

An architectural rendering of modern buildings, featuring a mix of low-rise and high-rise structures with large windows and balconies. The entire image is overlaid with a semi-transparent blue filter. The sky is filled with soft, white clouds.

July 2023
Environmental Statement

Upper Brook Street Masterplan **(McLaren / Kadans)**



Environmental Statement Volume 2: Main Text

Upper Brook Street Masterplan – McLaren / Kadans

July 2023

Environmental Statement Volume 2: Main Text

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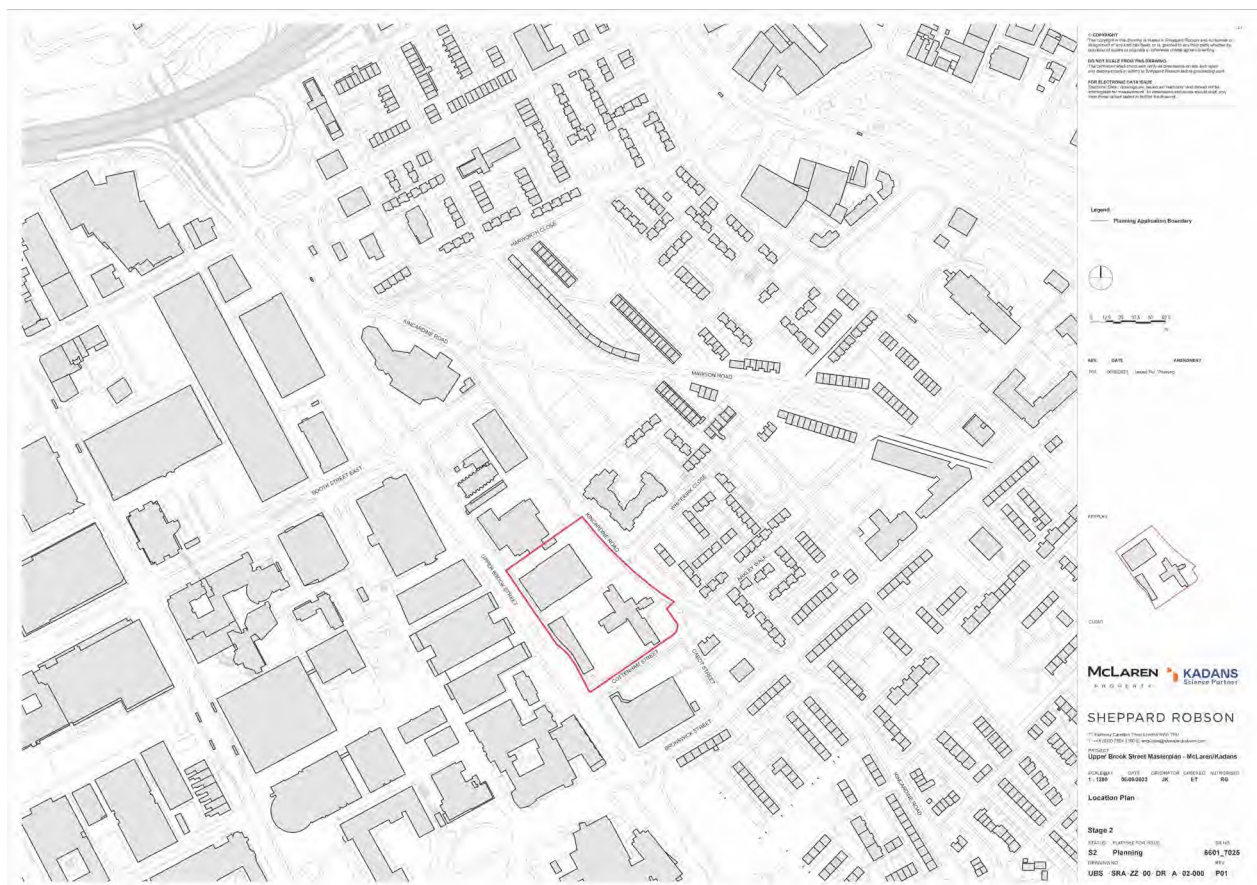
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1. Introduction

- 1.1 McLaren Property Ltd. and Kadans Science Partner (hereafter referred to as the 'Applicant') is seeking to obtain full planning permission for the development of new Sci-Tech laboratory and office space and purpose-built student accommodation (PBSA) (hereafter referred to as the 'Proposed Development') on a single plot of previously developed land that forms Upper Brook Street Masterplan – McLaren / Kadans (hereafter referred to as the 'Site').
- 1.2 The Site is located within the administrative authority of Manchester City Council (MCC) in the ward of Ardwick.
- 1.3 The Site Location Plan (see **Figure 1.1** below or **Volume 2a: Main Text Figures, Figure 1.1**) shows the planning application boundary edged red on an Ordnance Survey (OS) base map.

Figure 1.1: Site Location Plan



- 1.4 The Site is described in detail in **Volume 2: Main Text, Chapter 3: Site Description**. A detailed description of the Development is provided in **Volume 2: Main Text, Chapter 5: The Proposed Development**, which is supported by a series of plans and drawings.
- 1.5 Avison Young, who are competent Environmental Impact Assessment (EIA) experts have been commissioned by the Applicant to co-ordinate the process and produce the Environmental Statement (ES) for the Proposed Development. As such, this ES has been coordinated by Avison Young's Environmental Planning team who are members of the Institute of Environmental Management and Assessment (IEMA) EIA Quality Mark. This voluntary scheme demonstrates excellence in the field of Environmental Impact Assessment. Accreditation was achieved following the critical review of various ES prepared by Avison Young and a raft of in-depth interviews regarding the Team's professional experience, activities, business functions and contribution to innovation in the sector. On-going accreditation will be subject to continued independent evaluation by IEMA and the fulfilment of ongoing professional commitments.

The Site

- 1.6 The Site is 1.084 hectares (ha) in area and comprises a former Citroën car dealership, which is accessed from both Upper Brook Street (UBS) to the west and Kincardine Road to the east, and the former Elizabeth Yarwood Court residential complex, which is accessed from Kincardine Road to the east of the Site. The land uses surrounding the Site comprise University buildings to the west, residential dwellings and student accommodation to the east, retail to the south and commercial and student accommodation to the north.

Development Proposals

Outline of the Proposed Development

- 1.7 The planning application will be submitted to MCC. As previously described, the planning application seeks to obtain full planning permission.
- 1.8 In summary, the Proposed Development will comprise:
- Demolition of existing buildings;
 - Erection of Sci-Tech Building – The proposed building provides 13,723m² of combined laboratory and office space along with a ground floor publicly accessible café, meeting room suites throughout the building, and a secure cycle store and cycle changing. The building massing is split into a low level 6 storey block (inc. plant) to Kincardine Road, jumping up to 9 storeys (inc. plant) at Upper Brook Street, with an atrium to the centre of the floorplates that houses informal breakout spaces and forum seating at ground floor;
 - Erection of Purpose Built Student Accommodation (PBSA) Building – The proposed building provides 737 student bedrooms (288 studios and 449 cluster bedrooms arranged in a variety of cluster sizes), student

amenities, management suite, commercial / community spaces and supporting ancillary areas. The proposed PBSA scheme is arranged in two parallel building blocks with central cores, which are linked on the ground floor to form spaces for indoor and outdoor student amenities. The block facing Upper Brook Street has 23 storeys and the block facing Kincardine Road has 9 storeys;

- New Community Centre – A 293m² community centre is proposed to be provided at the ground floor of the PBSA building. The proposed Community Centre is envisaged as a multi-use, multi-purpose space for the whole community and will have an active frontage towards Kincardine Road; and
- Delivery of a high-quality landscaping and public realm provision including the new Thorburn Walk connecting Kincardine Road to Upper Brook Street.

1.9 The full description of the Development, as it appears on the planning application form is as follows:

“Full planning permission for the demolition of existing buildings and erection of a single 6 to 9 storey block for Sci-Tech use (Use Class E (g)(ii) and 267sqm of a café/bar (Use Class E (b), and a single 9 to 23 storey block to be used for Purpose Built Student Accommodation (Use Sui Generis), comprising 737 bedrooms in total and 293sqm of community use (Use Class F2 (b) and 80sqm of commercial floorspace (Use Class E) on Upper Brook Street Masterplan – McLaren / Kadans.”

1.10 Environmental constraints and potential adverse effects have been identified throughout the EIA process and, as a result, mitigation measures have been incorporated into the proposals through design (known as embedded mitigation). Where environmental mitigation measures have not been integrated into the proposals through design, it is expected that the requisite mitigation measures will be secured by appropriate planning conditions where relevant (known as additional mitigation). Mitigation has been identified, where appropriate, in each technical chapter of this ES (**Volume 2: Main Text, Chapters 6 to 11**) and is summarised in **Volume 2: Main Text, Chapter 13: Schedule of Additional Mitigation** for ease of reference.

1.11 A detailed description of the Proposed Development can be found in **Volume 2: Main Text, Chapter 5: The Proposed Development** of this ES, including the presentation of a series of plans and drawings.

The Planning Context

1.12 The Site is identified within the ‘Corridor Manchester Strategic Vision to 2025’¹ as part of an area currently occupied by and that is the focus for further knowledge-intensive organisations and businesses, operating in health, higher education, advanced materials, low carbon and digital services amongst others. The Oxford Road Corridor is an area running south from St Peter’s Square to Whitworth Park along Oxford Road, overlapping with the core of Manchester’s Central Business District. This strategic vision was complemented by the 2018 Oxford Road Strategic Spatial Framework². This spatial strategy was intended to provide a basis for guiding decision-making

¹ Manchester City Council et al, Corridor Manchester Strategic Vision to 2025

² Oxford Road Corridor Partnership March 2018 Oxford Road Strategic Spatial Framework

on planning applications and the preparation of land use, urban design, movement and development principles inform the Strategic Regeneration Framework and future policy.

- 1.13 The Oxford Road Corridor Strategic Regeneration Framework Guidance For land adjacent to Upper Brook Street, former Elizabeth Gaskell Campus, former Salvation Army and land adjacent to Birchall Way (SRFG) 2019³ identifies the area to the west of Upper Brook Street, east of Kincardine Road, north of Brunswick Street and south of Grosvenor Street as one of four sites to support the Oxford Road Corridor Institutions in their growth.
- 1.14 The Proposed Development forms one part of the Upper Brook Street site. The SRFG includes key diagrams for the area that establish heights, movement hierarchy, block plans, use, space and massing that have informed and guided the Proposed Development.

The Planning Application and Environmental Impact Assessment

EIA Context

- 1.15 EIA is a systematic process by which information about the scope and likely environmental effects of a proposed development are assessed and presented to the Local Planning Authority (LPA) (in this case, MCC), relevant stakeholders and the public to inform the decision on whether the development should be granted planning permission.
- 1.16 The Proposed Development constitutes 'EIA development' under the Town and Country Planning (Environmental Impact Assessment) (England) Regulations 2017 (SI 2017/571)⁴ as amended^{5, 6} (hereafter referred to as the 'EIA Regulations'). Criteria for establishing the need for an EIA are set out in Schedules 1 and 2 of the EIA Regulations. The Proposed Development falls under Schedule 2, Category 10 'Infrastructure Projects', Subsection (b) 'Urban Development Projects', and this ES has been prepared as the Proposed Development is likely to give rise to one or more significant environmental effects.
- 1.17 This document is the ES which reports the findings of the EIA and supports the planning application for the Proposed Development. It has been prepared by Avison Young with technical contributions from a range of specialist consultants experienced in EIA (see **Table 1.1** below or **Volume 3: Appendices, Appendix 1.1** for an overview of the profession experience of the individuals involved in the production of this ES). This ES provides sufficient environmental information to enable MCC to make an informed decision on whether to grant planning permission.

³ Manchester City Council Oxford Road Corridor SRFG 2019

⁴ HMSO. The Town and Country Planning (Environmental Impact Assessment) Regulations. 2017.

⁵ HMSO. The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018.

⁶ HMSO. The Environmental Assessments and Miscellaneous Planning (Amendment) (EU Exit) Regulations 2018.

Table 1.1: The Project Team

Discipline	Company
Client Team	
Applicant	McLaren Property Ltd.
	Kadans Science Partner
Design Team	
Architect	Sheppard Robson
Landscape Architect	Re:form Landscape Architecture
EIA Team	
Planning and EIA Coordination	Avison Young
Built Heritage, Townscape and Visual	Donald Insall Associates
Socio-economics	Brookdale Consulting
Wind Microclimate	Wilde Consulting Engineers
Daylight, Sunlight and Overshadowing	GIA Surveyors
Climate Change	Cundall
Transportation	Civic Engineers

- 1.18 This ES relates to the planning application which is defined by the description of the development and the detailed plans for development that accompany the application.

The Environmental Statement

- 1.19 The ES is divided into three volumes and the contents outlined below:

- **Volume 1: Non-Technical Summary** – A document providing a synopsis of the ES without utilising technical language. The summary includes a description of the Proposed Development, the potential environmental effects associated with the Proposed Development and the measures proposed to mitigate these effects.
- **Volume 2: Main Text** - This volume contains the main body of text of the ES, split into chapters. It provides an introduction, the approach to assessment, the assessment of alternatives, a description of the Proposed Development, a series of technical assessments relating to specific environmental topics including cumulative and combined effects and a summary of residual effects.
- **Volume 2a: Main Text Figures** – This volume contains the supplementary figures associated with the chapters in Volume 2: Main Text.
- **Volume 3: Appendices** – This volume contains supporting information and a collection of technical reports upon which the conclusions of the ES are based.

Environmental Statement Availability

- 1.20 The Non-Technical Summary, ES and Appendices are available for viewing at MCC Offices and on the MCC website⁷. Further copies of the ES and Appendices are available on CD at a cost of £25 from Avison Young. Contact details are as follows:

Avison Young

65 Gresham Street
London
Greater London
EC2V 7NQ

Contact: Patrick Duffy

Tel: 020 7911 2678

Manchester City Council

Floor 6 Town Hall Extension
Albert Square
Manchester
Greater Manchester
M60 2LA

Contact: Jennifer Atkinson

Tel: 0161 234 4561

⁷ MCC (2023) Planning Application Portal. Available at: <https://pa.manchester.gov.uk/online-applications/>

2. EIA Approach

Introduction

- 2.1 This chapter describes the methodology used to undertake the EIA in accordance with the Town and Country Planning (Environmental Impact Assessment) (England) Regulations 2017 (SI 2017/571)¹ as amended^{2, 3} (referred to as the '2017 EIA Regulations') and National Planning Practice Guidance (NPPG).
- 2.2 The chapter begins with a description of the general approach to assessment and EIA regulatory compliance, including how the planning applications and EIA are linked. EIA procedure and methodology is presented, then the stakeholder consultation process is explained, and the consultees listed, before the spatial and temporal scope of the assessment is discussed.
- 2.3 Following this, the criteria used for impact prediction, assessing significance and implementing and securing mitigation measures are explained, along with any limitations and assumptions. With regard to the methodologies and assumptions for the technical assessments, each chapter has its own specific assessment methodology and assumptions, which are explained within the relevant sections.
- 2.4 A wide range of experience, resources and skills have been coordinated in order to bring together the application. The Project Team, along with their professional roles, is presented at the end of this chapter.

EIA Procedure and Methodology

EIA General Approach

- 2.5 The EIA Regulations, supported by UK case law, provide the legal framework for the process of EIA and contents of Environmental Statements. This ES was prepared to comply with the 2017 EIA Regulations and reference was also made to currently available good practice guidance in EIA including:
- Impact Assessment Guidelines and ES Review Criteria from the Institute of Environmental Management and Assessment (IEMA)⁴.
 - Environmental Impact Assessment: A Guide to Good Practice and Procedures. A Consultation Paper⁵.

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

² HMSO. The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018.

³ HMSO. The Environmental Assessments and Miscellaneous Planning (Amendment) (EU Exit) Regulations 2018.

⁴ Institute of Environmental Management (IEMA). Guidelines for Environmental Impact Assessment. 2004.

⁵ Department for Local Communities and Local Government. Environmental Impact Assessment: A guide to good practice and procedures. A Consultation Paper. June 2006.

- IEMA Guidance 'Shaping Quality Development'⁶.
 - IEMA Guidance 'Delivering Quality Development'⁷.
 - Topic specific guidance referred to in **Volume 2: Main Text, Chapters 6 to 11**, where appropriate.
- 2.6 The assessment of likely significant environmental effects was based on current knowledge of the Site and its surrounding environment. The assessments addressed both the likely beneficial and adverse effects of the Development during the Site preparation, demolition and construction works required to facilitate the Development (the 'Works') and of the Development once completed and operational.
- 2.7 In line with legislative requirements, direct, indirect, cumulative, short-, medium-, long-term, permanent, temporary, beneficial and adverse effects are addressed where applicable. The approach taken in the assessment of cumulative effects and effect interactions is set out later in this Chapter and within **Volume 2: Main Text, Chapter 12: Effect Interactions**.
- 2.8 As part of the iterative EIA and design process, the design of the Development has evolved to take account of various environmental constraints and opportunities. In this respect, environmental desktop reviews, interim assessments of the emerging Development and relevant knowledge gained from environmental baseline surveys all worked to influence the evolution of the Development (refer to **Volume 2: Main Text, Chapter 4: Alternatives and Design Evolution**). Consequently, a number of potentially significant adverse environmental effects were 'designed out' or reduced in severity as part of the overall EIA and design process. Similarly, where feasible, potentially significant beneficial environmental effects were encouraged. In undertaking the assessment of likely significant environmental effects, such design measures (commonly referred to as 'Primary Mitigation') were considered as inherent components of the Development (refer to **Volume 2: Main Text, Chapter 5: The Proposed Development**).
- 2.9 Similarly, and in accordance with the Institute of Environmental Management and Assessment (IEMA) best practice guidance⁸, when identifying likely significant environmental effects, any methods of environmental management or protection that *"...will be required regardless of any EIA assessment, as is imposed, for example, as a result of legislative requirements and / or standard sectorial practices..."* (commonly known as 'Tertiary Mitigation') were reasonably assumed to be implemented. Examples include (not exhaustive):
- Implementation of a Construction Environmental Management Plan (CEMP);
 - Considerate Contractor practices; and
 - Remediation of contaminated land, appropriate to the end-use of the land.

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

⁷ IEMA. Environmental Impact Assessment Guide to Delivering Quality Development. July 2016.

⁸ IEMA. Environmental Impact Assessment Guide to Shaping Quality Development. 2015.

- 2.10 Following the assessment of the Development's likely significant environmental effects (inherently accounting for Primary and Tertiary Mitigation), any remaining likely significant adverse effects were identified. Furthermore, additional methods to prevent, reduce, ameliorate and / or offset any remaining significant adverse environmental effects were formulated (commonly referred to as 'Secondary Mitigation'). Such additional mitigation and any monitoring requirements necessary to ensure the efficacy of the mitigation measures are set out in detail within **Volume 2: Main Text, Chapters 6 to 11** and are summarised in **Volume 2: Main Text, Chapter 12: Schedule of Additional Mitigation**.
- 2.11 Following the identification of 'additional' Secondary Mitigation, the remaining likely significant residual effects of the Development were identified. The 'additional' Secondary Mitigation was reasonably assumed to be implemented.

Basis of Assessment

- 2.12 The planning application will be defined by detailed plans, an accommodation schedule. These plans, accommodation schedule along with the written description of the development set out in **Volume 2: Main Text, Chapter 5: The Proposed Development**, identify the development to be assessed for the purposes of the EIA process. This ensures the likely significant effects of the development will be assessed and appropriate mitigation measures identified.

Screening

- 2.13 Regulation 6 of the EIA Regulations makes provision for a developer to request a 'Screening Opinion' from the Local Planning Authority (LPA) to ascertain whether an EIA is required if a development is classed as a Schedule 2 development. This decision is based on the likelihood of significant environmental effects arising in relation to the development proposals. The Proposed Development falls within Schedule 2, Category 10 'Infrastructure Projects' Subsection (b) 'Urban development projects, including the construction of shopping centres and car parks, sports stadiums, leisure centres and multiplex cinemas' in the EIA Regulations (as the Proposed Development exceeds the 150 dwellings threshold, as set out in the EIA Regulations). Due to the scale and location of the Proposed Development, it has been assumed for the purposes of the planning application that a statutory EIA will be required and therefore the Applicant has undertaken an EIA in respect of the proposals without seeking a Screening Opinion from MCC.

Scoping

- 2.14 Scoping is a process that, through research and consultation, identifies the environmental issues that require assessment as part of the EIA. This essentially refines the focus of the EIA on the environmental aspects which are likely to result in significant environmental impacts whilst also ensuring that no potentially significant areas are

overlooked. This focussed and proportionate approach to EIA is encouraged within the online Planning Practice Guidance (PPG)⁹ which states:

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

- 2.15 The EIA Regulations provide an opportunity for applicants of planning applications to ask the relevant LPA to state in writing the information that ought to be provided in an ES. The result is a ‘Scoping Opinion’. The Applicant recognised the value of seeking a Scoping Opinion from MCC and so commissioned Avison Young to undertake an EIA Scoping Study.
- 2.16 The key issues to be addressed by the EIA were identified through use of statutory consultee on line data sources, consideration of other available environmental baseline information, together with professional judgement and relevant experience. The findings were presented in an Informal EIA Scoping Note that was submitted to MCC on the 3rd February 2023. A copy of the EIA Scoping Note can be found at **Volume 3: Appendices, Appendix 2.1** of this ES.
- 2.17 MCC’s informal Scoping Opinion was issued through an exchange of emails on the 8th and 16th March 2023 and the 5th April 2023 and can be found at **Volume 3: Appendices, Appendix 2.2**. These exchanges confirm the general acceptance of the scope proposed, confirm the viewpoints and which require render images for the townscape and heritage assessment and also confirm the need to scope into the EIA and assessment of the effects of the Proposed Development on transport.
- 2.18 The scoping process concluded that significant environmental effects would be likely in relation to the topics listed below and that these should be included in the EIA:
- Townscape, Visual and Built Heritage (refer to **Volume 2: Main Text, Chapter 6: Townscape, Visual and Built Heritage**);
 - Socio-economics (refer to **Volume 2: Main Text, Chapter 7: Socio-economics**);
 - Wind Microclimate (refer to **Volume 2: Main Text, Chapter 8: Wind Microclimate**);
 - Daylight, Sunlight and Overshadowing (refer to **Volume 2: Main Text, Chapter 9: Daylight, Sunlight and Overshadowing**);
 - Climate Change (refer to **Volume 2: Main Text, Chapter 10: Climate Change**); and

⁹ <https://www.gov.uk/guidance/environmental-impact-assessment#Preparing-an-Environmental-Statement1>.

- Transportation (refer to **Volume 2: Main Text, Chapter 11: Transportation**).

2.19 The EIA scoping process also identified that the Proposed Development would be unlikely to result in significant effects in respect of several environmental topics. This being the case, such environmental topics could be scoped out of the full EIA process and the ES. Further information regarding insignificant effects to be scoped out of the ES can be found by reference to **Volume 3: Appendices, Appendix 2.1** and **Appendix 2.2**.

Consultation

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

- MCC Development Management; and
- MCC Highways.

.19.2 All relevant comments from the consultees relating to the EIA, whether made directly to the Applicant's EIA Team or via the scoping responses are addressed in **Volume 2: Main Text, Chapters 6 to 11**.

EIA Methodology

2.20 In addition to observing the formal requirements of the EIA Regulations, further formal guidance has been drawn from National Planning Practice Guidance (NPPG). Specific technical guidance is referenced in the individual technical chapters as appropriate.

Consistency

2.21 To assist the reader in understanding the technical assessments a consistent approach has been adopted throughout the EIA to ensure that likely significant effects are identified and evaluated in a transparent manner. Each environmental assessment topic has adopted the following approach:

- Baseline Assessment and Identification of the Study Area;
- Identification of Sensitive Receptors;
- Identification of Embedded Mitigation Measures;
- Identification of Potential Effects during Construction and Operation of the Proposed Development (including indirect, direct, adverse and beneficial);
- Assessment of Impact Significance;
- Identification of Impact Significance;
- Identification of Mitigation Measures;

- Assessment of Residual Effects; and
- Assessment of Cumulative Effects.

Spatial and Temporal Scope of Assessment

2.22 The spatial extent of the EIA is described by the geographical area potentially affected by the Proposed Development and will need to take into account:

- The physical extent of the Proposed Development defined by the limits of land to be used both during construction and operation (temporary and permanent);
- The position of sensitive receptors within or outside of the Site boundaries; and
- The nature of the baseline environment and the way in which the impacts are likely to be propagated.

2.23 The effects for each of the disciplines are likely to extend to different spatial extents. The spatial scope for each discipline will be described within each of the topic chapters as required.

2.24 The environmental baseline studies undertaken as part of the EIA consider the current conditions of the Site. Therefore, each technical chapter will contain a description of the relevant study area that may be affected by the Proposed Development.

2.25 With reference to the baseline conditions, the impact assessment will be made against existing baseline conditions. The assessment will address effects arising from the construction and operation of the Proposed Development as follows:

- Construction effects may arise directly from construction activities but also from the temporary use of land (e.g. construction sites) or from associated changes in traffic movements; and
- Operational effects may arise from the permanent operational activities and ongoing use of the Proposed Development and new infrastructure, including but not limited to highways, noise, and air quality.

2.26 The significance of the effects that will arise in each of these phases is based on any changes compared to the baseline conditions (i.e. those conditions which would exist if the Proposed Development did not go ahead).

2.27 The Proposed Development is expected to have a design life of at least 60 years and would be maintained and upgraded as required. Therefore, the EIA does not cover the decommissioning of the Proposed Development. In addition, the likely impact of any decommissioning, maintenance and upgrade works would be no worse than those discussed for the construction phase of the Proposed Development.

Impact Prediction

2.28 Schedule 4 of the 2017 EIA Regulations state that an ES should include:

"A description of the likely significant effects of the development on the environment resulting from inter alia:

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

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

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

The risk to human health, cultural heritage or environment (for example accidents and disasters);

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;

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

The technologies and substances used."

2.29 Predictions of environmental impacts are carried out using quantitative methods, or in some cases, qualitative terms using expert opinion. All assumptions used and any areas of uncertainty are defined in the relevant chapters.

2.30 The following types of effect are considered:

- Direct impacts that arise from activities that form an integral part of the Proposed Development (e.g. new infrastructure / land take);
- Indirect impacts that arise from activities not explicitly forming part of the Proposed Development (e.g. noise changes due to changes in road traffic flows on existing roads resulting from the operation of the development);
- Permanent impacts that result from an irreversible change to the baseline environment (e.g. land take) or impacts which persist for the foreseeable future (e.g. visual impact);
- Temporary impacts that persist for a limited period only, for example, due to particular construction activities (e.g. noise from construction plant);
- Beneficial impacts that have a positive influence; and
- Adverse impacts that have a negative influence.

Significance Criteria

- 2.31 The significance of effect is assessed by looking at what the changes will be against the existing or predicted baseline as a result of both the construction and operation of the development. It is a product of the sensitivity of the receptor, and the magnitude of the impact upon it. The criteria used to define the sensitivity of a receptor and magnitude of impact is provided in **Table 2.1** and **Table 2.2** below. These criteria are used as a guide only and the specific criteria for each technical assessment will be presented within each chapter.

Table 2.1: *Description of the Sensitivity of an Environmental Receptor*

Sensitivity	Typical Descriptors
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

- 2.32 Descriptions of the magnitude of impact are provided in **Table 2.2** below.

Table 2.2: *Description of the Magnitude of an Impact*

Magnitude of Impact	Impact Type	Typical Criteria Descriptors
Very Large	Adverse	Loss of resource and / or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Large	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Medium	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (potentially more) key characteristics, features or elements.

Magnitude of Impact	Impact Type	Typical Criteria Descriptors
	Beneficial	Minor benefit to, or addition of, one (potentially more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Small	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No Change	N/A	No loss or alteration of characteristics, features or elements; no observable in either direction.

2.33 A typical significance of effects assessment matrix is provided in **Table 2.3** below.

Table 2.3: Typical Matrix for the Assessment of the Significance of Effects

Sensitivity / Value	Magnitude of Impact				
	No Change	Small	Medium	Large	Very Large
Very High	Negligible	Minor Adverse / Beneficial	Major or Moderate Adverse / Beneficial	Major Adverse / Beneficial	Major Adverse / Beneficial
High	Negligible	Minor Adverse / Beneficial	Moderate or Minor Adverse / Beneficial	Major or Moderate Adverse / Beneficial	Major Adverse / Beneficial
Medium	Negligible	Minor Adverse / Beneficial or Negligible	Minor Adverse / Beneficial	Moderate or Minor Adverse / Beneficial	Major or Moderate Adverse / Beneficial

Sensitivity / Value	Magnitude of Impact				
	No Change	Small	Medium	Large	Very Large
Low	Negligible	Minor Adverse / Beneficial or Negligible	Minor Adverse / Beneficial or Negligible	Minor Adverse / Beneficial	Moderate or Minor Adverse / Beneficial
Negligible	Negligible	Negligible	Minor Adverse / Beneficial or Negligible	Minor Adverse / Beneficial or Negligible	Minor Adverse / Beneficial

Effects highlighted in **orange** are significant in EIA terms.

Identification of Significant Effects

2.34 Based on the sensitivity and magnitude criteria set out above, specific significance criteria have been used in each technical assessment and these are explained in the methodology sections within each technical chapter. Often, these are based on clearly defined criteria from published best practice guidance. However, wherever possible, the following terminology has been utilised:

- Major Beneficial;
- Moderate Beneficial;
- Minor Beneficial;
- Negligible;
- Minor Adverse;
- Moderate Adverse; and
- Major Adverse.

2.35 Each technical chapter will set out what level of effect is considered to be significant. However, generally the technical specialists advise that Major Adverse / Beneficial, Major to Moderate Adverse / Beneficial and Moderate Adverse / Beneficial effects are considered to be significant. In certain circumstances, based on the effects in question, Minor Adverse / Beneficial effects may be considered significant, and equally not significant. This conclusion is an observation based on professional judgment.

2.36 The assessment of likely significant effects has been undertaken for all potential effects to determine their relative importance. This has taken into account the following considerations:

- Magnitude (size of impact);
- Sensitivity of the surrounding environment and receptors;
- Spatial extent (size of the area affected);
- Duration (short, medium or long term);
- Nature of the effect (direct or indirect, reversible or irreversible);
- Inter-relationships and combination effects;
- International, national or local standards; and
- Relevant policy guidance.

Mitigation

2.37 The development of measures designed to avoid, reduce or offset significant adverse environmental effects associated with a proposal is one of the key elements of EIA. Measures to mitigate environmental effects of the Proposed Development can take two forms;

- Embedded mitigation is the mitigation embedded into (and which forms part of) the Development itself which has the effect of avoiding, reducing or offsetting significant adverse effects, determined during the course of the assessment; and
- Additional or further mitigation is the mitigation that is not embedded into the Development itself and which is imposed through planning condition or planning obligation.

2.38 Where environmental mitigation measures have not been integrated into the Proposed Development through design, it is expected that all other requisite measures or 'additional mitigation' will be secured by appropriate planning conditions or legal obligations. Descriptions of these mitigation measures are included in the appropriate technical chapters and summarised in **Volume 2: Main Text, Chapter 13: Schedule of Additional Mitigation**.

Cumulative Effects

2.39 In line with Schedule 4 Paragraph 5(e) of the EIA Regulations, an ES must provide a description of the likely significant effects of a project on the environment resulting from:

"...the culmination of effects with other existing and / or approved projects..."

2.40 Such effects are known as 'cumulative effects'.

2.41 Given that existing development forms part of the environmental baseline conditions relevant to the Site and the Proposed Development, the potential for cumulative effects focuses as a minimum on those developments with:

- A resolution to grant planning permission.

- A valid planning permission and yet to start on-site.
 - A valid planning permission and under construction.
- 2.42 The cumulative effects assessment will also consider developments which are reasonably expected to be carried out on a programme which will potentially result in cumulative impacts. These are referred hereafter as 'Cumulative Schemes'.
- 2.43 Cumulative Schemes for consideration in the Cumulative Effects Assessment (CEA) were initially identified through a planning application search of the MCC Planning Portal. The search area extended to a 1km radius from the Site boundary. This process identified a series of projects to be included within the CEA. No additional Cumulative Schemes were identified through the EIA Scoping responses.
- 2.44 In addition to the above it was also decided to include an assessment of the emerging proposals for the remainder of the Upper Brook Street regeneration area on plots to the north of the Site. While this is not a 'Cumulative Scheme' as defined above these proposals do form part of the overall regeneration area and are likely to be the subject of a planning application while the Proposed Development is being considered by MCC. Therefore, a consideration of this Cumulative Scheme with the Proposed Development will provide MCC with a comprehensive assessment of the overall effects of the regeneration area along Upper Brook Street.
- 2.45 The list of Cumulative Schemes considered as part of the CEA are identified in **Table 2.4** which should be read in conjunction with **Figure 2.1**. Following the agreement of the list of Cumulative Schemes to be included within the ES, the topic specialists have identified which Cumulative Schemes fall within the zone of influence of that topic. Inter-project cumulative effects are considered within each topic chapter of the ES (**Volume 2, Chapters 6 to 11**).
- 2.46 It is important to note that each environmental topic assessed as part of the EIA process, and reported within **ES Volume 2: Main Text, Chapters 6 to 11**, may not necessarily need to consider all Cumulative Schemes. Accordingly, the approach to the assessment of cumulative effects was tailored to the particular environmental topic being considered. Full justification is provided within **Volume 2: Main Text, Chapters 6 to 11**.

Table 2.4: List of Cumulative Schemes

No.	Planning Reference	Description of Development	Status	Distance and Direction from the Site
1*	101664/FO/2013/N2	Brunswick Neighbourhood Selective demolition and clearance (including a number of residential, retail and other non-residential buildings) to allow the phased redevelopment and refurbishment of the Brunswick Neighbourhood, including the erection of 444 new	Application validated: 18 February 2013. Application approved: 30 May 2013. Construction started and nearing completion, with only	Encompasses the southern half of the Site along with the surrounding Brunswick area

No.	Planning Reference	Description of Development	Status	Distance and Direction from the Site
		residential dwellings (C3); the refurbishment of 839 existing homes [including low rise reversals and the refurbishment of Artillery Court, Silkin Court, Lockton Court, Lamport Court, and existing maisonettes and low rise houses]; a new boulevard and new access roads, new car parking and service areas; a new mixed use building comprising of 4 retail units (A1 or launderette or A5), and a neighbourhood housing office (B1a) with 18 apartments (C3) above; a mixed use residential extra care home with 60 residential units, and a day care centre on part of the ground floor (C2/D1); the upgrading of Gartside Gardens [with new multi-use games area, a new playground, realigned pathways, new entrances and new landscaping]; a new orchard; 25 new allotments; new boundary treatments; new open spaces; with associated infrastructure, landscaping and tree planting.	the construction of the Linden Homes development at the intersection of Upper Brook Street and Brunswick Street remaining.	
2**	N/A	Upper Brook Street Masterplan – PAG / Moda Living Demolition of structures associated with the former BMW Williams Dealership and the erection of up to 3 buildings comprising of student accommodation and up to 2 buildings comprising life sciences use, up to 120m in height.	Currently in the pre-application stage.	Adjacent to the Site's north-western boundary.
3	124472/FO/2019	Kincardine Court Extension Erection of a part 4, part 5, part 6 storey extension to existing student accommodation building to form 25 additional student flats (comprising 100 bedrooms) (Use Class Sui Generis) to form 86 student flats in	Application validated: 14 August 2019 Application approved: 06 December 2019.	15m north-east.

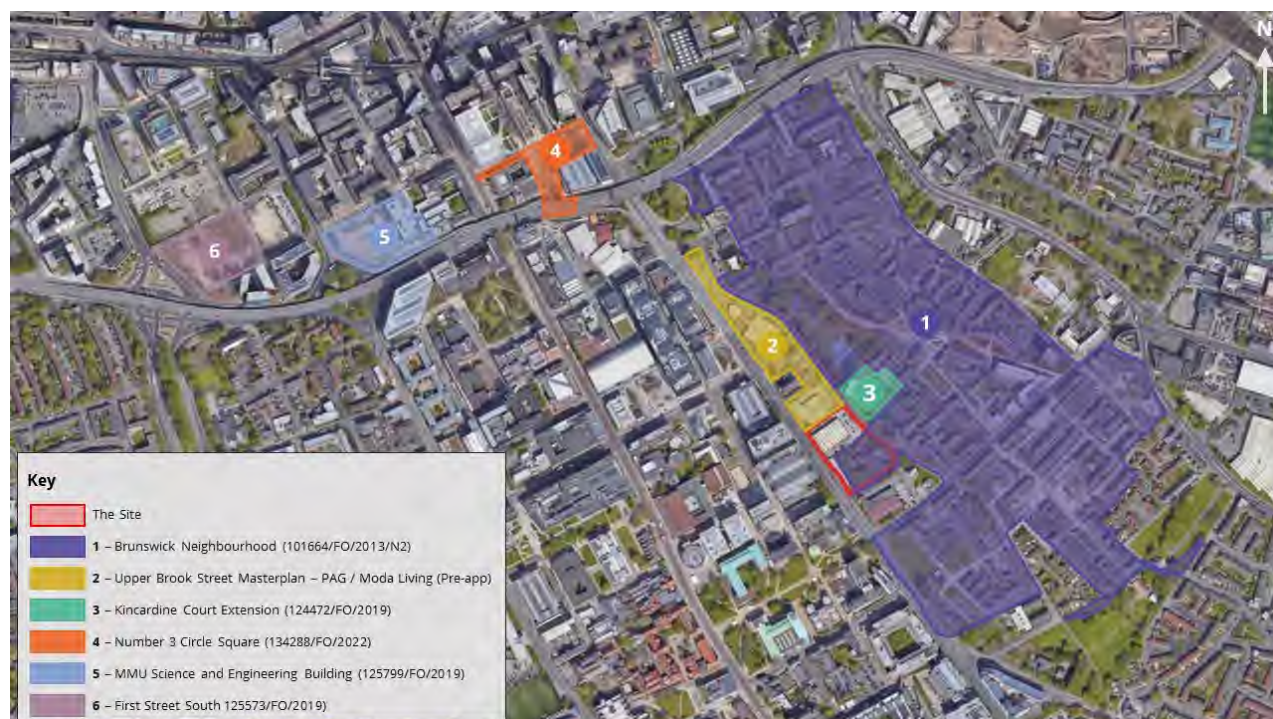
No.	Planning Reference	Description of Development	Status	Distance and Direction from the Site
		total (329 bedrooms) following removal, modification and reconfiguration of existing car parking, landscaping and boundary treatment together with the erection of a single storey water tank.	Construction completed: October 2022.	
4	134288/FO/2022	Number 3 Circle Square Erection of 15 storey building comprising office space (Use Class E(g)(i)) and ancillary flexible commercial uses (Use Class E), rooftop terrace, highway works, landscaping, and other associated works.	Application validated: 19 July 2022. Application approved: 04 November 2022. Groundworks started: 06 December 2022.	570m north-west.
5	125799/FO/2019	MMU Science and Engineering Building Demolition of existing John Dalton West Building and associated structures, and erection of a new 7 storey education building (Use Class D1) for the Faculty of Science and Engineering (comprising teaching and research spaces, academic offices, social learning areas, catering/kitchen facilities and an energy centre), physical connections to and external refurbishment of the John Dalton Tower, hard and soft landscaping works, car and cycle parking and associated works.	Application validated: 20 December 2019. Application approved: 12 March 2020. Construction started: 14 April 2021.	720m north-west.
6	125573/FO/2019	First Street South Construction of four buildings of heights varying from 10 storeys to 45 storeys together comprising Co-living bedspaces (use class sui generis) and associated amenity facilities, with ground floor commercial units (Use classes A3 (Café / Restaurant and D2 (Gym)), private amenity space and public realm comprising hard and soft	Application validated: 22 January 2020. Application approved: 09 March 2021. Construction started: 21 March 2022.	925m north-west.

No.	Planning Reference	Description of Development	Status	Distance and Direction from the Site
		landscaping, car parking and cycle facilities and other associated works.		

* A significant amount of Cumulative Scheme No. 1 (Brunswick Neighbourhood) is already built-out, and therefore a part of the baseline environment for the EIA. The remainder that is not built out, i.e. the Linden Homes development on the intersection of Upper Brook Street and Brunswick Street, are considered to be the 'cumulative' element for the EIA.

** Cumulative Scheme No. 3 (Kincardine Court Extension) has since been constructed and is therefore now a part of the baseline environment.

Figure 2.1: Map of Cumulative Schemes



- 2.47 The assessment of all cumulative effects reasonably assumes that all mitigation relevant to the Development and Cumulative Schemes would be implemented. For this reason, only the likely residual cumulative effects and their significance are identified. Such effects are considered for the construction phase and for the completed, occupied and operational Development.
- 2.48 The extent to which likely significant cumulative effects can be quantified and / or qualified is dependent upon the information available for each of the Cumulative Schemes. However, where possible, the determination of likely significant cumulative effects was informed by professional and expert judgement, calculations and / or detailed, scientific modelling with the significance of the likely cumulative effect(s) being defined as previously noted.

Effect Interactions

- 2.49 It is common practice for an ES to acknowledge effect interactions; that is, the combination of different environmental effects resulting from one project upon individual sensitive receptors, or a set of sensitive receptors.
- 2.50 The likely significant effect interactions arising from the Proposed Development are considered for the construction phase and for the completed and operational Development. The assessment of effect interactions as presented in **Volume 2: Main Text, Chapter 12: Effect Interactions** draws from the results of the assessments presented in **Volume 2: Main Text, Chapters 6 to 11**.

Limitations and Assumptions

- 2.51 The EIA has been undertaken based on the planning application drawings and description of the development submitted with the planning applications. The technical assessments have been based on the current land uses and the existing baseline conditions at the Site. Any assumptions made or limitations relating to individual technical assessments are presented, where applicable, in the relevant technical chapters.

3. Site Description

Introduction

- 3.1 This chapter provides a description of the Site including a description of the location, a brief site history and a description of its surrounding area and context. It also summarises the potential environmental constraints to the development of the Site.

Site Location

- 3.2 The Site is located to the east side of Upper Brook Street to the south of Manchester City Centre. The Site is bounded by Upper Brook Street to the west, Kincardine Road to the east, Cottenham Street to the south and to the north of the Site is a vacant single-storey commercial building (also identified for redevelopment within the Oxford Road Corridor SRFG) and the Grade II* listed 'Former Unitarian Chapel' which now functions as student accommodation.
- 3.3 The area to the west of the Site is dominated by the University of Manchester's Main Campus, which includes the National Graphene Institute, the Manchester Engineering Campus and the Sir Henry Royce Institute, with buildings ranging from four to ten storeys in height of a modern design.
- 3.4 The area to the east of the site is predominantly residential with a mix of two storey housing and four to six storey student accommodation. This development forms part of the wider Brunswick Estate. The Brunswick Estate is an area currently undergoing extensive urban regeneration (see Cumulative Scheme 1 (Brunswick Neighbourhood)).
- 3.5 To the south is a large footprint two storey commercial building occupied by the Tai Wu restaurant and W.H. Lung Supermarket with residential development beyond.
- 3.6 The Site Location Plan is presented at **Volume 2a: Main Text Figures, Figure 1.1**.

Site Description

- 3.7 The Site, shown from an aerial view of the Site in **Figure 3.1** below, has an area of 1.084 hectares (ha) and is partially in use as a temporary paid car park. The paid car park is located on a section of the Site which was formerly in use as a Citroën car dealership and is accessed from both Upper Brook Street to the west and Kincardine Road to the east. In the eastern half of this part of the Site, fronting onto the Upper Brook Street, is the former Citroën dealership pavilion. In the western half of the Site is the former Citroën dealership showroom

and an area of associated hardstanding that is currently used on a temporary basis for paid car parking, along with a small, shed structure.

- 3.8 The remainder of the Site comprises the now vacant Elizabeth Yarwood Court residential complex, which is accessed from Kincardine Road to the east of the Site, and which comprises of a 1-storey 'cross-shaped' main building and an associated landscaped garden. Heads of Terms have been agreed between MCC and Kadans Science Partner 8 UK Ltd. in connection with the former Elizabeth Yarwood Court site.

Figure 3.1: Aerial View of the Site



- 3.9 The Site is identified for redevelopment within the Oxford Road Corridor SRFG with mixed commercial uses in-line with the SRFG. The Proposed Development forms one element of the wider Upper Brook Street Illustrative Masterplan.

Ecology and Arboriculture

- 3.10 A Preliminary Ecological Appraisal¹ of the Site has been undertaken. It found that much of the Site is hard surfaces and of minimal ecological value though there is a line of introduced shrubs along Upper Brook Street. There are vegetated areas associated with the former Elizabeth Yarwood Court and separate road verges. The garden areas associated with Elizabeth Yarwood Court include amenity grass, planting beds including vegetable

¹ Brooks Ecological (Feb 2023) Upper Brook Street, Manchester Preliminary Ecological Appraisal

and ornamental areas, shrub borders and some paved footpaths and patio areas which includes a diverse array of common garden plants. The invasive species cotoneaster was noted throughout planting, whilst rhododendron and Japanese rose are also present. The roadside verges and other peripheral grassed areas include an array of common grass and Forbs species.

- 3.11 None of the trees on the Site have more than a 'Negligible' suitability to support roosting bats. However, part of Elizabeth Yarwood Court does have the potential to support roosting bats. No evidence of badger activity has been found on the Site.
- 3.12 An Arboriculture Survey² identified three hedgerows and 22 trees on the Site. All hedgerows were determined to be of moderate quality. Of the trees 12 were determined to be of low quality, nine of moderate quality and one of poor quality.

Flood Risk and Drainage

- 3.13 The nearest Main River is the River Medlock and is located approximately 590m north-east of the Site at its closest point. The culverted Cornbrook river, a tributary of the River Irwell, is located approximately 75m south-east of the Site at its closest point where it crosses underneath Upper Brook Street. The Site is located partly within Flood Zone 1 (indicating a less than 0.1% chance of flooding each year) and Flood Zone 2 (indicating between a 0.1% - 0.5% chance of flooding each year). The areas of the Site situated within Flood Zone 2, and which are at the greatest risk of flooding from fluvial sources, are largely confined to the north, the east and the centre of the Site.
- 3.14 The northern extent and the eastern corner of the Site is primarily at 'Low' risk (indicating between a 0.1% to 1% chance of flooding each year) of surface water flooding. A small area of medium risk 1% to 3.3% chance of surface water flooding is located centrally on the Site. The remainder of the Site is at 'Very Low' risk (indicating a less than 0.1% chance of flooding each year) of flooding from surface water sources.
- 3.15 The Site is not at risk of flooding from tidal / coastal or reservoir sources.

Site Planning History

- 3.16 The full planning history of the Site is provided within the planning application's Supporting Planning Statement (SPS). A summary of the planning history of the Site, relevant to the EIA, is provided below:
- All previous applications relating to the northern section of the Site have been in association with its former use as a car dealership. This part of the Site has not been subject to any planning applications in the last 5 years.

² Arbtech (2023) Arboricultural Survey to BS5837:2012

- The southern section of the Site has been subject to previous applications in association with its former use as sheltered housing. More notably, the southern section has also comprised part of an application for the widescale redevelopment and refurbishment of the Brunswick Neighbourhood. The original application for the redevelopment of Brunswick Neighbourhood (ref: 101664/FO/2013/N2) was approved in October 2016 and gained consent for the demolition of the existing building on-Site, Elizabeth Yarwood Court, and the redevelopment of the southern section Site for residential housing. A series of associated discharge of conditions, non-material amendments and Section 73 applications have followed. An executive Committee Report has been published by MCC (July 2021) removes Elizabeth Yarwood Court from the Brunswick Neighbourhood to reposition its redevelopment in line with the wider Upper Brook Street Masterplan.

4. Alternatives and Design Evolution

Introduction

- 4.1 A statutory requirement for inclusion in an ES is the reporting of the consideration of alternatives which have been considered by the Applicant in the development and evolution of a proposal. Schedule 4 of the EIA Regulations states that an ES is required to provide:

“A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”

- 4.2 This chapter describes the alternatives that were studied by the Applicant for the Proposed Development and the process of design evolution in response to the EIA process.
- 4.3 Firstly, the chapter considers the ‘no development’ option, which describes the likely conditions at the Site in the absence of implementing the Proposed Development.
- 4.4 Secondly, the constraints and opportunities identified in relation to the Site have been considered and have influenced the design of the Proposed Development. The Applicant and the design team have undertaken a continuous review process to improve the design, taking into account the views of key consultees, stakeholders and the public. This design evolution process is described in detail and the reasons for the selection of the preferred option stated.

Policy Context

- 4.5 The design principles and evolution of the Proposed Development has been guided by a number of key documents, as listed below:
- **Oxford Road Corridor Strategic Spatial Framework** – in March 2018, Deloitte LLP published the Oxford Road Corridor Strategic Spatial Framework (SSF) on behalf of the Oxford Road Corridor Partnership. The SSF establishes a number of important placemaking principles for the Site, such as an emphasis on the quality and design of public realm and architecture within denser developments; the creation of new, and enhancement of existing, connections between existing neighbourhoods and the Site through improved permeability and pedestrian / cycle connections; and the requirements for supporting infrastructure (e.g. energy, power and drainage) to provide capacity for future growth along the Oxford Road Corridor.

- **Oxford Road Corridor Strategic Regeneration Framework Guidance (SRFG)** – in September 2019, Deloitte LLP published the Oxford Road Corridor SRFG on behalf of Manchester City Council (MCC). The SRFG identifies a number of sites across the Oxford Road Corridor suitable for redevelopment, which includes the Site itself and the wider Upper Brook Street area.
- **Upper Brook Street Illustrative Masterplan** – Alongside the Oxford Road Corridor SRFG, an Illustrative Masterplan was prepared for the wider Upper Brook Street site to highlight the key development principles and to demonstrate how they could be delivered.
- **MCC Core Strategy Development Plan** – Adopted in July 2012, the MCC Core Strategy Development Plan is the key document to guide development in the City of Manchester over the plan period (2012 - 2027).

4.6 A full overview of the policy context of the Site is provided within the Supporting Planning Statement (SPS) submitted as part of the planning application.

The 'Do-Nothing / No Development' Option

4.7 The 'no development option' evaluates the likely environmental conditions at the Site in the absence of implementing the Proposed Development. Schedule 4 of the EIA Regulations states that the assessment provide *"an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed"*. Details regarding the existing baseline conditions of the Site and its surrounds for all environmental topics scoped into this ES are provided within **Volume 2: Main Text, Chapters 3, 6 to 11** inclusive.

4.8 In the absence of the Proposed Development, the baseline environment is not anticipated to change from the existing conditions as predominantly underutilised commercial land and a care home building with an area of landscaped garden. As previously noted, the Site is identified for redevelopment in Oxford Road SRFG 2019, and as such, it is likely that the Site will be developed if the current proposal was not made such that the 'no development' scenario is unrealistic.

4.9 Should the Proposed Development not be permitted, it would be expected that the existing on-Site condition and activities would remain until another proposal is permitted although in this scenario the current Site conditions would remain until future development occurs. As such, a review was undertaken of the environmental topic areas scoped into this ES, to determine the implications in terms of evolution of the environmental baseline conditions if the Proposed Development were not to come forward.

Townscape, Visual and Built Heritage

4.10 In the 'no development' scenario, the Site would remain in its current condition as comprising predominantly underutilised commercial land with a care home building and an area of landscaped garden. As such, the existing

townscape and visual conditions would remain as present and there would be no effects on townscape characteristics or visual amenity.

- 4.11 In the 'no development scenario', the setting of the surrounding heritage assets would remain unchanged by the Proposed Development. However, should the planning application be approved, Upper Brook Street Masterplan – PAG / Moda Living would be constructed regardless resulting in a change to the setting of the surrounding heritage assets. Should the Proposed Development not go ahead, any previously unknown archaeological remains would remain in situ beneath the Site.
- 4.12 Details of existing landscape and visual conditions and attributes relevant to the Site are provided in **Volume 2: Main Text, Chapter 6: Townscape, Visual and Built Heritage**.

Socioeconomics

- 4.13 The Site is currently vacant; however it does contain a former car dealership and a former care home. The Site currently supports no permanent employees, though there is some part-time employment generated through security operations and maintenance of the Site. The Proposed Development would replace the existing uses with that of Sci-Tech and PBSA, along with the direct and indirect jobs that may be associated with them. The Proposed Development would result in an increase in jobs during the construction and operational phases which would not be achieved if the Site was not to be developed.
- 4.14 In the no development scenario, the Site would remain in its current condition. Nevertheless, the evolution of the baseline conditions at the wider district (MCC) and regional (Northwest) level could be expected to continue to evolve, as the Cumulative Schemes are completed, in line with relevant policy. As such, over the long-term and beyond the Site, opportunities would exist for the provision of new commercial land uses and other economic benefits.
- 4.15 An assessment of the effect of the Proposed Development on socioeconomics is provided in **Volume 2: Main Text, Chapter 7: Socio-economics**.

Wind Microclimate

- 4.16 In the no development situation, the existing built form and massing of the Site would remain. Accordingly, the wind microclimate of the Site and its surrounds would also remain as per the present day. Details of wind modelling for the existing Site situation are provided in **Volume 2: Main Text, Chapter 8: Wind Microclimate**.
- 4.17 Again, with reference to **Volume 2: Main Text, Chapter 8: Wind Microclimate**, the presence of relevant Cumulative Schemes did not give rise to any significant changes to wind microclimate conditions in and around the Site. It is therefore judged that even accounting for relevant Cumulative Schemes, existing wind conditions in and around the Site would, in the no development situation, exist over the long-term.

Daylight, Sunlight and Overshadowing

- 4.18 In the no development situation, the existing built form, massing and vegetation of the Site would remain. Accordingly, level of daylight and sunlight to surrounding residential properties would remain as per the present day, as would levels of overshadowing to amenity spaces surrounding the Site. Details of existing daylight, sunlight, overshadowing and solar glare levels for the existing Site situation are provided in **Volume 2: Main Text, Chapter 9: Daylight, Sunlight, Overshadowing**.
- 4.19 The presence of relevant Cumulative Schemes would result in effects on levels of daylight, sunlight, overshadowing and solar glare regardless of whether the Development is implemented. Details of the cumulative daylight, sunlight, overshadowing and solar glare impacts are provided in **Volume 2: Main Text, Chapter 9: Daylight, Sunlight, Overshadowing**.

Climate Change

- 4.20 If the Proposed Development were not to come forward, and the Site remained in its current largely undeveloped state, the Site would continue to contribute minimally to greenhouse gas emissions.
- 4.21 Over the longer term it could be expected that technological advances to reduce greenhouse gas emissions and a strong behavioural / social agenda to reduce greenhouse gas emissions, it is conceivable that over the long-term greenhouse gas emissions in the wider area could well reduce.
- 4.22 A climate change assessment of the Proposed Development is provided in **Volume 2: Main Text, Chapter 10: Climate Change**.

Transportation

- 4.23 In the Site's vacant form, there are a negligible number of vehicle trips generated. Should the Proposed Development not come forward, it is expected that traffic conditions would remain unchanged from their current state. Development of the Site will result in an increase of trips on the strategic road network.
- 4.24 An assessment of the potential effects of the Proposed Development upon traffic conditions is included in **Volume 2: Main Text, Chapter 11: Transportation**.

Key Design Drivers and Design Evolution

Key Design Drivers

- 4.25 The design of the Proposed Development has been informed through an environmental constraints analysis. The key design drivers for the Proposed Development include:

Building 1 – Sci-Tech Building

- Constraints:
 - The Fire Strategy requires a 15m buffer between the Sci-Tech building and the PBSA building, as well as a 6.3m buffer from the centre of Cottenham Street to the Sci-Tech building. This has defined the eastern and western footprints of the Sci-Tech building.
 - In response to pre-application feedback from MCC, access to the PBSA building for servicing is required directly from Kincardine Road, this has influenced the layout and landscaping of the rear service yard.
- Opportunities:
 - The offset from Kincardine Road allows for landscaping to create a pedestrian and cycle connection into the Site.
 - The 15m buffer zone between the PBSA and Sci-Tech buildings allows for the creation of a new pedestrian and cycle route and area of public realm between the two buildings called Thorburn Walk. Thorburn Walk will create a vital link between Upper Brook Street and Kincardine Road and create an active frontage for the proposed Sci-Tech and PBSA buildings.
 - A landmark location with the opportunity to create active frontages to encourage pedestrian foot traffic.

Building 2 – PBSA

- Constraints:
 - Due to PBSA adjacency to the Sci-Tech Building, a 15m offset has been allowed in the design to improve views from student rooms and overlooking.
 - Likewise, a 6m offset has been allowed from the northern site boundary to provide 12m offset in total.
 - The existing sewer location and perimeter 4m no-build zone requires an additional offset from Kincardine Road.
 - Servicing access is from Kincardine Road in response to feedback from MCC. This constrains the Ground Floor layout and plant location to this area.
- Opportunities:
 - The Site's adjacency to Ardwick offers the opportunity to create a community space to benefit local residents.
 - The offset from Kincardine Road allows for landscaping to create a pedestrian and cycle friendly connection into the Site from the community.
 - The 15m buffer zone provides an opportunity for the creation of Thorburn Walk, a new pedestrian and cycle route and public realm area between the two buildings and creating a link between Upper Brook Street and Kincardine Road.

Design Evolution and Alternative Uses

- 4.26 The Applicant and the Design Team for the application have regularly liaised with MCC during a series of pre-application meetings to ensure that the evolving design meets the aspirations for the Proposed Development. The Applicant has also engaged with statutory consultees and the public as outlined in the Statement of Community Involvement (SCI) which is submitted as part of the Supporting Planning Statement (SPS).
- 4.27 Several key changes have occurred over the course of the design phase of the Proposed Development. These are outlined below:

PBSA Building

Layout & Massing

- 4.28 Three layout options were explored and tested for the PBSA building, as shown in **Figure 4.1**. Option 3 was selected to progress further for its suitability to optimise for key criteria such as site density, aspect and views from students' rooms, overlooking, daylight provision, microclimate and use of external spaces.

Figure 4.1: Design Evolution for PBSA Building Layout



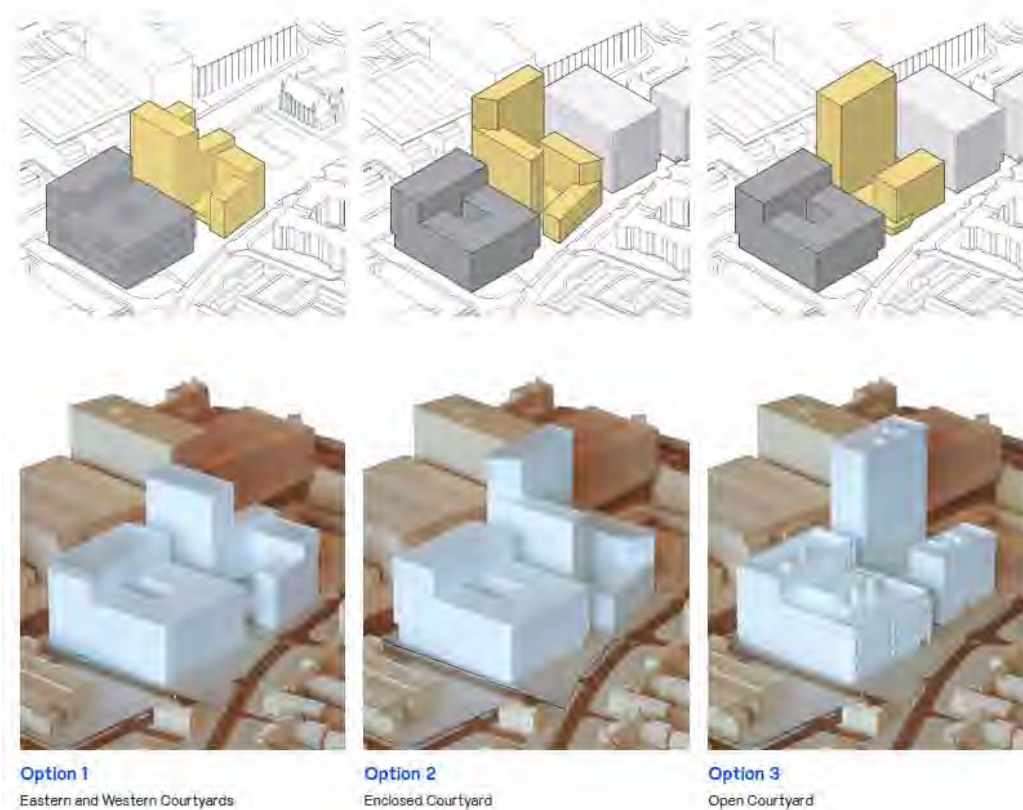
- 4.29 Three massing layouts were explored for the PBSA building. The design options have progressed from enclosed building structures dominated by internal views to a layout where external amenity space is more welcoming and green infrastructure can be maximised. The public space focus has shifted through the designs of the development to one where there is a clear pedestrian opening which emphasises the new pedestrian route created through the site.
- 4.30 Option 1 and 2 have significantly more frontage facing the neighbouring development sites in the Corridor which would impact on views, daylight provision and privacy of the student residents. The Option 3 design faces outwards onto the passing roads which ensures greater natural light for residents, optimises views from student rooms and overlooking. In Option 2 and to a lesser extent Option 1, there would be a lack of internal daylight and sunlight

levels, particularly at lower floor levels. The outdoor space within the Site would be overshadowed by the enclosed placement of the buildings.

4.31 Option 3 was selected as the two-block design allows for the:

- Maximisation of the available views by orientating the PBSA bedrooms towards the east and west.
- Creation of a larger buffer zone between the Kincardine Road block and Kincardine Road which to be used for landscaping.
- Of the three designs, Option 3 would better align with the urban context of the area.

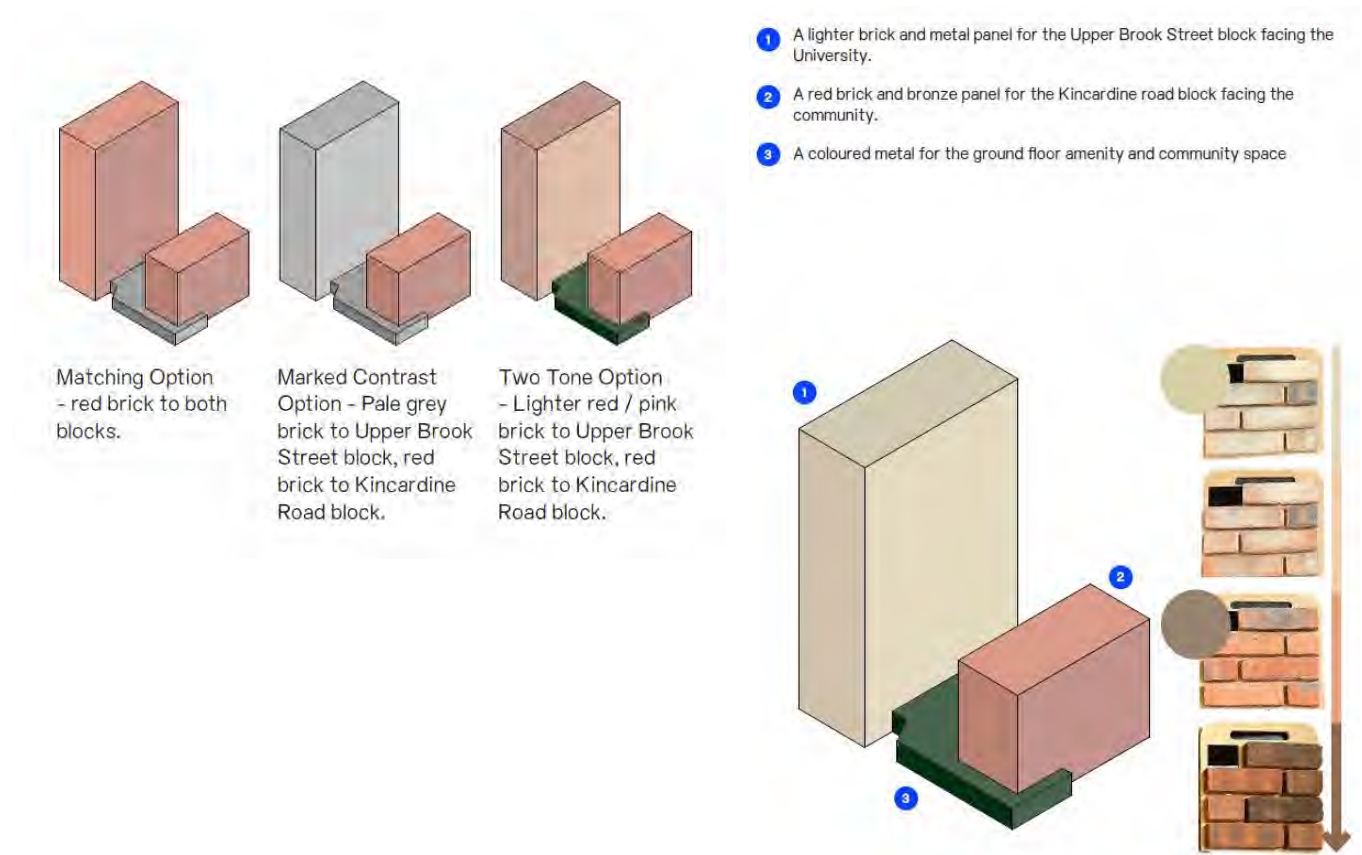
Figure 4.2: Design Evolution for PBSA Building Massing



Façade

4.32 Three options were explored for the façade materiality of the PBSA building (see **Figure 4.3** below). This included a 'matching option' (i.e. red brick to both blocks), a 'marked contrast option' (i.e. pale grey brick to the UBS block and red brick to the Kincardine Road block), and a 'two tone option' (i.e. lighter red / pink brick to the UBS block and red brick to the Kincardine Road block).

Figure 4.3: Design Evolution for PBSA Building Façade Brick Tone



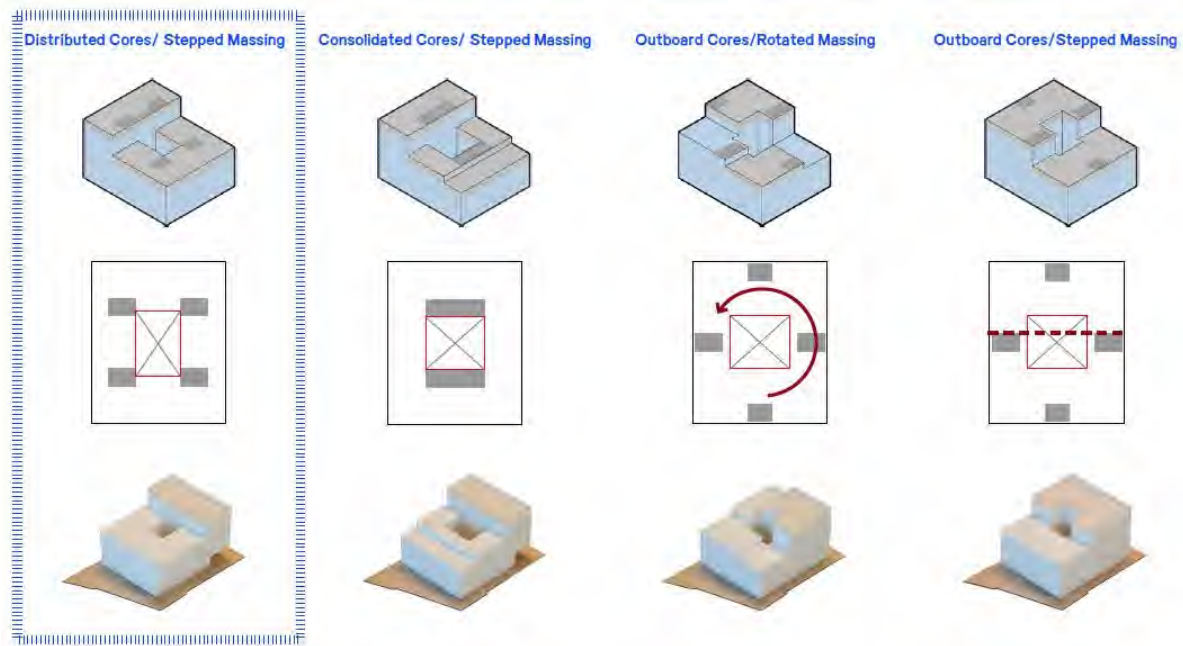
- 4.33 The 'two tone option' was development and tested further with various tones of brickwork applied to the building blocks. It was agreed that the most successful variation from a Townscape and Visuals perspective would be a buff brick applied to the UBS block and a red brick applied to the Kincardine Road block.

Sci-Tech Building

Layout and Massing

- 4.34 A proposed building massing is provided within the Oxford Road SRFG. During the design stage, a design verification process was undertaken to explore alternative options for the massing and layout of the Sci-Tech building, shown in **Figure 4.5** below. It was concluded that the initial proposal offered the best lab functionality and tenancy splits due to the atomised cores, and the simple single stepped massing functioned the best in terms of townscape views and services distribution.

Figure 4.5: Design Evolution for Sci-Tech Building Massing



Façade

4.35 The design evolution of the Sci-Tech building's façade is presented as a series of sketches at **Figure 4.6** below. As the southern bookend of the Upper Brook Street Masterplan area, the façade of the Sci-Tech building needed to complement the rest of the proposed buildings, while also providing a robust statement at the start of the Masterplan area. It is understood that primarily all of the central buildings of the wider emerging Upper Brook Street Masterplan are likely to have a gridded façade, and the northern bookend of the emerging Upper Brook Street Masterplan area has a staggered cladding design to finish the composition. It was based upon these principles that the Design Team arrived at the design of the finalised Sci-Tech building.

Figure 4.6: Design Evolution for Sci-Tech Building Façade



A Comparison of Environmental Effects

- 4.36 With reference to preceding section of this Chapter, it is clear that a number of key design alternatives evolved with time in response to a thorough pre-application process, which was influenced by consultation with MCC, other statutory consultees, public consultation and various constraints and opportunities associated with the Site.
- 4.37 Giving due consideration to the environmental topics scoped into this ES, **Table 4.1** provides a qualitative comparative assessment of environmental effects of the Proposed Development through each stage of its design evolution, as when presented to MCC during each pre-application meeting. It should be noted that this comparison is based on professional judgement only and is undertaken on a broad 'traffic light' system to allow for a clear visual representation of how the options compare to each other. In this respect, the use of the colours red, amber and green demonstrate a gradual comparative improvement in environmental performance for the environmental topic considered in **Table 4.1**. In addition, the colour red represents an unacceptable environmental effect, the colour orange represents a neutral environmental effect, and the colour green represents an acceptable environmental effect.

Table 4.1: A Comparison of the Environmental Effects

Environmental Parameter Design Option	TVHIA	Socioeconomics	Sunlight Daylight, and Overshadowing	Wind Microclimate	Climate Change	Transportation
Pre-application Meeting 1						
Pre-application Meeting 2						
Pre-application Meeting 3						
Pre-application Meeting 4						

Conclusions

- 4.38 The consideration of alternatives has included the evaluation of a ‘no development’ option and alternative design options. The design of the scheme has evolved through consultation with MCC, key stakeholders and the public and the findings of the series of studies that make up the EIA. A detailed description of the development proposals is presented in **Volume 2: Main Text, Chapter 5: The Proposed Development**.

5. The Proposed Development

Introduction

5.1 Schedule 4, Part 1 of the 2017 EIA Regulations outlines the information that should be provided within an ES which includes:

- (a) *"A description of the location of the development;*
- (b) *A description of the physical characteristics of the whole development, including, where relevant, requisite 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 (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;*
- (d) *An estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases)."*

5.2 The information presented in this chapter alongside the plans submitted for approval form the basis of the EIA and provides the level of detail required to enable the assessment of environmental effects in line with the 2017 EIA Regulations.

5.3 This chapter and the accompanying figures define the application area, the proposed land uses, the quantum of development proposed, the means of access proposals and describes the Proposed Development in line with Schedule 4 of the EIA Regulations. A description of the broad construction methods and processes is presented towards the end of this chapter.

Description of the Development

Application Description

5.4 The planning application seeks full planning permission for the demolition of the existing structures on-Site and the construction of:

- A purpose-built student accommodation (PBSA) building (the 'PBSA building'); and
- A science and technology lab / office building (the 'Sci-Tech building').

5.5 The Proposed Development is defined on the planning application form as:

“Full planning permission for the demolition of existing buildings and erection of a single 6 to 9 storey block for Sci-Tech use (Use Class E (g)(ii) and 267sqm of a café/bar (Use Class E (b), and a single 9 to 23 storey block to be used for Purpose Built Student Accommodation (Use Sui Generis), comprising 737 bedrooms in total and 293sqm of community use (Use Class F2 (b) and 80sqm of commercial floorspace (Use Class E) on Upper Brook Street Masterplan – McLaren / Kadans.”

Development Drawings

5.6 As outlined in **Volume 2: Main Text, Chapter 2: EIA Approach**, the assessment of effects has been undertaken on the basis of the quantum of development and the detailed planning application drawings and elevations (set out in **Table 5.1** and provided in **Volume 3: Appendices, Appendix 5.1: Detailed Application Drawings**). These drawings include detailed layout, heights and elevations. These plans, along with the written description of the Development, allow the likely significant effects of the proposals to be fully assessed and the appropriate mitigation secured.

Table 5.1: Application Drawings

Detailed Planning Application Drawing Title	Drawing Reference Number
General Arrangement (Sci-Tech)	
General Arrangement Sci-Tech Building Ground Floor Plan	UBS-SRA-ST-00-DR-A-02-500
General Arrangement Sci-Tech Building Roof Floor Plan	UBS-SRA-ST-R1-DR-A-02-509
General Arrangement Sci-Tech Building First Floor Plan	UBS-SRA-ST-01-DR-A-02-501
General Arrangement Sci-Tech Building Second Floor Plan	UBS-SRA-ST-02-DR-A-02-502
General Arrangement Sci-Tech Building Third Floor Plan	UBS-SRA-ST-03-DR-A-02-503
General Arrangement Sci-Tech Building Fourth Floor Plan	UBS-SRA-ST-04-DR-A-02-504
General Arrangement Sci-Tech Building Fifth Floor Plan	UBS-SRA-ST-05-DR-A-02-505
General Arrangement Sci-Tech Building Sixth Floor Plan	UBS-SRA-ST-06-DR-A-02-506
General Arrangement Sci-Tech Building Seventh Floor Plan	UBS-SRA-ST-07-DR-A-02-507

Detailed Planning Application Drawing Title	Drawing Reference Number
General Arrangement Sci-Tech Building Eighth Floor Plan	UBS-SRA-ST-08-DR-A-02-508
General Arrangement (PBSA)	
General Arrangement PBSA Ground Floor Plan	UBS-SRA-SA-00-DR-A-02-600
General Arrangement PBSA Roof Floor Plan	UBS-SRA-SA-R1-DR-A-02-609
General Arrangement PBSA First Floor Plan	UBS-SRA-SA-01-DR-A-02-601
General Arrangement PBSA Second Floor Plan	UBS-SRA-SA-02-DR-A-02-602
General Arrangement PBSA Third to Seventh Floor Plan	UBS-SRA-SA-ZZ-DR-A-02-603
General Arrangement PBSA Eighth Floor Plan	UBS-SRA-SA-08-DR-A-02-604
General Arrangement PBSA Ninth to Sixteenth Floor Plan	UBS-SRA-SA-ZZ-DR-A-02-605
General Arrangement Seventeenth to Eighteenth Floor Plan	UBS-SRA-SA-ZZ-DR-A-02-606
General Arrangement PBSA Nineteenth to Twenty First Floor Plan	UBS-SRA-SA-ZZ-DR-A-02-607
General Arrangement PBSA Twenty-Second Floor Plan	UBS-SRA-SA-22-DR-A-02-608
General Arrangement (Sci-Tech and PBSA)	
Combined General Arrangement Ground Floor and Public Realm Plan	UBS-SRA-ZZ-00-DR-A-02-100
Combined General Arrangement First Floor Plan	UBS-SRA-ZZ-01-DR-A-02-101
Combined General Arrangement Cross Section AA	UBS-SRA-ZZ-SE-DR-A-02-320
Combined General Arrangement Cross Section BB	UBS-SRA-ZZ-SE-DR-A-02-321
Combined General Arrangement Long Section CC	BS-SRA-ZZ-SN-DR-A-02-322
Combined General Arrangement Long Section DD	UBS-SRA-ZZ-SS-DR-A-02-323

Detailed Planning Application Drawing Title	Drawing Reference Number
Combined General Arrangement Typical Lower Level Plan	UBS-SRA-ZZ-ZZ-DR-A-02-102
Combined General Arrangement Typical Upper Level Plan	UBS-SRA-ZZ-ZZ-DR-A-02-103
Combined General Arrangement Roof Level Plan	UBS-SRA-ZZ-ZZ-DR-A-02-104
External Envelope (Sci-Tech)	
External Envelope Sci-Tech South East Bay Study	UBS-SRA-ST-EE-DR-A-02-401
External Envelope Sci-Tech North East Bay Study	UBS-SRA-ST-EN-DR-A-02-400
External Envelope Sci-Tech South West Bay Study	UBS-SRA-ST-ES-DR-A-02-402
External Envelope Sci-Tech North West Bay Study	UBS-SRA-ST-EW-DR-A-02-403
Site Elevations (Sci-Tech and PBSA)	
Site Elevations Existing - Cottenham Street: South East	UBS-SRA-ZZ-EE-DR-A-02-302
Site Elevations Existing - Thorburn Walk: North West	UBS-SRA-ZZ-EE-DR-A-02-305
Site Elevation Proposed - Cottenham Street: South East	UBS-SRA-ZZ-EE-DR-A-02-308
Site Elevation Proposed - Thorburn Walk: South East	UBS-SRA-ZZ-EE-DR-A-02-310
Site Elevations Existing - Kincardine Road: North East	UBS-SRA-ZZ-EN-DR-A-02-300
Site Elevation Proposed - Kincardine Road: North East	UBS-SRA-ZZ-EN-DR-A-02-306
Site Elevation Existing – Upper Brook Street: South West	UBS-SRA-ZZ-ES-DR-A-02-301
Site Elevation Proposed – Upper Brook Street: South West	UBS-SRA-ZZ-ES-DR-A-02-307
Site Elevations Existing – North West	UBS-SRA-ZZ-EW-DR-A-02-303
Site Elevations Existing - Thorburn Walk: South East	UBS-SRA-ZZ-EW-DR-A-02-304

Detailed Planning Application Drawing Title	Drawing Reference Number
Site Elevation Proposed – North West	UBS-SRA-ZZ-EW-DR-A-02-309
Site Elevation Proposed - Thorburn Walk: North West	UBS-SRA-ZZ-EW-DR-A-02-311
Other	
Design & Access Statement	UBS-SRA-XX-XX-RP-A-00100
Location Plan	UBS-SRA-ZZ-00-DR-A-02-000
Site Plan – Existing	UBS-SRA-ZZ-00-DR-A-02-001
Site Plan – Proposed	UBS-SRA-ZZ-00-DR-A-02-002
Demolition Plan	UBS-SRA-ZZ-00-DR-A-02-010

Land Use and Quantum of Development

PBSA Building

- 5.7 The Development would comprise a PBSA building, comprised of two blocks connected at ground floor level: the 'UBS Block' and the 'Kincardine Block'.
- The 'UBS Block' would be a nine to 23 storey building, up to a maximum of 113.6m AOD, containing:
 - 737 student accommodation rooms;
 - 293m² of community use (Use Class F2 (b)); and
 - 80m² of commercial floorspace (Use Class E).
- 5.8 The UBS Block and Kincardine Block would be connected at ground floor level, which would contain 2,001m² gross internal area (GIA) of amenity space, plant, back of house functions and cycle storage, as well as 377m² GIA of community space.
- 5.9 The proposed student accommodation mix is shown in **Table 5.2** below.

Table 5.2: Proposed Student Accommodation Mix

Room Type	Number of Units	Mix
Studio	252 (UBS Block)	34.2%
Accessible Studio	8 (UBS Block)	1.1%
Enlarged / Convertible Studio	28 (UBS Block)	3.8%
Cluster	290 (UBS Block)	39.3%
	159 (Kincardine Block)	21.6%
Total	737	100%

Sci-Tech Building

5.10 The Development would also comprise a 'Sci-Tech' building which would be a single six to nine storey block, up to a maximum of 80.195m AOD. The final height of the flues are yet to be confirmed as this is dependent upon the use of the Sci-Tech building and the fumes being extracted, however, a height of approximately 5m is anticipated. The Development will provide:

- 13,723m² GIA of Use Class E (g)(ii);
- 267m² of a café / bar (Use Class E (b); and
- Ancillary reception / amenity / breakout space.

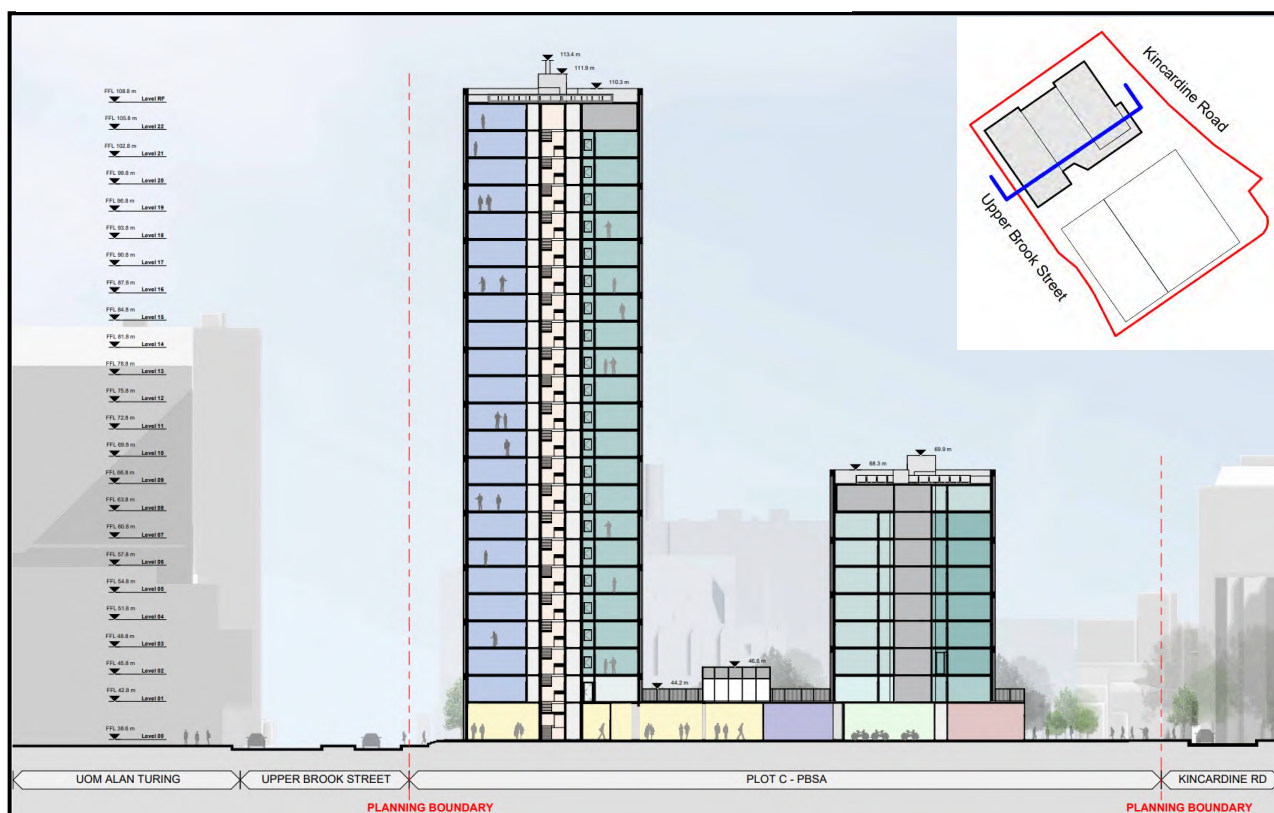
Layout and Scale

PBSA Building

5.11 The PBSA building would be located in the northern portion of the Site and would be the larger of the two buildings. The PBSA building would have two blocks of different sizes within it, the taller of which (the UBS Block) would be located to the west and would be 23 storeys (ground plus 22 storeys, adjacent to Upper Brook Street, and the smaller 9 storey building (ground plus 8 storeys) (Kincardine Block) to the east, closer to Kincardine Road.

- 5.12 As shown in **Figure 5.1**, the ground floor level would connect the UBS Block and the Kincardine Block of the PBSA Building. The ground floor comprises of reception, amenity and back of house / plant areas, and community and retail provisions. The tower blocks comprise of a mixture of 'studio' and 'cluster' type student accommodation units, with plant and amenity located at roof level of each tower. External amenity and landscaping are also proposed at first floor level between the two towers, with additional landscaping around the Site at ground level
- 5.13 PBSA rooms would begin at Level 01 within both the UBS Block and Kincardine Block. Rooms would be organised around a two-stair core and communal corridor in a largely north-south orientation, parallel to Upper Brook Street.

Figure 5.1: PBSA Layout Plan (Source: Modified from Sheppard Robson)

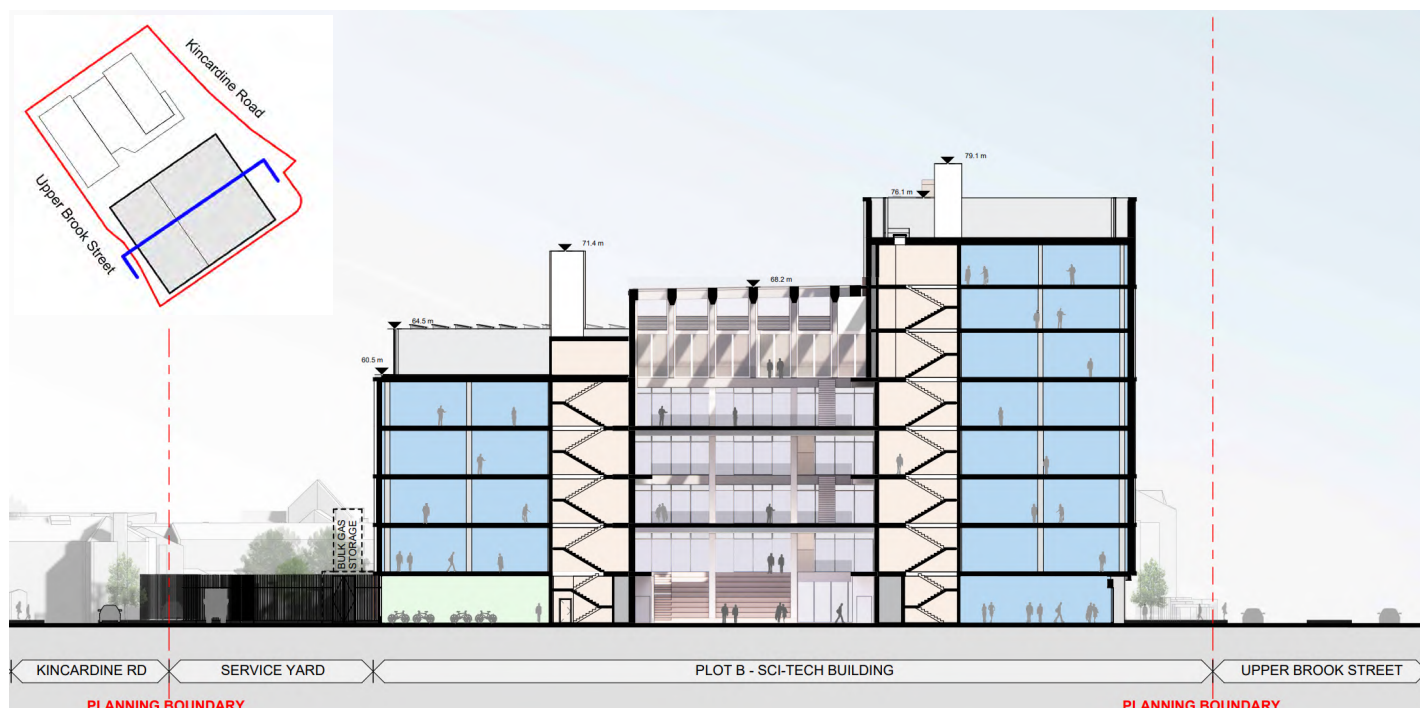


- 5.14 As well as at ground floor level, amenity space would be located at Level 01 and Level 22 of the UBS Block. All amenity spaces would be private for occupiers but accessible for all occupiers of the Development.
- 5.15 Photovoltaic (PV) panels would be located at roof level of the UBS Block and Kincardine Block.

Sci-Tech Building

- 5.16 The Sci-Tech Building would be located in the southern portion of the Site and would be 6 to 9 storeys tall. The ground floor would contain lab space, reception/amenity space, a café, plant and back of house functions.
- 5.17 Office / Lab space would be located at Level 01 upwards and organised around a central atrium with four cores set around it.
- 5.18 Breakout spaces would be located from Level 01 to Level 05 and set within the central atrium space.
- 5.19 Plant would be located at Level 05 and at roof level.

Figure 5.2: Sci-Tech Layout Plan (Source: Modified from Sheppard Robson)



Landscaping, Green Infrastructure and Open Space

5.20 As shown in **Figures 5.3** and **5.4**, external amenity and landscaping are also proposed at first floor level between the two towers of the PBSA, with additional landscaping around the Site at ground level.

Figure 5.3: Landscape Illustrative Plan (Source: Re-form)

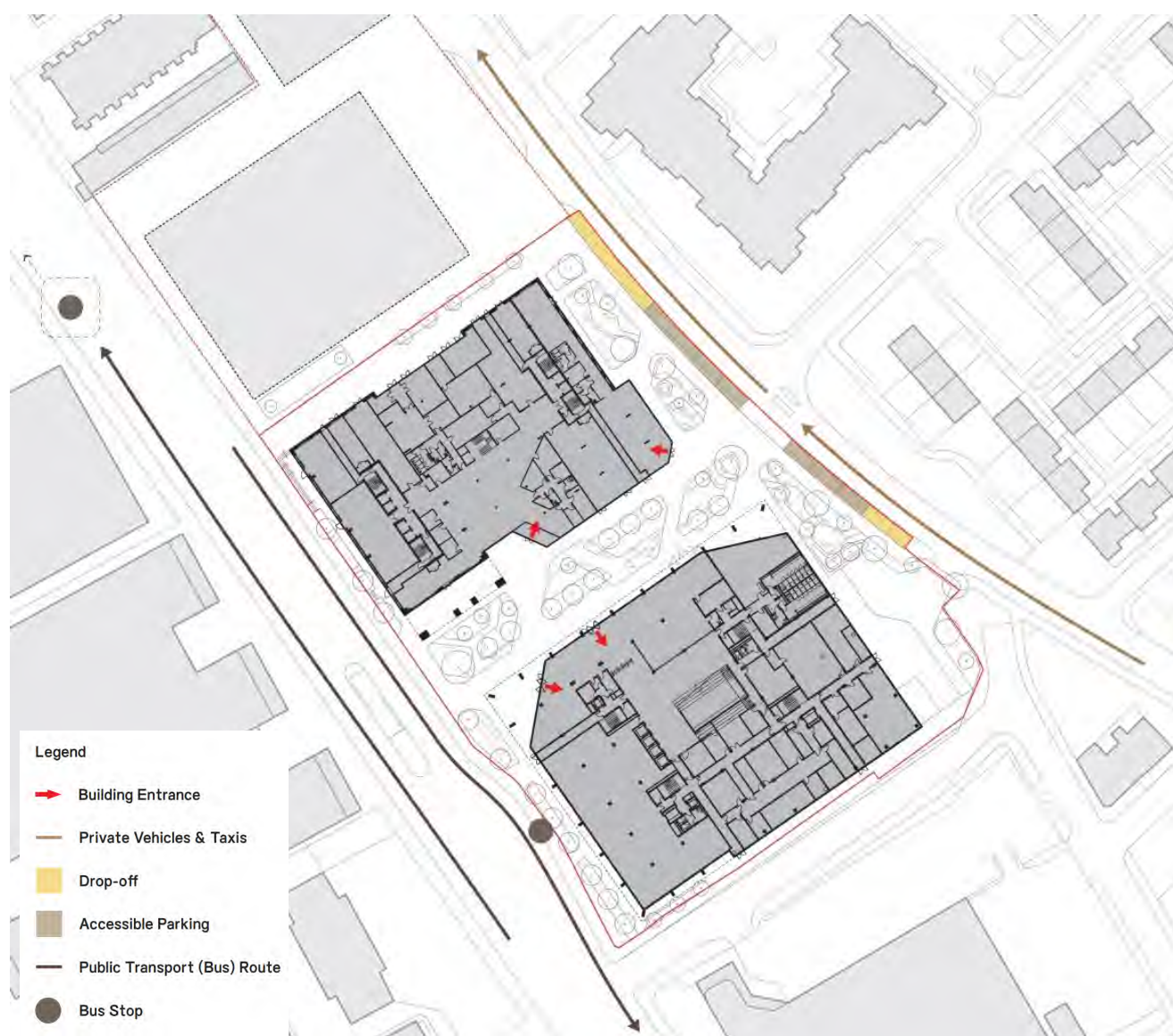


[illegible]

Vehicular Access and Parking

- 5.21 Vehicular access to the Proposed Development and Upper Brook Street Masterplan – PAG / Moda Living would be provided from Kincardine Road, which would be accessed from Upper Brook Street via Brunswick Street to the south of the Site.
- 5.22 No car parking space for general use would be provided as part of the Proposed Development. However, 7 no. accessible parking bays would be provided along the boundary with Kincardine Road for users of both buildings, in compliance with MCC requirements (shown below in **Figure 5.5**).
- 5.23 Taxi drop-off and collection will be provided via Kincardine Road to the north-east of the Site, with dedicated laybys adjacent to the new public realm space.

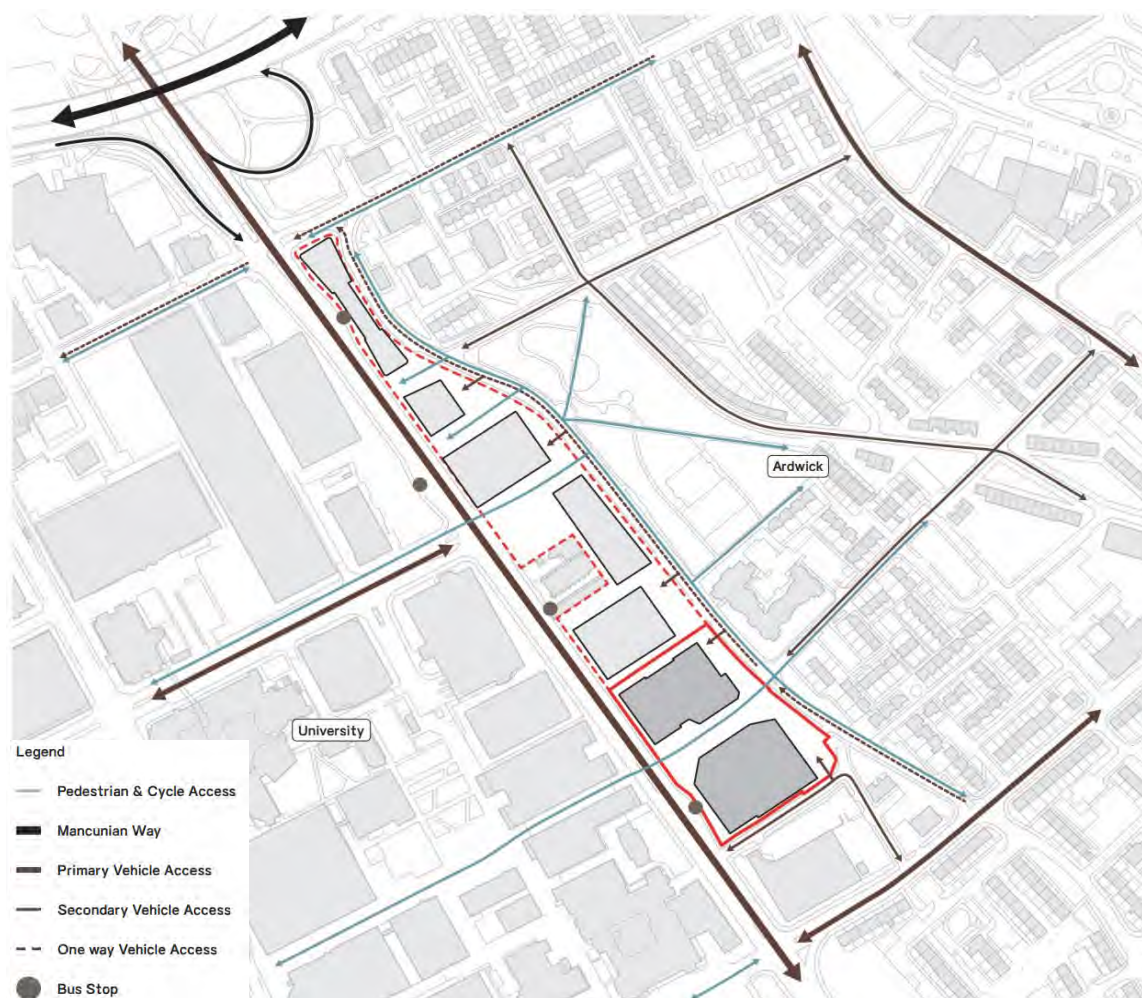
Figure 5.5: Vehicular Parking (Source: Modified from Sheppard Robson)



Pedestrian and Cycle Access

- 5.24 Pedestrian and cycle access to the Proposed Development and Upper Brook Street Masterplan – PAG / Moda Living would also be focussed along Kincardine Road.

Figure 5.6: Pedestrian and Vehicular Access Plan (Source: Modified from Sheppard Robson)



Waste Management

PBSA

- 5.25 Waste forecast has been developed in line with MCC Waste Storage and Collection Guidance for New Developments (GD04) and best practice including British Standard's BS 5906:2005 'Waste Management in Buildings'.

- 5.26 Refuse storage facilities are located at ground floor in two locations on the north side of the building. Holding areas are located to the northwest corner of the building with a waste collection area located adjacent to Kincardine Road to the east. Separate bins stores will be provided for the community and commercial units.

Sci-Tech

- 5.27 Refuse storage facilities are located at ground floor in two locations on the east side of the building. A holding area is located to the east side of the building with a waste collection area located adjacent to Cottenham Street to the south.

Utilities and Infrastructure

- 5.28 The following public utility service connections are to be provided to the Site to serve the Proposed Development:

- Wholesome Mains Cold Water (MCWS);
- Fire Water Supply (Sprinklers and Wet Riser);
- Fire Hydrant (subject to existing hydrant locations in relation to the proposed building entrances);
- Electricity;
- Telecommunications; and
- Below Ground Drainage.

Electricity Infrastructure

- 5.29 The District Network Operator (Electricity North West (ENW)) own and operates the electrical network that surrounds the development. The incoming supply strategy has been based on a supply in line with ENW policy documentation. This ensures an adequate spatial allowance should the electrical network become an ENW asset.
- 5.30 The total maximum demand for the Sci-Tech building has been calculated to be 3.6 MVA. It is anticipated that a HV supply is provided to a RMU room or private substation from the ENWL HV network.

Gas Infrastructure

- 5.31 In line with the Energy Strategy, the heating and cooling will be delivered through air source heat pumps,
- 5.32 Natural gas is not being provided to the Site. It is understood that ESP / Cadent have gas infrastructure at the Site which will need to be removed.

Potable Water

- 5.33 The District Network Operator (United Utilities) operates the water and drainage network that surrounds the development. A distribution main runs down Upper Brook Street in the foot path between the site boundary and roadway, terminating at the old church building (The Chapel) on the corner of Inchley Road. The size of the water mains suggests that connections for the Development would be readily available without reinforcement works although this needs to be confirmed with United Utilities.

PBSA

- 5.34 The building is to be provided with a dedicated, metered utility water service connection to serve a wholesome water storage tank and booster sets. It is anticipated that the wholesome peak load will be 5.5 litres per second.
- 5.35 In addition, a separate, dedicated fire supply is proposed, to serve the sprinkler and wet riser tanks, and any additional fire hydrants required to the Site.

Sci-Tech

- 5.36 The overall incoming water capacity required is approximately 1.8l/s. The size and number of local water mains in the vicinity of the Development suggest that connections for the development would be readily available without reinforcement works.
- 5.37 The building will be provided with low-temperature hot water (LTHW) heating and Chilled Water (CHW) cooling systems generated via air-source heat pumps located at the roof level. To aid distribution and load profiles, two installations will be provided to the building. One will serve the Upper Brook Street 7-storey elevation and the second the rear 4-storey elevation.

Foul Sewerage

- 5.38 United Utilities' preferred point of connection is the public combined sewer within the site or the 600 x 860 combined sewer within Upper Brook Street.

Energy Strategy

PBSA

- 5.39 The Proposed Development will adopt the use of an energy hierarchy and a holistic approach to sustainability to meet national best practice guidance and MCC's objectives for energy consumption reduction, carbon dioxide emissions reduction and sustainable design and construction.
- 5.40 The envelope of the new build will be designed to perform significantly better than the Building Regulation standards with low U-values, g-values and low air leakage rates. Heat losses through the facades will be minimised whilst the size and position of openings has been optimised to maximise the use of natural light

within each space. The Proposed Development will be mechanically ventilated throughout the year, making use of heat recovery to reduce the heating demands and manually perforated opening through the façade used to purge the space and assist with summertime overheating. Energy efficient services employed in the development include high efficiency LED lighting coupled with occupancy and daylight controls to significantly reduce the lighting energy use. Electrical and mechanical systems within the development will be metered and controlled with a full Building Management System (BMS). This will enable energy use to be tracked and opportunities for efficiency improvements to be made.

- 5.41 Radiators via heat pumps are proposed to provide the local heating to the bedrooms. The ground floor amenity area will have its own VRF system. A standalone Air Source Heat Pump will provide domestic hot water. Along with plant and a roof terrace, the roof area will be the location of PV arrays.
- 5.42 No natural gas systems are proposed for the Development. The ground floor diesel generator flue is proposed to terminate at roof level (Tower 2, G + 22), a minimum of 1m above the roof level. Flue diameter is envisaged to be 250mm diameter. However, this is to be confirmed by the generator manufacturer. The generator will only be operational in the event of a power failure or for maintenance purposes when the generator will be tested for main failure once a month for up to one hour.

Sci-Tech

- 5.43 The intention is to achieve a low carbon / Net Zero Carbon (NZC) energy provision. To achieve this includes a consideration of passive measures including building design and materials. Along with the passive measures, consideration is given to system design principles and Low and Zero Carbon generating technologies. The preferred option being Reverse Cycle Chillers which provide low carbon space heating and efficient comfort cooling and low carbon domestic hot water generation. It is also anticipated that all PV areas will be optimised. This technology will be placed on all available roof space. With 30% - 40% of this roof space to be active area of PV.

Ventilation Strategy

PBSA

- 5.44 Studio units in the PBSA will each be served by a dedicated Mechanical Ventilation with Heat Recovery (MVHR) unit while cluster units will have communal MVHR units. The MVHR units will supply & extract with heat recovery providing continuous mechanical ventilation. They will have local intake & exhaust louvres and supply fresh air to the bedrooms and in the communal units supply fresh air to the communal living area. They will also provide extract from the en-suites and communal kitchen.
- 5.45 Amenity Spaces / Reception will have local / communal MVHR units. Natural ventilation to also be considered based on a mixed mode natural ventilation / mechanical ventilation strategy.

- 5.46 Retail units and Community Unit are proposed as shell and core, for future fit-out by the tenant. Perimeter louvres for intake and exhaust to be provided to allow the tenant to install local MVHR units as part of their fit-out.
- 5.47 Back of House areas will also have local / communal MVHR units to areas such as post room, offices, meeting rooms, WCs / shower, and laundry. Natural ventilation and extract will be used for bin store, cycle store areas.

Sci-Tech

- 5.48 Supply and extract ventilation systems will be provided to each floor plate via roof mounted air handling plant. A unit will be provided to each core, serving each general floor plate area based on a notional tenancy split. Primary air supply and exhaust ductwork risers will be allocated to each. The air handling unit serving these areas will be complete with thermal wheel heat recovery device and integral air filters to minimise external air pollution.
- 5.49 Fume cupboards extract discharge positions will be located such that fumes are adequately dispersed and do not re-enter the building (or any that are adjacent) or present a potential hazard or nuisance. The design will be developed with a specialist and with combined systems discharging at high velocity at between 3- 5m above the respective roof levels.

Ground Floor and Atrium Break-Out Space and other space

- 5.50 The ground floor reception area and breakout space will be provided with general ventilation from a dedicated air handling unit located at upper roof level. The system will be designed to serve the ground floor reception area, café seating area, central break-out/circulation space and upper-level break-out spaces facing on to the atrium. The four primary cores will be provided with mechanical supply and extract ventilation. This will include the ventilation of the toilet provision at each floor level. The ground floor back of house areas will be provided with mechanical ventilation via local void mounted air handling equipment and fans to suit the respective spaces. Café kitchen ventilation will also be provided with a dedicated catering extract system to roof level.
- 5.51 Natural ventilation will be the plant, generator and tank rooms, substations, gas stores and meter rooms and bin and refuse stores.

Drainage

- 5.52 A Flood Risk Assessment (FRA) and Drainage Strategy for the PBSA building has been prepared by Civic Engineers¹, a separate FRA and Drainage Strategy for the Sci-Tech building has also been prepared by HDR². Both documents are submitted with the planning application.

¹ Civic Engineers (April 2023) Flood Risk Assessment and Drainage Strategy – PBSA Building

- 5.53 Both Drainage Strategies would ensure that occupants of the Site would remain safe during a 1-in-100-year (plus 45% climate change (subject to approval from the LLFA)) flood event scenario.
- 5.54 Surface water runoff rates for the PBSA building would be restricted to 5l/s, the Sci-Tech building would be restricted to 2.5l/s.
- 5.55 Surface water runoff from the Proposed Development would be controlled through the use of various Sustainable Urban Drainage System (SuDS) measures such as rain gardens, permeable surfacing and geocellular storage:
- For the PBSA building:
 - A tanked / geocellular system with an attenuation volume of 101m² located in the south of the Site;
 - Permeable paving with an approximate storage of 154m²; and
 - Rain gardens would be situated around the PBSA building and along Thorburn Walk.
 - For the Sci-Tech building:
 - A tanked / geocellular system with an attenuation volume of 477m² located beneath the service yard in the north-east of the Site;
 - Permeable surfacing and rain gardens which would provide conveyance, water quality, amenity and biodiversity benefits; and
 - Overland exceedance flow route towards Upper Brook Street in the south-west of the Site.
- 5.56 The existing connections would be used for both foul and surface water runoff, discharging respectively into the public combined sewers in the surrounding highways. For the PBSA building, surface water runoff would discharge to the culvert located approximately 140m south of the Site.

Telecommunications

- 5.57 The number of providers in the vicinity of the Site indicates that tenants will have a wide selection of providers to choose from and that diverse / resilient supplies are available. There to be a minimum of two separate fibre networks available for individual tenants to be able to obtain diverse / resilient supplies.
- 5.58 Incoming telecommunication (BT) and / or ICT (Private Network) fibre optic service ducts will be provided within the PBSA to serve the building. Incoming service ducts will be routed via cable ducts and service routes into a main intake / comms room, to be located at ground floor level.
- 5.59 The Sci-Tech building itself has been designed with separate incoming service locations to allow for diverse supply routes into and around the building.

² HDR (May 2023) Flood Risk Assessment and Drainage Strategy – Sci-Tech Building

Construction

Construction Programme

PBSA

- 5.60 Construction works are programmed to begin in October 2023, with initial demolitions and enabling works being completed by the end of February 2024. This would be followed by substructure and frame to podium works which would be completed by the end of August 2024. The construction and fit out of the remainder of the PBSA building would follow, with completion programmed for May 2026.

Sci-Tech

- 5.61 Construction works are forecast to commence in Q4 2023 involving demolition and site clearance works, before then progressing with the main construction works in May 2024. Completion of the Sci-Tech building is expected in Q1 2026.

Description of the Works

- 5.62 The following sections describe the key activities that would take place from the inception of works throughout the construction process in order to implement the Proposed Development.

Pre-Commencement and Enabling Works

- 5.63 The following pre-commencement and enabling works activities would be carried out (as required) prior to the commencement of the construction works:
- Preparation of a Construction Environmental Management Plan (CEMP) and approval by MCC;
 - Securing of construction site boundaries via the use of hoardings;
 - Set-up of contractor welfare and site accommodation;
 - Clearing of the site of existing statutory utility service connections, removal of any private utilities, and removal of existing buildings;
 - Utility disconnections and diversions will be carried out prior to demolition of the existing buildings;
 - A Phase 1 ground conditions desk study has been undertaken by A2 Site Investigation, covering the whole application boundary. It is considered that there are associated risks so ground investigation is recommended to be conditioned.

- Appropriately timed tree and vegetation clearance; and
- Implementation of any necessary service infrastructure works, such as re-routing existing utility works.

Demolition Works

5.64 Demolition of three structures on-Site would be necessary to facilitate the construction of the Proposed Development, these structures are:

- Elizabeth Yarwood Court;
- Former Citroën dealership showroom; and
- Former Citroën dealership pavilion.

5.65 In addition to the demolition of the buildings, where present, below ground structures and obstructions such as drains, hardstanding, relic foundations, service ducts and pipelines would be removed to facilitate construction of the Proposed Development.

Site Preparation and Groundworks

5.66 Any remediation works identified as being required in order to ensure the Site is suitable for use in accordance with the requirements of Part IIA of the Environmental Protection Act 1990³ following the site investigation works would be implemented at this stage. Any geotechnically and / or chemically unsuitable soils encountered during the earthworks would be treated for re-use within the Site or removed for off-site disposal to a suitably licensed waste disposal facility.

5.67 An earthworks exercise would be undertaken to create formation levels for the Proposed Development. It is anticipated that this would be undertaken in one phase at the outset of the construction works. It is assumed that all land within the Site as shown on the plans would be subject to earthworks and material movements though minimal cut and fill would be required and a cut and fill balance would be achieved within the Site and no significant import or export of material would be required. All earthworks would be undertaken in accordance with relevant industry guidance including CIRIA Report C572: Treated ground engineering properties and performance⁴, British Research Establishment document FB75: Building on Fill - Geotechnical Aspects⁵ and British Standard 6031:2009: Code of Practice for Earthworks⁶. In addition, all proposed buildings and their foundations would be designed in accordance with Building Regulations Approved Document A - Structure⁷. It is

³ Environmental Protection Act 1990.

⁴ CIRIA (2002) C572: Treated ground engineering properties and performance.

⁵ British Research Establishment (2015) Document FB75: Building on Fill - Geotechnical Aspects.

⁶ British Standard 6031:2009: Code of Practice for Earthworks.

⁷ HM Government (2013) Approved Document A - Structure (2004 Edition incorporating 2004, 2010 and 2013 amendments).

assumed that movement of materials would adhere to the guidance set out in the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites⁸.

- 5.68 Salford Archaeology has undertaken a desk-based assessment of the Site⁹. The potential for the Site to contain buried archaeological remains is considered to be high. Such remains may include the 19th-century houses and garden soils, however any such remains within the Site are likely to be of low (local) significance. The exact scope and extent of any further investigation of the Proposed Development area will be determined by the Greater Manchester Archaeological Advisory Service (GMAAS), in their capacity as archaeological advisor to Manchester City Council. If a programme of archaeological evaluation is required this would be undertaken prior to ground works commencing, and if required, monitoring and recording (a watching brief) during ground works.

Construction Works

Building Foundations

- 5.69 Based on the anticipated ground conditions and loads, it is proposed that the Proposed Development will be supported on piled foundations. Piles are anticipated to be traditional non-displacement rotary bored piles, end bearing into the Cemented Sandstone Foundation, circa 6m below existing ground level. Pile caps support the columns over and transfer the building loads to the piles. The core, and columns offset from the core, will be founded on piled rafts. The ground floor is proposed as a 300mm thick reinforced concrete slab, suspended between the pile caps.

Building Superstructure

- 5.70 The structural proposals are for an in situ reinforced concrete braced frame to support the design loads and achieve the response factors required as part of the design brief. Reinforced concrete core walls and columns will support reinforced concrete flat slabs at each level. The reinforced concrete frame with flat slabs provides a flat soffit to maximise horizontal services distribution, minimises floor to floor heights, and maximise clear floor to ceiling heights, whilst providing inherent acoustic and inertial mass to mitigate against noise and vibration transmission.

Construction Site Access, Parking and Traffic

- 5.71 For the purposes of the ES, it has been assumed that construction traffic would travel to / from the Site via the A57(M) and the A34, A6 and along Brunswick Street as described in **Volume 2: Main Text, Chapter 11: Transportation**. It is anticipated that the main internal roads would be completed up to base course prior to the commencement of the buildings within the Site.

⁸ DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69308/pb13298-code-of-practice-090910.pdf.

⁹ Salford Archaeology (2022) Upper Brook Street Plot C, Manchester Archaeological Desk Based Assessment

- 5.72 A suitable level of parking would be provided on-Site during the construction stage. No off-Site parking along the roads around the Site would be permitted unless otherwise agreed.
- 5.73 Limited information is available regarding the likely traffic movements to be generated during the construction phase of the Proposed Development, as a contractor and construction vehicle routing are not yet confirmed. The number of construction vehicles (including private car trips from the workforce and Heavy Goods Vehicle (HGV) movements) would depend on the size and number of the vehicles operated by the appointed contractor. Specialised vehicles such as low-loaders would be used to deliver construction plant and other machinery.

Construction Traffic Management

- 5.74 Appropriate traffic management controls would be implemented during the Works in line with Health and Safety Executive (HSE) standards¹⁰ to ensure the safety of other road users and to protect the environment including:
- Appropriate signing of the delivery route(s) to ensure vehicles use the approved route(s) to and from the Site.
 - Warning signs where appropriate in the vicinity of the Site permanent and temporary access(es), both for vehicles and other road users.
 - Layout of working areas to allow adequate space for goods vehicle manoeuvring within the Site.
 - Temporary traffic management for short periods during delivery of abnormal / oversized loads, as required.
 - Design of the Site access(es) to ensure that vehicles have appropriate visibility upon leaving the Site.
 - Wheel washing facilities for vehicles leaving the Site.

Construction Public Highway Strategy

- 5.75 Appropriate signage for temporary / permanent alternative routes would be implemented as part of a CEMP. Disruption to the public highway in the vicinity of the Site is not anticipated to occur.

Construction Compound

- 5.76 During construction, site accommodation / construction compounds would be required for the appointed contractor and subcontractors. The locations of the site accommodation / construction compounds are unknown at this time but it is assumed that they would be located within the site boundary.

Site Working Hours and Days

¹⁰ Health and Safety Executive (2006) Health and Safety in construction HSG 150 [online] Available at: <http://www.hse.gov.uk/pubns/books/hsg150.html>

5.77 Working hours would be subject to agreement with MCC. However, it has been assumed that standard working hours would be followed. These are presented below:

- Monday – Friday: 07:00 - 19:00;
- Saturday: 07:00 – 13:00; and
- No working on Sundays and Bank Holidays.

5.78 Exceptions may arise, for example when abnormal loads are delivered or when specialist activities are conducted, when works may be required outside of these times. The Applicant acknowledges that should these circumstances arise, the appropriate permissions and notifications would be sought in advance from MCC.

5.79 Where works unavoidably need to take place outside the core working hours, occupiers of nearby residential properties shall be informed by the contractor in advance of the works and their likely duration.

Temporary Drainage Solution

5.80 Any new drainage infrastructure required through the construction phase would be sized to ensure existing capacity is maintained and the appropriate consents put in place.

5.81 It is assumed that prior to the commencement of the main construction activities, a temporary drainage solution would be implemented to mitigate flood risk and sediment loading. The temporary drainage solution would be developed during detailed design and would align with the permanent drainage solution, where possible.

5.82 It is assumed that the temporary drainage solution during the Works would include measures to remove silt, sediment and debris and to attenuate surface water runoff prior to controlled disposal through discharge to the strategic drainage network. The temporary drainage solution would be implemented / managed in accordance with the relevant EA Pollution Prevention Guidelines.

5.83 Where components of the permanent drainage strategy are used during construction, all silt and debris build-up would be removed, and the permanent components fully reinstated on completion of the Works.

Environmental Management and Mitigation

Environmental Management Plans

5.84 A CEMP would be conditioned as part of the planning permission which would detail the environmental controls, protection measures and safety procedures that would be adopted during the Works, providing a tool to ensure the successful management of the likely environmental effects as a result of construction activities.

Management of Construction Works and Liaison

- 5.85 In terms of quality management, the Development would be constructed by the relevant appointed contractor in line with the principles set out in the externally accredited to BS ISO 9001: 2015¹¹ (or recognised equivalent). The Site would also be registered with the Considerate Constructors Scheme.
- 5.86 All Works would be undertaken in line with the relevant legislative requirements, including the Construction (Design and Management) Regulations 2015¹² and Environmental Protection Act¹³.
- 5.87 The Applicant / appointed contractor would continue to undertake liaison with the local community, SRBC and other stakeholders, as appropriate, during the Works.

Security, Emergencies and Accidents

- 5.88 The site security arrangements for the Works would be in line with the requirements set out within the Construction (Design and Management) Regulations¹⁴. It is also anticipated that the Development would include appropriate levels of security, including fencing, CCTV and on-Site security personnel.
- 5.89 All works would be undertaken in line with the Health and Safety at Work Act¹⁵. In addition, as part of the CEMP, there would be a requirement for the preparation of risk assessments and method statements prior to the commencement of activities. This would aid with the identification of risks and the Proposed Development mitigation measures to reduce any risk to an acceptable level.
- 5.90 The CEMP would also contain a series of procedures / measures for emergencies / accidents that could occur alongside contact details for relevant organisations that need to be notified.

Materials Storage and Handling

- 5.91 Environmental issues would be considered in the procurement of raw materials and all such materials would be appropriately stored in order to minimise damage by vehicles, vandals, weather or theft.
- 5.92 Contractors and their subcontractors would be expected to maintain a tidy Site and where practical, to operate a 'just-in-time' policy for the delivery and supply of materials for the works.
- 5.93 Tanks and drums of liquid chemicals and fuels would be stored in bunded compounds and, where feasible, packaging would be returned.

¹¹ International Organization of Standardisation. <https://www.iso.org/standard/62085.html> 2015.

¹² Construction (Design and Management) Regulations (Statutory Instrument No. 51) [online] Available at: <http://www.legislation.gov.uk/uksi/2015/51/contents/made>

¹³ Environmental Protection Act 1990 (as amended) [online] Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>.

¹⁴ Construction (Design and Management) Regulations 2015 (Statutory Instrument No. 51) [online] Available at: <http://www.legislation.gov.uk/uksi/2015/51/contents/made>

¹⁵ Health and Safety at Work Act 1974 (as amended) (Statutory Instrument No. 37) (as amended) [online] Available at: <http://www.legislation.gov.uk/ukpga/1974/37/contents>

Waste Management and Minimisation

- 5.94 It is anticipated that waste would be generated during the Works, for example, packaging from deliveries and off-cuts of materials that are surplus to requirements. A Site Waste Management Plan (SWMP) would be prepared for the Development and would set out management / control measures to ensure that waste generated from carrying out the Works is kept to a minimum.
- 5.95 The movement of materials would adhere to the guidance set out in the 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'¹⁶.

Control of Noise, Vibration, Dust and Lighting

- 5.96 Noise mitigation measures and the Best Working Practices as outlined in British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Part 1 noise'¹⁷ and British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Part 2 vibration'¹⁸, would be implemented. Mitigation measures that would be considered include using quiet construction methods, locating plant and equipment away from noise sensitive receptors, limiting hours of construction, and ongoing monitoring.
- 5.96.1 Mitigation measures that would be considered include using quiet construction methods, locating plant and equipment away from noise sensitive receptors, limiting hours of construction, and ongoing monitoring.
- 5.96.2 It is recognised that Works generated noise, vibration and dust could give rise to temporary and local disturbance. Site-specific best practice measures would therefore be implemented by the contractors to minimise the disturbance to local residents and other potentially sensitive receptors in the surrounding area.
- 5.96.3 Noise and vibration levels would be monitored during the Works. If noise and vibration levels breach the agreed levels above which action must be taken to reduce potentially harmful effects, at sensitive receptors, alternative methods would be explored and employed.
- 5.97 It is anticipated that the CEMP would contain relevant mitigation measures presented within the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction'¹⁹. The measures that would be considered include prevention measures such as screening stockpiles of material, deployment of windbreak netting, dampening exposed soils as appropriate and ongoing monitoring.

¹⁶ Defra. Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. 2009.

¹⁷ British Standards Institution. British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 noise. 2014.

¹⁸ British Standards Institution. British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 vibration. 2014.

¹⁹ Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction. 2014.

5.98 Good practice guidance documents prepared by the CIRIA²⁰ note that lighting on construction sites is typically part of on-Site security and health and safety requirements. As such, it is assumed that the following sources of lighting would be present during the Works:

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

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

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

Pollution Control

5.100 The Works would be managed in accordance with the CIRIA guidance 'C532 - Control of Water Pollution from Construction Sites'²¹ and the relevant Good Practice Guidelines for Pollution Prevention, as follows:

- GPP 5: Works and maintenance in or near water²².
- PPG 6: Working at construction and demolition sites²³.
- GPP8: Safe storage and disposal of used oils²⁴.
- GPP 13: Vehicle washing and cleaning²⁵.
- GPP 21: Pollution incident response planning²⁶.
- GPP 22: Dealings with spills²⁷.

²⁰ Construction Industry Research and Information Association. Environmental good practice on-site 3rd edition (C692). 2010.

²¹ Construction Industry Research and Information Association. Control of Water Pollution from Construction Sites. Guidance for consultants and contractors (C532) [online]. 2001.

²² Environment Agency. GPP 5: Works and maintenance in or near water. 2017.

²³ Environment Agency. PPG 6: Working at construction and demolition sites. 2012.

²⁴ Environment Agency. GPP8: Safe storage and disposal of used oils. 2017.

²⁵ Environment Agency. GPP 13: Vehicle washing and cleaning. 2017.

²⁶ Environment Agency. GPP 21: Pollution incident response planning. 2017.

- 5.101 Bunding would be provided around any source of potential pollutants required for construction (e.g. mortar mixers, fuel stores etc.). This would ensure that in the unlikely event of an accidental spillage, surface and ground water would remain protected.

Protection of Ecological Resources and Trees

- 5.102 As part of the CEMP, procedures and management measures to ensure the protection of ecological resources, including habitats (where retained) and protected species would be included.

Summary

- 5.103 This chapter has presented a description of the Proposed Development which is defined through a series of plans. The description of the development, an Accommodation Schedule and the plans set out the basis for the assessments described in this ES.
- 5.104 The potential environmental impacts of the construction phase of the Proposed Development have been considered and all controls or measures to mitigate these effects are in line with current environmental standards and legislative requirements. Further detail of construction impacts has been presented in each technical chapter, where applicable.
- 5.105 The Applicant has developed and would implement a CEMP for the Site prior to construction, thereby ensuring that any potential environmental effects are within suitable standards or mitigated in accordance with measures identified through the EIA process, where no standards exist.

²⁷ Environment Agency. GPP 22: Dealings with spills. 2018.

6. Townscape, Visual and Built Heritage

Introduction

- 6.1 This chapter assesses the effects of the Proposed Development on townscape character, visual amenity and built heritage features and designations. In particular, it identifies and assesses the anticipated effects of change resulting from the Proposed Development on the character and features of the townscape; and on people's views and visual amenity within the Townscape, Heritage and Visual Impacts Assessment (THVIA) Study Area.
- 6.2 The chapter describes the methods used to assess the likely significant effects, the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect effects of the Proposed Development arising from its construction, height, mass and detailed design, the mitigation measures required to prevent, reduce, or offset the identified significant effects and the residual effects. It has been written by Donald Insall.
- 6.3 This chapter is supported by the following figures and technical appendices (see **Volume 2a: Main Text Figures** and **Volume 3: Appendices**, respectively).
- **Figure 6.1:** Heritage Assets Map;
 - **Figure 6.2:** Location of Viewpoints included within Assessment;
 - **Appendix 6.1:** Townscape, Heritage and Visual Impacts Assessment (Insall, 2023);
 - **Appendix 6.2:** Heritage Assets (Scoped Out);
 - **Appendix 6.3:** Verified Views Methodology; and
 - **Appendix 6.4:** Accurate Visual Representations (AVRs).

Planning Policy Context

- 6.4 The Planning Policy Context is provided in full in the Townscape, Heritage and Visual Impacts Assessment provided in **Appendix 6.1**.

Assessment Methodology and Significance Criteria

Method of Collecting Baseline Data

- 6.5 The baseline condition for the assessment is the area within which the Proposed Development may be visible. Baseline data is collated from desktop study (please refer to the Bibliography in Section 2.4 of the Townscape, Heritage and Visual Impacts Assessment in **Appendix 6.1**) and field appraisal to analyse townscape character and

to define and describe the views within the study area. This process, in combination with a review of relevant policy, enables the identification of townscape sensitivities and particular interests (including designations) requiring special consideration. Site visits have been undertaken to inform the understanding of the qualities, character and significance of the existing townscape and views.

- 6.6 The Landscape Institute and the Institute for Environmental Management and Assessment's (IEMA) Guidelines for Landscape and Visual Impact Assessment (Third Edition) (GLVIA3)¹ uses the term 'receptor' to mean both elements of the physical landscape and townscape, and people who will see the Proposed Development and its setting. The relevant receptors include people or groups of people likely to experience views of the Proposed Development. People who will be affected by the changes in the townscape and visual environment include people living in the area, people who work there, people passing along roads, bus or other forms of transport, people visiting the area and people engaging in recreation of different types.
- 6.7 The receptors identified in the chapter are townscape, heritage and visual receptors (views), however inherent in this assessment of the receptors are the people experiencing the change in the townscape and visual environment.
- 6.8 With regard to guidance provided in the GLVIA3, views are identified in relation to the characteristic of the viewing location; this should include consideration to the effect of the Development on a view and whether the view is a static location, or as part of a panorama or moving route; in the case of this assessment views can all be appreciated as static views and as part of a moving route. This includes consideration of the use of the viewing location, such as why the viewer may be there, and what viewers may be doing at the viewing location. Although this requires a degree of subjective assessment, it is important to understand the inherent characteristics of the viewing location as this has a direct effect on the assessment. From the baseline assessment any sensitive visual receptors within the study area were identified.

Selection of Views for Assessment

- 6.9 The important aspect of defining the study area is to determine the area within which significant effects may occur as a result of the Development. For this reason, it is important to identify the sensitive receptors within this visual envelope. Views are selected for the purpose of this assessment on the basis of a number of criteria, which relate to:
- The general visibility of the Proposed Development;
 - The importance of the townscape;
 - The presence of heritage assets; and
 - The Proposed Development's effect on individual vistas.

¹ Landscape Institute and IEMA (April 2013) Guidelines for Landscape and Visual Impact Assessment [Third Edition]

- 6.10 Views were selected to accurately reflect the various orientations and distances from which the Site will be visible.
- 6.11 All the viewpoint photographs have been surveyed and superimposed with an accurate computer model to show the size and form of the proposals in relation to their surroundings in rendered, wireline or block form according to the technical methodologies below. The viewpoint photographs were taken in Spring, whilst not presenting the minimum possible foliage cover this has been taken into account in the assessment. Furthermore, this impacts on only a limited number of views owing to the urban context.

Assessment Methodology

- 6.12 For each of the views, Accurate Visualisation Representations (AVRs) have been produced according to the Verified Views Methodology contained in **Appendix 6.3** and are assessed as follows:
- Baseline Photos of View;
 - Proposed Development Visualisation;
 - Proposed Development + Upper Brook Street Masterplan – PAG / Moda Living Cumulative Scheme Visualisation; and
 - Proposed Development Upper Brook Street Masterplan – PAG / Moda Living Cumulative Scheme + Consented Cumulative Schemes Visualisation.
- 6.13 The Townscape, Heritage and Visual Impacts Assessment is divided into four interrelated concepts:
- Description and evaluation of the existing townscape character, including landscape elements, heritage assets and consideration of the sensitivity to the Development;
 - Description and evaluation of the existing views towards the Site through consideration of visual and townscape receptors and their sensitivity to the Development;
 - Assessment of the potential changes and effects on the townscape character as a result of the Development; and
 - Assessment of the potential changes in views and effects on visual receptors.
- 6.14 The assessment of townscape and visual effects is less amenable to scientific or statistical analysis than some topics, having an inherent element of subjectivity and professional judgement. In order to ensure that the process is as transparent as possible a rigorous approach to assessment methodology has been adopted, taking account of published guidance. The following text describes methods used to arrive at the necessary judgements in the specific context of townscape and visual effects.
- 6.15 The broad objective in assessing the effects of the Development is to identify likely significant effects on the townscape and visual resource. Significance is assessed through a combination of two considerations: the sensitivity of the receptor and the magnitude of change that will result from the Development. Sensitivity and

magnitude of change can be graded and thereafter considered holistically in order to ascertain the significance of the effect envisaged.

Sensitivity of Receptors

Sensitivity of Townscape Receptors

- 6.16 The sensitivity of a townscape receptor is an expression of its ability to accommodate the Development as part of its own character. This is dependent on the importance of the townscape, the value and quality of the townscape and the nature and expectation of the viewer.
- 6.17 The quality of a townscape character receptor is a reflection of its attributes, such as the condition of the buildings and spaces or landscape components and the attractiveness and scenic quality of the area, as well as its sense of place. A townscape which is consistent, intact and with well-defined distinctive attributes is generally considered to be of a higher quality and, in turn, higher sensitivity than a townscape where the presence of inappropriate, low-quality or discordant elements has detracted from its inherent attributes. The higher the quality of a receptor, the greater is its sensitivity to the Proposed Development. The vulnerability of the townscape receptor is the degree to which it could be compromised through new development.
- 6.18 The existing character, scale and prominence of the receptor determines the degree to which the receptor may accommodate the influence of the Proposed Development. The character is defined by the particular attributes of the built form and open space and the distinctive pattern and scale they combine to form. For example, an urban area that is of a particularly distinctive and intact character may have high sensitivity to the influence of the Proposed Development, whereas an urban area that lacks a sense of place, has been poorly altered and is of a discordant character may have a low sensitivity.
- 6.19 The value of a townscape character receptor is also a reflection of its importance in terms of any designations that may apply, or its importance in itself as a landscape or townscape resource, which may be due to its heritage, ecological, cultural or recreational value. A receptor that lies within the boundary of a recognised landscape or townscape-related planning designation, such as a conservation area, or groups of listed buildings, will be of high value depending on the proportion of the receptor that is covered and the level of importance – national, regional or local – of the designation. It is important to note the absence of designations does not preclude local resource value, as an undesignated townscape character receptor may be important as a resource in the local or immediate environment due to its relative rarity. The higher the value of a receptor, the greater its sensitivity to the Proposed Development.
- 6.20 The nature and expectation of the viewer reflects the occupation or activity of the people who will experience the view. In the case of townscape assessment, people who will see the Proposed Development and its setting are taken to be the general public, taking into account the differing interests and expectations likely to be found in residents, visitors and those who work in a place.

6.21 Following consideration of the above and guidance contained in the GLVIA3, the sensitivity of the townscape receptors are graded as 'low', 'medium' or 'high', the definitions of which are provided in **Table 6.1** below.

Table 6.1: Sensitivity of Townscape Receptors

Sensitivity	Description
High	- The townscape is likely to contain an area designated of international, national or regional importance, with a large concentration of valued features which combine to create a sense of uniformity, richness, harmony and a distinct destination with a unique sense of place. - The townscape is unique, featuring a pattern and style of development that is distinctive within an international, national or regional context and is consistent, intact and well defined.
Medium	- Undesignated area or local designation, with some attractive or noteworthy features. May also include areas of regional designation, subject to townscape quality. - The area will display physical elements with some uniformity and coherence of reasonable condition. - The townscape is distinctive within the local context, featuring a pattern and style of development that is relatively intact, but includes a number of areas of discordant character. - There may be evidence of alteration to original features, resulting in a mixed character.
Low	- The townscape may have local pockets with a sense of place and local distinctiveness. However, the pattern and style of physical elements lacks uniformity and coherence, with any pockets of quality disconnected from one another. - Physical elements will be of an overall poor quality.

Sensitivity of Visual Receptors

6.22 The sensitivity of a visual receptor is dependent on the importance of the viewpoint, the value and quality of the view and the nature and expectation of the viewer. This includes heritage values as well as a wider spectrum of considerations on community use, location, environmental and social factors and so forth.

6.23 The importance of the viewpoint is determined by any recognition the viewpoint may have. A viewpoint that is protected by planning policy will have a greater importance, and this may be increased if facilities for the enjoyment of the view are provided, such as a viewpoint indicator, benches or footpaths. Conversely, a viewpoint located on a minor road will tend to have limited importance. A viewpoint that is visited or used by a large number of people

will tend to have greater importance than one experienced by very few people, although this is not always the case. The greater importance of the viewpoint, the higher its sensitivity is likely to be.

- 6.24 The value and quality of the view is a reflection of the scenic qualities, and heritage significance, gained in the view. The value of the view will be increased if it overlooks a designated area such as a conservation area. The quality of the view will be increased if the condition of the townscape is near to its optimum for its type. Views that are well known at a local level for their scenic qualities can also have an increased value, even if there is no formal recognition or designation. The greater the value and quality of the view, the greater its sensitivity is likely to be.
- 6.25 The nature and expectation of the viewer reflects the occupation or activity of the people who will gain the view. Viewers whose attention is focused on the townscape – walkers that are travelling through an area for the purpose of enjoying the view, for example – are likely to have a higher sensitivity. A view that is gained from a place where people gather, with some awareness of and focus on their surroundings, may have an increased importance. Viewers travelling in cars or on buses will tend to have a lower sensitivity as their experience is transient.
- 6.26 Following consideration of the above and taking into account guidance contained in the GLVIA3 (2013), the sensitivity of the visual receptor is graded as low, medium or high, definitions of which are provided in **Table 6.2** below.

Table 6.2: Sensitivity of Visual Receptors

Sensitivity	Description
High	The view is likely to be an internationally, nationally or regionally important view. Could include landmark features of regional or national importance with high amenity value. The view will include significant elements of visual interest and attractive or notable compositional qualities. In addition the view will be enjoyed by a large number of recreational users and visitors, possibly there for the sole purpose of enjoying the view or the public amenity. The view could also include significant heritage assets including listed buildings.
Medium	Undesignated view or locally recognised view. The view could include some features of value or interest with limited signs of neglect or degradation. The view will be either intentional or incidental to the viewer, with some amenity value. The view could include significant elements of visual interest and attractive or notable compositional qualities. It may also be a view that contains heritage assets such as highly Graded listed buildings whose heritage significance is clearly readable, but not best represented, in this particular view.
Low	The view is likely to be an undesignated view, which does not include any landmark features and is low amenity value, showing signs of neglect and degradation. The view is unlikely to include elements of visual interest and attractive or notable compositional qualities. The view will be incidental to the viewer, and in most cases the viewer will be in motion. It may contain heritage assets such as Grade II listed buildings, conservation areas or locally listed buildings whose heritage significance is clearly readable, but not best represented, in this particular view.

Magnitude of Change

- 6.27 Magnitude of change is an expression of the scale and type of change on townscape receptors and views that will result from the Development. As with sensitivity, magnitude of change is graded in bands as defined in **Table 6.3** below. The same magnitude of change process is also applied to heritage receptors.

Table 6.3: *Magnitude of Change to Townscape and Visual Receptors*

Magnitude of Change	Description
Major	The Development constitutes an immediately apparent feature in the townscape and visual context and has a material influence on the receptor.
Moderate	The Development constitutes a visible and recognisable feature in the townscape and visual context, is generally distinguishable from the existing baseline characteristics, and has a readily apparent influence on the receptor.
Minor	The Development forms a minor component of the townscape and visual context, is generally indistinguishable from the existing baseline characteristics, and its influence on the receptor may be missed.
Negligible	The Development is barely discernible within the townscape context, is indistinguishable from the existing baseline characteristics, and its influence on the receptor equates to a 'no change' situation.
None / Neutral	If the Development is not visible within the view and there will be no change to the view and therefore there is no effect.

- 6.28 The extent to which a sensitive receptor may be affected by the Development will influence the magnitude of change. If the Development influences a limited part of the townscape or visual receptor, the magnitude of change will generally be lower. The degree of change in character of the receptor will influence the magnitude of change. The greater the degree of contrast between the existing and the proposed character, the higher the magnitude of change.
- 6.29 The degree of change in the quality and value of the townscape will also influence the magnitude of change. The greater the degree to which the Development results in a loss of elements of quality or value or their introduction the higher the magnitude of change.

Nature of Effect

- 6.30 The nature of effect is classed as adverse, neutral or beneficial on a sliding scale and as set out in **Table 6.4** below. It is also subject to more specific considerations, namely distance, extent of effect, position, context, and proportion of view affected, and these are explained below:

- The distance between the visual receptor and the Development;
 - Generally, the greater the distance, the lower the magnitude of change as the Development will constitute a smaller and generally less apparent external influence or component of the view.
- The extent of the receptor that will be affected by visibility and, therefore, the influence of the Development;
 - If the Development affects a limited part of the visual receptor, such as a road route, the magnitude of change will generally be lower.
- The extent of the Development that will be seen;
 - Visibility may range from part of to the whole Proposed Development. The implication of this on the visual character receptor can vary and is largely dependent on distance. While an outlook over the majority of the Development will generally increase its influence on the receptor, a long view in which the whole Development is visible can have a more limited influence and, therefore, a lower magnitude of change than a close view where only part of the Development is seen due to intervening landform or existing built form. Views may be glimpsed, partial, filtered or open.
- The position of the Development in relation to the principal orientation of the visual receptor or in relation to any existing focus of views from the receptor;
 - If the Development is seen in a specific, directional vista from a receptor such as a route, the magnitude of change will generally be greater; if the Development is seen in the context of an existing external influence or eye-catching external feature the magnitude of change may be greater.
- The context within which the Development will be seen; and
 - This is important as it will determine the contrast that the Development will have on the existing outlook. The scale and patterns of the townscape, the existing land uses, and the degree and type of Development and settlement seen in the view will all be relevant.
- The proportion of the view that is affected by visibility of the Development.
 - Where an elevated viewpoint may offer views of the entire Development it may be seen in the context of a wide panorama or a long depth of field thus reducing its importance within the view.

6.31 Townscape and visual effects and their magnitude are categorised in **Table 6.4** below.

Table 6.4: Townscape and Visual Effects

Nature of Effect	Description
Major Adverse	The Development would cause a material deterioration in a view. In most instances this category of significance will arise where a very high or high sensitivity receptor is assessed as being likely to experience a moderate / major magnitude of change and one which is adverse in nature. Alternatively, a moderate magnitude of change on a highly sensitive receptor

Nature of Effect	Description
	or a major magnitude of change on a moderate sensitivity receptor may result in a major level of significance.
Moderate Adverse	The Development would cause a notable deterioration in a view. In most instances this category of significance will arise where a moderate sensitivity receptor is assessed as being likely to experience a moderate magnitude of change and one which is adverse in nature. Alternatively, a minor magnitude of change on a highly sensitive receptor or a major magnitude of change on a low sensitivity receptor may result in a moderate level of significance.
Minor Adverse	The Development would cause a perceptible deterioration in a view. In most instances this category of significance will arise where a low/moderate sensitivity receptor is assessed as being likely to experience a minor / moderate magnitude of change and one which is adverse in nature.
Negligible	The Development would cause no discernible deterioration or improvement in a view. In most instances a negligible effect will arise where a low sensitivity receptor is assessed as being likely to experience a negligible magnitude of change.
Minor Beneficial	The Development would cause a perceptible improvement in a view. In most instances this category of significance will arise where a low / moderate sensitivity receptor is assessed as being likely to experience a minor / moderate magnitude of change and one which is beneficial in nature.
Moderate Beneficial	The Development would cause a notable improvement in a view. In most instances this category of significance will arise where a moderate sensitivity receptor is assessed as being likely to experience a moderate magnitude of change and one which is beneficial in nature. Alternatively, a minor magnitude of change on a highly sensitive receptor or a major magnitude of change on a low sensitivity receptor may result in a moderate level of significance.
Major Beneficial	The Development would cause a material improvement in a view. In most instances this category of significance will arise where a very high or high sensitivity receptor is assessed as being likely to experience a moderate / major magnitude of change and one which is beneficial in nature. Alternatively, a moderate magnitude of change on a highly sensitive receptor or a major magnitude of change on a moderate sensitivity receptor may result in a major level of significance.

Significance of Effects

- 6.32 A matrix is used to determine the significance of the effect, taking into consideration the sensitivity of the receptor and the magnitude of the impact (**Table 6.5**). This effect will then be assessed to determine the attribute of this change; beneficial, adverse or neutral. The sensitivity of the view and its ability to absorb this change will be assessed as an integral part of these two elements and appears within the commentary. The effects will be further

categorised according to the duration, i.e. short, medium or long-term, and effects can be temporary or permanent.

- 6.33 Impacts on value or significance can be direct or indirect, and can be characterised in terms of timing, scale, duration, reversibility and the likelihood of the impact occurring. Impacts can be short, medium or long term, permanent or temporary and can be positive or negative.
- 6.34 The magnitude of an impact can vary from 'major' to 'negligible'. **Table 6.5** below sets out the definitions of magnitude of impact in relation to the sensitivity of townscape views as receptors. For each view, the magnitude of the predicted impact has been considered, taking into account the criteria set out in **Table 6.5**.
- 6.35 A 'significant effect' in EIA terms has been defined as an effect with an assigned value of **Moderate** or **Major Adverse / Beneficial**. Any effect with an assigned value of **Minor Adverse / Beneficial** or **Negligible** would be 'Not Significant' in EIA terms.

Table 6.5: Sensitivity and Impact Matrix

		Sensitivity of Receptor		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Minor / Negligible	Minor / Negligible
	Minor	Minor / Negligible	Minor	Moderate / Minor
	Moderate	Moderate / Minor	Moderate	Major / Moderate
	Major	Moderate / Minor	Major / Moderate	Major

Notes: Major, Moderate or Minor effects can be Beneficial or Adverse in nature.

Effects highlighted in orange are 'Significant' in EIA terms.

Consultation

Table 6.6: Record of Consultation

Consultee	Date	Comments	Actions
Historic England	29/03/23	<i>"The site, and its wider environs are currently characterised by poor quality modern buildings, set within visually unappealing landscaping. Cumulatively the site is a poor piece of townscape, that severs the university campus to the west from the residential development to the east.</i> <i>The exception to this poor townscape is the former Unitarian Chapel, now converted into student accommodation. This is an attractive building, designed by Charles Barry and</i>	Demonstrate the wider masterplan as part of the proposals.

Consultee	Date	Comments	Actions
		<i>constructed in a handsome gothic style. It is perhaps the earliest Gothic non-conformist place of worship, and is of considerable architectural interest. It is accordingly listed at grade II*.</i> <i>We welcome the redevelopment of the site, and believe that the wider masterplan has the potential to not only improve the townscape of Manchester, but also to better reveal the significance of the chapel. From the information provided in the meeting we are comfortable that the proposed quantum of development could be achieved on the site without harming the significance of the chapel, and that sensitive consideration is being given to the design of both the buildings and the wider landscaping.</i> <i>The nature of the wider site masterplan means that there is going to be distinct physical and visual separation between this element of the proposals and the listed building. Most pertinently this includes intervening built form. Therefore, while we believe that care and attention will need to be taken to ensure that this scheme is a good neighbour from a townscape perspective, we do not believe that the proposals as they are currently formed will result in harm to the significance of the listed building."</i>	

Baseline Conditions

- 6.36 A full and detailed description of the existing Site and surrounding areas as well as its historic development is provided in the Townscape, Heritage and Visual Impacts Assessment (THVIA) (see **Volume 3: Appendices, Appendix 6.1**). The relevant elements from this THVIA are drawn upon to set the specific context of the townscape and urban environment in and around the Site, and to establish a visual baseline against which the effects of the Development can be evaluated.
- 6.37 This section describes the townscape context of the Site and identifies the surrounding townscape and visual receptors (views) that are likely to be affected by the Development.

Description of the Site and its Immediate Townscape and Historical Context

Historical Context

- 6.38 Manchester was slow to expand beyond its medieval core and even as late in the 1770s reached only as far south as Piccadilly Gardens. Industrialisation, however, caused a rapid expansion and by 1813 Oxford Road, Upper Brook Street and Ardwick Green South were all in existence, with narrower residential side streets of varied character already forming in their north. Worker terraces subsequently began to spread across the former fields and market gardens between Upper Brook Street and the Ardwick Green, a chapel, prison and Non-Conformist burial group

all existing by the 1830s. A building boom followed in the late-1860s and by 1884 almost all of this area was filled with short rows of terraced housing, interspersed with occasional industrial buildings. This was a pattern replicated across Chorlton-cum-Medlock, although a large area of development was demolished in 1869 for Owens College (now the University of Manchester).

- 6.39 Whilst some larger industrial sites did emerge, the area at the northeast of Upper Brook Street retained its primarily Victorian character until the post-war period, in contrast to the large-scale redevelopment visible in the construction and extension of the Manchester Royal Infirmary or the expansion of Owens College. Targeted slum clearance took place in the 1960s, focused on individual sections of specific roads, whilst the burial ground was cleared of its headstones and reopened as gardens. Again, change was comparatively limited when compared to the large-scale redevelopment occurring in the eastwards expansion of the university and the construction of the Mancunian Way. Far more radical change came in the 1970s-80s, when the entirety of the area between Upper Brook Street and Ardwick Green South was cleared, with only scattered buildings such as the chapel and its Sunday School (added in 1881), the Mawson Hotel and certain small industrial sites surviving. The area was redeveloped primarily as the Brunswick Estate (incorporating housing and amenities such as Elizabeth Yarwood Court), although SRF Upper Brook Street sites (SRF Sites) were identified for primarily light industrial / commercial development, leading into the heavily industrial area to the north of the Mancunian Way. To their immediate west, the University of Manchester and what was then UMIST also spread along Upper Brook Street in this period, and infill within the combined university estate has continued subsequently.
- 6.40 The character of the SRF Sites and their immediate surroundings to the east has remained fairly consistent since the 1970s / 80s, although a student accommodation complex now stands on Kincardine Road and a programme of regeneration is underway on the Brunswick Estate. Three of the complexes on the SRF Sites, plus the Mawson Hotel and the adjacent homeopathic clinic, became vacant in the 2010s.

Contemporary Context

- 6.41 Upper Brook Street is a heavily trafficked road which, alongside the SRF Sites, forms a significant intervention in the townscape which severs Brunswick to the east from the university campus to the west with minimal routes spanning east-west between them. The Site and the wider SRF Sites comprises poor quality modern buildings set within large expanses of hard landscaping with a poor quality to the green landscaping with a variety of boundary treatments. They are now largely vacant which reinforces the poor environment they have created, lacking any sense of place or distinctiveness. By contrast, the redevelopment of the university campus and implementation of the Brunswick masterplan has significantly uplifted the wider environs with large-scale contemporary university blocks to the west and high-quality new housing interspersed within the Brunswick Estate to the east. Whilst a significant contrast to one in terms of their built form – both areas have benefitted from recent enhancements to the public realm encouraging movement east and west – currently truncated by the wedge of the SRF Sites in-between. The exceptions to the poor townscape are the Mawson Hotel to the south-east corner and the restored former Unitarian Chapel to the north-west (see below).

The Site

- 6.42 The Site extends to 1.084 hectares (ha) and is partially in use as a temporary paid car park. The paid car park is located on a section of the Site which was formerly in use as a Citroën car dealership (SRF Site C) and is accessed from both Upper Brook Street to the west and Kincardine Road to the east. It comprises a large, flat-roofed rectangular block with glazing to Upper Brook Street returning to the north and south facades and channelled cladding to the remaining and rear. Hard landscaping for parking surrounds to the north, south and east, with patches of grass and planting and a section of low wall with railings to Upper Brook Street and a wide metal gate; this is mirrored to Kincardine Road with a taller brick wall with piers and metal railings.
- 6.43 A tall brick wall separates the former dealership from the remainder of the Site (SRF Site B) which comprises the former Elizabeth Yarwood Court residential complex, accessed from Kincardine Road to the east, with a single storey car display open canopy fronting Upper Brook Street continuing the channelled cladding of the former Citroën car dealership to its canopy. This is now vacant with temporary fencing, a low metal rail boundary set on a grass verge with a larger area of grass to the corner with Cottenham Street and a tall white picket fence to its rear (east). Elizabeth Yarwood Court is a two-storey red brick 1970s building which has a crucifix plan form, the north, west and south arms comprising adjoined bays with pitched roofs and gabled ends – to the east a single range with a hipped roof bay at its end. Windows are modern uPVC casements. The building is surrounded by soft landscaping with trees and planting with an area of hard landscaping for parking off its Kincardine Street entrance. Aside from along its boundaries with the former car showroom structures the Site is bound by a tall, boarded timber fence.

Receptors

Heritage Receptors

- 6.44 The Heritage Assets Map at **Figure 6.1** shows the heritage assets (receptors) present within a 0.5km boundary of the Site. The potential effects as a result of the demolition and construction works and of the presence of the Proposed Development on each relevant heritage receptor are identified in **Table 6.7** along with the associated rationale for scoping that effect in or out of the assessment. Images are provided within **Appendix 6.2**.

Figure 6.1: Map of nearby Heritage Receptors

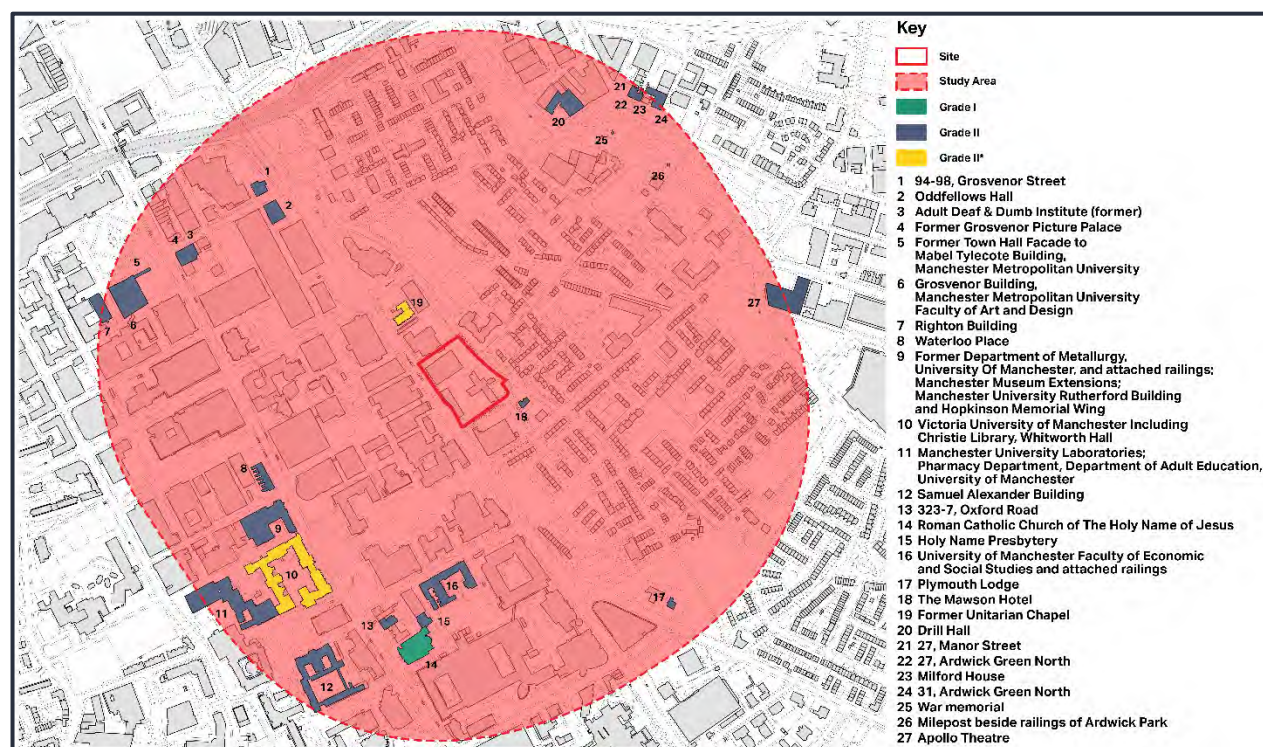


Table 6.7: List of nearby Heritage Receptors

Reference No. on Figure 6.1	Heritage Receptor (Grade II unless stated otherwise)	Potential Effect and Rationale for Scoping-In / Out	Scoped-In / Out
1	94-98 Grosvenor Street	Existence and operation effects: unlikely to have an impact on setting due to location north of the substantial Manchester Engineering Campus. Construction effects: unlikely to have an impact due to distance away on a heavily trafficked road in an area of development within the city centre.	Out
2	Oddfellows Hall	Existence and operation effects: Hall is incorporated into substantial Manchester Engineering Campus therefore they are unlikely to have an impact on its setting. Construction effects: unlikely to have an impact due to distance away on a heavily trafficked road in an area of development within the city centre.	Out
3	Adult Deaf & Dumb Institute (former)	Existence and operation effects: unlikely to have an impact on setting due to distance and presence of substantial university buildings in-between. Construction effects: likely to have no impact due to distance and position on corner of a minor road and Oxford Road – a largely traffic controlled road.	Out

Reference No. on Figure 6.1	Heritage Receptor (Grade II unless stated otherwise)	Potential Effect and Rationale for Scoping-In / Out	Scoped-In / Out
4	Former Grosvenor Picture Palace	Existence and operation effects: unlikely to have an impact on setting due to distance and presence of substantial university buildings in-between. Construction effects: likely to have no impact due to distance and position on corner of a minor road and Oxford Road – a largely traffic controlled road.	Out
5	Former Town Hall Facade to Mabel Tylecote Building	Existence and operation effects: unlikely to have an impact on setting due to distance and presence of substantial university buildings in-between. Construction effects: likely to have no impact due to distance and located to the west of Oxford Road (a largely traffic controlled road).	Out
6	Grosvenor Building	Existence and operation effects: unlikely to have an impact on setting due to distance and presence of substantial university buildings in-between. Construction effects: likely to have no impact due to distance and located to the west of Oxford Road (a largely traffic controlled road).	Out
7	Righton Building	Existence and operation effects: unlikely to have an impact on setting due to distance and presence of substantial university buildings in-between. Construction effects: likely to have no impact due to distance and located to the west of Oxford Road (a largely traffic controlled road).	Out
8	Waterloo Place	Existence and operation effects: located to the east of the terrace the Development will not appear within its setting when viewing its principal façade. Whilst the large-scale building to its rear means that it would be unlikely to be possible to view the Development in context with the listed terrace from the rear which would also likely be obscured by the intervening modern and large scale university buildings. Construction effects: likely to have no impact due to distance and located to the west of Oxford Road (a largely traffic controlled road).	Out
9	Former Dept of Metallurgy, Manchester Museums Extensions, Rutherford Building, Hopkinson Memorial Wing	Existence and operation effects: located to the east, the Development will not appear within its setting when viewing its principal façade. Whilst the density of buildings to its rear means that it would be unlikely to be possible to view the Development in context with the listed building from the rear which would also likely be obscured by the intervening modern and large-scale university buildings.	Out

Reference No. on Figure 6.1	Heritage Receptor (Grade II unless stated otherwise)	Potential Effect and Rationale for Scoping-In / Out	Scoped-In / Out
		Construction effects: likely to have no impact due to distance and located to the west of Oxford Road (a largely traffic controlled road).	
10	Victoria University, Christie Library, Whitworth Hall (Grade II*)	Existence and operation effects: located to the east, the Development will not appear within its setting when viewing its principal façade. Whilst the density of buildings to its rear means that it would be unlikely to be possible to view the Development in context with the listed building from the rear which would also likely be obscured by the intervening modern and large-scale university buildings. Construction effects: likely to have no impact due to distance and located to the west of Oxford Road (a largely traffic controlled road). See View 14 within Appendix 6.2	Out
11	Manchester University Laboratories	Existence and operation effects: set deep within the campus to the west of Oxford Road and owing to the intervening modern and large-scale university buildings there is unlikely to be an impact. Construction effects: likely to have no impact due to distance and located to the west of Oxford Road (a largely traffic controlled road) and set within the campus.	Out
12	Samuel Alexander Building	Existence and operation effects: set within the campus with its principal façade facing north and owing to the intervening modern and large-scale university buildings there is unlikely to be an impact. Construction effects: likely to have no impact due to distance and located to the west of Oxford Road (a largely traffic controlled road) and set within the campus.	Out
13	323-7, Oxford Road	Existence and operation effects: the close proximity of the large-scale Simon Building to its rear and further intervening modern and large-scale university buildings means there is unlikely to be an impact. Construction effects: likely to have no impact due to distance and location on Oxford Road (a largely traffic controlled road).	Out
14	Roman Catholic Church of The Holy Name of Jesus (Grade I)	Existence and operation effects: the scale of the Church itself and the intervening modern and large-scale university buildings means there is unlikely to be an impact. Construction effects: likely to have no impact due to distance and location on Oxford Road (a largely traffic controlled road).	Out

Reference No. on Figure 6.1	Heritage Receptor (Grade II unless stated otherwise)	Potential Effect and Rationale for Scoping-In / Out	Scoped-In / Out
		See View 15 within Appendix 6.2	
15	Holy Name Presbytery	Existence and operation effects: orientated to face east, the Development will not appear within its setting when viewing its principal façade. Whilst the density of buildings to its rear means that it would be unlikely to be possible to view the Development in context with the listed building from the rear which would also likely be obscured by the intervening modern and large-scale university buildings. Construction effects: positioned on a minor road within the University Estate there is likely to be no impact.	Out
16	University of Manchester Faculty of Economic and Social Studies	Existence and operation effects: orientated to face north, the Development will not appear within its setting when viewing its principal façade. Whilst it may be possible to view the Development in the context of the listed building to the rear, this would be limited to views from the Dover Street carpark owing to the scale of the Stopford Building to the south and must be considered in the context of the intervening modern and large-scale university buildings. Construction effects: positioned on a minor road within the University Estate there is likely to be no impact.	Out
17	Plymouth Lodge	Existence and operation effects: orientated to face southwest, the Development will not appear within its setting when viewing its principal façade. Given the distance in-between and the context of large-scale buildings along Upper Brook Street it is also unlikely that there will be an impact. Construction effects: positioned on a minor road within the University Estate there is likely to be no impact.	Out
18	The Mawson Hotel	Existence and operation effects: located immediately to the southeast of the Development Site there will be a direct impact on its setting. Construction effects: located immediately to the southeast of the Site there will likely an impact due to construction.	In
19	Former Unitarian Chapel (Grade II*)	Existence and operation effects: located immediately to the north of the Development Site there will be an impact on its setting, albeit in the context of an intervening Development Site also being brought forward at this time. Construction effects: located to the north of the Site there will likely an impact due to construction.	In
20	Drill Hall	Existence and operation effects: orientated to face southeast, the Development will not appear within its	Out

Reference No. on Figure 6.1	Heritage Receptor (Grade II unless stated otherwise)	Potential Effect and Rationale for Scoping-In / Out	Scoped-In / Out
		setting when viewing its principal façade. Whilst the Development will be visible in views from the building across Brunswick, it will form part of a skyline of large University buildings and owing to the tight density of buildings and Mancunian Way to its rear this will not be in context of the building itself. Construction effects: positioned a substantial distance from the Site there is likely to be no impact.	
21	27 Manor Street	Existence and operation effects: orientated to face southwest, the Development will not appear within its setting when viewing its principal façade. Whilst the Development will be visible in views from the building across Brunswick, it will form part of a skyline of large University buildings and owing to the tight density of buildings and Mancunian Way to its rear this will not be in context of the building itself. Construction effects: positioned a substantial distance from the Site there is likely to be no impact.	Out
22	27 Ardwick Green North	Existence and operation effects: orientated to face southwest, the Development will not appear within its setting when viewing its principal façade. Whilst the Development will be visible in views from the building across Brunswick, it will form part of a skyline of large University buildings and owing to the tight density of buildings and Mancunian Way to its rear this will not be in context of the building itself. Construction effects: positioned a substantial distance from the Site there is likely to be no impact.	Out
23	Milford House	Existence and operation effects: orientated to face southwest, the Development will not appear within its setting when viewing its principal façade. Whilst the Development will be visible in views from the building across Brunswick, it will form part of a skyline of large University buildings and owing to the tight density of buildings and Mancunian Way to its rear this will not be in context of the building itself. Construction effects: positioned a substantial distance from the Site there is likely to be no impact.	Out
24	31 Ardwick Green North	Existence and operation effects: orientated to face southwest, the Development will not appear within its setting when viewing its principal façade. Whilst the Development will be visible in views from the building across Brunswick, it will form part of a skyline of large University buildings and owing to the tight density of	Out

Reference No. on Figure 6.1	Heritage Receptor (Grade II unless stated otherwise)	Potential Effect and Rationale for Scoping-In / Out	Scoped-In / Out
		buildings and Mancunian Way to its rear this will not be in context of the building itself. Construction effects: positioned a substantial distance from the Site there is likely to be no impact.	
25	War Memorial	Existence and operation effects: the War Memorial is a relatively small-scale structure, its principal setting being the backdrop of the surrounding park to the east. As such the built form to the west does not form a part of its setting and therefore the Site would unlikely have an impact on its setting. Construction effects: positioned a substantial distance from the Site there is likely to be no impact.	Out
26	Milepost at Ardwick Park	Existence and operation effects: the milepost relates directly to the highway and there would be no impact. Construction effects: positioned a substantial distance from the Site there is likely to be no impact.	Out
27	Apollo Theatre	Existence and operation effects: the theatre sits on the southeast corner of a major roundabout and is orientated to face west, as such the Development will not appear within its setting when viewing its principal façade. Whilst the Development will be visible in views from the building across Brunswick, it will form part of a skyline of large University buildings and owing to the scale of the building itself from the rear this will not be in context of the building itself. Construction effects: positioned a substantial distance from the Site there is likely to be no impact.	Out

6.45 A description of the two heritage receptors scoped into the assessment are provided below.

The Mawson Hotel, Frances Street (Grade II)

6.46 The building's primary significance is derived from the architectural and historic interest of its retained and legible ground-floor plan form, its purpose design as a public house, and the survival of historic fabric. Its rarity in Manchester as a surviving 1930s 'local' public house also adds significance. Historic interest also lies in its association with the Tetley Brewery and its preferred architects (Bramley & Smith). Its significance is however somewhere reduced by the non-sympathetic replacement doors and windows, whilst the functional rear elevation and 20th-century flank walls are of no particular interest. The complete loss of the building's historic setting as a

'local' within a densely packed working-class area of linear housing has however had the greatest impact on its significance.

Former Unitarian Chapel (Grade II)*

- 6.47 The main significance of the site is derived from the chapel, both in the overall visual impact of its surviving and restored exterior, particularly as viewed from the north and west, and in its association with the great 19th-century architects Barry and Pugin. Importantly, it is believed to have been one of England's earliest Non-Conformist places of worship built in the Gothic style and, indeed, the country's first purpose-built Unitarian chapel. Further historic interest is derived from the chapel and Sunday school's evidential value, providing an insight into the size, wealth, social diversity and ambition of industrialising Manchester's 19th-century Non-Conformist community, a community that also created the adjacent Non-Conformist burial ground (now Gartside Gardens).
- 6.48 Visually, the main chapel building also has a landmark status on Upper Brook Street, although this has been reduced by the presence of taller and larger-footprint buildings running along the length of Upper Brook Street to its west. The sympathetic nature of its external restoration maintains its visual presence, although its significance is reduced by the loss of its internal fabric and, externally, of the original roof and the upper courses to the north, south and east walls.
- 6.49 The chapel seems to have always been situated in a constrained site, further reduced in size by the construction of the Sunday school. Prior to the 1960s / 70s redevelopment of the area, it was surrounded by (lower) 19th century terraces to the north, south and east with little or no open space; views into the site are a modern creation through the opening up of space to its north. Similarly, Upper Brook Street has always been a major and heavily traversed thoroughfare.

Townscape and Visual Receptors

- 6.50 The identification of townscape and visual receptors with the potential to be affected directly or indirectly by the Development was undertaken. Sensitivity was then ascribed in relation to these receptors which vary in their capacity to accommodate different forms of development (please see the section 'Assessment of Likely Significant Effects' for the ascribed sensitivity for each).
- 6.51 A map illustrating the location of the following townscape receptors is included at **Figure 6.2**.
- 6.52 Key townscape and visual impacts relating to the redevelopment of the Site have been assessed through 13 strategic and close up views identified by Donald Insall Associates and agreed with Manchester City Council as part of the informal EIA Scoping process. The views selected (see **Table 6.8** below) were based upon analysis of the Site and its surroundings. The 13 viewpoints within this assessment include views north and south along the heavily trafficked Upper Brook Street, across the university campus to the west and through the residential housing in Brunswick to the east – both areas which have been subject to significant development in recent years.

Figure 6.2: Location of Viewpoints included within Assessment

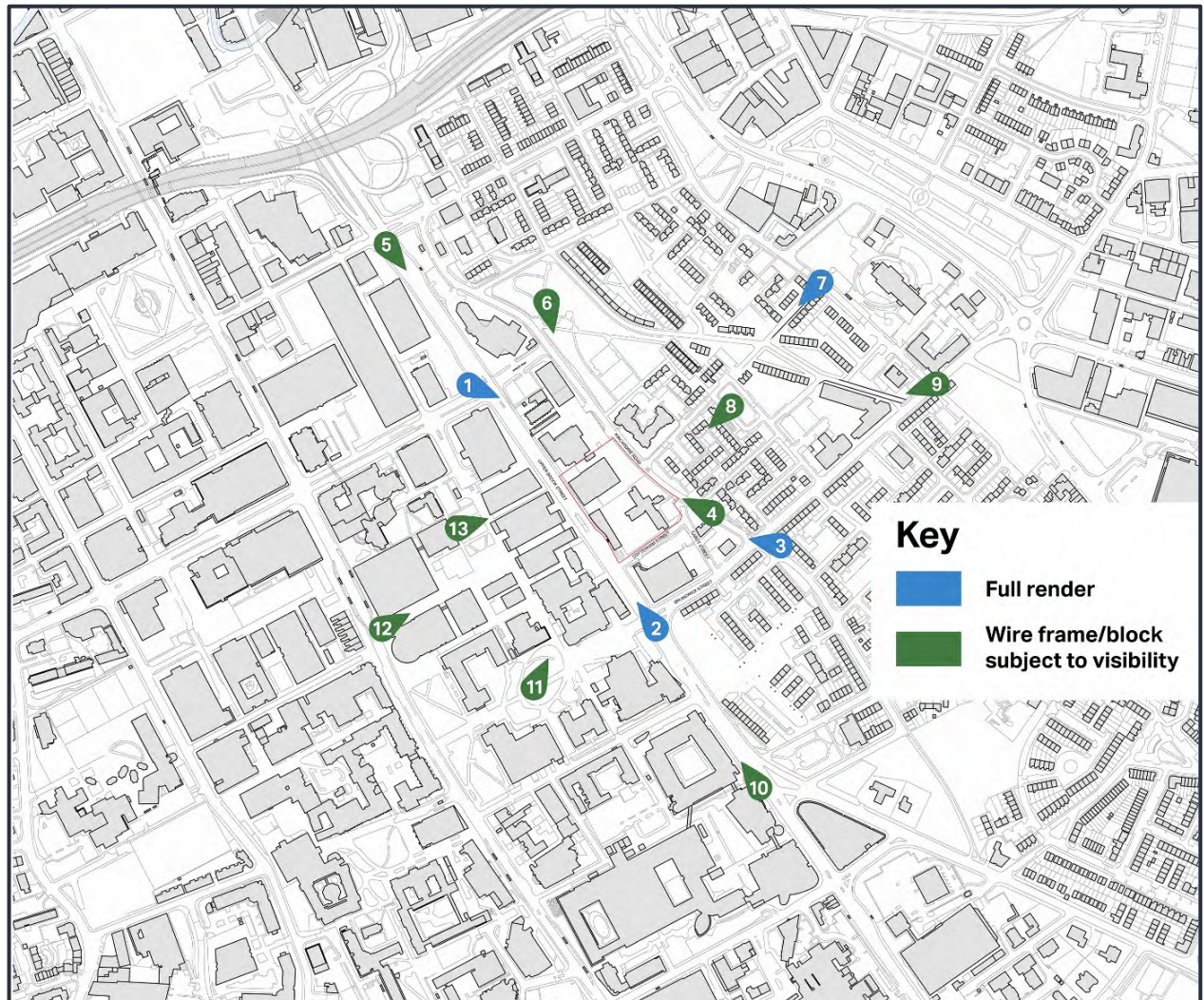


Table 6.8: Identified Views

View Number	View Name
1	View from north corner of Upper Brook Street / Booth Street East junction
2	View from east end of pedestrianised section of Brunswick Street
3	View from junction of Brunswick Street and Kincardine Road
4	View from northeast side of the Mawson Hotel on Kincardine Road
5	View south from Upper Brook Street / Grosvenor Street junction
6	View from Gartside Gardens
7	View from northeast end of Balsam Close
8	View from Rudcroft Close 'Orchard'
9	View from Brunswick Village block at southeast end of Sylvia Pankhurst Way
10	View from west side of junction between Upper Brook Street and Plymouth Grove
11	View from Brunswick Park
12	View from west end of Wilton Street
13	View from Rumford Street public realm

Cumulative Effects Assessment

6.53 The Cumulative Effects Assessment (CEA) has been undertaken to consider the effects of the following Cumulative Schemes in-combination with the Proposed Development (i.e. the 'Cumulative Scenario'), which are shown as a chalk render in the AVRs included in **Appendix 6.4**. As noted in **Volume 2: Main Text, Chapter 2: EIA Approach**, a number of Cumulative Schemes are under construction and are nearing completion or have been completed. These have therefore been included within the baseline conditions assessment and the baseline photography and include:

- Cumulative Scheme No. 1 (Brunswick Neighbourhood); and
- Cumulative Scheme No. 3 (Kincardine Court Extension).

6.54 The following schemes are included in the CEA:

- Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living);
 - As Cumulative Scheme No. 2 comprise the northern blocks of the Upper Brook Street Masterplan, this will form the immediate backdrop of the Proposed Development and will have a material effect on the way the Proposed Development will be perceived. Cumulative effects will be assessed based upon visual information available at the time of production of this ES chapter.
- Cumulative Scheme No. 4 (Number 3 Circle Square);

- Cumulative Scheme No. 5 (MMU Science and Engineering Building); and
- Cumulative Scheme No. 6 (First Street South).

Embedded Mitigation

Demolition and Construction

- 6.55 Embedded mitigation measures include the provision of structural landscaping within the Development and the management of construction effects such as plant presence, noise, light pollution and vibration through the phasing of the Proposed Development and consideration of height parameters. These measures will reduce impacts during the demolition and construction period to a lower level.

The Completed and Operational Development

- 6.56 The embedded mitigation in relation to townscape, heritage and visual impacts includes the following:
- Consideration of maximum height parameters and development of massing to mediated between distinct scales to flanking neighbourhoods;
 - Creation of east-west public routes, increased connectivity and community uses;
 - Quality of architecture and provision of active frontages;
 - Extensive public realm and landscaping including linear and pocket parks; and
 - Unified masterplan approach with Cumulative Scheme No.2 (Upper Brook Street Masterplan – PAG / Moda Living) further reinforcing embedded mitigation methods above.

Assessment of Likely Significant Effects (including in the Cumulative Scenario)

- 6.57 An assessment of the likely construction phase effects associated with the Development is followed by a summary of the effects on each townscape, heritage and visual receptor for the complete and operational phase (see AVRs at **Appendix 6.4** upon which this assessment is based).
- 6.58 The cumulative effects with other relevant Cumulative Schemes (Nos. 2, 4, 5 and 6), including the nature and significance of effects, are also identified.

Demolition and Construction

- 6.59 The construction effects on the surrounding townscape and views will be temporary and are limited to effects such as the presence of scaffolding and hydraulic access platforms, large machinery, cranes, storage, site accommodation and welfare facility.
- 6.60 The most significant visual effects associated with the construction process will be the presence of cranes, and the presence of temporary structures (such as portacabins) within the setting of heritage assets. It is envisaged that site accommodation and combined welfare facility would be contained within the Site and behind hoarding. The presence of such temporary structures is inevitable in connection with construction of the type and scale envisaged. This temporary situation is common as a consequence of building activity in the city and there is no practical way of avoiding it, nor is it an unusual view, and is commonly experienced at many similar sites in Manchester – including the recent developments on the west side of Upper Brook Street.
- 6.61 The above aspects of the construction phase are likely to have a temporary, short-term, **Negligible** to **Minor Adverse** effect (**Not Significant**) on all the views and the townscape. In terms of Heritage Receptors, the above aspects of the construction phase are likely to have a temporary, short-term, **Minor Adverse** effect (**Not Significant**) on the Mawson Hotel and the Former Unitarian Chapel.

The Completed and Operational Development

The Site

Existing

- 6.62 The Site is a receptor of low sensitivity made up of modern low-rise blocks of no architectural merit with poor quality surrounding public realm. Alongside the wider Masterplan Sites, it forms part a corridor that has the sense that it is a forgotten piece of land on a heavily trafficked road into the city centre which forms a wedge in the townscape divorcing the two flanking areas of regeneration and renewal from one another.

The Proposed Development

- 6.63 The magnitude of change which the Development would bring would be major; with the resulting nature of the effect being **Moderate Beneficial (Significant)**, with the poor quality buildings on the Site being replaced by high quality buildings which have been designed to mediate between the contrasting townscapes to either side and that would be set within a high quality and coordinated public realm, including: a pocket park; the reinstatement of the historic Thorburn Road as a linear park; and the creation of active frontages and community uses to create a sense of place and draw the local distinctiveness of the University campus and the Brunswick community together.

Cumulative Scenario

- 6.64 This likely **Moderate Beneficial (Significant)** change would be further reinforced by the cumulative impact of the Masterplan Sites which bring about a major regeneration of the area, centred on a coordinated approach to massing and public realm, linking the two neighbouring communities together and creating a new part of the city.

Table 6.9: The Site – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
The Site	Low	Major	Direct, long-term Moderate Beneficial effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Beneficial effect (Significant)

- 6.65 The following commentary discusses the effects of the Development on the baseline from the 13 views, which comprises the basis of the visual assessment. Views 1, 2, 3, 4, 5, 6 and 10 take into consideration the potential effect on the Former Unitarian Chapel (Grade II*), whilst View 3 takes into account the effect of the Development on the Mawson Hotel (Grade II) as heritage receptors. The potential effect on townscape receptors was integrated into the selection of the views for analysis and therefore is embedded in the assessment below. The cumulative effects of the Masterplan Development sites to the north are shown in separate AVR images with the addition of wider consented schemes forming the concluding image.
- 6.66 The views assessed are shown on the map at **Figure 6.2** with the AVRs produced contained in **Appendix 6.4**. The sensitivity of the views and townscape and heritage receptors is identified as part of the assessment of the existing view.

View 1: View from north corner of Upper Brook Street / Booth Street East junction

Existing

- 6.67 View 1 is taken from the north corner of the Upper Brook Street / Booth Street East junction at a point in the townscape where people will pause to cross the roads with the opportunity to view the Former Unitarian Chapel and attached Former Sunday School. Whilst the Grade II* listed building is a heritage receptor of high sensitivity, its setting has been significantly compromised by the surrounding townscape which is otherwise of low sensitivity – with low-quality single storey car showroom units which are now vacant, unkempt surrounding hard landscaping, a variety of boundary treatments and a lack of uniformity or coherence. The recent developments on the University campus along the west side of Upper Brook Street have started to create a new sense of place and local distinctiveness, with these taller buildings located obliquely in the view. Terminating the view to the south at the junction of Upper Brook Street and Plymouth Grove is Nick Everton House – a contemporary 13 storey student accommodation block. Whilst the heavily trafficked road reinforces the poor quality of the townscape, it also offers significant opportunity for enhancement given the number of people who experience this view, waiting at the crossroads and travelling in vehicles.

With the Proposed Development

Townscape Receptors

- 6.68 The Development would be readily visible in View 1 and would have a significant effect on the local townscape, transforming a previously down at heel area through the introduction of high-quality architecture which responds to the taller buildings both facing on Upper Brook Street and terminating the view to the south. The enhancement to the townscape would be further reinforced through the introduction of activity and an enhanced public realm.
- 6.69 The Proposed Development would have a **Moderate Beneficial** effect (**Significant**) on the local townscape.

Visual Receptors

- 6.70 The east side of Upper Brook Street in View 1 has no appeal beyond the Chapel and Sunday School, the Proposed Development would introduce visual interest which, alongside the facing University buildings, would create a sense of place and a major uplift of the view both for pedestrians at the crossroads and vehicles travelling south out of the city centre.
- 6.71 The Proposed Development would have a **Moderate Beneficial** effect (**Significant**) in View 1.

Heritage Receptors

- 6.72 Whilst height would be introduced into the setting of the Grade II* listed chapel, it does not rise up behind its roofline and its pinnacles will remain in silhouette. Furthermore, the uplift in the general environment of the local townscape would impact positively on the vibrancy of the restored chapel building, any potential conflict between the two further mitigated by the use of buff brick to the PBSA building, sympathetic to the tone of the chapel building and through the architectural detailing and modelling proposed.

- 6.73 The Proposed Development would have a **Major Beneficial (Significant)** effect on the Grade II* listed Former Unitarian Chapel.

Cumulative Scenario

Townscape Receptors

- 6.74 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would bring further major and beneficial change to the townscape, regenerating adjacent sites along a significant stretch of Upper Brook Street. This would change its character from one of a generic arterial road running into the city centre into part of a transformed district alongside the University buildings on the facing side of the street. The Cumulative Scheme would also serve to better root the PBSA and Sci-Tech buildings in the townscape by infilling the detracting land use in-between, and bringing forward a unified, rather than disjointed, development. The public realm enhancements proposed, creation of further routes east-west and introduction of active frontages would only serve to lift the townscape further and reinforce the newly created sense of place.
- 6.75 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the townscape would be a **Moderate Beneficial** effect (**Significant**).

Visual Receptors

- 6.76 Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would transform View 1, with new development in the near distance which would give context to the Proposed Development and continue its uplift and visual appeal, drawing people's attention to this side of Upper Brook Street when previously the chapel was the only feature of interest. The creation of the public square would maintain views of the Grade II* listed chapel akin to how they existed in the late-19th century and allow it still to be read as a local landmark in this view.
- 6.77 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) in View 1 would be a **Moderate Beneficial** effect (**Significant**).

Heritage Receptors

- 6.78 Historically, other than the open aspect to the northwest maintained through the creation of the public square proposed, the Grade II* chapel stood in a much more tightly-constrained setting; therefore the massing of the Development in the Cumulative Scenario would not by default have an adverse effect. The southern building of the Masterplan Site would, however, introduce built form behind the chapel's roofline (currently seen in silhouette) which would have been one of the more prominent elements in the historic townscape. The impact is however mitigated given the detracting effect of the Site as existing on the chapel's setting, the stepped massing building up away from the chapel and the positive impact that the general uplift of the townscape and introduction of activity would have in this close-up view – particularly the public square.

- 6.79 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the Grade II* listed Former Unitarian Chapel would be a **Major Beneficial (Significant)** effect.
- 6.80 Within View 1, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect**.

Table 6.10: View 1 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Low	Major	Direct, long-term Moderate Beneficial effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Beneficial effect (Significant)
Heritage (Former Unitarian Chapel)	High	Major	Direct, long-term Major Beneficial effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Major Beneficial effect (Significant)

View 2: View from east end of pedestrianised section of Brunswick Street

Existing

- 6.81 View 2 is taken from the east end of Brunswick Park as it exits the University campus, this former section of Brunswick Street has recently been subject to significant public realm enhancements through its pedestrianisation, the creation of a linear park and the introduction of the Schuster Annexe which sits obliquely in this view. At this point the change in the quality townscape is significant, dominated by the heavily trafficked road and the low-rise, ad-hoc buildings on the facing side of Upper Brook Street including the Tai Wu restaurant and W.H. Lung Supermarket and former car showrooms located on the proposed Development Site. The reinstated steep pitched roof of the Former Unitarian Chapel (Grade II*) is visible to the north, here its sensitivity is medium given its distance in the view and the presence of the tall modern buildings in the city centre which, owing to their distance, share a similar roofline.

With the Proposed Development

Townscape Receptors

- 6.82 The Proposed Development would replace the detracting single storey former showrooms with high-quality architecture which would transform the local townscape, enhanced further through the creation of a new public realm and a linear public park on Thorburn Walk - which has been designed to draw people from Brunswick Park into and through the Site. Whilst the additional massing would be readily visible in this view and have a major effect on the townscape, here the manner which it successfully mediates between the facing University buildings on Upper Brunswick Street and the surrounding more domestic-scaled buildings to the south and east is clear.
- 6.83 The Proposed Development would have a **Moderate Beneficial** effect (**Significant**) on the local townscape.

Visual Receptors

- 6.84 In View 2, the viewer is affronted by a lack-lustre group of low-rise buildings upon exiting the regenerated University campus and the amenity of Brunswick Park. Whilst adding mass into the open skyline afforded by the low rise buildings on the Site, the Proposed Development would create a significant enhancement, introducing activity and visually appealing architecture and public realm, whilst maintaining a view of the chapel front as a local landmark.
- 6.85 The Proposed Development would have a **Moderate Beneficial** effect (**Significant**) in View 2.

Heritage Receptors

- 6.86 The Development would obscure the rear half of the chapel roof, which, as historically, rises above the lower level surrounding buildings. This effect is however mitigated to a degree by the wider enhancements the Development would bring to the quality of the local townscape, grounding the chapel within a contemporary urban development rather than as an island within an otherwise low-quality townscape as existing.
- 6.87 The Proposed Development would have a **Minor Adverse (Not Significant)** effect on the Grade II* listed Former Unitarian Chapel.

Cumulative Scenario

Townscape Receptors

- 6.88 The cumulative effect brought about by the adjacent Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would complete the coordinated redevelopment of a significant stretch of townscape – the scale of which would transform a low-quality area into a new part of the city and better root the two buildings of the Proposed Development into its context. The newly created public realm and introduction of activity at ground floor would draw people from Brunswick Park up Upper Brook Street to dwell and engage with the Site, further revitalising the townscape.
- 6.89 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the townscape would be a **Moderate Beneficial** effect (**Significant**).

Visual Receptors

- 6.90 The cumulative effect brought about by the adjacent Upper Brook Street Masterplan – PAG / Moda Living would continue the positive impact of the Proposed Development in this view, enlivening the backdrop. Despite the introduction of a tall building to the northern end of Upper Brook Street Masterplan – PAG / Moda Living, the massing across the Sites has been carefully considered to step up to the context of taller buildings in the city centre so that in View 2 the tall building shares a similar roofline to the Proposed Development. Upper Brook Street Masterplan – PAG / Moda Living would however further obscure the chapel, diminishing its role as a local landmark in this view; the associated effect however is reduced given the distance and intervening low-quality townscape as existing.
- 6.91 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) in View 2 would be a **Moderate Beneficial** effect (**Significant**).

Heritage Receptors

- 6.92 Upper Brook Street Masterplan – PAG / Moda Living would further obscure the chapel and introduce development behind the silhouette of its roofline bringing about a significance change to its setting in this view. The effect however is reduced given the distance and intervening low-quality townscape as existing and mitigated to a degree giving the beneficial impacts that the Proposed Development would bring, creating a revitalised townscape in which the chapel would sit which would draw people to engage with it through the creation of the public square - even if itself not readily visible in this view.
- 6.93 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the Grade II* listed Former Unitarian Chapel would be a **Minor Adverse (Not Significant)** effect.
- 6.94 In View 2, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect**.

Table 6.11: View 2 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Low	Major	Direct, long-term Moderate Beneficial effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Beneficial effect (Significant)

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Heritage (Former Unitarian Chapel)	Medium	Minor	Direct, long-term Minor Adverse effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Minor Adverse effect (Not Significant)

View 3: View from junction of Brunswick Street and Kincardine Road

Existing

- 6.95 This view centres on Kincardine Road with the low-rise domestic buildings of the Brunswick Estate to the east and the upper floors of Kincardine Court. The buildings to the west of Kincardine Road merge into a single townscape backdrop. Whilst the chapel is visible, it is not prominent in the view owing to the size of the tree canopies (even in winter) and the massing of the University campus buildings which sit behind, rising above its roofline and building up to the taller building development at Circle Square in the distance. The Mawson Hotel (Grade II) is most prominent in this view, divorced from its historic setting and sitting on an island site with the more utilitarian 1970s single storey homeopathic clinic sat obliquely in the foreground, its sensitivity is medium. Behind its roofline rises the Sir Henry Royce Institute, reducing the prominence of the chimney stacks – particularly given the white cladding material and white banding at the top of the stacks. The grey zinc clad Alan Turing Building infills the townscape gap between the two buildings on the island whilst the Schuster and George Kenyon Buildings rise up once again puncturing the roofline. The low-rise buildings which make up the Development Site are absorbed into this varied and solid townscape with minimal effect. Whilst the Mawson Hotel and chapel (to a lesser extent) introduce nodes of interest to the townscape, overall its sensitivity is low.

With the Proposed Development

Townscape Receptors

- 6.96 The Proposed Development would have a major effect on the townscape in this view, introducing massing into a 'quiet' section of townscape – whilst clearly more prominent, the introduction of the high-quality architecture would play a place-making role and create activity on the west side of Kincardine Road. The proposed stepping to the massing means that the Proposed Development is unlikely to have an overbearing impact on the secondary nature of Kincardine Road and domestic estate beyond, whilst the taller elements to Upper Brook Street are read in the context of the taller University campus buildings which are present in this view as existing. The impact is mitigated further by the visual interest which is created through the architectural response and the uplift it the environment through the new public realm proposed along Kincardine Road to connect to the neighbourhood to the west.

- 6.97 The Proposed Development would have a **Moderate Beneficial (Significant)** effect on the local townscape.

Visual Receptors

- 6.98 In View 3 the townscape is blurred with a series of low-level buildings – bookended by the Mawson Hotel and the chapel (although in itself lacking any real distinction in this view). The Proposed Development would have a major effect which would uplift the view, creating a focus and introducing visual interest whilst the stepped massing to prevent the Development from having an overbearing impact on the Mawson Hotel as the principal feature in this view as existing.

- 6.99 The Proposed Development would have a **Moderate Beneficial (Significant)** effect in View 3.

Heritage Receptors

- 6.100 Although introducing increased massing behind the Mawson Hotel and obscuring the chapel to a degree, the Proposed Development would serve to make the Mawson Hotel and chapel buildings more distinct rather than blurring into the wider backdrop as existing. The likely effect must also be considered in light of the manner which the two buildings have been divorced from their formerly tight knit urban context - now appearing as islands in a low-quality townscape. As such, whilst the Proposed Development would obscure views of the chapel's south elevation to a degree, historically this elevation would have largely been obscured by the tightly knit townscape of late-19th century terrace housing. The impact is further mitigated by the wider benefits that the proposed revitalisation of the Development Site would bring to their setting in this view, whilst maintaining visibility of both.
- 6.101 The Proposed Development would have a **Moderate Beneficial (Significant)** effect on the Grade II* listed Former Unitarian Chapel and Grade II listed Mawson Hotel.

Cumulative Scenario

Townscape Receptors

- 6.102 Upper Brook Street Masterplan – PAG / Moda Living would continue the massing and built form of the Development Site northwards along Upper Brook Street with the taller building towards the city centre sharing a similar roofline to the PBSA building owing to its distance away. The additional development would root the Proposed Development in a considered and coordinated approach which, given the vacancy of the Upper Brook Street Masterplan – PAG / Moda Living Sites (and therefore their likely future development), would be beneficial to the townscape rather than an ad-hoc approach. Furthermore, extending the public realm northwards along Kincardine Road, introducing further routes east-west and the creation of active frontages would further uplift the general environment of Kincardine Road and draw people to engage with the site. As such, any increase in effect would therefore be beneficial.
- 6.103 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the townscape would be a **Moderate Beneficial** effect (**Significant**).

Visual Receptors

- 6.104 In View 3 the cumulative impact with Upper Brook Street Masterplan – PAG / Moda Living would further reinforce the revitalisation of this part of Upper Brook Street, which, although introducing further mass into the skyline, would uplift the view and the visual interest within it owing to its architectural quality and the extension of the new public realm northwards along Kincardine Road.
- 6.105 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) in View 3 would be a **Moderate Beneficial** effect (**Significant**).

Heritage Receptors

- 6.106 Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would not cause any increased effect on the setting of the Mawson Hotel, sitting comfortably adjacent to the massing of the Sci-Tech building. The Former Unitarian Chapel would, however, be completely obscured which would have an adverse effect, albeit this is mitigated to a degree given the fact that it would have been largely obscured (other than its roof) historically and its lower sensitivity in this view.
- 6.107 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the Grade II* listed Former Unitarian Chapel would be a **Moderate Adverse (Significant)** effect whilst to the Mawson Hotel the effect would remain **Moderate Beneficial (Not Significant)**.
- 6.108 In View 3, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect**.

Table 6.12: View 3 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Low	Major	Direct, long-term Moderate Beneficial effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Beneficial effect (Significant)
Heritage (Former Unitarian Chapel)	Medium	Moderate	Direct, long-term Moderate Beneficial effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Adverse effect (Significant)

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Heritage (Mawson Hotel)	Medium	Major	Direct, long-term Moderate Beneficial effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Beneficial effect (Significant)

View 4: View from northeast side of the Mawson Hotel on Kincardine Road

Existing

- 6.109 This view looks directly at the development site from Kincardine Road however, although the low-rise buildings including the former Elizabeth Yarwood Court sheltered housing block and former car dealership / showrooms make up the foreground they are rather forgotten in the view and it is the large-scale buildings on the west side of Upper Brook Street including the Engineering Campus, Sir Henry Royce Institute and the Alan Turing Building which dominate. The former chapel is absorbed into this townscape, save only for its contrasting lighter brick and detailing including buttresses and pinnacles; right of the chapel contemporary, large scale buildings fill the gap building up to the tall building at Circle Square. Overall, the townscape is low-quality, rather disjointed with the foreground of the view on Kincardine Road making no contribution to local distinctness, save for the moderate visibility of the Grade II* chapel.

With the Proposed Development

Townscape Receptors

- 6.110 The Proposed Development would have a major effect on the townscape in this view, replacing the low-quality environment which has been created by the low-rise buildings of no merit in the foreground being dominated by the contemporary large-scale buildings to Upper Brook Street behind. Instead, a considered architectural response would be inserted which would create a sense of place and local identity, further reinforced by the public realm enhancements which would be prominent in this view, drawing people up Kincardine Road and to the central linear park and active ground floor frontages. Whilst the additional massing would be experienced more directly, this would be mitigated to a degree by the design development which has sought to mediate between the significant change in scales between the east and west, the materiality and the architectural detailing proposed.
- 6.111 The Proposed Development would have a **Moderate Beneficial (Significant)** effect on the local townscape.

Visual Receptors

- 6.112 View 4 would be completely transformed by the Proposed Development, whereby the larger-scale buildings on Upper Brook Street which draw the viewers eye over the poor-quality, low-level buildings on the site would be obscured. Instead the view would be dominated by the Proposed Development, with the high-quality architecture and public realm pulling the view towards and into the site and the activity within in which would all serve to add vitality and vibrancy into the view, creating a sense of place not afforded by the existing Site.
- 6.113 The Proposed Development would have a **Moderate Beneficial (Significant)** effect on View 4.

Heritage Receptors

- 6.114 Whilst the Proposed Development would obscure the front of the chapel, its rear half would remain visible – characteristic of the close-knit townscape within which it stood historically. In this context and considered against the detracting impact of the Site on its setting as existing and the manner which with the chapel is absorbed into the townscape as existing the magnitude of change that the Proposed Development would bring would be minor and balanced against the benefits that the wider revitalisation of the Development Site would bring.
- 6.115 The Proposed Development would have a **Minor Adverse (Not Significant)** effect on the Grade II* listed Former Unitarian Chapel.

Cumulative Scenario

Townscape Receptors

- 6.116 Upper Brook Street Masterplan – PAG / Moda Living of Upper Brook Street (Cumulative Scheme No. 2) would continue the massing and built form northwards along Upper Brook Street and would unlikely bring about any increased effect to that of the Site in townscape terms (other than the increased benefits that a coordinated response and public realm strategy would bring as previously outlined), with the taller building towards the city centre sharing a similar roofline to the PBSA building owing to its distance away.
- 6.117 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the townscape would be a **Moderate Beneficial** effect (**Significant**).

Visual Receptors

- 6.118 The massing of Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would continue across the view, bookended by the tall building at the northmost end which would obscure the tall buildings visible in the city centre. It would sit comfortably with the Proposed Development and would not have an impact on the magnitude of effect in View 4.
- 6.119 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on View 4 would be a **Moderate Beneficial** effect (**Significant**).

Heritage Receptors

- 6.120 The chapel would be completely obscured by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2), the magnitude of change is however reduced to a degree given the fact that it would have been largely obscured (other than possibly its roof) historically and its lower sensitivity in this view.
- 6.121 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the Grade II* listed Former Unitarian Chapel would be a **Minor Adverse (Not Significant)** effect.
- 6.122 In View 4, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect**.

Table 6.13: View 4 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Low	Major	Direct, long-term Moderate Beneficial effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Beneficial effect (Significant)
Heritage (Former Unitarian Chapel)	Medium	Minor	Direct, long-term Minor Adverse effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Adverse effect (Significant)

View 5: View south from Upper Brook Street / Grosvenor Street junction

Existing

- 6.123 This view typifies the mixed nature of Upper Brook Street – dominated by the heavily trafficked road which separates the townscape into two distinct halves. To the west the contemporary large-scale buildings of the University – in this view dominated by the high quality, dark brown brick frame of Engineering Block B which shares its roofline with the white-clad Sir Henry Royce Institute owing to its further distance down the street. On the facing side of the street, a collection of pockets of poor-quality hard landscaping and low-rise car showrooms and dealerships which lack any sense of identity or place, punctured only by the Former Unitarian Chapel with its steep, slate-clad roof and buttresses reading as defining features in the townscape. Beyond Nick Everton House terminates the view, rising to a similar height as the chapel owing to its significant distance away. In this view the

chapel is of moderate sensitivity, located mid-distance in the view whilst the townscape is low with only the chapel and pocket of high-quality buildings to the university campus providing interest.

With the Proposed Development

Townscape Receptors

- 6.124 Owing to the distance to the north from which this view is taken, the full height of the PBSA building would puncture the skyline to this side of Upper Brook Street. It would however also be read in context with the facing Sir Henry Royce Institute and Nick Everton House in the distance, which would help to ingrate it into the townscape. The quality of the architectural design and materiality would also serve to ensure that, despite the prominence of this addition to the low-level roof line, it would add visual interest to a largely uninspired townscape to this side of Upper Brook Street. Further design mitigation such as public realm enhancement and unifying the communities to the east and west would not be discernible in this view.
- 6.125 The Proposed Development would have a **Minor Beneficial (Not Significant)** effect on the local townscape.

Visual Receptors

- 6.126 The PBSA building would introduce a significant feature in View 5, which alongside the chapel building, would add character and visual interest in an otherwise drab environment on the east side of Upper Brook Street which makes no contribution to the view.
- 6.127 The Proposed Development would have a **Minor Beneficial (Not Significant)** effect on View 5.

Heritage Receptors

- 6.128 The front and rear blocks would rise up behind the steep pitched roof of the chapel and would loom over this small-scale building to degree. The distance in this view and the gap between the two blocks would reduce the magnitude of the change whilst the contemporary design proposed would ensure it does not compete with its architectural character, with materials and a modelled façade which have sought to be sympathetic to its setting.
- 6.129 The Proposed Development would have a **Minor Adverse (Not Significant)** effect on the Grade II* listed Former Unitarian Chapel.

Cumulative Scenario

Townscape Receptors

- 6.130 The addition of Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No.2) would uplift the effect on the townscape, now reading as a coordinated regeneration of the townscape along Upper Brook Street rather than two isolated blocks set within an otherwise retained low-quality environment. The cumulative effect

would also be drawn from the wider mitigation measures such as the enhanced public realm and active frontages which would extend northwards along Upper Brook Street and be readily discernible in this view.

- 6.131 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the local townscape would be a **Major Beneficial (Significant)** effect.

Visual Receptor

- 6.132 View 5 would be significantly enhanced through the addition of Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No.2), creating a continuous frontage of high quality development along the east side of Upper Brook Street including active frontages and enhanced public realm – adding vitality and vibrancy for both pedestrians and vehicle traffic.
- 6.133 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on View 5 would be a **Major Beneficial (Significant)** effect.

Heritage Receptors

- 6.134 Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No.2) would obscure the Former Unitarian Chapel, increasing the adverse effect. However, it is only through the late-20th century development of the area which, with regard to the SRF Sites has otherwise had a negative impact on the chapel's setting, that the chapel is visible (at this distance it is probable that its pitched roof would have also been obscured). Within this historic context the magnitude of the adverse effect is reduced.
- 6.135 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the Grade II* listed Former Unitarian Chapel would be a **Moderate Adverse (Significant)** effect.
- 6.136 In View 5, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect**.

Table 6.14: View 5 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Low	Moderate	Direct, long-term Minor Beneficial (Significant) effect	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Major Beneficial (Significant) effect

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Heritage (Former Unitarian Chapel)	Medium	Minor	Direct, long-term Minor Adverse effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate (Significant) effect

View 6: View from Gartside Gardens

Existing

- 6.137 Gartside Gardens has been subject of a scheme of enhancement as part of the Brunswick Estate renewal and forms a pleasant amenity space which is largely grassed in this view with a strong presence of trees to the boundary with Kincardine Road. Kincardine Court sits to the south of gardens whilst the low-rise former car showrooms are visible through the tree line. The steep pitched roof of the chapel rises up behind but even with a winter tree coverage is not readily discernible – its pinnacles being most prominent. Beyond, the dark silhouette of Engineering Block B on Upper Brook Street with the white facades of the Sir Henry Royce Institute rising up directly behind the chapel roof. Whilst the townscape beyond is mixed and of low sensitivity, Gartside Gardens itself offers a high amenity value, particularly in this city centre location and therefore the townscape overall is of medium sensitivity.

With the Proposed Development

Townscape Receptors

- 6.138 Set behind the tree line which runs along the west side of Gartside Gardens and owing to the distance of the Proposed Development, the magnitude of change to the townscape of Kincardine Road would not be major in this view, read alongside the Sir Henry Royce Institute in the background. The introduction of large-scale built form would however have an adverse impact on the landscaped amenity value of the gardens, albeit reduced to a degree due to the relatively small size of the gardens and therefore its existing urban context and the visibility of Kincardine Court to the south. The direct townscape improvements that the replacement of the poor-quality buildings and hard landscaping would bring to Kincardine Road would not be readily discernible in this view although the overall revitalisation of the Site and improved public realm and connectivity would likely have a knock-on beneficial effect on Gartside Gardens itself.
- 6.139 The Proposed Development would have a **Moderate Adverse (Significant)** effect on the local townscape.

Visual Receptors

6.140 The Proposed Development would introduce built form which would rise above the tree canopy in View 6 which would reduce the amenity value of views from Gartside Gardens, albeit the presence of Kincardine Court in this view and its clear urban context reduces this to a degree.

6.141 The Proposed Development would have a **Moderate Adverse (Significant)** effect on View 6.

Heritage Receptors

6.142 The massing of the taller PBSA block in this view would be set well away from the chapel roof and given its limited visibility and the presence of a taller contemporary building in the immediate backdrop of the chapel, it is considered to bring about a negligible magnitude change.

6.143 The Proposed Development would have a **Negligible (Not Significant)** effect on the Grade II* listed Former Unitarian Chapel.

Cumulative Scenario

Townscape Receptors

6.144 Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No.2) would introduce new, large-scale development in the immediate setting of Gartside Gardens which would reduce the impact of the Proposed Development itself. It would however bring about a greater magnitude of change to the open nature of the gardens by comparison to the ‘quiet’ low-rise existing backdrop, through the introduction of increasing and visible massing along its boundary. The extent of this effect would be mitigated to a degree by the proposed extension of Gartside Gardens amenity value along Inchley Road, integrating the gardens into the wider public realm scheme and connecting the communities to its east and west.

6.145 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the local townscape would be a **Major Adverse (Significant)** effect.

Visual Receptors

6.146 Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No.2) would add further built form in closer proximity to the view which would increase the urbanising effect. In View 6, the tree line would now all read against a backdrop of buildings rather than the open sky afforded by the low-level buildings as existing. Whilst the magnitude of the change would be increased, this would still be mitigated to a degree by the presence of Kincardine Court in this view and its clear urban context as existing.

6.147 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on View 6 would be a **Major Adverse (Significant)** effect.

Heritage Receptors

- 6.148 Although of limited visibility, in this view, the Former Unitarian Chapel would be totally obscured with the addition of the Proposed Development and Upper Brook Street Masterplan – PAG / Moda Living, and the intervisibility of their historic uses would be lost. This would be offset to a degree through mitigation measures which include the integration of Gartside Gardens into the public realm strategy, connecting the gardens via the closure of Inchley Road to the public square to the northwest of the chapel and therefore maintaining a physical connection.
- 6.149 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the Grade II* listed Former Unitarian Chapel would be a **Major Adverse (Significant)** effect.
- 6.150 In View 6, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect**.

Table 6.15: View 6 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Medium	Moderate	Direct, long-term Moderate Adverse effect (Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Schemes No. 2 – Major Adverse effect (Significant)
Heritage (Former Unitarian Chapel)	Medium	Negligible	Direct, long-term Negligible effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Schemes No. 2 – Major Adverse effect (Significant)

View 7: View from northeast end of Balsam Close

Existing

- 6.151 As part of the Brunswick Estate regeneration, Balsam Close has been extended from a small close to a road which runs through the heart of the neighbourhood (roughly aligning with a historic terraced street). It is flanked on the north side by high-quality residential development of three storey brick townhouses with contemporary framing to windows, doors and balconies and a strong brick boundary line with retained two storey 1970s brick houses on the facing side. It is a key element of the newly created community and local distinctiveness and therefore the townscape is of medium sensitivity. The housing frames views through the heart of the new neighbourhood which is then bookended by the University campus buildings which terminate the view with the Alan Turing and Schuster

Buildings at lower level and the George Kenyon Building rising up behind to the right of the townscape gap. The low-rise Development Site buildings make no contribution to this view.

With the Proposed Development

Townscape Receptors

- 6.152 The Proposed Development would introduce built form which would rise above the existing building line. The Sci-Tech building and rear block of the PBSA building would sit within the established roofline and, owing to the contextual tones of the materials and their distance, would be unlikely to have any particular effect on the townscape. However, despite the development of the massing to set the taller element of the PBSA building to the Upper Brook Street frontage, this has not mitigated the impact of its height to any particular degree at this distance and change would occur (moderate owing to its distance). The proposed architectural design and materials would, however, integrate it into this next phase in the life of the Brunswick Estate – creating a visual link with the contemporary housing within the estate and reading as part of the wider regeneration of Ardwick. Further mitigation would be brought about by the significant townscape benefit of the creation of a linear park along Thorburn Walk which directly aligns with the extended Balsam Close; signposted by the presence of the taller building in the townscape. This would create a physical link to the east all the way through to Upper Brook Street and on into the University campus, and therefore drawing the community across and through the Site.
- 6.153 The Proposed Development would have a **Moderate Adverse (Significant)** effect on the local townscape.

Visual Receptors

- 6.154 In View 7 the front block of the PBSA building would clearly puncture the established roofline and draw focus to its presence. Whilst it would change the character of the view, dominated by small-scale residential development, this would be mitigated to a degree through the visual interest derived from the architectural design and the role it would play as a landmark, signifying new activity to draw people across from Ardwick to engage with the new public realm and community uses proposed.
- 6.155 The Proposed Development would have a **Moderate Adverse (Significant)** effect on View 7.

Heritage Receptors

- 6.156 There are no heritage receptors present in this view.

Cumulative Scenario

- 6.157 In View 7, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) and Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would have **No Effect** in the Cumulative Scenario.

Table 6.16: View 7 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Medium	Moderate	Direct, long term Moderate Adverse effect (Significant)	Cumulative Schemes Nos. 3, 4, 5 and 6 – No Effect

View 8: View from Rudcroft Close 'Orchard'

Existing

- 6.158 The Orchard is a small piece of landscaped public realm which forms part of the regeneration of the Brunswick Estate, offering amenity for surrounding residents and planted with trees. Immediately facing the Orchard are retained 1970s two storey brick houses with pitched roofs, whilst infilling the townscape gap to the north is a collection of modern blocks and the taller Sir Henry Royce Institute which continues the ridge line of the houses. Whilst elsewhere within the estate the townscape is of medium sensitivity, here it is of low sensitivity.

With the Proposed Development

Townscape Receptors

- 6.159 The Proposed Development would introduce built form which would puncture the existing roofline. The Sci-Tech building and rear block of the PBSA building would however sit behind the housing – with only a glimpse of the rear block of the PBSA building being visible in the infilled townscape gap. The front block of the PBSA building would, however, rise up behind the roofline of the housing. The magnitude of change would be reduced to a degree by setting the taller element further to the west – creating a visual gap which would prevent the massing from looming over the houses. Alongside the lesser sensitivity of the townscape and the greater visibility of the architectural detailing and materiality, further mitigation in townscape terms would be brought about through the Orchard's position just to the south of the central road leading to Thorburn Walk and its associated public realm, community and connectivity enhancements.
- 6.160 The Proposed Development would have a **Minor Adverse (Not Significant)** effect on the local townscape.

Visual Receptors

- 6.161 Despite The Orchard's amenity value, it is small area of landscaping contained by built form. View 8 is centred on a small section of the surrounding 1970s housing, as such it is of lesser sensitivity. The front block of the PBSA building would form a significant addition in this view, which would disrupt the 'quiet' nature of the low-rise housing. Through the architectural design and materiality proposed, it would however add visual interest and act as a landmark to the Proposed Development of which it forms part, drawing people to associated amenities including the enhanced public realm and ground floor community uses.

6.162 The Proposed Development would have a **Minor Adverse (Not Significant)** effect on View 8.

Heritage Receptors

6.163 There are no heritage receptors present in the this view.

Cumulative Scenario

Townscape Receptors

6.164 The southern building of Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would provide context to the presence of the PBSA building in the backdrop of the housing, more comfortably integrating it into the townscape. It would also introduce a single high-quality architectural response in the infilled townscape gap which now has a confused appearance, whilst roughly aligning with the ridge height of the two-storey housing owing to its distance. As such there would be no increase in effect.

6.165 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on View 8 would be a **Negligible (Not Significant)** effect.

Visual Receptors

6.166 Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would be visible in View 8, replacing a myriad of buildings in the townscape gap with a single architectural response which would uplift that part of the view whilst not significantly increasing the massing. It would also give context to the front block of the PBSA building, better integrating the Proposed Development into the view.

6.167 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on View 8 would be a **Negligible (Not Significant)** effect.

6.168 In View 8, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect** in the Cumulative Scenario.

Table 6.17: View 8 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Low	Moderate	Direct, long term Minor Adverse effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Negligible effect (Not Significant)

View 9: View from Brunswick Village block at southeast end of Sylvia Pankhurst Way

Existing

- 6.169 The Brunswick Village block is contemporary grey brick four storey block which sits on the corner of Brunswick Street and Sylvia Pankhurst Way and signifies one of the entrances into the Brunswick Estate with a wide piece of public realm leading to the heart of the regeneration area to the north where contemporary three-storey townhouses facing on to an area of public realm. Beyond, tall buildings within the city centre puncture the skyline. To the facing side of the road the retained small-scale housing of the 1970s estate with the large scale 1970s Chemistry Building terminating views along the street.

*With the Proposed Development***Townscape Receptors**

- 6.170 The Proposed Development would be entirely obscured and would have **No Effect**.

Visual Receptors

- 6.171 The Proposed Development would be entirely obscured from View 9 and would have **No Effect**.

Heritage Receptors

- 6.172 There are no heritage receptors present in the this view.

*Cumulative Scenario***Townscape Receptors**

- 6.173 In townscape terms, the southern buildings of Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would be obscured by the Brunswick Village block. Aside from the tall building proposed to the northern-most site, where they become visible the Upper Brook Street Masterplan – PAG / Moda Living buildings would sit comfortably alongside the massing of the Brunswick Village block and the tall buildings which they obscure in the city centre. The tall building would, however, be visible, puncturing the skyline and disrupting the otherwise lower-scale townscape within which the city centre taller buildings are comfortably accommodated owing to their distance.
- 6.174 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the local townscape would be a **Moderate Adverse (Significant)** effect.

Visual Receptors

- 6.175 The Brunswick Village block frames views along Sylvia Pankhurst Way, drawing the view into the heart of the regeneration area, reinforced by the shared domestic scale of buildings in this view. This would be diminished to a degree by the disrupting impact that the tall building would have, terminating views along the new public realm. The tall building itself however would be signifier of regeneration and renewal which would mitigate the impact to a degree owing to the visual link this would create with the contemporary Brunswick Estate buildings that dominate the view.
- 6.176 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on View 9 would be a **Moderate Adverse (Significant)** effect.
- 6.177 In View 9, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect**.

Table 6.18: View 9 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Medium	None	No Effect	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Moderate Adverse effect (Significant)

View 10: View from west side of junction between Upper Brook Street and Plymouth Grove

Existing

- 6.178 Although still dominated by the heavily trafficked road, in this view the low quality townscape has been enhanced to a degree through the construction of the three storey terraces of townhouses as part of the Brunswick Estate renewal which have introduced a high-quality contemporary frontage with small front gardens and enhanced planting to the street. In the oblique view the contemporary façade of the five-storey modern Michael Smith building lines the pavement. Located some distance away the Former Unitarian Chapel (Grade II*) and low-rise buildings of the Development Site are lost within the townscape; whilst in the background terminating five taller buildings in the city centre break the roofline, three of which rise up behind the chapel roofline.

With the Proposed Development

Townscape Receptors

- 6.179 The Proposed Development would introduce significant built form, rising up behind the townhouse terrace. The massing of the front block to the PBSA building would however follow the context for large-scale buildings within the University campus extending along the west side of Upper Brook Street and as such would not be without context which would reduce the magnitude of change - albeit infilling the open gap and creating a canyoning effect to a degree. Whilst the high-quality of the architectural response and materiality may be perceived in this view, further design mitigation such as public realm enhancement and unifying the communities to the east and west would not be discernible.
- 6.180 The Proposed Development would have a **Minor Adverse (Not Significant)** effect on the local townscape.

Visual Receptors

- 6.181 View 10 highlights the contrasting character between the east and west sides of Upper Brook Street, with the three storey townhouses drawing the view north to the city centre where taller buildings sit comfortably in the background. The Proposed Development would terminate the view, introducing significant development and obscuring the presence of built form within the city centre. The front block of the PBSA building would however sit within the established roofline of the large-scale contemporary University buildings, owing to its distance and their position closer in the foreground. Its contrasting relationship with the domestic townhouses in the foreground would be mitigated further through the role of the heavily trafficked road in this view (by comparison to the quiet and low-scale of the domestic properties to the east).
- 6.182 The Proposed Development would have a **Minor Adverse (Not Significant)** effect on View 10.

Heritage Receptors

- 6.183 Aside from its façade, the chapel would be obscured in this view but the magnitude of change would be minimal given its more contained nature following the 19th century development of the area and its lack of prominence in the street scene as existing.
- 6.184 The Proposed Development would have a **Negligible (Not Significant)** effect on the Grade II* listed Former Unitarian Chapel.

Cumulative Scenario

Townscape Receptors

- 6.185 Only the northern-most, tallest building of Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would be visible in View 10 and, owing to the distance, would sit comfortably alongside the PBSA building – the townscape gap would, however, be narrowed further and the canyoning effect within this view would be increased.

- 6.186 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the local townscape would be a **Minor Adverse (Not Significant)** effect.

Visual Receptors

- 6.187 The northern-most tallest building of Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would sit alongside the PBSA block in View 10 with a similar roofline owing to its increased distance, as such its presence would better integrate the Proposed Development into the view and would not increase the magnitude of the effect to any particular degree.
- 6.188 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on View 10 would be a **Minor Adverse (Not Significant)** effect.

Heritage Receptors

- 6.189 The Former Unitarian Chapel and its roofline would likely be completely obscured in this view, although at this distance the magnitude of change would remain negligible.
- 6.190 The cumulative effect brought about by Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) on the Grade II* listed Former Unitarian Chapel would be a **Negligible (Not Significant)** effect.
- 6.191 In View 10, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect** in the Cumulative Scenario.

Table 6.19: View 10 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Low	Moderate	Direct, long-term Minor Adverse effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Minor Adverse effect (Not Significant)
Heritage (Former Unitarian Chapel)	Low	Negligible	Direct, long-term Negligible effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 – Negligible effect (Not Significant)

View 11: View from Brunswick Park

Existing

- 6.192 Brunswick Park now forms a key amenity asset, the pedestrianisation of the road has allowed for the creation of a liner park with landscaping and amenity spaces which connects between Oxford Road and Upper Brook Street. To the north it is framed by mid-rise modern University blocks including the Roscoe and Schuster Buildings whilst the Tai Wu restaurant and W.H. Lung Supermarket on Upper Brook Street are just visible to the east.

With the Proposed Development

Townscape Receptors

- 6.193 The Proposed Development would be entirely obscured from view and would have no effect.

Visual Receptors

- 6.194 The Proposed Development would be entirely obscured from view and would have no effect.

Heritage Receptors

- 6.195 There are no heritage receptors present in the this view.

Cumulative Scenario

- 6.196 The Proposed Development and Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would be entirely obscured within View 11 and as such there would be **No Effect** in the Cumulative Scenario. In View 11, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect** in the Cumulative Scenario.

Table 6.20: View 11 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Medium	None	No Effect	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living) – No Effect

View 12: View from west end of Wilton Street

Existing

- 6.197 This view centres on the now pedestrianised Wilton Street which leads through into the public realm which sits at the heart of this part of the University campus and now continues to meet Upper Brook Street following the development of the Alan Turing building - its open atrium sat underneath an oversailing canopy intended to reinstate a east-west historic route. The two four storey zinc blocks frame the rear of this view, opening up the public realm at its centre. In the foreground it is framed by two buildings of slightly differing heights; to the north the Kilburn Building with a façade of alternating brown brick panels and glazed slots with the slightly taller University Place to the south, here larger yellow brick panels framing glazing. Although of varying scales and architectural designs, this view reflects the strong townscape character of this part of the University campus of differing large-scale modern and contemporary buildings, unified by revitalisation areas of public realm.

With the Proposed Development

Townscape Receptors

- 6.198 The Sci-Tech building would be largely obscured behind the Alan Turing Building and would have no impact on the townscape as seen in this view. Whilst the front block of the PBSA block would be partially visible, stepping up to the rear of the Kilburn Building –given the context of the range of large-scale contemporary buildings of differing footprints and heights which sit collectively in this part of the campus the overall magnitude of change to the townscape would be negligible. This would be mitigated further by the high quality design proposed and more significantly the continuation of the reinstated east-west route through into Thorburn Walk and across into the Brunswick neighbourhood, framed by the two buildings proposed.
- 6.199 The Proposed Development would have a **Negligible (Not Significant)** effect on the local townscape.

Visual Receptors

- 6.200 View 12 is dominated by a mix of large-scale University buildings, connected via a shared public realm. Whilst the front block of the PBSA building would introduce built form into the view, this is entirely in context with the existing contemporary architecture and massing and would have a negligible effect.
- 6.201 The Proposed Development would have a **Negligible (Not Significant)** effect on View 12.

Heritage Receptors

- 6.202 There are no heritage receptors present in the this view.

Cumulative Scenario

- 6.203 The Proposed Development and Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would be entirely obscured within View 12 and as such there would be **No Effect** in the Cumulative Scenario. In View 12, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect** in the Cumulative Scenario.

Table 6.21: View 12 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / Visual	Medium	Negligible	Negligible effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living) – No Effect

View 13: View from Rumford Street public realm

Existing

- 6.204 View 13 is taken from the regenerated public realm at the heart of this part of the campus which comprises a mix of hard and soft landscaping with areas of seating. The Sir Henry Royce Institute and Alan Turing Buildings frame the view with the glazed and white clad façade to the north rising up to 10 storeys, set higher than the grey zinc clad building four storey building to the south respectively. Although differing in scale and architectural treatment, this typifies the large-scale contemporary blocks across the campus and they are unified by the shared public realm which continues between the two buildings to Upper Brook Street where the view is terminated by Kincardine Court to the rear.

With the Proposed Development

Townscape Receptors

- 6.205 The Sci-Tech building would not be visible within View 13 and would have therefore have no effect. The front block of the PBSA building would be visible, largely in-filling the gap between the two buildings. However, this is a newly created gap brought about through the continued regeneration of the campus and the proposed massing would sit comfortably in the townscape – seen in context of the Sir Henry Royce Institute and further reinforced by embedded mitigated in the form of the high-quality architecture and detailing proposed.
- 6.206 The Proposed Development would have a **Negligible (Not Significant)** effect on the local townscape.

Visual Receptors

- 6.207 Whilst the front block of the PBSA building would be visible in View 13, this view is symptomatic of framed views from within this part of the University campus, whereby large-scale buildings of differing footprints, heights and architectural character sit alongside one another and are revealed in views as people pass through the public realm. As such the addition of the Proposed Development would be wholly typical in this view.

6.208 The Proposed Development would have a **Negligible (Not Significant)** effect on View 13.

Heritage Receptors

6.209 There are no heritage receptors present in the this view.

Cumulative Scenario

6.210 The Proposed Development and Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2) would be entirely obscured within View 13 and as such there would be **No Effect** in the Cumulative Scenario. In View 13, the consented Cumulative Schemes (i.e. Cumulative Schemes Nos. 4, 5 and 6) would have **No Effect** in the Cumulative Scenario.

Table 6.22: View 13 – Sensitivity, Magnitude and Effect Significance Assessment

Receptor	Sensitivity	Magnitude of Change	Effect (including significance)	Cumulative Effect (including significance)
Townscape / View	Medium	Negligible	Negligible effect (Not Significant)	Cumulative Schemes Nos. 4, 5 and 6 – No Effect Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living) – No Effect

Summary of Effects

6.211 The external proposals to the Site would have significant effects on townscape and visual receptors both on and near the Site. The overall effect on the Development Site, views and townscape would be **Moderate Beneficial (Significant)**, bringing about a significant enhancement, particularly in views of the Site from along Upper Brook Street. This would be in the form of the revitalisation of this largely low-quality and seeming forgotten townscape and the introduction of active frontages, increased connectivity across the Site and significantly enhanced public realm. These would all result in improved levels of activity linking together the two flanking communities which would have a **Moderate Beneficial (Significant)** effect on the townscape and its overall environment; whilst the perception would be a major enhancement, this is categorised as moderate owing to its existing low-quality. This benefit is further reinforced by the cumulative impact of the Masterplan Sites which would see significant change and uplift to all but the most southern SRF Sites, centred on the same principles of the introduction of buildings of high architectural quality and considered massing which builds up to the north along Upper Brook Street towards the tall buildings present in the city centre, set within extensive public realm centred on the reinstatement of east-west connections and the provision of amenity spaces for the wider community.

- 6.212 From the Brunswick Estate to the east some **Minor Adverse (Not Significant)** to **Moderate Adverse (Significant)** effects have been identified due to the contrast with the domestic scale of the housing and owing to the impact on the amenity value of Gartside Gardens. This is reduced to a degree due to the quality of the architectural design proposed and the visual link this creates with the contemporary housing within the estate; furthermore, the presence of the large-scale University campus buildings in these views gives context to the proposed step-up in the scale of development facing Upper Brook Street. The adverse effects are reduced further by the public realm and connectivity enhancements which would stop the Brunswick community and Development Site from turning their back on one another and continue the significant revitalisation of the estate across the Site and into the regenerated area of the University campus. This would draw similar beneficial effects from within the University campus where the massing and height of the proposed Development would have a **Negligible (Not Significant)** effect owing to the townscape and views within which it would sit.
- 6.213 In terms of the effects on the two heritage receptors, the Mawson Hotel (Grade II) would be **Moderate Beneficial (Significant)** owing to the significant enhancement that would be brought to its fragmented setting despite the extent of massing proposed. The effect on the Former Unitarian Chapel (Grade II*) varies in the views presented but in the main part, taking into considered the much more tight knit urban grain which existed from the late-19th century until its setting was detrimentally altered in the 1970s, the effect generally only sways into **Minor Adverse (Not Significant)** where the increased massing is significant in the context of its roofline which would have likely been more readily visible historically and where completely obscured in view when considered in context of Upper Brook Street Masterplan – PAG / Moda Living (Cumulative Scheme No. 2).
- 6.214 The Townscape, Visual and Heritage effects, considered collectively (and excluding the Cumulative Schemes) are as follows:
- Views 1, 2, 3 and 4– **Moderate Beneficial (Significant)**;
 - View 5 – **Minor Beneficial (Not Significant)**;
 - Views 9 and 11 – **No Effect (Not Significant)**;
 - Views 12 and 13 – **Negligible (Not Significant)**;
 - Views 8 and 10 – **Minor Adverse (Not Significant)**; and
 - Views 6 and 7 – **Moderate Adverse (Significant)**.

Additional Mitigation

- 6.215 There is no additional mitigation proposed during the Demolition and Construction Phase owing to the largely low quality of the existing townscape. It is anticipated that a Landscape Environmental Management Plan (LEMP) will be secured for the long-term management and maintenance of the Development's proposed public realm by means of a planning condition. This will secure the beneficial effects to the townscape and setting of the Grade II*

listed Former Unitarian Church and the Grade II listed Mawson Hotel outlined in the Likely Significant Effects section above. of

Residual Effects and their Significance

6.216 The significance of all residual effects would remain as presented within the previous section 'Assessment of Likely Significant Effects', as summarised in **Table 6.23** below.

Table 6.23: Summary of Residual Effects and their Significance

Receptor		Demolition and Construction			The Completed and Operational Development		
		Effect (including significance)	Additional Mitigation	Residual Effect (including significance)	Effect (including significance)	Additional Mitigation	Residual Effect (including significance)
The Site		Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Moderate Beneficial (Significant)	None required	Moderate Beneficial (Significant)
View 1	View from north corner of Upper Brook Street / Booth Street East junction	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Moderate Beneficial (Significant)	None required	Moderate Beneficial (Significant)
	Former Unitarian Chapel	Minor Adverse (Not Significant)	None required	Minor Adverse (Not Significant)	Major Beneficial (Significant)	None required	Major Beneficial (Significant)
View 2	View from east end of pedestrianised section of Brunswick Street	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Moderate Beneficial (Significant)	None required	Moderate Beneficial (Significant)
	Former Unitarian Chapel	Minor Adverse (Not Significant)	None required	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)	Landscape Environmental Management Plan (LEMP)	Minor Adverse (Not Significant)
View 3	View from junction of Brunswick Street and Kincardine Road	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Moderate Beneficial (Significant)	None required	Moderate Beneficial (Significant)
	Former Unitarian Chapel	Minor Adverse (Not Significant)	None required	Minor Adverse (Not Significant)	Moderate Beneficial (Significant)	None required	Moderate Beneficial (Significant)
	Mawson Hotel	Minor Adverse (Not Significant)	None required	Minor Adverse (Not Significant)	Moderate Beneficial (Significant)	None required	Moderate Beneficial (Significant)

Receptor		Demolition and Construction			The Completed and Operational Development		
		Effect (including significance)	Additional Mitigation	Residual Effect (including significance)	Effect (including significance)	Additional Mitigation	Residual Effect (including significance)
View 4	View from northeast side of the Mawson Hotel on Kincardine Road	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Moderate Beneficial (Significant)	None required	Moderate Beneficial (Significant)
	Former Unitarian Chapel	Minor Adverse (Not Significant)	None required	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)	LEMP	Minor Adverse (Not Significant)
View 5	View south from Upper Brook Street / Grosvenor Street junction	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Minor Beneficial (Not Significant)	None required	Minor Beneficial (Not Significant)
	Former Unitarian Chapel	Minor Adverse (Not Significant)	None required	Minor Adverse (Not Significant)	Minor Adverse (Not Significant)	LEMP	Minor Adverse (Not Significant)
View 6	View from Gartside Gardens	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Moderate Adverse (Significant)	LEMP	Moderate Adverse (Significant)
	Former Unitarian Chapel	Minor Adverse (Not Significant)	None required	Minor Adverse (Not Significant)	Negligible (Not Significant)	LEMP	Negligible (Not Significant)
View 7	View from northeast end of Balsam Close	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Moderate Adverse (Significant)	LEMP	Moderate Adverse (Significant)
View 8	View from Rudcroft Close 'Orchard'	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Minor Adverse (Not Significant)	LEMP	Minor Adverse (Not Significant)
View 9	View from Brunswick Village block at southeast end of Sylvia Pankhurst Way	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	No Effect	LEMP	No Effect
View 10	View from west side of junction between Upper Brook Street and Plymouth Grove	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Minor Adverse (Not Significant)	LEMP	Minor Adverse (Not Significant)
	Former Unitarian Chapel	Minor Adverse (Not Significant)	None required	Minor Adverse (Not Significant)	Negligible (Not Significant)	LEMP	Negligible (Not Significant)

Receptor		Demolition and Construction			The Completed and Operational Development		
		Effect (including significance)	Additional Mitigation	Residual Effect (including significance)	Effect (including significance)	Additional Mitigation	Residual Effect (including significance)
View 11	View from Brunswick Park	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	No Effect	LEMP	No Effect
View 12	View from west end of Wilton Street	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Negligible (Not Significant)	LEMP	Negligible (Not Significant)
View 13	View from Rumford Street public realm	Minor Adverse to Negligible (Not Significant)	None required	Minor Adverse to Negligible (Not Significant)	Negligible (Not Significant)	LEMP	Negligible (Not Significant)

Residual effects that are 'Significant' in EIA terms are highlighted in **orange**

7. Socio-economics

Introduction

- 7.1 This chapter assesses the effects of the Proposed Development on socio-economics. In particular, it considers effects that may arise as a result of the Proposed Development on receptors sensitive to socio-economic change.
- 7.2 The chapter describes the methods used to assess the likely significant effects, the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect effects of the Proposed Development arising from construction and operation of the Site, the mitigation measures required to prevent, reduce, or offset any identified adverse significant effects and the residual effects. The assessment also considers cumulative effects with other committed development in the area and in-combination with the forthcoming site to the north of the proposed development that also forms part of the Oxford Road Corridor Strategic Regeneration Framework Guidance document (SRF). It has been written by Brookdale Consulting.
- 7.3 This chapter is supported by the following figures and technical appendices (see **Volume 2a: Main Text**).
- **Figure 7.1:** Population projections for Manchester local authority area 2023-2043 (number); and
 - **Figure 7.2:** Population projections for Manchester local authority area by age group 2016-2026 (% change).

Assessment Methodology and Significance Criteria

- 7.4 The study areas are selected to provide the best overview at local level (ward), local authority and regional level. The ward for the proposed development is Ardwick (inner study area), Manchester (wider study area) and the North West of England.

Scope of Assessment

- 7.5 The first stage of the assessment is to establish the baseline conditions through interrogation of published data or other sources. This includes a review of local and national policies and strategies related to economic development and regeneration, which is used to identify priorities at the local and national level. It also establishes the existing demographic, economic and social conditions through reference to a number of published data sources such as Census data, Higher Education Statistics Agency (HESA) data, the Office of National Statistics (ONS), NOMIS and information published by the National Health Service (NHS) and Department for Education. The baseline analysis will consider the following broad topics:
- Population;
 - Housing;

- Employment, unemployment and occupations including employment demand; and
 - Social and Community Infrastructure.
- 7.6 The Site, as described in the Baseline Conditions section of this chapter, consists of a former car dealership (now in temporary parking use) and sheltered housing building which was vacated in June 2021 and has since been lying vacant. The Site is assumed to have negligible current socio-economic use.
- 7.7 The second stage of the assessment is to assess the socio-economic effects during both the construction and operational phases of the Proposed Development. The construction spend on the scheme will support construction jobs over the lifetime of the build. This will have multiplier effects through induced (supply chains) and indirect (employee spend supporting further jobs) impacts. These will be quantified, and their significance evaluated at local and regional level.
- 7.8 Operational impact is calculated from typical student spend¹ which is converted to jobs in appropriate sectors in the study areas and beyond. The Sci-Tech building and retail space are assessed in terms of job creation based on standard employment densities for the type of space created. An assessment of business rates impacts is included. The assessment of additionality factors (leakage and displacement) allows net benefits to be calculated.
- 7.9 The effect on demand for local social and community infrastructure is assessed with a particular focus on health and educational facilities by reference to current supply of services drawn from NHS data.
- 7.10 The impact on and relationship with housing supply and demand in the area is assessed. This assessment draws upon local housing market data gathered by MCC. Business rates and Council Tax revenues are also assessed with purpose-built student accommodation (PBSA) having potential to release local housing back into the general population, thus increasing MCC's Council Tax revenues.

Characterisation of Impact

- 7.11 The overall impact methodology is primarily based on a quantitative assessment of the economic impacts in terms of jobs and Gross Value Added (GVA), in line with HM Treasury Green Book guidance².
- 7.12 The level of significance is assessed as shown in **Table 7.1**.

¹ <https://www.manchester.ac.uk/study/experience/student-life/living-costs/>

² HM Treasury (2022) The Green Book: Central Government Guidance on Appraisal and Evaluation. Available at: <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

Table 7.1: Impact Methodology

Magnitude of the Impact		
Spatial Extent of Impact	Duration of Impact	Scale of Impact
- Inner Study Area (Ardwick) - Wider Study Area (Manchester) - North West of England (or beyond)	- Long-term / permanent (more than 10 years) - Medium-term (existing for 5 to 10 years) - Short-term (existing for 1 to 5 years) - Temporary effect (existing for less than 1 year)	As there are no specific standards or guidelines, the impacts have been assessed relative to baseline conditions, or a 'No Development' scenario
Sensitivity of the Receptor		
The sensitivity of the receptor is typically assessed in terms of the recoverability of the receptor and importance of the receptor. However, this method of assessment does not perform well in terms of socioeconomic impacts (particularly beneficial impacts), where the receptor is assumed to be the economy, population, businesses and workforce in the study area. For example, in the case of job creation (or job losses) the sensitivity has been judged in terms of the level of unemployment in the area. Specific receptors identified in the assessment include construction, industrial and office employment and the sensitivity is judged on the ability of the sector to absorb the predicted increase in employment.		

Sensitivity of Receptors

7.13 The Sensitivity of the Receptor is measuring the capacity of the variable in question (e.g. population, housing, employment/unemployment) to absorb any change. This is classified as a subjective judgement based on the best available evidence within the following model:

- Very High Sensitivity – evidence base suggests the variable is already over capacity before any new change is introduced;
- High Sensitivity – evidence base suggests the variable is close to or is at capacity;
- Medium Sensitivity – evidence base suggests the variable has capacity to accommodate some change; and
- Low Sensitivity – evidence base suggests the variable has no capacity issues and can easily accommodate change.

7.14 The Magnitude of Impact is a composite measure which judges the combined effects of the modelled impacts of the development, including the location, duration and scale of the effect. The composite measure follows this model:

- Very High – a long-term and / or large-scale impact in the Inner Study Area;
- High – any combination of impacts between the Very High and Medium definition;
- Medium – a medium-term and/or moderate scale impact in the Wider Study Area;
- Low – any combination of impact between the Medium and Negligible definition; and
- Negligible – a temporary and / or small-scale impact at the North West of England level.

Significance Criteria

7.15 There are no recognised significance criteria for socioeconomic and health effects and, as such, professional judgement will be used based upon the identified needs of the local area, planning policy objectives and the magnitude of potential impacts in line with the significance criteria set out in **Volume 2: Main Text, Chapter 2: Approach**. Mitigation measures will be identified as required along with any residual effects.

7.16 The significance takes into consideration the following variables:

- The sensitivity of the receptor – i.e. their value and susceptibility to change;
- The magnitude of effect experienced by the receptor – i.e. the degree of alteration from the baseline;
- The scale at which any effect will be felt – i.e. Site level, at the immediate setting of the Site, at the scale of the study area;
- The duration of any effect (short-term, long-term etc);
- The socioeconomic effect of the Proposed Development itself; and
- The changes that will occur over time with the Proposed Development in place.

7.17 The magnitude of change is considered alongside the sensitivity of the receptor and the significance of the impact is thus identified. **Table 7.2** sets out the resulting impact matrix.

Table 7.2: Matrix for Significance of Effect

		Sensitivity of Receptor			
		Very High	High	Medium	Low
Magnitude of Impact	Very High	Major Adverse / Beneficial	Major Adverse / Beneficial	Major Adverse / Beneficial	Moderate Adverse / Beneficial
	High	Major Adverse / Beneficial	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial
	Medium	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial
	Low	Moderate Adverse / Beneficial	Minor Adverse / Beneficial	Minor Adverse / Beneficial	Negligible
	Negligible	Minor Adverse / Beneficial	Negligible	Negligible	Negligible

Any effects highlighted in orange are significant in EIA terms.

7.18 Any identified effects rated as **Major** (Adverse or Beneficial) are regarded as **Significant** in EIA terms.

Assumptions / Limitations

7.19 The assessment is based on the latest available and most comprehensive socio-economic data sources provided by central and local government. A number of these carry production lags, for example the latest population projections are based on 2021 mid-year estimates.

Consultation

7.20 An informal EIA Scoping Note was received by MCC from Avison Young's Environmental Planning Team on 31 February 2023. MCC's response, received by Avison Young on 8 March 2023, confirmed that the proposed scope of the Socioeconomics ES chapter was agreeable. No further actions were required from Avison Young or Brookdale Consulting.

7.21 As the socio-economic assessment draws upon existing sources of information, largely government statistics, no consultation was deemed necessary.

Baseline Conditions

7.22 This section describes the baseline conditions at the Site and the study area.

Current Site

7.23 The Site comprises land controlled by McLaren Property and Manchester City Council (MCC). The part of the Site under the control of McLaren Property is a former car dealership now used for temporary paid car parking. The part of the Site owned by MCC comprises the former Elizabeth Yarwood Court sheltered housing complex which was closed in June 2021 and has been vacant since. The Site is identified for redevelopment within the SRF, with mixed commercial uses in-line with the SRF being a priority. Heads of Terms have been agreed between MCC and Kadans Science Partner 8 UK Ltd in connection with the Elizabeth Yarwood Court site

General Population Characteristics

7.24 According to the ONS, based on latest 2021 data, Manchester has a total population of 549,900. Within this, the Ardwick ward accounts for 3.9% of the population at 21,906. A breakdown of the population by broad age category is given in **Table 7.3**. It can be seen that Ardwick has a very high proportion of working age people at 77%. A total of 34% of its population are in the 18-24 age reflecting the predominance of students. The North West has nearly four times the level of retired people as Ardwick ward.

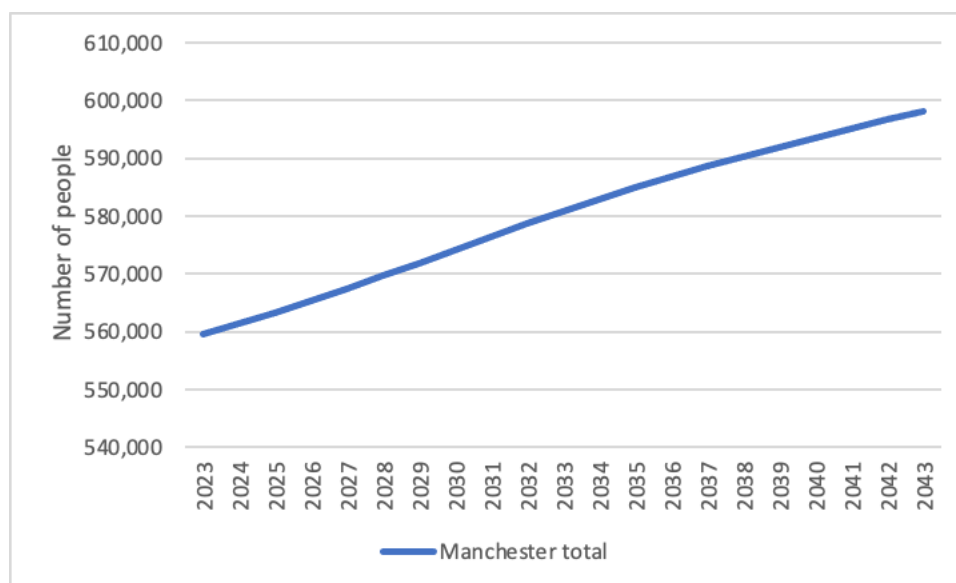
Table 7.3: Population of Ardwick ward compared to Manchester and North West, 2021

Age Range	Ardwick Ward	Manchester	North West
0 to 15 years	3,958	113,500	1,389,700
16 to 64 years	16,873	383,700	4,637,700
65 and over	1,075	52,600	1,394,900
Total number	21,906	549,800	7,422,300
Age Range	Ardwick Ward	Manchester	North West
0 to 15 years	18.1%	20.6%	18.7%
16 to 64 years	77.0%	69.8%	62.5%
65 and over	4.9%	9.6%	18.8%
Total %	100%	100%	100%

Source: ONS 2017 mid-year population estimates

- 7.25 Population projections, often referred to as sub-national population projections (SNPP), are produced every two or three years at local authority level, with the most recent release based on 2019 data (published March 2023). **Figure 7.1** shows the population projections for Manchester for the period 2023 to 2043. The overall population is expected to grow from 549,900 to 598,149, which represents an 8.8% increase over the period.

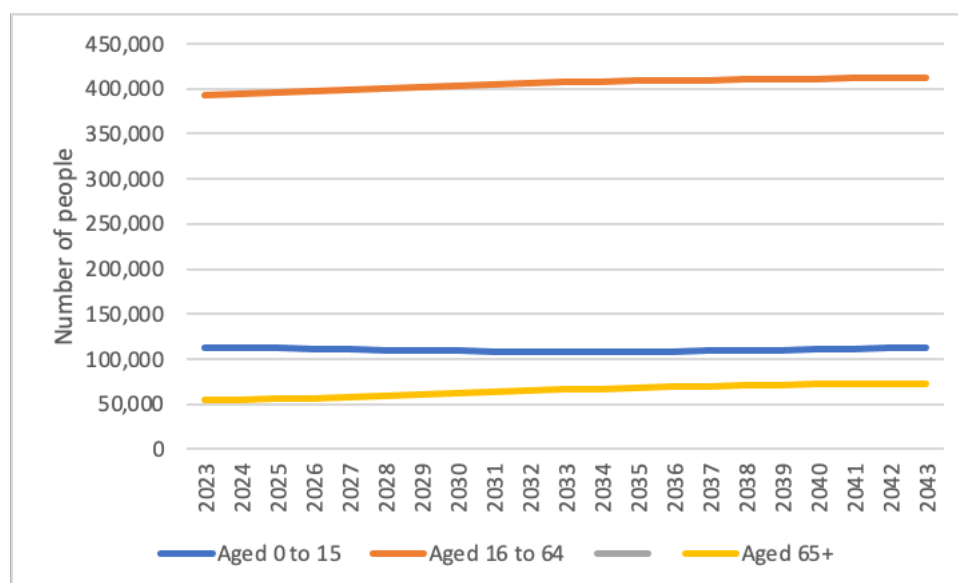
Figure 7.1: Population projections for Manchester local authority area 2023-2043 (number)



Source: ONS Crown Copyright [Population Projections from Nomis on March 2023]

7.26 The projections by age range are shown in **Figure 7.2**. The working age population is by far the largest and is expected to increase up to 2033 when it flattens off. The increase is driven by anticipated increases in student numbers. Those in retirement age are also expected to increase while the youngest age group is expected to reduce as a proportion of the population.

Figure 7.2: Population projections for Manchester local authority area by age group 2016-2026 (% change)



Source: ONS Crown Copyright [from Nomis September 2019]

- 7.27 Due to the methodology employed to calculate migration, the ONS mid-year estimates attribute a lower growth rate than would be expected. The Greater Manchester (GM) Forecasting Model was developed to strengthen and supplement the ONS mid-year estimates, by drawing upon local intelligence including expected residential development. Whilst the GM baseline forecast only goes to 2037, for Manchester, it forecasts a higher level of population growth at 16%, almost double the ONS projection to 2043³. This highlights the need to plan for growth of a vibrant and dynamic city such as Manchester with a strong research and business base.

Housing

- 7.28 MCC's Core Strategy was adopted in July 2012 with an expectation of substantial housing growth to meet a growing population. At that time, over 60,000 new dwellings were anticipated as being required in Manchester equating to an average of 3,333 per year to 2027. High density development was, and is, seen as appropriate in the city centre. For PBSA, key criteria were laid down including proximity to university campuses (including the University of Manchester and Manchester Metropolitan University), access to shops, wider regeneration potential, safety and crime reduction and non-proliferation of nuisance parking; with the Oxford Road Corridor being designated as a strategic area⁴.
- 7.29 Around the same time as the Core Strategy, MCC's Student Strategy Implementation Plan was conceived to address issues arising from Manchester's large student population, namely day to day impacts on affected neighbourhoods e.g. anti-social behaviour, improving housing for students, addressing parking issues and ensuring student lets do not encroach into family housing areas.
- 7.30 At the time of the Core Strategy publication, PBSA was seen as being in potential oversupply due to a large number of applications being in the planning pipeline at the time of the introduction of student fees. However, since that time rising student numbers (especially postgraduates), the impact of COVID-19 on rental housing supply, growth in the general population and generally smaller household sizes have restricted availability of housing leading to a rapid rise in rents. According to MCC, there were circa 24,000 PBSA beds in Manchester in 2018/19 of varying age, price and quality⁵. Between 2010/11 to 2018/19, 6,440 new houses were built in the city centre, with 28% or 1,800 units being PBSA. This has meant that most students wishing to live locally have ended up in the mainstream letting market thus putting pressure on this sector in terms of prices and reducing MCC's Council Tax revenue stream. MCC has identified that Manchester's PBSA is high cost, of variable quality, sometimes in the wrong location and of poor design in terms of welfare and wellbeing of students. In revising Policy H12, MCC is endorsing high quality PBSA in the Oxford Road Corridor area.
- 7.31 MCC's 2022 Strategic Housing Availability Assessment highlights a need for 19,436 homes over the next five years (including a 5% buffer) with supply of all schemes (including those about to be approved) of 25,689 leading to a surplus of 6,253. Whilst it meets Government requirements, MCC recognises that there are risks to delivery and

³ Greater Manchester Forecasting Model Summary of outputs – 2019 update

⁴ Manchester's Local Development Framework Core Strategy Development Plan Document Adopted 11th July 2012

⁵ Manchester City Council (14 October 2020) Report for Resolution, Purpose Built Student Accommodation in Manchester.

growth requirements could be higher. HESA data indicates that 26% of Manchester students live in PBSA at the current time, suggesting headroom for growth.

- 7.32 Ardwick has the second highest number of households in Manchester at 8,473⁶ and the highest proportion of housing benefit claimants of the city centre wards at 35.2% (2,979 households). PBSA in this location provides an opportunity to improve housing stock, release traditional student lets back into the mainstream market, improve student experience, support regeneration and improve MCC's funding streams by release of Council Tax.

Employment

- 7.33 ONS data show that economic activity in the Ardwick ward is 50.2%, well below Manchester at 67%, which is also below the level for the North West at 76.8%⁷. The low economic activity rate is due to the number of students which is 34.8% of the working age population compared to 32.8% at the Manchester level and 26.4% for the North West. Full time employment rates are 50.0%, well below the 69.1% rate across Manchester. Only 26.6% of Ardwick residents have Level 4 qualifications (degree) or above, well below the level in the rest of Manchester at 45.1% (38.6% for the North West).

- 7.34 As part of the Oxford Road Corridor, a designated Enterprise Zone (EZ) since 2016, there is a recognised need to ensure the limited amount of land available is used to its full potential by increasing density, improving quality and ensuring appropriate uses for both student accommodation and employment activities that will lever the significant knowledge-based activities of Manchester's academic institutions. When combined with the fact that 50% of students remain in Manchester, there is potential to:

*'leverage the important economic advantages and agglomeration opportunities associated with the Oxford Road Corridor' and to 'maximise the opportunity to drive the City's sustainable, inclusive growth and enhanced productivity.'*⁸

- 7.35 In the period 2014-2020 an estimated 3.8m sq ft of floorspace was delivered leaving 4.2m sq ft in the pipeline representing less than 10 years land supply for the area. As a knowledge economy powerhouse, there is significant potential to grow jobs in the area through the delivery of new high-density employment space. The building will create a wide range of graduate and non-graduate employment opportunities ranging from lab technicians, researchers, business support and PhD / C-Level roles such as R&D, drug manufacturing, QA and marketing.
- 7.36 Wages data are only available for the whole of Manchester and the North West. By place of residence, at £574.9 per week (gross weekly earnings full time and part time)⁹ Manchester is below the North West at £603.7.

⁶ Manchester City Council Intelligence Hub

⁷ Nomis Ward Profile using 2011 Census data and Area Profile from Labour Force Survey

⁸ Oxford Road Corridor Strategic Regeneration Framework Guidance September 2019

⁹ Drawn from the Annual Survey of Hours and Earnings 2018, ONS

However, by place of work, Manchester is above the North West at £669 versus £582¹⁰. This highlights that Manchester as a whole, is a relatively prosperous area with significant in-commuting for work.

- 7.37 In 2021 the total number of people working in Ardwick was 44,300¹¹. This includes employees and working proprietors (sole traders, sole proprietors, partners and directors). The resident population of the ward is 21,906, and the working population is 16,867. This indicates that there is substantial net inward migration into the area for work of around 27,000. Given its city centre location and excellent public transport links, increased business space in the area would increase the opportunities for sustainable economic growth in Manchester.
- 7.38 Employment forecasts in the Greater Manchester Forecasting Model¹² show employment in Greater Manchester is forecast to grow by 12% (183,000) jobs from 2017 to 2037. The city of Manchester is expected to provide a large share of this employment growth, especially if new development sites are brought forward, with Ardwick being a key city centre ward with growth potential.

Unemployment

- 7.39 Unemployment accounts for 6.2% of the working age population in the Ardwick ward, which is just above the rate for the rest of Manchester of 6% and well above the 4.2% level for the whole of the North West¹³.

Occupations

- 7.40 According to the ONS, the largest proportion of resident workers in Ardwick ward are in elementary occupations at 22.1%, followed by sales and customer services at 17% and professional at 16% (Manchester 14.8%, 11.2% and 20% respectively). Personal services are next at 10.5%, slightly above Manchester at 9.8%. The top three categories of employment account for 55.1% of the working population, slightly above the 46% for the rest of Manchester.
- 7.41 **Table 7.4** shows the structure of employment broken down by sector. BRES figures show that Ardwick employment is dominated by health (38.4%) and education (31.6%). This highlights the presence of the Manchester hospitals and University of Manchester in the ward. This 70% of jobs compares with 21.8% in Manchester and 22.5% in the North West. Only 4% of jobs in Ardwick are in retail, well below the proportion in Manchester at 7.6% and well below the North West at 9.2%. Professional, scientific & technical jobs are also low at 2.3% compared to 14% in Manchester and 8.8% in the North West. There is potential for this sector to increase with the provision of new Sci-Tech space.

¹⁰ ONS Annual Survey of Hours and Earnings (ASHE) 2022 Weekly mean pay - Gross (£) - For all employee jobs

¹¹ According to the ONS Business Register and Employment Survey (BRES)

¹² MCC (2017) *Greater Manchester Forecasting Model – Summary of outputs – 2017 update*, October 2017, Public Intelligence, Chief Executive's Department

¹³ Data from Manchester Intelligence Hub for Feb 2023 plus NOMIS Area Profile using Labour Force Survey.

Table 7.4: Structure of employment by sector 2021 (%)

Employment Sector	Ardwick	Manchester	North West
Agriculture, forestry and fishing	0.1%	0.0%	1.1%
Mining, quarrying and utilities	0.0%	0.3%	1.0%
Manufacturing	1.1%	2.6%	8.4%
Construction	1.1%	2.6%	5.5%
Motor trades	0.6%	0.5%	1.6%
Wholesale	2.3%	2.4%	3.7%
Retail	4.0%	7.6%	9.2%
Transport and storage	3.4%	7.1%	5.4%
Accommodation and food services	3.4%	8.5%	7.8%
Information and communication	0.9%	4.5%	2.8%
Financial and insurance	1.1%	5.4%	3.4%
Property	2.0%	2.8%	2.1%
Professional, scientific and technical	2.3%	14.0%	8.8%
Business administration & support services	3.4%	11.1%	8.2%
Public administration and defence	3.4%	5.7%	4.8%
Education	31.6%	9.5%	7.7%
Health	38.4%	12.3%	14.8%
Arts, entertainment, recreation & other serv.	1.0%	3.1%	3.7%
Total	44,300	422,290	3,544,000

Source: ONS: BRES 2021

Social and Community Infrastructure

- 7.42 There are 7 General Practitioner (GP) surgeries located within 1.2 miles walking distance of the Site (in line with best practice to provide choice to residents), as shown in **Table 7.5**. These surgeries have a combined number of registered patients of over 96,000. All surgeries are currently accepting new patient registrations and with 69 GPs¹⁴ across the 7 practices, suggests adequate capacity at 1,391 patients per GP, well below the English average of 1,700¹⁵.

Table 7.5: GP surgeries within 1.2 miles of the Site

Distance from the Site	Number of Surgeries	Total Number of Registered Patients	% of Surgeries Accepting New Patients
Within 1 mile	3	43,062	100%
1.1 to 1.2 miles	4	52,976	100%
Total	7	96,038	100%

Source: NHS Choices

- 7.43 There are at least 3 dental surgeries located within one mile of the Site and a further 7 within 1.2 miles. **Table 7.6** shows that none are accepting new NHS patients. Availability of NHS dentists is a current concern nationwide due to skills shortages and will require investment in training and funding to resolve. The Government has recently put in place new policy measures to address this. NHS Manchester has 68 dentists per 100,000 population compared with only 49 for the North West.¹⁶

¹⁴ <https://digital.nhs.uk/data-and-information/publications/statistical/general-and-personal-medical-services/28-february-2023#resources> (Practice-level CSVs February 2023)

¹⁵ ONS Census Trends in patient-to-staff numbers at GP practices in England: 2022

¹⁶ NHS (2022) *NHS Dental Statistics 2021-22 Annex 2 – Geographical breakdown of dental data*

Table 7.6: Dental surgeries within 1.5 miles of the Site

Distance from the Site	Number of Surgeries	Number (%) Accepting New NHS Patients	Number (%) Not Accepting New NHS Patients	Number (%) Not Supplying Information
Within 1 mile	3	0 (0%)	1 (33.3%)	2 (66.6%)
1.1 to 1.2 mile	7	0 (0%)	4 (57%)	1 (43%)
Total number	10	0 (0%)	5 (50%)	5 (50%)

Source: NHS Choices

Embedded Mitigation

7.44 This section describes the measures which have been ‘embedded’ into the Proposed Development.

Demolition and Construction

7.45 There are no embedded mitigation measures of relevance in this category.

The Completed and Operational Development

7.46 The completed and operational Development will be carefully designed to provide state of the art student accommodation and office and commercial space that is attractive to workers and employers. Necessary traffic improvement works will be undertaken as outlined within **Volume 2: Main Text, Chapter 11: Transportation**.

7.47 The location is highly sustainable given its proximity to the city centre, with rail, tram and bus transport, cycle and walking routes and proximity to the West Coast mainline and Manchester airport.

Assessment of Likely Significant Effects

7.48 This section of the chapter reviews the potential impacts of the Proposed Development and their significance, accounting for the embedded mitigation.

Construction Sector Employment

7.49 There will be a number of economic impacts as a result of the construction phase of the Proposed Development. The calculations are based on the estimated construction costs for the Proposed Development of £65m excluding VAT.

7.50 It is estimated in **Table 7.7** that the scale of the development could support 826 person years of construction related employment, comprising 333.6 on-site construction job years and a further 492.4 indirect job years in supporting industries such as specialist suppliers and manufacturing. It is estimated that the Proposed Development could be completed over a 36-month period which implies that there will be 111 construction FTE jobs supported on-site during the build period and a further 275.3 off-site indirect FTE jobs. The GVA associated with these jobs will be £20m per year.

Table 7.7: Calculation of Construction Jobs

Calculation	Metric
Construction expenditure (a)	£65m
Number of jobs per £1m of expenditure (b)	5.1 ¹⁷
Number of direct construction job years (c) = (a)*(b)	333.6
Employment multiplier for construction (d)	2.476 ¹⁸
Number of indirect construction job years (e) = (c)*(d-1)	492.4
Total number of direct and indirect job years (f) = (c)+(e)	826

Source: Brookdale Consulting

7.51 This generates two effects that have thus been measured on the significance of effects scale. Firstly, short-term disruption to the local area during the construction programme, though its proximity to good road connections will support access and materials movement in the immediate area. In the short-term, this could be disruptive to local businesses. The main receptor in this case is the ability of the local businesses to accommodate change. As a result of a rating of high magnitude of impact and medium sensitivity of receptor, this has been given an overall **Moderate Adverse** effect, which is **Not Significant** in EIA terms.

7.52 Secondly, there will be a short-term employment gain for the construction industry which is well represented in Manchester at 11,000 workers and 194,000 in the North West as a whole. It is likely that most employment benefits will be retained within the North West, but a very small level within Ardwick which has 500 workers in the sector. The contractor will be appointed on a competitive tender basis, but local contractors will be welcome to bid to maximise the opportunity for the local gain, and the use of local materials encouraged where possible. In addition, the construction workers based in Manchester will generate further benefits as they spend in local shops and other services. The main receptor in this case is construction employment. As a result of a rating of

¹⁷ ONS Annual Business Survey 2019

¹⁸ ONS Input-Output Tables 2016

low magnitude of impact and high sensitivity of receptor, this indicator has been given a **Minor Beneficial** effect rating, which is **Not Significant** in EIA terms.

The Completed and Operational Development

Purpose Built Student Accommodation Created

- 7.53 The Proposed Development will create 740 bedrooms for purpose-built student accommodation. As presented earlier within this Chapter, this is in high demand within Manchester. Based on the University of Manchester's estimated living costs for undergraduate and postgraduate students, and assuming a 50/50 split between undergrad and postgrad, this suggests annual spending of £7.9m per year which equates to 92 direct and indirect jobs in relevant sectors and GVA per year of £5.4m. The main receptor in this case is local population. As a result of a rating of medium magnitude of impact and low sensitivity of receptor, this indicator has been given a **Minor Beneficial** effect rating, which is **Not Significant** in EIA terms.

Sci-Tech and Retail Floorspace Created and Jobs

- 7.54 The Proposed Development will deliver 21,077 sqm of purpose-built Sci-Tech space building on the knowledge economy of Manchester. A small amount of retail (265 sqm) will also be created to service new residents and workers. A development of this size will create 545 direct and indirect jobs based on an employment density of 36 sqm per job for Sci-Tech space (which is based on Kadans experience in developing such facilities elsewhere and in line with Government guidance on job densities) and 17.5 sqm per job for retail. Displacement of 20% for Sci-Tech and 30% for retail in line with national guidance¹⁹ and a multiplier of 1.427 for retail and 1.569 for Sci-Tech. This will result in total GVA per year of £20.6m.
- 7.55 The Proposed Development will increase the revenues to MCC through business rates (£2.37m per year) related to the Sci-Tech space and Council Tax (£0.5m per year) assuming that the houses that would have been occupied by students are occupied by working people. This makes a total of £2.86m per year in additional taxes to MCC.
- 7.56 The main receptor in this case is the local economy. As a result of a rating of low magnitude of impact and medium sensitivity of receptor, this indicator has been given a **Minor Beneficial** effect rating, which is **Not Significant** in EIA terms.

GP and Dentist Provision

- 7.57 The Proposed Development will bring 740 new residents to the area, many of whom will be there for term time and home out of term (postgraduates staying year-round). GP provision is more than sufficient relative to national benchmarks while there is a shortage of dentists nationally. Some students may choose to remain registered at their home address for either doctors or dentists. For GP provision, as a result of a rating of low magnitude of impact and low sensitivity of receptor, this indicator has been given a **Negligible Adverse** effect rating, which is **Not Significant** in EIA terms. For dentist provision, as a result of a rating of low magnitude of

¹⁹ Additionality Guide Fourth Edition HCA

impact and high sensitivity of receptor, this indicator has been given a **Minor Adverse** effect rating, which is **Not Significant** in EIA terms.

Additional Mitigation / Enhancement Measures

- 7.58 This section describes the measures which are required to mitigate any significant environmental effects with regards to socio-economics.

Demolition and Construction

- 7.59 The construction impact assessment presented identifies the potential for short term disruption to the local area during the construction programme of the Proposed Development, including the logistical implications of access and materials movement in the area. While short-term, this could be moderately disruptive to the local businesses.
- 7.60 To mitigate the potential disruption, it is suggested that the design and timings for the construction programme should take this into account to minimise these effects, avoiding rush hour where possible for logistics. Best practice measures will be included within a Construction Environment Management Plan (CEMP) and secured by condition.
- 7.61 The introduction of a Local Employment Scheme could help to retain some of the employment benefits in the local area. McLaren Properties, the developer, have an established training programme for placements and new apprentice entrants providing over 150 opportunities per year across all areas of construction. The Proposed Development will provide training for many of these during construction. As part of the tender process, Kadans will request a proportional level of local apprenticeships (site and office roles) from the Main Contractor throughout the design and build programme.
- 7.62 During the design stage and construction phase of the Development, Kadans will also seek to raise awareness for the Proposed Development, including direct engagement with MCC, Ward representative, schools / colleges and career bodies. Activities will include site tours, career fairs, webinars and promotional material.

The Completed and Operational Development

- 7.63 The impacts of the Proposed Development during the operational phase are assessed as either **Minor** or **Moderate Beneficial (Not Significant)**. Therefore, no additional mitigation for the adverse effects of the Development is required. However, Kadans is committed to increasing the beneficial impacts through promoting local employment through multiple routes including the Greater Manchester Local Enterprise Partnership, local groups and partnerships with Manchester focused job fairs and events. Kadans have a partnership with various social enterprises including Ahead Partnership who assist with school introductions, content writing and more.

- 7.64 Kadans will engage with tenants to support outreach programmes and promote various elements of the Sci-Tech sphere as well as how to access the Apprenticeship Levy.

GP and Dentist Provision

- 7.65 The impacts on GP provision are assessed as **Negligible** while impacts on dental provision are assessed as **Minor Adverse**. However, this reflects a national shortage of NHS dental provision post COVID-19 which is being addressed nationally. Encouraging students to remain registered with their home dentists or to pay for private provision might be considered.

Likely Residual Effects of the Development and their Significance

- 7.66 With implementation of best practice demolition and construction management practices, it is assumed that the effect would reduce from **Moderate Adverse** in the short-term to a short-term **Negligible** residual effect in the inner study area, which is **Not Significant** in EIA terms. **Table 7.8** below summarises this assessment.
- 7.67 As the effects of the completed Development are assessed as **Minor Beneficial**, no additional mitigation measures are required so the residual impacts remain the same and are rated as **Not Significant**.

Table 7.8: Residual Effects Summary

Description of Effect	Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
Demolition and Construction			
Disruption to local area due to movement of materials etc.	Moderate Adverse short-term effect on immediate area, which is Not Significant	Best practice mitigation measures implemented by way of CEMP	Negligible short-term effect on immediate area, which is Not Significant
Employment gain for construction industry	Minor Beneficial short-term effect on the wider area, which is Not Significant	Local Employment Scheme	Minor Beneficial short-term effect on the wider area, which is Not Significant
The Completed and Operational Development			
Local population	Minor Beneficial effect rating on immediate area, which is Not Significant	None required	Minor Beneficial effect rating on immediate area, which is Not Significant
Local employment	Minor Beneficial long-term effect on immediate area, which is Not Significant	None required	Moderate Beneficial long-term effect on immediate area, which is Not Significant

Conclusions

- 7.68 The Site comprises a former car dealership and a sheltered housing complex, both no longer in active use. The Site is identified for redevelopment within the Oxford Road Corridor SRF Guidance document. There is strong demand for high quality commercial, retail and student accommodation and a need to ensure that land is allocated to the best uses.
- 7.69 The construction of the Proposed Development will support 826 person years of construction related employment, with GVA of £20m per year for three years. This is assessed as a **Minor Beneficial** short-term effect on the wider area, which is **Not Significant**.
- 7.70 The Proposed Development will create 740 bedrooms for purpose-built student accommodation, creating 92 direct and indirect jobs in relevant sectors and GVA per year of £5.4m.
- 7.71 In addition, the Proposed Development will deliver 21,077 sqm of purpose-built Sci-Tech space and 265 sqm of retail, creating 545 direct and indirect jobs and GVA per year of £20.6m.

- 7.72 The Proposed Development will contribute to Manchester's economic prosperity building on its knowledge economy strengths to the benefit of Greater Manchester and the North West. It will increase the revenues to MCC through business rates and Council Tax in the order of £2.86m per year.
- 7.73 Given this context, the Proposed Development is regarded as having a positive and lasting effect in the area. This is assessed as a **Minor Beneficial** overall rating which is **Not Significant** in EIA terms.

Assessment of Cumulative Effects and their Significance

- 7.74 **Table 7.9** sets out the Cumulative Schemes noting which are scoped-in or scoped-out of Socio-economics and Health's Cumulative Effects Assessment (CEA).

Table 7.9: Cumulative Schemes

No.	Planning Reference	Description of Development	Scoped In / Out	Justification
1	101664/FO/2013/N2	Brunswick Neighbourhood	In	Whilst some of this development is refurbishment, there will be an increase in new dwellings and overall demand from the development which will impact on local receptors such as construction industry and social infrastructure.
2	N/A	Upper Brook Street Masterplan – PAG / Moda Living	In	The development will increase the supply of student accommodation and R&D space which will impact on local receptors.
3	124472/FO/2019	Kincardine Court Extension	In	The development will increase the supply of student accommodation which will impact on local receptors.
4	134288/FO/2022	Number 3 Circle Square	In	The development is aimed towards the office market but will have an impact on the local receptors such as the construction industry and the wider economy.
5	125799/FO/2019	MMU Science and Engineering Building	In	As a redevelopment, the project will not increase demand on local facilities but will impact the construction industry in the short term.
6	125573/FO/2019	First Street South	In	The development will increase demand on local facilities so is scoped in.

Approach

- 7.75 The first stage of the CEA is to establish which Cumulative Schemes are relevant in socio-economic terms and that are to be included within the CEA. Of the six Cumulative Schemes identified, all are scoped in but for different reasons. All Cumulative Schemes will have an impact on the construction sector.
- 7.76 Cumulative Schemes No. 2 and No. 3 will increase the amount of accommodation provision for students by 1,110 and 100 units, respectively. Cumulative Schemes No. 1 and 6 will increase provision of housing for mixed housing co-living, respectively. Cumulative Scheme No. 2 will increase the amount of Life Science space next to the University of Manchester. Cumulative Scheme No. 4 will increase the amount of office space in the City Centre. Cumulative Scheme No. 5 will see the redevelopment of one of Manchester Metropolitan University's buildings.
- 7.77 These Cumulative Schemes are assessed to establish the potential cumulative effects from the combination of all of the relevant developments to assess the potential wider impact.
- 7.78 There are no further synergistic effects included in the assessment.

Likely Residual Cumulative Effects and their Significance

Demolition and Construction

- 7.79 Given the scale of these developments relative to the local construction industry, it is likely that construction jobs will leak outside the immediate area and external contractors will be required from outside the area. The indirect benefits of the construction, such as the workers' spend in the area, will still remain and are increased by the total volume of new construction activity across the programme of approved developments.
- 7.80 Given that other developments are likely to complete while new ones emerge, the overall scale of construction activity is likely to remain at a similar level. This indicator would remain as **Moderate Beneficial** impact rating for the wider area, which would remain as **Not Significant** in EIA terms.
- 7.81 The Construction effects assessment highlighted the potential for short term disruption to the local area during the construction programme given the need for access and materials movement. While short-term, this could be moderately disruptive to the area.
- 7.82 With implementation of best practice construction practices, it is assumed that the residual impact of the proposed development would move from **Moderate Adverse** in the short-term to a short-term **Negligible** residual impact in the inner study area, which is **Not Significant**. This is not expected to change for the cumulative impact assessment, assuming all developments implement the same mitigating factors.

The Completed and Operational Development

- 7.83 The CEA of the completed and operational Cumulative Schemes is based upon an overall assessment of the impact on the local population, economy and social and community infrastructure. The Proposed Development

will provide both student homes and employment space, both of which are needed. The Oxford Road Corridor SRF aims to increase the impact of Manchester's knowledge resources, encouraging high quality student accommodation and Sci-Tech workspace.

- 7.84 The inclusion of Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living) together with the Kadans development represent a combined Sci-Tech and Life Science space of 65,077 sqm, though this is only around 17% of the pipeline of office space according to the SRF with a need for more in the long term.
- 7.85 The combined student accommodation will support 1,840 beds in the face of strong demand for more accommodation. The sustainable transport links will support business space growth drawing in employees from across Greater Manchester. Whilst there is capacity within GPs for the population expansion forecast, and a new GP surgery proposed as part of the wider masterplan, there are issues with availability of dentists, in common with other parts of the UK. The cumulative effect of these developments will be to increase supply of housing, Sci-Tech and Life Science space, retail, and office space which will increase local economic activity and contribute towards established growth objectives.
- 7.86 Therefore, the impact significance is assumed to move from **Minor Beneficial** to the immediate study area to **Moderate Beneficial** for the wider area, which is **Not Significant in EIA terms**.

Mitigation Measures

- 7.87 The requirement for additional dentists is being addressed at the UK Government level to increase access to NHS dentists. Additionally, it is understood that subject to NHS sign-off, a new GP surgery is proposed as part of the wider Upper Brook Street Masterplan. While this GP surgery does not form a part of the Proposed Development, it would provide additional GP capacity for current and future local residents.

8. Wind Microclimate

Introduction

- 8.1 This chapter assesses the effects of the Proposed Development on wind microclimate. In particular, it considers effects that may arise as a result of the Proposed Development upon pedestrian comfort and safety.
- 8.2 The chapter describes the methods used to assess the likely significant effects, the baseline conditions currently existing at the site and surroundings, the potential direct and indirect impacts of the development arising from wind down draft, flow channelling, etc. The mitigation measures required to prevent, reduce, or offset the impacts and the residual impacts are also discussed.
- 8.3 The chapter has been written by Wilde Analysis Ltd, an engineering consultancy with extensive expertise in wind engineering.
- 8.4 This chapter is supported by the following figures and technical appendices (see **Volume 2a: Main Text Figures** and **Volume 3: Appendices**, respectively).
- **Figure 8.1:** Hourly Average Wind Speeds at Manchester Airport 10m Above Ground Level;
 - **Figure 8.2:** CFD full domain;
 - **Figure 8.3:** CFD inner domain (baseline conditions);
 - **Figure 8.4:** CFD inner domain (with Proposed Development);
 - **Figure 8.5:** CFD inner domain (with relative Cumulative Schemes);
 - **Figure 8.61** – Acceptability for Lawson Comfort Criteria, current Site;
 - **Figure 8.7:** Acceptability for Lawson Safety Criteria, current Site;
 - **Figure 8.82:** Acceptability for Lawson Comfort Criteria, with Proposed Development;
 - **Figure 8.9:** Receptor locations external to the Site;
 - **Figure 8.10:** Acceptability for Lawson Safety Criteria, with Proposed Development;
 - **Figure 8.11:** Acceptability for Lawson Comfort Criteria, with Cumulative Schemes;
 - **Figure 8.12:** Acceptability for Lawson Safety Criteria, with Cumulative Schemes; and
 - **Appendix 8.1:** Wind Assessment Report¹.

¹ Wilde Analysis (2023) 'F2314 101 R01 RevC Upper Brook Street, Manchester Wind Microclimate Study.pdf'

Assessment Methodology and Significance Criteria

Assessment Methodology

- 8.5 The assessment compares the wind conditions at pedestrian level in the vicinity of the existing Site with the wind conditions likely to be generated following the construction of the Proposed Development, and separately following the construction of neighbouring developments (the Cumulative Scenario).
- 8.6 The purpose of this study is to determine the effect of the Proposed Development on pedestrian comfort within the vicinity of the Site as compared to the baseline conditions. The study comprises the wind assessment of the Site both with, and without, the Proposed Development. It should be noted that the form of the Proposed Development considered in the current study represents maximum building heights considered by the architects. Moreover, no landscaping has been considered within the Site in the Proposed Development scenario, making the current analysis a worst-case scenario in terms of microclimate behaviour. Checks have been made where necessary to inform the likely effects of the landscaping scheme. This involved re-running the CFD model (see later in the chapter for detail on the modelling) for the most concerning wind direction with some details captured in the landscaping scheme. The assessment follows the guidance given by Lawson^{2,3}, which is discussed further below.
- 8.7 Manchester City Council (MCC) does not specify a particular methodology which is required for wind assessment.

Meteorological Conditions

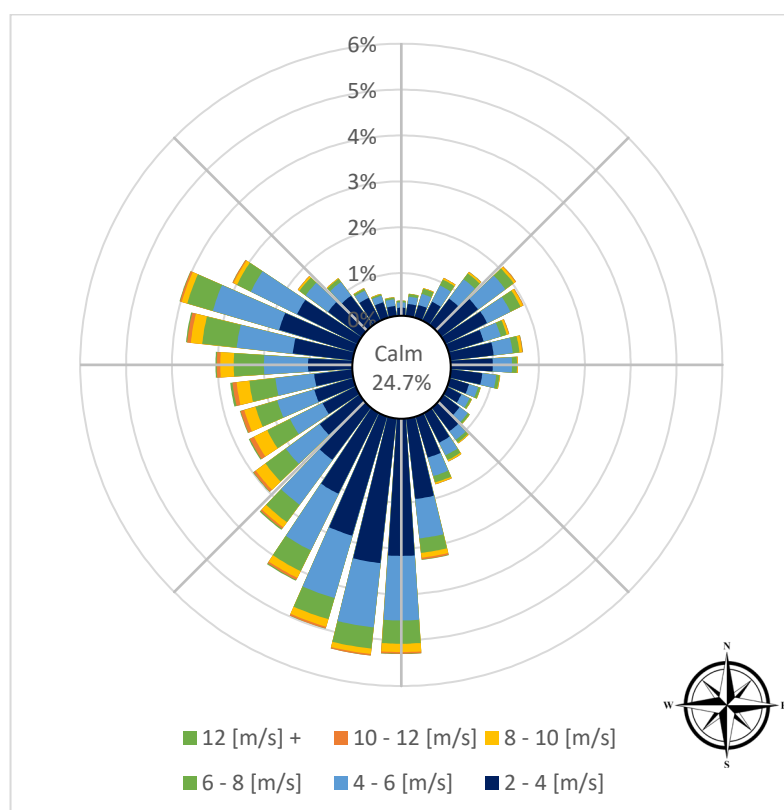
- 8.8 The starting point for wind assessments is to utilise meteorological data, which in this case was from Manchester Airport. This gives statistical information on hourly-averaged wind speeds by direction and by month as measured by an anemometer at a given distance above the ground.
- 8.9 Manchester Airport has an automatic weather station located at 53.3588°N 2.2727°W at 71 m above mean sea level. Wind data is collected at standard exposure. This is defined as being over level, open terrain at a height of 10 m above the ground, where open terrain is defined as an area where the distance between the anemometer and any obstruction is at least 10 times the height of the obstruction.
- 8.10 Since the wind speed and direction are continually changing, and since the Lawson criteria are couched in terms of percentages of the time that wind speed exceeds a particular value, it is necessary to establish the frequency distribution of wind speeds (i.e. a means to calculate how often the wind exceeds a particular speed) in each direction.

² Lawson T (2001); 'Building Aerodynamics', Imperial College Press

³ LDDC Planning Advice Note – Wind Effects and Tall Buildings, July 2017

- 8.11 Hourly mean wind speed and direction are obtained from Manchester Airport weather station and through mathematical description (the Weibull distribution), speed frequency distribution in each direction is determined.
- 8.12 This information needs to be translated to the Site. This is primarily about making an assessment of the variation of wind speed with height above the ground (the “velocity profile”), which is highly dependent on the nature of the terrain. This involves understanding, for each wind direction, how the terrain in the direction from which the wind is blowing is likely to affect the measured data and the conditions approaching the development site. The resulting velocity profile takes the form of a “reference velocity” at a given height and a variation of speed above and below this height.
- 8.13 The frequency distributions for wind speed and direction allow us to combine results with statistical weightings to build up a picture of locations at which the wind speed exceeds threshold values specified by the Lawson criteria. These are presented in terms of a contour plot showing those locations that are deemed by the Lawson criteria to be suitable for particular activities, such as sitting, standing, etc. This is a major advantage of computational fluid dynamics (CFD) simulation over wind tunnel testing, since it enables a quick visual assessment of areas suitable for particular usage categories, which can help, for example, with the location of doorways, siting of play areas, etc.
- 8.14 Hourly mean wind speed data, by speed and direction, were obtained over a period from January 2010 to May 2022. A wind rose of this data can be seen in **Figure 8.1**.

Figure 8.1: Hourly Average Wind Speeds at Manchester Airport 10m Above Ground Level



Frequency Distribution for Wind Directions

- 8.15 The probability of wind direction is assumed to be the same at the Site as at Manchester Airport. The probability of reference speed, per direction (in this case the 95th percentile in that direction at a height of 10m above the ground) is adjusted to allow for the effects of terrain both at Manchester Airport and around the Site. The resulting set of reference speeds, with respect to wind direction is shown in **Table 8.1**. The wind directions in **Table 8.1** have been chosen so as to provide both a distributed overview and additional resolution in common directions. This is achieved via 12 equi-spaced wind directions, and an additional 6 focussed primarily around the south-westerly direction.

Table 8.1: Wind Reference Speed (10 m Above Ground Level) by Direction

Wind Direction (degrees)	Wind Direction Range (degrees)	Reference Wind Speed (m/s)
0	345-15	7.10
30	15-45	7.38
60	45-75	6.75
90	75-105	5.16
120	105-135	4.16
150	135-165	4.89
170	165-175	5.63
180	175-185	5.65
190	185-195	5.69
200	195-205	6.00
210	205-215	6.30
220	215-225	6.98
240	225-255	7.96
260	255-265	8.62
270	265-275	8.33
280	275-285	8.44
300	285-315	7.42
330	315-345	6.13

Extent of the Study Area

- 8.16 Three computational models were constructed – these represented the existing Site, with the Proposed Development and another with the neighbouring (cumulative) development. Buildings of the surrounding context

up to a radius of 600m were included to get realistic flow paths through the Site. An outer rectangular domain was constructed to rotate based on wind direction.

- 8.17 Details of the CFD domain (under baseline conditions, with the Proposed Development and with relevant Cumulative Schemes) are pictured in **Figures 8.3 to 8.5**. Geometry of buildings and terrain were based on public data sources. Building geometry was de-featured; that is, minor geometrical features judged as unlikely to affect wind flow were removed. Examples of this would include decorative pillars on the side of a building, or a generator on a rooftop.

Figure 8.2: CFD full domain

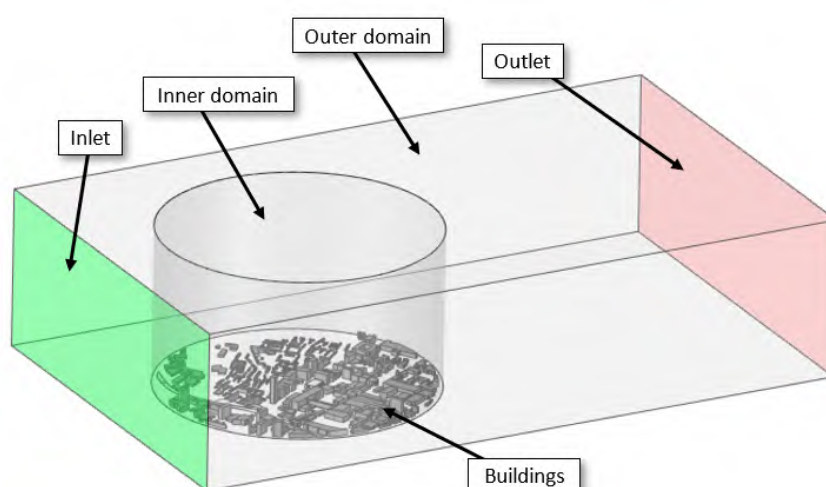


Figure 8.3: CFD Inner Domain (Baseline Conditions)

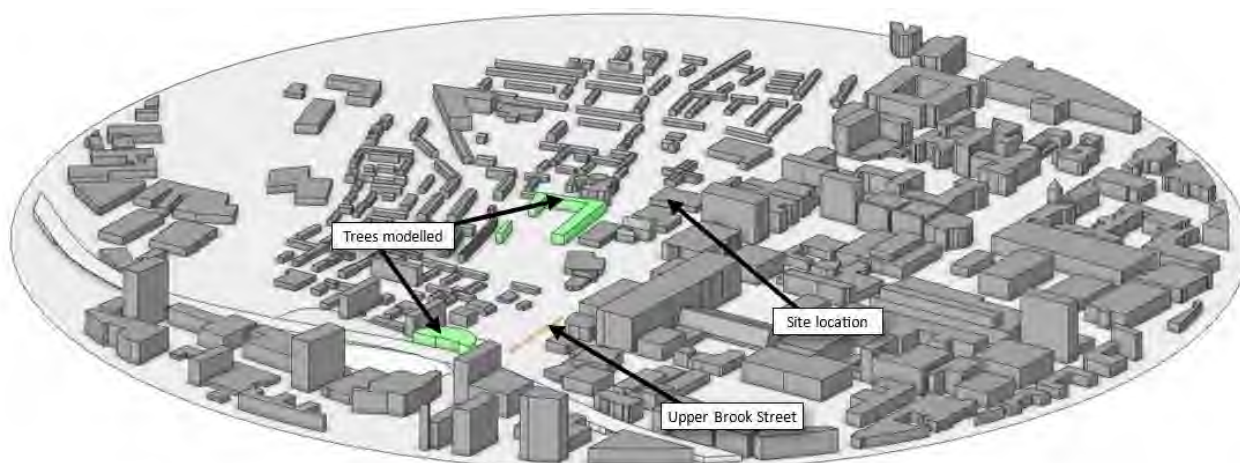


Figure 8.4: CFD Inner Domain (with Proposed Development)

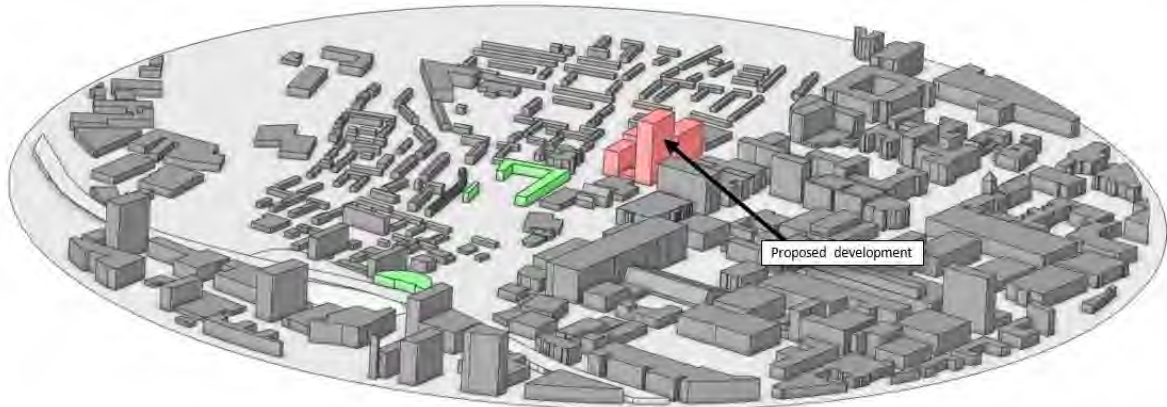
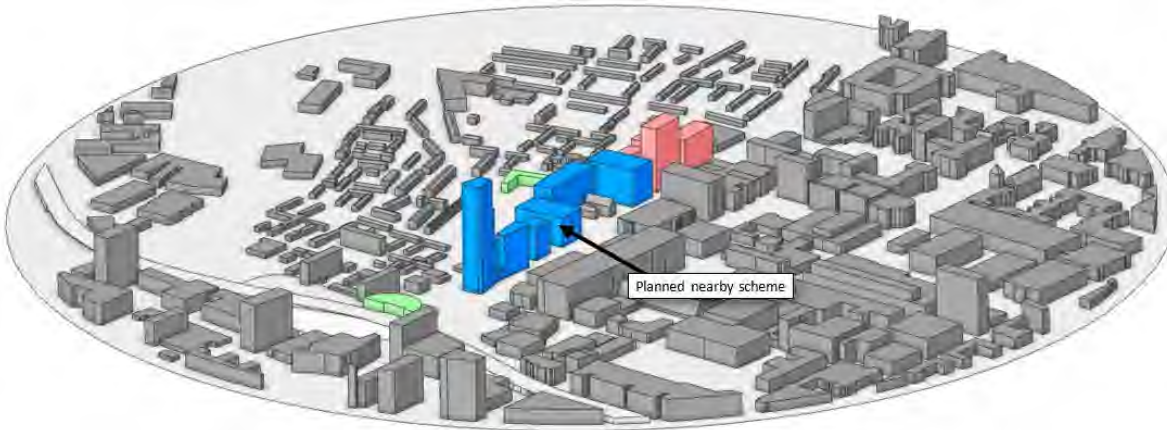


Figure 8.5: CFD Inner Domain (with relevant Cumulative Schemes, see – Table 8.5)



CFD Testing

- 8.18 On the outer domain, the upstream face is designated as an inlet and downstream face designated as an outlet.
- 8.19 For each wind direction, the reference speed was used to calculate a velocity profile (i.e. variation of horizontal wind speed with respect to elevation), a power law was used to represent the velocity profile at the inlet boundary.
- 8.20 The CFD solver then calculated the flow patterns within the modelled region, such that the effect of the buildings on local flow patterns was determined.

Evaluation of Simulation Results

- 8.21 Lawson summarised criteria for wind safety and comfort in terms of wind speeds that should not be exceeded for a given proportion of the time for conditions to be deemed appropriate for particular activities to be undertaken. Several variations of the Lawson criteria appear in the literature; the London Docklands Development Corporation (LDDC) variant was used in this assessment. This approach is the most conservative of the variations, is commonly used in wind assessments and is more readily comprehensible to the non-expert reader.

- 8.22 For each wind direction, CFD can be used to express velocity at any location as a multiple of the reference speed. This, together with the statistical distribution of wind direction and reference speed allows us to determine the probability that any particular velocity threshold is exceeded for a specified percentage of the time. Thus, conditions at any location can be assessed against the Lawson criterion for a particular activity at that location.
- 8.23 Assessment against the Lawson Criteria is performed at average pedestrian height (1.5m above ground level). Results can either be presented at individual locations, or as a contour map over an area.
- 8.24 Based on the current data available no conclusive predictions can be made on future extreme weather conditions, in the context of this chapter projected future extreme weather events are likely to impact most significantly areas in which the safety criterion is exceeded.

Identification of Sensitive Receptors

- 8.25 Sensitive receptors have been identified as locations where specific activities such as sitting, standing, strolling take place. It is important to ensure that these areas do not present comfort levels that are unacceptable for the activities, as this will result in pedestrians changing their behaviour to avoid these adverse conditions.

Sensitivity, Value or Importance

- 8.26 Sensitivity, value or importance of each receptor is defined in terms of its intended use, as per the Lawson Criteria for pedestrian comfort. There are four categories of intended use – sitting, standing, strolling and business walking.

Sitting

- 8.27 Locations to be used for sitting are assessed to the most stringent threshold according to the Lawson Criteria. This would include areas such as outdoor restaurants or park benches, where only light breezes would be desired. For a location to be deemed inappropriate for sitting, wind speeds must exceed 4 m/s at least 5% of the time.

Standing

- 8.28 Locations to be used for standing are assessed to the second most stringent threshold according to the Lawson Criteria. This would include bus stops or entrances to buildings, where standing for long periods of time would be expected. For a location to be deemed inappropriate for standing, wind speeds must exceed 6 m/s at least 5% of the time.

Strolling

- 8.29 Locations to be used for strolling are assessed to the second least stringent threshold according to the Lawson Criteria. This would include places where window shopping may take place, or a park with designated paths. For a location to be deemed inappropriate for strolling, wind speeds must exceed 8 m/s at least 5% of the time.

Business Walking

- 8.30 Locations to be used for business walking are assessed to the least stringent threshold according to the Lawson Criteria. Business walking refers to pedestrian movement (via a walk, run or cycle) without lingering. For a location to be deemed inappropriate for business walking, wind speeds must exceed 10 m/s at least 5% of the time. After this threshold, wind speeds are considered a nuisance for most activities.

Safety

- 8.31 Additionally, the Lawson Criteria defines conditions which are deemed unsafe for pedestrians. For conditions to be deemed unsafe, wind speeds must exceed 15 m/s for at least 2 hours total per year (approximately 0.02% of the time). Wind speeds above this threshold present safety risks, particularly for vulnerable pedestrians (elderly, cyclists, etc.)

Characterisation of Impact

- 8.32 Each receptor is classified in terms of the most stringent activity which is appropriate at that location. For example, if the location exhibits winds that exceed 7 m/s at least 5% of the time, it would be deemed appropriate for strolling, but not sitting. This classification is made for baseline conditions and with the Proposed Development included, so a comparison may be made. The intended use of the location is also considered.
- 8.33 Effects are either adverse, beneficial or negligible. If there is a change in the level of Lawson criteria exceeded, the effect will be designated as adverse or beneficial depending on the direction of change. If there is no change in the level of Lawson criteria exceeded, the effect will be designated as negligible.
- 8.34 The magnitude of each effect is considered either minor, moderate or major. An effect is considered minor if winds are 1 level calmer / windier than baseline conditions, moderate if winds are 2 level calmer / windier than baseline conditions and major if winds are 3 level calmer / windier than baseline conditions. If the change does not represent an exceedance of the criteria for intended use at that location, then the effect will be considered minor regardless. This information is presented in **Table 8.2**.

Table 8.2: Significance Criteria for Wind Microclimate Assessment

Modelled Wind Microclimate Criteria	Effect Classification and Significance
Wind Conditions are 3-levels calmer / windier than existing.	Major
Wind Conditions are 2-levels calmer / windier than existing.	Moderate
Wind Conditions are 1-level calmer / windier than existing, or the criterion for intended use at that location is not exceeded	Minor

- 8.35 In line with Lawson's overall methodology, strong winds are reported separately from the Comfort Criteria assessment and do not form part of the significance criteria (but may nevertheless require mitigation if conditions exceed the relevant threshold).
- 8.36 In the context of this section, only effects identified as **Moderate** or **Major Adverse** are significant for the purposes of EIA and would require mitigation.
- 8.37 Where potential significant adverse effects are identified, a corresponding entry has been included in the 'Mitigation Measures' section of this chapter to describe the remedial measures proposed to mitigate the effect.
- 8.38 Given the nature of the Proposed Development and its expected lifetime, all operational effects are considered to be long term.

Assumptions / Limitations

- 8.39 The assessment described above has been conducted through CFD analysis. CFD is a widely recognised method for modelling airflows, both internal and external, and as modern machines have developed in computer power, it allows for the detailed analysis of most flow-related problems. However, there are some limitations with CFD in relation to the modelling of wind environments. The method generally uses steady flow assumptions, which means that short term gusts are not captured explicitly.
- 8.40 However, the mean hourly assessment provides a thorough assessment of the open spaces with regards to pedestrian comfort throughout the flow domain and provides a good indication of the areas of high speeds and wind acceleration to facilitate identification of suitable mitigation measures. A correction can be made to the data to account for the effect of gusting, and this is particularly relevant for the safety criteria.
- 8.41 Wind speeds within a porous region (that are used to represent trees, for example) are difficult to accurately assess. As such, the effect of trees in critical areas are not considered so as to ensure a conservative assessment (although significant groups of trees were included elsewhere). Where foliage is considered or recommended as mitigation, checks have been done of representative planting to confirm its ability to mitigate adverse conditions. These checks involved re-running the CFD model for the most concerning wind direction with some features captured in the landscaping scheme.
- 8.42 The Lawson criteria for pedestrian comfort focus on the effect of wind force on people's activities but does not factor in other environmental variables such as air temperature, solar radiation and relative humidity. Overlaying all these climatic factors would be a complex process and Lawson's simplified method presents the best available methodology for anticipating wind effects in the built environment.
- 8.43 The buildings were modelled as simplified blocks, i.e. with smooth surfaces and no façade features, which is generally sufficient detail to represent buildings in airflow modelling at this scale. This assumption is industry

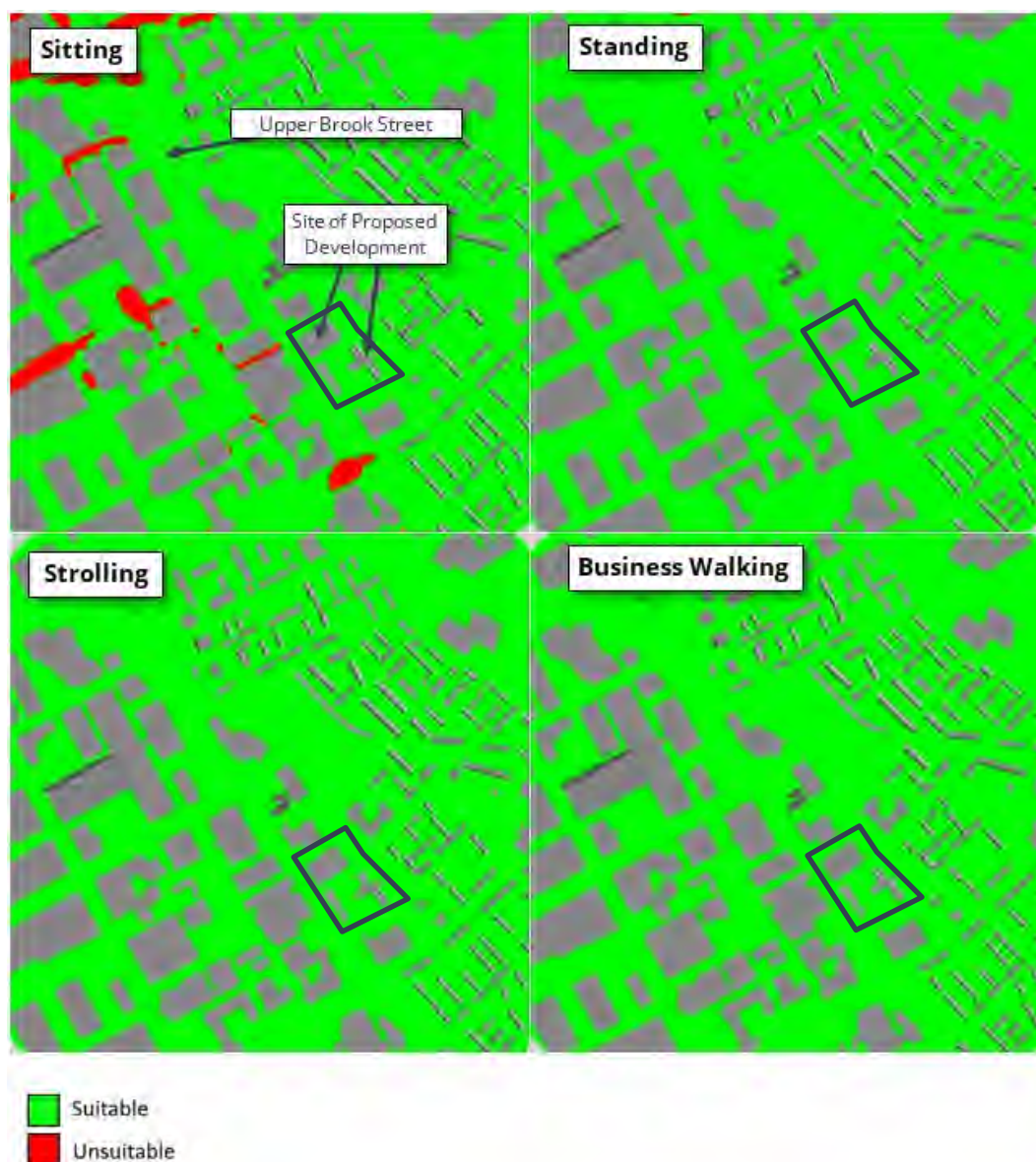
standard, as further detail to the model such as the window reveals and façade texture would add an impractical and unnecessary complexity to the model without adding greater quality results.

- 8.44 Façade treatments increase surface roughness which inhibits local turbulence and provides resistance to passing wind. The expected consequence of removing façade treatments is that wind speeds will increase at pedestrian level. It is therefore considered conservative.

Baseline Conditions

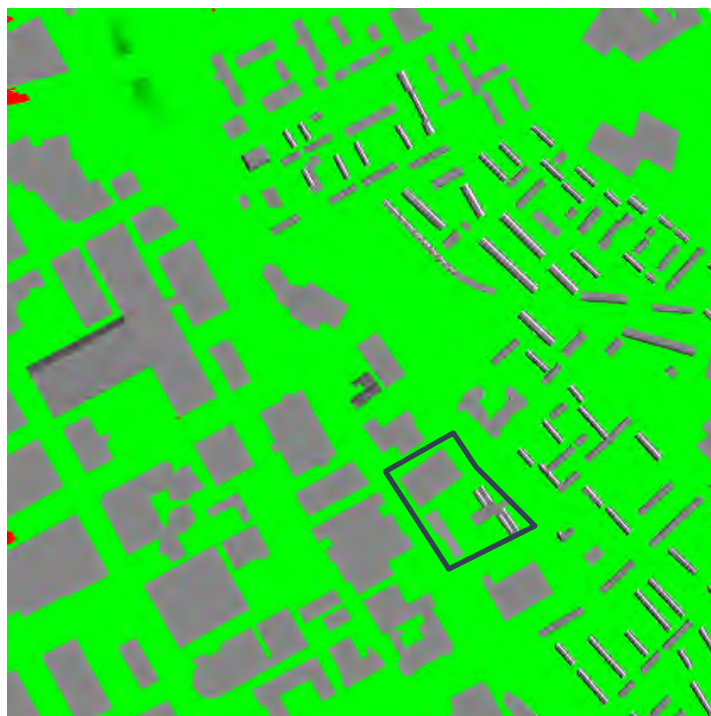
- 8.45 The current Site presents no significant concerns with respect to acceptability under the 4 conditions of the Lawson Criteria for pedestrian comfort. Contours showing acceptability of each condition are shown in **Figure 8.6**. Some locations are deemed inappropriate for sitting – of these, only the channel between the Henry Royce Institute and the Alan Turing building is in close enough proximity to the Proposed Development to be considered. None of these areas are assessed to the sitting criterion. All other conditions - standing, strolling and business walking - exhibit no exceedances of the Lawson Criteria. These conditions will be used as a baseline to assess the likely significant effects of the Proposed Development.

Figure 8.6: Acceptability for Lawson Comfort Criteria, current site



- 8.46 Locations that exceed the threshold to be deemed unsafe (wind speeds exceeding 15m/s for 2 hours per year) are presented in **Figure 8.7**. There are no locations that are deemed unsafe in the vicinity of the Site.

Figure 8.7: Acceptability for Lawson Safety Criteria, current site



Embedded Mitigation

The Completed and Operational Development

- 8.47 There are 30+ trees proposed for the Site, consisting of a mixture of native broadleaf, bushy multi-stem and low-level shrub species. These have not been considered within the statistical CFD model due to the unknown eventual size and density of this foliage. In this way, a worst-case condition is analysed. These trees, along with soft landscape features, are expected to mitigate high wind speeds at ground level on the Site; this is confirmed via later mitigation checks.

Assessment of Likely Significant Effects

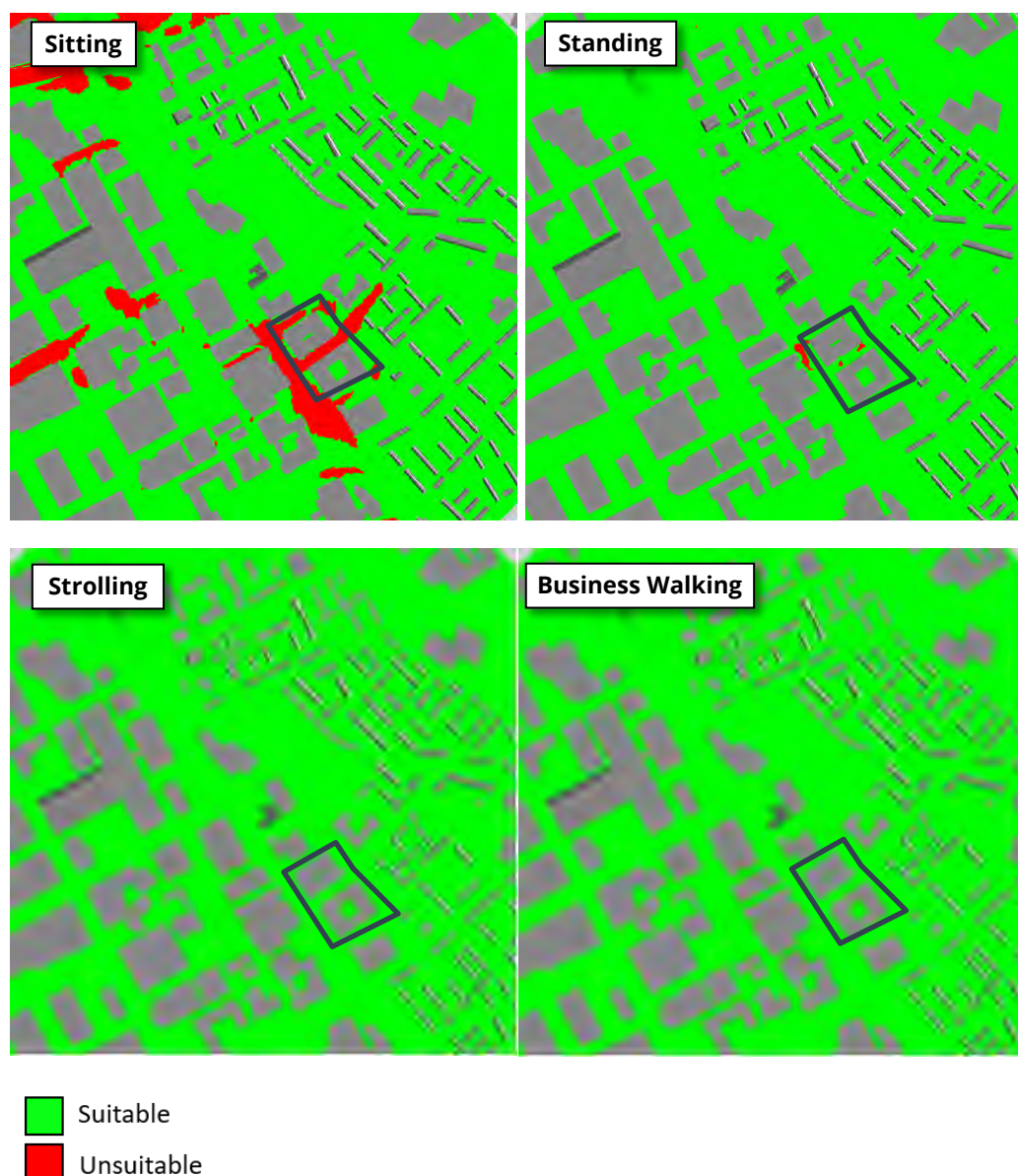
Demolition and Construction

- 8.48 The assessment only considers the Proposed Development in its fully constructed state. Wind conditions are expected to be 'worst-case' when the building is at maximum height; therefore, partially constructed stages are not considered as part of the assessment. During construction, no public access to the Site will be allowed, so assessing pedestrian comfort on Site during construction would not be appropriate. Furthermore, changes to wind conditions at partially constructed stages are temporary.
- 8.49 There is no operational requirement to consider decommissioning.

The Completed and Operational Development

- 8.50 Contours showing acceptability of each condition of the Lawson Comfort Criteria are shown with the Proposed Development included in **Figure 8.8**. With the addition of the Proposed Development, the regions deemed inappropriate for sitting become more widespread. These are located where wind channelling was previously observed - between the Proposed Development and along Upper Brook Street. Three small regions have appeared around the north building of the Proposed Development which is now deemed inappropriate for standing. This does not necessarily constitute a problem - the location and sensitivity of receptors with respect to the changed wind environment must be considered before conclusion are made.

Figure 8.83: Acceptability for Lawson Comfort Criteria, with Proposed Development



8.51 The effects on the sensitive receptors external to the Site with the Proposed Development included are listed in **Table 8.3**. Receptor locations are identified in **Figure 8.9**. The bus stop on Upper Brook Street outside the Alan Turing building exhibits a **Minor Adverse** change in wind speed (**Not Significant**). This location is now deemed inappropriate for sitting according to the Lawson criteria, although no seating is found in the area. All other sensitive receptors exhibit no change in acceptability according to the Lawson Criteria. Since pedestrian comfort is not expected to be significantly affected, no mitigation measures are suggested. Note that conditions on-site are assessed separately.

Figure 8.9: Receptor locations external to the Site

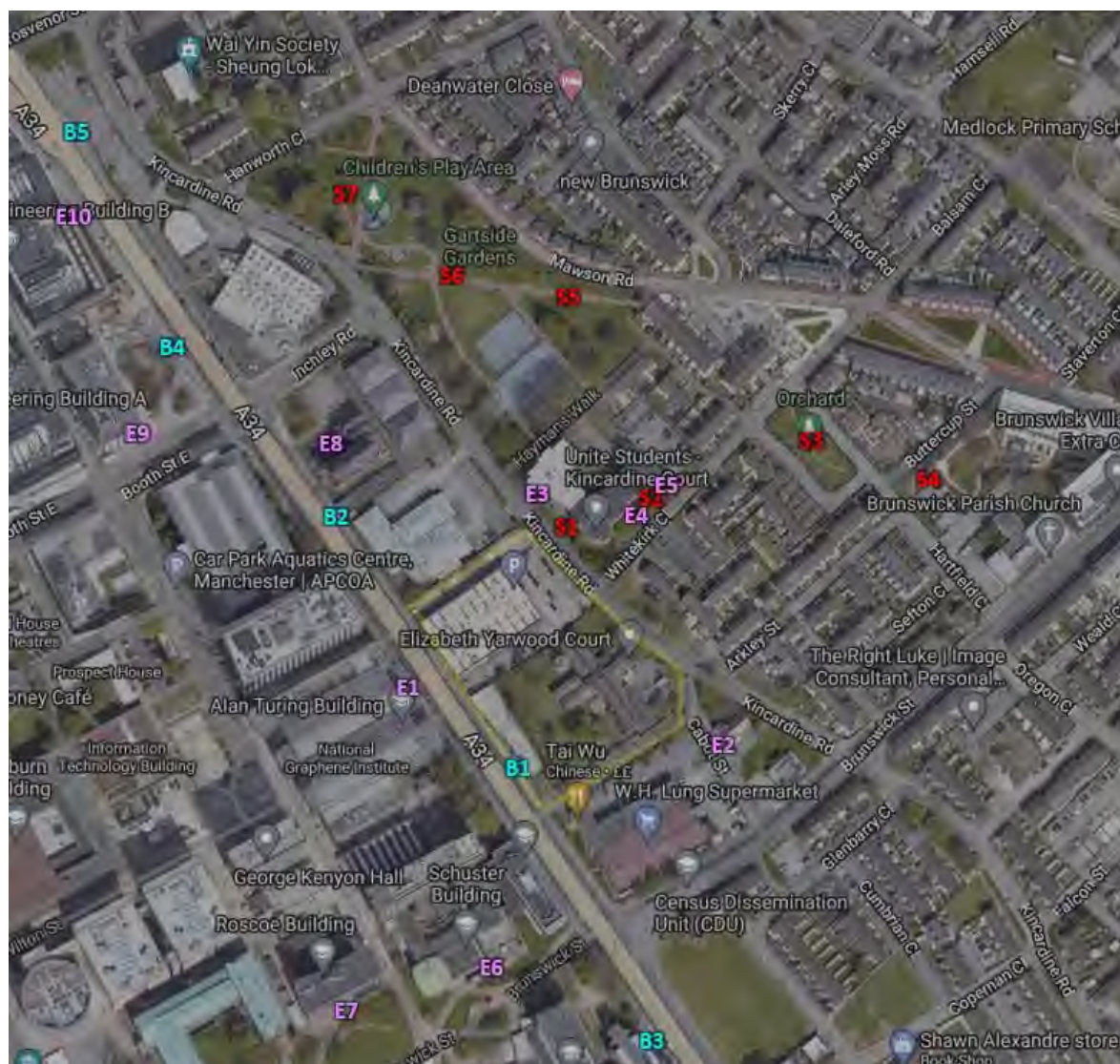


Table 8.3: Likely significant effects at receptor locations with Proposed Development

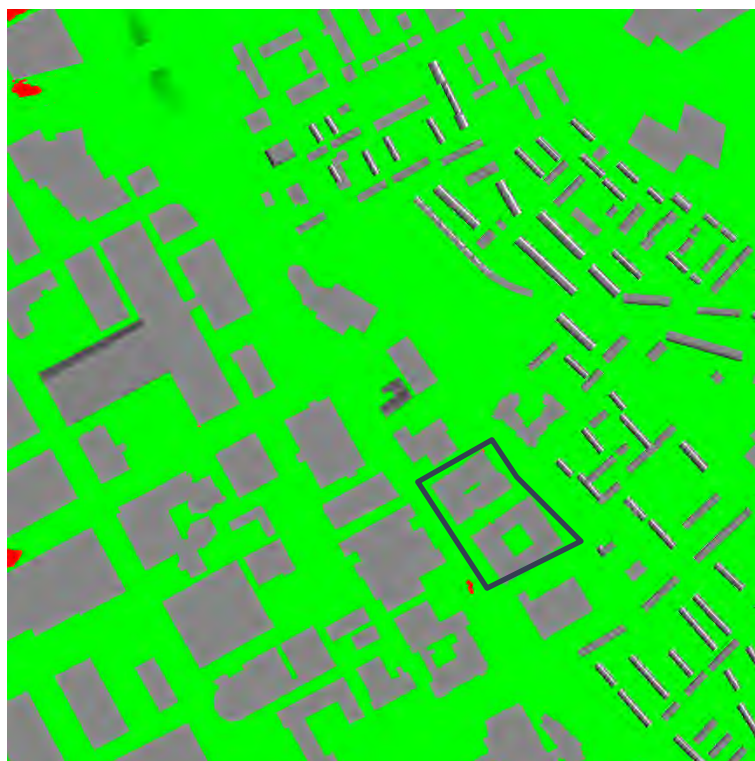
ID	Type	Location	Potential Effect including Significance
S1	Seating	Kincardine Court (Kincardine Road)	Negligible
S2	Seating	Kincardine Court (Whitekirk Cl)	Negligible
S3	Seating	Orchard park	Negligible
S4	Seating	Park on Buttercup Street	Negligible
S5	Seating	Gartside Gardens – east corner	Negligible
S6	Seating	Gartside Gardens – central	Negligible
S7	Seating	Gartside Gardens – north side	Negligible
E1	Entrance	Alan Turing building (Upper Brook Street)	Negligible
E2	Entrance	Cabot Street	Negligible
E3	Entrance	Kincardine Court (Kincardine Road)	Negligible
E4	Entrance	Kincardine Court (Whitekirk Cl)	Negligible
E5	Entrance	Kincardine Court – (Whitekirk Cl)	Negligible
E6	Entrance	Schuster Building – (Brunswick Street)	Negligible
E7	Entrance	Roscoe Building (Brunswick Street)	Negligible
E8	Entrance	The Chapel (Upper Brook Street)	Negligible
E9	Entrance	Engineering Building A (Booth Street East)	Negligible
E10	Entrance	Engineering Building B (Upper Brook Street)	Negligible
B1	Bus Stop	Upper Brook Street (Outside Alan Turing building)	Minor Adverse
B2	Bus Stop	Upper Brook Street (Opposite Manchester Aquatics centre car park)	Negligible
B3	Bus Stop	Upper Brook Street (Outside Chemistry Building)	Negligible

ID	Type	Location	Potential Effect including Significance
B4	Bus Stop	Upper Brook Street (Outside Engineering Building A)	Negligible
B5	Bus Stop	Upper Brook Street (Outside Engineering Building B)	Negligible

8.52 Sensitive receptors also exist on-site. Since these receptors are being constructed as part of the Proposed Development and there are no baseline conditions to compare to, they are discussed separately to external receptors. Casual seating is currently planned in the region between the proposed buildings, an area which is deemed unsuitable for sitting based on conditions with no foliage or screening. There are widespread landscape features and over 30 trees planned in this area, which are expected to provide coverage from incoming winds. These landscaping features are beyond the fidelity of the current statistical CFD model. While it is possible to include some of these features, including all such features in the local area would increase the model size to an unmanageable level. Furthermore, removal of such features is considered conservative as they will provide additional resistance to flow, reducing wind speeds. A test simulation which included a simplified representation of chosen larger scale landscaping demonstrated a substantial reduction in windspeed in the location of interest from the 240-degree direction, since this is representative of conditions which contribute most to the exceedance. As such, the landscaping scheme is considered to be effective mitigation of this concern and no additional mitigation measures are suggested. Wind conditions are predicted to be at worst **Minor Adverse (Not Significant)** in terms of the sensitive receptors in the area following consideration of the on-site features.

8.53 Contours showing acceptability of the Lawson Safety Criteria are shown with the Proposed Development included in **Figure 8.10**. The contours show a small region on Upper Brook Street adjacent to the Proposed Development which now exhibits an exceedance of the safety criteria. Due to the small size of the exceedance, it is predicted that minor landscape features excluded from the model such as smaller trees and bus shelters would mitigate the effect sufficiently as to not be considered significant. A second test simulation which included a simplified representation of landscaping in the affected area demonstrated a sufficient reduction in windspeed in the location of interest from the 260-degree direction. As this is a key direction due to its frequency, high reference velocity and influence on winds in this area, the landscaping is considered to be effective mitigation of this concern.

Figure 8.10: Acceptability for Lawson Safety Criteria, with Proposed Development



Additional Mitigation

8.54 As no significant adverse effects are identified, additional mitigation measures are not deemed necessary.

Likely Residual Effects of the Development and their Significance

8.55 Likely residual effects of the Development and their Significance at sensitive receptors external to the Site with the Proposed Development included, following mitigation, are listed in **Table 8.4**.

Table 8.4 - Likely significant effects at receptor locations with Proposed Development following mitigation

ID	Type	Location	Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
S1	Seating	Kincardine Court (Kincardine Road)	Negligible (Not Significant)	None	Negligible (Not Significant)
S2	Seating	Kincardine Court (Whitekirk Cl)	Negligible (Not Significant)	None	Negligible (Not Significant)
S3	Seating	Orchard park	Negligible (Not Significant)	None	Negligible (Not Significant)
S4	Seating	Park on Buttercup Street	Negligible (Not Significant)	None	Negligible (Not Significant)
S5	Seating	Gartside Gardens – east corner	Negligible (Not Significant)	None	Negligible (Not Significant)
S6	Seating	Gartside Gardens – central	Negligible (Not Significant)	None	Negligible (Not Significant)
S7	Seating	Gartside Gardens – north side	Negligible (Not Significant)	None	Negligible (Not Significant)
E1	Entrance	Alan Turing building (Upper Brook Street)	Negligible (Not Significant)	None	Negligible (Not Significant)
E2	Entrance	Cabot Street	Negligible (Not Significant)	None	Negligible (Not Significant)
E3	Entrance	Kincardine Court (Kincardine Road)	Negligible (Not Significant)	None	Negligible (Not Significant)

ID	Type	Location	Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
E4	Entrance	Kincardine Court (Whitekirk CI)	Negligible (Not Significant)	None	Negligible (Not Significant)
E5	Entrance	Kincardine Court – (Whitekirk CI)	Negligible (Not Significant)	None	Negligible (Not Significant)
E6	Entrance	Schuster Building – (Brunswick Street)	Negligible (Not Significant)	None	Negligible (Not Significant)
E7	Entrance	Roscoe Building (Brunswick Street)	Negligible (Not Significant)	None	Negligible (Not Significant)
E8	Entrance	The Chapel (Upper Brook Street)	Negligible (Not Significant)	None	Negligible (Not Significant)
E9	Entrance	Engineering Building A (Booth Street East)	Negligible (Not Significant)	None	Negligible (Not Significant)
E10	Entrance	Engineering Building B (Upper Brook Street)	Negligible (Not Significant)	None	Negligible (Not Significant)
B1	Bus Stop	Upper Brook Street (Outside Alan Turing building)	Minor Adverse (Not Significant)	None	Minor Adverse (Not Significant)
B2	Bus Stop	Upper Brook Street (Opposite Manchester Aquatics centre car park)	Negligible (Not Significant)	None	Negligible (Not Significant)
B3	Bus Stop	Upper Brook Street (Outside Chemistry Building)	Negligible (Not Significant)	None	Negligible (Not Significant)
B4	Bus Stop	Upper Brook Street (Outside Engineering Building A)	Negligible (Not Significant)	None	Negligible (Not Significant)
B5	Bus Stop	Upper Brook Street (Outside Engineering Building B)	Negligible (Not Significant)	None	Negligible (Not Significant)

8.56 No additional mitigation measures have been identified as being required and, as such, the significance of all residual effects would remain as presented within the previous section 'Assessment of Likely Significant Effects'.

- 8.57 Only one **Minor Adverse** effect (**Not Significant**) is observed with respect to the Lawson criteria – this is located at the bus stop on Upper Brook Street outside of the Alan Turing building (location B1). All other receptor locations exhibit **Negligible** change (**Not Significant**) to pedestrian comfort and safety.
- 8.58 Increases in wind speed are expected to be observed in the vicinity of the Proposed Development, however these increased wind speeds are not expected to cause significant distress to pedestrians.

Assessment of Cumulative Effects and their Significance

8.59 **Table 8.5** provides a list of the developments which are to be included within the Cumulative Effects Assessment. Detail on the schemes is included in Chapter 2: EIA Approach and not repeated here.

Table 8.5: Cumulative Schemes

Scheme No.	Planning Reference	Description of Development	Scoped In / Out	Justification
Manchester City Council (MCC)				
1	101664/FO/2013/N2	Brunswick Neighbourhood Selective demolition and clearance (including a number of residential, retail and other non-residential buildings) to allow the phased redevelopment and refurbishment of the Brunswick Neighbourhood, including the erection of 444 new residential dwellings (C3); the refurbishment of 839 existing homes a new boulevard and new access roads, new car parking and service areas; a new mixed use building comprising of 4 retail units and a neighbourhood housing office (B1a) with 18 apartments (C3) above; a mixed use residential extra care home with 60 residential units, and a day care centre on part of the ground floor (C2/D1); and various landscaping proposals.	Out	Height of buildings not sufficient to significantly alter wind conditions.
2	N/A	Upper Brook Street Masterplan – PAG / Moda Living Demolition of structures associated with the former BMW Williams Dealership and the erection of up to 5 buildings, up to 120m in height.	In	Height of buildings sufficient to alter wind conditions. Close proximity to proposed development.
3	124472/FO/2019	Kincardine Court Extension Erection of a part 4, part 5, part 6 storey extension to existing student accommodation building to form 25 additional student flats (comprising	Out	Height of buildings not sufficient to significantly alter wind conditions.

Scheme No.	Planning Reference	Description of Development	Scoped In / Out	Justification
		100 bedrooms) (Use Class Sui Generis) to form 86 student flats in total (329 bedrooms) following removal, modification and reconfiguration of existing car parking, landscaping and boundary treatment.		
4	134288/FO/2022	Number 3 Circle Square Erection of 15 storey building comprising office space (Use Class E(g)(i)) and ancillary flexible commercial uses (Use Class E), rooftop terrace, highway works, landscaping, and other associated works.	Out	Effect on wind conditions at the Proposed Development expected to be negligible due to distance from the Proposed Development and downstream shielding from the MSCP and elevated Mancunian Way.
5	125799/FO/2019	MMU Science and Engineering Building Demolition of existing John Dalton West Building and associated structures, and erection of a new 7 storey education building (Use Class D1) for the Faculty of Science and Engineering physical connections to and external refurbishment of the John Dalton Tower, hard and soft landscaping works, car and cycle parking and associated works.	Out	Distance from Proposed Development is considered unlikely to result in significant cumulative effects.
6	125573/FO/2019	First Street South Construction of four buildings of heights varying from 10 storeys to 45 storeys together comprising Co-living bedspaces (use class sui generis) and associated amenity facilities, with ground floor commercial units (Use classes A3 (Café / Restaurant and D2 (Gym)), private amenity space and public realm comprising hard and soft landscaping, car parking and cycle facilities and other associated works.	Out	Distance from Proposed Development is considered unlikely to result in significant cumulative effects.

Approach

- 8.60 The wind assessment outlined earlier is repeated with relevant cumulative schemes included. Acceptability of locations with respect to the Lawson Criteria are compared to baseline conditions.

Likely Residual Cumulative Effects and their Significance

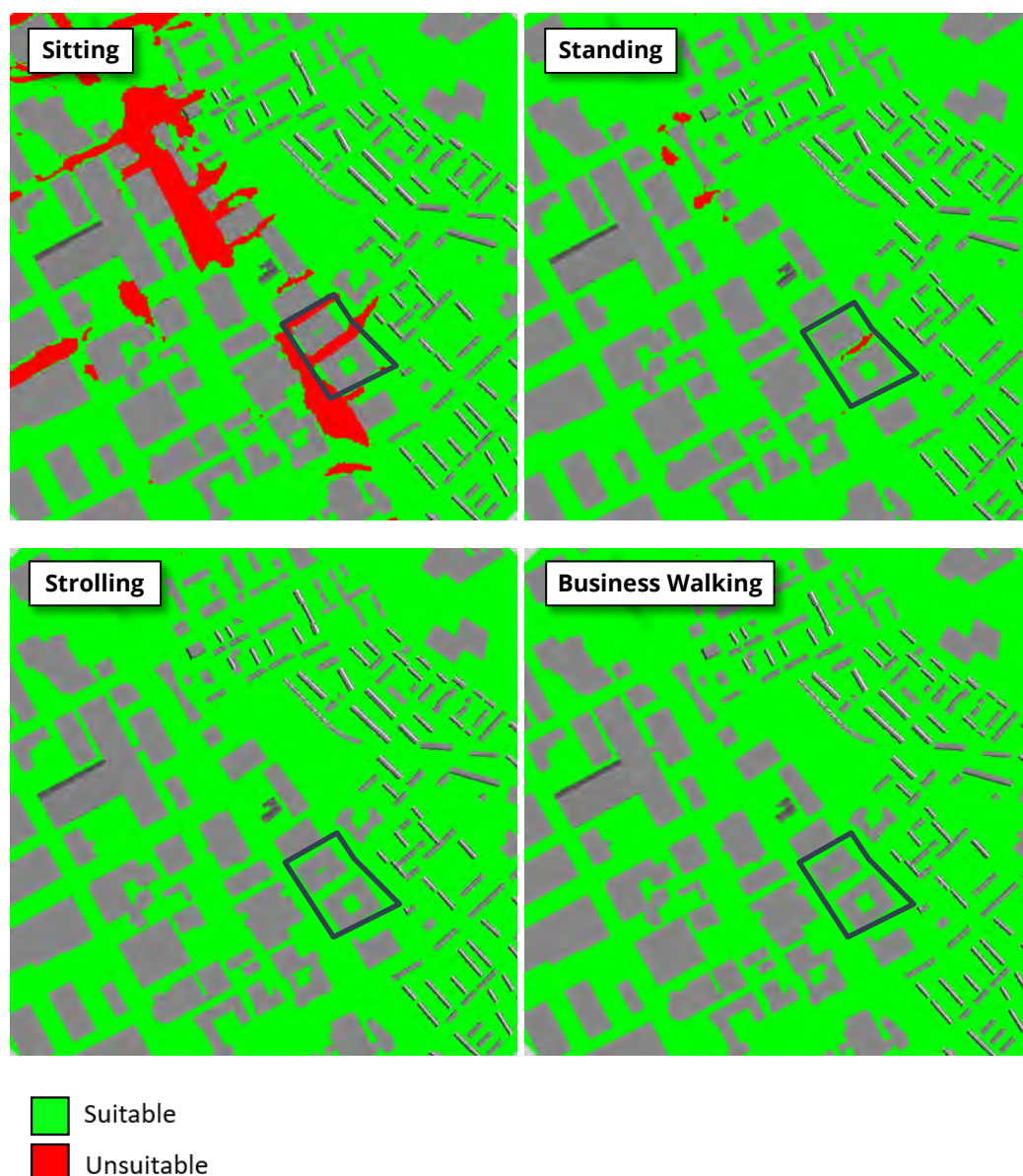
Demolition and Construction

- 8.61 The assessment only considers the Proposed Development in its fully constructed state. Wind conditions are expected to be 'worst-case' when the building is at maximum height, therefore partially constructed stages are not considered. Furthermore, changes to wind conditions at partially constructed stages are temporary.
- 8.62 There is no operational requirement to consider decommissioning.

The Completed and Operational Development

- 8.63 Contours showing acceptability of each condition of the Lawson Comfort Criteria are shown with the Cumulative Schemes included in **Figure 8.11**. With the addition of the Cumulative Schemes, there is no significant change to the acceptability of the Lawson Criteria around the Proposed Development. A large region further north along Upper Brook Street is identified which is now deemed inappropriate for sitting – from previous results, this is caused largely by the Upper Brook Street Masterplan – PAG / Moda Living scheme and not the Proposed Development. The areas deemed inappropriate for standing have also changed – in the proximity of the Proposed Development, these regions have changed location slightly (more concentrated between the proposed buildings, rather than on Upper Brook Street), but are overall similar in size. Small regions around the neighbouring development are identified which are deemed inappropriate for standing – similarly to the sitting criterion, this is viewed as a consequence of the Upper Brook Street Masterplan – PAG / Moda Living scheme, not the Proposed Development. Other conditions - strolling and business walking – still exhibit no exceedances of the Lawson Criteria.

Figure 8.11: Acceptability for Lawson Comfort Criteria, with cumulative schemes



8.64 The effects on the sensitive receptors external to the Site with the cumulative schemes included are listed in **Table 8.6**. The Minor Adverse changes in wind conditions are attributed to the neighbouring Upper Brook Street Masterplan – PAG / Moda Living scheme and not the Proposed Development. As such, no mitigation measures are required. The changes are found at the entrance to Engineering Building B (E10), and the bus stops outside of Engineering Building A and B.

Table 8.6: Likely significant effects at external receptor locations with Proposed Development and Cumulative Schemes

ID	Type	Location	Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
S1	Seating	Kincardine Court (Kincardine Road)	Negligible (Not Significant)	None	Negligible (Not Significant)
S2	Seating	Kincardine Court (Whitekirk Cl)	Negligible (Not Significant)	None	Negligible (Not Significant)
S3	Seating	Orchard Park	Negligible (Not Significant)	None	Negligible (Not Significant)
S4	Seating	Park on Buttercup Street	Negligible (Not Significant)	None	Negligible (Not Significant)
S5	Seating	Gartside Gardens – east corner	Negligible (Not Significant)	None	Negligible (Not Significant)
S6	Seating	Gartside Gardens – central	Negligible (Not Significant)	None	Negligible (Not Significant)
S7	Seating	Gartside Gardens – north side	Negligible (Not Significant)	None	Negligible (Not Significant)
E1	Entrance	Alan Turing building (Upper Brook Street)	Negligible (Not Significant)	None	Negligible (Not Significant)
E2	Entrance	Cabot Street	Negligible (Not Significant)	None	Negligible (Not Significant)
E3	Entrance	Kincardine Court (Kincardine Road)	Negligible (Not Significant)	None	Negligible (Not Significant)
E4	Entrance	Kincardine Court (Whitekirk Cl)	Negligible (Not Significant)	None	Negligible (Not Significant)
E5	Entrance	Kincardine Court – (Whitekirk Cl)	Negligible (Not Significant)	None	Negligible (Not Significant)
E6	Entrance	Schuster Building – (Brunswick Street)	Negligible (Not Significant)	None	Negligible (Not Significant)
E7	Entrance	Roscoe Building (Brunswick Street)	Negligible (Not Significant)	None	Negligible (Not Significant)

ID	Type	Location	Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
E8	Entrance	The Chapel (Upper Brook Street)	Negligible (Not Significant)	None	Negligible (Not Significant)
E9	Entrance	Engineering Building A (Booth Street East)	Negligible (Not Significant)	None	Negligible (Not Significant)
E10	Entrance	Engineering Building B (Upper Brook Street)	Minor Adverse (Not Significant)	None	Minor Adverse (Not Significant)
B1	Bus Stop	Upper Brook Street (Outside Alan Turing building)	Minor Adverse (Not Significant)	None	Minor Adverse (Not Significant)
B2	Bus Stop	Upper Brook Street (Opposite Manchester Aquatics centre car park)	Negligible (Not Significant)	None	Negligible (Not Significant)
B3	Bus Stop	Upper Brook Street (Outside Chemistry Building)	Negligible (Not Significant)	None	Negligible (Not Significant)
B4	Bus Stop	Upper Brook Street (Outside Engineering Building A)	Minor Adverse (Not Significant)	None	Minor Adverse (Not Significant)
B5	Bus Stop	Upper Brook Street (Outside Engineering Building B)	Minor Adverse (Not Significant)	None	Minor Adverse (Not Significant)

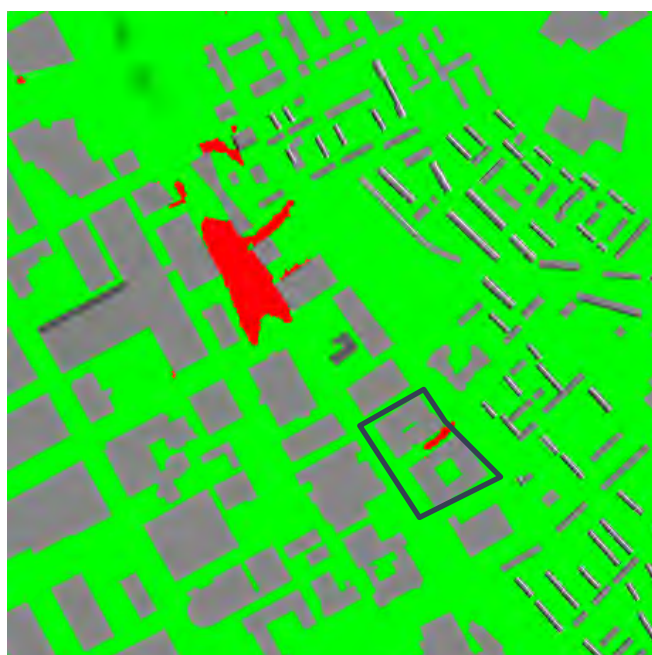
8.65 On-site receptors are assessed separately to external receptors, as they do not yet exist in baseline conditions. The effects on the sensitive receptors on the Site with the Cumulative Schemes included are listed in **Table 8.7**. Effects of the Cumulative Schemes and on on-Site receptors is considered either **Minor Adverse / Beneficial** or **Negligible**, both being **Not Significant** in EIA terms.

Table 8.7: Likely significant effects at on-site receptor locations with Proposed Development and Cumulative Schemes

ID	Type	Location	Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
S1	Seating	Between proposed buildings (Upper Brook Street side)	Negligible (Not Significant)	None	Negligible (Not Significant)
S2	Seating	Between proposed buildings (Centre of channel)	Minor Adverse (Not Significant)	None	Minor Adverse (Not Significant)
S3	Seating	Between proposed buildings (Upper Brook Street side)	Minor Adverse (Not Significant)	None	Minor Adverse (Not Significant)
S4	Seating	North-east side (beside Kincardine Road)	Negligible (Not Significant)	None	Negligible (Not Significant)
E1	Entrance	North building retail space (On Upper Brook Street)	Minor Beneficial (Not Significant)	None	Minor Beneficial (Not Significant)
E2	Entrance	Main entrance to residential space in north building	Negligible (Not Significant)	None	Negligible (Not Significant)
E3	Entrance	Main entrance to residential space in south building	Negligible (Not Significant)	None	Negligible (Not Significant)
E4	Entrance	North building community space (on Kincardine Road)	Negligible (Not Significant)	None	Negligible (Not Significant)

8.66 Contours showing acceptability of the Lawson Safety Criteria are shown with Cumulative Schemes included in **Figure 8.12**. The contours show that, with the on-site landscaping scheme excluded, a small region in the corridor between the proposed buildings is deemed unsafe. However, with the inclusion of the 30+ trees proposed for the Development, consisting of a mixture of native broadleaf, bushy multi-stem and low-level shrub species, this flow channel is expected to be fully mitigated (evidenced by the results of the test simulation, detailed in paragraph 8.51). The effect is therefore considered **Minor Adverse**. A large area has appeared to the north along Upper Brook Street which is now deemed unsafe. The effects of the Proposed Development were assessed to be **Negligible** on this area as the change in wind conditions is viewed as a consequence of the Upper Brook Street Masterplan – PAG / Moda Living scheme, not the Proposed Development.

Figure 8.12: Acceptability for Lawson Safety Criteria, with Cumulative Schemes



9. Daylight, Sunlight and Overshadowing

Introduction

- 9.1 This chapter assesses the effects of the Proposed Development upon daylight, sunlight and overshadowing. In particular, it identifies and assesses the anticipated effects of change resulting from the Proposed Development on receptors sensitive to daylight, sunlight and overshadowing conditions.
- 9.2 The chapter describes the methods used to assess the likely significant effects, the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect effects of the Proposed Development arising from daylight, sunlight and overshadowing, the mitigation measures required to prevent, reduce, or offset the identified significant effects and the residual effects. It has been written by GIA Chartered Surveyors.
- 9.3 This chapter is supported by the following figures and technical appendices (see **Volume 2a: Main Text and Figures** and **Volume 3: Appendices**, respectively).
- **Figure 9.1:** Daylight and Sunlight Receptor Locations;
 - **Figure 9.2:** Overshadowing Receptor Locations;
 - **Figure 9.3:** Assessment of Cumulative Effects;
 - **Appendix 9.1:** Daylight and Sunlight Baseline and the Proposed Development Drawings;
 - **Appendix 9.2:** Daylight and sunlight Baseline and the Proposed Development Results;
 - **Appendix 9.3:** Overshadowing Baseline and the Proposed Development Drawings; and
 - **Appendix 9.4:** Overshadowing Baseline and the Proposed Development Results.

Assessment Methodology and Significance Criteria

Assessment Methodology

Methodology for Determining Baseline Conditions and Sensitive Receptors

- 9.4 The BRE Guidelines¹ suggest that residential properties have the highest requirement for daylight and sunlight and states that:

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

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

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

- Kincardine Court;
- Hardshaw Close;
- Arkley Street;
- Sefton Close;
- Mawson Hotel; and
- 43 Upper Brook Street.

- 9.7 These properties are identified in the drawings contained at **Appendix 9.1** and **Figure 9.1** below.

¹ Building Research Establishment (BRE) Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition, 2022.

Figure 9.1: Daylight & Sunlight Receptor Locations



- 9.8 The assessment has considered other adjacent residential properties and due to the distance and orientation from the Proposed Development, they are unlikely to be affected, so they have not been assessed in detail.
- 9.9 The surrounding amenity areas, identified in **Figure 9.2**, have been assessed for overshadowing.

Figure 9.2: Overshadowing Receptor Locations



Scenarios Assessed

9.10 The following scenarios have been assessed and are reported within this Chapter of the ES:

- The existing Site + all relevant features surrounding the Site; and
- The Proposed Development.

9.11 The 'Baseline Scenario' considers the current baseline condition (as can be seen in April 2023). This scenario is depicted on drawing nos. 2283/01-03 (**Appendix 9.1**).

9.12 The 'Proposed Development Scenario' is illustrated on drawing nos. 2283/04-06 (**Appendix 9.1**).

Methodology for Determining Demolition and Construction Effects

9.13 Owing to the evolving and changing nature of demolition and construction activities, the assessment of potential effects during demolition and construction of the Proposed Development on daylight and sunlight to surrounding properties has not been modelled.

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

Methodology for Determining Operational Effects

- 9.15 The following approaches are undertaken to assess the effect on the sensitive receptors of surrounding properties when the Proposed Development is completed and operational:
- Daylight:
 - Vertical Sky Component (VSC); and
 - No Sky Line (NSL) Method.
 - Sunlight:
 - Annual Probable Sunlight Hours (APSH).
 - Overshadowing:
 - Sun Hours on Ground (SHOG).

Outline Approach for Daylight, Sunlight and Overshadowing Assessments

- 9.16 The technical analyses carried out to inform the daylight and sunlight assessment have been undertaken by creating a digital three-dimensional (3D) model of the existing Site and Proposed Development, based on measured survey data.
- 9.17 The 3D model uses Waldram Diagrams to establish the VSC and 3D geometric calculations for daylight distribution. This model (which is orientated to north by the use of Ordnance Survey (OS) information) enables the path of the sun to be tracked throughout the year to establish the shadow cast by the existing and proposed buildings and thus calculate the sun hours on ground in each scenario.
- 9.18 In accordance with the BRE Guidance, only those surrounding properties which have windows facing towards the Site were included in the assessment. If a nearby property has no windows facing the Site, these properties would not be affected by the Proposed Development in terms of light.

Daylight

Vertical Sky Component (VSC) Method

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

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

- 9.20 This ratio is the percentage of the total unobstructed view that is available, once obstructions (e.g. the Proposed Development), are placed in front of the point of view.
- 9.21 The assessment is calculated from the centre of a window on the outward face and measures the amount of light available on a vertical wall or window following the introduction of visible barriers, such as buildings. The VSC has been calculated using a 'Waldram Diagram'.
- 9.22 The Waldram Diagram is effectively a snapshot taken from that point of the sky in front of the window, together with all relevant obstructions to it, i.e. the buildings. For calculation purposes, trees may be ignored unless they form dense continuous belts.
- 9.23 Due to the limitations of peripheral vision, the maximum VSC value is almost 40% for a completely unobstructed vertical wall or window. In terms of assessment criteria, the BRE Guidelines state that:

“if the VSC, with the development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window may appear more gloomy and electric lighting will be needed more of the time”.

No Sky Line (NSL) Method

- 9.24 The BRE Guidelines provide that where room layouts are known, the effect on the daylight distribution can be calculated by plotting the NSL. In terms of the surrounding receptors, it has not been possible to obtain room layouts for all of the properties and therefore layouts have been assumed where information is not available.
- 9.25 The NSL method is a measure of the distribution of daylight at the 'working plane' within a room. The 'working plane' means a horizontal 'desktop' plane 0.85m in height for residential properties. The NSL divides those areas of the working plane which can receive direct sky light from those which cannot. If a significant area of the working plane lies beyond the NSL (i.e. it receives no direct sky light), then the distribution of daylight in the room will be poor and supplementary electric lighting may be required.
- 9.26 The potential effects of daylighting distribution in an existing building can be found by plotting the NSL in each of the main rooms. For houses, this will include living rooms, dining rooms and kitchens. Bedrooms should also be analysed, although the BRE state that they are less important. The BRE Guidelines identify that if the area of a room that does receive direct sky light is reduced to less than 0.8 times its baseline value, then this would be noticeable to its occupants.
- 9.27 In regard to deep rooms which are lit by windows on one side, the BRE Guidelines state (para. 2.2.12):

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

Sunlight

Annual Probable Sunlight Hours (APSH)

- 9.28 Sunlight is measured using a sun indicator which contains 100 spots, each representing 1% of APSH. Therefore, where no obstruction exists the total annual probable sunlight hours would amount to 1486, and each spot equates to 14.86 hours of the total annual sunlight hours.
- 9.29 The number of spots is calculated for the Baseline and Proposed Development scenarios during the year and also during the winter period, and a comparison made between the two. This provides a percentage of APSH for each of the time periods for each window assessed.
- 9.30 The BRE Guidelines note that:

"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon."

"all main living rooms of dwellings...should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun".

"If the main living room to a dwelling has a main window facing within 90° of due north, but a secondary window facing within 90° of due south, sunlight to the secondary window should be checked."

"...a south facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day".

- 9.31 In regard to existing surrounding receptors, the BRE Guidelines state that a window may be adversely affected if a point at the centre of the window receives less than 25% of the APSH, including at least 5% of the APSH during the winter months (21 September to 21 March), or less than 0.8 times its baseline sunlight hours during either period, or if there is a reduction in total APSH which is greater than 4%.
- 9.32 As is often the case, it is not always possible to determine the room uses within each of the neighbouring properties, nor is it clear which window should be considered as the 'main windows'. Therefore, unless the rooms use is known through plans, all the rooms with windows facing the Site and within 90 degrees of due south have been considered in the assessment. Windows that do not face within 90 degrees of due south do not have a realistic expectation of direct sunlight, due to their orientation and the sunlight path in the northern hemisphere.

Overshadowing

Sun Hours on Ground (SHOG)

- 9.33 The method for assessing hours in sun is the 'sun-on-ground indicator'. The assessment applies both to new and existing gardens / amenity areas, which are affected by new developments. The BRE Guidelines suggest that the

Spring Equinox (21 March) is a suitable date for the assessment. Using specialist software, the path of the sun is tracked to determine where the sun would reach the ground and where it would not.

- 9.34 The BRE Guidelines recommend that at least half of a garden or amenity area should receive at least 2 hours of sunlight on March 21 or the area which receives 2 hours of direct sunlight should not be reduced to less than 0.8 times its former value (i.e. there should be no more than a 20% reduction).

Summary of Criteria for Daylight, Sunlight and Overshadowing

- 9.35 **Table 9.1** provides a summary of the criteria set out within the BRE Guidelines for daylight, sunlight and overshadowing.

Table 9.1: *Summary of Daylight, Sunlight and Overshadowing Assessment Criteria*

Amenity	Method	BRE Criteria
Daylight	VSC	A window may be adversely affected if its VSC measured at the centre of the window is less than 27% and less than 0.8 times its former value.
	NSL	A room may be adversely affected if the daylight distribution (NSL) is reduced beyond 0.8 times its existing area.
Sunlight	APSH	A window may be adversely affected if a point at the centre of the window received for the whole year, less than 25% of the APSH including at least 5% of the APSH during the winter months (21 September to 21 March) and less than 0.8 times its former sunlight hours during either period, and for existing neighbouring buildings, if there is a reduction in total APSH which is greater than 4%.
Overshadowing	SHOG	An amenity area may be adversely affected if less than 50% of its area receives less than 2 hours of direct sunlight on 21 March and less than 0.8 times its former value.

Significance Evaluation Methodology

Daylight, Sunlight and Overshadowing Magnitude of Effect

- 9.36 For daylight and sunlight, the BRE Guidelines outline the approach within the accompanying appendix, in terms of assigning criteria to assess the effects:

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

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

"Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact include:

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

9.37 The classification of what constitutes a major adverse impact is documented within Paragraph H7 of the BRE Guidelines:

"Factors tending towards a major adverse impact include:

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

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

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

9.39 The initial numerical criteria for determining the magnitude of effect is based on percentage alterations, as follows:

Table 9.2: Daylight & Sunlight Magnitude of Effect

Magnitude of Effect	Percentage Alteration from Baseline
Negligible	0-20%
Minor	20-29.9%
Moderate	30-39.9%
Major	40%+

Sensitivity of Identified Receptor

- 9.40 It is important that the location and nature of the Site and surrounding area are considered when determining the significance of any impacts identified. The BRE Guide is very clear that the targets provided are not mandatory. The location of the development could be deemed to be special circumstances in which the planning authority may wish to use different target values. This scope and view should also be followed through to the sensitivity of the surrounding receptors. There should be an expectation that a higher degree of obstruction is inevitable in an area with modern high-rise buildings.
- 9.41 For these reasons, the surrounding receptors may have a lower sensitivity to change in an urban location than those located in suburban, less dense areas. Sensitivity classification is assigned on how the proposed receptor is able to accommodate or adapt to the effect of the Proposed Development. The existing residential receptors surrounding the Site are in a dense, urban location where there is an expectation through extant permissions and regeneration framework objectives for a higher density of development. The Site is currently low-rise, meaning it is underdeveloped and within an unusually open aspect given its location and recent development in the area. The receptors are therefore deemed to have a medium to low sensitivity.
- 9.42 The following existing receptors are defined as having a medium sensitivity:
- Hardshaw Close;
 - Arkley Street;
 - Sefton Close; and
 - Mawson Hotel.
- 9.43 The following receptors are student accommodation. As such, due to the more temporary and transient nature of occupancy, they are defined as having a low sensitivity:
- Kincardine Court; and
 - 43 Upper Brook Street.

Site Survey

- 9.44 A site inspection was undertaken on Wednesday 22 March 2023 to review the existing context.

Consultation

- 9.45 There are no specialists within Manchester City Council (MCC) or other statutory consultees relevant to the area of daylight, sunlight and overshadowing. As such, no consultation has been undertaken.

Significance Criteria

- 9.46 The significance of any identified environmental effects is determined by the assessment of their magnitude against their sensitivity. **Table 9.3** below illustrates how the sensitivity of the receptors and the magnitude of any effect combine to confirm significance.

Table 9.3: Matrix for Significance of Effect

		Sensitivity of Receptor		
		High	Medium	Low
Magnitude of Impact	Major	Major Adverse / Beneficial	Major Adverse / Beneficial	Moderate – Minor Adverse / Beneficial
	Moderate	Moderate Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial
	Minor	Moderate – Minor Adverse / Beneficial	Minor Adverse / Beneficial	Negligible
	Negligible	Negligible	Negligible	Negligible

Any effects highlighted in orange are significant in EIA terms.

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

Limitations and Assumptions

- 9.49 Where actual room layouts were available on MCC's planning portal, these have been considered in regard to the modelling of the internal layouts within the existing surrounding properties. Where layout information was not available, assumptions have been made as to the use and internal configuration of the rooms (from external observations during a site inspection) behind the fenestration observed.
- 9.50 Floor levels have been assumed for adjoining properties assessed, where access has not been obtained. This dictates the level of the working plane which is relevant for the NSL assessments.

Baseline Conditions

- 9.51 The full Baseline Daylight and Sunlight results can be found in **Appendix 9.2** and are summarised in **Table 9.5** below.
- 9.52 A total of 217 windows facing the Site serving 155 rooms within six receptors were assessed for VSC and NSL for daylight and 56 rooms were assessed for APSH for sunlight within five receptors.
- 9.53 Out of the 217 windows assessed for daylight, 172 (79%) meet the BRE guidelines for VSC. For NSL, 134 (87%) of the 155 rooms assessed meet the BRE criteria. For sunlight, 55 (98%) of the 56 rooms assessed meet the BRE criteria for both Winter and Annual APSH.
- 9.54 Overall, this baseline scenario is considered a high level of compliance. The Site is currently low-rise and therefore underdeveloped given the dense, urban location and emerging height and density in the locality, which contributes to higher baseline results to the surrounding receptors.

Table 9.4: Baseline Daylight and Sunlight results to surrounding sensitive receptors

Receptor Address	Total No. of Windows that Meet VSC Criteria		Total No. of Rooms that Meet NSL Criteria		Total No. of Rooms that Meet APSH Criteria	
	Pass	Total	Pass	Total	Pass	Total
Kincardine Court	77	91	79	79	15	15
Hardshaw Close	38	43	23	23	9	9
Arkley Street	1	1	1	1	-	-
Sefton Close	8	19	9	9	4	4
Mawson Hotel	18	27	11	14	4	5
43 Upper Brook Street	30	36	11	29	23	23
Total	172	217	134	155	55	56

- 9.55 For overshadowing, all of the surrounding amenity areas receive direct sunlight for two hours on March 21, and the amenity area therefore meets the SHOG criteria in the baseline scenario.

Embedded Mitigation

Demolition and Construction

- 9.56 No embedded mitigation measures are required for the demolition and construction stage.

The Completed and Operational Development

- 9.57 The height, scale and massing of the Proposed Scheme has been considered through an iterative process. The buildings have been designed to correspond with the emerging height and density in the locality and that of a dense, urban, city centre environment. As such, in context to the dense, urban nature of the site, consideration has been given to limiting the effects on daylight, sunlight and overshadowing to the surrounding sensitive receptors.

Assessment of Likely Significant Effects

Demolition and Construction

- 9.58 As per paragraphs 9.13 and 9.14 daylight, sunlight and overshadowing effects have been scoped out and are not assessed in detail.

The Completed and Operational Development

Daylight to Surrounding Sensitive Receptors

- 9.59 The full Proposed Development daylight results can be found within **Appendix 9.2** and are summarised in **Tables 9.5** and **9.6** below.
- 9.60 A total of 217 windows serving 155 rooms were assessed for daylight within six buildings considered to be sensitive receptors.
- 9.61 The breakdown of the baseline results against the Proposed Development for each of the individual buildings forming part of this assessment are discussed in more detail below.

Table 9.5: Summary of VSC Daylight Results

Receptor Address	VSC				
	Total No. of Windows	No. of Windows that Meet BRE Guidelines	No. of Windows Below BRE Guidelines		
			Minor Adverse	Moderate Adverse	Major Adverse
Kincardine Court	91	15	31	44	1
Hardshaw Close	43	4	25	14	0
Arkley Street	1	1	0	0	0
Sefton Close	19	18	1	0	0
Mawson Hotel	27	25	2	0	0
43 Upper Brook Street	36	36	0	0	0
Total	217	99	59	58	1

Table 9.6: Summary of NSL Daylight Results

Receptor Address	NSL				
	Total No. of Rooms	No. of Rooms That Meet BRE Guidelines	No. of Rooms Below BRE Guidelines		
			Minor Adverse	Moderate Adverse	Major Adverse
Kincardine Court	79	40	16	14	9
Hardshaw Close	23	15	7	1	0
Arkley Street	1	0	0	1	0
Sefton Close	9	9	0	0	0
Mawson Hotel	14	14	0	0	0
43 Upper Brook Street	29	24	0	0	5
Total	155	102	23	16	14

Kincardine Court

- 9.62 A total of 91 windows serving 79 rooms were assessed for daylight within this receptor to compare the baseline against the Proposed Development.
- 9.63 For VSC, 15 (17%) of the 91 windows meet the BRE criteria. 31 of the affected windows will experience an alteration between 20-30%, 44 of the affected windows will experience an alteration between 30-40%, and the remaining one window will experience alterations in excess of 40% from the baseline value.
- 9.64 For NSL, 40 (51%) of the 79 rooms assessed will meet the BRE criteria. 16 of the affected rooms will experience an alteration between 20-30%, 14 of the affected rooms will experience an alteration between 30-40%, and the remaining nine rooms will experience alterations in excess of 40% from the baseline value.
- 9.65 The use as student accommodation is a key consideration in understanding the sensitivity of this receptor. Student occupants are typically more transient than traditional residential occupiers as their university terms generally run from September to June, so they will not be in occupation for the entire year. The provision of social and study space also means they have the option to use alternative habitable space within the building. Rooms for student accommodation are also typically designed with a desk adjacent to the main window, which means they will consistently receive adequate daylight to this area. As such, the sensitivity of this receptor is lower than that of a traditional residential property.

- 9.66 Furthermore, the design of Kincardine Court and its proximity to the Development Site mean that deviations from the BRE criteria are inevitable. The building is located in close proximity to its boundary with several deep, single aspect rooms facing the development site. As such, the receptor places a burden on the Proposed Development to maintain existing light levels, which are higher than would usually be anticipated in a dense, urban environment such as this.
- 9.67 Given the nature of the property, of the 76 windows which do not meet the VSC daylight target criteria, 61 serve bedrooms, which the BRE consider as having a lesser requirement for daylight, and this means that only 15 living room windows do not meet the VSC daylight target.
- 9.68 Similarly, of the 39 rooms that do not meet the NSL daylight target criteria, 32 are bedroom, which are considered as having a lesser requirement for daylight, meaning only seven livingroom kitchen diners do not meet this target.
- 9.69 Overall, considering the dense, urban location, emerging height and density in the locality, use of the receptor and the flexibility with which the BRE Guidance is intended to be used, the effect on daylight to this receptor is considered to be **Minor Adverse** in significance and **Not Significant** in EIA terms. The effects are considered to be long-term, permanent, and local.

Hardshaw Close

- 9.70 A total of 43 windows serving 23 rooms were assessed for daylight within this receptor to compare the baseline against the Proposed Development.
- 9.71 For VSC, four (9%) of the 43 windows meet the BRE criteria. 25 of the affected windows will experience an alteration between 20-30% and the remaining 14 windows will experience an alteration between 30-40% from the baseline value.
- 9.72 For NSL, 15 (65%) of the 23 rooms assessed will meet the BRE criteria. Seven of the affected rooms will experience an alteration between 20-30% and the remaining room will experience an alteration between 30-40% from the baseline value.
- 9.73 None of the windows which do not meet the BRE target criteria are impacted to a major degree. A total of 25 of the windows are impacted to a minor degree and the remaining 14 windows are impacted to a moderate degree, meaning the majority of the impacts are minor. Furthermore, the windows will continue to retain average VSC daylight levels of 23.17% with the Proposed Development in place, which is within 20% of the 27% VSC target and considered wholly acceptable given the dense, urban nature of the area.
- 9.74 For NSL daylight, six of the eight rooms that do not meet the target criteria are bedrooms, which are considered as having a lesser requirement for daylight. As such, only two living rooms do not meet the NSL daylight criteria, and they will continue to receive daylight to 68.9% and 72.1% of their area with the Proposed Development in place, against a target of 80%, and this is considered acceptable given the locality.

- 9.75 Overall, considering the dense, urban location, emerging height and density in the locality and the flexibility with which the BRE guide is intended to be used, the effect on daylight to this property is considered to be **Moderate Adverse** in significance and **Not Significant** in EIA terms. The effects are considered to be long-term, permanent, and local.

Arkley Street

- 9.76 A total of one window serving one room was assessed for daylight within this receptor to compare the baseline against the Proposed Development.
- 9.77 For VSC, the one (100%) window assessed meets the BRE criteria.
- 9.78 For NSL, the one (0%) room assessed meets the BRE criteria. The one affected room will experience an alteration between 30-40% from the baseline value.
- 9.79 The room which does not meet the NSL daylight criteria is a bedroom, which the BRE considers as having a lesser requirement for daylight. Furthermore, it will continue to receive daylight to 60.6% of its area with the Proposed Development in place, which is acceptable given the urban nature of the Site.
- 9.80 Overall, consider the dense, urban location, emerging height and density in the locality, limited impacts and the flexibility with which the BRE guide is intended to be used, the effect on daylight to this receptor is considered to be **Minor Adverse** in significance and **Not Significant** in EIA terms. The effects are considered to be long-term, permanent, and local.

Sefton Close

- 9.81 A total of 19 windows serving nine rooms were assessed for daylight within this receptor to compare the baseline against the Proposed Development.
- 9.82 For VSC, 18 (95%) of the 19 windows meet the BRE criteria. The one affected window will experience an alteration between 20-30% from the baseline value.
- 9.83 For NSL, nine (100%) of the nine rooms assessed will meet the BRE criteria.
- 9.84 The window which does not meet the VSC daylight criteria serves a living room which is provided with other windows. The BRE state that where a room is served by multiple windows of the same size the mean VSC for the room overall can be calculated. When the mean VSC is calculated, the reduction in VSC daylight is 6.3%, which is within the 20% reduction considered acceptable by the BRE. As such, the impact on this receptor is negligible.
- 9.85 Notwithstanding, when considering its existing use, all of the affected windows and rooms are bedrooms, which the BRE consider as having a lesser requirement for daylight.

- 9.86 None of the windows and rooms assessed for sunlight to this receptor are impacted and the effect is therefore considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Mawson Hotel

- 9.87 A total of 27 windows serving 14 rooms were assessed for daylight within this receptor to compare the baseline against the Proposed Development.
- 9.88 For VSC, 25 (93%) of the 27 windows meet the BRE criteria. The two affected windows will experience an alteration between 20-30% from the baseline value.
- 9.89 For NSL, 14 (100%) of the 14 rooms assessed will meet the BRE criteria.
- 9.90 Both of the windows which do not meet the VSC daylight criteria are reduced by a minor degree. The impact is therefore limited in context to the receptor and minor overall.
- 9.91 Overall, considering the city centre location, emerging height and density in the locality and the flexibility with which the BRE Guidance is intended to be used, the effect on daylight to this property is considered to be **Minor Adverse** in significance and **Not Significant** in EIA terms. The effects are considered to be long-term, permanent, and local.

43 Upper Brook Street

- 9.92 A total of 36 windows serving 29 rooms were assessed for daylight within this receptor to compare the baseline against the Proposed Development.
- 9.93 For VSC, 36 (100%) of the 36 windows meet the BRE criteria.
- 9.94 For NSL, 24 (80%) of the 29 rooms assessed will meet the BRE criteria. The five affected rooms will experience an alteration in excess of 40% from the baseline value.
- 9.95 The use as student accommodation is a key consideration in understanding the sensitivity of this receptor. Student occupants are typically more transient than traditional residential occupiers as their university terms generally run from September to June, so they will not be in occupation for the entire year. The provision of alternative social and study space also means they have the option to use alternative habitable space within the building. Rooms for student accommodation are also typically designed with a desk adjacent to the main window, which means they will consistently receive adequate daylight to this area. As such, the sensitivity of this receptor is lower than that of a traditional residential property.
- 9.96 Furthermore, given that this receptor is a converted church, the design means that deviations from the BRE criteria are inevitable. The building is designed with several deep, single aspect rooms facing the development site which are served by small windows. This means that the baseline levels are low as the design constrains the levels of

daylight without the Proposed Development in place, and this places a burden on the Proposed Development to maintain existing light levels.

- 9.97 Notwithstanding, the impacts are limited in context to the receptor as a whole and are therefore considered acceptable given the nature of the locality.
- 9.98 Overall, considering the city centre location, emerging height and density in the locality, sensitivity of the receptor and the flexibility with which the BRE guide is intended to be used, the effect on daylight to this property is considered to be **Minor Adverse** in significance and **Not Significant** in EIA terms. The effects are considered to be long-term, permanent, and local.

Sunlight to Surrounding Sensitive Receptors

- 9.99 The Full Proposed Development Sunlight results can be found within **Appendix 9.2** and are summarised in **Tables 9.7** and **9.8** below.
- 9.100 A total of 56 living rooms were assessed for sunlight within five buildings considered sensitive receptors.
- 9.101 Windows that are not within 90 degrees of due south, or do not serve living rooms, were excluded from the assessment.
- 9.102 The buildings are discussed in more detail in **Table 9.7** and **Table 9.8** below.

Table 9.7: Summary of Annual Sunlight Results

Receptor Address	APSH				
	Total No. of Rooms	No. of Rooms that Meet BRE Guidelines	No. of Rooms Below the Threshold for Total APSH		
			Minor Adverse	Moderate Adverse	Major Adverse
Kincardine Court	15	15	0	0	0
Hardshaw Close	9	9	0	0	0
Arkley Street	-	-	-	-	-
Sefton Close	4	4	0	0	0
Mawson Hotel	5	4	0	0	1
43 Upper Brook Street	23	23	0	0	0
Total	56	55	0	0	1

Table 9.8: Summary of Winter Sunlight Results

Receptor Address	Winter PSH				
	Total No. of Rooms	No. of Rooms that Meet BRE Guidelines	No. of Rooms Below the Threshold for Winter PSH		
			Minor Adverse	Moderate Adverse	Major Adverse
Kincardine Court	15	15	0	0	0
Hardshaw Close	9	9	0	0	0
Arkley Street	-	-	-	-	-
Sefton Close	4	4	0	0	0
Mawson Hotel	5	4	0	0	0
43 Upper Brook Street	23	23	0	0	0
Total	56	56	0	0	0

Kincardine Court

- 9.103 A total of 15 rooms within this receptor were assessed for sunlight to compare the baseline against the Proposed Development.
- 9.104 15 (100%) of the 15 rooms meet the BRE criteria for both annual and winter PSH.
- 9.105 None of the rooms assessed for sunlight to this receptor are impacted and the effect is therefore considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Hardshaw Close

- 9.106 A total of nine rooms within this receptor were assessed for sunlight to compare the baseline against the Proposed Development.
- 9.107 Nine (100%) of the nine rooms meet the BRE criteria for both annual and winter PSH.
- 9.108 None of the rooms assessed for sunlight to this receptor are impacted and the effect is therefore considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Sefton Close

- 9.109 A total of four rooms within this receptor were assessed for sunlight to compare the baseline against the Proposed Development.
- 9.110 Four (100%) of the four rooms meet the BRE criteria for both annual and winter PSH.
- 9.111 None of the rooms assessed for sunlight to this receptor are impacted and the effect is therefore considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Mawson Hotel

- 9.112 A total of five rooms within this receptor were assessed for sunlight to compare the baseline against the Proposed Development.
- 9.113 Four (80%) of the five rooms meet the BRE criteria for both annual and winter PSH. One room experiences an alteration of greater than 40% in annual PSH.
- 9.114 The baseline levels for the room that does not meet the annual PSH criteria are very low, and the room does not meet either the annual or winter PSH target. This places a high burden on the Site to maintain existing levels and leads to greater proportional changes in sunlight than the absolute reductions suggest. As such, the effects are considered minor and acceptable.

- 9.115 Overall, consider the dense, urban location, limited impacts and the flexibility with which the BRE guide is intended to be used, the effect on sunlight to this property is considered to be **Minor Adverse** in significance and **Not Significant** in EIA terms. The effects are considered to be long-term, permanent, and local.

43 Upper Brook Street

- 9.116 A total of 23 rooms within this receptor were assessed for sunlight to compare the baseline against the Proposed Development.
- 9.117 23 (100%) of the 23 rooms meet the BRE criteria for both annual and winter PSH.
- 9.118 None of the rooms assessed for sunlight to this receptor are impacted and the effect is therefore considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Overshadowing to Surrounding Sensitive Receptors

- 9.119 The Full Proposed Overshadowing results can be found within **Appendix 9.4**.

Sefton Close

- 9.120 The rear gardens to Sefton Close were assessed for overshadowing. The amenity areas will continue to receive two hours of direct sunlight on 21 March to in excess of 50% of their area with the Proposed Development in place. Therefore, it will meet the BRE criteria for Sun Hours on Ground.
- 9.121 As such, the effect on overshadowing to this amenity area is considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Hardshaw Close

- 9.122 The rear gardens to Hardshaw Close were assessed for overshadowing. One garden is reduced by 11% with the Proposed Development in place, which is less than the 20% anticipated by the BRE Guidance and therefore acceptable. The remaining amenity areas will continue to receive two hours of direct sunlight on 21 March to in excess of 50% of their area with the Proposed Development in place. Therefore, it will meet the BRE criteria for Sun Hours on Ground.
- 9.123 As such, the effect on overshadowing to this amenity area is considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Gartside Gardens

- 9.124 Gartside Gardens was assessed for overshadowing. The amenity area will continue to receive two hours of direct sunlight on 21 March to in excess of 50% of its area with the Proposed Development in place. Therefore, it will meet the BRE criteria for Sun Hours on Ground.
- 9.125 As such, the effect on overshadowing to this amenity area is considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Kincardine Court

- 9.126 The amenity area serving Kincardine Court was assessed for overshadowing. The amenity area will continue to receive two hours of direct sunlight on 21 March to in excess of 50% of its area with the Proposed Development in place. Therefore, it will meet the BRE criteria for Sun Hours on Ground.
- 9.127 As such, the effect on overshadowing to this amenity area is considered to be **Negligible** and **Not Significant** in EIA terms. The effects are long-term, permanent, and local.

Additional Mitigation

Demolition and Construction

- 9.128 The potential daylight and sunlight effects relating to demolition and construction works will vary throughout the construction programme and gradually increase to the potential effects identified for the completed and operational Development.
- 9.129 As such, no additional mitigation is considered necessary during the demolition and construction phases of work.

The Completed and Operational Development

- 9.130 The impact on daylight impacts to the surrounding properties is considered **Negligible** to **Moderate Adverse** and the impact on sunlight is considered **Negligible** to **Minor Adverse**. Overall, this is considered to be **Not Significant** in EIA terms. Given the context of the Site and nature of effects, no further additional mitigation is considered necessary in respect of daylight, sunlight and overshadowing.

Likely Residual Effects of the Development and their Significance

Table 9.9: Residual Effects Summary

Description of Effect	Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
Demolition and Construction			
Daylight	N/A (Scoped out)	N/A (Scoped out)	N/A (Scoped out)
Sunlight	N/A (Scoped out)	N/A (Scoped out)	N/A (Scoped out)
Overshadowing	N/A (Scoped out)	N/A (Scoped out)	N/A (Scoped out)
The Completed and Operational Development			
Daylight	Long-term, permanent, local, Negligible to Moderate Adverse effect (Not Significant)	None required	Long-term, permanent, local, Negligible to Moderate Adverse effect (Not Significant)
Sunlight	Long-term, permanent, local, Negligible to Minor Adverse effect (Not Significant)	None required	Long-term, permanent, local, Negligible to Minor Adverse effect (Not Significant)
Overshadowing	Long-term, permanent, local, Negligible effect (Not Significant)	None required	Long-term, permanent, local, Negligible (Not Significant)

Conclusions

- 9.131 Construction of the Development would have a gradually increasing effect on the levels of daylight, sunlight, and overshadowing to existing residential properties and amenity spaces surrounding the Site, as the massing of the Development steadily increases. Those effects that are perceptible as the Proposed Development nears completion would be similar to those of the completed and operational Development.
- 9.132 Following the completion of the Development, the results of the assessment show that the existing residential properties surrounding the Site will continue to receive adequate levels of daylight. Whilst daylight to the surrounding properties would be noticeably affected as a result of the Development, this is not unusual given the urban context of the Site and its surroundings. It is considered that the overall daylight availability for the affected residential properties remains adequate given the dense, urban location, underdeveloped nature of the Development Site and emerging height and density in the locality.

- 9.133 In terms of sunlight, all of the surrounding properties apart from Mawson Hotel will be unaffected by the Proposed Development. Reductions in sunlight amenity to the property which is affected are limited and all of the surrounding residential properties will continue to receive adequate levels of sunlight with the Proposed Development in place.
- 9.134 In terms of the potential for the Development to result in overshadowing of existing amenity spaces in the vicinity of the Site, all either experience reductions within the recommend BRE Guidance and / or will continue to receive sunlight in excess of the target criteria.

Assessment of Cumulative Effects and their Significance

Table 9.10: Cumulative Schemes

Scheme No.	Planning Reference	Description of Development	Scoped In / Out	Justification
Manchester City Council (MCC)				
1	101664/FO/2013/N2	Brunswick Neighbourhood Selective demolition and clearance (including a number of residential, retail and other non-residential buildings) to allow the phased redevelopment and refurbishment of the Brunswick Neighbourhood, including the erection of 444 new residential dwellings (C3); the refurbishment of 839 existing homes [including low rise reversals and the refurbishment of Artillery Court, Silkin Court, Lockton Court, Lamport Court, and existing maisonettes and low rise houses]; a new boulevard and new access roads, new car parking and service areas; a new mixed use building comprising of 4 retail units (A1 or launderette or A5), and a neighbourhood housing office (B1a) with 18 apartments (C3) above; a mixed use residential extra care home with 60 residential units, and a day care centre on part of the ground floor (C2/D1); the upgrading of Gartside Gardens [with new multi use games area, a new playground, realigned pathways, new entrances and new landscaping]; a new orchard; 25 new allotments; new boundary treatments; new open spaces; with associated infrastructure, landscaping and tree planting	In	In close proximity to the Site, meaning there is potential for the receptor to be affected and / or cause a cumulative effect.
2	N/A	Upper Brook Street Masterplan – PAG / Moda Living Demolition of structures associated with the former BMW Williams Dealership and the erection of up to 3 buildings comprising	In	In close proximity to the Site meaning there is potential for the receptor to be affected and / or cause a cumulative effect.

Scheme No.	Planning Reference	Description of Development	Scoped In / Out	Justification
		of student accommodation and up to 2 buildings comprising life sciences use.		
3	124472/FO/2019	Kincardine Court Extension Erection of a part 4, part 5, part 6 storey extension to existing student accommodation building to form 25 additional student flats (comprising 100 bedrooms) (Use Class Sui Generis) to form 86 student flats in total (329 bedrooms) following removal, modification and reconfiguration of existing car parking, landscaping and boundary treatment together with the erection of a single storey water tank	In	In close proximity to the Site, meaning there is potential for the receptor to be affected and / or cause a cumulative effect.
4	134288/FO/2022	Number 3 Circle Square Erection of 15 storey building comprising office space (Use Class E(g)(i)) and ancillary flexible commercial uses (Use Class E), rooftop terrace, highway works, landscaping, and other associated works	Out	Sufficient distance from the Site as to not create a cumulative effect.
5	125799/FO/2019	MMU Science and Engineering Building Demolition of existing John Dalton West Building and associated structures, and erection of a new 7 storey education building (Use Class D1) for the Faculty of Science and Engineering (comprising teaching and research spaces, academic offices, social learning areas, catering/kitchen facilities and an energy centre), physical connections to and external refurbishment of the John Dalton Tower, hard and soft landscaping works, car and cycle parking and associated works.	Out	Sufficient distance from the Site as to not create a cumulative effect.
6	125573/FO/2019	First Street South Construction of four buildings of heights varying from 10 storeys to 45 storeys together comprising Co-living bedspaces (use class sui generis) and associated amenity facilities, with ground floor commercial units (Use classes A3 (Café /	Out	Sufficient distance from the Site as to not create a cumulative effect.

Scheme No.	Planning Reference	Description of Development	Scoped In / Out	Justification
		Restaurant and D2 (Gym)), private amenity space and public realm comprising hard and soft landscaping, car parking and cycle facilities and other associated works.		

Approach

- 9.135 Cumulative Schemes Nos. 1, 2 and 3 (noted in **Table 9.10** above) have been included within the Cumulative Effects Assessment (CEA). The Cumulative Schemes have been included within the baseline to understand their impacts on the surrounding properties both with and without the Proposed Development in place. The CEA is set out in **Figure 9.3** below.

Figure 9.3: Assessment of Cumulative Effects



Cumulative Schemes are shown in orange.

The Proposed Development is shown in blue.

Likely Residual Cumulative Effects and their Significance

Demolition and Construction

- 9.136 The potential daylight and sunlight effects relating to demolition and construction works will vary throughout the construction programme and gradually increase to the potential effects identified for the completed Proposed Development. As such, the demolition and construction phase has been scoped out of the assessment of cumulative effects.

The Completed and Operational Development

Daylight to Surrounding Sensitive Receptors

- 9.137 The full assessment of cumulative daylight effects results can be found within **Appendix 9.2** and are summarised in **Tables 9.11** and **9.12** below.
- 9.138 A total of 279 windows serving 209 rooms were assessed for daylight within eight buildings considered to be sensitive receptors.
- 9.139 The breakdown of the results for each of the individual buildings forming part of this assessment are discussed in more detail in **Table 9.11** below.

Table 9.11: Summary of VSC Daylight Results

Receptor Address	VSC				
	Total No. of Windows	No. of Windows that Meet BRE Guidelines	No. of Windows Below BRE Guidelines		
			Minor Adverse	Moderate Adverse	Major Adverse
Kincardine Court	143	61	11	67	4
Hardshaw Close	43	4	26	13	0
Arkley Street	1	1	0	0	0
Sefton Close	19	18	1	0	0
Mawson Hotel	27	25	2	0	0
43 Upper Brook Street	36	36	0	0	0
Brunswick Neighbourhood	10	10	0	0	0
Total	279	155	40	80	4

Table 9.12: Summary of NSL Daylight Results

Receptor Address	NSL				
	Total No. of Rooms	No. of Rooms that Meet BRE Guidelines	No. of Rooms Below BRE Guidelines		
			Minor Adverse	Moderate Adverse	Major Adverse
Kincardine Court	127	79	23	14	11
Hardshaw Close	23	15	7	1	0
Arkley Street	1	0	0	0	1
Sefton Close	9	9	0	0	0
Mawson Hotel	14	14	0	0	0
43 Upper Brook Street	29	25	4	0	0
Brunswick Neighbourhood	6	6	0	0	0
Total	209	148	34	15	12

9.140 The surrounding sensitive receptors do not experience any materially greater impact on daylight with the surrounding Cumulative Schemes in place. Furthermore, Brunswick Neighbourhood will fully comply with the VSC and NSL daylight criteria once constructed and operational.

Sunlight to Surrounding Sensitive Receptors

9.141 The full assessment of cumulative sunlight effects results can be found within **Appendix 9.2** and are summarised in **Tables 9.13** and **9.14** below.

9.142 A total of 61 living rooms were assessed for sunlight within seven buildings considered sensitive receptors.

9.143 Windows that are not within 90 degrees of due south, or do not serve living rooms, were excluded from the assessment.

9.144 The buildings are discussed in more detail in **Table 9.13** below.

Table 9.13: Summary of Annual Sunlight Results

Receptor Address	APSH				
	Total No. of Rooms	No. of Rooms that Meet BRE Guidelines	No. of Rooms Below Threshold for Total APSH		
			Minor Adverse	Moderate Adverse	Major Adverse
Kincardine Court	19	19	0	0	0
Hardshaw Close	9	9	0	0	0
Arkley Street	-	-	-	-	-
Sefton Close	4	4	0	0	0
Mawson Hotel	5	4	0	0	1
43 Upper Brook Street	23	23	0	0	0
Brunswick Neighbourhood	1	1	0	0	0
Total	61	60	0	0	1

Table 9.14: Summary of Winter Sunlight Results

Receptor Address	Winter PSH				
	Total No. of Rooms	No. of Rooms That Meet BRE	Below threshold for Winter PSH		
			Minor Adverse	Moderate Adverse	Major Adverse
Kincardine Court	19	19	0	0	0
Hardshaw Close	9	9	0	0	0
Arkley Street	-	-	-	-	-
Sefton Close	4	4	0	0	0
Mawson Hotel	5	5	0	0	0
43 Upper Brook Street	23	23	0	0	0
Brunswick Neighbourhood	1	1	0	0	0
Total	61	61	0	0	0

9.145 The surrounding sensitive receptors do not experience any greater impact on sunlight with the surrounding Cumulative Schemes in place. Furthermore, Brunswick Neighbourhood will fully comply with the APSH sunlight criteria once fully constructed and operational.

10. Climate Change

Introduction

- 10.1 This chapter assesses the effects the Proposed Development will have upon the climate (greenhouse gases) and the anticipated effects of climate change impacts on the Proposed Development.
- 10.2 The chapter describes the methods used to assess the likely significant effects, the baseline conditions currently existing at the Site, the potential direct and indirect effects of the Proposed Development arising from its construction, the mitigation measures required to prevent, reduce, or offset the identified significant effects and the residual effects. It has been written by the Cundall Sustainability Team.
- 10.3 This chapter is supported by the following figures and technical appendices (see **Volume 2a: Main Text and Figures** and **Volume 3: Appendices**, respectively).
- **Figure 10.1** – Life Cycle Modules;
 - **Appendix 10.1.1** – Sci-Tech Climate Change Risk Tracker;
 - **Appendix 10.1.2** – PBSA Climate Change Risk Tracker;
 - **Appendix 10.2** – Upper Brook Street GHG Emissions Model;
 - **Appendix 10.3** – Upper Brook Street PBSA BRUKL Report;
 - **Appendix 10.4** – Upper Brook Street Sci-Tech BRUKL Report;
 - **Appendix 10.5** – Waste Management Strategy – PBSA;
 - **Appendix 10.6.1** – Upper Brook Street Student Accommodation Whole of Life Carbon Report;
 - **Appendix 10.6.2** – Upper Brook Street Sci-Tech Whole of Life Carbon Report; and
 - **Appendix 10.7** – Upper Brook Street UK Climate Projections data.

Assessment Methodology and Significance Criteria

Assessment Methodology

Greenhouse Gas (GHG) Emissions

10.4 The methodology applied to the climate change mitigation assessment follows the latest Institute of Environmental Management and Assessment (IEMA) Guidance¹. The significance criteria used for this assessment was determined using expert judgement. The goal and scope of undertaking this assessment is to:

1. Identify the existing sources of GHG currently at the Site, and consider how these may change under a 'do-minimum' scenario;
2. Identify the likely sources of GHG emissions arising from the construction, operation and decommissioning of the Proposed Development, and quantify them as far as practical; and
3. Consider measures in which different alternatives (such as development type, construction methodology, operating mechanisms, and end of life uses) can demonstrably reduce GHGs.

10.5 This assessment has taken a project lifecycle approach to identifying areas of material GHG emissions generated as a result of the Proposed Development. This approach assesses each phase of the Development as per BS EN 15978 Sustainability of construction works (**Figure 10.1**), and categories the effect of the carbon generated accordingly (I.e. manufacturing emissions, work on site, operational energy, etc.).



Figure 10.1: Life Cycle Modules as per BS EN 15978.

¹ IEMA (2022) Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance (2nd Edition)

10.6 Assumed emissions categories for the development project lifecycle stages are identified in **Table 10.1**, and have been calculated based on design data, UK standard emissions factors, and relevant assumptions (set out later in the section). Project related carbon emissions calculations are summarised in **Table 10.16** and provided in full in **Appendix 10.2**.

10.7 As baseline emissions are unavailable for the current Site use, proposed emissions have been calculated and compared against the relevant local and national carbon budgets² to inform significance of effects, in line with the IEMA Guidance.

Climate Change Resilience

10.8 The Proposed Development is assessed to demonstrate how it is able to adapt to climate change hazards, and support climate change mitigation. Key mitigation measures that will improve the Proposed Development's resilience to climate change hazards are identified and incorporated in the assessment of effects.

10.9 A project climate risk assessment which has reviewed the impacts of the climate change hazards on the Proposed Development over its projected life cycle (assumed to be 60 years) has been undertaken and is provided as **Appendix 10.1**. This assessment considers how climate change hazards will impact upon building components including the building structure, building fabric and building services.

10.10 In reviewing the local and regional climate hazards, physical risks that impact building structure, fabric, building services and site landscape were identified. As there is no standardised method to assess the significance of these identified risks, the conclusion as to whether an effect is significant in EIA terms is a professional judgment as set out below. Quantitative risk ratings based on the likelihood of the risk and the severity of the consequence have been defined for each risk hazard to reflect the determination of magnitude and sensitivity.

10.11 The risk assessment aims to identify the risks posed by these Climate Change hazards on the Proposed Development and identify means of mitigating them as far as reasonably practicable. Hence, the Design Team has provided input on their respective disciplinary areas in relation to mitigation measures embedded within the design of the Proposed Development. These are provided in **Appendix 10.1.1** and **Appendix 10.1.2**.

Policy Context

National Policy and Legislation

National Planning Policy Framework (NPPF) 2021

First published on 27 March 2012 and most recently revised in July 2021, the NPPF sets the Government's planning policies for England and how these are expected to be applied. Addressing climate change is one of the core land

² Department for Business, Energy and Industrial Strategy (2016) Guidance: Carbon Budgets. <https://www.gov.uk/guidance/carbon-budgets>

use planning principles which the NPPF expects to underpin both plan-making and decision-taking. New development should be planned for in ways that avoid increased vulnerability to the range of impacts arising from climate change and can help to reduce greenhouse gas emissions. This can mean care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure, or reducing emissions through its location, orientation and design. Key NPPF sections relating to Climate Change include Section 9 – Transport, Section 14 Energy and Climate Change policies.

The Climate Change Act 2008 (amended 2019)

Committed the UK to its first statutory carbon reduction target to reduce carbon emissions by at least 80% from 1990 levels by 2050. In June 2019, the legislated target was amended to net zero emissions by 2050, following advice from the UK Committee on Climate Change. The 2008 Climate Change Act requires that that five-yearly carbon budgets are set and not exceeded to ensure that progress is made towards the long-term target. The first three carbon budgets were set in 2009, with the fourth and fifth following in 2011 and 2016 respectively. The sixth carbon budget has been produced in December 2020 and marks the first carbon budget produced under the new Net Zero legislation.

Energy Act 2013

This Act establishes a legislative framework for delivering secure, affordable and low carbon energy. The act also makes provisions for the decarbonisation of the electricity sector, electricity market reform, nuclear regulation and the sale of Government Pipeline and Storage System (GPSS).

Local Policy

Manchester Climate Change Framework 2020-25

This Framework is Manchester's high-level strategy for meeting the commitment in the 'Our Manchester Strategy 2016-25'. The Framework builds on the Draft Manchester Zero Carbon Framework 2020-2038, which was published in February 2019 and Manchester City Council's declaration of a climate emergency in July 2019. The document has been shaped by experts in climate change to ensure it is in line with the latest science and the Paris Agreement.

Guidance and Best Practice

Institute of Environmental Management & Assessment (IEMA) (2020) Climate Change Resilience & Adaptation Guidance³

- 10.12 This document is an essential reference point for considering climate change resilience and adaptation in EIAs, for professionals coordinating EIAs or supporting significant assessments for climate change and greenhouse gas impacts.

Institute of Environmental Management & Assessment (IEMA) (2022, 2nd Edition) Assessing Greenhouse Gas Emissions and Evaluating their Significance Guidance

- 10.13 This document is an essential reference point for considering greenhouse gas impacts in development EIAs, for professionals coordinating EIAs or supporting significant assessments for climate change and greenhouse gas impacts.

Chartered Institution of Building Services Engineers (CIBSE) TM46 Energy Benchmarking

- 10.14 This publication offers a comprehensive outline of building energy benchmarks. It provides details of separate energy uses and includes weather and occupancy adjustments. This publication and supplementary files will allow initial benchmarking of the operational energy of the Proposed Development.

UKGBCA Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets 2022⁴

- 10.15 This framework offers 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.

Scope of Assessment

- 10.16 The current land uses on the Site are described in detail in **Volume 2: Main Text, Chapter 3: Site Description**; additionally, the proposed land uses for the Site as part of the Proposed Development are described in detail in **Volume 2: Main Text, Chapter 5: The Proposed Development**.

Greenhouse Gas Emissions

- 10.17 Given the type of development, a summary of key emissions sources anticipated for each development stage, in addition to the assessment methodology capturing them, can be seen below in **Table 10.1**.

³ IEMA (2020) Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation

⁴ UKGBC (2022) A Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets

Table 10.1: Key emissions sources for the Proposed Development

		Activity	GHG Source	Assessment Method
Project Lifecycle Stage	Pre-construction Phase (A1 – A3)	Enabling and demolition work	Plant and vehicle fuel	Upfront embodied carbon
	Construction Phase (A4-A5)	Plant and vehicle movement Materials transport Disposal and transport of waste Worker commuting Temporary site energy consumption	Plant and vehicle fuel Site facility electricity, fuel, refrigerants, etc. Waste	Upfront embodied carbon
	Operational Phase (B1-C4)	Building energy consumption Operational waste Buildings materials manufacturing	Building electricity, fuel, refrigerants, etc. Material embodied emissions Waste	Whole of life (WLC) carbon Waste calculations Operational energy calculations

- 10.18 The scope of timing for this project is laid out in **Table 10.2** below. This has been extracted from the Sci-Tech and PBSA buildings' respective programmes.

Table 10.2: Upper Brook Street project development programme

Building	Construction	Operation
Student Residences (PBSA)	Jan 2024 – May 2026	Sept 2026 - 2086
Sci-Tech Building	April 2024 – April 2026	April 2026 2086

Climate Change Projections

- 10.19 Future climate projections are used to undertake the climate risk assessment based on the latest research from the International Panel of Climate Change (IPCC). Medium (Representative Concentration Pathway (RCP) 4.5) and high (RCP8.5) emissions scenarios will model possible future climate evolution and will cover a broad range of plausible future climate scenarios. This report will focus on the RCP4.5 and 8.5 scenarios and the timeframe of medium to long term projections (2050 & 2080). Key climate impacts that will be assessed are rising temperatures, precipitation, flooding, wind & snowing / snowstorms.

Identification of Sensitive Receptors

Greenhouse Gases

- 10.20 Given the nature of emissions and the greenhouse effect, the ozone and whole planet (by extension) are receptors of any emissions impacts. Further, and in accordance with the IEMA Guidance, all emissions attributed to the proposed development are considered to be of significance (i.e. an important consideration), as they directly impact climate change and its impacts on sensitive receptors.

Climate Change Resilience

- 10.21 The geographical extent of the receptors for the scope of this Climate Change Resilience assessment is limited to the local area and the elements of the Proposed Development, identified as the public realm and the buildings. The sensitivity of receptors is defined by a combination of two factors: the susceptibility and the vulnerability of the receptor.

Significance Criteria

Greenhouse Gas Emissions

- 10.22 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 continues by explaining that there is no single preferred method to evaluate significance, but the greater the project's carbon budget (i.e. 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 of the impact (i.e. the level of GHG emissions) that drives significance.
- 10.23 Therefore, the below (**Table 10.3**) are descriptions of different levels of effect the Proposed Development has been assessed against for this Chapter.

Table 10.3: Magnitude / Significance criteria for GHG emissions, as per the IEMA Guidance.

Level	Significance Criteria
Major adverse (Significant)	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 and Manchester's trajectory towards net zero.
Moderate adverse (Significant)	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 and Manchester's trajectory towards net zero.
Minor adverse (Not Significant)	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 and Manchester's trajectory towards net zero.
Negligible (Not Significant)	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 (Significant)	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.

- 10.24 As per the IEMA Guidance, a project that follows a 'business-as-usual' or 'do minimum' approach and is not compatible with the UK or Manchester's net zero trajectory or accepted aligned practice or area-based transition targets, results in a significant adverse effect. This is then considered in terms of levels of significance (i.e. moderate, major, etc.).
- 10.25 A project that is compatible with the budgeted, science-based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that has a minor adverse effect that is not significant. It may have residual emissions but is doing enough to align with and contribute to the relevant transition scenario, keeping the UK on track towards net zero by 2050 with at least a 78% reduction by 2035 and thereby potentially avoiding significant adverse effects.
- 10.26 A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory, and has minimal residual emissions, is assessed as having a negligible effect that is not significant. This project is playing a part in achieving the rate of transition required by nationally set policy commitments.

- 10.27 To assess the significance of the impact of emissions arising from the construction and operation of the Proposed Development, the relevant UK carbon budget and local Manchester carbon budgets have been used. These carbon budgets are in place to restrict the amount of GHG emissions the UK can emit in a five-year period if they are to meet net zero commitments.
- 10.28 The appropriate national UK and local Manchester carbon budgets during the period of the construction and operation of the Proposed Development are below in **Table 10.4** and **Table 10.5**.

Table 10.4: Manchester Carbon Budget from 2023-2100 (Tyndall Centre for Climate Research, 2023)

Manchester Carbon Budget		
Carbon Budget Period	Recommended Carbon Budget (Mt CO ₂)	Annualised carbon budget (assuming equal distribution through period)
2023 – 2027	4.6	0.92
2028 – 2032	2.4	0.48
2033 – 2037	1.2	0.24
2038 – 2042	0.6	0.12
2043 – 2047	0.3	0.06
2048 – 2100	0.3	0.006

Table 10.5: UK Carbon Budget from 2023-2100 (Department for Business, Energy and Industrial Strategy, 2016)

UK Carbon Budget	
Carbon Budget Period	Recommended Carbon Budget (Mt CO ₂)
2023-2027	1950
2028-2032	1725
2033-2037	965
2038-2100 (assumed)	965
Total	5605

- 10.29 The carbon budgets demonstrate a decline in the amount of GHG emissions that the UK and local Manchester area can emit in the future if they are to stay on track towards their respective net zero trajectories. This means that any source of emissions contributing to the UK's carbon inventory is going to have an increased impact on the UK and Local Manchester carbon budgets in the future. However, for the sake of defining a rating of significance, the below benchmarks have been used to categorise the results for this assessment. The benchmarks have been

developed using publicly available 2019 Manchester emissions data⁵ relating to the commercial sector, considering the type of development proposed. However, there were significant limitations in setting these benchmarks, given the lack of detail behind the emissions data categorisation. As such, best professional judgement has been applied to create a useful gauge to consider the significance of the project's emissions impacts. This is presented in **Table 10.6** below.

Table 10.6: *Significance of Climate Change Effects*

Significance		Carbon Budget	
		Manchester	UK
Significant	Beneficial	Net negative CO2e	Net negative CO2e
Not Significant	Negligible	<0.9%	<0.005%
Not Significant	Minor Adverse	1-1.9%	0.0051 - 0.01%
Significant	Moderate Adverse	2-5%	0.011%-0.02%
Significant	Major Adverse	>5%	>0.02%

Climate Change Resilience

- 10.30 To objectively determine level of significance, the sensitivity of affected receptors and the anticipated magnitude of change from the baseline conditions is considered. Significance of effects have been determined using professional judgment based on the criteria set out below.
- 10.31 As this climate risk assessment assumes that the Proposed Development will operate for approximately 60 years, the time frame of the hazards / impacts will be medium to long term. Similarly, the assessment reviews local hazards within and surrounding the Site only, thus the assessment of effects will be on the local level.

Magnitude

- 10.32 In categorising effect significance, 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).
- 10.33 The impact of a climate risk hazard on building element (receptor) can be either adverse or negligible in nature. The criteria for identifying the magnitude of the impact are outlined in **Table 10.7**.

⁵ Department for Business, Energy and Industrial Strategy (2022) UK local authority and regional greenhouse gas emission.

Table 10.7: Magnitude criteria for climate risks

Magnitude	Description
Very Large	- 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 to 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.
Large	- 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.
Medium	- 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.
Small	- 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.

Magnitude	Description
No Change	• 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 the resilience of the 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.

Sensitivity of Receptors

10.34 The sensitivity of receptors is judged on a scale ranging from very high, high, medium, low, and negligible, dependent on the ability to withstand the existing and future climate conditions. As seen in **Table 10.8**.

Table 10.8: Sensitivity of receptor climate risk criteria

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 / prevailing 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 / prevailing climatic factors (e.g. lose much of its original function and form).	Receptor is dependent on existing / prevailing 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 / prevailing 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 / prevailing	Climatic factors have little influence on the receptors.

Rating / Sensitivity Value	Guidelines on susceptibility of receptors (Public realm, building)	Guidelines on vulnerability of receptors (Public realm, building)
	climatic factors (e.g. retain much of its original function and form).	
Negligible	Not applicable (no receptors are not susceptible to risk hazards).	Not applicable (no receptors are not vulnerable to risk hazards).

- 10.35 The assessment matrix provided in the **Table 10.9** identifies the significance of effects arising from climate hazards. A significant effect is defined as a moderate or major hazard to the Proposed Development.

Table 10.9: Significance of climate risks

Magnitude of Impact / Effect	Sensitivity Value of Receptor				
	Very High	High		Medium	Low / Negligible
No Change	Neutral	Neutral	Neutral	Neutral	Neutral
Small	Minor Adverse	Minor Adverse	Negligible / Minor Adverse	Negligible / Minor Adverse	Neutral / Negligible
Medium	Moderate / Major Adverse	Minor / Moderate Adverse	Minor Adverse	Negligible / Minor Adverse	Negligible / Minor Adverse
Large	Major Adverse	Moderate / Major Adverse	Moderate Adverse	Negligible / Minor Adverse	Negligible / Minor Adverse
Very Large	Major Adverse	Major Adverse	Moderate / Major Adverse	Minor / Moderate Adverse	Minor Adverse

Significant effects are shown in orange.

Assumptions / Limitations

Greenhouse Gas Emissions

10.36 The below assumptions and resulting limitations have been adopted for this assessment (see **Table 10.10** below):

Table 10.10: GHG Assumptions

No.	Assumption	Context
1	Building energy usage	The Part L BRUKL documents have been used to provide an estimate of the energy consumption of the Proposed Development. There are limitations of this energy data as it standardises a usage of a building to assess compliance with efficiency standards. The nature of the Proposed Development also means that the usage and therefore energy consumption could vary dramatically due to the type and number of events potentially happening in a year.
2	Phasing	Emissions associated with pre-construction enabling works are grouped with upfront carbon emissions, these are based upon the design information available and the quantified materials.
3	Design Life	A design life of 60 years has been adopted for this assessment.
4	Waste	All waste is assumed to be sent to landfill during operation. This is a significant limitation, as it elevates the forecast emissions associated with operational waste considerably, however this is not considered to undermine the robustness of the assessment as it leads to an over-estimation of emissions and thus represents a worse case estimate. Further, please note that in the absence of building-specific estimates, an assumed value has been used for the Sci-Tech. The assumed value is the same quantity as the PBSA building.
5	Carbon emission factors	Carbon emission factors produced by the Government and governing industry departments have been utilised, however there is potential for differing carbon emission factors to be applicable at the time of the carbon emission activity. Further, baseline emissions were unable to be sourced for the site, and hence, an alternative methodology has been chosen for determining significance.
6	Embodied emissions	The data used to forecast the WLC and upfront carbon emissions for the Development are based on quantities of materials identified in bill of quantities. This information has been provided by the Project Team and is considered a robust basis on which to forecast the likely carbon emissions associated with building materials.

Climate Change Projections

10.37 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 Proposed Development. Where

relevant, time-appropriate information from most recently updated policy and guidance documents have been used, and this will be identified in the assessment.

- 10.38 Whilst the intent of this assessment is to reduce the risks associated with Climate Change on the Proposed Development, 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.

Consultation

- 10.39 No consultation has taken place with external stakeholders in relation to the GHG emissions or climate change impacts arising from the project, as of yet regarding this Climate Change ES Chapter.

Baseline Conditions

- 10.40 The northern part of the Site is currently partly unused and used on a temporary basis for carparking but was formerly a Citroën car dealership and is accessed from both Upper Brook Street (UBS) to the west and Kincardine Road to the east. The southern part of the Site, owned by MCC, comprises the former Elizabeth Yarwood Court residential complex and is accessed from Kincardine Road to the east of the Site.

Local Greenhouse Gas Emissions

- 10.41 Local emissions data could not be sourced for the Site. However, local emissions data was able to be sourced from UK government's publicly available emissions data records⁶. This includes a breakdown of emissions for Manchester, categorised by industry. However, emissions recorded for 2019 (most representative year of data) against the commercial industry are not aggregated into any more detail, and hence, unhelpful in determining a baseline for the existing site land use's emissions footprint.

Site Emissions

- 10.42 Site emissions for the existing land use are unable to be quantified. An alternative methodology has been adopted for assessing significance as a result.

Climate Change Conditions

- 10.43 An assessment of climate change hazards is based on a set of standard climate projections to understand the range of impacts that may occur over time. The projections of climate used in this chapter are aligned with the

⁶ Department for Business, Energy and Industrial Strategy (2022) UK local authority and regional greenhouse gas emission.

previously mentioned IPCC research and are based on the latest 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 impacts and risks of climate change.

- 10.44 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), which have also been referred to in the IPCC 6th Assessment (2022). The RCPs provide a representation of several distinct, but equally probable, global carbon emissions scenarios. This report will focus on the RCP4.5 and RCP8.5 scenarios and the timeframe of medium to long term projections (2050 & 2080).

Increasing Average / Maximum Temperatures

- 10.45 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.
- 10.46 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.
- 10.47 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 average weather data taken from the last 12+ years, the annual average day temperature in Manchester (see **Table 10.11**): 12.7°C and night: 5.7°C; and the average summer day temperature: 19°C and night: 11°C; and for winter, the average day temperature is 6.7°C and night: 1.3°C.

Table 10.11: Annual average temperatures for Manchester⁷

Historical weather data	Day	Night
Average temperature (°C)	12.7	5.7
Summer temperature (°C)	19	11
Winter temperature (°C)	6.7	1.3

Intense Rainfall Events / Precipitation⁸

- 10.48 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 saturate 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 conducive. 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.
- 10.49 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 average weather data taken from the last 12+ years, the current average winter months rainfall in Manchester is 31.5mm with a peak in December with 34.5mm, and in the summer months rainfall the average is 34mm with peak of 37.7mm in August. The climate science indicates that summer will see increases in the overall volume of rainfall which is again predicted to occur in more intense downfalls.

Flooding

- 10.50 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 Site is not within close proximity to the sea; therefore, the only flooding risks will arise from fluvial flooding from the nearby river.

Wind

- 10.51 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

⁷ World Weather Online (2023) Manchester M13 Annual Weather Averages Lancashire.

⁸ UKCP18 Factsheet: Precipitation.

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.

Snow⁹

- 10.52 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 increased overall frequency.

Future Baseline

Greenhouse Gas Emissions

- 10.53 As the global population continues to grow, efficiencies will need to be engineering in order to meet the Paris Climate Agreement targets of limiting global warming to well below 2°C. The increased uptake of electric vehicles and low emissions zones will likely continue to decrease localised emissions. New developments within the UK and local area will continue to be required to meet energy efficiency standards in order to minimise the cumulative impact of development into the future.

Climate Change Projections

- 10.54 Due to the nature of climate change hazards, current baseline conditions that are being considered are likely to change during operation. **Table 10.12** will present the recognised physical risks and projected UKCP18 data marked against the IPCC's RCP4.5 and RCP8.5 pathways to the area of Manchester (M13 9TN). A visual representation is presented in **Appendix 10.7**.

Table 10.12: Results of future baseline related to climate change

Physical Risks	Results
Annual Average Temperatures	2020s: Both RCP scenarios showing similar temperature rises, with central projections at around 0.7-0.8°C of warming. 2050s: Average temperatures will rise to between -0.9°C to 3.6°C under RCP4.5 and -0.5°C to 4.4°C under RCP8.5 above historical levels. 2080s: Greater divergence is seen in the 2080s with rises of between -0.3°C and 4.8°C for RCP4.5 and between 0.5°C and 6.7°C for RCP8.5.
Summer Maximum Temperatures	2020s: Maximum temperatures are similar across all scenarios at just 0.9 and 1.0°C increases. 2050s: Maximum temperatures will rise to between -0.7°C and 4.3°C under RCP4.5 and between -0.2°C and 5.3°C under RCP8.5 above historical levels.

⁹ UKCP18 Factsheet: Snow

Physical Risks	Results
	2080s: Both scenarios show significant increases out to the 2080s, from 3.2°C for RCP4.5 to 5.0°C for RCP8.5. The elongated ranges show a high degree of uncertainty about long-term temperature peaks with increases at the high end of 6.2°C (RCP4.5) and 8.9°C (RCP8.5).
Winter Minimum Temperatures	2020s: Similar outturn across all scenarios at 0.7-0.8°C increases. 2050s: Increasing spread of temperatures ranges from 1.3°C for RCP4.5 to 1.7°C for RCP8.5. 2080s: Scenarios diverge more significantly between 1.9°C for RCP4.5 and 3.1°C for RCP8.5.
Winter Precipitation	2020s: Similar projections across both scenarios at 2.6-3.0% central but significant rise of 31.1-31.7% at high end of ranges. 2050s: Increases of 4.7% and 7.1% central are seen across the two scenarios with the high end of the ranges reaching 38% and 41.3%. 2080s: The high ends of the ranges continue to become more extreme, reaching 8.8% and 14.8% central and 45.4% and 54% for the high end of ranges.
Summer Precipitation	2020s: Similar levels of reductions across all scenarios at -7% and -8% central projections. 2050s: Summer precipitation is projected to decrease markedly across all scenarios, with central projections of 14% to 19% reductions. 2080s: Precipitation rates continue to decrease with RCP4.5 showing a central 26% reduction and RCP8.5 a 36% reduction.

Embedded Mitigation

Demolition and Construction

Greenhouse Gas Emissions

10.55 The WLC assessment used to predict the Proposed Development's demolition and construction GHG emissions has been completed in accordance with the RICS WLC Professional Statement¹⁰. The RICS Statement includes assumptions on material properties and recycled content that align with industry practice and are considered as embedded mitigation. These are listed in full in the Appendix 10.6.1/10.6.2 but in summary

- All concrete will contain minimum 20% cement replacement
- Reinforced steel to comprise minimum 97% recycled content, while support frames and structural steel to contain minimum 15% recycled content
- 100% FSC or PEFC certified timber and timber products to be used through the development

¹⁰ RICS Professional Statement 'Whole life carbon assessment for the built environment 2017'

- All aluminium to contain minimum 35% recycled content
- Plasterboard assumed to be British Gypsum Gyroc wall board 12.5mm thick, comprising minimum 60% recycled content

10.56 Further potential mitigation measures are set out below in the 'Additional Mitigation' section of this chapter.

Climate Change Resilience

10.57 Embedded mitigation measures relating to climate change for the Proposed Development are incorporated into the design of the building, so they are applicable to the development only when it is completed. See below for detail on mitigation relating to climate change resilience embedded within the design of the Proposed Development.

The Completed and Operational Development

Greenhouse Gas Emissions

10.58 The completed and operational development GHG assessment has been completed from the building BRUKL based on the strategies outlined in the Energy and Sustainability Assessment. These strategies form the GHG mitigation measures embedded in the design of the Proposed Development and include:

- The building envelopes will be designed to perform significantly better than the Building Regulation standards with low U-values, g-values and low air leakage rates.
- Façade design will incorporate measures to minimise heat loss whilst the size and position of openings has been optimised to maximise the use of natural light within each space.
- The development will be mechanically ventilated throughout the year, making use of heat recovery to reduce the heating demands and manually perforated opening through the façade used to purge the space and assist with summertime overheating
- Energy efficient services employed in the development include high efficiency LED lighting coupled with occupancy and daylight controls to significantly reduce the lighting energy use.
- Electrical and mechanical systems within the development will be tightly metered and controlled with a full Building Management System (BMS). This will enable energy use to be tracked and opportunities for efficiency improvements to be made.

10.59 Potential additional mitigation measures are set out below in the 'Additional Mitigation' section of this chapter.

Climate Change Resilience

10.60 The measures described below, which are incorporated within the Proposed Development, will provide mitigation to the potential impacts arising from the climate change hazards described. It should be noted that while the below measures may influence GHG emissions, they are addressed separately and are exclusive to climate resilience mitigation.

Increasing Average / Maximum Temperatures

Architectural / Structural

- 10.61 **Both PBSA and Sci-Tech:** Handrails and bike racks to be stainless steel specification as per BS 8300 recommendations. Provide sufficient movement joints in materials susceptible to thermal expansion. Building blocks are mostly brick with exception of curtain walling. Internal and external shading horizontally and vertically to protect from UV exposure. Openable windows on all floors.

Building Services

- 10.62 **PBSA:** Cooling loads not provided for student accommodation. Generator hook-up points externally for sudden power outages. Future weather scenario assessment to be appointed. Better u-values to be targeted to reduce solar gain.
- 10.63 **Sci-Tech:** Transformers are sized with 20% spare capacity over the current maximum demand calculation. There is 20% additional capacity in the HVAC systems / ASHP beyond the current estimated requirements. The building energy strategy takes a fabric first approach to reduce energy usage. All thermal and energy modelling is being carried out is using the latest CIBSE Climate data and with current and future weather scenarios being use as required by BREEAM NC V6, HEA04, ENE01 and ENE05 Credits. As a minimum the following weather information for Manchester is to be used for all Weather under a climate change scenario (DSY 2020 Emissions Scenario: High (A1F1): 50th percentile DSY2 and DSY 3). Back-up generation for client operations forms part of the client fit out. Spatial allowance has been made at roof level for client generators.

Civils & Infrastructure

- 10.64 **PBSA:** Access roads and surfaces to be designed to withstand expected vehicle loading. Explore asphalt cooling systems such as additives, surface coating and layer design.
- 10.65 **Sci-Tech:** Subbase to be detailed for proposed finished, use, and loading in accordance with all relevant standards and codes.

Landscape and Ecology

- 10.66 **Both:** Ecological input to inform landscaping strategy and the prioritisation of native vs drought tolerant planting. A hybrid drainage strategy including Sustainable Urban Drainage Systems (SUDS) features and attenuation tanks is proposed to limit any risk from flash flooding. Raingardens incorporated as part of the SUDS. These will provide on-site attenuation in the case of high rainfall events or flash flooding. Planting to include species capable of withstanding periods of drought as well as periods of flooding.

Intense Rainfall Events / Precipitation

Architectural / Structural

- 10.67 **PBSA:** On-site attenuation included in drainage strategy. Permeable pavements to remove excess water. Rainwater guttering designed for future scenarios (also as per onsite drainage strategy). Flow rates to be considered.
- 10.68 **Sci-Tech:** Below ground drainage design will be undertaken in accordance with policy for the area indicates that surface water runoff should be restricted to match the greenfield rate (Qbar) of 2.5 l/s. Attenuation requirements to restrict the runoff to the public network will be calculated using the required storm rate with the required allowance for climate change. SUDS measures to be included which will include permeable paving.

Building Services

- 10.69 **PBSA:** Increase deflection limits to avoid excessive ponding.
- 10.70 **Sci-Tech:** The Site is in Flood Zone 2 and flood risk assessment is being undertaken and measures to control flooding incorporated into scheme (none anticipated to be required over normal building measures). Falls on roofs to avoid ponding of water.

Civils & Infrastructure

- 10.71 **PBSA:** Rain gardens as part of a SUDs drainage strategy to provide pollution treatment and allow water to be stored within aggregate sub-base. Tanked/geocellular attenuation systems to provide high storage capacity and can be incorporated within road pavements.
- 10.72 **Sci-Tech:** Below ground drainage design will restrict surface water runoff to match the greenfield rate (Qbar) of 2.5 l/s. Attenuation requirements to restrict the runoff to the public network will be calculated using the required storm rate with the required allowance for climate change. SUDS measures to be included, including permeable paving.

Landscape & Ecology

- 10.73 **PBSA:** Onsite landscaping should be designed to be climate appropriate and have sufficient drainage to accommodate high rainfall events planters etc. Use systems to store limited amounts of rainwater but allow excessive amounts to freely discharge.
- 10.74 **Sci-Tech:** Raingardens to attenuate surface water run-off. Incorporation of planted raingardens as part of a sustainable drainage system to function as part of the Site's overall drainage strategy. These will provide on-site attenuation in the case of high rainfall events or flash flooding. Planting to include species capable of withstanding periods of drought as well as periods of flooding. Soil specification to include free draining sub soils and a layer of attenuation to ensure surface water is allowed to permeate through and doesn't saturate the topsoil layer. Use systems to store limited amounts of rainwater but allow excessive amounts to freely discharge.

Flooding

Architectural / Structural

10.75 **PBSA:** External levels strategy and design directs surface water flows away from entrances and the immediate building curtilage, allowing safe access and egress from the building entrances.

10.76 **Sci-Tech:** Not specified.

Building Services

10.77 **PBSA:** Not specified.

10.78 **Sci-Tech:** The Flood Risk Assessment (submitted with the planning application) demonstrates but the Sci-Tech building is above the 100-year flood level. Electrical equipment will be on plinths at ground floor level or on plant supports on the roof to raise them above slab and roof levels.

Civils & Infrastructure

10.79 **Both:** Below ground drainage design will be undertaken in accordance with policy for the area so that surface water runoff is restricted to match the greenfield rate (Qbar) of 2.5 l/s. Attenuation requirements to restrict the runoff to the public network will be calculated using the required storm rate with the required allowance for climate change. SUDS measures to be included, including permeable paving. Pile design to be optimised to accommodate for groundwater conditions. Substructure design to be undertaken based on site investigations and confirmation of groundwater levels.

Landscape & Ecology

10.80 **Both:** Current design includes onsite water attenuation, landscaping, and SUDS. Incorporation of planted raingardens as part of the SUDS to function as part of the Site's overall Drainage Strategy. These will provide on-site attenuation in the case of high rainfall events or flash flooding. Planting to include species capable of withstanding periods of drought as well as periods of flooding. External levels strategy and design directs surface water flows away from entrances and the immediate building curtilage, allowing safe access and egress from the building entrances.

Wind

Architectural / Structural

10.81 **PBSA:** A Wind Microclimate Assessment has been undertaken. The use of brick should limit noise nuisances resulting from strong wind. Roof plant will be screened to mitigate wind impacts on roof. Fitting details will have wind conditions considered.

- 10.82 **Sci-Tech:** The façade, and specially the elements intended for shading, are fixed and there is a low risk of them being affected by strong wind. MEP equipment at roof (plant area) is to be protected by a screen. Stability of the building is provided through the reinforced concrete cores and the detailed structural design will be undertaken to limit sway of the building to acceptable limits in accordance with current structural codes. Wind load calculations will be undertaken to account for potential climate change.

Building Services

- 10.83 **PBSA:** Not specified.
- 10.84 **Sci-Tech:** Tenants will be responsible for backup generation to their critical services; spatial allowance has been allowed for this. Emergency lighting is provided by integrated 3-hour battery packs; this will provide the same level of resilience as a central 3-hour battery / UPS system. No sensitive equipment has been located on the roofs.

Snowing / Snowstorms

Architectural / Structural

- 10.85 **PBSA:** Generators are at ground level to facilitate access. External plant will be screened.
- 10.86 **Sci-Tech:** Seating to be provided under building canopies to provide areas of sheltered seating. Handrails and bike racks to be stainless steel specification as per BS 8300 recommendations with several under building canopies to ensure year-round use. MEP equipment at roof (plant area) is to be protected by a screen.

Building Services

- 10.87 **PBSA:** Shelter on fixtures. Seating to be provided under building canopies to provide areas of sheltered seating. Handrails and bike racks to be stainless steel specification as per BS 8300 recommendations with several under building canopies to ensure year-round use. Heating would have spare capacity; 25% spare capacity on electrical infrastructure. Passive heating on external sunlight and concrete as passive heating material.
- 10.88 **Sci-Tech:** Emergency lighting for the building will be standard battery backed emergency lighting with 3 hours duration. Transformers are sized with 20% spare capacity over the current maximum demand calculation. There is 20% additional capacity in the HVAC systems / ASHP beyond the current estimated requirements. The building energy strategy takes a fabric first approach to reduce energy usage. All thermal and energy modelling is being carried out is using the latest CIBSE Climate data. With current and future weather scenarios being used as required by BREEAM NC V6, HEA04, ENE01 and ENE05 Credits. As a minimum the following weather information for Manchester is to be used for all weather under a climate change scenario (DSY 2020 Emissions Scenario: High (A1F1): 50th percentile DSY2 and DSY 3). Back-up generation for client operations forms part of the client fit out. Spatial allowance has been made at roof level for client generators.

Civils & Infrastructure

- 10.89 **PBSA:** Drainage strategy to be developed to accommodate for a 1 in 100-year critical storm with allowance for climate change. This will accommodate for run-off resulting from snowfall.
- 10.90 **Sci-Tech:** Not specified.

Assessment of Likely Significant Effects

Demolition and Construction

Greenhouse Gas Emissions

- 10.91 The construction phase will be responsible for a significant proportion of the Proposed Development’s carbon footprint over the project lifecycle. This is due to the upfront carbon associated with the extraction of raw materials, transport to manufacturing unit, the manufacturing process, transport to site and the work on site. This is referred to as the life cycle stages A1 to A5, as per RICS guidance (EN 15978).
- 10.92 It is important to note that not all emissions attributed to the project will be emitted within the immediate vicinity of the project or within the local government area (i.e. due to transport, materials manufacturing, etc.). **Table 10.13** provides a summary of the modelled estimate emissions associated with the construction phase of the Proposed Development, based on the full assessment provided in **Appendix 10.2**.

Table 10.13: Total GHG emissions attributed to the Proposed Development’s construction stage.

Emissions Source	Associated Emissions Estimate (MtCO2e)	Full Assessment Provided In:
Upfront embodied carbon	0.034	Appendix 10.2

- 10.93 In line with the IEMA Guidance, all emissions are considered significant given the permanent and cumulative nature of GHG emissions. However, it is necessary to provide context for the scale of emissions, and to comment upon the risk of these preventing the UK achieving its long-term carbon commitments. Hence, **Table 10.14** provides the context of the significance of emissions associated with the Proposed Development, in the context of the UK and Manchester’s ability to meet their respective carbon budgets.

Table 10.14: Construction-related emissions within the context of the local and national carbon budgets.

Emissions Source	Emissions (MtCO ₂ e)	Total Construction Emissions (MtCO ₂ e)	Manchester Carbon Budget (%)	UK Carbon Budget (%)	Full Assessment Provided In:
Upfront Carbon	0.034	0.034	1.24%	0.003%	Appendix 10.2
Significance:			Minor Adverse (Not Significant)	Negligible (Not Significant)	N/A

10.94 The results in **Table 10.14** identify an estimated contribution of 0.034 MtCO₂e construction related emissions. This equates to a 1.24% portion of the relevant Manchester carbon budget and a 0.003% portion of the broader UK carbon budget for the budget periods covering the project's construction period (2024-2026). The impact that these emissions are assumed to have (prior to mitigation) on Manchester and the UK's ability to meet their respective carbon budgets is identified as **Minor Adverse (Not Significant)** and **Negligible (Not Significant)**, respectively.

10.95 It is worth noting that the UK carbon budgets have not yet been updated following the change in the UK Climate Change Act from an 80% reduction by 2050, to a 100% reduction by 2050. In practice the annual levels at which the UK can emit GHGs between now and 2050 will be reduced from those in the current budgets. However, given the small contribution of the Proposed Development to the national carbon budget it is not expected to compromise the ability of the UK to meet its national targets.

The Completed and Operational Development

Greenhouse Gas Emissions

10.96 Over the assumed 60-year design life period, operational emissions can be expected to be generated from various sources, noted in **Table 10.15**.

10.97 During the operation phase of the Proposed Development, use-related emissions will contribute significantly to whole life emissions of the project. Key impact areas include provision of heating and cooling in buildings included within the Proposed Development, material replacement (WLC embodied carbon) and operational waste.

10.98 Note that the assumption that all waste generated by the project will be sent to landfill, holds significant implications for the operational waste emissions calculations. A waste management strategy demonstrating intentions to segregate waste has been developed for the project's operational phase, however, the portion of waste to be recycled is not reflected in the forecast waste quantities. Hence, a worst case scenario approach was required for the assessment. Noting this, indication of a plan ensuring waste is separated where possible will mitigate a large portion of the emissions associated with each building's waste.

10.99 **Appendix 10.2** provides a full breakdown of operational emissions and data sources used to complete the assessment.

Table 10.15: Total GHG emission attributed to the Development's operational phase

Emissions Source	Associated emissions estimates (MtCO ₂ e)	Full Assessment Provided In:
WLC Carbon	0.017	Appendix 10.2, 10.6.1 and 10.6.2
Building Energy	0.002	Appendix 10.2, 10.3 and 10.4
Operational waste	0.018	Appendix 10.2 and 10.5
Total	0.036	

10.100 To provide context, the operational emissions associated with the Proposed Development are considered in relation to the UK and Manchester's ability to meet their respective carbon budgets, as shown in **Table 10.16** below.

Table 10.16: Emissions from completed Development within the context of the local and national carbon budgets.

Emissions Source	Emissions (MtCO2e)	Total Operational Emissions (MtCO2e)	Manchester Carbon Budget (%)	UK Carbon Budget (%)	Full Assessment Provided In:
WLC Carbon	0.017	0.036	1.22%	0.002%	Appendix 10.2, 10.3, 10.4, 10.5, 10.6.1, and 10.6.2.
Building Energy	0.002				
Waste	0.018				
Significance			Minor Adverse (Not Significant)	Negligible (Not Significant)	N/A

10.101 The results in **Table 10.16** indicate an estimated total contribution of 0.036MtCO₂e as a result of the Proposed Development's operational phase. This equates to a moderate portion of 1.22% of the Manchester carbon budget and a minor adverse 0.002% portion of the broader UK carbon budget for the budget periods covering the buildings' operational periods (2026-2086). The impact that these emissions are assumed to have on the local Manchester area's ability to meet its net zero trajectories are considered to be potentially **Moderate Adverse (Significant)**. The impact the Proposed Development is considered to have on the broader UK carbon budget's trajectory is **Minor Adverse (Not Significant)**.

Table 10.17: Summary of GHG emissions assessment considering impact of significance against Manchester and UK carbon budgets (see Appendix 10.2)

Phase of Development	Emissions Source	Emissions (MtCO ₂ e)	Total (MtCO ₂ e)	Manchester Carbon Budget (%)	UK Carbon Budget (%)
Construction	Upfront Carbon	0.034	0.034	1.24% Minor Adverse (Not Significant)	0.003% Negligible (Not Significant)
Operation	WLC Carbon	0.017	0.036	1.22% Minor Adverse (Not Significant)	0.002% Negligible (Not Significant)
	Building Energy	0.002			
	Waste	0.018			
Total		0.070		1.46% Minor Adverse (Not Significant)	0.002% Negligible (Not Significant)

10.102 In summary (as per **Table 10.17**), project related emissions are estimated to contribute 0.070MtCO₂e of additional GHG emissions as a result of the Proposed Development. This equates to a **Minor Adverse (Not Significant)** (1.46%) of the local Manchester area's carbon budget, and a **Negligible (Not Significant)** portion (0.002%) of the UK's carbon budget.

10.103 Overall, the Proposed Development is considered to pose a potentially **Minor Adverse (Not Significant)** effect in relation to the local Manchester area's ability to meet its carbon budget, and a **Negligible (Not Significant)** effect in relation to the UK carbon budget's trajectory.

Climate Change Resilience

10.104 **Table 10.18** below identifies the likely climate change hazards imposed on the Proposed Development. The effects of these hazards are assessed prior to any mitigation measures embedded into design, if receptors were to be exposed to the identified risks without interference. It is necessary to understand how and to what extent the initial hazards impose on the site geographically. A significance of effect averaged across all building components is identified for each hazard. The full analysis underpinning this assessment is provided in **Appendix 10.1**.

Table 10.18: Climate Change hazards imposed on the Proposed Development

Nature of Hazard	Receptor 1: Building	Receptor 2: Public Realm
	Architectural / Structural Thermal expansion of building materials. Decreased service life of building components and accelerated	Architectural / Structural Overheating of public spaces making them uncomfortable for users.

Nature of Hazard	Receptor 1: Building	Receptor 2: Public Realm
Increasing average / maximum temperatures	deterioration of the façade through UV exposure. Increased UV exposure may result in deterioration of flexible elements (e.g. sealants). Building Services 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. Landscape & Ecology Roof top and green wall vegetation may brown and die, leading to increased irrigation costs and / or replacement.	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. Building Services Regional power outages resulting in temporary disruption to street lighting. Civils & Infrastructure Access roads and surfaces such as asphalt can become susceptible to permanent deformation. Landscape & Ecology 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 Effect: Moderate Adverse (Significant) in the long term at the local level.	Average Effect: Moderate Adverse (Significant) in the long term at the local level.
Intense rainfall events / Precipitation	Architectural / Structural Drainage and guttering overwhelmed by intense rainfall events resulting in water ingress into building envelope. Building Services	Architectural / Structural Overwhelming of building guttering and drainage system could result in water falling into access routes and public realm spaces. Building Services

Nature of Hazard	Receptor 1: Building	Receptor 2: Public Realm
	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. Civils & Infrastructure Overwhelming of building guttering and drainage system could result in water falling into access routes and public realm spaces overwhelming local drainage systems. Landscape & Ecology Waterlogging of landscaped areas on the rooftop.	Sci-Tech Area: High temperatures resulting in temperature-controlled areas operating outside of required temperature thresholds. Chemicals being stored outside of their optimum storage temperature resulting in wastage Temperature, humidity and pressure sensitive equipment operating outside of thresholds resulting in inaccuracies in results, premature degradation and replacement of equipment. Civils & Infrastructure Changes in peak rainfall events could increase the volume of surface water runoff leading to water overflowing into access roads. Landscape & Ecology 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 on-Site.
	Average Effect: Moderate Adverse (Significant) in the medium / long term at the local level.	Average Effect: Minor Adverse (Not Significant) in the medium term at the local level.
Flooding	Architectural / Structural Accessibility into the building may be restricted and routes to the science park disrupted during flooding. Building Services 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. Civils & Infrastructure Foundations and substructure not designed to accommodate changing weather and groundwater conditions.	Civils & Infrastructure Flooding and onsite water ponding resulting in manholes and service trenches being unable to be accessed. Landscape & Ecology Waterlogging and surface ponding of landscaped areas.

Nature of Hazard	Receptor 1: Building	Receptor 2: Public Realm
	Average Effect: Minor Adverse (Not Significant) in the medium / long term at the local level.	Average Effect: Minor Adverse (Not Significant) in the medium / long term at the local level.
Wind	Architectural / Structural Building material resistance to wind resulting in swaying through building, external facade features that may produce nuisance noises due to strong wind, and other features that may affect internal comfort. Nearby debris (roof shingles, unsecured furniture, branches from fallen trees) picked up by wind may be projected against building envelope and roof equipment (if MEP). Higher likelihood of wear and tear of building materials. Building Services Extended periods of wind events can lead to regional disruptions to electrical distribution and results in power outages for buildings onsite. Regional power outages / shutdowns resulting in loss of electrical heating in building. Roof-mounted equipment to be damaged by strong wind.	Architectural / Structural Strong wind in public spaces making them uncomfortable for users. Non-stationary furniture (chairs, umbrella stands, etc.) blown away by strong wind. Civils & Infrastructure Regional power outages / shutdowns resulting in temporary disruption to street lighting. Landscape & Ecology Fallen trees a safety hazard for passers-by and building users. Roosting habitats and planting species around site may be harmed by wind or fallen trees as a result of wind.
	Average Effect: Minor Adverse (Not Significant) in the medium term at the local level.	Average Effect: Minor Adverse (Not Significant) in the medium term at the local level.
Snowing / Snowstorms	Architectural / Structural 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. MEP equipment at roof level - accessibility of equipment. Building Services Extended periods of snowfall / storm events can lead to regional disruptions to	Architectural / Structural MEP equipment at roof level - accessibility of equipment. Building Services Regional power outages / shutdowns resulting in temporary disruption to street lighting. Civils & Infrastructure Restricted accessibility of transport. Surface run off around public realm.

Nature of Hazard	Receptor 1: Building	Receptor 2: Public Realm
	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 the buildings' 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. 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 Effect: Minor Adverse (Not Significant) in the medium / long term at the local level.	Average Effect: Minor Adverse (Not Significant) in the medium / long term at the local level.

Additional Mitigation

Demolition and Construction

Greenhouse Gas Emissions

- 10.105 As no significant adverse effects have been predicted mitigation measures are not required. However, several measures are identified below that would assist in reducing the amount of GHG emitted as a result of the Proposed Development.

Construction Materials

- 10.106 Given the scale of the Proposed Development and the current programme for the ongoing design and construction, there will be opportunities to reduce the GHG emissions associated with site activities and material procurement. As such the following materials selection strategies should be considered and are outlined in more detail in Appendix 10.6:

- The lowest embodied carbon content (i.e. high cement replacement concrete mixes, steel alternatives, high recycled content materials, etc.);
- Materials sourced as close to the Proposed Development as possible, in order to minimise transport related emissions;
- Less volume required overall (i.e. design optimisation); and
- Pre-assembled or partially pre-assembled where possible, to mitigate unnecessary time spent on installation on site.

10.107 Consideration must also be given to each materials' end of life impact and alignment with a circular economy during design.

Construction Plant and Office Operations

10.108 At this stage of the planning process, there is little detailed information with regards to specific plant and site office requirements. Until such a point where a construction contractor has been appointed this is not something that can be accurately estimated.

10.109 Measures that would reduce GHG releases are minimising fuel combustion plant with grid connected lighting, electric plant, including emissions mitigation measures in a Construction Environmental Management Plan (CEMP) (i.e. use of low emission plant, switching all plant off when not in use).

Workforce Commuting

10.110 At this stage, there is no construction contractor appointed, so commitments made on workforce incentives to encourage public and active transport commuting during construction cannot yet be confirmed. However, these will likely be included in the project Construction Environmental Management Plan (CEMP) or similar.

10.111 Measures that would reduce GHG releases are ensuring the right facilities are available (i.e. adequate showers & changing rooms), encourage uptake of the cycle-to-work scheme, encouraging public transport use to mitigate private transport use and where possible employ a local workforce to limit travel distance.

The Completed and Operational Development

Greenhouse Gas Emissions

10.112 As no significant adverse effects have been predicted mitigation measures are not required. However, several measures are identified below that would assist in reducing the amount of GHG emitted as a result of the Proposed Development. Further details are also provided in the Appendix 10.6 and the Energy & Sustainability Strategy.

Building Energy Consumption

- 10.113 Operational energy from building use is expected to be the greatest portion of the Proposed Development's emissions impact. Continued decarbonisation of the grid is expected to gradually reduce the footprint of grid sourced electricity in the future.

Operational Traffic

- 10.114 Mitigation of emissions from user and staff travel will be developed in full as part of a Full Travel Plan to be prepared prior to occupation. A Framework Travel Plan, setting out the principles to which a more detail Travel Plan will have to adhere is provided at **Volume 3: Appendices, Appendix 11.2**. The Framework Travel Plan is expected to provide further details of targeted mode share, supplemented with a travel survey and monitoring regime.

Operational Waste

- 10.115 The operational waste strategy (as set out in the Energy & Sustainability Strategy) provides appropriate levels of waste storage and separation to optimise the facilities' abilities to separate waste for recycling and divert waste from landfill. This will also assist in managing waste streams, enabling recycling and reuse, and limiting the frequency of waste collection. This will assist the Proposed Development in achieving their waste management objectives and development-specific waste targets. Further, an operational waste management plan, including a waste hierarchy, monitoring and reporting framework needs to be considered during operation of both buildings.

Climate Change Resilience

- 10.116 Additional mitigation in relation to climate resilience refers to the mitigation measures specific to the maintenance and operational phase of the Completed Development. Such measures will be implemented when climate hazards (identified in Table 10.18) would occur.

Increasing Average / Maximum Temperatures

Architectural / Structural

- 10.117 **Both:** Extensive tree planting and ornamental planting throughout public realm will lower air temperatures, helping to combat the 'urban heat island' effect and provide areas of shade in hot weather. Seating and benches to have timber tops to maintain comfortable seating temperatures in hot weather.

Building Services

- 10.118 **PBSA:** Onsite generators are on standby but only for fire/safety emergencies.
- 10.119 **Sci-Tech:** Emergency lighting for the building will be standard battery backed emergency lighting with three hours duration.

Landscape & Ecology

- 10.120 **Both:** Tree and ornamental planting to incorporate variety of native species alongside non-native varieties. Proposals avoid large planting areas with monoculture of species. All planting types to include range of varieties to limit the impact and spread of diseases. Planting selection to consider both periods of drought and wet weather conditions to ensure suitable establishment and longevity.
- 10.121 **PBSA:** Planting in roof terrace to incorporate species tolerant to periods of drought.

Wind

Architectural / Structural

- 10.122 **Both:** Extensive tree planting is proposed throughout the public realm offering buffering to prevailing winds. Tree planting positions are staggered to avoid any channelling of winds. All street furniture will be stationary and fixed down, to be specified in the next stages.

Building Services

- 10.123 **Sci-Tech:** Backup generation is provided for life safety services.

Landscape & Ecology

- 10.124 **Both:** Detailed management regime will ensure operatives will check tree guying whist roots are establishing a regular interval and after strong winds. Any damages to planting or habitats will be identified as part of the management and maintenance of the Site. This will be undertaken regularly and will be identified as part of a detailed management and maintenance strategy.

Snowing / Snowstorms

Architectural / Structural

- 10.125 **Both:** Detailed management regime will ensure on site operatives will check surfacing and furniture throughout winter months ensuring they are clear of snow and fit for purpose. Access and maintenance strategy is designed with specialist.

Building Services

- 10.126 **Both:** Building management to conduct gritting to prevent snow build-up. Mats to be placed inside entrance door. Detailed management regime will ensure on site operatives will check surfacing and furniture throughout winter months ensuring they are clear of snow and fit for purpose.

Civils & infrastructure

10.127 **Both:** Maintenance strategy to include treating snowy surfaces to reduce severance from public highway.

Likely Residual Effects of the Development and their Significance

Demolition and Construction

Greenhouse Gas

- 10.128 In the presence of mitigation measures, residual GHG emissions associated with the Proposed Development will remain as **Negligible (Not Significant)** in the context of both the UK carbon budget, and **Minor Adverse (Not Significant)** for the local Manchester carbon budget.
- 10.129 It is not considered that these emissions will compromise the ability of the UK or the City of Manchester to meet their carbon budgets for the project's construction period, nor contribute significantly to cumulative GHG emissions and climate related impacts more broadly.
- 10.130 The construction phase measures identified in the 'Additional Mitigation' section of this ES chapter have the potential to further reduce carbon emissions associated with the Proposed Development.

The Completed and Operational Development

Greenhouse Gas Emissions

- 10.131 Opportunities to further mitigate operational emissions, particularly in relation to operational waste, will need to be confirmed in subsequent design stages. This, and adoption of any additional mitigation measures, will reduce emissions.
- 10.132 After proposed mitigation measures are adopted the operational emissions are likely to remain as a **Minor Adverse (Not Significant)** impact on the local Manchester area's ability to meet their carbon budget. In addition, the impact the Proposed Development is considered to have on the broader UK carbon budget's trajectory will likely remain **Negligible (Not Significant)**.

Climate Change Resilience

- 10.133 The residual effects on the Proposed Development arising from climate change hazards following implementation of the embedded and additional mitigation measures are set out in **Table 10.19**. **Table 10.19** describes the likely significant effects 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 addressed to identify the likely outputs developed by the Design Team – simultaneously highlighting responsibilities within the Design Team in addressing each mitigation measure.

Table 10.19: Residual Effects Summary

Description of Effect		Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
Demolition and Construction				
GHG Emissions	Contribution towards Manchester's Carbon Budget	Minor Adverse (Not Significant)	Proposed within the WLC report	Minor Adverse (Significant)
	Contribution to the UK's Carbon Budget	Negligible (Not Significant)	Proposed within the WLC report	Negligible (Not Significant)
Climate Resilience	N/A	N/A	N/A	N/A
The Completed and Operational Development				
GHG Emissions	Contribution towards Manchester's Carbon Budget	Minor Adverse (Not Significant)	TBC – not available at current design stage.	Moderate Adverse (Significant)
	Contribution to the UK's Carbon Budget	Negligible (Not Significant)	TBC – not available at current design stage.	Minor Adverse (Not Significant)
Climate Resilience	Increasing average / maximum temperatures	Moderate Adverse in the long-term at the local level (Significant)	Mitigation measures already embedded.	Minor Adverse in the long-term at the local level (Not Significant)
	Intense rainfall events	Moderate Adverse in the medium / long term at the local level (Significant)	Mitigation measures already embedded.	Minor Adverse in the long term at the local level (Not Significant)
	Flooding	Minor Adverse in the medium / long term at the local level (Not Significant)	Mitigation measures already embedded.	Minor Adverse in the long term at the local level (Not Significant)
	Wind	Minor Adverse in the medium / long term at the local level (Not Significant)	Detailed management regime will ensure operatives will check tree guying whilst roots are establishing a regular interval and after strong winds	Negligible in the long term at the local level (Not Significant)

Description of Effect		Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
	Snowing / Snowstorms	Minor Adverse in the medium / long term at the local level (Not Significant)	PBSA: Passive heating on external sunlight Building management to conduct gritting to prevent snow build-up. Maintenance strategy to include treating snowy surfaces to reduce severance from public highway.	Negligible in the long term at the local level (Not Significant)

Conclusions

- 10.134 In summary, as per **Table 10.17**, project-related emissions are forecast to contribute 0.070MtCO₂e of additional GHG emissions over the operating life of the Proposed Development. This equates to a **Minor Adverse (Not Significant)** 1.46% portion of the local Manchester area's carbon budget, and a **Negligible (Not Significant)** 0.002% of the broader UK's carbon budget.
- 10.135 This assessment has been completed taking into account the embedded mitigation and Development strategies as used within the models. However, the implementation of additional mitigation measures, particularly regarding construction materials selection and waste management during the operational period, are likely to reduce the Proposed Development's residual significance. Within the context of the UK's carbon budget requirements and net zero trajectory, the Proposed Development is considered to contribute a **Negligible (Not Significant)** impact. The adoption of mitigation measures will likely maintain this level of significance of impact.
- 10.136 This chapter has assessed the environmental impact of Climate Change associated with the Proposed Development. A review of current legislation, national and local policy has been undertaken which has allowed an assessment of the potential risks posed to the Proposed Development from Climate Change.
- 10.137 Climate projections present adverse outlooks on the climate in the near future without immediate and radical mitigation. An assessment for future climate impacts and risks have been undertaken based on the data available publicly, on two probable future emissions scenarios. Significant risks identified include increasing average or maximum temperatures, intense rainfall events, flooding, wind and snow.
- 10.138 The mitigation measures against the two receptors (public realm and building) are considered against the timescale of the project and mitigation would be most usefully implemented. As the Proposed Development undergoes changes throughout the design stages, mitigation measures will adapt subsequently.
- 10.139 The residual effects of the Proposed Development following the implementation of the embedded mitigation measures have been estimated to be *Minor Adverse in the medium / long term at the local level* – however, regular monitoring of Design Team progress and developments is to be expected to re-assess the identified risks.

10.140 This chapter demonstrates how the design, as far as reasonably practicable, maximises resilience to climate change, maximises the potential for adaptation to climate change in the future, and minimises the risk of loss of operational performance due to the impacts of climate change on interdependent infrastructure.

Assessment of Cumulative Effects and their Significance

Greenhouse Gas Emissions

10.141 A Cumulative Effects Assessment (CEA) of the GHG emissions of the Proposed Development and the Cumulative Schemes has not been carried out as part of this chapter. This is due to:

- All GHG emissions being inherently cumulative, i.e.:
 - The impacts arising from increased GHG emissions is the result of aggregation and increased concentration of GHGs within the global atmosphere. As such the specific location of the GHG emission source is not relevant to the impacts arising from it.
 - The impacts of climate change on a given location arise from the aggregated GHG levels in the global atmosphere, not from the magnitude of GHG emissions in the local area.
- The receptor for the effects of increased GHG emissions (the global atmosphere) is not geographically constrained, and as such a Study Area cannot be defined for the purposes of the CEA. This accords with the IEMA Guidance.
- It is assumed that each Cumulative Scheme will seek to implement best practice measures in the form of embedded mitigation to limit their GHG emissions.

Climate Resilience

10.142 The Proposed Development includes measures to ensure its resilience to the effects of climate change as identified in this chapter. None of these measures will prevent any of the other developments within the Cumulative Scheme from incorporating measures to ensure their resilience to climate change. Further, taken together, there will be an increase in climate resilience within the building stock within Manchester. However, the Proposed Development and the identified Cumulative Schemes form only a very small proportion of the built stock in Manchester and as such would have a combined negligible effect on the resilience of built stock across the city.

In-Combination Climate Change Effects

10.143 **Volume 2: Main Text, Chapters 6 – 11** were examined by Cundall to determine whether the significance of any of the effects identified within this chapter in relation to climate change resilience would be affected by the potential effects identified within the other technical ES chapters. No in-combination climate change effects were identified within:

- **Volume 2: Main Text, Chapter 6: Townscape, Visual and Built Heritage;**

- **Volume 2: Main Text, Chapter 7: Socio-economics;**
- **Volume 2: Main Text, Chapter 8: Wind Microclimate;**
- **Volume 2: Main Text, Chapter 9: Daylight, Sunlight and Overshadowing; and**
- **Volume 2: Main Text, Chapter 11: Transportation.**

11. Transportation

Introduction

- 11.1 This chapter assesses the effects of the Proposed Development upon transportation. In particular, it identifies and assesses the anticipated effects of change resulting from the Proposed Development on receptors sensitive to changes in the amount and operation of transportation.
- 11.2 The chapter describes the methods used to assess the likely significant effects, the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect effects of the Proposed Development arising from motorised vehicle traffic generated by the development during the construction and operational phases, the mitigation measures required to prevent, reduce, or offset the identified significant effects and the residual effects. It has been written by Civic Engineers.
- 11.3 This chapter is supported by the following technical appendices (see **Volume 3: Appendices**).
- **Appendix 11.1:** Transport Assessment;
 - **Appendix 11.2:** Framework Travel Plan; and
 - **Appendix 11.3:** Construction Stage Vehicle Movement Calculations.

Assessment Methodology and Significance Criteria

Assessment Methodology

- 11.4 The aim of the assessment is to identify, as far as reasonably possible, the nature of the transport changes within the area of the Proposed Development, to assess the significance and to identify mitigation measures to reduce any significant effects identified.
- 11.5 The Transport Assessment (TA) at **Appendix 11.1** considers the traffic impacts during the operation of the Proposed Development.
- 11.6 The content of the TA, including trip rates, has been agreed with Manchester City Council (MCC) and Transport for Greater Manchester (TfGM), detailed in **Table 11.3** below. Any comments from the highway authorities have been given due consideration as part of the TA.

Desktop Study

- 11.7 Various online resources were used to gather data for the report, the specific details of which can be found below.

Local Highway Network

- 11.8 An initial site visit was carried out to assess the Local Highway Network surrounding the site. Any information gathered about Traffic Regulation Orders (TROs) in the area was combined with online map data to provide an analysis of the network.

Highway Safety

- 11.9 Details of collisions in the area surrounding the Site are taken from crashmap.co.uk for the five years up to and including 2021, the most recent year for which data is available. Data on this site is collected from the official data published by the Department for Transport which is based on records they receive from police forces across the UK. It only provides information about collisions that happen on public roads, are reported to the police and that are subsequently recorded. While fatal accidents are almost always known to the police, there are a considerable proportion of non-fatal collisions that are not reported. Collisions are categorised by injury severity, all of which are analysed in the initial assessment. Results can also be filtered by casualty type to help identify any trends in the data, collisions involving pedestrians, cyclists and motorcycles are each looked at individually.

Walking Links

- 11.10 A site visit and walk around the area is used to assess the walking network in the area. Details including street lighting, footway conditions and widths, locations of pedestrian crossings, and the types of crossings that are present are taken from online sources. Hazards in the area (e.g. cars parked on the footway) are also noted along with any obstacles or route severance that is present.

Cycle Links

- 11.11 TfGM publish a map of all the cycle routes around the city. This is used to inform the assessment about cycle routes in the area. The maps provide up to date details of traffic free routes, on-road routes (segregated / signposted / advisory etc.), streets that have 20mph limits, and the locations of cycle parking. With rapid recent change in the cycle network in Manchester to support sustainable journeys, the map is in some locations out of date, with better provision now available. For this, Google Street View / satellite information is used.

Public Transport Links

- 11.12 Information on transport links in the area was gathered using information from TfGM and National Rail. TfGM provide details of bus and tram services operating in the city while National Rail provide information on the rail services in and out of the city.

Identification of Sensitive Receptors

- 11.13 For both the construction and operational phases, the receptor has been identified as road users i.e. pedestrians, cyclists and motorists. For the purposes of this assessment, the receptor is considered to be of high sensitivity, thus providing the most robust assessment of environmental effects.

Magnitude of Change

- 11.14 A summary of the criteria that have been used to determine magnitude of change from the baseline conditions as a result of the proposed development are set out in **Table 11.1** below. It should also be noted however, that the absolute effect is also important e.g. the total flow of traffic or HGVs on a link. This is because an increase of 100% in the traffic flow on a road is likely to lead to an insignificant impact if the existing flows are low. Where this is applicable, professional judgement is applied and commentary provided.

Table 11.1: Matrix of Magnitude of Change

Impact	Magnitude of Change			
	Negligible	Minor	Moderate	Major
Severance	Change in total traffic or HGV flows of less than 30%	Change in total traffic or HGV flows of 30 – 60%	Change in total traffic or HGV flows of 60 – 90%	Change in total traffic or HGV flows of over 90%
Pedestrian Delay	Two-way traffic flow <1400 vehicles per hour	A judgement based on the road links with two-way traffic flows exceeding 1400 vehicles per hour, in the context of individual characteristics		
Pedestrian Amenity	Change in total traffic or HGV flows <100%	A judgement based on the routes with >100% change in traffic flows, in the context of individual characteristics		
Driver Delay	Change in total traffic or HGV flows of less than 30%	Change in total traffic or HGV flows of 30 – 60%	Change in total traffic or HGV flows of 60 – 90%	Change in total traffic or HGV flows of over 90%
Accidents and Safety	<10% change in traffic volumes (AADT) where there is a significant accident occurrence	10-20% change in traffic volumes (AADT) where there is a significant accident occurrence	20-30% change in traffic volumes (AADT) where there is a significant accident occurrence	>30% change in traffic volumes (AADT) where there is a significant accident occurrence

Characterisation of Impact

- 11.15 Impacts consider the following, including details of how the impacts are categorised in terms of positive or negative; extent; magnitude; duration; timing; frequency; reversibility; and likelihood:

Severance

- 11.16 Severance is defined in the Design Manual for Roads and Bridges (DMRB) as “the separation of residents / site users from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows”. Developments cause severance when they cut existing routes by placing physical obstructions in the way of pedestrians, cyclists, or vehicular traffic. Severance is generally a negative impact. Conversely, developments can improve connectivity by creating new routes, which have a positive impact. The change in route length will determine the extent and magnitude of the impact. The duration, timing and reversibility of the impact will depend on whether the change is temporary, during the construction phase, or permanent. Because creating

or severing routes requires physical infrastructure, it is possible to clearly state the likelihood of this impact occurring.

Driver Delay

- 11.17 It is considered that driver delay contributes to the level of driver stress, outlined in the DMRB as having three principal elements: frustration, fear of potential accidents and uncertainty relating to the route being followed. It is recognised that the weight of these factors varies depending on the driver. For example, those who drive for commuting purposes will often have a higher stress threshold, due to route experience and knowledge, compared to those who may only drive on a route occasionally for leisure purposes. An increase in vehicle journey times (driver delay) can be caused by developments through either changes to the highway network, for example, introducing a new junction, or by the addition of traffic generated by the new development. Generally, driver delay is perceived to be negative, although it can result in slower vehicle speeds which can have a positive impact on road safety (see below), or discouraging people from driving. The extent of the impact is measured by looking at the trip distribution across the wider highway network. Generally, the further away from the development, the more the development traffic disperses, and the impact has less magnitude. Weekday morning and afternoon peak hours are considered because these are the times when the development will generate most trips and when the network is at its busiest. Vehicle trip generation estimations are based on the Trip Rate Information Computer System (TRICS) database and data from the 2011 and 2021 Census, and use of TfGM mode share data. Actual trip generation may differ depending on the availability of car parking, availability of alternative modes of transport and the measures implemented through the Framework Travel Plan at Appendix 11.2 (which accompanies this planning application) which will reduce the need to travel and encourage and enable residents and people working at the development to choose modes of transport other than the private car. Therefore, while it is possible to estimate the impacts on journey time, there is the possibility that the actual impacts may differ. There is also potential for impacts to be reversed if fewer people choose to use the private car.

Pedestrian Delay

- 11.18 The Institute of Environmental Management and Assessment (IEMA) guidelines describe how changes in the volume, composition or speed of traffic have the potential to affect the ability of people to cross roads. Changes to pedestrian journey times can be either positive (shorter or less busy) or negative (longer and busier). The magnitude of the impact is usually greater immediately surrounding the development because both pedestrians and development-related vehicular traffic quickly disperse through the network of streets, especially in a city centre. Weekday peak hour trip generation is assessed as this represents the periods when the development will generate the most trips, as well as when the surrounding streets are at their busiest with existing demand. Changes to pedestrian journey times are highly likely if they are caused by physical changes to the network but may fluctuate if caused by other pedestrians or vehicles.

Pedestrian Amenity

- 11.19 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition, footway widths and separation from traffic. Improvements to the landscape treatment (such as the introduction of street trees or benches) can have a positive impact on pedestrian amenity. An increase in traffic and reduction in footway widths would have a negative impact. The greatest impact will be in the immediate environs of the development where changes to the site frontage and landscaping will have a permanent effect on pedestrian amenity. Changes associated with traffic flows generated by the development will depend on the time of day and the way that people choose to travel.

Accidents and Safety

- 11.20 The IEMA guidelines state that an assessment of road safety on the highway network should be undertaken based on recent personal injury accident (PIA) records. An increase in traffic is generally understood to increase the likelihood of an accident occurring. The severity of the impact will depend on vehicle speeds and the specific characteristics of the accident. An increase in road safety incidents is negative. A development can have a positive impact on road safety by reducing the number of conflict points or by managing these conflict points to engender slower vehicle speeds or warn pedestrians, particularly those with disabilities, about the potential hazard, for example by installing tactile paving at a pedestrian crossing. As the occurrence of an accident is *"an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury"*, it is difficult to predict the timing or frequency of any incidents. Mitigation measures that influence the impact of the development on accidents and safety can include measures to reduce vehicle speeds and traffic volumes.

Hazardous Loads

- 11.21 The assessment considers whether hazardous load movements will be required as part of the life cycle of the proposed development, and the potential effect this may have related to transport and access. Hazardous loads are more likely to be associated with the development during the demolition and construction phases and are unlikely to occur, even temporarily, during the operation of the proposed development. Risks associated with hazardous loads are generally considered to be negative.

Significance Criteria

- 11.22 As above, for both the construction and operational phases the receptor has been identified as road users i.e. pedestrians, cyclists and motorists. For the purposes of this assessment the receptor is considered to be of high sensitivity, thus providing the most robust assessment of environmental effects. The significance of change in traffic flow volume on road users for each of the environmental effects previously identified is considered in relation to the significance matrix of **Table 11.2**.

Table 11.2: Matrix of significance for the consideration of environmental effects

		Sensitivity of Receptor		
		High	Medium	Low
Magnitude of Change / Effect	Major	Major Adverse / Beneficial	Major – Moderate Adverse / Beneficial	Moderate – Minor Adverse / Beneficial
	Moderate	Major – Moderate Adverse / Beneficial	Moderate – Minor Adverse / Beneficial	Minor Adverse / Beneficial
	Minor	Moderate – Minor Adverse / Beneficial	Minor Adverse / Beneficial	Minor Adverse / Beneficial – Negligible
	Negligible	Negligible	Negligible	Negligible

11.23 Within the assessment, the level of magnitude will be defined on the basis of relevant guidance and the application of standard transport planning practice. Considering **Table 11.2** the following terms will be used to assess the significance of environmental effects:

- Major Adverse or Beneficial effect – where the Proposed Development would cause a significant improvement or deterioration to the receptor;
- Moderate Adverse or Beneficial effect – where the Proposed Development would cause a noticeable improvement or deterioration to the receptor;
- Minor Adverse or Beneficial effect – where the Proposed Development would cause a barely noticeable improvement or deterioration to the receptor; and
- Negligible effect – where the Proposed Development would cause no noticeable improvement or deterioration to the receptor.

11.24 Any links predicted to experience a change of traffic flow of less than 30% as a result of the Proposed Development are considered to be subject to negligible magnitude of change. In considering the level of significance, any impact which is of 'moderate effect' or 'major effect', has been considered as a significant effect.

Assumptions / Limitations

11.25 Detailed information regarding the construction methodology and total forecast construction traffic movements is not available so a qualitative assessment has been made.

- 11.26 At this stage it is not envisaged that any hazardous material will be exported from the Site. If at a later stage the investigations do find material considered as being hazardous then an appropriate risk assessment would be carried out so that any significant effects would be identified and appropriately mitigated.
- 11.27 This assessment considers trips generated by the PBSA and Sci-Tech element of the Proposed Development, as the proposed community space is ancillary and would not generate trips in its own right.

Consultation

- 11.28 Consultations that have taken place are shown in **Table 11.3**.

Table 11.3: Consultation

Consultee	Date	Comments	Actions
Manchester City Council	December 2022	Agreed scope of the Transport Assessment	TA produced as agreed
Transport for Greater Manchester	December 2022	Agreed scope of the Transport Assessment	TA produced as agreed
Manchester City Council	8 and 16 th March and 5 April 2023	Agreed Transportation should be scoped into the ES	Transportation Assessment to be provided in the ES

Baseline Conditions

- 11.29 This section describes the baseline conditions of the site and surrounding area; further detail is included in Section 2 of **Appendix 11.1**.

Local Highway Network

- 11.30 The A34 Upper Brook Street is a radial route to and from Manchester city centre. Adjacent to the Site, the carriageway is approximately 15.5m wide, consisting of two northbound and two southbound lanes and a central median. To the north of the Site, the central median is used as a third northbound lane.
- 11.31 Further north, the A34 provides a connection with the A57(M) the Manchester ring road and to the south connections can be made with the M56 and M60.
- 11.32 Cottenham Street is a local access road to the south of the Site, with a carriageway width of around 6m which accommodates two-way traffic and a line of parking on the south side which is for resident permit holders / 3-hour stay free parking.

- 11.33 Kincardine Road is a local access road. South of Whitekirk Close, it has a carriageway width of approximately 7.5m and is for northbound traffic only with a 1.2m contraflow cycle lane that is controlled by a modal filter. North of Whitekirk Close, the carriageway is approximately 7.5m wide and carries two-way traffic and has resident permit holders / 3-hour max pay and display parking on the east side.

Highway Safety

- 11.34 Data was examined for road traffic accidents in the vicinity of the Site that took place in the 5-year period to 2021, the most recent year for which data is available, and has been summarised in **Table 11.4**. In addition, the number of accidents involving pedestrians, cyclists or motorcyclists have been recorded.

Table 11.4: List of collisions on the streets surrounding the Site (2016 – 2021)

Location	All accidents – injury severity			Accidents comprising		
	Fatal	Serious	Slight	Pedestrian	Cycle	Motorcycle
UBS/Inchley Road junction	0	1	2	0	3	0
UBS between Inchley Road and Brunswick Street	0	0	2	1	0	0
UBS/Brunswick Street junction	0	1	3	1	1	1
Kincardine Road between Inchley Road and Brunswick Street	No accidents reported					

Walking Links

- 11.35 Pedestrian access to the Site can be made from the east, south, and west. Upper Brook Street has footways on both sides; adjacent to the Site, the footway is 2m wide. There is a staggered signal-controlled toucan crossing (pedestrians and cyclists) adjacent to the Site on Upper Brook Street, this crossing has dropped kerbs and tactile paving to assist people with limited mobility or sight and people with pushchairs or wheelchairs in crossing the road.
- 11.36 There are dropped kerbs at the junction of Cottenham Street and Upper Brook Street. Cottenham Street has a 2m footway on the north side of the street that extends around 60m from the junction with Upper Brook Street, at which point the footway narrows to around 1m and continues for a further 20m before terminating. The south

side of Cottenham Street has a 2m footway with dropped kerbs at the vehicle entrance to the building to the south; there are no dropped kerb crossings at Cabot Street to the east.

- 11.37 Kincardine Road has a 2m footway on the west side of the street south of Whitekirk Close, with an unpaved (grass verge) section around 20m to the north of the vehicle entrance to Elizabeth Yarwood Court. On the east side of the street, the footway is separated by the carriageway by an area of landscaping. North of Whitekirk Close, Kincardine Road has footways on both sides.
- 11.38 Within the wider area, there are signal controlled crossings on Upper Brook Street at key junctions. To the east of the Site, there are a network of footways and pedestrian paths through the residential area. To the west, there are a network of pedestrian paths providing connections through the University of Manchester's campus.

Cycle Links

- 11.39 Cycle access to the Site is provided from Upper Brook Street or Kincardine Road. To the west of the Site, there are traffic-free routes that connect with the on-road segregated cycle lane along Oxford Road which provides a direct route to the city centre to the north or to Rusholme and Withington to the south. Some other streets in the area have on-road routes that have other cycle facilities or are sign posted but with no facilities, like Kincardine Road. Although there are no dedicated cycle facilities on Upper Brook Street, other than crossing points, there are connections to the cycle network nearby.

Public Transport Links

- 11.40 There are 5 buses per hour in each direction from bus stops immediately outside the Site on Upper Brook Street. 350m away, on Oxford Road, there are stops served by 16 different bus services. Manchester Piccadilly Station, Manchester Oxford Road Station and tram stops are all within 1.2km (approximately a 15-20 minute walk from the Site) and are accessible by cycle and connecting bus services.

Sensitivity of Receptors

- 11.41 The receptor has been identified as road users i.e. pedestrians, cyclists and motorists. For the purposes of this assessment the receptor is considered to be of high sensitivity, thus providing the most robust assessment of environmental effects.

Embedded Mitigation

- 11.42 The appropriate mitigation measures have been explored at the design stage to eliminate, minimise or manage identified potential significant effects on the environment by the Proposed Development. Strategies of best practice for mitigation will be followed when considering the methods of dealing with the environmental impacts.
- 11.43 The assessment of transport and access impacts assumes that the measures outlined below will be implemented, with the initial significance of the impacts assessed on the basis that these embedded measures are effective.

The Completed and Operational Development

- 11.44 This section provides details of the mitigation measures ‘embedded’ into the Proposed Development.

Car-free Development

- 11.45 In line with scoping discussions, as detailed in **Appendix 11.1**, the Proposed Development is car-free except for disabled parking. The location of the Site, being adjacent to the well-established university campuses and its proximity to public transport and comprehensive cycle network justifies the car-free status. By not providing car parking on-site, users will be encouraged to travel by more sustainable modes.
- 11.46 This means fewer vehicle trips will be generated by the Proposed Development, mitigating the impact of the Proposed Development in terms of severance, driver delay, pedestrian delay, pedestrian amenity and road safety.

Cycle Parking and Trip-end Facilities

- 11.47 Cycle parking is proposed across the Proposed Development at a ratio of 1:4 for the PBSA building, and as per the adopted MCC policy for offices applied to the Sci-Tech building. Cycle parking will also be provided for visitors. Cycle parking has been designed to accommodate a range of sizes and models of cycle, and to be accessible.
- 11.48 Both buildings will provide cycle maintenance facilities, and the Sci-Tech building will have lockers, showers and changing areas to encourage people to cycle.

Sustainable Infrastructure

- 11.49 Inclusive access will be provided to the Proposed Development with well-signposted entrance points. Access to the buildings will accommodate the needs of all users, including those people with disabilities. This will have a positive impact on pedestrian amenity.
- 11.50 Furthermore, the Proposed Development will provide improved active frontage along Upper Brook Street and Kincardine Road when compared to the existing situation, in addition to high quality public realm. This will have a positive impact on pedestrian amenity.

Assessment of Likely Significant Effects

- 11.51 This section details the potential impacts of the Proposed Development and their significance. It covers the potential impacts, issues identified in the EIA Scoping Note (**Appendix 2.1**) and issues raised through consultations.

Demolition and Construction

- 11.52 Construction traffic will access the Site using the A34 Upper Brook Street, the A57(M), and either the M602, M60 or M62 to access the motorway network. These are all strategic roads designed to accommodate the movements of larger vehicles. The contractor may agree other routes with MCC depending on the origin of building

materials. Routing is shown on **Figure 11.1** and **Figure 11.2** below, taken from the Construction Environmental Management Plan (CEMP).

- 11.53 The Site will be primarily fed via the southbound A34 into a newly formed access gate.

Figure 11.1: Route from West: M602 – Mancunian Way – A34 South Bound

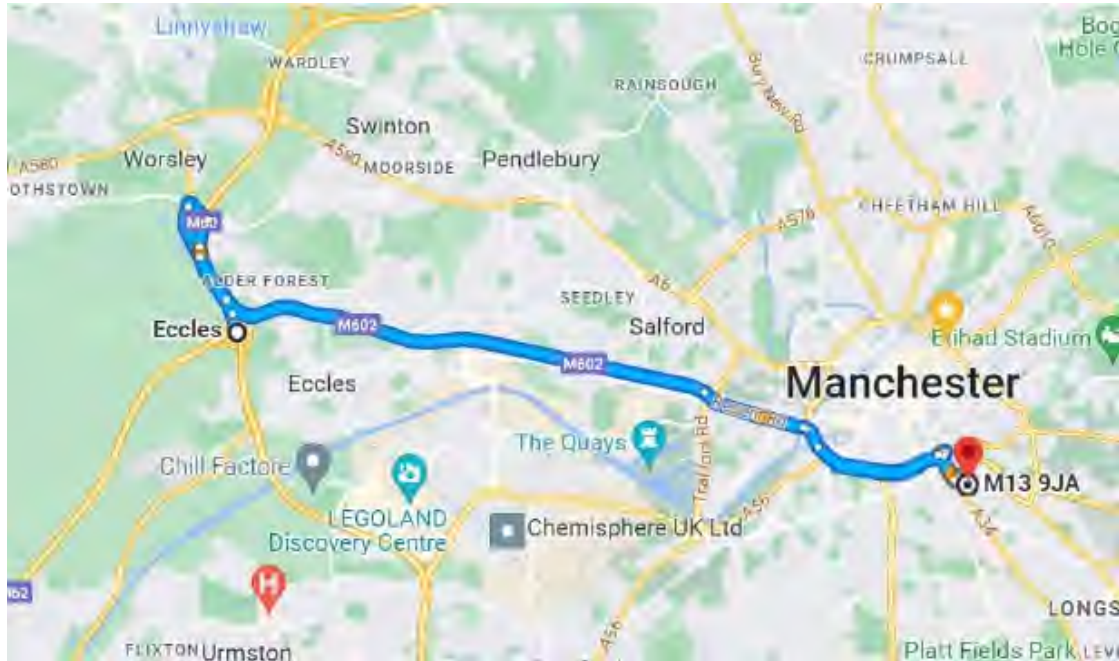


Figure 11.2: Route from North / East: M62 – M60 Clockwise – A57 Westbound



- 11.54 Traffic originating from the south, will be directed to travel either clockwise or anticlockwise on the M60 and then follow the above West (**Figure 11.1**) and North / East routes (**Figure 11.2**) into the City Centre and to the Site.
- 11.55 There will be an increase in traffic on the local highway network from construction workers travelling to work at the Site, this might be car or cycle traffic and will include additional pedestrians. There will be an increase in AADT flows of 101 resulting from travel to work, see **Appendix 11.3** for the breakdown of this calculation. These trips have been equally distributed to the 4 count points and other links considered in **Table 11.5**.
- 11.56 There will be an increase in HGVs on the local highway network associated with the construction and delivery of materials to site. An estimate has been provided by the programme manager at Buro Four, and the increase in AADT will be 54 HGVs, with a breakdown of this calculation provided at **Appendix 11.3**. These trips have been distributed on the network assuming an equal split between the three delivery routes described above, and the impact at the DfT count points and other links in the vicinity is presented in **Table 11.5**.
- 11.57 The total increase in AADT resulting from the construction and demolition phase of the development will be 156 total vehicles, of which 54 are HGV.

Table 11.5: Traffic Impact – Demolition and Construction

Location (DfT Count Point)	Construction Year		Demolition / Construction Traffic		Increase (%)	
	AADT					
	All	HDV	All	HDV	All	HDV
A34 Upper Brook Street (56493)	18,883	132	43	18	0.23%	13.70%
A6 Ardwick Green South (26157)	19,425	505	25	0	0.13%	0.00%
A57 Hyde Road (16544)	16,736	574	43	18	0.26%	3.15%
A6 Stockport Road (56136)	10,520	143	25	0	0.24%	0.00%
Kincardine Road at junction with Whitekirk Close	Kincardine Road is not proposed as the construction vehicle route for the Proposed Development.					
Brunswick Street at the junction with Kincardine Road	9,542	175	43	18	0.45%	10.33%

- 11.58 The impact of this temporary additional traffic on severance, driver delay, pedestrian amenity, pedestrian delay and accident and safety is expected to be **Negligible**, which is **Not Significant** in EIA terms, referring to the indices set out in **Table 11.1**.

The Completed and Operational Development

Severance

- 11.59 An opening year of 2026 is considered as the anticipated completion year of the development.
- 11.60 It was agreed with MCC and TfGM during the scoping process for the Transport Assessment produced for the planning application, that, as the Proposed Development is car-free, and located in a sustainable location, detailed trip distribution and junction modelling was not required, as confirmed in the Transport Assessment.
- 11.61 However, to give an indication of impact, traffic count data has been taken from the DfT website for count locations in the vicinity, and is provided in **Table 11.6**, along with the impact of the Proposed Development in terms of the number of trips and as a percentage (%). Traffic count data for Kincardine Road and Brunswick Street were taken from surveys carried out in 2023.

Table 11.6: Traffic Impact – the Completed and Operational Development

Location (DfT Count Point)	Opening Year AADT		Opening Year with Development AADT		Increase	
	All	HDV	All	HDV	All	HDV
A34 Upper Brook Street (56493)	18,883	132	18,891	132	0.04%	0.00%
A6 Ardwick Green South (26157)	19,425	505	19,431	505	0.03%	0.00%
A57 Hyde Road (16544)	16,736	574	16,754	574	0.11%	0.00%
A6 Stockport Road (56136)	10,520	143	10,526	143	0.05%	0.00%
Kincardine Road at junction with Whitekirk Close	1,352	14	1,375	15	1.67%	5.97%
Brunswick Street at junction with Kincardine Road	9,542	175	9,607	176	0.68%	0.48%

- 11.62 These increases in traffic are likely to be indiscernible when compared with day-to-day fluctuations in traffic and therefore the Proposed Development is considered to have a **Negligible** impact on severance which is **Not Significant** in EIA terms, when referring to **Table 11.1** which indicates that a change in total traffic or HGV flows of less than 30% has a Negligible impact.

Pedestrian Amenity & Pedestrian Delay

- 11.63 Increased numbers of pedestrian and cyclists on the local highway network are to be expected. Increased active travel will reduce the number of private vehicles generated by the Proposed Development.
- 11.64 Additional benefit will come from improved perception of safety due to more people using the streets surrounding the site, resulting in a positive impact on pedestrian amenity.
- 11.65 There will therefore be a permanent long-term impact on pedestrian delay, pedestrian severance and pedestrian amenity, It is not possible to quantify at this stage, as baseline pedestrian and cycling numbers are not known, but the impact would be at least **Negligible** to **Minor Beneficial**.

Driver Delay & Driver Stress

- 11.66 The potential impact of the Proposed Development on other road users is likely to be **Negligible**, which is **Not Significant** in EIA terms, with little increase in driver delay or driver stress expected, as the change in total traffic and HGV flows is much less than 30%, as referenced in **Table 11.1**.

Accidents & Safety

- 11.67 An increase in traffic is generally understood to increase the likelihood of an accident occurring. The increase in traffic associated with the Proposed Development is extremely low, as shown in **Table 11.6**, and therefore its impact on accidents and safety is likely to be **Negligible**, which is **Not Significant** in EIA terms, as per the criteria set out in **Table 11.1**, as the increase in traffic on the assessed links is less than 10%.

Additional Mitigation

- 11.68 The following paragraphs summarise the mitigation that will be implemented in order to reduce the likely significant environmental effects of changes in traffic flow volume as a result of construction and operation of the Proposed Development, while maximising the environmental benefits.

Demolition and Construction

- 11.69 While no significant construction traffic related effects have been identified, it is proposed that a Construction Environmental Management Plan (CEMP) will be produced and implemented by the appointed contractor in such a way as to minimise the impacts of construction traffic amongst other construction related effects.
- 11.70 The CEMP will include details of routing and the times of day of movements, which will be undertaken in accordance with best practice construction management processes. It will include details of acceptable practices with respect to vehicle movements.
- 11.71 During the construction period it is anticipated that associated traffic flows will not compromise the efficiency of the existing highway network. It is envisaged that the construction traffic would be managed through a CEMP which could include the following measures in order to further reduce the impact of the development traffic:
- Preferred routes for heavy good vehicles (HGVs) to and from the site to be identified and agreed with the local highway authority;
 - Any abnormal loads to be scheduled in consultation with both the local highway authorities and the local Constabulary and to be advertised well in advance in order to minimise possible disruption;
 - HGV movements to be confined to a designated operational period, the precise hours to be agreed with the highway authority;
 - The operator should ensure that all drivers are informed of the requirement to drive slowly and safely on approaches to the site. Supplementary road signs enforcing such instructions could also be erected, if this is felt necessary;
 - Warning signs indicating the presence of the site entrances and directing HGV traffic to be erected;
 - Car parking to be provided on-site for contractor vehicles; and

- Instructing HGV drivers that they are not to arrive at the site outside of the site's permitted period of operation and that they should not park / lay-over on the adjacent highway network.

11.72 Additional measures to be considered within the CEMP should include, but are not limited to, areas inclusive of:

- Construction Travel Plan;
- Agreed vehicle route plan;
- Agreed hours of operation; and
- Details of road cleaning.

11.73 It is anticipated that a planning condition requiring a CEMP be submitted and approved prior to construction works commencing will be attached to any planning consent to cover these aspects.

The Completed and Operational Development

11.74 As set out in the Embedded Mitigation section, the following mitigation is already embedded into the design of the Proposed Development:

- The Proposed Development is car-free;
- Cycle parking and trip end facilities (showers, changing areas, lockers) are provided; and
- New active frontage to encourage pedestrian / cycle trips.

11.75 Additional mitigation is set out below.

Crossing on Upper Brook Street

11.76 The Applicant is funding the review of the toucan (pedestrian and cycle) crossing on Upper Brook Street immediately adjacent to the Development, with a view to removing the stagger so that pedestrians and cyclists can cross in one movement, rather than having to wait in the middle in the current situation. This will make crossing easier for pedestrians and cyclists, reduce pedestrian delay, improve pedestrian amenity, improve road safety and reduce the severance impact of Upper Brook Street as it currently functions. Removing the stagger at the crossing may increase driver delay on Upper Brook Street. This will be assessed by TfGM and balanced against the other benefits of removing the stagger. Note that as this stretch of Upper Brook Street has signal-controlled junctions (at Booth Street to the north and Brunswick Street to the south), changes to the pedestrian crossing signals in between are unlikely to have a significant impact on overall driver journey times.

11.77 There may be driver delay caused by longer stopping times at the upgraded crossing on Upper Brook Street, this will be weighed against the impact on pedestrians and cyclists. As this stretch of Upper Brook Street has signal-controlled junctions (at Booth Street to the north and Brunswick Street to the south), changes to the pedestrian crossing signals in between are unlikely to have a significant impact on overall driver journey times. Any increase in driver delay is likely to encourage people to drive less, which will ultimately have a positive environmental impact.

It is likely that the provision of an upgraded crossing will have a positive impact on pedestrians and cyclists, who will be able to cross in one movement, and will not have to wait in the middle of the road. It is not possible to quantify at this stage, as baseline pedestrian and cycling numbers are not known, but the impact would be at least Negligible Beneficial.

Framework Travel Plan

11.78 The Framework Travel Plan (FTP) (provided at **Appendix 11.2**) prepared in support of the Proposed Development identifies potential measures to promote the available sustainable transport options to users of the Site and to minimise single occupancy car trips associated with the Proposed Development. The subsequent reduction in traffic will mitigate the impacts of the Proposed Development in terms of severance, driver delay, pedestrian delay, pedestrian amenity and road safety.

11.79 Sustainable travel measures proposed in the FTP include:

- Sustainable travel communications on moving-in and on-going;
- Cycle parking;
- Changing facilities at the Sci-Tech building;
- Cycle maintenance;
- Encouraging car share;
- Budget for staff travel incentives at PBSA;
- Tenant businesses at Sci-tech building encouraged to implement cycle to work and season ticket loan schemes; and
- Free cycle repair sessions.

Likely Residual Effects of the Development and their Significance

Demolition and Construction

11.80 The anticipated Transport and Access associated environmental effects on road users as a result of increased traffic levels associated with the demolition and construction phase of the Proposed Development are **Negligible** given their temporary nature and magnitude of effect which is **Not Significant**.

11.81 Following the introduction of the best practice construction mitigation measures it is concluded that the residual effects on road users will remain as **Negligible** which is **Not Significant**.

The Completed and Operational Development

- 11.82 The Transport and Access associated environmental effects on road users as a result of increased traffic levels associated with the operational phase of the Proposed Development are **Negligible** given their magnitude of effect which is **Not Significant**.
- 11.83 Following the introduction of the operational mitigation measures it is concluded that the residual effects on road users will remain as **Negligible** which is **Not Significant**.

Table 11.7: Residual Effects Summary

Description of Effect	Potential Effect including Significance	Additional Mitigation Measures	Residual Effect including Significance
Demolition and Construction			
Severance	Negligible (detailed assessment not required)	Production of Construction Environmental Management Plan. Key principles adhered to.	Negligible (Not Significant)
Driver Stress			
Pedestrian Delay			
Pedestrian Amenity			
Accidents and Safety			
Hazardous Loads			
Completed and Operational Development			
Severance	Negligible (detailed assessment not required)	None required	Negligible (Not Significant)
Driver Stress			
Pedestrian Delay			
Pedestrian Amenity			
Accidents and Safety			
Hazardous Loads			

Assessment of Cumulative Effects and their Significance

11.84 **Table 11.8** provides a list of the Cumulative Schemes which are to be included within, and that have been scoped-out of the Cumulative Effects Assessment (CEA).

Table 11.8: Cumulative Schemes

Scheme No.	Planning Reference	Description of Development	Scoped In / Out	Justification
Manchester City Council (MCC)				
1	101664/FO/2013/N2	Brunswick Neighbourhood	In	Cumulative Scheme No. 1 wraps around the Proposed Development and will impact the same roads.
2	N/A	Upper Brook Street Masterplan – PAG / Moda Living	In	Planning application not yet submitted; however, the McLaren / Kadans Project Team have been in regular discussion with the PAG / Moda Living Project Team and have been supplied with draft ES Chapter including development flows and traffic reassignment information.
3	124472/FO/2019	Kincardine Court Extension	Out	Car parking to be removed, impact will be reduced.
4	134288/FO/2022	Number 3 Circle Square	Out	Cumulative Scheme No. 4 has a significantly lower traffic impact than the existing total car parking on the Site, and therefore detailed assessment was not made, and will not be included in the CEA.
5	125799/FO/2019	MMU Science and Engineering Building	Out	Cumulative Scheme No. 5 results in removal of a significant amount of on-site parking and therefore will have a reduced impact on the roads in the area, as people are less likely to drive.
6	125573/FO/2019	First Street South	Out	Very low vehicle impact in the peak hours, with no distribution diagrams provided in the Transport Assessment. Therefore not included in the cumulative assessment, as impact is very limited. The impact of the Cumulative Scheme is also much lower than what was previously on-site.

Approach

11.85 It was agreed with MCC and TfGM during the scoping process for the Transport Assessment produced for the planning application, that, as the Proposed Development is car-free, and located in a sustainable location, detailed

trip distribution and junction modelling was not required, as confirmed in the Transport Assessment, and therefore a high level assessment of Cumulative Impacts has been made.

- 11.86 **Table 11.6** indicates that the increase in traffic on surrounding roads caused by the Proposed Development during the operational phase is minimal, with the maximum increase being experienced on Kincardine Road of 1.67%. For the construction phase (**Table 11.5**), the impact is **Negligible** on all routes as change in total traffic is less than 10%.
- 11.87 The Proposed Development traffic for the construction phase and operational phase is added to the change in traffic arising from the Cumulative Schemes which have been scoped into the Cumulative assessment. Information is taken from the respective Transport Assessments / ES Chapters / other available information for each Cumulative Scheme.
- 11.88 Note that, as Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living) is not yet approved but proposes changes to the operation of the local highway network, a scenario with, and without, Cumulative Scheme No. 2 has been assessed. Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living) highway changes include the closure of Inchley Road, and Kincardine Road becoming 1-way northbound. This results in reassignment of existing and future traffic flows in the area, and therefore in **Table 11.11** below, where the cumulative impact with Cumulative Scheme No. 2 is assessed, the cumulative traffic flows have been derived from information provided by the Project Team for Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living), which includes the reassignment of the base traffic, the traffic generated by Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living), the Proposed Development and other Cumulative Schemes.
- 11.89 Qualitative comments have been included on the potential impacts on non-car modes of transport.

Potential Impacts

Construction and Demolition

- 11.90 **Table 11.9** below indicates the cumulative impact of the Proposed Development and Cumulative Scheme No. 2 (Upper Brook Street Masterplan – PAG / Moda Living). These have been distributed on the network as per the Proposed Development flows. Note that there is no construction and demolition information available for Cumulative Scheme No. 1 (Brunswick Neighbourhood), as this is now largely built out it is considered acceptable as to not be considered within the CEA.

Table 11.9: Traffic Impact – Construction and Demolition Cumulative Impact of Proposed Development with Upper Brook Street Masterplan – PAG / Moda Living

Location (DfT Count Point)	Construction Year AADT		Demolition Construction Traffic / Cumulative Schemes		Increase	
	All	HDV	All	HDV	All	HDV
A34 Upper Brook Street (56493)	18,883	132	153	58	0.81%	44.00%
A6 Ardwick Green South (26157)	19,425	505	95	0	0.49%	0.00%
A57 Hyde Road (16544)	16,736	574	153	58	0.57%	0.00%
A6 Stockport Road (56136)	10,520	143	95	0	0.90%	0.00%
Kincardine Road at junction with Whitekirk Close	Construction traffic for the Proposed Development will not be routed along Kincardine Road.					
Brunswick Street at the junction with Kincardine Road	9,542	175	153	58	1.60%	33.19%

- 11.91 The increase in all vehicles will have a **Negligible** effect on pedestrian delay, pedestrian amenity and accidents and safety on all considered links. This is as per the metrics set out in **Table 11.1**. The impact on severance and driver delay is expected to be **Negligible**, which is **Not Significant** in EIA terms on all considered DfT links except A34 Upper Brook Street which will have a **Minor Adverse** effect, there will also be a **Minor Adverse** effect on Brunswick Street.

The Completed and Operational Development

- 11.92 Once all Cumulative Schemes are operational, there is the potential for increase in vehicle movements at junctions in the vicinity. However, the limiting factor is likely to be availability of car parking. Once car parks in the area are full, users of each of the Cumulative Schemes will be more likely to use other, more sustainable forms of transport, as they will become comparatively more convenient. **Table 11.10** shows the impact of the Cumulative Schemes and the Proposed Development (without Upper Brook Street Masterplan – PAG / Moda Living).

Table 11.10: Traffic Impact – without Upper Brook Street Masterplan – PAG / Moda Living

Location (DfT Count Point)	Opening Year AADT (no dev)	Proposed Development AADT	Brunswick Neighbourhood AADT	Opening Year AADT (with Cumulative Schemes)	Cumulative Increase	% Increase
A34 Upper Brook Street (56493)	18,883	8	64	18,955	72	0.38%
A6 Ardwick Green South (26157)	19,425	6	9	19,440	15	0.08%
A57 Hyde Road (16544)	16,736	18	100	16,855	119	0.71%
A6 Stockport Road (56136)	10,520	6	46	10,571	51	0.49%
Kincardine Road south of Whitekirk Close	1,352	23	0	1,375	23	1.67%
Brunswick Street at junction with Kincardine Road	9542	65	306	9,912	370	3.88%

- 11.93 Based on the cumulative change (not including Upper Brook Street Masterplan – PAG / Moda Living) in traffic on the surrounding links, and using the metrics set out in **Table 11.1** for measuring the impact on receptors, there will be a **Negligible** impact on severance, pedestrian delay, pedestrian amenity, driver delay and accidents and safety on all considered links.
- 11.94 There will be an increase in the number of pedestrians and cyclists in the area when all the Cumulative Schemes are completed. It is not possible to quantify at this stage, as baseline pedestrian and cycling numbers are not known, but the impact would be at least **Negligible to Minor Beneficial**.
- 11.95 **Table 11.11** shows the impact of the Cumulative Schemes and the Proposed Development (with Upper Brook Street Masterplan – PAG / Moda Living), with a very low impact on traffic on surrounding links, and a reduction in traffic on some links because of the reassignment of traffic when Inchley Road is closed and Kincardine Road becomes 1-way northbound. The Cumulative Scheme flows column of **Table 11.11** includes the reassignment of

the base traffic, the 'Upper Brook Street Masterplan – PAG / Moda Living' development traffic, the Proposed Development and other Cumulative Schemes.

Table 11.11: Traffic Impact – with Upper Brook Street Masterplan - PAG / Moda Living

Location (DfT Count Point)	Opening Year (no Cumulative Schemes)		Cumulative Scheme Flows		Opening Year (with Cumulative Schemes)		% Increase	
	AADT	HDV	AADT	HDV	AADT	HDV	AADT	HDV
A34 Upper Brook Street (56493)	18,883	132	308	5	19,191	137	1.63%	3.79%
A6 Ardwick Green South (26157)	19,425	505	-275	0	19,150	505	-1.42%	0.00%
A57 Hyde Road (16544)	16,736	574	196	4.5	16,932	578.5	1.17%	0.78%
A6 Stockport Road (56136)	10,520	143	196	4.5	10,716	147.5	1.86%	3.15%
Kincardine Road at junction with Whitekirk Close	1,352	14	100	7	1,452	21	7.40%	50.00%
Brunswick Street at junction with Kincardine Road	9,542	175	1072	16	10,614	191	11.23%	9.14%

- 11.96 Based on the cumulative change (including Upper Brook Street Masterplan – PAG / Moda Living) in traffic on the surrounding links, and using the metrics set out in **Table 11.1** for measuring the impact on receptors, there will be a **Negligible** impact on severance, pedestrian delay, pedestrian amenity, driver delay and accidents and safety on all of the considered DfT links. For Brunswick Street there will be a **Minor Adverse** impact on accidents and safety, as the change in total AADT is more than 10%, and on Kincardine Road, there will be a **Minor Adverse** impact on severance and driver delay.

Mitigation Measures

Demolition and Construction

- 11.97 Construction vehicle movements and footway closures will be agreed with MCC as each Cumulative Scheme comes forward for development and this process will be managed by MCC accordingly.

- 11.98 It is anticipated that each Cumulative Scheme will implement its own CEMP to help mitigate impacts. It is standard practice for MCC to require CEMPs for developments of the scale of the Cumulative Schemes identified. The measures required to be addressed by MCC in a CEMP will have the effect of minimising transport related impacts on a site-specific basis such that effects are **Negligible**. It is therefore considered that the cumulative effect of each of the cumulative schemes with the Proposed Development would be **Not Significant** in the context of traffic flows conditions on the local highway.

The Completed and Operational Development

- 11.99 As individual Cumulative Scheme come forward there will be an overall improvement to the public realm and footway frontage in the area, increasing pedestrian connectivity, amenity and safety.
- 11.100 Local policy and vision strategies from both MCC and TfGM are targeting modal shift away from the private car by enhancing infrastructure for walking and cycling and investing in public transport. These wider changes to the network will mitigate cumulative impacts of the Cumulative Schemes. No additional mitigation measures are required to address cumulative operational effects.

Residual Impact

- 11.101 There is likely to be a **Moderate Beneficial** residual cumulative impact on pedestrian amenity, safety and connectivity resulting from the improvements to the public realm and the increase in the numbers of pedestrians and cyclists in the area.
- 11.102 The increase in vehicle trips generated by the Cumulative Schemes may impact severance, driver delay, pedestrian amenity, accidents and safety and hazardous loads, however in most cases the Cumulative Schemes are replacing existing developments which have the potential for a higher trip generation, as is the case with the Proposed Development.
- 11.103 This is to be considered alongside investment from MCC and TfGM to improve walking, cycling and public transport journeys to achieve mode shift away from private car use.
- 11.104 These impacts are likely to be **Negligible** which is **Not Significant**.

12. Effect Interactions

Introduction

- 12.1 This chapter presents an assessment of the likely significant effect interactions of the Proposed Development; that is, the likely combination of significant environmental effects generated by the Proposed Development in isolation upon a particular receptor or group of receptors. Effect interactions were considered for the demolition and construction phase and the completed and operational Development.
- 12.2 This chapter, prepared by Avison Young, was informed by all assessments undertaken as part of the Environmental Impact Assessment (EIA) and subsequently reported in the Environmental Statement (ES). As such, this chapter draws from information contained in **Volume 2: Main Text, Chapters 6 to 11** inclusive.
- 12.3 It should be noted that effect interactions are commonly referred to as a type of 'cumulative effect'. However, as outlined in **Volume 2: Main Text, Chapter 2: EIA Approach**, the likely cumulative effects of the Proposed Development with other Cumulative Schemes per environmental topic area scoped into the ES (different to 'effect interactions') are considered separately within **Volume 2: Main Text, Chapter 6 to 11** inclusive.

Assessment Methodology and Significance Criteria

Assessment Methodology

- 12.4 There are no established methodologies for assessing, qualifying or quantifying the interaction of effects from a particular project upon a receptor or group of receptors. However, the following method was employed, based upon professional judgement, experience and a review of other similar assessments undertaken to inform recently published ESs for outline planning applications:
- A review of **Volume 2: Main Text, Chapters 6 to 11** to establish:
 - The range of likely adverse / beneficial residual effects arising from the demolition and construction phase and the completed and operational Development in isolation.
 - The receptor or group of receptors affected by the identified likely adverse / beneficial residual effects of the demolition and construction phase and the completed and operational Development in isolation.
 - Tabulation of the above, thereby allowing for the identification of receptors, or groups of receptors, that would experience multiple likely adverse / beneficial residual environmental effects.
- 12.5 Only likely adverse / beneficial residual effects were considered in this assessment. This is owing to the following:
- 'Negligible' or 'no effects' would have no potential to interact with any other likely residual effects.

- The reasonable assumption that all embedded and additional mitigation referred to in **Volume 2: Main Text, Chapters 6 to 11** inclusive would be implemented and would achieve its intended purpose.

Significance Criteria

- 12.6 The significance of each individual likely significant environmental effect was defined according to the methodologies outlined in **Volume 2: Main Text, Chapters 6 to 11** inclusive. However, once again, there are no accepted methodologies which allow for the establishment of the relative significance of effect interactions. This is partially due to the fact that the assessment of effect interactions does not compare 'like effects' with 'like effects'.
- 12.7 In view of the above, this assessment can only identify the range of likely significant residual environmental effects (and their significance as defined in **Volume 2: Main Text, Chapters 6 to 11** inclusive) upon a particular receptor or group of receptors. In order to undertake a worst-case scenario assessment, it was assumed that the combination of two or more significant residual effects from two or more environmental topics (i.e. **Volume 2: Main Text, Chapters 6 to 11** inclusive) upon a particular receptor or group of receptors would constitute a significant effect interaction.

Likely Residual Effect Interactions of the Development and their Significance

Demolition and Construction

- 12.7.1 **Table 12.1** summarises all likely adverse / beneficial residual effects associated with the demolition and construction phase, as identified in **Volume 2: Main Text, Chapters 6 to 11** inclusive. **Table 12.1** also identifies the receptor or groups of receptors affected by the residual effects.

Table 12.1: *Likely Residual Effects of the Demolition and Construction Phase*

Topic and Type of Residual Effect		Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
Townscape, Visual and Built Heritage (TVBH)			
TVBH01 – The Site		Minor Beneficial to Negligible effect (Not Significant)	The Site
View 1	TVBH02 – View from north corner of Upper Brook Street / Booth Street East	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of

Topic and Type of Residual Effect		Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
	Junction	Significant)	the area
	TVBH03 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 2	TVBH04 – View from east end of pedestrianised section of Brunswick Street	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
	TVBH05 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 3	TVBH06 – View from junction of Brunswick Street and Kincardine Road	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
	TVBH07 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
	TVBH08 – Mawson Hotel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II listed Mawson Hotel)
View 4	TVBH09 – View from northeast side of the Mawson Hotel on Kincardine Road	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
	TVBH10 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 5	TVBH11 – View south from Upper Brook Street / Grosvenor Street junction	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area

Topic and Type of Residual Effect		Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
	TVBH12 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 6	TVBH13 – View from Gartside Gardens	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
	TVBH14 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 7	TVBH15 – View from northeast end of Balsam Close	Minor Adverse to Negligible effect (Not Significant)	Assessed Views
View 8	TVBH16 – View from Rudcroft Close 'Orchard'	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
View 9	TVBH17 – View from Brunswick Village block at southeast end of Sylvia Pankhurst Way	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
View 10	TVBH18 – View from west side of junction between Upper Brook Street and Plymouth Grove	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
	TVBH19 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 11	TVBH20 – View from Brunswick Park	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
View 12	TVBH21 – View from west end of Wilton	Minor Adverse to	Local residents, users of

Topic and Type of Residual Effect		Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
	Street	Negligible effect (Not Significant)	the area
View 13	TVBH22 – View from Rumford Street public realm	Minor Adverse to Negligible effect (Not Significant)	Local residents, users of the area
Socio-economics (SE)			
SE01 – Disruption to local area due to movement of materials etc.		Negligible short-term effect on immediate area (Not Significant)	Local economy
SE02 – Employment gain for construction industry		Short-term Minor Beneficial effect on the immediate area (Not Significant)	Local construction industry employment
Wind Microclimate (WM)			
No significant residual effects associated with the Works.			
Daylight, Sunlight and Overshadowing (DSO)			
No significant residual effects associated with the Works.			
Climate Change (CC)			
CC1 – GHG Emissions		Minor Adverse effect (Not Significant)	Local Manchester carbon budget
CC2 – Climate Resilience		Minor Adverse effect (Not Significant)	UK's Carbon Budget
Transportation (T)			
T1 – Severance		Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists

Topic and Type of Residual Effect	Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
T2 – Driver Stress	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T3 – Pedestrian Delay	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T4 – Pedestrian Amenity	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T5 – Accidents and Safety	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T5 – Hazardous Loads	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists



The Completed and Operational Development

- 12.7.2 **Table 12.2** summarises all likely adverse / beneficial residual effects associated with the operational phase of the Proposed Development, as identified in **Volume 2: Main Text, Chapters 6 to 11** inclusive. **Table 12.2** also identifies the receptor or groups of receptors affected by the residual effects.

Table 12.2: Likely Residual Effects of the Operational Phase

Topic and Type of Residual Effect		Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
Townscape, Visual and Built Heritage (TVBH)			
TVBH23 – The Site		Moderate Beneficial (Significant)	Local residents, users of the area
View 1	TVBH24 – View from north corner of Upper Brook Street / Booth Street East junction	Moderate Beneficial effect (Significant)	Local residents, users of the area
	TVBH25 – Former Unitarian Chapel	Major Beneficial effect (Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 2	TVBH26 – View from east end of pedestrianised section of Brunswick Street	Moderate Beneficial effect (Significant)	Local residents, users of the area
	TVBH27 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 3	TVBH28 – View from junction of Brunswick Street and Kincardine Road	Moderate Beneficial effect (Significant)	Local residents, users of the area.
	TVBH29 – Former Unitarian Chapel	Moderate Beneficial effect (Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
	TVBH30 – Mawson Hotel	Moderate Beneficial effect (Significant)	Setting of nearby Listed Building (Grade II listed Mawson Hotel)
View 4	TVBH31 – View from northeast side of the Mawson Hotel on	Moderate Beneficial effect (Significant)	Local residents, users of the area

Topic and Type of Residual Effect		Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
	Kincardine Road		
	TVBH32 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 5	TVBH33 – View south from Upper Brook Street / Grosvenor Street junction	Minor Beneficial effect (Not Significant)	Local residents, users of the area
	TVBH34 – Former Unitarian Chapel	Minor Adverse effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 6	TVBH35 – View from Gartside Gardens	Moderate Adverse effect (Not Significant)	Local residents, users of the area
	TVBH36 – Former Unitarian Chapel	Negligible effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former Unitarian Chapel)
View 7	TVBH37 – View from northeast end of Balsam Close	Moderate Adverse effect (Significant)	Local residents, users of the area
View 8	TVBH38 – View from Rudcroft Close 'Orchard'	Minor Adverse effect (Not Significant)	Local residents, users of the area
View 9	TVBH39 – View from Brunswick Village block at southeast end of Sylvia Pankhurst Way	No Effect	Local residents, users of the area
View 10	TVBH40 – View from west side of junction between Upper Brook Street and Plymouth Grove	Minor Adverse effect (Not Significant)	Local residents, users of the area
	TVBH41 – Former Unitarian Chapel	Negligible effect (Not Significant)	Setting of nearby Listed Building (Grade II* listed Former

Topic and Type of Residual Effect		Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
			Unitarian Chapel)
View 11	TVBH42 – View from Brunswick Park	No Effect	Local residents, users of the area
View 12	TVBH43 – View from west end of Wilton Street	Negligible effect (Not Significant)	Local residents, users of the area
View 13	TVBH44 – View from Rumford Street public realm	Negligible effect (Not Significant)	Local residents, users of the area
Socio-economics (SE)			
SE3 – Local Population		Long-term Minor Beneficial effect on the immediate area (Not Significant)	District economy
SE4 – Local Employment		Long-term Moderate Beneficial effect on the immediate area (Not Significant)	District economy
Wind Microclimate (WM)			
WM01 – Pedestrian comfort and safety at the bus stop (B2) along Upper Brook Street outside the Alan Turing Building		Minor Adverse effect (Not Significant)	Pedestrian comfort and safety
Daylight, Sunlight and Overshadowing (DSO)			
DSO1 - Daylight		Permanent Moderate Adverse to Negligible effect in the long-term at the local level (Not Significant)	Kincardine Court, Hardshaw Close, Arkley Street, Sefton Close, Mawson Hotel and Upper Brook Street
DSO2 - Sunlight		Permanent Minor Adverse to Negligible effect in the long-term at the local level (Not	Mawson Hotel, 74-80 Frances Street

Topic and Type of Residual Effect	Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
	Significant)	
DSO3 - Overshadowing	Permanent Negligible effect in the long-term at the local level (Not Significant)	Rear gardens at Sefton Close, Hardshaw Close and amenity spaces at Gartside Gardens, Kincardine Court
Climate Change (CC)		
CC3 – GHG Emissions	Moderate Adverse effect (Significant)	Local Manchester Carbon Budget
CC4 – Climate Resilience	Permanent Minor Adverse effect (Not Significant)	UK's Carbon Budget
Transportation (T)		
T7 – Severance	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T8 – Driver Stress	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T9 – Pedestrian Delay	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T10 – Pedestrian Amenity	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T11 – Accidents and Safety	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists
T12 – Hazardous Loads	Negligible effect (Not Significant)	Road users i.e. pedestrians, cyclists and motorists

12.8 **Table 12.3** reorganises the results of **Table 12. 1** and **12.2** so that the full range of likely significant residual environmental effects arising from the demolition and construction phase and the operational phase upon specific receptors or groups of receptors can be easily identified. As noted earlier in this Chapter, the combination of two or more significant residual effects from two or more environmental topics upon a particular receptor or group of receptors was judged as a significant effect interaction.

Table 12.3: Likely Significant Effect Interactions

Receptor / Group of Receptors Affected	Likely Residual Effects	Would Significant Effect Interactions be Experienced?
Construction and Demolition		
No significant residual effects associated with the Works.		
The Completed and Operational Development		
Local residents / users of the area	Beneficial effects – TVBH23, TVBH24, TVBH26, TVBH28 and TVBH31 Adverse effects – TVBH35, 37	No No significant effect interactions would occur at the receptor as while all of the residual effects identified in Column 2 are significant individually, they are limited to a single environmental topic (Townscape, Visual and Built Heritage).
Setting of nearby Listed Buildings (Grade II* listed Former Unitarian Chapel and Grade II listed Mawson Hotel)	Beneficial effects – TVBH25, TVBH29 and TVBH30	No No significant effect interactions would occur at the receptor as while all of the residual effects identified in Column 2 are significant individually, they are limited to a single environmental topic (Townscape, Visual and Built Heritage).

12.9 **Table 12.3** demonstrates that no significant residual effect interactions are anticipated as a result of the demolition and construction phase of the Development, or for the completed and operational Development.

Conclusions

12.10 There are no significant residual effects associated with the construction phase and as such, no effect interactions are identified.

12.11 All significant residual effects pertain to the impact of the operational Development on views and the Former Unitarian Chapel and Mawson Hotel (see **Chapter 6: Townscape, Visual and Built Heritage** for further information) and Manchester's carbon budget (see **Chapter 10: Climate Change**) for further information). These are summarised below:

- Townscape, Visual and Built Heritage:
 - **Moderate Beneficial** effect on the townscape of the Site and on the following viewpoints: View 1 (View from north corner of Upper Brook Street / Booth Street East junction), View 2 (View from east end of pedestrianised section of Brunswick Street) and View 3 (View from junction of Brunswick Street and Kincardine Road). This is **Significant** in EIA terms.
 - **Moderate Adverse** effect on the following viewpoints: View 6 (View from Gartside Gardens) and View 7 (View from north-east end of Balsam Close). This is **Significant** in EIA terms.
 - **Moderate Beneficial** effect on the setting of the Grade II listed 'Mawson Hotel' from View 3. This is **Significant** in EIA terms.
 - **Major Beneficial** effect on the setting of the Grade II* listed 'Former Unitarian Chapel' from View 1, and a **Moderate Beneficial** effect on its setting from View 3. Both are **Significant** in EIA terms.
- Climate Change:
 - **Moderate Adverse** effect on Manchester's carbon budget. This is **Significant** in EIA terms.

13. Schedule of Additional Mitigation

Introduction

- 13.1 This chapter provides a summary of the additional mitigation commitments outlined within the Environmental Statement (ES). Mitigation is an iterative process of controlling environmental effects by a hierarchy of avoidance (most desirable), reduction, amelioration and compensation. Mitigation measures fall into two broad categories:
- Mitigation measures embedded in the proposals (hereinafter referred to as 'embedded mitigation'). These have been identified throughout the development of the proposal and are used to inform the Proposed Development design, such that it avoids key areas or includes features that would minimise the identified potential impacts on specific receptors (e.g. by changes in layout); and
 - Additional mitigation measures. These have been developed later in the process once specific potential impacts on key environmental receptors have been identified.
- 13.2 It is important to distinguish between these two forms of mitigation, as the embedded mitigation has helped to define the Proposed Development details that have been assessed. In each topic specific Chapter, the 'Assessment of Likely Significant Effects' section (i.e. without additional mitigation) represents an assessment of the Proposed Development comprising the embedded design measures, whilst the 'Residual Effects' section assesses the Proposed Development with the additional mitigation measures in place. Embedded mitigation measures are presented in **Chapter 5: The Proposed Development** and within each of the technical assessments, where relevant (see **Chapters 6 - 11**). The embedded mitigation measures will be secured by the approval of the Detailed Planning Drawings (see **Volume 3: Appendices, Appendix 5.1**).
- 13.3 The residual effects of the Proposed Development have been assessed as part of the EIA and can be described as the effects which remain after the implementation of the embedded and any additional proposed mitigation measures. The additional mitigation measures and their corresponding residual effect to which they address are presented below in **Table 13.1**. It is expected that the additional mitigation measures will be secured through appropriately worded planning conditions. Reference should be made to each technical chapter for the full definition of the effect stated and the proposed additional mitigation.

Table 13.1: Summary of Additional Mitigation Measures for the Construction and Operational Phases

Topic and Type of Significant Residual Effect	Additional Mitigation Measures	
	During the Construction Phase	During the Operational Phase
Townscape, Visual and Built Heritage		
Setting of the surrounding Listed Buildings (Mawson Hotel and Former Unitarian Chapel)	None required	Adoption of a Landscape Environmental Management Plan (LEMP)
Socio-economics		
Disruption to local area (due to movement of materials etc.)	Adoption of a Construction Environmental Management Plan (CEMP)	N/A
Employment gain for the construction industry	Local Employment Scheme	N/A
Wind Microclimate		
No significant effects	None required	None required
Daylight, Sunlight and Overshadowing		
No significant effects	None required	None required
Climate Change		
Construction Materials	Use of lowest embodied carbon content Materials sourced as close to the Proposed Development as possible Less volume required overall (i.e. design optimisation) Pre-assembled or partially pre-	N/A

Topic and Type of Significant Residual Effect	Additional Mitigation Measures	
	During the Construction Phase	During the Operational Phase
	assembled where possible Consideration of each materials' end of life impact	
Construction Plant and Office Operations	N/A	N/A
Workforce Commuting	N/A	N/A
Building Energy Consumption	N/A	N/A
Operational Traffic	N/A	Framework Travel Plan (FTP)
Operational Waste	N/A	Operational Waste Management Plan
Circular Economy	N/A	N/A
Transportation		
Severance	Adoption of a CEMP	FTP
Driver Stress	Adoption of a CEMP	FTP
Pedestrian Delay	Adoption of a CEMP	FTP
Pedestrian Amenity	Adoption of a CEMP	FTP
Accidents and Safety	Adoption of a CEMP	FTP
Hazardous Loads	Adoption of a CEMP	FTP

Conclusions

- 13.4 The Proposed Development has been designed in accordance with the findings and recommendations of the EIA. Any adverse effects identified through the assessment have been minimised as far as possible through the design process (embedded mitigation measures) or the application of appropriate mitigation measures to be secured as a planning condition or through legal agreement (additional mitigation measures).
- 13.5 The majority of effects associated with the construction and demolition activities of the Proposed Development will be controlled through a Construction Environment Management Plan (CEMP) and the implementation of industry standard practices and procedures.
- 13.6 A number of the effects associated with the operational phase of the Proposed Development will be primarily controlled through the Landscape Ecological Management Plan (LEMP) and the Framework Travel Plan (FTP).
- 13.7 Each of the mitigation measures described above would be secured through the stipulation of a suitably worded planning condition or legal agreement. The specific details of the mitigation measures would be further developed by the Applicant at the detailed design stage and would be adhered to during the construction and operational phases of the Development (to an appropriate and agreed-upon timescale).

Abbreviations

AADT	Annual Average Daily Traffic
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
AVRs	Accurate Visualisation Representations
BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Methods
BRES	Business Register and Employment Survey
BS	British Standards
CC	Climate Change
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CHW	Chilled Water
CIBSE	Chartered Institution of Building Service Engineers
DAS	Design and Access Statement
Defra	Department for Environment, Food & Rural Affairs
DfT	Department for Transport
DLUHC	Department for Levelling Up, Housing and Communities
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DSO	Daylight, Sunlight and Overshadowing
EA	Environment Agency
EIA	Environmental Impact Assessment
ENW	Electric North West
ES	Environmental Statement
EU	European Union
FRA	Flood Risk Assessment
FTP	Framework Travel Plan
GEA	Gross External Area
GHG	Greenhouse Gas
GIA	Gross Internal Area
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GM	Greater Manchester
GMAAS	Greater Manchester Archaeological Advisory Service
GP	General Practitioner
GPSS	Government Pipeline and Storage System
GVA	Gross Value Added
HA	Highways Agency
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
HMSO	His Majesty's Stationery Office
HSE	Health and Safety Executive
IAQM	Institute of Air Quality Management
IEEM	Institute of Ecology and Environmental Management
IEMA	Institute of Environmental Management and Assessment
IPCC	International Panel of Climate Change
km	Kilometre
LVIA	Landscape and Visual Impact Assessment
MAGIC	Multi-agency Geographic Information for the Countryside

MCC	Manchester City Council
MCWS	Mains Cold Water Service
MVHR	Mechanical Ventilation with Heat Recovery
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NSL	No Sky Line
NTS	Non Technical Summary
NZC	Net Zero Carbon
ONS	Office of National Statistics
OS	Ordnance Survey
PV	Photovoltaic (Panels)
RCP	Representative Concentration Pathway
SE	Socio-economics
SCI	Statement of Community Involvement
SHOG	Sun Hours on Ground
SNPP	Sub-national Population Projections
SPS	Supporting Planning Statement
SRFG	Strategic Regeneration Framework Guidance
SSF	Strategic Spatial Framework
SuDS	Sustainable Drainage System
SWMP	Site Waste Management Plan
TA	Transport Assessment
TVBH	Townscape, Visual and Built Heritage
TfGM	Transport for Greater Manchester
THVIA	Townscape, Heritage and Visual Impacts Assessment
TRICS	Trip Rate Information Computer System
TROs	Traffic Regulation Orders
UBS	Upper Brook Street
UKGBC	UK Green Building Council
UU	United Utilities
VSC	Vertical Sky Component
WLC	Whole of Life Carbon
WM	Wind Microclimate

Glossary

Above Ordnance Datum (AOD)	The distance above the mean tides at Newlyn, Cornwall.
Air pollutants	Amounts of foreign and/or natural substances occurring in the atmosphere that may result in adverse effects on humans, animals, vegetation and/or materials
Air quality	A measure of the degree to which air is polluted.
Air quality sensitive receptors	People, property or designated sites for nature conservation that may be at risk from exposure to air pollutants that could potentially arise as a result of the development.
Baseline	Existing environmental conditions present on, or near a site, against which future changes may be measured or predicted.
BREEAM	The Building Research Establishment's Environmental Assessment Method for rating the environmental performance of an office building.
Construction Environmental Management Plan (CEMP)	A documented management system with environmental procedures to monitor residual impacts of the construction and operational phases of the development.
Cumulative effects	Effects that result from incremental changes caused by other past, present or reasonably foreseeable actions.
Ecology	The study of living organisms in relation to their surroundings.
Emission	A material that is expelled or released to the environment. Usually applied to gaseous or odorous discharges to the atmosphere.
Emission factors	The average emission rate of a given pollutant for a given source, relative to units of activity. Used to model future pollution concentrations under different scenarios
Environmental Impact Assessment (EIA)	A technique for ensuring that the likely effects of new development on the environment are fully understood and taken into account before the development is allowed to go ahead. It provides a focus for public scrutiny of the project and enables the importance of the predicted effects, and the scope for modifying or mitigating them, to be properly evaluated by the decision-making authority.
Environmental impact	The total effect of any operation on the surrounding environment.
Environmental Statement (ES)	The outcome of the Environmental Assessment presented in a formal document or documents in accordance with EC Directive 85/337. Includes such information that is reasonably required to assess the environmental effects of a development.
Flood	The inundation of normally dry land by water.
Flood plain	An area of limited relief bordering a river inundated when a river overflows its banks during a flood.

Gross Domestic Product (GDP)	A measure of the total economic activity occurring in the UK.
Heavy Duty Vehicle	A vehicle type classification, including rigid and articulated heavy goods vehicles, plus buses and coaches, that is used by air quality dispersion models
Hydrology	The scientific study of water in the earth/atmosphere system.
Hydrogeology	The study of geological factors relating to the Earth's water.
Impact significance	Opinions from a relevant planning authority at an initial stage as to what are the nature and potential scale of the environmental impacts arising from the proposed development and assessing what further studies are required to establish their significance.
Light pollution	Different forms of unwanted or wasted light as identified by the Institute of Lighting Engineers, including sky glow, glare and light trespass.
Light Duty Vehicle	A vehicle type classification, including motorcycles, cars and light goods vehicles, that is used by air quality dispersion models
Listed Building	A building included in a list produced by the Secretary of State for Culture, Media and Sport. It comprises buildings and other structures that are of special architectural or historic interest.
Mitigating factor	A matter to be taken into account as a benefit to offset any perceived or demonstrable harmful impact.
Mitigation (measure)	The measures put forward to prevent, reduce and where possible, offset any adverse effects on the environment.
Net	After all deductions have been made.
Non-Technical Summary (NTS)	A summary of the Environmental Statement in non-technical language providing a concise, yet comprehensive summary of the likely effects of the project on the environment.
Permeability	The extent to which an environment allows a variety of access routes through it. A permeable environment is one where there is ease of movement and where people have a choice in the routes they may use.
(Sensitive) Receptor	A component of the natural, created or built environment such as human being, water, air, a building, or a plant that is affected by an impact.
Residual impacts	Those impacts of the development that cannot be mitigated following implementation of mitigation proposals.
Risk assessment	An assessment of the likelihood and severity of an occurrence.
Schedule 2 development	Development project types under EIA regulations where EIA is not mandatory in all cases but may be required, depending on the size, nature and scale of the development and the potential for significant environmental effects to arise.

Scoping	An initial stage in determining the nature and potential scale of environmental impacts arising as a result of a development, and an assessment of what further studies are required to establish their significance.
Scoping opinion	A written statement of the opinion of the relevant planning authority as to the information to be provided in the Environmental Statement.
Scoping report	Report submitted prior to an EIA setting out the methods and scope proposed to assess the environmental impacts of a development.
Screening opinion	A written statement of the opinion of the relevant planning authority as to whether an EIA is required of a development.
Statutory Consultees	Groups or bodies that, by law, must be consulted as part of the planning application process for certain types of development.
Sustainable Drainage Systems (SuDS)	Sustainable drainage systems use techniques to control surface water run-off as close to its origin as possible, before it enters a watercourse. This involves moving away from traditional piped drainage systems to engineering solutions that mimic natural drainage processes such as porous pavements.
Topography	The natural or artificial features, level and surface form of the ground surface.