Centre, with The Oxford Road Corridor being an internationally important location in this regard".* Policy JP-P 5 outlines the necessity to continue supporting the growth and success of the university sector through *"continuing to help develop Greater Manchester as the UK's best destination for students".*

10.12 The Plan outlines the role of the City Centre as the most significant economic location in the country outside of London and the need for it to be strengthened significantly. There is a need for improvements in the public realm, walking and cycling facilities, and green infrastructure to help enhance the local character and environmental quality of the City Centre so that it can rival city centres across the globe.

Local Planning Policy

10.13 The Manchester Core Strategy (2012) outlines 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 establish where major development and other forms of investment should be located in order to be sustainable, meet local needs and take full advantage of opportunities. A key

spatial principle of the Core Strategy is that the regional centre of Manchester will be the focus for economic and commercial development, retail, leisure and cultural activity, alongside high-quality city living.

10.14 Policy H 12 (Purpose Built Student Accommodation (PBSA)) sets out the criteria for which new PBSA will be developed, with priority given to schemes which are part of the universities' redevelopment plans, or which are being progressed in partnership with the universities, and which clearly meet Manchester City Council's regeneration priorities.

Guidance

10.15 The earliest iterations of the First Street Strategic Development Framework (FSDF) identified the Site as falling within the FSS character area where high quality residential uses are directed. The SDF identifies this area as an opportunity to deliver a distinctive residential neighbourhood with access to the cultural and employment opportunities offered in this part of the city centre.

10.16 Manchester City Council approved a Residential Growth Strategy in 2016, which seeks to deliver a minimum of 25,000 new homes in a ten-year period between 2016 and 2025. This policy framework aims to ensure that there is the right quality, mix and type of housing in the right locations to meet demand and changing demographics, develop neighbourhoods of choice and improve equality amongst the City's residents in terms of housing choice, quality and affordability in order to develop strong communities.

10.17 The Strategy outlines how it will *"support the delivery of residential-led development providing a significant number of high-quality homes alongside commercial development".* The Strategy takes note of the significant student population in Greater Manchester and attributes some of the growth of the private rented sector in the region to demand for student housing. The proposed development provides PBSA which will help to meet both increasing levels of demand for housing within the city whilst also creating new employment opportunities.

Assessment Methodology and Significance Criteria

Scenarios Tested

10.18 In line with the standard approach (as set out in ES Volume 1: Chapter 2) this Chapter of the ES will assess the following scenarios:

- Scenario 1: Existing Site (baseline) with committed developments;
- Scenario 2: Scenario 1 plus Proposed Development;
- Scenario 3: Scenario 2 plus mitigation; and
- Scenario 4: Existing Site (baseline) with Proposed Development, mitigation and cumulative developments.

10.19 Each scenario is addressed in turn within the 'Identification and Evaluation of Likely Significant Effects' section.

10.20 For the purposes of the Socio-Economic assessment, whilst the consideration of both Plot 10a and Plot 10b as cumulative developments would require a minor change in the technical analysis, it is

considered that this would have no material impact on the assessment of socio-economic effects. This is because the effects of both of these developments (as they relate to the discipline of Socio-Economics) are included within the existing baseline. Principally, these effects relate to the employment generated through the development of office space (Plot 10a) and the additional student population generated (Plot 10b) as well as the employment generated through the development of both plots. Were such effects to be considered cumulatively, it is considered that the scale of these would not be sufficient to alter the magnitude of change and in turn their significance. Therefore, and as such it is considered that the re-categorisation of Plot 10a and Plot 10b from "committed" to "cumulative" schemes would simply alter the structure of the Chapter (in a minor way) but not materially affect the assessment of effects.

The Study Area

10.21 The anticipated effects of the Proposed Development are set out in more detail in Table 10.1 (Geographical study areas). The likely effects influence the geography over which the Study Area is considered. The effects of the Proposed Development are considered across the following geographies:

- Local Impact Area (LIA) – the definition of the LIA varies depending on the effect being assessed and any associated need to use bespoke catchments and/ or administrative spatial scales as set out within relevant local and regional policies. (See Table 10.1 and Figure 10.1 below).

- District – Manchester City Council (MCC) is Identified as the administrative area in which the Proposed Development is located and the area in which employment targets are set.

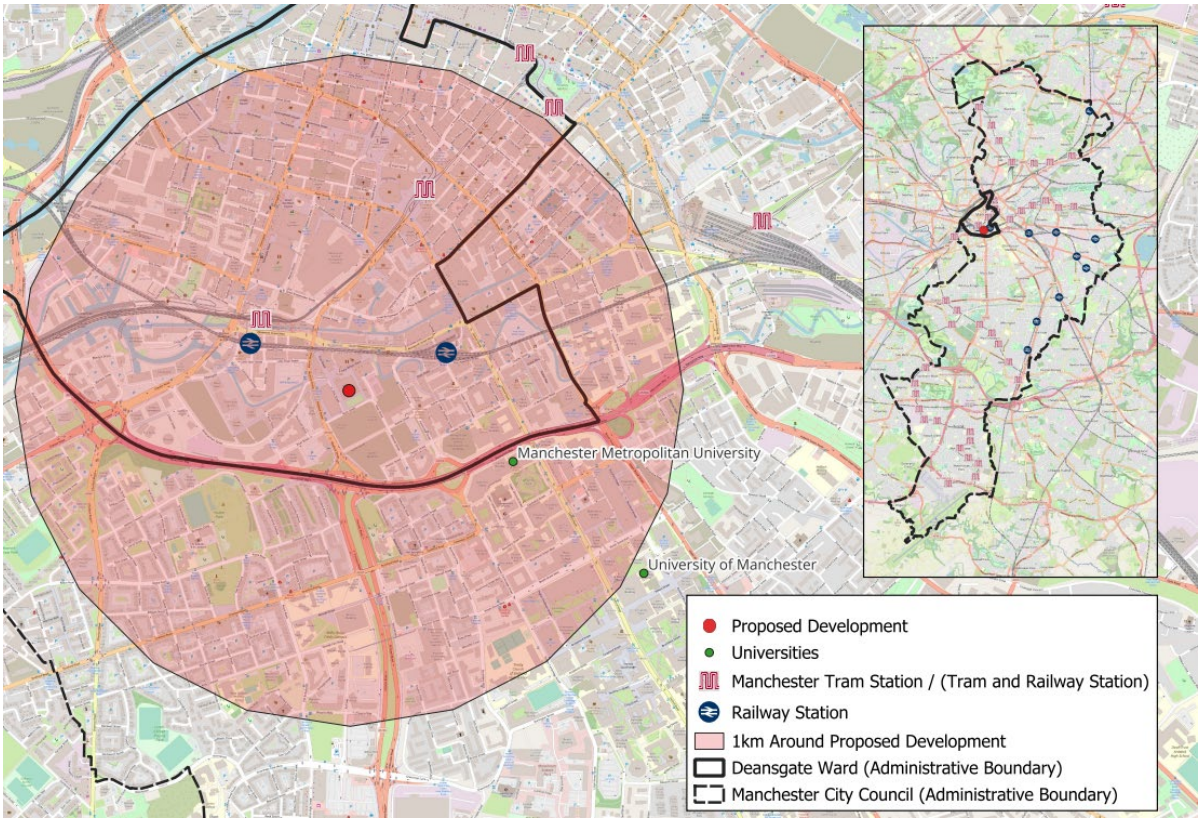
- Sub-regional – Greater Manchester is predominantly considered when assessing temporary construction employment effects of the Proposed Development.

Table 10.1: Geographical study areas

Effect	Study Area	Justification
Temporary employment uplift during the construction stage	Sub-regional (Greater Manchester)	Construction labour is likely to be drawn from a wide geography across Greater Manchester.
Change in direct operational employment	District (MCC)	Employment/economy targets are set at district level.
Change in economic performance (GVA and spend)	District (MCC)	Employment/economy targets are set at district level.
Demand for healthcare facilities	LIA (one km from the Site)	Based on HUDU guidance indicating that impact on GP capacity should be assessed within one-km catchment from any Proposed Development.
Demand for student bedspaces and contribution towards local strategic objectives	District (MCC)	Whilst individual universities may have their own objectives, strategic objectives in respect of providing student accommodation are typically set at the district level.
Demand for open space, amenity space and leisure facilities	LIA (Deansgate Ward)	Benchmarks for both quality and quantity of open / amenity space provision are typically provided at the district level. In the absence of up to date, locally set benchmarks for the provision of accessible open/green space, the Fields in Trust 6 acre (2.4 ha) per 1,000

Effect	Study Area	Justification
		population benchmark is applied at a Ward level geography. This reflects the areas of open and amenity space and leisure facilities that residents of the Proposed Development would typically use on a day-to-day basis.

Figure 10.1: Site Location Plan



10.22 In addition, national level data is also included within the baseline assessment, where relevant, to provide additional context and to help determine the sensitivity of baseline conditions in other geographies.

Source of Effect

10.23 The EIA Scoping Report (**Appendix 2.1**) provides more detail on the scope of this Chapter, including any effects which have been scoped out. Socio-economic effects are likely during both the construction and operational phases of the Proposed Development. **Table 10.2** describes the likely socio-economic effects from the Proposed Development and their relevant receptors.

Table 10.2: Likely Effects and Relevant Receptors

Effect	Description	Receptor
Change in employment during the construction stage	The construction of the Proposed Development will create temporary employment within the construction sector.	Individuals seeking construction employment
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 seeking employment
Change in economic performance (GVA and spend)	The economic output and local spending impacts of employment generated as a result of the Proposed Development	The local economy
Change in demand for healthcare facilities	An increase in resident (student) population could affect the balance of supply of the provision of local primary healthcare services such as GPs.	Primary healthcare facilities
Change in supply of student bedspaces and contribution towards local strategic objectives	An increase in the supply of student accommodation can affect the local demand-supply balance and make a contribution towards delivering local strategic objectives.	Students seeking accommodation
Change in the supply of and demand for open space, amenity space and leisure facilities	An increase in resident (student) population could affect the balance of supply of the provision of open /amenity space and leisure facilities. The provision of open/amenity space on Site has the potential to alter the balance of supply and to contribute towards improving both the quantity and quality of the public realm.	Open/amenity space and leisure facility provision and their users

Significance Criteria

Receptors and Receptor Sensitivity

10.24 The sensitivity of each receptor, outlined in **Table 10.3**, is evaluated as being high, medium, low, or negligible based on a review of the baseline position of each receptor, and where relevant, its performance against other benchmark areas. Where relevant, the importance of the receptor in local and regional policy terms is also considered in defining its sensitivity.

Table 10.3: Definition of Sensitivity of Receptor

Sensitivity	Definition
High	Evidence of direct and significant socio-economic concern relating to the receptor. May be given a high priority in local, regional and/ or national economic and regeneration policy.
Medium	Some evidence of socio-economic concern linked to receptor, which may be indirect. Change relating to receptor has medium priority in local, regional and/ or national economic and regeneration policy.
Low	There is little evidence of socio-economic concern relating to receptor. Receptor is given a low priority in local, regional and/ or national economic and regeneration policy.
Negligible	Very low importance with little or no priority even at the local scale.

Magnitude of Impact

10.25 The magnitude of impact experienced by each receptor is determined by considering the change from (future) baseline conditions, both before and (if required) after mitigation. The criteria used for the assessment of the magnitude of socio-economic impacts (both beneficial and adverse) are outlined in Table 10.4.

Table 10.4: Definition of Magnitude of Impact

Magnitude	Definition
Major	Loss of resources and/ or integrity of resource; severe damage to key characteristics, features, or elements.
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Loss of resource, but not adversely affecting its integrity; partial loss of and/ or damage to key characteristics, features, or elements.
	Benefit to and/ or addition of key characteristics, features, or elements; improvement of attribute quality.
Minor	Some measurable change in attributes, quality, or vulnerability; minor loss of and/ or alteration to one (or more) key characteristics, features or elements.
	Minor benefit to and/ or addition of one (or more) key characteristics, features, or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Very low importance with little or no priority even at the local scale.

Nature of the Effect

10.26 The nature of the effect is defined as either:

- Beneficial – an advantageous effect on the impact area; or
- Adverse – detrimental effects on the impact area; or
- Neutral – neither beneficial nor adverse.

Level of the Effect

10.27 The level or scale of the effect is based on the matrix set out in Table 10.5.

Table 10.5: Matrix Used to Determine the Level of Effect

Sensitivity of the receptor	Magnitude of impact			
	Negligible	Minor	Moderate	Major
Negligible	Negligible	Negligible	Minor	Minor
Low	Negligible	Minor	Minor	Moderate
Medium	Minor	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

Baseline Conditions

10.28 This section considers the current baseline environment in respect of Socio-Economics, including committed developments. For the purposes of this Chapter all committed developments are considered relevant with respect to this discipline.

Population

10.29 Population data indicates that there are currently around 551,936 people living in Manchester. According to ONS census data 70% of the population are of working age (16-64) in comparison to the benchmark areas of 96% across the Deansgate ward, 64% across Greater Manchester and 63% across the North West and England.

10.30 Manchester has one of the largest student populations in Europe, with over 120,000 students across Greater Manchester's five universities. The total student population is the largest concentration outside of London, with a growing proportion of international students.

10.31 The University of Manchester (UoM) and Manchester Metropolitan University (MMU) are the two closest universities to the Proposed Development. UoM attracted 42,260 full-time students in 2021/22, a 15% increase since 2016/17. Manchester Metropolitan University (MMU) witnessed of 13% over the past five years, rising to 31,555 full-time students in 2021/22. Measured by full-time student numbers MMU is within the top ten UK universities outside of London.

Employment and the Local Economy

10.32 Total employment in Manchester stood at 431,850 in 2022 with all sector productivity (measured by GVA per FTE) standing at c.£87,000. This is lower in comparison to the English National Average of £86,670, but above the Greater Manchester (c.£73,880) and North West (c.£74,300) averages. The latest labour market indicators suggest that Manchester's unemployment rate was higher (5.3%) than comparator areas (Deansgate, 1%; Greater Manchester, 4.1%; North West, 3.9%). Similarly, the proportion of the working age population that are claimants (claimant rate) is higher in Manchester (6.2%) compared to Greater Manchester (4.9%) and the North West (4.2%), however is low at 1% in the Deansgate ward which the Site is located within. In Manchester, there are currently (August 2023) 23,610 people claiming Universal Credit (UC) or Job Seeker's Allowance (JSA).

10.33 Across the Manchester region 39% of employment is made up of employment within sectors that broadly reflect the office-based service economy - constituting broad industrial groups: Information

and communication; Financial and insurance activities; Real estate activities; M Professional, scientific and technical activities; and Administrative and support service activities. This compares to 31% across Greater Manchester, 25% across the North West and 29% nationally. Productivity (measured by GVA per FTE) in these 'service activity' sectors is greater in Manchester (c.£102,500) than in Greater Manchester (c.£91,500) and the North West (c.£95,400), however is lower than the average across England (c. £124,100).

10.34 Manchester has a lower proportion of employment in the construction sector (2.1%) than Greater Manchester (4.9%), the North West (5.2%) and nationally, the sector is therefore underrepresented locally. However, productivity in the construction sector measured by GVA per FTE is £122,421 – this is notably higher than all comparator areas, including the national average (c. £98,821).

10.35 A review of the committed baseline schemes indicates that these would generate a large number of on-Site employment through a combination of commercial uses (e.g., retail, office, leisure and hotel uses). Through the application of high-level assumptions around these (to ensure consistency of approach across a wide variety of developments) it is estimated that committed baseline schemes could generate in the order of 3,500 FTE net additional jobs within the study area (District). This constitutes approximately 0.8% of the district-level employment in 2022.

Student Accommodation

10.36 There were c.26,800 total PBSA beds available to students in Manchester for the 2022/23 academic year, owned or leased by either UoM, MMU or the private sector.

10.37 The Manchester market is characterised by its legacy of older bed spaces due to limited development over the last decade. This has also been exacerbated through notable reductions in supply such as the UoM 1,075 bed Owens Park development. Levels of undersupply in the market have been well-publicised, with both UoM and MMU unable to meet first year demand for bedspaces for the 2022/23 academic year. This shortage of supply is also recognised in a recent analysis undertaken by Manchester City Council, which cites the fact that sufficient new accommodation had not been delivered in appropriate locations.

10.38 An analysis undertaken by Cushman & Wakefield during the 2022/23 academic year concluded that there was a total demand pool of 51,220 students potentially requiring student accommodation at UoM and MMU. Set against a current supply of 26,800 PBSA bedspaces, this suggests that there were 24,390 students unable to access PBSA, equating to a student-bed ratio of 1.91. This analysis is supported through MCC evidence which suggests that around 750 additional bedspaces are needed to be delivered each year through to 2030 in order to keep pace with demand.

10.39 In addition, there is an acknowledged demand amongst students for good quality and affordable city centre accommodation, driven in particular by growth in numbers of international students. International student numbers constitute 28% of the Manchester's total student population and in the four years from 2016/17 to 2020/21 the international student body at UoM and MMU has risen by 28%, compared to the total student body increase for the period of 8%. Therefore, overseas students account for an increasing proportion of Manchester's student population and almost half of PBSA tenancies.

10.40 A report from MCC identifies some of the factors that have contributed towards a decline in the quality of PBSA in Manchester. It cites factors such as an aged PBSA market, and a lack of supply / competition within the market which has created little incentive for the refurbishment of schemes in order to improve quality, amenities and communal space.

10.41 A review of the committed baseline schemes indicates that the total numbers of student bedspaces that are to be provided is 576 (Plot 10b First Street). This represents 2% of the total amount of PBSA bedspaces available to Manchester students for the 2022/23 academic year. It also represents just over 75% of the projected annual supply requirement indicated by MCC to keep pace with demand.

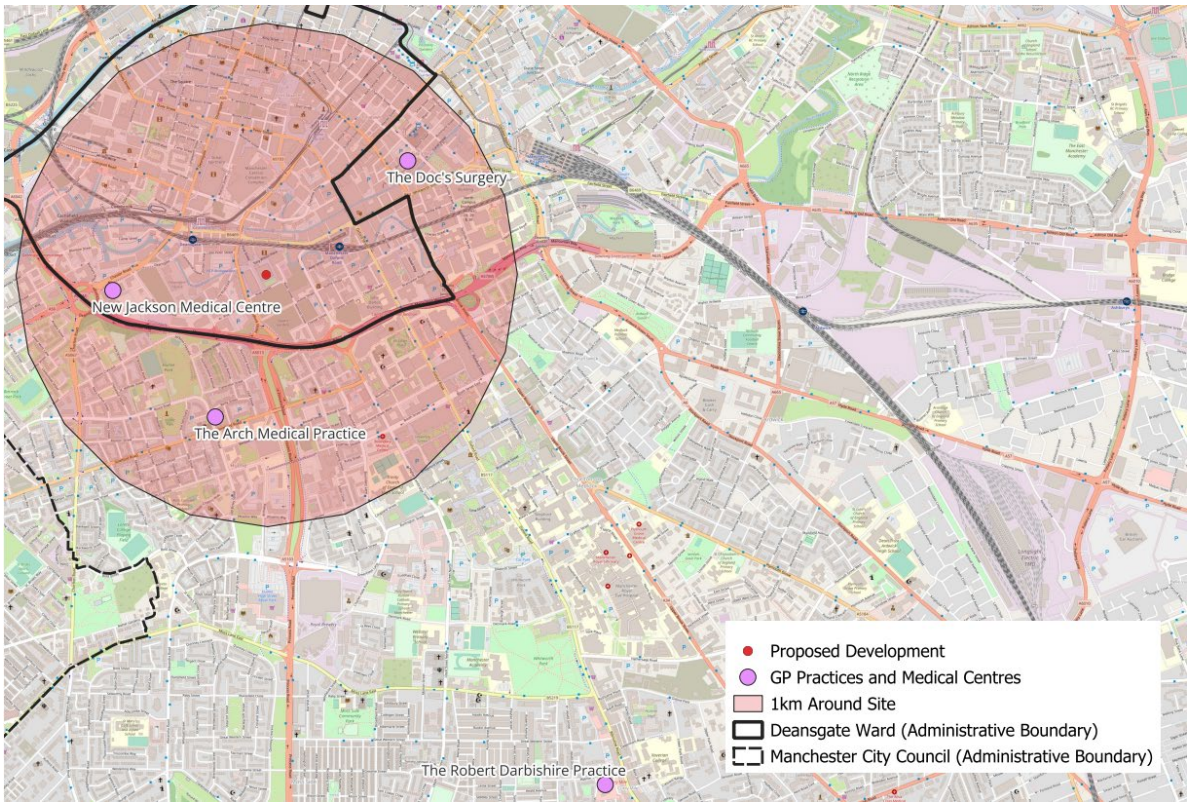
Health Care

10.42 Within 1 km of the Site there are 2 GP Practices operating within the NHS Manchester Clinical Commissioning Group CCG area: The Arch Medical Practice (0.4 miles) and The Doc's Surgery (0.4 miles). These practices are operating at a patient to full-time equivalent (FTE) GP ratio of 2,062:1 and 2,101:1, respectively. Both practices are therefore above the commonly accepted benchmark ratio used in healthcare planning and recommended by the HUDU of 1,800 patients per FTE GP. Together, these GPs have a combined patient list size of 31,058 and approximately 15 FTE GPs, giving them an overall patient to FTE GP ratio of 2,071:1.

10.43 Alongside these 2 GP practices, a new build medical centre was recently opened across the ground and first floor of the Elizabeth Tower residential development (New Jackson Medical Centre). This is located 0.4 miles away from the proposed development. The centre offers its services as a branch Site for 3 separate GP practices, The Docs practice, the Cornbrook Medical Practice and Vallance Medical. The average patient to FTE GP ratio across these three practices is approximately 2,411:1 - above the commonly accepted benchmark ratio used in healthcare planning (1,800 patients per FTE GP) suggesting that the opening of this centre may not alleviate GP capacity issues in the surrounding area. The three practices operating within the facility have respective Care Quality Commission Standards of outstanding, good and good.

10.44 Considering the large student population, there is the provision of student specific healthcare at Manchester universities. Specifically, the University of Manchester and Manchester Metropolitan University play a role in coordinating the provision of primary healthcare services for students. For instance, UoM launched a new GP service on campus for the 2022/23 year that allows students to register as patients and access a range of non-emergency services by appointment. These include examinations, medication prescriptions, vaccinations, and referrals to other medical specialists. The service runs in partnership with The Robert Darbishire Practice, located 1.5 miles from the proposed development. This practice is currently operating at a ratio of c.2,060 patients to FTE GP, above the benchmark of 1,800 patients per FTE GP. UoM also provides, through its Occupational Health Service, a confidential service to ensure the health of students (and staff) by assessing and advising on fitness for work, training and study, so as to ensure that health issues are effectively managed. MMU is yet to provide a dedicated GP service to its students; however, it provides a range of other health services through its Mental Health and Wellbeing service.

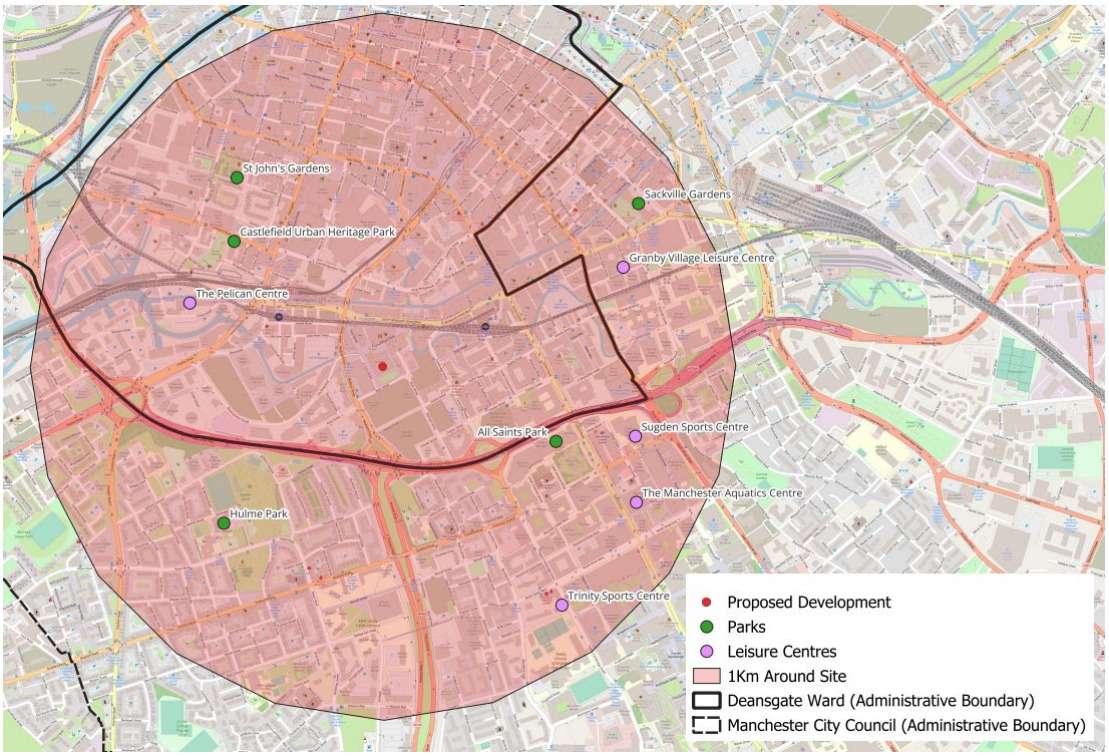
Figure 10.2: GPs Located Within a 1-Km Radius of Proposed Development and Student Specific Medical Services



Open Space and Leisure Facilities

10.45 There are a number of leisure facilities including gyms / health clubs and sports centres within the vicinity of the Site. The nearest leisure centre is Sugden Sports Centre, approximately a 14-minute walk away. Being a city centre there are numerous entertainment sites within close proximity to the proposed development, including HOME cinema, Odeon Cinema and Junkyard Crazy Golf. As well as this, it is a close walk into the rest of the city centre and both the Deansgate tram station and Manchester Oxford Road railway station are within a 7-minute walk of the Site, providing easy access to the rest of the city.

Figure 10.3: Leisure Centres and Parks Located Within 1-Km of Site



10.46 There are a number of open / amenity spaces in close proximity to the Site, including Hulme Park (4.88ha), All Saints Park (0.75ha), Castlefield Urban Heritage Park (0.81ha), St John's Gardens (0.5ha). Despite this, the Deansgate Ward has an average of 0.059 ha per 1000 people of accessible green space per person. This level of provision is significantly below the benchmark of provision of 2.4 ha suggested by the Fields in Trust Green Space Index although not unexpected given the inner-city location.

10.47 The current Manchester Blue and Green Infrastructure Strategy (2022) is in place to respond to commitments made in the City's Local Plan and Climate Change Action Plan. It demonstrates the council's commitment to Green Spaces, with plans to spend £12.5 million on a Large-scale Capital Park Investment Program between 2021-25.

10.48 Of the committed baseline schemes identified, eight of these include some form of public realm or amenity space provision. These will deliver new, high quality public realm that will also improve connectivity between public spaces within the LIA (Deansgate Ward) and across the wider City Centre. These include proposals under development to create a new 0.5 ha public park as part of The Blade and Three60 development, linking into the public realm brought forward as part of the Deansgate Square development and to other public spaces across the City Centre and south to Hulme Park.

Receptor Sensitivity

10.49 Table 10.6 summarises the sensitivity of each of the receptors identified in the baseline.

Table 10.6: Receptor Sensitivity

Receptor	Sensitivity	Study Area	Justification
Individuals seeking construction employment	Medium	Sub-regional (Greater Manchester)	A proportion of the temporary construction employment created as a result of construction activity could be expected 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 seeking employment and the local economy	High	District (MCC)	Local economic growth, including jobs and GVA will contribute to the overall economic growth and 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 and regional rates.
Primary healthcare facilities	Low	LIA (1 km from the Site)	The current ratio of registered patients per FTE GP is above benchmark levels and expected to increase further as new housing development comes forward. There is, however, a range of specific student-focused healthcare services provided by universities within the LIA which students are encouraged to access.
Students seeking accommodation	High	District (MCC)	Evidence provided by MCC, and market agents indicates an undersupply in the provision of student bedspaces in central Manchester and a need to improve the quality of student accommodation.
Open/amenity space and leisure facility provision and their users	Low	LIA (Deansgate Ward)	For a City Centre location, there is a good range of publicly accessible open / amenity spaces and leisure facilities that are accessible within Deansgate Ward and within 1km of the Proposed Development. Committed baseline schemes will also deliver new public realm that will add to the quality and connectivity between public spaces across the LIA and wider City Centre.

Identification and Evaluation of Likely Significant Effects

10.50 This section identifies the likely environmental effects resulting from the Proposed Development during both the construction phase and the operational phase. A summary of the effects for Scenario 1 (existing Site with committed baseline developments) and Scenario 2 (Scenario 1 plus Proposed

Development) is presented in a table at the end of each element of the assessment. The preceding text relates to the socio-economic effects arising from the Proposed Development only. This forms the basis of the assessment for both Scenarios 1 and 2.

Construction Phase

Temporary Construction Employment

10.51 The period of construction works will support a number of on-Site and off-Site employment opportunities within the construction sector.

10.52 To estimate the impact of temporary employment supported as a result of construction activity, the turnover per employee within the construction industry at the regional (North West) level is applied to forecast costs associated with the construction works. It is then divided by the expected duration of the construction works (in number of years) to provide the average annual number of construction workers per annum.

10.53 It is acknowledged that whilst some construction workers may live locally, and their expenditure on household goods and services would also support employment in local businesses, it is also likely that construction workers could be drawn from within the wider region, depending on the roles available and contractors selected. On this basis, an estimate of the induced effects supported by the construction activity cannot be accurately quantified, and therefore is not assessed.

10.54 The Proposed Development is expected to require a £58 million investment over a 2.3 year period. The regional average turnover per full time equivalent (FTE) job in the construction is applied to the forecast costs associated with the works and then divided by their expected duration. This approach leads to an estimated demand for 273 construction workers per annum over the life cycle of the works.

10.55 This employment could be expected to include a broad range of job-types and occupations, both on-Site as well as off-Site (i.e., both direct and indirect / supply chain employment). A number of these jobs could be expected to be filled by residents of Manchester and who may currently be unemployed. However, it is assumed that the majority of construction jobs would be accessed by people (i.e., both employed as well as unemployed) from across the wider Greater Manchester sub-region.

10.56 The nature of the jobs supported during the period of works is expected to vary. On-Site employment could include highly skilled professions (such as Site surveyors) alongside lower skilled supply chain jobs (such as labourers), whilst off-Site activity could be expected to support employment across a wide supply chain ranging from suppliers of building materials to architects.

10.57 The construction sector currently supports around 65,000 FTE jobs across Greater Manchester. The estimated annual construction jobs supported during the period of works could therefore be expected to represent 0.42% of all regional employment in the construction sector. Given the small percentage, construction activity is not expected to stimulate a noticeable change in the baseline conditions at the regional level, and as such, the magnitude of the impact is assessed to be **Negligible.**

10.58 With the sensitivity of the receptor assessed as medium, this would give rise to a direct, temporary, short term and minor beneficial (not significant) effect at the Greater Manchester level.

10.59 The effect of the assessment presented above on both Scenarios 1 and 2 is considered in **Table 10.7.**

Table 10.7: Temporary Construction Employment - Scenario Assessment (Scenario 1 and 2)

Scenario	Comment	Magnitude of change	Assessment of Significance
Scenario 1 (existing Site with committed baseline developments)	Given the scale of development across twelve committed baseline schemes identified, although not quantified, it is reasonable to assume that this would lead to an increase in the requirement for construction labour at the sub-regional (Greater Manchester) level. This increased level of activity is judged to represent a minor magnitude of change.	Minor	**Minor Beneficial (Not Significant)**, direct (D), temporary (T), short term (ST)
Scenario 2 (Scenario 1 plus Proposed Development)	Alongside the proposed development, the increased demand for temporary construction employment is assessed as representing a minor magnitude of change.	Minor	**Minor Beneficial (Not Significant)**, D, T, ST

Operational Phase

Employment and Local Economic Performance

10.60 The Proposed Development has the potential to make a positive contribution to the Manchester (local) economy primarily as a result of the levels of additional student expenditure linked to the provision of 555 student bedspaces. Additionally, it is expected that the provision of student accommodation will also generate a small number of jobs connected to the management and maintenance of the facility. The Applicant has confirmed the likely levels of employment generated in this capacity (see below) and this is based on previous experience of delivering similar accommodation.

10.61 Student expenditure makes an important, and often overlooked contribution to the economy. Firstly, students pay money to the universities for their fees, accommodation and other ancillaries (on campus catering etc) which is then re-spent by universities. Whilst the benefits of this are captured in the impact of universities themselves and not directly attributable to PBSA, the provision of high-quality accommodation can have a substantial bearing on decision making and attracting students to particular universities.

10.62 Secondly, students spend money off campus on a variety of goods and services including food, clothing, bars and cafes. The presence of students in any particular area often coincides with the presence of retail and retail services which can add to the vibrancy and vitality of high streets and increase weekend and evening activity in an area which is traditionally quieter at these times.

10.63 For the purposes of estimating the levels of expenditure likely to be generated by students living within the Proposed Development, it is assumed that:

- The accommodation will operate at full occupancy levels (555 students); and
- All its occupants are in full-time education (part-time students tend not to live in live in PBSA).

10.64 Survey data provides insight into spending patterns of Manchester domiciled students. It is estimated that the average university student spends £5,787 every year. This figure excludes housing costs as it is assumed that the accommodation fees collected are not spent locally unless through

supply chain activity of the operator which is already captured in the impacts of employment and GVA. Tuition fees are also not included, as they would capture employment supported through higher education provision. Applying this assumption to the total number of students generates an annual expenditure of £3.2 million.

10.65 The regional (North West) turnover per FTE worker in the retail sector is estimated at c.£198,000 (2023 prices). The level of spending is therefore expected to support 16 FTE jobs directly. A composite multiplier (1.5) is applied to estimate the number of additional indirect and induced jobs supported through student spending. In total therefore the student expenditure has the potential to support 24 direct, indirect and induced FTE jobs in the local economy. Given the central and connected location of the Site, which is in close proximity to retail services and amenities, it is likely that a high proportion of this expenditure will be spent locally.

10.66 Based upon estimates derived from the proposed accommodation operator, it is expected that the Proposed Development would generate a total of 11 direct FTE jobs on Site. These would comprise permanent roles including management, customer service and maintenance operative roles. Additionally, housekeeping and security roles would be created and employed through a third party. Based upon the application of a GVA per job benchmark (Manchester level) for the relevant sector (Accommodation & food services) this level of employment could support a GVA uplift of c.£0.3m per annum. The application of a composite multiplier to this level of employment indicates that 17 direct, indirect and induced FTE jobs could be supported in the local economy. Applying an all sector GVA per job benchmark (Manchester level) to the indirect and induced jobs, the total direct, indirect and induced GVA impact is estimated at £0.4m per annum.

10.67 In total, therefore, the combined employment effect generated through on and off-Site employment and through student expenditure is estimated at 41 FTE jobs. The GVA impact of on-Site employment is estimated at £0.4m per annum. These represent significantly less than 0.1% of the employment levels (and associated GVA) at the local economy (Manchester) level. The magnitude of change is therefore assessed to be **Negligible** at the District level.

10.68 With the sensitivity of the receptor identified as high, this would give rise to a direct, long term and **Minor Beneficial (Not Significant)** effect at the district level.

10.69 The effect of the assessment presented above on both Scenarios 1 and 2 is considered in **Table 10.8.**

Table 10.8: Employment and the Local Economy - Scenario Assessment (Scenario 1 and 2)

Scenario	Comment	Magnitude of change	Assessment of Significance
Scenario 1 (existing Site with committed baseline developments)	An estimated 3,500 net additional jobs that could be generated by committed baseline schemes represents 0.8% of the total employment at the district level. This represents a minor magnitude of change.	Minor	**Moderate Beneficial (Significant**), D, long term (LT)
Scenario 2 (Scenario 1 plus Proposed Development)	The scale of employment generation from the Proposed Development is negligible in the context of the level that could be generated by committed baseline schemes.	Minor	**Moderate Beneficial (Significant),** D, LT

Student Accommodation Supply

10.70 An additional 555 bedspaces represent 2.1% of the reported supply of 26,800 bedspaces in the study area and nearly 75% of MCC's projected annual supply requirement to keep pace with demand for student accommodation in Manchester.

10.71 The baseline analysis highlights a lack of quality, affordable student accommodation within the city centre. Manchester universities represent one of the largest student concentrations in the UK outside of London and has witnessed significant growth in international students – now constituting over one fifth of the student population. Recent closures of MMU's Crewe and South Manchester campuses has resulted in an even larger number of student places being located at city centre campuses and it is expected that numbers will continue to remain strong over the medium term, indicating a need for accommodation close to the university campuses.

10.72 The 'Our Manchester Strategy' outcomes highlight the prominent economic role that students make to the city and in particular the role of retaining high quality graduates. The role of accommodation in securing these outcomes is recognised:

"A high-quality residential offer for students in appropriate locations, is critical for Manchester's Universities ability to attract and retain students in a global market. The retention of highly skilled graduates from the city's universities is a key component in the drive towards a knowledge economy and forming the critical mass of activity necessary to strengthen the economy."

10.73 In terms of quality, MCC has acknowledged that the overall quality of PBSA stock is poor compared to other university cities. In this context, the addition of new, high quality PBSA in a city centre location represents an important contribution to addressing this need. Therefore, in making a judgement on both quantity and quality considerations, it is assessed that an additional 555 bedspaces constitutes a moderate magnitude of impact.

10.74 With the sensitivity of the receptor identified as high, this would give rise to a direct, long term and major beneficial (significant) effect at the district level.

10.75 The effect of the assessment presented above on both Scenarios 1 and 2 is considered in Table 10.9.

Table 10.9: Student Accommodation Supply - Scenario Assessment (Scenario 1 and 2)

Scenario	Comment	Magnitude of change	Assessment of Significance
Scenario 1 (existing Site with committed baseline developments)	Committed baseline schemes will provide 2% of the total amount of PBSA bedspaces available to Manchester students for the 2022/23 academic year. It also represents just over 75% of the projected annual supply requirement indicated by MCC to keep pace with demand.	Moderate	**Major Beneficial (Significant),** D, LT

Scenario	Comment	Magnitude of change	Assessment of Significance
Scenario 2 (Scenario 1 plus Proposed Development)	Alongside committed baseline schemes the Proposed Development will provide 1,131 bedspaces, constituting 4.2% of the total amount of PBSA bedspaces available to Manchester students for the 2022/23 academic year. It also represents just over 150% of the projected annual supply requirement indicated by MCC to keep pace with demand. This therefore constitutes a major magnitude of change. 10.75.1.	Major	**Major Beneficial (Significant),** D, LT

Primary Healthcare Facilities

10.76 The Proposed Development is expected to yield an overall student population of 555 persons. As a worst-case scenario, assuming all of these students would be additional (and not already registered with GPs in the LIA), this would lead to an increase in the number of registered patients per FTE GP in the LIA from 2,071 to 2,108 (+1.8%). In reality, however, many students will access university-affiliated healthcare services when needed or remain registered with their home GPs.

10.77 On this basis the magnitude of change is assessed as **Negligible**. With the sensitivity of the receptor identified as low, this would lead to a direct long-term and **Negligible (Not Significant) effect** at the LIA level.

10.78 The effect of the assessment presented above on both Scenarios 1 and 2 is considered in **Table 10.10.**

Table 10.10: Primary Healthcare Facilities - Scenario Assessment (Scenario 1 and 2)

Scenario	Comment	Magnitude of change	Assessment of Significance
Scenario 1 (existing Site with committed baseline developments)	Committed baseline schemes will deliver approximately 4,900 homes which, if assuming a rough population yield of 1.5 persons per home (considered reasonable given city centre location) could yield an increased population of c.7,300. Combined with committed baseline student bedspaces this could yield a population increase of approximately 7,900. Assuming that none of these residents/students are not already registered at practices within the LIA, this would lead to an increase in the number of registered patients per FTE GP from 2,071 to 2,595 (+25.3%). This theoretical analysis does not take account for the fact that all schemes that will yield an increased population will be required to mitigate the impacts on primary healthcare facilities either through direct, on-Site provision or through financial contributions secured via a Section 106 agreement. For the purposes of this assessment, it has been assumed that each population-yielding development will mitigate its own impacts and therefore the magnitude of change is considered to be negligible.	**Negligible**	**Negligible (Not Significant),** D, LT

Scenario	Comment	Magnitude of change	Assessment of Significance
Scenario 2 (Scenario 1 plus Proposed Development)	Alongside committed baseline schemes the Proposed Development could lead to a population increase of approximately 8,400. Assuming that none of these residents/students are not already registered at practices within the LIA, this would lead to an increase in the number of registered patients per FTE GP from 2,071 to 2,632 (+27.1%). For the purposes of this assessment, it has been assumed that each population-yielding development will mitigate its own impacts. On this basis, the magnitude of change reflects the impact of the Proposed Development in isolation and is therefore negligible.	**Minor**	**Negligible (Not Significant),** D, LT

Open Space Provision and Leisure Facilities

10.79 An uplift in the student population as a result of the Proposed Development will increase demand and usage of nearby open and green spaces and recreational / leisure facilities. The Proposed Development will bring forward 1,352 sq. m (0.14 ha) of public realm / amenity space within the building's curtilage as well as providing 422 sq. m of internal amenity space and 144 sq. m of external amenity space within the building itself. This level of provision represents 0.76 sq. m /person and 0.26 sq. m /person respectively.

10.80 Considering the publicly accessible outdoor space (0.14 ha) in isolation, this would increase the total Ward level provision to 1.14 ha (+14%) and would make a small, positive contribution towards altering the balance of provision from 0.06 ha / 1,000 population to 0.07 ha / 1,000 population at the Ward level. This calculation factors in the increase in local population of 555 students and assumes that students do not already reside within the study area (worst-case scenario). Whilst an improvement in local provision, the overall level of provision at the Ward level significantly falls below the Fields in Trust Green Space Index standard, though not uncommon for a city centre location.

10.81 With the Site occupying a city centre location in close proximity to an array of leisure and recreational facilities, it is judged that the impact of additional students within the local area can be supported by the existing range of services provided. Furthermore, given the impact of student expenditure (quantified above) and the strategic importance placed on this by MCC, it is reasonable to assume that additional students could support the viability and vitality of existing and new recreation and leisure facilities locally.

10.82 On balance it is assessed that the magnitude of change associated with the open space provision and leisure facilities is negligible. With the sensitivity of the receptor assessed as low, the Proposed Development would give rise to a direct, long-term and minor beneficial (not significant) effect at the LIA (Ward) level.

10.83 The effect of the assessment presented above on both Scenarios 1 and 2 is considered in **Table 10.11.**

Table 10.11: Open Space Provision and Leisure Facilities - Scenario Assessment (Scenario 1 and 2)

Scenario	Comment	Magnitude of change	Assessment of Significance
Scenario 1 (existing Site with committed baseline developments)	Committed baseline schemes could yield an increased population of c.7,900 and could also deliver a range of new public realm and amenity spaces. A review of these developments estimates that at least 2 ha of public realm and amenity spaces could be delivered. This would alter the balance of provision from 0.06 ha / 1,000 population to 0.13 ha / 1,000 population at the Ward level. The location of committed baseline schemes within the city centre and in close proximity to an array of leisure and recreational facilities, it is judged that the impact of additional residents and students within the local area can be supported by the existing range of services provided. Furthermore, given the impact of student expenditure (quantified above) as well as general resident expenditure, it is reasonable to assume that additional population could support the viability and vitality of existing and new recreation and leisure facilities locally.	**Negligible**	**Negligible (Significant / Not Significant),** D, LT
Scenario 2 (Scenario 1 plus Proposed Development)	Alongside committed baseline schemes the Proposed Development could lead to a population increase of approximately 8,400. This would alter the balance of provision from 0.06 ha / 1,000 population to 0.13 ha / 1,000 population at the Ward level. The location of committed baseline schemes within the city centre and near an array of leisure and recreational facilities, it is judged that the impact of additional residents and students within the local area can be supported by the existing range of services provided. Furthermore, given the impact of student expenditure (quantified above) as well as general resident expenditure, it is reasonable to assume that additional population could support the viability and vitality of existing and new recreation and leisure facilities locally.	**Negligible**	**Negligible (Significant / Not Significant),** D, LT

Cumulative Effects

10.84 Within the discipline of Socio-Economics, all cumulative developments identified have the potential to interact with the Proposed Development and are considered here.

10.85 Collectively, the cumulative developments have the potential to deliver approximately:

- 2,400 student bedspaces;
- 3,500 new homes;

- 86,000 sq. m office floorspace;
- 550 sq. m of retail floorspace;
- A range of community uses; and
- New public realm / amenity spaces with at least four of the cumulative developments indicating that they could deliver these (not quantified).

10.86 The assessment of cumulative effects adopts a similar approach to the main assessment presented above. Given the breadth of cumulative developments identified it is considered that a proportionate approach is to adopt a consistent approach to assessment across different socio-economic effects. The assessment is necessarily approximate to provide a sense of the scale of impact relative to the baseline position alongside the Proposed Development. Table 10.12 considers the cumulative effects of the Proposed Development alongside committed baseline and cumulative developments, plus mitigation (Scenario 4).

Table 10.12: Cumulative Scheme Assessment (Scenario 4)

Effect	Comment	Magnitude of change	Assessment of Significance
Temporary Construction Employment	Given the scale of development across all committed baseline and cumulative schemes identified alongside the Proposed Development, although not quantified, it is reasonable to assume that this would lead to a substantial increase in the requirement for construction labour at the sub-regional (Greater Manchester) level. potential to generate increased demand for labour as well as well as substantial levels of opportunity within the construction sector. A recent publication by RICS UK suggests that the construction sector is improving in terms of activity and that looking forward, indicators are upbeat. Given the anticipated 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.	Medium	**Moderate Beneficial (Significant),** D, T, ST.
Employment and Local Economic Performance	An estimated 8,200 net additional jobs that could be generated by committed baseline and cumulative developments represents 1.9% of the total employment at the district level. This represents a minor magnitude of change.	Minor	**Moderate Beneficial (Significant),** D, Permanent (P), LT

Effect	Comment	Magnitude of change	Assessment of Significance
Student Accommodation Supply	Alongside committed baseline schemes, the cumulative developments will provide c. 3,500 bedspaces, constituting 13.1% of the total amount of PBSA bedspaces available to Manchester students for the 2022/23 academic year. It also represents around 4.5 years of supply according to the projected annual supply requirement indicated by MCC (750 per annum) to keep pace with demand. This therefore constitutes a major magnitude of change. 10.86.1.	Major	**Major Beneficial (Significant),** D, P, LT
Primary Healthcare Facilities	Alongside committed baseline schemes the cumulative developments could lead to a population increase of approximately 12,500. Assuming that none of these residents/students are not already registered at practices within the LIA, this would lead to an increase in the number of registered patients per FTE GP from 2,071 to 3,140 (greater than 50%). For the purposes of this assessment, it has been assumed that each population-yielding development will mitigate its own impacts. On this basis, the magnitude of change reflects the impact of the Proposed Development in isolation and is therefore negligible.	**Negligible**	**Negligible (Not Significant),** D, P, LT
Open Space Provision and Leisure Facilities	Alongside committed baseline schemes the Proposed Development could lead to a population increase of approximately 12,500. The extent of potential additional public realm and amenity space provision is not quantified. Assuming no additional provision, then this level of population increase would alter the balance of provision from 0.13 / 1,000 population (Scenario 2) to 0.10 ha / 1,000 population at the Ward level. The location of committed baseline schemes within the city centre and in close proximity to an array of leisure and recreational facilities it is judged that the impact of additional residents and students within the local area can be supported by the existing range of services provided. Furthermore, given the impact of student expenditure (quantified above) as well as general resident expenditure, it is reasonable to assume that additional population could support the viability and vitality of existing and new recreation and leisure facilities locally.	**Negligible**	**Negligible (Not Significant),** D, P, LT

Mitigation Measures

Construction Phase

10.87 No adverse effects are identified during the construction phase.

Operational Phase

10.88 No adverse effects are identified during the operational phase.

10.89 Since no mitigation measures are recommended the assessment of Scenario 3 is the same as Scenario 2.

Residual Effects

Construction Phase

Table 10.13: Residual Effects (Construction Phase) (Scenario 4)

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	**Minor Beneficial (Not Significant),** D, T, ST

Operational Phase

Table 10.14: Residual Effects (Operational) (Scenario 4)

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	**Minor Beneficial (Not Significant),** D, LT, P
Change in supply of student bedspaces and contribution towards local strategic objectives	Students seeking accommodation	N/A	N/A	**Major Beneficial (Significant),** D, LT, P
Change in demand for primary healthcare facilities	Primary healthcare facilities	N/A	N/A	**Negligible (Not Significant),** D, LT
Change in the supply of and	Open/amenity space and leisure	N/A	N/A	**Negligible (Not Significant),** D, LT

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
demand for open space, amenity space and leisure facilities	facility provision and their users			

Monitoring

10.90 No monitoring is recommended during the operational phase.

Reference List

10.91 This Chapter has been prepared in reference to the following:

- Care Quality Commission (2023): https://www.cqc.org.uk/
- Cushman & Wakefield (2022) Student Needs Assessment Manchester
- Department for Levelling up, Housing and Communities (2023) National Planning Policy Framework
- Fields in Trust (2023): Green Space Index https://www.fieldsintrust.org/green-space-index
- Greater Manchester Combined Authority (2019) Housing Strategy
- Greater Manchester Combined Authority (2024) Places for Everyone Plan
- Healthy Urban Development Unit: https://www.healthyurbandevelopment.nhs.uk/our-services/delivering-healthy-urban-development/hudu-model/
- Higher Education Statistics Authority (2022) Student Enrolments by HE provider 2014/15 to 2021/22
- Homes and Communities Agency (2014) Additionality Guide
- Manchester City Council (2023) Economic Scrutiny Committee Report "Purpose Built Student Accommodation in Manchester"
- Manchester City Council (2020) Executive Report "Purpose Built Student Accommodation in Manchester"
- Manchester City Council (2020) First Street Development Framework
- Manchester City Council (2012) Local Development Framework
- Manchester City Council (2022) Manchester Blue and Green Infrastructure Strategy
- National Health Service (August 2023) General Practice Workforce Survey

- Office of National Statistics (2021) National Census
- Office of National Statistics (2022) Business Register and Employment services
- Office of National Statistics (2023) Business Register and Employment services
- Office of National Statistics (2023) Claimant Count
- Office of National Statistics (2023) Annual Population Survey
- Office of National Statistics (2021) Gross Value Added (Balanced) by Industry
- ORVal Outdoor Recreation Valuation (Exeter.ac.uk)
- Royal Institute of Chartered Surveyors (2023) RICS, Q1 2023, UK Construction Monitor
- Royal Bank of Scotland (2023) Student Living Index 2023, University Cost

11. Sunlight, Daylight, Overshadowing and Solar Glare

Introduction

11.1 This Chapter of the ES has been prepared by GIA and assesses the likely significant effects of the Proposed Development with respect to Daylight, Sunlight, Overshadowing & Solar Glare. This chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.

11.2 This Chapter is accompanied by the following appendices:

- Appendix 11.1: Drawings of the Baseline and Proposed Scenarios
- Appendix 11.2: Daylight and Sunlight Analysis Results
- Appendix 11.3: Overshadowing Analysis Results
- Appendix 11.4: Solar Glare Assessment

11.3 The authors of this Chapter are Krystle Stewart and Nicola Hensey. Krystle Stewart has a Masters in Building Science (MBSc Dist) from Victoria University of Wellington, NZ and 8 years of UK experience in preparing solar glare for EIA developments. Nicola Hensey has an honours degree in law (LLB Hons) and has 16 years of experience in preparing daylight, sunlight, overshadowing, light intrusion and solar glare ES Chapters. GIA are the largest specialist daylight and sunlight advisor in the UK, with over 29 years of specialisation and expertise, having advised on some of the largest developments within Greater Manchester and the United Kingdom.

Assumptions and Limitations

11.4 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.

11.5 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 the precise evaluation of the diffuse levels of daylight within each of the rooms via the NSL.

11.6 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.

11.7 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 assumes 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.

11.8 It is also to be noted that the hours presented reflect solar time and therefore do not take Daylight Saving Hours into account.

Relevant Legislation, Policy and Guidance

Policy

National Planning Policy

National Planning Policy Framework (2023)

11.9 Paragraph 129(c) states that local planning authorities should refuse applications which they consider fail to make efficient use of land. The discussion in relation to daylight and sunlight highlights the Government's recognition that increased flexibility is required in response to the requirement for higher density development:

"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 (2021)

11.10 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.”

11.11 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)

11.12 Policy DM1 states that all developments should have regard to the effects on amenity including privacy, light, noise, vibration, air quality and odours.

11.13 Policy EN2 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)

11.14 The SPD sets out a series of design principles which should be considered and implemented where necessary. Those principles relevant to this assessment are:

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

First Street Development Framework (March 2020)

11.15 Paragraph 3.22 states:

"Any development should be orientated to balance the need to maximise daylight penetration on the development itself whilst also minimise its effect on neighbouring development. Opportunities to enhance daylight between buildings should also be investigated in terms of building angles."

Guidance

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

11.16 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 sun lighting 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."

11.17 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).

11.18 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".

11.19 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)

11.20 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

Daylight, Sunlight & Overshadowing

11.21 The following scenarios have been assessed and are reported within this Chapter of the ES:

- Scenario 1: Existing baseline (i.e. site with committed developments (schemes under construction));
- Scenario 2: Existing Site (baseline) with Proposed Development;
- Scenario 3: Existing Site (baseline) with Proposed Development and cumulative development (i.e. those with planning permission, but not under construction).

11.22 The baseline scenario considers the current baseline condition (as can be seen in November 2023) and assumes that the completion of the following currently under implemented / construction buildings. This scenario is depicted on drawing nos. EB1, EB2 & EB3 (Appendix 11.1).

- First Street South (Plots A, B and D only) (125573/FO/2019);
- Plot 9a, First Street (132600/FO/2021);
- Plot 10a, First Street (136043/FO/2023); and
- Plot 10b, First Street (136170/FO/2023).

11.23 Other committed developments, as listed within Appendix 2.2., are not included within the baseline, by virtue of their insufficient massing and / or distance to the Site. These committed developments would not affect assessment results, or the significance of effects described within this Chapter.

11.24 The assessment of daylight, sunlight and overshadowing effects is based principally on the amount of visible sky before (Baseline Scenario) and after the construction of a new development (Proposed Scenario). A change in the baseline level of visible sky will, therefore, change the results of those effect assessments.

Daylight & Sunlight

11.25 The removal of Plots 10a & 10b First Street from the Baseline Scenario will only change the daylight and sunlight effect assessments of those properties whose visible sky will be affected by both Plots 10a & 10b First Street in the Baseline Scenario and the Proposed Development in the Proposed Scenario. As can be seen from plot EP1 (see Appendix 11.1), this means that the only sensitive receptor that would be affected would be Loxford Court.

11.26 The removal of Plots 10a & 10b First Street from the Baseline Scenario would marginally increase the baseline levels of sky visibility to the few rooms in Loxford Court that can see Plot 10a through the gap between the two blocks which comprise Plot 11 First Street. Assessed against a baseline which includes Plots 10a & 10b First Street, the daylight effect of the Proposed Development on Loxford Court is negligible (BRE compliant). A marginal increase in the baseline level of visible to sky to the few rooms described above by removing Plots 10a & 10b First Street from the Baseline Scenario will not change the significance of that effect. Loxford Court is not material for sunlight assessment as there are no Site facing windows within Loxford Court which are orientated to within 90 degrees of due south, this property is not material for sunlight assessment.

11.27 Summary – For the reasons above, it is considered that the removal of Plots 10a & 10b First Street from the Baseline Scenario will not change the significance of the daylight and sunlight effects described in the ES Chapter.

Overshadowing

11.28 Due to the path of the sun and the northerly location of Plots 10a & 10b First Street relative to the sensitive receptors, it is considered that the removal of Plots 10a & 10b First Street from the Baseline Scenario will not change the significance of the daylight and sunlight effects described in the ES Chapter.

11.29 For context, the following scenario has also been assessed for 'Sun Hours on Ground (SHOG) purposes. This scenario is depicted on drawing nos. COB1, COB2 & COB3 (Appendix 11.1).

- Scenario 1: Existing baseline (i.e. site with committed developments (schemes under construction));
- Scenario 2: Existing Site (baseline) with Proposed Development;
- Scenario 3: Existing Site (baseline) with Proposed Development and cumulative development (i.e. those with planning permission, but not under construction).
- Scenario 4: Consented Baseline (Existing Baseline + the consented Block C on the Site)

11.30 The reason for the additional assessment scenario (Scenario 4) is to demonstrate that compared to the level of shadow cast by Block C as approved by the 2021 Planning Permission, the Public Park and areas serving Blocks A/B & D will see an improvement in the amount of SHOG.

11.31 The Proposed Development is illustrated on drawing nos. EPROP1, EPROP2 & EPROP3 (Appendix 11.1).

Solar Glare

11.32 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 the construction period have been removed.

11.33 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. 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.

11.34 The most appropriate scenario is considered to be Existing Site (baseline) with Proposed Development.

11.35 Based on a common practice approach to portray the worst-case scenario, the cumulative effect will not be considered as neighbouring Committed Developments can block sunlight reaching the facades of the Proposed Development and/or obscure the Proposed Development from the viewpoints to be assessed. However, the following committed development are included within the surrounding context, where visible from sensitive receptors, in their completed form due to their planning permissions having been implemented, or construction having commenced:

- Plot 9a, First Street (132600/FO/2021);
- First Street South (Blocks A, B and D only) (125573/FO/2019);
- Metropolitan University Science and Engineering Building (125799/FO/2019);
- Barclay House (118033/P3OPA/2017);
- Havelock (129081/FO/2021);

- Viadux (115871/FO/2017);
- Plot 10a, First Street (136043/FO/2023);
- Plot 10b, First Street (136170/FO/2023); and
- Great Jackson Street (132199/FO/2021).

The Study Area

Daylight & Sunlight

11.36 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."

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

11.38 Note, the Site is located towards the south of Plot 11, and is therefore shielded from nearby residential and student properties within First Street, as well as Macintosh Mills and residential properties along Cambridge Street, by Blocks A, B and D.

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

- 30-42 Rockdove Ave;
- 44-72 Rockdove Ave;
- Loxford Court;
- Block 1 Parkway Gate;
- Block 3 Parkway Gate;
- Block 2 Parkway Gate;
- Block B, Plot 11, First Street;
- Block A, Plot 11, First Street; and
- Block D, Plot 11, First Street.

11.40 The location of these properties relative to the Site is identified in the drawings in Appendix 11.1.

11.41 Note, Parkway Gate comprises PBSA, and therefore is occupied on a temporary and short-term basis. Given its proximity to the Proposed Development, this Site has been considered. Based on our professional judgement, there are no other PBSA developments that are in sufficient proximity to

the Site so as to be affected beyond a negligible extent by the construction of the Proposed Development.

Overshadowing

11.42 The following areas of outdoor amenity space are defined as receptors and will be considered due to their proximity to the Site:

- The public & private outdoor amenity areas of Plot 11, First Steet South

Solar Glare

11.43 For Solar Glare, 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.

11.44 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 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.

11.45 The identified road junctions and rail 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 tram lines from which the Proposed Development will be visible. No train (or tram) driver viewpoints have been identified within 500 metres of the Site, where the Proposed Development would be visible within the 60° field of view. The locations assessed identified below are indicated in **Figure 11.1.**

- Mancunian Way Westbound (MW1-MW3);
- Mancunian Way Eastbound (MW4-MW6);
- Mancunian Way Slip Road/Medlock Street Junction (Slip1-3);
- Medlock Street (MS1 & MS2);
- Chester Street junctions with Wilmott Street and Cambridge Street (CS1 & CS2);
- Cambridge Street junction with Mancunian Way on-ramp (CBS);
- Newcastle Street junction with Loxford Street (NS);
- Princess Street junction with Stretford Road (PR1); and
- Princess Street merging traffic (PR2).

Source of Effect

11.46 The bulk, scale and massing of the Proposed Development could reduce the daylight and sunlight amenity experienced at residential buildings in close proximity, with windows facing the Site.

11.47 The bulk, scale and massing of the Proposed Development could increase the shadow experienced within outdoor amenity areas surrounding the Site.

11.48 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

Methodology for Determining Operational Effects

11.49 The following approaches are undertaken to assess the effect on the sensitive receptors of surrounding properties when the Proposed Development is completed and operational:

Daylight

- Vertical Sky Component (VSC); and
- No Sky Line (NSL) Method.

Sunlight

- Annual Probable Sunlight Hours (APSH).

Overshadowing

- Sun Hours on Ground (SHOG).

Outline Approach for Daylight, Sunlight and Overshadowing Assessments

11.50 The technical analyses carried out to inform the daylight and sunlight assessment have been undertaken by creating a digital three-dimensional (3D) model of the existing Site and Proposed Development, based on measured survey data.

11.51 The 3D model uses Waldram Diagrams to establish the VSC and 3D geometric calculations for NSL. This model (which is orientated to north by the use of Ordnance Survey (OS) information) enables the path of the sun to be tracked throughout the year to establish the shadow cast by the existing and proposed buildings and thus calculate the SHOG in each scenario.

11.52 In accordance with the BRE Guidance, only those surrounding properties which have windows facing towards the Site were included in the assessment. If a nearby property has no windows facing the Site, these properties would not be affected by the Proposed Development in terms of light.

Daylight

Vertical Sky Component (VSC) Method

11.53 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".

11.54 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.

11.55 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'.

11.56 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.

11.57 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:

"If the VSC, with the development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window may appear more gloomy and electric lighting will be needed more of the time".

No Sky Line (NSL) Method

11.58 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.

11.59 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. The NSL divides those areas of the working plane which can receive direct sky light from those which cannot. If a significant area of the working plane lies beyond the NSL (i.e., it receives no direct sky light), then the distribution of daylight in the room will be poor and supplementary electric lighting may be required.

11.60 The potential effects of daylighting distribution in an existing building can be found by plotting the NSL in each of the main rooms. For houses, this will include living rooms, dining rooms and kitchens. Bedrooms should also be analysed, although the BRE state that they are less important. The BRE Guidelines identify that if the area of a room that does receive direct sky light is reduced to less than 0.8 times its baseline value, then this would be noticeable to its occupants.

11.61 Therefore, it is implied that an NSL of at least 80% would be considered satisfactory.

11.62 In regard to deep rooms which are lit by windows on one side, the BRE Guidelines state (para. 2.2.10):

"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."

Sunlight

Annual Probable Sunlight Hours

11.63 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 would amount to 1486, and each spot equates to 14.86 hours of the total annual sunlight hours.

11.64 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.

11.65 The BRE Guidelines note that:

"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon."

"All main living rooms of dwellings…should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun".

"If the main living room to a dwelling has a main window facing within 90° of due north, but a secondary window facing within 90° of due south, sunlight to the secondary window should be checked."

"…a south facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day".

11.66 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%.

11.67 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. Windows that do not face within 90 degrees of due south do not have a realistic expectation of direct sunlight, due to their orientation and the sunlight path in the northern hemisphere.

11.68 The BRE recommends that the availability of sunlight should be checked for all external spaces where sunlight would be appreciated / expected. They provide a list of examples which includes the back garden of dwelling houses, parks and playing fields and external sitting out areas, such as public squares and around fountains / monuments.

11.69 The BRE recommends that at least half the area of the external amenity space must be capable of receiving at least 2 hours of sunlight, on 21 March (the spring equinox) and, if this is not achieved in the baseline condition, then the BRE consider a 20% reduction of the area that receives 2 hours sunlight to be acceptable on the grounds that the reduction is unlikely to be noticed by the occupants or users.

Overshadowing

11.70 The method for assessing hours in sun 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.

11.71 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

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

Table 11.1: Summary of Daylight, Sunlight & Overshadowing Assessment Criteria

Method	BRE 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 Evaluation Methodology for Daylight, Sunlight and Overshadowing

Daylight, Sunlight and Overshadowing Magnitude of Effect

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

"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; and*
- *The affected building only has a low level of requirement for skylight or sunlight."*

11.74 The classification of major adverse is documented within Paragraph 7 of the BRE Guidelines:

- *"Factors tending towards a major adverse impact include:*
- *a large number of windows are affected;*
- *the loss of light is substantially outside the guidelines;*
- *all the windows in a particular property are affected; and*
- *the affected indoor spaces have a particular strong requirement for skylight or sunlight, e.g., a living room in a dwelling".*

11.75 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.

11.76 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 I 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.

11.77 The initial numerical criteria for determining the magnitude of effect is based on percentage alterations, as follows:

Table 11.2: Daylight, Sunlight and Overshadowing Magnitude of Effect

Magnitude	Percentage Alteration from Baseline
Negligible	0-20%
Minor	20-29.9%
Moderate	30-39.9%
Major	40%+

11.78 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 25o i.e., a more suburban location.

11.79 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 effect 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

11.80 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.

11.81 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.

11.82 The following daylight, sunlight and overshadowing sensitive receptors are considered to be of medium sensitivity.

- 30-42 Rockdove Ave;
- 44-72 Rockdove Ave;
- Loxford Court;
- Block B, Plot 11, First Street;
- Block A, Plot 11, First Street;
- Block D, Plot 11, First Street; and
- The public & private outdoor amenity areas of Plot 11, First Street.

11.83 The following daylight, sunlight and overshadowing sensitive receptors are considered to be of low sensitivity due to their transient residential (student) nature.

- Block 1 Parkway Gate;
- Block 3 Parkway Gate; and

- Block 2 Parkway Gate.

Significance of Daylight & Sunlight Effects

11.84 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 11.3: 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		

11.85 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.

Methodology for Determining Operational Effects for Solar Glare

11.86 The technical analyses carried out to inform the assessments and identify possible solar glare effects on road users and train drivers have been undertaken by creating a digital three-dimensional (3D) model of the surrounding area, based on photogrammetry survey data, and insertion of a 3D model of the Proposed Development.

11.87 The potential for reflected solar glare or dazzle from the glazed or reflective façade cladding of the Proposed Development has been assessed using specialist lighting software. The assessment shows the path of the sun for the entire year around the Proposed Development. From this, two computer generated angular images have been produced for each selected viewpoint, indicating the area which sees the reflection of the sun-path at any point during the year. A modified diagram portraying a standardised extent of human vision is then overlaid onto the image.

11.88 The fovea centralis (also generally known as the fovea) is a part of the eye, located in the centre of the macula region of the retina. The fovea is responsible for sharp central vision (also called foveal vision), which is necessary in humans for reading, watching television, driving, and any activity where visual detail is of primary importance. The macula corresponds to the central 13° of the visual field; the fovea to the central 3°.

11.89 Appendix 11.4 (Figure 10) highlights the degrees of vision corresponding to the foveal view, with a red circle of 3° of angle in order to identify the area most sensitive to reflected solar glare. Another

red circle represents the incidence of the 30° radius of our typical field of view in order to identify a secondary area of sensitivity to potential reflected glare instances.

11.90 The degrees of vision provide a reference from which potential concerns can be judged. At 3°, the potential for the reflected glare to cause a hazard is high and mitigation would be required. Between 3° and 30°, there is the potential that there could be an issue and mitigation may be necessary.

11.91 As stated in the CIE 146:2002, occurrences at angles beyond 30° would be of little significance in most situations but may be relevant in exceptional circumstances. When seated in a driving seat of a typical car, for example, the limits of the windscreen would generally obstruct the driver's view at angles beyond 30° from the line of sight. Therefore, the risk of reflective solar glare causing a hazard is reduced.

Viewpoints for Road Users

11.92 As indicated previously, the assessment considers potentially sensitive viewpoints for road users surrounding the Site. The viewpoints are generally located at the minimum stopping distance and at the driver's eye level. The focal point is a relevant traffic element, such as signals or incoming traffic.

11.93 Identifying the viewpoints based on the stopping distance is calculated as the combination of thinking and braking distances, using the following formula:

$$D_{total} = D_{thinking} + D_{braking} = V*T + V^2/(2\mu*g)$$

11.94 Where each component is:

V = Relevant vehicle speed, typically the road speed limit.

T = Thinking time (0.67 sec)

μ = Braking effort (considered 0.65 for cars and 0.5 for buses)

g = Gravity acceleration.

11.95 The height of the viewpoint is considered to be 1.5m for cars and 2.0m for buses. Appendix 11.4 (Figure 08) identifies the typical stopping distance range for a car travelling at different speeds. Therefore, a viewpoint for a car driving at 30 mph (i.e., speed limit for a dense urban location) would be placed at 23m from a traffic light and 1.5m above the ground.

11.96 The assessment also considers a driver's field of vision which takes the angular extent seen at any given time, which for humans facing forwards is approximately 180 degrees.

Evaluating Effects and Significance for Solar Glare

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

- Major;
- Moderate;
- Minor; and

- Negligible.

11.98 There are no quantitative criteria within the BRE Guidelines or elsewhere regarding acceptable levels of solar glare. Generally, however, solar reflections at high altitudes are less likely to cause nuisance or distraction.

11.99 Professional judgement has therefore been applied to assign the magnitude of impact for solar glare arising from the Proposed Development and to determine the criteria for assessing the significance of solar glare set out in Table 11.4.

11.100 The following guide is used to ascertain the possible initial magnitude of impact for each viewpoint assessed. Where reflections occur from multiple façades and from multiple buildings, an initial magnitude of impact is given for each instance of potential solar glare.

Table 11.4: 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.	

11.101 Consideration is then given to mitigating factors that could influence the likelihood of solar reflections resulting in an instance of solar glare, these may include:

- sunlight availability probability;
- area of façade off which reflections are visible, particularly where the area of reflection visible is less than 8 pixels in diameter and cannot reflect the full solar disc;
- period of time reflections are visible;
- angle at which reflections are visible from line of sight;
- views of the development being obscured; and
- the time of day at which the solar reflection will occur for example during peak traffic times.

11.102 Effects in terms of solar glare can only be adverse (negative) in nature due to this not being a comparative assessment.

11.103 All road junctions and tram tracks assessed have been identified as being of high sensitivity as an action is required by a driver that is a safety concern if their visibility is impaired by solar glare. In determining the overall effect at a junction, whilst consideration is given to both controlled and uncontrolled junctions, the later, those where a driver does not have a fixed viewpoint such as a

traffic light or where no specific manoeuvres are required by a driver, are less likely to be impacted by solar glare this is a safety concern but are still considered high risk.

11.104 As the sensitive receptor is a driver approaching a road junction, multiple viewpoints at any one junction may be assessed for each of the traffic lanes or signals affected. In terms of significance criteria however, professional judgement has been used to determine the overall effect at the junction as a whole, taking into consideration the effects at all viewpoints assessed for that junction. Similarly for train drivers, the overall effect is reported for the stretch of track assessed as a whole. Therefore, following the initial magnitude of an effect for each viewpoint and consideration of mitigating factors, a clear statement is then made as to whether the overall effect is significant or not significant. As a general rule, the following criteria is applied:

- 'Moderate' or 'major' effects are deemed to be 'significant';
- 'Minor' effects are considered to be 'not significant', although they may be a matter of local concern; and
- 'Negligible' effects are considered to be 'not significant' and not a matter of local or wider concern.

Baseline Conditions

Daylight & Sunlight

11.105 The Baseline scenario considers the current baseline condition (as can be seen in November 2023) and assumes that the completion of the following currently under construction buildings. This scenario is depicted on drawing nos. EB1, EB2 & EB3 (Appendix 11.1).

- First Street South (Plots A, B and D only) (125573/FO/2019);
- Plot 9a, First Street (132600/FO/2021);
- Plot 10a, First Street (136043/FO/2023); and
- Plot 10b, First Street (136170/FO/2023).

11.106 A total of 1546 windows facing the Site serving 829 rooms within 9 buildings were assessed for VSC and NSL (daylight) and 419 rooms were assessed for APSH (sunlight) within the 4 buildings which are material for consideration in sunlight terms i.e., their windows are orientated to within 90o of due south.

11.107 The full Baseline daylight and sunlight results can be found in Appendix 11.2 and are summarised in Table 11.5 below.

Table 11.5: Baseline levels of VSC, NSL & APSH within the surrounding sensitive receptors (Scenario 1)

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
30-42 Rockdove Ave.	20	17	20	20	n/a	n/a

Address	Total No. Windows That Meet VSC Criteria		Total No. Rooms That Meet NSL Criteria		Total No. Rooms That Meet APSH Criteria	
44-72 Rockdove Ave.	36	32	36	36	n/a	n/a
Loxford Court	74	45	62	62	n/a	n/a
Block 1 Parkway Gate	253	49	186	70	50	11
Block 3 Parkway Gate	105	57	91	57	n/a	n/a
Block 2 Parkway Gate	129	24	86	20	n/a	n/a
Block B, Plot 11, First Street	283	202	264	194	202	198
Block A, Plot 11, First Street	172	38	148	72	19	19
Block D, Plot 11, First Street	474	365	202	173	148	144
Total	**1546**	**829**	**1095**	**704**	**419**	**372**

11.108 Out of the 1546 windows assessed for VSC daylight, 829 (54%) meet or exceed the BRE recommended criteria. For NSL, 704 (64%) of the 1095 rooms assessed meet the BRE recommended criteria. For sunlight, 372(89%) of the 419 rooms assessed meet the BRE criteria for both Winter and Annual APSH.

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

11.110 If the Proposed Development was not constructed the baseline daylight and sunlight levels would remain the same as there are no 'natural' factors that would influence baseline conditions, only human induced changes (i.e., development). With respect to human induced changes, any proposed 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.

Overshadowing

11.111 The full Baseline overshadowing results can be found in **Appendix 11.3** and are summarised in **Table 11.6** below.

Table 11.6: Baseline levels of SHOG within the surrounding sensitive receptors (Scenario 1)

Area Name	Level	Area benefitting from 2 hours of SHOG on 21st March	Meets SHOG Criteria?
Plot 11 Park, Public	Ground	94.36%	Yes
Block B, Plot 11, First Street, Private	First	68.42%	Yes
Block A, Plot 11, First Street, Private	First	51.46%	No
Block A, Plot 11, First Street, Private	Second	69.29%	No
Block D, Plot 11, First Street, Private	First	71.75%	Yes

11.112 All areas meet the BRE recommended level of SHOG in the baseline situation.

Solar Glare

11.113 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.

11.114 However, it should be noted that the Proposed Development will be located on a Site where its existing state is predominantly cleared to enable the implementation of the Plot 11 permission (125573/FO/2019) and contains temporary Site offices to support the construction of Blocks A, B and D, Plot 11. The temporary 4-storey max Site offices have predominantly solid elevations with small windows mostly facing towards the north, as such, 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

Construction Phase

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

11.116 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, sunlight and overshadowing.

Operational Phase

Daylight & Sunlight

11.117 The outputs of the computer modelling for both daylight and sunlight is provided in full within Appendix 11.2, with the key metrics provided in Tables 11.7 to 11.10 below.

11.118 A total of 1546 windows facing the Site serving 829 rooms within 9 buildings were assessed for VSC and NSL (daylight) and 419 rooms were assessed for APSH (sunlight) within the 4 buildings which are material for consideration in sunlight terms i.e., their windows are orientated to within 90° of due south.

11.119 The breakdown of the baseline results against the Proposed Development for each of the individual buildings forming part of this assessment are discussed in more detail below.

Table 11.7: Summary of VSC Daylight Results (Scenario 2)

Address	Total No. of windows	No. of windows that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
30-42 Rockdove Ave.	20	20	0	0	0
44-72 Rockdove Ave.	36	36	0	0	0
Loxford Court	74	74	0	0	0
Block 1 Parkway Gate	253	226	22	5	0
Block 3 Parkway Gate	105	0	0	0	105
Block 2 Parkway Gate	129	89	27	13	0
Block B, Plot 11, First Street	283	247	21	0	15
Block A, Plot 11, First Street	172	139	32	1	0
Block D, Plot 11, First Street	474	447	27	0	0
Total	**1546**	**1278**	**129**	**19**	**120**

Table 11.8: Summary of NSL Daylight Results (Scenario 2)

Address	Total No. of Rooms	No. of windows that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
30-42 Rockdove Ave.	20	20	0	0	0
44-72 Rockdove Ave.	36	36	0	0	0
Loxford Court	62	62	0	0	0
Block 1 Parkway Gate	186	174	11	1	0
Block 3 Parkway Gate	91	17	5	19	50
Block 2 Parkway Gate	86	78	6	1	1
Block B, Plot 11, First Street	264	264	0	0	0
Block A, Plot 11, First Street	148	148	0	0	0
Block D, Plot 11, First Street	202	202	0	0	0
Total	**1095**	**1001**	**22**	**21**	**51**

Table 11.9: Summary of Annual Sunlight Results (Scenario 2)

Address	Total No. of windows	No. of windows that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
Block 1 Parkway Gate	50	45	1	1	3
Block B, Plot 11, First Street	202	200	0	0	2
Block A, Plot 11, First Street	19	18	1	0	0
Block D, Plot 11, First Street	148	136	4	3	5
Total	**419**	**399**	**6**	**4**	**10**

Table 11.10: Summary of Winter Sunlight Results (Scenario 2)

Address	Total No. of windows	No. of windows that meet BRE Guidelines Negligible	Below BRE Guidelines - Magnitude of Change		
			Minor	Moderate	Major
Block 1 Parkway Gate	50	50	0	0	0
Block B, Plot 11, First Street	202	201	0	1	0
Block A, Plot 11, First Street	19	19	0	0	0
Block D, Plot 11, First Street	148	136	0	0	12
Total	**419**	**406**	**0**	**1**	**12**

11.120 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**.

11.121 Of the 9 properties assessed, the effect of the Proposed Development upon the daylight and sunlight amenity within the 3 properties listed within **Table 11.11** would be **Negligible (not Significant).**

Table 11.11: Properties with a Negligible Daylight and Sunlight effect (Scenario 2)

Properties with a Negligible Daylight and Sunlight effect	
30-42 Rockdove Ave.	30-42 Rockdove Ave.
44-72 Rockdove Ave.	

11.122 In accordance with the significance criteria described above, the effect upon the daylight amenity within the below property is considered to be minor adverse (not significant).

- Block A, Plot 11, First Street

11.123 The remaining 5 properties are discussed in detail below:

Block 1 Parkway Gate

Daylight

11.124 A total of 253 windows serving 186 rooms were assessed for daylight within this property.

11.125 Any changes in daylight amenity (VSC & NSL) to 167 (90%) of the 186 rooms assessed will be fully BRE compliant. The effect upon daylight amenity within these 167 rooms is therefore considered to be **Negligible (Not Significant).**

11.126 In accordance with the significance criteria described above, 15 of the remaining 19 rooms will experience changes in VSC and/or NSL which are minor. The effect upon the daylight amenity within these 15 rooms is therefore considered to be minor adverse (not significant).

11.127 The windows serving 3 of the remaining 4 rooms will experience absolute changes in VSC of between 3.2% and 3.9% which, whilst small, present themselves as moderate adverse in view of the low

baseline values. In view of the small actual changes in VSC to the windows serving these 3 rooms, the overall effect upon them is considered to be minor adverse (not significant).

11.128 The windows serving the remaining room will experience minor changes in VSC and a change in NSL of 31%. Paragraph F7 of the BRE guidelines states, *"In assessing the loss of light to an existing building, the VSC is generally recommended as the appropriate parameter to use. This is because the VSC depends only on obstruction, and is therefore a measure of the daylit environment as a whole."* The effect of the Proposed Development upon the daylight amenity within these rooms is, therefore, considered to be minor adverse.

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

Sunlight

11.130 A total of 101 windows serving 50 rooms were assessed for sunlight within this property.

11.131 Any changes in sunlight amenity to 45 of the 50 rooms assessed will be fully BRE compliant. The effect upon sunlight amenity within these 45 rooms is therefore considered to be **Negligible (Not Significant).**

11.132 In accordance with the significance criteria described above, 1 of the remaining 5 rooms will experience APSH changes which are minor. The effect upon the sunlight amenity within this room is therefore considered to be minor adverse (not significant).

11.133 The remaining 4 rooms all have low baseline values of total APSH and 0% baseline winter APSH values. The relatively small 6% to 9% absolute change in total APSH therefore present themselves as moderate to major adverse. In view of the isolated number of rooms affected and the low sensitivity of the property being student accommodation (i.e., transient residential rather than permanent), the overall effect of the Proposed Development upon the sunlight amenity within this property is considered to be minor adverse (not significant).

Block 3 Parkway Gate

Daylight

11.134 A total of 105 windows serving 91 rooms were assessed for daylight within this property.

11.135 The changes in daylight amenity to all 91 rooms assessed will be **Major**. On the 10 lowest and thereby most sensitive floors, the retained VSC's with the Proposed Development in place range from 8% to 16% with, for context, the average retained value being 12%

11.136 The reason for the large percentage of baseline changes is that the windows in this property derive light over a currently undeveloped Site which, when developed in keeping with the surrounding context, reduces the level of daylight amenity to be more in line with that. This is evidenced by the baseline values for the lowest 10 floors of Block 1 Parkway Gate which range from 4% to 18% with, for context, the average value being 9% (reduces to 8.3% with the Proposed Development in place).

11.137 At paragraph 1.6 of the BRE guidelines it states, *"…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."* The analysis shows that, despite the major

reductions in daylight amenity to this property with the Proposed Development in place, the retained values are commensurate, if not better, than those in a neighbouring block of the same development.

11.138 The overall effect of the Proposed Development upon the daylight amenity within this property is, therefore, considered to be **Minor Adverse (Not Significant)** in view of its comparability in amenity terms to its immediate context and the fact that it is of lower sensitivity being transient rather than permanent residential in nature.

Sunlight

11.139 This property is not material for sunlight assessment as none of its windows are orientated to within 90° of due south.

11.140 The effect of the Proposed Development upon the sunlight amenity within this property is, therefore, considered to be **Negligible (Not Significant).**

Block 2 Parkway Gate

Daylight

11.141 A total of 129 windows serving 86 rooms were assessed for daylight within this property.

11.142 Any changes in daylight amenity (VSC & NSL) to 101 (78%) of the 129 rooms assessed will be fully BRE compliant. The effect upon daylight amenity within these 101 rooms is, therefore, considered to be **Negligible (Not Significant).**

11.143 In accordance with the significance criteria described above, 24 of the remaining 28 rooms will experience changes in VSC and/or NSL which are minor. The effect upon the daylight amenity within these 24 rooms is therefore considered to be **Minor Adverse (Not Significant).**

11.144 The windows serving 3 of the remaining 4 rooms will experience absolute changes in VSC of between 3.2% and 3.9% which, whilst small, present themselves as moderate adverse in view of the low baseline values. In view of the small actual changes in VSC to the windows serving these 3 rooms, the overall effect upon them is considered to be **Minor Adverse (Not Significant).**

11.145 The windows serving the remaining room will experience minor changes in VSC and a change in NSL of 31%. Paragraph F7 of the BRE guidelines states, *"In assessing the loss of light to an existing building, the VSC is generally recommended as the appropriate parameter to use. This is because the VSC depends only on obstruction, and is therefore a measure of the daylit environment as a whole."* The effect of the Proposed Development upon the daylight amenity within these rooms is, therefore, considered to be **Minor Adverse.**

11.146 The overall effect of the Proposed Development upon the daylight amenity within this property is considered to be **Minor Adverse (Not Significant).**

Sunlight

11.147 This property is not material for sunlight assessment as none of its windows are orientated to within 90° of due south.

11.148 The effect of the Proposed Development upon the sunlight amenity within this property is, therefore, considered to be **Negligible (Not Significant).**

Block B, Plot 11, First Street

Daylight

11.149 A total of 283 windows serving 264 rooms were assessed for daylight within this property.

11.150 Any changes in daylight amenity (VSC & NSL) to 235 (89%) of the 264 rooms assessed will be fully BRE compliant. The effect upon daylight amenity within these 235 rooms is, therefore, considered to be **Negligible (Not Significant).**

11.151 In accordance with the significance criteria described above, 14 of the remaining 29 rooms will experience changes in VSC and/or NSL which are minor. The effect upon the daylight amenity within these 14 rooms is therefore considered to be **Minor Adverse (Not Significant).**

11.152 The remaining 15 rooms are a column of bedrooms each served by 2 windows, one of which will experience a major change in VSC. The other window serving each room will be affected to either a **Negligible** or **Minor** extent. The windows affected to a **Negligible** to **Minor** extant will all retain VSC levels of between 18% and 32% against the BRE recommended 27% and all of the window affected to a major extent will retain a very reasonable in an urban context VSC level of above 15%. These retained levels of VSC also mean that all of these 15 rooms will be fully BRE compliant in NSL terms.

11.153 Overall and in consideration of the levels of retained daylight amenity, the effect of the Proposed Development upon the daylight amenity within this property is considered to be **Minor Adverse (Not Significant).**

Sunlight

11.154 A total of 206 windows serving 202 rooms were assessed for sunlight within this property.

11.155 Any changes in sunlight amenity to 199 (99%) of the 202 rooms assessed will be fully BRE compliant. The effect upon sunlight amenity within these 199 rooms is therefore considered to be **Negligible (Not Significant).**

11.156 The remaining 3 rooms will moderate to major changes in winter and/total sunlight amenity. They will, however, retain winter sunlight amenity levels of between 4% and 8% against the BRE recommended 5% and total sunlight amenity of between 24% and 30% against the BRE recommended 25%. In view of the very good levels of retained sunlight amenity, the effect upon theses rooms is considered to be **Minor (Not Significant).**

11.157 In view of the very isolated number of rooms affected and the reasonable in an urban context retained values to the affected rooms, the overall effect of the Proposed Development upon the sunlight amenity within this property is considered to be **Minor Adverse (Not Significant).**

Block D, Plot 11, First Street

Daylight

11.158 A total of 474 windows serving 202 rooms were assessed for daylight within this property.

11.159 Any changes in daylight amenity (VSC & NSL) to 186 (92%) of the 202 rooms assessed will be fully BRE compliant. The effect upon daylight amenity within these 186 rooms is, therefore, considered to be **Negligible (Not Significant).**

11.160 In accordance with the significance criteria described above, the remaining 16 rooms will experience changes in VSC and/or NSL which are minor. The effect upon the daylight amenity within these 16 rooms is therefore considered to be minor adverse (not significant).

11.161 The overall effect of the Proposed Development upon the daylight amenity within this property is considered to be **Minor Adverse (Not Significant).**

Sunlight

11.162 A total of 339 windows serving 148 rooms were assessed for sunlight within this property.

11.163 Any changes in sunlight amenity to 136 (92%) of the 148 rooms assessed will be fully BRE compliant.

11.164 The remaining 12 rooms will experience changes in annual sunlight amenity ranging from minor to major and retain total APSH levels of between 11% and 22% against the BRE recommended 25% and major changes in winter sunlight amenity and retain winter APSH levels of 3% against the BRE recommended 5%.

11.165 In view of the isolated number of rooms affected and the reasonable in an urban context retained values to the 12 affected rooms, the overall effect of the Proposed Development upon the sunlight amenity within this property is considered to be **Minor Adverse (Not Significant).**

Overshadowing

11.166 The outputs of the computer modelling analysis and SHOG analysis is provided in full within **Appendix 11.3**, with a summary provided in **Table 11.12** below.

Table 11.11: Summary of SHOG analysis results compared to the existing baseline (Scenario 2)

Area Name	Level	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?
Park, Plot 11, Public	Ground	94.36%	85.36%	9.54%	Yes
Block B, Plot 11, First Street, Private	First	68.42%	55.95%	18.23%	Yes
Block A, Plot 11, First Street, Private	First	51.46%	3.4%	93.38%	No
Block A, Plot 11, First Street, Private	Second	69.29%	25.4%	63.35%	No
Block D, Plot 11, First Street, Private	First	71.75%	68.91%	3.96%	Yes

11.167 The following areas meet the BRE guidelines. The effect upon them will, therefore, be **Negligible (Not Significant)**

- Park, Plot 11, First Street, Public
- Block B, Plot 11, First Street, Private
- Block D, Plot 11, First Street, Private

11.168 The enclosed areas of amenity space serving Block A, Plot 11, First Street will experience major changes in sunlight amenity as a result of the Proposed Development. This is, however, to be expected given the enclosed nature of the area and the fact that the baseline position of the Site is undeveloped.

11.169 The 21 March SHOG assessment is designed to establish if an area of amenity space will be adequately sunlit throughout the year. Block A's outdoor terraces are, however, more likely to be used during the summer months when the weather is warmer. On this basis, Block A's and the other areas of the Plot 11 outdoor amenity space have been assessed to establish the extent of their areas that can benefit from at least 2 hours of SHOG on 21st June. As summary these results is in the table below

Table 11.13: Summary of 21st June SHOG analysis results (Scenario 2)

Area Name	Level	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
Park, Plot 11, Public	Ground	97.64%	96.19%	1.48%
Block B, Plot 11, First Street, Private	First	87.05%	84.83%	2.56%
Block A, Plot 11, First Street, Private	First	66.62%	66.62%	0%
Block A, Plot 11, First Street, Private	Second	90.70%	90.70%	0%
Block D, Plot 11, First Street, Private	First	97.17%	95.28%	1.95%

11.170 It can be clearly seen that, whilst Block A's areas of outdoor amenity space may not be adequately sunlit throughout the year, during the summer months, when the sun is higher in the sky and areas are more likely to be used, there will be an abundance of SHOG (66.62% and 90.7% of the areas respectively)

11.171 A comparison of the shadow caused by the consented scheme for the Site and the Proposed Development has also been undertaken. The results can be found in **Appendix 11.3.**

11.172 Whilst there will still be a major effect upon the areas of amenity space serving Block A Plot 11, First Street, there will be very small changes or improvements to all of the other areas serving the Plot 11 proposal. This is summarised in **Table 11.14** below.

Table 11.14: Summary of SHOG analysis results compared to the consented baseline (Scenario 4)

Area Name	Level	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?
Park, Plot 11, Public	Ground	66.43%	85.36%	+28.5%	Yes
Block B, Plot 11, First Street, Private	First	13.15%	55.95%	+325.5%	Yes
Block A, Plot 11, First Street, Private	First	51.46%	3.4%	93.38%	No
Block A, Plot 11, First Street, Private	Second	69.46%	25.4%	63.43%	No
Block D, Plot 11, First Street, Private	First	70.07%	68.91%	1.66%	Yes

11.173 Whilst the Proposed Development will cause material changes in the level of 21st March SHOG to the outdoor amenity spaces serving Block A, Plot 11, these areas will be well sunlit in the summer months when the areas are more likely to be used. In addition, compared to the consented scheme for the Site, some area will see improvements to amount of SHOG. Overall, therefore, the effect of the Proposed Development upon the areas of outdoor amenity space serving Plot 11 is considered to be **Minor Adverse (Not Significant).**

Solar Glare

Embedded Mitigation

11.174 Owing to the proximity of the Site to several sensitive road locations, as well as the highly glazed nature of the Proposed Development mitigation strategies have been incorporated within the detailed façade design.

11.175 The following strategies have been embedded within the façade design:

- the use of anodised aluminium purge ventilation panels to break up reflections; and
- facetted facades so that large areas of flat glazing of the same angle are avoided and that each panel is at an alternative angle from the panels next to it thus reflecting sunlight at a different time to the adjacent panel.

11.176 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. 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 junctions. It is likely that solar reflections may be unavoidable at all junctions, so the façade design has sought to limit the area of reflections to minimise the risk of solar reflections resulting in an instance of solar glare being generated by the buildings' facades.

Assessment of Significant Effects – Solar Glare

11.177 The full solar glare assessment is provided in Appendix 11.4.

11.178 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 have been 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.

11.179 Following a review of an extended area of investigation (approximately 500m radius from the Proposed Development), a total of 17 road locations 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 road driver's line of sight have been considered within the discussion below.

11.180 The assessment has been undertaken in a worst-case scenario considering there is no cloud cover, so the sun is shining for all days of the year for the full duration of daylight hours.

11.181 Of the total 17 road locations, a total of eight locations have at least one viewpoint which sees the potential for solar glare within 30° of a road users' line of sight but great than 10°. At these eight locations, the effect is considered to be permanent, Minor Adverse and Not Significant. These road locations are listed below and are not discussed further within the Chapter:

- Mancunian Way Westbound (MW2 & MW3);
- Mancunian Way Slip Road/Medlock Street Junction (Slip3);
- Medlock Street (MS1);
- Cambridge Street junction with Mancunian Way on-ramp (CBS);
- Newcastle Street junction with Loxford Street (NS);
- Princess Street junction with Stretford Road (PR1); and
- Princess Street merging traffic (PR2).

11.182 At the remaining nine locations, reflections occur within 10° of a road user's line of sight which require further consideration.

Mancunian Way Westbound (MW1)

11.183 One viewpoint along Mancunian Way travelling westbound has been assessed with reflections occurring with 10° of a driver's direct line of sight. Viewpoint MW1 shows the view of drivers in the right lane looking ahead while approaching the Cambridge Street junction off ramp. The viewpoint assessed is not a junction but has been assessed due to the sensitive nature of this motorway.

11.184 Table 11.15 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 above.

Table 11.15: Summary of Potential Reflections within 10° for drivers on Mancunian Way travelling Westbound (MW1) (Scenario 2)

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*
MW1	Eastern	05:00 to 07:00 GMT	Mid-March to mid-April and mid-August to mid-September	From 8° and above the driver's visor cut-off line	Moderate
	Southern	14:00 to 16:00 GMT	Mid-January to mid-February and mid-October to mid-November	From 8° and above the driver's visor cut-off line	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

11.185 For this stretch of motorway and the viewpoint assessed:

- Reflections are only visible with 10° of a driver's line of sight at one of the three viewpoints assessed along this stretch of road.
- The reflections from the eastern façade occur in the early mornings when the solar intensity is low, therefore any reflections generated would be low intensity.
- The Proposed Development is located c. 460m from the Viewpoint MW1, therefore the Proposed Development is visible within only a small portion of the field of view.
- There are no signals where visibility can be affected by reflections from the Proposed Development.
- All potential reflections occur above the driver's visor line, which would mitigate the effects when deployed.
- Anodised aluminium screens have been distributed across the tower elevations to break up reflections and lower the intensity of any reflections that do occur.

- The reflections occurring from the eastern facade are generated by a facetted façade, whereby each glazed panel is at a slightly different angle to the adjacent panel. Therefore, the reflections occurring would be at slightly different times of the day and year from the adjacent panels and so reflections at any one time would only occur from a very small area which, given the distance from the Proposed Development, would not reflect the full solar disc.

- The reflections occurring from the southern elevation appear within a very small area of the field of view, and at a glancing angle, therefore the area of each panel is very small within 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. 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 location 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 from the eastern and southern elevations are less than 40%.

11.186 Therefore, whilst the initial effect is Moderate Adverse in relation to westbound traffic on Mancunian Way (as set out in Table 11.15), based on mitigation measures set out above, and once professional judgment is applied, the overall effect in terms of solar glare to drivers on Mancunian Way travelling westbound is considered to be permanent, Minor Adverse and Not Significant.

Mancunian Way Eastbound (MW4-MW6)

11.187 Three viewpoints along Mancunian Way eastbound has been assessed with reflections occurring with 10° of a driver's direct line of sight. Viewpoint MW4 shows the view of drivers in the central lane looking ahead while traffic is merging from the Deansgate Interchange, MW5 shows the view of drivers in the central lane approaching the Medlock Street junction off ramp, and MW6 shows the view of drivers in the left lane just before passing over the Medlock Street junction. These viewpoints assessed are not junctions but have been assessed due to the sensitive nature of this motorway.

11.188 Table 11.16 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 above.

Table 11.16: Summary of Potential Reflections within 10° for drivers on Mancunian Way travelling Eastbound (MW4-6) (Scenario 2)

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*
MW4	Western	13:00 to 15:00 GMT	Mid-November to mid-January	From 7° and above the driver's visor cut-off line	Moderate
MW5	Western	13:00 to 15:00 GMT	Early-November to late-January	From 6° and mostly above the	Moderate

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*
				driver's visor cut-off line	
MW6	Western	14:00 to 16:00 GMT	Mid-November to mid-January	From 9° and mostly above the driver's visor cut-off line	Moderate
	All other reflections occur outside 10° so are considered **Minor Adverse.**				
*Prior to consideration of any mitigating factors outlined below.					

11.189 For this stretch of motorway and the viewpoint assessed:

- There are no signals where visibility can be affected by reflections from the Proposed Development.
- The majority of potential reflections occur above the driver's visor line, which would mitigate most of the effects when deployed.
- Anodised aluminium screens have been distributed across the tower elevations to break up reflections and lower the intensity of any reflections that do occur.
- The reflections are generated by a facetted façade, whereby each glazed panel is at a slightly different angle to the adjacent panel. Therefore, the reflections occurring would be at slightly different times of the day and year from the adjacent panels and so reflections at any one time would only occur from a very small area which, given the distance from the Proposed Development, would not reflect the full solar disc.
- 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. 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 location with a greater intensity than the reflections that would be generated from the Proposed Development.
- The reflections occur outside peak traffic times.
- 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 less than 30%.

11.190 Therefore, based on professional judgement, in consideration of the initial magnitude of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers on Mancunian Way travelling eastbound 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, 23 metres from the junction.

Mancunian Way Slip Road/Medlock Street Junction (Slip1)

11.191 Two viewpoints on Mancunian Way off ramp at Medlock Street junction have been assessed with reflections occurring with 10° of a driver's direct line of sight. Viewpoint Slip1a shows the view of drivers in the right lane looking ahead and viewpoint Slip1b shows the view of drivers in the right lane looking at the right-side traffic lights.

11.192 Table 11.17 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 above.

Table 11.17: Summary of Potential Reflections within 10° for drivers on Mancunian Way slip road toward Medlock Street junction (Slip1) (Scenario 2)

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*
Slip1a	Western	14:00 to 16:00 GMT	Early-November to late-January	From 7° and mostly above the driver's visor cut-off line	Moderate
Slip1b	Western	11:00 to 12:00 GMT	Mid-November to mid-January	A very small area from 9° and above the driver's visor cut-off line	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

11.193 At this location, for the viewpoints assessed:

- The majority of potential reflections occur above the driver's visor line, which would mitigate most of the effects when deployed.
- Anodised aluminium screens have been distributed across the tower elevations to break up reflections and lower the intensity of any reflections that do occur.
- The reflections are generated by a facetted façade, whereby each glazed panel is at a slightly different angle to the adjacent panel. Therefore, the reflections occurring would be at slightly different times of the day and year from the adjacent panels and so reflections at any one time would only occur from a very small area which, given the distance from the Proposed Development, would not reflect the full solar disc.
- 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. 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 location with a greater intensity than the reflections that would be generated from the Proposed Development.

- The reflections occur outside peak traffic times.

- 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 less than 20%.

11.194 Therefore, based on professional judgement, in consideration of the initial magnitude of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers on Mancunian Way off ramp junction with Medlock Street 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, 23 metres from the junction.

Mancunian Way Slip Road/Medlock Street Junction (Slip2)

11.195 Two viewpoints on Mancunian Way off ramp within the Medlock Street junction have been assessed with reflections occurring with 10° of a driver's direct line of sight. Viewpoint Slip2a shows the view of drivers in the left lane looking ahead and viewpoint Slip2b shows the view of drivers in the left lane looking at the left side traffic lights.

11.196 Table 11.18 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 above.

Table 11.18: Summary of Potential Reflections within 10° for drivers on Mancunian Way slip road within Medlock Street junction (Slip2) (Scenario 2)

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*
Slip2a	Western podium balustrade	18:00 to 19:00 GMT	Mid-March to mid-April and mid-August to mid-September	One single glazed panel is visible at 7°	Moderate
Slip2b	Western	12:00 to 16:00 GMT	Mid-October to mid-February	From 3°	Major
	Western podium balustrade	18:00 to 19:00 GMT	Mid-March to mid-April and mid-August to mid-September	One single glazed panel is visible at 2°	Major
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

11.197 At this location, for the viewpoints assessed:

- Reflections occurring from the tower element when drivers look forward sit outside 10° of a driver's line of sight (from Viewpoint Slip2a).

- Reflections from the podium balustrades are from a very small area within the field of view and occur in the evenings 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.

- Anodised aluminium screens have been distributed across the tower elevations to break up reflections and lower the intensity of any reflections that do occur.

- The reflections are generated by a facetted façade, whereby each glazed panel is at a slightly different angle to the adjacent panel. Therefore, the reflections occurring would be at slightly different times of the day and year from the adjacent panels and so reflections at any one time would only occur from a very small area which, given the distance from the Proposed Development, would not reflect the full solar disc.

- The area of each panel is less than 8 pixels in diameter within the view, as such, it is not possible for the full sun's intensity to be reflected.

- 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. 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 portion of the sun's path would remain visible at this location 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 from the tower elevation is 30%-50%, whilst when reflections could occur from the podium balustrade, it's 10%.

11.198 Therefore, based on professional judgement, in consideration of the initial magnitude of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers on Mancunian Way off ramp within Medlock Street junction is considered to be permanent, 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, 23 metres from the junction.

Medlock Street junction with Mancunian Way on ramp (MS2)

11.199 Two viewpoints at the Medlock Street junction with the Mancunian Way on ramp have been assessed with reflections occurring with 10° of a driver's direct line of sight. Viewpoint MS2a shows the view of drivers in the left turning lane looking ahead and viewpoint MS2b shows the view of drivers in the left turning lane looking at the left side traffic lights. No reflections within 10° of a driver's line of sight are visible for viewpoint MS2a.

11.200 Table 11.19 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 above.

Table 11.19: Summary of Potential Reflections within 10° for drivers on Medlock Street junction with Mancunian Way on ramp (MS2) (Scenario 2)

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*
MS2b	Western	09:00 to 11:00 GMT	Early-November to late-January	From 6° and above the driver's visor cut-off line	Moderate
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

11.201 At this location, for the viewpoints assessed:

- No reflections are visible within 10° when drivers look forward.
- The reflections occur in the mornings in winter when the solar intensity is low, therefore any reflections generated would be low intensity.
- All potential reflections occur above the driver's visor line, which would mitigate the effects when deployed.
- Anodised aluminium screens have been distributed across the tower elevations to break up reflections and lower the intensity of any reflections that do occur.
- The reflections are generated by a facetted façade, whereby each glazed panel is at a slightly different angle to the adjacent panel. Therefore, the reflections occurring would be at slightly different times of the day and year from the adjacent panels and so reflections at any one time would only occur from a very small area which, given the distance from the Proposed Development, would not reflect the full solar disc.
- The reflections occurring at a glancing angle; therefore the area of each panel is very small within 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. 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 location 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 from the tower elevation is less than 30%.

11.202 Therefore, based on professional judgement, in consideration of the initial magnitude of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers on Medlock Street junction with the Mancunian Way on ramp 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, 23 metres from the junction.

Chester Street junction with Cambridge Street (CS1)

11.203 One viewpoint has been assessed with reflections occurring with 10° of a driver's direct line of sight at this junction, CS1. There is just one lane of traffic, and this is not a controlled junction, therefore the viewpoint assessed (CS1) shows the view of drivers looking forward as they approach the junction.

11.204 Table 11.20 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 above.

Table 11.20: Summary of Potential Reflections within 10° for drivers on Chester Street junction with Cambridge Street (CS1) (Scenario 2)

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*
CS1	Eastern	Sunrise to 06:00 GMT	Mid-April to mid-August	From 5° and mostly above the driver's visor cut-off line	Moderate
	All other reflections occur outside 10° so are considered **Minor Adverse.**				
*Prior to consideration of any mitigating factors outlined below.					

11.205 At this location, for the viewpoint assessed:

- There are no signals where visibility can be affected by reflections from the Proposed Development.
- The reflections occur in the early mornings 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 reflections are generated by a facetted façade, whereby each glazed panel is at a slightly different angle to the adjacent panel. Therefore, the reflections occurring would be at slightly different times of the day and year from the adjacent panels and so reflections at any one time would only occur from a very small area which, given the distance from the Proposed Development, would not reflect the full solar disc.
- The area of each panel is less than 8 pixels in diameter within the view, as such, it is not possible for the full sun's intensity to be reflected.
- 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. 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.

- The reflections occur outside peak traffic times.

- 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 less than 30%.

11.206 Therefore, based on professional judgement, in consideration of the initial magnitude of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers on Chester Street junction with Cambridge Road 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, 23 metres from the junction.

Chester Street junction with Wilmott Street (CS2)

11.207 One viewpoint has been assessed with reflections occurring with 10° of a driver's direct line of sight at this junction, CS2. There is just one lane of traffic, and this is not a controlled junction, therefore the viewpoint assessed (CS2) shows the view of drivers looking forward as they approach the junction.

11.208 Table 11.21 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 above.

Table 11.21: Summary of Potential Reflections within 10° for drivers on Chester Street junction with Wilmott Street (CS2) (Scenario 2)

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*
CS2	Eastern	Sunrise to 06:00 GMT	Mid-April to mid-August	From 5° and mostly above the driver's visor cut-off line	Moderate
	Eastern podium	Sunrise to 05:00 GMT	Mid-April to mid-August	4° to 6°	Major
	All other reflections occur outside 10° so are considered Minor Adverse.				
*Prior to consideration of any mitigating factors outlined below.					

11.209 At this location, for the viewpoint assessed:

- There are no signals where visibility can be affected by reflections from the Proposed Development.

- The reflections occur in the early mornings 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 reflections are generated by a facetted façade, whereby each glazed panel is at a slightly different angle to the adjacent panel. Therefore, the reflections occurring would be at slightly different times of the day and year from the adjacent panels and so reflections at any one time would only occur from a very small area which, given the distance from the Proposed Development, would not reflect the full solar disc.

- 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. 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.

- The reflections occur outside peak traffic times.

- 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 less than 30%.

11.210 Therefore, based on professional judgement, in consideration of the initial magnitude of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers on Chester Street junction with Wilmott Road is considered to be permanent, 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, 23 metres from the junction. As detailed below, mitigation measures are proposed to ensure that effects can be minimised to Minor Adverse (Not Significant). Mitigation measures include the use of low reflectance glazing specifications, and further studies prior to the installation of any glazing.

Cumulative Effects

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

- One City Road 128002/FO/2020; and

- One Medlock Street 135419/FO/2022.

Construction Phase

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

11.213 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, sunlight and overshadowing.

Operational Phase

Daylight & Sunlight

11.214 The outputs of the computer modelling for both daylight and sunlight is provided in full within **Appendix 11.2**, with the key metrics provided in **Tables 11.22** to **11.25** below.

11.215 The same 1546 windows facing the Site serving 829 rooms within 9 buildings were assessed for daylight and the same 419 rooms within the 4 buildings assessed for sunlight as were assessed in the existing baseline versus Proposed Development scenario.

11.216 A summary of the overall daylight changes in these two assessment scenarios can be seen in **Tables 11.22** and **11.23** below.

Table 11.22: Summary of VSC & NSL Daylight Results – Proposed Development Only (Scenario 2)

	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+
30-42 Rockdove Ave.	20	20	0	0	0	20	20	0	0	0
44-72 Rockdove Ave.	36	36	0	0	0	36	36	0	0	0
Loxford Court	74	74	0	0	0	62	62	0	0	0
Block 1 Parkway Gate	253	226	22	5	0	186	174	11	1	0
Block 3 Parkway Gate	105	0	0	0	105	91	17	5	19	50
Block 2 Parkway Gate	129	89	27	13	0	86	78	6	1	1
Block B, Plot 11, First Street	283	247	21	0	15	264	264	0	0	0
Block A, Plot 11, First Street	172	139	32	1	0	148	148	0	0	0
Block D, Plot 11, First Street	474	447	27	0	0	202	202	0	0	0
TOTALS	**1546**	**1278**	**129**	**19**	**120**	**1095**	**1001**	**22**	**21**	**51**

Table 11.23: Summary of VSC & NSL Daylight Results – Proposed Development & Cumulative Schemes (Scenario 3)

	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+
30-42 Rockdove Ave.	20	20	0	0	0	20	20	0	0	0
44-72 Rockdove Ave.	36	34	2	0	0	36	36	0	0	0
Loxford Court	74	74	0	0	0	62	62	0	0	0
Block 1 Parkway Gate	253	223	25	5	0	186	174	11	1	0
Block 3 Parkway Gate	105	0	0	0	105	91	17	5	16	53
Block 2 Parkway Gate	129	89	27	13	0	86	78	6	1	1
Block B, Plot 11, First Street	283	247	21	0	15	264	264	0	0	0
Block A, Plot 11, First Street	172	119	52	1	0	148	129	11	7	1

	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+
Block D, Plot 11, First Street	474	447	27	0	0	202	202	0	0	0
TOTALS	**1546**	**1253**	**154**	**19**	**120**	**1095**	**982**	**33**	**25**	**55**

11.217 The reason for the small decrease in compliance levels is due to the additional effect of the cumulative schemes listed at paragraph 12.201.

11.218 A summary of the overall sunlight changes in these two assessment scenarios can be seen in **Tables 11.24** and **11.25** below.

Table 11.24: Summary of APSH Sunlight Results – Proposed Development Only (Scenario 2)

	ANNUAL PROBABLE SUNLIGHT HOURS ROOM							
			ANNUAL (%)			WINTER (%)		
ADDRESS	TOTAL	PASS	20-30	30-40	40+	20-30	30-40	40+
30-42 Rockdove Ave.	0	0	0	0	0	0	0	0
44-72 Rockdove Ave.	0	0	0	0	0	0	0	0
Loxford Court	0	0	0	0	0	0	0	0
Block 1 Parkway Gate	50	45	1	1	3	0	0	0
Block 3 Parkway Gate	0	0	0	0	0	0	0	0
Block 2 Parkway Gate	0	0	0	0	0	0	0	0
Block B, Plot 11, First Street	202	199	0	0	2	0	1	0
Block A, Plot 11, First Street	19	18	1	0	0	0	0	0
Block D, Plot 11, First Street	148	136	4	3	5	0	0	12
TOTALS	**419**	**398**	**6**	**4**	**10**	**0**	**1**	**12**

Table 11.25: Summary of APSH Sunlight Results – Proposed Development & Cumulative Schemes (Scenario 3)

	ANNUAL PROBABLE SUNLIGHT HOURS ROOM							
			ANNUAL (%)			WINTER (%)		
ADDRESS	TOTAL	PASS	20-30	30-40	40+	20-30	30-40	40+
30-42 Rockdove Ave.	0	0	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+
44-72 Rockdove Ave.	0	0	0	0	0	0	0	0
Loxford Court	0	0	0	0	0	0	0	0
Block 1 Parkway Gate	50	45	1	1	3	0	0	0
Block 3 Parkway Gate	0	0	0	0	0	0	0	0
Block 2 Parkway Gate	0	0	0	0	0	0	0	0
Block B, Plot 11, First Street	202	199	0	0	2	0	1	0
Block A, Plot 11, First Street	19	14	0	3	2	0	0	0
Block D, Plot 11, First Street	148	136	4	3	5	0	0	12
TOTALS	**419**	**394**	**5**	**7**	**12**	**0**	**1**	**12**

11.219 The reason for the small decrease in compliance levels is due to the additional effect upon total sunlight amenity of the cumulative schemes listed at paragraph 12.201.

Overshadowing

11.220 A summary of the overall SHOG changes in these two assessment scenarios can be seen in **Tables 11.26** and **11.27** below.

Table 11.26: Summary of SHOG Results – Proposed Development Only (Scenario 2)

Area Name	Level	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?
Park, Plot 11, Public	Ground	94.36%	85.36%	9.54%	Yes
Block B, Plot 11, First Street, Private	First	68.42%	55.95%	18.23%	Yes
Block A, Plot 11, First Street, Private	First	51.46%	3.4%	93.38%	No
Block A, Plot 11, First Street, Private	Second	69.29%	25.4%	63.35%	No
Block D, Plot 11, First Street, Private	First	71.75%	68.91%	3.96%	Yes

Table 11.27: Summary of SHOG Results – Proposed Development & Cumulative Schemes (Scenario 3)

Area Name	Level	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?
Park, Plot 11, Public	Ground	94.36%	85.50%	9.39%	Yes
Block B, Plot 11, First Street, Private	First	68.42%	55.96%	18.21%	Yes
Block A, Plot 11, First Street, Private	First	51.46%	3.33%	93.53%	No
Block A, Plot 11, First Street, Private	Second	69.29%	25.45%	63.27%	No
Block D, Plot 11, First Street, Private	First	71.75%	68.57%	4.43%	Yes

11.221 The reason for the very marginal differences in SHOG levels is due to the existence of the cumulative schemes listed at paragraph 12.201.

Mitigation Measures

Construction Phase

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

11.223 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, sunlight and overshadowing.

Operational Phase

Daylight, Sunlight & Overshadowing

11.224 Overall, the impact on daylight impacts to the surrounding properties is considered **Negligible** to **Minor Adverse** and the impact on sunlight is considered **Negligible** to **Minor Adverse.** 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.

Solar Glare

11.225 As detailed above, the design has evolved with solar glare effects in mind through the inclusion of a facetted façade and the use of anodised aluminium screens 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.

11.226 Permanent, **Moderate Adverse (Significant)** effects are predicted to occur for a driver at two road locations, and **Minor** to **Moderate Adverse (Significant)** effects are predicted to occur for a driver at six road locations. 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 considerably reduced. The probability of the sun shining during the times of the year when potential reflections are expected to occur ranges from 10% in the early mornings/mid-afternoons from the mid-seasons through winter months, up to 40%-50% in the mid-seasons in the afternoon.

11.227 Furthermore, the assessment does not include the sun itself within any viewpoints which would also cause very intense glare to drivers at all of the affected viewpoints. For all affected 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 11.4**. 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.

11.228 Due to reflections occurring in close proximity to the direct line of sight of drivers, and significant effects identified, a low reflectance glazing is required to reduce the intensity of any reflections that occur. It is recommended that a glazing specification with a maximum Visible Light Reflectance (VLR) of 14% is used for the proposed eastern and western facades.

11.229 Prior to installation of the glazing, it is recommended that a detailed Solar Glare intensity assessment is undertaken for the proposed glazing specification to confirm the glazing selections satisfactorily addresses the significant effects identified.

Residual Effects

Operational Phase

Table 11.28: Residual Effects (Operational) (Scenario 2)

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	30-42 Rockdove Ave	None	n/a	**Negligible** (Permanent)
	44-72 Rockdove Ave			**Negligible** (Permanent)
	Loxford Court			**Negligible** (Permanent)
	Block 1 Parkway Gate			**Minor Adverse** (Permanent)
	Block 3 Parkway Gate			**Minor Adverse** (Permanent)
	Block 2 Parkway Gate			**Minor Adverse** (Permanent)
	Block B Plot 11, First Street			**Minor Adverse** (Permanent)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
	Block A Plot 11, First Street			**Minor Adverse** (Permanent)
	Block D Plot 11, First Street.			**Minor Adverse** (Permanent)
Adverse reduction in sunlight amenity	Block 1 Parkway Gate	None	n/a	**Minor Adverse** (Permanent)
	Block B Plot 11, First Street			**Minor Adverse** (Permanent)
	Block A Plot 11, First Street			**Minor Adverse** (Permanent)
	Block D Plot 11, First Street.			**Minor Adverse** (Permanent)
Adverse increase in shadow	Public Park Plot 11, First Street	None	n/a	**Negligible** (Permanent)
	Block B Plot 11, First Street, Private			**Negligible** (Permanent)
	Block A Plot 11, First Street Private			**Minor Adverse** (Permanent)
	Block A Plot 11, First Street, Private			**Minor Adverse** (Permanent)
	Block D Plot 11, First Street, Private			**Negligible** (Permanent)
Negligible & Minor Adverse (Not Significant) effects on Solar Glare	Road users at nearby road junctions	Embedded in the design, no further mitigation needed.	N/A	**Minor Adverse (Not Significant)** effects on Solar Glare
Minor-Moderate and Moderate Adverse (Significant) effects on Solar Glare	Road users at: • Slip1 • Slip2 • MS2 • MW4-6 • CS1 • CS2	Proposed glazing specifications for eastern and western elevations should be low reflectance, the recommended VLR is 14%. Further detailed assessed is recommended prior to installation of glazing.	Planning Condition	**Minor Adverse (Not Significant)** effects on Solar Glare. To be confirmed via further detailed testing with further mitigation incorporated if required to ensure residual effects are not significant.

Monitoring

11.230 None required.

Reference List

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

- Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework. 2021.

- 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

12. Townscape and Visual Impact

Introduction

12.1 This Chapter of the ES has been prepared by Optimised Environments Ltd (OPEN) and assesses likely significant townscape and visual effects. The Townscape and Visual Impact Assessment (TVIA) assesses effects that may arise because of the Proposed Development on both the townscape character as an environmental resource, and on people's views and visual amenity. These townscape and visual effects may occur both within the area of land within the Site of the Proposed Development and from the wider townscape within the TVIA Study Area (Figure 12.1).

12.2 This Chapter is accompanied by the following appendices:

- Appendix 12.1: Townscape and Visual Assessment Methodology, a detailed description of the methodology used in the landscape and visual assessment.
- Appendix 12.2: Our Studio Accurate Visual Representation (AVR) Document (including Figures 12.7 - 12.21).

12.3 Plan figures are provided within this chapter, while visualisations are provided in Appendix 12.2, and are referred to in the text where relevant, consisting of the following:

- Figure 12.1: TVIA Study Area;
- Figure 12.2: Townscape Character;
- Figure 12.3: Townscape Designations;
- Figure 12.4: Cumulative Developments;
- Figure 12.5: ZTV;
- Figure 12.6: Cumulative ZTV;
- Figure 12.7: Viewpoint 1 - Hulme Street;
- Figure 12.8: Viewpoint 2 - Hulme Arch Bridge;
- Figure 12.9: Viewpoint 3 - Newcastle Street;
- Figure 12.10: Viewpoint 3 - Newcastle Street (Dusk);
- Figure 12.11: Viewpoint 4 - Oxford Road / Whitworth Street;
- Figure 12.12: Viewpoint 5 - Mancunian Way Slip Road to Medlock Street;

- Figure 12.13: Viewpoint 6 - Hulme Park;
- Figure 12.14: Viewpoint 7 - All Saints Park;
- Figure 12.15: Viewpoint 8 - Booth Street West;
- Figure 12.16: Viewpoint 9 - Clarendon Street / Princess Street;
- Figure 12.17: Viewpoint 10 - Hulme Street / Jackson Crescent;
- Figure 12.18: Viewpoint 11 - Higher Cambridge Street;
- Figure 12.19: Viewpoint 12 - Chester Street;
- Figure 12.20: Viewpoint 13 - Hulme Street / Rockdove Avenue; and
- Figure 12.21: Viewpoint 14 - Clarendon Street.

12.4 The authors of this Chapter are qualified landscape architects, with over 25 years' combined experience in carrying out TVIA and Landscape and Visual Impact Assessment (LVIA). The lead author is a Chartered Member of the Landscape Institute.

Assumptions and Limitations

12.5 The photographs and other graphic material such as Zone of Theoretical Visibility (ZTV) mapping and Accurate Visual Representations (AVRs) used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, can never show exactly what the Proposed Development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image. They are not considered to be completely representative of what is apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs. The viewpoints illustrated are representative of views in the TVIA study area but cannot represent visibility at all locations.

Relevant Legislation, Policy and Guidance

Legislation

Planning (Listed Buildings and Conservation Areas) Act 1990

12.6 The Planning (Listed Buildings and Conservation Areas) Act is a UK Act of Parliament introduced in 1990 that changed laws relating to the granting of planning permission for building works, with a particular focus on listed buildings and conservation areas. It created special controls for the demolition, alteration or extension of buildings, objects or structures of particular architectural or historic interest, as well as conservation areas.

12.7 Conservation areas are areas that have been designated by the local planning authority as being of ‘special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance’. Conservation area controls, as established by the Act, apply in addition to normal planning controls. Part II of the Act (para 72(1) places a general duty as respects conservation areas in exercise of planning functions that ‘special attention shall be paid to the desirability of preserving or enhancing the character or appearance of that area’.

12.8 This TVIA has regard to the character and appearance of conservation areas, which are mapped in Figure 12.3, described in the Baseline Conditions and the assessment of the effects of the Proposed Development.

Town and Country Planning (Environmental Impact Assessment) Regulations 2017

12.9 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') govern the process of EIA in the context of town and country planning in England. The EIA regulations only apply to certain types of development, set out in Schedule 2, including urban development projects of more than 150 dwellings and more than 5 hectares (ha).

12.10 The aim of EIA is to protect the environment by ensuring that the local planning authority, when deciding whether to grant planning permission for a project which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision-making process. This TVIA includes information reasonably required to assess the likely significant environmental effects of the Proposed Development, including both written assessment and AVRs, which have been prepared by competent experts, in line with guidance and standards.

12.11 The TVIA has been prepared to fully comply with Regulation 4 and Schedule 4 (Part I and II) of the EIA Regulations: 'Information for Inclusion in Environmental Statements'; and in accordance with the National Planning Practice Guidance (NPPG).

Policy

National Planning Policy

National Planning Policy Framework 2023 (NPPF)

12.12 The National Planning Policy Framework (NPPF) sets out the government's planning policies for England and how these are expected to be applied.

12.13 The purpose of the planning system is to contribute to the achievement of sustainable development through three overarching objectives. The environmental objective is of particular relevance to the purposes of TVIA.

> ***"An 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."***

12.14 Section 12 of the NPPF deals with the requirements of good design. The overarching principle is set out in paragraph 131, which states:

> ***"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."***

12.15 The NPPF advises, in section 12 Achieving well-designed places, paragraph 135, 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'.

12.16 The NPPF advises, in section 15 Conserving and enhancing the natural environment, paragraph 180, that landscapes should be taken into account in the planning process through the protection and enhancement of valued landscapes.

12.17 Whilst the Site is not located in a Conservation Area and does not contain listed buildings, heritage is an intrinsic part of landscape assessment and potential views from Conservation Areas and the context around listed buildings will be considered as part of the assessment. Section 16 of the NPPF concerns conserving and enhancing the historic environment. Paragraph 195 states that heritage assets are:

"an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations".

12.18 There is also an overarching desirability set out within the NPPF for new development to contribute positively to local character and distinctiveness. The NPPF advises in paragraph 203, that Plans should set out a positive strategy for the conservation and enjoyment of the historic environment taking into account:

'the desirability of new development making a positive contribution to local character and distinctiveness; and opportunities to draw on the contribution made by the historic environment to the character of a place.'

Local Planning Policy

Places for Everyone Joint Development Plan Document (Publication Stage) 2021

12.19 Nine of the ten local authorities in Greater Manchester have developed a joint plan, the Places for Everyone Joint Development Plan of Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, and Wigan Councils. This plan has been approved by the nine local authorities and has undergone independent examination. Consultation on main modifications is currently underway, following which the Plan will be adopted.

12.20 The Publication Stage Joint Plan, Policy JP-Strat 2 sets out the following policy for the City Centre:

'The role of the City Centre as the most significant economic location in the country outside London will be strengthened considerably. 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 considerable by a range of high density new homes, supported by necessary infrastructure. Development will enable people to take advantage of the access to education and training and the extensive public transport offer, reducing the need to travel to work whilst supporting economic growth and reducing levels of poverty.'

Manchester's Local Development Framework, Core Strategy Development Plan Document (2012 - 2027)

12.21 Spatial Objectives S06 Environment:

'Protect and enhance both the natural and built environment of the City and ensure the sustainable use of natural resources, in order to mitigate and adapt to climate change, support biodiversity and wildlife, improve air, water and land quality, recreational opportunities and provide networks of high quality green infrastructure, ensuring that the City is inclusive and attractive to residents, workers, investors and visitors. The development of networks of green infrastructure across the City and City Region, together with protecting and enhancing townscape character and securing a high standard of design in all development proposals, will promote healthy, low-carbon lifestyles, contribute to a sense of wellbeing, and help to facilitate the sustainable and inclusive growth of the City.'

12.22 Policy CC9 Design and Heritage

'Design of new buildings will need to be of the highest standard in terms of appearance and function. The standards and guidance explained in other LDF policies should be the basis for the approach to design, with particular attention to be given to the City Centre context and character.

Development in Manchester City Centre should preserve or enhance the heritage assets that have been identified, including listed buildings, conservation areas and scheduled ancient monuments.

The Council will support high density and mixed use development in the City Centre, but developers must recognise the specific design challenges that must be overcome to ensure complementarity of function and form. New development must support the range of uses the Council expects in the City Centre and contribute to a coherent and integrated physical environment.'

12.23 Policy EN1 Design Principles and Strategic Character Areas

'New development in Manchester will be expected to take into consideration its location within the specific character areas and reinforce the sense of place and local distinctiveness of the City. This is considered an important element in increasing the sense of local ownership of and respect for a neighbourhood' and that 'Opportunities for good design to enhance the overall image of the City should be fully realised, particularly on major radial and orbital road and rail routes.'

'City Centre Character Area - The City Centre contains a rich legacy which reflects its urban evolution to the current day and includes listed buildings, conservation areas, archaeological remains and an historic street pattern. Its core area presents a particularly dense environment that accommodates a wide and closely integrated range of uses including commercial, civic and residential activities. Relative to the amount of development there is limited open space and this includes a range of civic and less formal green spaces and waterways. Outside the core and associated with the Inner Relief Route there are less active and less densely developed areas with significant elements of cleared land. The City Centre is the focus of the City's transport routes.

Developers will be expected to consider the City's heritage and continue the rich pattern of activity in the core area.

While there will be opportunities to create landmark buildings, developments should also contribute positively to the experience of all at street level.

Wherever possible the opportunity should be realised to enhance existing and provide new areas of meaningful open space, and the maintenance and improvement of the City's permeability should be considered in all proposals.'

12.24 Policy EN2 Tall Buildings

'Tall buildings are defined as buildings which are substantially taller than their neighbourhoods and/or which significantly change the skyline. Proposals for tall buildings will be supported where it can be demonstrated that they:

- ***Are of excellent design quality,***
- ***Are appropriately located,***
- ***Contribute positively to sustainability,***
- ***Contribute positively to place making, for example as a landmark, by terminating a view, or by signposting a facility of significance, and***
- ***Will bring significant regeneration benefits.***

A fundamental design objective will be to ensure that tall buildings complement the City's key existing building assets and make a positive contribution to the evolution of a unique, attractive and distinctive Manchester, including to its skyline and approach views.'

12.25 Policy EN3 Heritage

'New developments must be designed so as to support the Council in preserving or, where possible, enhancing the historic environment, the character, setting and accessibility of areas and buildings of acknowledged importance, including scheduled ancient monuments, listed buildings, registered parks and gardens, conservation areas and archaeological remains.'

12.26 Policy EN9 - Green Infrastructure

"New Development will be expected to maintain existing green infrastructure in terms of its quantity, quality and multiple function. Where the opportunity arises and in accordance with current Green Infrastructure Strategies the Council will encourage developers to enhance the quality and quantity of green infrastructure, improve the performance of its functions and create and improve linkages to and between areas of green infrastructure. Where the benefits of a proposed development are considered to outweigh the loss of an existing element of green infrastructure, the developer will be required to demonstrate how this loss will be mitigated in terms of quantity, quality, function and future management".

Guidance

First Street Strategic Regeneration Framework (2015) and Development Framework (2018 and 2020)

12.27 The First Street area has been a regeneration priority for Manchester City Council for several years. MCC has approved several Development Framework and Strategic Regeneration Frameworks for the area since 2010. These documents identify four distinct development areas, comprising First Street North, First Street Central, First Street South, and the Creative Ribbon. The First Street SRF defined the "key role and function of each of these areas, appropriate development activity and a set of urban design criteria providing a framework for future proposals" (Deloitte, 2018), and has been updated by subsequent Development Frameworks. The Proposed Development is situated within the First Street South development area, as identified within these documents.

12.28 The most recent Development Framework (Deloitte, 2018) of relevance to the First Street South development area provides relevant information on the existing character of the area as well as setting a framework for the scale, type and quality of development that is likely to be appropriate there, including immediately around the Site. It is intended to be judged as a material consideration in the determination of any planning application within the area.

12.29 The European Landscape Convention (ELC) (2000) provides a foundation for closer co-operation on landscape issues across Europe and was ratified in the UK on 21 November 2006 and became binding on 1 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.

12.30 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".

12.31 This definition covers 'natural, rural, urban and peri-urban areas'. It recognises that landscape has important cultural, ecological, environmental and social dimensions and is a key element of achieving sustainable development. In this urban context, the use of the word 'landscape' is more appropriately termed 'townscape' though the constituent factors remain consistent.

Consultation

12.32 Consultation with regard to townscape and visual effects has been undertaken. The key elements have involved pre-application consultation meetings and the Scoping Opinion.

Table 12.1: Summary of consultation relating to TVIA

Consultation	Consultee	Date	Consultee feedback	Response
Pre-application meeting	MCC	August 2023	Careful consideration of effects on residents of Hulme to be included.	Several viewpoints represent views experienced by residents in Hulme, including Viewpoint 3: Newcastle Street, Viewpoint 8: Booth Street West, Viewpoint 9: Clarendon Street / Princess Street, Viewpoint 10: Hulme Street / Jackson Crescent, Viewpoint 13: Hulme Street / Rockdove Avenue, and Viewpoint 14: Clarendon Street.
Pre-application meeting	MCC	August 2023	No issues raised with proposed viewpoint locations.	Viewpoints presented in the TVIA are in line with those proposed within Scoping Report with some additions made to ensure viewpoints selected best represent the relevant receptors and updates made to the micro-siting of viewpoint locations during surveys.

Assessment Methodology and Significance Criteria

Introduction

12.33 This section provides a brief summary of the methodology used to carry out the TVIA, which is set out in full in Appendix 12.1.

12.34 The TVIA follows best practice guidance contained in the following documents:

- Landscape Institute with the Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3);
- Landscape Institute (2018). Townscape Character Assessment. Technical Information Note 05/2017 (Revised 2018);
- Landscape Institute (2019). Landscape Institute Technical Guidance Note 02/19, Visual Representation of Development Proposals; and

- Natural England (2014). An Approach to Landscape Character Assessment.

12.35 The TVIA considers both Townscape and Visual Amenity / Views. Due to the locality of the Proposed Development, located in an urbanised area, the issues normally referred to in an EIA as 'landscape' are referred to herein as 'townscape'. GLVIA3 (Landscape institute and Institute for Environmental Management and Assessment, 2013) provides detailed guidelines which are applicable to TVIA.

12.36 Townscape is *'the landscape within the built-up area, including the buildings, the relationships between them, the different types of urban open spaces, including green spaces, and the relationship between buildings and open spaces'* (Landscape Institute, 2013 and 2018). Townscape effects are effects on the townscape as a resource in its own right, or effects on perceived character of the townscape.

12.37 Visual amenity is defined (in GLVIA3) as *'The overall pleasantness of the views people enjoy of their surroundings, which provides the visual setting or backdrop for the activities of the people living, working, recreating, visiting or travelling through an area',* with visual effects being effects on specific views and visual amenity experienced by people.

Scenarios Tested

12.38 The TVIA considers the effects of the Proposed Development in the following scenarios:

- The effect of the Proposed Development (and embedded mitigation) against the 'baseline', i.e. the townscape as it appears at the time of writing the ES, including baseline committed developments (listed in Table 12.11) that are under construction. This includes Blocks A, B and D of the First Street South proposals (Ref. 125573/FO/2019). The baseline therefore assumes these buildings are constructed and fully completed in the study area and immediate context of the Site; and

- The effect of the Proposed Development (and embedded mitigation) with cumulative developments, i.e. the cumulative scenario where all committed and cumulative developments (listed in Table 12.1) are present in the townscape.

12.39 The above scenarios may differ from those considered within other assessment chapters, which include a 'baseline with the Proposed Development' scenario (i.e. without mitigation). There is no assessment of the 'baseline with the Proposed Development' (without mitigation) scenario within the TVIA because all mitigation for TVIA, including good design, architectural responses (such as materiality, form, layout, massing) and landscape design proposals are primary mitigation measures embedded in the design of the Proposed Development (therefore there is no need for a separate assessment without this embedded mitigation). Please refer to the Mitigation Measures section below for further information on the primary mitigation measures embedded within the design of the Proposed Development.

12.40 Furthermore, moving Plot 10a and 10b from committed to cumulative would not substantially alter results. It's inclusion within *"committed"* accounts for a realistic worst-case development scenario, considering works in relation to Plot 10b have commenced and pre-commencement conditions have been discharged for Plot 10a. The TVIA has found that Plot 10a and 10b are also not that visible from the agreed TVIA viewpoints. Of the 14 views assessed, they are only seen in Viewpoint 1 (Hulme St) and Viewpoint 5 (Mancunian Way) with any degree of influence, at close range. In Viewpoint 1, the Proposed Development is not visible, as it is behind First St Blocks A, B and D. First St Plot 10a and 10b tend to be more visible in views from the north, however the Proposed Development is not very

visible at all from these areas to the north, due to the screening by intervening First Street Blocks A, B and D - so there is limited cumulative interaction/effect on views from the north. Consideration of Plot 10a and 10b as part of the committed baseline is considered a realistic scenario with high certainty that the effects assessed against this baseline would occur, considering works in relation to Plot 10b have commenced and pre-commencement conditions have been discharged for Plot 10a

The Study Area

12.41 The proposed study area for the TVIA covers a 1 km radius from the Proposed Development, as shown in **Figure 12.1.** This study area includes the Site itself and the full extent of the wider townscape around it, upon which the Proposed Development may have a significant influence. This is based on a desk-based ZTV analysis and field survey of the extent of townscape and designated receptors likely to be affected and the extent of the area from which the Proposed Development may have significant townscape and visual effects.

12.42 The actual visibility of the Proposed Development that will be experienced by people will be influenced substantially by the density and height of the built-up area in the locality. Significant townscape and visual effects can be scoped out beyond 1 km, which is considered to be the maximum area within which a significant effect would be likely to occur as a result of the Proposed Development, on the basis of professional judgement, benchmarking of study areas for other similar projects in Manchester and crucially the ZTV of the Proposed Development. In an urban context such as this, visibility of the Proposed Development beyond a distance of 1 km is shown in the ZTV to be very limited, and significant effects are not considered likely to occur beyond the outer limit (1km) of the study area. The study area of 1 km is therefore considered to be suitable for the purposes of assessing likely significant effects.

Source of Effect

12.43 The potential likely significant effects of the Proposed Development on the townscape and visual resource are assessed in terms of three categories of effects: effects on townscape character; effects on views/visual amenity; and cumulative effects.

12.44 The TVIA predicts, describes, and assesses the likely significant effects that the Proposed Development will have on the townscape and visual resource, and covers the following types of effects:

- Effects on townscape character - arising from the introduction of new elements that alter the existing pattern of elements that define character; or through visibility of the Proposed Development, which may alter the way in which the pattern of elements is perceived. Effects on townscape character are assessed on Townscape Character Areas (TCAs) and designations.

- Visual effects - assessment of how the introduction of the Proposed Development will affect the views available to people and their visual amenity. Visual effects are assessed on principal visual receptors (i.e. groups of people, such as within settlements, using transport routes or recreational trails) and representative viewpoints in the study area.

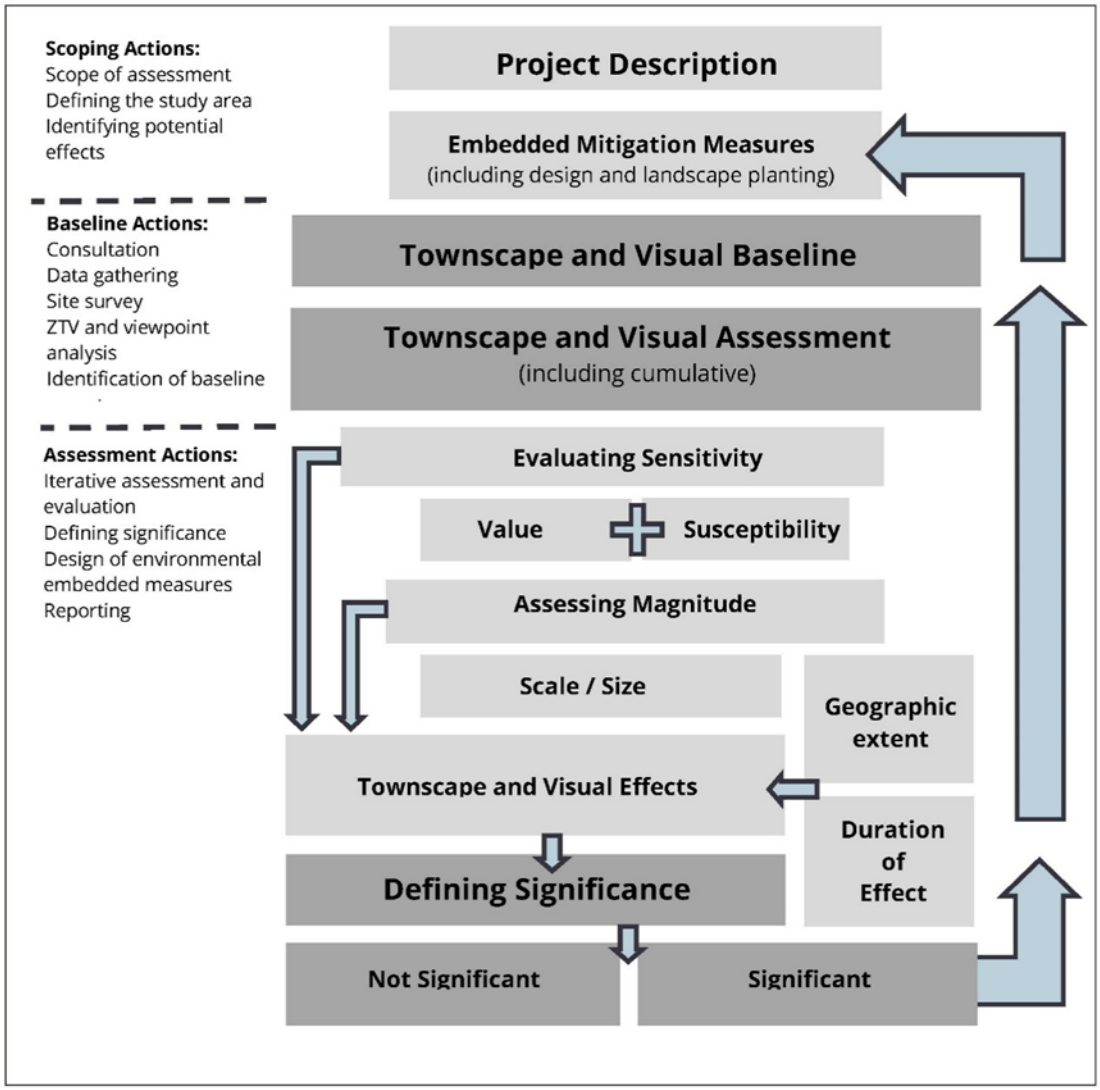
- Cumulative effects - arising where multiple developments are experienced at a proximity where they may have a greater incremental effect, or where they may combine to have a sequential effect. The TVIA assesses the cumulative effect of the Proposed Development with other existing or approved projects (listed in **Table 12.11**) against the baseline, with the assessment of significance apportioning the amount of the effect that is attributable to the

Proposed Development. The contribution of the Proposed Development to the cumulative effect upon the baseline character/view is assessed and information provided on how the effects of the Proposed Development would combine and interact with the effects of other cumulative developments (Table 12.12). Townscape and visual effects will be assessed through an assessment of the sensitivity to change of each receptor, in conjunction with the magnitude of change arising from the Proposed Development, combining to inform judgements on significance of effect.

Overview of Approach to TVIA

12.45 An overview of the TVIA process is provided here and illustrated diagrammatically in :

Plate 12.1: Overview of Approach to TVIA



12.46 The TVIA assesses the likely significant effects that the construction stage (including groundworks) and operational stage of the Proposed Development have on the townscape and visual resource, encompassing effects on townscape character, townscape designations, visual effects and cumulative effects.

12.47 The assessment of whether an effect has the potential to be of likely significance has been based upon review of existing evidence base, consideration of commitments made (primary mitigation measures embedded into the design of the Proposed Development), professional judgement, evaluation of sensitivity of the receptor and magnitude of change, and where relevant, recommended aspect specific methodologies and best practice.

12.48 To ensure the provision of a proportionate EIA Report that is focused on likely significant effects, the assessment takes into account the considerable levels of existing environmental information available, extensive local geographical knowledge and understanding of the Site and surroundings gained from site surveys. This includes, but is not limited to, work undertaken as part of the 2019 TVIA for the Plot 11, First Street South EIA.

12.49 The townscape and visual assessment unavoidably involves a combination of quantitative and qualitative assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

12.50 For a full description of the TVIA assessment methodology, please refer to **Appendix 12.1**: Townscape and Visual Assessment Methodology.

Significance Criteria

12.51 Sensitivity to change is an expression of the ability of a landscape or visual receptor to accommodate the Proposed Development. Sensitivity will be determined through a combination of the value attached to the receptor and the susceptibility of the receptor to the Proposed Development. The criteria used to define sensitivity in the townscape, visual and cumulative assessments varies. Levels of sensitivity - high, medium to high, medium, medium to low, low and negligible will be applied in order that the judgement used in the process of assessment is made clear.

12.52 Magnitude of change is an expression of the degree of change that will occur on the townscape and visual receptors as a result of the introduction of the Proposed Development. The magnitude of change will be assessed in terms of the size and scale of the effect and the geographical extent of the area influenced. Levels of magnitude of change will be applied in order that the judgement used in the process of assessment is made clear. The criteria used to determine magnitude of change differs for assessment of effects on townscape receptors and visual receptors.

12.53 The effects of the Proposed Development are of variable duration, and will be assessed as either short-term or long-term, and permanent or temporary/reversible. Effects resulting from construction will be apparent only during the short-term. The main built components of the Proposed Development will be apparent after final completion and the effects resulting will be assessed as permanent.

12.54 The reversibility of effects is variable. The effects that will occur during the construction stage from the use of tall cranes and heavy machinery, are likely to be temporary. Permanent effects include physical removal of landscape/townscape elements required for the development of the Site and any residual effects that remain following construction of the built elements.

12.55 The objective of the assessment of the Proposed Development is to predict the likely significant effects on the townscape and visual resource.

12.56 The significance of effects is assessed through a combination of two considerations - the sensitivity of the landscape or visual receptor and the magnitude of change that will result from the Proposed Development. In accordance with the Landscape Institute's GLVIA3, the TVIA methodology requires the application of professional judgement. Although it is not reliant on its use, the following matrix (Table 12.1) has been included to illustrate how combinations of the ratings for sensitivity and magnitude of change can give rise to significant effects, as well as to give an understanding of the threshold at which significant effects may arise.

Table 12.1: Significance Matrix

	Sensitivity:		
Magnitude of change:	High	Medium	Low
Large	Major (significant)	Major-moderate (significant)	Moderate-minor (not significant)
Medium	Major-moderate (significant)	Moderate (significant or not significant)	Minor (not significant)
Small	Moderate-minor (not significant)	Minor (not significant)	Negligible (not significant)
Negligible	Minor (not significant)	Minor-negligible (not significant)	Negligible (not significant)

12.57 Effects that are assessed as major or major-moderate within the matrix are assessed to be significant. Those effects that are assessed as moderate may be significant, or not significant, depending on the specific factors and effect that is assessed in respect of a particular landscape or visual receptor. In accordance with GLVIA3, experienced professional judgement has been applied to the assessment of all effects and reasoned justification is presented in respect of the findings of each case.

12.58 The TVIA also determines the nature of the effects, i.e. whether townscape and visual effects are beneficial, neutral or adverse in accordance with defined criteria. A significant adverse effect could be, for example, where the Proposed Development would result in complete variance from the scale and pattern of the townscape or view, or cause a high quality townscape/highly sensitive view to be permanently changed; or a significant beneficial effect could be, for example, where the Proposed Development would integrate well with the prevailing townscape character of the area or view, and improve the quality of the townscape or composition of a view.

Graphic Production

12.59 The Proposed Development has been modelled and set within this terrain and building height block model, to determine where it would be visible using visualisations from a series of representative viewpoints.

12.60 Visual representations have been provided in Figures 12.7 – 12.21 for each of the 14 viewpoints agreed with MCC. Methodology for the production of the visualisations is contained within the document 'Accurate Visual Representation (AVR) Methodology 2023' provided by Our Studio.

12.61 Photomontages have been produced for five of the 14 viewpoints, and wireline visualisations for nine viewpoints, to illustrate the Proposed Development in the context of the building height block model and other baseline committed developments.

Baseline Conditions

Introduction

12.62 This section describes the 1km study area based on current and future conditions. Establishing a baseline helps to gain an understanding of what makes the study area distinctive, what its important components or characteristics are, and how it could change prior to the introduction of the Proposed Development. Baseline conditions describe the townscape character, related planning policies and designations, visual receptors and views, and cumulative developments.

Baseline and Key Sensitivities –Townscape

Historical and Cultural Context

12.63 Historically the study area has been a changing, dynamic place, partly due to fluctuating economic circumstances. The social and economic revolution of the Industrial Age was a key factor in the development of the area, as evidence by the textile warehouses, cotton mills and commercial buildings of the 18th and 19th centuries. During the early 20th century the cotton industry fell into decline and with it the canals and rail transport. Warehouses were left empty and abandoned - a legacy still visible today. However, the decline started to reverse in the mid to late 20th century and today tourism and leisure are now the growth industries. To the south of the Site is the ward of Hulme, which has historically been used primarily as a residential area. Victorian terraces made way for 1960's housing, which have subsequently been removed and new homes built in their place.

Existing Land Use of the Site and Immediate Surroundings

12.64 The planning application (Ref. 125573/FO/2019) for development on the Site and immediate surroundings, referred to as First Street South, was approved in March 2021, and Blocks A, B and D are currently under construction, however the baseline for this TVIA assumes Blocks A, B and D are completed and operational, as described above. The buildings vary in height between 22 and 45 storeys, and feature associated public realm provision. First Street South constitutes a new mixed-use, residential-led development, comprising co-living bedspaces, ground floor commercial units and the provision of amenity facilities, as well as associated public realm improvements, in the immediate vicinity of the Site.

12.65 The Site is currently vacant land, consisting of areas of hardstanding and scrub, surrounded by boundary hoardings. Adjoining roads include the adjacent A57 (M) Mancunian Way to the south; Medlock Street to the west; Hulme Street to the north and Wilmott Street to the east. There is little change in levels across the Site but the A57 (M) is raised to approximately the second storey of the Site above ground level.

12.66 There are no water features on the site and no visible streams across the site, although numerous canals and open water channels exist in the study area.

Land Use of the Surrounding Area

12.67 North of the Proposed Development is the city centre of Manchester, containing a rich historic legacy of conservation areas, listed buildings and street patterns. The area has a tight, dense urban grain which is still largely based around a street pattern shaped by canals, rivers and railways. It contains a wide and closely integrated range of uses including commercial, civic and residential activities set within iconic Victorian Architecture and large municipal buildings. Mainline railway tracks extend from Deansgate Station to the north, running parallel with the Manchester Ship Canal which comes into the city from the west.

12.68 The area between the city centre and the Site has been through extensive re-development, with First Street North being realised and now forming a distinctive new neighbourhood which acts as a prosperous cultural, commercial and residential hub for the city. The First Street South proposals have extended this character further south, towards the Mancunian Way, which generally contains high-rise, high-density development to the north, separating the city centre from lower density residential development to the south.

12.69 To the east of the Proposed Development is a mix of commercial and renovated industrial buildings which follow established historic street grids along the A34 Oxford Rd, Cambridge Street and Princess Street.

12.70 To the south-east of the Site are facilities and buildings associated with the University of Manchester as well as other major educational and medical institutions located alongside a linear route in a variety of large scale buildings. The area is typically very active 24-hours a day, with active street frontages and a vibrant feel. Many attractive parks and open spaces are also characteristic of this area.

12.71 South of the Site is dominated by the A57 (M) Mancunian Way which forms part of the Manchester – Salford inner ring road. The section near the Site is elevated and runs roughly east to west. Beyond the A57(M) are typically 1960's social housing estates of Hulme and zoned industrial areas which are often aligned along a north-west to south-east axis and connected to major roads such as A5067 Stretford Road. The areas are predominantly residential with some areas of open public green space. Hulme's character is rapidly changing in the east, with the addition of modern flats along Leaf Street and new student hall buildings along Bonsall Street. Stylish cafes and shops are opening up to cater for the new residents in the eastern part of Hulme. South-west of the Site are residential areas typically located around large areas of open space such as St Georges (or Barrack) Park. Chester Road (A56) connects the Mancunian Way to Old Trafford to the west.

12.72 The area known as Knott Mill is located to the west of the Site, and is subject to an illustrative masterplan to provide an overall strategy for the future development of this area, with the ambition for new development to create a critical mass of residential and workspace accommodation, which will in turn support the introduction of a range of amenity provision. A Strategic Regeneration Framework for Great Jackson Street, also located to the west of the Site, south-west of Knott Mill, was published in 2007 and subsequently updated in 2015 and 2018. Several of the developments proposed within this masterplan are now complete or nearing completion, including tall buildings at Deansgate Square and Crown Street. South Tower, within the Deansgate Square development, is the tallest building in Manchester at 201m. These developments have created a pattern of high rise buildings in close proximity to the Mancunian Way, and have extended the apparent city centre of Manchester further south and west.

Connectivity and Public Rights of Way

12.73 The Site is adjacent to Medlock Street to the west, and surrounded by the three buildings of First Street South to the north and east. The A5103 forms the southern boundary. Pedestrian access to the Site is not currently available.

12.74 The nearest recognised long distance public path is Sustrans National Cycle Route 6, which passes in close proximity to the east of the Site. Almost adjacent to this is the 98 mile long Cheshire Ring Canal Walk to the north of the Site. The Site itself does not contain any Public Rights of Way or public access, but is in close proximity to these two national long distance paths. The Proposed

Development will not directly impact upon the national paths but has the potential to impact upon views from the path. Rights of Way will therefore be considered as part of the visual assessment.

Urban Grain, Height and Massing

12.75 The three buildings within the First Street South development have altered the townscape in close proximity to the Site, which until recently comprised formerly industrial vacant land. The largest of these, Block D, extends to 45 storeys. Blocks A and B have a stepped form, and reach 22 storeys and 26 storeys respectively at their highest points. The buildings are clad predominantly in glass unitised curtain walling which features a repeating white ceramic frit pattern to create horizontal banding. Each of these buildings is positioned on a 'landscape wedge' or podium at first floor level, which provides new amenity spaces for residents. There are also public realm improvements, including a public square and public park. The three buildings within the First Street South site act as a gateway area into the city centre, albeit of a more residential nature than the mixed-use First Street North development to the north. The area immediately surrounding the Site now functions as a transition between more open, residential areas to the south and the more densely developed, urban character of the city centre townscape to the north.

12.76 To the north of this are the new buildings of the First Street North site, which forms a new cultural quarter within the city supports and enhances the character of the surrounding townscape. The First Street North site has important public spaces and routes, with HOME hotel, Q Park, student accommodation (Vita), offices and leisure. The elevations of HOME are clad in red, glazed terracotta panels which respond to the local red-brick context; while the cladding of the Q Park and Vita buildings have yellow and grey panel and dazzle facades.

12.77 To the west of the Site are clusters of initially tall commercial and residential units with premises built up to or close to their boundaries. The River Street tower is located within relatively close proximity to the western edge of the Site, and extends to 92 m with a total of 32 floors. Across the wider area, building forms are uniform and are usually comprised of an unbroken chain of built form throughout the plots. The height of the blocks varies from typically 6 – 8 storeys with internal courtyards. Massing of these redeveloped sites is dense and the street view of some roads to the north is narrow.

12.78 Deansgate Square is a cluster of tall buildings to the north-west of the Proposed Development, consisting of four skyscrapers. The highest of these, the South Tower, is 64 storeys (201m) tall and represents the tallest building in Manchester. The four skyscrapers form a distinctive landmark element in the skyline to the north-west of the Site. Beetham Tower also forms a landmark feature, and is the second-tallest building in Manchester at 169m high with a total of 47 floors. It is located north of Deansgate Square, to the north-west of the site.

12.79 The areas of land to the north-east of the site include vacant land with car parking, where views are available across flat car parking areas, limited by tree belts, scrub and hoarding around plots. Areas to the south-east contain primarily educational buildings such as those associated with the University of Manchester. Buildings are often in laid out in a grid formation with the buildings forming a tall boundary with an internal space within it, or fronting an area of public space.

12.80 To the south and south-west of the Site the urban grain is often more open, with large formal open spaces (such as Hulme Park) and tree lined footpaths allowing more open views towards the site. Residential blocks are of typically lower height and mass than the industrial areas, being comprised of 2 to 3-storey buildings along linear routes as well as some larger residential blocks set within areas

of mown grass open space. Buildings are often less uniform in character, age and orientation across the residential areas, creating a more varied street typology to the south.

Townscape Character Areas

Strategic Character Areas (SCAs)

12.81 Strategic Character Areas (SCAs) are identified within the Core Strategy Development Plan Document (DPD) (MCC, 2012). Policy EN1 relates to "Design Principles and Strategic Character Areas":

"All development in Manchester will be expected to follow the seven principles of urban design, as identified in national planning guidance and listed above and have regard to the strategic character area in which the development is located. Opportunities for good design to enhance the overall image of the City should be fully realised, particularly on major radial and orbital road and rail routes..."

12.82 Eleven SCAs are identified within the Manchester city area, at a strategic scale, within which the Site falls within the boundaries of the following SCAs:

12.83 Central Art SCA: Described by the DPD as:

"The character of the area we have today is predominantly one of 1960's social housing estates and zoned industrial areas bisected by the transport network and largely resulting from the comprehensive redevelopment of the past. Significant areas of employment are found where this area overlaps with the fringe of the City Centre such as at Strangeways which is a large, distinctive, entirely industrial area suitable for further employment growth. Much of the Central Arc is experiencing regeneration with some contemporary urban solutions, for example in Hulme, now complete, and some still to be progressed.

The opportunity exists for development on a large scale using innovative urban design solutions. These should use District Centres and key nodes of public transport as focal points and involve existing communities. The opportunity should also be taken to use the canals to create a distinctive urban environment and enhance access through the City."

12.84 The Central Arc Character Area is characterised by 1960's social housing estates and zoned industrial areas bisected by the transport network. There are significant areas of employment, particularly on the City Centre fringe, as well as areas of regeneration, such as in Hulme. Opportunities also exist for development on a large scale.

12.85 City Centre SCA: Described by the DPD as:

"The City Centre contains a rich legacy which reflects its urban evolution to the current day and includes listed buildings, conservation areas, archaeological remains and an historic street pattern. Its core area presents a particularly dense environment that accommodates a wide and closely integrated range of uses including commercial, civic and residential activities. Relative to the amount of development there is limited open space and this includes a range of civic and less formal green spaces and waterways. Outside the core and associated with the Inner Relief Route there are less active and

less densely developed areas with significant elements of cleared land. The City Centre is the focus of the City's transport routes.

Developers will be expected to consider the City's heritage and continue the rich pattern of activity in the core area.

While there will be opportunities to create landmark buildings, developments should also contribute positively to the experience of all at street level.

Wherever possible the opportunity should be realised to enhance existing and provide new areas of meaningful open space, and the maintenance and improvement of the City's permeability should be considered in all proposals."

12.86 The City Centre Character Area is dominated by the historic core, although the Site falls outside this area, being associated with the Inner Relief Route. Here there are less active and less densely developed areas with significant elements of cleared land. The City Centre is the focus of the City's transport routes. While there will be opportunities to create landmark buildings, developments should also contribute positively to the experience of all at street level.

Townscape Character Areas (TCAs)

12.87 A finer grained character assessment of the townscape character of the study area has been undertaken as part of the TVIA, to provide a townscape character baseline that is appropriately detailed to the assessment of the Proposed Development and TVIA study area.

12.88 Townscape Character Areas (TCAs) are defined within the TVIA study area (Figure 13.2), informed by desk study analysis of the SCAs, previous TVIAs for First Street South and surveys undertaken within the site and TVIA study area. Six TCAs are identified within the TVIA study area (**Figure 12.2**), with a baseline description of each TCA provided in Table **12.3** together with an evaluation of their sensitivity to change.

Table 12.3: Townscape Character Areas (Scenario 1)

Criteria		Assessment Description
TCA1: Castlefield and St John		
Baseline		This TCA is covered by the conservation areas of Castlefield and St Johns. Its eastern extent is defined by the A56 Deansgate with the A57, railway lines and canal sections dividing up the area into subtly different compartments. Historic industrial red brick buildings are found throughout the TCA providing a strong link to the industrial heritage of the area. The area is now residential in nature with converted warehouses sitting amongst new build apartment blocks. There are no committed developments scoped in within this TCA.
Value	High	The Castlefield and St John Street CAs are located at least partially within this TCA, denoting a heightened townscape value across this area. The value is considered to be high.
Susceptibility	Low	Parts of this TCA are more open due to intersecting infrastructure creating areas which are less built up, and which are punctuated by small areas of open space and car parking between linear infrastructure and the large buildings in the area. This has resulted in a more open urban grain allowing views towards the TCA in which the Site is located, and in that regard this area is susceptible to change. However, the level of susceptibility is moderated by the existing developments in the same part of the view and townscape as the Proposed Development. Susceptibility is considered to be low.

Criteria		Assessment Description
Sensitivity	Medium	The combination of high value and low susceptibility results in this TCA having a medium sensitivity to changes associated with the Proposed Development.
TCA2: Manchester City urban core		
Baseline		Manchester City urban core contains several conservation areas and within the study area these include Whitworth Street, George Street, St Peters Square, Upper King Street and Deansgate / Peter Street Conservation Areas. The large scale of buildings in this area limits views out of the area into other parts of the city. Key buildings in the area include the Midland Hotel, Central Library, City Art Gallery and Town Hall. The historic character created by this impressive urban fabric is punctuated by newer additions such as tall office blocks and apartments as well as residential or hotel conversions within some of the historic red brick buildings in the area. There are no committed developments scoped in within this TCA.
Value	High	This TCA is covered by several CAs, some of which extend further into the centre of Manchester. These CAs denote a heightened townscape value across this area and the value is considered to be high.
Susceptibility	Low	This area would be susceptible to changes within its core, however, the TCA shares little intervisibility with the Site and the potential influence that the Proposed Development could have on this TCA is minimal. Susceptibility is therefore considered to be low.
Sensitivity	Medium	The combination of value and susceptibility to the Proposed Development would give rise to an overall sensitivity rating of medium for this TCA.
TCA3: City Centre transition		
Baseline		This is an area of transition between the historic core of Manchester and the industrial centre fringes that are now undergoing large scale regeneration. The area has several buildings with very large footprints, including the 235 Casino, Odeon Cinema, Manchester Central Convention Complex and Bridgewater Hall. Other buildings form irregular blocks which sometimes result in narrow streets. Some buildings have retained historic facades, in particular where the area begins to transition more with the historic core to the north. The Beetham Tower is a notable addition to this area and can currently be used as an orientating landmark building. Committed developments 4: Barclay House, 5: Havelock, 6: Viadux and 7: Staycity Deansgate are located within this TCA. These committed developments are all under construction and therefore form part of the baseline.
Value	Medium	The value of this TCA is medium. Although the TCA itself is not covered by any townscape designations or CAs which may denote a special townscape value, it is bordered to the west, north and east by several CAs that define the historic core of the city centre. There are several features of townscape value, including historic features and landmark buildings.
Susceptibility	Low	Due to the large scale and massing of the buildings within this area, the influence that the Proposed Development would have on the TCA is restricted, and the potential for townscape effects is limited. The area is capable of accommodating further change within the same context and in the neighbouring TCA to the south in keeping with the current pattern of committed development. Susceptibility to change is considered to be low.
Sensitivity	Medium	The combination of value and susceptibility to the Proposed Development would give rise to an overall sensitivity rating of medium for this TCA.
TCA4: Major Educational		
Baseline		This area is predominantly University focussed with large institutional buildings mixing with varied residential which has a strong student presence including many specific student halls accommodation blocks. The area is described as the 'Corridor' in the Manchester Core Strategy 2012 – 2027 as a key economic asset

Criteria		Assessment Description
		in recognition of the thriving university and hospital core that surrounds the A34 Oxford Road. The larger scale institutional character is expanding towards Hulme with the addition of the Birley Fields Campus and impressive Brooks Building. A mix of uses and architectural character has evolved over the years resulting in a vibrant and active character for the area, particularly within the core along Oxford Road. Committed development 3: Metropolitan University Science and Engineering Building is located within this TCA. This development is under construction and therefore forms part of the baseline.
Value	Medium	The value of this TCA is medium. Although the TCA itself is not covered by any townscape designations or CAs which may denote a special townscape value, it is bordered to the north by the Whitworth Street and Princess Street CA. Its character results from the mix of uses and architectural styles, and it has local value due to its position as the heart of the well-established university area of Manchester.
Susceptibility	Low	Due to the large scale and massing of the buildings within this area, the influence that the Proposed Development would have on the area is restricted and as such the potential for townscape effects is also limited. The area has an active and vibrant character capable of absorbing substantial change without loss of characteristics. Susceptibility to change is considered to be low.
Sensitivity	Medium	The combination of value and susceptibility to the Proposed Development would give rise to an overall sensitivity rating of medium for this TCA.
TCA5: South-west City Centre Redevelopment		
Baseline		Located between the Mancunian Way A57(M), Chester Road A56 and Whitworth Street B6469, and to the south of the Bridgewater/Rochdale Canals, this area has been a focus for large scale redevelopment within the south-western part of Manchester City Centre. It includes the First Street, Great Jackson Street and Knott Mill masterplan areas. It comprises a mix of redeveloped industrial buildings, recently constructed residential towers/new build apartments and office block developments, and areas of vacant land. The large scale of the recently constructed towers and those currently under construction, within the context of the other committed developments in this area, fits with the focus of large-scale regeneration encompassing tall buildings and a mix of architectural styles at its core. This has created a high quality residential-led neighbourhood at a key point of entry into the City Centre. The identity of this 'Southern Gateway' is therefore starting to materialise. However, at present it still has a somewhat fragmented character with some historical and industrial components remaining, including some of the surviving cobblestone roads, large industrial / commercial units and remnant red brick factory buildings. Committed developments within this TCA which are under construction and therefore form part of the baseline comprise 1: Plot 9a, First Street, 2: First Street South (Plots A, B and D only), 8: The Blade and Three60, 9: Plot 10A, First Street, 10: Plot 10B, First Street, 11: Great Jackson Street Plot F and 12: Vision. Committed developments within this TCA which are not yet under construction and are therefore considered within the cumulative assessment comprise 13: One City Road, 14: Park Place, 15: Travelodge Deansgate Locks, 16: Deansgate South, 17: Bridgewater House, 18: One Medlock Street, 19: Great Jackson Street - Crown Street Plot D, 20: Great Jackson Street - Crown Street Plot C and E, and 21: Student Castle.
Value	Medium	The value of this TCA is medium. It is not covered by any townscape designations or conservation areas which may denote a special townscape value. However, it has undergone substantial recent redevelopment, including with the completion of Blocks A, B and D within First Street, which contribute to the development of a

Criteria		Assessment Description
		distinctive 'gateway' to the city centre. There are also several historic features and a range of architectural styles. These elements contribute to a higher value. Overall, the value is considered to be medium.
Susceptibility	Low	The Proposed Development is located within this TCA, and its character is therefore of higher susceptibility to change as a result of the introduction of the Proposed Development. The area has a fragmented character and is currently undergoing substantial redevelopment within the First Street, Great Jackson Street and Knott Mill masterplan areas with recently constructed and under-construction tall residential towers. The large scale of the recently constructed towers combined with areas of vacant land awaiting re-development indicate its capability to accommodate further change within the same context and of a type which is in keeping with the current pattern of committed development.
Sensitivity	Medium	The combination of value and susceptibility to the Proposed Development would give rise to an overall sensitivity rating of medium for this TCA.
TCA6: Residential		
Baseline		The area to the south of the Mancunian Way A57(M), is residential in character. Residential streets and crescents connect to the A5067, Stretford Road / Chorlton Road and the A5103 Princess Road. Compartments of this area are interspersed with green open spaces such as Hulme Park, St Georges Park and Bold Street Sports Ground. Building types vary but are predominantly made up of two-storey residential semi-detached houses or two- to three-storey terraced streets. Larger flatted properties are found in the eastern parts of this area where it interfaces with the Major Educational TCA and the A5103 Princess Road. The area's character is rapidly changing in the East, with the addition of modern flats along Leaf Street and new student hall buildings along Bonsall Street. The further residential area that has been identified within the study area is to the east of Kincardine Road and south of the Mancunian Way. This area is primarily terraced two- and four-storey homes with some taller, flatted development. There are peripheral areas of greenspace. This area is currently undergoing regeneration. There are no committed developments scoped in within this TCA.
Value	Low	The value of this TCA is low. It is not covered by any townscape designations or CAs which may denote a special townscape value, although it has local value for residents. Its contrasting character to the higher density development within areas to the north towards the city centre provides a more suburban character within close reach of the city centre. The area is likely to be locally valued.
Susceptibility	Medium	Whilst potentially indirect effects could occur to large areas of this TCA, the Proposed Development lies within a distinctly urban area that already accommodates larger built elements. These include Blocks A, B and D within First Street South in close proximity to the Site, as well as the wider townscape of Manchester City Centre. However, the susceptibility to changes associated with the Proposed Development is heightened by the differences in scale between the Proposed Development and the smaller, domestic residential scale of this TCA. Overall, the susceptibility is considered to be medium.
Sensitivity	Medium	The combination of value and susceptibility to the Proposed Development would give rise to an overall sensitivity rating of low for this TCA.

Townscape Features and Designations

12.89 There are no local landscape or townscape designations recognised for their scenic quality and no nationally designated Registered Parks and Gardens (RPGs) or World Heritage Sites located within the study area. The Site is not located within a Conservation Area (CA), but to the north there are eight conservation areas within or partially located within the study area. These conservation areas

lie within the townscape character areas Castlefield & St Johns TCA and Manchester City Urban Core TCA as follows and identified in Figure 13.3:

12.90 Castlefield & St John's TCA:

- Castlefield CA
- St John Street CA
- Manchester City Urban Core TCA:
- Deansgate CA
- St Peter's Square CA
- Upper King Street CA
- George Street CA
- Whitworth Street CA
- Albert Square CA

12.91 These conservation areas influence the sensitivity of the townscape in the study area. Conservation areas are therefore included in the assessment of sensitivity for each townscape area which is used in combination with the magnitude assessments for the townscape areas to assess the likely significant effects of the Proposed Development on the townscape character of the study area.

12.92 Each conservation area has a detailed description within the Manchester City Council conservation area appraisals detailing the identity, history and townscape of each area as well as opportunities for improvement and enhancement and control of development. The 'Townscape' citation from these conservation appraisals has been included in **Table 12.4** below in order for particular townscape sensitivities to be considered in the townscape character assessment.

Table 12.4: Conservation Area Townscape Appraisal Extracts (Scenario 1)

Conservation Areas within Castlefield and St Johns TCA
Castlefield CA
'Although the variety of building materials used in Castlefield is very wide, it tends to be more rugged and industrial in character than in other parts of the city centre. Stone, brick and slate are used extensively, but the most impressive building components are the massive cast-iron columns supporting the railway viaducts and, of course, the viaducts themselves, which are constructed of iron lattice beams. When the quays and canal branches were used for loading, unloading and transporting goods, they needed to be durable and resistant to the heavy pounding of horses' hooves and the iron rims of wagon wheels. Granite setts were therefore used as they were the most durable material available. After many years of use, the top surfaces became smooth and rounded.'
St John Street CA
'At the west end the view along St John Street was originally terminated by St John's Church, now replaced by a formal garden containing a central memorial. Looking eastwards there is no evidence to indicate that there has ever been a specific focal point to punctuate the view. Georgian properties here have given way to a long row of Victorian shops

Conservation Areas within Castlefield and St Johns TCA
and offices which screen the former Deansgate Goods Station… St John Street is a wide street by Georgian standards, and this contrasts sharply with the narrow back streets - Artillery Street, Culvercliffe Walk and Longworth Street - which provided access to the workers' cottages. The linear, dynamic, directional character of these streets also contrasts with the static, tranquil spaces of the gardens, particularly St John's Churchyard. The contrast is also significant in the hard materials of the streets and the soft trees and shrubs in the gardens.'
Conservation Areas within Manchester City Urban Core TCA
Deansgate / Peter Street CA
'Deansgate is the longest and straightest street in the city centre and consequently there is a distant view to the north showing the tower of the cathedral framed by buildings on either side. To the south, railway viaducts in Castlefield cross Deansgate and terminate the view. Peter Street, and its continuation into Quay Street, is the most important junction in the area… Acute and oblique angles affect the plan form of buildings; since land in the city centre is at a premium, buildings totally cover their Site and as a result more interesting buildings occur, many with corner entrances which are typical of Manchester.'
St Peters Square
'The main characteristic of St Peter's Square conservation area is primarily one of civic grandeur, but it also contains some commercial property. It has been designated to include a more extensive area than just the square described above, in order to include several distinguished buildings. The Peace Garden, although laid out after the designation and therefore not a part of the St Peter's Square conservation area, is regarded as an important element of the same urban space… The Central Library and the Town Hall Extension were designed at the same time, and together they form a single composition with a walkway between them, thus creating one of the most dramatic urban spaces in the City.'
Upper King Street CA
'The upper part of King Street is a wider and more majestic continuation of the earlier portion to the west. Although almost all properties in the street have been re-developed at some time, the west retains the small-scale property boundaries typical of the Georgian period while the upper part to the east has changed its character completely… The buildings are large, and although the architectural styles vary greatly they do for the most part create a harmonious street scene. The view looking up the street is terminated by a group of buildings with an interesting skyline of pediments, cupolas and chimneys in the Baroque style. These buildings are not exceptionally tall, though there is a general increase of height and mass towards the top of King Street. All are dwarfed, however, by the tower of the Piccadilly Plaza, which can be seen in the distance.'
George Street CA
'The regular grid pattern of streets established in Georgian times is still in existence. Where open spaces are created by the removal of a block of buildings, it is essential that the character of the area is retained by maintaining the street pattern. The most significant buildings, such as the Art Gallery, are situated on the wider streets at the periphery of the conservation area… Near the junction of Portland and Princess Streets, some of the small-scale Georgian buildings still survive, many of them accommodating small shops and public houses.'
Whitworth Street CA
'Manchester is situated on a large plain which stretches from the west coast to the Pennines… Consequently even minor rivers are capable of shaping the land into valleys. Part of the conservation area lies in the valley of the River Medlock, and this is marked by a distinct southerly slope and by large bends in the course of the river creating contrasting spaces within the overlying street grid system. The Rochdale Canal traverses the area from north-east to south-west, and although not contributing to the slope it nevertheless flows gently downhill through a series of nine

Conservation Areas within Castlefield and St Johns TCA
locks, two of which are in the conservation area… The great height of the warehouses along Princess Street, and especially on Whitworth Street, give the area its most obvious physical character of a canyon-like atmosphere… Although streets are arranged on a rectilinear grid, so that Sites are more or less rectangular, no street runs straight for any great distance before changing direction. This creates subtle changes and interest, with views along a street being modified or foreshortened by the elevations of buildings on the outer side of a bend or curve. It also gives even greater emphasis to the corners of buildings.'
Albert Square CA
'The main characteristic of the Albert Square conservation area is its civic grandeur, but it also contains many commercial properties and small-scale buildings. Originally designated to include the immediate surroundings of Albert Square and the Town Hall, its extension as far as Deansgate in 1985 has added properties of a lesser architectural significance. Lincoln Square and its statue are included, most of the buildings in the square being of the 1960s and 1980s and of varying architectural merit. The most notable is Lincoln House fronting on to Deansgate, a glass office block built in 1986. A pleasant atmosphere is created in the Square by the paving and the generous planting of trees.' 'There is much variety in the building materials used in Albert Square. Stone, brick, terracotta and slate are used extensively. These solid traditional materials are preferred, in new developments, to large expanses of cladding, concrete and glass. Generally buildings on the eastern side of the Square are built of yellow stone whilst those on the west side, opposite the Town Hall, are finished in red brick. This helps to emphasise the civic importance of the Town Hall. The civic route, proposed in the 1945 plan, between the Town Hall and the Law Courts was largely unrealised, but it did emphasize the principal characteristic of the conservation area, namely the view looking east along Brazennose Street which focuses on the dominant tower of the Town Hall, framed by commercial buildings on either side.'

Current Trends for Change

12.93 The First Street area was identified as having regeneration potential by Manchester City Council as early as 2010. An original Development Framework was published in 2010, followed by a subsequent Strategic Regeneration Framework in 2015. An updated Development Framework was published in 2019, followed by an addendum in 2020.

12.94 The 2015 SRF identified four distinct development areas, comprising First Street North, First Street Central, First Street South, and the Creative Ribbon. It defined the "key role and function of each of these areas, appropriate development activity and a set of urban design criteria providing a framework for future proposals" (Deloitte, 2018). The Development Framework (2018) provided an update on work carried out to date, as well as providing a description of evolving proposals for the First Street Central development area. The 2020 addendum also related specifically to First Street Central.

12.95 First Street South was originally envisaged as an "anchor destination at the southern end of the site", and this was updated through the 2015 SRF to incorporate "a number of uses… including food and local amenity retail, hotel/restaurant facilities, student accommodation, and car parking" (Deloitte, 2018). However, through the 2018 Development Framework, this was updated to focus on residential development due to increased demand for residential accommodation and enhanced interest from investors.

12.96 The Development Framework (2018) identifies several urban design criteria, to be treated as material considerations in the determination of planning applications within this area. Criteria of relevance to TVIA include:

- *"First Street South should form a coherent urban district that responds to and reinforces the existing character and pattern of development in the area, as well as the emerging character and quality being generated within the wider First Street site…*

- *First Street South will consist of a mixture of lower, medium and taller buildings. The distribution of height will respond to the need for good levels of sunlight and daylight to dwellings, amenity spaces and public open spaces, as well as the opportunities to create strategic views to and from particular buildings. The massing of buildings within First Street South should be varied to provide visual interest to streets and to the skyline of the development as a whole. Breaks and gaps in elevations should be created to allow glimpsed views between streets and private courtyard landscaping…*

- *Buildings in First Street South should use a range of materials that are complementary to the surrounding existing areas as well as the emerging context elsewhere within the wider First Street development. These may include the use of brick and other robust self-finished materials." (Deloitte, 2018)*

Baseline and Key Sensitivities – Views and Visual Receptors

Visual Amenity

12.97 The First Street South blocks A, B and D form the immediate context of the Site to the north and east, and comprise modern, newly built residential development ranging in height from 22 storeys to 40 storeys. North of this, further modern mixed use development at First Street North has become a new cultural quarter of the city, containing the HOME theatre. To the west a small, tree lined landscape area exists contained within a circular access slipway linking the Mancunian Way with Medlock Street. Three modern student residences lie to the south of Chester Street, to the east of the Site, and range from approximately 14 - 16 stories. The River Street tower, to the west of the Site, comprises 32 storeys.

12.98 Together, these new developments have altered the skyline in the immediate surroundings of the Site, creating a clear distinction between tall buildings to the north of the Mancunian Way, and lower-rise development within Hulme to the south. Overall, these developments form a clear landmark indicating the southern boundary of the city centre.

12.99 Areas to the south-east contain educational buildings such as those associated with the University of Manchester and Manchester Metropolitan University. Buildings are often laid out in a grid formation with the buildings forming a tall boundary with an internal space within, or fronting an area of public space.

12.100 To the south and south-west of the Site, views are often more open, with large formal open spaces (such as Hulme Park) and tree lined footpaths allowing more open views towards the Site. Residential blocks are of typically lower height and mass than the industrial areas, being comprised of 2 to 3-storey buildings along linear routes as well as some larger residential blocks set within areas of mown grass open space. Buildings are often less uniform in character, age and orientation across the residential areas, creating a more varied street typology to the south.

12.101 The visual amenity of the Site and immediate parts of the study area are influenced by the urban grain, height and mass of existing and under-construction buildings and the streetscape in the immediate vicinity, with a complex urban grain and diverse visual amenity arising from the regeneration of the area, with contrasts of old red-brick and modern buildings, industrial built

heritage and newly constructed or approved tall buildings in juxtaposition. Committed developments within the study area which either already influence the visual amenity, or will influence views when they are constructed, are shown in Figure 12.5.

Visual Receptors

12.102 Visual receptors are the groups of people who experience the visual amenity of the study area and who may experience views of the Proposed Development.

12.103 Principal visual receptors in the TVIA are the people within the study area who will be affected by changes in views and visual amenity as a result of the Proposed Development, which primarily include:

- Residents living in the area;
- People working in the area;
- People travelling through the area on the roads or trains; and
- People engaged in recreation including cyclists, walkers and people using the canal and public parks.

12.104 Visual receptors in the study area include (but are not limited to) - residents of Hulme and Manchester City Centre, student residents in the areas between the Site and Oxford Road; as well as motorists on the network of public roads in the study area; Metrolink tram and rail passengers; people working in central Manchester; visitors, particularly to the civic centre around Manchester Town Hall, Library and St Peters; and pedestrians using both footpaths around streets and long distance paths such as those along the Bridgewater and Rochdale Canals as well as the canals themselves. The nearest recognised long distance route is Sustrans National Cycle Route 6 located adjacent to the Site. The 98-mile long Cheshire Ring Canal Walk also passes some 300m away to the north of the Site.

12.105 Visual receptors are identified and assessed in the viewpoint assessment from a range of representative viewpoints in the study area, shown in Figure 12.4.

Zone of Theoretical Visibility

12.106 The visual baseline is defined by the ZTV - the geographical area from which the Proposed Development is likely to be visible. The ZTV in Figure 12.6 shows the main areas in which the Proposed Development will theoretically be visible, highlighting the different areas that may afford views and assisting in the identification of representative viewpoints where they may be affected.

12.107 The ZTV has been modelled using a 1m resolution Environment Agency LIDAR Digital Surface Model (2022) which includes surface features such as buildings and vegetation, with additional information taken from OS OpenMap Local woodland and building data. The Proposed Development has been modelled and set within this surface model and the ZTV calculated based on its maximum height/scale, to determine where it would be theoretically visible. Although it is a theoretical representation of potential visibility, the ZTV indicates that the visibility of the Proposed Development will be geographically contained, with areas of higher visibility concentrated to the closest areas to the immediate surroundings of the Proposed Development.

12.108 A greater amount of the Proposed Development will be visible from the closest and most open areas around the Site with direct views (indicated with purple / blue colour in the ZTV), including the Princess Road corridor through Hulme to the immediate south; the Mancunian Way corridor to the east and west approach to the Site; Hulme Park; areas of land to the immediate east extending to Cambridge Street; and areas to the north along Medlock Street and First Street. These areas are likely to have visibility of the full height and massing of the Proposed Development. A range of viewpoints from these areas have been assessed in the viewpoint assessment in Table 12.10 of this TVIA.

12.109 A lesser amount of the Proposed Development will be visible from within visually contained streets and spaces, and the more distant parts of the study area (indicated with green / yellow colour in the ZTV), where there may be partial visibility behind other buildings. These areas include, for example, parts of Castlefield and Deansgate to the north-west; parts of the Mancunian Way to the west; areas around Manchester University/Oxford Road to the east; and more distant residential areas of Hulme to the south. A range of viewpoints from these areas have been assessed in the viewpoint assessment in Table of this TVIA.

12.110 Many parts of the study area (with no colour shown in the ZTV) have no visibility of the Proposed Development. Across the north of the Study Area in particular, the ZTV indicates very limited theoretical visibility, due to visual containment provided by the adjacent Blocks A, B and D within First Street South. Areas of higher visibility are localised and contained within areas of townscape that are currently undergoing changes in character as a result of ongoing regeneration projects and the construction of other tall buildings.

Viewpoints

12.111 Viewpoints have been selected to illustrate potentially significant townscape and visual impact effects and represent views experienced by visual receptors. Fourteen viewpoints for the TVIA were proposed within the scoping report. Viewpoints included in the TVIA are shown in Table and mapped in Figure 12.4. The existing view from these 14 viewpoints is shown in Figures 12.7 - 12.21. A description of the baseline / existing view from each of these viewpoints, and consideration of their value, is described in

12.112 Table.

12.113 A consideration of the effects of lighting within the Proposed Development on visual amenity at night-time is included from Viewpoint 3.

Table 12.5: Viewpoints (Scenario 1)

VP No.	Viewpoint	Figure
1	Hulme Street	Figure 12.7
2	Hulme Arch Bridge	Figure 12.8
3	Newcastle Street	Figure 12.9
3	Newcastle Street (dusk view)	Figure 12.10
4	Oxford Road / Whitworth Street	Figure 12.11
5	Mancunian Way Slip Road	Figure 12.12
6	Hulme Park	Figure 12.13
7	All Saints Park	Figure 12.14
8	Booth Street West	Figure 12.15
9	Clarendon Street / Princess Street	Figure 12.16
10	Hulme Street / Jackson Crescent	Figure 12.17
11	Higher Cambridge Street	Figure 12.18

VP No.	Viewpoint	Figure
12	Chester Street	Figure 12.19
13	Hulme Street / Rockdove Avenue	Figure 12.20
14	Clarendon Street	Figure 12.21

Table 12.6: Baseline View Descriptions (Scenario 1)

Viewpoint 1: Hulme Street		
Baseline conditions: Figure 12.7a		Representative of views experienced by pedestrians, road users and residents of nearby residential blocks and warehouse conversions in Hulme Street/Cambridge Street area. The streetscape is cluttered and the pedestrian environment on this side of the road is influenced by the surrounding cark parking. The character of the townscape in the view is influenced by converted red-brick warehouses of former cotton mills, the MacIntosh Warehouse and imposing chimney stacks in the views along Hulme Street and Cambridge Street (not seen in photographic view). Committed developments Plots 10a and 10b at First Street are visible beyond a low-rise red brick building to the west, with the edge of River Street tower visible beyond. The left of the view is occupied by vacant plots occupied by car parking in the foreground. Beyond, Blocks A, B and D of First Street South are visible, and contain the view to the south-west. Modern student accommodation blocks at Parkway Gate are visible further south, to the left of First Street South.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area or conservation area. However, Sustrans National Cycle Route 6 passes in close proximity to the viewpoint along Hulme Street. It also affords a distinctive view of the townscape of red-brick warehouses recognised for their industrial significance, and their contrast with modern architectural styles. In particular, the recently constructed Plot 11, First Street South buildings have come to define the view to the west, and their associated design quality have contributed to the regeneration, character and visual amenity of this area. The views are likely to be valued by people living, working and at leisure in the area.
Susceptibility:	Medium	The viewpoint is representative of views experienced by residents on Hulme Street and Cambridge Street, as well as pedestrians and road users in the surrounding area, including cyclists on Sustrans National Cycle Route 6. Residents within the area may have static long-term views towards the Proposed Development. However, this will be in the context of existing tall buildings and construction of new buildings in the existing view, in relatively close proximity, which will moderate the susceptibility to further change.
Sensitivity:	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to changes associated with the Proposed Development.
Viewpoint 2: Hulme Arch Bridge		
Baseline conditions: Figure 12.8a		Representative of views experienced by pedestrians and motorists near the Hulme Arch Bridge, on Stretford Road and travelling northbound on Princess Road (although the viewpoint provides a clearer view due to its higher elevation when compared to Princess Road). The view will be similar to that experienced by nearby residents. The existing view is partially channelled along Princess Road by the underpass and roadside trees on the central reservation and embankments with the Hulme Arch Bridge forming a key intervening feature. Blocks A, B and D of First Street South are all visible beyond Hulme Arch Bridge in the view to the north, with some filtering towards these buildings being provided by intervening trees along Princess Road. Block D in particular forms a notable feature in the view. The cluster of tall, new student accommodation blocks at Parkway Gate are also visible beyond the Mancunian Way and intervening trees. There are several other tall buildings visible

Viewpoint 1: Hulme Street		
		in this part of the view and further east. To the west of the First Street South buildings, the Beetham Tower and Viadux are visible. Blocks of residential buildings on the edge of Hulme frame the view to the west, and blocks of modern student accommodation are visible to the east.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. It is dominated by the roadways although it does afford a distinctive view of the Hulme Arch Bridge within its treed context with views likely to be valued by people living, working and at leisure in the area.
Susceptibility:	Low	The viewpoint is representative of views experienced by pedestrians and motorists travelling on roads near Hulme Arch Bridge. The activity of pedestrians and motorists only partly depends on appreciation of views of townscape, with their attention also focussed on other matters. Existing tall buildings in the view, particularly in views to the north, beyond the feature formed by Hulme Arch Bridge, will moderate the susceptibility to further change of this type.
Sensitivity:	Medium	The combination of medium value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to changes associated with the Proposed Development.
Viewpoint 3: Newcastle Street		
Baseline conditions: Figure 12.9a		Representative of views experienced by residents of nearby housing, pedestrians and road users. The foreground of the view is occupied by two and four storey red-brick accommodation. The view is influenced by several tall buildings, including Blocks B and D at First Street South, as well as buildings at Parkway Gate. These buildings are seen beyond the Mancunian Way, which is just visible on its raised gantries passing over Newcastle Street to the north. Two buildings at Deansgate Square are also visible to the north-west, as well as the top of Great Jackson Street Plot F. Several modern apartment blocks form the skyline around these larger towers. The view demonstrates a variety of architectural styles, with contrasts between the character of red-brick low rise buildings with their strongly articulated roofscape and glass towers rising above.
Baseline conditions (night-time): Figure 10a		Representative of views experienced at dusk by residents of nearby housing, pedestrians and road users. The baseline view features several sources of lighting, including street lighting on Newcastle Street in the fore- to mid-ground of the view. There is also visible lighting within residential development on Newcastle Street, as well as within more distant development at Deansgate Square, First Street South and Parkway Gate.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. However, Sustrans National Cycle Route 6 passes in close proximity to the viewpoint along Newcastle Street. It also affords a view of the evolving townscape with the more recent modern architectural styles and taller tower blocks. Views are likely to be valued by people living in the area.
Susceptibility:	Medium	The viewpoint is representative of views experienced by residents on Newcastle Street, as well as pedestrians and road users in the surrounding area, including cyclists on Sustrans National Cycle Route 6. Residents within the area may have static long-term views towards the Proposed Development. However, this will be in the context of existing tall buildings including Blocks B and D within First Street South in relatively close proximity, which will moderate the susceptibility to further changes of this type.
Sensitivity:	Medium	The combination of medium value and medium sensitivity results in the receptors experiencing this view having a medium sensitivity to changes associated with the Proposed Development.

Viewpoint 1: Hulme Street		
Viewpoint 4: Oxford Road / Whitworth Street		
Baseline conditions: Figure 12.11a		Representative of views experienced by pedestrians, particularly those approaching the Oxford Road railway station and students walking around the University buildings and accommodation, together with road users coming and going from the city centre. This viewpoint is dominated by the eclectic streetscape consisting of the old red-brick Victorian buildings and modern buildings of Oxford Road, Whitworth Street and the station entrance. It is a vibrant, busy and heavily trafficked foreground, both vehicular and pedestrian. The view along Whitworth Street extends to the railway bridge as it approaches Oxford Road station. Beyond this, recent development around First Street, including the upper floors of Blocks B and D within First Street South, are apparent, with variety in façade colour and treatment.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. The viewpoint is located on the edge of the Whitworth Street Conservation Area which lies on the east side of Oxford Street. It affords a view of the evolving townscape with the more recent modern architectural styles and taller tower blocks, a gateway view experienced by people moving through the townscape, as well as a view likely to be valued by people living in the area.
Susceptibility:	Low	The viewpoint is representative of pedestrians and motorists travelling on Oxford Road and Whitworth Street, as well as pedestrians accessing Oxford Road station. The activity of pedestrians and motorists only partly depends on appreciation of views of townscape, with their attention also focussed on other matters. Existing tall buildings and construction activity in the view will moderate the susceptibility to further change of this type.
Sensitivity:	Medium	The combination of medium value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 5: Mancunian Way Slip Road		
Baseline conditions: Figure 12.12a		Representative of views experienced by motorists on Medlock Street, including those entering the city centre after exiting the Mancunian Way on the nearby slip road. The viewpoint is also representative of views experienced by pedestrians moving into the city centre from Hulme. Blocks A, B and D within First Street South are prominent within the existing view, seen on the opposite side of Medlock Street and along Hulme Street. Block D is particularly prominent, being the tallest of the three buildings, as well as seen in closest proximity. To the right of the First Street South buildings, further modern development at Parkway Gate is visible, as well as the Mancunian Way and mid-rise residential development within Hulme. To the left, historic red-brick mill buildings at MacIntosh Mills are visible along Hulme Street, with further modern tall buildings beyond. Committed developments Plots 10a and 10b within First Street are visible to the north of First Street South, on the opposite side of Hulme Street, and limit longer-distance views in this direction.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. The view is over the evolving townscape, with a mixture of historic buildings and more recent modern tall buildings. In particular, the recently constructed First Street South buildings have come to define the view to the east, and their associated design quality has contributed to the visual amenity of this area.
Susceptibility:	Low	The viewpoint is representative of pedestrians and motorists travelling on Medlock Street, including those accessing and exiting the Mancunian Way. The activity of pedestrians and motorists only partly depends on appreciation of views of townscape, with their attention also focussed on other matters. Existing tall

Viewpoint 1: Hulme Street		
		buildings and construction in the view will moderate the susceptibility to further change of this type.
Sensitivity:	Medium	The combination of medium value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 6: Hulme Park		
Baseline conditions: Figure 12.13a		Representative of views experienced by people playing (football, basketball and playpark) and walking through Hulme Park. Areas of amenity grassland and footpaths within Hulme Park occupy the foreground of the view, partially contained by mature trees within the edges of the park. Filtered views are available beyond to the River Street tower, Blocks B and D within First Street South, and the surrounding residential areas of Hulme, formed by 3 storey red-brick flatted housing along Jackson Crescent. Although not visible from the viewpoint, Beetham Tower and two towers within Deansgate Square form tall building focal points in the backdrop to the north from parts of the park, forming an impression of 'the city' due to their contrast in height and materiality with the residential buildings around the park, although tall buildings are also beginning to influence the view to the east of the park.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy, and does not lie within or overlook a designated area. It is, however, located within a public park, where views of the greenspace and the experience it provides in contrast to the surrounding city, are likely to be locally valued and visited by a relatively large number of people passing through or playing in the park.
Susceptibility:	Medium	The viewpoint is representative of views experienced by people engaged in recreation within Hulme Park. Their attention is likely to be focussed at least partially on appreciation of their surroundings. Existing tall buildings in the view will moderate the susceptibility to future change of this type.
Sensitivity:	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 7: All Saints Park		
Baseline conditions: Figure 12.14a		Representative of views experienced mainly by students within the Manchester Metropolitan University (MMU) campus. At the time of writing the LVIA, the park is undergoing redevelopment, and the viewpoint photography has therefore been taken outside the park. Views from within the park are also described. The foreground and middle ground of the view is dominated by the open greenspace, paths, trees and seating areas that create the park. The view illustrates that the park is surrounded by moderately scaled educational buildings of MMU that provide enclosure. Block D within First Street South can be seen beyond the trees which form the perimeter of the park. From within the park, further taller buildings can be seen above these in some directions, such as the top of one of the Deansgate Square towers. The view is generally restricted and contained by the urban areas around it and the tree cover within the greenspace.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy, and does not lie within or overlook a designated area. It is, however, located within a public park, where views of the greenspace and the experience it provides as a contrast to the surrounding city are likely to be locally valued and visited by a relatively large number of people using the park. The view itself is not a specific view from the park, but is incidental to its setting.
Susceptibility:	Medium	The viewpoint is representative of views experienced by people engaged in recreation within All Saints Park. Their attention is likely to be focussed at least partially on appreciation of their surroundings. Existing tall buildings in the view,

Viewpoint 1: Hulme Street		
		seen beyond MMU buildings in the immediate context, will moderate the susceptibility to future change of this type.
Sensitivity:	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 8: Booth Street West		
Baseline conditions: Figure 12.15a		Representative of views observed by pedestrians, road users and residents from within the higher education campus area, where there are aligned views along Booth Street West, near the junction with Higher Cambridge Street. The view in this direction is of recent urban flatted developments with active ground floor uses, the large expanse of hard surfacing and the enclosure created by the four storey or taller buildings that enclose this junction. Two blocks within First Street South are visible to the north-west, beyond the lower-rise buildings which front Higher Cambridge Street. Beetham Tower and Viadux are visible further beyond. To the left of the viewpoint, it appears that the city density starts to dissipate as storey heights decrease and the building levels remain low into the distance. To the right a seven storey Liberty Living block accommodates students. Immediately behind the viewpoint sits the tall tower of a hotel building. This building creates a more modern character in the immediate streetscape, which is otherwise generally formed of lower-rise red brick and cladded buildings.
Value:	Low	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. It affords a view of the urban townscape with a range of modern building styles within a relatively hard environment.
Susceptibility:	Medium	The viewpoint is representative of views experienced by residents on Booth Street West (primarily student housing), as well as pedestrians and road users in the surrounding area. Residents within the area may have static long-term views towards the Proposed Development. However, this will be in the context of existing tall buildings including Block D within First Street South, and a tall hotel building in close proximity, which will moderate the susceptibility to further changes of this type.
Sensitivity:	Low	The combination of low value and medium susceptibility results in the receptors experiencing this view having a low sensitivity to change associated with the Proposed Development, due to the limited association between the viewpoint and the Site, and the existing presence of tall buildings in the view.
Viewpoint 9: Clarendon Street / Princess Street		
Baseline conditions: Figure 12.16a		Representative of views experienced by residents within residential development along Clarendon Street, Rockdove Avenue and surrounding roads, as well as pedestrians and road users on Princess Street. Views are channelled along Princess Street to the north, towards the Mancunian Way. Modern development has brought the apparent edge of Manchester city centre closer to the viewpoint over recent years, and there is a cluster of tall buildings located to the north of the Mancunian Way, which limit longer-distance views in this direction. This includes Blocks A, B and D within First Street South, Parkway Gate, and committed developments Plots 9a and 10a within First Street.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. It affords a view of the urban townscape with a range of modern building styles, and the foreground is formed by the tree-lined Princess Street in close proximity. In particular, the recently constructed First Street South buildings, with associated high design quality, influence the view to the north.
Susceptibility:	Medium	The viewpoint is representative of views experienced by residents on Clarendon Street and surrounding roads, as well as pedestrians and road users on Princess

Viewpoint 1: Hulme Street		
		Street and in the surrounding area. Residents within the area may have static long-term views towards the Proposed Development. However, this will be in the context of existing tall buildings including Blocks A, B and D within First Street South, which will moderate the susceptibility to further changes of this type.
Sensitivity:	Medium	The combination of low value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 10: Hulme Street / Jackson Crescent		
Baseline conditions: Figure 12.17a		Representative of views experienced by residents of nearby housing, pedestrians and road users. The foreground of the view is occupied predominantly by three-storey red-brick accommodation, as well as trees which line Hulme Street and filter views towards built development. The view is influenced by several tall buildings, including Block D at First Street South and River Street to the east, as well as buildings at Deansgate Square and New Jackson to the north. The view to the west offers a more open outlook over Hulme Park, seen beyond Jackson Crescent. The view demonstrates a variety of architectural styles, with contrasts between the character of closer proximity red-brick low rise buildings, with the emerging pattern of tall buildings in longer-distance views to the north and east. The skyline in the view is evolving.
Value:	Low	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. It affords a view of the urban townscape, with a contrasting mix of building styles including low-rise red brick buildings and high-rise glass towers. Foreground views over trees and open space within Hulme Park are available, as well as over the tree-lined Hulme Street. The view is likely to be of local value to residents.
Susceptibility:	Medium	The viewpoint is representative of views experienced by residents on Hulme Street and Jackson Crescent, as well as pedestrians and road users in the surrounding area. Residents within the area may have static long-term views towards the Proposed Development. However, this will be in the context of existing tall buildings including Block D within First Street South, which forms a focal point at the end of the aligned view along the road, and will moderate the susceptibility to further changes of this type.
Sensitivity:	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 11: Higher Cambridge Street		
Baseline conditions: Figure 12.18a		Representative of views experienced by people accessing MMU buildings on Higher Cambridge Street, residents within an area of residential development to the west of Higher Cambridge Street, and pedestrians and road users in the surrounding area. The foreground of the view is occupied by Higher Cambridge Street, which forms an arterial route towards Manchester city centre from the south. The Mancunian Way passes in close proximity to the north, and a roundabout to the north of the viewpoint provides access to the Mancunian Way from Higher Cambridge Street. This area features vegetation which filters views towards the elevated road. Beyond this, there are views towards tall buildings on the edge of Manchester city centre, including Blocks B and D within First Street South, buildings at Parkway Gate and Deansgate Square. To the west of Higher Cambridge Street is an area of three-storey red brick residential development, set beyond a small area of communal gardens. The scale of these buildings contrasts with the emerging pattern of taller buildings to the north of the Mancunian Way. Further south, apartment buildings featuring five storeys or more are situated

Viewpoint 1: Hulme Street		
		along Higher Cambridge Street. To the east are buildings associated with MMU, including the MMU Business School and blocks of student accommodation.
Value:	Low	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. It affords a view of the urban townscape, with a contrasting mix of building styles including low-rise red brick buildings and high-rise glass towers. The view is likely to be of some local value to residents.
Susceptibility:	Low	The viewpoint is representative of people accessing MMU buildings, as well as pedestrians and road users. The activity of people at work or accessing an educational facility, as well as pedestrians and motorists, only partly depends on appreciation of views of the townscape, since their attention is also focussed on other matters. Although the viewpoint is also representative of residents, views from residential properties towards the Site are likely to be heavily filtered by surrounding vegetation. Existing tall buildings and construction activity in the view will moderate the susceptibility to further change of this type.
Sensitivity:	Low	The combination of low value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 12: Chester Street		
Baseline conditions: Figure 12.19a		Representative of views experienced by pedestrians, road users and residents of nearby residential blocks and warehouse conversions on Chester Street, as well as people accessing buildings within the MMU Faculty of Science and Engineering. The streetscape is busy, with Chester Street forming a relatively narrow one-way route which connects to Oxford Road to the east. A small garden is situated to the south of Chester Street and is visible in the left of the view. Beyond this is the John Dalton Tower, part of the MMU Faculty of Science and Engineering. Committed development 3: Metropolitan University Science and Engineering Building is situated beyond the existing John Dalton Tower, which is to be refurbished as part of the works. The existing tower is visible in the view, filtered by trees within the small garden. On the northern side of Chester Street, to the right of the view, are a combination of modern red-brick mid-rise apartments, as well as a converted red brick warehouse. Recent development at Parkway Gate and First Street South is visible in the view along Chester Street to the west.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area or conservation area. It does, however, afford a distinctive view of the townscape of red-brick warehouses recognised for their industrial significance, and their contrast with modern architectural styles. Views are likely to be valued by people living, working and at leisure in the area.
Susceptibility:	Medium	The viewpoint is representative of views experienced by residents on Chester Street, people accessing MMU buildings, and pedestrians and road users in the surrounding area. Residents within the area may have static long-term views towards the Proposed Development. However, this will be in the context of existing tall buildings and construction of new buildings in the existing view, in relatively close proximity, which will moderate the susceptibility to further change.
Sensitivity:	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 13: Hulme Street / Rockdove Avenue		
Baseline conditions: Figure 12.20a		Representative of views experienced by residential receptors within properties on Hulme Street and Rockdove Avenue, as well as pedestrians and road users in the surrounding area. The Mancunian Way forms a prominent feature in the view

Viewpoint 1: Hulme Street		
		from this location, which is located in close proximity to the junction between Medlock Street, Princess Road and the Mancunian Way. Residential development on Hulme Street / Rockdove Avenue is partially filtered from view by vegetation along Medlock Street Junction, although in winter more open views will be available. Beyond the Mancunian Way to the north and north-east, recent development has brought tall buildings into close proximity to the lower-rise residential development around the viewpoint. In particular, there are views towards Blocks B and D within First Street South, and buildings at Parkway Gate further east. Plot 10A, First Street is visible to the north of the First Street South buildings.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. It affords a view of the urban townscape with a range of modern building styles, and much of the foreground view is occupied by the Mancunian Way, seen at close proximity. The recently constructed First Street South buildings, with their associated design quality, influence the view to the north-east. The view is likely to be of some value to local residents.
Susceptibility:	Medium	The viewpoint is representative of views experienced by residents on Hulme Street, Rockdove Avenue and surrounding roads, as well as pedestrians and road users in the surrounding area. Residents within the area may have static long-term views towards the Proposed Development. However, this will be in the context of existing tall buildings including Blocks A, B and D within First Street South, which will moderate the susceptibility to further changes of this type.
Sensitivity:	Medium	The combination of low value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.
Viewpoint 14: Clarendon Street		
Baseline conditions: Figure 12.21a		Representative of views experienced by residential receptors on Clarendon Street, as well as pedestrians and road users in the surrounding area. Mid-rise modern development is located to the south of the viewpoint, on Clarendon Street, and has views to the north. The Mancunian Way forms a prominent feature in the view to the north from this location. Beyond the Mancunian Way to the north, recent and emerging development has brought the apparent edge of Manchester city centre into close proximity. In particular, there are views of tall buildings at Parkway Gate, and Blocks B and D within First Street South. These developments are heavily filtered by trees between Clarendon Street and the Mancunian Way, although in winter more open views will be available in this direction.
Value:	Medium	The view is not formally recognised or afforded protection in local planning policy and does not lie within or overlook a designated area. It affords a view of the urban townscape with a range of modern building styles, and much of the foreground view is occupied by the Mancunian Way, seen at close proximity. The recently constructed First Street South buildings, with their associated design quality, influence the view to the north-east. The view is likely to be of some value to local residents.
Susceptibility:	Medium	The viewpoint is representative of views experienced by residents on Clarendon Street and surrounding roads, as well as pedestrians and road users on Princess Street and in the surrounding area. Residents within the area may have static long-term views towards the Proposed Development. However, this will be in the context of existing tall buildings including Blocks B and D within First Street South, which will moderate the susceptibility to further changes of this type. Views towards the Mancunian Way and the presence of tree cover also moderate the susceptibility of receptors to changes occurring beyond these elements in the view.

Viewpoint 1: Hulme Street		
Sensitivity:	Medium	The combination of low value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development.

Identification and Evaluation of Likely Significant Effects – Townscape

12.114 The assessment of effects on townscape falls into three categories:

- The physical effects on townscape elements present on the Site, such as the removal of trees / open space;
- The direct and indirect effects on TCAs present on the Site and across the study area; and
- The direct and indirect effects on townscape designations across the study area.

Physical Townscape Effects

12.115 Physical townscape effects occur only on the Site, where existing townscape elements would be removed or altered by the Proposed Development. In respect of the Proposed Development there are no landscape or townscape features or elements that are sensitive to physical change due to the current vacant condition of the Site. Physical townscape effects are not therefore considered further within the TVIA.

Townscape Character Effects

12.116 Townscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular area of townscape, and the way that this pattern is perceived. Effects on townscape character would occur both within the Site, where the existing townscape would be directly altered by the addition of the Proposed Development; and contextually, where visibility of the Proposed Development may alter the way in which the townscape would be perceived.

12.117 Representative viewpoints are referred to in this assessment as they give a useful indication of the appearance of the Proposed Development from different TCAs. It should be noted however, that levels of magnitude of effect on townscape receptors are generally found to be lower than the magnitude of effect on viewpoints that lie within these TCAs. This means that if a viewpoint is assessed to undergo a medium-high magnitude of effect it does not necessarily follow that the TCA within which it lies would also undergo a medium-high magnitude of effect, but could undergo a medium magnitude of effect instead, for example. This is because the effects on viewpoints are assessed within the context of a specific outlook of the Proposed Development and are usually specifically selected to gain a direct view towards the Site. The Proposed Development is the principal consideration in the viewpoint assessment, and influences that lie in other areas of the view are considered to a lesser degree. The townscape character of a receptor is not, however, determined so specifically by the outlook over the Proposed Development, and there are many other considerations, both visual and perceptual, that combine to give an area its townscape character. This means that the degree of influence of the Proposed Development can be slightly less on townscape character than on a specific view.

Preliminary Assessment - Townscape Character

12.118 In order to ensure that the assessment of the effects of the Proposed Development on townscape character is proportionate, Table presents a preliminary assessment of all of the TCAs within the Study Area. It indicates which TCAs are considered to have potential to undergo a likely significant effect as a result of the Proposed Development that require further assessment, and the TCAs that do not require further assessment due to the lack of potential effects. Those with potential for significant effects are assessed further in Table 12.8.

Table 12.7: Preliminary Assessment of Effects on Townscape Character (Scenario 3)

TCA Receptor	Distance to Proposed Development	Included within detailed assessment?
TCA1: Castlefield and St Johns	0.6 km	Theoretical visibility of the Proposed Development is limited from this TCA. Although there is visibility of the Proposed Development from the small parts of this TCA, its character is likely to experience low levels of change during construction and operation, due to the distance, presence of intervening tall buildings/development (including Deansgate Square, Beatham Tower, First Street South Blocks A, B and D, and development at New Jackson), and restricted visibility of the Proposed Development from the majority of this TCA. Therefore, it is considered that there is no potential for likely significant effects on the character of TCA1 arising and it is therefore not assessed further.
TCA2: Manchester city urban core	0.5 km	Theoretical visibility of the Proposed Development is very limited from TCA2, due to distance, contained nature of townscape pattern within TCA 2, intervening buildings within TCA 2 and neighbouring TCAs, and screening by Block D within First Street South. It is considered that there is no potential for likely significant effects on the character of TCA2 and it is, therefore, not assessed further.
TCA3: City centre transition	0.3 km	Theoretical visibility of the Proposed Development is very limited from this TCA, due primarily to distance and screening by Block D within First Street South. There is therefore limited potential for indirect effects to its townscape character as a result of the construction and operation of the Proposed Development. It is therefore not considered further.
TCA4: Major educational	0.2 km	Theoretical visibility of the Proposed Development is limited. There are small areas of theoretical visibility around the MMU Brooks Building (near Viewpoint 2), MMU Faculty of Science and Engineering building (near Viewpoint 12), within All Saints Park (viewpoint 7), within the Trinity Church of England High School grounds, and along the

TCA Receptor	Distance to Proposed Development	Included within detailed assessment?
		Mancunian Way. The character of the TCA is likely to experience low levels of change during construction and operation. This is due to the presence of existing tall buildings/development within the neighbouring TCA5: South west city centre redevelopment, within which the Proposed Development would be located, and restricted visibility of the Proposed Development from the majority of this TCA. As such, it is considered that there is no potential for significant effects on the character of TCA4 and it is therefore not assessed further.
TCA5: South west city centre redevelopment	0 km	Included within detailed assessment, due to the position of the Proposed Development within this TCA and the potential for direct and indirect effects to its townscape character during the construction and operation stages.
TCA6: Residential	< 0.1 km	Included within detailed assessment, due to the proximity of the Proposed Development to this TCA, and the potential for indirect effects on character during the construction and operation stages, through visibility of the Proposed Development in the backdrop to this TCA in views and extent of visibility as shown in the ZTV (Figure 13.6) and Viewpoints 3, 6, 9, 10, 13 and 14.

12.119 The effect of the Proposed Development on the townscape character of TCA5 and TCA6 scoped in for detailed assessment is assessed, against the existing baseline, in Table 12.8 below. In order to assess the likely significant effects of the Proposed Development on the townscape character of these TCAs, the sensitivity to change of the townscape of each TCA is assessed in conjunction with the magnitude of change arising from the Proposed Development.

Table 12.8: Townscape Character Assessment Scenario 3)

Criteria		Assessment Description
TCA 5: South-west City Centre Redevelopment		
Sensitivity	Medium	The combination of medium value and low susceptibility results in this TCA having a medium sensitivity to changes associated with the Proposed Development.
Magnitude of Change / Significance of Effect (Construction)	Medium / not significant (moderate)	Construction activity within the Site will result in physical changes to parts of the townscape within this TCA, as well as indirect changes to the perceived character of the wider TCA outside the Site. Due to the existing vacant condition of the Site, no demolition will be required as part of the Proposed Development. Construction activity will include the introduction of site compound, materials excavation, storage and handling; flight auger piling used for the building's foundations; construction plant, particularly taller cranes; and smaller plant including dump trucks, concrete mixers, piling rigs, lorries, skip wagons, excavators and rollers. Construction traffic will also be present within the TCA accessing the Site.

Criteria		Assessment Description
		The existing character of this TCA, as described in **Table 12.3,** is of an area currently and recently undergoing regeneration, including construction of tall buildings. As such, it is considered that the construction of the Proposed Development will not be at odds with the existing character. This will mitigate the magnitude of change associated with the Proposed Development. The magnitude of change to the perceived townscape character of TCA 5: South-west City Centre Redevelopment will be medium. This is due primarily to the direct, physical changes to the Site which will result from the construction of the Proposed Development. The magnitude of change to the townscape character will be no higher than medium, due to the existing character of an area under regeneration, which includes a baseline featuring the construction of tall buildings. Overall, the effect on the townscape character of TCA 5: South-west City Centre Redevelopment that will result from the Proposed Development during the construction phase will be not significant (minor).
Magnitude of Change / Significance of Effect (Operation)	Small / not significant (minor)	The Proposed Development will result in physical changes to a small part of the townscape within this TCA, as well as indirect changes to the perceived character of the wider TCA outside the Site. The Proposed Development will alter the character of the Site from the existing vacant land to an area of high-density residential development and associated public realm. The character of the Site will be in keeping with the neighbouring parts of the TCA. The ZTV indicates that the Proposed Development will be visible from parts of this TCA, particularly from an area in close proximity to the west. From much of the TCA there will be no visibility of the Proposed Development. Where it is visible, the Proposed Development will be in keeping with the surrounding development and townscape character of this TCA. The magnitude of change to the perceived character of TCA 5: South-west City Centre Redevelopment will be small. Overall, the effect on the townscape character of TCA 5: South-west City Centre Redevelopment that will result from the Proposed Development during the operational phase is considered not to be significant (minor).
TCA 6: Residential		
Sensitivity	Medium	The combination of the low value and medium susceptibility results in this TCA having a medium sensitivity to changes associated with the Proposed Development.
Magnitude of Change / Significance of Effect (Construction)	Medium / not significant (moderate) from areas within closest proximity Small / not significant (minor) across more distant parts of TCA	Construction activities with the Site will result in no direct changes to the townscape character of TCA 6: Residential and result only in indirect changes to its perceived character through views of the construction works occurring in its townscape context. Construction works occurring at lower levels with the Site will largely be screened behind intervening buildings and the Mancunian Way, such that the site compound, materials excavation/storage, drilling and smaller construction plant will result in no changes to the character of TCA 6. Taller plant such as cranes within the Site will be visible in the townscape context of the TCA during the construction period, together with the upper elements of the partially constructed building. The character of TCA 6: Residential is defined by generally low-rise residential properties, with some parts being influenced by modern mid-rise development. The existing and emerging city centre skyline is

Criteria		Assessment Description
		visible in its backdrop with a number of tall buildings under construction and the skyline marked by tower cranes. Changes associated with construction of the Proposed Development in the adjacent TCA 5: South-west City Centre Redevelopment are similar to and have associations with the changes already taking place, which moderates the perceived changes to its townscape context. The magnitude of change to the perceived townscape character of TCA 6: Residential that will result from the Proposed Development during construction is assessed as medium from the closest areas of the TCA, primarily those areas directly to the south of the Site. The wider TCA extends to the west, south and east at greater distance and will be subject to a low magnitude of change where visibility of the construction activity is available at greater distance. Overall, the effect on the townscape character of TCA 6: Residential that will result from the Proposed Development during the construction phase will be not significant (moderate) across areas within closest proximity, reducing to not significant (minor) across more distant parts of the TCA.
Magnitude of Change / Significance of Effect (Operation)	Small / not significant (minor)	The ZTV shows that theoretical visibility of the Proposed Development will be intermittent across this TCA, with particular areas of visibility around Hulme Park to the south-west; between Princess Road and Higher Cambridge Street to the south; and along the Mancunian Way. There are also more distant areas of visibility across southern parts of the TCA, as well as in the unit of the TCA to the east of Kincardine Road. From those areas indicated as experiencing visibility of the Proposed Development, it will appear to be in keeping with other developments under construction and recently completed high-rise buildings, including Blocks A, B and D within First Street South, within an area of intensive regeneration on the edge of the neighbouring TCA 5: South-west City Centre Redevelopment. The Proposed Development will bring development slightly closer to this TCA than some of the existing development within TCA 5. However, due to its position adjacent to the larger Block D, which it will appear to be backclothed against from much of TCA 6, the effect of this slightly closer proximity is considered, overall, to be limited. Taking this into account the magnitude of change is assessed as small. Overall, the effect on the townscape character of TCA6: Residential that will result from the Proposed Development during the operational phase is considered to be not significant (minor) across parts of the TCA which experience visibility of the Proposed Development. Elsewhere, there will be no change and no effect.

Preliminary Assessment - Conservation Areas

12.120 In order to ensure that the assessment of the effects of the Proposed Development on the townscape and appearance of Conservation Areas (CAs) is proportionate, Table presents a preliminary assessment of all of the CAs within the Study Area. It indicates which CAs are considered to have potential to undergo a likely significant effect as a result of the Proposed Development that require further assessment, and the CAs that do not require further assessment due to the lack of potential effects.

Table 12.9: Preliminary assessment of Cas Scenario 3)

CA Receptor	Distance to Proposed Development	Included within detailed assessment?
Castlefield	0.6 km	Theoretical visibility of the Proposed Development is very limited from this TCA. Existing intervening tall buildings / development within TCA5: South west city centre redevelopment exert an existing influence on the CA, which lowers the susceptibility to change as a result of the Proposed Development. No potential for significant effects on character of TCA and not assessed further.
St John Street	0.8 km	There is no theoretical visibility of the Proposed Development from this TCA. No potential for significant effects on character of TCA and not assessed further.
Deansgate and Peter Street	0.7 km	Theoretical visibility of the Proposed Development is very limited from this TCA. No potential for significant effects on character of TCA and not assessed further.
Albert Square	0.8 km	There is no theoretical visibility of the Proposed Development from this TCA. No potential for significant effects on character of TCA and not assessed further.
St Peter's Square	0.6 km	Theoretical visibility of the Proposed Development is very limited from this TCA. No potential for significant effects on character of TCA and not assessed further.
Upper King Street	0.9 km	There is no theoretical visibility of the Proposed Development from this TCA. No potential for significant effects on character of TCA and not assessed further.
George Street	0.6 km	There is no theoretical visibility of the Proposed Development from this TCA. No potential for significant effects on character of TCA and not assessed further.
Whitworth Street and Princess Street	0.5 km	There is no theoretical visibility of the Proposed Development from this TCA. No potential for significant effects on character of TCA and not assessed further.

12.121 Table 12.9 indicates that none of the CAs within the Study Area are considered to have potential to undergo a significant effect as a result of the Proposed Development, and consideration of effects on CAs is therefore not considered further.

Identification and Evaluation of Likely Significant Effects - Visual

12.122 The visual effects of the Proposed Development are assessed for each viewpoint, against the existing baseline, in Table 12.10.

Table 12.10: Viewpoint Assessment (Scenario 3)

Criteria		Assessment Description
Viewpoint 1: Hulme Street		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to changes associated with the Proposed Development (as described in Table).
Magnitude of Change / Significance of Effect (construction)	Small / not significant (minor)	The Proposed Development will result in a small magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of cranes, although much of the construction activity will be screened from view by the existing townscape, including Block D of First Street South. The effect of the Proposed Development during the construction phase on the view experienced by residents and road users on Hulme Street is assessed as not significant (minor), adverse and short-term. Similar views will be experienced by cyclists on Sustrans National Cycle Route 6.
Magnitude of Change / Significance of Effect (operation)	Negligible / not significant (minor-negligible)	The Proposed Development will be fully screened from view from this viewpoint by Block D within First Street South. There may be glimpsed views towards the Proposed Development from the surrounding area, seen beyond the existing First Street South buildings. Where visible, the Proposed Development will be in keeping with the emerging pattern of tall buildings seen to the west from this location. The overall magnitude of change is considered to be negligible, taking into account that there may be some views towards the Proposed Development from the surrounding area. The effect of the Proposed Development during the operational phase on the view experienced by residents and road users on Hulme Street is considered to be not significant (minor-negligible), neutral and long-term. Similar views will be experienced by cyclists on Sustrans National Cycle Route 6.
Viewpoint 2: Hulme Arch Bridge		
Sensitivity	Medium	The combination of medium value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to changes associated with the Proposed Development (as described in Table).
Magnitude of Change / Significance of Effect (construction)	Medium / significant (moderate)	The Proposed Development will result in a medium magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of cranes and the emerging building, seen beyond the distinctive view of the Hulme Arch Bridge. Existing vegetation along Princess Road will filter views towards the construction activity. The effect of the Proposed Development during the construction phase on the view experienced by pedestrians and road users near Hulme Arch Bridge is assessed as significant (moderate), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Medium / significant (moderate)	Upper parts of the Proposed Development will be seen beyond the distinctive view of the Hulme Arch Bridge in views to the north from this viewpoint. Views towards the Proposed Development will be filtered by vegetation along Princess Road. The Proposed Development will be seen in the context of Blocks B and D within First Street South. It will be positioned between these two buildings, and will be taller than Block B but smaller than Block D. Overall, it is considered that the Proposed Development will be in keeping with the emerging townscape pattern in this part of the view. The magnitude of change is therefore considered to be medium. The effect of the Proposed Development during the operational phase on the view experienced by pedestrians and road users near Hulme Arch Bridge is assessed as significant (moderate), neutral and long-term.

Criteria		Assessment Description
Viewpoint 3: Newcastle Street		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to changes associated with the Proposed Development (as described in Table).
Magnitude of Change / Significance of Effect (construction)	Medium / significant (moderate)	The Proposed Development will result in a medium magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of cranes and the emerging building. Lower level construction activity will be screened from view. Views towards the emerging building will be framed by existing development along Newcastle Street, and the construction activity will be readily visible. The effect of the Proposed Development during the construction phase on the view experienced by residents on Newcastle Street is assessed as significant (moderate), adverse, and short-term. Similar views will be experienced by cyclists on Sustrans National Cycle Route 6.
Magnitude of Change / Significance of Effect (operation)	Medium / significant (moderate)	Upper parts of the Proposed Development will be seen in the mid-ground of the view, beyond low-rise residential development visible in the foreground. The Proposed Development will be backclothed against Block D within First Street South, and will be seen in the context of Block B further east. The Proposed Development will be seen in the same sector of the view as existing buildings of a similar style. In particular, its containment within the sector of the skyline already occupied by Block D will reduce the magnitude of change associated with the Proposed Development. However, the Proposed Development will bring development of this type into closer proximity than the existing First Street South buildings. Overall, the magnitude of change is considered to be medium. The effect of the Proposed Development during the operational phase on the view experienced by residents on Newcastle Street is assessed as significant (moderate), neutral, and long-term. Similar views will be experienced by cyclists on Sustrans National Cycle Route 6.
Magnitude of Change / Significance of Effect (night-time)	Small / not significant (minor)	The Proposed Development will introduce a further source of artificial lighting into this view, which features several existing sources throughout the baseline, including lighting within residential development at First Street South. The Proposed Development will bring the influence of artificial lighting within tall buildings on the emerging edge of Manchester city centre into closer proximity to the viewpoint than the existing influence. However, the Proposed Development will be backclothed against Block D within First Street South, and the lighting introduced into the view will therefore be contained within a sector of the view which already experiences the influence of night-time lighting from tall residential buildings. Overall, the magnitude of change is considered to be small. The effect of the Proposed Development during night-time is considered to be not significant (minor), neutral and long-term.
Viewpoint 4: Oxford Road / Whitworth Street		
Sensitivity	Medium	The combination of medium value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Magnitude of Change / Significance of Effect (construction)	Negligible / not significant (minor / negligible)	The Proposed Development will result in a negligible magnitude of change during the construction phase. Views of the emerging building will be screened from view by the existing townscape, and changes will be restricted to potential visibility of the upper parts of cranes at the Site. This activity will be seen in the context of the busy townscape which often features construction activity.

Criteria		Assessment Description
		The effect of the Proposed Development during the construction phase on the view experienced by pedestrians and motorists on Oxford Road and Whitworth Street is assessed as not significant (minor-negligible), adverse, and short-term.
Magnitude of Change / Significance of Effect (operation)	Zero / not significant (no effect)	The Proposed Development will be fully screened from view from this viewpoint by the existing townscape. Overall, the Proposed Development is considered to result in no change. The effect of the Proposed Development during the operational phase on the view experienced by road users on Oxford Road / Whitworth Street is considered to be not significant (no effect), neutral and long-term.
Viewpoint 5: Mancunian Way Slip Road to Medlock Street		
Sensitivity	Medium	The combination of medium value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Magnitude of Change / Significance of Effect (construction)	Large / significant (major-moderate)	The Proposed Development will result in a large magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of crane movements and the emerging building at relatively close proximity. There may also be views towards ground-level construction activity across the Site. There will be limited screening of the Proposed Development from this viewpoint, and pedestrians and motorists on Medlock Street will have open views towards construction activity. The effect of the Proposed Development during the construction phase on the view experienced by residential receptors on Clarendon Street / Princess Street is assessed as significant (major-moderate), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Large / significant (major-moderate)	The Proposed Development will be seen to almost its full extents in the view to the east. The building will be visible at close proximity, in the context of existing tall buildings including all three existing blocks within First Street South. It will be seen adjacent to Block D, which is located in slightly closer proximity to the viewpoint, and will be smaller than this building, but taller than Block B which is seen beyond. Its position to the south of Block D will also bring development closer to the Mancunian Way, which currently acts to contain tall buildings within the city centre to the north. Therefore, the Proposed Development will extend the emerging pattern of tall buildings into slightly closer proximity to the smaller-scale development within Hulme to the south, although its design and form will largely be in keeping with the existing development. There will be open views towards the full scale of the Proposed Development from this viewpoint, including of ground-level public realm development. Overall, the magnitude of change is considered to be large. The effect of the Proposed Development during the operational phase on the view experienced by residents and road users on Clarendon Street is assessed as significant (major-moderate), beneficial and long-term.
Viewpoint 6: Hulme Park		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Magnitude of Change / Significance of Effect (construction)	Medium / significant (moderate)	The Proposed Development will result in a medium magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of crane movements and the emerging building, which will be seen in the view to the east beyond vegetation within the park. Views towards the ground-level construction activity across the Site,

Criteria		Assessment Description
		and the lower parts of the emerging building, will be screened by existing built form and vegetation to the east of Hulme Park. The effect of the Proposed Development during the construction phase on the view experienced by recreational receptors within Hulme Park is assessed as significant (moderate), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Medium / significant (moderate)	Upper parts of the Proposed Development will be seen in the view to the east, beyond vegetation within the park and low-rise residential development visible in the adjacent townscape. The Proposed Development will be seen in the context of Blocks B and D within First Street South, as well as River Street, which form tall features in the existing view. These buildings are taller in scale than the Proposed Development, and the Proposed Development will be in keeping with the emerging pattern of tall buildings seen to the east, beyond the edge of the park. However, the Proposed Development will extend this type of development further south. Overall, the magnitude of change is considered to be medium. The effect of the Proposed Development during the operational phase on the view experienced by recreational receptors within Hulme Park is assessed as significant (moderate), neutral, and long-term.
Viewpoint 7: All Saints Park		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Magnitude of Change / Significance of Effect (construction)	Negligible / not significant (minor / negligible)	The Proposed Development will result in a negligible magnitude of change during the construction phase. This will be as a consequence of limited views of construction activity at the Site. This may include visibility of crane movements and the upper parts of the emerging building. Views towards the ground-level construction activity across the Site, and the lower parts of the emerging building, will be screened by existing built form to the west of All Saints Park. Existing vegetation within the park will filter views towards the construction activity. The effect of the Proposed Development during the construction phase on the view experienced by recreational receptors within Hulme Park is assessed as not significant (minor / negligible), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Negligible / not significant (minor / negligible)	Upper parts of the Proposed Development will be seen in the view to the west, beyond adjacent built form associated with Manchester Metropolitan University. During summer, views of the Proposed Development will be heavily filtered by vegetation within the park, while there will be views towards the upper floors of the Proposed Development in winter. The Proposed Development will be seen in the context of Block D within First Street South, as well as one of the towers at Deansgate Square, which form tall features in the existing view, and which are also seen beyond the adjacent university buildings. These buildings are taller in scale than the Proposed Development, and the Proposed Development will be in keeping with the emerging pattern of tall buildings seen to the west. Overall, the magnitude of change is considered to be negligible. The effect of the Proposed Development during the operational phase on the view experienced by recreational receptors within All Saints Park is assessed as not significant (minor - negligible), neutral, and long-term.
Viewpoint 8: Booth Street West		
Sensitivity	Low	The combination of low value and medium susceptibility results in the receptors experiencing this view having a low sensitivity to change associated with the Proposed Development (as described in Table).

Criteria		Assessment Description
Magnitude of Change / Significance of Effect (construction)	Negligible / not significant (negligible)	The Proposed Development will result in a negligible magnitude of change during the construction phase. Views of the emerging building will be screened from view by the existing townscape, and changes will be restricted to potential visibility of the upper parts of cranes at the Site. This will be seen in the context of the existing busy townscape. The effect of the Proposed Development during the construction phase on the view experienced by residents, pedestrians and road users on Booth Street West and the surrounding area is assessed as not significant (negligible), adverse, and short-term.
Magnitude of Change / Significance of Effect (operation)	Zero / not significant (no effect)	The Proposed Development will be fully screened from view from this viewpoint by the existing townscape. Overall, the Proposed Development is considered to result in no change. The effect of the Proposed Development during the operational phase on the view experienced by residents and road users on Booth Street West and surrounding areas is considered to be not significant (no effect), neutral and long-term.
Viewpoint 9: Clarendon Street / Princess Street		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table 12.2).
Magnitude of Change / Significance of Effect (construction)	Medium / significant (moderate)	The Proposed Development will result in a medium magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of crane movements and the emerging building at relatively close proximity. Views may be available towards ground-level construction activity at the Site, although this will be limited by the Mancunian Way and intervening vegetation. Due to screening by intervening vegetation, it is likely that the construction activity will be experienced by local residents in the area surrounding their properties, rather than from within properties themselves. The effect of the Proposed Development during the construction phase on the view experienced by residential receptors on Clarendon Street / Princess Street is assessed as significant (moderate), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Medium / significant (moderate)	The Proposed Development will be seen to almost its full extents in the view to the north. It will be seen at close proximity, in the context of existing tall buildings to the north of the Mancunian Way. This includes Blocks A and D at First Street South, while the Proposed Development will screen views towards Block B. The Proposed Development will bring this development into slightly closer proximity to the viewpoint than these existing buildings, although it will be in keeping with the existing pattern and design of emerging tall buildings in this part of the city. There will be filtering by vegetation alongside Princess Street, although this effect will be more limited in winter when vegetation cover is reduced. Views towards lower parts of the building will be screened from view by the Mancunian Way. It is likely that views from within residential properties will be restricted by surrounding vegetation, and views are therefore considered to be experienced by residents in the area surrounding their properties, as well as road users. Overall the magnitude of change is considered to be medium. The effect of the Proposed Development during the operational phase on the view experienced by residents and road users on Clarendon Street and Princess Street is assessed as significant (moderate), neutral and long-term.
Viewpoint 10: Hulme Street / Jackson Crescent		
Sensitivity	Medium	The combination of low value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table 12.2).

Criteria		Assessment Description
Magnitude of Change / Significance of Effect (construction)	Small / not significant (minor)	The Proposed Development will result in a small magnitude of change during the construction phase. This will be as a consequence of limited views of construction activities at the Site. This may include visibility of crane movements and the upper parts of the emerging building. Views towards the ground-level construction activity across the Site, and the lower parts of the emerging building, will be screened by existing built form and vegetation on Hulme Street and the surrounding area. The effect of the Proposed Development during the construction phase on the view experienced by residential receptors on Hulme Street is assessed as not significant (minor), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Small / not significant (minor)	Upper parts of the Proposed Development will be seen in the view to the east, beyond low-rise residential development visible in the adjacent townscape. Tree cover on Hulme Street and in the surrounding area will heavily filter views towards the Proposed Development, although this effect will be more limited in winter when tree cover is reduced. The Proposed Development will be seen in the context of Block D within First Street South, as well as River Street, which form tall features in the existing view. These buildings are taller in scale than the Proposed Development, and the Proposed Development will be in keeping with the emerging pattern of tall buildings seen to the east, beyond the edge of the park, although it will extend this type of development slightly further south. Overall, the magnitude of change is considered to be small. The effect of the Proposed Development during the operational phase on the view experienced by residential receptors on Hulme Street is assessed as not significant (minor), neutral, and long-term.
Viewpoint 11: Higher Cambridge Street		
Sensitivity	Low	The combination of low value and low susceptibility results in the receptors experiencing this view having a low sensitivity to change associated with the Proposed Development (as described in Table 12.2).
Magnitude of Change / Significance of Effect (construction)	Small / not significant (negligible)	The Proposed Development will result in a small magnitude of change during the construction phase. This will be as a result of views of construction activity at the Site, including crane movements and the upper parts of the emerging building. Views of lower parts of the emerging building and ground-level construction will be screened from view by existing built form within the surrounding townscape, primarily development at Parkway Gate and along Loxford Street to the west. The effect of the Proposed Development during the construction phase on the view experienced by receptors on Higher Cambridge Street is assessed as not significant (negligible), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Small / not significant (negligible)	Upper parts of the Proposed Development will be seen in the view to the north-west, beyond Higher Cambridge Street towards Manchester city centre. The scale of the Proposed Development will contrast with the existing low-rise residential development visible in the adjacent townscape. However, it will be in keeping with recent development in its immediate vicinity, including Blocks B and D within First Street South, which will both appear taller than the Proposed Development from this perspective. Lower parts of the Proposed Development will be screened from view by development at Parkway Gate. Tree cover to the north-west of the viewpoint will also partially filter views in this direction, although this effect will be more limited in winter when vegetation cover is reduced. The Proposed Development will be in keeping with the emerging pattern of tall buildings which form a cluster to the north-west. Views towards the Proposed Development from within residential properties are likely to be heavily filtered by vegetation, and visibility will primarily be experienced by residents in the area surrounding their

Criteria		Assessment Description
		properties, road users, and people accessing university buildings. Overall, the magnitude of change is considered to be small. The effect of the Proposed Development during the operational phase on the view experienced by residential receptors, road users and people accessing university buildings is assessed as not significant (negligible), neutral, and long-term.
Viewpoint 12: Chester Street		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table12.2).
Magnitude of Change / Significance of Effect (construction)	Medium / significant (moderate)	The Proposed Development will result in a medium magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of cranes and the emerging building. There may be visibility of ground level construction activity within the Site. Views towards the emerging building will be framed by existing development along Chester Street, and the construction activity will be readily visible. The effect of the Proposed Development during the construction phase on the view experienced by residents on Newcastle Street is assessed as significant (moderate), adverse, and short-term.
Magnitude of Change / Significance of Effect (operation)	Medium / significant (moderate)	The Proposed Development will be seen to the west, framed in the view along Chester Street. The Proposed Development will screen longer-distance views to the west, and will create a sense of enclosure at the end of Chester Street. It will be partially screened by development on either side of Chester Street, although its full vertical extent will be readily visible. It will be seen in the context of Blocks B and D within First Street South, although these are positioned beyond built form along the northern edge of Chester Street in views from this location, while the Proposed Development will be positioned further south, at the western end of Chester Street. Although the Proposed Development will appear lower in the skyline than Blocks B and D within First Street South, to the right of the view, it will be taller than development at Parkway Gate, to the left. It will also appear greater in width than the adjacent First Street South buildings, and therefore its massing will appear slightly out of proportion with the surrounding development. Overall, the magnitude of change is considered to be medium. The effect of the Proposed Development during the operational phase on the view experienced by residents and road users on Chester Street is assessed as significant (moderate), neutral, and long-term.
Viewpoint 13: Hulme Street / Rockdove Avenue		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Magnitude of Change / Significance of Effect (construction)	Large / significant (major-moderate)	The Proposed Development will result in a large magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of crane movements and the emerging building at relatively close proximity. Views towards ground-level construction activity within the Site may also be available, beyond the nearby roundabout and junction with Medlock Street. Visibility may be available from within residential properties on Rockdove Avenue, although this is likely to be slightly reduced in summer due to filtering by adjacent tree cover and vegetation. The effect of the Proposed Development during the construction phase on the view experienced by residential receptors on Hulme Street /

Criteria		Assessment Description
		Rockdove Avenue is assessed as significant (major-moderate), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Large / significant (major-moderate)	The Proposed Development will be seen to almost its full extents in the view to the north-east. The building will be visible at close proximity, in the context of existing tall buildings to the north of the Mancunian Way. This includes Blocks B and D at First Street South. The Proposed Development will be seen at a similar distance from the viewpoint as Block D. It will however bring development into closer proximity to this viewpoint than Block B. Its position to the south of Block D will also bring development closer to the Mancunian Way, which currently acts to contain tall buildings within the city centre to the north. Therefore, the Proposed Development will extend the emerging pattern of tall buildings into slightly closer proximity to the viewpoint, although its design and form will largely be in keeping with the existing development. It is likely that views towards the Proposed Development will be available from within residential properties, although these will be partially filtered by nearby vegetation cover during summer months. Overall the magnitude of change is considered to be large. The effect of the Proposed Development during the operational phase on the view experienced by residents and road users on Hulme Street and Rockdove Avenue is assessed as significant (major-moderate), beneficial and long-term.
Viewpoint 14: Clarendon Street		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table 12.2).
Magnitude of Change / Significance of Effect (construction)	Large / significant (major-moderate)	The Proposed Development will result in a large magnitude of change during the construction phase. This will be as a consequence of construction activities at the Site, including visibility of crane movements and the emerging building at close proximity. Views towards ground-level construction activity within the Site may also be available, beyond the elevated Mancunian Way. Visibility is likely to be available from within residential properties on Clarendon Street. Views of the construction activity will be slightly filtered by tree cover to the north of the viewpoint, between Clarendon Street and the Mancunian Way, although this will be limited in winter. The effect of the Proposed Development during the construction phase on the view experienced by residential receptors on Clarendon Street is assessed as significant (major-moderate), adverse and short-term.
Magnitude of Change / Significance of Effect (operation)	Large / significant (major-moderate)	The Proposed Development will be seen to almost its full extents in the view to the north. The building will be visible at close proximity, in the context of existing tall buildings to the north of the Mancunian Way. This includes Blocks B and D at First Street South. It will be seen alongside development at Parkway Gate, to the east. The Proposed Development will be smaller in height than Block D, although due to its closer proximity to the viewpoint, it is likely to appear similar in height. Its position to the south of Block D will also bring development closer to the Mancunian Way, which currently acts to contain tall buildings within the city centre to the north. Therefore, the Proposed Development will extend the emerging pattern of tall buildings into slightly closer proximity to the viewpoint, although its design and form will largely be in keeping with the existing development. It is likely that views towards the Proposed Development will be available from within residential properties, although these will be partially filtered by nearby vegetation cover during summer months. Overall the magnitude of change is considered to be medium.

Criteria		Assessment Description
		The effect of the Proposed Development during the operational phase on the view experienced by residents and road users on Clarendon Street is assessed as significant (major-moderate), neutral and long-term.

Cumulative Effects

12.123 This section of the TVIA provides an assessment of the cumulative townscape and visual effects of the Proposed Development in conjunction with other committed developments ('cumulative schemes').

12.124 The cumulative effects assessment in this TVIA assesses the contribution of the Proposed Development to the effect arising with committed schemes. Cumulative schemes included in the TVIA were agreed in consultation with MCC and are listed in Table 12.1 and mapped in Figure 12.5. These cumulative schemes are considered further within the following assessment.

12.125 AVRs in Figures 12.7 - 12.21 show the Proposed Development in the context of these cumulative schemes, with a scale verifiable wireline to indicate the location of cumulative schemes within the view. The baseline viewpoint photography also captures partially constructed developments within the 3D context.

12.126 The contribution of the Proposed Development to the cumulative effect upon the baseline character or view is assessed, in conjunction with these cumulative schemes, with the assessment of cumulative effect apportioning the amount of the effect that is attributable to the Proposed Development.

12.127 The cumulative effects assessment ('CEA') for the Proposed Development focuses on the cumulative effects of the completed and operational development and does not consider its cumulative effects during construction, which cannot be accurately assessed due to the uncertainties of the construction phasing for cumulative schemes that are approved, but where construction is not started, and the uncertainty of overlaps with the construction phase for the Proposed Development. Cumulative effects during construction are likely to be similar or less in magnitude than those assessed for the completed and operational development, of short-term, adverse but temporary during the construction phase for the Proposed Development.

Table 12.11: Committed and Cumulative Developments included within TVIA (Scenario 4)

Reference	Location	Planning Ref	Status	TVIA Consideration
1	Plot 9a, First Street	132600/FO/2021	Under construction	Baseline (committed)
2	First Street South (Plots A, B and D only)	125573/FO/2019	Under construction	Baseline (committed)
3	Metropolitan University Science and Engineering Building	125799/FO/2019	Under construction	Baseline (committed)
4	Barclay House	118033/P3OPA/2017	Under construction	Baseline (committed)
5	Havelock	129081/FO/2021	Under construction	Baseline (committed)
6	Viadux	115871/FO/2017	Under construction	Baseline (committed)

Reference	Location	Planning Ref	Status	TVIA Consideration
7	Staycity Deansgate	125804/FO/2019	Under construction	Baseline (committed)
8	The Blade and Three60	126668/FO/2020	Under construction	Baseline (committed)
9	Plot 10a, First Street	136043/FO/2023	Under construction	Baseline (committed)
10	Plot 10b, First Street	136170/FO/2023	Under construction	Baseline (committed)
11	Great Jackson Plot F	132199/FO/2021	Under construction	Baseline (committed)
12	Vision	111003/FO/2016/C1	Under construction	Baseline (committed)
13	Deansgate South (Fusion)	129406/FO/2021	Application approved	Cumulative
14	One City Road	128002/FO/2020	Application approved	Cumulative
15	Park Place	129273/FO/2021	Application approved	Cumulative
16	Travelodge Deansgate Locks	126308/FO/2020	Application approved	Cumulative
17	Bridgewater House	134694/FO/2022	Application approved	Cumulative
18	One Medlock Street	135419/FO/2022	Application approved	Cumulative
19	Great Jackson Street - Crown Street Plot D	137227/FO/2023	Application submitted	Cumulative
20	Great Jackson Street – Plot C and E	137226/FO/2023	Application submitted	Cumulative
21	Student Castle	121252/FO/2018	Application approved	Cumulative

12.128 Committed developments that are approved and under construction are considered as part of the baseline and assessed in the main 'Identification and Evaluation of Likely Significant Effects' section of this TVIA.

12.129 Cumulative Developments that are approved, but not yet under construction, and those awaiting determination (as highlighted in Table 12.1), are considered as part of the cumulative baseline and assessed in the following 'Cumulative Effects' assessment.

12.130 Cumulative developments considered in the cumulative effect assessment will further the influence of tall residential buildings in the baseline townscape character. In particular, 19: Great Jackson Street - Crown Street Plot D is a proposed tower of 71 storeys, which if consented and built would become the tallest building in Manchester. In addition, 15: Park Place, 20: Great Jackson Street - Plot C and E, and 21: Student Castle are all proposed at more than 50 storeys and are located in a cluster to the north of the Mancunian Way, west of the Proposed Development.

12.131 Although these cumulative developments are taller than many of the existing buildings within Manchester, they are in keeping with the emerging pattern of tall residential development on the south-western edge of Manchester city centre, contained by the Mancunian Way.

Likely Cumulative Townscape Effects and their Significance

12.132 The cumulative effects of the Proposed Development on townscape character for the completed and operational development are assessed in Table 12.1211.

12.133 Where TCAs have been scoped out of the main assessment (described above), these are also excluded from the cumulative effects assessment. If TCAs are considered unlikely to undergo a significant effect as a result of the Proposed Development given a baseline which includes existing and under construction projects, it is judged that it is also unlikely to undergo a significant effect given a baseline which also includes cumulative developments. The cumulative effects assessment therefore focusses on TCAs which are considered to have the potential to experience significant effects.

Table 12.12: Cumulative Townscape Character Assessment (Scenario 4)

Criteria		Cumulative Assessment Description
TCA 5: South-west City Centre Redevelopment		
Sensitivity	Medium	The combination of medium value and low susceptibility results in this TCA having a medium sensitivity to changes associated with the Proposed Development (as described in Table 12.32).
Cumulative Magnitude of Change / Significance of Effect (Operation)	Small / not significant (minor)	The character of this TCA is heavily influenced by regeneration activity, with an increasing influence from tall buildings as well as the contrast between different architectural styles. There are several cumulative developments within this TCA. In particular, 13: One City Road, 14: Park Place, 17: Bridgewater House, 18: One Medlock Street, 19: Great Jackson Street - Crown Street Plot D, and 20: Great Jackson Street - Crown Street Plot C and E, will contribute to an emerging cluster of tall buildings located to the west of the Proposed Development, and located along the south-western boundary of the TCA. The Proposed Development will be broadly in keeping with the emerging character of this TCA, and will contribute to its ongoing regeneration. The Proposed Development will be located slightly further south than the cumulative developments to the west, in slightly closer proximity to residential areas of Hulme, but it will continue the pattern of tall buildings located adjacent to the Mancunian Way which has been established by existing and cumulative developments. Overall, the cumulative magnitude of change to the perceived character of TCA5: South-west City Centre Redevelopment is assessed as small. The contribution of the Proposed Development to the cumulative effect on the character of TCA5: South-west City Centre Redevelopment in the context of the approved cumulative developments is assessed as not significant (minor), beneficial and long-term.
TCA 6: Residential		
Sensitivity	Medium	The combination of the medium value and low susceptibility results in this TCA having a medium sensitivity to changes associated with the Proposed Development (as described in Table 12.2).
Cumulative Magnitude of Change / Significance of Effect (Operation)	Small / not significant (minor)	The cumulative magnitude of change to the perceived character of TCA6: Residential resulting from the contribution of the Proposed Development to the cumulative schemes is assessed as small. The Proposed Development will contribute to the increasing influence of tall buildings within the adjacent TCA5: South-west City Centre Redevelopment, to the north of TCA6: Residential. It will be visible in a sector of the neighbouring TCA which is already subject to the influence of tall buildings, including primarily Plots A, B and D within First Street South. The Proposed Development will bring development of this type into slightly closer proximity to TCA6: Residential. However, in the context of cumulative developments including 13: One City Road, 14: Park Place, 17: Bridgewater House, 18: One Medlock Street, 19: Great Jackson Street - Crown Street Plot D, and 20: Great

Criteria		Cumulative Assessment Description
		Jackson Street - Crown Street Plot C and E, which form an emerging cluster to the north-west, the contribution of the Proposed Development, and its interaction with the cumulative developments, will be limited. The additional contribution of the Proposed Development to the cumulative effect on the character of TCA6: Residential in the context of the approved cumulative developments is assessed as not significant (minor), neutral and long-term in duration.

Likely Cumulative Visual Effects and their Significance

12.134 The visual effects of the Proposed Development are assessed against the cumulative baseline, in Table 12.13.

12.135 Due to the position of the Proposed Development within a heavily developed urban area, there are limited long-distance views available from much of the Study Area. This, combined with the containment of the majority of cumulative developments within one part of the Study Area, means that from several viewpoints, there will be no visibility of cumulative developments. Where this is the case, or where there is no visibility of the Proposed Development (as described in Table), viewpoints are not considered within the cumulative assessment.

12.136 Viewpoints assessed above as experiencing a small magnitude of change or lower within the viewpoint assessment are also excluded from the cumulative viewpoint assessment. From these viewpoints, under a baseline scenario in which there are further tall buildings in the view, it is not considered that the Proposed Development will result in a greater magnitude of change than when considered in a baseline scenario which excludes cumulative developments. As described in the assessment methodology, significant effects are only considered to have the potential to arise where the magnitude of change is assessed as medium or higher. Therefore, excluding these viewpoints focusses the cumulative effects assessment on likely significant effects.

12.137 Therefore, viewpoints included within Table 12.13 are those from which there will be visibility of both the Proposed Development and cumulative developments, and from which a medium cumulative magnitude of change or higher has been identified within the viewpoint assessment.

12.138 The assessment of cumulative visual effects focusses on the interaction between the Proposed Development and cumulative developments which are visible in the same sector of the view, as illustrated by the wirelines within Figures 12.7 - 12.21. However, where there is likely to be a cumulative interaction with a development in close proximity in a different sector of the view, this is also described.

Table 12.13: Cumulative Viewpoint Assessment (Scenario 4)

Criteria		Cumulative Assessment Description
Viewpoint 2: Hulme Arch Bridge		
Sensitivity	Medium	The combination of medium value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table 12.2).
Cumulative Magnitude of Change / Significance	Small / not significant (minor)	A number of cumulative schemes including One Medlock Street (18) and Student Castle (21), will be visible in the view of the Manchester city centre skyline, and will extend and increase the tall building scale of the city in the view, to the east and west of the Site. The Proposed Development represents a continuation of this effect that will be established by approved schemes. The scale of the

Criteria		Cumulative Assessment Description
of Effect (operation)		Proposed Development can be noted as being smaller in height than the committed developments which will be present in the view, as well as smaller than the adjacent Block D within First Street South, as described in the project alone assessment. It will be contained within the horizontal extent of the view occupied by Blocks B and D, while other cumulative developments will be seen to extend the influence of tall buildings over a wider extent of the Manchester city centre skyline. On balance, the additional cumulative magnitude of change resulting from the contribution of the Proposed Development in the context of the approved cumulative schemes is assessed as small, primarily because it is contained within the sector of the view already influenced by the First Street South blocks, limiting its interaction with other approved cumulative schemes, which will contribute more to the increasing influence of tall buildings on the Manchester city centre skyline as seen from this viewpoint. The additional contribution of the Proposed Development to the cumulative effect on the view in the context of the approved cumulative developments is assessed as not significant (minor), neutral and long-term in duration.
Viewpoint 3: Newcastle Street		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Cumulative Magnitude of Change / Significance of Effect (operation)	Small / not significant (minor)	A number of cumulative schemes, including One Medlock Street (18), Park Place (14), and Great Jackson Street Plot D (19), will be visible in the view to the north-west. These developments will generally be seen in front of the existing towers at Deansgate Square, and will form a cluster of tall buildings in this sector of the view, to the west of the Proposed Development. The scale of the Proposed Development can be noted as being similar in height on the skyline as the committed developments which will be present in the view, although this is likely partially due to its closer proximity to the viewpoint. It will be backclothed against the taller Block D beyond, as described in the viewpoint assessment in Table , while other cumulative developments such as One Medlock St (18) and Park Place (15) will be seen to slightly extend the influence of tall buildings in the city centre backdrop, albeit contained within a relatively defined cluster of development and only their upper floors being visible above the foreground housing. The Proposed Development will be seen in closer proximity to the viewpoint than these cumulative developments, which will emphasise its scale, however its interaction with other cumulative schemes is limited because it will be subsumed within the massing of First Street Block D. The cumulative magnitude of change resulting from the additional contribution of the Proposed Development in the context of the cumulative schemes is assessed as small, primarily due to its relatively close proximity to the viewpoint and its contribution with One Medlock St (18) and Park Place (15) to a slight intensification of the effect of tall buildings in the city backdrop, however the additional effect is limited by it being contained within the sector of the view that is already influenced by the First Street South blocks and the limited amount of the upper parts of One Medlock St (18) and Park Place (15) that will be visible adjacent to the existing Deansgate Square. The additional contribution of the Proposed Development to the cumulative effect on the view in the context of the cumulative developments is assessed as not significant (minor), neutral and long-term in duration.
Viewpoint 5: Mancunian Way Slip Road to Medlock Street		

Criteria		Cumulative Assessment Description
Sensitivity	Medium	The combination of medium value and low susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Cumulative Magnitude of Change / Significance of Effect (operation)	Medium / significant (moderate)	There is one cumulative development visible in the view towards the Proposed Development, which comprises Student Castle (21), seen in the view along Hulme Street to the north-east of the Proposed Development. There are likely to be further cumulative developments seen in other sectors of the view, including most notably One Medlock Street, seen at close proximity to the west from this viewpoint. The Proposed Development is likely to contribute to an increase in the scale of the surrounding buildings which will be experienced by receptors at this viewpoint. There will be a containment of the view in several directions, and greater influence from tall buildings in the immediate surroundings of the viewpoint. The Proposed Development will contribute to this effect, along with other cumulative developments, particularly One Medlock Street (18). The cumulative magnitude of change resulting from the additional contribution of the Proposed Development in the context of the cumulative developments is assessed as medium. This is due to its contribution with One Medlock Street (18) and Student Castle (21) to the containment of views and increasing influence of tall buildings in the surrounding townscape. However, the additional effect is limited by its proximity to the existing First Street South blocks and its containment broadly within this sector of the view. The additional contribution of the Proposed Development to the cumulative effect on the view in the context of the cumulative developments is assessed as significant (moderate), neutral and long-term in duration.
Viewpoint 6: Hulme Park		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table 12.2).
Cumulative Magnitude of Change / Significance of Effect (operation)	Small / not significant (minor)	There are several cumulative developments visible from this viewpoint, including Student Castle (21), One Medlock Street (18), One City Road (13) and Park Place (14). In particular, Student Castle will form a prominent feature in the view to the east, being seen beyond River Street. It will appear taller in the view than Block D within First Street, which it will appear adjacent to. Other cumulative developments will exert a more limited influence on the skyline visible from this viewpoint. There may also be visibility of further cumulative developments in a different sector of the view to the north, including buildings at Great Jackson Street (19 and 20). The Proposed Development represents a continuation of the effect that will be established by cumulative schemes. The scale of the Proposed Development can be noted as being smaller in height than the committed developments which will be present in the view, particularly One Medlock Street which will be seen to the west of Block D within First Street South. Both One Medlock Street and Park Place will appear larger in scale than any of the existing buildings or the Proposed Development. The Proposed Development will also be smaller than the adjacent Block D within First Street South, as described in the project alone assessment. It will be located further south than other cumulative developments in views from this viewpoint, and will extend the influence of tall buildings over a wider extent of the city centre skyline. On balance, the additional cumulative magnitude of change resulting from the contribution of the Proposed Development in the context of the cumulative schemes is assessed as small, primarily due to its smaller scale and its position adjacent to the First Street South blocks, limiting its interaction with other

Criteria		Cumulative Assessment Description
		cumulative schemes, which will contribute more to the increasing influence of tall buildings on the Manchester city centre skyline as seen from this viewpoint. The additional contribution of the Proposed Development to the cumulative effect on the view in the context of the cumulative developments is assessed as not significant (minor), neutral and long-term in duration.
Viewpoint 9: Clarendon Street / Princess Street		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Cumulative Magnitude of Change / Significance of Effect (operation)	Negligible / not significant (minor-negligible)	Figure 12.16b indicates that Student Castle (21) will be theoretically visible in the view to the north-east, seen at distance. Part of this building will be screened beyond the Proposed Development, so only the edge of the tower will be seen. It is also likely to be difficult to discern due to distance and the effect of filtering by intervening vegetation. There is likely to be very limited association between the Proposed Development and Student Castle, and therefore a negligible additional cumulative effect at most. The additional contribution of the Proposed Development to the cumulative effect on the view in the context of the cumulative developments is assessed as not significant (minor-negligible), neutral and long-term in duration.
Viewpoint 13: Hulme Street / Rockdove Avenue		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in Table).
Cumulative Magnitude of Change / Significance of Effect (operation)	Medium / significant (moderate)	Although Figure 12.20b shows that there are no cumulative developments in the view towards the Proposed Development, One Medlock Street (18) will be visible to the north, seen in a different sector of the view. There may also be more limited visibility of further cumulative developments across this sector of the view, including Park Place (14). The Proposed Development is likely to contribute to an increase in the scale of the surrounding buildings which will be experienced by receptors at this viewpoint. It will contribute to the increasing containment of the view in several directions, and greater influence from tall buildings in the immediate surroundings of the viewpoint. The Proposed Development will contribute to this effect, along with other cumulative developments, particularly One Medlock Street (18). The cumulative magnitude of change resulting from the additional contribution of the Proposed Development in the context of the cumulative developments is assessed as medium. This is due to its contribution with One Medlock Street (18) to the increasing influence of tall buildings in the surrounding townscape. In particular, the Proposed Development will contain views to the north-east, and will bring development of this type into closer proximity to lower-rise residential development to the south. However, the additional effect is limited by its proximity to the existing First Street South blocks and its containment broadly within this sector of the view. The additional contribution of the Proposed Development to the cumulative effect on the view in the context of the cumulative developments is assessed as significant (moderate), neutral and long-term in duration.
Viewpoint 14: Clarendon Street		
Sensitivity	Medium	The combination of medium value and medium susceptibility results in the receptors experiencing this view having a medium sensitivity to change associated with the Proposed Development (as described in

Criteria		Cumulative Assessment Description
		Table).
Cumulative Magnitude of Change / Significance of Effect (operation)	Negligible / not significant (minor-negligible)	One Medlock Street (18) may be visible to the north-west, seen in a different sector of the view to the Proposed Development. There are no further cumulative developments in the view. Due to filtering by the close proximity vegetation within this view, and the close proximity of the Proposed Development, there is likely to be very limited association between the Proposed Development and One Medlock Street, and therefore a negligible additional cumulative effect at most. The additional contribution of the Proposed Development to the cumulative effect on the view in the context of the cumulative developments is assessed as not significant (minor-negligible), neutral and long-term in duration.

Mitigation Measures

12.139 As described above, mitigation relating to TVIA is embedded within the design of the Proposed Development. Therefore, there is no additional mitigation proposed.

12.140 Primary mitigation for TVIA includes good design, and appropriate architectural responses (such as materiality, form, layout, massing) and landscape design proposals. For further information regarding the design process and embedded mitigation, please refer to the Design and Access Statement.

Residual Effects

12.141 Given that all mitigation is embedded within the design of the Proposed Development, residual effects will be the same as those assessed previously.

Construction Phase

12.142 The likely significant townscape and visual effects resulting from the Proposed Development during the construction phase are summarised in Table 12.14.

Table 12.14: Summary of Likely Significant Effects, Mitigation Measures and Residual Effects during Construction Phase (Scenario 4)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Significant visual effect on residents of closest area of Hulme to immediate south of the Site, consisting of Clarendon Street (as represented by Viewpoints 9 and 14), Rockdove Avenue (as represented by Viewpoint 13), the area around Newcastle Street (as represented by Viewpoint 3), and within Hulme Park (as represented by Viewpoint 6). Effect likely to be significant due to the scale and proximity of construction of Proposed	Residents and people engaged in recreation within Hulme	The primary mitigation measure will be the timely completion of construction works and the short-term, temporary duration of the effect. Other mitigation may help to slightly reduce	CEMP	Significant and temporary visual effect on residents of closest area of Hulme to immediate south of the Site during construction phase.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Development tall building in views from smaller scale residential streets and public spaces in closest area of Hulme.		adverse visual effects of the construction phase, including tidy Site management, appropriate hoardings, scaffolding covers and well located, modern light fittings as part of a CEMP to minimise lighting intrusion.		
Significant visual effect on motorists travelling on roads within close proximity to the Site, including on Medlock Street (as represented by Viewpoint 5) and within Hulme (as represented by Viewpoint 2). Similar effects are likely to be experienced by motorists travelling along a short section of the Mancunian Way. Effects are likely to be significant due to the scale and proximity of construction of Proposed Development tall building, from adjacent roads and a short, elevated section of the Mancunian Way passing the Site, with views into the construction Site.	Pedestrians and road users			Significant and temporary visual effect on pedestrians and road users within the immediate surroundings of the Site during construction phase.
Significant visual effect on people within closest area immediately around the Proposed Development including to the east around Chester Street (as represented by Viewpoint 12) and to the west on Medlock Street (as represented by Viewpoint 5). Effect likely to be significant due to the scale and proximity of construction of Proposed Development tall building in views from closest streets and public spaces.	Residents / pedestrians in area surrounding the Site			Significant and temporary visual effect on people within the closest streets to the east and west of the Site, including Chester Street and Medlock Street.

Operational Phase

12.143 The likely significant townscape and visual effects resulting from the Proposed Development during the operational phase are summarised in **Table 12.15.**

Table 12.15: Summary of Likely Significant Effects, Mitigation Measures and Residual Effects during Operational Phase(Scenario 4)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Significant visual effect on residents of closest area of Hulme to immediate south of the Site, consisting of Clarendon Street (as represented by Viewpoints 9 and 14), Rockdove Avenue (as represented by Viewpoint 13), area around Newcastle Street (as represented by Viewpoint 3), and within Hulme Park (as represented by Viewpoint 6). Effects are likely to be significant due to the scale and proximity of Proposed Development tall building in views from smaller scale residential streets and public spaces in closest area of Hulme, however Proposed Development will be viewed as part of the backdrop of tall buildings forming the emerging south-west city centre skyline.	Residents and people engaged in recreation within Hulme	Primary mitigation measures are embedded into the design quality and appropriate location of the Proposed Development. The appearance strategy is grounded in emerging city scale of other baseline committed developments in surrounding area, including existing First Street South buildings; the material palette of glass unitised curtain walling is in keeping with existing First Street South buildings; and the associated landscape design proposals will improve public realm. Although significant, effects are generally assessed to be beneficial or neutral in nature due to replacement of a derelict vacant site with new buildings and public realm, that have a positive relationship to both local and city scale and context.	CEMP	Significant and permanent visual effect on residents of closest area of Hulme to immediate south of the Site during operational phase.
Significant visual effect on motorists travelling on roads within close proximity to the Site, including on Medlock Street (as represented by Viewpoint 5) and within Hulme (as represented by Viewpoint 2). Similar effects are likely to be experienced by motorists travelling along a short section of the Mancunian Way. Effects are likely to be significant due to the scale and proximity of Proposed Development tall building, however Proposed Development will be viewed as part of the backdrop of tall buildings forming the emerging south-west city centre skyline.	Pedestrians and road users			Significant and permanent visual effect on pedestrians and road users within the immediate surroundings of the Site during operational phase.
Significant visual effect on people within closest area immediately around the Proposed Development including to the east around Chester Street (as represented by Viewpoint 12) and to the west on Medlock Street (as represented by Viewpoint 5). Effect likely to be significant due	Residents / pedestrians in area surrounding the Site			Significant and permanent visual effect on people within the closest streets to the east and west of the Site, including Chester Street and Medlock Street, during operational phase.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
to the scale and proximity of Proposed Development tall building, however Proposed Development will be viewed as part of the backdrop of tall buildings forming the emerging south-west city centre skyline.				

12.144 The TVIA assesses the likely significant effects of the Proposed Development on the townscape and visual resource. It assesses the significance of changes on both the townscape as a resource in its own right, and on people's views and visual amenity. It also assesses the cumulative effects arising in conjunction with cumulative committed developments. Visual effects have been assessed from 14 representative viewpoints, using photomontage and wireline visualisations to show the predicted appearance and position of the Proposed Development (Figure 12.7 - 12.20).

12.145 No significant townscape effects are predicted to arise as a result of the Proposed Development during the construction or operational phases. This is primarily due to limited visibility of the Proposed Development beyond its immediate context, and existing development activity of a similar character within the surrounding TCA 5: South-west city centre redevelopment, which establishes development of this type as a characteristic of the baseline.

12.146 The Proposed Development comprises one tall building. It is substantially taller than the adjacent neighbourhood of Hulme to the south, but is comparable or smaller than other towers and baseline committed developments in the immediate area, including the existing development at First Street South in its immediate context, and Deansgate Square, New Jackson and Beetham Tower to the north-west. Given its scale, the Proposed Development has some localised significant visual effects when viewed from the closest smaller scale residential areas of Hulme to the immediate south; from the immediate area around Medlock Street/Hulme Street/Chester Street; and from the roads including Medlock Street and the Mancunian Way when approaching and immediately passing the Proposed Development in close proximity from the road.

12.147 Although cumulative development, considered in the cumulative effect assessment, will further the influence of tall residential buildings in the Study Area, there will be limited intervisibility of the Proposed Development with these cumulative developments. This effect will be partly due to the position of most of the cumulative developments within the city centre context to the north and west of the Site, and the screening of the Proposed Development from the north by the taller Block D within First Street South. Therefore, cumulative townscape and visual effects arising as a result of the Proposed Development will be limited. Townscape and visual effects of the Proposed Development will generally remain as assessed in this baseline committed development scenario, rather than increasing as a result of its combination with cumulative committed development. Exceptions to this, where significant effects will arise as a result of the additional contribution of the Proposed Development to the cumulative effect on the view, will be at Viewpoint 5 and Viewpoint 13. This is due to the contribution of the Proposed Development with One Medlock Street (18) to the increasing influence of tall buildings in the surrounding townscape.

12.148 The TVIA has found that townscape and visual effects in general, and these localised significant visual effects, are mitigated by the design quality of the Proposed Development and its appropriate location in an area where regeneration is occurring and its positive contribution to place making. The Proposed Development will improve the visual amenity of the Site, where the vacant land is currently having adverse effects on visual amenity of the area and improve the gateway views from the Mancunian Way and Princess Road of the cityscape to the north. The Proposed Development will complement Manchester's key existing and committed building assets and make a positive contribution to the development of a distinctive townscape in this area of Manchester.

Monitoring

12.149 No monitoring is recommended during the operational phase with respect to TVIA.

Reference List

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

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https://www.manchester.gov.uk/downloads/download/5672/core_strategy. (Accessed 24/11/2023).

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- Manchester City Council (2023). Castlefield Conservation Area. [Online]. Available at: https://www.manchester.gov.uk/info/511/conservation_areas/972/castlefield_conservation_area. (Accessed 24/11/2023).

- Manchester City Council (2023). Deansgate and Peter Street Conservation Area. [Online]. Available at: https://www.manchester.gov.uk/info/511/conservation_areas/1092/deansgatepeter_street_conservation_area. (Accessed 24/11/2023).

- Manchester City Council (2023). George Street Conservation Area. [Online]. Available at: https://www.manchester.gov.uk/info/511/conservation_areas/1048/george_street_conservation_area. (Accessed 24/11/2023).

- Manchester City Council (2023). St John Street Conservation Area. [Online]. Available at: https://www.manchester.gov.uk/info/511/conservation_areas/914/st_john_street_conservation_area. (Accessed 24/11/2023).

- Manchester City Council (2023). St Peter's Square Conservation Area. [Online]. Available at: https://www.manchester.gov.uk/info/511/conservation_areas/966/st_peters_square_conservation_area. (Accessed 24/11/2023).

- Manchester City Council (2023). Upper King Street Conservation Area. [Online]. Available at: https://www.manchester.gov.uk/info/511/conservation_areas/916/upper_king_street_conservation_area. (Accessed 24/11/2023).

- Manchester City Council (2023). Whitworth Street and Princess Street Conservation Area. [Online]. Available at: https://www.manchester.gov.uk/info/511/conservation_areas/970/whitworth_street_conservation_area. (Accessed 24/11/2023).

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13. Wind Microclimate

Introduction

13.1 This Chapter of the ES has been prepared by Architectural Aerodynamics Limited (ArcAero) and assesses the likely wind microclimate impacts of the proposals 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: Wind Microclimate Assessment (1690207rep3v2)

13.3 The Authors of this chapter are Dr Robin Stanfield and Joseph Osman. Robin has undergraduate and postgraduate degrees in experiential and computational aerodynamics, culminating in an Engineering Doctorate. He has 16 years' experience carrying out wind microclimate assessments in the UK and internationally. As part of this experience Robin has led EIA for wind microclimate in UK cities for some of the most major tall building developments and masterplans, is a regular peer reviewer for various planning authorities, and has experience as an expert witness for planning enquiries. Joseph has a Masters degree in aerospace engineering and 15 years of professional experience, including 8 years working on wind engineering projects globally. Included within this, Joseph has regularly contributed to wind microclimate projects subject to EIA, and acted as peer reviewer for a number of planning authorities. Both authors are directors of Architectural Aerodynamics LTD, which has been operating for 5 years and has delivered wind microclimate assessments on ~200 schemes.

Assumptions and Limitations

13.4 The studies have been carried out computationally via computational fluid dynamics (CFD) methods. The particular method adopted employs turbulence models to approximate the magnitude of velocity fluctuations about the average wind speeds predicted, in order to derive an estimation of the effect of gusts. ArcAero conducts regular validation of proprietary CFD processes against experimental results.

Relevant Legislation, Policy and Guidance

Policy

National Planning Policy Framework, 2023

13.5 The National Planning Policy Framework (NPFF) was revised in September 2023 by the Department of Communities and Local Government (DCLG). The relevant paragraphs are as follows:

Paragraph 135 of the National Planning Policy Framework states that:

"Planning policies and decisions should ensure that developments:

…

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."

13.6 There is no specific planning policy guidance dealing with microclimate in terms of pedestrian comfort set out in the revised NPPF.

Manchester's Local Development Framework, Core Strategy Development Plan Document

13.7 Manchester's Local Development Framework, Core Strategy Development Plan Document, Policy 12.4 states *"Tall buildings by their very nature can dominate the street scene and be highly visible over long distances. They can also have an impact on the local micro-climatic conditions, for example, by creating wind tunnels. It is for these reasons that it is considered particularly important that they are designed to the highest quality, both in terms of appearance and their impact on the functioning of surrounding space."*

Guidance

National Planning Practice Guidance (NPPG), 2019

13.8 The NPPG states, under 'Consider form' (Paragraph 25), that: *"Some forms pose specific design challenges, for example how taller buildings meet the ground and how they affect local wind and sunlight patterns should be carefully considered."*

13.9 The NPPG states, under 'Consider scale' (Paragraph 26), that *"Account should be taken of local climatic conditions, including daylight and sunlight, wind, temperature and frost pockets."*

National Design Guide, 2021

13.10 Policy 41 of the National Design Guide states that a new development *"enhances positive qualities and improves negative ones. Some features are physical, including:" "environment – including landscape and visual impact, microclimate, orientation, flood risk, noise, air and water quality."*

13.11 Policy 71 of the National Design Guide states that *"Proposals for tall buildings (and other buildings with a significantly larger scale or bulk than their surroundings) require special consideration. This includes their location and siting; relationship to context; impact on local character, views and sight lines; composition - how they meet the ground and the sky; and environmental impacts, such as sunlight, daylight, overshadowing and wind. These need to be resolved satisfactorily in relation to the context and local character."*

Assessment Methodology and Significance Criteria

Overview

13.12 The full technical methodology for the computational fluid dynamics (CFD) study is set out in Appendix 15.1.

13.13 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. This assessment considers the wind conditions that would result upon the introduction of the Proposed Development into the study area. This assessment further considers the cumulative

impact following the introduction of consented developments within the surrounding area, as set out below.

13.14 The current assessment considers the study area to comprise the Site plus buildings and spaces within a radius of 450 metres from the centre of the Site. For a development of this scale, this allows for approximately 450 metres of the surrounding area to be modelled, including relevant cumulative and reasonably foreseeable developments.

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

Computational Fluid Dynamics

13.16 CFD modelling has employed a steady-state Reynolds-Averaged Navier-Stokes (RANS) approach. This method employs turbulence models to approximate the magnitude of velocity fluctuations about the average wind speeds predicted, in order to derive an estimation of the effect of gusts. Full details on this approach are provided in Appendix A13.1, salient highlights of this approach are:

- The Shear Stress Transport k-ω turbulence model has been employed.
- Architectural features of 0.5 metres or more have been captured within the geometry modelled.
- Cell sizes of as small as 0.2 metres were utilised to capture flow behaviour in critical locations.
- The region of interest closest to the ground (1.5 metres) incorporated 5 layers of cells.

13.17 Modelling has derived mean and gust equivalent mean wind speeds, in accordance with best industry practice. In doing so 16 wind directions were assessed, in 22.5° increments.

Site Wind Climate

13.18 Wind environment studies require that wind speed data obtained from a measurement station be transposed to the Site of interest. The measurement station of choice for the assessment is that at Manchester Airport.

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

Assessment Criteria

13.20 The industry standard criteria for wind microclimate assessments are commonly referred to in the UK as the Lawson criteria after one of their main authors. As with most other leading practitioners,

ArcAero use the 'LDDC' (London Docklands Development Corporation) variant of the Lawson Criteria.

13.21 The LDDC variant applies a single percentage probability of exceedance of a range of wind speeds and associates different wind speeds to different types of usage. This offers a relatively simple and practical manner for the assessment of wind comfort and safety.

13.22 A wind speed of 15 m/s occurring once per year is rated as unsuitable, in terms of safety, with the potential to de-stabilise the less able members of the public including the elderly, cyclists and children.

13.23 The LDDC variant of the Lawson criteria prescribes that wind conditions are suitable for a given activity when the threshold is exceeded no more than 5% of the time. The value of 5% has been established as giving a reasonable allowance for extreme and relatively infrequent winds that are tolerable within each category.

13.24 Where certain activities are year-round, such as walking, entrance use or for waiting areas, comfort ratings are required to be met in all seasons. For more seasonal activities, such as outdoor recreation or for sitting spaces, the assessment focuses on relevant seasons where the expectation will exist for conditions to be suitable. The LDDC comfort threshold wind speed values are presented in Table 13.1.

Table 13.1: Lawson Comfort Criteria

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

13.25 The assessment takes full account of seasonal variations in wind conditions and pedestrian activities. For example, conditions for recreational activities focus on summer (June, July, August), but also consider spring (March, April, May) and autumn (September, October, November), while conditions for pedestrian thoroughfare, access or waiting (e.g., bus stops) consider all seasons, with winter (December, January, February) usually being the critical season. The assessment is summarised in terms of suitability for various activities. The activities considered, and their relation to the Lawson comfort criteria are summarised in Table 13.2.

Table 13.2: Suitability Assessment

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

Scenarios Tested

13.26 A digital model of the existing buildings within a 450-metre radius from the centre of the Site was constructed. The building proposals that comprise the Proposed Development and cumulative surrounding developments were also constructed, and the following scenarios were modelled in CFD:

- Scenario 1: Existing Site (baseline) with committed developments
- Scenario 2: Existing Site (baseline) with committed developments and cumulative developments
- Scenario 3: Scenario 1 plus Proposed Development
- Scenario 4: Scenario 2 plus Proposed Development

13.27 The Proposed Development has not been tested in the absence of any surrounding context.

13.28 The effect of treating Plot 10a as a cumulative scheme will have no material impact on the wind microclimate in and around the Proposed Development. This is because, in summary, the prevailing wind direction for Manchester is from the south and west; plot 10a is downstream of the Proposed Development and therefore changes within the Plot 10a boundary will have minimal impact. If there is a scenario where the current plot 10a scheme is not built out and the site were then to become open and accessible to the public without being hoarded off then further testing of the exact scenario may be advisable to ensure that the area is suitable for use.

13.29 The effect of treating Plot 10b as a cumulative scheme will have no material impact on the wind microclimate in and around the Proposed Development. Plot 10b is further downstream from the prevailing direction than Plot 10a and therefore there is considered less potential for impact.

The Study Area

13.30 The study considers all wind effects up to 450m radius from the Proposed Development and contains all features which are likely to affect the wind flow at the Site. This distance is considered sufficient to capture all wind effects on Site, as well as those effects on the surrounding area.

Source of Effect

13.31 Potentially adverse wind effects caused by interaction of the wind with the Proposed Development may, but not necessarily be limited to:

- Downdrafts
- Funnelling / channelling of winds
- Corner accelerations
- Significant exposure to prevailing winds.

Significance Criteria

13.32 During construction, receptors are defined to be pedestrians and cyclists on the road around the Site and construction workers within the Site. During construction, sensitivity to wind is typically reduced. All receptors are considered to be medium sensitivity to the local wind microclimate conditions and are given an equal weighting.

13.33 For the scenario for the Proposed Development in place, receptors are defined to be persons on foot, seated or travelling by bicycle within the Proposed Development and surrounding areas. All receptors are equally sensitive to the presence or absence of an acceptable wind microclimate. An unacceptable microclimate exists when either an exceedance of the safety criteria exists, or when the comfort criteria is not met for the existing / planned use at a receptor. All receptors are considered to be highly sensitive to the local wind microclimate conditions and are given an equal weighting.

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

13.35 On this basis, therefore, exceedances of the safety criteria are considered to be of major magnitude, while exceedances of the comfort criteria are considered to be of moderate or minor magnitude. Where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change, this will be considered negligible.

13.36 Major and moderate effects are considered to be significant in EIA terms. Minor effects, as noted above being tolerable, are not considered to be significant.

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

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

Baseline Conditions

13.38 The following schemes are either recently completed or have construction underway. They are therefore expected to be completed before commencement of the Construction or Operational phases of the Proposed Development, and are therefore considered in the Baseline Assessment:

- Plot 9a, First Street (132600/FO/2021)
- First Street South (Plots A, B and D only) (125573/FO/2019)
- Metropolitan University Science and Engineering Building (125799/FO/2019)
- Barclay House (118033/P3OPA/2017)
- Havelock (129081/FO/2021)
- Plot 10a, First Street (136043/FO/2023)
- Plot 10b, First Street (136170/FO/2023)
- Great Jackson Plot F (132199/FO/2021)

13.39 The results for the existing Site within existing surroundings are presented graphically within Appendix 13.1 (Figures 4.1 for safety, Figure 4.2 for worst-seasonal comfort, and Figure 4.3 for the summer comfort).

13.40 Within the existing Site and surrounds, there are no exceedances of the safety criteria for pedestrian activity throughout the year. This is considered to be a Negligible effect.

13.41 Furthermore, wind comfort conditions for majority of the areas are suitable for at least strolling or better throughout the year. During summer, most of these areas improve to short-term standing or better. Thus, all entrances and thorough fares are suitable for their intended uses. This is considered to be a Negligible effect.

Identification and Evaluation of Likely Significant Effects

Construction Phase

13.42 During construction, conditions are expected to transition gradually from those experienced in the existing condition to those for the completed Proposed Development. As such, no significant environmental effects are expected.

Operational Phase

13.43 The results for the Proposed development within existing surroundings are presented graphically within Appendix 13.1 (Figures 4.7 for safety, Figure 4.8 for worst-seasonal comfort, and Figure 4.9 for the summer comfort conditions).

13.44 With the introduction of the proposed development, the wind conditions within the Site and surrounding area generally meet the safety criteria for all users, which is a Negligible effect.

13.45 Wind conditions at thoroughfares within the Site are suitable for strolling or better throughout the year and thus comfortable for pedestrian access to and passage through the Site. As for the entrances to the Proposed Development, all entrances to the development are predicted to be suitable for short-term standing or better throughout the year and thus for comfortable pedestrian ingress/egress. Furthermore, Wind comfort conditions at the recreational space between Block C and Block D are suitable for recreational activities from spring to autumn. In winter, the conditions are largely suitable for recreational activities however, there is a small area that is only suitable for strolling which coincides with the main throughfare through the area. This is considered to be a Negligible effect.

13.46 Within the neighbouring surrounds, wind conditions are substantially suitable for strolling or better, and thus suitable for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress/egress throughout the year. This is considered to be a Negligible effect.

Cumulative Effects

13.47 The cumulative developments that were considered in this assessment are:

- Vision (111003/FO/2016/C1)
- One City Road (128002/FO/2020)
- Park Place (129273/FO/2021)

- Travelodge Deansgate Locks (126308/FO/2020)
- One Medlock Street (135419/FO/2022)
- Student Castle (121252/FO/2018)

13.48 This list is a subset of the full list provided by from Deloitte Limited on 18th October 2023. Any schemes that lie on or beyond the perimeter of a 900m diameter disc centred at the Proposed Development have not been modelled and are therefore not included.

13.49 The results for the Proposed development within cumulative surroundings are presented graphically within Appendix 13.1 (Figures 4.10 for safety, Figure 4.11 for worst-seasonal comfort, and Figure 4.12 for the summer comfort).

13.50 Within the proposed development and around the Site, there are no exceedances of the safety criteria for pedestrian activity throughout the year. This is considered to be a Negligible effect.

13.51 With regards to wind comfort, wind conditions at thoroughfares within the Site are suitable for strolling or better throughout the year and thus comfortable for pedestrian access to and passage through the Site. Also, all entrances to the development are predicted to be suitable for short-term standing or better throughout the year and thus for comfortable pedestrian ingress/egress. Furthermore, in winter, the conditions are largely suitable for recreational activities however, there is a small area that is only suitable for strolling which coincides with the main throughfare through the area. This is considered to be a Negligible effect.

13.52 Within the neighbouring surrounds, wind conditions are substantially suitable for strolling or better, and thus suitable for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress/egress throughout the year. This is considered to be a Negligible effect.

Mitigation Measures

Construction Phase

13.53 It is not anticipated that there will exist a construction phase where wind conditions are expected to exceed acceptable levels, and as such mitigation measures are not required.

Operational Phase

13.54 With conditions meeting the Lawson safety criteria and being suitable for intended uses when assessed against the Lawson comfort criteria, in all scenarios, mitigation measures are not required.

Residual Effects

13.55 With conditions meeting the Lawson safety criteria and being suitable for intended uses when assessed against the Lawson comfort criteria, in all scenarios, residual effects are Negligible and are Not Significant.

Construction Phase

Table 13.3: Residual Effects (Construction Phase) (Scenario 2 to 4)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Lawson criteria met within the Site and surrounding area.	Persons on foot, seated or travelling by bicycle	Not required.	Not required.	**Negligible** residual effect.

Operational Phase

Table 13.4: Residual Effects (Operational) (Scenario 3 and 4)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Lawson criteria met within the Site and surrounding area.	Persons on foot, seated or travelling by bicycle	Not required.	Not required.	**Negligible** residual effect.

Monitoring

13.56 No monitoring is recommended to take place during the construction or operational phase.

Reference List

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

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

14. Ground Conditions

Introduction

14.1 This Chapter of the ES has been prepared by GRM Development Solutions (GRM) and assesses the impacts and the consequential effects (level of significance) on ground conditions (land contamination and geotechnical issues) as a result of the Proposed Development. 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 implemented.

14.2 This Chapter is accompanied by the following appendices:

- Appendix 14.1 Cundall Johnston and Partnerships LLP (Cundall), 'Geotechnical and Geoenvironmental Assessment', dated June 2016 (Ref: 1011906.RPT.GL.004)
- Appendix 14.2 Geotechnical Engineering Ltd, 'Factual Report on Ground Investigation', dated July 2016 (Ref: 31847)
- Appendix 14.3 GRM, 'Site Appraisal Report' for Block C, First Street, Manchester, dated November 2023 (Ref: GRM/P10418/SAR.1)
- Appendix 14.4 Groundsure Location Intelligence, Enviro and Geo Insight Report and Historic Ordnance Survey (OS) maps, date obtained January 2024 (Ref: EMS_917745_1137632)
- Appendix 14.5 GRM, 'Remedial Strategy' for Block C, First Street, Manchester, dated November 2023 (Ref: GRM/P10418/RS.1)

14.3 The authors and reviewers involved with the production of this Chapter are detailed below:

- Author of this Chapter is Sonia Singh. Sonia holds a Masters in Hydrogeology (MSc) from University of Birmingham and is a fellow Member of the Geological Society with over 7 years of geotechnical and environmental experience.
- Reviewer of this Chapter is Siobhan Jackson. Siobhan holds a Bachelors of Science degree (BSc Hons) in Environmental Science from Lancaster University and is a Chartered Environmentalist and Member of the Institution of Environmental Sciences with over 20 years of environmental experience.
- Director and approver of this ES Chapter is Richard Upton. Richard holds a Masters from Cranfield University and is a Chartered Environmentalist and Member of the Institution of Environmental Sciences with over 20 years geo-environmental experience in a consultancy setting.

Assumptions and Limitations

14.4 The identification of possible future receptors is based on the Proposed Development indicative concept design.

14.5 It has been reasonable to assume that the proposed construction activities will follow industry best practices and relevant guidance to comply with current legislation. It is assumed that best practice will also be implemented during the construction and operation of the Site.

14.6 The previous ground investigations were designed to obtain information on ground conditions beneath the Site, both for engineering design and assessing the environmental risks. While sufficient and robust, there may be ground conditions or contamination present in areas of the Site which are not identified in the ground investigation reports and cannot be included in this assessment. However, any additional contamination or unexpected ground condition issues uncovered subsequently during construction will not result in significant adverse effects following the adoption of best practices.

Relevant Legislation, Policy and Guidance

Legislation

14.7 Statutory guidance is issued by the Secretary of State for Environment, Food and Rural Affairs in accordance with section 78YA of the Environmental Protection Act 1990 ("the 1990 Act"). Section 57 of the Environment Act 1995 created Part 2A of the Environmental Protection Act 1990 ("Part 2A") which establishes a legal framework for dealing with contaminated land in England and explains specific aspects of Part 2A liability arrangement, and the process by which the enforcing authority may recover the cost of remediation from liable parties in certain circumstances. Part 2A establishes the remediation provisions, goals of remediation, and how regulators should ensure that remediation requirements are reasonable.

14.8 Development of potentially contaminated land is covered by the 1995 Environment Act (amended 2021), The Contaminated Land (England) Regulations 2000 and the DETR circular 02/2000 EPA 1990: Part IIA Contaminated Land. Under section 57 of the Environment Act, it is the duty of Local Authorities to determine whether land is contaminated. Contaminated land is defined by the aforementioned regulatory framework as land which is in such a condition by reason of substances in, on or under the land where: Significant harm is being caused, or there is a significant possibility of such harm being caused; or Pollution of controlled waters is being caused, or is likely to be caused. Under the Water Resources Act 1991, 'Controlled Waters' are defined as including both surface water and groundwater. Where a site is classified as 'contaminated land', remediation is required to render significant pollutant linkages (i.e. source-pathway-receptor) that are associated with significant harm or pollution of the receptor such as controlled waters, subject to a test of reasonableness.

14.9 There are specific regulations that have been enacted to implement the statutory national legislation into UK law. These regulations include:

- The Anti-Pollution Works Regulations 1999;
- The Control of Asbestos Regulations 2012,
- The Environmental Damage (Prevention and Remediation) (England) Regulations 2015;
- The Environmental Permitting (England and Wales) Regulations 2016.
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

Policy

National Planning Policy

14.10 The main policy document relevant to this Chapter of the ES is the National Planning Policy Framework (NPPF) published in December 2023. This revised Framework replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018, updated in February 2019, revised in July 2021 and updated in September 2023. The NPPF replaces Planning Policy Statement 23: Planning and Pollution Control (2004). The main statements from the NPPF in relation to ground conditions and land contamination are:

14.11 Paragraph 123 states that "*planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. 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*".

14.12 Paragraph 124 states that "*planning policies and decisions should: (c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land*".

14.13 Paragraph 189 states that "*Planning policies and decisions should ensure that:*

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments".

14.14 Paragraph 190 states that "Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner".

14.15 Paragraph 191 states 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 the wider area to impacts that could arise from the development".

Local Planning Policy

14.16 The local development plan produced by Manchester City Council is used to inform the planning decisions within the borough. The Core Strategy was adopted in July 2012 and this sits alongside and in some cases, replaces the previously adopted Local Plan. The Core Strategy contains a number of strategic aims and requirements for developments within the borough.

14.17 Policy H1: Overall Housing Provision, states there will be a presumption towards high density housing development in the City Centre which meets the needs of workers moving to Manchester. It also mentions the City Centre is also an appropriate location for purpose built student accommodation.

14.18 Policy EN 17: Water Quality, states "*development should avoid adverse impact on water quality, including during the construction phase, and wherever possible should seek to enhance water quality, both chemical and ecological. Development should minimise surface water run-off from development and associated roads, and maximise the use of appropriate sustainable drainage systems, to minimise groundwater contamination, and to avoid pollutants reaching watercourses".*

14.19 Policy EN 18: Contaminated Land and Ground Stability, states *"The Council will give priority for the remediation of contaminated land to strategic locations as identified within this document. Any proposal for development of contaminated land must be accompanied by a health risk assessment. All new development within former mining areas shall undertake an assessment of any associated risk to the proposed development and, if necessary, incorporate mitigation measures to address them".*

Guidance

14.20 Guidance and other industry best practice references used in this ES Chapter for the assessment of the Site include:

- Relevant British Standards including BS5930 Code of practice for Ground Investigations, and BS10175 Investigation of Potentially Contaminated Sites – Code of Practice; BS8485:2015+A1:2019 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings';
- Land Contamination Risk Management (LCRM), published online at https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm;
- British Geological Survey (BGS) Geological Mapping;
- BGS GeoIndex web tool;
- MAGIC Groundwater Vulnerability Mapping;
- Historical Ordnance Survey (OS) Maps;
- DEFRA/Environment Agency R&D CLR Publications including R&D 66 'Guidance for the Safe Development of Housing on Land Affected by Contamination (2008);
- BR211 (2023) 'Guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects)';
- UK Health Security Agency (HSA) radon map – published online on 01/12/2022 - https://www.ukradon.org/information/ukmaps;
- CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings';
- The Government's Planning Practice Guidance (PPG);
- CL:AIRE Definition of Waste Code of Practice (DoWCoP);
- Greater Manchester Mineral Resource Map, Scale 1:100,000. Published 2006;

- Environment Agency's National Groundwater and Contaminated Land Centre report NC/99/73 Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention.
- Groundsure Location Intelligence, Enviro and Geo Insight Report and Historical Ordnance Survey (OS) maps, scale 1:2,500 and 1:10,560 (Ref: EMS_917745_1137632, date obtained: 12/01/2024).

Assessment Methodology and Significance Criteria

Scenarios Tested

14.21 The following scenarios have been tested:

- Scenario 1: Existing Site (baseline);
- Scenario 2: Scenario 1 plus Proposed Development; and
- Scenario 3: Scenario 2 plus mitigation.

14.22 For the existing baseline conditions under Scenario 1, the ground conditions will be assessed, such as the local geology, hydrogeology and hydrology which could impact upon or be impacted by the Proposed Development. The baseline assessment includes the existing Site (the boundary of Block C) and the committed developments within the local area that are nearest to the Site (Blocks A, B and D). This assessment considers the current/previous land uses of the Site and local area that may have impacted the ground conditions at the Site. Other committed developments, as listed within Appendix 2.2, are not included in the baseline as they are unlikely to impact the ground conditions at the Site due to their distance, and these developments would not affect the assessment of the results in the 'Cumulative Effects' section.

14.23 Scenario 3 considers the baseline (including the committed development of Plot 11, Blocks A, B and D), the Proposed Development, the cumulative effects with Plots 10a and 10b which aren't included in Scenario 1, and mitigation. Whether Plots 10a or 10b are considered either as committed schemes or cumulative developments, Plots 10a and 10b would still be considered under the Scenario 3 assessment given their proximity.

Approach

14.24 The method of baseline data collection and assessment is in accordance with current guidance and industry best practice. The investigations have been undertaken in accordance with the approach detailed in LCRM. Baseline conditions have been collected from documentary research and intrusive ground investigation of the Site, and also include the history of the Site and surrounding areas, geology, hydrogeology, hydrology, mining and quarrying, mineral resources and environmental data. The baseline information obtained was used to assess the likelihood of finding geotechnical and contamination issues (including their possible nature and extent) that may impact the Proposed Development and identified receptors.

14.25 Various phases of intrusive ground investigation have been conducted at the Site. A factual ground investigation report, titled Geotechnical Engineering Report (Ref: 31847 dated July 2016), presented in **Appendix 14.2**, covers the Site and a wider development area, with interpretive aspects presented in a report titled Geotechnical and Geoenvironmental Assessment (Ref: 1011906.RPT.GL.004 dated

June 2016), presented in Appendix 14.1, which was undertaken by Cundall. The wider landholding includes main structures referenced as Blocks A, B, C and D with Blocks A, B and D currently under construction. The Site Appraisal Report by GRM (Ref: GRM P10418/SAR.1 dated November 2023) for the Site (Block C), presented in Appendix 14.3, includes a supplementary ground investigation undertaken in 2023 to confirm the ground conditions which have not varied significantly since the 2016 investigation.

14.26 A summarised desk study has been undertaken by GRM within the Site Appraisal Report. The assessment involved a review of publicly available information for the Proposed Development such as British Geological Survey (BGS) mapping, the data.gov repository, and previous site investigations including those by other consultants. Relevant information has been gathered from previous reports, in particular the ground conditions encountered, and collated in the latest Site Appraisal Report by GRM, to formulate a Conceptual Site Model to allow an assessment of the potential environmental risks. Additional information gathered from the Groundsure Report, recently obtained for the Site and presented in Appendix 14.4, has been reviewed to formulate an updated preliminary assessment of potential environmental risks.

14.27 The fundamental principle behind the contaminated land regulatory regime in the UK is the 'pollutant linkage' concept, which encompasses the source (potential contaminants or pollutants which may cause harm) – pathway (a potential route by which contaminants can move from the source to the receptor) – receptor (a target that may be harmed (e.g. humans, groundwater or surface water bodies)) approach.

14.28 Impacts and risks detailed in this Chapter are assessed and reported according to the above criteria. The categorisation of risk is as detailed in 'Contaminated land risk assessment. A guide to good practice (C552, 2001)' and 'Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008 Volume 1', which consider both probability (likelihood) and consequence in order to ascertain the level of risk. Where an unacceptable risk and pollutant linkage is identified following the risk assessment and intrusive investigation, remediation works will be proposed to mitigate the risk.

The Study Area

14.29 The Site encompasses the land required for the construction of the Proposed Development.

14.30 The study area encompasses the surrounding area located within a 250m buffer around the Site to assess the ground conditions and current/previous site uses and a 1km buffer around the Site to assess the available environmental data on controlled waters, ecological sites and landfills. This is highly conservative and considers the Proposed Development influence based on the environmental data and ground conditions available.

Source of Effect

14.31 Information gathered during the desk study is used to assess the presence of contamination and geological effects which have been evaluated with the sensitivity of receptors based on the following factors:

- Surrounding land uses and occupants of adjacent sites;
- Proposed end-use, based on the nature of the Proposed Development;
- Construction operations that will be necessary as part of the Proposed Development;

- Surrounding sites of environmental importance; and
- Geology, hydrogeology (including the underlying groundwater) and hydrology of the Site and its surrounding area.

Significance Criteria

14.32 An assessment has been made for each impact identified of the likely significance based on its effects to the identified receptor.

14.33 Where receptors are present, their importance (sensitivity) and the potential impact of the Proposed Development has been qualitatively determined.

14.34 Effects are classified based on the identified sensitivity/importance of the receptor and the predicted magnitude of the impact, using the standard assessment matrix set out in Table 14.1. The terms are those used based on the guidance set out in Paragraphs 14.20 and 14.26, which consider both probability (likelihood) and consequence in order to ascertain the level of risk.

Table 14.1: Criteria to determine the Significance of an Effect prior to mitigation

Magnitude of impact	**Sensitivity/importance of Receptor(s)**			
	High	Medium	Low	Very Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

14.35 Effects that are deemed to be significant for the purposes of this assessment and this Chapter are those that are described as being Moderate or Major (beneficial or adverse) following the Infrastructure Planning EIA Regulations 2017 in accordance with standard EIA practice. The level of effect criteria are rationalised in Table 14.2.

Table 14.2: Level of effect criteria

Significance of effect	**Criteria**
Major Adverse:	Results in loss of attribute which may include short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution of controlled waters. Catastrophic damage to buildings / property.
Moderate Adverse:	Results in impact on integrity of attributes or loss of part of attribute including long term damage to Human Health ("significant harm") or pollution of controlled waters. A significant change in a particular ecosystem or organism forming part of such ecosystem.
Minor Adverse:	Results in minor impact on attribute ranging from pollution of non-sensitive water resources. Non-permanent health effects to human health (easily prevented by means such as protective clothing). Damage to buildings / structures / services or the environment. Easily reparable effects of damage to buildings, structures and services.
Negligible:	Results in no measurable impact on attribute.
Minor Beneficial:	Results in a minor positive impact on attribute.
Moderate Beneficial:	Results in a positive impact on quality of attribute.
Major Beneficial:	Results in a major positive impact on attribute.

14.36 If potentially significant effects are identified, measures are proposed to mitigate the risk identified. These will be implemented through the Construction Environmental Management Plan (CEMP) and remediation measures, secured through health and safety legislation and planning conditions. Industry best practice will be applied whether there are significant effects or not. The generic categories of mitigation are outlined in Table 14.3

Table 14.3: Categories of mitigation

Significance of effect	Criteria
Remedial works	Remedial works to allow the development to proceed, with the scope and nature of work dependent on the results of investigations and risk assessment.
Design changes	Significant effects can be reduced by changes in design (e.g. gas protection measures) or modification of layout (e.g. sited away from contamination).
Protective measures during construction	Significant effects which can be reduced by use of appropriate protective equipment such as gloves and respiratory protection, and effective dust suppression techniques.
Environmental Management	Environmental management may be required to prevent construction work and future operations to prevent land contamination issues.

Baseline Conditions

14.37 This section describes the Site in its current state prior to development and the sensitivity of the environment that would be impacted.

Site Description

14.38 The Site previously comprised a disused parcel of land to the west of Newcastle Street. At present, the Site is covered with hardstanding and currently used as car parking associated with the wider construction site for Blocks A, B and D. At the time of the GRM investigation there were existing structures on the Site including site cabins and construction material storage containers around the areas of car parking.

14.39 Buried obstructions have been encountered across the Site, including brick and concrete structures and buried basements across the wider development area.

Site History

14.40 A review of the available historical OS maps has been undertaken to give an insight into the development of the Site through time which may highlight potential hazards.

14.41 The earliest map reviewed (1848) records rows of terraced residential properties across the Site, with roads (Chester Street, Garden Street and Mount Street) crossing the Site. The 1891-1896 map records further residential properties, and a larger building labelled as ‘Club’ within the southern area of the Site. By 1938, the majority of residential properties are no longer recorded. Two buildings are left within the southern area separated by Garden Street with the building formerly labelled as ‘Club’ labelled as ‘Institute’ on the 1948-1951 map. The other building forms part of a ‘Chair Frame Works’ extending off site. To the north of Chester Street, an unoccupied area forms part of the wider extents for ‘Medlock House (clothing)’ works since 1938. The 1969-1974 map shows a small building to the north of and fronting onto Chester Street associated with Medlock House. This map no longer records the buildings within the southern area. By 1980, the small building associated with the Medlock House is no longer recorded; however, Medlock House has been redeveloped and has expanded over the northern-most extent of the Site. There are no further significant changes shown at the Site on the historical OS maps.

14.42 Aerial photographs, dated 2000, record the southern area of the Site to be derelict ground with asphalt surfacing and dense vegetation near its boundary. The northern area of the Site remains developed associated with the Medlock House. By 2009, Medlock House has been demolished, including the areas to the north of the Site, with hardstanding remaining. The construction activities associated with the development of adjacent lands Block A, B and D are shown on 2022 aerial maps.

14.43 The area immediately surrounding the Site generally records residential buildings from the earliest maps reviewed (1848). The 1893 map records a gas works and rubber works approximately 200m north and north east of the Site. Buildings noted as a church and school are recorded 20m to the east, and a 'Brass Foundry' is labelled approximately 150m east. Buildings labelled as 'Victoria Foundry' and later labelled as iron foundry and 'Victoria Works', are recorded 250m north west. By 1932, the rubber works expanded further west, recorded 77m north of the Site at its closest point. The majority of the residential buildings surrounding the Site are no longer recorded on the 1948-1953 maps, potentially indicating WW2 bomb damage. New buildings are recorded near the site, including a food production works (which later becomes a warehouse) 100m to the south west, printing works (later labelled as 'Church Works') 20m to the north, engineering works and coal yard 50m to the north east, warehouse 40m to the north west and Medlock House (clothing) immediately north of the Site. By the 1969-1974 maps, most of the residential buildings to the south and food production/warehouse are replaced with a main road (A57 Mancunian Way) and associated subways. By 1980, the warehouse to the north west is no longer recorded and appears to be redeveloped with small buildings, along with the expansion of Medlock House. The engineering works and coal yard to the north east are no longer recorded and the area is later labelled as a car park. The church and school to the east of the Site are no longer present and the area is redeveloped into a large warehouse. The 1987-1990 map shows the gas works to the north is demolished and redeveloped as a car park with the 1992-1995 map recording this area as redeveloped with council buildings. The former 'Church works' 20m north of the Site, is labelled as 'laboratory'. There are no further significant changes recorded on the historical OS maps for the surrounding area. However, the aerial photographs for 2009 show the buildings to the north and east have been demolished including the laboratory, rubber works and warehouse.

14.44 An extract of the 1968 fire insurance plan, presented in Cundall's report provided in Appendix 14.2, records a small building labelled as 'Garage' to the north and fronting onto Chester Road within the Site. Based on its location, it corresponds with the small building recorded as part of the Medlock House demise on the 1969-1974 map. The insurance plan also indicates there are single level basements below Medlock House to the north of the site and below the engineering works to the north east of the site. An underground shelter is also recorded partially below the coal yard to the north east. It is likely that these basements/ underground shelters have been removed and backfilled in line with best practice, given that there are new developments over these locations.

Geology

14.45 The BGS geological map records superficial deposits of Glaciofluvial Sheet Deposits (sand and gravel) underlain by Glacial Till (gravelly Clay), and Solid Geology of Chester Formation (sandstone). Made ground will be present from the previous developments.

Hydrogeology

14.46 The Environment Agency has classified the underlying superficial deposits, Glaciofluvial Deposits as a Secondary A Aquifer and the underlying Glacial Till as a Secondary Undifferentiated Aquifer. The Environment Agency has classified the underlying Solid Geology as a Principal Aquifer.

14.47 The Site is located in the northern extents of a Zone III total catchment groundwater Source Protection Zone associated with an abstraction from the Chester Formation 1.20km south.

14.48 There are three active groundwater abstraction licences within 1km of the Site, two located at 340m east and 370m south associated with the Metropolitan University and one located 950m north west associated with a Science Museum. Their usage relates to heat pump and general use. Based on the available BGS borehole records which indicate deep boreholes in these areas into the sandstone, groundwater is being abstracted from the deeper Principal Aquifer (Chester Formation).

Hydrology

14.49 The River Medlock is located 250m north and is wholly culverted at the closest point to the Site. There are no surface water abstraction points within 1km of the Site.

Flooding

14.50 The Gov.uk internet based flood risk map for planning indicates the site is within 'Flood Zone 1' which has a low probability of flooding from rivers and the sea (less than 0.1% chance in any year).

Mining and Quarrying

14.51 The Site is not within a Coal Authority reporting area and there is no evidence of mineral extraction having occurred within the site boundary.

Mineral Resource Protection

14.52 The BGS Mineral Resources Map for Greater Manchester indicates that the Site overlies an area of potential resources for sands and gravels associated with the Glaciofluvial Deposits. The BGS onshore maps suggest the site does not lie within areas that can potentially be exploited for resources. Any future opencast activities will require consideration of the site's location and current proposed end use, which is likely to make removal socially and commercially unacceptable.

Environmental data and notable hazards

14.53 A summary of the relevant additional environmental data is presented below obtained using publicly available information and from the Groundsure report, presented in Appendix 14.4.

14.54 The majority of the Site was previously developed with residential buildings, with small portions of the site formerly occupied with a garage or works storage building. Surrounding the site, there were light industrial warehouses and works. The majority of these industries (including the former gas works, engineering works and coal yard) are no longer present and have been redeveloped presumably in line with best practice and appropriately remediated. As such, and given the presence of intact hardstanding, it is unlikely that the previous developments at the Site and surrounding areas would have significantly impacted the site. There are currently no industrial properties/warehouses (such as garages) within influencing distance that could impact the Site.

14.55 There are two licensed discharge consents to controlled waters, one 240m to the north of the Site (noted as sewerage discharges of storm overflow by United Utilities) and the other 245m east (noted as trade effluent and cooling waters). They are unlikely to have an impact on the Site due to the nature of the discharge, distance and scale.

14.56 There are no current/historic landfills located within 1km of the site.

14.57 The Site is not located within 1km of a designated ecological (e.g. a Special Area of Conservation (SAC), a Ramsar site) or geological site (e.g. SSSI).

14.58 The Site does not lie within a radon affected area based on the latest radon maps available on UKHSA (December 2022).

14.59 Following the desk study, the environmental considerations and other notable hazards that are applicable for the Site, are listed below:

- Live services, which may require disconnection or diversion. New underground services (e.g. water pipes) would be required for the Proposed Development;
- Possible made ground associated with the previous development of the Site, which may present a geotechnical hazard (deepened foundations) or pose a soil contamination and ground gas risk;
- The Site is at risk from Unexploded Ordnance. GRM are not aware of a UXO Report for the site and it is recommended that one is produced for the site to provide detailed specialist advice.
- Buried obstructions may present an issue to the proposed construction works (including the progression of piled foundations). Site enabling works are required to remove existing hardstanding and buried obstructions.

14.60 Following the review of the desk study information, a preliminary Site Conceptual Model is presented in Figure 14.1, and includes possible pollutant linkages (i.e. source-pathway-receptor) and level of risk (magnitude of impact from sources to receptors identified in relation to the Propose Development). An updated and detailed assessment of the pollutant linkages, following review of the ground conditions from the previous investigations, is presented in the below sections.

Previous Investigation of the Site

14.61 Ground investigations by GRM and others were undertaken to establish the ground conditions below the Site and refine the geoenvironmental and geotechnical risk assessment. The Exploratory Hole Location Plans and logs for both investigations are presented within the reports in Appendix 14.2 and 14.3.

14.62 The 2016 Geotechnical Engineering Ltd ground investigation progressed four exploratory holes within the Block C area (one cable-percussive borehole (CP102) to a depth of 6.65m below existing ground level (begl), one cable-percussive borehole with rotary coring follow on (CP/RC102A) to a depth of 27.70m begl and two mechanically excavated trial pits (TP108 and TP109) to depths of between 3.40m and 4.20m begl).

14.63 The 2023 GRM ground investigation comprised a total of four windowless sample boreholes (WS01 to WS04), to depths ranging between 1.00m and 4.00m begl. The boreholes were positioned in areas which could be accessed around the existing site cabins and car parking. Buried obstructions were encountered in three of the four locations, a total of two holes managed to penetrate the made ground and buried obstructions following re-drilling.

14.64 Made ground was encountered across the entire site, from surface to depths ranging between 0.45m and 2.4m below existing ground level (begl). The made ground was variable, with the surface layers generally comprising asphalt hardstanding, concrete or localised relaid topsoil consisting of

brown clayey sand with gravels of quartzite and brick. The deeper made ground consisted of variable strata of either brown sandy gravel of sandstone and quartzite or brown clayey sand/organic silt with gravels of brick, tarmacadam, coal, ash glass and ceramics.

14.65 The natural strata below the made ground were recorded as Glaciofluvial Deposits and these were encountered in all exploratory locations that penetrated the made ground. The base of these deposits were proven in two locations at depths of between 4.95m and 5.45m begl. These deposits were recorded as loose to medium dense, orangish brown, slightly clayey sand or silty sandy gravel typically containing gravels of sandstone, quartzite, mudstone and siltstone.

14.66 Below the Glaciofluvial Deposits ,the Glacial Till was encountered and its base was proved in one location (CP/RC102A) at 11.65m begl. These deposits were generally recorded as stiff to very stiff, sandy, clay with gravels of siltstone, quartzite, sandstone and rare coal.

14.67 The Solid Geology of Chester Formation was only encountered in one location at a depth of 11.65m begl and extended to the base of the borehole at 27.70m begl. These deposits consisted of a more weathered horizon of very dense weakly cement reddish brown sand to a depth of 13.65m begl which was underlain by less weathered strata of extremely weak to medium strong, reddish brown, sandstone.

14.68 Groundwater ingress was not observed during the GRM 2023 investigation. The 2016 ground investigation noted damp horizons at the base of made ground, with a groundwater strike at the base of Glacifluvial Deposits at approximately 5.0m begl, perched above the cohesive Glacial Till. There are two main groundwater bodies beneath the Site; a shallow groundwater table at the base of the Glaciofluvial Deposits , and a second groundwater table within the solid strata (Chester Formation).

14.69 Ground gas monitoring was undertaken as part of the 2016 ground investigation across the entire Site area and including the adjacent development for Blocks A, B and D. No significantly elevated concentrations of ground gas were recorded within the Site or across the wider site area. However, localised depleted oxygen levels were noted. No additional potential sources of ground gas were identified in the 2023 GRM ground investigation, and no additional gas monitoring was considered to be necessary.

Assessment of Pollutant Linkages

14.70 Where a possible contamination source (a hazard) is identified within the Site that poses a significant level of risk, an assessment is undertaken to establish whether there is a plausible and effective pathway by which the receptor or sensitive target may be impacted.

14.71 Based on the available information, sources of contamination within the Site include:

- Made ground across the Site; and
- Asbestos associated with the former development.

14.72 Based on the available information from the desk study, whilst various works and industries were noted previously these have all been redeveloped and as such there were no significant sources of contamination identified outside the Site.

14.73 The following pathways were identified as plausible;

- For human receptors, indoor and outdoor inhalation of soil/soil dust and asbestos fibres, ingestion of, and dermal contact with contaminated soil and soil dust and inhalation of ground gases.
- For controlled waters, leaching of contaminants, infiltration and vertical migration to the groundwater in Glaciofluvial Deposits (Secondary A Aquifer) and to Chester Formation (Principal Aquifer), although it is restricted by the presence of cohesive Glacial Till. Overland and lateral groundwater flow to the River Medlock, although these are not considered to be plausible pathways given its distance from the Site.
- For underground services, migration of contamination through leaks and joints, degradation of water pipe materials.

14.74 Potential contaminants of concern associated with the identified source of contamination (made ground) were assessed during the chemical analysis for both phases of ground investigation. All chemical analysis results were screened against end use specific Tier 1 Acceptance Criteria (TAC) used by GRM which are formulated using publicly available environmental standards. These represent a target level below which minimal risk to the receptor can be assessed. For the Site, the chemical analysis results were compared against the TAC for a residential end use without plant uptake.

14.75 From the available soil contamination data, several samples of the made ground recorded lead, benzo(a)pyrene and naphthalene above the relevant TAC. Additionally, the same samples recorded elevated hydrocarbon fractions aromatic C16-C21 and aromatic C21-C35 above the relevant TAC. The TAC screening values that were used in this assessment are highly conservative and the exposure scenarios are likely to be significantly reduced as the ground floor of the structure is generally communal areas and plant rooms. As such, there is a low risk from soil contamination at the Site. Despite this, the Proposed Development will protect site users by the implementation of mitigation measures. For the landscaped areas, soils used as a growing medium (topsoil and subsoil), which will form a capping layer above the made ground, will need to be imported and analysed to confirm their suitability.

14.76 Asbestos containing materials (ACMs) have been identified across the wider development area (Blocks A, B and D) within the previous investigations, but have not been identified in the grid of shallow sampling undertaken across the Site, and therefore there is a low risk of asbestos being present at the Site.

14.77 For controlled waters, whilst elevated concentrations of heavy end petroleum hydrocarbons have been identified, free product or mobile hydrocarbons were not observed and concentrations recorded are as expected for an inner city brownfield setting. The significant thickness (greater than 6m) of predominantly cohesive Glacial Till will restrict the pathway for migration of any potential leachable contamination from the made ground to the underlying Principal Aquifer located at depth beneath the Site (and associated Zone III groundwater SPZ). As such, a significant impact from contaminated made ground has not been identified to the aquifers (very low risk), and the Proposed Development will also further limit infiltration and vertical migration.

14.78 Environmental receptors and their sensitivity, identified in the conceptual site model for the current Site, following the review of baseline conditions based on the previous ground investigations and desk study, are summarised in the Table 14.4.

Table 14.4: Summary of Baseline Receptors (Scenario 1)

Receptor	Sensitivity	Rationale
Construction Workers	Medium	Based on possible risks from soil contamination (such as asbestos) and ground gases (depleted oxygen).
End users (occupants, maintenance workers)	Low	Proposed end use as student accommodation with car parking and limited areas of landscaping.
Nearby site users	Very Low	Based on distance from site to neighbouring residential blocks/commercial sites.
Shallow groundwater within Secondary A Aquifer	Low	Receptor is not regarded as being highly sensitive, given the lack of abstractions nearby. Nearest abstraction >250m and likely associated with the deeper aquifer and not for potable use.
Deep groundwater within the Principal Aquifer	Very Low	Low permeability superficial deposits will limit transmission from surface and given its depth, contaminants would naturally attenuate during infiltration.
Surface water (River Medlock)	Negligible	Given the distance, it will not be impacted by the Site.
Ecological/geological sites. Flora and fauna	Negligible	Given the distance, it will not be impacted by the Site.
Construction material including underground services	Low	Possible degradation of water pipe materials.

Future Baseline or the 'Do Nothing Scenario'

14.79 In the event that the Proposed Development does not proceed, the baseline would not significantly change over time. It is assumed that the current use as car parking would continue and minor changes to the ground surface would occur due to the traffic.

Identification and Evaluation of Likely Significant Effects

Construction Phase

14.80 The Proposed Development will comprise a high rise structure. Therefore, due to anticipated structural loadings and settlement tolerances, the Proposed Development will require a piled foundation solution.

14.81 Impacts from the enabling works which would include removal of hardstanding, old basements and buried obstructions, are expected to be similar to the effects identified from the construction phase.

14.82 Potential impacts during the construction phase are the following:

- Oil, fuel and chemical storage facilities and vehicle parking required during the construction of the Proposed Development and leaks and spills causing contamination to soils and groundwater;
- Construction activities causing disturbance of soils and sediments;
- Surface water runoff from stockpiles and construction materials and groundwater dewatering during construction;
- Reprofiling the Site during earthworks which may require removal of waste materials and/ or introduction of contaminated soils for infilling;

- Soil contamination including possible contaminated airborne dust generated during construction and ground gases impacting identified receptors (site users, workers, surrounding users and controlled waters);
- Discovery of possible new contaminated soils based on visual and olfactory evidence or groundwater / surface unsuitable for discharge without treatment during construction;
- Construction activities that may create new pathways or modify pollution linkages.

Operational Phase

14.83 Limited potential impacts during the operational phase are anticipated to include:

- Existing soil contamination impacting site users and buildings.

Cumulative Effects

14.84 The committed developments which have been treated as forming part of the existing baseline, are presented in Appendix 2.2. It also includes details on their location from the Site and general descriptions which have been referred to in this section.

14.85 Committed developments that may pose a cumulative effect are the nearby development of Blocks A, B and D to the north of the site 125573/FO/2019 and Plot 10a 136043/FO/2023 and Plot 10b 132199/FO/2021. These are currently under construction and will also comprise high rise residential accommodation. The overall proximity of the buildings could impact on the surface water drainage network. This impact is likely to be lessened by an appropriate drainage design. It is also acknowledged that the development could further increase the impact on vehicle movements (and increase the potential for leaks/spills of fuel). The resultant effect is considered to be minor adverse.

14.86 The majority of the other committed developments are located over 100m distance. Additionally, there are large areas of residential/commercial developments and several intervening roads between the Site and these developments. Therefore, from a land contamination point of view, the Proposed Development and associated construction activities will pose a negligible cumulative effect.

Mitigation Measures

14.87 This section describes the impact avoidance measures that would be incorporated into the design, and during enabling works, construction and operational phases. Any additional mitigation measures (if required) arising from residual effects are described later in this Chapter.

14.88 A Remediation Strategy (Ref: GRM/P10418/RS.1 dated November 2023 produced by GRM), presented in Appendix 14.5, outlines the mitigation measures to reduce unacceptable risks from the Proposed Development and to the receptors identified. Relevant details of the remedial works to be implemented have been extracted to supplement this section.

14.89 A Construction Environmental Management Plan (CEMP) will be produced for the Site that provides proposed controlled measures to mitigate environmental impacts, including measures related to land quality.

14.90 The conservation of soils and any waste disposal should be undertaken by the appropriate stockpiling and management of the material to ensure it does not become mixed with other site materials and become contaminated or degraded. This can be undertaken through the implementation of best site practices. Any waste transfer/haulage tickets of materials exported and imported should be kept on file for future reference.

Construction Phase

14.91 Oil, fuel and chemical storage facilities required during the construction phase, use of vehicles, and surface water runoff will be managed appropriately during construction. The risks posed by these facilities and other activities can be mitigated through the implementation of good site management and health and safety practices. This will be managed through the implementation of a Construction Environmental Management Plan (CEMP). The CEMP will also include surface water runoff management and groundwater dewatering following best practice and guidelines. Therefore, the effects are indirect, and temporary, assessed as **Negligible** level following the implementation of mitigation measures.

14.92 With regards to earthworks, the contractors will ensure that all material is suitable for the proposed use to mitigate contamination-related impacts in landscaped areas and groundwater. Any material moved on and off the Site will need to comply with relevant legislation and guidance, such as DoWCoP, with production of a Materials Management Plan (MMP) as necessary. Therefore, the effects are indirect and temporary and are assessed as **Negligible** level following the implementation of mitigation measures.

14.93 There is contaminated made ground present on the Site that would impact site users. However, mitigation as stipulated in the Remedial Strategy is to comprise a minimum 450mm thick clean growth medium above a granular anti-dig layer or geotextile marker in all soft landscaped areas to break the source-pathway-receptor linkage. The thickness of the growth medium will need to be increased locally for specific planting requirements, such as tree pits. The thickness of the capping layer will be confirmed by hand dug validation pits in the areas of soft landscaping. Any materials imported for use to construct the clean growth medium will be submitted for chemical validation to confirm that they are suitable for use. The details of these validation works undertaken are to be presented in a Remediation Completion Report. The effects are direct and permanent, assessed as **Major Beneficial**.

14.94 Whilst asbestos has not been identified at the Site, it has been encountered in the wider site area, and there remains a risk of asbestos containing materials (ACMs) being encountered during construction. Specific mitigation measures are not proposed at this stage; however, the presence of asbestos will need to be considered during the production of any site-specific risk assessments for site workers, and suitable PPE adopted if ACMs are encountered following industry regulation and guidance. Construction activities should consider the potential for dust generation and employ appropriate suppression measures. The effects are direct and temporary, assessed as **Negligible** level following the implementation of mitigation measures.

14.95 Site users within the surrounding developments will be considered during site activities and measures to prevent the generation of dust (if ACMs are identified) by employing appropriate suppression measures for air quality, as mentioned in Chapter 6 of the ES and implemented by the CEMP. The effects are indirect and temporary, assessed as **Negligible** level following the implementation of mitigation measures.

14.96 Development of the Site will result in a proportion of the made ground being removed and disposed offsite, large areas of impermeable surfacing being introduced and implementation of a surface water drainage system which will reduce the contamination risk and infiltration of water. Therefore, the risk to the underlying aquifers from the contaminated made ground will be largely mitigated. The effects are direct and permanent, assessed as **Minor Beneficial** level with no specific mitigation measures required for the protection of controlled waters.

14.97 No specific ground gas protection measures are required in new buildings in accordance with current guidance. Precautions will be used for any site staff undertaking works in deep excavations/confined spaces where air circulation is limited due to the localised presence of depleted oxygen following industry best practice with site-specific risk assessment. The effects are direct and temporary, assessed as **Negligible** level.

14.98 Should any material suspected of being significantly contaminated be encountered during the construction of the Proposed Development, GRM will be contacted to undertake additional investigation and assessment as necessary.

14.99 Foundations and services will be designed and constructed to prevent the creation of new pathways for contaminant migration. The appropriate pile type (Continuous Flight Auger) will be used which will mitigate creation of a pathway from the made ground to the underlying aquifers. For water pipes, the concentrations of contaminants recorded to date (specifically the hydrocarbons) are such that upgraded pipes will be required for the Site. The effects are direct and permanent, assessed as **Negligible** level following the implementation of the mitigation measures above.

Operational Phase

14.100 Following construction there is little opportunity for land contamination to occur given the proposed end use of the development. There is unlikely to be any significant storage or use of potentially contaminative materials. Any significant impact to soils and groundwater can be avoided by adhering to good housekeeping and management practices should minor hazardous substances be required for use or storage (e.g. cleaning products) at the Proposed Development. For instance, using bunds or locked storage areas with appropriate signage. The effects are direct and temporary, assessed as **Negligible** level following the implementation of the mitigation measures above.

14.101 As stated in the Remedial Strategy, there is a requirement for a clean capping layer in the landscaped areas which will mitigate the impacts of existing soil contamination to site users. The effects are direct and permanent assessed as **Major Beneficial.**

Embedded Mitigation

14.102 Design and mitigation measures are adopted and embedded within the scheme as identified within Chapter 3 (Description of the Proposed Development). The proposals include carefully considered design measures to minimise the level of adverse effects on the land.

Residual Effects

14.103 With the implementation of a CEMP the risks posed by fuel storage facilities and other construction activities can be mitigated by good site management practices. The residual risk is judged to be **negligible**. With the implementation of a CEMP the risks to surface water from surface run off, particulate sediment migration and dust migration is judged to be negligible, provided that good site management practices are employed as per the CEMP. Any material moved on and off the Site will need to comply with industry guidance such as provision of a Materials Management Plan (MMP).

14.104 Following remediation to deal with any contaminated soils, the residual effects will be **negligible** to end users and controlled waters.

Construction Phase

14.105 Table 14.5 summaries the mitigation measures and post mitigation residual effects for the construction phase.

Table 14.5: Residual Effects (Construction) (Scenario 3)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Spills/leaks, sediments and surface water runoff	Controlled waters and human receptors	CEMP details practices & procedures	CEMP	**Negligible (Not significant)** Temporary
Contaminated soils exported and imported to site	Controlled waters and human receptors	MMP	MMP	**Negligible (Not significant)** Temporary
Contaminated made ground	Site users	Capped with clean growth medium	Remedial Strategy	**Major Beneficial (Not Significant)** Permanent
Contaminated dust, possible ACMs	Site workers, nearby human receptors	Suitable PPE adopted, dust suppression	Site-specific risk assessment	**Negligible (Not significant)** Temporary
Contaminated made ground	Controlled waters	None required	N/A	**Negligible (Not significant)** Temporary
Depleted oxygen in deep excavations/ confined spaces	Site workers	Site-specific risk assessment to detail practices & procedures	Site-specific risk assessment	**Negligible (Not significant)** Temporary
Construction method & materials	Controlled waters and human receptors	Appropriate methods and materials	Consult with contractors and suppliers	**Negligible (Not significant)** Permanent

Operational Phase

14.106 Table 14.6 summaries the mitigation measures and post mitigation residual effects for the operational phase.

Table 14.6: Residual Effects (Operation) (Scenario 3)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Hazardous chemical/ fuel substance	Human receptors	Follow good housekeeping practice	Building / site management	**Negligible (Not significant)** Temporary
Contaminated made ground	Site users	Capped with clean growth medium	Remedial Strategy	**Major Beneficial (Not Significant)** Permanent

Monitoring

14.107 It is expected that significantly hazardous or contaminative substances will not be used during the operation of the development and that good building/site management will be in place to prevent future contamination issues arising. As such, no monitoring is recommended for the Proposed Development during its operation.

Reference List

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

- See Section 14.20

15. Residual Impacts

Air Quality

Table 15.1: 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				
Impact of suspended particulate matter on human-health and deposited dust (nuisance) on human-health and nuisance	Receptors within 350 m of the Site.	The mitigation measures are set out in Appendix 6.2.	Implementation of Construction Environmental Management Plan (CEMP)	Not Significant, temporary

Table 15.2: 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)
Operation				
Impact of concentrations of NO^2, PM^{10} and $PM^{2.5}$ on existing receptors.	Existing receptors.	None.	None.	Not Significant, permanent.
Impact of concentrations of NO^2, PM^{10} and $PM^{2.5}$ on human-health of future occupants of the development.	Future occupants of the development.	Provision of air-tight (hermetically sealed) windows and mechanical ventilation at all residential homes on the first floor and at certain homes on the second and third-floor level	Included in design of development.	Not Significant, permanent.

Climate Change

Table 15.3: 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 (Temporary/Permanent)
Climate Change Resilience				
Heavy rainfall leading to stockpile erosion and siltation of drainage assets	Building	None required	Not applicable	Not Significant, temporary
Heavy rainfall leading to inability to undertake construction activity and programme delays	Building	None required	Not applicable	Not Significant, temporary
Heavy rainfall spreading contaminated soil during ground excavations	Environmental and human health	None required	Not applicable	Not Significant, temporary
Heavy rainfall leading to groundwater flooding, affecting Site personnel undertaking below ground excavations	Human health	None required	Not applicable	Not Significant, temporary
Heatwaves and high temperatures affecting Site personnel welfare	Human health	None required	Not applicable	Not Significant, temporary
Heatwaves and high temperatures leading to increased dust generation	Human health	None required	Not applicable	Not Significant, temporary
Heatwaves and high temperatures leading to inability to undertake construction activity and programme delays	Building	None required	Not applicable	Not Significant, temporary
Strong winds leading to damage of stockpiles	Building	None required	Not applicable	Not Significant, temporary
Strong winds leading to Site personnel and nearby pedestrian harm	Human health	None required	Not applicable	Not Significant, temporary
Strong winds affecting on-Site crane operations	Building	None required	Not applicable	Not Significant, temporary
Strong winds leading to damage to Site hoardings	Building	None required	Not applicable	Not Significant, temporary
In-combination Climate Change Impact				
Air quality - Extended period of drought could increase exposure of sensitive	Air quality - sensitive receptors	None required	Not applicable	Not Significant, temporary

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
receptors to dust generated from construction activities				
Air quality - Extended period of drought could reduce availability of water for dust suppression which would reduce the effectiveness of embedded mitigation measures	Air quality - sensitive receptors	None required	Not applicable	**Not Significant**, temporary
Ecology - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Daylight, Sunlight, Overshadowing and Solar Glare - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Drainage - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Ground Conditions - Heavy rainfall leading to increase in mobilisation and release of contaminants into nearby surface water	Ground Conditions - Surface water receptors	None required	Not applicable	**Not Significant**, temporary
Ground Conditions - Increased frequency and intensity of drought events leading to dust creation and mobilisation/release of contaminated soil, affecting nearby pedestrians	Ground Conditions - human health receptors	None required	Not applicable	**Not Significant**, temporary
Human Health - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Noise and Vibration - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Wind Microclimate - Potential interactions of climate change	None identified	None required	Not applicable	Not significant and temporary
Greenhouse Gas Emissions				
GHG emissions	Global Climate	Carbon offset payments to	Payment by developer to	**Minor Adverse (Not Significant)**, permanent

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
		ensure the construction is carbon neutral	reputable offsetting provider	

Table 15.4: 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 (Temporary/Permanent)
Climate Change Resilience				
Increased frequency of intense rainfall leading to overwhelming of drainage assets and potential flooding	Building and human health	None required	Not applicable	Not Significant, temporary
Wetter winters and increased frequency of intense rainfall leading to elevated groundwater levels and potential flooding	Building	None required	Not applicable	Not Significant, temporary
Increased frequency of intense rainfall leading to river level rise and subsequent flooding	Building and human health	None required	Not applicable	Not Significant, temporary
Drought conditions affecting landscape design and planting	Environmental receptors	None required	Not applicable	Not Significant, temporary
Increased mean temperatures and heatwaves leading to failure of mechanical and electrical equipment	Building	None required	Not applicable	Not Significant, temporary
Increased mean temperatures and heatwaves leading to overheating in residential element	Human health receptors	None required	Not applicable	Not Significant, temporary
Drought conditions affecting potable water availability	Building and human health	None required	Not applicable	Not Significant, temporary
Windstorm events and extreme winds leading to damage to the development and / or unsafe conditions for users	Building and human health	None required	Not applicable	Not Significant, temporary

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
In-Combination Climate Change Impact				
Air Quality - Increased frequency and intensity of heatwaves could increase the need to ventilate homes through opening windows to avoid overheating, reducing effectiveness of air quality mitigation.	Air Quality - human health receptors	None required	Not required	**Negligible**
Ecology - Increased temperatures, heatwaves and drought conditions could cause vegetation dieback and reduce the effectiveness of mitigation planting, intended to create new habitat.	Ecology - sensitive receptors	None required	Not applicable	**Not Significant**, temporary
Daylight, Sunlight, Overshadowing and Solar Glare - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Drainage - Increased frequency of intense rainfall leading to surface water flooding of proposed development and surrounding areas	None identified	None required	Not applicable	**Not Significant**, temporary
Ground Conditions - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Human Health - Potential interactions of climate change	None identified	None required	Not applicable	**Not Significant**, temporary
Noise and Vibration - Increased temperatures and heatwaves could lead to increased frequency of internal noise exceeding thresholds as a result of opening windows in high temperatures.	Noise and Vibration - sensitive receptors	None required	Not applicable	**Not Significant**, temporary
Wind Microclimate - Increased temperatures and heatwaves could cause vegetation dieback	Wind Microclimate	None required	Not applicable	**Not Significant**, temporary

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
and reduce the effectiveness of mitigation planting, intended to mitigate the effects of wind on sensitive receptors.				
Greenhouse Gas Emissions				
GHG emissions	Global Climate	The Proposed Development's GHG emissions impacts have been partially mitigated at this stage. They also meet the existing and emerging policy requirements and would fully contribute to decarbonisation in line with MCC's and UK's policy goals for schemes of this type.	Embedded in design of the Proposed Development and to be implemented by Proposed Development Facilities Management Team.	**Minor Adverse (Not Significant)**

Human Health

Table 15.5: 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				
Employment & Economy	Workers	N/A	N/A	**Moderate Beneficial,** temporary
Air Quality - dust	Human receptor locations within 350m	CEMP details practices & procedures	CEMP	**Not Significant,** temporary
Climate Change Resilience	Workers, nearby residents & visitors	None required	N/A	**Not Significant,** temporary
Climate Change (GHG)	Global	None required	N/A	**Not Significant,** temporary

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	Workers; existing residential	Noise & Vibration Management Plan (NVMP)	NVMP as part of overall CEMP	**Minor - Moderate at times,** temporary
Wind Microclimate	People on foot, seated, or on bicycle	Not required	N/A	**Negligible**
Ground Conditions: dust	Workers	CEMP details practices & procedures	CEMP	**Negligible**
Ground Conditions: contaminated soils	Site users	Capping with clean growth medium	Remedial Strategy	**Major Beneficial**

Table 15.6: 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)
Employment & Economy	Local workers & economy	N/A	N/A	**Major Beneficial,** permanent
Housing	Students	N/A	N/A	**Major Beneficial,** permanent
Healthcare Provision	Residents	N/A	N/A	**Negligible**
Open space; recreation & amenity	Residents & visitors	N/A	N/A	**Negligible**
Air Quality - emissions NO_2, PM_{10} & $PM_{2.5}$	Human receptor locations – existing	None	None	**Not Significant,** permanent
Air Quality - emissions NO_2, PM_{10} & $PM_{2.5}$	Human receptor locations – future occupants of new development	Provision of airtight (hermetically sealed) windows & mechanical ventilation at all residential homes on the first floor & at certain homes on the second & third-floor level	Included in design	**Not Significant,** permanent

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post-Mitigation Residual Effect – Significance and Duration (i.e., Temporary / Permanent)
Climate Change Resilience	Residents & visitors; nearby residents	None required	N/A	**Not Significant**, permanent
Climate Change – GHG emissions	Global climate - human health	None required	N/A	**Minor Adverse (Not Significant)**, permanent
Noise from building services plant	Existing & New Residents	Appropriate location, selection, screening and/or attenuation of building services plant	Included in design	**Negligible**
Sunlight, daylight & overshadowing	Surrounding residential	None required	N/A	**Minor Adverse (Not Significant)**, permanent
Solar Glare	Road users at nearby junctions	Embedded in design	N/A	**Minor Adverse (Not Significant)**, permanent
Solar Glare	Road users at 6 locations	Proposed glazing specifications should be low reflectance	Suitably worded Planning Condition	**Minor Adverse (Not Significant)**
Townscape & Visual	Residents & visitors; local neighbourhood	**Incorporated into design**	**n/a**	**Significant**
Wind Microclimate	Persons on foot, seated or on bicycle	Not required	N/A	**Negligible**
Ground Conditions: contaminated soils	Residents & visitors	Capping with clean growth medium	Remedial Strategy	**Major Beneficial**

Noise and Vibration

Table 15.7: 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				
Minor and Moderate adverse noise disturbance effects on residents	Local residents	Best Practicable Means mitigation. Quiet plant/methods. Noise and Vibration Management Plan (NVMP)	Noise & Vibration Management Plan through suotably worded planning condition	**Minor - Moderate Adverse** noise disturbance effects on residents at times, temporary.

Table 15.8: 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)
Operation				
Minor adverse noise annoyance effects from building services plant	Existing Residential properties.	Appropriate location, selection, screening and/or attenuation of building services plant.	N/A	**Negligible**, permanent.

Socio-Economic

Table 15.9: 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				
Change in employment during the construction stage	Individuals seeking construction employment	N/A	N/A	**Minor Beneficial (Not Significant),** D, T, ST

Table 15.10: 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)
Operation				
Change in direct operational employment and change in economic performance (GVA and spend)	Individuals seeking employment and the local economy	N/A	N/A	**Minor Beneficial (Not Significant),** D, LT, P
Change in supply of student bedspaces and contribution towards local strategic objectives	Students seeking accommodation	N/A	N/A	**Major Beneficial (Significant),** D, LT, P
Change in demand for primary healthcare facilities	Primary healthcare facilities	N/A	N/A	**Negligible (Not Significant),** D, LT
Change in the supply of and demand for open space, amenity space and leisure facilities	Open/amenity space and leisure facility provision and their users	N/A	N/A	**Permanent, Negligible (Not Significant),** D, LT

Sunlight, Daylight, Overshadowing and Solar Glare

Table 15.11: 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				
N/A				

Table 15.12: 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 (Temporary/Permanent)
	30-42 Rockdove Ave	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)
Adverse reduction in daylight amenity	44-72 Rockdove Ave			**Negligible** (Permanent)
	Loxford Court			**Negligible** (Permanent)
	Block 1 Parkway Gate			**Minor Adverse** (Permanent)
	Block 3 Parkway Gate			**Minor Adverse** (Permanent)
	Block 2 Parkway Gate			**Minor Adverse** (Permanent)
	Block B Plot 11, First Street			**Minor Adverse** (Permanent)
	Block A Plot 11, First Street			**Minor Adverse** (Permanent)
	Block D Plot 11, First Street.			**Minor Adverse** (Permanent)
Adverse reduction in sunlight amenity	Block 1 Parkway Gate	None	n/a	**Minor Adverse** (Permanent)
	Block B Plot 11, First Street			**Minor Adverse** (Permanent)
	Block A Plot 11, First Street			**Minor Adverse** (Permanent)
	Block D Plot 11, First Street.			**Minor Adverse** (Permanent)
Adverse increase in shadow	Public Park Plot 11, First Street	None	n/a	**Negligible** (Permanent)
	Block B Plot 11, First Street, Private			**Negligible** (Permanent)
	Block A Plot 11, First Street Private			**Minor Adverse** (Permanent)
	Block A Plot 11, First Street, Private			**Minor Adverse** (Permanent)
	Block D Plot 11, First Street, Private			**Negligible** (Permanent)
Negligible & Minor Adverse (Not Significant) effects on Solar Glare	Road users at nearby road junctions	Embedded in the design, no further mitigation needed.	N/A	**Minor Adverse (Not Significant)**, permanent
Minor-Moderate and Moderate Adverse and **Significant** effects on Solar Glare	Road users at: • Slip1 • Slip2 • MS2 • MW4-6 • CS1 • CS2	Proposed glazing specifications should be low reflectance, the recommended VLR is 14%. Further detailed assessed is recommended prior to installation of glazing.	Planning Condition	**Minor Adverse (Not Significant),** permanent. To be confirmed via further detailed testing with further mitigation incorporated if required to ensure residual effects are not significant.

Townscape and Visual Impact

Table 15.13: 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 (Temporary/Permanent)
Significant visual effect on residents of closest area of Hulme to immediate south of the Site, consisting of Clarendon Street (as represented by Viewpoints 9 and 14), Rockdove Avenue (as represented by Viewpoint 13), the area around Newcastle Street (as represented by Viewpoint 3), and within Hulme Park (as represented by Viewpoint 6). Effect likely to be significant due to the scale and proximity of construction of Proposed Development tall building in views from smaller scale residential streets and public spaces in closest area of Hulme.	Residents and people engaged in recreation within Hulme	The primary mitigation measure will be the timely completion of construction works and the short-term, temporary duration of the effect. Other mitigation may help to slightly reduce adverse visual effects of the construction phase, including tidy Site management, appropriate hoardings, scaffolding covers and well located, modern light fittings as part of a CEMP to minimise lighting intrusion.	CEMP	**Significant** and temporary visual effect on residents of closest area of Hulme to immediate south of the Site during construction phase.
Significant visual effect on motorists travelling on roads within close proximity to the Site, including on Medlock Street (as represented by Viewpoint 5) and within Hulme (as represented by	Pedestrians and road users			**Significant** and temporary visual effect on pedestrians and road users within the immediate surroundings of the Site during construction phase.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
Viewpoint 2). Similar effects are likely to be experienced by motorists travelling along a short section of the Mancunian Way. Effects are likely to be significant due to the scale and proximity of construction of Proposed Development tall building, from adjacent roads and a short, elevated section of the Mancunian Way passing the Site, with views into the construction Site.				
Significant visual effect on people within closest area immediately around the Proposed Development including to the east around Chester Street (as represented by Viewpoint 12) and to the west on Medlock Street (as represented by Viewpoint 5). Effect likely to be significant due to the scale and proximity of construction of Proposed Development tall building in views from closest	Residents / pedestrians in area surrounding the Site			**Significant** and temporary visual effect on people within the closest streets to the east and west of the Site, including Chester Street and Medlock Street.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
streets and public spaces.				

Table 15.14: 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 (Temporary/Permanent)
Significant visual effect on residents of closest area of Hulme to immediate south of the Site, consisting of Clarendon Street (as represented by Viewpoints 9 and 14), Rockdove Avenue (as represented by Viewpoint 13), area around Newcastle Street (as represented by Viewpoint 3), and within Hulme Park (as represented by Viewpoint 6). Effects are likely to be significant due to the scale and proximity of Proposed Development tall building in views from smaller scale residential streets and public spaces in closest area of Hulme, however Proposed Development will be viewed as part of the backdrop of tall buildings forming the emerging south-	Residents and people engaged in recreation within Hulme	Primary mitigation measures are embedded into the design quality and appropriate location of the Proposed Development. The appearance strategy is grounded in emerging city scale of other baseline committed developments in surrounding area, including existing First Street South buildings; the material palette of glass unitised curtain walling is in keeping with existing First Street South buildings; and the associated landscape design proposals will improve public realm. Although significant, effects are generally assessed to be	CEMP	**Significant** and permanent visual effect on residents of closest area of Hulme to immediate south of the Site during operational phase.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
west city centre skyline.		beneficial or neutral in nature due to replacement of a derelict vacant site with new buildings and public realm, that have a positive relationship to both local and city scale and context.		
Significant visual effect on motorists travelling on roads within close proximity to the Site, including on Medlock Street (as represented by Viewpoint 5) and within Hulme (as represented by Viewpoint 2). Similar effects are likely to be experienced by motorists travelling along a short section of the Mancunian Way. Effects are likely to be significant due to the scale and proximity of Proposed Development tall building, however Proposed Development will be viewed as part of the backdrop of tall buildings forming the emerging south-west city centre skyline.	Pedestrians and road users			**Significant** and permanent visual effect on pedestrians and road users within the immediate surroundings of the Site during operational phase.
Significant visual effect on people within closest area immediately around the Proposed Development including to the east around Chester Street (as represented by Viewpoint 12) and	Residents / pedestrians in area surrounding the Site			**Significant** and permanent visual effect on people within the closest streets to the east and west of the Site, including Chester Street and Medlock Street, during operational phase.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (Temporary/Permanent)
to the west on Medlock Street (as represented by Viewpoint 5). Effect likely to be significant due to the scale and proximity of Proposed Development tall building, however Proposed Development will be viewed as part of the backdrop of tall buildings forming the emerging south-west city centre skyline.				

Wind Microclimate

Table 15.15: 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				
Lawson criteria met within the Site and surrounding area.	Persons on foot, seated or travelling by bicycle	N/A	N/A	**Negligible**, temporary.

Table 15.16: 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)
Operation				
Lawson criteria met within the Site and surrounding area.	Persons on foot, seated or travelling by bicycle	N/A	N/A	**Negligible**, permanent

Ground Conditions

Table 15.17: 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 (Temporary/Permanent)
Spills/leaks, sediments and surface water runoff	Controlled waters and human receptors	CEMP details practices & procedures	CEMP	**Negligible (Not significant)** Temporary
Contaminated soils exported and imported to site	Controlled waters and human receptors	MMP	MMP	**Negligible (Not significant)** Temporary
Contaminated made ground	Site users	Capped with clean growth medium	Remedial Strategy	**Major Beneficial (Not Significant)** Permanent
Contaminated dust, possible ACMs	Site workers, nearby human receptors	Suitable PPE adopted, dust suppression	Site-specific risk assessment	**Negligible (Not significant)** Temporary
Contaminated made ground	Controlled waters	None required	N/A	**Negligible (Not significant)** Temporary
Depleted oxygen in deep excavations/ confined spaces	Site workers	Site-specific risk assessment to detail practices & procedures	Site-specific risk assessment	**Negligible (Not significant)** Temporary
Construction method & materials	Controlled waters and human receptors	Appropriate methods and materials	Consult with contractors and suppliers	**Negligible (Not significant)** Permanent

Table 15.18: 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 (Temporary/Permanent)
Hazardous chemical/ fuel substance	Human receptors	Follow good housekeeping practice	Building / site management	**Negligible (Not significant)** Temporary
Contaminated made ground	Site users	Capped with clean growth medium	Remedial Strategy	**Major Beneficial (Not Significant)** Permanent

16. Type 1 Cumulative Impacts

16.1 This section gives consideration to 'Type 1' cumulative effects.

16.2 The assessment is informed by the results of the technical assessments as set out in Chapters 6-14 of the ES.

16.3 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.

16.4 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. The standalone assessment is based on the professional opinion and experience of Deloitte, in its capacity as the EIA coordinator.

Legislation, Policy and Guidance

Legislation

16.5 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'.

16.6 The EIA Regulations require 'a description of the likely significant effects', including cumulative effects.

16.7 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

16.8 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

16.9 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.

16.10 The EC guidelines above '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'.

16.11 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*

16.12 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.

16.13 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 and, as relevant, the non-technical reports.

16.14 The assessment has been undertaken by suitably qualified and experienced EIA practitioners. 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.

16.15 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.

16.16 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.

16.17 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

16.18 The following terms have been used to define the significance of the effects identified:

- 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)

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Cumulative Effects
Local residents	Temporary **Minor and Moderate Adverse** noise disturbance effects on residents at times.	No in combination effects.
Economic Growth and Employment	**Moderate Beneficial** impact on local employment during the construction phase (temporary).	No in combination effects.
GHG Emissions	Permanent **Minor Adverse (Not Significant)** increase in GHG emissions.	No in combination effects.
Residents and people engaged in recreation within Hulme (specifically at Clarendon Street (as represented by Viewpoints 9 and 14), Rockdove Avenue (as represented by Viewpoint 13), the area around Newcastle Street (as represented by Viewpoint 3), and within Hulme Park (as represented by Viewpoint 6)).	**Significant** visual effect (temporary)	No in combination effects.
Pedestrians and road users (including on Medlock Street (as represented by Viewpoint 5) and within Hulme (as represented by Viewpoint 2).	**Significant** visual effect (temporary)	No in combination effects.

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Cumulative Effects
Residents / pedestrians in area surrounding the Site (including to the east around Chester Street (as represented by Viewpoint 12) and to the west on Medlock Street (as represented by Viewpoint 5)).	**Significant** visual effect (temporary)	No in combination effects.

16.23 Table 16.1 shows that there are unlikely to be in-combination construction phase Type 1 cumulative effects.

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 construction phase of development. The potential effect interactions are then discussed further.

Table 16.2: Type 1 Cumulative Effects (Operation)

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Cumulative Effects
Economic Growth and Employment	**Major Beneficial** impact from direct operational employment and change in economic performance (GVA and spend) (permanent).	No in combination effects.
Housing Need	**Moderate Beneficial** impact resulting from change in supply of student bedspaces (permanent).	No in combination effects.
GHG Emissions	**Permanent Minor Adverse** (Not Significant) increase in GHG emissions.	No in combination effects.
Selected residents at Block 1 Parkway Gate, Block 3 Parkway Gate, Block 2 Parkway Gate, Block A Plot 11, First Street, Block D Plot 11, First Street, and Block B Plot 11, First Street.	**Minor Adverse (Not Significant)** reduction in daylight and sunlight amenity, and overshadowing.	No in combination effects.
Road users at nearby road junctions.	**Minor Adverse (Not Significant)** effects on solar glare.	No in combination effects.
Road users at: Slip1, Slip2, MS2, MW4-6, CS1 and CS2	**Minor-Moderate and Moderate Adverse (Significant)** effects on Solar Glare.	No in combination effects.
Residents and people engaged in recreation within Hulme (specifically at Clarendon Street (as represented by Viewpoints 9 and 14), Rockdove Avenue (as represented by Viewpoint 13), the area around Newcastle Street (as represented by Viewpoint	**Significant** visual effect (permanent)	No in combination effects.

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Cumulative Effects
3), and within Hulme Park (as represented by Viewpoint 6)).		
Pedestrians and road users (including on Medlock Street (as represented by Viewpoint 5) and within Hulme (as represented by Viewpoint 2).	**Significant** visual effect (permanent)	No in combination effects.
Residents / pedestrians in area surrounding the Site (including to the east around Chester Street (as represented by Viewpoint 12) and to the west on Medlock Street (as represented by Viewpoint 5)).	**Significant** visual effect (permanent)	No in combination effects.

16.27 Table 16.2 shows that there are unlikely to be in-combination operation phase Type 1 cumulative effects.

Mitigation Measures

16.28 Where relevant, the individual residual effects which contribute to the potential cumulation have been considered within the ES and mitigated where necessary and feasible.

Deloitte.

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