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1. Introduction

- 1.1. This Environmental Statement ('ES') has been prepared in support of development proposals coming forward within Plot 10 of the First Street Masterplan. Plot 10 comprises two development plots, known as Plot 10a and Plot 10b. Standalone planning applications are being submitted on each plot:
 - Plot 10a comprises an application for full planning permission for a NABERS 5.5* sustainable office building (Use Class E) and associated public realm ('the Proposed 10a Development') on the western portion of the plot, fronting onto First Street ('the 10a Site'). The application is being brought forward by First Street (Developments Ltd) ('the 10a Applicant'). The application was validated by Manchester City Council ('MCC') as the Local Planning Authority ('LPA') on 23 January 2023 (ref: 136043/FO/2023).
 - Plot 10b comprises an application for full planning permission for a building comprising Purpose-Built Student Accommodation ('PBSA') (Use Class Sui Generis) and a ground floor food hall (Use Class E and/or Sui Generis), and associated public realm ('the Proposed 10b Development') on the eastern portion of the plot fronting onto River Street ('the 10b Site'). The 10b Site also includes adjacent land to the east which will be used for temporary welfare facilities for the contractor during construction. The application is being brought forward by House of Social 1 Ltd ('the 10b Applicant').
- 1.2. Each plot can be developed and accessed independently of the other. A planning application for drainage diversions along Hulme Street and River Street was validated by MCC on 17 January 2023 (Planning Ref. 135987/FO/2023) to facilitate the redevelopment of both plots. This small-scale standalone application has not been considered as part of the EIA.
- 1.3. Collectively, for the purposes of this ES, these two planning applications are referred to as the 'Proposed EIA Development'. The two application boundaries, which are contiguous, are referred to collectively as 'the EIA Site'. Both the Proposed 10a Development and the Proposed 10b Development are described in **Chapter 4** of this ES. To allow for proper consideration of each application in its own right, the ES has considered multiple scenarios to assess the individual effects of each application and the combined effect of the Proposed EIA Development as a whole.
- 1.4. The EIA Site is shown in **Appendix 1.1**.
- 1.5. The ES sets out the findings of an EIA carried out in respect of the Proposed EIA Development.

Requirements for EIA

- 1.6. 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.
- 1.7. The purpose of the EIA is to establish the nature of the Proposed EIA 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. The assessment compares the existing situation at the start of the work (baseline), with the situation during construction, and when the Proposed EIA Development is operational.
- 1.8. The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the "EIA Regulations") require that any Proposed Development falling within the description of a 'Schedule 2 development' (as defined within the meaning of the EIA Regulations), will be subject to an EIA where such development is likely to have 'significant' effects on the environment by virtue of such factors as its nature, size or location (EIA Regulation Schedule 3).
- 1.9. The Proposed EIA Development is considered to fall under the category of 'urban development projects' (EIA Regulations Schedule 2, 10, (b)) where:
 - The development includes more than 1 hectare of urban development which is not a dwellinghouse development; or
 - The development includes more than 150 dwellings; or
 - The overall area of the development exceeds 5 hectares.

1.10. 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”

1.11. The EIA Site covers an area of approximately 1.2 hectares and the Proposed EIA Development will comprise: 576 PBSA bedspaces; 1,304sqm (GIA) of food and beverage use; and 28,252 sqm (GIA) of commercial floorspace. Therefore, the nature and scale of the Proposed EIA Development is significantly larger than the existing scenario. For these reasons, an EIA is considered appropriate to test the likely significant effects of the Proposed EIA Development on the surrounding environment. The 10a and 10b Applicants have therefore submitted an Environmental Statement (in relation to certain topic areas where there is likely to be a significant effect of the environment) in support of the planning application, the scope of which was formally agreed within a Scoping Opinion from MCC.

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

- A description of the development, including in particular *(included in ‘EIA 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 ‘EIA Site, Surroundings and Description of Proposals’ and relevant technical chapters)*.
- A description of the factors specified in regulation 4(2) 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)*:
 - e) the construction and existence of the development, including, where relevant, demolition works;
 - f) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
 - g) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
 - h) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
 - i) 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;
 - j) 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,
 - k) the technologies and the substances used.
- A description of the likely significant effects on the factors specified in regulation 4(2) 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

- 1.13. 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 Chapters 6 -13 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
Architect (Plot 10a)	Jon Matthews Architects
Architect (Plot 10b)	Tim Groom Architects
Air Quality	Cundall
Climate Change	Cundall
Daylight, Sunlight and Overshadowing	Proximity
Human Health	Enfusion
Noise and Vibration	Cundall
Socio-Economics	Ekosgen
Townscape and Visual Impact	Planit-IE
Wind Microclimate	Architectural AeroDynamics

Organisation of the Environmental Statement

- 1.14. This ES comprises 15 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).
- 1.15. 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.

1.16. **Table 1.2** sets out the structure of the ES¹:

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.	EIA Site Description and Proposed Development	EIA Site description and details of the Proposed Development.
4.	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	Assessment of the effects on air quality during construction and subsequent operation.
7.	Climate Change	Assessment of the effects of the proposals on climate change factors: - Greenhouse Gas Emissions (7a) - Climate Change Risk Assessment (7b)
8.	Daylight, Sunlight and Overshadowing	Assessment of the effects on daylight and sunlight to adjacent receptors.
9.	Human Health	Assess the effects the Proposed Development may have on human health.
10.	Noise and Vibration	Assess the effects the Proposed Development may have on noise and vibration.
11.	Socio-Economics	Assess the effects the Proposed Development may have socio-economic receptors.
12.	Townscape and Visual Impact	Assessment of effects relating to townscape and visual impact.
13.	Wind Microclimate	Assessment of effects on the microclimate in terms of wind, including pedestrian comfort levels and safety.
14.	Type 1 Cumulative Effects	Assessment of effects and interaction of effects.
15.	Summary of Residual Impacts	Summary of the effects that remain after mitigation.
Volume 2: Technical Appendices		
Volume 3: Non-Technical Summary		

Other Documents

1.17. Together with the ES, the following documents in **Table 1.3** are submitted to MCC in support of the Plot 10b Planning Application. For completeness, it also sets out the documents submitted as part of the Plot 10a application.

Table 1.3: List of documents submitted in support of the Plot 10a and the Plot 10b application.

Document	Plot 10a	Plot 10b
<i>Application Site Boundary and Location Plan</i>	Jon Matthews Architects	Tim Groom Architects
<i>Existing and Proposed Site plans, sections and elevations (including drawing schedule)</i>	Jon Matthews Architects	Tim Groom Architects

¹Although 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 - 15 of this ES.

Document	Plot 10a	Plot 10b
<i>Topographical Survey (including Ground Penetration Radar)</i>	Jon Matthews Architects	Survey Operations
<i>Landscape Strategy and Drawings</i>	Planit-IE	Planit-IE
<i>Accommodation Schedule (in Design and Access Statement)</i>	Jon Matthews Architects	Tim Groom Architects
<i>Design and Access Statement</i>	Jon Matthews Architects	Tim Groom Architects
<i>Archaeological Desktop Assessment</i>	Pre-Construct Archaeology	Pre-Construct Archaeology
<i>Broadband Connectivity Assessment</i>	n/a	G-Tech
<i>Crime Impact Statement</i>	GMP: Design for Security	GMP: Design for Security
<i>Commercial Strategy</i>	n/a	Vita Group Ltd
<i>Residential Management Strategy</i>	n/a	Vita Group Ltd
<i>Ecological Extended Phase 1 Desktop</i>	Penny Anderson Associates	Penny Anderson Associates
<i>Energy Statement and Environmental Standards Statement</i>	Cundall	Ridge Consultants
<i>BREEAM Pre-Assessment</i>	Cundall	AA Projects
<i>Flood Risk and Drainage Strategy</i>	Ramboll	RoC Consulting
<i>Gateway One Fire Statement</i>	n/a	Design Fire Consultants
<i>Green and Blue Infrastructure Statement</i>	Deloitte	Deloitte
<i>Ground Conditions</i>		
<i>Plot 10b - Phase 1 Desktop Study; Phase 2 Site Investigation and Ground Gas Addendum.</i>	Ramboll	RoC Consulting
<i>Local Labour Benefit – Statement of Intent</i>	Ask Real Estate	Vita Group Ltd
<i>Statement of Consultation</i>	Deloitte	Deloitte
<i>Planning and Tall Building Statement</i>	Deloitte	Deloitte
<i>TV Reception Survey</i>	G-Tech	G-Tech
<i>Transport Statement</i>	Vectos SLR	Vectos SLR
<i>Framework Travel Plan</i>	Vectos SLR	Vectos SLR
<i>Mechanical and Ventilation Statement</i>	Cundall	Ridge Consultants
<i>Waste Management and Servicing Strategy (including MCC's Waste Pro-Forma)</i>	Vectos SLR	Vectos SLR
<i>Heritage Statement</i>	Deloitte	Deloitte
<i>Air Quality Assessment</i>	Cundall	Cundall (ES Chapter)

Document	Plot 10a	Plot 10b
<i>Daylight, Sunlight and Overshadowing Assessment</i>	Proximity	Proximity (ES Chapter)
<i>Noise Assessment</i>	Cundall	Cundall (ES Chapter and Appendix)
<i>Townscape and Visual Impact Assessment</i>	Planit-IE	Planit-IE (ES Chapter)
<i>Wind Microclimate Study</i>	Arch-aero	Arch-aero (ES Chapter)
<i>Sequential Test</i>	N/A	Deloitte

Environmental Statement Availability

- 1.18. 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.
- 1.19. 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
- 1.20. For copies of any of the above, please contact the Manchester Planning Team at Deloitte:
- Plot 10, First Street Team – Planning and EIA
 - Deloitte LLP
 - The Hanover Building,
 - Corporation Street
 - Manchester
 - M4 4AH

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 EIA 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** – EIA Scoping Opinion

Legislation and Guidance

- 2.3. The ES has been prepared to comply with EIA Regulations, which implement European Council Directive No. 85/337/EEC as amended by Directive 2014/52/EU and entered into force on 17 May 2017.
- 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)
 - Reference has been made to the Institute of Environmental Management and Assessment (IEMA) publications, including:
 - IEMA ES Review Criteria
 - IEMA Guidelines for Environmental Impact Assessment (2004)
 - IEMA Special Report into the State of Environmental Impact Assessment Practice in the UK (2011)
 - IEMA Shaping Quality Development (2015)
 - IEMA Delivering Quality Development (2016)
 - IEMA Delivering a Proportionate EIA (2017)
- 2.5. The ES has also had regard to the National Planning Policy Framework 2021 (NPPF). The NPPF sets out the Government's economic, environmental and social planning policies for England, articulating the Government's aspiration for sustainable development. The NPPF has been considered where it is relevant to EIA.
- 2.6. As relevant to the ES technical chapter's scope, methodology and assessment of effects, key local planning policy, material considerations and guidance documents have been considered. These include:
- Manchester City Council Core Strategy (2012)
 - Saved Unitary Development Plan Policies (1995)
 - Draft Emerging Places for Everyone Joint Development Plan Document (Publication Stage Plan, 2021)
 - First Street Strategic Development Framework (2018)
- 2.7. Any additional planning policy or guidance documents considered relevant to specific disciplines have been identified within the relevant technical chapters.

Screening, Scoping and Consultation

- 2.8. An EIA Scoping Opinion Request was issued to MCC on 25 November 2022. As part of this process the EIA set out that 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. An explanation for each discipline is provided in the EIA Scoping Report in **Appendix 2.1**. A formal Scoping Opinion was received on 26 January 2023 (see **Appendix 2.3**).
- 2.9. At the point of submission of the Scoping Opinion Request to MCC it was not known where the construction welfare facilities for Plot 10b would be located. Subsequently, vacant hoarded-off land immediately north of Macintosh Mills and east of the 10b Site was identified. In order to ensure the Plot 10b proposals are fully deliverable, the site compound has now been included within the red line boundary submitted with the Application. This has resulted in the EIA Site being larger than that initially set out in the Scoping Opinion Request; however, the proposed works are only temporary in nature and relate only to the construction phase, and do not impact the conclusions of any technical disciplines. Following completion of Plot 10b, the welfare site will then be returned to its existing condition and use.

Non-Significant Effects

- 2.10. As part of this scoping process the following topics have been scoped out:
- Agricultural Circumstances
 - Archaeology
 - Aviation
 - Ecology and Nature Conservation
 - Ground Conditions
 - Heritage
 - Electronic Interference
 - Transport and Access
 - Flood Risk and Drainage

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 EIA Development by defining the environmental sensitivities, constraints and opportunities associated with the EIA 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, EIA Scoping Report and EIA Scoping Opinion.
- 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 EIA Development provided in **Chapter 4**.

Structure of Technical Chapters

- 2.16. Each technical chapter of the ES (Chapters 6 to 13) 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 10a Development and the Proposed 10b Development, and to the combined effect of the Proposed EIA 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 EIA 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 EIA Site remains unchanged. This is a critical part of the EIA process as it provides a measure against which potential environmental effects can be assessed.
Identification and Evaluation of Key Impacts	This section identifies the likely significant effects on the environment resulting from the Proposed EIA Development. A description of the likely effects of the Proposed EIA 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 EIA Development identified within the vicinity of the EIA 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 EIA Development on a single receptor. These are addressed in Chapter 15.

Technical Chapter Structure	
	Type 2 - Cumulative effects are those that arise from incremental changes caused by other consented or reasonably foreseeable activities ('committed developments') together with the Proposed EIA Development.
Residual Effects	The residual effects, i.e. the remaining effects of the Proposed EIA 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 EIA Development.

- 2.17. Chapter 5 provides information to allow the construction phase of the Proposed EIA Development to be assessed by the disciplines set out in Chapters 6 to 13.

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 EIA Site remains unchanged). Baseline data has been obtained from a variety of sources, including published documents, maps, historical information and EIA Site survey data. Given the complex nature of the EIA Site and surroundings, each technical chapter (Chapters 6 to 13) includes a clear description of what is assumed as the baseline against which the assessment is being made.
- 2.25. The baseline includes nearby schemes under construction and where relevant will include nearby committed developments, and therefore represent the 'worst case' scenario.
- 2.26. 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

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

- Remediation.
- Enhancement.

- 2.28. Where the effectiveness of the mitigation proposed has been considered uncertain, or where it depends upon assumptions of operating procedures, data and/or professional judgement has been introduced to support these assumptions.
- 2.29. Detailed mitigation recommended during the construction phase will be set out in the Construction Environmental Management Plan (CEMP) to be agreed with MCC prior to the commencement of work and implemented throughout the duration of the works. Outline mitigation measures to be included in a future CEMP are set out in Chapter 5: Construction Methodology and Programme.
- 2.30. Mitigation to be implemented during the operational phase will be secured through approved documents, planning conditions and obligations.

Residual Effects

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

Cumulative Effects

- 2.32. The ES considers the potential for likely significant effects on the environment resulting from consented or reasonably foreseeable activities or developments in the area, which could lead to potentially significant cumulative effects in conjunction with the Proposed EIA Development ('Committed Developments').
- 2.33. These 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.
- 2.34. A search of MCC's planning applications database and knowledge of the area has identified a number of schemes for which cumulative effects are considered likely. A full list, as of September 2022, is contained at **Appendix 2.2**. These have been formally agreed with Manchester City Council via the EIA Scoping Opinion that was received on 26th January 2023 and no significant planning permissions have been approved since.
- 2.35. Each technical chapter (Chapters 5-13) has assessed the potential for likely significant effects on the environment as a result of the above committed developments, together with the Proposed EIA Development.
- 2.36. In addition, Chapter 15 assesses the Type 1 Cumulative effects.

Delivery & EIA Scenario Testing

- 2.37. The Proposed 10a Development and the Proposed 10b Development may be delivered sequentially or in tandem. Therefore, the EIA considers the following seven scenarios:
- Scenario 1: Baseline
 - Scenario 2: Baseline + Plot 10a
 - Scenario 3: Baseline + Plot 10a + cumulative
 - Scenario 4: Baseline + Plot 10b
 - Scenario 5: Baseline + Plot 10b + cumulative
 - Scenario 6: Baseline + Plot 10a + Plot 10b
 - Scenario 7: Baseline + Plot 10a + Plot 10b + cumulative
- 2.38. The intention is that the Proposed EIA Development will be complete and operational by Q3 2026 and which has been used as the basis for the technical assessments.

Assumptions and Limitations

- 2.39. The principal assumptions that have been made and any limitations that have been identified in preparing the ES are set out in each technical chapter. General assumptions include the following:
- All of the principal land uses adjoining the EIA 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 in 2022 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 EIA Development;
 - Information received from third parties is complete and up to date;
 - The various stages of the Proposed EIA Development will satisfy minimum environmental standards, consistent with contemporary legislation, practice and knowledge;
 - Assessments are based upon, and conclude, the “worst case” effects that would arise from the application as defined by the description of development set out in Chapter 4, Site Surroundings and Description of the proposals;
 - Construction and demolition methods and phasing will follow the timetable and methods set out in Chapter 5, Construction Management 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 EIA Development will be provided by statutory undertakers.

Objectivity

- 2.40. 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 EIA Site, its surrounding context, a more detailed description of the Proposed EIA Development as well as the EIA Site's suitability for the Proposed EIA Development.

Site Description

- 3.1. The EIA Site comprises approximately 1.2 hectares of brownfield land located within Manchester City Centre which is currently vacant. The EIA Site's last use was as a temporary event space for organised outdoor events including Manchester Pride festival, which ended in August 2021. The EIA Site is located within Plot 10 of the First Street SDF and is split into two plots: Plot 10a to the west, fronting onto First Street; and 10b to the east, fronting onto River Street.
- 3.2. In its current state, the EIA Site is predominantly comprised of hardstanding with a minimal amount of vegetation. The EIA Site slopes downwards from the south-west to the north-east towards River Street.
- 3.3. The EIA Site can be accessed by vehicle via Newcastle Street; however, this is restricted by site hoarding around the perimeter and locked gates to north and south.

Wider Area

- 3.4. Immediately to the north and north-west are the completed No.1 and No.8 First St buildings, which are home to a number of major occupiers including WSP, Autotrader, Amaze, Odeon and Jacobs. James Grigor Square is located north west of the EIA Site and provides attractive outdoor space.
- 3.5. Beyond this is First Street North ('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 student accommodation, an MSCP and a range of carefully curated food and drink operators, as well as new public spaces.
- 3.6. To the east of the EIA Site there are a number of former Mills including Macintosh Mill, Chorlton Mill and Cambridge Mill which are Grade II listed and are in residential and office uses. Further beyond to the east, there is a range of more modern, mixed-use development which include student accommodation, retail, apartment and food and beverage units. Taller developments exist within this area including Unite Students Medlock Heights and Artisan Heights.
- 3.7. To the immediate south is the under construction Plot 11 Downing site (125573/FO/2019), which is the construction of four co-living towers of varying heights (between 10 and 45 storeys). Slightly further south, beyond Parkway Gate and Medlock House student accommodation, is the Mancunian Way – a key arterial vehicle route into the City.
- 3.8. Immediately west of the EIA Site is Plot 9 of the First Street Masterplan. Planning Permission (132600/FO/2021) was secured for a nine storey 'net-zero' office building, being brought forward by Ask at Plot 9a (the northern segment). 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.

Site Specific Environmental Designations

Air Quality

- 3.9. The EIA 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 Cundall.

Ecology

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

Flood Risk and Drainage

- 3.11. According to the Environment Agency's (EA) Flood Map, the north east part of the EIA Site (covering the Plot 10b site) is located within Flood Zone 2, whilst the remaining areas are located within Flood Zone 1.
- 3.12. The EIA Site is located within the Critical Drainage Area prescribed by Manchester, Salford and Trafford Councils Strategic Flood Risk Assessment.
- 3.13. For further details on flood risk, please refer to the Flood Risk and Drainage Strategies prepared by Ramboll (Plot 10a) and RoC (Plot 10b).

Heritage

- 3.14. The EIA Site is not located within a Conservation Area and does not contain any designated or non-designated heritage assets. There are nine heritage assets within a 250m radius of the EIA Site. The radius of 250m was chosen to reflect the built up, urban nature of the EIA Site, whilst ensuring assets within a close range that have the potential to be affected, are considered. A ZVI² was produced by Planit-IE, indicating sight lines, supporting the proposed radius. Most notably these include the Grade II Listed MacIntosh Mills, Cambridge Mill, and Chorlton New Mill which are in close proximity to the EIA Site to the east.
- 3.15. There are no conservation areas within the 250m boundary. Castlefield Conservation Area is located 335m to the west and Whitworth Street Conservation Area is located 396m to the east.
- 3.16. For further details on heritage and the nearby heritage assets, please refer to the Heritage Statements prepared by Deloitte LLP.

Accessibility

- 3.17. The EIA 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.
- 3.18. For further details on transport, please refer to the Transport Assessments and Framework Travel Plans prepared by Vectos for 10a and 10b

Planning History

- 3.19. The approved planning permissions of most relevance on EIA Site are set out in the table below.

Table 3.1 – EIA Site Planning History

PP Reference	Description	Status
048549/DF/CMD/95	Works to make good building facades, boundary treatment and site surface following the demolition of structures on Wilmot Street	Approved November 1995
111240/FO/2016/C1	Creation of a temporary landscaped area in advance of permanent redevelopment	Approved April 2016
130608/FO/2021	Planning Permission for the change of use to allow for temporary events space including the erection of two temporary stages and tent within Plots 9 and 10 of First Street, as well as pop-up concessions stands and a private corporate event space for a period of 12 weeks	Withdrawn 15 September 2021

² The ZVI is submitted alongside this application as part of the Townscape and Visual Impact Assessment contained within the ES.

The Proposed EIA Development

- 3.20. The description of development for the Proposed 10a Development (Ref: 136043/FO/2023) is:
- “Erection of 13-storey office building (Use Class E) with associated public realm, external roof terraces (level 12 and 13) and other associated works including external amenity spaces”*
- 3.21. The description of development for the Proposed 10b Development is:
- “Full Planning Permission for a 14-storey building comprising purpose-built student accommodation (Sui Generis) and ground floor food hall (Use Class E and/or Sui Generis), and other associated works including external amenity spaces, public realm, secure cycle parking, access and servicing arrangements; and associated site construction compound for a temporary period”*
- 3.22. The term ‘Proposed EIA Development’ used within this Report refers to all stages of demolition, construction and operation of both the Proposed 10a Development and the Proposed 10b Development.
- 3.23. The intention is to deliver the Proposed EIA Development in its entirety, with both the Proposed 10a Development and the Proposed 10b Development being delivered in tandem; however, this each application will benefit from a standalone planning permission that is capable of being delivered in its own right.
- 3.24. **Table 3.2** sets out the application proposals for Plot 10a:

Table 3.2 – Plot 10a (office) Development Quantum (Ref: 136043/FO/2023)

Proposed 10a Development	
Proposed Use	28,252 sqm commercial office space (GIA) (Use Class E) (33,682 sqm GEA)
Proposed Height	13 Storeys / 90.3m AOD
Car Parking	No Car Parking
Cycle Parking	204 secure cycle parking spaces

- 3.25. **Table 3.3** sets out the application proposals for Plot 10b:

Table 3.3 – Plot 10b (PBSA and food hall) Development Quantum

Proposed 10b Development	
Student Accommodation	576 student bedspaces (Use Class Sui Generis), split between: • x76 (6-bed clusters) • x24 (5-bed clusters) Including: • 15% (86 bed spaces) affordable units provided under a nomination agreement to MMU • 24 studios reserved / adaptable for those with accessibility needs, with two studios fitted out from the outset.
Food Hall	Approximately 1,304sqm (GIA) commercial space (Use Class E and/or Sui Generis)
Proposed Height	14 Storeys (85.3m AOD / 46.1m AGL)
Car Parking	No Car Parking

Layout

Site Layout

- 3.26. The original masterplan positioned two blocks parallel to River Street. The buildings on Plot 10 have been re-orientated from that shown indicatively in the 2018 First Street masterplan. Previously, it was envisaged that Plots 10a and 10b would comprise two offices of equal footprint on the northern and southern halves of the EIA Site. The current proposals have re-orientated the buildings so they occupy the western and eastern halves of Plot 10 respectively in longer linear blocks. This design move has the following advantages:
- Extension and retention of First Street along a single frontage;
 - More flexible and adaptable floorplates;
 - Creation of larger office with address directly from Medlock Street and First Street;
 - Extends existing public realm within James Grigor Square southwards towards First Street South
 - Provides alternative PBSA use which creates a transition to the residential-led uses to the east; and
 - Focus on public realm enhancement along the key routes of River St, Wilmott St and First St through the introduction of soft and hard landscaping and external seating areas, creating more vibrant and attractive interfaces.
- 3.27. It is considered that the new layout and mix of uses will allow the buildings to fit in cohesively with the existing surroundings whilst helping the legibility of the north-south and east – west connections.
- 3.28. Further detail on the EIA Site layout can be found within the Design and Access Statement's prepared by Jon Matthews Architects and Tim Groom Architects.

Internal Layout

Plot 10a

- 3.29. Internally the layout has been carefully considered to provide the optimum experience for future occupiers and create a flexible, high-quality space
- 3.30. The design includes more practical elements such as designing in flexibility for where floorplates can be divided, or interconnected stairs included. The large floorplates have also been designed to provide space for occupiers to include spaces for collaboration and respond to the different ways of working.
- 3.31. The layout has also been designed to accommodate significant areas of amenity, including winter gardens on every level provide occupant controllable environments for access to fresh air and improve wellbeing. A generous private external terrace is provided for the occupier at the Eleventh Floor which is open to the elements. There is also a terrace at the Twelfth Floor open to all users of the building. The development will benefit from a generous cycle hub facility allowing for the storage of 204 cycles, 200 lockers, 20 showers, drying lockers and cycle maintenance facilities.

Plot 10b

- 3.32. The proposed scheme for Plot 10b provides purpose built student residential accommodation from first to twelfth floor with an offering of communal amenities at ground floor and mezzanine.
- 3.33. within the northern part of the ground floor layout is the food-hall which is supported by WC's, dedicated refuse stores, kitchens and food storage. The food-hall is double height and comprises a mezzanine, providing for a large open space connected to the first floor. In the southern part of the ground floor there is an entrance lobby to the student accommodation as well as student amenity spaces including a gym, cycle store and co-working space. Back of House function such as laundry, comms, parcel store and staff rooms are also included in the ground floor as well as substations and building plant.
- 3.34. The internal upper floors consist entirely of residential accommodation arranged in clusters. The residential accommodation is accessed via corridors located centrally along the axis of the building. Each enters directly into a generous communal area encouraging social interaction.

- 3.35. The first floor comprises of the mezzanine to the food-hall which provides accommodates extra seating and WC's. Separated by the central core there are 4 (6-bed) student clusters on the first floor providing 24 student bed spaces.
- 3.36. Typical floors of the Proposed 10bDevelopment comprise of 6 (6-bed) clusters and 2 (5-bed) clusters providing a total of 46 student bed spaces.
- 3.37. The roof level comprises of an air source heat pump and other building plant.

Scale and Massing

- 3.38. Jon Matthews Architects' proposed design for the 13 storey office block will contribute to the emerging streetscape in this part of First Street, balancing the much taller buildings approved and under construction at Great Jackson Street and First Street Plot 11 to the south. At 14 residential storeys, the student accommodation block, designed by Tim Groom Architects (85.3m AOD / 46.1m AGL) steps down from 10a (90.3m AOD / 59.37m AGL) creating a transition to the residential and historic buildings to the east. This building is around 24 metres lower than the maximum height envisaged in the First Street Framework.
- 3.39. The Design and Access Statements prepared by Jon Matthews Architects and Tim Groom Architects set 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. Throughout this process the scale and proportion of the volumes, and also the relationship between each volume were assessed and evaluated.
- 3.40. The scale and massing of the buildings were 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. In particular, Plot 10b underwent detailed assessment to ensure the massing was appropriate for its context, resulting in a significantly smaller massing than that envisioned in the SDF.
- 3.41. As part of this process, a Townscape and Visual Impact Assessment was undertaken, as detailed in the TVIA submitted with the 10a application (Ref: 136043/FO/2023) and within Chapter 12 of the ES. The initial Zone of Visual Influence 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 was appropriate and responds to the surrounding context.

Appearance and Materiality

- 3.42. The Proposed EIA Developments have been carefully crafted to take cues from the existing and emerging surroundings and use these to create contemporary, high-quality architectural design for this part of Manchester City Centre. The two plots have different architectural styles and materials which complement one another to create a harmonious streetscape that transitions from the traditional brick vernacular of Macintosh Village to the modern office heart of First Street.
- 3.43. Both buildings have followed best architectural practice and are founded on the concepts of a strong ground floor, a middle, and a crown. The ground floor is where more intricate design details are located to provide a human-scale of the proposals. This architectural detail was discussed in depth as part of pre-application discussions with MCC to ensure that the proposals will continue to push forward Manchester's ambitions for high-quality and sustainable buildings.
- 3.44. Specific details for each of the plots is set out below.

Plot 10a

- 3.45. Jon Matthews Architects developed and tested two key concepts whilst establishing the principle for the facade design. These were:
- Floor to ceiling windows.
 - Windows in a band above desk height.
- 3.46. Overall, this concept will lead to an elegant form and a high quality environment for occupiers. Plot 10a is designed to be read alongside Plot 9a as a 'family' of buildings, both of which share the same design approach described above. The tone of the buildings transitions from the greens hues at Plot 9a to copper at Plot 10a, and it is envisioned that the forthcoming Plot 10b will be of red brick. Together, these create a cohesive streetscape but with each building having an individual and distinct identity.
- 3.47. The proposed cladding is a pre-cast concrete panel system. This helps to reduce the embodied carbon over using a curtain walling system and plays a key role in the high sustainability credentials of the building. The natural concrete aggregate will be flecked with a copper tone.

Plot 10b

- 3.48. Tim Groom Architects' proposed design is a building that is contemporary in its architectural resolution whilst also comfortable in the immediate context. The proposed language and material expression of the facade has been developed following the analysis of Manchester's mills and warehouses. Secondary detail within the ordered facade provides depth and layering with stepped piers, string courses and elegant pilasters to upper floors. Entrances are demarcated by enlarged arched openings and architectural embellishments such as multiple stepped brickwork, referencing those of Macintosh Mill.
- 3.49. The articulation of the building massing has been arranged to provide a distinctive plinth, middle and top. The purpose of the plinth is to address the human scale. This should be rich in depth and detailing. The central section responds to the regular rhythm of the historical mills in the surrounding area. The architecture is referential in detail to those elements prominent in the mill buildings, such as the window reveals, expressive piers and decorative banding.
- 3.50. The proposed material palette references the varying tones and textures of the existing and emerging context. The main facade is predominantly composed of textured red brickwork, in tones of red, which reference the historic fabric of the city. Layering of the facade is created through the use of aluminium detailing as secondary material. The material retains the use of the red tones, however more depth in colour is proposed to enrich the facade. Internally, the use of industrial materials maintain continuity with the use of a natural palette of timber which provides warmth.
- 3.51. The top element, or crown, of the building will be visible from the wider range view of the Plot 10b Site. As such, it is proposed that the upper floors will provide a distinctive architectural element. The upper floors, or crown, of the building are articulated by elegant detailing defined by slim pilasters and arched openings. A change in material between the bays adds to the perception of further depth.

Landscaping Strategy

- 3.52. Planit-IE, award winning landscape architect, are acting as master landscape architect on the First Street Masterplan.
- 3.53. For Plot 10a in particular, the landscaping approach is to provide a continuity to the existing First Street public realm to the north of the EIA Site. The adjacent Plot 9a delivers the majority of the public realm extension with Plot 10a completing the eastern footpath connecting First Street to Hulme Street to the south in consistent sandstone paving to match existing materials. The southern section of the western footpath will be delivered with the Plot 9b proposals when they come forward to complete the permanent condition of this linkage.
- 3.54. Located off River Street, between both developments (10a & 10b), a flexible pocket space is proposed. The space is designed with mixed shrub and perennial planting as backdrop and a provision for F&B spill out associated with the Plot 10b Market Hall. Small and simple, the space offers a contrast to the larger events spaces found across the estate.
- 3.55. A linear planting area along Wilmott Street including a rain garden that acts as part of the wider SuDS system is to be included. Pollinator friendly species and ecology features such as bee posts will be incorporated to create a habitat that encourages biodiversity in Manchester city centre.
- 3.56. Hulme Street will be simple paved street with trees and planting to add colour, scale and help to maximise the EIA Sites tree planting opportunities. River Street will comprise of a high quality Yorkstone street surfacing that forms a continuation of the materials palette used at James Grigor Square whilst north of the street provides spill out space for outdoor dining experience.
- 3.57. Throughout, trees are planted along pedestrian thoroughfares, with 26 in total. Permeable surfaces have been incorporated into the landscaping proposals to enable drainage through sustainable drainage.
- 3.58. Refer to Planet IE Landscape Design & Access Statement for full details of the Landscape and Public Realm proposals.

Waste and Servicing

- 3.59. A service yard area is provided between Plots 10a and 10b with access for service vehicles from Hulme Street.
- 3.60. Please refer to the Waste and Servicing Strategy and completed MCC Waste Proforma prepared by Vectos SLR for additional information on servicing and access.

Office

- 3.61. The Proposed 10a Development incorporates an internal servicing bay which provides direct access to the bin stores and goods lift. The Amazon parcel 'Bring Me' lockers have also been located adjacent to the service yard at ground floor and will have a dedicated drop-off point within the service yard.

- 3.62. The refuse store has been sized to accommodate 19 no. 1100l euro bins plus 5 no. 240 l bins for green waste and additional 4 no. 240l bins are provided for the ground floor cafe space.
- 3.63. The waste provision forecast has been based on BS5906:2005 for offices and hotels and will be a daily private collection, as is the case around First Street.

Student Accommodation

- 3.64. A loading bay is proposed on River Street (east) for Plot 10b.
- 3.65. The student residence will have a 24 hour management team which will be responsible for managing the waste and recycling strategy on-site. Student refuse is stored at ground floor level and is located along the west facade adjacent to the service yard. Student residents would take their waste via lifts to a ground floor refuse drop lobby where there would be chutes which deposit their waste into the bins within the bin store. Every two days, the management team will move the refuse bins to the collection point at the day of servicing.
- 3.66. The PBSA bin store will include 16 no. 1100l euro bins.

Food Hall

- 3.67. The waste generated through the operation of the food hall is to be collected daily by the Food Hall staff/cleaners and deposited in bins in the refuse store, back of house.
- 3.68. Any external food delivery services will strictly only occur from the service yard. This will be monitored by front of house staff to ensure all deliveries are collected from here and drivers / cyclists do not enter the front of the building.
- 3.69. The food hall bin store will include 3 no. 1100l euro bins and 3 x 240litre bins plus space for oil collection.

Parking

- 3.70. There are no car parking spaces proposed within the Proposed EIA Development.
- 3.71. The EIA Site will benefit from cycle parking facilities that encourage active travel.

Office

- 3.72. A total of 204 double stacked cycle spaces will be provided at ground floor level, as well as showers and changing facilities.

Student Accommodation

- 3.73. A total of 88 secure cycle spaces will be provided at ground floor level and an additional 12 visitor stands within the public realm. To encourage active travel choices, House of Social will offer bikes free of charge for students, kept within the cycle store, to use on a regular basis as well as the students being able to store their own bikes within the secure cycle stores.

Accessibility

- 3.74. 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 team have given due regard to Equality Act, Building Regulations and MCC's Design for Access 2.
- 3.75. Further details of the accessibility of the office building can be found within the Design and Access Statement prepared by Jon Matthews Architects and Tim Groom Architects.

4. Alternatives and Design Evolution

Introduction

- 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 EIA 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 EIA 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 EIA Development is not progressed.
 - Alternative locations for the Proposed EIA Development.
 - Alternative Uses for the EIA Site.
 - Alternative Scale and Massing for the Proposed EIA Development.

The ‘do nothing’ alternative

- 4.5. The ‘do nothing’ scenario refers to the option of leaving the EIA Site in its current state, as described above in Section 3.
- 4.6. The EIA Site is located within a highly strategic and sustainable location within the heart of Manchester City Centre and is therefore not making an efficient use of land in its existing state. Currently, the EIA Site is comprised of vacant, undeveloped land with hoarding that has been subject to graffiti, creating an unattractive appearance for the surrounding area whilst also providing no opportunity for permeability between this part of the City Centre.
- 4.7. The current condition of the EIA Site creates what can be considered as a ‘gap site between the existing developments within FSN and those coming forward within First Street South (FSS) (Plot 11 First Street). This has a negative effect on the surrounding townscape which is generally characterised by mid to high density urban form by failing to create a connection between them. Furthermore, due to the EIA Site being vacant, it therefore receives little activity and can therefore be susceptible to crime due to its reduced natural surveillance – as evidenced by the graffiti. The EIA Site currently contains a very limited amount of vegetation and is predominantly hardstanding, therefore it currently provides little in regards biodiversity and local amenity.
- 4.8. The EIA Site is located within the First Street SDF 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 EIA Site falls within the ‘First Street Central’ character zone; a new office destination targeted at a range of commercial occupiers, particularly those seeking the benefits of a central and highly accessible city centre location, competitively priced to help distinguish the accommodation from other locations in the city centre.
- 4.9. The First Street SDF area also sits within the Oxford Road Corridor. The Corridor is an innovation district with a mix of knowledge, business and cultural businesses. It includes two of the UK’s largest universities, a university NHS foundation trust, and a large cluster of digital, technology and life science businesses.
- 4.10. The proposed PBSA and office uses are therefore highly suitable for this location and will directly support the regeneration ambitions set out by the First Street and Oxford Road Corridor frameworks.

- 4.11. Therefore, the 'do nothing' scenario has been discounted due to the established need for regeneration of this part of the City Centre, demand for strategically located and high quality office space, as well as suitable land for new PBSA required by Manchester's growing student population.

Consideration of Alternative Locations

- 4.12. The EIA Site is situated within a highly strategic location within the City Centre and is therefore well served by multiple modes of sustainable transportation methods. For instance, the Manchester Oxford Road train station and Deansgate Metrolink stop are both located within under a ten minutes walk from the EIA Site, providing access to a number of locations throughout Greater Manchester and beyond.
- 4.13. As aforementioned, the EIA Site has been identified for redevelopment within the First Street and Oxford Road Corridor regeneration frameworks. The proposed uses at Plot 10 are highly compatible within these regeneration areas due to the proximity to universities as well as a number of key services and amenities offered by the City Centre core that appeal to office occupiers and residents alike.
- 4.14. It should also be recognised that the EIA 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 EIA Site

- 4.16. As mentioned above, the EIA Site is strategically located within the City Centre and close to both universities campuses, making the EIA Site highly suitable for office and student accommodation.
- 4.17. As noted above, the EIA Site is earmarked for commercial office development in the First Street SDF where delivery of robust, flexible and generously proportioned commercial office buildings that are capable of occupation by a single end user or multiple tenancy arrangements are fundamental to the success of First Street Central as a business destination.
- 4.18. The latest figures from the Manchester Office Agents Forum ('MOAF'), released in October 2022 and reporting on the third quarter of 2022, highlights that over 326,000 sq. ft. of office floorspace space was leased, a 30% increase in uptake to the previous quarter and same period last year. MOAF anticipates a stronger final quarter, taking it to beyond 1m sq. ft. for the whole year. One of the most notable deals within the City Centre during this quarter was the GPA taking 36,375 sq ft at 101 Barbirolli Square and Manchester Metropolitan University signing for 36,116 sq. ft at Manchester Technology Centre³.
- 4.19. According to the latest research from Savills released in October 2022, Manchester's average Grade A increased in 2022 reflecting a continued recovery from the pandemic. The data revealed that the average Grade A rents stand at £34.35per 11% higher than the 2021 figure, which is also 7% higher than the pre-pandemic high⁴.
- 4.20. This demonstrates the continued investor appetite for office floorspace in Manchester where there is strong occupier market. The strong uptake of office space has led to a shortage of Grade 'A' office space as demand outstrips supply, with Grade A availability falling by 8% to 834,000 sq. ft at the end of Q3, meaning there is a continuous demand in the City for the new supply that is brought forward.
- 4.21. The new office building proposed on Plot 10a would provide approximately 28,252 sqm (GIA) of market leading sustainable new office space, supporting around c.1,025 jobs. A range of interior features are designed to contribute to occupier wellbeing sustainability and future resilience. During the construction stage the Proposed EIA Development will create construction jobs for Manchester's residents that will be secured through a Local Labour Agreement whilst local expenditure is expected to be high during this phase.
- 4.22. The building has been designed to be at the forefront of flexible and high-quality, sustainable Grade A office floorspace that caters to market demands. As well as NABERS 5.5* rating, the building is also targeting WELL Building Standards, BREEAM Outstanding and an EPC A rating.
- 4.23. Together with Plot 9a, it will be one of the first buildings in Manchester to have a Smartscore rating. In this regard, Smart Spaces involve installing a smart platform for the development that not only provides the softer services for occupiers such as a community via a building social media platform, but also allows a more efficient management of some of the harder services such as access into buildings and energy saving through integrated building intelligence.

³ Place North West (2022). MOAF: Office take-up climbs 30% in Q3. Viewed online: <https://www.placenorthwest.co.uk/moaf-office-take-up-climbs-30-in-q3/>

⁴ Savills (2022) Market in Minutes: Manchester Occupational Office Data Q3 2022 Viewed Online: https://www.savills.co.uk/research_articles/229130/334954-0

Having a smart platform integrated into the design is an effective way of improving the efficiency and sustainability of a building.

- 4.24. As is discussed in more detail below, the original First Street indicative masterplan envisaged Plots 10a and 10b being orientated horizontally, creating two similar sized office plots on the northern and southern halves of the EIA Site. This layout resulted in less diversity of floorplates to respond to occupier demand and changing requirements arising out of covid and the future of work. It also raised concerns over the attractiveness and value of Plot 10b, located on the southern half of the EIA Site with no visibility to Medlock Street or the city core.
- 4.25. Re-orientating the plots therefore created opportunity to deliver a broader mix and more viable proposition. This created two linear plots. The development density and height of building on the eastern plot is constrained by restrictive covenants related to Macintosh Mill to the east. The inclusion of a PBSA use on 10b offers the opportunity deliver a substantially slimmer linear building, allowing its footprint to be removed completely from the restricted covenant area and maximising distances between the building and Macintosh Mill, mitigating impacts upon overshadowing as far as possible.
- 4.26. Furthermore, as detailed in Section 2 of the Planning Supporting Statement, there is an established and undisputed need for new PBSA within Manchester. MCC's Policy as expressed in Policy H12 of the Core Strategy and Executive Report PBSA in Manchester (9 December 2020) is that new PBSA should be well designed and located within the Oxford Road Corridor, in close proximity to the City's university campuses. The Site is ideally located to address this unmet demand, being both within the Corridor and under 5 minutes' walk from the campuses. 15% of the rooms will be operated for MMU under a nomination agreement at an affordable price point. The proposed PBSA use will therefore meet the criteria set out in Policy H12 and the Council's Executive Reports, as detailed in the submitted Planning Supporting Statement.
- 4.27. The efficiency of the re-masterplanned site, delivering a single larger-footprint office means that the overall quantum of office floorspace will not be materially reduced within First Street and commercial uses will remain the predominant use across the area.
- 4.28. Alternative residential use of the 10b plot was considered but would likely require a wider development footprint, reducing the efficiency of the office building and/or reducing separation from the existing residential to the east. Residential would also not address the identified demand for PBSA, increasing the likelihood of this demand being met in alternative, less suitable locations.
- 4.29. Whilst a hotel could be accommodated on the 10b Site, this would not address this local and immediate demand for PBSA within the Oxford Road Corridor.
- 4.30. A committee report published by Manchester City Council in December 2020 highlighted issues relating to both the poor quality and high cost of PBSA in comparison to other cities⁵. Recent survey data also indicate that student satisfaction with private student accommodation was lowest in Manchester (82%) in comparison to all other core UK cities surveyed⁶. The Student Need Assessment prepared by Cushman and Wakefield indicated that there were c.26,830 total PBSA bedspaces available to students in Manchester for the 2022/23 academic year. The City wide student to bed ratio stands at 1:91:1 meaning that 24,390 students with a requirement for a bed are currently unable to access one in PBSA Headroom.
- 4.31. As highlighted above, there is a continued and growing demand for high quality, purpose built, city centre student accommodation in Manchester, and the Proposed 10b Development will be located within the Oxford Road Corridor meaning it will be less than a 10 minute walk from two of the largest university campuses in the UK. The location within the Oxford Road Corridor also places it in within walking distance of a variety of services and amenities including retail units, healthcare services and leisure activities.
- 4.32. Vita's plans for Plot 10 will introduce the group's pioneering new student accommodation brand: House of Social. Focused on high-end sharing apartments supported by great social facilities, House of Social caters to a growing demand among students for private rented accommodation in the city centre, relieving the pressures this demand currently puts on the local housing stock.
- 4.33. MMU is fully supportive of the Proposed 10b Development, as set out in their letter of support submitted with this application. The University sets out that there is a shortfall of bedspaces and that First Street is ideally located to meet this need. Furthermore, the University also recognises the market demand for the House of Social product and which

⁵ Manchester City Council Report to Executive – 9 December 2020 - Purpose Built Student Accommodation in Manchester. Available at: <https://democracy.manchester.gov.uk/documents/s21690/Purpose%20Built%20Student%20Accommodation.pdf>

⁶ Knight Frank & UCAS Student Accommodation Survey Report – 2021. Available at: <https://content.knightfrank.com/research/1663/documents/en/knight-frank-ucas-student-accommodation-survey-report-2021-7707.pdf>

will help fit into the University's residential strategy. In addition, the University will have nomination agreements to 15% of the beds (86 beds) in the scheme and which will be priced at an affordable point for students. Manchester Metropolitan University also go on to recognise that Vita have an excellent approach to student wellbeing and pastoral care.

- 4.34. The building on Plot 10b will provide 576 student bedspaces within 4 and 6-bed apartments, supported by a fitness suite, co-study suites and great amenity space. This dedicated and quality, well managed provision will help to draw students out of mainstream residential accommodation, freeing this up for Manchester's residents.
- 4.35. The proposed Purpose Built Student Accommodation (PBSA) will also include a ground floor food hall accessible not only to student residents but also the wider public, providing alternative uses that benefit the wider community and contribute positively to the vibrancy of the neighbourhood.
- 4.36. First Street sits at a key node in the city centre adjacent to the civic quarter and forming part the Oxford Road Corridor. It is a long-standing regeneration priority for the City Council requiring accelerated delivery and integration into the wider Corridor area. It is now an established mixed-use neighbourhood, anchored by its distinctive cultural and leisure offer; large, flexible Grade A offices; and bespoke residential uses.
- 4.37. Despite this success to-date, the latest phases of commercial and residential development at First Street have stalled. First Street needs to evolve its offer to maintain its distinctive offering and respond to market changes and deliver the final phases of development. New proposals for Plots 9 and 10 can reinvigorate the heart of the masterplan to deliver next generation NZC offices, complementary uses and activate the ground floor.
- 4.38. For the reasons above, alternative uses were discounted as the proposed office and student accommodation is the most appropriate in the context of location and responds to identified regeneration priorities and need for economic growth.

Consideration of Alternative Scale and Massing

- 4.39. Different scales and massing options have been considered for the Proposed EIA Development, the aim of which is to maximise the suitable use of the EIA 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.
- 4.40. The EIA Site has been identified within the First Street SDF (2015, 2018, 2020 (addendum)). In drafting the 2018 SDF, 5Plus Architects had evolved the 2015 masterplan to reflect an increase in height and density for Plot 10. Therefore, urban design analysis had been undertaken to determine suitable massing for Plot 10, and it is that buildings of up to 17 storeys on Plots 9a and 10a and 12 storeys on Plots 9b and 10b is considered sustainable and deliverable. The SDF highlights how an increase in scale and density will respond to the emerging spatial context around First Street and create a powerful visual and functional connection between the edge of the City Centre and its core. The approach maintains the focus on the provision of public realm and landscaping of the very highest quality which is so central to the First Street offer.
- 4.41. The original First Street masterplan positioned two blocks parallel to River Street. This allowed one block to positively address River Street and the other to respond to Hulme Street on the opposite side of the EIA Site. By rotating the blocks by 90 degrees has enabled both addresses to front onto River Street. This ensures both Plot 10a & 10b respond positively to John Grigor Square, and free up Hulme Street to act as primarily service access. This orientation has enabled for the creation of new public realm providing strong north – south linkages between First Street North and FSN.
- 4.42. Plot 10 is also located within the 'Southern-Arc': an area of the city centre defined by the parallel relationship of the railway viaduct and the ring road. The Proposed EIA Development has a prominent position within the Southern Arc, being sited in between Great Jackson Street, FSN and Student Castle / Artisan Heights which are prominent towers which contribute significantly to Manchester's skyline. There is a clear opportunity for the Proposed EIA Development to help 'knit together' the built form within the wider area as highlighted above.
- 4.43. Jon Matthews Architects' and Tim Groom Architects' proposed designs for the 13 storey office block and 14 storey PBSA block will contribute to the emerging streetscape in this part of First Street, balancing the much taller buildings recently constructed and under construction at Great Jackson Street to the west, Unite Students Artisan Heights and Bridgewater Heights to the east and First Street Plot 11 to the south.
- 4.44. The scale and massing of the Proposed EIA Development is wholly in line with the development framework which envisions the delivery of medium height office buildings to extend the emerging density at First Street Central.
- 4.45. As stated in Section 3 the scale and massing of the buildings were interrogated in depth during pre-application discussions with MCC and 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. As part of this the Proposed Development for Plot 10b underwent detailed assessment to ensure the massing was appropriate for its context, resulting in a reduced massing from 17 to 14 storeys.

- 4.46. Plot 10a rises to a total of 13 commercial storeys (c. 90.3m AOD / 59.37m AGL) and Plot 10b comprises 14 residential storeys (c. 85.3m AOD / 46.1m AGL). In fact, Plot 10b is smaller than that envisioned in the SDF given that it utilises residential floor-to-floor heights as opposed to commercial heights. In addition, it steps back from the pavement line along Wilmott/River Street to provide in excess of a c. 24m distance between the building and the existing Macintosh Mills – this another key improvement from the indicative massing shown in the SDF which saw the building being developed up to the pavement line.
- 4.47. The Design and Access Statements set 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. Throughout this process the scale and proportion of the volumes, and also the relationship between each volume were assessed and evaluated.

Summary

- 4.48. Where possible, alternative options have been considered throughout the design process. The above has set out why the EIA Site is considered suitable for the Proposed EIA Development.
- 4.49. The above has justified the need for regeneration of this part of the City Centre, demand for strategically located and high quality office space, as well as suitable land for new PBSA required by Manchester's growing student population. It has highlighted how the location provides a major opportunity to make an efficient use of brownfield land, in a highly strategic and accessible location close to the City Centre Core and the Oxford Road Corridor.
- 4.50. The proposed office and student accommodation and food hall are the most appropriate in the context of its strategic location and responds to identified regeneration priorities and need for economic growth for this part of the City Centre and Manchester as a whole. The proposed scale and massing has been designed to follow the endorsed framework and respect its surroundings whilst achieving the most optimum solution for the EIA Site.
- 4.51. The above process has been informed by the First Street SDF and the desire to create a positive relationship with the wider masterplan EIA Site. The Proposed EIA Development has also been influenced by pre-application consultation with key stakeholders including local landowners, residents, businesses, statutory consultees, as well as with MCC. Throughout this design process, environmental constraints and opportunities have been considered from the outset to arrive at the most appropriate solution for the Proposed EIA Development. On this basis, Regulation 18(3) and Paragraph 2 of Schedule 4 of the EIA Regulations has been addressed.

5. Construction Phasing and Methodology

Introduction

- 5.1. This Chapter describes the proposed construction programme and key activities that will be undertaken at Plot 10.
- 5.2. The following appendices are submitted in support of this ES Chapter:
- Appendix 5.1 – Plot 10a Construction Management Plan and TMP
 - Appendix 5.2 – Plot 10b Construction Management Plan
- 5.3. The main aim throughout the construction period is to minimise the impact on the surrounding properties and roadways for the duration of the work. Close collaboration with all project teams of all construction projects will be maintained at all times to achieve this aim.
- 5.4. It is important to acknowledge the two proposal sites and their combined impacts. Separate Construction Management Plan's have been formed for both 10a and 10b as they are to be constructed by separate contractors. These two contractors, and ultimately the client teams, are in close discussion and will work together to ensure minimal impacts on locality.
- 5.5. The following narrative explains this methodology and timescales envisaged at the time of the planning application. More detailed proposals will be developed once contractors are appointed and prior to commencement on-site. This will include preparation of detailed plans to incorporate Construction Management, Construction Phase Health and Safety, Environmental Management as well as Site Waste Management, Logistics and Traffic Management.

Construction Programme

- 5.6. If delivered simultaneously, the total construction programme will span a period of approximately two and a half years within which there will be elements of ground works, foundations, frame construction, façade cladding and internal fit out. The Proposed 10a Development and Proposed 10b Development are anticipated to be delivered in overlapping phases as defined below:
- 10a – 120 weeks
 - 10b – 130 weeks
- 5.7. Both Applicants have construction programmes which see works commencing in 2023, and with a target operational date for Q3 2026. A simultaneous construction period is considered to represent the 'worse case' scenario of the potential environmental impacts arising during the construction phase. These are indicative construction programmes and the Applicants highlight that there are multiple risks involved in the development process. The Applicants note that this programme may ultimately be extended in the event delays caused by sustained periods of poor weather, unexpected ground conditions or other abnormal, volatility in economic and housing markets, political uncertainty, and the availability of funding.
- 5.8. 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 EIA 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.
- 5.10. 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

- 5.11. The following is a brief overview of the methodology to be adopted for the construction and fit out of the Proposed EIA Development. The section also considers general logistics as well as traffic management for the movement of material to the disposal of waste. It has been considered on the basis of both schemes coming forward in tandem, representing a 'worst case' scenario.

Site Logistics

- 5.12. The EIA Site has been cleared previously and was most recently used for public car parking. It is proposed to temporarily close a linear section of road on River Street. This will be a hoarded delivery bay with a gate in and gate out. Traffic will arrive from Willmott Street north (adjoining River Street) and depart onto Hulme Street east. The gates will be manned during working hours.
- 5.13. It is envisaged that the temporary site establishment and welfare space will consist of good quality temporary cabins. The welfare facilities will be suitably sized to suit the anticipated number of operatives. The welfare facilities will be located close to the EIA Site. Separate welfare facilities for each Proposed EIA Development will be utilised.
- 5.14. Material storage will be generally contained within the EIA Site boundary or the welfare facilities, with access through the EIA Site entrance gates for deliveries. When the concrete frame reaches podium level, small low height forklift trucks will be employed to store materials both within the below ground floor car parking provision for the façade construction and fit out elements of the works.
- 5.15. Any temporary public road or footpath closures associated with the construction phase will be agreed with Manchester City Council highways department and relevant diversion signage put in place.
- 5.16. Access to the EIA Site entrances will be controlled by biometric scanner through a secure metal turnstile. This will monitor operative's movements and prevent unauthorised public access to the EIA Site. The main gates will be locked secured at all times with the exception of when a delivery is being made. The gates will be manned by qualified banksmen who will coordinate traffic, bank deliveries as well as ensure the road and pavement areas are kept clean.
- 5.17. Where required, appropriate wheel and vehicle wash facilities will be in place to ensure delivery wagons leave the EIA Site clean and tidy with regular cleaning of Willmott Street using road sweepers.
- 5.18. Loading and unloading of material deliveries will occur within the EIA Site boundary unless exceptional circumstances require special measures to be instigated.
- 5.19. Waste materials will be placed in skips and these will be removed on a regular basis. Food waste from canteens and eating areas will be contained within a smaller covered skip to prevent vermin.
- 5.20. The EIA Site will employ security guards as appropriate to prevent and discourage nuisance. Regular patrols will take place throughout the shift. As an additional measure, CCTV will be installed to elements of the EIA Site to aid early identification of potential issues.

Construction Works

- 5.21. Construction works generally comprise of the following;
- Creation of piling mat substrate and formation for tower crane base.
 - Bearing piles and associated pile caps set out across the expanse of the ground floor slab.
 - Installation of tower crane.
 - Construction of in-situ concrete frame, concrete stair cores and floors to roof level by concrete pump and jump-form construction.
 - Roof coverings.
- 5.22. Specific internal works relating to both buildings;
- Installation of brickwork facade including windows and discrete MVHR grilles.
 - Installation of internal mechanical and electrical systems including main lifts.
 - Fit out of apartments including walls, floors, ceilings, bathrooms, kitchens and final finishes.
 - Fit out of office floorplates, reception spaces and bathrooms.
 - Installation of façade access measures.
 - Completion of internal finishes to communal space.
- 5.23. Finishing works;

- Removal of Tower crane(s).
- Removal of permanent hoardings and temporary gates.
- Completion of public realm and S.278 works
- Phased decant from site leading to the full opening of the development.

Infrastructure Works

5.24. The works generally comprise of the following;

- Drainage connections to a UU main combined drain from River Street.
- Electrical supply incoming of Wilmott Street. Connected into substation
- Mains water will be sourced from the identified supply currently in Wilmott Street.
- Telecoms and data infrastructure proposed to be sourced from Wilmott Street

Traffic Management Plan

5.25. The EIA Site is served primarily from Wilmott Street. It is envisaged that deliveries will arrive via Medlock Street, through River Street and on to Wilmott Street. Traffic will leave via Hulme Street east, through Cambridge Street and onto the Mancunian Way as applicable.

5.26. A full traffic management plan will be developed to address the following issues:

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

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

Deliveries

5.28. Delivery routes for the major materials and items of plant will be as per the section above (item 5.22). The Principal Contractors will endeavour to deliver outside of peak traffic hours to minimise local disruption and the normal workings of the surrounding properties.

Parking

5.29. There will be a limited number of visitor and key staff parking within the compound area. Site personnel will be encouraged to utilise the extensive public transport options available to them. Any personnel who have to attend by car will be asked to avoid parking in residential areas and instead utilise nearby formal carparking areas.

Health and Safety

5.30. The project will be carried out in accordance with the Construction, (Design and Management) Regulations 2015, and all other relevant legislation and guidance.

5.31. The Principal Contractors will produce a Construction Phase Health and Safety Plan each, prior to works on each EIA Site commencing on-site that will be reviewed and signed off by the client and their Principal Designer. This document will form the basis of the procedure for managing health and safety during the construction phase and will be periodically reviewed as the work progresses.

Construction Materials

- 5.32. The materials selected at this stage of the design process do not generate a risk to construction personnel using the appropriate PPE and following manufacturers guidance.

Site Security and Safety

- 5.33. Protecting the public from risks to their health and safety arising from the construction work is a high priority. Every care will be exercised to prevent risk to members of the public and appropriate action, including dust & noise control & the erection of perimeter fencing to a specified standard, will be taken.
- 5.34. Vandalism and theft of plant, equipment, materials and fuel is possible throughout the duration of the development. The Principal Contractor will take appropriate action, as described in previous sections, to ensure the EIA Site is secure at all times from unauthorised access. As described previously, the EIA Site will have metal turnstile access system controlled by an individual proximity fob system. In the event of a lost or stolen data the system can be updated to prevent fraudulent use.
- 5.35. The provision of CCTV would be considered if required to main site points and compound areas to assist in the prevention of unauthorised activities.

Environmental Management

- 5.36. An Environmental Plan will be developed to address and monitor the following issues:

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

Environmental Legislation

- 5.37. Applicable environmental legislation will be identified in a register, to ensure that appropriate systems are put in place in order to comply with the legal requirements in question.

Pollution

- 5.38. The Principal Contractor will establish procedures, to ensure the prevention of water and ground pollution, relating to the following risk activities:
- De-watering of the EIA Site (if required).
 - Soil contamination remediation.
 - Earthworks (including piling, spoil movement and removal, and movement of contaminated soils).
 - Concrete works (including washing out of concrete delivery vehicles and pumps).
 - Storage and movement of fuels, oils, chemicals and other such fluids.
 - Cleaning (including plant, machinery and wheel washing).

Nuisance (Noise, Vibration and Dust)

Noise and Vibration

- 5.39. The principal concerns relating to the nuisances of noise and vibration come from construction activities such as demolition, excavation, cutting, breaking out and plant movements. Mitigation measures will be considered to include low noise options, noise attenuation techniques and carrying out certain activities during agreed hours of the day.
- 5.40. In order to minimise the noise, the Principal Contractors will provide the following:
- Any compressors brought on to the EIA Site to be silenced or sound reduced models fitted with acoustic enclosures;
 - All pneumatic tools to be fitted with silencers or mufflers where available;
 - Care to be taken when erecting or striking scaffolds to avoid impact noise from banging steel. All operatives undertaking such activities to be instructed on the importance of handling the scaffolds to reduce noise to a minimum;
 - The majority of deliveries to be programmed to arrive during normal working hours only. Care to be taken when unloading vehicles to minimise noise. Delivery vehicles to be routed so as to minimise disturbance to

local residents. Delivery vehicles to be prohibited from waiting within or in the vicinity of the EIA Site with their engines running;

- All plant items to be properly maintained and operated according to manufacturers' recommendations in such a manner as to avoid causing excessive noise;
- Where possible, all plant to be sited so that the noise impact at nearby noise sensitive properties is minimised;
- Local hoarding, screens or barriers to be erected as necessary to shield particularly noisy activities; and,
- Problems concerning noise from construction works can often be avoided by taking a considerate and neighbourly approach to relations with the local residents. Where possible, works should only take place during given periods, e.g. during normal construction hours and not at night.

5.41. In order to minimise vibration, the Principal Contractors will provide the following;

- Adoption of low vibration working methods. Consideration should be given to use of the most suitable plant;
- Where processes could potentially give rise to significant levels of vibration, on - site vibration levels should be monitored regularly by a suitably qualified person;
- Where piling is to take place, any obstructions should first be removed;
- The provision of cut-off trenches in order to interrupt the direct transmission path of vibrations; and,
- Application of piling techniques aimed at reducing resistance to penetration e.g. pre-boring for driven piles and adding water to the hole for impact bored piles.

Dust

5.42. The principle concerns relating to air quality and emissions from construction activities are in the form of dust and fumes. The degree of dust deposition is usually dependant on the nature of the works. Increased levels of dust are most likely to occur during EIA Site activities related to demolition (of which there are none planned on-site) piling, moving construction traffic and ground works.

5.43. In order to minimise the dust and fumes, the Principal Contractor will provide the following:

- Providing a hard surface where vehicle movements occur;
- Control measures and dust suppression techniques;
- Minimising stock piling and positioning in a manner that reduces risk of dust arising through wind action;
- Measures such as screening and covering;
- Installation of appropriate wheel and body wash facilities;
- Keeping of adjacent roads and pavements clean;
- Ensure plant is turned off and not left running when not in use; and,
- Selection of electrically powered plant where possible in lieu of diesel or petrol plant

5.44. Best practice mitigation measures are to be implemented during the construction phase of the development via the Construction Management Plan (CMP). It is anticipated that the generation of dust and harmful pollutants emissions from construction site activities will be reduced with the correct implementation of these measures. A Dust Management Plan will form part of the CMP to ensure that all recommended mitigation measures will be implemented properly.

Public Relations

5.45. The Principal Contractors will ensure that regular contact is made with local residents and community groups to ensure they are kept up to date with general progress on the EIA Site. This is especially important for major work elements such as piling and tower crane erection due to our close proximity to adjacent buildings. The Principal Contractor display a contact number on hoardings which will be operational 24/7.

Waste Management Strategy

5.46. In line 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

- 5.47. Waste generated during the construction phase is to be cleared on a daily basis to a main holding skip. Each floor plate will have a designated waste area that will see bins located within it that can be emptied at the end of each shift. During high waste activities, such as dry lining, this waste removal may need to occur several times a day via the hoists and as such general operatives will be employed to ensure this will occur. Hazardous waste will be stored and disposed of separately but main waste will enter a common skip where our supplier will sort at their transfer station before issuing us recycling percentages and data.
- 5.48. To reduce the volume of waste sent to landfill, waste from EIA Site will be segregated at the waste transfer station into the following categories.
- CAT A: Hazardous waste – Paint tins, mastic etc
 - CAT B: Metal
 - CAT C: Timber
 - CAT D: Plasterboard
 - CAT E: General Waste
- 5.49. All carriers of waste will hold a valid waste transfer licence and provide certification to the main contractor for all elements of the process.

Summary

- 5.50. 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 standards of the Regulations and associated guidance.
- 5.51. Every stage of the project will be pre risk assessed and appropriate controls applied, subcontractors will be pre vetted and will be subject to extensive pre contract requirements of information transfer and risk assessment.
- 5.52. A fundamental aspect of the Principal Contractor's role is the development of a Construction 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.
- 5.53. The Construction Management 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 and which will ensure the Health and Safety of all those working on or affected by the project works.
- 5.54. The Principal Contractors will have an on-going process of monitoring health and safety standards throughout its organisation. This is normally done directly (on-site) by the site management team through regular inspections, toolbox talks etc. and also via the risk assessment process both during the completion of risk assessments and then by monitoring the effectiveness of risk control measures, which have been implemented. 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.
- 5.55. Health and safety is also incorporated as a fundamental aspect of the overall project review. The Applicants will appoint Principal Contractors that can demonstrate competency in the management and execution of Health and Safety. The Principal Contractors will work closely with the Principal Designers at this early stage of the project and will influence the detailed design to remove construction and residual safety risks.
- 5.56. At the earliest opportunity (prior to commencement of construction operations), the Principal Contractors will enter into dialogue with all relevant parties, including neighbours to ensure there is effective coordination throughout all stages of the build.

6. Air Quality

Introduction

- 6.1. This Chapter of the ES has been prepared by Cundall and assesses the likely air quality impacts of the proposals upon the EIA 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.
- 6.2. This Chapter is accompanied by a technical appendix, Air Quality Appendix 6.1, which provides further detail on the methodology for the dispersion modelling, results of dispersion modelling and the construction dust assessment methodology and findings. Air Quality 6.2 includes this Chapter's relevant figures.
- 6.3. The lead authors of the chapter are qualified to MSc level, professionally chartered, and are Members of the Institute of Air Quality Management (MIAQM) with experience in preparing several ES Chapters for EIA developments.

Assumptions and Limitations

- 6.4. In undertaking the Air Quality assessment, there are a number of limitations and constraints affecting the outputs from this work. These include:

Dispersion Modelling – General

- 6.5. No terrain data have been included within the model. Topographical features such as hills can have a significant effect on the dispersion of pollutants, generally when the ground level within 1 km of the sources varies by more than 100m (1 in 10). A review of the local area indicated difference in height of <100m. The use of terrain data was therefore excluded from further consideration within the assessment.

Model Verification

- 6.6. The local air quality impacts were assessed based on the results from atmospheric dispersion modelling. A series of assumptions have been made in relation to the dispersion modelling used to predict impacts from the Proposed EIA Development. These have been outlined in the impact assessment methodology outlined in Appendix 6.
- 6.7. The uncertainty in the predictions for the current baseline was reduced by carrying out model verification and adjustment of results to align with measured concentrations. This process is summarised in Appendix 6.

Future Year Emission Factors

- 6.8. A greater level of uncertainty is associated with predictions for future years than for the base year, with greater uncertainty the further into the future the predictions are made. Sensitivity testing has therefore been undertaken with modelling using both the base year and future year EFT v11.0 factors produced by Defra.
- 6.9. Results are presented for 2 different scenarios in Appendix 6.1:
- 2023 background with 2027 traffic flows and 2022 emission factors (worst case)
 - 2023 background with 2027 traffic flows factored and 2027 emission factors (best case)
- 6.10. Interpretation of results was made using worst-case data.

Construction Details

- 6.11. Assumptions relating to quantities for demolition, earthworks and construction are based on the design details provided by John Matthews Architects and Tim Groom Architects.

Energy Design

- 6.12. Heating, cooling and hot water provision for the buildings is assumed to be provided by air source heat pumps (ASHPs) powered by electricity.

- 6.13. There will be a requirement for back-up diesel generators (life safety and tenant). Generator flues will be located at roof level and operating less than 50 hours per year, based on required maintenance testing. There is assumed to be 6m separation screen between the flues and the roof top community terrace with flues emitting just above this level. Based on the size, minimum operation hours and proposed location of the generators, they are not expected to have a significant impact on local air quality.

Legislative and Policy Context, Guidance

Legislation

- 6.14. The air quality assessment will consider key air quality legislation, which is summarised in Table 6-1.

Table 6-1: Legislation relevant to Air Quality

Legislation	Description
EU Ambient Air Quality Directive 2008/50/EC	Establishes the requirements of Member States in terms of improvements required to air quality. Sets standards for a variety of pollutants for human-health and the environment.
The Air Quality Standards Regulations 2010	Transposes formalised EU Limit Values set out in directive 2008/50/EC to UK law. An Amendment was published in 2016
The Clean Air Quality Strategy 2019	Defra published a Clean Air Strategy in January 2019, setting out a wide range of actions for UK Government to reduce pollutant emissions and improve air quality. The actions are grouped into four main emission sources: Transport, Domestic, Farming and Industry. The Clean Air Strategy sets out the case for action and demonstrates the government's determination to improve air quality. In some cases, the goals are even more ambitious than EU requirements to reduce people's exposure to toxic pollutants like nitrogen oxides, ammonia, particulate matter, non-methane volatile organic compounds and sulphur dioxide.
Environment Act 1995, Part IV, amended by the Environment Act 2021	Defines the requirements for Local Air Quality Management (LAQM).
Environment Protection Act 1990, amended by the Pollution Prevention and Control Act 1999 and the Environment Act 2021	Part III provides statutory nuisance provisions for nuisance dust. Nuisance complaints about dust would need to be investigated by the Local Authority. In practice, dust deposition is generally managed appropriately by suitable on-site practices and mitigation, avoiding the determination of statutory nuisance and/or prosecution or enforcement notices.
The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018	Developers and contractors are required to meet compliance with the emission standards for Non-Road Mobile Machinery (NRMM). The Regulations exercise of the powers conferred by section 2(2) of, and paragraph 1A of Schedule 2 to, the European Communities Act 1972 in relation to the type, description, construction or equipment of vehicles.
Environment Act, 2021	The Act makes provision about targets, plans and policies with the focus of improving the natural environment. This includes air quality, as well as water, nature and biodiversity, regulation of chemicals, waste and resource efficiency and recall of products failing to meet environmental standards. The Act introduces a duty on government to bring forward at least two air quality targets by October 2022 for consultation. These are to be to reduce the annual average level of fine particulate matter (PM^{2.5}) and to set a long-term (minimum of 15 year) target for its reduction. The 2021 Act amends the Environment Act 1995 Part IV by seeking to strength local air quality a management (LAQM) through greater cooperation at local level and broadening the range of organisations that play a role in improving air quality. Responsibility for tackling air pollution is to be shared between designated local authorities, all tiers of local government and neighbouring authorities. The environment secretary will be required to review the Air Quality Strategy at least every five years and publish annual progress reports to parliament.

Legislation	Description
	The 2021 Act amends the Clean Air Act 1993 to give local authorities more power to reduce pollution in smoke control areas by replacing the criminal offence of emitting smoke from a chimney in a smoke control area with a civil penalty regime, seeking to enable simpler, quicker and more proportionate enforcement at local level. It also amends the Environmental Protection Act 1990 by extending the system of statutory nuisance to private dwellings in smoke control areas, which could result in abatement notice and issuing fines for criminal offence of breaches. The 2021 Act introduces new powers for the government to compel vehicle manufacturers to recall vehicles and non-road machinery that fails to meet legal binding standards.

- 6.15. The UK Air Quality Objectives (AQOs) which apply to this assessment are shown in Table 6-2. Some pollutants have long-term (annual mean) objectives due to the chronic way they affect human-health, or the natural environment and others have short-term (1-hour, 24-hour mean) objectives due to the acute way they affect human health of the natural environment.
- 6.16. Previous research carried out on behalf of Defra identified that exceedances of the NO₂ 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m³. This assumption is still considered valid; therefore, Defra's Technical Guidance document, LAQM.TG(22) confirms that this figure can be referenced where 1-hour mean monitoring data are not available (typically if monitoring NO₂ using passive diffusion tubes).

Table 6-2: UK Air Quality Objectives (AQOs)

Pollutant	Averaging Period	Objective Threshold (µg/m ³)
Nitrogen Dioxide (NO ₂)	Annual mean	40
	1-hour mean	200 Not to be exceeded more than 18 times per year (equivalent to the 99.79th percentile of 1-hour mean values)
Particulate Matter (PM ₁₀)	Annual mean	40
	24-hour mean	50 Not to be exceeded more than 35 times per year (equivalent to the 90.4th percentile of 24-hour mean values)
Particulate Matter (PM _{2.5})	Annual mean	20

- 6.17. Dust is the generic term to describe particulate matter in the size range 1–75µm in diameter, as defined in British Standard document BS 6069 (Part Two). Dust nuisance is the result of the perception of the soiling of surfaces by excessive rates of dust deposition. Under provisions in the Environmental Protection Act 1990, dust nuisance is defined as a statutory nuisance.
- 6.18. There are currently no standards or guidelines for dust nuisance in the UK. Complaints about excessive dust deposition would have to be investigated by the local authority and any complaint upheld for a statutory nuisance to occur. In practice, dust deposition is generally managed effectively by the use of suitable on-site practices and mitigation during activities with the potential to generate dust, such as demolition and construction activities.

National Planning Policy

- 6.19. Consideration of the strategic location and design of new developments is of key importance in the land-use planning process and can provide a means of improving air quality. Air quality considerations as part of development applications may become material in determining planning applications. Relevant planning policy and guidance at the National Level is summarised in Table 6-3.

6.20.

Table 6-3: Key Policy and Guidance

Policy/Guidance	Description
National Policy and Guidance	
Ministry of Housing, Communities & Local Government – National Planning Policy Framework (NPPF) (2021)	The National Planning Policy (NPPF) published March 2012 and last updated in July 2021 with the purpose of planning achieving sustainable development. Paragraph 186 of the NPPF states that: <i>“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 AQMAs 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”.</i> In addition, paragraph 105 states that: <i>“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.”</i> Paragraph 174 discusses how planning policies and decisions should contribute to and enhance the natural and local environment. Of relevance to air quality, NPPF notes that this can be achieved by: <i>“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”</i>
Planning Policy Guidance (updated 2019)	Planning Practice Guidance (PPG) documents have been published as part of the NPPF. PPG relating to air quality was last updated in November 2019. It provides guidance on the significance of air quality in determining the local impact of proposed developments and highlights the importance of local and neighbourhood plans with regard to air quality. A flowchart is provided to assist local authorities in determining how air quality considerations might fit into development management processes.
UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations. Detailed Plan. Defra / Department of Transport (DfT) (2017)	This plan was produced in response to a UK Supreme Court Ruling and sets out how the UK will achieve compliance with EU Limit Values for nitrogen dioxide (NO₂) in the shortest possible time. The plan outlined infrastructure initiatives and grants and the requirements for Local Authorities to produce local action plans, with the aim of reducing NO₂ concentrations below the objective as soon as practically possible.

Sub-Regional Planning Policy

6.21. Relevant planning policy and guidance at the sub-regional (Greater Manchester) is summarised in Table 6-4.

Table 6-4: Sub-Regional Policy and Guidance

Policy/Guidance	Description
Local Policy and Guidance	
Greater Manchester's Clean Air Plan	Eight Greater Manchester authorities were identified by the Government as having roads which are expected to continue to exceed the maximum legal limits of NO₂ in 2021. They were directed by Government to undertake feasibility studies to identify measures for reducing NO₂ concentrations to compliant levels in the 'shortest possible time'. These studies must produce a series of business cases for assessing and implementing the relevant measures to address the problem.

Policy/Guidance	Description
	The 10 Greater Manchester local authorities, Greater Manchester Combined Authority (GMCA) and Transport for Greater Manchester (TfGM) have worked together to develop a Clean Air Plan to tackle nitrogen dioxide (NO₂) exceedances at the roadside, known as GM CAP. Central Government agreed that the Greater Manchester charging Clean Air Zone would not go ahead on 30 May 2022. The original Greater Manchester CAP was designed to comply with a legal direction from government issued before the coronavirus pandemic. Since then, there have been significant changes in the market for vehicles compliant with Clean Air Zone standards, particularly vans, and the cost of living has increased. Greater Manchester local authorities have now submitted the case for a new investment-led Greater Manchester CAP, with no charging Clean Air Zone, to government. A response is expected from government after the new Prime Minister is in place in September 2022. While Greater Manchester waits for feedback from government, participatory policy development will take place with key stakeholders to develop and shape the new CAP Policy, including proposals for funding support. A public consultation on the new CAP will then take place in early 2023, subject to government feedback.
Greater Manchester Air Quality Action Plan 2016-2021 (AQAP)	The AQAP identifies a range of actions to reduce emissions and mitigate the impacts on air quality. Some Key actions regards development and transportation are: ▪ Actions for managing new development: ▪ Construction Management Guidance – where a key priority area is affected by a proposed scheme, a high level of mitigation control will be requested. ▪ Development Planning Guidance - to ensure that potential local air quality effects are not overlooked and is not intended to introduce a burden on developers or local authorities to undertake unnecessary work. ▪ Cumulative Development Database - A centralised database of significant planning applications and air quality assessments will be managed by Transport for Greater Manchester (TfGM), as a record of the cumulative effects of multiple developments and thereby facilitate combined approaches to minimising emissions. ▪ Clean Air Zone – TfGM will undertake an appraisal of the effects of charging Clean Air Zones (CAZ) ▪ 20mph Zones - The implementation of 20mph zones in urban areas has been cited as having the potential to benefit local air quality through smoother vehicle flow through junctions and reduced acceleration and braking, as well as having potential for additional benefits from encouraging modal shift from driving to walking or cycling ▪ Encouraging Travel Planning - Individuals and companies are encouraged to look at travel planning measures, and to investigate the potential of additional demand management measures to affect a significant mode shift and to stimulate the uptake of low-emission vehicles ▪ Taxi and Private Hire Quality Controls to Priorities Low-Emission Vehicles Green Infrastructure - The provision of green infrastructure in and around urban areas is now widely recognised as contributing towards creating places where people want to live and work.
Greater Manchester Low-Emission Strategy (2016)	The Low-Emission Strategy sets out a framework for policies and measures to: ▪ Reduce air pollution as a contributor to ill-health in Greater Manchester ▪ Support the UK government in meeting EU air quality thresholds Contribute to a reduction in Greater Manchester's carbon footprint; and encourage low-emission behaviours in the culture and lifestyles of the city region.
Greater Manchester Planning Guidance on Air Quality	Greater Manchester Combined Authority (GMCA) have adopted the most recent IAQM guidance on the assessment and control of dust from demolition and construction sites, and also for air quality considerations in land-use planning and development control. Applicants, developers and consultants are advised to read the IAQM guidance prior to submitting a planning application.
Greater Manchester's Plan for Homes, Jobs and the Environment, - Draft for Approval (2020)	The plan was prepared on behalf of the 10 Greater Manchester local authorities and looks ahead to the period 2020 to 2037. The plan • sets out how Greater Manchester should develop up until 2037 • identifies the amount of new development that will come forward across the 10 districts, in terms of housing, offices, and industry and warehousing, and the main areas in which this will be focused

Policy/Guidance	Description
	- supports the delivery of key infrastructure, such as transport and utilities - protects the important environmental assets across the city region allocates sites for employment and housing outside of the existing urban area; and defines a new green belt boundary for Greater Manchester
Greater Manchester Places for Everyone Joint Plan	Following an announcement in December 2020, nine Greater Manchester councils (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) will discuss proposals to work together on a joint development plan. The Places for Everyone would underpin Greater Manchester's ambitious plans for sustainable and inclusive growth, building on evidence already collected. The nine councils will continue to work closely with Stockport Council, who decided in 2020 to withdraw from the Greater Manchester Spatial Framework.

Local Planning Policy

6.22. Relevant planning policy and guidance at the Local level is summarised in Table 6-5.

Table 6-5: Local Policy and Guidance

Policy/Guidance	Description
The Manchester Core Strategy 2012-2027	The strategy aims to improve air quality and detailed in Policy EN 16: <i>"The Council will seek to improve the air quality within Manchester, and particularly within AQMAs, 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 CHP, and biomass plant.</i> <i>When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. These includes cumulative impacts, particularly in AQMAs."</i>

Guidance

6.23. Table 6-6 lists other relevant guidance which will be referred to and followed as part of the Air Quality Assessment of the Proposed EIA Development.

Table 6-6: Other Relevant Policy and Guidance

Policy/Guidance	Description
Defra Local Air Quality Management (LAQM) Policy Guidance (2022) and Technical Guidance (2022)	The guidance issued under Part IV of the Environment Act 1995 is designed to help local authorities with their LAQM duties. The guidance sets out the general approach to use and detailed technical guidance to guide local authorities through the Review and Assessment process.
EPUK/IAQM Land Use Planning & Development Control (2017)	This guidance has been produced to ensure that air quality is adequately considered in the land use planning and development control processes by relevant officers within local authorities, developers, and consultants involved in the preparation of development proposals and planning applications. This document is best practice guidance and has no formal or legal status.
IAQM Assessment of Dust from Demolition and Construction (2016)	The document provides guidance for developers, their consultants and environmental health practitioners on how to undertake a construction impact assessment (including demolition and earthworks). The guidance provides a method for assigning a magnitude of risk (high, medium or low) and identifies appropriate mitigation measures.
Covid-19: Supplementary Guidance, Local Air Quality Management Reporting in 2021	The guidance had been informed by responses from an impact survey received following the release of the interim statement on Covid-19 impacts to the LAQM regime. The guidance is to be read in conjunction with LAQM.TG22

Assessment Methodology and Significance Criteria

Scenarios Tested

- 6.24. The proposed EIA scenarios are:
- Baseline (factored to 2019 to enable model verification with 2019 monitoring data)
 - Future 2027 baseline (scenario without the development in place (Do Minimum))
 - Future 2027 baseline + Proposed EIA Development (including proposals for Plot 10a and Plot 10b) (scenario with the development in place (Do Something)).
- 6.25. The future baseline scenarios will include committed developments in the area, to enable assessment of the cumulative impact. The Proposed EIA Development assessment scenario listed above will be compared against the future baseline, which will include traffic flows from committed developments in the area.
- 6.26. The Transport Planners (Vectos) have advised that Manchester City Council assume no growth in the city centre and that historically traffic has been falling. Vectos have therefore indicated that no growth factors need to be applied to the 2027 future flows.
- 6.27. The future scenarios have been modelled at worst case and best-case assumptions. Worst case assumes no improvement in vehicle emission from current year (2023) and best case uses predicted lower emissions for 2027, which are anticipated as a result of improvement in the vehicle fleet. In both worst- and best-case scenarios backgrounds have been retained at 2023 levels as a result of assuming no improvement in background concentrations by 2027.
- 6.28. The results of the future baseline + Proposed EIA Development scenario will be used to inform an exposure assessment for the proposed on-site receptors. The Do Nothing and Do Something scenarios will be compared to inform an assessment of change in emissions associated with nearby existing receptors.
- 6.29. The approach taken in the preparation of this ES Chapter differs slightly from that advocated with the scoping report in that the Do something Scenario has evaluated the combined impacts associated with the development of both Plot 10a and 10b. This is considered to be a robust and worst-case approach, which covers all eventualities, including the development of Plot 10a or 10b in isolation from the other, or the development of both plots together.
- 6.30. The methodology for the dispersion modelling is detailed further in Appendix 6.

The Study Area

- 6.31. The Proposed EIA Development falls within the jurisdiction of Manchester City Council. The main air pollution sources affecting the Proposed EIA Development and surrounding sensitive receptors are:
- Road traffic on Medlock Street to the west of the EIA Site
 - Road traffic on section of the A57(M) Mancunian Way to the south of the EIA Site
 - Road traffic on River Street to the north and east of the EIA Site
- 6.32. Detailed dispersion modelling of NO_x, PM₁₀ and PM_{2.5} emissions from operational traffic has been carried out to assess human exposure at the Proposed EIA Development and existing receptors close to the modelled road network. Receptors will be selected at worst-case locations such as close to junctions and closest to the road as well as locations on the Proposed EIA Development facade. The modelled receptors are listed in Appendix 6, as the change in AADT at the nearest road link is less than 100, it is concluded that there would not be a significant impact on Macintosh Village and therefore are excluded.
- 6.33. Additionally, the construction dust assessment includes all other sensitive receptors within a 350m boundary, which may be impacted by construction dust emissions, and within 50m of the routes anticipated to be used by demolition and construction vehicles up to 500m from the EIA Site entrance(s). Receptors in the area are likely to include residential dwellings and schools (high sensitivity receptors) as well as offices, shops and community centres (medium sensitivity receptors).

Existing Conditions

- 6.34. Existing ambient air quality conditions relates to relevant pollution that is already present in the environment from various sources such as industrial processes, commercial and domestic activities, road traffic emissions and natural resources.
- 6.35. Existing sources of emissions within the study area (2km) have been defined using several approaches, as follows:

- Industrial and waste management sources that may affect the area have been identified using the Environment Agency's Pollution Inventory Data.
- Local sources have also been reviewed through examination of the latest Annual Status Report (ASR) for Greater Manchester Combined Authority.
- Background concentrations have been defined using the national pollution maps published by Defra. These cover the whole country on a 1x1 km grid.

Source of Effect

Construction Phase

Construction Dust

- 6.36. There are a number of likely significant air quality related environmental impacts, which will be fully assessed at sensitive receptors. These primarily relate to the impact of air quality and dust on existing residential and commercial receptors in the locality of the EIA Site at both Construction and Operational phases, as well as impacts on future occupants of the Proposed EIA Development itself.
- 6.37. The demolition and construction work associated with the development have the potential to generate dust, giving rise to impacts on dust soiling and human-health, especially through the generation of PM₁₀. The generation of dust on-site has the potential to cause adverse air quality impacts where there are human receptors within 350m and ecological receptors within 50m of construction works. A Construction Dust Assessment has therefore been scoped in.
- 6.38. An assessment of ecological receptors has been scoped out of the construction dust assessment, as there are no sensitive ecological receptors within 50m of the Proposed EIA Development.
- 6.39. Best practice mitigation controls have been identified in accordance with IAQM guidance and are listed in Appendix 6.

Construction Traffic

- 6.40. Construction traffic accessing the EIA Site during the demolition and construction period will result in a temporary increase in vehicles on the local road network. This will result in increased vehicle emissions, and the potential for trackout of dust generated from construction activities. Screening of construction traffic data to determine the need for detailed assessment has therefore been scoped in.
- 6.41. Construction traffic data predictions will be screened in accordance with EPUK/IAQM criteria. The construction traffic assessment will consider sensitive receptors within 200m of the assumed construction traffic routes on the local road network. As the Proposed EIA Development is located close to an AQMA, where predicted changes in traffic meet the following Environmental Protection UK (EPUK)/ IAQM's criteria applicable for inside of an AQMA:
- a change of Light Duty Vehicle (LDV) flows of more than 100 Annual Average Daily Traffic (AADT), or
 - a change of Heavy-Duty Vehicle (HDV) flows of more than 25 AADT.
- 6.42. Vectos have advised that a prediction of construction traffic flows is difficult to determine as it varies between different contractors and also due to the nature and timescales of construction and would be subject to a construction logistics plan prepared by a contractor. Based on similar projects, Vectos have predicted that during the busiest period maximum daily HGVS associated with the construction works may be as high as 100 a day. This is associated with the construction pour which would typically only happen every 4 days. Averaging out the construction vehicles during the entire construction period, the AADT daily traffic would be a lot lower, with HGVs anticipated to be <50 AADT and potentially also <25 AADT. This could be confirmed once the construction logistics plan is available across both Plots.
- 6.43. Vectos has also advised that any contractor staff parking would be off-site in a city centre car parks and staff may also arrive by non-car modes. It is therefore expected that LDV vehicles associated with the construction period would be <100 AADT.
- 6.44. An assessment of non-road mobile machinery (NRMM) has been scoped out of the assessment, as it assumed that machinery will be selected to conform to the regulatory requirements outlined in the Department for Transport document on reducing emissions from NRMM.

Operation Phase

On-site Combustion Plant

- 6.45. Any on-site combustion plant such as boilers and combined heat and power (CHP) has the potential to impact air quality receptors both on and off-site. Emissions from combustion plant would include NO₂ and possibly also PM₁₀ and PM_{2.5} if diesel is used as a source.
- 6.46. Typically, any combustion plant where the NO_x emission rate is less than 5 mg per sec (mg/s) is unlikely to give rise to significant effects on air quality, provided that the emissions are released from a vent or a stack in a location and at a height that provides adequate dispersion. The inclusion of any centralised gas fired energy plant and/or diesel generators has been considered, in accordance with criteria listed in EPUK/IAQM guidance.
- 6.47. Heating, cooling and hot water provision for the buildings will be provided by air source heat pumps (ASHPs) powered by electricity. On this basis, an assessment of emissions associated with the operational energy strategy is not considered necessary.
- 6.48. There will be a requirement for back-up diesel generators (life safety and tenant). Generator flues will be located at roof level and operating less than 50 hours per year, based on required maintenance testing. Based on the current design, the location of the generator flues and roof top community terrace are >10m horizontal distance. There will also be a 6m separation screen with flues emitting just above this level. Based on the size, minimum operation hours and proposed location of the generators, they are not expected to have a significant impact on local air quality. Further consideration of the generator emissions has therefore been scoped out. Once final design information is available, details of the proposed plant, operating hours and flue locations could be confirmed as part of a planning conditions.

Operational Traffic Emissions

- 6.49. During operation, the Proposed EIA Development has the potential to affect local air quality as a result of traffic exhaust emissions, such as NO₂ and PM₁₀, associated with vehicles travelling to and from the Proposed EIA Development.
- 6.50. Traffic data will be obtained from the Transport Consultant in 24-hour AADT format with the calculated percentage of HDVs and average speed data (kph). The traffic data used in the modelling is discussed further and listed in Appendix 6.

Human Exposure

- 6.51. Potential exposure of future occupants of the EIA Site was considered in accordance with the Defra Technical Guidance and EPUK/IAQM Planning Guidance. This assessment evaluated the exposure that future occupants or visitors might experience associated with existing baseline conditions, considering the following:
- The background and future baseline air quality, and whether this will be likely to approach, or exceed, the threshold values set by the air quality objectives
 - The presence and location of air quality focus areas as an indicator of local hotspots where the air quality objective thresholds may be exceeded
 - The presence of any heavily trafficked roads, with emissions that could give rise to significantly higher concentrations of pollutants (e.g., NO₂), that would cause unacceptably high exposure for users of the new development; and
 - The presence of non-road transport sources that may be significant, such as nearby airports, railway lines with high traffic usage of diesel locomotives or coal-fired steam locomotive railway lines.
- 6.52. The current/baseline conditions were established qualitatively by reviewing relevant air quality information that is readily available from the Local Authority, including Review and Assessment Reports and historic monitoring data. These data were used to understand current/baseline pollutant concentrations at receptors within the study area, and the risk that any changes in air quality may cause exceedance of AQOs at these locations.
- 6.53. Detailed dispersion modelling has been used to undertake an assessment of human exposure at the Proposed EIA Development and to assess the impact of increases in traffic emissions on nearby existing receptors. Using the traffic data, the latest vehicle emission factors released by Defra have been used to calculate road-traffic emissions. The assessment focuses on concentrations of NO₂, PM₁₀ and PM_{2.5} for which air quality objectives are set in legislation. The inputs required for the modelling are outlined in the Air Quality Appendix 6.
- 6.54. The EPUK/IAQM land-use planning guidance incorporates the latest position of the Institute of Air Quality Management (IAQM) on effect significance and provides an approach to determining the significance of likely effects resulting from the Proposed EIA Development on local air quality. The guidance also provides advice on how to describe the significance of the effects predicted from air quality modelling.

- 6.55. All receptors included in the assessment are considered to be of high sensitivity. The predicted concentrations have been compared to national air quality objectives for NO₂, PM₁₀ and PM_{2.5}. Where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or proposed occupants is judged as significant, unless provisions is made to reduce their exposure by some means. Changes of less than 0.5%, will be described as Negligible. For the existing receptors, the impact magnitude associated with increase in traffic emission associated with the Proposed EIA Development are established in accordance with the Impact Descriptors criteria shown in the EPUK and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality'. These are outlined in Table 6-7.

Table 6- 7: Air Quality Environmental Impacts

Long-term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight/Minor*	Moderate
76 – 94% of AQAL	Negligible	Slight/Minor*	Moderate	Moderate
95 – 102% of AQAL	Slight/Minor*	Moderate	Moderate	Major/ Substantial*
103 – 109% of AQAL	Moderate	Moderate	Major/ Substantial*	Major/ Substantial*
110% or more of AQAL	Moderate	Major/ Substantial*	Major/ Substantial*	Major/ Substantial*
75% or less of AQAL	Negligible	Negligible	Slight/Minor*	Moderate
* listed as slight and substantial in IAQM guidance have been relabelled here as Slight/Minor and Major/Substantial, to align with wider ES assessment methodology				

Baseline Conditions

- 6.56. To assess the significance of any new development proposal (in terms of air quality), it is necessary to identify and understand the baseline air quality conditions in and around the study area. This provides a reference against which any potential changes in air quality can be assessed. Since air quality is predicted to change in the future (mainly because of changes to vehicle emissions), the baseline situation is extrapolated forward to the opening year. The future baseline scenario is the predicted baseline for the opening year.
- 6.57. To identify the existing air quality conditions, a review of publicly available information has been undertaken, including the latest local authority air quality reports, monitoring data, and background concentration maps. This section presents the results of the review.

Local Sources of Pollution

- 6.58. Industrial air pollution sources are regulated through operating permits or authorisations, which list stringent emission requirements. Regulated industrial process are classified as either Part A or Part B processes and are regulated through the Pollution Prevention and Control (PPC) system which has been transposed into National legislation. The larger, more polluting, Part A processes are regulated by the Environment Agency for emissions to air, water and land. The smaller, less polluting processes are regulated by the local authority for emission to air.
- 6.59. A review of the Environment Agency Pollutant Inventory for 2020 indicated that there is one Part A permit site, operated by Heineken UK Ltd, located 1.3km South of the Proposed EIA Development and is regulated for emissions to air and waste transfer. The location of this site in relation to the Proposed EIA Development is shown in Figure 6-1.
- 6.60. The Part B processes are regulated and reviewed by the Local Authorities and given the nature of these processes, are unlikely to significantly affect ambient air quality in the vicinity of the Proposed EIA Development. The Part B processes within 2km of the Proposed EIA Development are shown in Figure 6-2. The nearest sites to the Proposed EIA Development are Johnsons Dry Cleaners UK Ltd, approximately 0.9km to the north and Asda supermarket, approximately 1.0km to the south.
- 6.61. Any emissions from these installations are assumed to be represented in the Defra background concentrations.
- 6.62. The most recent 2021 ASR also confirmed that there were no new industrial and other sources identified.

Local Air Quality Management

- 6.63. The Environment Act 1995 requires local authorities to review and assess air quality with respect to the objectives for seven pollutants specified in the National Air Quality Strategy. Local authorities are required to carry out an assessment and provide an Annual Status Report (ASR) of their area every year. If the ASR identifies any potential

hotspot areas likely to exceed air quality objectives, a detailed assessment of those areas is required. If objectives are not predicted to be met, the local authority must declare the area as an Air Quality Management Area (AQMA). If an AQMA has been declared, the Local Authority will also need to produce an Air Quality Action Plan (AQAP), to include measures to improve air quality in the AQMA.

- 6.64. The Proposed EIA Development is located in Manchester City Centre. The baseline assessment includes a brief review and summary of the Greater Manchester Combined Authority's latest available Annual Status Report for 2021 (ASR) and the data available from Clean Air Greater Manchester.
- 6.65. A single AQMA was designated on the 1st May 2016 for the whole of Greater Manchester and reflects the location of the motorways, major roads and urban areas, for exceedances of the annual mean NO₂ objective threshold. The AQMA was declared due to concerns regarding annual mean NO₂ and 24-hour mean PM₁₀ concentrations. The AQAP was published in 2016 and sets out measures to improve air quality in the AQMA. The latest ASR reports that Defra have responded positively to Greater Manchester's suggestion that update of the AQAP should be postponed until the impact of the proposed Greater Manchester wide Clean Air Zone (CAZ) is understood.
- 6.66. The location of the AQMA boundary with respect to the Proposed EIA Development is shown in Figure 6-3.

Local Air Quality Monitoring

- 6.67. A review of existing local air quality conditions in the vicinity of the Proposed EIA Development has been undertaken. Automatic and diffusion tube monitors within 2km of the Proposed EIA Development have been evaluated as part of this assessment.

Automatic Monitoring

- 6.68. Automatic or continuous monitoring involves drawing air through an analyser continuously to obtain near real-time pollutant concentration data. A review of the most recent ASR for Greater Manchester Combined Authority showed that Manchester City Council operates two automatic monitoring stations with 2km of the Proposed EIA Development. These are an urban traffic (MAN1) and an urban centre site (MAN3) located approximately 0.4km to the east and 1.2km to the north-east, respectively. The location of these automatic monitors is shown in Figure 6-4 and details about these are provided in Table 6-8.

Table 6- 8: Details of Automatic Monitoring Sites within 2km

Site ID	Site Location	OS Grid Reference x y		Site Type	Pollutants Monitored	Distance to kerb of nearest road (m)
MAN1	Manchester Oxford Road	384233	397287	Urban Traffic	NO ₂ , PM ₁₀	1
MAN3	Manchester Piccadilly	384310	398337	Urban Centre	NO ₂ , O ₃ , PM ₁₀ , PM _{2.5} , SO ₂	30

- 6.69. Recent NO₂ monitoring results from 2015 to 2021 are shown in Table 6-9, with numbers of hourly exceedances of 200µg/m³ indicated in brackets. An exceedance is defined as an annual mean greater than 40µg/m³ for NO₂, or when the hourly value exceeds 200µg/m³ more than 18 times within a calendar year. All exceedances of the objective thresholds are indicated in bold. Annual mean concentrations that also exceed 60µg/m³ have also been underlined.

Table 6- 9: Results of Local Air Quality Monitoring at Automatic Sites – Nitrogen Dioxide (NO₂)

Site ID	Site Type	Distance from Site (km)	Annual Mean NO ₂ Concentration (µg/m ³)						
			2015	2016	2017	2018	2019	2020	2021*
MAN1	Urban Traffic	0.5 km E	<u>66</u> (60)	<u>66</u> (90)	<u>65</u> (6)	<u>62</u> (2)	59 (1)	36 (0)	n.d.
MAN3	Urban Centre	1.2 km NE	39 (1)	40 (0)	36 (1)	35 (0)	36 (0)	27 (0)	27(0)

Notes: Exceedances of the annual mean air quality objective are indicated in **bold**. Underlined values exceed 60 µg/m³, the value at which exceedances of the short-term objective are likely to occur.

Site ID	Site Type	Distance from Site (km)	Annual Mean NO ₂ Concentration (µg/m ³)						
			2015	2016	2017	2018	2019	2020	2021*

* Data contains some unratified (provisional) values and covers the period January-October 2021

- 6.70. These results show that the NO₂ annual mean air quality objective was exceeded all years in the period 2015 to 2019 at the urban traffic site (MAN1). Excluding an annual mean concentration of 40µg/m³ recorded in 2016, concentrations recorded at the urban centre site (MAN3) were below the objective. Annual mean concentrations of NO₂ recorded at both automatic monitoring sites within 2km between 2015 and 2021 remained above the new WHO Air Quality interim target range (20µg/m³ to 40µg/m³) and well above the new WHO guidance level of 10µg/m³.
- 6.71. The number of hourly exceedances of 200µg/m³ have been well below the permissible 18 times per year at both sites since 2017.
- 6.72. The latest provisional data from 2020 to 2021 supports the general decreasing trend in urban background concentrations, this is most likely due to the impacts of COVID-19 lockdown measures but may also be due to a combination of national decreases in vehicle emissions due to technology improvements.
- 6.73. Annual mean concentrations of PM₁₀ recorded at the monitoring sites within 2km are listed in Table 6-10, with number of days exceedance shown in brackets. An exceedance is defined as a PM₁₀ annual mean greater than 40µg/m³, or when the daily value exceeds 50µg/m³ more than 35 days within a calendar year. All exceedances are indicated in bold.

Table 6-10: Results of Local Air Quality Monitoring at Automatic Sites- PM₁₀

Site ID	Site Type	Distance from Site (km)	Annual Mean PM ₁₀ Concentration (µg/m ³)						
			2015	2016	2017	2018	2019	2020 ^{Error! Bookmark not defined.}	2021 ^{Error! Bookmark not defined.}

MAN1	Urban Traffic	0.5 km E	28 (25)	27 (16)	27 (15)	30 (15)	26 (18)	<u>n.d.</u>	<u>n.d.</u>
MAN3	Urban Centre	1.2 km NE	20 (3)	20 (3)	20 (3)	21 (2)	20 (7)	15 (n.d.)	15 (n.d.)

- 6.74. Annual mean concentrations recorded at both sites between 2015 and 2021 remained at or above the new WHO Air Quality guidance level for annual mean PM₁₀ of 15µg/m³. Lower figures in 2020 and 2021 are most likely due to a combination of the impacts of COVID-19 lockdown measures and national decreases in vehicle emissions due to technology improvements.
- 6.75. Annual mean concentrations of PM₁₀ met the air quality objective at both sites in all years monitored between 2015 and 2021. Concentrations at the urban traffic site on Oxford Road (MAN1) showed a maximum of 30µg/m³ recorded in 2018. Following a marginal exceedance of the WHO target of 20µg/m³ in 2018, the concentrations at the urban centre site have not exceeded the 20µg/m³ in target in 2020 and 2021. This is most likely due to a combination of national decreases in vehicle emissions due to technology improvements, and the impacts of Covid Lockdown measures. Concentrations at the urban traffic site on Oxford Road have been above the WHO target in recent years, with a maximum of 30µg/m³ recorded in 2018.
- 6.76. The number of times daily PM₁₀ averages have been recorded above 50µg/m³ have been below the permissible 35 days at both sites during this monitoring period. Trends have remained broadly static at both sites since 2015.
- 6.77. Annual mean PM_{2.5} concentrations recorded between 2015 and 2021 are listed in Table 6-11. PM_{2.5} is also monitored at the urban centre site (MAN3). An exceedance is defined as an annual mean greater than 20µg/m³ for PM_{2.5}. Annual mean concentrations of PM_{2.5} have been below the air quality objective at this site between 2015 and 2021, with a maximum of 12µg/m³ recorded in 2019. Concentrations have also been below the WHO target of 10µg/m³ in 2020 and 2021 to date. Greater Manchester is aiming to sustain compliance until 2030 and thereafter.
- 6.78. Concentrations remain above the new WHO guidance level of 5µg/m³ in all years.

Table 6- 11: Results of Local Air Quality Monitoring at Automatic Sites – PM_{2.5}

Site ID	Site Type	Distance from Site (km)	Annual Mean PM _{2.5} Concentration (µg/m ³)						
			2015	2016	2017	2018	2019	2020 ^{Error! Bookmark not defined.}	2021 ^{Error! Bookmark not defined.}
MAN3	Urban Centre	1.2 km NE	10	10	8	11	12	8	9

Non-Automatic Monitoring

- 6.79. The Clean Air Greater Manchester Website shows that GMCA has over 400 diffusion tubes monitoring NO₂ in Greater Manchester, 16 of which are within 2km of the Proposed EIA Development. Of the locations within 2km of the Proposed EIA Development, eleven of these are “Roadside” sites, two are “Kerbside” and the remaining four are “Urban background”. The locations of the sites within 2km are shown in Figure 6-5.
- 6.80. Details of the diffusion tubes are listed in Table 6-12 and the latest monitoring results are provided in Table 6-13. All exceedances of the annual mean objective (40µg/m³) are indicated in bold. Annual mean concentrations that also exceed 60µg/m³ have also been underlined.

Table 6-12: Details of Diffusion Tube Monitoring Sites within 2km

Site ID	Site Location	OS Grid Reference		Site type	Distance to kerb of nearest road (m)
		x	y		
MAN09AB	Newton Street	384601	398303	Kerbside	0.5
MAN24	Princess Street /Cooper Street	383954	398060	Kerbside	0.5
MAN26AB	Long Millgate	383971	398876	Urban background	59
MAN29A	Oxford Street	384117	397505	Roadside	2.0
MAN59/ 60/61	Piccadilly Gardens	384310	398337	Urban background	56
MAN71	Great Ancoats Street	385161	398290	Roadside	2.0
MAN72	Lockton Close	384761	397384	Urban background	46
MAN77	Hewitt Street	383602	397488	Urban background	2.0
MAN82/83/84	Oxford Road	384233	397287	Roadside	0.5
MAN 96	Ardwick Green	385189	397167	Roadside	2.0
MAN 97	Chester Road	382886	397215	Roadside	11.0
SA27	Frederick Street	383076	398738	Roadside	1.5
SA39	Trinity Way	383040	398563	Roadside	8.0
SA60	Regent Road	382445	397724	Roadside	4.0
SA79	Chapel Street	382602	398519	Roadside	10.0
SA81	Regent Road 2	382561	397722	Roadside	1.5

Table 6-13: Diffusion Tube Monitoring Results 2016 to 2020

Site ID	Distance to Site	Site Type	Annual Mean NO ₂ Concentration (µg/m ³)				
			2016	2017	2018	2019	2020
MAN09AB	1.3 km NE	Kerbside	51.9	51.1	45.8	44.9	32.5
MAN24	0.8 km NE	Kerbside	45.3	44.7	40.3	40.8	26.8
MAN26AB	1.6 km NE	Urban background	37.1	35.5	33.4	33.0	22.9
MAN29A	0.4 km NE	Roadside	<u>66.2</u>	57.7	58.8	55.4	39.0
MAN59/ 60/61	1.2 km NE	Urban background	40.8	35.7	31.6	33.1	22.3
MAN71	1.7 km NE	Roadside	51.2	50.4	46.1	45.3	31.4
MAN72	1.0 km E	Urban background	40.0	34.6	33.4	32.8	24.5
MAN77	0.2 km NW	Urban background	44.2	38.8	41.0	43.7	26.9

Site ID	Distance to Site	Site Type	Annual Mean NO ₂ Concentration (µg/m ³)				
			2016	2017	2018	2019	2020
MAN82/83/84	0.5 km E	Roadside	<u>60.2</u>	56.2	54.0	52.0	33.9
MAN 96	1.4 km E	Roadside	-	-	-	46.0	36.4
MAN 97	0.8 km W	Roadside	-	-	-	32.3	23.4
SA27	1.6 km NW	Roadside	39.8	36.8	34.1	37.2	26.7
SA39	1.4 km NW	Roadside	46.8	41.6	39.1	41.7	30.4
SA60	1.3 km NW	Roadside	-	40.7	40.2	36.7	27.0
SA79	1.6 km NW	Roadside	-	-	-	41.1	27.3
SA81	1.2 km NW	Roadside	-	-	-	46.4	34.8

Notes: Exceedances of the annual mean air quality objective are indicated in **bold**.
Values greater than 60µg/m³ are underlined.
- no data available

- 6.81. Of the 16 diffusion tube monitoring locations, all but 2 of the roadside/kerbside sites exceeded the NO₂ objective (40µg/m³) at some point during the period between 2016 and 2020. The maximum concentration recorded at a roadside/kerbside site in 2019 was 55.4µg/m³, recorded at MAN29A. Exceedances of the NO₂ annual mean objective were also recorded at one of the urban background sites, with a maximum of 43.7µg/m³, recorded at MAN77 in 2019. MAN77 is located nearest to the Proposed EIA Development. 2020 data has not been specifically interpreted due to atypical conditions created by COVID-19 lockdown.
- 6.82. Since 2017, the annual mean NO₂ concentrations recorded at all of the 17 sites within 2km have been below 60µg/m³. Exceedances of the short-term objective are therefore considered to be unlikely.

Defra's Background Pollutant Concentration Mapping

- 6.83. Background concentrations refer to existing levels of pollution in the atmosphere, as a result of emission from a variety of sources, such as traffic, industrial and agricultural processes. Defra publishes background pollutant mapping for every 1km x 1km OS grid square across the UK for NO_x, NO₂, PM₁₀ and PM_{2.5}. Background pollutant mapping has been reviewed for the grid square in which the Proposed EIA Development lies and surrounding grid squares. The 2019 background concentrations (which are based on 2018 monitoring data) are presented in Table 6-14. Defra background concentrations are all below the air quality objectives for annual mean NO₂ and PM₁₀ and PM_{2.5}.

Table 6- 14: Defra's 2019 background concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5}

OS Grid Square		Annual Mean Concentration (µg/m ³)			
x	y	NO _x	NO ₂	PM ₁₀	PM _{2.5}
383500	397500	39.9	26.1	13.5	8.7
383500	398500	44.6	28.2	13.1	8.5
384500	397500	44.5	28.2	14.4	9.1
384500	398500	47.0	29.3	13.6	8.8
384500	399500	32.8	22.2	12.5	8.2
385500	398500	35.2	23.4	12.6	8.3
Average		40.7	26.2	13.3	8.6

- 6.84. Table 6-15 shows the comparison between the measured 2019 concentrations at the nearest urban background continuous monitor (MAN3) along with the estimated 2019 Defra background concentrations at the corresponding OS grid square. There are significant differences of 17.9%, 15.2%, 34.0% and 25.2% in NO_x, NO₂, PM₁₀ and PM_{2.5} concentrations, respectively.

Table 6-15: Comparison between monitored (MAN3) and Defra background concentrations

Pollutant	Estimated Defra background concentration (µg/m ³)	Measured concentration at MAN3 (µg/m ³)	Difference	Difference (%)
NO _x	51.8	63.1	-11.3	-17.9
NO ₂	30.8	36.3	-5.5	-15.2

Pollutant	Estimated Defra background concentration ($\mu\text{g}/\text{m}^3$)	Measured concentration at MAN3 ($\mu\text{g}/\text{m}^3$)	Difference	Difference (%)
PM ₁₀	13.2	20	-6.8	-34.0
PM _{2.5}	8.6	11.5	-2.9	-25.2

6.85. A further investigation has been carried out to compare the other urban background monitoring sites with the estimated Defra background concentration at other locations within the wider Greater Manchester Area. Table 6-16 which shows this further comparison indicates that there is a difference in annual mean NO₂ of between 10.5% and 29.6% at the other urban background sites, however it should be noted that values are much lower, and less typical of the study area.

Table 6-16: Comparison between monitored NO₂ and Defra background NO₂ concentrations

Site	Estimated Defra background concentration ($\mu\text{g}/\text{m}^3$)	Measured NO ₂ concentration ($\mu\text{g}/\text{m}^3$)	Difference	Difference (%)
TRAFF	17.0	19	-2.0	-10.5
WIG5	13.4	19	-5.6	-29.5

6.86. Accordingly, it was decided to adjust the predicted Defra background concentrations using the most conservative ratios derived from the MAN 3 automatic monitor. These are described below:

- The adjustment factor for background NO_x is 1.22
- The adjustment factor for background NO₂ is 1.18
- The adjustment factor for background PM₁₀ is 1.51
- The adjustment factor for background PM_{2.5} is 1.33

6.87. The worst-case adjusted background concentrations for 2019 have been applied to the future scenarios in 2027. This is considered to be a conservative approach as the background concentration is likely to decrease in future years.

Local Traffic Data

6.88. The presence of any heavily trafficked roads, with emissions that could give rise to significantly higher concentrations of pollutants (e.g., NO₂), may cause unacceptably high exposure for users of the new development.

6.89. Traffic count data for the area is reported in the Appendix 6.

6.90. The emissions from roads in the area not included in the model are assumed to be represented in the background concentrations listed in the previous section.

Future Baseline

6.91. The UK Government originally directed Greater Manchester to introduce a Category C Clean Air Zone (CAZ), with an aim of achieving statutory NO₂ Limit Values. In response, Greater Manchester has developed a Clean Air Plan to tackle harmful and illegally high levels of roadside air pollution across the city-region.

6.92. Review of the Clean Air Greater Manchester website in January 2023 indicated that the original Clean Air Plan was unworkable and would not have met the obligations to achieve compliance with the legal limit for harmful nitrogen dioxide air pollution by 2024 and could have caused significant financial hardship for people affected. Government agreed that the Greater Manchester charging Clean Air Zone would not go ahead on 30th May 2022. A public consultation on the new Clean Air Plan proposals is expected to take place in early 2023, subject to government feedback.

Sensitive Receptors

6.93. Sensitive receptors include, but are not limited to, residential housing, hospitals, schools, day-care and convalescent facilities and include those who are at a heightened risk of negative health outcomes due to exposure to air pollution.

6.94. Sensitive receptors near the development were identified with reference to mapping data provided by Ordnance Survey.

- 6.95. The EIA Site is located within a densely urbanised area. There are several properties surrounding the EIA Site, identified in the Address Base Plus geographical data set. These include several receptors considered to be of high sensitivity, such as residential properties and hotels. Sensitive residential receptors within 350m are illustrated in Figure 6-6 of Appendix 6.2 and include receptors within 20m of the red line boundary.
- 6.96. Defra MAGIC mapping has been reviewed to determine the presence of any sensitive ecological sites. Typical ecological receptors of significance include Special Conservation Areas (SCAs), Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs), RAMSAR sites, Local Nature Reserves with dust sensitive features. There are no designated ecological receptors within 1km of the EIA Site boundary.

Identification and Evaluation of Likely Significant Effects

Construction Phase Impacts

- 6.97. There is potential for fugitive dust associated with dust generating activities during demolition, earthworks and construction phases to impact nearby sensitive receptors. The anticipated impact and significance of effects are listed in Table 6-17.

Table 6-17: Significance of Effects - Construction Phase

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level
PM ₁₀ and NO _x from on-site Construction NRMM machinery	High sensitivity human receptors	Minor Negative	Minor to Moderate Adverse	High
PM ₁₀ and NO _x from Construction traffic exhaust emissions	High sensitivity human receptors	Minor Negative	Minor to Moderate Adverse	High
Dust and PM ₁₀ associated with demolition activities	High sensitivity human receptors	Minor Negative	Minor to Moderate Adverse	High
Dust and PM ₁₀ associated with earthworks activities	High sensitivity human receptors	Minor Negative	Minor to Moderate Adverse	High*
Dust and PM ₁₀ associated with construction activities	High sensitivity human receptors	Minor Negative	Minor to Moderate Adverse	High
Notes: *The Ground Contamination Risk Assessment and Remedial Strategy (Ramboll) concluded a risk to construction workers associated with asbestos fibres in made ground. This risk is to be minimised by ensuring appropriate health and safety precautions are in place. The contractor is to provide a copy of an Asbestos Management Plan (AMP).				

Operation Phase

Human Exposure

- 6.98. Air quality conditions for future occupiers and visitors of the Proposed EIA Development will be influenced by local background and road emissions. Impacts from the proposed standby generators have not been included within this evaluation as they were scoped out of further assessment.
- 6.99. Detailed dispersion modelling of NO_x, PM₁₀ and PM_{2.5} emissions from operational traffic was used to undertake assessment of human exposure at the development. The results are presented in Appendix 6 and include two different scenarios:
- Future year traffic flows and 2022 emission factors (worst case)
 - Future year traffic flows and 2027 emission factors (best case)
- 6.100. Interpretation of worst-case data indicates the following:
- 6.101. Modelled impacts at all receptors were negligible apart from Receptor 5 (8 First Street), where a minor negative impact was predicted
- 6.102. Table 6-18 presents the potential Significance of Effects for Air Quality identified for the Operational Phase.

Table 6-18 Significance of Effects – Operation

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level
Emissions from an increase in operational traffic	High sensitivity human receptors	Negligible to Minor Negative	Minor Adverse	High

Cumulative Effects

- 6.103. Cumulative effects relate to 'other' projects and plans and not different aspects of the proposals. Appendix 2 provides a list of the committed developments in the area. The cumulative effect of the Proposed EIA Development and these committed developments have been considered to determine if there would be a likely significant impact.
- 6.104. Two types of cumulative effects have been assessed:
- Type 1 Effects: The combination of individual effects (for example noise, dust and visual effects) from a development on a particular receptor; and
 - Type 2 Effects: Effects from several developments, which individually might be insignificant, but when considered together could create a significant cumulative effect.
- 6.105. Cumulative impacts have been considered in relation to an agreed list of consented developments in the area. Data used in the operational traffic assessment already included the contribution from committed development traffic flow. The traffic data used to inform the assessment included Proposed EIA Development flows associated with Plot 10a Site and neighbouring Plot 10b Site. Overall, the impact of the Proposed EIA Development is considered Negligible with regards to cumulative emissions of NO₂ and particulate matter and the overall effect is considered not significant. Any increase in emissions associated within the operation of the Proposed EIA Development are therefore not expected to result in a significant impact when considered in combined with other effects (Type 1 effect) and the combined impacts from other committed developments in the area are also not expected to result in a significant impact (Type 2 effect).
- 6.106. A construction dust assessment has determined the risk from nuisance dust during the construction works which inform the mitigation measures required. With the provision of these measures, there the impact of dust will be insignificant and therefore not result in a significant individual effect (Type 1). Considering the effects from other developments, there is potential for the nearby Plot 10a works to overlay with the Plot 10a construction period. However, with the provision of appropriate mitigation measures, this would not result in a significant cumulative effect (Type 2).

Mitigation Measures

Construction

- 6.107. The primary aim of the dust risk assessment is to identify the appropriate site-specific mitigation measures that will be adopted to ensure there will be no significant effect on local amenity and public health.
- 6.108. Full details of mitigation measures are presented in Appendix 6.1 and should be read in accordance with the findings of the construction dust assessment. These best practice mitigation measures are to be implemented during the construction phase of the development via a Construction Environmental Management Plan (CEMP). It is anticipated that the generation of dust and harmful pollutants emissions from construction site activities will be reduced with the correct implementation of these measures. It is anticipated that this will be formally requested by Planning Condition and will include the requirement for a Dust Management Plan. The Dust Management Plan is to ensure that all recommended mitigation measures will be implemented properly.
- 6.109. Due to the proximity of sensitive receptors from the construction site and trackout routes, construction dust monitoring is included within the recommended mitigation measures. The Dust Management Plan will need to include relevant details relating to construction dust monitoring, such as number of monitors installed, locations and site action levels. The monitoring methodology will need to be agreed with Manchester City Council in advance of commencement.
- 6.110. Emissions from Non-Road Mobile Machinery (NRMM) will be mitigated through the specification of minimum NRMM emission requirements, in accordance with Department for Transport guidance.
- 6.111. It is anticipated that the dust generation and harmful emissions from construction site activities will be greatly reduced or eliminated with the correct implementation of the best practice methods identified.

Operation

- 6.112. Based on the predicted concentrations using worst case current year (2022) emissions and backgrounds the impact of the operation on all traffic sensitive receptors is negligible, and therefore no mitigation measures are required.

Residual Effects

- 6.113. Table 6-19 and Table 6-20 provide a tabulated summary of the outcomes of the air quality assessment of the Proposed EIA Development with respect to the construction and operational phases, respectively.

Table 6-19: Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the construction phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Construction Phase				
PM ₁₀ and NO _x from on-site Construction NRMM machinery	High sensitivity human receptors within 350m of EIA Site boundary	Specification of minimum NRMM emission requirements	Contractor to select compliant vehicles	Negligible
PM ₁₀ and NO _x from Construction traffic exhaust emissions	High sensitivity human receptors within 50m of the trackout route for construction vehicles, within 500m from the EIA Site exit.	Listed in Appendix 6. Based on the construction dust assessment within Appendix 6, these should include medium risk mitigation measures for trackout of construction vehicles	Implementation of recommendation mitigation measures, to be outlined in a Dust Management Plan	Negligible
Dust and PM ₁₀ associated with earthworks and construction activities	High sensitivity human receptors within 350m of EIA Site boundary	Listed in Appendix 6. Based on the construction dust assessment within Appendix 6, these should include medium risk mitigation measures for earthworks and high-risk mitigation measures for construction	Implementation of recommendation mitigation measures, to be outlined in a Dust Management Plan	Negligible

Table 6-20: Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the operational phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Operational Phase				
Emissions from an increase in operational traffic	High sensitivity human receptors	Listed in Appendix 6	Implementation of Travel Plan	Negligible

Monitoring

- 6.114. There are no requirements for any monitoring during the operational phase of the development. Nevertheless, indoor air quality monitoring would be useful to inform the appropriateness of the ventilation strategy.

Reference List

- 6.115. This ES Chapter has been prepared by reference to the following:
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

- HMSO (2010). Statutory Instrument 2010 No. 1001, The Air Quality Standards Regulations 2010, London: HMSO
- HMSO (2016). Statutory Instrument 2016 No. 1184, Environmental Protection, England, The Air Quality Standards (Amendment) Regulations 2016, London: HMSO, <https://www.legislation.gov.uk/uksi/2016/1184/contents/made>
- Department for Environment Food and Rural Affairs (Defra) (2019) Clean Air Strategy 2019, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
- Environment Act 1995, Chapter 25, Part IV Air Quality
- HMSO (2021) Environment Act 2021, November 2021, <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>
- Environmental Protection Act 1990, Chapter 43, Part III Statutory Nuisances and Clean Air <https://www.legislation.gov.uk/ukpga/1990/43/part/III>
- HMSO (2018) The Non-Road Mobile Machinery Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018, UK Statutory Instruments, 2018 No. 764, <https://www.legislation.gov.uk/uksi/2018/764/made>
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7. Climate Change

- 7.1. The Climate Change Chapter will be broken down into two elements: Whole Life Carbon Assessment – Climate Change Mitigation
- Greenhouse Gas Emissions**
Introduction
- 7.2. This Chapter of the ES is prepared by Cundall and assesses the likely significant effects of the Proposed EIA Development with respect to climate change, and specifically greenhouse gas (GHG) emissions. These effects arise due to the preparation of the EIA Site for construction, the construction and operation of the Proposed EIA Development over its entire life, and finally its decommissioning.
- 7.3. The assessment captures the operational GHG emissions from both regulated and unregulated energy use, as well as its embodied carbon emissions, i.e. those associated with raw material extraction, manufacture and transport of building materials, construction and the emissions associated with maintenance, repair and replacement as well as dismantling, demolition and eventual material disposal.
- 7.4. 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.
- 7.5. This Chapter is accompanied by 2 technical reports, the Plot 10a Whole Life Carbon Assessment (document ref. FSP-CDL-XX-XX-RP-SY-70207), and the Plot 10b Whole Life Carbon Assessment (document ref. FSP-CDL-XX-XX-RP-SY-70208).
- 7.6. The author of this Chapter with respect to climate change (whole life embodied carbon) hold semi-Chartered Membership of the Institute of Environmental Management and Assessment. The author is educated to master’s level and has experience in preparing input on climate change for EIA developments.

Assumptions and Limitations

- 7.7. Reasonable assumptions have been made following industry guidance for carbon emissions assessments to be modified and updated during construction and operational stages of the development. Where relevant, time-appropriate information from most recently updated policy and guidance documents have been used, and this is identified in the assessment.

Legislative and Policy Context, Guidance

- 7.8. The ES refers to the Local, Regional (where applicable) and the National Planning Policy Framework (and any associated guidance available) with reference to all environmental, social, and economic policies of relevance to the Proposed EIA Development.

Legislation

- 7.9. The following legislative guidance has been used in the development of the Climate Change ES Chapter:

Table 7.1: National. Legislation and Guidance on Climate Change

Legislation and Guidance	Description
The ‘EIA’ Directive 2014/52/EU	Assessment of the effects of certain public and private projects on the environment (hereafter referred to as ‘the EIA Directive’) came into force on 16th April 2014 and was transposed into UK law by the Town and Country Planning (Environmental Impact Assessment) Regulations May 2017
National Planning Framework (NPPF)	First published on 27 March 2012 and revised in July 2018, February 2019, March 2019 and July 2021 as a key part of Government reforms to make the planning system less

Legislation and Guidance	Description
	complex and more accessible, to protect the environment and to promote sustainable growth, The Government have also published a series of planning Practice Guidance covering different topics including (but not limited to) air quality climate change and waste.
EU Climate Law	Establishes the requirements of Member States in terms of Climate change
UK Climate Change Act 2008 Amended June 2019	Requiring the government to reduce the UK's net emissions of greenhouse gases by 100% relative to 1990 levels by 2050
Energy Act 2013	Makes provisions for the setting of decarbonization targets for the UK and reforming the electricity market.
British Standard BS EN15978:2011 (Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method.	The nationally recognized Life Cycle Assessment (LCA) methodology for the built environment. Sets out the scope of the Life Cycle Assessment including reference study periods.
UKGBC A Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets 2022	Guidance for organisations to consider physical climate risks and understand how they are or will be impacted at the built asset scale. To make better informed decisions that have benefits for their operations and the future built environment.
UK Climate Change Act 2008 Amended June 2019	Requiring the government to reduce the UK's net emissions of greenhouse gases by 100% relative to 1990 levels by 2050

National Planning Policy

- 7.10. National Planning Policy Framework July 2021 (NPPF). Addressing climate change is one of the core land use planning principles which the NPPF expects to underpin both plan-making and decision-taking. Key NPPF sections relating to an EIA's Climate Change Chapter include Section 9 – transport related issues, Section 14 Energy and climate change policies.

Sub-Regional Planning policy (where relevant)

- 7.11. Greater Manchester Combined Authority – Draft Places for Everyone. This draft document is currently at independent examination by the Planning Inspectorate, we have taken note of the direction of travel of Greater Manchester policy.
- 7.12. Manchester Climate Change Framework 2020-2025.
Climate Adaptation and Resilience Objective – To adapt the city's buildings, infrastructure and natural environment to the changing climate and to increase the climate resilience of our residents and organisations.
- 7.13. Greater Manchester Resilience Strategy 2020-2030.
A guide to prioritise resilience in communities, enhancing resilience understanding, shaping resilience within the region, being ready for future challenges, and strengthening response and recovery arrangements.

Local Planning Policy

- 7.14. Manchester City Council Core Strategy with a focus on the following policies:
- Policy EN 4 – Reducing CO2 Emissions by Enabling Low and Zero Carbon Development
 - Policy EN 6 – Target Framework for CO2 reductions from low or zero carbon energy supplies
 - Policy EN 8 – Adaptation to Climate Change
 - Policy EN 14 – Flood Risk
 - Policy EN 15 – Biodiversity and Geological Conservation
 - Policy EN 16 – Air Quality
 - Policy EN 17 – Water Quality

- Policy T 1 – Sustainable Transport

Guidance

- Royal Institute of Chartered Surveyors - Professional Statement: Whole Life Carbon Assessment for the Built Environment, 2017
- IEMA Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2017
- IEMA Climate Change Adaptation Practitioner Guidance 2022
- UK Green Building Council's Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets 2022
- Low Energy Transformation Initiative (LETI)'s Embodied Carbon Primer, 2020

Assessment Methodology and Significance Criteria

- 7.15. This section outlines the methodology for assessing the likely significant effects related to climate change from the construction, existence, operation and decommissioning of the Proposed EIA Development. Full details of the methodology, including relevant assumptions and limitations, can be found in Appendix D4.
- 7.16. Guidance from the Institute of Environmental Management and Assessment (IEMA) on assessing GHG emissions and evaluating their significance has also been used to inform the assessment. This guidance states that “in the absence of a defined threshold of GHG emissions, all GHG emissions can be deemed significant”.
- 7.17. GHG emissions are reported as tonnes of carbon dioxide equivalent (tCO₂e). CO₂e refers to a common unit employed to compare the emissions from various GHGs (methane, ozone, nitrous oxide etc.) based on their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide (CO₂) with the same GWP. The adoption of CO₂e as the common metric allows all GHGs to be included within the assessment and contextualised against local and national targets.
- 7.18. The assessment was carried out in accordance with the British Standard BS EN15978:20112 (Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method), the RICS Professional Statement: Whole Life Carbon assessment for the built environment (hereafter referred to as the ‘RICS PS’) and the Greater London Authority’s Whole Life-Cycle Carbon Assessments guidance Pre-consultation draft document.
- 7.19. The Proposals will be supported by a specific EIA Climate Change Chapter which will consider all of the potential impacts referenced above in the Technical Chapter setting out the credentials of the development as a whole.
- 7.20. The methodology and strategy proposed by Cundall will also set out Climate Change mitigation by utilising existing benchmark data for the type and scale of the Proposed EIA Development in relation to Whole Life Carbon, setting out the results and risks to the Proposed EIA Development.
- 7.21. The impact of the Proposed EIA Development will be assessed using RICS Whole Life Carbon Assessment Methodology to assess the identified scenarios for the Proposed EIA Development. Demonstrating how the Proposed EIA Development limits its contribution to Climate Change. Again, the results and risks to the development for the Proposed EIA Development (with consideration for the effects of Climate Change) will establish the need to implement measures to ensure the buildings are adaptable.
- 7.22. Baseline GHG emissions associated with embodied carbon are considered zero as they have already occurred and are of a historical nature only. Similarly, with no construction activities currently taking place onsite, baseline emissions associated with construction are considered zero.
- 7.23. The potential impact of the baseline schemes within the surrounding Manchester area is considered to add little to the understanding of the developments assessments and are therefore scoped out.
- 7.24. As stated in the IEMA Guidance (2022) “GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant”. It goes on to explain that there is no single preferred method to evaluate significance, but the greater the project’s magnitude of change, the greater its significance. Unlike other EIA topics, sensitivity is only considered for a single receptor (i.e. the whole planet), and therefore it is the magnitude that drives significance. The following list provides examples of how to distinguish different levels of significance. Major or moderate adverse effects and beneficial effects are significant. Minor adverse and negligible effects are not considered to be significant.

Table 7.2: Significant effect evaluation of greenhouse gas impacts

Significant Effect	Greenhouse Gas Impact
Major Adverse	The project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
Moderate Adverse	The project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
Minor Adverse	The project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
Negligible	The project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
Beneficial	The project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

Climate Change Risk Assessment – Climate Change Adaptation

- 7.25. Cundall have carried out an initial Whole Life Embodied Carbon Assessment (WLCA) based on cost plan and design information and following RICS guidance document 'Whole life carbon assessment for the built environment, 1st edition'. Material LCA assessment using the BRE approved tool. The assessment covered all the expected carbon emissions for the Proposed EIA Development over its projected life cycle (Study period of 60 years), with the following categories included in the assessment (for document references see 1.4):
- Substructure
 - Superstructure (frame, upper floors, roof, stairs and ramps, external walls, windows and external doors)
 - Internal finishes
 - Fittings, furniture, and equipment
 - External works
 - Benchmark operational energy data
- 7.26. Within the Climate Change EIA Chapter, Cundall have summarised the key measures that are included in the proposals and detail what will be considered at the next stages of design in order to mitigate emissions.
- 7.27. Specifically, Cundall have initiated individual discussions with the Design Team to provide options, ideas, and comparative analysis for low carbon approaches to architectural, structural, and services design strategies
- 7.28. This ES chapter details the embodied carbon reduction appraisal, highlighting considerations the design team will be making as the design develops, to encourage and facilitate the use of low-carbon materials.

Scenarios Tested

Whole Life Carbon Assessment – Climate Change Mitigation

- 7.29. The baseline will be based on industry standard carbon footprint values. As the plot is currently vacant, the assumption can be made that the GHG baseline is 0. Other baseline cases have been scoped out from this assessment due them not being considered as directly contributing to the development's GHG emissions.
- 7.30. Cundall has carried out WLC Assessments for both Plot 10a and Plot 10b.
- 7.31. Scenarios for considerations in the GHG emissions analysis are as follows:
- Scenario 2: Baseline + Plot 10a,
 - Scenario 4: Baseline + Plot 10b,
 - Scenario 6: Baseline + Plot 10a + Plot 10b.

The Study Area

- 7.32. The study area is focused on the EIA Site for the new office and new student residential buildings proposed for Plot 10a and 10b respectively. The Proposed EIA Development falls within the jurisdiction of Manchester City Council.
- 7.33. The boundary line of the study area may not be directly impacted but urban public realm beyond the EIA Site boundary is to be considered.

Source of Effect

- 7.34. This section outlines the various potential sources of effect attributable to the Proposed EIA Development.
- 7.35. In the UK, 30-35% of annual carbon emissions are attributable to buildings. Of the annual carbon emissions associated with buildings about 80% is associated with ongoing operational carbon emissions relating to the existing building stock and the remaining 20% is related to the embodied impact of new construction.
- 7.36. Operational carbon emissions will make up a declining proportion of a development's whole life carbon emissions as operational carbon targets become more stringent. To fully capture a development's carbon impact, a whole life-cycle approach is needed to capture its unregulated emissions (i.e. those associated with equipment), its embodied emissions (i.e. those associated with raw material extraction, manufacture and transport of building materials, and construction) and emissions associated with maintenance and eventual material disposal.

Baseline Conditions

Construction and existence assessment baseline

- 7.37. Baseline GHG emissions associated with embodied carbon are considered zero as they have already occurred and are of a historical nature only. Similarly, with no construction activities currently taking place onsite, baseline emissions associated with construction are considered zero.
- 7.38. The baseline GHG emissions will be calculated from existing activities at the EIA Site using the same GHG quantification methodology as defined in the 'Operational assessment baseline' section below.

Operational assessment baseline

- 7.39. The operational assessment baseline accounts for the impact of existing uses and operations on the EIA Site. Given that all buildings on the EIA Site have largely been unused, the GHG emissions associated with operational carbon currently would be zero.

Construction Phase

- 7.40. The Construction Phase will be responsible for a large proportion of the development carbon footprint over its lifetime. This is due to the embodied carbon associated with the extraction of raw materials, transport to manufacturing unit, the manufacturing process, the transport to site the work on EIA Site. This is referred to as the life cycle stages A1 to A5.
- 7.41. GHG emissions from the construction and existence of the Proposed EIA Development include the impacts of manufacture and production of construction materials, construction site works including plant activities, and transport of construction materials to and from the EIA Site and removal of waste from site. These emissions were estimated using a Whole Life Carbon (WLC) assessment. The WLC assessment was undertaken using the Sturgis Carbon Calculator and its associated Environmental Product Declaration database.

- 7.42. During the construction phase it is unlikely that the EIA Site will be subject to the impacts of Climate Change dramatically. The EIA Site may experience a summer heatwave as well as greater rainfall. This has the potential to limit site operations, but this is not deemed significant.

Table 7.3: Construction phase significance of impact

Nature of Impact	Sensitivity	Significance of Effect	Confidence level
Removal of raw materials	Medium-low	Minor Adverse	Low
Transport to manufacturing unit	Medium-low	Minor Adverse	Low
Manufacturing process	Medium- low	Minor Adverse	Low
Transport to site	Medium-low	Minor Adverse	Low
Works on site	Medium-low	Minor Adverse	Low

In-Use and End of Life Phase

- 7.43. GHG emissions from the in-use and end-of-life period of the Proposed EIA Development include the impacts of deconstruction and disposal of the buildings at end of life, including impacts of site works by demolition contractors. GHG emissions from the decommissioning were informed by the WLC assessment.

Identification and Evaluation of Likely Significant Effects

- 7.44. GHG emissions associated with the Proposed EIA Development would account for approximately 75,496 tCO₂e over its 60-year design life. This is a significant reduction when compared to current industry practice.
- 7.45. GHG emissions from the construction and existence (28,774 tCO₂e) account for 38% of the total WLC emissions, whereas GHG emissions from the 60-year operational phase (46,722 tCO₂e) contribute 62%.
- 7.46. Of the GHG emissions associated with the operation of the Proposed EIA Development, 36% of the emissions are related to the operational energy consumption (36,871 tCO₂e).
- 7.47. The below tables present the results of the Proposed EIA Development GHG emissions assessment.
- 7.48. The following table highlights what the likely impacts may be and what elements are scoped in or out of further assessment.

Table 7.4: Construction Phase - Significant impacts scoped in or out

Receptor	Effect	Discussion of Effect	Applicable Development Construction Phase	Scoped In / Out
Office development	Material usage	Amount of non-renewable material use required.	C	In
Student residential	Material usage	Amount of non-renewable material use required.	C	In
Office development	Site Work	Carbon emissions during site work	C	In
Student residential	Site Work	Carbon emissions during site work	C	In

Receptor	Effect	Discussion of Effect	Applicable Development Construction Phase	Scoped In / Out
Office development	Material transportation during construction	Carbon emissions from material movement due to construction transportation	C	In
Student residential	Material transportation during construction	Carbon emissions from material movement due to construction transportation	C	In

Plot 10a

Table 7.1: Plot 10a carbon emissions

Plot 10a Carbon Emissions	Construction Phase Embodied Carbon (A1-A5)	Life Cycle Embodied Carbon (Module B to C excl. B6, B7)	Whole Life Embodied Carbon (A-C)
Tonnes CO ₂ e	18,319	11,721	30,041
Significance of Effect	Moderate Adverse	Moderate Adverse	Moderate Adverse

Table 7.2: Plot 10a GHG emissions

Plot 10a Carbon Emissions	Annual GHG emissions (tCO ₂ e)	Total GHG emissions (tCO ₂ e) (60-year design life)
Operational material consumption	195	11,721
Operational energy consumption	293	17,601
Operational water consumption	5	310
Total operational GHG emissions	494	29,631

Plot 10b

Table 3.7: Plot 10b carbon emissions

Plot 10b Carbon Emissions	Construction Phase Embodied Carbon (A1-A5)	Life Cycle Embodied Carbon (Module B to C excl. B6, B7)	Whole Life Embodied Carbon (A-C)
Tonnes CO ₂ e	10,455	6,847	17,302
Significance of Effect	Moderate Adverse	Moderate Adverse	Moderate Adverse

Table 7.4: Plot 10b GHG emissions

Plot 10a Carbon Emissions	Annual GHG emissions (tCO ₂ e)	Total GHG emissions (tCO ₂ e) (60-year design life)
Operational material consumption	114	6,847
Operational energy consumption	155	9,271
Operational water consumption	16	973
Total operational GHG emissions	285	17,090

Plot 10a & 10b

Table 7.5: Plot 10a & 10b carbon emissions

Plot 10a & 10b Carbon Emissions	Construction Phase Embodied Carbon (A1-A5)	Life Cycle Embodied Carbon (Module B to C excl. B6, B7)	Whole Life Embodied Carbon (A-C)
Tonnes CO2e	28,774	18,568	47,343
Significance of Effect	Moderate Adverse	Moderate Adverse	Moderate Adverse

Table 7.6: Plot 10a & 10b GHG emissions

Plot 10a & 10b Carbon Emissions	Annual GHG emissions (tCO2e)	Total GHG emissions (tCO2e) (60-year design life)
Operational material consumption	309	18,568
Operational energy consumption	448	26,871
Operational water consumption	21	1,283
Total operational GHG emissions	779	46,722
Significance of Effect	Moderate adverse	Moderate adverse

Cumulative Effects

- 7.49. The global atmosphere is the receptor for GHG emissions. Owing to the transboundary nature of GHG emissions, the effects of the Proposed EIA Development have been considered in the context of global GHG emissions and concentrations of GHGs in the atmosphere. All developments have a cumulative effect on atmospheric GHG concentrations and climate change. As such, the GHG emissions assessment is inherently cumulative and, therefore, a separate cumulative assessment is not required.
- 7.50. The potential effects from climate change identified in could affect all of the cumulative schemes, and there is clearly a need for a coordinated approach to both mitigating and adapting to climate change. There is strategic guidance and ever-stronger policies in the form of the NPPF and the Local Planning Policy (as described earlier in this chapter). It is considered that with all new major development needing to carefully consider climate change adaptation and be designed accordingly, there will be an overall positive cumulative effect.

Mitigation Measures

- 7.51. The opportunity for enhancement measures should also be considered where appropriate.
- 7.52. In response to the risks and significant effects identified above, the design team will be making appropriate mitigation measures. The mitigation measures are considered against the timescale of the project, and appropriate design and operational mitigation measures might be implemented. As the development undergoes changes throughout the design stages, mitigation measures will adapt subsequently. The scope of this Climate Change GHG Chapter looks at the potential GHG emissions.

Residual Effects

- 7.53. The residual impacts of the Proposed EIA Development will be estimated in the table below. The table describes the likely significant effect prior to the implementation of mitigation measures.

Plot 10a & 10b

Table 7.7: .Residual effects - Plot 10a & 10b carbon emissions

Plot 10a & 10b Carbon Emissions	Construction Phase Embodied Carbon (A1-A5)	Life Cycle Embodied Carbon (Module B to C excl. B6, B7)	Whole Life Embodied Carbon
Tonnes CO2e	28,774	18,568	47,343
Significance of Effect	Moderate Adverse	Moderate Adverse	Moderate Adverse

Table 7.8: .Likely significant effects prior to implementation of mitigation measures - Plot 10a & 10b carbon emissions

Likely Significant Effect	Component	Mitigation Measure	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Moderate Adverse	Construction	The construction site would be managed in an environmentally sound manner in terms of resource use and storage. Recycling facilities would be provided on-site for construction and operational waste to mitigate volume of material sent to landfill.	Moderate Adverse – temporary as long as mitigation measures are implemented
Moderate Adverse	Materials	Reducing transportation emissions by prioritising local material procurement. Reduce Material quantities through design development	Moderate adverse – permanent if quantities of materials for building elements are not considered effects
Moderate Adverse	Operation	A fabric first approach has been adopted to reduce the operational energy demand of the Proposed EIA Development. A centralised energy loop would provide heating, hot water and cooling through the use of heat pump technology to all aspects of the Proposed EIA Development. This is highly efficient and would allow the Proposed EIA Development to respond to the decarbonisation of the national grid (though grid decarbonisation has not been assumed in order to present a worst-case assessment). • Solar PV to be accommodated on the available roof space of Building 10a, providing a source of on-site renewable energy; • Variable speed pumps and drives; • High performance heating, cooling and ventilation systems.	Minor adverse - temporary as long as energy strategy is implemented

7.54. In response to the risks and significant effects identified above, the design team will be making appropriate mitigation measures during detailed design stages. The mitigation measures are considered against the timescale of the project, and appropriate design and operational mitigation measures might be implemented. As the development undergoes changes throughout the design stages, mitigation measures will adapt subsequently. The scope of this Climate Change GHG Chapter looks at the potential GHG emissions, the measures include:

Commercial, Business & Services

7.55. The commercial, business & services typology's carbon reduction recommendations are based on Cundall past projects on office developments.

7.56. The main recommendations include:

- high %GGBS (Ground Granulated Blast-furnace Slag) cement replacement concrete

- local source concrete
- use of low carbon finishes
- inclusion of glulam beams in the building frames
- use of low carbon blockwork for masonry
- avoiding use of suspended ceilings
- refurbished raised access flooring
- use of natural material insulation.

Student Accommodation

- 7.57. The residential typology's carbon reduction recommendations are based on Cundall past projects on residential developments and the LETI whole life carbon benchmark for good residential construction practices.
- 7.58. The main recommendations include:
- use of high %GGBS (Ground Granulated Blast-furnace Slag) cement replacement concrete
 - local source concrete
 - high recycled steel element
 - steel made from electric arc furnace
 - high recycled aluminium
 - combined aluminium
 - timber framed windows
 - use of low carbon finishes
 - avoid the use of suspended ceilings
 - low carbon material for external works.

Monitoring

- 7.59. As the development undergoes changes throughout the design stages, mitigation measures will adapt subsequently. As such a monitoring plan will be developed to check that the assumptions made above remain valid. Planning conditions will also be monitored to ensure the means of implementation are carried out at their respective timelines. Two more Whole Life Carbon Assessments (WLCA) will be undertaken in a reiterative process as the design of the development progresses to ensure residual effects (carbon emissions) are foreseen as accurately as possible.

Reference List

- 7.60. This ES Chapter has been prepared by reference to the following:

Climate Change GHG Emissions

- IEMA (2020) *Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation*
- UKGBC (2022) *A Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets*
- RICS (2017) *Professional Statement: Whole Life Carbon Assessment for the Built Environment*
- IEMA (2017) *Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance*
- LETI (2020) *Embodied Carbon Primer Emissions and Evaluating their Significance*. Available online at: <https://www.iema.net/assets/newbuild/documents/IEMA%20GHG%20in%20EIA%20Guidance%20Document%20V4.pdf>
- *British Standards Institute (2011) BS EN 15978:2011*, Available at: <https://shop.bsigroup.com/ProductDetail/?pid=000000000030367221>
- *Royal Institution of Chartered Surveyors (2017) Whole life carbon assessment for the built environment*. Available at: <https://www.rics.org/globalassets/rics-website/media/upholding-professional-standards/sector-standards/building-surveying/whole-life-carbon-assessment-for-the-built-environment-1st-edition-rics.pdf>
- *Greater London Authority (2020) Whole Life-Cycle Carbon Assessments guidance Pre-consultation draft*. Available at: <https://consult.london.gov.uk/5627/widgets/16756/documents/6852>

Climate Change Risk Assessment

Introduction

- 7.61. This Chapter of the ES is prepared by Cundall and assesses the likely impacts on climate change hazards that affect the proposals upon the EIA Site and surrounding area. This Chapter will also describe 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.
- 7.62. This Chapter is accompanied by one technical document, the RIBA Stage 2 Climate Change Risk Review (document ref: FSP-CDL-XX-XX-RP-SY-70209 Rev P01).
- 7.63. The author of this input with respect to climate change risk assessment holds fully Chartered Membership of the Institute of Structural Engineers. The author is educated to PHD level and has experience in preparing input on climate change for EIA developments.

Assumptions and Limitations

- 7.64. Reasonable assumptions have been made on industry guidance for approximate estimations of risk assessments to be modified and updated during construction and operational stages of the development. Where relevant, time-appropriate information from most recently updated policy and guidance documents have been used, and this is identified in the assessment.

Legislative and Policy Context, Guidance

- 7.65. The ES refers to the Local, Regional (where applicable) and the National Planning Policy Framework (and any associated guidance available) with reference to all environmental, social, and economic policies of relevance to the Proposed EIA Development.

Legislation

- 7.66. The following legislative guidance has been used in the development of the Climate Change ES Chapter:

Table 7.13: National. Legislation and Guidance on Climate Change

Legislation and Guidance	Description
The 'EIA' Directive 2014/52/EU	Assessment of the effects of certain public and private projects on the environment (hereafter referred to as 'the EIA Directive') came into force on 16th April 2014 and was transposed into UK law by the Town and Country Planning (Environmental Impact Assessment) Regulations May 2017
National Planning Framework (NPPF)	First published on 27 March 2012 and revised in July 2018, February 2019, March 2019 and July 2021 as a key part of Government reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth, The Government have also published a series of planning Practice Guidance covering different topics including (but not limited to) air quality climate change and waste.
EU Climate Law	Establishes the requirements of Member States in terms of Climate change
UK Climate Change Act 2008 Amended June 2019	Requiring the government to reduce the UK's net emissions of greenhouse gases by 100% relative to 1990 levels by 2050
Energy Act 2013	Makes provisions for the setting of a decarbonization
HEMA EIA Climate Change Resilience Guidance 2020	Considerations that should be given to climate adaptation and outlines key stages in the EIA process

Legislation and Guidance	Description
IEMA Climate Change Adaptation Practitioner Guidance 2022	An introduction to adaptation from both a strategic and practical perspective into how to approach the topic of climate change adaptation from an organizational standpoint.
UKGBC A Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets 2022	Guidance for organisations to consider physical climate risks and understand how they are or will be impacted at the built asset scale. To make better informed decisions that have benefits for their operations and the future built environment.

National Planning Policy

- 7.67. National Planning Policy Framework July 2021 (NPPF). Addressing climate change is one of the core land use planning principles which the NPPF expects to underpin both plan-making and decision-taking. Key NPPF sections relating to an EIA's Climate Change Chapter include Section 9 – transport related issues, Section 14 Energy and climate change policies.

Sub-Regional Planning policy (where relevant)

- 7.68. Greater Manchester Combined Authority – Draft Places for Everyone. This draft document is currently at independent examination by the Planning Inspectorate, we have taken note of the direction of travel of Greater Manchester policy.
- 7.69. Manchester Climate Change Framework 2020-2025.
Climate Adaptation and Resilience Objective – To adapt the city's buildings, infrastructure and natural environment to the changing climate and to increase the climate resilience of our residents and organisations.
- 7.70. Greater Manchester Resilience Strategy 2020-2030.
A guide to prioritise resilience in communities, enhancing resilience understanding, shaping resilience within the region, being ready for future challenges, and strengthening response and recovery arrangements.

Local Planning Policy

- 7.71. Manchester City Council Core Strategy with a focus on the following policies:
- Policy EN 4 – Reducing CO2 Emissions by Enabling Low and Zero Carbon Development
 - Policy EN 6 – Target Framework for CO2 reductions from low or zero carbon energy supplies
 - Policy EN 8 – Adaptation to Climate Change
 - Policy EN 14 – Flood Risk
 - Policy EN 15 – Biodiversity and Geological Conservation
 - Policy EN 16 – Air Quality
 - Policy EN 17 – Water Quality
 - Policy T 1 – Sustainable Transport

Guidance

- IEMA Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation 2020.
- IEMA Climate Change Adaptation Practitioner Guidance 2022
- UK Green Building Council's Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets 2022

Assessment Methodology and Significance Criteria

- 7.72. The Proposals will be supported by a specific EIA Climate Change Chapter which will consider all of the potential impacts of climate hazards referenced in the Technical Chapter setting out the credentials of the development as a whole.

- 7.73. The methodology and strategy proposed by Cundall sets out Climate Change mitigation by utilising existing benchmark data for the type and scale of the Proposed EIA Development.
- 7.74. The impact of climate hazards on the Proposed EIA Development has been assessed to demonstrate how the Proposed EIA Development limits its contribution to Climate Change. The results and risks to the development for the Proposed EIA Development (with consideration for the effects of Climate Change) establishes implement measures to ensure the buildings are adaptable.
- 7.75. The potential impact of the baseline schemes within the surrounding Manchester area is considered to add little to the understanding of the developments assessments and are therefore scoped out.

Climate Change Risk Assessment – Climate Change Adaptation

- 7.76. For reporting purposes, the structure of this ES chapter follows the procedural steps which are listed in Table 1 of the IEMA guidance on Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2020).
- 7.77. The risk assessment reviews the impacts of climate hazards on the EIA Site over its projected life cycle (assumed to be 60 years). This covers structure, fabric and building services. Future climate projections are assessed based on the latest research from the IPCC. These are a medium (RCP4.5) and a high (RCP8.5) emissions scenario to cover a broad range of plausible future climates. Key impacts reviewed are temperatures, precipitation, sea level & storms.
- 7.78. The risk assessment identifies the risks posed by these Climate Change hazards on the Proposed EIA Development, taking into account particular impacts that may increase the risk. The respective project team engineers have input on structural stability & robustness, weather proofing & detailing, material durability, health & safety of building occupants, impacts on building contents and business continuity.
- 7.79. This has identified means of mitigating the above risks as far as reasonably practicable.
- 7.80. Within the Climate Change EIA Chapter, Cundall have summarise the key measures that are included in the proposals and detailed what is to be considered at the next stages of design in order to improve resilience.
- 7.81. Whilst the intent of this project is to reduce the risks associated with Climate Change, it does not guarantee that residual Climate Change risks will not exist. The risk assessment is based on recorded historical climate data and projections for the changes of this climate into the future. Whilst every attempt has been made to communicate the uncertainty surrounding predictions of future climate, the exact trajectory of global emissions and the climactic response to this remains uncertain.
- 7.82. There is currently insufficient evidence as to how fast the Antarctic and Greenland ice sheets may melt (an uncertainty acknowledged by the IPCC). The timescales of these events, and therefore the timescales over which sea levels will rise is therefore likely to be at the upper end of the IPCC's projections, however, may be considerably more in the centuries to come. This may not immediately be obvious as a risk in Manchester, however it could be a factor in the future and there may be indirect impacts.

Scenarios Tested

Climate Change Risk Assessment – Climate Change Adaptation

- 7.83. Cundall has carried out both the Plot 10a and Plot 10b CCRA.
- 7.84. Scenarios considered in the CCRA are as follows:
- RCP 4.5
 1. Scenario 6: Baseline + Plot 10a + Plot 10b,
 2. Scenario 8: Completed development (baseline and cumulative).
 - RCP 8.5 (2040 & 2080, medium and long term)
 1. Scenario 6: Baseline + Plot 10a + Plot 10b,
 2. Scenario 8: Completed development (baseline and cumulative).

The Study Area

- 7.85. The study area is focused on the EIA Site for the new office and new student residential buildings proposed for Plot 10a and 10b respectively. The Proposed EIA Development falls within the jurisdiction of Manchester City Council.
- 7.86. The boundary line of the study area may not be directly impacted but urban public realm beyond the EIA Site boundary is to be considered.

Source of Effect

- 7.87. This section outlines the various potential sources of affect attributable to the Proposed EIA Development.
- 7.88. Global mean temperatures have already reached 1.1°C above the pre-industrial average and are almost certain to reach the Paris Agreement aspiration limit of 1.5°C in the next decade. But most UK design standards are still based on historic weather data, meaning that buildings and infrastructure are not fit for either the current observed warming or the significant further warming expected over the coming decades.
- 7.89. For the UK, climate change has led to a continued trend of record-breaking weather patterns. The Met Office reports that the last two decades have seen all of the top 10 warmest years and six of the top 10 wettest years on record. Studies have clearly shown that these extreme weather events are made both more likely, and more severe, by human-induced climate change. Continuing to emit greenhouse gases into the atmosphere will lead to further warming, worsening this trend and leading to greater instability in our climate and the societal systems that are founded on it.
- Climate projections paint a stark picture of how our climate might look in the future. Without immediate and radical mitigation, it is expected that:
- Summer temperatures will be substantially hotter on average, with a marked increase in the frequency and severity of heatwaves
 - Considerably more rainfall will occur during winter, in shorter more intense downpours
 - Less rain will fall during the summer overall, and that which does fall will do so in shorter more intense spells, leaving much greater periods of drought in-between
- 7.90. Sea levels will rise further, reducing the return period of extreme sea levels and undermining the effectiveness of coastal defences.
- 7.91. These chronic and acute changes in climate act to increase the frequency and severity of weather extremes such as floods, storms, heatwaves, and droughts. This magnifies the risks to buildings and infrastructure by increasing their vulnerability and exposure
- 7.92. For this EIA Site, the physical hazards due to climate change have been considered as: increase in peak summer temperature, increase in average temperature, increase in volume and intensity of winter rainfall, decrease in rainfall volume, but increase in intensity in summer rainfall, shifts in wind and snowfall patterns.

Baseline Conditions

- 7.93. An assessment of future climate impacts is based on a set of standard climate projections to understand the range of outcomes that may occur and take proportionate action to address risks. The projections of climate used in this report are based on data available from the UK Climate Projections 2018 (UKCP18) which provide the most up-to-date assessment of how the climate of the UK may change over the 21st century. Its tools have regional and local projections and are designed to help those who wish to better understand the risk impacts and hazards of climate change.
- 7.94. To account for the uncertainty in global carbon emissions, UKCP18 uses four distinct global emissions pathways to define a common set of emissions scenarios for use in climate research. Introduced in the Intergovernmental Panel on Climate Change's (IPCC) fifth Assessment Report (AR5), these defined scenarios are known as the Representative Concentration Pathways (RCPs). The RCPs provide a representation of several distinct, but equally probable, global carbon emissions scenarios. This report will focus on two scenarios: RCP4.5 and 8.5 and the timeframe of medium to long term projections (2040 & 2080 respectively).

Identification and Evaluation of Likely Significant Effects

- 7.95. The significance of climate hazards considers the magnitude of environmental impacts on building elements during construction and operation, alongside the sensitivity of the receptors exposed to these hazards.
- 7.96. As there is no legislative definition of 'significance', the conclusion as to whether an impact on a climate hazard is significant comes down to professional judgement, reflecting the determination of magnitude and sensitivity.
- 7.97. In categorising magnitude of impact, due consideration has also been given to the nature, duration and geographical scale of the effect in question (e.g. direct/indirect, temporary/permanent, short/medium-term, etc).

Table 7.14: Magnitude / consequence of environmental impact

Magnitude / Consequence	Environmental Impact
Substantial / Severe (risk rating: 12-16)	Severe damage to key characteristics, features or elements of the development. Permanent / irreplaceable change, which is certain to occur. • Catastrophic damage to building/public realm. • Substantial exposure a potential loss. • No or negligible effort to strengthen resilience of built asset. • Damage to building/services/environment rendering asset unsafe to occupy. • Asset is stranded - demolition and full re-build required • Business interruption or direct damage resulting in total financial loss.
High (risk rating: 7-9)	Partial loss of or damage to key characteristics, features or elements (Significant). Permanent / irreplaceable change, which is likely to occur • High levels of damage to building/public realm. • Substantial re-build or substantial reduction in asset value • Limited effort to strengthen resilience of built asset. • Damage to building/services/environment rendering asset unsafe to occupy. • Business interruption or direct damage resulting in substantial financial loss
Moderate (risk rating: 4-6)	Minor loss of, or alteration to, one (maybe more) key characteristics, features or elements; measurable change in attributes, quality or vulnerability. Long-term though reversible change, which is likely to occur. • Low levels of damage to building/public realm. • Efforts have been made to strengthen resilience of built asset. • Damage to building/services/environment rendering asset unsafe to occupy or unsafe on a short-term basis. • Damage to vulnerable buildings/structures/services or the environment. • Limited business interruption resulting in financial loss
Minor (risk rating: 2-3)	Very minor loss of, or alteration to, one (maybe more) key characteristics, features or elements; noticeable change in attributes, quality or vulnerability. Short- to medium-term though reversible change, which could possibly occur. • Very low levels of damage to building/public realm. • Built asset has negligible exposure to a potential loss. • Substantial efforts have been made to strengthen resilience of built asset. • Damage to building/services/environment rendering asset unsafe to occupy or unsafe on a very short-term basis. • Damage to vulnerable buildings/structures services or the environment. • No or limited business interruption resulting in financial loss.
Negligible (risk rating: 1)	Temporary or intermittent very minor loss of, or alteration to, one (maybe more) characteristic, feature or element; possible change in attributes, quality or vulnerability. Short-term, intermittent and reversible change, which is unlikely to occur • Negligible levels of damage to building/public realm. • Built asset has negligible exposure to a potential loss. • Substantial efforts have been made to strengthen resilience of built asset. • Damage to building/services/environment will not render asset unsafe to occupy. • Limited damage to vulnerable buildings/structures services or the environment. • Very limited business interruption resulting in financial loss.
Neutral	No loss or alteration to any characteristic, feature or element.

- 7.98. The sensitivity of receptors is defined by a combination of two factors: the susceptibility and the vulnerability of the receptor. The geographical extent of the receptors for the scope of this Climate Change Chapter is limited to the local area and the assets on the Proposed EIA Development, identified as the public realm and building. The sensitivity of the receptor is judged on a scale of Very high, high, medium, low, and negligible, dependent on ability to withstand the existing climate conditions. As seen in the below table.

Table 7.15: Sensitivity of receptors

Rating/Sensitivity Value	Guidelines on susceptibility of receptors (Public realm, building)	Guidelines on vulnerability of receptors (Public realm, building)
Very High	Receptor has no ability to withstand/not be substantially altered by the projected changes to the existing/prevaling climatic factors (e.g. lose substantial amount of its original function and form).	Receptor is directly dependent on existing/prevaling climatic factors and reliant on these specific existing climate conditions continuing in future (e.g. river flows and groundwater level) or only able to tolerate insufficient variation in climate conditions.
High	Receptor has minimal ability to not be substantially altered by the projected changes to the existing/prevaling climatic factors (e.g. lose much of its original function and form).	Receptor is dependent on existing/prevaling climatic factors or able to tolerate limited variation in climate conditions.
Medium	Receptor has some ability to withstand/not be altered by the projected changes to the existing/prevaling climatic conditions (e.g. retain elements of its original function and form).	Receptor is dependent on some climatic factors but able to tolerate a range of conditions.
Low	Receptor has the ability to withstand/not be altered much by the projected changes to the existing/prevaling climatic factors (e.g. retain much of its original function and form).	Climatic factors have little influence on the receptors.
Negligible	Not applicable (no receptors are not susceptible to risk hazards).	Not applicable (no receptors are not vulnerable to risk hazards).

- 7.99. To determine level of significance, the assessment of likely significant effects to sensitive receptors has considered the sensitivity of the receptor and the anticipated magnitude of change in the baseline conditions. Significant effects have been determined on the basis of the impact magnitude criteria and through professional judgment.
- 7.100. The assessment matrix provided in the below table will identify the significance of the climate hazard, developed from Table 2.3 Impact Significance Matrix in 'Plot 10 FS – Issued Briefing Note'. A significant effect is defined as a high or moderate adverse hazard to the development.

Table 7.16: Assessment matrix

Magnitude of Impact/Effect	Sensitivity Value of Receptor				
	Very High	High	Medium	Low	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Negligible	Minor Adverse	Minor Adverse	Negligible/Minor Adverse	Negligible/ Minor Adverse	Neutral/ Negligible

Moderate/Minor	Moderate/High Adverse	Minor/ Moderate Adverse	Minor Adverse	Negligible/ Minor Adverse	Negligible/ Minor Adverse
High	High/Substantial Adverse	Moderate/High Adverse	Moderate Adverse	Negligible/ Minor Adverse	Negligible/ Minor Adverse
Substantial / Severe	Substantial Adverse	High/Substantial Adverse	Moderate/High Adverse	Minor/ Moderate Adverse	Minor Adverse
Significant Impact		Potentially Significant Impact	Potentially Significant Impact	Potentially Significant Impact	Not significant

Cumulative Effects

- 7.101. An assessment of the significant climate change effects against the significant criteria has been undertaken below. Type 1 Effects will detail these effects on building and public realm receptors and the consequent design disciplines.
- 7.102. Further direction for Type 2 Effects to be confirmed by project planning team and approved by local authority.

Increasing average / maximum temperatures

- 7.103. Surface air temperature is a key indicator of global, regional and local climate change that has implications for the built and natural environment, human health and critical infrastructure.
- 7.104. Extreme heat can have a range of impacts. Brief hot spells can lead to impacts on human health, especially in urban areas where buildings retain heat, resulting in higher night-time temperatures. Impacts on transport can include buckling of rail tracks and reductions in the safe loading of aircraft. More prolonged heat can result in strong demands on water resource, cause pipe movement and breakages due to soil shrinkage and create favourable conditions for wildfire.
- 7.105. Global temperature in any given year is affected by factors such as the concentration of greenhouse gases in the atmosphere and natural processes within the climate system. Regionally, factors including circulation patterns and the land-sea contrast strongly affect temperature. Locally, land height and land use have an influence on temperature, such as sea breezes and frost hollows
- 7.106. Increases in temperature are a consistent feature of each of the climate scenarios. The most significant risks are likely to be as a result of increases in summer peak temperatures and increases to average temperatures which could change the demand profiles for building cooling systems. Currently according to historical weather data, the annual average day temperature: 12.8°C and night: 6.5°C; and the current summer day temperature: 19°C and night: 11.3°C; and for winter, the average day temperature is 6.7°C and night: 2.3°C.

Intense rainfall events / Precipitation

- 7.107. Precipitation, both rainfall and snowfall, can cause significant societal and economic impacts on various timescales. Short, intense rainfall events (e.g. thunderstorms) can lead to pluvial or surface flooding as surface run-off inundates small catchments and the urban landscape. Prolonged periods of excessive precipitation saturates soil, increasing the risk of fluvial or river flooding. Above average precipitation for long periods can ultimately lead to a raised water table, which can result in groundwater flooding in areas where the geological characteristics are favourable. In the UK and Europe, flooding is one of the most economically and socially disruptive natural hazards with impacts on transport, infrastructure and energy supply. Changes in precipitation patterns in the future – increases or decreases in totals on seasonal or multi-year timescales – have implications for major investment and planning decisions made by UK public and private sector organisations.
- 7.108. Changes in annual precipitation patterns are a consistent feature across each of the climate scenarios. Each scenario projects increases in winter precipitation which is predicted to occur in shorter more intense downpours. According to historical weather data, the current average winter months rainfall is 93.7mm with a peak in December with 94.1mm, and in the summer months rainfall the average is 118mm with peak of 124.2mm in July. The climate science indicates that summer will see reductions in the overall volume of rainfall which is again predicted to occur in shorter more intense downfalls.

Flooding

- 7.109. The Environment Agency (EA) uses computer models to assess an area's long-term risk from rivers and the sea, surface water, reservoirs, and some groundwater. The EIA Site is not within close proximity to any major seas; therefore, the only flooding risks will arise from fluvial flooding from the nearby river.

Snow

- 7.110. While projections of snow both nationally and regionally are of lower concern than current weather, it is clear that operations and maintenance regimes will still need to consider snow, and it is also expected that more intense winter storms will bring more extreme events alongside the reduced overall frequency.

Wind

- 7.111. There have been no compelling trends in storminess (maximum gust speeds), from the UK wind network over the last four decades, indicating that climate change has not had a significant impact on wind speeds and storms up to the present. However, there is some indication of a potential for increase in wind speeds over the UK during the second half of the 21st century during the winter (when more significant impacts of wind are experienced). This is also accompanied by an increase in the frequency of winter storms over the UK. Any increase is however masked by year-to-year variability and should be considered with local microclimate knowledge.

Table 7.17: Assessment of significant climate change effects

Nature of Impact	Type 1 Effect (Building)	Type 2 Effect (Public Realm)
Increasing average / maximum temperatures	<i>Architectural/Structural</i> - Thermal expansion of building materials - Decreased service life of building components and accelerated deterioration of the façade through UV exposure - Increased UV exposure may result in deterioration of flexible elements (e.g. sealants) <i>Building Services</i> - Extended periods of hot weather can lead to regional disruptions to electrical distribution and results in power outages for buildings onsite - HVAC systems running at maximum capacity for longer resulting in additional wear and tear and increasing the likelihood of mechanical failure and maintenance works. - Overheating of elevator controllers / main distribution transformer - Future utility costs increasing - Comfort cooling system may not have sufficient capacity to maintain comfort conditions and cause heat stress for occupants - Additional cooling capacity to meet increasing temperatures contribute to increased demand on buildings electrical infrastructure. <i>Landscape & Ecology</i> - Roof top and green wall vegetation may brown and die, leading to increased irrigation costs and/or replacement. Average risk rating: 7 (High Adverse)	<i>Architectural/Structural</i> - Overheating of public spaces making them uncomfortable for users - Overheating and humidity of outdoor furniture (i.e. benches) and fixtures (handrails, bike racks) making them unable to be used for their intended purposes - Urban heat island impacts causing increase in temperatures and day-time temperatures <i>Building Services</i> - Regional power outages resulting in temporary disruption to street lighting. <i>Civils & Infrastructure</i> - Access roads and surfaces such as asphalt can become susceptible to permanent deformation <i>Landscape & Ecology</i> - Water shortages could lead to landscape vegetation loss and die back - Extended drought to the soils may impede their availability to absorb any flash flood or rainfall events leading to flooding following summer storms - Non-native planting susceptible to predators and pests - New pests and diseases in wake of higher temperatures and migration - Increase in native drought-tolerant species - Increased dry winds may impact/cause damage to species coming in Average risk rating: 7 (High Adverse)

Nature of Impact	Type 1 Effect (Building)	Type 2 Effect (Public Realm)
Intense rainfall events / Precipitation	<i>Architectural/Structural</i> - Drainage and guttering overwhelmed by intense rainfall events resulting in water ingress into building envelope <i>Building Services</i> - Roof top equipment damaged by heavy rainfall events or ponding of water on rooftop - Heavy rainfall and regional flooding could result in ingress into ground floor and basement areas resulting in damage to mechanical / electrical equipment, floors, finishes and furniture <i>Civils & Infrastructure</i> - Overwhelming of building guttering and drainage system could result in water falling into access routes and public realm spaces overwhelming local drainage systems. <i>Landscape & Ecology</i> - Waterlogging of landscaped areas on the rooftop. Average risk rating: 6 (Moderate Adverse)	<i>Architectural/Structural</i> - Overwhelming of building guttering and drainage system could result in water falling into access routes and public realm spaces. <i>Civils & Infrastructure</i> - Changes in peak rainfall events could increase the volume of surface water runoff leading to water overflowing into access roads <i>Landscape & Ecology</i> - Changes in peak rainfall events could increase the volume of surface water runoff leading to water overflowing into areas of landscaping and waterlogging of soils resulting in damage to planting onsite. Average risk rating: 5 (Moderate Adverse)
Flooding	<i>Architectural/Structural</i> - Accessibility into the building may be restricted and routes to the science park disrupted during flooding <i>Building Services</i> - Heavy rainfall and regional flooding could result in ingress into ground floor and basement areas resulting in damage to mechanical / electrical equipment, floors, finishes and furniture <i>Civils & Infrastructure</i> - Foundations and substructure not designed to accommodate changing weather and groundwater conditions Average risk rating: 3 (Minor Adverse)	<i>Civils & Infrastructure</i> - Flooding and onsite water ponding resulting in manholes and service trenches being unable to be accessed. <i>Landscape & Ecology</i> - Waterlogging and surface ponding of landscaped areas. Average risk rating: 3 (Minor Adverse)
Snowing	<i>Architectural/Structural</i> - MEP equipment at roof level - accessibility of equipment <i>Building Services</i> - Extended periods of snowfall/storm events can lead to regional disruptions to electrical distribution and results in power outages for buildings onsite - Additional heating capacity to meet increased frequency of cold days contribute to increased demand on building/'s electrical infrastructure. Heating systems running at maximum capacity for longer resulting in additional wear and tear and increasing the likelihood of mechanical failure and maintenance works.	<i>Architectural/Structural</i> - Snowing in public spaces making them uncomfortable for users - Snow on outdoor furniture (i.e. benches) and fixtures (handrails, bike racks) making them unable to be used for their intended purposes <i>Building Services</i> - Regional power outages/shutdowns resulting in temporary disruption to street lighting. <i>Civils & Infrastructure</i> - Restricted accessibility of transport. - Surface run off around public realm.

Nature of Impact	Type 1 Effect (Building)	Type 2 Effect (Public Realm)
	• Future utility costs increasing • Comfort heating system may not have sufficient capacity to maintain comfort conditions and cause heat/ventilation stress for occupants • Regional power outages/shutdowns resulting in loss of electrical heating in building. Average risk rating: 4 (Minor Adverse)	Average risk rating: 3 (Minor Adverse)

Mitigation Measures

- 7.112. In response to the risks and significant effects identified above, the design team have and will be making appropriate mitigation measures. The mitigation measures are considered against the timescale of the project, and appropriate design and operational mitigation measures will be implemented. As the development undergoes changes throughout the design stages, mitigation measures will adapt subsequently. The scope of this Climate Change Chapter looks at the potential climate change risks for the development and surrounding area during operation, and as such no potential environmental effects have been identified for the construction phase.

Increasing average / maximum temperatures

Architectural/Structural

- 7.113. Plot 10a: The precast concrete cladding will offer ample shading to the terrace in the way of tall column structures which are restrained back to the core by secondary steel at high level - this will again provide shading from above. Incorporating variety of planting in public spaces including trees, perennials, and shrubs. Natural shading will be provided by scalloped pre-cast cladding. Glazing ratios will be optimised to 40%, whilst 60% solid to the façade has been introduced to reduce solar gain and therefore reduce the energy demands by reducing the need to provide cooling. The increase in solid façade will have additional insulation which will improve the thermal performance of the façade which will further reduce heat losses. The solid façade will be made from a natural material; precast concrete has been chosen for its inherent reduction in embodied carbon. Use of this material will provide significant savings in the energy used to construct the building. It will also improve the airtightness of the façade resulting in less energy escaping from the building.
- 7.114. Plot 10b: External canopies / pergolas have been proposed by the Landscape Architects to provide the external seating with shelter from the sun. The principal material proposed on Plot 10b is brickwork. This is a UV stable product. The specific brickwork selected will take the UV Stability into further consideration. Overheating and Ventilation assessments are being carried out by Ridge to ensure that the size of windows, degree that they open and the free air they provide addresses the overheating and ventilation requirement of all rooms. The windows have been positioned at a minimum of 100mm back from the external.

Building Services

- 7.115. Plot 10a: The building will have a back-up power supply for essential services via a diesel generator, however, this will not include street lighting. Passive cooling will be promoted and used in the first instance. The facade has been designed to allow for mixed mode ventilation with opening vents as part of the glazing system. These will provide natural ventilation to the workplace. The vents will be manually opened. On temperate days, the windows will open to allow fresh air into the floor plate. This fresh air will be pulled across the floor plate by mechanical extractors and will provide fresh air to all parts of the workplace. Using natural ventilation reduces the energy requirement by removing the need to provide fresh air to office floor plates. Access to natural ventilation will also help to improve employee wellbeing. It helps to avoid recirculated air, reducing CO2 which in turn improves employee's performance and health.
- Refrigerant pipework is susceptible to UV damage. Pipework insulation to be painted in UV-resistant paint. The design has been based on the tenant requirements and use current CIBSE weather files and doesn't allow for climate change, however the central plant is designed to achieve 24 deg C within the space and is therefore oversized for the proposed (future) internal design condition of 26 deg C. This difference will therefore go some way to offsetting increases in external temperature due to climate change. A DfP model has been used from stage 2 onwards to look at how the EIA Site can optimise efficiency.

- 7.116. Plot 10b: Emergency lighting, including where necessary external lighting with battery back-up, will be provided to allow people to exit the building and travel to a point of safety. There is currently very limited cooling in the project however the heating systems are currently based on Air Source Heat Pumps. The ASHPs could be utilised in cooling as well as heating mode in the future, allowing additional energy efficient cooling to be added without an increase in electrical load or additional main cooling plant. TM59 overheating analysis for the accommodation spaces has used the DSY50 weather file that accounts for a level of future hotter periods. Retrofit may be needed to recover cooling energy.

Civils & Infrastructure

- 7.117. Plot 10a: Natural stone and soft landscaping.
- 7.118. Plot 10b: Raingardens along Wilmott Street.

Landscape & Ecology

- 7.119. Plot 10a: Proposing drought and heat resistant species that will cope with future climate change. Incorporating bioswales along River Street east and collect surface runoff. Including water retaining materials in soil mix such as clay pebbles and water retaining granules
- 7.120. Plot 10b: No landscaping is proposed on the roof of Plot 10b. Landscape is limited to the ground floor.

Intense rainfall events / Precipitation

Architectural/Structural

- 7.121. Plot 10a: Blue roof proposed for terrace areas - floors 11 & 12. The blue roof can be future proofed to take into account increase level of rainfall and be designed to hold a greater volume of water before discharging.
- 7.122. Plot 10b: Concrete slab construction will prevent water ingress from above.

Building Services

- 7.123. Plot 10a: Basement plant equipment does not include electrical provision. Cold water stores / tanks and booster sets. Substations and switch rooms located at ground floor.
- 7.124. Plot 10b: Public realm levels to be designed to direct overland flows away from the building. MEP equipment will be mounted such that elements sensitive to water ingress are not directly on the ground either by plinths or mounting feet, using wall mounted equipment or blank sections.

Civils & Infrastructure

- 7.125. Plot 10a: Raingardens and bioswales. All tree planting in soft landscape. Flat blue roof construction will discharge all water inboard through the building via RWPs to below ground drainage points. No rainwater will be allowed to flow over the building façade.
- 7.126. Plot 10b: The proposed surface water discharge rate from the EIA Site has been limited to 4.85l/s which is a 50% betterment on the calculated Q1 (1 in 1 year storm) run-off rate for the existing brownfield site in line with local planning policy. Surface water attenuation is provided in the form of a below ground tank for all rainfall events up to the Q100 (1 in 100 year storm) + 40% allowance for climate change.

Landscape & Ecology

- 7.127. Plot 10a: Surface water drainage discharges to public sewer. Infiltration not feasible due to ground conditions. Scope for SUDS features within the public realm is limited due to levels and extensive hard landscaping, rain gardens to be incorporated where feasible. Raingardens and bioswales. Suggestion to use solar/renewables to power any additional irrigation needs and to make any irrigation 'water neutral'.
- 7.128. Plot 10b: Adequate controlled drainage: Surface water attenuation is provided in the form of a below ground tank for all rainfall events up to the Q100 (1 in 100 year storm) + 40% allowance for climate change.

Flooding

Architectural/Structural

- 7.129. Plot 10a: A secondary entrance is proposed which will provide access off Hulme Street to the rear of the building. This is the higher end of the EIA Site and therefore least likely to be affected by flooding.

- 7.130. Plot 10b: Specifically the building floor level and all entrances have been set such that they are within Flood Zone 1 and above the predicted flood level for the 1 in 1000 fluvial flood event (> 0.1% probability of fluvial flooding in any one year).

Building Services

- 7.131. Plot 10a: An opening in the slab above the basement with lifting device will allow any damaged plant to be replaced if need be. This is written into the access & maintenance strategy for the building.
- 7.132. Plot 10b: GF slab level set above EA predicted flood levels such that the building is within flood zone 1. MEP equipment will be mounted such that elements sensitive to water ingress are not directly on the ground either by plinths or mounting feet, using wall mounted equipment or blank sections.

Civils & Infrastructure

- 7.133. Plot 10a: Raingardens and bioswales.
- 7.134. Plot 10b: Raingardens and bioswales. Pile design will be based upon the ground conditions and ground water levels as encountered in the site investigation and won't specifically consider future changes in ground water levels.

Landscape & Ecology

- 7.135. Plot 10a: Water storage/irrigation needs for landscaping needs will be reviewed by the wider team as planting specs are developed.
- 7.136. Plot 10b: Manual watering of trees will be required for the first two growing seasons – thereafter, rainfall will provide the necessary watering requirements. Additional manual watering will only be required during extreme drought conditions. Soils will be specified to retain moist.

Snow

Architectural/Structural

- 7.137. Both Plots: Storage areas to keep equipment locked away safe in extreme weather can be provided. The cycle store is internal and therefore not affected. All plant and equipment mounted on the roof will be suitable for an outdoor environment and will have the necessary protection provided as part of the design.

Building Services

- 7.138. Plot 10a: The building will have a back-up power supply for essential services via a diesel generator, however this will not include street lighting. The design has been produced in line with the tenant specification and uses current CIBSE weather files, however, the heating calculation assume a worst-case scenario and maintains space temperature with no internal gains. As the building is used there will be additional heat gains from lights, equipment and occupants.
- 7.139. Plot 10b: Emergency lighting, including where necessary external lighting with battery back-up, will be provided to allow people to exit the building and travel to a point of safety. Electrical supplies to ASHPs will be sized for the maximum output based on the manufacturer's literature. The overall building demand is diversified but capable of heating on a cold day. The frequency of cold days will increase running costs but won't have an impact on the capability of the building's infrastructure.

Residual Effects

- 7.140. The residual impacts of the Proposed EIA Development following implementation of proposed mitigation will be estimated in the table below, following the mitigation measures discussed with the design team in the Mitigation Measures section. The table describes the likely significant effect prior to the implementation of mitigation measures if receptors were to be exposed to the identified risks without interference. The means of implementation of mitigation are also addressed to identify the likely outputs developed by the design team – simultaneously highlighting responsibilities within the design team in addressing each mitigation measure.
- 7.141. The scope of this Climate Change Chapter looks at the potential climate change risks to the development (as built and during operation) and its surrounding area. As such no potential environmental effects in relation to climate change have been identified for the construction phase.

Table 7.18: 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 (i.e., Temporary/Permanent)
Operational Phase				
High adverse effects from increasing average / maximum temperatures (Average risk rating: 7)	Public Realm	<u>Both Plots</u> <i>Para 7.46,.47:</i> Proposed EIA Development will include external shading in the form of soft landscaping/planting and canopies/pergolas. <i>Para 7.52,.52:</i> consideration of high heat resistant plant species and incorporating bioswales	Landscaping strategy at design stage Ventilation strategy and Planting strategy / Ecology reports at preconstruction stage for relevant planning conditions	Moderate adverse effects from increasing average / maximum temperatures (Average risk rating: 5)
High adverse effects from increasing average / maximum temperatures (Average risk rating: 7)	Building	<u>Plot 10a</u> <i>Para 7.46:</i> glazing ratios will be reduced, and solid façade will be introduced to reduce solar gain and energy demand for cooling. <i>Para 7.48:</i> Mixed mode ventilation on façade. <u>Plot 10b</u> <i>Para 7.47:</i> 100mm operable windows to be positioned at certain angles. <i>Para 1.49:</i> ASHPs installed.	Overheating and ventilation assessments and HVAC/Energy strategy at preconstruction stage for relevant planning conditions	Minor adverse effects from increasing average / maximum temperatures (Average risk rating: 4)
Moderate adverse effects from intense rainfall events (Average risk rating: 5)	Public Realm	<u>Plot 10a</u> <i>Para 7.58:</i> Raingardens and bioswales. All tree planting in soft landscape. <u>Plot 10b</u> <i>Para 7.57:</i> public realm levels to be designed to direct overland flows away from the building. <i>Para 7.60:</i> Raingardens to be incorporated where feasible.	Flood risk assessment at preconstruction stage for relevant planning conditions Landscaping strategy and Elevation plans at design stage	Minor adverse effects from intense rainfall events (Average risk rating: 3)
Moderate adverse effects from intense rainfall events (Average risk rating: 6)	Building	<u>Plot 10a</u> <i>Para 7.54:</i> blue roof proposed on terrace areas on two floors. <i>Para 7.60:</i> Surface water drainage discharges to public sewer <u>Plot 10b</u> <i>Para 7.54,.61:</i> adequate controlled drainage. <i>Para 7.55:</i> Roof slabs set to falls to prevent standing water. <i>Para 7.59:</i> surface water attenuation to be provided in the form of a below ground tank <i>Para 7.57:</i> MEP equipment will be mounted.	Flood risk assessment at preconstruction stage for relevant planning conditions Landscaping strategy and MEP report at design stage	Minor adverse effects from intense rainfall events (Average risk rating: 3)
Minor adverse effects from flooding (Average risk rating: 3)	Public Realm	<u>Plot 10a</u> <i>Para 7.62:</i> a secondary entrance proposed to be more elevated than the rest of the EIA Site. <i>Para 7.67:</i> Water storage/irrigation needs for landscaping needs will be	Design and Access Statement, Elevation plans, Landscaping strategy and MEP	Negligible effects from flooding (Average risk rating: 2)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
		reviewed by the wider team as planting specs are developed. <u>Plot 10b</u> <i>Para 7.67:</i> Raingardens and bioswales.	report at design stage	
Minor adverse effects from flooding (Average risk rating: 3)	Building	<u>Plot 10a</u> <i>Para 7.64:</i> An opening in the slab above the basement with lifting device will allow any damaged plant to be replaced if need be. <u>Plot 10b</u> <i>Para 7.65:</i> MEP equipment will be mounted.	Access and maintenance strategy at design stage	Minor adverse effects from flooding (Average risk rating: 3)
Minor adverse effects from snowing (Average risk rating: 3)	Public Realm	<u>Plot 10a</u> <i>Para 7.71:</i> The building will have a back-up power supply for essential services via a diesel generator, however this will not include street lighting.	Architectural plans at design stage Energy strategy at preconstruction stage for relevant planning conditions	Minor adverse effects from snowing (Average risk rating: 3)
Minor adverse effects from snowing (Average risk rating: 4)	Building	<u>Plot 10a</u> <i>Para 7.70:</i> Storage areas to keep equipment locked away safe in extreme weather can be provided. All plant and equipment mounted on the roof will be suitable for an outdoor environment and will have the necessary protection provided as part of the design. <u>Plot10b</u> <i>Para 7.72:</i> Emergency lighting, including where necessary external lighting with battery back-up, will be provided to allow people to exit the building and travel to a point of safety.	Architectural plans at design stage	Minor adverse effects from snowing (Average risk rating: 4)

Monitoring

7.142. As the development undergoes changes throughout the design stages, mitigation measures will adapt subsequently. As such a monitoring plan will be developed to check that the assumptions made above remain valid. Planning conditions will also be monitored to ensure the means of implementation are carried out at their respective timelines.

Reference List

7.143. This ES Chapter has been prepared by reference to the following:

Climate Change Adaptation

- IEMA (2020) *Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation*.
- IEMA (2022) *Climate Change Adaptation Practitioner Guidance*.
- UKGBC (2022) *A Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets*.
- Met Office (2021) *UKCP18 Factsheet: Precipitation*.

- Met Office (2021) *UKCP18 Factsheet: Temperature*.
- Met Office (2021) *UKCP18 Factsheet: Snow*.

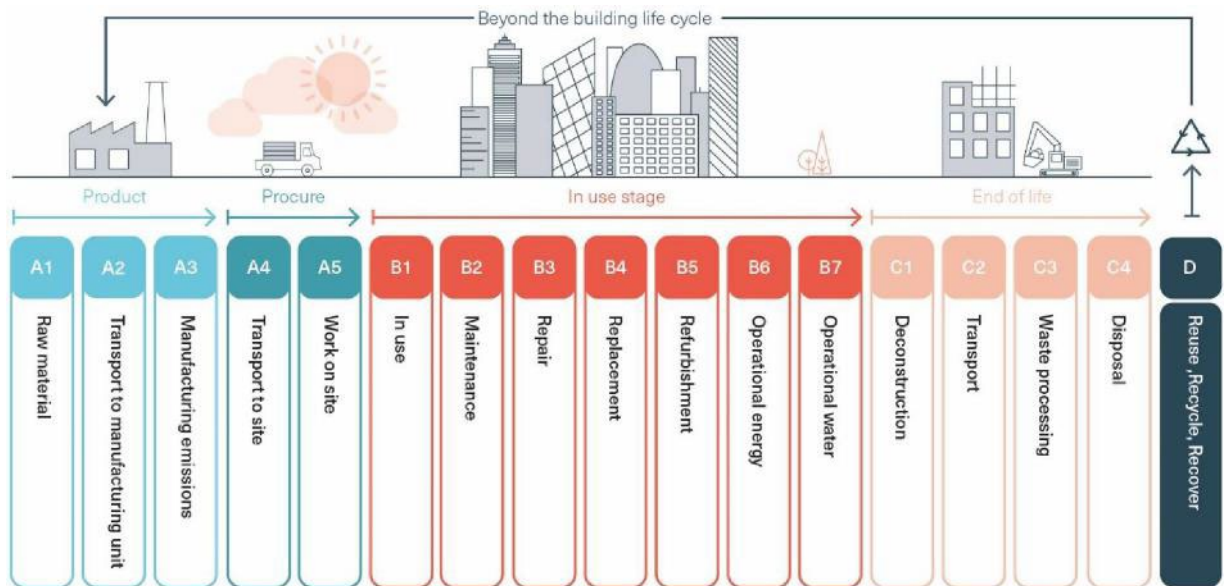


Figure:	7.1		
Title:	Figure 7.1: Whole life carbon cycle stages A1 - D		
Project:	Plot 10 – First Street		
Date:	February 2023	Scale:	N/A

8. Daylight, Sunlight and Overshadowing

Introduction

- 8.1. This Chapter of the ES has been prepared by Proximity and assesses the likely Daylight and Sunlight amenity impacts of the Proposed EIA Development upon the EIA 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. This Chapter is accompanied by the following technical appendices:
- 10A – Massing Images Baseline v Proposed
 - Window Maps
 - 10A Technical Analysis Results
 - 10B – Massing Images Baseline v Proposed
 - 10B Technical Analysis Results
 - 10A + 10B – Massing Images Baseline v Proposed
 - 10A + 10B Technical Analysis Results
 - Massing Images - Cumulative Scenario
 - Technical Analysis Results - Cumulative Scenario
 - Mirror Image Analysis
 - Façade Study
- 8.3. The authors of the chapter are chartered surveyors with up to 18 years experience in preparing daylight and sunlight amenity impact assessments for EIA developments.

Assumptions and Limitations

- 8.4. To ensure transparency within the EIA process, the following limitations and assumptions have been identified.
- We have inspected the EIA Site and walked its surroundings and in so doing have identified the window provision of the neighbouring buildings that overlook the EIA Site (to the extent that such windows are capable of being observed from the adjacent public highways).
 - To facilitate the running of the technical analysis, computerised 3D massing simulations of the EIA Site and its immediate surroundings have been constructed, in its Baseline, Proposed and Cumulative massing configurations. In building the 3D massing models, the following information, provided to us by others, has been relied upon:
 - Working to a brief set by Proximity, Technics Group and Clugston Group were instructed to laser scan the EIA Site and its surroundings, to capture the massing of the EIA Site and its surroundings and the window provision of the neighbouring buildings. The scan data has been supplemented with a photogrammetric model to establish the massing of buildings in the wider area.
 - A topographically accurate computer generated 3D model of the Proposed EIA Development has been given to us in an AutoCAD format by scheme Architects, Jon Matthews Architects for Plot 10a; and Tim Groom Architects for Plot 10b.
 - 3d Autocad model of 10a massing provided by Jon Matthews Architects
 - 3d Autocad model of 10b massing provided by Tim Groom Architects

- Following technical assessment we have been advised that the footprint of plot 10b will be positioned circa 1m further west (i.e. further back from the River Street frontage facing Macintosh Mill) than has been assessed. Whilst this minor change may yield marginally different results it is unlikely to result in materially different conclusions than those set out below.
- Proximity have identified the neighbouring buildings of residential use from observations made during their site inspections, but also by reference to the Valuation Office Agency records – neighbouring buildings with a Council Tax Band being of residential use.
- In undertaking this appraisal Proximity will not have been inside any of the neighbouring buildings. It is, therefore, be necessary to make some assumptions as to the size, arrangement, and use of the rooms behind the neighbouring windows. Assumptions have been informed by letting particulars available from the internet, lease plans available from Land Registry, and from Planning Applications available digitally via Manchester City Council's public planning access system, as follows:
 - Macintosh Mill – Lease plans available from Land Registry;
 - Chorlton Mill – Lease plans available from Land Registry;
 - Cambridge Mill – Lease plans available from Land Registry;
 - City South Apartments – Lease plans available from Land Registry;
 - Plot 11 First Street development – MCC Ref 125573/FO/2019.
- For the purposes of the Cumulative assessments, Proximity's understanding of the massing of the various Planning approved neighbouring developments will be based on pdf drawings that are available to download from Manchester City Council's Planning public access portal and referenced in the table within the Cumulative Effects section of this Chapter below.

Legislative and Policy Context, Guidance

Legislation

- 8.5. There is no legislation that governs daylight and sunlight amenity

National Planning Policy

- 8.6. There are no national planning policy guidelines that directly govern daylight and sunlight amenity in terms of sufficiency and acceptable negative or adverse impacts.
- 8.7. It is, however, acknowledged that the National Planning Policy Framework ("NPPF") 2021 confirms the Government's objective to conserve and enhance the natural and local environment in the planning system. The availability of daylight and sunlight are, of course, natural resources that can enhance an environment.
- 8.8. The NPPF promotes, where appropriate, an uplift in density for residential development in town and city centres, and notes that a flexible approach should be taken in applying guidance relating to daylight and sunlight in such areas of high density.
- 8.9. The recommended standards and appraisal methodology is set out in the Building Research Establishment (BRE) Guidance Note 'Site Layout Planning for Daylight & Sunlight: A Guide to Good Practice' as the most appropriate basis for measuring and evaluating the daylight and sunlight amenity impact in the built environment (see Guidance section below for further detail).

Sub-Regional Planning policy

- 8.10. n/a

Local Planning Policy

- 8.11. Manchester City Council's ("the Council") Core Strategy was adopted in July 2012 and is the key development plan document in the Local Development Framework ("LDF").
- 8.12. The Council will promote the construction of tall buildings, per Policy EN2 of the Core Strategy. Tall buildings, in the context of that Policy, 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 if certain design criteria are met.
- 8.13. It is acknowledged as part of Policy EN2 that tall buildings can have a significant impact on the local environment and the Council expect that its impact be modelled.

- 8.14. The Council do, however, also acknowledge in Policy CC6 of the Core Strategy that development in the City Centre will generally be “high density” and that the scale, massing and height of development in the City Centre will exceed what is appropriate elsewhere in the City.
- 8.15. The Core Strategy confirms that all new developments should follow certain “development principles”. Policy DM1 – Development Management – confirms that all developments should have regard to a number of issues, such as the effects on amenity, including light.
- 8.16. The Guide to Development in Manchester Supplementary Planning Document (“SPD”) confirms that consideration should be given to issues including overshadowing to hard landscaped areas within the public realm.

MCC Residential Quality Guidance

- 8.17. This Guidance was published in March 2017 and is intended to provide clear direction on the considerations, qualities, and opportunities that will help to deliver high quality residential development of part of successful and sustainable neighbourhoods across Manchester.
- 8.18. In encouraging developers to “appreciate scale” the Guidance acknowledges that taller buildings can have an impact on the character and atmospheric quality of the spaces immediately around them; affecting light and shadow amongst other things and requiring developers and their design teams to demonstrate how massing and scale have been considered in terms of its impact on the neighbourhood, street and block.

First Street Masterplan

- 8.19. The First Street Strategic Development Framework dated August 2015 is adopted by Manchester City Council and confirms that high density development (tall buildings located in close proximity of one another) are appropriate for the EIA Site and its immediate surroundings.
- 8.20. The Framework Update of 2018 and Framework Addendum of 2020 envisage buildings of greater heights / density than that adopted in the August 2015 document, and expands the defined area of the First Street framework.

Guidance

The BRE Guidance

- 8.21. The BRE Guidance was produced following extensive consultation with architects, planning officers, consultants, professional institutions and Government officials.
- 8.22. The Guidance was first published in 1991 and superseded the Department of the Environment Guidance “Sunlight and Daylight Planning Criteria and Design of Buildings”.
- 8.23. The current edition (3rd) of the BRE Guidance was published in June 2022.
- 8.24. Its overall purpose is to assist in evaluating the relationship between new and existing buildings to ensure that each retains the potential to achieve a “fair share” of available daylight and sunlight given their relative siting, height and mass.
- 8.25. The BRE Guidance is technically robust and has become the industry standard methodology for assessing daylight and sunlight amenity in the built environment.
- 8.26. The provisions of the BRE Guidance are not mandatory and the BRE have taken steps to confirm that it should not be read as an instrument of planning policy:
‘The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural daylight is only one of many factors in site layout design’.
- 8.27. It is important to note that the BRE Guidance was principally developed for use in the assessment of low density suburban environments and should, therefore, be applied flexibly for developments in urban City or Town Centre sites, commercially influenced areas or areas where greater density is sought / encouraged.
- 8.28. The BRE targets should not, therefore, be seen as absolute and immovable targets when applied in built environments either of existing high density or where increased density is being sought / encouraged. To facilitate the flexible application of the BRE Guidance in such circumstances, it promotes the setting of alternative target values.
- 8.29. The high density and the City Centre location of the EIA Site and its surroundings justify the flexible application of the BRE Guidance in the daylight and sunlight amenity impact appraisal of this Proposed Development.

- 8.30. The BRE Guidance also notes that the guidelines contained therein may also be used as the basis for environmental impact assessment.

Assessment Methodology and Significance Criteria

- 8.31. The assessment will be undertaken in accordance with the provisions of the BRE Guidance identified above.
- 8.32. The primary purpose of any daylight and sunlight amenity impact assessment is to measure and evaluate the effects of any reduction in light on the identified key receptors of the surrounding built environment, that arise as a consequence of the Proposed EIA Development.
- 8.33. Although the provisions of the BRE Guidance are not mandatory, nor are its aspirational targets by any means fixed, it does provide an objective means of appraising daylight and sunlight amenity impact. Using the provisions of the BRE Guidance as a starting point, professional judgement and experience has been used to further assess the significance of any impact identified, taking into account such things as the sensitivity of the receptors, and the nature / character of the impact and any other relevant factors that would justify the further flexible interpretation of the results.
- 8.34. The methodology adopted follows that set out in the BRE Guidance, which provides criteria and methods for measuring daylight and sunlight amenity. The BRE Guidance establishes a set of parameters intended to assist in the quantification of daylight and sunlight levels.
- 8.35. A distinction can be drawn between “daylight” and “sunlight”. Daylight is directly received from an unobstructed overcast sky. Sunlight is light received directly from the sun.
- 8.36. In accordance with the BRE Guidance, the daylight amenity impact has been appraised through establishing the Vertical Sky Component (“VSC”) for all relevant neighbouring windows, and, where appropriate, by measuring the No Sky Line (“NSL”) of the rooms.
- 8.37. The BRE Guidance promotes that sunlight amenity to buildings is assessed through establishing the winter and summer Annual Probable Sunlight Hours (“APSH”) for certain windows that face within 90 degrees of due south. Sunlight amenity to external land is appraised through establishing the number of sunlight hours received (“Time in Sun”).
- 8.38. To technically appraise the impact that the Proposed EIA Development will have on the daylight and sunlight amenity of the surrounding built environment, a computer generated 3D model has been constructed that replicates the configuration and massing of the EIA Site and its surroundings in its Baseline, Proposed and Cumulative conditions.
- 8.39. Baseline, Proposed and Cumulative massing images of the EIA Site and its surroundings can be found at Section 1 and 7 of the Technical Appendix Report at Appendix 8.1, 8.4, 8.6 and 8.8 of this Statement.

Vertical Sky Component (“VSC”)

- 8.40. The VSC is a unit of measurement that represents the amount of visible sky that is capable of being measured at the midpoint of the external face of a window.
- 8.41. The more unobstructed sky or sky visibility available to a window, then, in theory, the potential daylighting capability of the room that it serves will increase.
- 8.42. The unit is expressed as a percentage, as it is the ratio between the amount of visible sky available to the window being tested, compared to what would be available from a totally unobstructed sky. To put this unit of measurement into perspective, the maximum percentage VSC value of a window located in a vertical plane is 50%, but in practice the VSC values do not typically exceed 40%, because of projecting window reveals and window heads which reduce the angles of measurement.
- 8.43. The BRE Guidance for daylight sets out that:
“... daylighting of an existing building may be adversely affected ... if ... the VSC measured at the centre of an existing window is less than 27%, and less than 0.8 times its former value”.
- 8.44. Daylight amenity will therefore not be materially or adversely affected if it can be established that a window achieves 27% VSC in the proposed condition.
- 8.45. If a window has a VSC of less than 27%, then a reduction in daylight is not considered material by the BRE so long as the reduction does not exceed 20% (i.e. 0.8 x) the baseline value. This loss is not considered material by the BRE as it is unlikely to be noticed by the building occupants.

No Sky Line (“NSL”)

- 8.46. The BRE Guidance confirms that the internal daylight distribution of an existing building can be found by plotting the NSL for each main room, which would include living rooms, dining rooms and kitchens (bedrooms can also be analysed, but the BRE consider them less important)
- 8.47. The NSL is measured at an internal working plane within a room and divides those parts of it which can and cannot see the sky through its window provision.
- 8.48. Those parts of a room beyond the NSL usually look dark and gloomy, compared with the rest of the room, because they receive no direct light from the sky.
- 8.49. The BRE Guidance considers that it is acceptable for the area of a room within the NSL to be reduced by 20% (or 0.8x) of its existing coverage, on the grounds that such a reduction in NSL coverage would not be noticed by the room occupants.

Annual Probable Sunlight Hours (“APSH”)

- 8.50. Unlike daylight, which is not materially influenced by orientation and assumes that light from the sky is uniform, the availability of sunlight is dependent upon orientation.
- 8.51. As the United Kingdom is in the northern hemisphere, sun is only received from the south, rising in the east and setting in the west. The availability of sunlight is therefore dependent upon the compass orientation of the window or room being tested relative to the position of due south.
- 8.52. The BRE Guidance for sunlight sets out that:
“If a living room of an existing dwelling has a main window facing within 90° of due south and any part of the new development subtends at an angle of more than 25° to the horizontal, measured from the centre of the window in a vertical section perpendicular to the window, the sunlighting of the existing dwelling may be adversely affected”.
- 8.53. Further, that sunlight may also be adversely affected if the main living room window:
“... receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21 September and 21 March”.
- 8.54. From this, it is established that sunlight amenity will not be materially affected if 25% of all anticipated APSH is received, with 5% being received during the winter months.
- 8.55. The winter months are September through to March.
- 8.56. Again, the BRE considers it acceptable to reduce the availability of sunlight by 20% (0.8 x its former value) in circumstances where the target APSH is not achieved, the justification being that such a reduction is unlikely to be noticed by the building or room occupants.

Sunlight to Open Spaces

- 8.57. 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.
- 8.58. 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). Again, if this is not achieved in the baseline condition, then the BRE consider a 20% (0.8x) 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.

Acceptable Tolerance Alternative Daylight and Sunlight Target

- 8.59. The BRE acknowledge the need for the provisions of the Guidance to be applied and interpreted flexibly, including adjustment, where it is used outside of the low density suburban environments for which it was principally designed, in confirming that: *“... the Developer or Planning Authority may wish to use different target values. For example, 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 proportion of existing buildings”.*
- 8.60. This is logical. It is unrealistic to rigidly impose the BRE’s low density massing targets in a higher density environments because it is obvious that they could not be met.

- 8.61. A generic or non-site specific alternative VSC value of 21.6% is capable of being established / interpreted as being an Alternative Target that is within an acceptable tolerance of the 27% BRE target for higher density environments through the application of BRE principles.
- 8.62. To explain, the BRE Guidance confirms that the 27% target VSC is an acceptable level of daylight, and one that is capable and accepted of being reduced by 20%. In this regard, if a window enjoys 27% VSC in the existing condition, it would be acceptable to reduce that VSC to 21.6% (i.e. a reduction of 5.4% VSC, which is 20% of 27%). In such circumstances, it would be concluded that a VSC of 21.6% would be adequate to satisfy the BRE's daylight test criterion.
- 8.63. That conclusion would be drawn on the basis that the reduction in direct sky light would not be noticed by the building or room occupants. However, that is not the same, and this is an important distinction, as concluding that 21.6% VSC is in anyway an insufficient or detrimental amount of direct sky light for a window or room to receive.
- 8.64. A VSC value of 21.6% is established to be an appropriate VSC Alternative Target suitable for impact assessment within in a high density City Centre environment. A window with a VSC of 21.6% means that the window would still have access to more than half of the available sky dome from which daylight is typically derived.
- 8.65. Using the same principle, APSH values of 4% for winter APSH (rather than the low density 5%) and 20% for annual APSH (rather than 25%) can be / are deemed to be within an acceptable tolerance of the unmodified BRE targets, and appropriate for City Centre environments.

Site Specific Daylight & Sunlight Targets

- 8.66. There are also occasions that, rather than assess amenity impacts against generic alternative targets, it is appropriate to set site-specific alternative daylight and sunlight targets, based on the specific massing conditions of a site and the surrounding context.
- 8.67. Examples of approaches for setting site specific alternative daylight and sunlight targets include the comparison of a Proposed massing against a massing established in planning policy; the impact of the receptor's own massing mirrored onto the EIA Site; or comparison with a former massing of a development site.

Sensitivity of Receptors

- 8.68. Having identified the relevant receptors, it is necessary to consider their sensitivity to reductions in daylight and sunlight. The general methodology that Proximity has adopted for determining sensitivity to a measured magnitude of change is tabulated below:

Table 8.1 - Methodology for Determining Sensitivity

Sensitivity	Examples of receptor
High	The receptor has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.

- 8.69. As confirmed above, the BRE Guidance emphasises the availability of daylight and sunlight to living rooms and daylight to bedrooms and family kitchens.
- 8.70. The BRE does not impose a hierarchy of habitable rooms, i.e. confirm whether one habitable room should receive more light than another, but in real terms, such a hierarchy does exist and that hierarchy should be borne in mind when considering and evaluating the impact that the Proposed EIA Development might have on the availability of light in a City Centre environment.
- 8.71. The above general methodology has been developed further below to establish the following window sensitivity matrix, informed in part by the BRE Guidance, and, based on the function or use of the rooms behind each of the windows that have been assessed:

Table 8.2 - Methodology for Determining Sensitivity of Rooms

Room Use	Daylight Sensitivity	Sunlight Sensitivity
Living Room / Combined Living, Kitchen & Dining ("LKD")	High	High
Kitchen / Dining	Medium	Low
Bedrooms	Medium / Low	Low
Student Accommodation	Low	Low
Communal Kitchens	Low	Low
Circulation Space	n/a	n/a
Toilets / Bathrooms	n/a	n/a
Commercial Uses	n/a	n/a

Determining the Magnitude of Change

- 8.72. It is permissible to reduce the amount of daylight and / or sunlight that a window currently receives without that reduction amounting to a material / significant or adverse impact on the existing amenity enjoyed. The following has been used as a methodology for determining the magnitude of change in evaluating the results of the technical study:

Table 8.3 - Methodology for Determining Impact Magnitude

Impact	Criteria for assessing impact
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. From a measurement perspective this will include any reduction in amenity of in excess of 40% of the existing or baseline values.
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. From a measurement perspective this will include any reduction in amenity of between 30-40% of the existing or baseline values.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstances/situation. From a measurement perspective this will include any reduction in amenity of between 20-30% of the existing or baseline values.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation. From a measurement perspective this will include any reduction in amenity of up to 20% less than the existing or baseline values. i.e. retained values in the Proposed condition will be at least 0.8x baseline values

- 8.73. It is important to note that anything more than a "Negligible" reduction in light levels does not necessarily mean that a window will be left with inadequate levels of daylight or sunlight; it simply means that the reduction in light will be more noticeable to the building occupants, which is not the same as having residual poor or insufficient natural light levels.
- 8.74. It is also important to note that magnitude of change does not, on its own, amount to an impact. Consideration also needs to be given to the sensitivity of the receptor.

Determining the Significance of Effects / Establishing Impact

- 8.75. The significance of an environmental impact is a factor of any magnitude of change and the receptor sensitivity. An impact or effect can be positive or negative. The table below defines an impact by reference to its general effect / consequence. The asterisk denotes sensitivity that is considered to be significant – those without an asterisk are considered to not have an impact that is classed as significant

Table 8.3 - Impact Significance Matrix

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial*	Major Adverse/Beneficial*	Moderate Adverse/Beneficial*
Moderate	Major Adverse/Beneficial*	Moderate Adverse/Beneficial*	Minor Adverse/Beneficial
Minor	Moderate Adverse/Beneficial*	Minor Adverse/Beneficial	Negligible
Negligible	Negligible	Negligible	Negligible

- 8.76. Notwithstanding the above generalisation of an impact, a reduction in daylight and sunlight amenity will at all times be subject to the BRE general compliance criteria, as follows:
- If the BRE targets are met in the Proposed condition, then any reduction in daylight and sunlight will not have a material impact on the amenity enjoyed.
 - Where the BRE targets are not achieved in the Baseline condition, a reduction of no more than 20% of the measured Baseline value will not have a material impact, on the grounds that such a reduction would not be noticed by the room occupants.
 - A 20% reduction of the measured baseline NSL will not have a material impact, on the grounds that such a reduction would not be noticed by the room occupants.
 - Applying BRE principles, a City Centre Alternative VSC Target of 21.6%, has been established, appropriate to the high density, City Centre context of the EIA Site.
 - A 4% winter and 20% annual APSH Alternative Target has been established through application of BRE principles, appropriate to the high density City Centre context of the EIA Site.
 - There is always a possible need to consider the further flexible interpretation of the daylight and sunlight results, where the design/form/shape of the neighbouring building has an inherent negative influence on its own daylight and sunlight potential.

Application of the BRE Guidance in Environmental Impact Assessment

- 8.77. Appendix H of the BRE Guidance outlines how the guidelines within can be applied in the context of Environmental Impact Assessment.
- 8.78. It notes a number of factors that tend towards a minor adverse impact, including only a small number of windows are affected; loss of light is marginally outside of the guidelines; a receptor has a low level requirement for daylight or sunlight; other reasons, such as a window standing unusually close to a boundary.
- 8.79. The BRE Guidance also notes factors tending towards a major adverse impact. Such factors include a large number of windows being affected; loss of light is substantially outside of the guidelines; all the windows in a particular property are affected.

Scenarios Tested

- 8.80. The daylight and sunlight amenity impacts of the Proposed EIA Development on the receptors identified below will be assessed in the following scenarios:
- Baseline Condition

The Plot 10a Site

- Baseline vs Plot 10a Site Proposed Development
- Baseline vs Plot 10a Site Proposed Development + Cumulative

The Plot 10b Site

- Baseline vs Plot 10b Site Proposed Development
- Baseline vs Plot 10b Site Proposed Development + Cumulative

Combined Plot 10a Site & Plot 10b Site

- Baseline vs Plot 10a Site & Plot 10b Site Proposed Developments
- Baseline vs Plot 10a Site & Plot 10b Site Proposed Developments + Cumulative

Macintosh Mill Mirror Images

- Baseline vs Plot 10 Massing based on Mirror Image height of Macintosh Mill

The Study Area

- 8.81. In identifying the Study Area, the BRE Guidance has been used. The Guidance emphasises the assessment of residential accommodation, specifically habitable rooms within residential buildings. A non-residential building may be assessed if there is a reasonable expectation of daylight and sunlight, such as hospitals or schools. Commercial office buildings are not typically considered to be daylight and sunlight receptors requiring impact assessment. Therefore, the appropriate study area has been defined following a site inspection and research to identify neighbouring buildings of residential use, with the application of professional judgement to consider which neighbouring buildings within 250m of the EIA Site rely on the EIA Site for the receipt of daylight and sunlight, warranting further technical appraisal.
- 8.82. Buildings of residential use and external amenity spaces identified as worthy of impact appraisal constitute the 'Study Area', and are as follows:
- Macintosh Mill, Cambridge Street
 - Cambridge Mill, Cambridge Street
 - Chorlton Mill, Cambridge Street
 - City South apartments, City Road East
 - Parts of the Plot 11 First Street Development closest to the Plot 10 Site
 - Manchester Student Village, Cambridge Street
 - External Amenity Space:
 - James Grigor Square (Time in Sun)
 - Sunken gardens of Macintosh Mill fronting Hulme Street (Time in Sun)
- 8.83. Residential buildings outside of 250m from the EIA Site, and those within 250m but not included within the scope of study, will not experience a material impact on daylight or sunlight amenity, based on distance from the EIA Site and / or orientation.
- 8.84. In line with BRE principles, any windows in the above-mentioned neighbouring buildings that are known to serve circulation space or welfare accommodation will not be analysed, neither will any windows that serve any non-domestic room uses.
- 8.85. The presence of the Premier Inn, located to the west of the EIA Site, is acknowledged. On the basis that it is of short term and transient occupation, this city centre hotel – for business and city break use, as opposed to “R&R” – is not considered to have a special requirement for daylight and sunlight. On this basis it will not be appraised.
- 8.86. The Vita Student accommodation to the north is also acknowledged. On the basis that the windows that overlook the EIA Site do not serve habitable rooms, this neighbouring building will not be appraised.

Source of Effect

- 8.87. The massing to be constructed on the Plot 10a Site and the Plot 10b Site are the source of daylight and sunlight impacts / effects of the Proposed EIA Development. The construction of this massing may result in reduced sky visibility from within habitable rooms of neighbouring buildings, and the windows that serve them. This in turn will have an effect on the daylight and sunlight amenity enjoyed in the proposed condition.

Baseline Conditions

- 8.88. The EIA Site is currently an open parcel of land and has predominantly been clear of buildings for over 10 years. In terms of daylight and sunlight to the neighbouring receptors, this absence of any mass in the Baseline condition is unusual for the City Centre context. It means that – save for the localised instances noted below – the neighbouring receptors do generally receive daylight and sunlight in excess of what might reasonably be expected in more developed parts of the City Centre.
- 8.89. The Baseline condition acknowledges the existing arrangement, configuration and massing of the EIA Site and its immediate and general surroundings, along with the massing of other neighbouring committed developments, i.e. those neighbouring property developments that have the benefit of a live Planning Permission and work has commenced on site for their construction, a list of which is provided in Appendix 2.2 of this Statement. The baseline condition includes the development Plot 9a to the west of the EIA Site and Plot 11 to the south of the EIA Site both of which have commenced construction.
- 8.90. The Baseline condition has been illustrated by massing images contained in Appendix 8.1, 8.4, 8.6 and 8.8.
- 8.91. The Baseline condition analysis will acknowledge the existing massing of the EIA Site and its surroundings and neighbouring property developments that are “committed to” – Planning Approved and where construction works have commenced.
- 8.92. The Baseline condition model of the EIA Site and its surrounding has been created using the following data:
- A laser scan Point Cloud survey of the elevations of the neighbouring buildings
 - A photogrammetric model of the wider massing context of the EIA Site
 - Internal room arrangements of the neighbouring receptors, based on drawing available from Manchester City Council’s public access planning portal, Land Registry and sales / lettings particulars
 - Drawings available from Manchester City Council’s public access planning portal where neighbouring buildings to be included are under construction, and the final form is not included within the point cloud survey data nor photogrammetric model.
- 8.93. The daylight amenity of the neighbouring receptors noted above is tabulated below:

Table 8.4 – Daylight Amenity of neighbouring receptors

Receptor	% windows achieves BRE VSC target (27%)	% windows below BRE VSC target (27%)
Macintosh Mill	29 windows (23%)	98 windows (77%)
Cambridge Mill	72 windows (71%)	30 windows (29%)
Chorlton Mill	81 windows (44%)	104 windows (56%)
City South Apartments	83 windows (31%)	188 windows (69%)
Plot 11 First Street Development	594 windows (81%)	137 windows (19%)
Manchester Student Village	116 windows (95%)	6 windows (5%)

- 8.94. The sunlight amenity of the neighbouring receptors noted above is tabulated below:

Table 8.5 – Sunlight Amenity of neighbouring receptors

Receptor	% rooms achieve Annual AND Winter Sunlight target	% rooms achieve EITHER Annual OR Winter Sunlight target	% rooms achieve NEITHER Annual NOR Winter Sunlight target
Macintosh Mill	34 rooms (61%)	11 rooms (20%)	11 rooms (20%)
Cambridge Mill	76 rooms (92%)	7 rooms (8%)	-

Receptor	% rooms achieve Annual AND Winter Sunlight target	% rooms achieve EITHER Annual OR Winter Sunlight target	% rooms achieve NEITHER Annual NOR Winter Sunlight target
Chorlton Mill	81 rooms (92%)	5 rooms (6%)	2 rooms (2%)
City South Apartments	165 rooms (84%)	21 rooms (11%)	11 rooms (6%)
Plot 11 First Street Development	n/a - Site facing windows are north facing, and in accordance with BRE Guidance do not require sunlight impact appraisal		
Manchester Student Village	97 rooms (100%)	-	-
	Achieves BRE 2 Hour Time in Sun Target (50%)		
James Grigor Square	Yes		
Macintosh Mill Sunken Garden	Yes		

Identification and Evaluation of Likely Significant Effects

Construction Phase

- 8.95. The impact that the physical construction of the Proposed EIA Development will have on daylight and sunlight amenity of the surrounding built environment has not been considered.
- 8.96. The effects of the construction phase are temporary because they are a function of the proposed massing, which will vary during the construction phase operations.
- 8.97. The Proposed EIA Development will have its greatest and long term daylight and sunlight impact upon completion of the construction phase once its massing has been fully established.

Operation Effects – Daylight

- 8.98. VSC calculations were conducted on the key receptors identified and the Baseline and Proposed ratio of impact was established. The results were then interpreted to determine compliance using the provisions of the BRE Guidance, the significance of impact matrix (see Table 10.4 above), identifying those windows achieving at least 21.6% as the City Centre Alternative target and acknowledging the need for further applied flexibility in certain circumstances.
- 8.99. Detailed and itemised daylight results are tabulated and form part of the Technical Appendix Report enclosed at Appendix 8.3, 8.5, 8.7 and 8.9 of this Statement. A general summary and commentary of the daylight results are set out on a property-by-property basis below for each of the Plot 10 development scenarios (10A, 10B and 10A + 10B).

Plot 10A - Daylight Amenity

- 8.100. Overall, 1538 windows serving habitable rooms have been appraised.
- 8.101. Following construction of the Plot 10a Proposed Development, 1190 windows (77%) would achieve the BRE's VSC target, with a further 135 windows (9%) achieving the acceptable tolerance VSC Alternative Target.
- 8.102. 214 windows (14%) would not achieve the VSC target, nor the acceptable tolerance Alternative Target. The significant majority of these are within the Plot 11 First Street Development and Macintosh Mill.
- 8.103. Impacts on VSC are summarised below:

Table 8.6 – Impacts on VSC (Plot 10a)

Receptor	BRE Target & Acceptable Tolerance Negligible	Minor Adverse Magnitude of Change	Moderate Adverse Magnitude of Change	Major Adverse Magnitude of Change
Macintosh Mill	72 windows (57%)	3 windows (3%)	40 windows (35%)	12 windows (11%)
Cambridge Mill	102 windows (100%)	-	-	-
Chorlton Mill	183 windows (99%)	2 windows (1%)	-	-
City South Apartments	271 windows (100%)	-	-	-
Plot 11 First Street Development	575 windows (79%)	31 windows (4%)	91 windows (12%)	35 windows (5%)
Manchester Student Village	122 windows (100%)	-	-	-

8.104. Overall, 842 rooms have been appraised.

8.105. 751 rooms (89%) would achieve the BRE's NSL target, experiencing negligible reductions in daylight distribution.

8.106. 91 rooms (11%) would experience a reduction that is noticeable to the occupants to varying degrees, summarised below.

Table 8.7 – Impacts on NSL (Plot 10a)

Receptor	BRE NSL Target Negligible	Minor Adverse Magnitude of Change	Moderate Adverse Magnitude of Change	Major Adverse Magnitude of Change
Macintosh Mill	42 rooms (54%)	5 rooms (7%)	2 rooms (3%)	29 rooms (39%)
Cambridge Mill	83 rooms (100%)	-	-	-
Chorlton Mill	86 rooms (98%)	2 rooms (2%)	-	-
City South Apartments	221 rooms (100%)	-	-	-
Plot 11 First Street Development	222 rooms (81%)	25 rooms (9%)	18 rooms (7%)	10 rooms (3%)
Manchester Student Village	97 rooms (100%)	-	-	-

Macintosh Mill

- 8.107. The majority of Macintosh Mill will experience a negligible impact on daylight amenity that is therefore not significant. The majority of this building's habitable rooms are served by windows on the north west and south east facing elevations. Massing on Plot 10 will only be seen through these windows at a very acute angle, and any reductions in daylight will - if present - be negligible, on the basis that these windows overlook open parcels of land and have a limited view of high rise massing (including Plot 11) in the immediate vicinity.
- 8.108. Impacts on the daylight amenity of this majority of Macintosh Mill's rooms will be not significant.
- 8.109. 127 individual windows which overlook the EIA Site directly have been appraised, serving 78 rooms of bedroom and LKD use.
- 8.110. In the Baseline Condition, 29 windows (23%) would achieve the BRE's VSC target. 98 windows (77%) would not achieve the BRE's VSC target.
- 8.111. The low percentage of windows achieving the BRE target reflects the inherently limited capacity for certain windows to receive daylight (those below pavement level and set within a narrow lightwell), and the obstruction to daylight resulting from the high rise, high density massing of the wider context in the vicinity (including development of Plot 9A and Plot 11).
- 8.112. In the 10A Proposed Condition, 72 windows (57%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that it would not be noticed by the room occupants.
- 8.113. Of the 78 rooms appraised, 42 (54%) would pass the BRE's NSL test, experiencing a negligible reduction in daylight distribution within the room.
- 8.114. The impact on the daylight amenity of this majority of windows and rooms is **negligible and not significant**.

- 8.115. 55 windows (43% of those appraised) do not achieve the BRE target nor acceptable tolerance value of 21.6%. Of these, 19 serve single-aspect bedrooms. Bedrooms are a low sensitivity daylight receptor in multiroom apartments.
- 8.116. Magnitudes of change are moderate to 15 of those 19 windows; the rooms served by these would also experience reductions in NSL noticeable to the room occupants, ranging from low to high magnitude of change. The impact of the Proposed 10a Development on these rooms and windows ranges from **minor - moderate adverse** and therefore significant.
- 8.117. There is major magnitude of change to 4 single aspect bedrooms. As above, given the low daylight sensitivity of bedrooms the impact of the Proposed 10a Development on this minority of bedrooms is **moderate-minor** adverse and therefore significant.
- 8.118. 5 windows serving dual aspect bedrooms would experience minor to moderate magnitude of change. The impact on these rooms is however negligible, on the basis that they are all served by other windows that do achieve the BRE target (or come within an acceptable tolerance of it), and all 5 of these bedrooms also pass the NSL test. The Proposed 10a Development impact on the daylight amenity of these bedrooms is therefore **negligible and not-significant**.
- 8.119. Regarding impacts on daylight amenity of LKDs, considered to be of high daylight sensitivity, there are 30 windows serving 15 LKDs that would not achieve the BRE targets. Of these:
- 20 windows serving 10 LKDs would experience moderate – major magnitudes of change, and the LKD rooms served will experience moderate – major magnitude of change in NSL. Impacts on daylight amenity of these LKD rooms are considered to be **Major** and therefore significant.
 - 10 windows (experiencing moderate to major magnitudes of change) serve 5 LKD rooms that are also served by other windows achieving the BRE target. These rooms would experience negligible impact on NSL. Impacts on the daylight amenity of these rooms is therefore considered to be **moderate – minor adverse** and therefore significant.
- 8.120. Overall, we consider the impact of the Proposed 10a Development on the daylight amenity of Macintosh Mill to be no more than **moderate adverse**, on the basis that:
- The majority of this building’s habitable rooms are served by windows on the north west and south east facing elevations. On the basis that these overlook open parcels of land and that the 10a Site may only be seen at very acute angles through these windows (if at all), this majority of windows and rooms of Macintosh Mill have not been subject of technical analysis, and impacts, if any, would be **negligible and not significant**.
 - More than half of windows and rooms appraised achieve the respective BRE targets for VSC and NSL, or experience reductions in daylight amenity unlikely to be noticeable to room occupants. Impacts on this majority are **negligible and not significant**.
 - The majority of windows appraised (77%) would not achieve the BRE daylight targets in the baseline condition. Windows of this building are limited in their capacity to receive direct daylight in the baseline condition as a result of both the high density of the surrounding massing, and certain window are located within a lightwell or adjacent other, taller parts of Macintosh Mill.
 - Major impacts on daylight amenity are limited to LKD rooms that account for a small minority (13%) of all rooms appraised, these generally being single aspect rooms directly overlooking the 10 Site. Given the high daylight sensitivity of these rooms, any development of the 10 Site (which, with reference to the SRF is likely to be of a significant uplift from historic massing levels comparable to Macintosh Mill, and aligning more closely with the significantly larger modern buildings of the wider First Street area) is likely to result in reductions in daylight amenity and impacts that are **moderate to major** adverse and therefore significant.

Cambridge Mill

- 8.121. 102 individual windows have been appraised.
- 8.122. The windows serve 83 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.123. All 102 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that it would not be noticed by the room occupants.
- 8.124. All 83 rooms (95%) would pass the BRE’s NSL test, experiencing a negligible reduction in NSL
- 8.125. Overall, the impact of the Proposed 10a Development on the daylight amenity of this neighbouring building is **negligible and not-significant**.

Chorlton Mill

- 8.126. 185 individual windows have been appraised.
- 8.127. The windows serve 88 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.128. 183 windows (99%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.
- 8.129. 86 rooms (98%) would experience a negligible reduction in NSL.
- 8.130. 2 rooms (1%) of bedroom use would experience a reduction amounting to a Minor magnitude of change. Both of these rooms are served by a window exceeding the VSC target of 27%.
- 8.131. The impact on daylight to this small minority of rooms is considered to be **minor – negligible adverse** and not-significant.
- 8.132. Overall, the impact of the Proposed 10a Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

City South Apartments

- 8.133. 271 individual windows have been appraised.
- 8.134. The windows serve 221 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.135. All 271 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.
- 8.136. All 221 rooms appraised (100%) would experience a negligible reduction in NSL.
- 8.137. Overall, the impact of the Proposed 10a Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

Plot 11 First Street

- 8.138. 731 individual windows have been appraised, within the two blocks closest to Plot 10.
- 8.139. The windows serve 275 rooms, assumed to be a mixture of bedrooms, studios and LKDs.
- 8.140. 440 windows (60%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants. The impact on these windows is **not significant**.
- 8.141. A further 135 windows (18%) would achieve VSC values considered to be within an acceptable tolerance of the BRE target (VSC of >21.6%), given the increased density of the City Centre generally and the massing of the wider First Street area as envisioned in MCC planning policy. The impact on these windows is **not significant**.
- 8.142. 79% of windows appraised would therefore experience a **not significant impact**.
- 8.143. 157 windows (21%), serving 70 rooms, would not achieve the acceptable tolerance VSC value of 21.6%, and would experience reductions ranging from minor to major. Of these:
- 34 rooms (12% of rooms appraised) would experience a negligible reduction in daylight distribution, passing the BRE's NSL test. The impact on the daylight amenity of these rooms is of **negligible – minor adverse** and not significant.
 - 36 of these rooms would not achieve the NSL target.
- 8.144. Overall, 224 of the 275 rooms appraised (81%) would experience a negligible reduction in NSL.
- 8.145. 24 rooms (9%) of those appraised would experience a low magnitude of change in NSL.
- 8.146. 18 rooms (7%) of those appraised would experience a medium magnitude of change in NSL.
- 8.147. 9 rooms (3%) of those appraised would experience a high magnitude of change in NSL.
- 8.148. On that basis, a small minority of rooms appraised, and a very small minority of the Plot 11 development as a whole, would experience **moderate – major adverse** (and therefore significant) **impact** on daylight amenity.

- 8.149. The analysis only focuses on those windows and rooms of this neighbouring building closest to Plot 10. The majority of windows and rooms of Plot 11 as a whole have not been appraised, on that basis that their view of Plot 10a is obstructed by other parts of the Plot 11 development. This un-appraised majority of windows and rooms of Plot 11 will experience a **negligible impact** that is not significant.
- 8.150. Overall, the impact of the Proposed 10a Development on the daylight amenity of this neighbouring building is of **negligible -minor adverse impact** and therefore not significant on the basis that those moderate and major impacts are localised and account for no more than a small minority of this neighbouring development as a whole.

Manchester Student Village

- 8.151. 122 individual windows have been appraised.
- 8.152. The windows serve 97 rooms, assumed to be student bedrooms.
- 8.153. All 122 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.
- 8.154. All 97 rooms appraised (100%) would experience a negligible reduction in NSL.
- 8.155. Overall, the impact of the Proposed 10a Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

Plot 10A - Sunlight Amenity

Macintosh Mill

- 8.156. 60 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.157. 21 rooms appraised (35%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight, where present, are unlikely to be noticeable to the room occupants.
- 8.158. 1 bedroom would achieve sunlight values within an acceptable tolerance of the winter target, and achieve the annual sunlight target.
- 8.159. 1 LKD would achieve annual sunlight values that are within an acceptable tolerance of the BRE target, and no reduction in winter sunlight.
- 8.160. Impacts on these 23 rooms are considered to be **negligible and not significant**.
- 8.161. 23 rooms (38%) would achieve the BRE's annual sunlight target but not the winter sunlight target. Magnitudes of change to winter sunlight amenity are typically high.
- 8.162. Of these 23 rooms:
- 12 are bedrooms. Impacts on annual sunlight amenity are **negligible and not significant**. Impacts of the Proposed 10a Development on winter sunlight amenity are **moderate-minor adverse** and therefore significant.
 - 9 rooms (15% of 60 rooms appraised) are LKDs. Impacts on annual sunlight amenity are **negligible and not significant**. Impacts of the Proposed 10a Development on winter sunlight amenity of this minority of LKDs is **major adverse** and therefore significant.
- 8.163. 10 rooms would achieve acceptable tolerance annual sunlight values. Impacts on the annual sunlight amenity of these rooms are therefore acceptable. These 10 rooms would not achieve the Winter sunlight targets nor come within an acceptable tolerance of them; reductions in winter sunlight amounting to a major magnitude of change. Of these 10 rooms:
- 5 are LKDs, and impacts on winter sunlight amenity is **major adverse** and therefore significant.
 - The 5 assumed bedrooms are a low sensitivity sunlight receptor. Given the high magnitudes of change to winter sunlight amenity of these bedrooms, impacts of the Proposed 10a Development on these bedrooms is **moderate adverse** and therefore significant.
- 8.164. 4 rooms (6%; 3 bedrooms and 1 LKD) would achieve neither winter nor annual sunlight targets. These rooms would experience major magnitudes of change to both winter and annual sunlight amenity. Impacts on the sunlight amenity of the LKD is therefore **major adverse** and therefore significant. Impacts on sunlight amenity of the 3 bedrooms is **moderate adverse** and therefore significant.

- 8.165. Overall the impact of the 10A Proposed Development on sunlight amenity of Macintosh Mill is considered to be **moderate adverse** and therefore significant. Whilst Major impacts on sunlight amenity are present to certain LKD rooms, the rooms experiencing major impacts on both winter and annual sunlight amenity account for a minority of Macintosh Mill as a whole.

Macintosh Mill – External Amenity Space

- 8.166. The sunken gardens external amenity area of Macintosh Mill, facing Hulme Street, have been time in sun appraised.
- 8.167. The area would experience no impact / reduction in time in sun. In the Proposed Condition, 56% of this external amenity area would achieve the BRE target of 2 hours' time in sun on 21 March (against a target of 50%). On that basis this external amenity area will remain adequately sunlit throughout the year.
- 8.168. The impact of the Proposed 10a Development on the sunlight amenity of the Macintosh Mill sunken gardens is therefore **negligible and not significant**.

Cambridge Mill

- 8.169. 83 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.170. All 83 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight, where present, are unlikely to be noticeable to the room occupants.
- 8.171. The impact of the Proposed 10a Development on sunlight amenity of Cambridge Mill is therefore **negligible and not significant**.

Chorlton Mill

- 8.172. 87 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.173. 86 rooms (99%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight are unlikely to be noticeable to the room occupants.
- 8.174. 1 room would achieve the BRE target of 0.8x baseline value for annual sunlight hours. This room would experience a reduction in winter sunlight hours from 2% to 1%. Whilst this equates to a high magnitude of change, in real terms this reduction is small. Further, this room and its windows are located adjacent to Chorlton Mill's own large chimney structure, which limits direct sunlight in the baseline condition.
- 8.175. On the basis that this room is a small minority of all rooms appraised, overall the impact of the Proposed 10a Development on the Chorlton Mill is considered to be **negligible and not significant**.

City South Apartments

- 8.176. 197 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.177. All 197 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight are unlikely to be noticeable to the room occupants.
- 8.178. The impact of the Proposed 10a Development on the City South apartments is therefore **negligible and not significant**.

Plot 11 First Street

- 8.179. Plot 11 is located to the south east of Plot 10.
- 8.180. The Plot 10a Site facing windows of Plot 11 are therefore northwest facing. On that basis, these window have a very limited expectation of direct sunlight over the Plot 10 Site.
- 8.181. The Proposed 10a Development will therefore have a **negligible and not significant impact** on the sunlight amenity of this neighbouring building's site-facing rooms.

Manchester Student Village

- 8.182. 97 rooms have been appraised, assumed to be assumed to be student bedrooms.
- 8.183. All 97 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition.

- 8.184. The impact of the Proposed 10a Development on the sunlight amenity of Manchester Student Village is therefore **negligible and not significant**.

James Grigor Square

- 8.185. James Grigor Square has been time in sun appraised.
- 8.186. In the Proposed Condition, 69% of James Grigor Square would achieve the BRE target of 2 hours time in sun on 21 March (against a target of 50%). On that basis this external amenity area will remain adequately sunlit throughout the year.
- 8.187. The impact of the Proposed 10a Development on the sunlight amenity of James Grigor Square is therefore **negligible and not significant**.

Plot 10B - Daylight Amenity

- 8.188. Overall, 1538 windows serving habitable rooms have been appraised.
- 8.189. Following construction of the Proposed 10b Development, 1409 windows (92%) would achieve the BRE's VSC target, with a further 58 windows (4%) achieving the VSC Alternative Target.
- 8.190. 71 windows (5%) would not achieve the VSC target, nor the VSC Alternative Target. The significant majority of these are within Macintosh Mill.
- 8.191. Impacts on VSC are summarised below:

Table 8.7 – Impacts on VSC (Plot 10b)

Receptor	BRE Target & Acceptable Tolerance Negligible	Minor Adverse Magnitude of Change	Moderate Adverse Magnitude of Change	Major Adverse Magnitude of Change
Macintosh Mill	65 windows (51%)	-	3 windows (2%)	59 windows (%)
Cambridge Mill	102 windows (100%)	-	-	-
Chorlton Mill	185 windows (100%)	-	-	-
City South Apartments	271 windows (100%)	-	-	-
Plot 11 First Street Development	722 windows (99%)	3 windows (<1%)	6 windows (1%)	-
Manchester Student Village	122 windows (100%)	-	-	-

- 8.192. Overall, 842 rooms have been appraised.
- 8.193. 794 rooms (95%) would achieve the BRE's NSL target, experiencing negligible reductions in daylight distribution.
- 8.194. 46 rooms (5%) would experience a reduction that is noticeable to the occupants to varying degrees, summarised below.

Table 8.8 – Impacts on NSL (Plot 10b)

Receptor	BRE NSL Target Negligible	Minor Adverse Magnitude of Change	Moderate Adverse Magnitude of Change	Major Adverse Magnitude of Change
Macintosh Mill	41 rooms (53%)	3 rooms (4%)	4 rooms (5%)	30 rooms (38%)
Cambridge Mill	83 rooms (100%)	-	-	-
Chorlton Mill	87 rooms (99%)	1 rooms (1%)	-	-
City South Apartments	221 rooms (100%)	-	-	-
Plot 11 First Street Development	267 rooms (97%)	24 rooms (1%)	6 rooms (2%)	-
Manchester Student Village	97 rooms (100%)	-	-	-

Macintosh Mill

- 8.195. The majority of Macintosh Mill will experience a negligible impact on daylight amenity that is therefore not significant. The majority of this building's habitable rooms are served by windows on the north west and south east facing

elevations. Massing on Plot 10 will only be seen through these windows at a very acute angle, and any reductions in daylight will - if present - be negligible, on the basis that these windows overlook open parcels of land and have a limited view of high rise massing (including Plot 11) in the immediate vicinity.

- 8.196. Impacts on the daylight amenity of this majority of Macintosh Mill's rooms will be not significant
- 8.197. 127 individual windows have been appraised, serving 78 rooms of bedroom and LKD use.
- 8.198. In the Baseline Condition, 29 windows (23%) would achieve the BRE's VSC target. 98 windows (77%) would not achieve the BRE's VSC target.
- 8.199. The low percentage of windows achieving the BRE target reflects the inherently limited capacity for certain windows to receive daylight (those below pavement level and set within a narrow lightwell), and the obstruction to daylight resulting from the high rise, high density massing of the wider context in the vicinity (including development of Plot 9A and Plot 11).
- 8.200. In the 10B Proposed Condition, 65 windows (51%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that it would not be noticed by the room occupants.
- 8.201. 62 windows (49%) serving 43 rooms do not achieve the Alternative VSC Target value of 21.6%, and would typically experience high magnitudes of change. Of these 43 rooms:
- 11 rooms (5 bedrooms and 6 LKDs;) are also served by a window that achieves the acceptable tolerance target. These 9 rooms would all pass the NSL test, experiencing a negligible reduction in daylight distribution. The impact on the daylight amenity of these 9 rooms is **negligible and not significant**.
 - 23 windows serve 22 bedrooms. These majority of these rooms would also experience a major magnitude of change in NSL. On the basis that bedrooms are a low sensitivity receptor in multi-room apartments, the impact of Proposed 10b Development on these bedrooms is **moderate adverse** impact and is therefore significant.
 - 20 windows serving 10 LKDs would experience a major magnitude of change in VSC. These rooms, of high daylight sensitivity, would also experience a major magnitude of change in NSL. The impact on these 10 rooms (13% of the 78 rooms appraised) will be **major adverse** impact and significant.
- 8.202. 41 rooms (53%) of the 78 appraised would pass the BRE's NSL test.
- 8.203. 37 rooms (47% of rooms appraised) would not pass these NSL test, and would experience a reduction in NSL that could be noticed to room occupants.
- 8.204. Overall we consider the impact of the Proposed 10b Development on the daylight amenity Macintosh Mill to be **moderate adverse** and therefore **significant**. This is on the basis that major impacts are localised to that portion of Macintosh Mill located closest to the 10b Site and served by windows that directly overlook Plot 10b.
- 8.205. The majority of this building's habitable rooms are served by windows on the north west and south east facing elevations. On the basis that these overlook open parcels of land and that the 10b Site may only been seen at very acute angles through these windows (if at all), this majority of windows and rooms of Macintosh Mill have not been subject of technical analysis, and impacts, if any, would be negligible and not significant.
- 8.206. Those windows and rooms experiencing a significant impact that is major adverse are, relative to Macintosh Mill as a whole, a relatively small proportion of this receptor. In accordance with the BRE Guidance, this relatively small proportion of windows tends towards a minor-moderate impact overall and therefore significant.

Cambridge Mill

- 8.207. 102 individual windows have been appraised.
- 8.208. The windows serve 83 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.209. All 102 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that it would not be noticed by the room occupants.
- 8.210. All 83 rooms (95%) would pass the BRE's NSL test, experiencing a negligible reduction in NSL
- 8.211. Overall, the impact of the Proposed 10b Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

Chorlton Mill

- 8.212. 185 individual windows have been appraised.

- 8.213. The windows serve 88 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.214. All 185 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.
- 8.215. The impact on these rooms is **negligible and not significant**.
- 8.216. 87 rooms (99%) would experience a negligible reduction in NSL. The impact on daylight to these rooms is considered to be **negligible and not significant**.
- 8.217. 1 room (1%; 1 LKDs) would experience a low magnitude of change in NSL. These rooms are however considered to remain adequately daylight, on the basis that it is served by two windows that achieve the VSC target, and that the room continues to receive direct daylight to 75% of its area.
- 8.218. Overall, the impact of the Proposed 10b Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

City South Apartments

- 8.219. 271 individual windows have been appraised.
- 8.220. The windows serve 221 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.221. All 271 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.
- 8.222. All 221 rooms appraised (100%) would experience a negligible reduction in NSL.
- 8.223. Overall, the impact of the Proposed 10b Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

Plot 11 First Street

- 8.224. 731 individual windows have been appraised, within the two blocks closest to Plot 10.
- 8.225. The windows serve 275 rooms, assumed to be a mixture of bedrooms, studios and LKDs.
- 8.226. 664 windows (91% of those appraised) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants. The impact on these windows is **not significant**.
- 8.227. A further 58 windows (8%) would achieve VSC values considered to be within an acceptable tolerance of the BRE target (VSC of >21.6%), given the increased density of the City Centre generally and the massing of the wider First Street area as envisioned in MCC planning policy. The impact on these windows is **not significant**.
- 8.228. 99% of windows appraised would therefore experience a negligible impact that is **not significant**.
- 8.229. 9 windows (1%), serving 1 LKD and 4 studios, would not achieve the acceptable tolerance VSC value of 21.6%, and would experience minor to major magnitudes of change in VSC. Of these:
- 3 studio rooms and 1 LKD room are also served by a window achieving VSC of at least 21.6%, and therefore within an acceptable tolerance of the BRE target. These 4 rooms would also pass the NSL test, experiencing negligible reduction in daylight distribution. The impact on daylight amenity of these rooms is **negligible and not significant**.
 - 2 studios are each served by two large windows achieving VSC of over 18%, marginally below of the acceptable tolerance target. These rooms would also pass the NSL test. The impact on the daylight amenity of these rooms is **negligible-minor** and not significant.
 - 1 studio is served by windows achieving 20-21% VSC and would not pass the NSL test. Impact of the Proposed 10b Development on this room is **negligible -minor and not significant**, given that both of its large window are close to achieving the acceptable tolerance value. Further, notwithstanding that changes to NSL are of a medium magnitude of change and may be noticed by the occupants, more than two thirds of this room will continue to receive direct daylight.

- 8.230. Overall, 267 of the 275 rooms appraised (97%) would experience a negligible reduction in NSL. 6 rooms (2%) would experience moderate magnitudes of change in NSL. 2 rooms (1%) would experience a minor magnitude of change in NSL.
- 8.231. The significant majority of windows and rooms appraised achieve the BRE targets. On the basis moderate and major impacts are localised and account for no more than a very small minority of this neighbouring development as a whole, the impact of the Proposed 10b Development on the daylight amenity of this neighbouring building is of **negligible and not significant impact**.

Manchester Student Village

- 8.232. 122 individual windows have been appraised.
- 8.233. The windows serve 97 rooms, assumed to be student bedrooms.
- 8.234. All 122 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.
- 8.235. All 97 rooms appraised (100%) would experience a negligible reduction in NSL.
- 8.236. Overall, the impact of the Proposed 10b Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

Plot 10B - Sunlight Amenity

Macintosh Mill

- 8.237. 60 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.238. 17 rooms appraised (28%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight, where present, are unlikely to be noticeable to the room occupants.
- 8.239. 2 bedrooms (3%) would achieve sunlight values within an acceptable tolerance of both the winter and annual sunlight targets.
- 8.240. Impacts on these 20 rooms are considered to be **negligible and not significant**.
- 8.241. 8 rooms (13%) would achieve either the annual sunlight target or the winter sunlight. Magnitudes of change where the target is not achieved is major.
- 8.242. Of these 8 rooms:
- 5 rooms, of unknown use, would experience a **negligible and not significant** impact on annual sunlight amenity. Winter sunlight amenity is reduced from 1% in the baseline condition to 0% in the Proposed Condition. Whilst this equates to a major magnitude of change, and associated moderate-major impact on winter sunlight amenity, this reduction from a very low baseline value may not be noticeable to the room occupants.
 - 3 rooms (1 LKD, 1 bedroom, 1 studio), each served by windows set below pavement level and looking into a narrow lightwell, would experience no reduction (from very low baseline levels) in winter sunlight amenity. Impacts on winter sunlight amenity of these rooms is negligible. These 3 rooms would experience a moderate and major magnitudes of change in annual sunlight amenity, equating to a major adverse impact on the LKD and studio, and a moderate adverse impact on the bedroom.
- 8.243. 15 rooms (25%) would achieve acceptable tolerance annual sunlight values. The impact on the annual sunlight amenity of these rooms is therefore acceptable and non-significant. These 15 rooms would not achieve the Winter sunlight targets nor come within an acceptable tolerance of them; reductions in winter sunlight amounting to a major magnitude of change. Of these 15 rooms:
- 8 are LKDs, and impacts on winter sunlight amenity is **major adverse** and therefore significant.
 - The 7 assumed bedrooms are a low sensitivity sunlight receptor. Given the high magnitudes of change to winter sunlight amenity of these bedrooms, the impact of the Proposed 10b Development on these bedrooms is **moderate – minor adverse** and therefore significant.
- 8.244. 17 rooms (28%; 10 bedrooms and 7 LKDs) would achieve neither winter nor annual sunlight targets. These rooms would predominantly experience major magnitudes of change to both winter and annual sunlight amenity. Impacts on

the sunlight amenity of the LKDs is **major adverse** and therefore significant. Impacts on sunlight amenity of the bedrooms is **moderate adverse** and therefore significant.

- 8.245. Overall the impact of the Proposed 10b Development on sunlight amenity of Macintosh Mill is considered to be **moderate adverse** and therefore significant, on the basis that:
- There only 7 LKD rooms experiencing major adverse impacts on both winter and sunlight amenity which, as a proportion of Macintosh Mill as a whole (comprising an estimated 100 apartments), is a small minority of all apartments within this neighbouring building.
 - The 10 bedrooms which achieve neither annual nor winter sunlight targets are a low sensitivity sunlight receptors.

Macintosh Mill – External Amenity Space

- 8.246. The sunken gardens external amenity area of Macintosh Mill, facing Hulme Street, have been time in sun appraised.
- 8.247. The area would experience no impact / reduction in time in sun. In the Proposed Condition, 56% of this external amenity area would achieve the BRE target of 2 hours' time in sun on 21 March (against a target of 50%). On that basis this external amenity area will remain adequately sunlit throughout the year.
- 8.248. The impact of the Proposed 10b Development on the sunlight amenity of the Macintosh Mill sunken gardens is therefore **negligible and not significant**.

Cambridge Mill

- 8.249. 83 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.250. All 83 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight, where present, are unlikely to be noticeable to the room occupants.
- 8.251. The impact of the Proposed 10b Development on Cambridge Mill is therefore **negligible and not significant**.

Chorlton Mill

- 8.252. 87 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.253. All 87 rooms (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight are unlikely to be noticeable to the room occupants.
- 8.254. The impact of the Proposed 10b Development on Chorlton Mill is therefore **negligible and not significant**.

City South Apartments

- 8.255. 197 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.256. All 197 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight are unlikely to be noticeable to the room occupants.
- 8.257. The impact of the Proposed 10b Development on the City South apartments is therefore **negligible and not significant**.

Plot 11 First Street

- 8.258. Plot 11 is located to the south east of Plot 10b.
- 8.259. The 10b Site facing windows of Plot 11 are therefore northwest facing. On that basis, these window have a very limited expectation of direct sunlight over the Plot 10b Site.
- 8.260. The Proposed 10b Development will therefore have a **negligible and not significant impact** on the sunlight amenity of this neighbouring building's site-facing rooms.

Manchester Student Village

- 8.261. 97 rooms have been appraised, assumed to be assumed to be student bedrooms.
- 8.262. All 97 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition.
- 8.263. The impact of the Proposed 10b Development on the sunlight amenity of Manchester Student Village is therefore **negligible and not significant**.

James Grigor Square

- 8.264. James Grigor Square has been time in sun appraised.
- 8.265. In the Proposed Condition, 80% of James Grigor Square would achieve the BRE target of 2 hours time in sun on 21 March (against a target of 2 hours time in sun to 50% of the area). On that basis this external amenity area will remain adequately sunlit throughout the year.
- 8.266. The impact of the Proposed 10b Development on the sunlight amenity of James Grigor Square is therefore **negligible and not significant**.

Plot 10A & Plot 10B - Daylight Amenity

- 8.267. Overall, 1538 windows serving habitable rooms have been appraised.
- 8.268. Following construction of Plot 10a + 10b Proposed Developments, 1132 windows (74%) would achieve the BRE's VSC target, with a further 101 windows (17%) achieving the VSC Alternative Target.
- 8.269. 305 windows (21%) would not achieve the VSC target, nor coming within an acceptable tolerance of it. The significant majority of these are within the Plot 11 First Street Development and Macintosh Mill.
- 8.270. Impacts on VSC are summarised below

Table 8.9 – Impacts on VSC (Plot 10a and 10b)

Receptor	BRE Target & Acceptable Tolerance Negligible	Minor Adverse Magnitude of Change	Moderate Adverse Magnitude of Change	Major Adverse Magnitude of Change
Macintosh Mill	65 windows (57%)	-	2 windows (2%)	60 windows (47%)
Cambridge Mill	102 windows (100%)	-	-	-
Chorlton Mill	183 windows (99%)	2 windows (1%)	-	-
City South Apartments	271 windows (100%)	-	-	-
Plot 11 First Street Development	490 windows (67%)	25 windows (6%)	83 windows (21%)	133 windows (34%)
Manchester Student Village	122 windows (100%)	-	-	-

- 8.271. Overall, 842 rooms have been appraised.
- 8.272. 732 rooms (87%) would achieve the BRE's NSL target, experiencing negligible reductions in daylight distribution.
- 8.273. 110 rooms (13%) would experience a reduction that is noticeable to the occupants to varying degrees, summarised below.

Table 8.10 – Impacts on NSL (Plot 10a and 10b)

Receptor	BRE NSL Target Negligible	Minor Adverse Magnitude of Change	Moderate Adverse Magnitude of Change	Major Adverse Magnitude of Change
Macintosh Mill	41 rooms (53%)	2 rooms (3%)	5 rooms (6%)	30 rooms (38%)
Cambridge Mill	83 rooms (100%)	-	-	-
Chorlton Mill	81 rooms (92%)	7 rooms (8%)	-	-
City South Apartments	221 rooms (100%)	-	-	-
Plot 11 First Street Development	209 rooms (76%)	32 rooms (12%)	19 rooms (7%)	15 rooms (5%)
Manchester Student Village	97 rooms (100%)	-	-	-

Macintosh Mill

- 8.274. The majority of Macintosh Mill will experience a negligible impact on daylight amenity that is therefore not significant. The majority of this building's habitable rooms are served by windows on the north west and south east facing elevations. Massing on Plot 10 will only be seen through these windows at a very acute angle, and any reductions in daylight will - if present - be negligible, on the basis that these windows overlook open parcels of land and have a limited view of high rise massing (including Plot 11) in the immediate vicinity.

- 8.275. Impacts on the daylight amenity of this majority of Macintosh Mill's rooms will be not significant.
- 8.276. 127 individual windows have been appraised, serving 78 rooms of bedroom and LKD use.
- 8.277. In the Baseline Condition, 29 windows (23%) would achieve the BRE's VSC target. 98 windows (77%) would not achieve the BRE's VSC target.
- 8.278. The low percentage of windows achieving the BRE target reflects the inherently limited capacity for certain windows to receive daylight (those below pavement level and set within a narrow lightwell), and the obstruction to daylight resulting from the high rise, high density massing of the wider context in the vicinity (including development of Plot 9A and Plot 11).
- 8.279. In the 10A & 10B Proposed Condition, 65 windows (51%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that it would not be noticed by the room occupants.
- 8.280. 41 rooms (53%) of the 78 appraised would also pass the BRE's NSL test.
- 8.281. 62 windows (49%) serving 45 rooms do not achieve the BRE target nor acceptable tolerance value of 21.6%, and would typically experience high magnitudes of change. Of these 45 rooms:
- 9 rooms (4 bedrooms and 5 LKDs) are also served by at least one window that achieves the acceptable tolerance target. All of these rooms would pass the NSL test, experiencing a negligible reduction in daylight distribution. The impact on the daylight amenity of these 9 rooms is **negligible and not significant**.
 - 21 windows serve single-window bedrooms. The majority of these rooms would also experience a major magnitude of change in NSL. On the basis that bedrooms are a low sensitivity receptor in multi-room apartments, the impact of 10A+10B Proposed Developments on these bedrooms is significant and **moderate adverse** and therefore significant.
 - 22 windows serving 11 LKDs would experience a major magnitude of change in VSC. These rooms, of high daylight sensitivity, would also experience a major magnitude of change in NSL. The impact on these 11 rooms (14% of the 78 rooms appraised) is significant and **major adverse** and therefore significant.
- 8.282. Notwithstanding that impacts to rooms directly overlooking the 10b Site are major adverse, overall we consider the impact of the 10A & 10B Proposed Development on the daylight amenity Macintosh Mill to be **moderate adverse** and therefore significant, on the basis that major impacts are localised to that portion of Macintosh Mill located on the opposite side of River Street to Plot 10, which directly overlook the 10b Site.
- 8.283. The majority of this building's habitable rooms are served by windows on the north west and south east facing elevations. On the basis that these overlook open parcels of land and that the 10b may only be seen at very acute angles through these windows (if at all), this majority of windows and rooms of Macintosh Mill have not been subject of technical analysis, and impacts, if any, would be negligible and not significant.

Cambridge Mill

- 8.284. 102 individual windows have been appraised.
- 8.285. The windows serve 83 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.286. All 102 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that it would not be noticed by the room occupants.
- 8.287. All 83 rooms (95%) would pass the BRE's NSL test, experiencing a negligible reduction in NSL
- 8.288. Overall, the impact of the Proposed EIA Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

Chorlton Mill

- 8.289. 185 individual windows have been appraised.
- 8.290. The windows serve 88 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.291. 183 windows (99%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.

- 8.292. 2 windows serving LKDs would experience a low magnitude of change. The impact on daylight amenity of these rooms is **negligible and not significant**, given that both pass the NSL test, and both of these rooms are served by multiple other windows experiencing negligible reductions in VSC.
- 8.293. 81 rooms (92%) would experience a negligible reduction in NSL. The impact on daylight to these rooms is considered to be **negligible and not significant**.
- 8.294. 7 rooms (8%; 5 LKDs and 2 bedrooms) would experience a low magnitude of change in NSL. These rooms are however considered to remain adequately daylight, on the basis that:
- all windows serving these rooms achieve the BRE's VSC target
 - all rooms continue to receive direct daylight to at least two thirds of their area.
- 8.295. The impact of the Proposed EIA Development on daylight amenity of these rooms is considered to be negligible and non-significant.
- 8.296. Overall, the impact of the Proposed EIA Development on the daylight amenity of this neighbouring building is **negligible and not significant**, given the localised and minor nature of the impacts on daylight amenity.

City South Apartments

- 8.297. 271 individual windows have been appraised.
- 8.298. The windows serve 221 rooms, assumed to be a mixture of bedrooms and LKDs.
- 8.299. All 271 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.
- 8.300. All 221 rooms appraised (100%) would experience a negligible reduction in NSL.
- 8.301. Overall, the impact of the Proposed EIA Development on the daylight amenity of this neighbouring building is **negligible and not significant**.

Plot 11 First Street

- 8.302. 731 individual windows have been appraised, within the two blocks closest to Plot 10.
- 8.303. The windows serve 275 rooms, assumed to be a mixture of bedrooms, studios and LKDs.
- 8.304. 389 windows (53%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants. The impact on these windows is **not significant**.
- 8.305. A further 101 windows (14%) would achieve VSC values considered to be within an acceptable tolerance of the BRE target (VSC of >21.6%), given the increased density of the City Centre generally and the massing of the wider First Street area as envisioned in MCC planning policy. The impact on these windows is **not significant**.
- 8.306. 67% of windows appraised would therefore experience a **not significant impact**.
- 8.307. 241 windows (33%), serving 105 rooms, would not achieve the acceptable tolerance VSC value of 21.6%, and would experience reductions ranging from minor to major. Of these:
- 54 rooms (20% of rooms appraised), comprising 7 LKDs, 36 studios (high sensitivity daylight receptors) and 11 bedrooms (low sensitivity daylight receptors) would experience a negligible reduction in daylight distribution, passing the BRE's NSL test. These rooms are served by two or more tall windows. Despite measured reductions in VSC at the face of the window, these rooms will continue to be adequately daylit in the Proposed Condition.
 - The impact on these bedrooms is therefore **negligible and not significant**. The impact on the LKDs and Studios is **negligible – minor adverse** and not significant.
 - 51 of the rooms served by these windows would not achieve the NSL target, experiencing reductions that could be noticeable to the room occupants.
- 8.308. Overall, 209 of the 275 rooms appraised (76%) would experience a negligible reduction in NSL. Impacts on daylight amenity of these rooms is negligible non-significant.

- 8.309. 32 rooms (12% of rooms appraised) (28 studios; 4 LKDs) of those appraised would experience a low magnitude of change in NSL. The impact of the Proposed EIA Development on the daylight amenity of these high sensitivity receptors is **minor - moderate adverse**.
- 8.310. 22 rooms (8%) (18 studios; 4 LKDs) of those appraised would experience a medium magnitude of change in NSL. Impact on the daylight amenity of these high sensitivity receptors is **moderate-major adverse**.
- 8.311. 15 rooms (5%) (5 studios; 10 bedrooms) of those appraised would experience a high magnitude of change in NSL. The impact on daylight amenity of the studios is **major**; the impact on daylight amenity of the bedrooms is **moderate-minor**.
- 8.312. On that basis, a small minority of rooms appraised, and a very small minority of the Plot 11 development as a whole, would experience **moderate – major impact**.
- 8.313. The analysis only focuses on those windows and rooms of this neighbouring building closest to Plot 10. The significant majority of windows and rooms of Plot 11 as a whole have not been appraised, on that basis that their view of Plot 10a is obstructed by other parts of the Plot 11 development. This un-appraised majority of windows and rooms of Plot 11 will experience a **negligible impact** and therefore not significant.
- 8.314. Overall, the impact of the Proposed EIA Development on the daylight amenity of this neighbouring building is of **minor adverse impact** and not significant, on the basis that those moderate and major impacts are localised and account for no more than a very small minority of this neighbouring development as a whole.

Manchester Student Village

- 8.315. 122 individual windows have been appraised.
- 8.316. The windows serve 97 rooms, assumed to be student bedrooms.
- 8.317. All 122 windows (100%) will continue to achieve the 27% VSC target in the Proposed condition, or retain VSC values of at least 0.8x baseline values, accepted by the BRE on the grounds that reductions would not be noticed by the room occupants.
- 8.318. All 97 rooms appraised (100%) would experience a negligible reduction in NSL.
- 8.319. Overall, the impact of the Proposed EIA Developments on the daylight amenity of this neighbouring building is **negligible and not significant**.

Plot 10A & 10B - Sunlight Amenity

Macintosh Mill

- 8.320. 60 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.321. 18 rooms appraised (28%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight, where present, are unlikely to be noticeable to the room occupants.
- 8.322. 3 bedrooms (5%) would achieve sunlight values within an acceptable tolerance of both the winter and annual sunlight targets.
- 8.323. Impacts of the Proposed EIA Development on these 21 rooms are considered to be **negligible and not significant**.
- 8.324. 8 rooms (13%) would achieve either the annual sunlight target or the winter sunlight. Magnitudes of change where the target is not achieved is major.
- 8.325. Of these 8 rooms:
- 5 rooms, of unknown use, would experience a **negligible and not significant** impact on annual sunlight amenity. Winter sunlight amenity is reduced from 1% in the baseline condition to 0% in the Proposed Condition. Whilst this equates to a major magnitude of change, and associated moderate-major impact on winter sunlight amenity, this reduction from a very low baseline value may not be noticeable to the room occupants.
 - 3 rooms (1 LKD, 1 bedroom, 1 studio), each served by windows set below pavement level and looking into a narrow lightwell, would experience no reduction in winter sunlight amenity. Impacts on winter sunlight amenity of these rooms is negligible. These 3 rooms would experience a moderate and major magnitudes of change in annual sunlight amenity, equating to major adverse impact on the LKD and studio, and a moderate adverse impact on the bedroom. Impacts are significant.

- 8.326. 15 rooms (25%) would achieve acceptable tolerance annual sunlight values. Impact on the annual sunlight amenity of these rooms is therefore acceptable. These 15 rooms would not achieve the Winter sunlight targets nor come within an acceptable tolerance of them; reductions in winter sunlight amounting to a major magnitude of change. Of these 15 rooms:
- 8 are LKDs that achieve the BRE target or experience negligible impacts on annual sunlight amenity, but for which impacts on winter sunlight amenity are **major adverse** and therefore significant.
 - The 7 bedrooms are a low sensitivity sunlight receptor. Given the high magnitudes of change to winter sunlight amenity of these bedrooms, impacts of the Proposed EIA Development on these bedrooms is **moderate – minor adverse**.
- 8.327. 17 rooms (28%; 10 bedrooms and 7 LKDs) would achieve neither winter nor annual sunlight targets. These rooms would experience significant impacts, with major magnitudes of change to both winter and annual sunlight amenity. Impacts on the sunlight amenity of the LKDs is **major adverse** and therefore significant. Impacts on sunlight amenity of the bedrooms is **moderate adverse** and therefore significant.

Macintosh Mill – External Amenity Space

- 8.328. The sunken gardens external amenity area of Macintosh Mill, facing Hulme Street, have been time in sun appraised.
- 8.329. The area would experience no impact / reduction in time in sun. In the Proposed Condition, 56% of this external amenity area would achieve the BRE target of 2 hours' time in sun on 21 March (against a target of 50%). On that basis this external amenity area will remain adequately sunlit throughout the year.
- 8.330. The impact of the Proposed EIA Development on the sunlight amenity of the Macintosh Mill sunken gardens is therefore **negligible and not significant**.

Cambridge Mill

- 8.331. 83 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.332. All 83 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight, where present, are unlikely to be noticeable to the room occupants.
- 8.333. The impact of the Proposed EIA Development on Cambridge Mill is therefore **negligible and not significant**.

Chorlton Mill

- 8.334. 87 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.335. 86 rooms (99%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight are unlikely to be noticeable to the room occupants.
- 8.336. 1 room would achieve the BRE target or 0.8x baseline value for annual sunlight hours. This room would experience a reduction in winter sunlight hours from 2% to 1%. Whilst this equates to a high magnitude of change, in real terms this reduction is small. Further, this room and their windows are located adjacent to Chorlton Mill's own large chimney structure, which limits direct sunlight in the baseline condition.
- 8.337. On the basis that this room is a small minority of all rooms appraised, the impact of the Proposed EIA Development on the Chorlton Mill is considered to be **negligible and not significant**.

City South Apartments

- 8.338. 197 rooms have been appraised, assumed to be a mixture of bedrooms and LKDs.
- 8.339. All 197 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition, or retain annual and winter sunlight values of at least 0.8x baseline values, acceptable to the BRE on the basis that reductions in sunlight are unlikely to be noticeable to the room occupants.
- 8.340. The impact of the Proposed EIA Development on the City South apartments is therefore **negligible and not significant**.

Plot 11 First Street

- 8.341. Plot 11 is located to the south east of Plot 10.
- 8.342. The EIA Site facing windows of Plot 11 are therefore northwest facing. On that basis, these window have a very limited expectation of direct sunlight over the EIA Site.

- 8.343. The Proposed EIA Development will therefore have an impact on the sunlight amenity of this neighbouring building's site-facing rooms **that is negligible and not significant**.

Manchester Student Village

- 8.344. 97 rooms have been appraised, assumed to be assumed to be student bedrooms.
- 8.345. All 97 rooms appraised (100%) would continue to achieve the BRE's annual and winter sunlight targets in the Proposed Condition.
- 8.346. The impact of the Plot 10A Proposed Development on the sunlight amenity of Manchester Student Village is therefore **negligible and not significant**.

James Grigor Square

- 8.347. James Grigor Square has been time in sun appraised.
- 8.348. In the Baseline condition 100% of James Grigor Square achieves the BRE target of 2 hours' time in sun to 50% of its area.
- 8.349. In the 10a + 10b Proposed Condition, 29% of James Grigor Square would achieve the BRE target of 2 hours' time in sun on 21 March (against a target of 50%).
- 8.350. On the basis this external amenity area – a high sensitivity sunlight receptor – would experience a high magnitude of change, and the impact of the Proposed EIA Development on James Grigor Square is considered to be **major adverse** and is therefore significant.
- 8.351. This is a significant uplift in impact from both the 10A and 10B assessments, both of which resulted in a negligible impact on this external amenity space. The reason for this is that in each of those assessments, James Grigor square continues to receive daylight over the remainder of Plot 10 without a building. i.e., in the assessment of 10a, sunlight continues to be received by James Grigor Square over the unbuilt upon Plot 10b (and vice versa). When the 10a and 10b massing are both present this presents a significant obstacle to direct sunlight to James Grigor Square. It should however be acknowledged that the SDF has always envisioned buildings on the EIA Site and which could inevitably have an impact on James Grigor Square.

Discussion of Significant Impacts

- 8.352. A summary of the operational impacts on daylight amenity is tabulated below:

Table 8.10 – Summary of operational impacts on daylight amenity

Receptor	Significance of Impact					
	10A		10B		10A + 10B	
	Daylight	Sunlight	Daylight	Sunlight	Daylight	Sunlight
Macintosh Mill	Moderate Adverse	Moderate Adverse	Moderate Adverse	Moderate adverse	Moderate Adverse	Moderate adverse
Cambridge Mill	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Chorlton Mill	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
City South Apartments	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Plot 11 First Street Development	Negligible – Minor adverse	Negligible	Negligible	Negligible	Minor adverse	Negligible
Manchester Student Village	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
James Grigor Square	n/a	Negligible	n/a	Negligible	n/a	Major adverse
Macintosh Mill – External Amenity	n/a	Negligible	n/a	Negligible	n/a	Negligible

- 8.353. Macintosh Mill will experience adverse impacts on daylight and sunlight amenity in all development scenarios. Overall, impacts to the other receptors appraised are considered to be acceptable in EIA terms.
- 8.354. In summary, localised portions of Macintosh Mill will experience high magnitudes of change in both daylight and sunlight to high sensitivity LKD rooms. These are limited to that end of Macintosh Mill that directly overlooks the EIA

Site. The majority of habitable rooms of Macintosh Mill are served by windows in the northwest- and southeast-facing elevations of the building. These windows have not been subject of a technical analysis, and they will experience no significant impacts on daylight and sunlight amenity, given their oblique relationship to the EIA Site and the Proposed EIA Developments and acute angle at which parts of Plot 10 may be seen.

- 8.355. Whilst the Proposed EIA Developments of the 10A Site and 10B Site will have a major adverse impact on daylight and sunlight amenity of certain rooms within Macintosh Mill, it is important to consider these Moderate and Major adverse impacts on Macintosh Mill in the context of its history as an industrial building, its relationship with Plot 10 and with the wider First Street masterplan, and development within the City Centre in general.

Macintosh Mill – Building Design and Baseline Context

- 8.356. Macintosh Mill is a Grade II listed building, originally a factory and converted to residential use circa 2005 / 2006.
- 8.357. The building's current external form reflects this building's original use as a factory. It has relatively small windows that would have served industrial space. Presumed to have been open plan to accommodate manufacturing processes within, the absence of internal walls facilitates a wider lateral distribution of daylight within a building.
- 8.358. By contrast, the existing, cellular layout of the building in its residential form means that lateral distribution of daylight is less possible, and the residential rooms inserted into this industrial building are more reliant on daylight from in front.
- 8.359. The historic façade and window apertures – designed for the needs of an industrial building and relatively unaltered due to the Grade II listing of the building – place a limitation on daylight when combined with the existing residential use (which has a greater requirement for daylight than the former commercial/industrial uses). In this regard there is – in daylight and sunlight terms – a friction between the retained façade of the industrial building and its current use as apartments.
- 8.360. Further, the typical windows of Macintosh Mill overlooking the EIA Site are relatively small when compared to the windows of other mill conversions, such as Chorlton Mill, Manchester Student Village and Cambridge Mill, to name but three examples in the immediate vicinity. They are also smaller than windows serving LKDs that would typically be found on new residential apartment buildings.
- 8.361. The combination of relatively small windows and the insertion of a residential use and floorplans into an industrial building mean that daylight and sunlight amenity are relatively restricted when compared to modern building design and guidance, and potentially more susceptible to amenity impacts of development in the vicinity.
- 8.362. Certain windows and rooms of Macintosh Mill are inherently limited in their capacity for daylight and sunlight amenity at lower ground floor level. The windows serving these rooms are set below pavement level within a narrow lightwell.
- 8.363. Rooms served by these windows in the baseline condition have both a low level of daylight and sunlight amenity in the baseline condition, and as a consequence a heightened susceptibility to changes of mass in the surrounding area. In effect, even small changes in real terms are likely to result in moderate and high magnitudes of change.
- 8.364. Windows at upper ground floor level and above currently enjoy an outlook over a large parcel of land that is free of massing and used as surface carparking. Such an unobstructed outlook is highly unusual for windows of a low rise building within the City centre and, given planning policy for First Street and the fact that such parcels of land in Manchester City Centre are frequently developed, such an outlook over a development plot (as opposed to say, a public square or park) and the amenity associated with that should not be considered permanent and irrevocable.
- 8.365. Given the unobstructed outlook, the effect on daylight and sunlight amenity resulting from development of the EIA Site in accordance with planning policy – and in keeping with the wider First Street area - is likely result in major magnitudes of change. Given the presence of high sensitivity LKD rooms, localised major adverse impacts should be reasonably anticipated with any redevelopment of this EIA Site.
- 8.366. There are an estimated 20-25 apartments in this part of Macintosh Mill and the two small 'projections' / projecting wings with Plot 10 facing windows. These account for a minority of all apartments within Macintosh Mill, with the majority of apartments in this building being part of the long, main 'wing' (oriented east-west) and served by north and south facing windows, and unaffected by the Proposed EIA Developments of Plot 10.

Daylight Amenity of Other Habitable Buildings in the Vicinity

- 8.367. Technical analysis results demonstrate that certain localised parts of Macintosh Mill will experience significant impacts on daylight and sunlight amenity.

- 8.368. On the basis the magnitude of change from baseline values is a factor in assessing significance of impact, the absence of massing on the EIA Site means that high magnitudes of change to Macintosh Mill are highly likely if not inevitable as a result of development of Plot 10. This in turn accentuates the significance of impact.
- 8.369. An analysis has been undertaken of other habitable buildings in the vicinity to establish – in daylight amenity terms – the character of the wider area in which Macintosh Mill sits. The aim of such an exercise is to consider whether the residual daylight amenity of Macintosh Mill following the development of Plot 10 is broadly in keeping with comparable buildings in this part of Manchester City Centre, and area that features a mixture of converted historic buildings, new buildings of comparable massing and high rise development.
- 8.370. The analysis takes the form of a façade render, to identify VSC conditions across elevations of other parts of Chorlton Mill, Sally’s Yard, Locks Yard and The Foundry apartment buildings, these being the buildings most similar to Macintosh Mill (in terms of height, massing and character) in the immediate vicinity.
- 8.371. The façade render images colour code the facades of the neighbouring buildings using a heat map style palette according the existing VSC levels, with the cool colours of purples and blues being very low VSCs. Acceptable tolerance VSCs of circa 20% and above are coloured shades of green.
- 8.372. Set out below is a building-by-building commentary of existing VSC levels that characterise buildings in this part of Manchester.
- 8.373. Where elevations of Chorlton Mill overlook Manchester Student Village very low VSC values are present at ground floor level. Higher up on this elevation VSC levels to the majority are <13%, as a result of the very significant massing of Manchester Student Village. Only the very top floor of Chorlton Mill exceeds this, and at the uppermost levels VSC values to elevations overlooking Student Village are of no more than circa 17% VSC (i.e. below the 21.6% that is considered to be within an acceptable tolerance of the BRE’s VSC target).
- 8.374. The Foundry apartment building has been assessed. This was built in the early 2000s between Chorlton Mill and 6-8 Marlborough Street. Certain areas of very poor VSC have been effectively designed into this, with parts of the façade overlooking the Marlborough Street being as low as 2%. Where this building overlook Marlborough Street the majority of it is 12% VSC or less.
- 8.375. Lockes Yard, again built in the early 2000s, is in close proximity to Chorlton Mill and directly overlooks it. As result, windows at lower floor levels would achieve VSCs of between 5 and 15%.
- 8.376. Sally’s Yard is an apartment building of a similar character to Macintosh Mill, a historic industrial / commercial building converted to residential use. The entirety of the façade facing Manchester Student Village achieves VSCs of between 3 and 5%, and has very low levels of daylight amenity due to the significant mass of the newer Manchester Student Village building.
- 8.377. In general terms, parts of residential buildings within the local area around Macintosh Mill are limited in their daylight amenity as a result of the relatively tight urban grain and the massing of both neighbouring buildings. Further, the design of certain newer buildings built in amongst the older buildings have been designed and constructed to fit within and strengthen this urban grain, and the low levels of daylight amenity inherent to the character of this part of Manchester City Centre.
- 8.378. By contrast, part of Macintosh Mill currently directly overlooks the EIA Site which is an open parcel of land, and in this regard is significantly less obstructed than is typical for a low rise, city centre apartment building. Notwithstanding this absence of massing on the EIA Site, the majority of windows appraised in Macintosh Mill do not achieve the BRE targets in the baseline condition, due to the high density of the wider area around Macintosh Mill, including the significant massing of Plot 11.

The SRF

- 8.379. The First Street SRF, the most recent update of which was adopted in 2018, outlines an expansion to the First Street area.
- 8.380. As noted earlier in this chapter, the SRF envisages development of the first street area and establishes principles for the use, design and massing of development in this part of Manchester.
- 8.381. For Plot 10, height parameters established in this document are for buildings of up to 17 commercial storeys in height.
- 8.382. We note that the Proposed EIA Developments of Plot 10A and 10B rise to 13 and equivalent 10 commercial storeys in height.
- 8.383. Given that certain rooms within these neighbouring buildings are high sensitivity receptors, combined with the relatively unobstructed outlook of these neighbouring buildings, moderate – major magnitudes of change to high

sensitivity receptors are inherent to the comprehensive redevelopment of Plot 10 as envisaged by the First Street SDF. The Proposed EIA Developments do not in this regard have an unusual or unforeseen impact on daylight and sunlight amenity of the neighbouring buildings.

Mirroring Macintosh Mill

- 8.384. The BRE Guidance notes that when assessing daylight amenity impacts, site- or context-specific alternative targets may be set in a number of ways, including with reference to the mass of a neighbouring building.
- 8.385. An analysis has been undertaken to identify the impact that a 'mirror image' massing – a mass based on the height of Macintosh Mill and placed on Plot 10 - would have on the habitable rooms of this receptor.
- 8.386. Where overlooking the EIA Site directly, Macintosh Mill is a building of 5 storeys in height. This means that any 'mirror image' massing on Plot 10 as the basis for an alternative target is significantly smaller than the massing envisioned for Plot 10 within the current version of the SRF, and the massing of the buildings in the First Street area generally.
- 8.387. In the proposed mirror image condition, 89 windows (70% of windows appraised) would achieve the VSC target (or retain at least 0.8x baseline values). 54 rooms of the 78 appraised would experience negligible reductions in NSL.
- 8.388. For comparison, in the 10b Proposed Condition, 65 windows (51%) would achieve the VSC target (or retain at least 0.8x baseline values). 41 rooms of the 78 appraised would experience negligible reductions in NSL.
- 8.389. The mirror image massing has a lesser impact on daylight amenity of Macintosh Mill compared to the 10b Proposed Development, due to the lower height. Notwithstanding, the analysis shows that even a low rise development on Plot 10b - of comparable stature to Macintosh Mill and significantly smaller than massing envisaged within the SRF - would result in high magnitudes of change and major adverse impacts to windows and rooms directly overlooking the EIA Site.
- 8.390. As a result of an equal height massing, 22 rooms within Macintosh Mill (28% of rooms) – including high sensitivity LKD rooms – would experience major impacts that are significant as a result of a mirrored height massing. 31 windows (25% of windows appraised) would experience impacts that are significant (including major adverse impacts to LKD rooms).
- 8.391. These significant impacts would be present from lower ground up to 2nd floor levels, with only the two uppermost floors avoiding significant impacts on VSC. There are two 3rd floor LKD rooms that experience impacts on NSL that are significant.
- 8.392. From this it can be concluded that localised major adverse impacts (high magnitudes of change to high sensitivity rooms / receptors) are unavoidable in development of Plot 10, even if the Plot 10b Site was developed with low rise massing comparable to Macintosh Mill.
- 8.393. In terms of sunlight amenity impact, in the proposed mirror image condition 33 rooms (55% of rooms appraised) would continue to achieve the BRE's annual and winter sunlight targets, or retain annual and winter sunlight values of at least 0.8x baseline values. For comparison, this figure is 17 rooms (28%) in the 10b Proposed condition.
- 8.394. In the proposed mirror image condition, 6 rooms (10% of those appraised) would achieve neither annual nor winter sunlight targets (nor the Alternative Target). For comparison, in the 10b Proposed condition this figure is 17 rooms (28%).
- 8.395. Notwithstanding that sunlight amenity impacts of a mirror image massing are lesser than those resulting from the Proposed 10b massing - a factor of lower height - high magnitudes of change and major adverse impacts that are significant would still be present to parts of Macintosh Mill if Plot 10 was developed to a height of 5 storeys.
- 8.396. In the mirror image condition, at 2nd and 3rd floor level there would be high magnitudes of change to winter sunlight of 14 rooms including high sensitivity LKDs. Moderate magnitudes of change are present to the winter sunlight amenity of a bedroom and an LKD at 4th floor level (albeit these rooms would achieve an acceptable tolerance winter sunlight value overall).
- 8.397. The conclusion that can be drawn from this exercise is that significant adverse impacts on sunlight amenity on Macintosh Mill are an unavoidable (if localised) consequence of development on Plot 10, even if the height of development is limited to equal that of Macintosh Mill. Whilst these major adverse impacts are more localised than the impact of the Proposed EIA Development, in both scenarios they account for a minority of Macintosh Mill as a whole.

Cumulative Effects

- 8.398. We are briefed to consider the potential cumulative daylight and sunlight impact of the Proposed EIA Development with other neighbouring developments that are planning approved but construction works have not yet commenced on site (a list of which is provided in Appendix 2.2 of this Statement).
- 8.399. The list is extensive, but having researched and considered the location and massing of these other property developments, many of them are not considered to be close enough to the EIA Site for their massing to have any material cumulative daylight and sunlight impact on any of the neighbouring buildings and external spaces considered as part of this Chapter.
- 8.400. However, the massing of the following neighbouring approved property developments are considered to be potentially in close enough proximity to the EIA Site and the Key neighbouring receptors that have been evaluated in this Chapter to justify cumulative review:

Table 8.11 – Cumulative Schemes

Application Reference	Map No	Distance from EIA Site	Scoped In/Out
One City Road 128002/FO/2020	8	90m	In
Hotspur House 120635/FO/2018	9	110m	In
Park Place 129273/FO/2021	10	250m	In
GJS Plot F 132199/FO/2021	11	250m	In
Student Castle 121252/FO/2018	12	270m	In
Apex Tower 133172/FO/2022	15	300m	In
Stay City Deansgate 125804/FO/2019	19	440m	In

- 8.401. Type 2 effects only are contemplated. We do not anticipate any Type 1 cumulative effects on daylight and sunlight amenity.

Plot 10A Cumulative

Daylight Amenity

- 8.402. In the 10A Proposed + Cumulative condition, there would be a negligible cumulative impact on the daylight amenity of
- Cambridge Mill
 - Manchester Student Village
 - Macintosh Mill.
- 8.403. These building are either too far from the 10a Site and cumulative developments to be materially affected by both in the cumulative condition.

- 8.404. Certain rooms of City South would experience a cumulative impact. Where there is an uplift in impact in the Proposed Cumulative Condition this is attributable to One City Road, these rooms' view of the Plot 10 A being wholly obscured by One City Road in the Cumulative Condition.
- 8.405. A small minority of rooms and windows of Chorlton Mill would experience an uplift of impact on daylight amenity in the Cumulative Condition. In the 10A Proposed Condition 2 rooms would experience a low magnitude of change in NSL. In the cumulative condition these become medium magnitude of change, and 7 other rooms would experience an uplift from negligible to minor magnitude of change in NSL. Uplift in VSC impacts would generally experienced by windows adjacent the large chimney and of limited view of the 10a Site, but which will see the 28 storey Hotspur House development.
- 8.406. A small minority of windows of the Plot 11 development would experience an uplift in impacts on VSC (77% of windows would achieve the targets or values within an acceptable tolerance of them) in the 10A Cumulative Condition, compared to 79% in the 10A Proposed Condition. In terms of NSL, there is no reduction in rooms achieving the NSL target in the Cumulative Condition. The cumulative impact on daylight is therefore considered non-significant.
- 8.407. Overall, impacts of Proposed 10a Development are non-significant in the cumulative condition.

Sunlight Amenity

- 8.408. In the 10A Proposed + Cumulative condition, there would be no cumulative impact on any of the neighbouring buildings appraised.
- 8.409. In the 10A Proposed + Cumulative condition, there would be negligible cumulative impact on either of the neighbouring external amenity spaces. Both would continue to achieve the BRE target in the cumulative condition.

Plot 10B Cumulative

Daylight Amenity

- 8.410. In the 10B Proposed + Cumulative condition, there would be no cumulative impact on the daylight amenity of
- Cambridge Mill
 - Manchester Student Village
- 8.411. Macintosh Mill will experience no reduction in rooms achieving the NSL target in the cumulative condition. There would be a reduction of 4% of windows achieving the BRE target in the cumulative condition (51% achieve the BRE target in the Proposed 10B condition). These windows are not Plot 10 facing (but do serve rooms that are also served by a Plot 10- facing window), and would as a result of Hotspur House generally achieve VSC values considered to be within an acceptable tolerance of the BRE target in the cumulative condition.
- 8.412. Certain rooms of City South would experience a cumulative impact. Where there is an uplift in impact in the Proposed Cumulative Condition this is attributable to One City Road, these rooms directly overlooking this development which is located between City South Apartments and Plot 10.
- 8.413. One room in Chorlton Mill would experience an uplift of impact on daylight amenity in the Cumulative Condition. In the 10B Proposed Condition 1 room would experience a low magnitude of change in NSL. In the cumulative condition 2 rooms experience a low magnitude of change. 96% of windows appraised would achieve the VSC target in the 10B + Cumulative condition, compared to 100% in the 10B Proposed Condition. Each of the rooms served by these windows are also served by windows that achieve the BRE target or experience negligible reductions in VSC.
- 8.414. Uplift in VSC impacts in the 10B Cumulative condition are generally experience by windows adjacent the large chimney and of very limited view of the 10b Site, but which will see the 28 storey Hotspur House development.
- 8.415. A small minority of windows of the Plot 11 development would experience an uplift in impacts on VSC (90% of windows would achieve the targets or values within an acceptable tolerance of them) in the 10B Cumulative Condition, compared to 91% in the 10B Proposed Condition. In terms of NSL, there is no reduction in rooms achieving the NSL target in the Cumulative Condition. The cumulative impact on daylight is therefore considered **non-significant**.

Sunlight Amenity

- 8.416. In the 10B Proposed + Cumulative condition, there would be no cumulative impact on any of the neighbouring buildings appraised.
- 8.417. In the 10B Proposed + Cumulative condition, there would be no cumulative impact on any of the external amenity spaces appraised.

Plot 10A + 10B Cumulative

Daylight Amenity

- 8.418. In the 10A + 10B Proposed + Cumulative condition, there would be no cumulative impact on the daylight amenity of
- Cambridge Mill
 - Manchester Student Village
- 8.419. Macintosh Mill will experience no reduction in rooms achieving the NSL target in the cumulative condition. There would be a reduction of 4% of windows achieving the BRE target in the cumulative condition (51% achieve the BRE target in the Proposed 10A + 10B condition). These 3 additional windows achieving acceptable tolerance values and 2 additional windows not achieving the BRE target are not Plot 10 facing (but do serve rooms with Plot 10- facing windows) experience extra over impacts in the cumulative condition due to their outlook towards the 28 storey Hotspur House. Cumulative impacts on the daylight amenity of Macintosh Mill are, overall, non-significant.
- 8.420. Certain rooms of City South would experience a cumulative impact. Where there is an uplift in impact in the Proposed Cumulative Condition this is attributable to One City Road, these rooms directly overlooking this development which is located between these windows and Plot 10 in the Cumulative Condition.
- 8.421. A small minority of rooms and windows of Chorlton Mill would experience an uplift of impact on daylight amenity in the Cumulative Condition. In the 10A+10B Proposed Condition 7 rooms would experience a low magnitude of change in NSL. In the cumulative condition 7 rooms experience a low magnitude of change and 3 rooms experience a moderate magnitude of change. 95% of windows appraised would achieve the VSC target in the 10A +10B + Cumulative condition, compared to 99% in the 10A+10B Proposed Condition.
- 8.422. A small minority of windows of the Plot 11 development would experience an uplift in impacts on VSC in the 10A+10B Cumulative Condition. In 10A + 10B Cumulative condition, 66% of windows would achieve the BRE target or come within an acceptable tolerance of it (compared to 67% in the 10A + 10B Condition). This reduction in windows achieving the BRE target of 1% is non-significant. Further, in terms of NSL, there is no change in the number of rooms achieving the NSL target in the Cumulative Condition, nor in the number of rooms experiencing low, medium and high magnitudes of change compared to the 10A+10B Condition. The cumulative impact on daylight is therefore considered non-significant.

Sunlight Amenity

- 8.423. In the 10A+10B Cumulative condition, there would be no significant cumulative impacts on any of the neighbouring buildings appraised.
- 8.424. In the 10A+10B Cumulative condition, there would be negligible cumulative impact on the external amenity spaces appraised.

Mitigation Measures

- 8.425. Impacts on the surrounding receptors of both schemes are predominantly negligible and non-significant.
- 8.426. Macintosh Mill is the only receptor that will experience significant impacts on daylight and sunlight amenity that are, overall, moderate adverse, with significant impacts being localised to a minority of Macintosh Mill as a whole. In general, overall terms, other buildings will only experience impacts of this significance in localised / small areas.
- 8.427. Within the current version of the SRF, the massing principles established include a massing of up to [17] storeys on Plot 10.
- 8.428. As a design response to the wider context of the EIA Site, initial proposals for Plot 10, and in particular Plot 10b, have not been to the full extent of the SRF massing principles, but rather to a height of 15 storeys.
- 8.429. Design development of the Proposed EIA Development has resulted in a reduction in height of the 10b massing, from 16 down to 14 storeys. This reduction will result in a slight lessening of measured daylight and sunlight impacts on the surrounding receptors.

Residual Effects

- 8.430. On the basis that no mitigation measures are proposed, the Residual Effects of the Proposed EIA Development on the Daylight and Sunlight amenity of the neighbouring sensitive receptors remain as per the Operational Phase effects identified earlier in this chapter.

8.431. The table below is designed to show how impacts are mitigated through application of mitigation measures, and to record / identify the residual effect after application of mitigation.

Table 8.1 – 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 Phase				
Not applicable				

Table 8.2 – 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)
Operational Phase				
Minor - Moderate Adverse impact on Daylight and Sunlight Amenity – All scenarios	Macintosh Mill	None proposed	n/a	Minor - Moderate adverse impact on daylight and sunlight amenity in all scenarios
Major adverse impact on Sunlight Amenity – 10A+10B scenario	James Grigor Square	None proposed	n/a	Major adverse impact on Sunlight Amenity – 10A+10B scenario

Reference List

8.432. This ES Chapter has been prepared by reference to the following:

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

9. Human Health

Introduction

- 9.1. This Chapter of the ES has been prepared by Enfusion and assesses the likely impacts of the proposals upon human health for 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.
- 9.2. The chapter has been prepared by Barbara Carroll BSc MSc CEnv FIEMA with over 25 years' experience of assessing plans and projects for their impacts on the environment, including effects on human health and wellbeing. She has prepared health chapters for other Environmental Statements supporting various development project proposals in Manchester and other urban locations. She is a co-author of the practical guide - *The EIA Handbook* (Telfords, Third Edition, November 2019).

Legislative and Policy Context

National Planning Policy

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

- 9.3. The revised 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.”*
- 9.4. Chapter 8 covers promoting healthy and safe communities, acknowledging that planning policies and decisions should aim to achieve healthy, inclusive, and safe places which:
- 9.5. *“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.*
- 9.6. *“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*
- 9.7. *“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 92).
- 9.8. Social, recreational, and cultural facilities and services should ‘support the delivery of local strategies to improve health, social and cultural wellbeing for all sections of the community (paragraph 93). It is important that sufficient choice of school places is available to meet the needs of existing and new communities (paragraph 95). Public safety should be promoted and “take into account wider security and defence requirements” (paragraph 97).
- 9.9. “Access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and wellbeing of communities” (paragraph 98). Sustainable transport should be promoted and this “can help improve air quality and public health” (paragraph 105). “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 119). “Developments should create places that are safe, inclusive, and accessible and which promote health and wellbeing...” (paragraph 130). “New development must be appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health...” (paragraph 185).

Public Health England (PHE) Strategy (2019)

- 9.10. 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 (Greater Manchester Councils Publication Draft 2021)

- 9.11. The Greater Manchester Spatial Framework (GMSF, Publication Draft, 2020) was withdrawn but nine of the previous ten Councils have agreed to progress with a Joint Development Plan that builds upon the evidence base already collected. The Publication Draft of the Manchester Plan to 2037 (GMCA, August 2021) was submitted to the Secretary of State in February 2022 for independent examination during 2022. GMCA have issued a revised schedule of Proposed Main Modifications (January 2023) to the JDP. Following further consultation and consideration by the Inspector, it is anticipated that the JDP will be adopted later in 2023.
- 9.12. The Vision for Greater Manchester (GM) includes to make Greater Manchester as *"a place where people live healthy lives"*; and Strategic Objectives include No 10 *"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)

- 9.13. MCC's Core Strategy is the key document in Manchester's Local Development Plan. It is founded on a Vision to 2027 that includes *"an increased and sustainable healthy population..."*. Policies relevant to health are as follows:
- Policy SP1 Spatial Principles includes requirement that development should make a positive contribution to neighbourhoods including *"making a positive contribution to the health, safety and wellbeing of residents"*
 - Policy EC1 Employment and Economic Growth in Manchester requires development proposals to make the best possible use of a site in terms of efficient use of space and including application of best practice in security design.
 - Policy EN4 seeks to reduce CO₂ emission and reduce fuel poverty by enabling low and zero carbon development.
 - Policy EN8 Adaptation to Climate Change includes requirements to minimise flood risk and reduce urban overheating.
 - Policy EN9 Green Infrastructure provides guidance on provision of new, and improvements to, the quality and accessibility of existing green infrastructure assets.
 - Policies EN10 and EN11 safeguard and create new open space, sport and recreation facilities.
 - Health is further protected through Policies EN14 Flood Risk, EN16 Air Quality, EN17 Water Quality, and EN18 Contaminated Land & Ground Stability
 - Policy T1 Sustainable Transport requires *"delivery of a sustainable, high quality, integrated transport system to encourage modal shift away from car travel... and to prepare for carbon free modes of transport"*.
 - Policy T2 will actively manage the pattern of development to ensure that there are accessible areas of opportunity and need.
 - Policy T3 supports proposals that contribute to an economically and environmentally sustainable transport network through strategic integration of strategic transport projects. Progression towards sustainable transport will promote healthier living and well-being.
 - Policy DM1 Development Management requires that all development should have regard to specific issues including *"Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation"*; Accessibility: *buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes"*; *"Community safety & crime prevention"*; and *"Design for Health"*.

First Street Strategic Framework (SDF) (Manchester City Council 2005, 2007, 2010, 2012, 2015, updated 2018 & Addendum July 2020)

- 9.14. The updating identified that that greater scale and density of office accommodation can be delivered on Plots 9 and 10 to meet demand and maximise contribution to economic growth. Additionally, the Addendum provides an added emphasis on climate change and sustainability – all these factors are important for human health and wellbeing.

Our Manchester Strategy, Forward to 2025

- 9.15. 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 6 themes, including *Health – tackling physical and mental inequalities and ensuring fair access to integrated services*.

Other Relevant Policy, Strategy & Guidance

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

- 9.16. Provides evidence of links between spatial planning and health, focusing on five key built environment topics – neighbourhood design, housing, healthier food, natural and sustainable environment, and transport.

Public Health England (PHE) Health Impact Assessment in Spatial Planning (2020)

- 9.17. 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)

- 9.18. Provides a framework that supports a proportionate approach that can apply to all scales and sectors of EIA. It confirms that a wider determinants approach should be taken by EIA scoping. An EIA health chapter is required when other EIA technical topics have been scoped in to assess likely significant effects on human receptors, or there is a likely significant change for the health of a group of individuals due to the proposed project and in a wider determinant of health not covered by other technical EIA topics.

Assessment Methodology and Significance Criteria

- 9.19. 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, the Scoping Opinion, professional experience, and assessment of impacts against relevant baseline information.
- 9.20. A Scoping Opinion was received from MCC on 26 January, confirming that Human Health should be scoped into the Environmental Statement.
- 9.21. *Shaping Neighbourhoods: For Local Health and Global Sustainability* (2003, 2010 & 2021) sets out the complexities of planning for health due to the multiple determinants and the need for cross-sectoral understanding and collaboration. This guide established a health map demonstrating the linkages between the global ecosystem, the natural and built environments, the local economy with communities, people, and their lifestyles. It explains the likely interactions between different sectors and seeks a common language for spatial planning and public health practitioners.
- 9.22. 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.

- 9.23. 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.
- 9.24. This HUDU checklist recognises that health and wellbeing can be affected by multiple determinants as shown in Figure 9.1.
- 9.25. The HUDU has further developed the checklist into a rapid HIA tool (London HUDU, 2019) that uses existing evidence to quickly assess the impacts of a development plan or proposal and recommend measures to address any negative impacts and maximise benefits. The tool is based on eleven topics or broad determinants of health and wellbeing focused on the built environment and issues influenced by planning decisions.
- 9.26. For the purposes of this health impact assessment, we have applied the HUDU checklist and eleven topics to the proposals in order to help determine the scope of the assessment by identifying the relevant topics. Applicable criteria/questions for each of the scoped topics were considered at the assessment stage in order to assess potential health impacts and the need for any mitigation or enhancement. Existing information and evidence were used, and impact assessment undertaken using professional judgment.
- 9.27. **Housing design and affordability** are key factors – provision of good quality residential development is known to have positive effects on health and wellbeing. The provision of good quality purpose-built student accommodation will contribute towards identified need and may release accommodation elsewhere for the wider residential need.
- 9.28. **Access to health and social care services** and other social infrastructure is directly important for health. This health assessment considers the proximity, accessibility, and capacity (where possible) of health and medical centres and dentists in the vicinity of the Proposed EIA 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 EIA Development area to the facility.
- 9.29. **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.
- 9.30. **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.
- 9.31. **Accessibility and active travel** are well established as factors in health and wellbeing. Summary findings from the technical studies for transport supporting the planning application and informing the air quality studies are considered and their implications for health and wellbeing incorporated into this health impact assessment.
- 9.32. **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.
- 9.33. **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.
- 9.34. **Access to work and training** is known to affect health and wellbeing. The delivery of a sustainable office building with a ground floor food market will enhance employment possibilities in the city centre, and the provision of purpose-built student accommodation will help enable students to study in the city centre.
- 9.35. **Social cohesion and inclusive design** are key factors for health and wellbeing. This HIA considers the implications of the design and project proposals in this respect, including connectivity and the potential for non-cohesion with existing communities.
- 9.36. **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 health impact assessment.

- 9.37. Overall, the HIA 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.
- 9.38. This Health chapter considers the direct implications for health such as the provision of student accommodation and employment space. 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 and accessibility to green infrastructure, amenity, cultural, leisure, and recreational facilities.
- 9.39. The summary findings of the Socio-Economic (Chapter 11) and Townscape/Visual Impact (Chapter 12) studies are integrated into the implications for the four themes for healthy urban living since these topics are key contributors to improvements in health and wellbeing.
- 9.40. The key findings from the Air Quality (Chapter 6); Climate Change (Chapter 7); Daylight, Sunlight & Overshadowing (Chapter 8); Noise & Vibration (Chapter 10); and Wind Microclimate (Chapter 13); 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.
- 9.41. 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 four themes of - Healthy Housing; Active Travel; Healthy Environment; and Vibrant Neighbourhoods. Thus, any significant impacts for human health are clearly presented in a separate chapter.
- 9.42. 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.
- 9.43. The geographical scope is determined by receptor groups that are likely to be significantly affected by the Proposed EIA Development. The scope of the Health Chapter is in part dependent upon the study areas and potential receptors identified in the other technical assessments (air quality, climate change, sunlight, noise, socio-economic and wind). Thus, the study area comprises the EIA 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 project. The scope of the human health impact assessment chapter is as outlined above and is undertaken in consideration of the Proposed EIA Development as part of a wider strategic development area.
- 9.44. Receptors were identified, as follows:
- construction workers
 - existing residents, businesses, communities around the EIA Site, and including any sensitive receptors such as hospitals, nurseries, schools, care homes identified by the technical assessments
 - future users and visitors of the EIA Site
 - pedestrians in the vicinity of the EIA Site
- 9.45. 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, 2018-2020), 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.
- 9.46. 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.

9.47. The recent IEMA guidance (November 2022) suggests categories and wider determinants of health, and those relevant to the Proposed EIA Development were identified, as follows:

Table 9. 1 EIA Wider Determinants of Health

Category	Wider Determinants of Health
Health related behaviours	Physical activity; diet & nutrition
Social environment	Housing; relocation; open space, leisure & play; transport modes & access; community safety; community identity & resilience; social participation, interaction & support
Economic environment	Education & training; employment & income
Bio-physical environment	Climate change mitigation & adaptation; air quality ; land quality ; noise & vibration; radiation
Institutional & built environment	Health & social care facilities; built environment; wider societal infrastructure & resources

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

Table 9. 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 9.3 Human Health Significance Matrix

	Sensitivity				
		High	Medium	Low	Very Low
High		Major	Major/Moderate	Moderate/Minor	Minor/Negligible
Medium		Major/Moderate	Moderate	Minor	Minor/Negligible
Low		Moderate/Minor	Minor	Minor	Negligible
Negligible		Minor /Negligible	Minor/Negligible	Negligible	Negligible

9.49. Therefore, a significant effect is reported in this assessment where, based on professional judgment, the Proposed EIA Development is likely to contribute to a material change in health outcomes associated with the health issue being assessed and, in determining this, the following questions have been considered:

- Have significant effects been identified in other assessments undertaken as part of the EIA that are linked to human health (i.e. are environmental or health standards threatened)?
- Are vulnerable groups affected?
- Is the effect reversible or irreversible?
- Does the effect occur over the short (less than one year), medium (one to five years) or long (over five years) term?
- Is the effect permanent or temporary?

- Does it increase or decrease with time?
- Is the effect at an individual, community or population level?
- Are mitigating measures available and is it reasonable to require these?

9.50. 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 an marginal effect on ability to deliver current health policy and/or ability to narrow health inequalities
- Negligible – no appreciable effects on health factors

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

Limitations and Assumptions

9.52. This Health Chapter considers the findings relevant to human health of each technical impact assessment scoped into the Environmental Statement – Air Quality (Chapter 6); Climate Change (Chapter 7); Daylight, Sunlight & Overshadowing (Chapter 8); Noise & Vibration (Chapter 10); Socioeconomics (Chapter 11); Townscape/Visual Impact (Chapter 12); and Wind Microclimate (Chapter 13);– and, as such, any key assumptions or limitations associated with each technical impact assessment are addressed within the individual chapters. The overall approach for collating, assessing, and reporting impacts on human health and well-being is considered to be appropriate and proportionate such that there are no limitations. The assessment, set out in this ES Chapter, is desk-based and with professional judgment using published information.

Baseline Conditions

9.53. The wider EIA Site, Plot 10 of the First Street masterplan, is located in the Deansgate Ward, adjacent to Newcastle Street to the west, River Street to the north, First Street to the east, and Hulme Street to the south. Immediately to the north and north west are the completed No.1 and No. 8 First Street buildings; James Grigor Square is located north west of the EIA Site and provides attractive outdoor space. Beyond this is the First Street North which is now complete and is a cultural hub for the city alongside a wider mix of uses, including student accommodation and new public spaces. To the east of the EIA Site are a number of former Mills, now in residential and officer uses. To the immediate south is the under construction Plot 11 with four co-living towers of varying heights. Further south of the EIA Site is the Mancunian Way, a key arterial vehicle route into the city. Immediately west of the EIA Site is Plot 9 with building to start on a nine-storey office building. There are currently no permanent structures on the EIA Site, and there are no trees on or adjacent to the EIA Site.

9.54. The EIA Site known as Plot 10a is bound by River Street to the north, development Plot 10b to the east, Hulme Street to the west, and Medlock Street to the west. Plot 10a would be progressed to deliver a sustainable office building fronting onto First Street. Plot 10b is bound by River Street to the north and east, Hulme Street to the south, and development Plot 10a to the west. The health and wellbeing impact assessment considers each of the 8 scenarios,

where relevant and as set out in Chapter 2 of this ES; overall, this health impact assessment considers the worst-case scenario 7with all phases, committed developments, and cumulative effects.

- 9.55. **Population:** In 2020, the total population of Manchester was 555,741 people (ONS), an increase of 10.51% since 2011. This growth exceeded the levels of population in Greater Manchester at 6.07% and nationally in Great Britain at 6.04% during the same period. However, this ONS figure is much lower than the rate of city population growth forecast by MCC and that is likely to increase to over 627,000 by 2025. The Manchester State of the City Report (2021) notes that Manchester has a much younger age profile than England with an annual growth of twice the national population for residents aged 20-39. An increasing number of residents are aged 25-39 due to the city's rising popularity as a place to live, study and work. In recent years a growing number of students have remained in the city after graduating to take advantage of attractive new accommodation and career opportunities.
- 9.56. The Report summarises that despite recent improvements, Manchester still has some of the worst health outcomes in the country and there are significant inequalities within the city (health and unemployment). The population of Deansgate Ward (2020) was 10,291 males and 8,499 females, with 17,777 of working age and only 364 people aged over 65 years. 8,432 people are white ethnicity according to the 2011 census.
- 9.57. **Health Profiles:** According to PHE data (2018-2020), life expectancy at birth for Manchester is 75.5 (males) & 79.9 (females) compared with 79.4 (males) & 83.1 (females) averaged for England. Provisional estimates of life expectancy at birth show the impact of the Covid-19 pandemic. The size of the fall in life expectancy in Manchester is more than that seen in England overall, widening inequalities in life expectancies between Manchester and the national average. Physically active adults (2019-20) are recorded at 62.4% for Manchester, lower than that averaged for England at 66.4%. Percentage of adults classified as overweight or obese are recorded at 61.0%, slightly lower than the 62.8% averaged for England. The excess winter deaths index (2019-20) at 18.3% was slightly higher than the averaged value of 17.4% for England.
- 9.58. The Proposed EIA Development is located in Deansgate Ward. According to MCC Intelligence Hub information using Ward profiles, the Deansgate Ward has very good health (2011 self-assessment from residents of the state of their general health), within the medium range for the City. Emergency hospital admissions for all causes are low at 36.3, compared with other Wards, and at the lowest of the range 36.3-186.7 for all Wards – indicating less poor health. 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. The Deansgate Ward has a IMD score (2019) of 24.14, (the least deprived is in the range 15.5-31.1 with 48.4-62.7 indicating the most deprived) indicating that Deansgate is one of the least deprived Wards in the City.
- 9.59. The Deansgate Ward also shows good health when other indicators are considered. The number of estimated households in fuel poverty (2020) was 604 which is within the lowest range for the City. The number of residents claiming benefits (Feb 2022) is the lowest in the City at 1,009 for a range of 1,009-8,254 for all Wards. Incidence of all cancer (2014-18) is 72.5 and at the lower end of the range 70.8-142.1 for MCC. The total reported street crimes for 2018 was 14,172, similar to adjacent Wards, and at the higher end of the range from 1,343 – 16,552 for all Wards.
- 9.60. **Student Accommodation:** Manchester has one of the largest student populations in Europe, with over 90,000 students at Greater Manchester's five universities. The lack of quality, affordable accommodation was one of the key issues identified in the 2019 report on PBSA; for most students choosing to live in the city centre, the mainstream lettings market is the most likely destination. 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. There is an acknowledged demand from students for good quality and affordable city centre accommodation, driven in particular by growth in numbers of international students.
- 9.61. **Employment:** Manchester has a lower proportion of employment in the construction sector (2.6%) than Greater Manchester (5.4%). Labour market indicators suggest that Manchester's unemployment rate is higher (8.9%) than comparator areas (for example, Greater Manchester 5.1%). Manchester has a higher share of employment within sectors that broadly approximate to the office-based service economy. Productivity is lower in Manchester (c. £78,000) than the national average (c. £83,000). Productivity in retail, leisure and hospitality sectors is higher in Manchester (c. £44,000) than the national average (c. £40,000).
- 9.62. **Healthcare Facilities:** There are eight GP practices operating within the neighbourhood/local level of within 1 mile of the EIA Site. In combination, these 8 practices have 44 FTE GPs and 99,267 registered patients – equating to a ratio of 2,251 patients per GP. This is higher than the commonly accepted benchmark ratio used in healthcare planning and recommended by the HUDU (1,800 patients per FTE GP), although 2 GP practices closest to the EIA Site are currently operating at within this ratio. There are ten dental practices within around 1 mile radius of the EIA Site. GM Healthwatch (2021) highlighted the current capacity of NHS dentists as insufficient to meet demand. There are no

care homes within the vicinity and the nearest at some 0.5 miles of the EIA Site is located to the south of the A57(M). The nearest hospitals are 0.9-1.5 miles distance from the EIA Site.

- 9.63. **Educational Facilities:** There are seven primary schools within 1.5 miles of the EIA Site, mostly located to the south of the A57(M) and there are none in the immediate vicinity. There is one day nursery/preschool facility 0.4 miles to the west of the EIA Site on City Road East; another six nursery schools are located between 0.5 and 1.5 miles of the EIA Site.
- 9.64. **Crime:** The total reported street crimes for 2018 was 14,172, similar to adjacent Wards, and at the higher end of the range from 1,343 – 16,552 reported within Manchester.
- 9.65. **Open Space, Recreation & Amenity:** There a number of open/amenity spaces in proximity to the EIA Site, including Hulme Park, All Saints Park, Castlefield Urban Heritage Park, St John's Gardens, and Sackville Garden. The River Irwell is less than one mile to the west of the EIA Site with access to riverside paths and cycleways. Being a city centre site there are numerous leisure sites within close proximity to the EIA Site, including cinemas, cafes, bars/pubs and restaurants. There are various gyms and leisure/sports centres in the vicinity – two gyms and a swimming pool within 0.5 miles of the EIA Site.
- 9.66. **Townscape & Visual Impact:** The EIA Site is located within the central heart of the First Street masterplan area which is now well established and partially complete. The EIA Site is not located within a Conservation Area and does not contain any designated or non-designated heritage assets, although there are 9 designated within a 250m radius of the EIA Site. The Oxford Road Corridor, to the east of the EIA Site, is an innovation district with a mix of knowledge, business and cultural businesses. The First Street masterplan area forms an emerging townscape character area which will be characterised by high quality development set within a cohesive network of streets and spaces broadly focussed on a commercially led neighbourhood. The EIA Site currently forms a void in the urban grain in a key location within First Street and the wider city centre. The void within First Street Central is accentuated by the yet to be developed Plots 9 and 11.
- 9.67. There is currently no defined land use within the EIA Site and immediate context to the south, which detracts from the First Street townscape character. To the north of the EIA Site, First Street north incorporates high quality public realm, including several pedestrian streets, incidental green spaces and two public squares. The EIA Site in its current form detracts from the emerging character and quality of public realm within First Street. The EIA Site is currently vacant, and it does not currently contribute positively to achieving the vision for First Street. The likely visibility of the Proposed EIA Development is limited due to the city centre location and dense surrounding built form. Eleven viewpoints were identified for key views.
- 9.68. **Air Quality:** Local air quality at the EIA Site is and will be affected by local traffic flows. The air quality technical studies identified a range of potentially sensitive receptor locations existing in the vicinity including student halls and residential units variously in nearby streets. Human receptors for potential dust impacts were identified within 50m of the boundary of the EIA Site and within 50m of the routes to be used by construction vehicles on the public highway, and up to 500m from the EIA Site entrance.
- 9.69. **Noise & Vibration:** Receptors sensitive to noise and vibration were identified around the EIA Site and comprised residential, offices and commercial space. Surveys were undertaken to establish the baseline noise environment during the day and the night. Nine sensitive receptor locations were identified around the Proposed EIA Development EIA Site.
- 9.70. **Wind Microclimate:** The baseline considered the surrounding context and 7 committed developments with regard to safety, worst-seasonal comfort and summer comfort. It was identified that the existing EIA Site and neighbouring surrounds, wind conditions are substantially suitable for strolling or better, and thus for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress/egress.
- 9.71. **Daylight, Sunlight & Overshadowing:** The EIA Site is currently an open parcel of land and has predominantly been clear of buildings for over 10 years. This is unusual for a city centre context in terms of daylight and sunlight to the neighbouring receptors. The baseline condition acknowledges the existing arrangement, configuration and massing of the EIA Site and its immediate and general surroundings, along with the massing of other neighbouring committed developments; it includes the development Plot 9a to the west of the EIA Site.
- 9.72. **Climate Change:** Greenhouse gas (GHG) emissions occur constantly and widely as a result of human and natural activity. The current use of the EIA Site is an open parcel of land and has been mostly clear of buildings for over 10 years. Climate projections indicate that summer temperatures will increase, more rainfall will occur in winter, and less rain will fall during the summer. These changes to the climate act to increase the frequency and severity of weather extremes and thus magnifies the risks to buildings by increasing their vulnerability and exposure.

Identification and Evaluation of Significant Effects; Mitigation Measures

- 9.73. The Proposed 10 Development comprises a 14-storey office building with winter gardens and roof terrace, delivering just over 20,000 sq. m floorspace, together with new public realm completing the missing link of First Street. No car parking is proposed and there are 204 secure cycle spaces to be provided. The Proposed 10b Development comprises a 14 -storey PBSA building, with a ground floor food and beverage unit, together with new public realm along Wilmott Street. No car parking is proposed and there are 88 secure cycle spaces to be provided.
- 9.74. A shared servicing route will be created between the buildings, running between River Street and Hulme Street. There are no permanent structures on the EIA Site. There are no existing trees on or adjacent to the EIA Site, however new tree planting is proposed.
- 9.75. **Student Accommodation:** A review of committed baseline schemes indicates that there are no new PBSA bedspaces committed in addition to the Proposed EIA Development. Scenario 6 therefore assesses the effect of an additional 576 bedspaces. The baseline analysis highlights a lack of quality, affordable student accommodation within the city centre, and it is expected that numbers will continue to remain strong over the medium term. There is a need to carefully manage student populations within dense city centre clusters. This 'freeing up' of former student lets and increasing the supply of homes for Manchester residents is identified within the 'Our Manchester Strategy' outcomes. The role of accommodation in retaining high quality graduates in the city is also recognised. Therefore, taking into consideration both quantity and quality of the proposed PBSA, the Proposed EIA Development would constitute a **Major Beneficial** impact for Scenarios 4 & 6, and this is significant in EIA terms.
- 9.76. **Employment:** During the construction phase, the Proposed EIA Development will support a temporary economic uplift. The total net direct employment is therefore estimated at 170 FTE. These jobs will generate GVA of £21.2m per annum over the construction period. Multiplier effects as a result of spill-over spending through the supply chain (indirect impacts) and through knock-on consumer spending as a result of wages being derived or spent locally (the induced impacts) will generate further employment during the construction phase. The estimated total direct, indirect and induced employment could be in the order of 230 FTEs. The combined effect of the Proposed EIA Development represents a **Minor Beneficial** impact. Currently, the EIA Site does not provide any existing employment. Scenario 6 could provide floorspace to accommodate approximately 1,820 gross direct FTE jobs – this represents an upper limit of gross employment generation within the limit of the assessment method. The total net direct employment is therefore estimated at c.820 FTEs. These jobs could generate GVA of £80m per annum. It is estimated that the total direct, indirect and induced employment could be in the order of 1,055 FTEs. The combined effect of the Proposed EIA Development represents a **Minor Beneficial** impact.
- 9.77. Additional expenditure from students living within PBSA will contribute towards an uplift in local expenditure in retail, leisure and hospitality sectors. This could support in the order of GVA uplift of £765,000 per annum that could in turn support a 10 FTE jobs, and this is considered to be **Negligible** impact.
- 9.78. **Healthcare Facilities:** Combining both the increase in student population and from non-student resident population (committed baseline schemes) will lead to added pressure on existing primary healthcare facilities, including GP and dental services. The increased demand for primary healthcare facilities as a result of the Proposed EIA Development (Plot 10b) is likely to be **Negligible**. It is considered that the addition of 576 students to the local area would constitute a minor magnitude of impact and that this increase in student population could be accommodated by existing facilities operated by University of Manchester.
- 9.79. **Educational Facilities:** The Proposed EIA Development is for student accommodation and an office and it is considered that the number of students with children that need access to nearby nurseries or schools is likely to be low and therefore, significant effects are not anticipated.
- 9.80. **Crime:** The EIA Site is currently open land and unused. By developing the EIA Site into an office building and a PBSA with a ground floor food market hall and having taken security into consideration in the design process, effects are likely to be positive.
- 9.81. **Open Space, Recreation & Amenity:** An uplift in resident population as a result of Scenario 6 will increase demand and usage of nearby open space and recreation facilities. However, this needs to be balanced against the potential for new quality provision and improved access to existing provision, alongside the wide array of leisure and amenity facilities located within the assessment area, such that the impacts are considered to be **Negligible**.
- 9.82. **Townscape & Visual Impact:** 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. The residual effects upon

townscape resources, townscape character and the visual envelope are anticipated to be **Not Significant** for Plot 10a and for Plot 10b, and the majority of which will be short term, temporary and local.

- 9.83. 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 EIA Development through an iterative process involving environmental assessment and consultation. Plot 10b has been designed to fit within the scale, massing and height parameters for Plot 10, as set out within the Strategic Development Framework. The proposed usage create the opportunity for activity at street level. Plot 10a has been designed to accord with the design principles as set out within Strategic Development Framework, and in particular with the scale, massing and height parameters for Plot 10, and the high quality design aspirations for both built development and the public realm. The proposed uses will create activity at ground level and create opportunities to animate the street scene. There are no secondary or tertiary mitigation measures proposed in relation to townscape and views in addition to primary 'embedded' mitigation measures.
- 9.84. During the construction phase townscape character, urban grain, land use, building heights, movement & linkages, public realm, and site character, temporary **Negligible to Small Neutral** effects were identified for Plot 10a and Plot 10b. Viewpoints ranged from **Negligible to Medium Adverse** for Plot 10a and for Plot 10b.
- 9.85. During the operational phase townscape character, urban grain, land use, building heights, movement & linkages, public realm, and site character, **Medium Beneficial** effects were identified for Plot 10a and Plot 10b. Viewpoints ranged from **Negligible to Medium Beneficial** for Plot 10a and for Plot 10b.
- 9.86. **Air Quality:** During the construction phase, there is the potential for dust soiling and risk to human health and wellbeing from dust associated with earthworks, construction material and track out during movement of construction vehicles. The surrounding area has a significant density of sensitive receptors, which have wide range of sensitivities to dust soiling and health effects. The studies identified that more than 100 high risk residential receptors are located within 20m of the of the potential construction traffic routes. The risk of adverse human health effects of PM₁₀ without any mitigation is low for earthworks, construction and trackout. The risk of dust soiling without any mitigation is High for earthworks, construction and trackout. 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 impacts to **Negligible** and temporary during the construction phase.
- 9.87. The air quality technical studies used detailed dispersion modelling of NO_x, PM₁₀ and PM_{2.5} emissions from operational traffic to undertake assessment of human exposure at the development at various sensitive receptor locations and including various facades of the proposed buildings. Assuming worst case conditions, i.e., no decrease in background pollutant concentrations between base year and opening year, no improvement in vehicle emission factors from 2022, the worst-case impact is 'moderate' at Receptor 5 (one out of 38 receptors identified), where there is a predicted increase of 0.3 µg/m³. There are no new exceedances of the NO₂ annual mean air quality objective. During the operational phase, the impacts at the other existing 37 receptor locations are **Negligible**. With regard to long term concentrations of PM₁₀ and PM_{2.5}, the impact of operational traffic increases is Negligible at all locations. For new receptors, 2 sensitive locations (out of 52 locations) are predicted to exceed annual mean NO₂ objective under the worst case scenario and will not exceed objective under the best case scenario. Modelled PM₁₀ and PM_{2.5} concentrations in all scenarios meet objectives at all receptor locations.
- 9.88. **Noise & Vibration:** During the construction phase, there will be noise impacts associated with fixed and mobile plant; also, vibration impacts, for example, associated with piling. There are no car park facilities for Plot 10 and therefore, there is no predicted increase in traffic and associated noise. Noise impacts will be mitigated through limitations to working hours and other management practices to be detailed and managed through the CEMP. Noise effects are predicted to range from **Negligible to Moderate Adverse** for the nine receptor areas studied – and these effects will be temporary. Construction vibration effects are predicted to be **Negligible**.
- 9.89. During the occupational phase, there will be noise from the building services plant and road traffic. There would be noise impacts associated with entertainment noise (music in the Food Hall) should it be included as part of the ground floor food hall within Plot 10b – for surrounding receivers and those residents at higher floor levels. Noise effects are predicted to range from **Negligible to Minor Adverse** for the nine receptor areas studied.
- 9.90. **Wind Microclimate:** 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**.
- 9.91. **Daylight & Sunlight:** Daylight and sunlight amenities for both Plot 10a and Plot 10b were found to be **Negligible** or **Minor Adverse** for all but one receptors investigated. For 10a & 10b separately, each were found to have **Moderate Adverse** effects for one receptor Macintosh Mill. For 10a & 10b together, **Major Adverse** effects were

identified for one receptor - James Grigor Square whilst the Proposed EIA Development will have **Moderate Adverse** effects on daylight and sunlight amenity for certain rooms within Macintosh Mill, it is important to consider these effects within the context of Plot 10, the wider First Street masterplan, and development in the city centre in general. The external amenity area of James Grigor Square was found to have **Major Adverse** effects for sunlight amenity.

- 9.92. **Climate Change:** The technical studies investigated the risk assessment of the impacts on climate change on the Proposed EIA Development over its projected life cycle (assumed to be 60 years). The assessment considered structural stability and robustness; weather proofing and detailing; material durability; and the direct health and safety of building occupants. The studies investigated the likely effects of increasing temperatures, intense rainfall events, flooding, snow and wind on the building and the public realm. Mitigation measures were developed as integral to the project design to reduce the significance of potential risks of adverse effects.
- 9.93. Plot 10b mitigation measures include external canopies for shading, blue roof for terraced areas floors 11&12. Surface water attenuation provided by below ground tank. As the development undergoes changes throughout the design stages, mitigation measures will adapt subsequently. Plot 10a mitigation measures include backed-up power supply, mixed mode ventilation and external shading. Residual effects were estimated at **Minor to Moderate Adverse** for increasing temperatures; **Minor Adverse** from intense rainfall events and snow; and **Negligible** from flooding.

Cumulative Effects

Temporary during Construction Phase

- 9.94. 1.89 Each separate technical topic has considered the relevant effects for health and wellbeing that could be cumulative with other nearby development projects. Each development project is designed and constructed with ways of working that are approved according to regulatory requirements that aim to protect human health and wellbeing. The implementation of such mitigation measures to reduce impacts to acceptable levels is ensured through the Construction Health & Safety Plan (HSP) and Environmental Management Plan (CEMP), and such Plans are applied to the construction of each development project.
- 9.95. 1.90 During the approximately two and a half construction time period, there are the possibilities for cumulative adverse impacts on air quality - dust soiling from activities and emissions from transport; transport disturbance; and loss of amenity for pedestrians and motorists. However, cumulative effects were identified to be **Negligible** through implementation of the CEMP.

Operational Phase

- 9.96. 1.91 Cumulative effects relate to Scenario 3 (Baseline + Plot 10a + cumulative); Scenario 5 (Baseline + 10b + cumulative; and Scenario 7 (Baseline + Plot 10a + Plot 10b + cumulative). Cumulative impacts for people seeking employment are indicated to be **Minor Beneficial**, for Scenario 3 and Scenario 7, whilst for Scenario 5 this is reduced to **Negligible**. Further cumulative effects on the local economy were found to be **Negligible** for all 3 scenarios.
- 9.97. 1.92 For students seeking accommodation, cumulative impacts are considered to be **Major Beneficial** for Scenario 3, Scenario 5 and Scenario 7. Potential cumulative adverse effects on open space and recreational facilities through the increase in the residential population were found to be **Negligible**. However, this increase in population was found to have cumulative **Minor Adverse** impacts on primary healthcare facilities of GPs and dentists. The demand derived from all committed baseline and cumulative schemes (approximately 3,700 residential units) collectively could deliver a large increase in resident population.
- 9.98. 1.93 Potential daylight and sunlight cumulative amenity effects were investigated with 7 neighbouring developments and **Negligible** cumulative effects were found. The cumulative impact of air quality due to changes in road traffic flows is expected to be **Negligible**.

Residual Effects

- 9.99. 1.94 Post-mitigation residual effects are summarised in the Table 9.4, as follows:

Table 9.4 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Significant Receptors listed as identified from each technical chapter and as relevant according to those presented in paragraph 9.42 previously – workers, residents & visitors (nearby & site), and pedestrians – during construction and operational phases

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e. Temporary/Permanent)
Construction Phase				
Employment & local economy	Workers, local economy	None	n/a	Temporary Minor Beneficial
Townscape	Nearby residents & visitors		CEMP	Small neutral effects Negligible Temporary
Visual - viewpoints	Nearby residents & visitors		CEMP	Negligible to Medium Adverse Temporary
Air quality	Workers, nearby residents & visitors	Reduce dust, vehicle emissions	CEMP	Negligible Temporary
Noise	Nearby residents & offices		CEMP	Negligible to Moderate Adverse Temporary
Wind	Persons on foot, seated, on bicycle	None required	n/a	Negligible
Operational Phase				
Employment & local economy	Workers	None	n/a	Permanent Negligible Scenarios 1, 4 & 5 Minor Beneficial Scenarios 2, 3, 6 & 7
Uplift in local economy	Local economy	None	n/a	Permanent Negligible Scenarios 1-7
Student bedspaces & PBSA supply	Students	None	n/a	Major Beneficial
Health care provision	Primary Healthcare Facilities	Financial Contribution	Secured through s106 agreement	Minor Adverse Scenarios 3, 5, 6, 7
Crime	Residents, workers, visitors	None	n/a	Negligible on crime
Open space & recreation facilities	Open space & recreational facilities & users	None	n/a	Negligible on open space & recreational facilities for Scenarios 1-7
Climate Change – Temperature, Rain, Flooding	Residents & visitors	None	n/a	Temperature - Minor to Adverse Rainfall Minor Adverse Flooding Negligible
Townscape	Residents & visitors	None	n/a	Medium Beneficial
Visual – viewpoints	Residents & visitors	None	n/a	Negligible to Medium Beneficial
Daylight & Sunlight Amenity	Macintosh Mill	None	n/a	Minor to Moderate Adverse on Macintosh Mill
Sunlight Amenity	James Grigor Sq	None	n/a	Major Adverse
Wind	Persons on foot, seated, on bicycle	None	n/a	Negligible
Air Quality	Residents & visitors	None	n/a	Negligible
Noise	Nearby residents & offices	Through design	n/a	Negligible to Minor Adverse

Summary for Healthy Urban Living

Social Environment & Health Related Behaviours

- 9.100. The Proposed Development (Scenarios 4, 5 & 7) includes approximately 700 student accommodation units with 60 apartment clusters. This carefully managed high quality student accommodation focuses students on the city centre in close proximity to the university campuses and high frequency public and sustainable transport routes. This clustering of students in the city centre facilitates a move away from students within residential areas beyond the city centre, thus making these units available to other residents. Overall, major positive effects indicated for student accommodation and with further positive effects likely for housing in the wider residential areas.
- 9.101. The Proposed EIA Development is located in the City Centre and is rich in choice and accessibility to sustainable transport modes – walking, cycling, bus, Metrolink, rail – with routes and interchanges for daily movement to work, retail and leisure activities. There are bus stops on Medlock Road and the nearest Metrolink station is at Deansgate about 0.3 mile distance. Overall, the location of the EIA Site in an area with excellent accessibility to public transport, and with varied access to pedestrian and cycle networks for employment, services, and facilities in the city centre, will encourage active travel with likely major positive effects in the local area that may be synergistic and cumulative in the longer-term.
- 9.102. 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 EIA Development and the active use of the EIA Site. The change delivered through regeneration will contribute to a reduction in crime and an improvement in community safety. By developing the EIA Site into an office building and a PBSA with a ground floor food market hall and having taken security into consideration in the design process, effects are likely to be positive.

Economic Environment

- 9.103. The delivery of the good-quality office development on the EIA Site will contribute to the enhancement of the vibrancy of the local neighbourhood within the wider city centre. Provision of and access to employment is known to have a positive effect on health and wellbeing. The provision of good quality PBSA in the city centre and near to the universities will support objectives for higher level education in the city.

Bio-Physical Environment

- 9.104. Any associated risk to human health has been considered through ground condition studies and found to be not significant – the results are below the relevant guideline levels for both residential and commercial uses. The EIA Site is located within flood zone 1 with a low probability of flooding and therefore, there is low risk to human health and wellbeing from flooding.
- 9.105. 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 EIA 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 EIA Site and this will help ameliorate any concerns for wellbeing.
- 9.106. During construction, there is the potential for dust and noise effects, but these will be minimised through the CEMP such that impacts are considered to be not significant. Pollution from vehicle exhausts is the main source of air quality effects in the vicinity of the EIA Site. It was determined that the air quality impacts associated with the Proposed EIA Development are not predicted to be significant. Noise studies undertaken to inform the project design considered impacts on existing sensitive receptor; there will be no noise generated by additional road traffic as 10b does not include any car parking places. Noise levels will be within the relevant limits for the building plant during operation and the likely impacts on any sensitive receptors was identified to have a minor adverse effect on the nearest residential receptors. There is also potential for adverse effects on the townscape and visual impacts. These will be mitigated through the CEMP, including with the use of quality hoardings.
- 9.107. Changes to daylight or sunlight, and the wind microclimate can adversely affect health and well-being with regard to a healthy environment. Overall, effects on sunlight and daylight amenity were found to be negligible for 5 of the 7 nearby receptors investigated. Adverse effects were identified for one building nearby and for one open amenity space nearby. Such effects are not unusual for a city centre development and they reflect the change as the EIA Site

has been open and disused for about 10 years. Potential effects on the wind microclimate were found to be negligible. During the occupational phase, townscape effects will be improved to be medium beneficial and visual impacts are minimised with viewpoints ranging from negligible to medium beneficial – indicating significant enhancement to the townscape and visuals and further contributing to a healthy environment. The proposed uses will create activity at ground level and create opportunities to animate the street scene.

- 9.108. 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, 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.

Institutional & Built Environment

- 9.109. The increase in population, taking into account nearby committed developments, was found to have likely cumulative minor adverse impacts on primary healthcare facilities of GPs and dentists. The buildings are proposed with high sustainability design and consistent with a city centre location such that overall effects contribute towards need, and are compatible with, the wider societal infrastructure.

Reference List

- 9.110. This ES Chapter has been prepared by reference to the following:
- National Planning Policy Framework (NPPF, updated 2019 & revised 2021)
<https://www.gov.uk/government/publications/national-planning-policy-framework--2>
 - Public Health England (PHE) Strategy (2019) *Public Health England (2019) Strategy 2020-2025*
 - <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
 - Public Health England (PHE) Strategy (2019) <https://www.gov.uk/government/publications/phe-strategy-2020-to-2025>
 - Manchester City Council (MCC) Core Strategy (adopted 2012)
https://secure.manchester.gov.uk/info/200074/planning/3301/core_strategy
 - Manchester City Council (MCC) First Street Strategic Framework (SDF) (2005, 2007, 2010, 2012, 2015, updated 2018 & Addendum July 2020)
 - Places for Everyone – Joint Development Plan (Greater Manchester Councils Publication Draft, 2021)
<https://www.greatermanchester-ca.gov.uk/what-we-do/planning-and-housing/places-for-everyone/the-plan/>
 - Manchester City Council (MCC) Manchester State of the City Report (2020)
https://www.manchester.gov.uk/info/200088/statistics_and_intelligence/8083/state_of_the_city_report_2020
 - Our Manchester Strategy, Forward to 2025
 - https://www.manchester.gov.uk/info/100004/the_council_and_democracy/8148/our_manchester_strategy-forward_to_2025
 - Public Health England (PHE) Spatial Planning for Health (2017) *Public Health England (2017) Spatial Planning for Health: an evidence resource for planning designing healthier places*
 - Public Health England (PHE) Health Impact Assessment in Spatial Planning (2020)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929230/HIA_in_Planning_Guide_Sept2020.pdf
 - The Manchester Strategy - Our Manchester (2016) <https://www.manchester.gov.uk/mcrstrategy>
 - IEMA Cave, B. Fothergill, J., Pyper, R. Gibson, G. and Saunders, P. (2017) *Health in Environmental Impact Assessment: A Primer for a Proportionate Approach*. Ben Cave Associates Ltd, IEMA and the Faculty of Public Health. Lincoln, England www.iema.net <https://www.iema.net/resources/reading-room/2017/05/01/get-primed-for-health-in-eia>
 - *Shaping Neighbourhoods: For Local Health and Global Sustainability* (2010) Barton H, Grant M & Guise R (3rd edition 2021) Taylor & Francis Ltd, England

- Wider Determinants of Health Public Health England (PHE) <https://fingertips.phe.org.uk/profile/wider-determinants>
- The London Healthy Urban Development Unit (HUDU) '*Healthy Urban Planning Checklist*' (2017)
- The London Healthy Urban Development Unit (HUDU) '*Rapid Health Impact Assessment (HIA) Tool*' (2019)
- <https://www.healthyurbandevelopment.nhs.uk/our-services/delivering-healthy-urban-development/health-impact-assessment/>
- Institute of Environmental Management and Assessment (IEMA) Effective Scoping of Human Health in Environmental Impact Assessment; Determining Significance for Human Health in Environmental Impact Assessment (November 2022) <https://www.iema.net/>
- Manchester City Joint Strategic Needs Assessment (JSNA 2021) https://www.manchester.gov.uk/info/500230/joint_strategic_needs_assessment
- Public Health England (PHE, 2017-2019) <https://fingertips.phe.org.uk/profile/health-profiles>
- Office for National Statistics (ONS) for health and life expectancies (2017-2019) <https://www.ons.gov.uk/peoplepopulationandcommunity>
- Manchester City Council
- https://secure.manchester.gov.uk/info/200088/statistics_and_intelligence/2178/health_and_wellbeing
- Manchester City Council https://secure.manchester.gov.uk/info/200088/statistics_and_intelligence/438/population/2
- Manchester City Council https://www.manchester.gov.uk/downloads/download/7316/state_of_the_city_report_2020

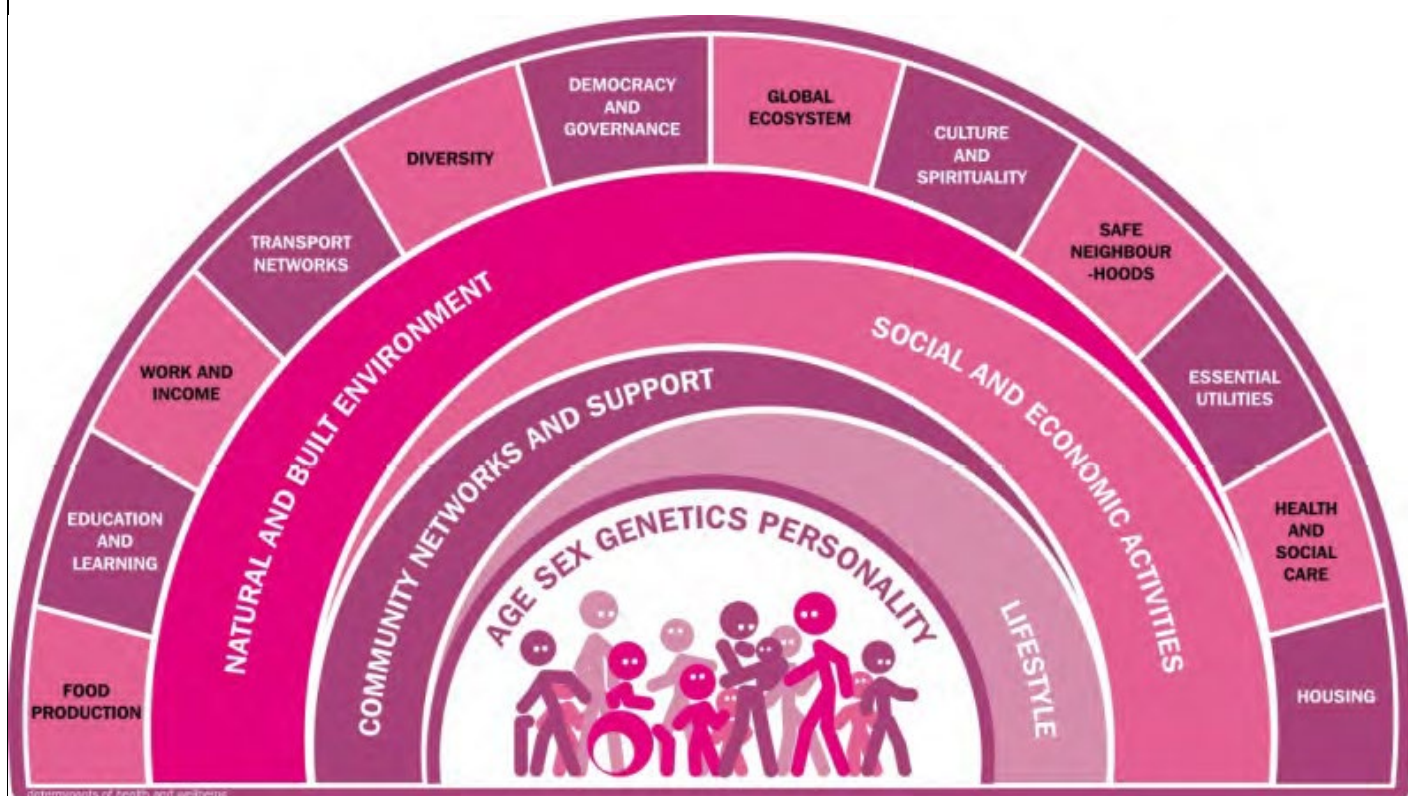


	Figure:	9.1		
	Title:	The Determinants of Health and Wellbeing (London HUDU developed from Barton & Grant 2007)		
	Project:	Plot 10 – First Street		
	Date:	January 2023	Scale:	N/A

10. Noise and Vibration

Introduction

- 10.1. This Chapter of the ES has been prepared by Cundall and assesses the likely Noise and Vibration impacts of the proposals upon the EIA 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.
- 10.2. This Chapter is accompanied by three technical appendices, a Plan of Sensitive Receptors (Appendix 10.1) and separate noise impact assessment reports for Plot 10a (Appendix 10.2) and Plot 10b (Appendix 10.3)
- 10.3. The primary author of this input has an MSc in Acoustics, is a Member of the Institute of Acoustics and has over 5 years' experience as an Acoustic Consultant in the industry. They have previous experience on contributing to EIA Chapters on 6 developments. The secondary author also has an MSc in Acoustics, is an Associate Member of the Institute of Acoustics, and has 5 years' experience as an Acoustic Consultant in the industry.

Assumptions and Limitations

- 10.4. There are a number of limitations and uncertainties associated with modelling of noise and, where applicable, realistic worst-case scenarios will be assumed (based on professional judgement):
- All values which will be presented in the ES will be the best possible estimates using professional judgement. To minimise uncertainty a realistic worst-case approach will be taken; and
 - The detailed construction method/programme information is not available at the time of writing. Therefore, professional experience from similar developments will be used to formulate construction phasing scenarios and select typical noisy activities for the assessment of noise. This will enable noise predictions to be made, but by its nature, construction noise is somewhat variable, and it is not possible to predict/model the noise exactly.

Legislative and Policy Context, Guidance

Legislation

- 10.5. The effects of the Proposed EIA Development upon existing sensitive receptors and impacts upon the Proposed EIA Development are to be assessed with reference to the relevant British Standards and guidance documents set out in Table 10.1 below.

Table 10.9 - Relevant British Standards and Legislation

Source	Description
BS 5228-1:2009+A1:2014 & BS 5223-2:2009 Code of practice for noise and vibration control on construction and open sites (BS 5228)	Recommendations for basic methods of noise and vibration control relating to construction sites where work activities may generate significant noise and / or vibration. It also provides guidance on methods of predicting and measuring noise and vibration, and assessing its impact on receptors.
BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233)	Recommendations for desirable internal and external ambient noise levels in dwellings that should not be exceeded for steady external noise sources.
Overheating: Approved Document O (June 2022)	Building regulations for controlling overheating, including limits for noise levels at night during periods of relief from overheating.
Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O (ANC / IOA Issued July 2022)	Recommendations demonstrating compliance with Approved Document O to see that internal ambient noise levels in dwellings should not be exceeded for steady external noise sources during periods of overheating.
BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142)	Methods for determining, at the outside of a building, noise levels from industrial and manufacturing premises, fixed installations and other associated activities. The rating method takes into account specific source characteristics, such as tonality, impulsivity and intermittency.

Source	Description
BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from ground borne vibration (BS 7385).	Presents guide values or limits for transient vibration, above which there is a likelihood of cosmetic damage.
Design Manual for Roads and Bridges, Sustainability & Environment LA 111 Noise and vibration Revision 2 (DMRB)	Advice on the assessment of noise and vibration impacts due to road traffic. The guidance provides a classification of magnitude of impacts related to changes in road traffic noise levels.
The Department of Transport/Welsh Office Memorandum 'Calculation of Road Traffic Noise' (CRTN)	Describes procedures for traffic noise calculation and is suitable for environmental assessments of schemes where road traffic noise may have an impact.

National Planning Policy

- 10.6. The overarching planning policy document which applies to the Proposed EIA Development in respect of noise is the National Planning Policy Framework (the Framework) (July 2021).
- 10.7. The key statements of the Framework relevant to the assessment are as follows:
- “174 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;”
- 180 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 life;
- 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.”
- 10.8. With specific reference to noise effects, the Framework refers to the Noise Policy Statement for England (NPSE) (2010). The NPSE provides guidance which enables decisions to be made regarding the acceptable noise burden to place on society, using three key phrases: the No Observed Effect Level (NOEL), the Lowest Observed Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL).
- 10.9. In March 2014, the Planning Practice Guidance (PPG) for noise was published. This online document advises on how planning can manage potential noise impacts in new development.

Local Planning Policy

- 10.10. The Core Strategy Development Plan adopted July 2012 is the adopted Development Plan for Manchester City Council for the 15 year period 2012 – 2027. Policy DM 1 states the following in regard to development management and noise:
- “All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:
- [..]
- Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.”

Guidance

- 10.11. Manchester City Council's (MCC) guidance on planning and noise is outlined in the 'Planning & Noise Technical Guidance' document (June 2022).
- 10.12. The aim of this document is to "provide help and advice in relation to noise in a planning context to encourage good acoustic design. It outlines what is expected in relation to current guidance and policy with the aspiration that new developments achieve the highest possible standards without compromising the health and wellbeing of people that live and work within the City of Manchester."
- 10.13. Section 3 of the Planning & Noise Technical Guidance document provides guidance and assessment criteria for the following relevant impacts:
- Internal ambient noise levels in new residential developments;
 - Guidance for controlling noise and vibration during construction / demolition phases; and
 - Noise and vibration limits from fixed plant / equipment.
- 10.14. Section 3.7.1.1 of the document relates to internal noise limits for residential properties and states:
- "The Council has adopted the following internal noise limits for residential properties:
- Bedrooms (night-time – 23.00 – 07.00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 15 times)
 - Living Rooms (daytime – 07.00 – 23.00) 35 dB L_{Aeq}
- 10.15. It is understood that Manchester City Council have generally requested that as part of determining appropriate internal ambient noise levels, that in addition to the above requirements an assessment of noise levels during periods of overheating is undertaken.
- 10.16. Recently published guidance from the ANC / IOA relates to achieving newly introduced limits for noise during periods of overheating as specified in Approved Document O - 'Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O (July 2022)'
- 10.17. This guidance will form the basis of assessing the overheating ventilation strategy with regards to compliance with the set noise limits, and though Approved Document O is Building Regulations legislation, this indicates to the Local Authority that should overheating strategies wish to be considered at the planning stage that compulsory legislation is in place to consider this throughout the design.
- 10.18. Section 3.7.1.5 of the document relates to noise limits from fixed building services plant and states:
- "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 level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."
- 10.19. Section 3.7.1.4 of the document relates to noise from construction or demolition works and states:
- "All noisy works i.e. those that are audible beyond the site boundary) should be restricted to the following hours to minimise disruption:
- Monday – Friday 7.30am – 6pm
 - Saturday: 8.30am – 2pm
 - Sunday/Bank holidays: No work
- These restrictions apply to deliveries/collections to the site."
- 10.20. Section 3.7.1.2 of the document relates to noise from entertainment noise at structurally connected locations and states:
- "...a criterion that would achieve a condition of 'inaudible' / 'virtually inaudible' which is applicable for new residential developments that are structurally connected to entertainment venues (or vice versa) would be:
- 'Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB ($L_{eq,5min}$), respectively'."
- 10.21. Section 3.7.1.2 of the document also relates to noise from entertainment noise at structurally detached locations and states:

“A planning application for a new entertainment venue that is structurally detached from other building uses should demonstrate that music noise from the proposal will not be ‘audible’ in nearby residential properties, assuming that the residential properties in question have their windows open. The criterion here is:

‘Entertainment noise ($L_{Aeq,5min}$) should be controlled to 5dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location.”

Assessment Methodology and Significance Criteria

Scenarios Tested

10.22. As a result of the proposed phasing of Plot 10b and the neighbouring Plot 10a, a number of test scenarios will be assessed such that all delivery sequences are considered. The proposed EIA scenarios are:

- Scenario 1: Baseline
- Scenario 2: Baseline + Plot 10a
- Scenario 3: Baseline + Plot 10a + cumulative
- Scenario 4: Baseline + Plot 10b
- Scenario 5: Baseline + Plot 10b + cumulative
- Scenario 6: Baseline + Plot 10a + Plot 10b
- Scenario 7: Baseline + Plot 10a + Plot 10b + cumulative

The Study Area

10.23. The Proposed EIA Development sits within the jurisdiction of Manchester City Council. The main noise sources affecting the Proposed EIA Development and surrounding sensitive receptors are:

- Road traffic on Medlock Street to the west of the EIA Site
- Road traffic on section of the A57(M) Mancunian Way to the south of the EIA Site
- Road traffic on River Street to the north and east of the EIA Site
- Railway noise on section of the Manchester and Ordsall Lane Junction Branch Rail Line to the north of the EIA Site

10.24. The noise and vibration sensitive receptors in proximity to the EIA Site which have been taken into consideration in the assessment are summarised in the table below.

Table 10.10 - List of sensitive receptors

Receptor	Existing / Future Development	Description	Sensitivity
A. Vita Students First Street	Existing Development	Residential dwelling	High
B. Macintosh Mills	Existing Development	Residential dwelling	High
C. Unite Students - New Medlock St	Existing Development	Residential dwelling	High
D. Unite Students - Parkway Gate	Existing Development	Residential dwelling	High

Receptor	Existing / Future Development	Description	Sensitivity
E. 8 First Street	Existing Development	Offices	Medium
F. 1 Tony Wilson Pl	Existing Development	Offices	Medium
G. Plot 10b (To be considered receptor in assessment with Plot 10a phased first)	Future Development	Residential and ground floor commercial use (Classes E and Sui Generis (drinking establishment))	High
H. Plot 10a (To be considered receptor in assessment with Plot 10b phased first)	Future Development	Offices	Medium
I. Plot 9a First Street	Future Development	Offices	Medium
J. First Street South	Future Development	Mixed residential and commercial (Classes A3 and D2)	High

10.25. The approximate location of identified sensitive receptors listed above which will be assessed in the ES is presented in Figure 10.1 below and Appendix 10.1. Receptors shaded in blue are existing receptors, and those shaded in pink are future receptors. An approximate site boundary is provided in dashed red.

Source of Effect

10.26. Potential noise related environmental impacts which may arise during the Construction Phase are considered to be as follows:

- Noise impacts associated with construction related fixed and mobile plant;
- Vibration impacts associated with construction related fixed and mobile plant (e.g. piling); and
- Noise impacts associated with increase in traffic on approach to EIA Site due to construction related vehicles.

10.27. Potential noise related environmental impacts which may arise during the Operational Phase are considered to be as follows:

- Noise impact associated with the “industrial/commercial” noise emissions from the Proposed Development. This will be the operation of building services plant.
- Noise impacts associated with entertainment noise should it be included as part of the ground floor food hall within Plot 10b. This could affect both surrounding receivers and structurally adjoined receivers at higher floor levels.
- Noise impacts on future occupants of the proposed development due to existing sound sources, primarily from road traffic.

Baseline Conditions

Baseline Surveys and Assessment

10.28. In order to assess the prevailing levels of environmental noise affecting noise-sensitive receivers, a new noise survey conducted in 2022 has been undertaken, with supplementary data also being utilised from a previous noise survey

undertaken by Cundall for the adjacent Plot 9a development in 2018. Additional survey data associated with Mancunian Way has been provided by Matt Fisher of Fisher Acoustics.

10.29. For the survey undertaken in 2022, continuous unattended noise logging measurements have been undertaken at two different locations.

10.30. Table 10.3 below documents the monitoring positions and the corresponding measurement type / period.

Table 10.11 - Monitoring Positions and Measurement Periods 2022 Survey

Monitoring position	Monitoring location	Measurement duration
MP1	East corner of the EIA Site, overlooking the junction between River Street and Hulme Street. For representative background sound levels, this measurement location is deemed appropriate for setting noise limits to Receptors A and B, due to the proximity to B and the equal distance from Medlock Street which is the primary noise source for Receptor A. It is also considered acceptable to use results from this position to set background limiting levels for Receptors C and D – these receptors are located in close proximity to A57(M) which will have elevated noise levels and therefore higher background levels, as such this is a worst case assessment.	Unattended measurement undertaken between 25 August and 30 August 2022.
MP2	South corner of the EIA Site, overlooking the junction between Newcastle Street and Hulme Street. For representative background levels, this measurement location is deemed appropriate for setting noise limits to Receptor H, due to the equal distance from Medlock Street which is the primary noise source for Receptor H.	Unattended measurement undertaken between 30 August and 2 September 2022.

10.31. The approximate location of each unattended measurement position for the 2022 survey is presented in Figure 10.1 below.

10.32. For the survey undertaken in 2018, continuous unattended noise logging measurements were undertaken for the position presented in Table 10.4 below, which documents the monitoring position and the corresponding measurement type / period.

Table 10.12 - Monitoring Positions and Measurement Periods 2018 Survey

Monitoring location	Survey Type	Date / period	Comments
MP3	Attended short-term measurements	21/06/2018 15:00 – 18:00 hrs 21/06/2018 23:00 hrs – 22/06/2018 02:00 hrs	Selected in order to establish road traffic noise impacts from River Street, as well as representative background noise levels at noise-sensitive receptor at MacIntosh Mills, 4 Cambridge Street.

Monitoring location	Survey Type	Date / period	Comments
		22/06/2018 06:00 – 10:00 hrs	
MP4		21/06/2018 15:00 – 18:00 hrs 22/06/2018 06:00 – 10:00 hrs	Selected in order to establish road traffic noise impacts from River Street, as well as representative background noise levels at noise-sensitive receptor at Student Accommodation at 13 Jack Rosenthal Street.
MP6A		21/06/2018 15:00 – 18:00 hrs 22/06/2018 06:00 – 10:00 hrs	Selected in order to establish road traffic noise impacts from Medlock Street
MP6B	Unattended logging measurements	10/12/2018 11:45 hrs – 11/12/2018 11:45 hrs	Selected in order to establish road traffic noise impacts from Medlock Street
MP5		11/12/2018 12:45 hrs – 12/12/2018 12:45 hrs	Selected in order to establish road traffic noise impacts from Hulme Street

- 10.33. The approximate location of the unattended measurement position for the 2018 survey is presented in Figure 10.3 below, alongside the approximate red line site boundary for Plot 10b.
- 10.34. For all surveys, the meters were field calibrated before and after with no significant drift witnessed. Calibration certificates for all equipment are available upon request. Monitoring equipment was set up by competently trained Cundall staff.
- 10.35. A review of the survey positions detailed above was undertaken by Fisher Acoustics. It was suggested that additional acoustic measurements previously undertaken by Fisher Acoustics at heights of 20 and 30 m above local ground level were included in calibrating the model to ensure a robust assessment to model noise from Mancunian Way as accurately as possible, particularly due to effects from this noise source at higher floor levels.

Table 10.13 - Monitoring Positions and Measurement Periods Fisher Acoustics Survey

Monitoring position	Monitoring location	Measurement duration
MP7a / MP7b	20 m and 30 m respectively above Medlock Street, approximately 66 m from the edge of Mancunian Way.	"Daytime", actual duration unknown. It is assumed that this is the steady-state noise level that would be measured at any time in the day.

- 10.36. The approximate measurement position, provided by Fisher Acoustics is shown in Figure 10.4
- 10.37. A summary of the average daytime (07:00 – 23:00 hours) and night-time (23:00 – 07:00 hours) ambient noise levels recorded for the 2022 survey is detailed within Table 10.6. The values are the logarithmically averaged $L_{Aeq,15min}$, the 15th highest night-time $L_{AFmax,5min}$, the range of $L_{A10,15min}$ and the range of $L_{A90,15min}$ dB values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and are given in dBA.

Table 10.14 - Summary of 2022 Baseline Monitoring Results

Monitoring Location	Assessment Period	Period	Average $L_{Aeq,15min}$ (dB)	15 th Highest Night-time $L_{AFmax,5min}$ (dB)	Range $L_{AF10,15min}$ (dB)	Range $L_{AF90,15min}$ (dB)
MP1	Daytime	25/08/2022 11:20 – 25/08/2022 23:00	68	-	58 - 79	54 - 64

Monitoring Location	Assessment Period	Period	Average $L_{Aeq,15min}$ (dB)	15 th Highest Night-time $L_{AFMax,5min}$ (dB)	Range $L_{AF10,15min}$ (dB)	Range $L_{AF90,15min}$ (dB)
		26/08/2022 07:00 – 26/08/2022 23:00	65	-	57 - 75	54 - 66
		27/08/2022 07:00 – 27/08/2022 23:00	60	-	57 - 69	53 - 61
		28/08/2022 07:00 – 28/08/2022 23:00	56	-	56 - 59	51 - 56
		29/08/2022 07:00 – 29/08/2022 23:00	56	-	56 - 59	51 - 55
		30/08/2022 07:00 – 30/08/2022 13:30	75	-	67 - 84	56 - 83
	Night-time	25/08/2022 23:00 – 26/08/2022 07:00	54	62	54 - 62	45 - 58
		26/08/2022 23:00 – 27/08/2022 07:00	54	65	55 - 58	48 - 54
		27/08/2022 23:00 – 28/08/2022 07:00	55	61	55 - 59	48 - 55
		28/08/2022 23:00 – 29/08/2022 07:00	53	63	54 - 58	47 - 53
		29/08/2022 23:00 – 30/08/2022 07:00	53	62	51 - 59	43 - 55
MP2	Daytime	30/08/2022 07:00 – 30/08/2022 23:00	63	-	56 - 72	52 - 61
		31/08/2022 07:00 – 31/08/2022 23:00	64	-	57 - 74	53 - 62
		01/09/2022 07:00 – 01/09/2022 23:00	64	-	57 - 74	52 - 65
		02/09/2022 07:00 – 02/09/2022 08:30	66	-	62 - 74	56 - 62
	Night-time	30/08/2022 23:00 – 31/08/2022 07:00	55	65	51 - 59	45 - 56
		31/08/2022 23:00 – 01/09/2022 07:00	54	70	51 - 59	45 - 56
		01/09/2022 23:00 – 02/09/2022 07:00	53	68	51 - 58	44 - 55

10.38. Based on statistical analysis of measured $L_{AF90,15min}$ dB values, Table 10.7 below presents a summary of assumed representative background levels at each monitoring location during the daytime and night-time:

Table 10.15 - Measured Representative Background Sound Levels MP1 and MP2

Period	Location	Representative $L_{AF90,15min}$ (dB)
Daytime (measurements between 07:00 – 23:00)	MP1	54
	MP2	54
Night-time (measurements between 23:00 – 07:00)	MP1	49
	MP2	46

10.39. A summary of the average daytime (07:00 – 23:00 hours) and night-time (23:00 – 07:00 hours) ambient noise levels recorded for the 2018 survey is detailed within Table 10.8. The values are the logarithmically averaged $L_{Aeq,15min}$, the maximum $L_{AFmax,15min}$, the range of $L_{A10,15min}$ and the range of $L_{A90,15min}$ dB values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and are given in dBA.

Table 10.16 - Summary of 2018 Baseline Monitoring Results

Monitoring Location	Assessment Period	Period	Average $L_{Aeq, 15min}$ (dB)	Highest $L_{AFMax, 15min}$ (dB)	Range $L_{AF10, 15min}$ (dB)	Range $L_{AF90, 15min}$ (dB)
MP3	Daytime	15:00 – 18:00 hrs	62	79	61 - 66	54 – 55
		07:00 – 10:00 hrs	61	79	63 - 66	54 – 55
	Night-time	23:00 – 02:00 hrs	47	73	49 - 54	42 – 45
		06:29 – 06:44 hrs	57	72	58	54
MP4	Daytime	15:00 – 18:00 hrs	64	82	64 - 67	55 – 57
		07:00 – 10:00 hrs	65	94	67 only	55 – 56
	Night-time	06:45 – 07:00 hrs	65	90	67	54
MP6A	Daytime	15:00 – 18:00 hrs	71	90	73 - 76	62 – 64
		07:00 – 10:00 hrs	73	90	76 - 77	55 - 56
	Night-time	06:10 – 06:25 hrs	66	79	70	58
MP6B	Daytime	11:45 – 23:00 hrs	71	93	68 - 76	60 – 66
		07:00 – 11:45 hrs	71	90	73 - 75	63 – 66
	Night-time	23:00 – 07:00 hrs	67	91	65 - 75	51– 65
MP5	Daytime	12:45 – 23:00 hrs	62	80	63 – 66	56 – 62
		07:00 – 12:45 hrs	63	81	64 – 66	61 – 63
	Night-time	23:00 – 07:00 hrs	60	80	67	50 - 62

10.40. A summary of data provided by Fisher Acoustics is given below.

Table 10.17 - Summary of Fisher Acoustics Results

Monitoring Location	Assessment Period	Period	L_{Aeq} (dB)	Highest $L_{AFMax, 15min}$ (dB)	Range $L_{AF10, 15min}$ (dB)	Range $L_{AF90, 15min}$ (dB)
MP7a	Daytime	Not reported	73	N/A	N/A	N/A
MP7b	Daytime	Not reported	64	N/A	N/A	N/A

10.41. It was noted on EIA Site that significant construction on sites to the western and southern boundaries of the EIA Site were present, meaning these may be an unreliably dominant noise source. Subsequently it was noted that on the dates 27 – 29 August at Position MP1, levels were noticeably lower than for other dates, which corresponded to the bank holiday weekend days. In particular, L_{AFmax} levels were generally very high across both positions, and due to the position in relation to road noise sources it was concluded that these were being driven by construction noise.

10.42. Given the generally higher background noise levels in 2022, the lowest $L_{A90, 15min}$ background levels measured in 2018 have been used to provide a robust set of limiting plant noise levels. Table 10.10 below presents an overall summary of the adopted background levels for each noise-sensitive receptors during the daytime and night-time:

Table 10.18 - Receptor Assigned Background Sound Levels

Period	Receptor	2018 Survey location adopted for defining background sound climate	Background L _{AF90,15min} (dB)
Daytime (measurements between 07:00 – 23:00)	A. Vita Students First Street B. Macintosh Mills	MP3	45
	C. Unite Students - New Medlock St* D. Unite Students - Parkway Gate* F. 1 Tony Wilson Pl G. Plot 10a I. First Street South	MP5	56
	E. 8 First Street H. First Street South	MP6B	60
Night-time (measurements between 23:00 – 07:00)	A. Vita Students First Street B. Macintosh Mills	MP3	42
	C. Unite Students - New Medlock St* D. Unite Students - Parkway Gate* F. 1 Tony Wilson Pl G. Plot 10a I. First Street South	MP5	50
	E. 8 First Street H. First Street South	MP6B	51
*MP5 is a distance from these receptors - however given the receptors proximity to Mancunian Way, background levels will in practice be higher than this and this is therefore an onerous limiting level			

Identification and Evaluation of Likely Significant Effects

Significant Criteria Effects

- 10.43. There are a number of likely significant noise and vibration related environmental impacts, which will be fully assessed at sensitive receptors. These primarily relate to the impact of noise on existing residential and commercial receptors in the locality of the EIA Site at both Construction and Operational phases, as well as impacts on future occupants of the Proposed EIA Development itself.
- 10.44. Environmental impacts as a result of increased traffic flows have been scoped out of the ES, given that there are no car park facilities for either of the plots. Any potential increase in noise from traffic flow at the Operational Phase can therefore be scoped out of the ES assessment.
- 10.45. It is not considered that any element of the Operational Phase is likely to result in any significant vibration impacts. The only elements of the Proposed EIA Development which may produce vibration are localised items of plant, whose vibration impact would be negligible as these will be appropriately isolated from occupants of the plots through design. This will also result in operational vibration to surrounding receptors being negligible, on this basis, potential Operational vibration impacts are scoped out of the ES assessment.

Construction Noise

- 10.46. BS 5228 provides practical information on demolition and construction noise and vibration reduction measures and promotes a 'Best Practice Means' approach to control noise and vibration. The calculation method provided in BS 5228 Part 1 is based on the numbers and types of equipment operating, their associated Sound Power Levels (SWL), and the distance to receptors, together with the effects of any screening.
- 10.47. BS 5228 provides several means of assessing the significance of construction noise, the appropriateness of which are subject to the context of the works and surroundings. A traditional approach is based on a fixed noise limit for construction works where noise levels between typically 07:00 to 19:00 hours, outside the nearest noise sensitive windows should not exceed 70 dBA in rural, suburban or urban areas away from main road traffic noise or 75 dBA in urban areas near main roads.
- 10.48. It is therefore recommended that the following good practice limits apply to construction noise:
- 70 dB L_{Aeq,T} Monday – Friday 07:00 to 19:00 hours; and

- 70 dB L_{Aeq,T} Saturday 07:00 to 13:00 hours .

10.49. The Magnitude criteria for construction noise have been derived from BS 5228 guidance. A semantic scale for description of the magnitude of construction noise effects is shown in Table 10.11 .

Table 10.19 - Construction Noise Magnitude Criteria

Magnitude	Description
High	Daytime noise levels greater than 75 dB L _{Aeq} for a total of less than 10 days in any 15-day period, or for a total of days less than or equal to 40 in any 6-month period
Moderate	Daytime noise levels between 70 and 75 dB L _{Aeq}
Minor	Daytime noise levels between 65 and 70 dB L _{Aeq}
Negligible	Daytime noise levels less than or equal to 65 dB L _{Aeq}

10.50. Construction hours are proposed to be set as follows in line with the guidance from the Local Authority:

- 07:30 – 18:00 hours on Monday to Fridays, and
- 08:30 – 14:00 hours on Saturdays;
- No working on Sundays or Bank Holidays.

Construction Traffic Noise

10.51. Construction traffic will be assessed by considering the short-term increase in traffic flows during works, following the principles of CRTN and DMRB.

10.52. The criteria for the assessment of the magnitude of effect of traffic noise changes arising from construction works have been taken from Table 3.54a of DMRB and are provided in Table 10.12 below.

Table 10.20 - Construction traffic noise magnitude criteria

Description (change in dBA)	Magnitude of Impact
5.0 dBA or more	High
3.0 – 4.9 dBA	Moderate
1.0 – 2.9 dBA	Minor
Less than 1.0 dBA	Negligible

Construction Vibration

10.53. BS 5228 Part 2 provides guidance on the perception of vibration resulting from construction activities within occupied buildings. This provides a simple method of determining annoyance alongside evaluation of cosmetic damage associated with vibration.

10.54. The table below details potential vibration levels measured in terms of 'Peak Particle Velocity' (PPV) and provides a semantic scale for description of construction vibration impacts on human receptors.

Table 10.21 - Guidance on Effects of Construction Vibration (PPV) Levels

Peak Particle Velocity Level	Description	Magnitude of Impact
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.	High
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.	Moderate
0.3 mm/s	Vibration might be just perceptible in residential environments.	Minor
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Negligible

- 10.55. Construction activities that produce vibration may impact on adjacent buildings. The criteria used in this assessment relate to the potential for cosmetic damage, not structural damage. The principal concern is generally transient vibration due to piling. Cosmetic damage is most likely to occur within the first 20 metres (m) of piling activities; at greater distances damage is less likely to occur. Likely levels of vibration at given distances can be estimated from existing piling vibration data, as provided in BS 5228 Part 2.
- 10.56. BS 7385 establishes the basic principles for carrying out vibration measurements and processing the data, with regard to evaluating vibration effects on buildings. Recommended PPV vibration limits for transient excitation for different types of buildings are presented in the following table.

Table 10.22 - Peak Particle Velocity Limits for Cosmetic Damage to Non-Heritage Asset Buildings

Type of building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse ¹	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures	50 mm/s at 4 Hz and above	
Industrial and heavy commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz ²	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
1 - Values referred to are at the base of the building; 2 - At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) should not be exceeded; mm/s – millimetres per second.		

- 10.57. Where vibration experienced at structures exceeds the values shown in the table above, this would be considered to be a significant adverse impact.

Operational Industrial/Commercial Noise

- 10.58. Industrial noise emissions will be assessed by in accordance with the methodology set out in BS 4142. This standard provides an assessment methodology and criteria relating to the following industrial sound sources:
- sound from industrial and manufacturing processes;
 - sound from fixed installations which comprise mechanical and electrical plant and equipment;
 - sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
 - sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

- 10.59. The proposed criteria for the assessment of the magnitude of impact of industrial noise emissions from the Proposed EIA Development are provided below in Table 10.15 and are based on the relative level difference between the BS 4142 Rating Levels ($L_{Ar,Tr}$) and the representative background sound levels ($L_{A90,T}$).

Table 10.23 - BS:4142 Noise Management Criteria

Description	Magnitude
$L_{Ar,Tr} = L_{A90,T} + 10$	High
$L_{Ar,Tr} = L_{A90,T} + 5$	Moderate
$L_{Ar,Tr} = L_{A90,T}$	Minor
$L_{Ar,Tr} = L_{A90,T} - 5$	Negligible

- 10.60. It is a requirement of the Local Authority to control the operational plant noise rating level to 5 dB below the existing representative background level. This will therefore see the magnitude of impact controlled by default to Negligible at a maximum through design.

Operational Entertainment Noise

- 10.61. Should any entertainment noise (i.e. amplified music) be an aspect of the operation of the ground floor Food Hall OR proposed gym within Plot 10b, it will be necessary to consider the significance of effect of this noise on nearby noise sensitive receptors.
- 10.62. Section 3.7.1.2 of the MCC Planning & Noise Technical Guidance document relates to noise from entertainment noise at structurally detached locations and states:
- “A planning application for a new entertainment venue that is structurally detached from other building uses should demonstrate that music noise from the proposal will not be ‘audible’ in nearby residential properties, assuming that the residential properties in question have their windows open.
- The criterion here is: ‘Entertainment noise ($L_{Aeq,5min}$) should be controlled to 5dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location.”
- 10.63. It is considered that a design to see that the above music criterion is achieved at the nearest noise-sensitive receptors would result in a Negligible magnitude of impact.
- 10.64. Should any entertainment noise be an aspect of the operation of the ground floor Food Hall or proposed gym within Plot 10b, it will also be necessary to consider the significance of effect of this noise on the upper floor residential spaces within the plot.
- 10.65. Section 3.7.1.2 of the MCC Planning & Noise Technical Guidance document relates to noise from entertainment noise at structurally connected locations and states:
- “...a criterion that would achieve a condition of 'inaudible' / 'virtually inaudible' which is applicable for new residential developments that are structurally connected to entertainment venues (or vice versa) would be:
- ‘Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB ($L_{eq,5min}$), respectively’.”
- 10.66. It is considered that a design to see that the above music criterion is achieved at the structurally adjoined noise-sensitive receptors would result in a Negligible magnitude of impact.

Noise Impacts on Proposed EIA Development

- 10.67. BS 8233 provides design guidelines for appropriate internal acoustic environments within buildings according to their function. It deals with control of noise from outside the building, noise from plant and services within it. Sections 3.6.1.1 of the MCC Planning & Noise Technical Guidance document to BS 8233 guidelines and sets the following noise limits for internal noise limits for residential properties:

Table 10.24 - Internal noise limits for student residential bedrooms

Activity	Location	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,16hour}$
			45 dB $L_{Amax,F}$ (not to be normally exceeded by more than 15 times)

- 10.68. It is considered that a design to see that the above ambient noise levels are achieved in new Student bedrooms would result in a Negligible magnitude of impact. Internal ambient noise levels in excess of the above limits would be considered as a Moderate / Major magnitude of impact.
- 10.69. Approved Document O is a new part of the Building Regulations that came into force in June 2022 and specifically covers the control of overheating and suitable mitigation for new residential buildings. With regard to noise, Section 3 of ADO discusses limitations to ensure the overheating strategy is useable and states:
- “Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.
- 40 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
 - 55 dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).”
- 10.70. It is considered that the requirement to comply with Building Regulations will mean the above targets must be achieved through design, and as such this would result in a Negligible magnitude of impact. Internal ambient noise levels in excess of the above limits would be considered as a Moderate / Major magnitude of impact.

Evaluation of Significant Criteria Effects

Construction Noise

- 10.71. A 3D SoundPLAN noise model has been used to predict the noise impact created during the construction of the Proposed EIA Development and associated infrastructure, in accordance with BS 5228.
- 10.72. The project’s Noise Consultant’s (Cundall) extensive experience of similar developments has been used to formulate potential phasing scenarios and select typical noisy activities for the noise assessment.
- 10.73. As previously discussed, a number of test scenarios is applicable to this assessment based on differing delivery sequences. As such, for the construction phase the following phasing sequences are to be considered;
- Plot 10a construction only
 - Plot 10a construction – to include completed Plot 10b development in model as a receptor
 - Plot 10b construction only
 - Plot 10b construction – to include completed Plot 10a development in model as a receptor
 - Simultaneous construction of Plot 10a and Plot 10b
- 10.74. The above situations are then each split into groundworks, substructure and superstructure construction phases.
- 10.75. Construction plant noise source data has been taken from BS 5228. Table 10.17 lists the source data used in the modelling process, as well as the percentage ‘on time’ during a working day. Each construction phase and associated plant items listed is for one plot only, i.e. for concurrent plot construction the quantities are modelled as double the numbers given for the phase below.

Table 10.25 - Construction Noise Source Data

Construction phase	Plant Item	Quantity	Sound Pressure Level @ 10m/dBA	On Time (%)	BS 5228:2009 Reference
Groundworks	Tracked excavator	2	69	80%	C2.25
	Dump truck	2	74	80%	C2.32
	Dozer	2	75	80%	C2.1

	Pneumatic breaker	1	83	80%	C1.6
	Hydraulic compactor	1	78	80%	C2.42
	Generator	1	65	100%	C4.83
Substructure	Gas cutter	1	79	80%	C1.18
	Caged material hoist	1	68	80%	C4.61
	Dump truck	1	78	80%	C4.2
	Tower crane	1	76	80%	C4.48
	Roller	1	73	80%	C2.38
	Water Pump	1	65	80%	C2.45
	Road Sweeper	1	76	80%	C4.90
	Piling	1	68	80%	C3.6
	Generator	1	65	100%	C4.83
Superstructure	Caged material hoist	1	68	80%	C4.61
	Hand – held cutter	1	65	80%	C3.35
	Grinder	1	80	80%	C4.93
	Tower Crane	1	76	80%	C4.48
	Skip / skip lorry	1	78	80%	C8.21
	Concrete lorry and pump	1	75	80%	C4.28
	Sweeper	1	76	80%	C4.90
	Tracked mobile crane	1	71	80%	C4.50
	Generator	1	65	100%	C4.83

10.76. The magnitude of impact has been determined at each receptor by comparing predicted worst-case noise levels taken from the SoundPLAN noise model with the demolition and construction noise magnitude criteria shown in Table 10.11 and the project significance effect matrix.

10.77. Table 10.18 presents the magnitude of the predicted noise impact at existing nearby noise sensitive receptors, during the construction phase of Plot 10a, without Plot 10b having been constructed or occupied.

Table 10.26 - Construction Noise Assessment - Plot 10a - Excluding Plot 10b

Demolition and Construction Phase	Receptor	Sensitivity	Predicted Worst Case Noise Level / $L_{Aeq,T}$ dB	Magnitude of Impact	Significance of Effect
Groundworks	A	High	69	Minor	Moderate
	B	High	68	Minor	Moderate
	C	High	55	Negligible	Minor
	D	High	38	Negligible	Minor
	E	Medium	66	Minor	Minor

	F	Medium	70	Moderate	Moderate
	I	Medium	73	Moderate	Moderate
	J	High	69	Minor	Moderate
Substructure	A	High	68	Minor	Moderate
	B	High	68	Minor	Moderate
	C	High	53	Negligible	Minor
	D	High	39	Negligible	Minor
	E	Medium	65	Minor	Minor
	F	Medium	68	Minor	Minor
	I	Medium	74	Moderate	Moderate
	J	High	69	Minor	Moderate
Superstructure	A	High	68	Minor	Moderate
	B	High	68	Minor	Moderate
	C	High	55	Negligible	Minor
	D	High	37	Negligible	Minor
	E	Medium	66	Minor	Minor
	F	Medium	69	Minor	Minor
	I	Medium	73	Moderate	Moderate
	J	High	68	Minor	Moderate

10.78. Table 10.19 presents the magnitude of the predicted noise impact at existing nearby noise sensitive receptors, during the construction phase of Plot 10a, with Plot 10b having already been constructed and occupied as a receptor.

Table 10.27 - Construction Noise Assessment - Plot 10a - Including Plot 10b

Demolition and Construction Phase	Receptor	Sensitivity	Predicted Worst Case Noise Level / $L_{Aeq,T}$ dB	Magnitude of Impact	Significance of Effect
Groundworks	A	High	68	Minor	Moderate
	B	High	58	Negligible	Minor
	C	High	51	Negligible	Minor
	D	High	38	Negligible	Minor
	E	Medium	69	Minor	Minor
	F	Medium	71	Moderate	Moderate
	G	High	78	Major	Major
	I	Medium	74	Moderate	Moderate
	J	High	70	Moderate	Major

Substructure	A	High	66	Minor	Moderate
	B	High	59	Negligible	Minor
	C	High	46	Negligible	Minor
	D	High	39	Negligible	Minor
	E	Medium	68	Minor	Minor
	F	Medium	69	Minor	Minor
	G	High	76	Major	Major
	I	Medium	74	Moderate	Moderate
	J	High	70	Moderate	Major
Superstructure	A	High	66	Minor	Moderate
	B	High	58	Negligible	Minor
	C	High	43	Negligible	Minor
	D	High	37	Negligible	Minor
	E	Medium	68	Minor	Minor
	F	Medium	69	Minor	Minor
	G	High	77	Major	Major
	I	Medium	74	Moderate	Moderate
	J	High	69	Minor	Major

10.79. Table 10.20 presents the magnitude of the predicted noise impact at existing nearby noise sensitive receptors, during the construction phase of Plot 10b, without Plot 10a having been constructed or occupied.

Table 10.28 - Construction Noise Assessment - Plot 10b - Excluding Plot 10a

Demolition and Construction Phase	Receptor	Sensitivity	Predicted Worst Case Noise Level / $L_{Aeq,T}$ dB	Magnitude of Impact	Significance of Effect
Groundworks	A	High	72	Moderate	Major
	B	High	72	Moderate	Major
	C	High	59	Negligible	Minor
	D	High	51	Negligible	Minor
	E	Medium	64	Negligible	Negligible
	F	Medium	67	Minor	Minor
	I	Medium	69	Minor	Minor
	J	High	70	Moderate	Major
Substructure	A	High	71	Moderate	Major
	B	High	72	Moderate	Major

Demolition and Construction Phase	Receptor	Sensitivity	Predicted Worst Case Noise Level / $L_{Aeq,T}$ dB	Magnitude of Impact	Significance of Effect
	C	High	60	Negligible	Minor
	D	High	54	Negligible	Minor
	E	Medium	63	Negligible	Negligible
	F	Medium	66	Minor	Minor
	I	Medium	67	Minor	Minor
	J	High	69	Minor	Moderate
Superstructure	A	High	72	Moderate	Major
	B	High	71	Moderate	Major
	C	High	59	Negligible	Minor
	D	High	53	Negligible	Minor
	E	Medium	64	Negligible	Negligible
	F	Medium	68	Minor	Minor
	I	Medium	68	Minor	Minor
	J	High	69	Minor	Moderate

10.80. Table 10.21 presents the magnitude of the predicted noise impact at existing nearby noise sensitive receptors, during the construction phase of Plot 10b, with Plot 10a having already been constructed and occupied as a receptor.

Table 10.29 - Construction Noise Assessment - Plot 10b - Including Plot 10a

Demolition and Construction Phase	Receptor	Sensitivity	Predicted Worst Case Noise Level / $L_{Aeq,T}$ dB	Magnitude of Impact	Significance of Effect
Groundworks	A	High	73	Moderate	Major
	B	High	73	Moderate	Major
	C	High	60	Negligible	Minor
	D	High	51	Negligible	Minor
	E	Medium	54	Negligible	Negligible
	F	Medium	67	Minor	Minor
	H	Medium	79	Major	Major
	I	Medium	59	Negligible	Negligible
	J	High	72	Moderate	Major
Substructure	A	High	71	Moderate	Major
	B	High	73	Moderate	Major
	C	High	60	Negligible	Minor

Demolition and Construction Phase	Receptor	Sensitivity	Predicted Worst Case Noise Level / $L_{Aeq,T}$ dB	Magnitude of Impact	Significance of Effect
	D	High	54	Negligible	Minor
	E	Medium	55	Negligible	Negligible
	F	Medium	66	Minor	Minor
	H	Medium	75	Major	Major
	I	Medium	56	Negligible	Negligible
	J	High	71	Moderate	Major
Superstructure	A	High	73	Moderate	Major
	B	High	72	Moderate	Major
	C	High	59	Negligible	Minor
	D	High	53	Negligible	Minor
	E	Medium	57	Negligible	Negligible
	F	Medium	68	Minor	Minor
	H	Medium	75	Major	Major
	I	Medium	58	Negligible	Negligible
	J	High	70	Moderate	Major

- 10.81. It can be seen from the results presented in the tables above that noise effects, as a result of construction, are predicted to be Negligible to Major.
- 10.82. It should also be noted that these effects will be temporary, as they will only occur during the construction phase of the Proposed EIA Development. The levels that have been predicted above do not consider best practice means which are discussed in the mitigation section of this chapter. As such, these can be considered absolute worst-case levels.

Construction Traffic Noise

- 10.83. It is understood that the baseline number of annual average daily traffic flow movements along Medlock Street is over 20,000 of which over 400 are HGV movements.
- 10.84. Based on a reasonable worst-case scenario of 10% increase in HGV traffic flows due to demolition and construction traffic, the noise change in dB at affected receptors would be <1dB for HGVs only, with the overall increase in traffic in proportion to all vehicle movements being lower than this still. The magnitude of impact would therefore be Negligible. For the highest sensitivity of receptor, it is therefore predicted that the significance of effect, due to demolition and construction traffic noise will be Minor (not significant).

Construction Vibration

- 10.85. BS 5228 indicates that demolition and construction activities (particularly piling) generally only generate vibration impacts when they are located less than 20m from sensitive locations. The impact depends on the type of piling, ground conditions, and receptor distance.
- 10.86. It is assumed that the substructure strategy would likely comprise of continuous flight augered (CFA) piles. Indicative vibration levels for this piling method, sourced from BS5228 Part 2, are presented in the table below.

Table 10.30 - Example Pile Vibration Levels

BS 5228 Reference	Soil Conditions	Mode	Plan Distance/m	PPV / mms ⁻¹
Table D.6 Ref No. 106	Made up ground over bedrock	Augering	5	0.54
		Surging casing	5	0.36
		Twisting in casing	5	0.22
		Spinning off	5	0.42
		Boring with rock auger	5	0.43

- 10.87. Based on the example vibration levels presented in Table 10.23 , at a plan distance of 5m, potential vibration levels from auger piling affecting nearby human receptors (i.e. occupants of the closest adjacent residential dwellings to a potential development cell) is not expected to exceed a minor magnitude impact. At a greater distance of approximately 20m from the piling vibration source (i.e. approximate distance to the nearest and most sensitive receptor B), the vibration levels may reduce even further to a magnitude of negligible impact.
- 10.88. Therefore, effects on people in nearby buildings, as a result of vibration generated by unmitigated piling (or other) activities, are predicted in relation to the to be moderate adverse at worst case, though likely minor (not significant) in practice.
- 10.89. In comparison to the BS 7385 vibration thresholds for cosmetic damage to structures (Table 10.14), example vibration levels from piling are below the BS 7385 thresholds for cosmetic damage to structures (i.e. surrounding residential structures). As such, it is considered very unlikely that cosmetic damage to the adjacent sensitive structures will occur and impacts on buildings (in terms of cosmetic damage) due to vibration from piling would be likely to have a negligible impact.
- 10.90. Therefore, it is considered that adverse effects related to building damage as a result of construction vibration are unlikely to occur.

Operational Industrial/Commercial Noise

- 10.91. At this stage of the Proposed EIA Development design, detailed information relating to noise levels generated by new items of plant and equipment is not available.
- 10.92. Notwithstanding the absence of specific plant data, all new items of plant and equipment will need to be selected, designed and, where appropriate, mitigated so that the MCC noise emission criteria identified in this chapter are not exceeded.
- 10.93. Based on relevant representative background noise levels during the daytime and night-time periods, the MCC plant noise limits to be achieved at 1m from the nearest noise-sensitive receptor can be defined as set out in Table 10.24 .

Table 10.31 - Rating Level Limits for Fixed Services Plant Noise at Sensitive Receptors

Period	Receptor	2018 Survey location adopted for defining background sound climate	Background L _A F _{90,15min} (dB)	MCC Limiting Plant Rating Criterion – dB L _A r,Tr
Daytime (between 07:00 – 23:00)	A. Vita Students First Street B. Macintosh Mills	MP3	45	40
	C. Unite Students – New Medlock St D. Unite Students – Parkway Gate F. 1 Tony Wilson Pl H. Plot 10a J. First Street South	MP5	56	51
	E. 8 First Street I. Plot 9a	MP6B	60	55
	A. Vita Students First Street B. Macintosh Mills	MP3	42	37

Period	Receptor	2018 Survey location adopted for defining background sound climate	Background L _{AF90,15min} (dB)	MCC Limiting Plant Rating Criterion – dB L _{A,r,Tr}
	C. Unite Students – New Medlock St D. Unite Students – Parkway Gate F. 1 Tony Wilson Pl H. Plot 10a J. First Street South	MP5	50	45
	E. 8 First Street I. Plot 9a	MP6B	51	46

- 10.94. The noise limits set out in Tables 10.24 relate to the total cumulative noise level at receptors from all fixed plant noise sources associated with the Proposed EIA Development, whilst the units are operating under their design duty conditions.
- 10.95. The cumulative rating limits apply at the sensitive receptors and must be met irrespective of the phasing sequence of Plots 10a and 10b. At the stage when sufficient details of plant equipment and layouts are available for assessment, if these are only available for a single plot, then allowance will need to be made for noise emissions from the adjacent plot to see that the cumulative noise limits are not exceeded once both schemes are operational.
- 10.96. Assuming these requirements are met, adverse noise effects will not occur at noise sensitive receptors (negligible impact) and the significance of effect will be minor at worst case (not significant) for all receptors.
- 10.97. Methods for ensuring that the plant noise limits in are met should be investigated at a later stage when details of plant and equipment are known. Further information on this is included in the Mitigation Section of this report.

Operational Entertainment Noise

- 10.98. It is understood that Plot 10b will include a Food Hall and gym. These may, therefore, include amplified music.
- 10.99. At this stage of the EIA Plot 10b design, detailed information relating to noise levels generated by amplified music is not available.
- 10.100. Therefore, to minimise the risk of adverse effects on new and existing sensitive receptors, music sources will need to be designed and, where appropriate, mitigated so that the MCC noise emission criteria identified in this chapter are not exceeded.
- 10.101. Based on calculated lowest octave band background noise levels determined during the survey for daytime and night-time periods, the MCC amplified noise limits to be achieved at 1m from the nearest noise-sensitive receptors can be

Table 10.32 - Receptor Assigned Octave Background Sound Levels

Period	Receptor	Survey location adopted for defining background sound climate	MCC limiting amplified noise criterion – dB L _{eq,T}						
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Daytime (measurements between 07:00 – 23:00)	A. Vita Students First Street B. Macintosh Mills	MP3	50	43	40	39	41	33	21
	C. Unite Students - New Medlock St D. Unite Students - Parkway Gate F. 1 Tony Wilson Pl G. Plot 10b H. Plot 10a J. First Street South	MP5	48	41	41	41	44	36	22

	E. 8 First Street I. Plot 9a	MP6B	48	47	44	44	47	40	25
Night-time (measurements between 23:00 – 07:00)	A. Vita Students First Street B. Macintosh Mills	MP3	40	33	33	29	28	20	11
	C. Unite Students - New Medlock St D. Unite Students - Parkway Gate F. 1 Tony Wilson Pl G. Plot 10b H. Plot 10a J. First Street South	MP5	41	35	35	36	38	29	14
	E. 8 First Street I. Plot 9a	MP6B	41	44	37	38	37	31	20

- 10.102. For amplified noise directly to student accommodation rooms above, music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed 47 dB and 41 dB (L_{eq}), respectively as per the MCC requirements.
- 10.103. Assuming these requirements are met, adverse noise effects will not occur at receptors (negligible impact) and the significance of effect should be minor at worst case (not significant).
- 10.104. Methods for ensuring that entertainment noise limits are met should be investigated at a later stage should any amplified music be confirmed as part of the Proposed EIA Development. Further information on this is included in the Mitigation Section of this chapter.

Noise Impacts on Proposed EIA Development

- 10.105. The likelihood of internal ambient noise levels in the most noise sensitive receptors (i.e. student accommodation bedrooms in Plot 10b) of the Proposed Development exceeding the proposed criteria depends on the façade make-up of the building, especially glazing and ventilation elements.
- 10.106. In order to achieve internal noise levels provided in BS 8233 and the MCC criteria, glazing and ventilation elements should provide a level of attenuation dependent upon the noise level incident upon them. Therefore, attenuation requirements of glazing and ventilators have been estimated in accordance with the “more rigorous calculation method” outlined in BS 8233:2014.
- 10.107. In order to determine road traffic noise propagation across the EIA Site, a model has been produced using SoundPLAN v8.2 acoustic modelling software. This model is capable of accurately determining sound propagation by taking into account variations in topography, barrier attenuation provided by existing landscaping and buildings, and distance attenuation.
- 10.108. Days on which construction was not taking place during the 2022 survey have been compared with the 2018 development. It was found that worst case hourly levels used to calibrate these noise models corresponded to worst case noise levels on Saturday 27 August of the 2022 survey. As such, it was concluded that calibrating the model to these levels was a reasonable worst-case assessment where calibrating to construction noise levels would be overly onerous. The noise levels from Mancunian Way have been independently calibrated to the Fisher Acoustics data.
- 10.109. The scenarios calculated have also considered situations where Plot 10a is a completed build or not – given that Plot 10a provides screening from noise sources (primarily River Street and Medlock Street) the modelling has indicated that incident noise levels are higher when excluding Plot 10a from the calculations. As such these worst case levels have formed the basis of subsequent break in calculations.
- 10.110. Break in calculations have been undertaken for worst case noise levels incident on a student bedroom. These are;
- daytime 07:00 – 23:00 – 63 dB L_{Aeq} (determined via calibrating survey data in 3D SoundPLAN model to worst case daytime levels);
 - night-time 23:00 – 07:00 – 60 dB L_{Aeq} (determined via calibrating survey data in 3D SoundPLAN model to worst case night-time levels); and
 - night-time 15th highest max – 70 dB $L_{AF,max}$ (determined via worst case 15th highest night-time L_{max} measured for either position during 2022 survey).

- 10.111. 3D façade noise maps of the day – and night-time L_{Aeq} noise levels across the student accommodation block are presented in Figures 10.5 10.6, 10.7 and 10.8.
- 10.112. Calculations for noise intrusion to habitable rooms have assumed the following room dimensions, this in lieu of exact layouts at the time of writing but estimated based on similar projects;
- bedroom floor area; 9m²;
 - bedroom height; 2.9m²
 - total façade area; 7.2 m²; and
 - area of windows; 2.9 m².
- 10.113. It is not known at the time of writing the proposed ventilation strategy. As such, it has been assumed that rooms will be mechanically ventilated and that glazed elements will be the dominant source of noise break in.
- 10.114. Calculations have found that worst case student accommodation rooms require a Glazing Specification rated at ≥ 28 dB Rw + Ctr.
- 10.115. Façade elements should be designed to be 10 dB above this rating, i.e. ≥ 38 dB Rw + Ctr. Generally, façade build ups that are structurally and thermally suitable for residential accommodation will achieve this level of sound reduction by default.
- 10.116. A detailed glazing attenuation assessment will be implemented in further detail as part of the embedded design of the Proposed EIA Development. Other alternative glazing specifications may be acceptable upon review, although all finalised glazing mitigation should be reviewed as part of detailed design.
- 10.117. The provision of suitable glazing will see that the resultant internal noise limits will mean the magnitude of impact will be negligible and the significance of effect will therefore be minor (not significant).
- 10.118. For office areas of the Proposed EIA Development, there is no requirement with regards to local planning policies to achieve certain noise limits within these areas. However, the design process will implement relevant technical guidance and legislation, such as that provided in BS 8233, to see that by default noise impact on the proposed office spaces is controlled to an acceptable level with regards to all relevant guidance.

Cumulative Effects

- 10.119. Cumulative effects are the combined effects of several development schemes (in conjunction with the Proposed EIA Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 10.120. The ES has given consideration to 'Cumulative 'Effects' for schemes located within a 500m radius from the boundary of the EIA Site, as listed in Appendix 2.2.
- 10.121. All schemes listed have the potential to contribute to cumulative impact of noise and vibration at sensitive receptors.
- 10.122. This potential for increased cumulative noise impacts at nearby receptors is from an increased number of industrial/commercial noise sources, possible increases in traffic flows and concurrent construction operations.
- 10.123. Based on previous studies, cumulative schemes that are located beyond a 100m radius of the Proposed EIA Development are unlikely to give rise to potential cumulative construction noise and vibration impacts. For committed developments that are within 100m of the Proposed EIA Development, cumulative significant demolition and construction effects would only exceed those already reported for the Proposed EIA Development if similar works occurred on those sites at the same time and at the same distances to sensitive receptors as the works being undertaken on the Proposed EIA Development. Any such cumulative effects would, however, be temporary effects that would not last past the demolition and construction phases.
- 10.124. For operational effects, it is assumed that all other developments will need to comply with the MCC planning policies that have been demonstrated herein to equate to a Negligible impact magnitude at any nearby noise sensitive receptor. Therefore, it is unlikely that significant cumulative effects would arise during the operational phase.

Mitigation Measures

Construction Noise

- 10.125. For demolition and construction, mitigation measures will include the limitations on working hours as implemented in MCC's criteria.
- 10.126. This will limit working hours to:

- Monday – Friday 7.30am – 6pm;
- Saturday: 8.30am – 2pm; and
- Sunday/Bank holidays: No work.

10.127. These restrictions also apply to deliveries/collections to the EIA Site.

10.128. Additionally, it is anticipated that the main contractor delivering the Proposed EIA Development will be required to submit a detailed Construction Environmental Management Plan (CEMP), prior to commencement pursuant to a planning condition or obligation. They will therefore be committed to following Best Practicable Means (BPM) to minimise the noise and vibration impact on nearby noise sensitive properties. Such measures include the following:

- all construction plant and equipment should comply with EU noise emission limits;
- machines in intermittent use should be shut down in the intervening periods between work or throttled down to a minimum;
- proper use of plant with respect to minimising noise emissions and regular maintenance. All vehicles and mechanical plant used for the purpose of the works should be fitted with effective exhaust silencers and should be maintained in good efficient working order;
- selection of inherently quiet plant where appropriate. All major compressors should be 'sound reduced' models fitted with properly lined and sealed acoustic covers which should be kept closed whenever the machines are in use and all ancillary pneumatic percussive tools should be fitted with mufflers or silencers of the type recommended by the manufacturers;
- plant and equipment such as flatbed lorries, skips and chutes should be lined with noise attenuating materials. Materials should be handled with care and be placed, not dropped;
- care should be taken when erecting or striking scaffolds to avoid impact noise from banging steel. All operatives undertaking such activities should be instructed on the importance of handling the scaffolds to reduce noise to a minimum before access is possible;
- all ancillary plant such as generators, compressors and pumps should be positioned so as to cause minimum noise disturbance. If necessary, localised screens and enclosures should be used to reduce noise from particular noisy, static operations;
- wherever possible, the use of hydraulic attachments or other means of crushing concrete and hard materials should be used in preference to pneumatic breakers. Where the use of impact hammers is necessary, their attachment to larger and heavier excavators often can reduce the level of vibration;
- deliveries should be programmed to arrive during daytime hours wherever practicable. Care should be taken when unloading vehicles to minimise noise. Delivery vehicles should be routed so as to minimise disturbance to local residents. Delivery vehicles should be prohibited from waiting on the highway or within the site with their engines running; and
- demolition and construction contractors would be obliged to adhere to the codes of practice for construction working and piling given in British Standard BS 5228 and the guidance given therein minimising noise emissions from the site.

10.129. It is considered that proper implementation of the mitigation measures will reduce the significance of effect predicted within the construction noise assessment section of this chapter.

Construction Vibration

10.130. Though predicted to be negligible, the means by which potential adverse vibration effects can be mitigated include:

- Implementation of vibration monitoring at nearby sensitive receptors;
- Use of continuous flight auger (CFA) injected piles rather than driven piles;
- During the initial CFA piling process, controlled trials test could be undertaken to establish a safe method of working based on observations of vibration intensity, the onset of local distress to the soil face and of changes in line and level;
- Removal of obstructions to piling (e.g. old basement floors, old foundations etc.). Where an unexpected obstruction is encountered, it might be preferable for piling to be halted at that position until the obstruction can be dealt with, rather than attempting prolonged hard driving;

- Where reasonably practicable, plant and/or methods of work causing significant levels of vibration at sensitive premises should be replaced by other less intrusive plant and/or methods of working;
- To minimize any potential adverse impacts as a result of vibration from stationary plant, equipment immediately adjacent to sensitive receptors could be relocated or isolated using resilient mountings; and
- The characteristics of vibration emissions from each item of plant, and their collective effect, should be assessed during the selection process for the acquisition of plant. Where practicable, plant should be selected which will have the least impact in terms of vibration.

Operational Industrial/Commercial Noise

10.131. Methods for ensuring that the plant noise limits are met should be investigated at a later stage when details of plant and equipment are known, but could include:

- selection of quiet items of plant and equipment;
- locating plant and equipment away from sensitive receptors;
- utilising specially designed acoustic enclosures for noisy items of plant;
- locating plant and equipment in plant rooms or behind noise screens;
- locating plant in positions which maximise available noise screening from existing and proposed structures in and around the site; and
- switching plant off or reducing operating levels (and subsequent noise output) when not required (e.g. at night).

Operational Entertainment Noise

10.132. Methods for seeing that the music noise limits are met should be investigated at a later stage when details of plant and equipment are known, but could include:

- All amplified music should be brought under control of an automatic volume control system to see that the noise limits are not exceeded. The installed noise limited should be capable of limiting noise at 1/3-octave band frequencies. An example system that may be appropriate is as follows: Cesva LF010
- To see that any noise limiting equipment operates effectively, it is advised that the installation of such equipment should be overseen by an appropriately experienced noise consultant. Furthermore, due to the uncertainty of factors such as on-site workmanship, it is advised that the process of establishing acceptable limiting values for the system (i.e. values compliant with the Local Authority criteria) should be determined via in-situ testing of the PA system; and
- Inclusion of lobbied door sets to all exit / entrance doorways to be used by patrons.
- Appropriate setting of operational hours, particularly with access to the external terrace areas

Noise Impacts on Proposed EIA Development

10.133. Calculations have found that worst case student accommodation rooms require a Glazing Specification rated at ≥ 28 dB Rw + Ctr. Façade elements should be designed to be 10 dB above this rating, i.e. ≥ 38 dB Rw + Ctr. Generally, façade build ups that are structurally and thermally suitable for residential accommodation will achieve this level of sound reduction by default.

10.134. The ventilation strategy is not known at the time of writing; however this will also have to be designed to ensure any noise break in through ventilation elements also satisfies internal noise limits.

10.135. The following general recommendations are made to ensure glazing elements mitigate noise to the appropriate targeted levels;

- All windows should be well sealed when closed. It is imperative that the frame does not compromise the performance of the glazing. It is therefore recommended that the frames be of uPVC, hardwood or aluminium constructions and be well sealed into the apertures.
- Softwood windows could also be used, providing guarantees are given by the manufacturer that acoustic properties will be maintained for the life of the windows.
- No gaps should be visible around the frame from the exterior.

Residual Effects

10.136. Table 10.26 below summarises the Noise and Vibration residual effects of the construction phase of the Proposed EIA Development.

Table 10.33 - Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the construction phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Construction Phase				
Major adverse	A	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary
Major adverse	B	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary
Minor adverse	C	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Negligible Temporary
Minor adverse	D	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Negligible Temporary
Minor adverse	E	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Negligible Temporary
Moderate adverse	F	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Minor adverse Temporary
Major adverse	G	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary
Major adverse	H	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary
Major adverse	I	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary

10.137. Table 10.27 below summarises the Noise and Vibration residual effects of the operational phase of the Proposed EIA Development

Table 10.34 - Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the operational phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Operational Phase				
Minor adverse	A	Compliance with local policy guidance	Through design	Minor adverse Permanent
Minor adverse	B	Compliance with local policy guidance	Through design	Minor adverse Permanent
Minor adverse	C	Compliance with local policy guidance	Through design	Minor adverse Permanent
Minor adverse	D	Compliance with local policy guidance	Through design	Minor adverse Permanent
Negligible	E	Compliance with local policy guidance	Through design	Negligible

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
				Permanent
Negligible	F	Compliance with local policy guidance	Through design	Negligible Permanent
Negligible	G	Compliance with local policy guidance	Through design	Negligible Permanent
Negligible	H	Compliance with local policy guidance	Through design	Negligible Permanent
Minor adverse	I	Compliance with local policy guidance	Through design	Minor adverse Permanent

Reference List

10.138. This ES Chapter has been prepared by reference to the following:

- BS 5228-1:2009+A1:2014 & BS 5223-2:2009 Code of practice for noise and vibration control on construction and open sites (BS 5228)
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233)
- Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O (ANC / IOA Issued July 2022)
- BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142)
- BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from ground borne vibration (BS 7385).
- Design Manual for Roads and Bridges, Sustainability & Environment LA 111
- Noise and vibration Revision 2 (DMRB)
- The Department of Transport/Welsh Office Memorandum 'Calculation of Road Traffic Noise' (CRTN) Non-Technical Summary
- National Planning Policy Framework (the Framework) (July 2021)
- Noise Policy Statement for England (NPSE) (2010)
- Manchester Core Strategy Development Plan
- MCC 'Planning & Noise Technical Guidance' document (June 2022)

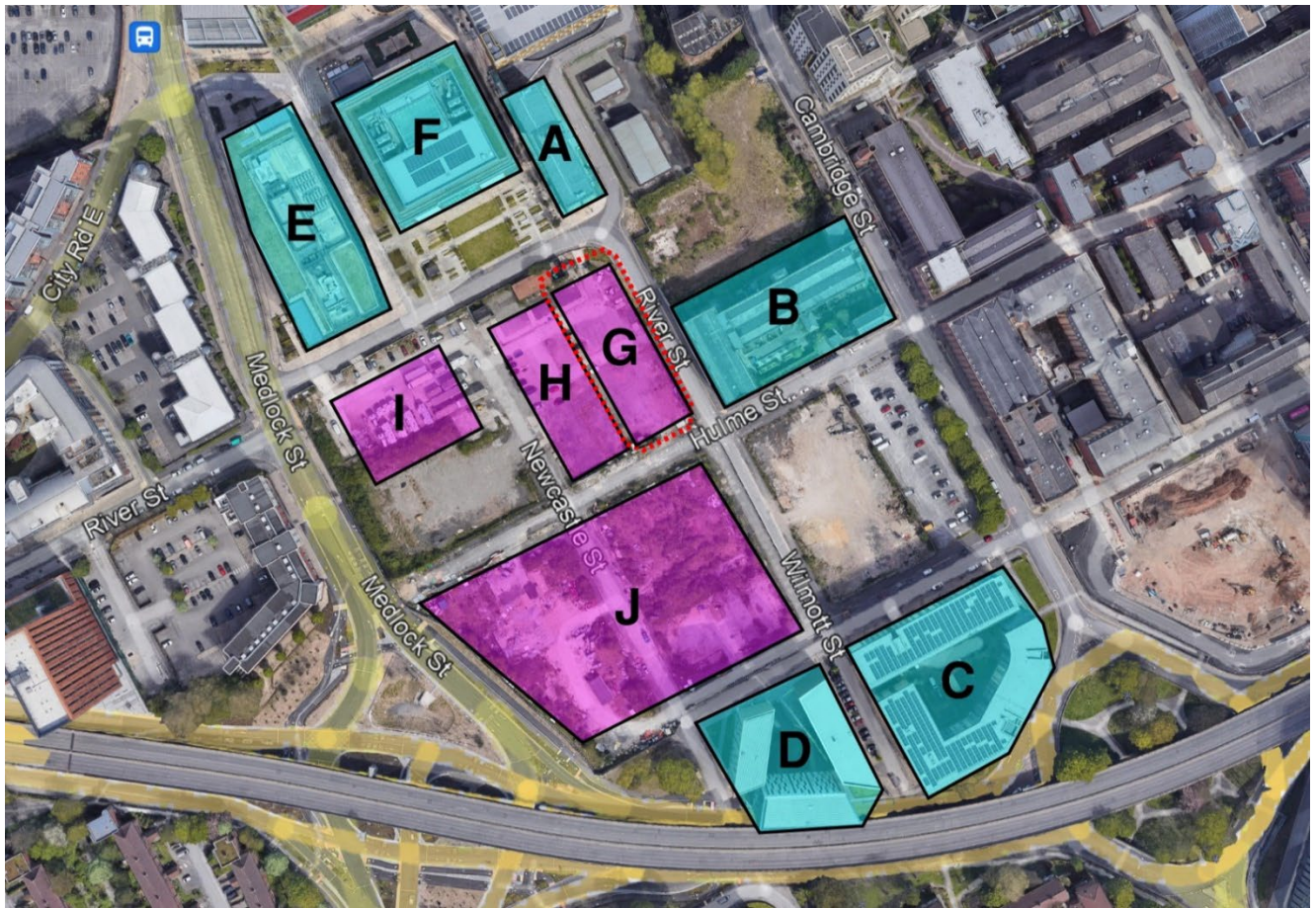


	Figure:	Figure 10.8		
	Title:	Noise and Vibration sensitive receptors plan		
	Project:	Plot 10		
	Date:	February 2023		N/A

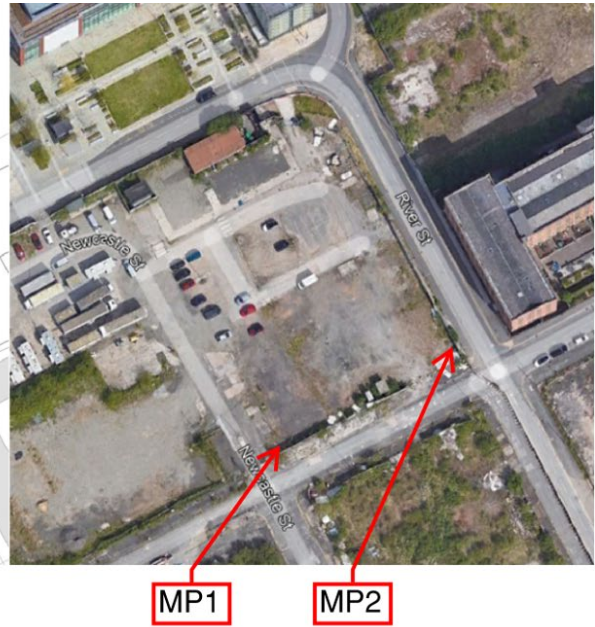
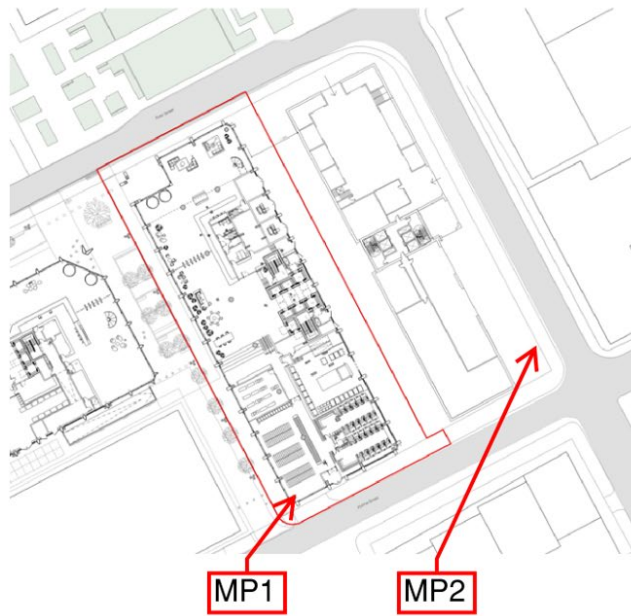


	Figure:	Figure 10.2		
	Title:	Noise measurement locations 2022 Survey		
	Project:	Plot 10		
	Date:	February 2023		N/A

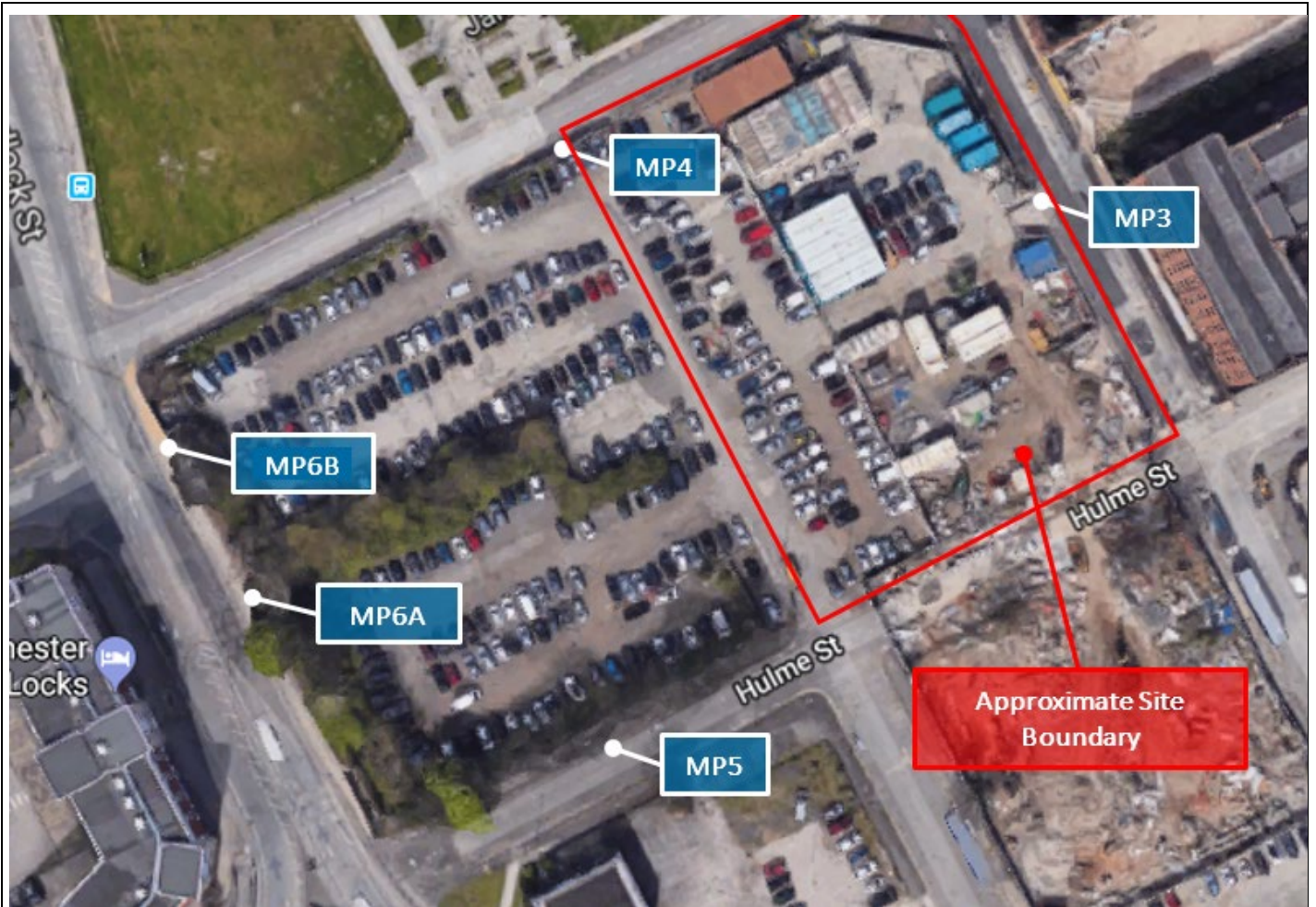


	Figure:	Figure 10.3		
	Title:	Noise measurement locations 2018 Survey		
	Project:	Plot 10		
	Date:	February 2023		N/A

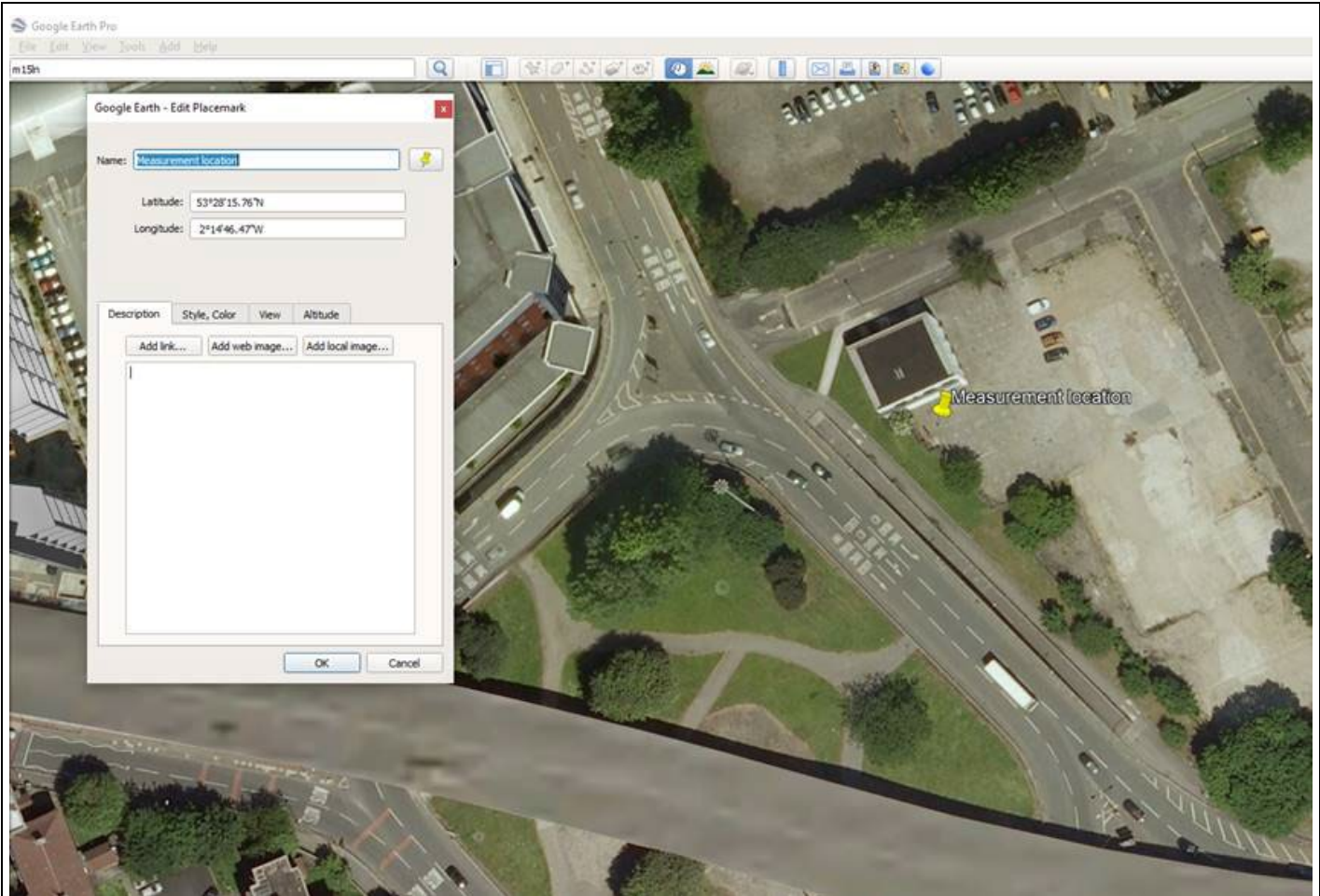


	Figure:	Figure 10.4		
	Title:	Noise measurement locations Fisher Acoustics Survey		
	Project:	Plot 10		
	Date:	February 2023		N/A

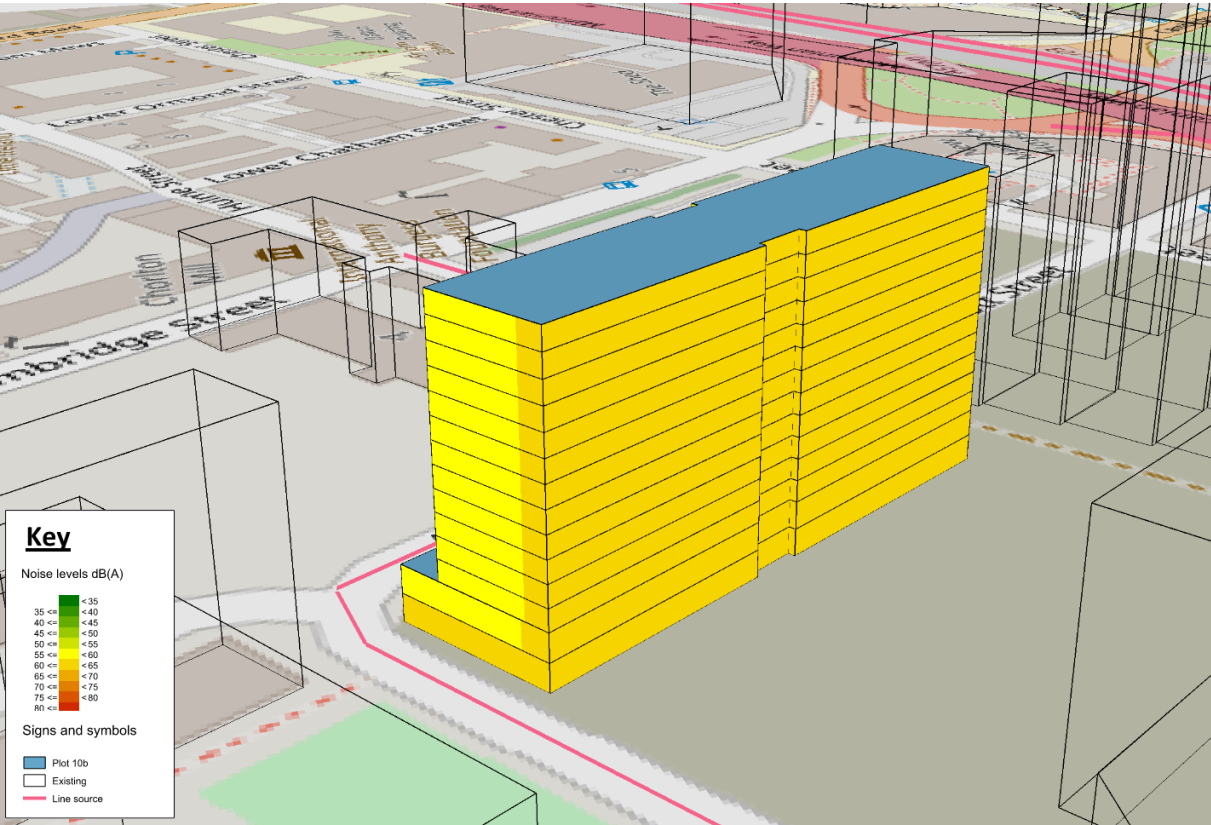


	Figure:	Figure 10.5		
	Title:	Daytime façade noise map from north west		
	Project:	Plot 10		
	Date:	February 2023		N/A

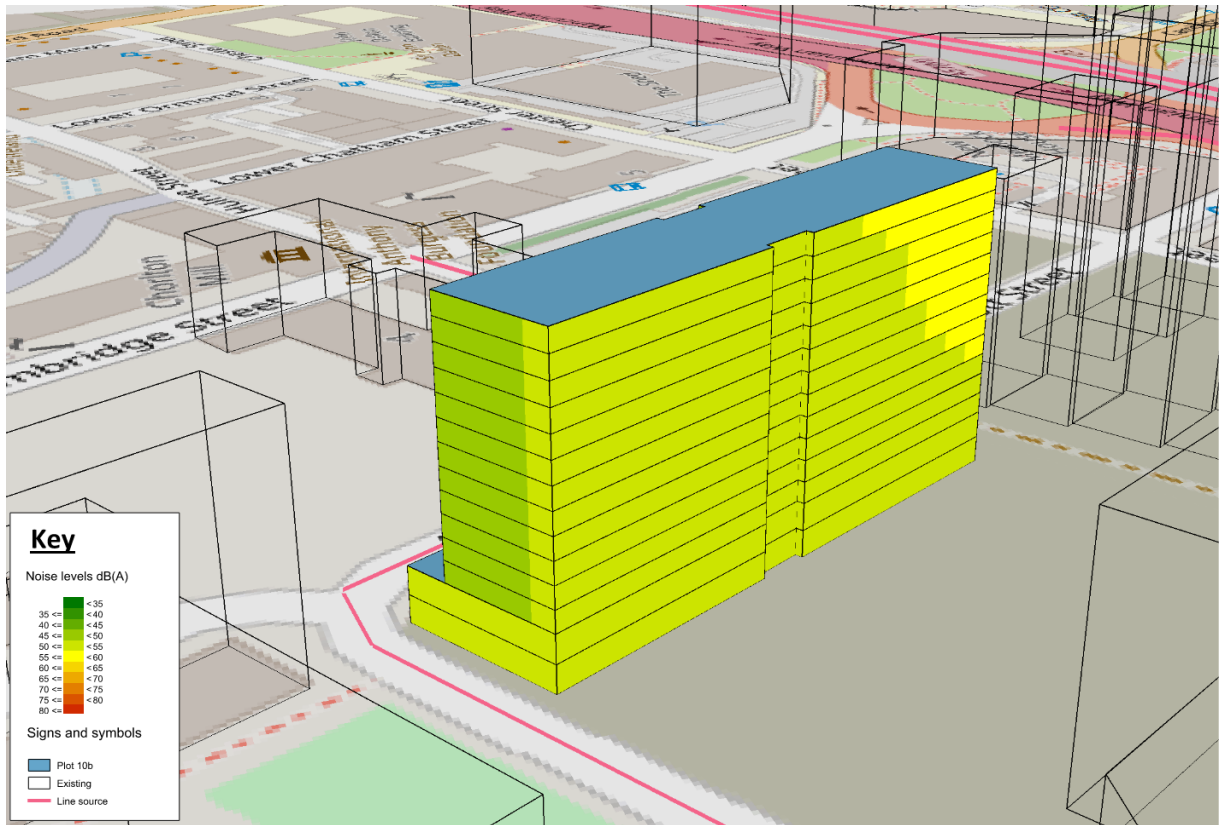


Figure:	Figure 10.6		
Title:	Night-time façade noise map from north west		
Project:	Plot 10		
Date:	February 2023		N/A

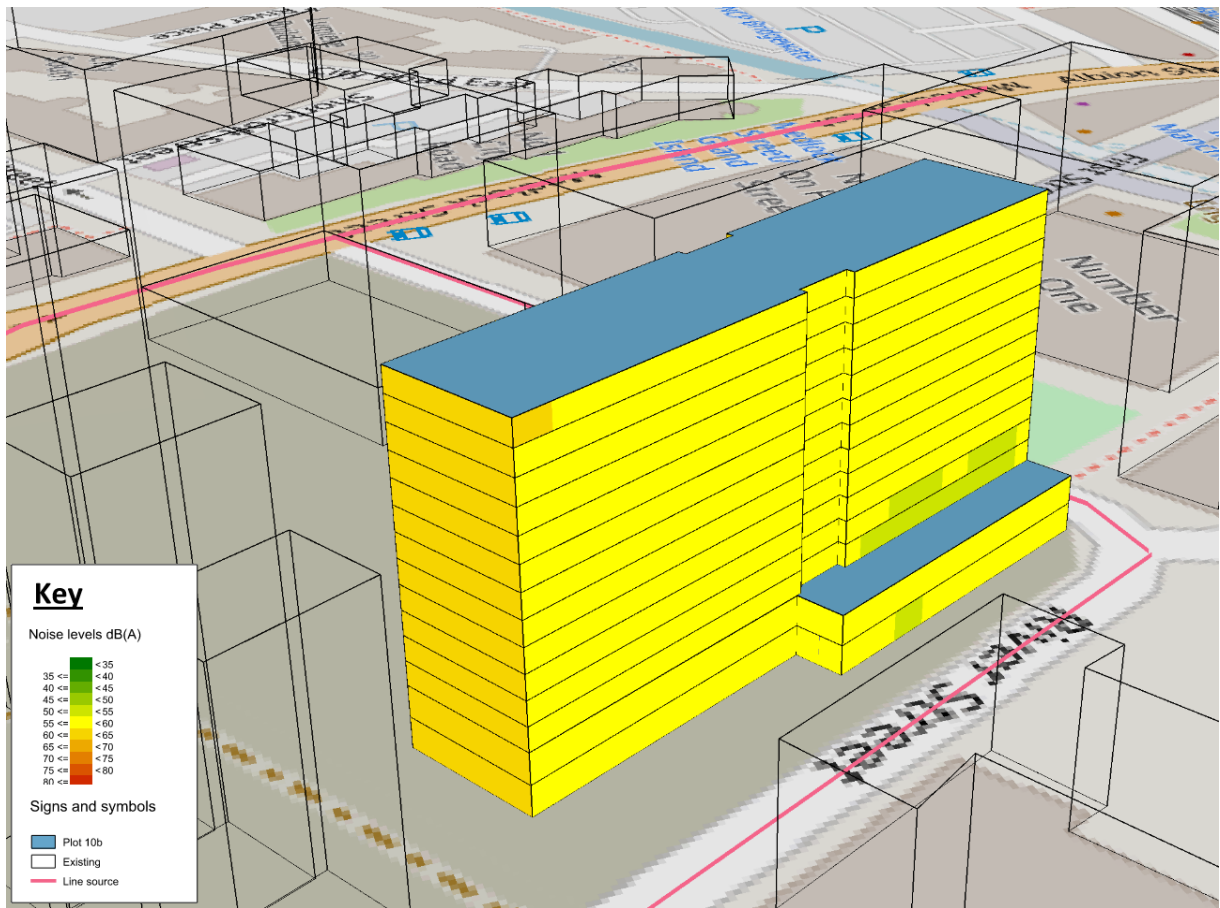


	Figure:	Figure 10.7		
	Title:	Daytime facade noise map from south east		
	Project:	Plot 10		
	Date:	February 2023		N/A

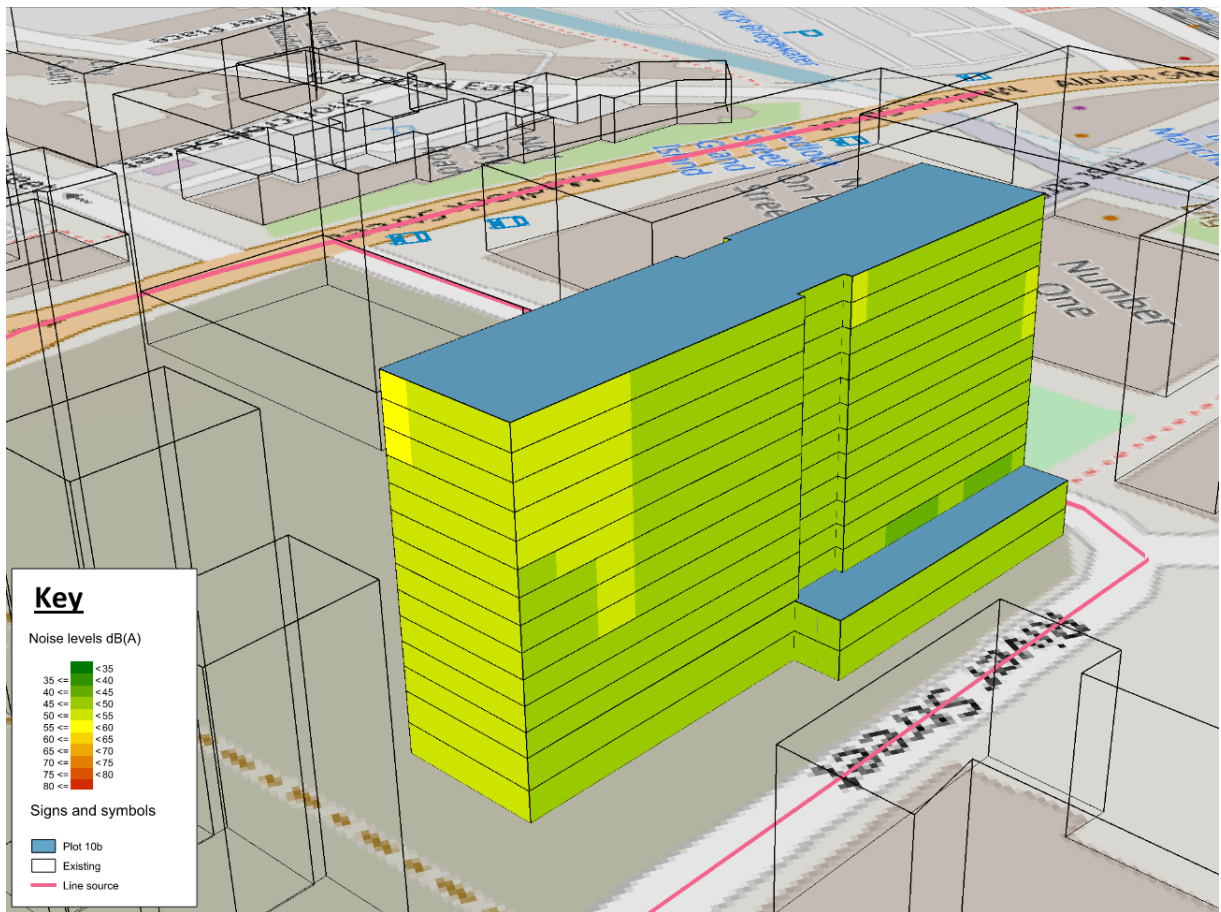


Figure:	Figure 10.8		
Title:	Night-time facade noise map from south east		
Project:	Plot 10		
Date:	February 2023		N/A

11. Socio-Economics

Introduction

- 11.1. This Chapter of the ES has been prepared by Ekosgen and assesses the likely Socio-Economic impacts of the proposals upon the EIA 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.
- 11.2. The author of the chapter (Will Christiansen, BSc Hons, MSc) has 4 years' experience in preparing c.25 EIA developments.

Assumptions and Limitations

- 11.3. 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.
- 11.4. 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 Assessment Area and clearly stated what geography the data collected refers to.

Legislative and Policy Context, Guidance

- 11.5. This considers the national, sub-regional and local planning documents and policies of relevance to this Chapter.

National Policy

The National Planning Policy Framework (NPPF)

- 11.6. In July 2021, 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".
- 11.7. 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, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".*
- 11.8. 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".
- 11.9. Paragraph 65 of the NPPF also outlines that "at least 10% of the total number of homes to be available for affordable home ownership", with exemptions relevant to the proposed development which "provides specialist accommodation for a group of people with specific needs (such as purpose-built accommodation for the elderly or students".

Sub-Regional Policy

Places for Everyone Plan

- 11.10. The emerging Places for Everyone is the new long-term joint development plan for nine Greater Manchester districts. On 14 February 2022, the Plan and supporting documents were submitted to the Secretary of State for examination.
- 11.11. 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.
- 11.12. The Plan highlights the importance in Manchester of *"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"*. The Proposed EIA Development will contribute towards accommodating for the wide community of students in Manchester, adding to the appeal of Manchester as a city to live, work and study in. 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"*.
- 11.13. The Plan acknowledges that Greater Manchester has one of the strongest office markets in the country, with the scale and quality of its offering being vital to supporting strong and productive sectors such as digital/creative, and business, financial and professional services. Policy JP-J 3 of the Plan outlines that at least 1,900,000 sqm of accessible new office floorspace will be provided in the Plan area over the period 2021-2037.
- 11.14. 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. As part of this, and supported by the Proposed EIA Development is the need for *"a broad range of commercial accommodation [which] will be delivered, helping the City Centre to capture growth across key economic sectors"*. The Proposed EIA Development will include additional commercial space which will contribute towards the goals of the Places for Everyone Plan, and the wider aims of the city region.

The Greater Manchester Strategy – Our People, Our Place (2018)

- 11.15. The Greater Manchester Strategy – Our People, Our Place (2018) vision is to make Greater Manchester one of the best places in the world to grow up, get on and grow old.
- 11.16. Manchester has a key role to play in both the provision of jobs for a growing population and offering high-quality housing and commercial areas for this population. As part of this, supported by the Proposed EIA Development it outlines the need to *"see housing policy as just one part of a wider place-making approach along with education and skills, employment, transport, health, commercial development and public service reforms"*. The commercial, office and purpose-built student accommodation will all equally contribute to the fulfilment of the Our People, Our Place strategy.

Local Policy

Manchester Core Strategy (2012)

- 11.17. 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. In relation to the Proposed EIA Development, relevant policies include:
- 11.18. 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. The Proposed EIA Development supports Policy H 12, through its provision of PBSA which demonstrates *"consideration given to the design and layout of the student accommodation and siting of individual uses within the overall development in relation to adjacent neighbouring uses. The aim is to ensure that there is no unacceptable effect on residential amenity in the surrounding area through increased noise, disturbance or impact on the street scene either from the proposed development itself or when combined with existing accommodation"*.

- 11.19. The Proposed EIA Development also includes a highly sustainable office building in line with Policy EC 1 (Employment and Economic Growth in Manchester). Policy EC 1 states that “a minimum of 200 ha of employment land will be developed between 2010 and 2027 for offices (B1a), research and development (B1b), light industrial (B1c), general industry (B2) and distribution and warehouses (B8)”. The Proposed EIA Development will provide offices (B1a), as well as PBSA which will contribute towards the continued success of research and development (B1b) in the city and the wider city region.

Relevant Guidance

First Street Strategic Development Framework

- 11.20. The earliest iterations of the **First Street Strategic Development Framework (SDF)** identified the EIA Site as falling within the ‘First Street Central’ character zone – a new office destination targeted at a range of commercial occupiers, particularly those seeking the benefits of a central and highly accessible city centre location, competitively priced to help distinguish the accommodation from other locations in the city centre.
- 11.21. The 2018 SDF update indicates that the First Street Central character area can accommodate a greater scale and density of office accommodation to meet the level of demand in the area and maximise its contribution to the City’s economic growth. It also identifies an opportunity to introduce flexible commercial, retail and leisure uses along the Wilmott Street frontage of First Street Central, extending the commercial spine from First Street North through the area, enhancing linkages to the residential communities to the south. The subsequent 2020 SDF Addendum reiterates the economic context of the regeneration area, as well as the demand for office space in the city

Residential Growth Strategy (2016)

- 11.22. 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.
- 11.23. 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 Proposed EIA Development provides both PBSA and commercial developments 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

- 11.24. Since there are no specific technical criteria to assess the significance of socio-economic effects, assessment will take place in accordance with the overarching EIA methodology (Chapter 2 of this ES) using professional judgement informed by experiences of similar projects.
- 11.25. The significance of socio-economic effects has broadly been determined by considering:
- The value of the resource (international, national, regional and local level importance);
 - The magnitude of the effect;
 - The duration of the effect;
 - The reversibility of the effect; and
 - The number of sensitive receptors.
- 11.26. The magnitude of socio-economic impacts will be assessed in line with the approach outlined in Table 11.1. In addition to the magnitude, the duration of impact will also be taken into account with the impacts ranging from those that are likely to be temporary or permanent.

Table 11.1 – Methodology for Determining Impact Magnitude

Magnitude of Impact	Criteria for Assessing Effect
Major	Total loss or major/substantial alteration to key element/features of the baseline (pre-development) conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/ alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstances/situation.

Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.
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11.27. The sensitivity of a receptor is based on the relative importance of the receptor using the framework outlined in Table 11.2.

Table 11.2 – Methodology for Determining Sensitivity

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

11.28. The significance of the impact is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. The Impact Significance Matrix is set out in Table 11.3. All impacts assessed as 'moderate' or 'major' are considered to be 'significant' in EIA terms and are denoted with an asterisk.

Table 11.3 – Impact Significance Matrix

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

11.29. The nature of the effect has been described as either adverse or beneficial as follows:

- Beneficial – An advantageous effect to a receptor;
- Adverse – A detrimental effect to a receptor; and
- Neutral – An effect that is on balance both beneficial and adverse.

Scenarios Tested

11.30. This chapter of the ES will assess all scenarios as set out in Chapter 2 of this ES. Each scenario is addressed in turn within the 'Identification and Evaluation of Likely Significant Effects' section below.

The Study Area

11.31. The approach to defining an appropriate study area has been informed by consideration of guidance on the topic. In respect of socio-economics, the relevant study area can vary according to different receptors; however, broadly, socio-economic impacts can be assessed with reference to a spectrum of spatial scales, ranging from the immediate local catchment through to the wider, sub-regional scale. The study area is also influenced by the availability of baseline data which may not always be available down to a local catchment area level.

11.32. The Scoping Report states that the study area will reflect the EIA Site's immediate local catchment, defined by using Lower Super Output Area (LSOA) administrative geographies. Accounting for the fact that, for socio-economic receptors assessed in this Chapter, there is limited availability of the relevant data down to a LSOA geography. Therefore, it is assessed that for most receptors the Manchester City Council local authority area represents the appropriate geography over which to assess socio-economic effects. This district/borough level approach reflects a geography at which there are consistently available socio-economic data within the public domain and therefore facilitates benchmarking and assessment. For some receptors a smaller study area is required; for instance, with respect to the demand for social and community infrastructure within close proximity to the Proposed EIA Development (i.e. within a certain distance radius from the EIA Site).

- 11.33. Wherever possible, the baseline characteristics of the study area will be benchmarked against comparator areas such as the sub-regional (Greater Manchester), regional (North West) and national level.

Baseline Conditions

- 11.34. The purpose of this section is to establish an understanding of the baseline conditions to inform the context for intervention and therefore the potential impact of the Proposed EIA Development on local characteristics. A range of published data sources has been considered to understand both the social and economic characteristics of the area as a starting point for the assessment.
- 11.35. For the purpose of establishing the baseline, the local assessment Area has been defined to reflect the anticipated catchment of the Proposed EIA Development, which for the majority of socio-economic receptors constitutes the relevant local authority / borough (in this case, Manchester City Council). This also reflects a geography at which there is consistently available socio-economic data within the public domain that can be accessed to establish the baseline position and readily compare to benchmark areas, such as the sub-regional (Greater Manchester), regional (North West) and national levels.
- 11.36. In some instances, alternative assessment areas have been considered, for example when considering the capacity of local primary healthcare facilities. These are typically based on a distance or journey time from the EIA Site and the rationale for the distance chosen is set out in the relevant sections below.
- 11.37. Study area baseline conditions are presented in Table 11.5. These are summarised by those most relevant to each socio-economic receptor.

Table 11.4 Baseline Conditions

Receptor	Baseline
Individuals seeking construction employment and the local economy (through GVA)	Assessment area: Borough level (Manchester). Manchester has a lower proportion of employment in the construction sector (2.6%) than Greater Manchester (5.4%), the North West (5.5%) and nationally (4.9%) (BRES, 2021). The sector is therefore underrepresented locally. Latest labour market indicators suggest that Manchester's unemployment rate is notably higher (8.9%) than comparator areas (Greater Manchester, 5.1%; North West, 4.7%) (APS, 2021). Similarly, the proportion of the working age population that are claimants (claimant rate) is higher in Manchester (5.7%) compared to Greater Manchester (4.9%) and the North West (4.2%). In Manchester, there are currently (October 2022) 22,310 people claiming Universal Credit (UC) or Job Seeker's Allowance (JSA) (ONS Claimant Count, 2022). All sector productivity (as measured by GVA per FTE) is lower in Manchester (c. £78,000) compared to the national average (c. £83,000). However, this level is above the Greater Manchester (c. £70,000) and North West (c. £71,000) averages (ONS, 2019; BRES, 2019). Productivity in the construction sector is in the order of £116,000 per FTE – this is notably higher than all comparator areas, including the national average (c. £100,000) (ONS, 2019; BRES, 2019). Receptor sensitivity to change is assessed as being 'moderate'.
Individuals seeking employment and the local economy (through GVA)	Assessment area: Borough level (Manchester). General labour market indicators as above. Manchester has a higher share of employment within sectors that broadly reflect the office-based service economy – constituting broad industrial groups: J: Information and communication; K: Financial and insurance activities; L: Real estate activities; M: Professional, scientific and technical activities; and N: Administrative and support service activities. These sectors account for 37% of employment, compared to Greater Manchester (29%), the North West (25%) and nationally (28%) (BRES, 2021).

Receptor	Baseline
	Manchester has a lower proportion of employment (22%) in retail, leisure and hospitality sectors (defined as Retail, Accommodation & food services and Arts, entertainment, recreation & other services) compared to the national and regional averages (26%) (BRES, 2021). All sector productivity as presented above. Productivity (as measured by GVA per FTE) in 'service activity' sectors (as previously defined) is lower in Manchester (c. £99,000) than the national average (c. £112,000) but higher than sub-regional and regional comparators (ONS, 2019; BRES, 2019). Productivity in retail, leisure and hospitality sectors (defined as Broad Industrial Groups G, I, R, S, T and U (Retail, Accommodation & food services and Arts, entertainment, recreation & other services) is higher in Manchester (c.£44,000) than comparator areas, including the national average (c.£40,000) (ONS, 2019; BRES, 2019). Receptor sensitivity to change is assessed as being 'moderate'.
Students seeking accommodation	Assessment area: Borough level (Manchester). Manchester has one of the largest student populations in Europe, with over 90,000 students at Greater Manchester's five universities. The total student population is the largest concentration outside of London, with a growing proportion of international students. The student population that the Proposed 10b Development is most likely to target is likely in attendance of the University of Manchester (UoM) and Manchester Metropolitan University (MMU). UoM is the UK's largest single Higher Education Institution (HEI) and attracted 40,305 full-time students in 2020/21, a 12% increase since 2015/16. Manchester Metropolitan University (MMU) witnessed positive growth of 10% over the past five years (HESA, 2022). UCAS Acceptances to both universities increased by 20% between 2020/21 and 2021/22 which is indicative of another large increase in student numbers for the current academic year (Cushman & Wakefield, 2022). There are c. 26,830 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 (Cushman & Wakefield, 2022). The Manchester market is characterised by its legacy of older bed spaces due to limited development over the last decade. Just over 2,500 new bed spaces have been delivered to the market since 2018, however, over this period a large number of beds have also left the market, including the UoM 1,075 bed Owens Park development (Cushman & Wakefield, 2022). 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 (Cushman & Wakefield, 2022). The demand-supply assessment indicates that there is a total demand pool of 51,220 students potentially requiring student accommodation at UoM and MMU. Set against a current supply of 26,830 PBSA bedspaces, this suggests that there are 24,390 students unable to access to PBSA, equating to a student-bed ratio of 1.91 (Cushman & Wakefield, 2022). 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% (HESA, 2022). Therefore, overseas students account for an increasing proportion of Manchester's student population and almost half of PBSA tenancies (Cushman & Wakefield, 2022).

Receptor	Baseline
	Receptor sensitivity to change is assessed as being 'high'.
Local economy (through GVA)	Assessment area: Borough level (Manchester). Latest general labour market indicators as above Manchester has a lower proportion of employment (22%) in retail, leisure and hospitality sectors (defined as Retail, Accommodation & food services and Arts, entertainment, recreation & other services) compared to the national and regional averages (26%) (BRES, 2021). All sector productivity as above (lower than national average, but above Greater Manchester and the North West) (ONS, 2019; BRES, 2019). Productivity in retail, leisure and hospitality sectors (defined as Broad Industrial Groups G, I, R, S, T and U (Retail, Accommodation & food services and Arts, entertainment, recreation & other services) is higher in Manchester (c.£44,000) than comparator areas, including the national average (c.£40,000) (ONS Regional Gross Value Added (balanced) by industry) Receptor sensitivity is assessed as being 'medium'.
Primary healthcare facilities	Assessment area: local/neighbourhood level (within 1 mile of the EIA Site). In addition to the provision of primary healthcare services for local residents, UoM and MMU play a role in coordinating the provision of primary healthcare services for students. For instance, UoM has launched a new GP service on campus for the 2022/23 year that will allow students to register as patients and access a range of non-emergency services by appointment. – including examinations, medication prescriptions, vaccinations, and referrals to other medical specialists. The service runs in partnership with The Robert Darbishire Practice. This practice is currently operating at a ratio of c.1,900 patients to FTE GP – marginally above a commonly accepted benchmark ratio used in healthcare planning and recommended by the HUDU (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. In the absence of data to quantitatively assess the demand and the capacity of these university healthcare services, the Robert Darbishire Practice is used as a proxy. Since this practice is marginally above the benchmark patient to FTE GP ratio the receptor sensitivity is assessed as being 'medium'. <u>Primary healthcare facilities for the general resident population (included to inform the assessment of cumulative effects)</u> Within 1 mile of the EIA Site there are eight GP practices operating across the NHS Salford Clinical Commissioning Group (CCG) and NHS Manchester CCG areas. The closest practices to the EIA Site are The Docs and The Arch Medical Practice (both 0.2 miles) which are currently operating at patient to FTE GP ratios of 1806:1 and 1693:1 respectively. Other practices within the 1 mile assessment area have higher ratios, with Blackfriars Medical Practice (0.8 miles) operating at a patient to FTE GP ratio of 6,978. Recognising that different practices have varied operational and staffing requirements to suit the needs of their patient population, the ratio of the closest sites are in line with the commonly accepted benchmark ratio used in healthcare planning and recommended by the HUDU (1,800 patients per FTE GP), however Blackfriars Medical Practice is significantly above this level. The City Health Centre, The Docs, Cornbrook Medical Practice, the Arch Medical Practice, Blackfriars Medical Practice, The Vallance Centre, Trinity Medical Centre, and the Limelight Health and Wellbeing Hub are all located within 1 mile of the EIA Site. In combination, there are 99,267 registered patients and just over 44 FTE GPs – operating at (2,251 patients per GP) and above the commonly accepted ratio. A new build medical centre is to be provided at the ground and first floor of the Elizabeth Tower residential development within the Great Jackson Street Strategic Regeneration Framework area. It is understood that

Receptor	Baseline
	this facility is likely to be operational within 2023 and that it will include 16 clinical rooms, supporting a patient population in the order of 8,000-10,000. The proposed FTE GP staffing arrangements are not known. Although unable to quantify, this additional provision would contribute to the alleviation of the current shortfall within the assessment area.
Open space and recreational facilities and their users	The EIA Site is bound by River Street to the north and east, Hulme Street to the south, and Newcastle street to the west. There are no permanent structures on the EIA Site, as well as no trees on or adjacent to the EIA Site. There are a number of leisure facilities, including gyms / health clubs and sport centres within the vicinity of the EIA Site. The nearest leisure centre is Sugden Sports Centre, less than a 15-minute walk away. Being a city centre site there are numerous leisure sites within close proximity to the EIA Site, including HOME cinema, Odeon Cinema, Junkyard Crazy Golf. As well as this, it is a close walk into the rest of the city centre and both Deansgate tram station and Manchester Oxford Road railway station are within a 5 minute walk from the EIA Site, providing easy access to the wider city. There are a number of open / amenity spaces in proximity to the EIA Site, including Hulme Park (4.88ha), All Saints Park (0.75ha), Castlefield Urban Heritage Park (0.81ha), St John's Gardens (0.5ha), and Sackville Garden (0.5ha). A City Wide Open Space Sport and Recreation Study (undertaken in 2009) highlighted that a priority for the City is for better quality and improved access for its open space, sport and recreation facilities. Given the quantity and variety of amenities and spaces within a city centre location, combined with professional judgment, the receptor sensitivity is assessed as being 'low'.

Identification and Evaluation of Likely Significant Effects

- 11.38. A desktop review of the committed baseline and cumulative schemes has been undertaken. The review has focused on documents that are in the public domain through the Manchester City Council planning application portal and as such it is not possible in every instance to obtain full scheme details. It should be noted that whilst some publicly available information on the proposed schemes may include independent assessments of socio-economic effects; , the approaches used are inevitably not all consistent. Therefore, to ensure a consistent approach in assessing baseline and cumulative schemes, information regarding the quantum of development proposed, by use, has been collated to enable a comparative assessment alongside the Proposed EIA Development. The limitations of this approach are recognised, however, it provides a proportionate approach that allows for an evaluation of the likely significance of socio-economic effects of the Proposed EIA Development when considered in conjunction with committed baseline and cumulative schemes.
- 11.39. The section below summarises the construction and operational phase socio-economic effects in relation to **Scenario 6**. For the purposes of this assessment this is referred to as the core scheme, including committed baseline schemes but excluding cumulative schemes which are considered in a later section. The equivalent assessment for the other scenarios is then presented at the end of the section in a tabular format, for ease of presentation. This refers to Scenarios 1 (Baseline), 2 (Baseline + Plot 10a) and 4 (Baseline + Plot 10b) and therefore exclude cumulative elements (Scenarios 3,5 and 7) which are evaluated in a later section.

Construction Phase

11.40. Construction phase impacts are considered to be temporary (all scenarios) and are assessed below:

Table 11.5: Construction Phase Impacts

Receptors affected	Receptor Sensitivity	Description of Impact	Magnitude of Impact	Scale of Effect and Significance
Individuals seeking construction employment and the local economy (through GVA)	Moderate	The estimated construction spend associated with the Proposed EIA Development (Plots 10a and 10b combined) will support a temporary economic uplift during the construction period. The level of investment proposed has the potential to support an estimated 1,140 construction job years, equivalent to 455 full time equivalent (FTE) jobs per year across the duration of the build, based on the average turnover per FTE in Manchester for the construction sector (BRES, 2019; ABS, 2019). The number of construction workers is likely to fluctuate over the duration of the construction programme to reflect the stage of development reached and associated workforce requirements. Although regional and national construction firms will often use their own workers on development schemes, it is common for at least some contractors to be drawn from the immediate local area. A local labour agreement would support the capture of local benefits. A leakage allowance is applied at 25% (medium, in accordance with HCA Additionality Guide, 2014), owing to the assessment area's high unemployment and claimant rate relative to comparator areas, and balanced against the possibility that many employment seeking residents locally may not have the appropriate skills profile to access skilled construction sector employment. Given construction sector underrepresentation locally, the likelihood of construction employment being displaced is higher. A 'medium' displacement allowance of 50% is applied. The total net direct employment is therefore estimated at 170 FTE. These jobs will generate GVA of £21.2m per annum over the construction period, estimated by applying the average GVA per FTE for the Manchester construction sector (ONS, 2019; BRES, 2019). This constitutes 2.4% of the total construction sector GVA in the study area. Multiplier effects as a result of spill-over spending through the supply chain (indirect impacts) and through knock-on consumer spending as a result of wages being derived or spent locally (the induced impacts) will generate further employment during the construction phase. Applying the HCA Additionality Guidance sub-regional multiplier for regeneration and physical infrastructure projects suggests that the estimated total direct, indirect and induced employment could be in the order of 230 FTEs. This constitutes 3% of the total construction sector employment in the study area. Within the context of the above, it is assessed that Scenario 6 represents a Minor magnitude of impact.	Scenario 6: minor <i>Scenario 1: negligible</i> <i>Scenario 2: minor</i> <i>Scenario 4: minor</i>	Scenario 6: Temporary, Minor Beneficial <i>Scenario 1: Temporary, negligible</i> <i>Scenario 2: Temporary, Minor Beneficial</i> <i>Scenario 4: Temporary, Minor Beneficial</i>

Operational Phase

11.41. All operational phase impacts are permanent and are assessed below:

Table 11.6: Operational Phase Impacts

Receptors effected	Receptor Sensitivity	Description of Impact	Magnitude of Impact	Scale of Effect and Significance
Individuals seeking employment and the local economy (through GVA)	Moderate	It is understood that the EIA Site does not provide any existing employment. Through the application of relevant employment densities to the proposed floorspace (HCA, 2015), and assuming 100% occupancy, Scenario 6 could provide floorspace to accommodate approximately 1,820 gross direct FTE jobs. Notwithstanding the limitations with this approach, this represents an upper limit of gross employment generation for the purposes of this exercise. A 'low' leakage allowance is applied at 10% owing to the assessment area's high representation of employment within office-based service activities; however, the likelihood of employment generated displacing existing activity and causing greater labour market competition within the assessment area is reasonably high. For the purposes of this assessment, it is assumed that 50% of activity will be displaced ('medium' displacement). The total net direct employment is therefore estimated at c.820 FTEs. These jobs could generate GVA of £80m per annum. Multiplier effects as a result of spill-over spending through the supply chain (indirect impacts) and through knock-on consumer spending as a result of wages being derived or spent locally (the induced impacts) will generate further employment. Applying the HCA Additionality Guidance local area composite multiplier for office uses suggests that the estimated total direct, indirect and induced employment could be in the order of 1,055 FTEs. It is assessed that the level of employment (and associated GVA uplift) constitutes a minor magnitude of impact.	Scenario 6: Minor <i>Scenario 1: negligible</i> <i>Scenario 2: minor</i> <i>Scenario 6: negligible</i>	Scenario 6: Permanent, Minor Beneficial <i>Scenario 1: Permanent, Negligible</i> <i>Scenario 2: Permanent, Minor Beneficial</i> <i>Scenario 4: Permanent, Negligible</i>
Students seeking accommodation	High	An additional 576 bedspaces represents 2.1% of the reported supply of 26,830 bedspaces in the study area. 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. 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	Scenario 6: Moderate <i>Scenario 1: Negligible</i> <i>Scenario 2: Negligible</i> <i>Scenario 4: Moderate</i>	Scenario 6: Permanent, Major Beneficial* <i>Scenario 1: Permanent, Negligible</i> <i>Scenario 2: Permanent, Negligible</i> <i>Scenario 4: Permanent, Major Beneficial*</i>

Receptors effected	Receptor Sensitivity	Description of Impact	Magnitude of Impact	Scale of Effect and Significance
		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.” In terms of quality, Manchester City Council has acknowledged that the overall quality of PBSA stock is poor compared to other university cities. This is reflected within the 2021 Student Accommodation Survey Report (Knight Frank, 2021) which reported that Manchester students living in private PBSA displayed the lowest level of accommodation satisfaction in comparison with 9 other major UK 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 576 bedspaces constitutes a moderate magnitude of impact.		
Local economy (through GVA)	Moderate	Additional expenditure from students living within PBSA will contribute towards an uplift in local expenditure in retail, leisure and hospitality sectors. Student spending levels are benchmarked according to data from the Natwest Student Living Index (2022). This benchmark reflects average expenditure, excluding housing/accommodation costs. It is assumed that expenditure displacement will be high (75%) and leakage will be low (10%), accounting for the relatively low geographic mobility of students during term time. This generates an estimated total annual net expenditure of c.£630,000. This uplift in spending has the potential to support employment within local shops and services, broadly within retail, leisure and hospitality sectors. The application of a turnover per FTE benchmark for retail, leisure and hospitality sectors (ABS, 2019; BRES, 2019) to the uplift in annual expenditure indicates that this could support a small amount of employment (estimated at less than 10 FTE jobs). This employment would support a modest uplift in GVA. The magnitude of impact is considered to be negligible.	Scenario 6: Negligible <i>Scenario 1: Negligible</i> <i>Scenario 2: Negligible</i> <i>Scenario 4: Negligible</i>	Scenario 6: Permanent, Negligible <i>Scenario 1: Permanent, Negligible</i> <i>Scenario 2: Permanent, Negligible</i> <i>Scenario 4: Permanent, Negligible</i>
Primary healthcare facilities	Medium	The increase in student population could lead to added pressure on existing primary healthcare facilities. It is considered that the addition of 576 students to the local area would constitute a minor magnitude of impact.. It should be noted, however, that primary healthcare facilities for the general resident population (non-student) are subject to greater demand pressures. As such, when considering the in-combination impact of cumulative schemes (Scenarios 3, 5 and 7), the sensitivity of the receptor (general resident population) is higher. Therefore, by virtue of the scale of residential development with the local area there is potential for adverse in-combination effects (as described below under ‘Cumulative Effects’).	Scenario 6: Minor <i>Scenario 1: Negligible</i> <i>Scenario 2: Negligible</i> <i>Scenario 4: Minor</i>	Scenario 6: Permanent, Minor Adverse <i>Scenario 1: Permanent, Negligible</i> <i>Scenario 2: Permanent, Negligible</i> <i>Scenario 4: Permanent,</i>

Receptors affected	Receptor Sensitivity	Description of Impact	Magnitude of Impact	Scale of Effect and Significance
				Minor Adverse
Open space and recreational facilities and their users	Low	An uplift in resident population as a result of Scenario 6 will increase demand and usage of nearby open space and recreation facilities. A number of open green spaces and parks have been identified within close proximity to the EIA Site as well as an array of leisure and recreational facilities, given the city centre location. Due to limited information availability, and an absence of up to date open space provision benchmarks for Manchester City Council (most recent available standards relate to work undertaken in 2009 and therefore are unlikely to accurately reflect the current balance of provision) it is not possible to accurately quantify the extent to which this increased student population will affect the existing balance of provision of open space and recreational facilities across the assessment area. It is also considered likely that many (if not all) of the committed baseline schemes will include elements that either add to the provision, or improve access to existing provision, in line with planning requirements to enhance public realm, landscaping etc. Given the scale of increase in student population, it is considered reasonable that this would place greater demand on the usage of local provision. However, this needs to be balanced against the potential for new quality provision and improved access to existing provision, alongside the wide array of leisure and amenity facilities located within the assessment area. On balance therefore the magnitude of change is assessed as negligible.	Scenario 6: Negligible <i>Scenario 1: Negligible</i> <i>Scenario 2: Negligible</i> <i>Scenario 4: Negligible</i>	Scenario 6: Permanent, Negligible <i>Scenario 1: Permanent, Negligible</i> <i>Scenario 2: Permanent, Negligible</i> <i>Scenario 4: Permanent, Negligible</i>

Cumulative Effects

11.42. A review of the cumulative schemes identified indicates that these schemes collectively will deliver:

- c.3,700 residential units;
- 850 student bedspaces;
- c.19,000 sq.m of commercial (broadly office) floorspace; and
- c.5,000 sq.m of retail, food and beverage floorspace.

11.43. The delivery of these has the potential to interact cumulatively with the Proposed EIA Development. Tables 11.7 and 11.8 summarise the significance of cumulative impacts associated with each relevant scenario, by construction and operational phases. This relates to Scenarios 3, 5 and 7.

Table 11.7: Cumulative impacts – construction phase

Receptors affected	Description of Impact	Scale of Effect and Significance
Individuals seeking construction employment and the local economy (through GVA)	It is possible that the construction phases of all of the cumulative schemes could overlap with that of the Proposed EIA Development. Based on the information that is publicly available, it is not possible to accurately quantify the additional construction employment alongside the timeframe over which it is likely to be generated; however, it is reasonable to suggest that the delivery of these schemes could lead to some competition for construction employment within the study area. As indicated within the assessment (Table 11.5), the local	<i>Scenario 3: Temporary, Moderate Beneficial*</i>

Receptors affected	Description of Impact	Scale of Effect and Significance
	construction sector is underrepresented. Assuming that the delivery of the cumulative schemes would not all coincide, it is reasonable to suggest that the sector locally may need to recruit at least some construction labour from outside of the study area. In addition, with the likely overlap in construction phases of the cumulative schemes there is potential for apprentices to move between schemes and complete their apprenticeships within the local authority. These are particularly beneficial as many apprenticeships require a three-year duration which can be difficult to achieve on shorter duration build projects. Therefore, alongside the potential for additional construction employment, having overlapping projects within the study area is considered to be beneficial and moderate magnitude of impact.	<i>Scenario 5: Temporary, Moderate Beneficial*</i> <i>Scenario 7: Temporary, Moderate Beneficial*</i>

Table 11.8: Cumulative impacts – operational phase

Receptors affected	Description of Impact	Scale of Effect and Significance
Individuals seeking employment and the local economy (through GVA)	The relevant cumulative schemes would generate additional operational employment that would be complementary to the proposed uses at Plot A. Based upon the application of assumptions consistent with those set out in Table 11.6 the scale of increase would represent a minor magnitude of impact.	<i>Scenario 3: Permanent, Minor Beneficial</i> <i>Scenario 5: Permanent, Negligible</i> <i>Scenario 7: Permanent, Minor Beneficial</i>
Students seeking accommodation	Alongside the Proposed 10b Development, the cumulative schemes will deliver 1,550 student bedspaces. In applying the same considerations as set out in Table 11.6, it is assessed that this would constitute a moderate magnitude of impact.	<i>Scenario 3: Permanent, Major Beneficial (significant)*</i> <i>Scenario 5: Permanent, Major Beneficial (significant)*</i> <i>Scenario 7: Permanent, Major Beneficial (significant)*</i>
Local economy (through GVA)	Alongside the Proposed EIA Development, the additional student and non-student resident expenditure derived from the cumulative schemes will deliver an uplift in spending within the local economy, however, the scale of uplift relative to the existing baseline remains negligible.	<i>Scenario 3: Permanent, Negligible</i> <i>Scenario 5: Permanent, Negligible</i> <i>Scenario 7: Permanent, Negligible</i>
Primary healthcare facilities	Alongside the Proposed EIA Development, the cumulative schemes will lead to an additional demand for primary healthcare services. It should, however, be noted that a distinction is made between primary healthcare receptors for the local resident population and the student population (the latter can be served by specific	<i>Scenario 3: Permanent, Minor Adverse</i> <i>Scenario 5: Permanent, Minor Adverse</i> <i>Scenario 7: Permanent, Minor Adverse</i>

Receptors affected	Description of Impact	Scale of Effect and Significance
	university provision that is not available to the wider non-student population). The delivery, therefore, of approximately 3,700 residential units (and the ensuing uplift in local population) could therefore exacerbate an existing shortfall in provision (see Table 11.5) and has the potential to constitute a moderate magnitude of impact. However, given planned expansion of capacity through a new build medical centre to be provided within the Great Jackson Street Strategic Regeneration Framework area, this additional provision – scheduled to be operational in 2023 - would contribute to the alleviation of the current shortfall within the assessment area. In this light, it is assessed that the population uplift derived from cumulative schemes could constitute a minor magnitude of impact. It is assumed that these schemes would seek to mitigate any potential adverse effects through the planning system, for example a financial contribution secured via Section 106 agreement.	
Open space and recreational facilities and their users	It is considered that collectively the cumulative schemes would bring forward new open space and recreational leisure facilities in the study area either through provision on-site and/or financial contributions. It is assumed that these will, at least, serve the increased demand derived from each scheme individually and have the potential to generate beneficial effects.	<i>Scenario 3: Permanent, Negligible</i> <i>Scenario 5: Permanent, Negligible</i> <i>Scenario 7: Permanent, Negligible</i>

Mitigation Measures

11.44. As indicated in Tables 11.6, 11.7 and 11.8, there are no significant adverse effects identified.

Residual Effects

11.45. Since no mitigation measures are recommended, Tables 11.9 and 11.10 summarise the residual effects for all receptors, summarised for each scenario.

11.46. Residual effects marked with an asterisk are assessed as being 'significant' in environmental impact assessment terms.

Table 11.9 – 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 Phase					
Uplift in local construction employment	Individuals seeking construction employment and the local economy (through GVA)	None	n/a	Scenario 1	Temporary, Negligible
				Scenario 2	Temporary, Minor Beneficial
				Scenario 3	Temporary, Moderate Beneficial*
				Scenario 4	Temporary, Minor Beneficial
				Scenario 5	Temporary, Moderate Beneficial*
				Scenario 6	Temporary, Minor Beneficial
				Scenario 7	Temporary, Moderate Beneficial*

Table 11.10 – 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)	
Operational Phase					
Net change in operational employment (and change in GVA)	Individuals seeking construction employment and the local economy (through GVA)	None	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Minor Beneficial
				Scenario 3	Permanent, Minor Beneficial
				Scenario 4	Permanent, Negligible
				Scenario 5	Permanent, Negligible
				Scenario 6	Permanent, Minor Beneficial
				Scenario 7	Permanent, Minor Beneficial
Increase in the number of student bedspaces and contribution towards local strategic objectives in respect of PBSA supply	Students seeking accommodation	None	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Negligible
				Scenario 3	Permanent, Major Beneficial*
				Scenario 4	Permanent, Major Beneficial*
				Scenario 5	Permanent, Major Beneficial*
				Scenario 6	Permanent, Major Beneficial*
				Scenario 7	Permanent, Major Beneficial*
Uplift in local household spend, increasing local expenditure, including on retail, household goods, food and drink, local transport, recreation and leisure and other expenditure likely to be spent locally.	Local economy (through GVA)	None	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Negligible
				Scenario 3	Permanent, Negligible
				Scenario 4	Permanent, Negligible
				Scenario 5	Permanent, Negligible
				Scenario 6	Permanent, Negligible
				Scenario 7	Permanent, Negligible

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)	
Additional demand for healthcare facilities (GP services and dentists) as a result of the uplift in population.	Primary healthcare facilities	None	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Negligible
				Scenario 3	Permanent, Minor Adverse
				Scenario 4	Permanent, Minor Adverse
				Scenario 5	Permanent, Minor Adverse
				Scenario 6	Permanent, Minor Adverse
				Scenario 7	Permanent, Minor Adverse
Additional demand for the use of the existing leisure facilities and open/amenity space	Open space and recreational facilities and their users	none	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Negligible
				Scenario 3	Permanent, Negligible
				Scenario 4	Permanent, Negligible
				Scenario 5	Permanent, Negligible
				Scenario 6	Permanent, Negligible
				Scenario 7	Permanent, Negligible

Reference List

11.47. This ES Chapter has been prepared by reference to the following:

- Cushman & Wakefield (2022) Student Need Assessment, River Street, Manchester
- Higher Education Statistics Authority (2022) HESA Student Record 2021/22
- Homes and Communities Agency (HCA) (2014) Additionality Guide, 4th Edition
- Homes and Communities Agency (HCA) (2015) Employment Density Guide, 3rd Edition
- Knight Frank (2021) Student Accommodation Survey, 2021
- Natwest (2022) Natwest Student Living Index 2022
- ONS (2020) Sub National Population Projections (2018 based) - local authority based by single year of age
- ONS (2022) Usual resident population, 2011 and 2021 and percentage change between 2011 and 2021
- ONS Annual Business Survey (2019); ONS Business Register and Employment Survey (2019)
- ONS Annual Population Survey (2021)
- ONS Business Register and Employment Survey (2021)
- ONS Claimant Count (2022)
- ONS Regional gross value added (balanced) by industry: local authorities by ITL1 region (2019); ONS Business Register and Employment Survey (2019)

12. Townscape and Visual Impact

Introduction

- 12.1. This Chapter of the ES has been prepared by Planit-IE and assesses the likely townscape and visual impacts on the EIA Site and surrounding area of proposals to deliver a purpose-built student accommodations scheme, with ground floor food market hall on Plot10b, First Street. This Chapter also describes the methods used to assess these impacts, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce or offset any significant negative impacts and the likely residual impacts after these methods have been adopted.
- 12.2. This Chapter is accompanied by four technical appendices, Townscape and Landscape Baseline and Assessment Table (**Appendix 12.1**), and a Visual Baseline and Effects (**Appendix 12.2**), Figures (**Appendix 12.3**), and Viewpoints and Photography (**Appendix 12.4**).
- 12.3. The author of the chapter is a fully qualified member of the Landscape Institute with over 15 years experience in preparing townscape and visual assessments for EIA developments.

Assumptions and Limitations

- 12.4. The hoarded-off, brownfield site to the east of River Street and north of Macintosh Mill, which is identified for future redevelopment in the First Street SDF, will be utilised during the construction process to provide welfare facilities for construction workers, as detailed in Section 4 of this Environmental Statement. Following completion of the development on 10b site, this area of land will be returned to its current state. We have considered this with regards to our townscape and visual impact discipline. This will be a temporary usage through the duration of the construction works; Thus, once the operational stage of the development is underway, no effects will remain in the construction compound area. During the construction phase of development, the welfare area will have temporary minor adverse impact which is considered to be non-significant.
- 12.5. The following methodology for assessment is proposed:
- The methodology is drawn from the GLVIA, 3rd Edition. The detail of the methodology has been agreed with the landscape officer on behalf of the MCC as part of the scoping process.
 - The photography and preparation of any Visually Verified Montages (VVMs) will be prepared in accordance with the Landscape Institutes Technical Guidance Note 06/19 entitle 'Visual Representation of Development Proposals'. The location and number of the views has been agreed with the Local Planning Authority.
 - The photography has been carried out by a professional photographer with substantial experience in this field of work. In accordance with the Technical Guidance Note, the photography was carried out with a 50mm Focal Length prime lens, unless there were exceptional conditions where wider-angle lenses are required to fully capture the scene. In this case, an appropriate lens was used to ensure the full potential height of new development could be captured at close-range.
 - A plumb line was used to ensure that the centre of the camera lens was directly over the surveyed viewing position at a height of 1.64 metres. The metadata of each image records the exact time and date of each image allowing accurate lighting conditions to be recreated in the computer model as required. Further information is also recorded such as the camera, lens, and exposure and aperture settings. All camera data is recorded in a spreadsheet for reference. The aim with the photography is to create an image similar to that perceived by the human eye.
- 12.6. The assessment of likely significant effects to sensitive receptors will consider the sensitivity of the receptor and the magnitude of change to determine significance, on a scale of negligible, minor, moderate and major. Significant effects will be determined through professional judgment.
- 12.7. The assessment of likely significant effects to sensitive receptors will consider the sensitivity of the receptor and the magnitude of change to determine significance, on a scale of large or high, medium, small or low and negligible. Significant effects will be determined through professional judgment.

Legislative and Policy Context, Guidance

Legislation

- 12.8. 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 the 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.
- 12.9. The ELC defines landscape as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’. It recognises that landscape has important cultural, ecological, environmental and social dimensions and is a key element of achieving sustainable development. In this context the use of the word ‘landscape’ is more appropriately termed ‘townscape’ though the constituent factors remain consistent.

National Planning Policy

- 12.10. The assessment of likely significant effects to sensitive receptors will consider the sensitivity of the receptor and the magnitude of change to determine significance, on a scale of large or high, medium, small or low and negligible. Significant effects will be determined through professional judgment.
- 12.11. The National Planning Policy Framework was updated in July 2021 and sets out the government’s planning policies for England and how these are expected to be applied.
- 12.12. The purpose of the planning system is to contribute to the achievement of sustainable development through three overarching objectives:
- 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;
 - 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 a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities’ health, social and cultural well-being; and,
 - An environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.
- 12.13. The environmental objective is of particular relevance to the purpose of townscape and visual impact assessment.
- 12.14. Section 12 of the NPPF deals with the requirements of good design. The overarching principle is set out in paragraph 126, which states, “the creation of high quality 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. Paragraph 130 of the NPPF sets out a number of principles of good design. In order to accord with these principles, it should be ensured that new developments:
- 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;
 - are visually attractive as a result of good architecture, layout and appropriate and effective landscaping;
 - 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);
 - 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;
 - 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,

- 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. Section 16 of the NPPF concerns conserving and enhancing the historic environment. Paragraph 189 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”.
- 12.17. Whilst the EIA Site is not located in a Conservation Area and does not contain listed buildings, heritage is an intrinsic part of townscape assessment and potential views from Conservation Areas listed buildings have been considered as part of the assessment. There is also an overarching desirability set out within the NPPF for new development to contribute positively to local character and distinctiveness.

Local Planning Policy - Manchester’s Local Development Framework, Core Strategy Development Plan Document (2012)

- 12.18. Manchester’s Core Strategy was adopted in July 2012. Relevant policies from the Strategy for the purposes of this chapter are outlined below.

Policy EN1 Design Principles and Strategic Character Areas

- 12.19. All development in Manchester will be expected to follow the seven principles of urban design, as identified in national planning guidance 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.

Policy EN3 Heritage

- 12.20. “Throughout the City, the Council will encourage development that complements and takes advantage of the distinct historic and heritage features of its districts and neighbourhoods”
- 12.21. 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.
- 12.22. Proposals which enable the re-use of heritage assets will be encouraged where they are considered consistent with the significance of the heritage asset.

Policy EN9 Green Infrastructure

- 12.23. 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 EIA 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.
- 12.24. The continued development of a network of green spaces, water bodies, canals, paths and cycleways, with priority given to those parts of the City where there is an identified existing lack of open space. The Council will seek to protect existing street trees and promote new planting, particularly where this can enhance green links in the urban area.
- 12.25. The provision of new, and improvements to the quality and accessibility of existing green infrastructure assets, to mitigate for any loss of green infrastructure.
- 12.26. The encouragement of green roofs, green walls, tree planting and other forms of green infrastructure to allow for the adaption to climate change in heavily urbanised areas. New green infrastructure provision should be an exemplar of best practice and innovation in terms of both its design and management.

Place Making and Design

- 12.27. In accordance with NPPF development in Manchester will be expected to follow the seven design principles set out below:

- Character: a place with its own identity.
- Continuity and enclosure: a place where public and private places are clearly distinguished.
- Quality of the public realm: a place with attractive, and successful outdoor areas.
- Ease of movement: a place that is easy to get to and move through.
- Legibility: a place that has a clear image and is easy to understand.
- Adaptability: a place that can change easily.
- Diversity: a place with variety and choice.

12.28. The protection and enhancement of local environmental quality, however, involves understanding and respecting the character and distinctiveness of place and townscape. A Character Study was prepared which considered Manchester's historical development and topography and identified eleven 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.

First Street Strategic Development Framework

- 12.29. The principles for development within First Street were established within the First Street Development Framework, which was endorsed in 2005, and was subsequently updated in 2012, 2018 and 2020 in response to changing market conditions, the ongoing success of First Street, the emerging development context and the transition to a low carbon economy.
- 12.30. Plot 10 was first outlined in the 2012 update as part of the Central Development Zone. The vision for this area, the 'commercial heart' of First Street, has been further refined in subsequent updates. The SDF 2018 update allows for commercial office development on Plot 10 of up to 17 storeys in height.

Guidance

- 12.31. The following guidance has been used in the assessment:
- Guidelines for Landscape & Visual Impact Assessment, 3rd Edition, 2013 (hereafter referred to as the Guidelines);
 - Planning Practice Guidance; and
 - IEMA Environmental Impact Assessment Guide to Shaping Quality Development, 2015.

Assessment Methodology and Significance Criteria

Scenarios Tested

- 12.32. As a result of the proposed phasing, it will be necessary to test a number of scenarios within the Townscape and Impact Assessment to ensure robustness. The TVIA scenarios to be assessed are:
- Scenario 1: Baseline
 - Scenario 2: Baseline + Plot 10a
 - Scenario 3: Baseline + Plot 10a + Cumulative Surroundings
 - Scenario 4: Baseline + Proposed development (Plot 10b)
 - Scenario 5: Baseline + Proposed development (Plot 10b) + Cumulative Surroundings
 - Scenario 6: Baseline + Plot 10a + Proposed development (Plot 10b)
 - Scenario 7: Baseline + Plot 10a + Proposed development (Plot 10b) + Cumulative Surroundings
- 12.33. A series of wireline and fully rendered photomontages were produced to represent each scenario and are provided in **Appendix 12.4**. The photomontages were produced in accordance with Landscape Institute Technical Guidance 06/19 Visual Representation of Development Proposals. Photomontages have only been produced for each scenario where the Proposed EIA Development will be visible. Those views which do not therefore have a full suite of photomontages are as follows:
- Viewpoint 6: plot 10b will be behind Plot 10a. Neither Plot 10a nor 10b will be visible. Therefore no Plot 10a and Plot 10b photomontage is provided.

- Viewpoint 7: neither Plot 10a nor 10b will be visible.
- Viewpoint 8: Plot 10a will be visible, but 10b will not be visible.

The Study Area

- 12.34. The study area for the assessment is approximately 500m from the centre of the EIA Site, in order to encompass the full extents of the EIA Site, the wider First Street area as defined within the SDF, and also takes into consideration the immediately adjacent townscape character areas which the Proposed EIA Development may significantly influence. The study area also takes into consideration the visual envelope for the Proposed EIA Development. The study area has been defined through a process of desktop and on-site survey and assessment, combined with professional judgement, in accordance with the Guidelines for Landscape and Visual Impact. The study area for the cumulative assessment has considered sites within a 1km radius of the EIA Site, in order to provide a robust assessment of all potential cumulative townscape and visual effects.
- 12.35. This assessment has been carried out with reference to the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, 2013 (referred to hereafter as “the Guidelines”) by Planit-IE Ltd, a registered practice of the Landscape Institute with considerable experience in landscape and visual assessment.
- 12.36. A three-stage assessment process has been adopted. Firstly, the nature of receptors (sensitivity) has been assessed, and secondly, the nature of effects (magnitude) likely to result from the Proposed EIA Development has been assessed. From this, the overall significance of the identified effects on receptors have been assessed.
- 12.37. The methodology is collated into a tabulated format where possible to provide structure for a consistent and methodical approach. Criteria and justifications are recorded in **Appendix 12.1** and **12.2** for transparency. The overall assessment of significance has regard to paragraph 5.56, page 92 (significance of landscape effects) and paragraph 6.44, page 116 (significance of visual effects) of the Guidelines.
- 12.38. The assessment of impacts is supplemented by a cumulative assessment of committed developments, in order to understand if any further potential significant environmental effects are likely to arise. Cumulative effects are defined as impacts that result from additional changes to the townscape or visual amenity caused by the Proposed EIA Development in conjunction with other developments (associated with or separate to it).
- 12.39. In order to give a robust assessment of impacts, where a scheme is consented and under construction consideration was given to the extent to which the consented development was visibly present on the EIA Site. Where the basic structure and massing of a consented scheme is present, the scheme was included in the baseline analysis. Where a consented scheme was under construction but in the early stages, and the ultimate scale and massing was not visible on site, the scheme was included within the cumulative assessment. This is because the presence or absence of the building form will have a noticeable effect on townscape receptors and views.
- 12.40. Desk based studies were carried out to collate and map baseline townscape information and carry out a review of policy and guidance to inform the assessment.
- 12.41. Potential viewpoints were initially identified through a process of desktop and onsite survey before being checked on site. Viewpoints were excluded where there was likely to be no significant impact beyond that which was already identified within the selected views. Viewpoints were agreed with the Local Planning Authority (LPA). An additional view, viewpoint 11, was added following consultation with the LPA.
- 12.42. Photographs for the selected viewpoints were taken by a professional photographer in October 2022.
- 12.43. In order to provide the most comprehensive, rounded and objective view of the Townscape and Visual Impacts of the Proposed EIA Development, assessed effects have been agreed following round-table review by a team of individual assessors within Planit-IE.

Baseline Townscape Value

- 12.44. Townscapes may be valued at community, local, national level or above. Existing townscape designations have been taken as the starting point for this assessment, as shown in **Table 12.1** below. However, the value attached to undesignated townscapes also needs to be assessed and this is considered in **Table 12.2**.
- 12.45. **Table 12.1** sets out the relative importance of generic townscape designations and descriptions.

Table 12.1: Value of Designated Townscapes

Value	Description
High	Sites, features or areas of national or international importance with settings of high quality such as World Heritage Site, AONB, National Parks, Grade I and Grade II* Listed buildings or Registered Parks and Gardens.
Medium	Sites, features or areas of local or regional importance with intact character such as Grade II* and Grade II Listed Buildings or Registered Parks and Gardens, Conservation Areas, Scheduled Monuments, local nature site, long distance recreational routes. Tree Preservation Orders (TPO) and local designations that exhibit wider geographic, cultural or townscape significance.
Low	Areas or features of local importance such as Tree Preservation Orders (TPO), Public Right of Way (PROW) and locally listed buildings.

- 12.46. Whilst the assessment of value is partly based on the Planning Policy importance of the townscape, other criteria used to assess townscape value in more detail, including that of undesignated townscape, are set out in **Table 12.2** below. The criteria are taken from the Planning Practice Guidance that supports the National Planning Policy Framework.

Table 12.2: Criteria for Assessing the Value of Non-Designated Townscapes

Attribute	Criteria
Functional	A building or place should be fit for purpose, designed and delivered in a way that delivers the intended function and achieves value for money in terms of lifetime costs.
Mix of uses	Mix of uses to ensure easy access to facilities and encourage a healthier environment, reducing the need to travel.
Well-designed public space	Functional and attractive hard and soft landscape elements, well orientated and designed routes, inclusion of facilities such as seats and play equipment and public art.
Buildings designed to be adaptable	Flexibility to be able to respond to a range of future needs – how easily buildings change be adapted for change of use, places that are easy and practical to manage with good access, natural surveillance and hard wearing materials that are easy to repair.
Distinctive character	Consideration of the local pattern of street blocks and plots; building forms; details and materials; style and vernacular.
Attractive spaces	Consideration of streetscapes, townscapes, buildings and elements within them all, microclimates and views should all be considered. This is also affected by the way a townscape is perceived using the senses and the effect of transient elements such as the presence of human activity and resulting tranquillity or vibrancy.
Promotes ease of movement	All users should be able to move safely, conveniently and efficiently to and within a place, appropriate number of legible routes to and through it, good connections with each other and other destinations.

- 12.47. An overall assessment of value has been made for each townscape receptors (refer to **Appendix 12.1**), based on an overview of the assessments made using each of the above criteria, in terms of high, medium and low value. The assessment of the value of a non-designated townscape is based on professional judgement. The assessment of a 'high' value would be given where a non-designated townscape is assessed as clearly displaying the criteria described above. A 'medium' assessment would be given where a non-designated townscape displays the criteria to a moderate extent, and an assessment of 'low' would be given where a non-designated townscape displays the above criteria to only a minor or negligible extent.

Baseline Susceptibility of Townscape Receptors to Change

12.48. Susceptibility of townscape receptors to change has been assessed using the criteria identified in **Table 12.3**, with reference to the baseline conditions.

Table 12.3: Townscape Receptor Susceptibility to Change

Susceptibility	Criteria
High	Little ability to accommodate the Proposed EIA Development without undue harm.
Medium	Some ability to accommodate the Proposed EIA Development without undue harm.
Low	Substantial ability to accommodate the Proposed EIA Development without undue harm.

Overall Sensitivity of Townscape Receptors

12.49. The assessment of receptor sensitivity combines judgements on the susceptibility of the receptor to the specific type of development proposed and the value attributed to that receptor, as detailed within **Appendix 12.1**.

Criteria for Determining Sensitivity of Visual Receptors

Type of View and Number of Viewers

12.50. In terms of assessing the baseline visual sensitivity, key factors to consider are the type of view and the likely numbers of viewers (the visual receptors). The type of view and the number of viewers are described in the following terms:

- Glimpsed (i.e. in passing)/Filtered/Oblique/Framed/Open Views; and
- Few/Moderate/Many Viewers.

Value of Views

12.51. The value attached to views has regard to a number of factors, including:

- recognition through planning designations or heritage assets; and
- the popularity of the viewpoint, its appearance in guidebooks, literature or art, on tourist maps and the facilities provided for its enjoyment.

12.52. The assessment of the value of views is summarised in **Table 12.4** below, in terms of High, Medium and Low value. These criteria are provided for guidance only and are not intended to be absolute.

Table 12.4: Value Attached to Views

Value	Criteria
High	Views from townscapes/viewpoints of national importance, or highly popular visitor attractions where the view forms an important part of the experience, or with important cultural associations.
Medium	Views from townscapes/viewpoints of regional/district importance or moderately popular visitor attractions where the view forms part of the experience, or with local cultural associations.
Low	Views from townscapes/viewpoints with limited designations, not particularly popular as a viewpoint and with minimal or no cultural associations.

Susceptibility of Visual Receptors to Change

12.53. The susceptibility of different types of visual receptor to changes in views is mainly a result of:

- The occupation or activity of the viewer at a given location; and,
- The extent to which a person's attention or interest may therefore be focussed on a view and the visual amenity experienced at a given view.

12.54. The assessment of a visual receptor to change is specific to the Proposed EIA Development. However, the Guidelines for Landscape and Visual Impact Assessment offers the generic guidance identified in **Table 12.5** as a starting point for the assessment.

Table 12.5: Visual Receptor Susceptibility to Change

Susceptibility	
High	• Users of public space, including users of public rights of way, whose attention is likely to be focussed on the townscape and on particular views; • Visitors to heritage assets or other attractions where views of the surroundings are an important part of the experience; • Communities where views contribute to the townscape setting enjoyed by residents; and, • Travellers on scenic routes.
Medium	• Travellers on road, rail or other transport routes, where the view is moderately important to the quality of the journey; and, • Users of public space, where the view is a part of the wider experience of the place.
Low	• People at their place of work, where the setting is not important to the quality of working life; • Travellers on road, rail or other transport routes, where the view is fleeting and incidental to the journey; and, • People engaged in outdoor sport or recreation, or users of a public space, which does not involve appreciation of views.

12.55. The Guidelines for Landscape and Visual Impact Assessment qualifies the above examples as follows:

“This division is not black and white and in reality, there will be a gradation in susceptibility to change. Each project needs to consider the nature of the groups of people who will be affected and the extent to which their attention is likely to be focussed on views and visual amenity.” (page 114, paragraph 6.35).

Overall Sensitivity of Visual Receptors

12.56. The assessment of receptor sensitivity combines judgements on the susceptibility of the receptor to the specific type of development proposed and the value attributed to that receptor, as detailed in **Appendix 12.2**.

Predicted Townscape and Visual Impact Criteria

12.57. The predicted townscape and visual impacts of the Proposed EIA Development are set out in **Appendix 12.1** and **Appendix 12.2** respectively.

Size and Scale of Effects

12.58. The size and/or scale of effects relates to the scale of physical changes in the townscape and the scale of the visible change in views, such as the loss or addition of features. This is broadly rated along the following scale:

- No Change – change will not be perceptible.
- Negligible – change will be just discernible.
- Minor – a small change will be perceptible.

- Moderate – change will be clearly noticeable.
- Major – total change will occur.

Geographical Extent of Effects

12.59. The geographical extent of effects relates to:

- the area over which townscape effects are likely to be experienced, i.e. this could be at the site level, the immediate locality, across a neighbourhood or across a series of neighbourhoods (city-wide);
- the area over which the changes are likely to be visible, i.e. viewpoint within the site, viewpoint within the immediate locality, viewpoint across/ through a neighbourhood or a vista or vantage point across neighbourhoods or the city skyline (city-wide).

Duration/Reversibility

12.60. Effects may be experienced over a range of timescales. For this assessment, the following timescales are considered appropriate:

- Short-term: 1 year or below.
- Medium-term: Between 1 and 10 years in duration.
- Long-term: Greater than 10 years in duration.

12.61. Effects may be temporary, permanent or reversible over time. For example, visual effects arising from construction activities may be limited solely to the construction period and therefore only temporary. The assessment therefore considers the practicality of effects being reversed.

Magnitude of Townscape Effects

12.62. The magnitude of a townscape effect is assessed in terms of its size or scale, the geographical extent of the area influenced by that effect, its duration and degree of reversibility and the impact these are likely to have on the baseline character of the townscape element.

12.63. The magnitude of change in the townscape takes into consideration the following factors:

- the extent/proportion of townscape elements lost or added;
- the contribution of that element to townscape character and the degree to which aesthetic/perceptual aspects are altered; and,
- whether the effect is likely to change the key characteristics of the townscape, which are critical to its distinctive character.

Magnitude of Visual Effects

Table 12.6: Magnitude of Townscape Effects

Category	Criteria
Major adverse townscape effect	The proposals will result in a total change in the key characteristics of townscape character; will introduce elements totally uncharacteristic to the attributes of the receiving townscape; and/or will result in a substantial or total loss, alteration or addition of key elements/features/characteristics.
Moderate adverse townscape effect	The proposals will result in a partial change in the key characteristics of townscape character; will introduce elements partially uncharacteristic to the attributes of the receiving townscape; and/or will result in partial loss, alteration or addition of key elements/features/characteristics.
Minor adverse townscape effect	The proposals will result in a small change in the key characteristics of townscape character; will introduce elements that are not uncharacteristic to the attributes of the receiving townscape; and/or will result in a minor loss, alteration or addition of elements/features/characteristics.

Negligible adverse townscape effect	The proposals will result in a just discernible change to townscape character/elements/features/characteristics.
Negligible townscape benefit	The proposals will result in a just discernible improvement to the townscape character/elements/features/characteristics.
Minor townscape benefit	The proposals will achieve a degree of fit with the townscape character/elements/features/characteristics and go some way towards improving the condition or character of the townscape.
Moderate townscape benefit	The proposals will achieve a good fit with the townscape character/elements/features/characteristics, or would noticeably improve the condition or character of the townscape.

- 12.64. The magnitude of a visual effect is assessed in terms of its size or scale, the geographical extent of the area influenced by that effect, its duration and degree of reversibility and the impact these are likely to have on the baseline character of the view.
- 12.65. The magnitude of change in the view relates to the degree of contrast or integration likely to result from the Proposed EIA Development and is influenced by the relative time over which a view is experienced and whether it is a full, partial or glimpsed view.
- 12.66. The criteria identified in **Table 12.7** are used to assess the magnitude of visual effects, based on the degree of change to the view or composition.

Table 12.7: Visual Effects – Magnitude

Category	Criteria
Major adverse or beneficial visual effect	The proposals will cause a dominant or complete change or contrast to the view, resulting from the loss or addition of substantial features in the view and will substantially alter the appreciation of the view.
Moderate adverse or beneficial visual effect	The proposals will cause a clearly noticeable change or contrast to the view, which would have some effect on the composition, resulting from the loss or addition of features in the view and will noticeably alter the appreciation of the view.
Minor adverse or beneficial visual effect	The proposals will cause a perceptible change or contrast to the view, but which would not materially affect the composition or the appreciation of the view.
Negligible adverse or beneficial visual effect	The proposals will cause a barely perceptible change or contrast to the view, which would not affect the composition or the appreciation of the view.
No change	The proposals will cause no change to the view.

Nature of Effects

- 12.67. The nature of effects may be positive or negative (beneficial or adverse), or neutral. Neutral effects recognise that there will be a change to the receptors, however this change is in keeping with the existing characteristics of the receptor.
- 12.68. Effects may also be direct or indirect. Direct effects are those that result directly from a development itself, whereas indirect effects may arise as a consequential change resulting from development.

Significance of Effects

12.69. The scale shown in **Table 12.8** is used to guide the assessment of the significance of both townscape and visual effects, from a combination of the assessment of receptor sensitivity and the magnitude of effects:

Table 12.8: Assessment of Townscape or Visual Significance

Sensitivity of Receptor	Magnitude of Effect				
	Large Effect	Medium Effect	Small Effect	Negligible Effect	Neutral/No Change
High	Significant	Moderately Significant	Moderately Significant	Minor Significance	Not Significant
Medium	Moderately Significant	Moderately Significant	Minor Significance	Not Significant	Not Significant
Low	Moderately Significant	Minor Significance	Not Significant	Not Significant	Not Significant

12.70. The table has regard to guidance in the Guidelines for Landscape and Visual Impact Assessment, Third Edition, 2013, at paragraph 5.56, page 92 (significance of landscape effects) and paragraph 6.44, page 116 (significance of visual effects). This matrix is used as a guide to determine significance, along with professional judgement.

12.71. For the purposes of this Townscape and Visual Impact Assessment, only effects deemed Moderately Significant and Significant are considered to be Significant in the meaning of EIA Regulations (2017).

Source of Effect

12.72. The following potential sources of affects attributable to the Proposed EIA Development relating to townscape and views are:

- The local townscape character and it's key components, including changes to townscape character areas, urban grain, land use, building heights, movement and linkages, public open space and environmentally designated areas.
- Site character – the Site as a townscape receptor (as defined by the red line boundary).
- Visual receptors, including; local residents, users of public open space, visitors to heritage assets, users of the strategic movement network, and employees at their place of work.

Baseline Conditions

12.73. Refer to **Appendix 12.1** for a full baseline analysis of baseline conditions.

EIA Site Context

12.74. Refer to **Figures 12.1-12.3** of **Appendix 12.1** for an illustration of site location, historical development and context.

12.75. The Site is located within the central heart of the First Street masterplan area, which is now well established and partially complete. The Development Framework for First Street broadly focusses on a commercially led neighbourhood. First Street North which is now complete, and is centred around Tony Wilson Place. First Street North is now a cultural hub for the city. James Grigor Square is located north west of the site and provides attractive outdoor space.

12.76. To the east of the Site are a number of former Mills including Macintosh Mill and Cambridge Mill which are Grade II listed and are now in residential and office uses. Both mills are substantially proportioned and 6 storeys in height.

12.77. To the immediate south is the under-construction Plot 11 Downing site, which is the construction of four co-living towers of varying heights (between 10 and 45 storeys).

- 12.78. Further south of the Site, beyond Parkway Gate and Medlock House student accommodation, is the Mancunian Way – a key arterial vehicle route into the City. On the opposite side of the Mancunian Way are low rise residential uses within the ward of Hulme.
- 12.79. To the west is Plot 9 of the First Street Masterplan. Planning Permission was secured for a nine storey, ‘net-zero’ office building being brought forward by Ask at Plot 9a (the northern segment).
- 12.80. The Site is not located within a Conservation Area and does not contain any designated or non-designated heritage assets. There are however, 9 designated heritage assets within a 250m radius of the Site with the closest being Grade II Listed Macintosh Mills located c. 40m to the east.
- 12.81. The Oxford Road Corridor, to the east of the Site, is an innovation district with a mix of knowledge, business and cultural businesses. It includes two of the UK’s largest universities, a university NHS foundation trust, and a large cluster of digital, technology and life science businesses.
- 12.82. The Site is bound by River Street to the north and east, Hulme Street to the south, and development Plot 9a to the west. It is not currently in use and there are no permanent structures or features on the Site due to historic clearance.

Townscape Character

- 12.83. Refer to **Figures 12.4** of **Appendix 12.1** for an illustration of townscape character.
- 12.84. The 2012 and 2015 versions of the Development Framework identified three distinct development areas of First Street, incorporating four of the character zones: First Street North, First Street Central, First Street South, and the Creative Ribbon. The EIA Site falls within the ‘First Street Central’ character zone, a new office destination targeted at a range of commercial occupiers, particularly those seeking the benefits of a central and highly accessible city centre location, competitively priced to help distinguish the accommodation from other locations in the city centre. The Development Framework was updated in 2018 to develop the design principles for First Street Central and allowed for a greater scale and density of office accommodation to be delivered on Plot 10.
- 12.85. The First Street masterplan area forms an emerging townscape character area which will be characterised by high quality development set within a cohesive network of streets and spaces broadly focussed on a commercially led neighbourhood. The character of First Street to the north is already well established in accordance with the vision set out within the Development Framework.
- 12.86. The EIA Site in its current form does not currently contribute to the aspirations for First Street Central. The character of First Street Central is yet to be fully defined, with the area largely not yet developed/redeveloped.
- 12.87. The First Street area sits within the wider townscape character area of the Oxford Road Corridor, an area extending from Oxford Road into the city centre and encompassing a range of education, business and cultural institutions. Corridor Manchester’s Strategic Vision for 2025 sets out an ambition for the area to be, “Manchester’s cosmopolitan hub and world-class innovation district, where talented people from the city and across the world learn, create, work, socialise, live and do business, contributing to the economic and social dynamism of one of Europe’s leading cities.”

Urban Grain

- 12.88. Urban grain on the EIA Site and in the surrounding area is shown in **Figure 12.5a** of **Appendix 12.3**.
- 12.89. The EIA Site currently forms a void in the urban grain in a key location within First Street and the wider city centre.
- 12.90. The wider study area presents a fairly coarse urban grain to the north, east and west reflecting the city centre location, with the EIA Site and a number of plots to the south currently vacant or covered by temporary surface car parking or construction works, which detracts from the First Street character and city centre location.
- 12.91. More recent infill development within the First Street Development Framework area has create a new urban grain of the area. New, large footprint commercial buildings lined by a newly established grid of streets, punctuated by a variety of public spaces ranging in size.
- 12.92. The more fine-grained residential development to the south of the EIA Site is separated from the EIA Site and surrounding First Street area by Mancunian Way motorway, which creates a significant north-south barrier between those two areas.

Land Use

- 12.93. Land Use on the EIA Site and in the surrounding area is shown in **Figure 12.6a** of **Appendix 12.3**.

- 12.94. The Development Framework for First Street broadly focusses on a commercially led neighbourhood. First Street North is now a cultural hub for the city including HOME a contemporary art, film and theatre complex alongside a wider mix of uses including student accommodation, an MSCP and a range of carefully curated food and drink operators, as well as new public spaces. The land uses within First Street North contribute significantly to defining the townscape character within First Street.
- 12.95. Mixed commercial, retail and leisure uses intensify to the north, within the heart of the city centre, and residential use is scattered throughout but intensifies to the south on the city fringes. The area to the west of the EIA Site contains predominantly student residential uses, including private residential buildings. The area to the south-east of the EIA Site contains a number of higher education buildings belonging to Manchester Metropolitan University.
- 12.96. The First Street Development Framework identifies the First Street Central area as becoming a predominantly commercial district, with a specific focus on delivering high-quality office space. Within the Framework it also outlines Manchester's on-going economic and population growth which will continue to drive the need for new high quality student residential accommodation.
- 12.97. There is currently no defined land uses within the EIA Site and immediate context to the east, west and south, which detracts from the First Street townscape character.
- 12.98. In June 2022, it was announced that the Government Property Agency (GPA) will take the development being built at Plot 9a of the First Street Masterplan. However, Plot 9a is currently under construction and currently has no active land use.
- 12.99. Plot 11 to south is in the early stages of construction and once complete will include 4 buildings of co-living bedspaces and associated amenity facilities, along with ground floor commercial units. It currently has no active land use.
- 12.100. Once complete, Plots 9a and 11 will create a cohesive mix of land uses in conjunction with Plot 10, that will help to define the character of First Street Central.

Building Heights

- 12.101. Building Heights on the EIA Site and in the surrounding area is shown in **Figure 12.7a** of **Appendix 12.3**.
- 12.102. The area to the east of the EIA Site is broadly characterized by a 6-10 storey height datum, with a handful of buildings reaching 15 storeys or higher. To the west and south of the EIA Site, high-rise student and private residential towers have increased the height datum of the wider area. The collection of buildings that comprise Deansgate Square to the east are all above 30 storeys. Buildings heights to the north west of the EIA Site range from 4-7 storeys. River Street Tower is a student residential block to the west of the Premier Inn Site and sits above 30 storeys high.
- 12.103. Buildings within the First Street character area to the north of the EIA Site are largely 7-10 storeys and height and contribute to defining the character of First Street.
- 12.104. The First Street Development Framework states that buildings of between 12 and 17 storeys on plot 10 is considered sustainable and deliverable.
- 12.105. The EIA Site and areas to the immediate west and south are currently devoid of built development, with the construction of Plot 9 to the west and Plot 11 to the south at the early stages. The lack of development on these adjacent plots currently detracts from the overall character of First Street, and in particular First Street Central.

Movement and Linkages

- 12.106. Movement and linkages on the EIA Site and in the surrounding area is shown in **Figure 12.8a** of **Appendix 12.3**.
- 12.107. The EIA Site is bound by River Street to the north and east, Hulme Street to the south and Plot 9a to the west. Beyond the First Street area to the west is Medlock Street, a primary route that merges into Princess Road to the south. Princess Road is a key arterial route, connecting the City Centre with several suburbs to the south. Hulme Street connects the EIA Site all the way to the Oxford Road and the Circle Square development.
- 12.108. There are currently no routes through the EIA Site. The key north-south axis through First Street is located to the western edge of the site, and forms a key movement route through the First Street development.
- 12.109. There are several Beeways as well as National Cycle Route 6 passing adjacent to the EIA Site, and embed First Street into the wider city context. The EIA Site is within easy walking distance of both Deansgate and Oxford Road Stations. Medlock Street to the west forms a barrier to east-west pedestrian movement, however it forms a key linkage into the city centre for vehicular traffic. The Mancunian to the south forms a major barrier to movement and effectively defines the southern extents of the city centre.

- 12.110. The EIA Site and Plot 9 to the west and Plot 11 to the south currently form voids in the movement network and act as a barrier to north-south and east-west connectivity due to their nature as unused sites fenced off for construction/future development.

Public Realm and Public Open Space

- 12.111. Public Realm and public open space in the EIA Site and in the surrounding area is shown in **Figure 12.9a of Appendix 12.3**.
- 12.112. To the north of the EIA Site, First Street north incorporates high quality public realm, including several pedestrian streets, incidental green spaces and two public squares. The First Street masterplan area has a comprehensive vision for high quality streets and spaces to reflect the aspirations of the new neighbourhood, as defined within the Development Frameworks. The EIA Site in its current form detracts from the emerging character and quality of public realm within First Street.
- 12.113. There is currently no public realm or public open space within the EIA Site, or within the adjacent undeveloped areas of First Street. James Grigor Square is located to the north of Plot 10, and forms a key gathering space within the First Street masterplan area. The interface between the EIA Site and James Grigor Square is currently poor.

EIA Site Character

- 12.114. EIA Site Character in the surrounding area is shown in **Figure 12.9a of Appendix 12.3**.
- 12.115. The EIA Site is currently vacant and forms a clearly defined future development parcel. It does not currently contribute positively to achieving the vision for First Street. The EIA Site currently lacks permeability, and does not facilitate north-south or east-west connections. The EIA Site does not contain any public access and currently detracts from the character and quality of James Grigor Square to the north.

Site Visibility and Key Views

- 12.116. An overall indication of the likely visibility of the Proposed EIA Development is illustrated in **Figure 12.1 of Appendix 12.4**, and indicates that the EIA Site is visually well contained. Dense surrounding built form due to the city centre location limits the potential visual extents of the Proposed EIA Development.
- 12.117. Key views are illustrated in **Figure 12.1 of Appendix 12.4** for the location of key viewpoints, and are listed below. Refer to **Appendix 12.4** for a complete baseline analysis of the key views.
- Viewpoint 1: View from cycle/ footway on Princess Road roundabout looking north west, north from Mancunian Way.
 - Viewpoint 2: View from footpath/ local centre on Cambridge Street looking west to EIA Site and wider First Street development.
 - Viewpoint 3: View from Hulme Street looking south west adjacent to cluster of listed mill buildings and through wider First Street development.
 - Viewpoint 4: View from Cambridge Street footway/ national cycle route looking south west to First Street development/ Listed Macintosh Mills.
 - Viewpoint 5: View from public square within First Street development looking south east.
 - Viewpoint 6: View from Medlock Street adjacent to river Medlock - showing context of street, the wider First Street setting and gateway out of the city centre.
 - Viewpoint 7: View from Whitworth Street West looking south through Listed viaduct arch to First Street development/ Listed Macintosh Mills.
 - Viewpoint 8: Elevated view south from platform of Deansgate Tram Stop - over city skyline.
 - Viewpoint 9: View from steps of Station Forecourt looking west over Grade II listed station buildings to city skyline.
 - Viewpoint 10: View from pedestrian space on Bonsall Street Bridge looking north over Hulme Arch to the city skyline beyond.
 - Viewpoint 11: View from River Street looking east over Mancunian Way through wider First Street development.

Identification and Evaluation of Likely Significant Effects

Potential Construction Phase Effects

- 12.118. A detailed assessment of the significant construction phase effects for townscape and views is set out in **Appendices 12.1 and 12.2**. The potential construction phase effects identified are for both Plot 10a and 10b. Reasonable assumptions have been made in order to provide a basis for the assessment and represents a 'worst case' in accordance with the Guidelines.
- 12.119. Sources of townscape and visual construction effects include:
- Site setup and site compound (visual effects).
 - Site/boundary fencing (visual effects).
 - Cranes and construction machinery/equipment.
 - Site clearance, removal and disposal of any existing material (landscape and visual effects).
 - Ground Works including site remediation, levelling & preparation (townscape effects, and visual effects).
 - Site access taken (movement and linkages – townscape effects).
 - Contractor parking, plant and equipment (visual effects).

Potential Operational Phase Townscape Effects

- 12.120. The components of the townscape which may potentially be affected by the Proposed EIA Development are known as the townscape receptors. These include the characteristics and character of the townscape, and the character and quality (or special qualities) of designated areas. The potential operational phase effects identified are for are for both Plot 10a and 10b.
- 12.121. Likely townscape effects have been identified with reference to interactions between the Proposed EIA Development and townscape receptors. Likely visual effects have been identified with reference to interactions between the Proposed EIA Development and visual receptors. The likely significant effects (highlighted below) are assessed in more detail in **Appendices 12.1 and 12.2**.

Table 12.9: Potential Townscape and Visual Effects

Receptor	Effect	Potential Effect	Applicable Development Phase (C / O)
Changes to townscape character areas within the site context.	Change to the First Street Character and indirect effects on neighbouring character areas.	Potential to positively reinforce the emerging First Street character as defined in the SDF	C/O
Changes to urban grain	Change to create a new urban grain.	Potential to positively establish a new urban grain on a current void within a key part of the city.	C/O
Changes to land use	Change to establish a new land use on a currently empty site.	Potential to establish a new land use in keeping with the First Street vision as established in the SDF.	C/O
Changes to building heights	Development will establish a new height datum on the EIA Site.	Built development on a currently empty site will create the potential to reinforce the existing First Street character, which currently includes buildings of 7-10 storeys to the north.	C/O
Changes to movement and linkages as a townscape effect.	Development will fit into the existing and new route hierarchy.	New development has the potential to reinforce existing surrounding routes by providing enclosure.	C/O
Changes to public realm/public open space.	Open space will be limited to the public realm along key movement routes surrounding the development.	Potential to positively reinforce the existing character of the public realm and key movement routes within First Street and contribute positively to wider connectivity.	C/O

Receptor	Effect	Potential Effect	Applicable Development Phase (C / O)
Changes to site character	Change from an unused site to actively used site.	Potential to positively enhance the currently underused site, reinforce the wider First Street character through reactivate the EIA Site, which in turn will promote a sense of safety and security for users.	C/O
Changes to the character and amenity of views (refer to Figure 1)	Changes to the character and quality of views.	Potential to create a new focal element which will provide legibility through the infilling of a currently empty site in a key location within the city.	C/O

Cumulative Effects

- 12.122. Cumulative effects are defined as impacts that result from additional changes to the townscape or visual amenity caused by the Proposed EIA Development in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.
- 12.123. A number of sites within a 1km radius of the EIA Site benefit from extant Planning Permission, or are currently under consideration by the Local Planning Authority.
- 12.124. As the likely construction period for each of the cumulative schemes is unknown, an assessment of the likely cumulative effects during the operational phase has been provided only, in order to create a robust assessment.
- 12.125. A photomontage view of the cumulative development has been produced for each scenario and is included in **Appendix 12.4**. Where consented development is not at a stage of construction which is advanced enough to give a reasonable indication of ultimate scale and massing, it has been included within the cumulative assessment in order to provide a robust assessment of likely townscape and visual impacts.
- 12.126. The cumulative townscape assessment considers the cumulative impacts on the First Street character area (as defined by the red line boundary within the Development Framework), and therefore includes the following 3 schemes:
- **Plot 11 First Street.** 125573/FO/2019. Construction of four buildings of heights varying from 10 storeys to 45 storeys together comprising Co-living bedspaces and associated amenity facilities, with ground floor commercial units, private amenity space and public realm comprising hard and soft landscaping, car parking and cycle facilities and other associated works.
 - **Plot 9a First Street.** 132600/FO/2021. Erection of a nine-storey building with rooftop plant and basement comprising office accommodation, roof top terrace, winter gardens, gym/ yoga studio, basement car parking (26 spaces) and cycle parking (130 spaces) landscaping and other associated works.
 - **One City Road.** 128002/FO/2020. Full Planning Application for demolition of existing structures on site, erection of one 11-storey plus basement office building and one 14-storey plus basement office building with ground floor commercial unit, landscaping, highways works, and associated works.
- 12.127. The 3 cumulative schemes in conjunction with the Proposed EIA Development will continue to create and consolidate the character of First Street through the creation of First Street Central and South. The proposed land uses, urban grain, building heights, movement and linkages and public realm will enable the proposals to achieve the overall vision for First Street as set out within the Development Framework. The Proposed EIA Development in conjunction with the cumulative schemes is predicted to result in significant beneficial townscape effects for all receptors.
- 12.128. The cumulative visual assessment includes consented schemes which are not sufficiently constructed for the ultimate scale and massing to be visible within the baseline views. The cumulative schemes considered are those which will be visible within the 11 key viewpoints. The cumulative schemes have been modelled using a basic coloured block, and are identified within **Appendix 12.4**. The cumulative schemes that have been assessed include the following 10 schemes:
- **Plot 11 First Street.** 125573/FO/2019. Located 5m to the south of the site. Construction of four buildings of heights varying from 10 storeys to 45 storeys together comprising Co-living bedspaces and associated amenity facilities, with ground floor commercial units, private amenity space and public realm comprising hard and soft landscaping, car parking and cycle facilities and other associated works.

- **Plot 9a First Street.** 132600/FO/2021. Located 45m to west of site. Erection of a nine-storey building with rooftop plant and basement comprising office accommodation, roof top terrace, winter gardens, gym/ yoga studio, basement car parking (26 spaces) and cycle parking (130 spaces) landscaping and other associated works.
- **Student Castle, Great Marlborough Street.** 121252/FO/2018. Located 300m to the east of the site. Partial demolition of the surplus part of existing MSCP and erection of a part 55, part 11 storey, part 4 storey mixed-use building comprising 853 Purpose Built Student Accommodation units.
- **Vision, Whitworth Street West.** 111003/FO/2016/C1. Demolition of existing building at 10 - 12 Whitworth Street West, and redevelopment of the site for a new 35 storey residential building comprising 327 apartments, with associated residents' services, facilities and communal spaces: servicing, highways, public realm and associated works.
- **Park Place.** 129273/FO/2021. Demolition of existing structures and the construction of two residential buildings of 56 storeys, with ground floor commercial uses car parking, cycle provision, landscaping, access and other associated works.
- **GJS Plot F.** 132199/FO/2021. Full planning permission for the demolition of existing structures and the erection of two 51-storey residential buildings across two phases, including residential amenity facilities, basement car parking, landscaping and public realm, servicing and access arrangements, highways alterations, and associated works.
- **Hotspur House.** 120635/FO/2018. Part demolition and redevelopment and part retention and refurbishment of the former Hotspur Press Complex (Medlock Mill) to deliver 171 residential units within refurbished mill space and 28 storey building, commercial floorspace together with servicing, access, landscaping including a new public space and pedestrian route between Gloucester Street and First Street, and other associated works.
- **Travelodge Deansgate Locks.** 126308/FO/2020. The demolition of 2 to 4 Whitworth Street West and the construction of a mixed-use building, comprising flexible units for retail, food and drink use at ground floor level with a hotel at upper storeys, together with associated landscaping, servicing, cycle parking and other associated works.
- **Viadux.** 115871/FO/2017. Erection of a 40 storey building to form 375 residential apartments and the erection of a 14 storey building for form offices together with ground floor commercial space with associated enclosed service yard, public realm including staircase and lift to connect with viaduct, car and le parking, landscaping and other associated works.
- **One City Road.** 128002/FO/2020. Full Planning Application for demolition of existing structures on site, erection of one 11-storey plus basement office building and one 14-storey plus basement office building with ground floor commercial unit, landscaping, highways works, and associated works.

12.129. A summary of the likely cumulative visual effects in each scenario for each key viewpoint is provided below.

Table 12.10: Cumulative Visual Effects

Viewpoint	Description of Effect	Cumulative Effect
Viewpoint 1: View from cycle/ footway on Princess Road roundabout looking north west, north from Mancunian Way.	Plot 9 will appear prominently in the view in all cumulative scenarios due to the proximity of Plot 9 to the viewpoint location. The scale and massing of Plot 9 is consistent with the Proposed EIA Development, and will help to positively reinforce the First Street character. Plot 11 will be partially visible within all cumulative scenarios and will reinforce the building line along Princess Road. Great Marlborough Street will also appear noticeably in all cumulative scenarios, appearing as a singular tall, landmark element distinct from the character of First Street.	Likely significant effects in all cumulative scenarios due to the extent of cumulative development within the view, close proximity to the viewpoint and to the Proposed EIA Development.
Viewpoint 2: View from footpath/ local centre on Cambridge Street looking west to EIA Site and wider First Street development.	Plot 11 will feature prominently in all cumulative scenarios, creating a prominent new element within the view and defining First Street South. Plot 11 will change the existing character of the view. Vision Whitworth Street will form a very minor, glimpsed addition to the view.	Likely significant effects in all cumulative scenarios due to the scale and massing of Plot 11.

Viewpoint 3: View from Hulme Street looking south west adjacent to cluster of listed mill buildings and through wider First Street development.	Plot 11, Park place and GFS Plot F will form very minor additional elements within the view in all cumulative scenarios. The cumulative schemes are largely screened by existing built form and by the Proposed EIA Development.	Not predicted to result in significant cumulative effects in any cumulative scenarios due to the limited views of cumulative development.
Viewpoint 4: View from Cambridge Street footway/ national cycle route looking south west to First Street development/ Listed Macintosh Mills.	Plot 11 will feature prominently in all cumulative scenarios, creating a prominent new element within the view and defining First Street South. Plot 11 will change the existing character of the view. Hotspur House is visible within the foreground of the view but is unlikely to result in any significant cumulative visual effects due to the nature of the Proposed EIA Development, which retains the original mill structure.	Likely significant effects in all cumulative scenarios due to the scale and massing of Plot 11.
Viewpoint 5: View from public square within First Street development looking south east	Great Marlborough Street will appear as a tall, landmark built element in all cumulative scenarios, but appears visually distinct from the First Street character area. Plot 11 will appear as a subtle addition to the view in conjunction with the Proposed EIA Development.	Not predicted to result in significant cumulative effects in any cumulative scenarios due to the limited views of Plot 11, and long-range views to Great Marlborough Street.
Viewpoint 6: View from Medlock Street adjacent to river Medlock - showing context of street, the wider First Street setting and gateway out of the city centre.	Partial views of Hotspur House and Great Marlborough Street. Glimpsed views of Plot 11.	No cumulative effects – no view of Plot 10b
Viewpoint 7: View from Whitworth Street West looking south through Listed viaduct arch to First Street development/ Listed Macintosh Mills.	Partial views of Hotspur House.	No cumulative effects – no view of Plot 10b
Viewpoint 8: Elevated view south from platform of Deansgate Tram Stop - over city skyline.	Prominent views of Travelodge Deansgate and Vision Whitworth Street in the foreground of the view, which prevent views towards the Proposed EIA Development. Additional cumulative development within the view include Hotspur House and Great Marlborough Street.	No cumulative effects – no view of the Proposed EIA Development in any cumulative scenarios due to screening from other cumulative schemes.
Viewpoint 9: View from steps of Station Forecourt looking west over Grade II listed station buildings to city skyline.	Plot 11 will be a noticeable addition to the view in all cumulative scenarios, and will signpost First Street South. Tall elements are not uncharacteristic within the backdrop of the existing view. The height of Plot 11 will contrast with the lower heights of the Proposed EIA Development.	Not predicted to result in significant cumulative effects in any cumulative scenarios.
Viewpoint 10: View from pedestrian space on Bonsall Street Bridge looking north	A number of cumulative schemes will be visible from this viewpoint due to the nature of the view as an elevated and long range viewpoint. Cumulative schemes visible include Plot 11, Vision Whitworth Street, Viadux, Plot 09 First Street,	No cumulative effects – negligible view of the

over Hulme Arch to the city skyline beyond.	One City Road and Great Marlborough Street. Plot 11 features prominently in the view, and also screens views of the Proposed EIA Development.	Proposed EIA Development.
Viewpoint 11: View from River Street looking east over Mancunian Way through wider First Street development.	One City Road and Plot 9a will appear prominently in the foreground of the view. Plot 9a will provide substantial visual screening of the Proposed EIA Development, appearing in front of the Proposed development from this viewpoint.	Likely significant effects in cumulative scenarios due to the scale and massing of Plot 9a and One City Road.

Mitigation Measures

- 12.130. There are no secondary or tertiary construction or operational phase mitigation measures proposed in relation to townscape and views in addition to embedded primary mitigation measures.
- 12.131. Primary mitigation includes modifications to the location or design of the Proposed EIA Development or measures specifically included in the design of the Proposed EIA Development to mitigate a known issue, and are therefore 'embedded' into the proposals and is effectively 'designing out' potentially significant effects.
- 12.132. The design proposals have been formulated through a lengthy iterative process involving environmental assessment and consultation. This process has allowed site constraints and opportunities to directly influence the evolution of the Proposed EIA Development. As a result, mitigation measures are embedded within the Proposals and will be further developed as part of the detailed design of the landscape and surrounding built form.
- 12.133. A summary of mitigation measures which have been 'designed in' to the proposals in order to reduce or where possible, avoid townscape and visual impacts is provided below, and is described further within the Design and Access Statement that accompanies this application. The embedded mitigation measure is described in brief below.

Construction Phase

- 12.134. Precise methodology that will be adopted in order to mitigate against potential construction phase impacts will be formulated as part of the ongoing design development. However, it is anticipated that measures to control construction impacts will be incorporated into a Construction Environmental Management Plan (CEMP), and should include:
- Site compounds to be positioned close to the proposed access points and as remote from existing developed areas as feasible;
 - Use of directional lighting used across the site.
 - Stockpiles located on site to limit visual impacts where possible.
 - High quality site hoarding.
 - Strict adherence to the self-storage areas and construction access roads;
 - Use of site hoarding where appropriate; and
- 12.135. The implementation of good site management, maintenance and housekeeping would ensure that temporary deterioration to landscape resources, character and visual amenity will be kept to a practicable minimum. Despite these better practice measures, there would still remain inevitable effects during construction works. However, in overall terms the residual effects upon townscape resources, townscape character and the visual envelope are not anticipated to be significant and the majority of which short term, temporary and local.

Operational Phase

- 12.136. Primary mitigation measures 'designed in' to the proposals are outlined below:
- The Proposed EIA Development has been designed to fit within the scale, massing and height parameters for Plot 10, as set out within the Strategic Development Framework. The proposed usage create the opportunity for activity at street level.
 - The concept for the public realm around Plot 10a is to create a series of contemporary and distinctive spaces that draw upon the site's sites unique location within the city. When taken in the context of the proposed and emerging buildings together with the sustainable transport links, the external spaces will become both a

destination and a stepping-stone to connect future commercial phases, leisure uses and existing residential areas within the locality.

- The approach to the public realm design has been to create a series of character areas which respond to the surrounding context and proposed uses.
- The frontage onto First Street provide continuity in terms of materials and quality to the existing works implemented to the north of First Street.
- Service access will be provided between Plot 10a and Plot 10b, which will minimise the potentially detrimental visual and townscape impacts of service vehicles.
- A clearly defined hierarchy of vehicular, services and pedestrian routes will be defined through the design approach and materials palette in order to maximise legibility and prioritising pedestrian movement.
- Along Hulme Street, a simple approach incorporating tree will add colour, scale and texture to the street.
- The building responds to the existing built character and quality within First Street to help create a cohesive character.
- The Proposed EIA Development works with existing topography and aims to effectively integrate the scheme without significant level changes.

Residual Effects

- 12.137. There are no secondary or tertiary mitigation measures proposed in relation to townscape and views in addition to primary 'embedded' mitigation measures. Therefore, any identified townscape or visual effects are likely to remain as residual effects, and these are described below.
- 12.138. For the purposes of this Townscape and Visual Impact Assessment, only effects deemed Moderately Significant and Significant are considered to be Significant in the meaning of EIA Regulations (2017).
- 12.139. A detailed assessment of effects is contained within Appendix 12.1 and Appendix 12.2.

Table 12.11 – 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 Phase – Plot 10a				
Negligible neutral effect.	Townscape Character	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Urban Grain	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Land Use	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Building Heights	None	N/A	Negligible neutral effect. Not significant. Temporary.
No change	Movement and Linkages	None	N/A	No change. Not significant. Temporary.
No change	Public Open Space and Public Realm	None	N/A	No change-small neutral effect. Not significant. Temporary.
Small neutral effect	Site Character	None	N/A	Small neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 1	None	N/A	Medium adverse effect. Moderately significant. Temporary.
Negligible adverse effect	Viewpoint 2	None	N/A	Negligible adverse effect. Not significant. Temporary.
Small adverse effect	Viewpoint 3	None	N/A	Small adverse effect. Minor significance. Temporary.
Small neutral effect	Viewpoint 4	None	N/A	Small neutral effect. Minor significance. Temporary.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Medium adverse effect	Viewpoint 5	None	N/A	Medium adverse effect. Moderately significant. Temporary.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 11	None	N/A	Medium adverse effect. Minor significance. Temporary
Construction Phase – Plot 10b				
Negligible neutral effect.	Townscape Character	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Urban Grain	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Land Use	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Building Heights	None	N/A	Negligible neutral effect. Not significant. Temporary.
No change	Movement and Linkages	None	N/A	No change. Not significant. Temporary.
No change	Public Open Space and Public Realm	None	N/A	No change -small neutral effect. Not significant. Temporary.
Small neutral effect	Site Character	None	N/A	Small neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 1	None	N/A	Medium adverse effect. Moderately significant. Temporary.
Negligible adverse effect	Viewpoint 2	None	N/A	Negligible adverse effect. Not significant. Temporary.
Small adverse effect	Viewpoint 3	None	N/A	Small adverse effect. Minor significance. Temporary.
Small neutral effect	Viewpoint 4	None	N/A	Small neutral effect. Minor significance. Temporary.
Medium adverse effect	Viewpoint 5	None	N/A	Medium adverse effect. Moderately significant. Temporary.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 11	None	N/A	Medium adverse effect. Minor significance. Temporary
Construction Phase – Plots 10a and 10b				
Small neutral effect.	Townscape Character	None	N/A	Small neutral effect. Minor significance. Temporary.
Small neutral effect	Urban Grain	None	N/A	Small neutral effect. Minor significance. Temporary.
Small neutral effect	Land Use	None	N/A	Small neutral effect. Minor significance. Temporary.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Small neutral effect	Building Heights	None	N/A	Small neutral effect. Minor significance. Temporary.
No change	Movement and Linkages	None	N/A	No change. Not significant. Temporary.
No change	Public Open Space and Public Realm	None	N/A	No change -small neutral effect. Not significant. Temporary.
Small beneficial effect	Site Character	None	N/A	Small neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 1	None	N/A	Medium adverse effect. Moderately significant. Temporary.
Negligible adverse effect	Viewpoint 2	None	N/A	Negligible adverse effect. Not significant. Temporary.
Small adverse effect	Viewpoint 3	None	N/A	Small adverse effect. Minor significance. Temporary.
Small neutral effect	Viewpoint 4	None	N/A	Small neutral effect. Minor significance. Temporary.
Medium adverse effect	Viewpoint 5	None	N/A	Medium adverse effect. Moderately significant. Temporary.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 11	None	N/A	Medium adverse effect. Minor significance. Temporary

Table 12.12 – 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 (i.e., Temporary/Permanent)
Operational Phase – Plot 10a				
Small beneficial effect.	Townscape Character	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Urban Grain	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Land Use	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Building Heights	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Movement and Linkages	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Public Open Space and Public Realm	None	N/A	Small beneficial effect. Minor significance. Permanent.
Large beneficial effect.	Site Character	None	N/A	Small beneficial effect. Moderately significant. Permanent.
Medium beneficial effect	Viewpoint 1	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Negligible beneficial effect	Viewpoint 2	None	N/A	Negligible beneficial effect. 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)
Small beneficial effect.	Viewpoint 3	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Viewpoint 4	None	N/A	Small beneficial effect. Minor significance.. Permanent.
Medium beneficial effect	Viewpoint 5	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium beneficial effect	Viewpoint 11	None	N/A	Medium beneficial effect. Minor significance. Permanent.
Operational Phase – Plot 10b				
Small beneficial effect.	Townscape Character	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Urban Grain	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Land Use	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Building Heights	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Movement and Linkages	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Public Open Space and Public Realm	None	N/A	Small beneficial effect. Minor significance. Permanent.
Large beneficial effect.	Site Character	None	N/A	Small beneficial effect. Moderately significant. Permanent.
Medium beneficial effect	Viewpoint 1	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Negligible beneficial effect	Viewpoint 2	None	N/A	Negligible beneficial effect. Not significant. Permanent.
Small beneficial effect.	Viewpoint 3	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Viewpoint 4	None	N/A	Small beneficial effect. Minor significance. Permanent.
Medium beneficial effect	Viewpoint 5	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
No change/negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium beneficial effect	Viewpoint 11	None	N/A	Medium beneficial effect. Minor significance. Permanent.

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Operational Phase – Plots 10a and 10b				
Medium beneficial effect.	Townscape Character	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Urban Grain	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Land Use	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Building Heights	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Movement and Linkages	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Public Open Space and Public Realm	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Large beneficial effect.	Site Character	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect	Viewpoint 1	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Small beneficial effect.	Viewpoint 2	None	N/A	Small beneficial effect. Not significant. Permanent.
Small beneficial effect.	Viewpoint 3	None	N/A	Small beneficial effect. Moderately significant. Permanent.
Small beneficial effect.	Viewpoint 4	None	N/A	Small beneficial effect. Moderately significant. Permanent.
Medium beneficial effect	Viewpoint 5	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
No change/negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium beneficial effect	Viewpoint 11	None	N/A	Medium beneficial effect. Minor significance. Permanent.

Reference List

12.140. This ES Chapter has been prepared by reference to the following:

- Council of Europe (Florence, 2000). The European Landscape Convention.
- Department for Communities and Local Government (2012), National Planning Policy Framework, London, DCLG.
- Planning Practice Guidance. The National Planning Policy Framework and relevant planning practice guidance. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>. [Accessed: 18/10/2022].
- Institute of Environmental Management & Assessment (IEMA), 2015. IEMA Environmental Impact Assessment Guide to Shaping Quality Development. ^[1]_{SEP}
- The Town and Country Planning (Environmental Impact Assessment.)
- Landscape Institute, IEMA, 2013. Guidelines for Landscape & Visual Impact Assessment, 3rd Edition, Oxon, Routledge. ^[1]_{SEP}

- Landscape Institute Technical Guidance Note 06/09 (2019). Visual Representation of Development Proposals. Available at: <https://www.landscapeinstitute.org/visualisation/>. [Accessed: 18/10/2022]. Environmental Impact Assessment EU Directive and UK Regulations, (85/337/EEC). 
- Manchester's Core Strategy 2012-2027 https://www.manchester.gov.uk/downloads/download/5672/core_strategy [Accessed: 18/10/2022].
- First Street Development Framework. https://www.manchester.gov.uk/downloads/download/7213/first_street [Accessed: 18/10/2022].

13. Wind Microclimate

- 13.1. 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.

Legislative and Policy Context, Guidance

- 13.2. The following legislation and policy have informed the assessment of effects within the ES Chapter.

Legislation

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

National Planning Policy

National Planning Policy Framework, 2021

- 13.4. The National Planning Policy Framework (NPPF) was revised in July 2021 by the Department of Communities and Local Government (DCLG). The relevant paragraphs are as follows:
- 13.5. Paragraph 130 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.

National Planning Practice Guidance (NPPG), 2019

- 13.7. The NPPG states, under ‘Consider form’, 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.”
- 13.8. The NPPG states, under ‘Consider scale’, that “Account should be taken of local climatic conditions, including daylight and sunlight, wind, temperature and frost pockets.”
- 13.9. Policy 41 of the National Design Guidance 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.”
- 13.10. Policy 71 of the National Design Guidance 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.”

Sub-Regional Planning policy (where relevant)

- 13.11. N/A

Local Planning Policy

Manchester's Local Development Framework, Core Strategy Development Plan Document

- 13.12. 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

13.13. N/A

Assessment Methodology and Significance Criteria

Overview

- 13.14. The full technical methodology for the CFD study is set out in Appendix 13.1.
- 13.15. 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 EIA 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.
- 13.16. The current assessment considers the study area to comprise the EIA Site plus buildings and spaces within a radius of 450 metres from the centre of the EIA 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.
- 13.17. 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

- 13.18. Computational fluid dynamics (CFD) modelling has employed a steady-state RANS approach. This method employs turbulence models to approximate the magnitude of velocity fluctuations about the average wind speeds predicted, in order to derive an estimation of the effect of gusts. 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.
- 13.19. The region of interest closest to the ground (1.5 metres) incorporated 5 layers of cells
- 13.20. 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

- 13.21. 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.
- 13.22. 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 EIA Site.

Assessment Criteria

- 13.23. 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.
- 13.24. 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.

- 13.25. A wind speed of 15 m/s occurring once per year is rated as unsuitable, in terms of safety, with the potential to destabilise the less able members of the public including the elderly, cyclists and children.
- 13.26. 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.
- 13.27. 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 11.1 – 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.

- 13.28. 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 11.2 – 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.

Significance Criteria

- 13.29. During construction, receptors are defined to be pedestrians and cyclists on the road around the EIA Site and construction workers within the EIA 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.
- 13.30. For the scenario for the Proposed EIA Development in place, receptors are defined to be persons on foot, seated or travelling by bicycle within the Proposed EIA 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.

- 13.31. 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.
- 13.32. 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 EIA 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.
- 13.33. 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.
- 13.34. The following are the significance criteria used to assess likely wind conditions as a result of the introduction of the Proposed EIA 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.

Scenarios Tested

- 13.35. A digital model of the existing buildings within a 450-metre radius from the centre of the EIA Site was constructed. The building proposals that comprise the Proposed EIA Development and cumulative surrounding developments were also constructed, and the following scenarios were modelled in CFD:
- Scenario 1: Baseline
 - Scenario 2: Baseline + Plot 10a
 - Scenario 3: Baseline + Plot 10a + Cumulative Surroundings
 - Scenario 4: Baseline + Proposed Development (Plot 10b)
 - Scenario 5: Baseline + Proposed Development (Plot 10b) + Cumulative Surroundings
 - Scenario 6: Baseline + Plot 10a + Proposed Development (Plot 10b)
 - Scenario 7: Baseline + Plot 10a + Proposed Development (Plot 10b) + Cumulative Surroundings

The Study Area

- 13.36. The study considers all wind effects up to 450m radius from the Proposed EIA Development and contains all features which are likely to affect the wind flow at the EIA Site. This distance is considered sufficient to capture all wind effects on EIA Site, as well as those effects on the surrounding area.

Source of Effect

- 13.37. Potentially adverse wind effects caused by interaction of the wind with the Proposed EIA Development may, but not necessarily be limited to:
- Downdrafts
 - Funnelling / channeling of winds
 - Corner accelerations
 - Significant exposure to prevailing winds.

Baseline Conditions

- 13.38. A number of committed developments have been considered in the assessment, within the baseline (existing) surrounding context. These schemes are presented in tabular format in Table 13.3.

Table 13.3 – Developments considered within the baseline context

Development Name	Planning Reference
Plot 11, First Street	125573/FO/2019
John Dalton West Building	125799/FO/2019
Barclay House	118033/P3OPA/2017
70 Great Bridgewater Street	129081/FO/2021
Vision, Whitworth Street West	111003/FO/2016/C1
Viadux	115871/FO/2017
Plot 9a First Street	132600/FO/2021

- 13.39. Baseline conditions are presented within Figures 13.1 (for safety), 13.2 (worst-seasonal comfort) and 13.3 (summer comfort) of Appendix 13.2.
- 13.40. Within the existing EIA Site and surrounds, wind conditions meet the criteria for pedestrian safety.
- 13.41. Within the existing EIA Site and neighbouring surrounds, wind conditions are substantially suitable for strolling or better, and thus for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress / egress.

Identification and Evaluation of Likely Significant Effects

Demolition & Construction

- 13.42. With the EIA Site currently being disused land, enclosed via hoarding, there is no significant demolition to speak of. Construction will therefore see the gradual evolution of the EIA Site into the Proposed EIA Development, and with it, the evolution of wind conditions from the baseline. With conditions in all developed scenarios being suitable and with conditions in the baseline being acceptable, conditions in the intervening period, where the emerging development will also be enclosed with hoarding, will also be suitable for pedestrian thoroughfare and ingress / egress at surrounding areas. There is thus a negligible effect during the construction period, and that effect is not significant.

Baseline + Plot 10a

- 13.43. Conditions for 'Baseline + Plot 10a' are presented within Figures 13.4 and 13.5 (for safety), Figure 13.6 (worst-seasonal comfort) and Figures 13.7 and 13.8 (summer comfort) of Appendix 13.2.
- 13.44. With the introduction of Plot 10a wind conditions meet the criteria for pedestrian safety.
- 13.45. Wind conditions at all thoroughfares are predicted to be suitable for at least strolling throughout the year and thus suitable for pedestrian access to and passage.
- 13.46. Wind conditions at all entrances to Plot 10a are predicted to be suitable for standing or better throughout the year and thus comfortable for pedestrian ingress / egress.
- 13.47. Wind conditions within the landscaped area between Plots 9 and 10a are suitable for short-term standing during summer, suitable therefore, for general recreational uses in summer.
- 13.48. Wind conditions within the level 12 roof terrace of Plot 10a are suitable in part, for long-term sitting, during summer, and otherwise suitable for short-term sitting. Where suitable for long-term sitting, these conditions would be suitable for an area with permanent seating that would expect considerable use in summer. Where less benign, conditions would be appropriate for a more general amenity space.
- 13.49. Wind conditions within the surrounding area are expected to remain substantially suitable for strolling or better, and thus for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress / egress.
- 13.50. The introduction of Plot 10a therefore represents a negligible effect and is not significant.

Baseline + Plot 10b

- 13.51. Conditions for 'Baseline + Plot 10b' are presented within Figures 13.9 (for safety), 13.10 (worst-seasonal comfort) and 13.11 (summer comfort) of Appendix 13.2.
- 13.52. With the introduction of Plot 10b wind conditions meet the criteria for pedestrian safety.
- 13.53. Wind conditions at all thoroughfares within the Site are predicted to be suitable for at least strolling throughout the year and thus suitable for pedestrian access to and passage through the Site.
- 13.54. Wind conditions at all entrances to the development are predicted to be suitable for standing or better throughout the year and thus comfortable for pedestrian ingress / egress.
- 13.55. Areas anticipated to feature outdoor seating to the east of Plot 10b, the bar area for example, are suitable for long-term sitting during summer, and thus for planned uses.
- 13.56. Wind conditions within the surrounding area are expected to remain substantially suitable for strolling or better, and thus for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress / egress.
- 13.57. The introduction of Plot 10b therefore represents a negligible effect and is not significant.

Baseline + Plot 10a + Plot 10b

- 13.58. Conditions for 'Baseline + Plot 10a + Plot 10b' are presented within Figures 13.12 and 13.13 (for safety), Figure 13.14 (worst-seasonal comfort) and Figures 13.15 and 13.16 (summer comfort) of Appendix 13.2.
- 13.59. With the introduction of the Plot 10b Proposed 10a Development and Proposed 10b Development wind conditions meet the criteria for pedestrian safety.
- 13.60. Wind conditions at all thoroughfares are predicted to be suitable for at least strolling throughout the year and thus suitable for pedestrian access to and passage.
- 13.61. Wind conditions at all entrances to the Proposed 10 Development and Proposed 10b Development are predicted to be suitable for standing or better throughout the year and thus comfortable for pedestrian ingress / egress.
- 13.62. Wind conditions within the landscaped area between Plots 9 and 10a are suitable for short-term standing during summer, suitable therefore, for general recreational uses in summer.
- 13.63. Wind conditions within the Plot 10a, level 12 roof terrace, are suitable in part, for long-term sitting, during summer, and otherwise suitable for short-term sitting. Where suitable for long-term sitting, these conditions would be suitable for an area with permanent seating that would expect considerable use in summer. Where less benign, conditions would be appropriate for a more general amenity space.
- 13.64. Areas anticipated to feature outdoor seating to the east of the EIA Plot 10b, the bar area for example, are suitable for long-term sitting during summer, and thus for planned uses.

- 13.65. Wind conditions within the surrounding area are expected to remain substantially suitable for strolling or better, and thus for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress / egress.
- 13.66. The introduction of the Proposed 10a Development and Proposed 10b Development together therefore represents a negligible effect and is not significant.

Cumulative Effects

- 13.67. A number of committed developments have been considered in the assessment, as cumulative developments that have been granted planning consent. These schemes are presented in tabular format in Table 13.4.

Table 13.4 – Developments considered within the cumulative context

Development Name	Planning Reference
One City Road	128002/FO/2020
Hotspur House	120635/FO/2018
Park Place	129273/FO/2021
GJS Plot F	132199/FO/2021
Student Castle	121252/FO/2018
Travelodge Deansgate Locks	126308/FO/2020
Apex Tower	133172/FO/2022
Transition	116850/FO/2017

Baseline + Plot 10a + Cumulative Surroundings

- 13.68. Conditions for 'Baseline + Plot 10a + Cumulative Surroundings' are presented within Figures 13.17 and 13.18 (for safety), Figure 13.19 (worst-seasonal comfort) and Figures 13.20 and 13.21 (summer comfort) of Appendix 13.2.
- 13.69. With the introduction of Plot 10a within cumulative surroundings, wind conditions meet the criteria for pedestrian safety.
- 13.70. Wind conditions on thoroughfares are predicted to be substantially suitable for strolling throughout the year and thus suitable for pedestrian access to and passage.
- 13.71. Wind conditions at all entrances to Plot 10a are predicted to be suitable for standing or better throughout the year and thus comfortable for pedestrian ingress / egress.
- 13.72. Wind conditions within the landscaped area between Plots 9 and 10a are suitable for short-term standing during summer, suitable therefore, for general recreational uses in summer.
- 13.73. Wind conditions within the level 12 roof terrace of Plot 10a are quite substantially suitable for long-term sitting, during summer, and otherwise suitable for short-term sitting.
- 13.74. Wind conditions within the surrounding area are expected to remain substantially suitable for strolling or better, and thus for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress / egress.
- 13.75. The introduction of Plot 10a within cumulative surroundings therefore represents a negligible effect and is not significant.

Baseline + Plot 10b + Cumulative Surroundings

- 13.76. Conditions for 'Baseline + Plot 10b + Cumulative Surroundings' are presented within Figures 13.22 (for safety), 13.23 (worst-seasonal comfort) and 13.24 (summer comfort) of Appendix 13.2.
- 13.77. With the introduction of the 10b Plot 10b within cumulative surroundings, wind conditions meet the criteria for pedestrian safety.

- 13.78. Wind conditions at all thoroughfares within the Site are predicted to be suitable for at least strolling throughout the year and thus suitable for pedestrian access to and passage through the Site.
- 13.79. Wind conditions at all entrances to the development are predicted to be suitable for standing or better throughout the year and thus comfortable for pedestrian ingress / egress.
- 13.80. Areas anticipated to feature outdoor seating to the east of Plot 10b, the bar area for example, are suitable for long-term sitting during summer, and thus for planned uses.
- 13.81. Wind conditions within the surrounding area are expected to remain substantially suitable for strolling or better, and thus for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress / egress.
- 13.82. The introduction of the 10b Plot 10b within cumulative surroundings therefore represents a negligible effect and is not significant.

Baseline + Plot 10a + Plot 10b + Cumulative Surroundings

- 13.83. Conditions for 'Baseline + Plot 10a + Plot 10b + Cumulative Surroundings' are presented within Figures 13.25 and 13.26 (for safety), Figure 13.27 (worst-seasonal comfort) and Figures 13.28 and 13.29 (summer comfort) of Appendix 13.2.
- 13.84. With the introduction of the Proposed 10a and Proposed 10b Development within cumulative surroundings, wind conditions meet the criteria for pedestrian safety.
- 13.85. Wind conditions at all thoroughfares are predicted to be suitable for at least strolling throughout the year and thus suitable for pedestrian access to and passage through the Site.
- 13.86. Wind conditions at all entrances are predicted to be suitable for standing or better throughout the year and thus comfortable for pedestrian ingress / egress.
- 13.87. Wind conditions within the landscaped area between Plots 9 and 10a are suitable for short-term standing during summer, suitable therefore, for general recreational uses in summer.
- 13.88. Wind conditions within the Plot 10a, level 12 roof terrace, are suitable in part, for long-term sitting, during summer, and otherwise suitable for short-term sitting. Where suitable for long-term sitting, these conditions would be suitable for an area with permanent seating that would expect considerable use in summer. Where less benign, conditions would be appropriate for a more general amenity space.
- 13.89. Areas anticipated to feature outdoor seating to the east of the EIA Plot 10b, the bar area for example, are suitable for long-term sitting during summer, and thus for planned uses.
- 13.90. Wind conditions within the surrounding area are expected to remain substantially suitable for strolling or better, and thus for thoroughfare use; and for short-term standing or better at building fronts, and thus for ingress / egress.
- 13.91. The introduction of the Proposed 10a and Proposed 10b Development within cumulative surroundings therefore represents a negligible effect and is not significant.

Mitigation Measures

- 13.92. 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

- 13.93. 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.

Table 13.5 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the construction phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Construction Phase				
Lawson criteria met within the EIA Site and surrounding area.	Persons on foot, seated or travelling by bicycle	Not required.	Not required.	Negligible residual effect.

Table 13.6 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the operational phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Operational Phase				
Lawson criteria met within the EIA Site and surrounding area.	Persons on foot, seated or travelling by bicycle	Not required.	Not required.	Negligible residual effect.

Reference List

13.94. This ES Chapter has been prepared by 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. Summary of Residual Impacts

Air Quality

Table 14.1: 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 Phase				
PM ₁₀ and NO _x from on-site Construction NRMM machinery	High sensitivity human receptors within 350m of EIA Site boundary	Specification of minimum NRMM emission requirements	Contractor to select compliant vehicles	Negligible
PM ₁₀ and NO _x from Construction traffic exhaust emissions	High sensitivity human receptors within 50m of the trackout route for construction vehicles, within 500m from the EIA Site exit.	Listed in Appendix 6. Based on the construction dust assessment within Appendix 6, these should include medium risk mitigation measures for trackout of construction vehicles	Implementation of recommendation mitigation measures, to be outlined in a Dust Management Plan	Negligible
Dust and PM ₁₀ associated with earthworks and construction activities	High sensitivity human receptors within 350m of EIA Site boundary	Listed in Appendix 6. Based on the construction dust assessment within Appendix 6, these should include medium risk mitigation measures for earthworks and high-risk mitigation measures for construction	Implementation of recommendation mitigation measures, to be outlined in a Dust Management Plan	Negligible

Table 14.2: 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)
Operational Phase				
Emissions from an increase in operational traffic	High sensitivity human receptors	Listed in Appendix 6	Implementation of Travel Plan	Negligible

Climate Change

Plot 10a & 10b

Table 14.3: .Residual effects - Plot 10a & 10b carbon emissions

Plot 10a & 10b Carbon Emissions	Construction Phase Embodied Carbon (A1-A5)	Life Cycle Embodied Carbon (Module B to C excl. B6, B7)	Whole Life Embodied Carbon
Tonnes CO2e	28,774	18,568	47,343
Significance of Effect	Moderate Adverse	Moderate Adverse	Moderate Adverse

Table 14.4: .Likely significant effects prior to implementation of mitigation measures - Plot 10a & 10b carbon emissions

Likely Significant Effect	Component	Mitigation Measure	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Moderate Adverse	Construction	The construction site would be managed in an environmentally sound manner in terms of resource use and storage. Recycling facilities would be provided on-site for construction and operational waste to mitigate volume of material sent to landfill.	Moderate Adverse – temporary as long as mitigation measures are implemented
Moderate Adverse	Materials	Reducing transportation emissions by prioritising local material procurement. Reduce Material quantities through design development	Moderate adverse – permanent if quantities of materials for building elements are not considered effects
Moderate Adverse	Operation	A fabric first approach has been adopted to reduce the operational energy demand of the Proposed Development. A centralised energy loop would provide heating, hot water and cooling through the use of heat pump technology to all aspects of the Proposed Development. This is highly efficient and would allow the Proposed Development to respond to the decarbonisation of the national grid (though grid decarbonisation has not been assumed in order to present a worst-case assessment). • Solar PV to be accommodated on the available roof space of Building 10a, providing a source of on-site renewable energy; • Variable speed pumps and drives; • High performance heating, cooling and ventilation systems.	Minor adverse - temporary as long as energy strategy is implemented

Table 14.5: Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the operational phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Operational Phase				
High adverse effects from increasing average / maximum temperatures (Average risk rating: 7)	Public Realm	<u>Both Plots</u> <i>Para 7.46,.47:</i> Proposed EIA Development will include external shading in the form of soft landscaping/planting and canopies/pergolas. <i>Para 7.52,.52:</i> consideration of high heat resistant plant species and incorporating bioswales	Landscaping strategy at design stage Ventilation strategy and Planting strategy / Ecology reports at preconstruction stage for relevant planning conditions	Moderate adverse effects from increasing average / maximum temperatures (Average risk rating: 5)
High adverse effects from increasing average / maximum temperatures (Average risk rating: 7)	Building	<u>Plot 10a</u> <i>Para 7.46:</i> glazing ratios will be reduced, and solid façade will be introduced to reduce solar gain and energy demand for cooling. <i>Para 7.48:</i> Mixed mode ventilation on façade. <u>Plot 10b</u> <i>Para 7.47:</i> 100mm operable windows to be positioned at certain angles. <i>Para 1.49:</i> ASHPs installed.	Overheating and ventilation assessments and HVAC/Energy strategy at preconstruction stage for relevant planning conditions	Minor adverse effects from increasing average / maximum temperatures (Average risk rating: 4)
Moderate adverse effects from intense rainfall events (Average risk rating: 5)	Public Realm	<u>Plot 10a</u> <i>Para 7.58:</i> Raingardens and bioswales. All tree planting in soft landscape. <u>Plot 10b</u> <i>Para 7.57:</i> public realm levels to be designed to direct overland flows away from the building. <i>Para 7.60:</i> Raingardens to be incorporated where feasible.	Flood risk assessment at preconstruction stage for relevant planning conditions Landscaping strategy and Elevation plans at design stage	Minor adverse effects from intense rainfall events (Average risk rating: 3)
Moderate adverse effects from intense rainfall events (Average risk rating: 6)	Building	<u>Plot 10a</u> <i>Para 7.54:</i> blue roof proposed on terrace areas on two floors. <i>Para 7.60:</i> Surface water drainage discharges to public sewer <u>Plot 10b</u> <i>Para 7.54,.61:</i> adequate controlled drainage. <i>Para 7.55:</i> Roof slabs set to falls to prevent standing water. <i>Para 7.59:</i> surface water attenuation to be provided in the form of a below ground tank <i>Para 7.57:</i> MEP equipment will be mounted.	Flood risk assessment at preconstruction stage for relevant planning conditions Landscaping strategy and MEP report at design stage	Minor adverse effects from intense rainfall events (Average risk rating: 3)
Minor adverse effects from flooding (Average risk rating: 3)	Public Realm	<u>Plot 10a</u> <i>Para 7.62:</i> a secondary entrance proposed to be more elevated than the rest of the EIA Site. <i>Para 7.67:</i> Water storage/irrigation needs for landscaping needs will be	Design and Access Statement, Elevation plans, Landscaping strategy and MEP	Negligible effects from flooding (Average risk rating: 2)

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
		reviewed by the wider team as planting specs are developed. <u>Plot 10b</u> <i>Para 7.67:</i> Raingardens and bioswales.	report at design stage	
Minor adverse effects from flooding (Average risk rating: 3)	Building	<u>Plot 10a</u> <i>Para 7.64:</i> An opening in the slab above the basement with lifting device will allow any damaged plant to be replaced if need be. <u>Plot 10b</u> <i>Para 7.65:</i> MEP equipment will be mounted.	Access and maintenance strategy at design stage	Minor adverse effects from flooding (Average risk rating: 3)
Minor adverse effects from snowing (Average risk rating: 3)	Public Realm	<u>Plot 10a</u> <i>Para 7.71:</i> The building will have a back-up power supply for essential services via a diesel generator, however this will not include street lighting.	Architectural plans at design stage Energy strategy at preconstruction stage for relevant planning conditions	Minor adverse effects from snowing (Average risk rating: 3)
Minor adverse effects from snowing (Average risk rating: 4)	Building	<u>Plot 10a</u> <i>Para 7.70:</i> Storage areas to keep equipment locked away safe in extreme weather can be provided. All plant and equipment mounted on the roof will be suitable for an outdoor environment and will have the necessary protection provided as part of the design. <u>Plot 10b</u> <i>Para 7.72:</i> Emergency lighting, including where necessary external lighting with battery back-up, will be provided to allow people to exit the building and travel to a point of safety.	Architectural plans at design stage	Minor adverse effects from snowing (Average risk rating: 4)

Daylight, Sunlight and Overshadowing

Table 14.6 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the construction phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Construction Phase				
Not applicable				

Table 14.7 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects during the operational phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Operational Phase				
Minor - Moderate Adverse impact on Daylight and Sunlight Amenity – All scenarios	Macintosh Mill	None proposed	n/a	Minor - Moderate adverse impact on daylight and sunlight amenity in all scenarios
Major adverse impact on Sunlight Amenity – 10A+10B scenario	James Grigor Square	None proposed	n/a	Major adverse impact on Sunlight Amenity – 10A+10B scenario

Human Health

Table 14.8 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Significant Receptors listed as identified from each technical chapter and as relevant according to those presented in paragraph 9.42 previously – workers, residents & visitors (nearby & site), and pedestrians – during construction and operational phases

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e. Temporary/Permanent)
Construction Phase				
Employment & local economy	Workers, local economy	None	n/a	Temporary Minor Beneficial
Townscape	Nearby residents & visitors		CEMP	Small neutral effects Negligible Temporary
Visual - viewpoints	Nearby residents & visitors		CEMP	Negligible to Medium Adverse Temporary
Air quality	Workers, nearby residents & visitors	Reduce dust, vehicle emissions	CEMP	Negligible Temporary
Noise	Nearby residents & offices		CEMP	Negligible to Moderate Adverse Temporary
Wind	Persons on foot, seated, on bicycle	None required	n/a	Negligible
Operational Phase				
Employment & local economy	Workers	None	n/a	Permanent Negligible Scenarios 1, 4 & 5 Minor Beneficial Scenarios 2, 3, 6 & 7
Uplift in local economy	Local economy	None	n/a	Permanent Negligible Scenarios 1-7
Student bedspaces & PBSA supply	Students	None	n/a	Major Beneficial

Health care provision	Primary Healthcare Facilities	Financial Contribution	Secured through s106 agreement	Minor Adverse Scenarios 3, 5, 6, 7
Crime	Residents, workers, visitors	None	n/a	Negligible on crime
Open space & recreation facilities	Open space & recreational facilities & users	None	n/a	Negligible on open space & recreational facilities for Scenarios 1-7
Climate Change – Temperature, Rain, Flooding	Residents & visitors	None	n/a	Temperature - Minor to Adverse Rainfall Minor Adverse Flooding Negligible
Townscape	Residents & visitors	None	n/a	Medium Beneficial
Visual – viewpoints	Residents & visitors	None	n/a	Negligible to Medium Beneficial
Daylight & Sunlight Amenity	Macintosh Mill	None	n/a	Minor to Moderate Adverse on Macintosh Mill
Sunlight Amenity	James Grigor Sq	None	n/a	Major Adverse
Wind	Persons on foot, seated, on bicycle	None	n/a	Negligible
Air Quality	Residents & visitors	None	n/a	Negligible
Noise	Nearby residents & offices	Through design	n/a	Negligible to Minor Adverse

Noise and Vibration

Table 14.9 - 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 Phase				
Major adverse	A	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary
Major adverse	B	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary
Minor adverse	C	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Negligible Temporary
Minor adverse	D	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Negligible Temporary
Minor adverse	E	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Negligible Temporary
Moderate adverse	F	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Minor adverse Temporary
Major adverse	G	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)
Major adverse	H	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary
Major adverse	I	Best Practicable Means to minimise noise and vibration	Construction Environmental Management Plan	Moderate adverse Temporary

Table 14.10 - 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)
Operational Phase				
Minor adverse	A	Compliance with local policy guidance	Through design	Minor adverse Permanent
Minor adverse	B	Compliance with local policy guidance	Through design	Minor adverse Permanent
Minor adverse	C	Compliance with local policy guidance	Through design	Minor adverse Permanent
Minor adverse	D	Compliance with local policy guidance	Through design	Minor adverse Permanent
Negligible	E	Compliance with local policy guidance	Through design	Negligible Permanent
Negligible	F	Compliance with local policy guidance	Through design	Negligible Permanent
Negligible	G	Compliance with local policy guidance	Through design	Negligible Permanent
Negligible	H	Compliance with local policy guidance	Through design	Negligible Permanent
Minor adverse	I	Compliance with local policy guidance	Through design	Minor adverse Permanent

Socio-economics

Table 14.11 – 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 Phase					
Uplift in local construction employment	Individuals seeking construction employment and the local economy (through GVA)	None	n/a	Scenario 1	Temporary, Negligible
				Scenario 2	Temporary, Minor Beneficial
				Scenario 3	Temporary, Moderate Beneficial*
				Scenario 4	Temporary, Minor Beneficial
				Scenario 5	Temporary, Moderate Beneficial*
				Scenario 6	Temporary, Minor Beneficial
				Scenario 7	Temporary, Moderate Beneficial*

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)

Table 14.12 – 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 (i.e., Temporary/Permanent)	
Operational Phase					
Net change in operational employment (and change in GVA)	Individuals seeking construction employment and the local economy (through GVA)	None	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Minor Beneficial
				Scenario 3	Permanent, Minor Beneficial
				Scenario 4	Permanent, Negligible
				Scenario 5	Permanent, Negligible
				Scenario 6	Permanent, Minor Beneficial
				Scenario 7	Permanent, Minor Beneficial
Increase in the number of student bedspaces and contribution towards local strategic objectives in respect of PBSA supply	Students seeking accommodation	None	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Negligible
				Scenario 3	Permanent, Major Beneficial*
				Scenario 4	Permanent, Major Beneficial*
				Scenario 5	Permanent, Major Beneficial*
				Scenario 6	Permanent, Major Beneficial*
				Scenario 7	Permanent, Major Beneficial*
Uplift in local household spend, increasing local expenditure, including on retail, household goods, food and drink, local transport, recreation and leisure and other expenditure likely to be spent locally.	Local economy (through GVA)	None	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Negligible
				Scenario 3	Permanent, Negligible
				Scenario 4	Permanent, Negligible
				Scenario 5	Permanent, Negligible
				Scenario 6	Permanent, Negligible
				Scenario 7	Permanent, Negligible
Additional demand for healthcare facilities (GP services and dentists) as a result of the uplift in population.	Primary healthcare facilities	None	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Negligible
				Scenario 3	Permanent, Minor Adverse
				Scenario 4	Permanent, Minor Adverse
				Scenario 5	Permanent, Minor Adverse
				Scenario 6	Permanent, Minor Adverse
				Scenario 7	Permanent, Minor Adverse
Additional demand for the use of the existing leisure facilities and open/amenity space	Open space and recreational facilities	none	n/a	Scenario 1	Permanent, Negligible
				Scenario 2	Permanent, Negligible
				Scenario 3	Permanent, Negligible
				Scenario 4	Permanent, Negligible

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e., Temporary/Permanent)	
	and their users			Scenario 5	Permanent, Negligible
				Scenario 6	Permanent, Negligible
				Scenario 7	Permanent, Negligible

Townscape and Visual Impact

Table 14.13 – 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 (i.e., Temporary/Permanent)
Construction Phase – Plot 10a				
Negligible neutral effect.	Townscape Character	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Urban Grain	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Land Use	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Building Heights	None	N/A	Negligible neutral effect. Not significant. Temporary.
No change	Movement and Linkages	None	N/A	No change. Not significant. Temporary.
No change	Public Open Space and Public Realm	None	N/A	No change-small neutral effect. Not significant. Temporary.
Small neutral effect	Site Character	None	N/A	Small neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 1	None	N/A	Medium adverse effect. Moderately significant. Temporary.
Negligible adverse effect	Viewpoint 2	None	N/A	Negligible adverse effect. Not significant. Temporary.
Small adverse effect	Viewpoint 3	None	N/A	Small adverse effect. Minor significance. Temporary.
Small neutral effect	Viewpoint 4	None	N/A	Small neutral effect. Minor significance. Temporary.
Medium adverse effect	Viewpoint 5	None	N/A	Medium adverse effect. Moderately significant. Temporary.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 11	None	N/A	Medium adverse effect. Minor significance. Temporary
Construction Phase – Plot 10b				
Negligible neutral effect.	Townscape Character	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Urban Grain	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Land Use	None	N/A	Negligible neutral effect. 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)
Negligible neutral effect	Building Heights	None	N/A	Negligible neutral effect. Not significant. Temporary.
No change	Movement and Linkages	None	N/A	No change. Not significant. Temporary.
No change	Public Open Space and Public Realm	None	N/A	No change -small neutral effect. Not significant. Temporary.
Small neutral effect	Site Character	None	N/A	Small neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 1	None	N/A	Medium adverse effect. Moderately significant. Temporary.
Negligible adverse effect	Viewpoint 2	None	N/A	Negligible adverse effect. Not significant. Temporary.
Small adverse effect	Viewpoint 3	None	N/A	Small adverse effect. Minor significance. Temporary.
Small neutral effect	Viewpoint 4	None	N/A	Small neutral effect. Minor significance. Temporary.
Medium adverse effect	Viewpoint 5	None	N/A	Medium adverse effect. Moderately significant. Temporary.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 11	None	N/A	Medium adverse effect. Minor significance. Temporary
Construction Phase – Plots 10a and 10b				
Small neutral effect.	Townscape Character	None	N/A	Small neutral effect. Minor significance. Temporary.
Small neutral effect	Urban Grain	None	N/A	Small neutral effect. Minor significance. Temporary.
Small neutral effect	Land Use	None	N/A	Small neutral effect. Minor significance. Temporary.
Small neutral effect	Building Heights	None	N/A	Small neutral effect. Minor significance. Temporary.
No change	Movement and Linkages	None	N/A	No change. Not significant. Temporary.
No change	Public Open Space and Public Realm	None	N/A	No change -small neutral effect. Not significant. Temporary.
Small beneficial effect	Site Character	None	N/A	Small neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 1	None	N/A	Medium adverse effect. Moderately significant. Temporary.
Negligible adverse effect	Viewpoint 2	None	N/A	Negligible adverse effect. Not significant. Temporary.
Small adverse effect	Viewpoint 3	None	N/A	Small adverse effect. Minor significance. Temporary.
Small neutral effect	Viewpoint 4	None	N/A	Small neutral effect. Minor significance. Temporary.
Medium adverse effect	Viewpoint 5	None	N/A	Medium adverse effect. Moderately 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)
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium adverse effect	Viewpoint 11	None	N/A	Medium adverse effect. Minor significance. Temporary

Table 14.14 – 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 (i.e., Temporary/Permanent)
Operational Phase – Plot 10a				
Small beneficial effect.	Townscape Character	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Urban Grain	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Land Use	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Building Heights	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Movement and Linkages	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Public Open Space and Public Realm	None	N/A	Small beneficial effect. Minor significance. Permanent.
Large beneficial effect.	Site Character	None	N/A	Small beneficial effect. Moderately significant. Permanent.
Medium beneficial effect	Viewpoint 1	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Negligible beneficial effect	Viewpoint 2	None	N/A	Negligible beneficial effect. Not significant. Permanent.
Small beneficial effect.	Viewpoint 3	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Viewpoint 4	None	N/A	Small beneficial effect. Minor significance.. Permanent.
Medium beneficial effect	Viewpoint 5	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
Negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. 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)
Medium beneficial effect	Viewpoint 11	None	N/A	Medium beneficial effect. Minor significance. Permanent.
Operational Phase – Plot 10b				
Small beneficial effect.	Townscape Character	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Urban Grain	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Land Use	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Building Heights	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Movement and Linkages	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Public Open Space and Public Realm	None	N/A	Small beneficial effect. Minor significance. Permanent.
Large beneficial effect.	Site Character	None	N/A	Small beneficial effect. Moderately significant. Permanent.
Medium beneficial effect	Viewpoint 1	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Negligible beneficial effect	Viewpoint 2	None	N/A	Negligible beneficial effect. Not significant. Permanent.
Small beneficial effect.	Viewpoint 3	None	N/A	Small beneficial effect. Minor significance. Permanent.
Small beneficial effect.	Viewpoint 4	None	N/A	Small beneficial effect. Minor significance. Permanent.
Medium beneficial effect	Viewpoint 5	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
No change/negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium beneficial effect	Viewpoint 11	None	N/A	Medium beneficial effect. Minor significance. Permanent.
Operational Phase – Plots 10a and 10b				
Medium beneficial effect.	Townscape Character	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Urban Grain	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Land Use	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Building Heights	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Movement and Linkages	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Medium beneficial effect.	Public Open Space and Public Realm	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Large beneficial effect.	Site Character	None	N/A	Medium beneficial effect. Moderately 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)
Medium beneficial effect	Viewpoint 1	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
Small beneficial effect.	Viewpoint 2	None	N/A	Small beneficial effect. Not significant. Permanent.
Small beneficial effect.	Viewpoint 3	None	N/A	Small beneficial effect. Moderately significant. Permanent.
Small beneficial effect.	Viewpoint 4	None	N/A	Small beneficial effect. Moderately significant. Permanent.
Medium beneficial effect	Viewpoint 5	None	N/A	Medium beneficial effect. Moderately significant. Permanent.
No change.	Viewpoint 6	None	N/A	No change. Not significant. Temporary.
No change.	Viewpoint 7	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 8	None	N/A	No change. Not significant. Temporary.
Negligible neutral effect	Viewpoint 9	None	N/A	Negligible neutral effect. Not significant. Temporary.
No change/negligible neutral effect	Viewpoint 10	None	N/A	Negligible neutral effect. Not significant. Temporary.
Medium beneficial effect	Viewpoint 11	None	N/A	Medium beneficial effect. Minor significance. Permanent.

Wind Microclimate

Table 14.15 – 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 Phase				
Lawson criteria met within the EIA Site and surrounding area.	Persons on foot, seated or travelling by bicycle	Not required.	Not required.	Negligible residual effect.

Table 14.16 – 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)
Operational Phase				
Lawson criteria met within the EIA Site and surrounding area.	Persons on foot, seated or travelling by bicycle	Not required.	Not required.	Negligible residual effect.

15. Type 1 Cumulative Effects

- 15.1. This section gives consideration to 'Type 1' cumulative effects.
- 15.2. The assessment is informed by the results of the technical assessments as set out in Chapter 6 - 13 of the ES.
- 15.3. 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.
- 15.4. 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

- 15.5. 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'.
- 15.6. The EIA Regulations require 'a description of the likely significant effects', including cumulative effects.
- 15.7. 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

- 15.8. 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

- 15.9. 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.
- 15.10. The EC guidelines 'are not intended to be formal or prescriptive, but are designed to assist EIA practitioners in developing an approach which is appropriate to a project'.
- 15.11. 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

- 15.12. 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.

- 15.13. 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.
- 15.14. 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 EIA Site (e.g. local residents and businesses located in close proximity to the EIA Site), likely cumulative effects, and their capacity to accommodate changes that will occur as a result of the combined residual environmental effects.
- 15.15. 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.
- 15.16. 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.
- 15.17. For the purposes of the assessment, receptor groups have been identified as those surrounding the EIA Site and those identified within the individual technical assessments.

Significance Criteria

- 15.18. 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.
- 15.19. 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

- 15.20. 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.
- 15.21. 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

- 15.22. 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.

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Cumulative Effects
Economic Growth and Employment	Moderate Beneficial impact on local employment during the construction phase (temporary).	No in combination effects.
Local Residents	Minor to moderate adverse acoustic impacts during the construction phase (temporary).	No in combination effects.
Carbon Emissions	Moderate adverse due to materials and vehicle movements required (temporary)	No in combination effects.
Townscape	Minor to moderate adverse impacts on the townscape and key views during the construction phase (temporary)	No in combination effects.

15.23. Table 15.1 shows that there are unlikely to be in-combination construction phase Type 1 cumulative effects.

Operational Phase

15.24. 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.

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Cumulative Effects
Economic Growth and Employment	Minor beneficial impact from the jobs created as a result of the Proposed Developments (permanent).	No in combination effects.
Social Infrastructure	Minor adverse impact due to the increased number of students who may need to use the facilities (permanent).	No in combination effects.
Housing Need	Major beneficial impact as a result of contributing to the shortfall of PBSA bedspaces in close proximity to the higher education facilities (permanent).	No in combination effects.
Local Residents	Minor adverse acoustic impacts during the operational phase (permanent). Minor to moderate adverse impact on the daylight and sunlight experienced by local residents (permanent)	Minor to moderate adverse impact.
Carbon Emissions	Minor to moderate adverse impact on carbon emissions and climate change (permanent)	No in combination effects.
Townscape	Minor to moderate beneficial impact on the surrounding townscape and key views.	No in combination effects.

Open Spaces	Major adverse impact on the sunlight received at James Grigor Square (permanent).	No in combination effects.
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- 15.25. Table 15.2 shows that there is potential for in-combination operational phase Type 1 Cumulative Effects to arise in relation to local residents. The interaction between residual daylight sunlight, and noise effects of the proposals on local residents is complex and varied, depending upon a range of factors such as the specific location of the residents. As such, it is not likely that one typical effect can be concluded, and a range of cumulative effects might be expected as shown. Although at times adverse effects may be experienced, it is not considered that these are significant and such effects will be appropriately controlled through the design and planning processes, and specific measures subject to planning conditions as appropriate. The effects must also be viewed within the much broader context of any adverse impacts being very localised to immediately surrounding buildings and that overall this is a small proportion of the surrounding neighbourhood and wider City Centre.

Mitigation Measures

- 15.26. Where relevant, the individual residual effects which contribute to the potential cumulation have been considered within the ES and mitigated where necessary and feasible.



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