
One Medlock Street
Environmental Statement
November 2022



ENVIRONMENTAL STATEMENT

VOLUME 2: MAIN TEXT

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CHAPTER 1: INTRODUCTION

1 Introduction

1.1 Background to the Proposed Development

- 1.1.1 This Environmental Statement (ES) has been prepared by Temple Group Ltd (“Temple”) on behalf of Premier Inn Hotels and Dominvs Group (“the Applicant”), and accompanies a full planning application for the proposed redevelopment of land known as One Medlock Street (“the Site”), which currently comprises a Premier Inn hotel and car park, to provide a development delivering office floorspace (Class E); purpose built student accommodation floorspace (Sui generis); and flexible community use (Class E/F1/F2)(“the Proposed Development”).
- 1.1.2 The Site covers an area of approximately 0.94 hectares (ha). The determining authority for the planning application is Manchester City Council (MCC) and the Site is located on the southern edge of Manchester City Centre, centred on Ordnance Survey (OS) National Grid Reference (NGR) SJ836971. The Site boundary is shown in **Figure 1.1**.
- 1.1.3 The full planning application comprises the demolition of the existing Premier Inn hotel on-site and the construction of the Proposed Development to deliver:
- a building of 13 storeys in height, providing 36,494 square metres (m²) Gross Internal Area (GIA) of commercial office floorspace;
 - a building of 37 storeys in height, providing 1,014 purpose-built student accommodation units;
 - 293 square metres of flexible community use floorspace;
 - internal and external amenity space;
 - hard and soft landscaping; and
 - associated highway works.
- 1.1.4 The Site is bounded by River Street to the north; Medlock Street to the east and south-east; the Mancunian Way, its exit slip road and the Mancunian Way/Princess Parkway junction to the south; and the River Street Tower purpose-built student accommodation (PBSA) development to the west.

Figure 1.1: Site Location Boundary



1.2 Requirement for Environmental Impact Assessment

- 1.2.1 The Environmental Impact Assessment (EIA) process is the mechanism by which the likely significant effects of the Proposed Development on the environment will be assessed.
- 1.2.2 The purpose of the EIA is to establish the nature of the Proposed Development and the environment in which it is likely to take place, during construction and operational phases, so as to identify its likely significant environmental effects both on its own and in combination with other relevant committed developments. The assessment compares the existing situation prior to the start of work (baseline) with the situation during the development phases (construction and operation). It identifies likely effects and the residual effects once mitigated, as well as the cumulative effects.
- 1.2.3 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, SI 2017/571 (the “EIA Regulations”), require that any proposed development falling within the description of a ‘Schedule 2 development’ (as defined within the EIA Regulations), will be subject to an EIA when such development exceeds thresholds and is likely to have significant effects on the environment by virtue of such factors as its nature, size or location (Regulation 2 (1)).
- 1.2.4 The Proposed Development falls within a description of development listed within Schedule 2 of the EIA Regulations: 10b Urban Development Projects. The thresholds for developments under 10b are:
- the development includes more than 1 hectare of urban development which is not dwellinghouse development; or
 - the development includes more than 150 dwellings; or
 - the overall area of the development exceeds 5 ha.
- 1.2.5 Given the scale of the Proposed Development exceeds the thresholds set out in Schedule 2 of the EIA Regulations: 10b Urban Development Projects (i.e. the Proposed Development will provide more than 150 dwellings equivalent), it is anticipated that there is the potential for significant environmental effects to arise. Thus, the Applicant recognises that the Proposed Development will constitute ‘EIA Development’ under the EIA Regulations and has therefore committed to undertaking an EIA. As such, this ES has been prepared to report the findings of the EIA.
- 1.2.6 Schedule 4 of the EIA Regulations specifies the minimum information required for inclusion in an ES. **Table 1.1** shows the location of information within the ES.

Table 1.1: Location of Information within the ES

Specified Information		Location within the ES
1	Description of the development, including in particular:	See below.
(a)	A description of the location of the development.	Volume 2, Chapter 2: The Site
(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.	Volume 2, Chapter 2: The Site, Chapter 5: The Proposed Development and Demolition and Construction Overview.
(c)	A description of the main characteristics of the operational phase of the development (in particular any production processes), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity used).	Volume 2, Chapter 5: The Proposed Development and Demolition and Construction Overview.
(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.	All Volume 2 technical chapters: Chapter 6: Socio-Economics; Chapter 7: Air Quality; Chapter 8: Noise and Vibration; Chapter 9: Wind Microclimate; Chapter 10: Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution; Chapter 11: Built Heritage; Chapter 12: Climate Change; and ES Volume 3: Townscape and Visual Impact Assessment (TVIA).
2	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.	Volume 2, Chapter 4: Alternatives Considered and Design Evolution.

Specified Information		Location within the ES
3	A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	Volume 2, Chapter 4: Alternatives Considered and Design Evolution, Volume 2 technical chapters (where relevant).
4	A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation, material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	Volume 2, technical chapters; Volume 3: TVIA.
5	A description of the likely significant effects of the development on the environment.	See below.
(a)	The construction and existence of the development, including, where relevant, demolition works;	Volume 2 technical chapters; Volume 3: TVIA.
(b)	The use of natural resources, in particular land, soil, water, and biodiversity, considering as far as possible the sustainable availability of these resources;	Volume 2 technical chapters; Volume 3: TVIA.
(c)	The emissions of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;	Volume 2, specifically Chapter 7: Air Quality and Chapter 8: Noise and Vibration.
(d)	The risks to human health, cultural heritage, or the environment (for example due to accidents or disasters);	Volume 2 technical chapters; Volume 3: TVIA.
(e)	The cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;	Volume 2 technical chapters; Volume 3: TVIA.
(f)	The impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;	Volume 2, Chapter 3: EIA Methodology; Chapter 12: Climate Change.
(g)	The technologies and the substances used.	Volume 2 technical chapters; Volume 3: TVIA.

Specified Information		Location within the ES
5 cont.	The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC(a) and Directive 2009/147/EC(b).	As above.
6	A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	Chapter 3: EIA Methodology; Volume 2 technical chapters; Volume 3: TVIA.
7	A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	Volume 2 technical chapters; Volume 3: TVIA; summarised in Volume 2, Chapter 14: Summary of Mitigation Measures and Residual Effects.
8	A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18©(c) of the European Parliament and of the Council or Council Directive 2009/71/Euratom(d) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	Volume 2, Chapter 3: EIA Methodology; Volume 2, specifically Chapter 12: Climate Change.
9	A non-technical summary of the information provided under paragraphs 1 to 8.	Volume 1, Non-Technical Summary (NTS).

Specified Information		Location within the ES
10	A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.	Volume 2, Chapter 1: Introduction, technical chapters (where relevant).

1.3 The Project Team

1.3.1 Details of the project team are set out in **Table 1.2** below.

Table 1.2: The Proposed Project Team

Project Role	Organisation
The Applicant	Premier Inn Hotels and Dominvs Group
Architect	Jon Matthews Architects
Town Planning Consultant, Socio-Economics and Health Consultant, Climate Change Consultant, Built Heritage	Turley
Landscape Architect and Townscape and Visual Impact Assessment Consultant	Planit IE Ltd
EIA Consultant	Temple
Air Quality Consultant	Redmore Environmental Ltd
Noise and Vibration Consultant	Cundall
Wind Microclimate Consultant	Architectural Aerodynamics
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution Consultant	GIA
Energy and Sustainability Consultant	Ridge
Public Relations Consultant	Turley

1.4 Statement of Professional Competence

1.4.1 The EIA Regulations state in Regulation 18 (5) (a & b):

"In order to ensure the completeness and quality of the environmental statement – a) The developer must ensure that the environmental statement is prepared by competent experts; and

b) The environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts."

1.4.2 In accordance with Regulation 18 (5) (a & b) it is confirmed that the EIA has been undertaken by, and the ES has been prepared by, competent experts from the organisations listed in **Table 1.3**. A statement of competence for the EIA Coordinators and contributors is provided below.

Temple

- 1.4.3 Temple is one of the UK's leading independent infrastructure and property consultancies, specialising in environment, planning and sustainability. An Institute of Environmental Management and Assessment (IEMA) EIA Quality Mark member and recognised provider of EIA services on some of the UK's most high-profile development schemes, Temple was responsible for the coordination and management of the EIA and the preparation of the ES. The Temple team was led by Stephen Price, Project Director. More information is contained in **Table 1.3** below.
- 1.4.4 Each of the technical assessments (**Chapters 6 to 12** and **Volume 3: Townscape and Visual Impact Assessment (TVIA)**) were provided by experts in their fields and reviewed by Temple. Statements of competence for the technical assessors are provided below.

Table 1.3: Competence of Technical Leads by ES Topic Scoped In

ES Topic	Technical Lead, Company	Statement of Competence
Coordination, Volume 1 NTS, Volume 2 Introductory and Summary Chapters (Chapter 1 to 5, 13 and 14)	Stephen Price (Project Director), Temple Tsz Kan Woo (Project Manager), Temple.	Stephen is a Chartered Town Planner (MRTPI) and Practitioner Member of the Institute of Environmental Management and Assessment (PIEMA). He has over 19 years' experience and has provided environmental planning advice on a range of projects, including commercial development, residential, healthcare, rail, high-speed rail, energy and waste. Tsz Kan is a Senior Consultant with Temple and has over 10 years' consulting experience. Tsz Kan is an Affiliate member of IEMA and has experience of project managing property EIAs on urban and greenfield sites.
Socio-Economics	Richard Laming, Turley. Tom Ellis, Turley.	Richard is a Senior Director at Turley and is a chartered member of the RTPI, with over 20 years' professional experience in planning, development and regeneration consultancy. He is involved in leading social and economic assessment and research for Turley's largest and most complex development projects. Tom is a Senior Planner at Turley and is a chartered member of the RTPI, with 5 years' experience working on behalf of private and public sector clients in considering the economic and social impacts of development, including leading the production of Socio-economics and Human Health assessments for EIA across the full range of built environment sectors.

ES Topic	Technical Lead, Company	Statement of Competence
Air Quality	Jethro Redmore, Redmore Environmental Ltd. Amelia Leatherbarrow-Hurst, Redmore Environmental Ltd.	Jethro (BEng (Hons), MSc, MIAQM, MEnvSc, PIEMA, CEnv) is Director of Redmore Environmental and has worked as a professional environmental scientist for approximately 16 years. He has conducted environmental studies (including air quality assessments) for a large variety of schemes. Amelia (BSc (Hons), AMEnvSc, AMIAQM) is a Senior Air Quality Consultant at Redmore Environmental and Associate Member of the Institute of Environmental Sciences and IAQM. She has over four years' experience within the air quality sector and conducts air quality studies for a range of projects, including residential, commercial, employment and industrial.
Noise and Vibration	Robert Turner, Cundall. Simon Everett, Cundall.	Robert is a Chartered Building Engineer (MCABE) and Member of the Institute of Acoustics (MIOA). He has over 17 years of experience in acoustic consultancy and has acted as lead consultant on a high number of projects, including high rise residential, higher education, healthcare and offices. Simon is a Member of the Institute of Acoustics (MIOA) with over 5 years of experience in acoustic consultancy. He has worked acted as a consultant on projects including high rise residential, higher education, healthcare and offices.
Wind Microclimate	Alex Turpitt, Architectural Aerodynamics. Hayati Hashim, Architectural Aerodynamics.	Alex is a Chartered Engineer (IMechE) with approximately 15 years' experience in wind engineering of various structures including tall buildings, stadia, bridges, specialist structures and masterplan developments. He has completed wind microclimate studies for hundreds of developments within the UK and worldwide, with more than 50 EIA developments. Hayati has over eight years' experience in wind engineering and has led over 150 wind engineering projects in the UK and South East Asia comprising high-rise structures, stadia and masterplan including more than 20 EIA projects.

ES Topic	Technical Lead, Company	Statement of Competence
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution	Sam Wallis, GIA. Krystle Stewart, GIA.	Sam (BSc (Hons) MRICS) is a chartered surveyor with 18 years' experience specialising in daylight and sunlight. GIA are the largest specialist daylight and sunlight advisor in the UK, with over 30 years of specialisation and expertise, having advised on some of the largest developments within Greater Manchester. Krystle is a Senior Associate Partner at GIA and has 7 years of UK experience working on Solar Glare and Light Pollution EIA matters for large-scale development throughout the UK. Krystle has a Masters with Distinction in Building Science (MBS) from Victoria University of Wellington (New Zealand) and also has 7 years of New Zealand experience working in sustainability and lighting design.
Built Heritage	Katy Lightbody, Turley	Katy is a qualified heritage specialist and town planner (MA (Hons), PG Dip, MRTPI, IHBC (affiliate) with 20 years' experience. She is experienced in assessing the heritage impact of development, based on understanding of the significance and setting of heritage assets. She has advised on a large number of tall building projects in urban locations.
Climate Change	James Blake, Turley.	James is a Full IEMA Member (MIEMA) and Chartered Environmentalist (CEnv) with over 23 years' EIA experience principally in residential, commercial and mixed-use development. James co-authored IEMA's <i>EIA Guide to GHG Emissions and their Significance</i> (2022) and is Director and Head of Sustainability at Turley
Townscape and Visual Impact	John Willerton, Planit IE.	John (BA (Hons) and Chartered Member of the Landscape Institute (CMLI)) has over 25 years of consultancy experience working as a Landscape Architect and Urban Designer, and over 15 years' experience authoring Townscape and Visual Impact Assessments, including assessments for a number of high-profile schemes within Manchester.

1.5 Structure of the Environmental Statement

1.5.1 The ES comprises of four key volumes:

- ES Volume 1: Non-Technical Summary NTS: this document will provide a concise summary of the Proposed Development, alternative designs that were considered, environmental effects and mitigation measures;
- ES Volume 2: Main Text: this will contain the main body of the EIA with the proposed chapter headings as set out below;

- ES Volume 3: TVIA: the methodology and findings of the TVIA accompanied by a full set of views and verified images; and
- ES Volume 4: Technical Appendices: these will provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs.

1.5.2 **Table 1.4** sets out the structure of the ES.

Table 1.4: Structure of the ES

Chapter No.	Chapter Title	Description
Volume 1	Non-Technical Summary (NTS)	This document will provide a concise summary of the proposed Development, alternative designs that were considered, environmental impacts and mitigation measures.
Volume 2	Main Text (this document)	
1	Introduction	Introduction to the ES, EIA Requirements, details of the project team, ES organisation and availability.
2	The Site	Description of the Site and the surrounding environs.
3	EIA Methodology	Methods used to undertake each assessment (including limitations), description of ES structure and content, generic significance criteria, scoping and consultation.
4	Alternatives Considered and Design Evolution	Description of the main alternatives and design evolution considered.
5	The Proposed Development and Construction Overview	Description of the Proposed Development and details of the demolition and construction.
6	Socio-Economics	Assessment of effects on employment.
7	Air Quality	Assessment of air quality effects.
8	Noise and Vibration	Assessment of noise and vibration effects.
9	Wind Microclimate	Assessment of effects on wind microclimate on and surrounding the Site.
10	Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution	Assessment of effects on daylight and sunlight levels of surrounding residential properties, overshadowing effects on proposed amenity spaces within the Proposed Development and in the surrounding area, effects of solar glare on key roads and traffic junctions around the Site, and effects of light pollution on surrounding residential properties and the Proposed Development itself.
11	Built Heritage	Assessment of effects on built heritage.
12	Climate Change	Assessment of effects on global climate change mitigation and adaptation.

Chapter No.	Chapter Title	Description
13	Effect Interactions	Assessment of potential for intra project (combined effects of individual topic impacts on a particular sensitive receptor) and inter project (combined effects of several development schemes – in conjunction with the Proposed Development – which may, on an individual basis be insignificant but, cumulatively, have a significant effect) effects.
14	Summary of Mitigation Measures and Residual Effects	Summary of the mitigation measures and the conclusions of the technical chapters of the ES (including Residual Effects).
Volume 3	Townscape and Visual Impact Assessment (TVIA)	Assessment of effects on townscape and views.
Volume 4	ES Technical Appendices	Data tables, figures and photographs to support the Chapters in Volume 2.

1.6 Other Documents

1.6.1 A number of other documents which sit outside of this ES have been submitted alongside the One Medlock Street planning application, including (but not limited to) the following:

- Architectural Drawings and Plans;
- Design and Access Statement;
- Planning and Tall Building Statement;
- Archaeological Desk-Based Assessment (DBA);
- Preliminary Ecological Appraisal (PEA);
- Drainage Strategy and Flood Risk Assessment;
- Energy Strategy;
- Environmental Standards Statement;
- Transport Statement;
- Travel Plan;
- Tree Survey and Arboricultural Impact Assessment;
- Contaminated Land Study;
- Waste Servicing Strategy;
- Broadband Connectivity Assessment;
- TV and Radio Assessment;
- Statement of Community Engagement;

- Socio-Economic Regeneration Impact Statement; and
- Circular Economy Statement.

1.7 Environmental Statement Availability

- 1.7.1 This ES is available for viewing the MCC planning portal, accessible at:
<https://pa.manchester.gov.uk/online-applications/search.do?action=simple&searchType=Application>.
- 1.7.2 This ES is also available for viewing by public during normal office hours at Manchester City Council, Planning Department, Town Hall, Manchester, M60 2LA, which would be subject to arrangement with Manchester City Council.
- 1.7.3 Copies of the NTS, the full ES and other associated documents are available (subject to availability) to purchase as either hard or digital copies from Temple Group Ltd, Express Building, 2 George Leigh Street, M4 5AD, Manchester. Further details, including pricing, are available on request.

1.8 Alternative Formats

- 1.8.1 The text size used in this document has been chosen to cut down on the quantity of paper required in its production. It can however be printed at A3 should a larger version be required.

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CHAPTER 2: THE SITE

2 The Site

2.1 Introduction

- 2.1.1 This chapter describes the Site, its location and its context as well as providing an overview of its existing land uses and features. It also identifies the key receptors which are considered potentially sensitive to the demolition and construction and operation of the Proposed Development. A more detailed description and analysis is available (in the form of the individual baseline assessments) within the technical assessments of the ES (**Volume 2, Chapters 6 to 12** and **Volume 3: Townscape and Visual Impact Assessment**).

2.2 Site Context

- 2.2.1 The Site is located on the southern edge of Manchester City Centre, within the Deansgate ward of Manchester. It is centred on Ordnance Survey (OS) National Grid Reference (NGR) SJ836971. The location of the Site in its wider geographical context is presented in **Figure 2.1**.
- 2.2.2 The Site is bounded by River Street to the north; Medlock Street to the east and south-east; the Mancunian Way, its exit slip road and the Mancunian Way/Princess Parkway junction to the south; and the River Street Tower purpose-built student accommodation (PBSA) development to the west.
- 2.2.3 The Site has a Greater Manchester Accessibility Level (GMAL) of 8 (very high), demonstrating that the Site has a very high level of accessibility. The Site is situated approximately 330m to the south-east of Deansgate Railway Station, served by Northern trains, and approximately 430m to the south-west of Oxford Road Railway Station, served by Northern, East Midlands Railway, Transport for Wales and Transpennine Express trains. Additionally, the Site is located approximately 395m to the south-east of the Deansgate-Castlefield stop of the Metrolink network, which is situated just opposite Deansgate Railway Station.
- 2.2.4 The Site is located directly adjacent to Medlock Street (the A5103) and the Mancunian Way Ring Road and there are approximately two bus stops within a 200m radius of the Site, providing services to route 256, serving Piccadilly Gardens, Hulme, Stretford, Lostock and Flixton.
- 2.2.5 The Site is located within the Greater Manchester Combined Authority Air Quality Management Area (AQMA), which was designated for exceedances in nitrogen dioxide (NO₂).
- 2.2.6 The existing building on-site is not a Listed Building, though there are approximately 235 Listed Buildings within a 1km radius of the Site. The closest Listed Buildings include the Grade II listed Former Cotton Mill on the west side of the junction with

Cambridge Street (approximately 185m to the north-east of the Site); the Grade II listed Mill Chimney Stack on the west side of the junction with Cambridge Street (approximately 235m to the north-east of the Site); Grade II listed Chorlton Old Mill (approximately 285m to the north-east of the Site); and the Grade II listed Mill on the north-east corner of the junction with Chester Street (approximately 300m to the east of the Site).

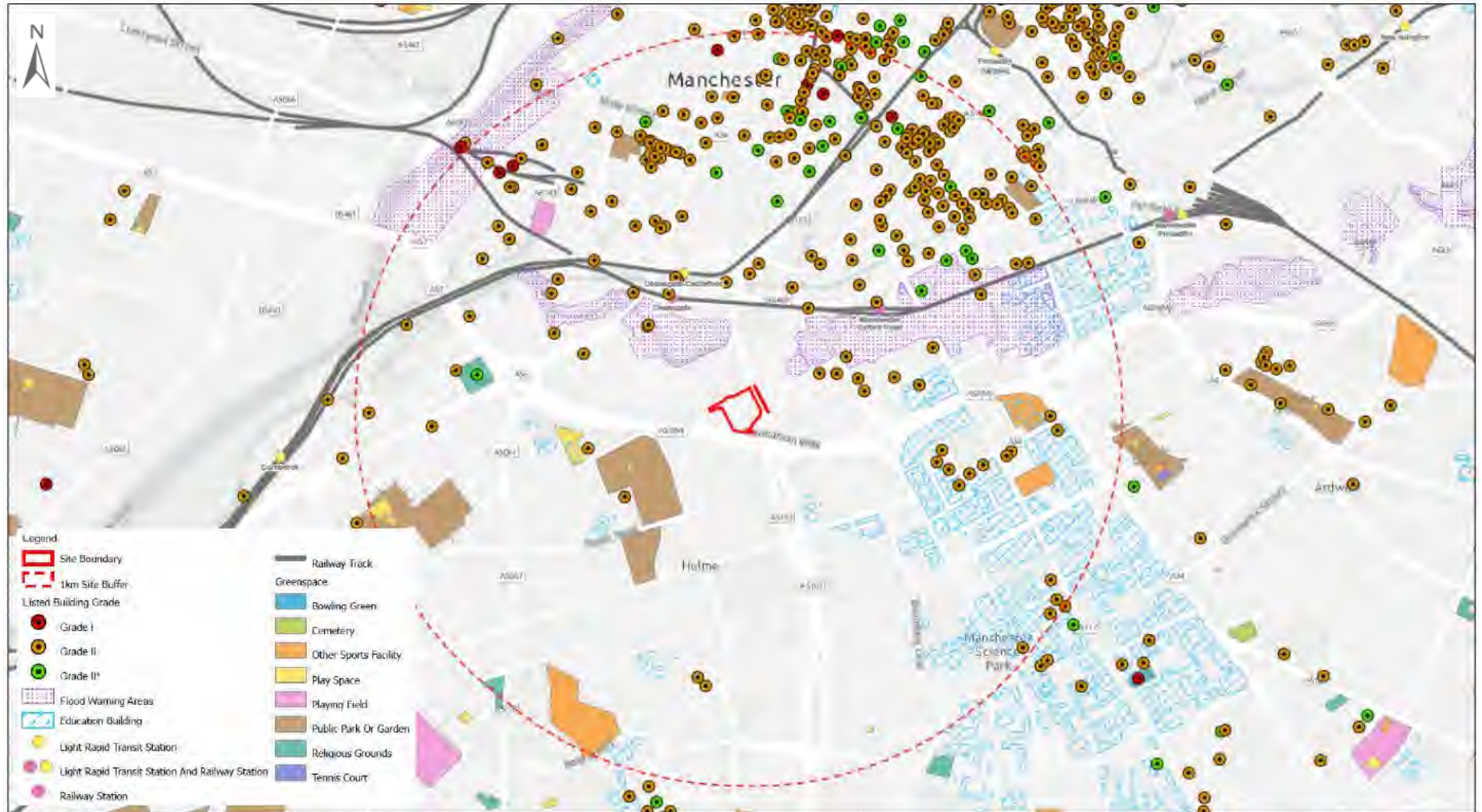
- 2.2.7 The Site is not located in a Conservation Area; the closest Conservation Area is the Castlefield Conservation Area, situated approximately 385m to the north-west of the Site. There is one Scheduled Monument (Remains of eastern wall of the Roman fort) situated approximately 490m to the north-west of the Site. There are no known prehistoric remains within 250m of the Site and the potential for buried archaeological remains deriving from prehistoric activity within the Site is thus considered to be low.
- 2.2.8 There are no Local Nature Reserves (LNRs), National Nature Reserves (NNRs) or Sites of Special Scientific Interest (SSSIs) within 1km of the Site. There are no European designated sites (Special Protection Areas (SPAs) or Special Areas of Conservation (SACs)) within 5km of the Site.
- 2.2.9 There are no Sites of Biological Interest within 2km of the Site; the closest Sites of Biological Interest (Chorlton Ees, Hardy Farm, Barlow Eye Tip and Chorlton Water Park) are situated approximately 4.6km to 5km to the south-west of the Site.
- 2.2.10 The Site is located within Flood Zone 1; a small area in the centre of the Site has a low risk of surface water flooding, whereas a small area in the south of the Site has a medium to high risk of surface water flooding. The Site is located in the Conurbation Core Critical Drainage Area.
- 2.2.11 There are no National Parks or Areas of Outstanding Natural Beauty within 1km of the Site.

2.3 Site Description

- 2.3.1 Currently, the Site is occupied by a Premier Inn hotel and car park. It comprises one building and hardstanding, with pockets of trees and bushes within the car park at the southern end of the Site, adjacent to Mancunian Way. The Site is bounded by:
- River Street to the north-west, with commercial and residential properties beyond;
 - Medlock Street (the A5103) to the north-east, with vacant space beyond;
 - The Mancunian Way Ring Road to the south-east; and
 - Student accommodation to the south-west.
- 2.3.2 Vehicular access to the site is granted via River Street.

- 2.3.3 Most of the Site is covered by buildings or hardstanding as car parking, service yards and other ancillary areas. Areas of green space are limited to urban trees, amenity grassland and a small area of introduced shrub.

Figure 2.1: Site Boundary and Context



2.4 Site Context by ES Topic

- 2.4.1 The sections below provide a brief description of the baseline conditions at the Site and the Site context by topics scoped into the EIA. A more detailed description and analysis is available (in the form of individual baseline assessments) within the technical chapters (**Volume 2, Chapters 6 to 12** and **Volume 3: Townscape and Visual Impact Assessment**).

Socio-Economics and Health

- 2.4.2 The Office for National Statistics' (ONS') 2020 Population Estimates ¹ found that a total of approximately 46,000 people reside across the four Middle Super Output Areas (MSOAs)² which combine to form Manchester City Centre³. This accounts for approximately 8% of the total population of approximately 555,700 living in the local authority of Manchester. The population of Greater Manchester as a whole is approximately 2.85 million.

Air Quality

- 2.4.3 The Site is located within the Greater Manchester Combined Authority (GMCA) AQMA, which was designated for exceedances in NO₂. At all diffusion tube sites in the vicinity of the Site, the Air Quality Strategy (AQS) objective for annual mean NO₂ concentrations has been exceeded in 2019. As these sites are positioned adjacent to road sources within an AQMA, elevated concentrations are to be expected. Concentrations of NO₂ during 2020 and 2021 were lower than previous years due to a reduction in traffic and associated emissions caused by the COVID-19 pandemic.

Noise and Vibration

- 2.4.4 The acoustic environment across the Site is heavily influenced by road traffic on the Mancunian Way flyover to the southwest and Medlock Street to the northeast. Both are major roads through Manchester, subject to high levels of traffic throughout the day.

Wind Microclimate

- 2.4.5 The existing Site's wind conditions are dominated by the built-up nature of the area. Surrounding buildings, particularly the River Street Tower development (that is

¹ ONS via Nomis (2021) Population Estimates: 2020.

² MSOAs are a geographic hierarchy designed to report of small area statistics in England and Wales. The minimum population of an MSA is 5,000 and the average is 7,200.

³ The four MSA references are: Manchester 054 (City Centre North & Collyhurst); Manchester 055 (Piccadilly & Ancoats); Manchester 057 University North & Whitworth Street; and Manchester 060 (Castlefield & Deansgate).

located to the west of the Site), have the potential to cause some downdraughts and accelerations at corners.

- 2.4.6 All areas within the Site and surrounding areas satisfy the safety criteria for pedestrian safety. Wind conditions within the Site and surrounding areas are substantially suitable for their existing uses, with conditions suitable for short periods of standing at entrances and at least strolling on thoroughfares and car park areas.

Built Heritage

- 2.4.7 Historic maps show that the Site formed part of an area of dense court and terraced housing during the 19th century, arranged around a grid network of streets and interspersed with public houses and industry closer to River Medlock.
- 2.4.8 Former buildings were largely demolished as part of extensive clearance in this area of Manchester during the 1930s and the Site remained vacant until the existing hotel was built in circa 2000, fronting Medlock Street with surface level car parking to the rear.
- 2.4.9 There are no designated or non-designated built heritage assets within the Site, however there are assets within the wider area, including the Britons Protection public house, 13 to 17 Albion Street, Chepstow House, Peverill of the Peak public house, Lee House, the Ritz Dance Hall and Manchester Oxford Road Station to the north and north-east. Directly to the east of the Site, beyond existing areas of vacant land is a grouping of grade II listed former cotton mills and associated chimneys lining Hulme Street and Cambridge Street and beyond the A5105 (Mancunian Way), to the south-east, is a former school house and the Roman Catholic Church of St Wilfrid.
- 2.4.10 With the exception of the Former Congregational Chapel on Deansgate to the north-west of the Site, within the boundary of Castlefield Conservation Area, other assets are 19th century buildings and structures associated with the development of the canal and rail network in the city.

Townscape and Visual Impact

- 2.4.11 The Site is located within the southern city centre edge which is defined by a number of new large mixed-use developments such as Deansgate Square, Elizabeth Tower, River Street and Parkway Gardens. All of these include tall building elements of 30 storeys and above. Beyond the ring road to the south, the scale of the city drops noticeably with a number of lower rise residential neighbourhoods, together with smaller green spaces around the Princess Parkway roadway and the larger Hulme Park to the south-west

Townscape

- 2.4.12 The Site is located within the First Street Area of Manchester City Centre, as defined in the City Centre Strategic Plan 2015-2018. The Site is also located within the boundary

of the First Street Development Framework (2018) area, specifically located within the ‘First Street Central’ section of the framework area. The First Street Development Framework has been subject to a supplementary update produced in 2020 (First Street Development Framework Update 2020).

2.4.13 The area to the east of the Site is broadly characterized by a 6-10 storey height datum, with a handful of buildings reaching 15 storeys or higher. Planning permission exists for buildings of up to 45 storeys in height on vacant land on the opposite side of Medlock Street, to the east of the Site. To the west of the Site, high-rise residential towers are increasing the height datum of the wider area.

Visual

2.4.14 The Site occupies a prominent position within the city and is open to a range of viewpoints around it. These include:

- residents within surrounding buildings and urban areas;
- visitors to the City, in Conservation areas and within the context of buildings of Heritage value;
- key routes such as roads, cycle ways, or long-distance paths located around the Site;
- users of public open spaces, such as those in the wider First Street development area; and
- drivers of vehicles on the adjacent major roadways, on the entry to the city centre

Climate Change

2.4.15 The current baseline conditions comprise of current emissions that result from the operation of the existing Premiere Inn Hotel. Such baseline emissions include greenhouse gas (GHG) emissions from the Site, such as gas combustion in building plant, as well as indirect emissions beyond the Site, such as the generation of consumed electricity.

2.5 Potential Key Sensitive Receptors

2.5.1 The key receptors which are considered potentially sensitive to the demolition and construction and operation of the Proposed Development have been identified and are summarised in **Table 2.1**.

Table 2.1: Potential Key Sensitive Receptors

Category	Potential Sensitive Receptor/Land Use
Residential	Future residents of the Proposed Development. Current residents within surrounding buildings and urban areas including (but not limited to): City South Apartments, River Street Tower, and Medlock Place.

Category	Potential Sensitive Receptor/Land Use
Commercial	Labour force in the Local and Wider Impact Areas. Offices within the surrounding area, including (but not limited to): First Street Development.
Community	Users of current public open spaces such as those in the wider First Street development and future public open spaces/realm.
Heritage assets	Former Cotton Mill on west side of junction with Cambridge Street (grade II listed). Mill chimney stack on west side of junction with Cambridge Street (grade II listed). Chorlton New Mill and attached chimney (grade II listed). Chorlton Old Mill (grade II listed). Mill on north-east corner of junction with Chester Street (grade II listed).
Global climate system	Global climate system.
Road Users	Users of road junctions near the Site.
Townscape and views	Townscape Character Areas (TCAs). Urban Grain. Land Use. Building Heights. Movement and Linkages. Public Open Space/Public Realm. Site Character. Visual amenity and views.

One Medlock Street
Environmental Statement
Volume 2
November 2022



CHAPTER 3: EIA METHODOLOGY

3 EIA Methodology

3.1 Introduction

- 3.1.1 This chapter sets out the methodology used to prepare each chapter of the ES and describes the general structure and content of the technical chapters. In particular, it sets out the process of identifying and assessing the likely significant effects of the Proposed Development on the environment.
- 3.1.2 Further detail on how the assessment methodology is applied to each topic is presented within the respective technical chapter or volume of this ES. These chapters include:
- Chapter 6: Socio-Economics;
 - Chapter 7: Air Quality;
 - Chapter 8: Noise and Vibration;
 - Chapter 9: Wind Microclimate;
 - Chapter 10: Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution;
 - Chapter 11: Built Heritage;
 - Chapter 12: Climate Change; and
 - ES Volume 3: TVIA.
- 3.1.3 The ES has been prepared to comply with the EIA Regulations¹ which implement European Council Directive 2014/52/EU. The ES has also drawn on current good practice guidance in EIA.

3.2 EIA Scoping and Consultation

- 3.2.1 Potential environmental topics in relation to the Proposed Development were evaluated, having regard to the EIA Regulations, as part of the scoping exercise and key statutory and non-statutory consultees were consulted as part of this process. This has been carried out in order to determine which topics should be included in the EIA, having regard to whether they are likely to give rise to significant effects.
- 3.2.2 A Scoping Report (**ES Volume 4, Appendix A1**) was submitted to MCC on 8th September 2022 with a formal request for an EIA Scoping Opinion in accordance with Regulation 15 of the EIA Regulations. MCC subsequently issued their Scoping Opinion on 2nd November, commenting on the proposed scope and methodology of the topics

¹ The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/571).

for assessment within the EIA, as listed in **Table 3.1**. A copy of the Scoping Opinion is provided in **ES Volume 4, Appendix A2**.

Table 3.1: Scope of the EIA Topic Chapters as agreed with MCC

Scoped In Topic Chapters
Socio-Economics
Air Quality
Noise and Vibration
Wind Microclimate
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution
Built Heritage
Climate Change

3.2.3 The following topics were scoped out of the ES as standalone chapters, as set out within the EIA Scoping Report (presented in **ES Volume 4, Appendix A1**) and agreed with MCC:

- archaeology;
- biodiversity;
- ground conditions and contamination;
- flood risk, drainage and water quality;
- transport;
- materials and waste; and
- major accidents and/or natural disasters.

3.2.4 Paragraphs 3.2.7 – 3.2.48 outline the justification for their exclusion from the ES.

3.2.5 The following statutory and non-statutory bodies provided consultation responses to MCC, which are presented in **ES Volume 4, Appendix A2**:

- Environment Agency;
- MCC Contaminated Land Section and Pollution Services;
- MCC Highways;
- MCC Flood Risk Management Team;
- Greater Manchester Ecology Unit (GMEU);
- Greater Manchester Archaeological Advisory Service (GMAAS);
- Transport for Greater Manchester (TfGM);
- United Utilities;
- Historic England;

- Manchester Airports Group (MAG); and
- National Air Traffic Services (NATS).

3.2.6 A summary of the key points raised in the Scoping Opinion in terms of the overarching approach to the EIA, methodology and criteria for assessment are presented in **Table 3.2**, including a response as to where the comments have been addressed within the ES or documents supporting the application. Where the Scoping Opinion refers to specific technical topics, these have been dealt with in each respective ES Chapter.

Table 3.2: Summary of Key Points Raised by MCC in the Scoping Opinion

Topic/ Section	Summary of Comment	Location within the ES or supporting documents where comments are addressed
Cumulative Effects		
N/A	The cumulative effects assessment and the list of committed schemes presented in Table 6.2 of the Scoping Report are considered to be acceptable and there are no additional schemes that would need to be included at this time.	This chapter and Chapters 6 to 12.
Review of Aspect Chapters proposed to be scoped out of the ES		
Archaeology	Archaeology has been identified as an item to be scoped out of the EIA. MCC is in agreement that archaeology can be scoped out of the EIA. This is provided that the application is supported by the appropriate documentation as detailed within the scoping report, including details of any mitigation to minimise any effects as a result of the development, and including any details raised by the statutory consultees in their responses.	Archaeological Desk-Based Assessment (submitted as a standalone report as part of the planning application).
	GMAAS accept that the archaeology is unlikely to be of national significance and is satisfied that the topic can be scoped out of the EIA.	
Biodiversity	Biodiversity has been identified as an item to be scoped out of the EIA. MCC is in agreement that biodiversity can be scoped out of the EIA. This is provided that the application is supported by the appropriate documentation as detailed within the scoping report, including details of any mitigation to minimise any effects as a result of the development, and	Preliminary Ecological Appraisal (submitted as a standalone report as part of the planning application).

Topic/ Section	Summary of Comment	Location within the ES or supporting documents where comments are addressed
	including any details raised by the statutory consultees in their responses.	
	GMEU agree that biodiversity can be scoped out of the EIA.	
Ground Conditions and Contamination	Ground Conditions and Contamination has been identified as an item to be scoped out of the EIA. MCC is in agreement that this discipline can be scoped out of the EIA. This is provided that the application is supported by the appropriate documentation as detailed within the scoping report, including details of any mitigation to minimise any effects as a result of the development, and including any details raised by the statutory consultees in their responses.	Contaminated Land Interpretative Report and Geotechnical Interpretative Report (submitted as a standalone reports as part of the planning application).
	The Environment Agency advise that it is confirmed with the applicant/agency that reporting associated with this topic of land contamination will be supplied as part of any subsequent planning application made.	
	The Environment Agency note that from the contaminated land reporting provided (x3 report provisioned), it is unclear as to whether it is considered that intrusive remedial works are required to facilitate the proposed development. The Environment Agency advise that this is clarified as part of any subsequent planning application submission made.	Chapter 5: The Proposed Development and Demolition and Construction Overview.
Flood Risk, Drainage and Water Quality	Flood Risk, Drainage and Water Quality has been identified as an item to be scoped out of the EIA. MCC is in agreement that this discipline can be scoped out of the EIA. This is provided that the application is supported by the appropriate documentation as detailed within the scoping report, including details of any mitigation to minimise any effects as a result of the development, and including any details raised by the statutory consultees in their responses.	Combined Flood Risk and Drainage Strategy (submitted as a standalone report as part of the planning application).
	The Environment Agency would welcome the confirmation provided within the ES that the proposed development will be managed	Chapter 5: The Proposed Development and

Topic/ Section	Summary of Comment	Location within the ES or supporting documents where comments are addressed
	through a site-specific strategy and design which will factor relevant good practice guidance (in relation to devising an appropriate drainage strategy).	Demolition and Construction Overview.
Transport	Transport has been identified as an item to be scoped out of the EIA. MCC is in agreement that transport can be scoped out of the EIA. This is provided that the application is supported by the appropriate documentation as detailed within the scoping report, including details of any mitigation to minimise any effects as a result of the development, and including any details raised by the statutory consultees in their responses.	Transport Assessment (submitted as a standalone report as part of the planning application).
	TfGM expect that a full Transport Assessment (TA) should be provided as part of the planning application and provide Site-specific and general requirements to be addressed within the TA.	
	TfGM state that a Framework Travel Plan for the development should accompany any future planning application.	Travel Plan (submitted as a standalone report as part of the planning application).

Topics to be Scoped Out of the ES

- 3.2.7 The following sections outline the reasoning and justification for scoping certain topics out of the ES.

Archaeology

- 3.2.8 A comprehensive archaeological desk-based assessment was prepared in 2021 to assess the potential impact of the Proposed Development on the subsurface archaeological resource and an updated desk-based assessment has been prepared and submitted as part of the planning application.
- 3.2.9 The Site does not fall within a conservation area, and does not contain any designated heritage assets, such as Scheduled Monuments, Registered Parks and Gardens or listed buildings.

- 3.2.10 The potential for buried archaeological remains deriving from various periods is considered to be as follows at the Site:
- Prehistoric Activity – low;
 - Roman period – fragmentary²;
 - Early Medieval period – low;
 - Late Medieval period – low; and
 - Post-Medieval period – low.
- 3.2.11 The Industrial period (post circa AD 1750) saw the rapid development of the Site (at the end of the 18th century), which showed the area was mainly rural, with a field boundary crossing the Site from north to south. By the mid-19th century, however, the Site had been developed with rows of workers' housing, two public houses and a school.
- 3.2.12 Desk-based research has indicated that the archaeological interest in the Site dates primarily to the 19th century and, specifically, the footprint of different types of early 19th century workers' housing, two public housing and a school. Pending the presence and extent of any below-ground foundations that survive intact, these sites may be considered non-designated heritage assets.
- 3.2.13 It is possible that non-designated buried archaeological remains, particularly dating to the 19th century, are present within the Site. These remains are likely to be at least partially truncated across the Site and may have been fully removed within the footprint of existing buildings. Any assets have been determined to be of local/borough or local significance.
- 3.2.14 The Proposed Development has the potential to impact upon archaeological deposits, if present. Under the National Planning Policy Framework (NPPF), adverse effects on archaeological remains require mitigation, regardless of the significance of effect. As some of the Site is currently occupied by standing buildings, evaluation in the pre-application period has not been achievable. However, the combination of archaeological trial trenching and targeted mitigation (as appropriate) will mitigate any potential adverse effects through preservation by record.
- 3.2.15 A specification for trial trenching will be prepared and submitted to MCC for approval, with works undertaken prior to construction on-site. Such works would be undertaken once planning permission is granted, in response to a suitably worded planning condition. On completion of these works, a Written Scheme of Investigation (WSI) for mitigation will be devised (if required) in consultation with MCC.

² As noted within the Archaeological Desk-Based Assessment (2022) prepared and submitted as part of the planning application.

- 3.2.16 In view of the above, the effects of the Proposed Development on archaeological remains are considered unlikely to be significant and have not been considered further within the EIA or reported in this ES.

Biodiversity

- 3.2.17 A Preliminary Ecological Appraisal (PEA) was completed for the Site, based on surveys undertaken on 15th July 2019 and again on 8th November 2020, and more recently on 31st August 2022.
- 3.2.18 Features within the Site boundary and accessible features immediately bordering it were evaluated and the extent and distribution of habitats and plant communities were recorded. Fauna using the area were recorded and areas of habitat suitable for statutorily protected species were identified where present, with an active search carried out for evidence of such use.
- 3.2.19 Additionally, a tree survey was also carried out during Site visits in 2019 and 2020 (and more recently in October 2022), which identified that most of the trees within the Site boundary and immediately adjacent were Category A³ or Category B⁴ trees, with a small number of Category C⁵ trees in the north-west corner of the Site.
- 3.2.20 In summary, most of the area is covered by buildings or hardstanding as car parking, service yards and other ancillary areas. Areas of green space are limited to urban trees, amenity grassland and a small area of introduced shrub. The trees on-site provide low potential for nesting birds, although there is no further protected species potential within or immediately adjacent to the Site. No invasive species were recorded and generally the Site is considered to be of low ecological value. Additionally, there are no statutory designations of national or internal importance within a 2km radius of the Site.
- 3.2.21 Impacts on protected species and habitats have been considered, although the lack of any habitats of value or protected species potential means that it is unlikely that any significant effects will occur. The only exception to this is the limited breeding bird value presented by the trees on Site. As a precautionary measure, any vegetation on Site would be cleared outside of the breeding bird season (March to August, inclusive) and controlled through a Construction Environmental Management Plan (CEMP), which would be agreed with MCC by means of a pre-commencement planning condition. Furthermore, compensatory tree planting would be provided by

³ Trees of high quality with an estimated remaining life expectancy of at least 40 years (in accordance with BS 5837:2012).

⁴ Trees of moderate quality with an estimated remaining life expectancy of at least 20 years (in accordance with BS 5837:2012).

⁵ Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm (in accordance with BS 5837:2012).

the Proposed Development, as detailed in the Design and Access Statement (DAS) that has been submitted as part of the planning application.

- 3.2.22 In view of the above, any effects of the Proposed Development on protected habitats and species are considered unlikely to be significant and have not been considered further within the EIA or reported in this ES.

Ground Conditions and Contamination

- 3.2.23 A Contaminated Land Desk Study has been undertaken for the Site, along with intrusive ground investigation work, following which a Geotechnical Interpretative Report was prepared. The Contaminated Land Desk Study and Geotechnical Interpretative Report are appended to the EIA Scoping Report (presented in **ES Volume 4, Appendix A1**).
- 3.2.24 During the demolition and construction of the Proposed Development, there is potential for adverse environmental effects to arise due to the disturbance of existing on Site contamination, including the migration of contamination to ground, soil, surface water and groundwater. However, a programme of remediation will be carried out prior to any demolition or breaking of ground, in line with a Remediation Method Statement. This will be integrated into the CEMP.
- 3.2.25 Additionally, the potential for accidental release of new contamination due to on Site demolition and construction activities (i.e. fuel spillage from plant/machinery or disturbance due to foundation works) will be mitigated via the implementation of all activities in line with the Construction Design and Management (CDM) Regulations⁶, CL:AIRE Development Industry Code of Practice⁷ and best practice measures.
- 3.2.26 Given that the Site has a high risk of unexploded ordnance (UXO) on Site, a working method statement will be prepared by the principal contractor, to identify safe working practices and response mechanisms, should UXO be encountered within the Site. This will be managed as part of the CEMP.
- 3.2.27 During the operational phase of the Proposed Development, there is also the potential for localised spillages of fuel, which may be carried to surface watercourses and underlying groundwater through surface run-off and leaching through the soil profile. Contaminants from fuel spillages are likely to occur on areas of hardstanding (i.e. the service yard). However, such areas will be subject to a controlled drainage scheme as part of the Site's drainage strategy, which will include necessary pollution preventative measures, such as the use of interceptors.

⁶ Her Majesty's Stationery Office, 2015; Construction Design and Management (CDM) Regulations.

⁷ Contaminated Land: Applications in Real Environments (CL:AIRE), 2011; The CL:AIRE Development Industry Code of Practice (version 2).

- 3.2.28 In view of the above, any effects of the Proposed Development in relation to ground conditions and contamination are considered unlikely to be significant and have not been considered further within the EIA or reported in this ES.

Flood Risk, Drainage and Water Quality

- 3.2.29 As noted within the Scoping Report (presented in **ES Volume 4, Appendix A1**), the Site is located in Flood Zone 1 and overall flood risk to the Site (from rivers, sea, surface water and reservoir) is considered to be low. There are also a number of combined public and private sewers within the vicinity of the Site.
- 3.2.30 All future surface water generated by the Proposed Development will be managed through a Site-specific Drainage Strategy and design. The Drainage Strategy and design will account for any increase surface water runoff (from building facades) and maintain or reduce surface water runoff and associated flooding (including surface water attenuation and betterment provided as part of the sustainable drainage systems (SuDS) strategy for the Site). This will include an allowance for climate change, in line with Environment Agency guidance, and will also be designed in line with the CIRIA SuDS Manual⁸ and requirements specified by MCC.
- 3.2.31 Drainage features will be developed to provide sufficient control of surface pollutants where/as necessary, providing suitable levels of treatment for surface water, which will remove pollutants prior to discharge to the wider aquatic environment. Details of the treatment train for all surface water runoff from the Proposed Development is included in the combined Flood Risk and Drainage Strategy that has been prepared and submitted with the planning application.
- 3.2.32 In view of the above, it is considered that any adverse changes to water resources and surface water flooding will unlikely be significant; therefore, flood risk, drainage and water quality have not been considered further within the EIA or reported in this ES.

Transport

- 3.2.33 As noted in the Scoping Report (presented in **ES Volume 4, Appendix A1**), the local road network currently carries relatively high traffic volumes within the main flows on the elevated Mancunian Way, at approximately 75,000 vehicles per day. Medlock Street is a busy gateway into the city and carries approximately 24,000 vehicles per day. The traffic on the side road of River Street is much lower at approximately 1,000 vehicles on the one-way link west of Medlock Street past the Site.

⁸ The SuDS Manual, C753, CIRIA 2015.

- 3.2.34 In addition to the above, MCC have implemented a highway improvement scheme at the Medlock Junction Roundabout, which has eased congestion and improved pedestrian cycle linkages from the city to the residential areas to the south.
- 3.2.35 The demolition and construction of the Proposed Development will result in the addition of temporary traffic on the local road network, comprising trips made by Heavy Goods Vehicles (HGVs), alongside general trips from demolition and construction staff and contractors. The exact number of trips anticipated to be generated by the demolition and construction of the Proposed Development is currently unknown (as it is subject to the specific construction timings, which will be determined by the principal contractor, when appointed); however, it is considered that the demolition and construction traffic generated will peak at 30-40 vehicles a day. Despite this increase, the volume is not unusual for an urban area and similar volumes have been seen with neighbouring development. Additionally, the maximum impact would be temporary and HGV trips would be anticipated to reduce.
- 3.2.36 In addition to the above, in order to minimise any adverse effects associated with demolition and construction traffic, a Traffic Logistics Plan (TLP) (or equivalent) will be implemented and managed as part of the CEMP. The TLP will adopt best practice measures, including provisions of traffic routing management of deliveries and appropriate signage. Consequently, any adverse effects anticipated to arise from the demolition and construction of the Proposed Development is considered unlikely to be significant.
- 3.2.37 During the operation of the Proposed Development, potential transport related effects are solely associated with the level of operational traffic and based on an appraisal of future development trips, it is anticipated that there would be a reduction in trips accessing the Site, due to removal of the existing Premier Inn hotel car park. Therefore, it is considered that the forecast trip generation of the operational Proposed Development is unlikely to give rise to significant effects in relation to severance, pedestrian delay and amenity (including fear and intimidation), driver delay or road collisions and safety.
- 3.2.38 In view of the above, it is considered that any adverse transport effects are unlikely be significant and transport has therefore not been considered further within the EIA or reported in this ES.

Materials and Waste

- 3.2.39 The demolition of the existing Premier Inn hotel will generate a series of waste arisings, likely to include (but not limited to) concrete, brick and steel. A percentage of the concrete and brick associated with the demolition will be crushed and re-used on Site. Other materials and any contaminated material will be disposed to appropriate landfill facilities. Such waste will be handled, processed and removed from Site by suitably qualified contractors, all being undertaken in line with the Hazardous Waste

(England and Wales) Regulations 2005⁹. Additionally, it is anticipated that waste will be produced as a result of the construction of the Proposed Development.

- 3.2.40 All waste arisings from the demolition and construction of the Proposed Development are to be controlled through the implementation of a CEMP and a best practice Site Waste Management Plan (SWMP). The CEMP will set out the principles and legal requirements relating to waste (including hazardous waste) and the SWMP will describe how materials will be managed and stored efficiently and disposed of legally.
- 3.2.41 Operational waste from the Proposed Development will predominantly be from users of the office space and students. The Proposed Development will include provisions for waste storage facilities, which will include facilities for the separation of waste for recycling purposes. An operational Waste and Servicing Strategy has been developed for the Proposed Development (and submitted as part of the planning application), which has set out principles, the strategy and targets for the management of waste and will maximise recycling, in accordance with MCC policy.
- 3.2.42 In terms of materials, there is not anticipated to be any significant issue in terms of availability of materials required for the Proposed Development, as the Proposed Development will comprise a high number of sustainable features and construction methods.
- 3.2.43 In view of the above, it is considered that any effects related to waste and materials are unlikely to be significant and have, therefore, not been considered further within the EIA or reported in this ES.

Major Accidents and/or Natural Disasters

- 3.2.44 As an office and student accommodation development, the Proposed Development would not be a source of hazard that could result in a major accident or disaster during operation. Measures to eliminate the risk of major accidents or disasters as a result of the demolition and construction of the Proposed Development will be outlined in a CEMP.
- 3.2.45 A review has been undertaken of potential sources of hazard in the surrounding area, that have the potential to interact with the Proposed Development. This included consideration of risks from ground contamination (which was considered unlikely to be significant); adverse changes to water resources and surface water flooding (which were also considered unlikely to be significant); structural, geomorphological or geochemical features (which were not recorded on or near the Site); potential coal mining activities (in which the Site is not located in an area to be affected by) and

⁹ HMSO, 2005; Hazardous Waste (England and Wales) Regulations.

Health and Safety Executive (HSE) Control of Major Accidents Hazards (COMAH) sites (of which there are none in close proximity to the Site).

- 3.2.46 As previously mentioned, given that the Site has a high risk of unexploded ordnance (UXO) on-site, a working method statement will be prepared by the principal contractor and will be managed as part of the CEMP.
- 3.2.47 Any increased risk of major accidents or natural disasters as a result of climate change will be addressed in **Chapter 12: Climate Change** of this ES.
- 3.2.48 In view of the above, it is considered that existing design measures and standard practice will adequately control any potential major accidents and/natural disasters. Therefore, major accidents and/or natural disasters has not been considered further within the EIA or reported on in this ES.

Public Consultation

- 3.2.49 Engagement with non-statutory consultees is an on-going process as part of the design development. The process of consultation and engagement is also critical to the preparation of a comprehensive and balanced scheme, to help focus the environmental studies and to identify specific issues that require further investigation, and to understand the views of the local community. Information and views have been sought and received from a range of statutory and non-statutory bodies through bilateral and public consultation.
- 3.2.50 Consultation and engagement events were undertaken from 21st September to 5th October and activities included:
- engagement with Deansgate and Hulme ward councillors;
 - an information leaflet distributed to 2,886 local residents surround the Site, ahead of the consultation launch;
 - a live webinar and Question and Answer (Q&A) session held on 28th September, between 6pm-7pm. The webinar included a presentation to take attendees through the details of the Proposed Development, along with a live Q&A session, where members of the project's technical team responded to questions. The recording was then uploaded to the website the following day;
 - a dedicated project website was hosted at www.onemedlockstreet.co.uk, which included details of the wider Site context, the vision for the Proposed Development, the Proposed Development itself, illustrative plans and the details of the live public webinar, along with contact method for the consultation team (which included an online feedback form, dedicated email address and Freephone consultation number);
 - a press release issue on consultation launch to Place North West; and

- targeted social media adverts on Facebook and LinkedIn throughout the consultation period.

3.2.51 Further details of the public consultation and exhibition events are provided within the Statement of Community Engagement submitted as part of the planning application.

3.3 The EIA Regulations

3.3.1 The EIA Regulations require that an EIA be undertaken for the Proposed Development, and that an ES identifying impacts and associated mitigation measures must be provided to accompany the Application.

3.3.2 For the purposes of the EIA Regulations, Regulation 18 (3) defines an environmental statement as:

“...a statement which includes at least:

- (a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development;*
- (b) a description of the likely significant effects of the proposed development on the environment;*
- (c) a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;*
- (d) a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;*
- (e) a non-technical summary of the information referred to in sub-paragraphs (a) to (d); and*
- (f) any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.”*

3.3.3 Temple has been commissioned by the Applicant to prepare the EIA in line with the EIA Regulations and the other relevant EIA guidance and to produce this ES which is submitted with the Application.

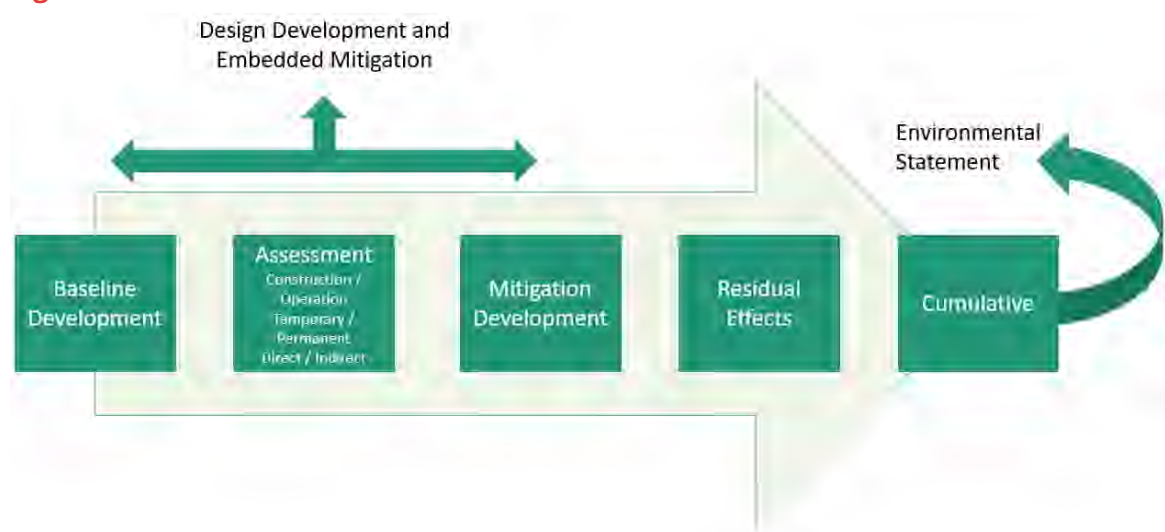
3.3.4 The Applicant has provided the necessary information to enable preparation of this ES. The ES will ensure that sufficient information is provided to enable the MCC to make a decision about the Application with due regard to and in the knowledge of any likely significant environmental effects.

3.4 The Environmental Statement Approach

Approach to Technical Studies

- 3.4.1 The approach taken to the EIA process is shown in **Figure 3.1**. The general approach to the assessment establishes the baseline for each topic. Receptors and resources are identified, and their sensitivity classified. The potential impacts of the Proposed Development on these receptors and resources are assessed for the construction and operational phases of the Proposed Development where relevant, taking into account any embedded mitigation. Subsequently, additional mitigation measures are considered, as appropriate, allowing the likely significant residual and cumulative effects to be identified.

Figure 3.1: EIA Assessment Process



- 3.4.2 In order to inform the design process, the EIA studies commenced at an early stage in the development and design process of the Proposed Development in 2022. The studies have been undertaken in accordance with current best practice. Specific guidance used is referenced within each of the respective technical chapters.
- 3.4.3 The assessments involved consultation with statutory and non-statutory bodies, desk-based research, Site inspections and surveys, impact and effect prediction and identification of mitigation measures.
- 3.4.4 The assessment and conclusions of the ES are based on the Proposed Development as described in **Chapter 5: The Proposed Development and Demolition and Construction Overview**.

Baseline Development

- 3.4.5 The ES primarily describes environmental impacts in terms of the extent of likely change to the baseline environment. Unless stated otherwise, the baseline represents the current environmental conditions of the Site.

3.4.6 For most of the technical ES chapters, this means the baseline has been taken as the existing conditions (2022 - when the majority of the baseline surveys, including noise, were undertaken) at the Site. However, in some circumstances (such as for climate change) it may be necessary to apply a ‘future baseline’ or a more historic one when based on population survey data. Where this has been undertaken, this has been explained within the relevant technical ES chapters.

Spatial Scope

3.4.7 The redline boundary of the Proposed Development is shown in **Figure 3.3**. Assessment study areas vary by topic areas, according to the baseline information and the nature of likely impacts. These are outlined within each technical chapter.

Temporal Scope

3.4.8 The ES assesses the environmental impacts of the Proposed Development during both construction and operation. The assessment compares the current and future baseline conditions (as appropriate) to those conditions expected with the construction and operation of the Proposed Development. The assessment assumes that construction starts in 2023 and ends in 2026, subject to securing planning permission.

3.4.9 The assessment considers the totality of the Proposed Development from construction through to operation, using the following assessment scenarios:

- existing baseline;
- future baseline (without Proposed Development);
- assessment of peak construction effects; and
- assessment of operational effects (all construction completed, the Proposed Development fully occupied and operational).

3.4.10 The assessment does not consider the demolition of the Proposed Development as it has been assumed that it will have a design life of 60 years.

Structure of Technical Chapters

3.4.11 Each technical chapter of the ES (**Chapters 6 to 12** and **Volume 3**) has been set out broadly in line with structure outlined in **Table 3.4**.

Table 3.4: Structure of the Technical Chapters

Technical Chapter Structure	
Scope of Assessment	Each of the technical chapters begins with an introduction to the assessment, explaining its purpose in the context of the Proposed Development and ES, including any key topics/aspects which have been scoped in or out of the assessment.

Technical Chapter Structure	
Key Legislation, Policy and Guidance Considerations	This section includes a summary of national, regional and local policies of relevance to the environmental discipline and assessment. Where applicable, relevant legislation has also been summarised.
Assessment Methodology	This section provides an explanation of methods used in undertaking the study with reference to published standards, guidelines and best practice. Limitations or difficulties encountered are discussed, where relevant. This section also discusses the application of sensitivity, magnitude and significance criteria within the assessments.
Baseline Assessment and Identification of Key Receptors	This section describes and evaluates the baseline environmental conditions i.e. the current situation and anticipated changes over time in the absence of the Proposed Development. This is a critical part of the EIA process as it provides a measure against which the likely significant effects on the environment can be assessed.
Identification and Description of Changes Likely to Generate Effects	This section provides a brief description of the changes likely to generate effects during both the demolition and construction of the Proposed Development and/or the operation of the Proposed Development.
Assessment of Likely Significant Effect	This section identifies the likely significant effects on the environment resulting from the Proposed Development during construction and operational phases taking into account the embedded mitigation outlined in the CEMP and within each of the topic chapters 6 to 12 and Volume 3. A description of the likely effects of the Proposed Development and an assessment of their predicted significance are also provided.
Scope for Additional Mitigation Measures	One of the main aims of the EIA process is to develop suitable mitigation measures to avoid, reduce or compensate for all significant adverse effects of a project. These measures relate to all phases. This section describes the additional measures which would be implemented to mitigate against potentially significant adverse effects. Where possible, enhancement measures have been proposed.
Residual Effects	The residual effects, i.e. the remaining effects of the Proposed Development assuming implementation of the proposed embedded and additional mitigation measures, have been estimated and presented.
Cumulative Effects	This section summarises the cumulative effects of the Proposed Development in combination with identified schemes.

- 3.4.12 The Townscape and Visual Impact Assessment (TVIA) follows the same structure as the technical chapters listed above but is provided as a separate volume (**Volume 3**).

Assessment of Effects

- 3.4.13 The assessment of significance of effects has been undertaken using appropriate national and international quality standards. Where no such standards exist, the judgements that underpin the attribution of significance have been described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.
- 3.4.14 The ES considers the following periods to support the assessment of likely significant effects:
- existing baseline (2022);
 - demolition and construction phase (2023 - 2026); and
 - operational phase (2026).
- 3.4.15 The ES identifies the likely significant effects of construction of the Proposed Development against the 2022 baseline.
- 3.4.16 The assessment of operational effects is undertaken against the future baseline in 2026 (the 'without development'/'do nothing' scenario, see **Chapter 4: Alternatives Considered and Design Evolution**), unless otherwise stated in the individual technical chapters.
- 3.4.17 Certain topics have undertaken an assessment of peak demolition and construction effects to ensure a reasonable worst-case scenario is considered and that any conclusions are sufficiently robust to accommodate potential changes in the construction methodology. Where a worst-case scenario has been assessed, this has been set out in the assumptions and limitations section of the technical chapters (**Chapters 6 to 12** and **Volume 3**).
- 3.4.18 Demolition and construction traffic is anticipated to access the Site via River Street. **Chapter 5: The Proposed Development and Demolition and Construction Overview** provides further detail on the proposed demolition and construction methodology and outlines the key demolition and construction activities that are likely to generate environmental effects.

Defining Significance

- 3.4.19 The changes generated by a development project may result in outcomes which are considered to be positive or adverse, and in some cases may be considered to be neutral. Examples would include: new scheme-related noise or air pollution, changes in lighting levels, loss of habitat or topsoil, new planting and habitat re-provision, changes to the townscape, loss of surface permeability, waste production, etc.

- 3.4.20 Examples of receptors/resources that might be affected by such changes include: people (residents, passers-by, workers etc.), designated sites (Sites of Specific Scientific Interest, Conservation Areas, groundwater protection zones etc.) and non-designated environmental resources of value.
- 3.4.21 Effects come about as the result of imposing changes on receptor/resources. The physical extent of effects (in terms of the geographical area affected, or the size of the human population affected, or the spatial extent of any protected species or habitats affected) should all be taken into account when assessing the importance of likely changes along with duration, frequency and reversibility.
- 3.4.22 Step 1 of the process of assessing the significance of an effect (i.e. the imposition of a change onto a receptor/resource) is to identify all relevant combinations of change and receptor/resource which may arise as a consequence of implementing the Proposed Development. This is most easily and clearly done by dividing the assessment by topic area and then further sub-dividing within topic areas the source and type of change (distinguishing between direct, indirect and secondary) and the receptor(s) effected by this.
- 3.4.23 Step 2 is to use professional judgement and/or appropriate best practice guidance (and taking into account specific statutory or non-statutory values and objectives as may be applicable, for example, in relation to air quality or water quality threshold values) to identify:
- the sensitivity of the receptors/resources concerned;
 - the strength (and the geographical scale at which the change is identified), duration and frequency of the likely changes; and
 - to score these components of the effect under consideration.
- 3.4.24 The duration of an effect can be assessed to be:
- temporary (e.g. demolition and construction phase); and
 - permanent (e.g. once the Proposed Development is completed and operational).
- 3.4.25 Where appropriate and greater precision is helpful, the following terms can also be used:
- short term (<5 years);
 - medium term (5-10 years); and
 - long term (>10 years).
- 3.4.26 Some changes will affect different receptors/resources to different degrees, and some receptors/resources may be affected by a range of potential changes (to which they may well exhibit different sensitivities). Significance must therefore be judged in the context of a specific combination of change and receptor/resource sensitivity.

- 3.4.27 Generic criteria for determining the value/sensitivity of a receptor or resource based on its relative importance and its ability to accommodate change and/or recover from impacts is provided in **Table 3.5** below.

Table 3.5: Criteria for Determining Value/Sensitivity

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

- 3.4.28 Generic criteria for determining the magnitude of an impact based on the strength of change, the geographical scale at which it is identified, the duration, frequency and reversibility of the change is provided in **Table 3.6**.

Table 3.6: Criteria for Determining Magnitude of Impact

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

- 3.4.29 Step 3 of the process of assessing the significance of an effect is to describe and document the outcome of Steps 1 and 2, and to judge the significance of each potential effect determined by the interaction of value/sensitivity and magnitude, whereby the effects can be beneficial, adverse or neutral.
- 3.4.30 A generic Effect Significance Matrix is set out in **Table 3.7** to assist in this judgement of significance, whereby it is generally considered that any effect greater than “minor” is considered a significant effect.

Table 3.7: Effect Significance Matrix

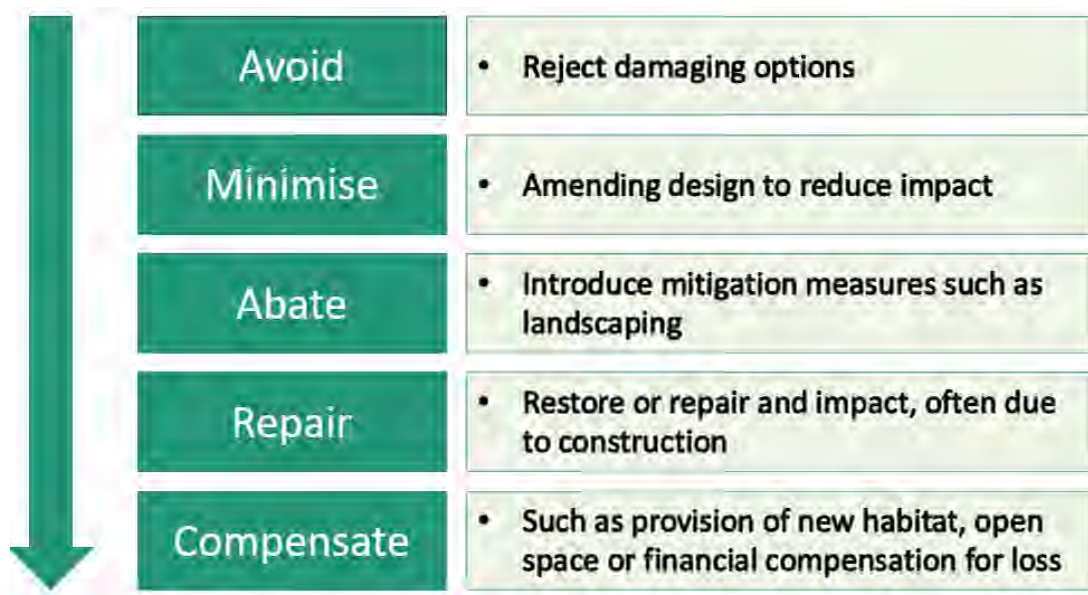
Magnitude of Impact	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial	Major – Moderate Adverse/Beneficial	Moderate – Minor Adverse/Beneficial
Moderate	Major – Moderate Adverse/Beneficial	Moderate – Minor Adverse/Beneficial	Moderate – Minor Adverse/Beneficial
Minor	Moderate – Minor Adverse/Beneficial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

- 3.4.31 In all cases the author should exercise professional judgement and take account of all relevant topic specific standards, guidance and threshold in assessing the significance of an effect.
- 3.4.32 Step 4 is to record those effects which are to be treated as significant, and to identify those effects which, while not in the end deemed to be significant, may well need to be considered further in the context of cumulative effects.
- 3.4.33 The matrix presented above in **Table 3.7** is widely accepted and used within the EIA industry. The magnitude and significance criteria have been provided as a guide for technical specialists to assess effect significance.
- 3.4.34 Where discipline specific methodology has been applied that differs from the generic criteria above, this has been clearly explained within the given chapter under the heading of Assessment Methodology and Significance Criteria.

Mitigation Measures

- 3.4.35 Any potentially significant adverse effects have been considered for mitigation at the design stage and, where practicable, specific measures have been put forward. Measures have been considered based on the hierarchy of mitigation set out in **Figure 3.2**.

Figure 3.2: Mitigation Hierarchy



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

3.4.37 Mitigation to be implemented during the construction and operational phases will be secured through planning conditions and obligations.

3.4.38 Two main types of potential mitigation measures have been assessed:

- **Embedded Mitigation** – embedded mitigation includes design/standard control measures, which have been taken into account in an initial assessment of the effects. The Proposed Development has been developed in such a way that the reduction and, wherever possible, elimination of any associated significant adverse environmental effects is integral to the overall design philosophy. The embedded mitigation measures will be captured and implemented through the design of the Proposed Development or provisions of a CEMP and are also presented within the technical chapters (**Chapters 6 to 12** and **Volume 3**).
- **Additional Mitigation** – further additional mitigation measures may be introduced, where appropriate, and are taken into account in the assessment of residual effects. Where it has not been possible to avoid adverse significant environmental effects, such additional mitigation and monitoring measures are discussed as applicable in the relevant technical chapter.

Residual Effects

3.4.39 The likely residual effects on the environment, assuming the successful implementation of the mitigation measures proposed, are identified within each assessment.

- 3.4.40 The residual effects have been assessed using the same system as described above taking account of any assessment mitigation proposals. Residual effects have then been assessed in terms of significance. Generally, based on the described classification and professional judgement, effects considered to be moderate, or major have been deemed significant, and those considered minor, or negligible, have been deemed not significant.

Cumulative Effects

- 3.4.41 The EIA Regulations specify that the description of the likely significant effects within an ES should include *“the direct effects and any indirect, secondary, cumulative...effects”*.
- 3.4.42 There are two types of cumulative effects: Type 1, intra-project effects which are the combined effects of individual topic impacts on a particular sensitive receptor, and Type 2, inter-project effects which are the combined effects of several development schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 3.4.43 The ES has given consideration to cumulative effects for schemes located within an approximate 500m radius from the boundary of the Site. Using professional judgement, it is considered that this spatial extent represents a suitable area over which any potential cumulative effects may occur. Any variations from this 500m radius boundary within individual topic assessments are set out in the respective technical chapters. The cumulative schemes considered include:
- approved but uncompleted schemes (i.e. unimplemented or under construction); and
 - schemes for which a planning application has been submitted and which is under consideration by MCC.
- 3.4.44 The EIA Regulations only require consideration of other existing and or approved schemes, however in order for the list to remain up to date at the time of submission, we have considered submitted applications up to two years prior to the submission of the planning application.
- 3.4.45 **Table 3.8** sets out the consented and committed schemes for consideration in the cumulative effects assessments, some of which are now known to be operational and therefore form part of the existing baseline. These are also shown spatially on **Figure 3.4** at the end of this chapter.

Table 3.8: Schemes for Consideration in the Cumulative Effects Assessment

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
1	One City Road 1 City Road East	128002/FO/2020	Full Planning Application for demolition of existing	20m	Approved 26.01.2021

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
	Manchester M15 4PN		structures on site, erection of one 11-storey plus basement office building (Use Class E) and one 14-storey plus basement office building with ground floor commercial unit (Use Class E), landscaping, highways works, and associated works.		
2	Plot 9 First Street Manchester M15 4FN	132600/FO/2021	Erection of a nine-storey building with rooftop plant and basement comprising office accommodation (Use Class E(c)) with ancillary facilities for occupiers including roof top terrace, winter gardens, gym/ yoga studio, basement car parking (26 spaces) and cycle parking (130 spaces) landscaping and other associated works	25m	Approved 14.04.2022
3	Plot 11 First Street Comprising Land Bound By Hulme Street To The North, Wilmott Street To The East, The Unite Parkway Gate Development And Mancunian Way To The South, And Medlock Street To The	125573/FO/2019	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	45m	Approved 09.03.2021

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
	West Manchester		facilities and other associated works.		
4	Olympia Trading Estate Great Jackson Street Manchester M15 4NP	116850/FO/2017	Demolition of the existing buildings on the site and construction of three residential buildings, 32, 26 and 18 storeys in height, comprising a total of 399 residential units (C3) and 50 retirement living units (C2) with roof top ancillary restaurant; 675 sq.m of commercial floor space (Use Classes A1, A2, A3, A4, B1, D1 or D2); associated car and cycle parking within a basement level; public realm and landscaping; access and servicing arrangements; and other associated works.	240m	Approved 03.05.2019
5	10-12 Whitworth Street West Manchester M1 5WY	111003/FO/2016/ C1	Demolition of existing building at 10 - 12 Whitworth Street West, and redevelopment of the site for a new 35 storey residential building (Use Class C3) comprising 327 apartments, with associated residents' services, facilities and communal spaces: servicing, highways, public realm and associated works.	260m	Approved 11.04.2016
6	Hotspur Press 2 Gloucester Street Manchester M1 5QR	120635/FO/2018	Part demolition and redevelopment and part retention and refurbishment of the former Hotspur Press	270m	Approved 30.10.2020

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
			Complex (Medlock Mill) to deliver 171 residential units (10 no. 1 bed, 1 person apartments, 49 no. 1 bed, 2 person apartments, 2no. 2 bed, 3 person apartments and 110 no. 2 bed 4 person apartments) - Use Class C3, within refurbished mill space and 28 storey building (including two levels of basement), commercial floorspace (Use Classes A1 (shop), A2 (financial and professional services), A3 (restaurants and cafes), B1 (office), D1 (medical clinic, health centre, art gallery and museum only) and/or D2 (gymnasium or bowling alley only) together with servicing, access, landscaping including a new public space and pedestrian route between Gloucester Street and First Street, and other associated works		
7	John Dalton West / John Dalton Tower Chester Street Manchester M1 5GD	125799/FO/2019	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,	340m	Approved 12.03.2020 Demolition undertaken, construction not yet started.

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
			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.		
8	Land Known As Birley Plot E Stretford Road Manchester	120896/FO/2018	Construction of a part 6, part 11 and part 16 storey building comprising 491 student bedspaces (sui generis), amenity space, cycle parking, landscaping, and associated highways work.	350m	Approved 09.10.2018 Under construction, almost complete.
9	Former Bauer Millet Site Albion Street Manchester	115871/FO/2017	Erection of a 40 storey building to form 375 residential apartments (Use Class C3a) and the erection of a 14 storey building for form offices (Use Class B1) (31,756 sqm) together with ground floor commercial space (Use Class A1, A3 or A4) (1010 sqm) with associated enclosed service yard, public realm including staircase and lift to connect with viaduct, car and le parking, landscaping and other associated works	350m	Approved 27.07.2017 Under construction.
10	Land Bound By Silvercroft Street, Crown Street, And	126668/FO/2020	Full planning permission for the erection of two 52-storey residential	360m	Approved 03.08.2020

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
	The Mancunian Way Manchester M15 4AX		buildings (Use Class C3) each incorporating a podium accommodating residential amenity facilities and ground floor and first floor commercial units (Use Classes A1, A2, A3, or D1), private and public basement car parking, landscaping and a public park, servicing and access arrangements, highways improvements, and associated works (Phases A, B, and D as defined on Drawing Reference: 10292Z1SHPG000PL00 B5D802 and 10292Z1SHPG000PLB1 B5D801). Outline planning permission (with all matters reserved) for an educational facility (Use Class D1) (Phase C as defined on Drawing References: 10292Z1SHPG000PL00 B5D802 and 10292Z1SHPG000PLB1 B5D801)		Construction has just started.
11	325 - 327 Deansgate Manchester M3 4LQ	125804/FO/2019	Demolition of existing buildings and structures on-site and erection of 22-storey building comprising apart-hotel (Use Class C1) with flexible commercial uses at ground floor and within existing viaduct arches (Use Class A1,	390m	Approved 26.06.2020

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
			A2, A3, A4, D2), access, landscaping and other associated works		
12	Land Bounded By Chester Road, Mancunian Way And Former Bridgewater Canal Offices Manchester	119806/FO/2018	Erection of two tall buildings (51 storeys and 21 storeys) comprising 664no residential units (use class C3) and commercial space (A1, A3 or D1), provision of two levels of basement parking, alterations to surface level car park, landscaping, highway alterations, access and associated works.	400m	Approved 04.07.2018 Under construction.
13	2 – 4 Chester Road Manchester M15 4QG	113870/FO/2016	Construction of two residential apartment buildings with ancillary amenity facilities for residents including a gym, landscaped terrace and swimming pool, new public realm and landscaping including two new pedestrian connections to the Castlefield basin from Chester Road, basement car parking and related highway, access, servicing and associated works.	400m	Approved 05.04.2017 Under construction, almost complete.
14	Great Marlborough Street Car Park Great Marlborough Street Manchester M1 5NJ	121252/FO/2018	Partial reconfiguration of existing Multi-Storey Car Park (MSCP), including temporary access off Great Marlborough Street, construction of 5 storey external ramps, closure of vehicular access to top level; and construction of new facade; and partial	430m	Approved 23.07.2021

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
			demolition of the surplus part of existing MSCP and erection of a part 55, part 11 storey, part 4 storey mixed-use building comprising 853 Purpose Built Student Accommodation units (sui generis), ancillary amenity space and support facilities, and 786sqm (GIA) SME incubator workspace (Use Class B1), including public realm improvements and other associated work.		
15	Land Bounded By Trumpet Street, Albion Street & Great Bridgewater Street Manchester M1 5LE	133172/FO/2022	Erection of a 26 storey residential tower for 72 apartments (Use Class C3) with associated car parking, cycle parking, servicing, and associated landscaping works.	320m	Validated 09.03.2022 Awaiting decision.
16	34 Great Jackson Street Manchester M15 4NG	129273/FO/2021	Demolition of existing structures and the construction of two residential buildings of 56 storeys (plus basement and roof plant) (use class C3), with ground floor commercial uses (use class E), car parking, cycle provision, landscaping, access and other associated works	270m	Validated 09.03.2021 Awaiting decision.
17	Land At Deansgate South Manchester	129406/FO/2021	Full planning permission for a 28-storey purpose built student	355m	Appeal allowed 04.06.2021

No.	Development	Planning Application Reference	Summary of Development	Approx. Distance from Site	Planning Status
			accommodation building (Sui Generis)		
18	Plot F Great Jackson Street Manchester M15 4AX	132199/FO/2021	Full planning permission for the demolition of existing structures and the erection of two 51-storey residential buildings (Use Class C3) across two phases, including residential amenity facilities, basement car parking, landscaping and public realm, servicing and access arrangements, highways alterations, and associated works.	100m	Approved 01.07.2022

Interactive Effects

3.4.46 Interactive effects are also considered in the ES. Interactive effects arise where a receptor experiences multiple effects of the Proposed Development (often across different environmental topics), and where the effect of one topic alters the experience of the effect of another topic. Common examples of these include:

- the combined nuisance effect of increased traffic, noise and air pollution, and adverse visual impacts during construction;
- changes to ground conditions and water levels and the resultant impact on archaeological remains; and
- increased demand on open space exacerbated by effects that would worsen the experience of using current amenity spaces.

3.5 Assumptions and Limitations

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

- assessments primarily assume the baseline conditions in 2022 when the majority of the baseline surveys, including noise, were undertaken;
- current surrounding land uses do not change, with the exception of the cumulative developments identified;

- assessments are based on published sources of information and primary data collection. Sources are provided as necessary;
- assessments are based on the description of the Proposed Development and the anticipated construction methodology and programme summarised in **Chapter 5: The Proposed Development and Demolition and Construction Overview**;
- the design, construction and operation phases of the Proposed Development will satisfy minimum environmental standards, consistent with contemporary legislation, practice and knowledge;
- planning permission, when granted, will contain conditions that will control disturbance during construction and operation, and be sufficient to limit the development to that which has been assessed in the EIA;
- any future development of the Site, beyond the Proposed Development to which this ES relates, will be determined through separate planning applications and is not assessed within this ES;
- the construction information on which the assessments are derived, are based on the best information available at the time of writing and represent a reasonable scenario of how the Proposed Development may be implemented; and
- subsequent to the modelling studies being carried out for some of the technical disciplines, the Proposed Development has incorporated minor design amendments. Where this is the case, the results presented in the ES have been adjusted to best reflect the Proposed Development and this is noted within the limitations and assumptions section of the individual technical chapters

3.6 Objectivity

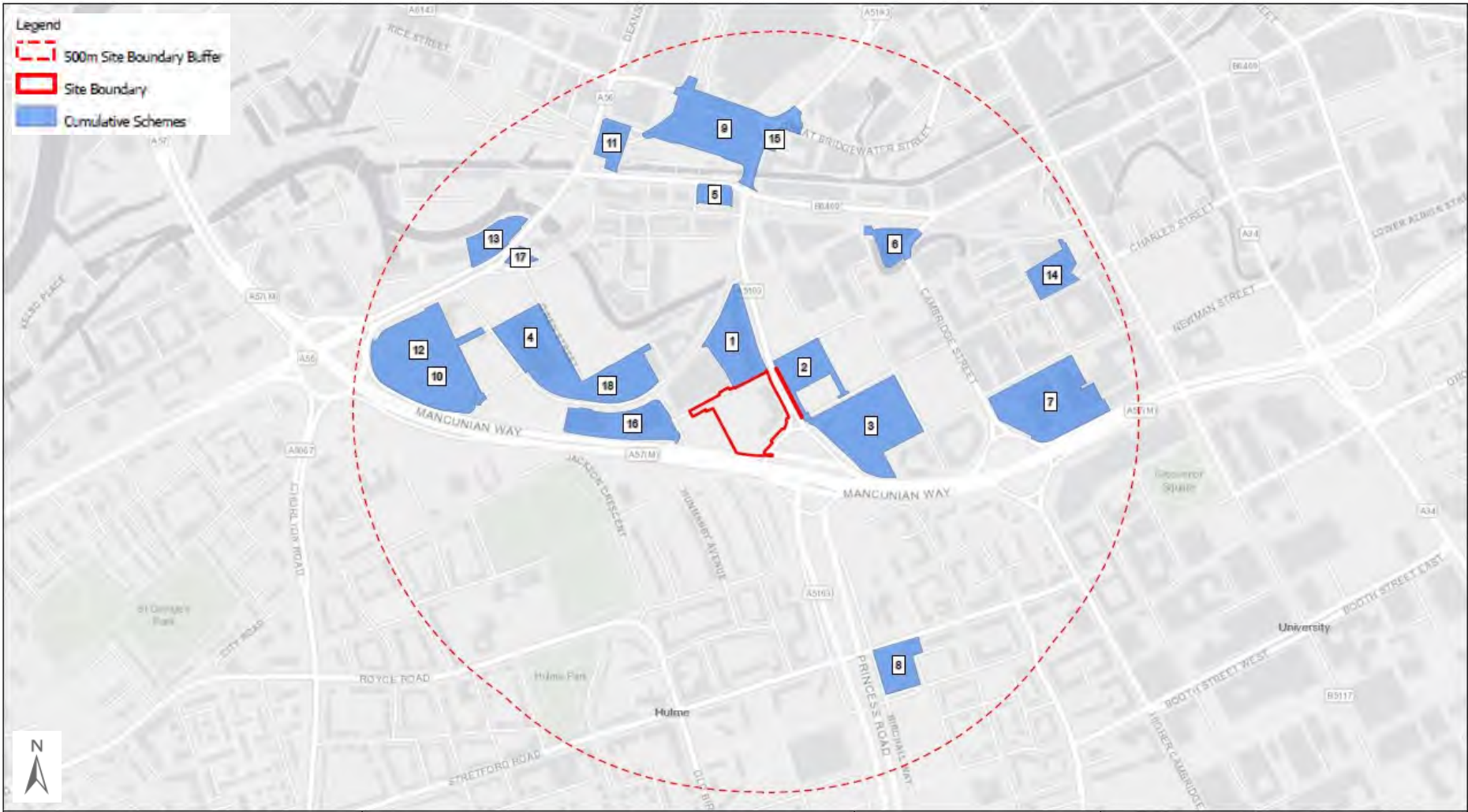
- 3.6.1 The technical studies undertaken within the ES have been progressed in a transparent, impartial and unbiased way with equal weight attached, as appropriate, to beneficial and adverse effects. Where possible, this has been based upon quantitative and accepted criteria together with the use of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

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

Figure 3.3: Site Boundary



Figure 3.4: Cumulative Schemes



One Medlock Street
Environmental Statement
Volume 2
November 2022



CHAPTER 4: ALTERNATIVES CONSIDERED AND DESIGN EVOLUTION

4 Alternatives Considered and Design Evolution

4.1 Introduction

- 4.1.1 Paragraph 2, Schedule 4 of the Environmental Impact Assessment (EIA) Regulations requires the Applicant to provide *“a description of the reasonable alternatives studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”*
- 4.1.2 This chapter describes the reasonable alternatives considered by the Applicant, including the ‘do nothing’ scenario, and documents how the design of the Proposed Development has evolved, taking environmental effects into account.

4.2 ‘Do Nothing’ Scenario

- 4.2.1 The consideration of alternatives, as required by the EIA Regulations, should address the evolution of the Site in the absence of the Proposed Development in question. This is known as the ‘do nothing’ scenario.
- 4.2.2 In the absence of the Proposed Development, it is reasonable to assume that the Site would remain as the existing Premier Inn hotel and car park. Whilst the Site is located in the First Street Strategic Development Area and the First Street Development Framework¹/First Street Development Framework Addendum² state that a mixed-use development would be suitable on the Site, there is an absence of a firm alternative redevelopment proposal for the Site. Consequently, it is reasonable to assume that the Site will continue to operate as the existing Premier Inn hotel and car park, thereby making a positive contribution to the City's hotel bedspace numbers.
- 4.2.3 Although it may be reasonable to assume that the Site will remain as the existing Premier Inn hotel and car park, given the Site's location in the First Street Strategic Development Area, the need for office provision³ and additional purpose-built student accommodation (PBSA)⁴ and the low density nature of the existing use (relative to its accessibility location in the city centre) it is considered that leaving the Site in its current state is not an efficient or effective use of land.

¹ MCC, 2018; First Street Development Framework.

² MCC, 2020; First Street Development Framework Addendum.

³ Cushman & Wakefield, 2022; Office Market Report.

⁴ Cushman & Wakefield, 2022; Student Need Assessment.

- 4.2.4 Within Manchester, there is an increasing demand for Grade A office floorspace, with amenity space, as occupiers now look to improve their office workspace to enhance staff retention, recruitment and wellbeing³ and in order that the city can continue to attract investment and additional employment. Furthermore, given the University of Manchester's and Manchester Metropolitan University's growth in student numbers and clear evidence of students occupying the mainstream housing market, there is also a growing demand for PBSA⁴. Consequently, the Proposed Development offers a good development opportunity for office floorspace and a significant development opportunity for PBSA, given the wider demand-supply dynamics in Manchester.
- 4.2.5 In view of the above, leaving the Site in its current state would not result in a positive impact on the supply of much needed office and PBSA development floorspace.

4.3 Alternative Sites

- 4.3.1 Given that the Site is the only location that is under the Applicant's control, no alternative locations for the Proposed Development have been considered. Furthermore, in order to lend itself to PBSA development, a site needs to be well located in relation to Oxford Road and the main university campuses, which rules out most development sites in the city centre.
- 4.3.2 Similarly, Grade A office development can only be viably delivered in limited locations in the city centre where there is a pre-existing office market, where accessibility is excellent and where there are amenities and facilities in close proximity. Again, these prerequisite conditions mean that office development of the type proposed can only be viably delivered in a limited number of locations within the city centre.
- 4.3.3 In these circumstances, whereby alternative locations are not explored, it is an accepted approach to look at the reasonable alternatives studied by the Applicant on the Site, which includes alternative uses and design iterations.

4.4 Alternative Uses

- 4.4.1 The Applicant had considered a non-PBSA residential use as an alternative to the PBSA component of the Proposed Development. However, this was discounted on the basis that there is an overriding and more pressing need for PBSA development and that the Site is one of a limited number with the locational attributes required for this to be delivered and operated in a sustainable manner. No alternatives to the office mix have been considered given MCC's aspiration for the Site to come forward for these uses as expressed through the First Street Strategic Regeneration Framework (SRF).

4.5 Consideration of Design Iterations

2019 Scheme

4.5.1 The Proposed Development was first brought forward for consultation in the first half of 2019, when the proposals were for three buildings to be located on the Site (as shown in **Figure 4.1**), to deliver:

- a building providing 301 residential apartments over 21 storeys;
- a building providing approximately 24,155 square metres (m²) (gross area) of commercial office floorspace over 13 storeys; and
- a building providing 256 residential apartments over 33 storeys (hereafter referred to as the '2019 Scheme').

2020 Scheme

4.5.2 The 2019 Scheme was considered to be too dense and therefore did not proceed to a planning application. Additionally, the Applicant decided to increase the provision of commercial floorspace.

4.5.3 Consequently, the design was amended to deliver two buildings on Site (as shown in **Figure 4.2**), to provide:

- a building providing 372 residential apartments over 41 storeys; and
- a building providing approximately 36,510 m² (gross area) of commercial office floorspace over 13 storeys (hereafter referred to as the '2020 Scheme').

Figure 4.1: Layout and Massing of the 2019 Scheme



Figure 4.2: Layout and Massing of the 2020 Scheme



The Proposed Development: Massing Evolution

- 4.5.4 Given the need for office and PBSA development (as demonstrated by the Office Market Report³ and Student Need Assessment⁴, the massing of taller block of the 2020 Scheme was reviewed, to deliver the Proposed Development, as shown in **Figure 4.3**.

Figure 4.3: Massing Evolution of the Taller Block of the Proposed Development

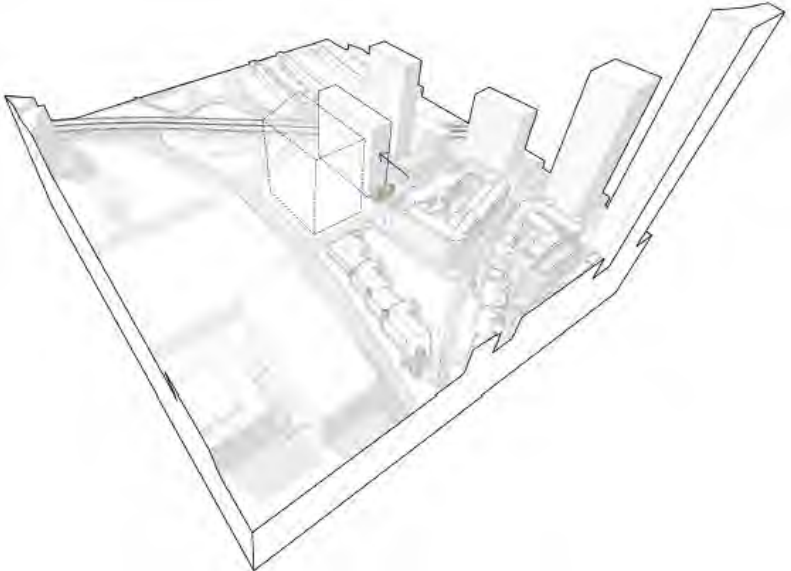
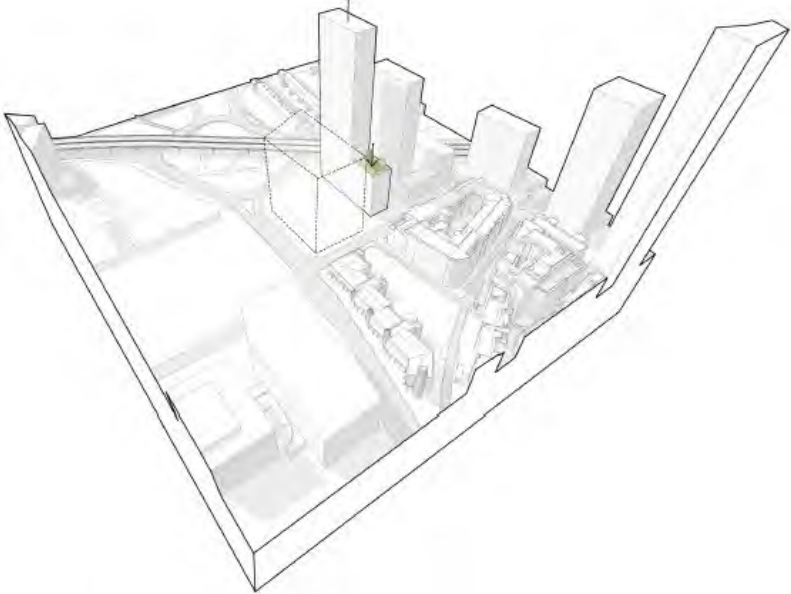
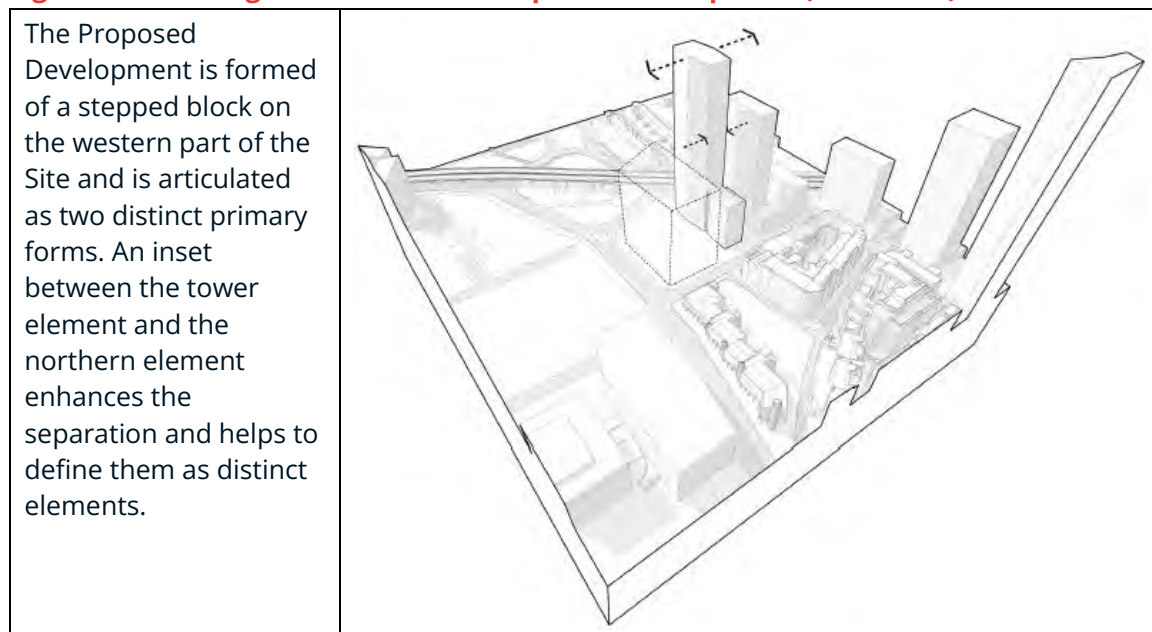
The Proposed Development is formed of one mid-rise block on the western part of the Site and steps away from River Street, to provide an approximate set back of 25m from City South and provide a public space in front of the building.	 A 3D architectural massing diagram showing a mid-rise building block on a site. The block is stepped away from the street frontage (River Street) to create a setback. The diagram shows the building's footprint and its relationship to the surrounding urban context, including other buildings and the street layout.
The Proposed Development is formed of one tall, stepped block on the western part of the Site, with the height away from City South and facing Mancunian Way, complementing the ring of the high-rise development already established along the city's ring road. The front section of the Proposed Development steps down to continue the mid-rise developments fronting onto River Street.	 A 3D architectural massing diagram showing a taller, stepped building block on the same site. This version shows a more complex massing with a taller central section and a lower section that steps down towards the street. The diagram illustrates how the building's form integrates with the existing high-rise development along the city's ring road and the mid-rise developments fronting onto River Street.

Figure 4.3: Massing Evolution of the Proposed Development (continued)



The Proposed Development Façade Evolution

Block A (Commercial) Façade

- 4.5.5 An early iteration of the block building's (Block A's) façade design explored setting back the exoskeleton from the building's corners, to open the corners up. This was adjusted to a closed corner, to strengthen the visual form of the building.
- 4.5.6 The evolution of Block A's façade is presented in **Figure 4.4**.

Block B (PBSA) Façade

- 4.5.7 The façade of the tower building (Block B) has developed from the design that was consulted upon as part of the 2020 Scheme. It featured a unitised cladding system, broken down by staggered vertical louvres. However, following consultation on this design, it was decided to redevelop the façade to incorporate a pattern of perforated metal panels and fine porous glass, giving the building a chequerboard aesthetic.
- 4.5.8 The chequerboard design was further developed to differentiate between the long and short elevations, with the longer edge of the building failing past the short façade, and a different crown treatment and a higher percentage of glazing to the short elevations.
- 4.5.9 The evolution of Block B's façade is presented in **Figure 4.5**.

Figure 4.4: Evolution of the Proposed Development's Block A Building Façade
July 2019:



September 2022:



Figure 4.5: Evolution of the Proposed Development's Block B Building Façade

March 2021:



December 2021:



September 2022:



4.6 Environmental Considerations and Comparison of Effects

- 4.6.1 Throughout the design development, environmental considerations have been taken into account. Flood risk from all sources and drainage requirements were allowed for from the outset and this is set out in the Flood Risk and Drainage Strategy report that has been submitted as part of the planning application. A Preliminary Ecological Appraisal was also undertaken in 2019, 2020 and updated in August 2022, which established that there were no notable constraints on the Site, such as protected habitats or species.
- 4.6.2 Following the above, different iterations (as outlined within this chapter) were explored. The heights and massing of the 2019 Scheme and 2020 Scheme were designed from a practical viewpoint, to allow maximum development of the Site. However, following the decision to deliver an office and PBSA scheme (i.e. the Proposed Development) instead of a residential and office scheme (i.e. the 2019 Scheme and 2020 Scheme), the heights and massing of the Proposed Development were amended to provide two buildings on the Site. This included the decision to reduce the tower building by approximately 16m for efficiency and viability purposes and to minimise townscape and microclimate (wind and daylight, sunlight and overshadowing) impacts across the Site and surroundings.
- 4.6.3 Technical specialists were appointed early on and undertook assessments, such as the following, to assess the residential and office scheme (i.e. the 2020 Scheme):
- a wind tunnel test was undertaken to identify the key risks and mitigation strategies with respect to wind microclimate;
 - daylight analysis was carried out to identify and mitigate potential daylight impacts; and
 - a Townscape and Visual Impact Assessment was undertaken to inform the understanding of potential impacts on townscape and visual amenity.
- 4.6.4 The results of the above listed assessments contributed towards the evolution of the office and PBSA scheme (i.e. the Proposed Development), which ensured comfortable wind conditions and acceptable levels of daylight to surrounding sensitive receptors.
- 4.6.5 In addition to the above, as part of the evolution of the Proposed Development, the north elevation of the lower element of Block B (delivering PBSA), which will be made from precast concrete, will now feature a new piece of public art. This will increase the social value of the Proposed Development and enhance future Site users' experience of the Proposed Development.

4.7 Summary and Conclusions

- 4.7.1 An alternative location for the Site was not investigated as this is the only Site in the locality under the Applicant's control.
- 4.7.2 In the absence of the Proposed Development, the Site would likely remain as the existing Premier Inn hotel and car park. It would, therefore, not contribute to meeting the demand for commercial (office) floorspace³ and PBSA⁴.
- 4.7.3 The Proposed Development has gone through a design evolution process, taking into account the key constraints and opportunities of the Site to inform the design. This, in combination with public consultation, has resulted in numerous iterations of the Proposed Development.
- 4.7.4 As a result of the design evolution process, the Proposed Development has been designed with the environmental constraints and opportunities in mind and it represents the most appropriate option in the context of the characteristics of the Site and the immediate surroundings.

One Medlock Street
Environmental Statement
Volume 2
November 2022



CHAPTER 5: THE PROPOSED DEVELOPMENT AND DEMOLITION AND CONSTRUCTION OVERVIEW

5 The Proposed Development and Demolition and Construction Overview

5.1 Introduction

- 5.1.1 This chapter describes the key elements of the Proposed Development, including those features which may lead to significant environmental effects, and includes a summary of the key demolition and construction activities and associated demolition and construction programme.

5.2 The Proposed Development

- 5.2.1 The description of development is as follows:

“The demolition of the existing hotel building and structures and the development of the site for office uses (Use Class E), flexible office/community use (Use Class E/F1/F2) and purpose-built student accommodation (Sui Generis) comprising two separate buildings, along with associated ancillary internal and external amenity space, hard and soft landscaping and associated highway works.”

Basis of Assessment

- 5.2.2 The key drawings which have formed the basis of the EIA are listed in **ES 4, Appendix B**. For the full list of plans, sections and elevations, refer to the accompanying planning application.

Proposed Development Overview

- 5.2.3 The Proposed Development comprises the demolition of the existing Premier Inn hotel and car park on Site and the construction of two buildings to deliver commercial office floorspace (Use Class E); purpose-built student accommodation (Sui Generis); and flexible community space (Class E/F1/F2 floorspace), as well as internal and external amenity space.
- 5.2.4 At 13 storeys in height plus basement and ground level, a block building (known as ‘Block A’) will provide the commercial office floorspace and be 97.71 m above ordnance datum (AOD) in height, to the top of the roof.
- 5.2.5 At 37 storeys in height plus ground and mezzanine levels, a tower building (known as ‘Block B’) will provide the PBSA and be 151.99 m AOD in height, to the top of the roof.

Proposed Land Use Mix and Areas

- 5.2.6 **Table 5.1** presents the breakdown of areas by land use type within the Proposed Development.

Table 5.1: Floorspace Area by Use Class of the Proposed Development

Use Class	Gross Internal Area (GIA) (m ²)	Gross External Area (GEA) (m ²)
Commercial (Use Class E)	36,494	37,790
PBSA (Sui Generis)	30,590	33,749
Community Space (Use Class E/F1/F2)	293	312
Total	67,377	71,851

- 5.2.7 Commercial floorspace will be located in Block A, with external terraces on typical floors and external terrace space at level 13. The ground floors of Block A will accommodate double height reception spaces, as well as shared workspace for informal meetings and breakout spaces.
- 5.2.8 Back of house service space will also be provided on the ground floor of Block A and the basement will provide plant, cycle storage and associated facilities.
- 5.2.9 The PBSA and community (Use Class E/F1/F2) space will be located in Block B, with amenity at ground, first and 11th floor levels and external terrace space on the roofs at level 11 and level 37.
- 5.2.10 Block B will be formed of two blocks of different heights: one lower block of ground plus 11 storeys, to the north of the Site, and a taller block of ground plus 37 storeys, to the south of the Site.
- 5.2.11 Flexible community space (Use Class E/F1/F2) will be provided within the ground floor of the lower block of Block B. Student amenity (such as a gym, launderette, parcel store, study spaces and meeting spaces) will be provided within the ground floor and part of the first floor, along with back of house areas, plant, bin stores and cycle stores.
- 5.2.12 The proposed unit mix of the PBSA of the Proposed Development is set out in **Table 5.2**.

Table 5.2: Proposed Unit Mix of PBSA

Unit Type	Total Units	Total Beds
Studio	272	272
Twodio	34	68
Threedio	34	102
6 Bed Cluster	44	264
7 Bed Cluster	44	308
Total	428	1,014

Massing

- 5.2.13 The massing of the Proposed Development, as shown in **Figure 5.1** and **Figure 5.2**) has been determined by the uses.
- 5.2.14 The Site sits to the south of a number of newly constructed and recently consented schemes that are consistent with the development principles set out in the First Street Strategic Regeneration Framework (SRF). The Proposed Development itself is also consistent with the development principles set out in the First Street SRF.

The proposed buildings are arranged parallel to Medlock Street, defining the edge of the Site and creating outward looking buildings, with active frontages to the surrounding streets.

Figure 5.1: Model of the Proposed Massing, looking north up Medlock Street



Figure 5.2: Proposed Massing



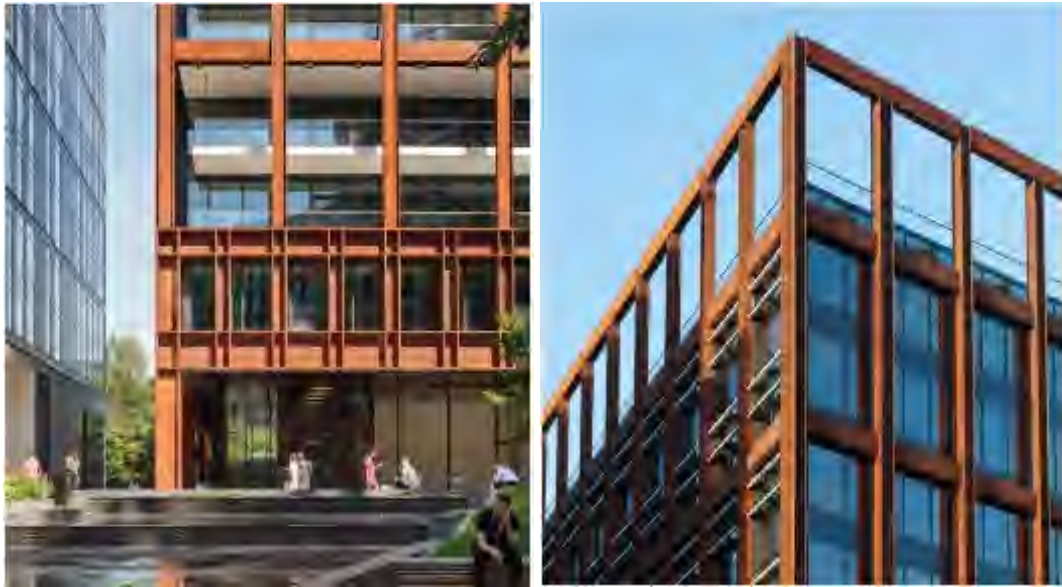
Entrances

- 5.2.15 The entrance to Block A (commercial building) will face the city on Medlock Street, whilst the entrance to Block B (PBSA building) will face onto Edge Street.

Façade

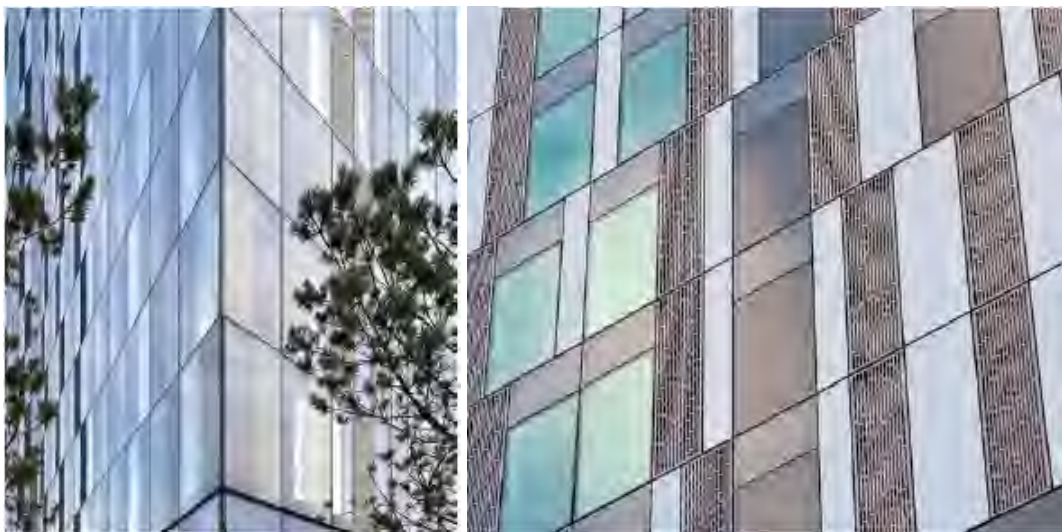
- 5.2.16 The façade treatment has been carefully considered and the material strategy has been developed to respond to the established and emerging context of the area.
- 5.2.17 The architectural expression for Block A (commercial building) will be determined by the steel structure (as shown in **Figure 5.3**). The 6m structural grid will provide the framework for a regular order. Columns will be located on the corners of the building, providing a picture frame to the building. The exoskeleton will continue up to unify the tiered floors and provide a coherent appearance to the building. The steel frame and cladding panels will provide solid elements to the façade.

Figure 5.3: Materiality of Block A (Commercial Building)



- 5.2.18 Block B (PBSA building) will be clad in a panel system made up of glazed and metal panels. Further detail will be added through the use of holes/gaps in the metal panels and glazing made of finely porous glass, forming a chequerboard effect over the façade (as shown in **Figure 5.4**).

Figure 5.4: Materiality of Block B (PBSA Building)



Proposed Parking and Access

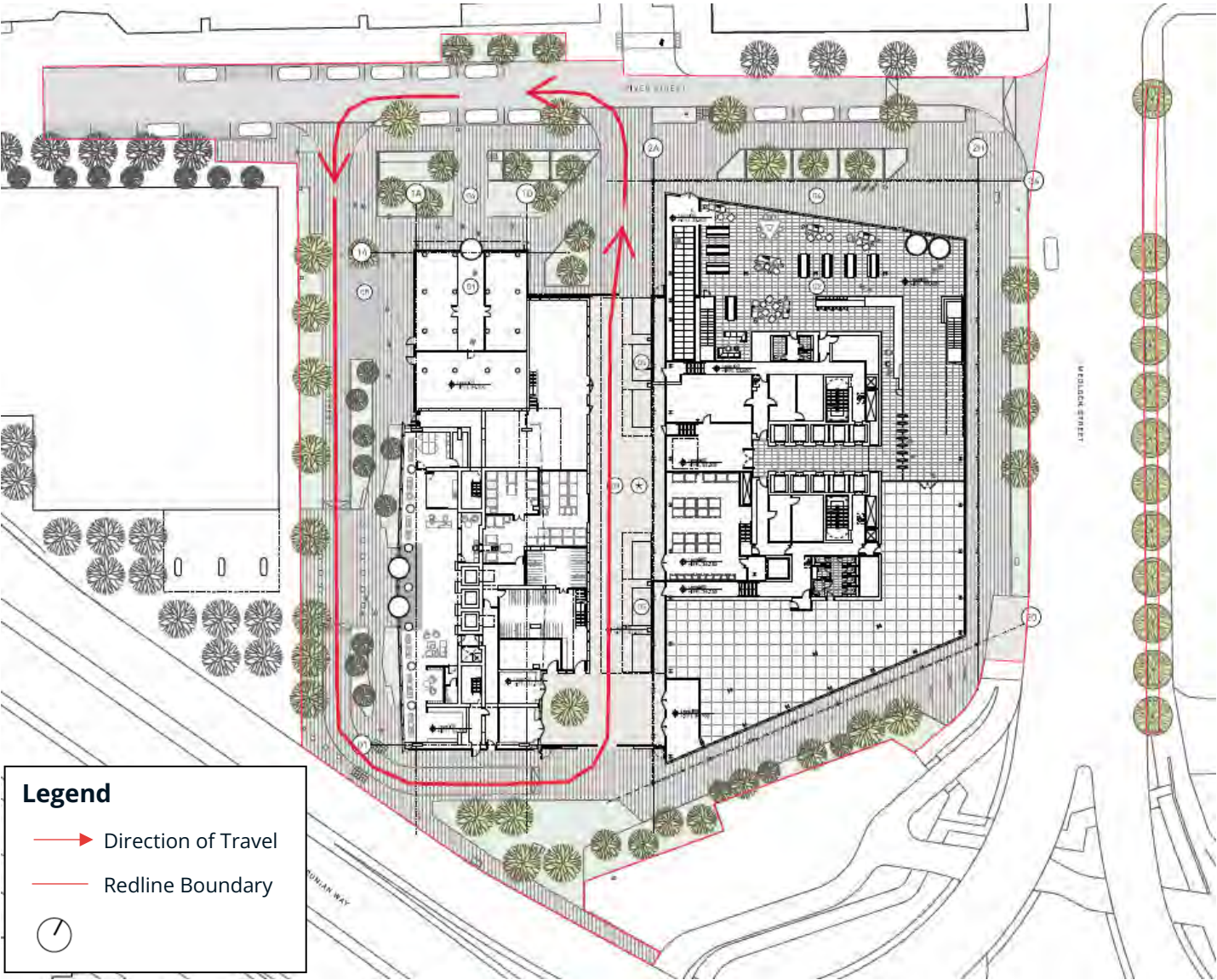
Vehicular Access

- 5.2.19 There will be two vehicular access points into the Site from River Street, connected within the Site to create a loop road around Block B (PBSA building). The western-most of these access points onto River Street will be located in the approximate location of the existing Premier Inn hotel car park access at the western edge of the Site. This is known as Edge Street and will provide access to

the front of Block B (including two proposed disabled car parking spaces which will be located there) and will act as a route for servicing vehicles to access the service yard to the rear of Block B.

- 5.2.20 An additional vehicular access will be created running between the two buildings and provide access to the servicing area and the disabled parking spaces for Block A. The proposed access will emerge onto River Street.
- 5.2.21 The vehicular access points and route through the Site are presented in **Figure 5.5**.

Figure 5.5: Proposed Vehicular Access Points and Route through the Site



Vehicular Car Parking

- 5.2.22 A total of eight disabled car parking spaces will be provided across the Site, six associated with Block A (office building) and two on Edge Street for Block B (PBSA building).

Pedestrian and Cycle Access and Cycle parking

- 5.2.23 The main pedestrian access to Block A (office building) will be at the north-east corner of the building, facing onto the junction of River Street and Medlock Street. An area of public realm will be provided in front of the main entrance and will accommodate some cycle parking stands for short-stay cycle parking activity.
- 5.2.24 The main pedestrian access to Block B (PBSA building) will be via pedestrian access points along the River Street frontage and the Edge Street frontage, both facing onto new areas of public realm.
- 5.2.25 Long-stay cycle parking will be provided within each building. Block A (office building) will provide 284 long stay cycle parking spaces within the basement level and Block B (PBSA building) will provide 434 long stay cycle parking spaces at ground and mezzanine levels. Shower and changing facilities will be provided in the basement level of Block A (office building).

Public Realm and Landscaping

- 5.2.26 The proposed landscaping of the Proposed Development will deliver a series of urban spaces and streets that wrap around and go through the Proposed Development, as shown in **Figure 5.6** and detailed below.
- 5.2.27 At the heart of the proposed landscaping will be a series of linear rain gardens proposed along River Street that will incorporate sustainable drainage, tree planting and an ecologically diverse planting scheme.
- 5.2.28 The linear garden will culminate in a new pocket park on River Street, providing seating opportunities within a green setting.
- 5.2.29 Semi-mature planting will be located along Medlock Street, River Street and Edge Street (as shown in **Figure 5.6**), to improve pedestrian experience, provide an instant setting for the Proposed Development and to help increase the number of trees growing in the city.
- 5.2.30 All wind mitigation will be achieved through the introduction of tree planting across the Proposed Development, supported by additional wind baffles to the south facing façade adjacent to Medlock Street.

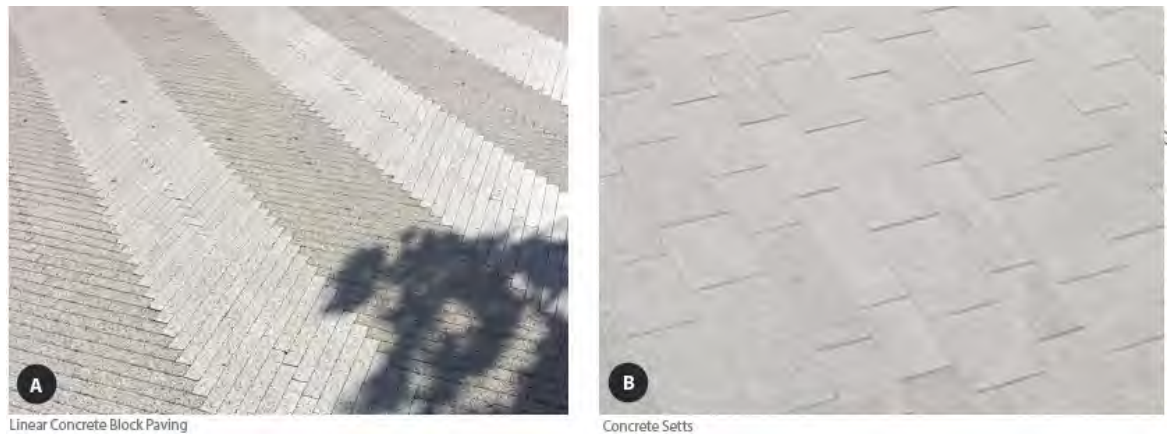
Figure 5.6: Proposed Landscaping



Hard Landscaping

- 5.2.31 The hard surfaces of the Proposed Development will be designed to be robust and durable, capable of withstanding user traffic/service vehicles, vandalism and general wear and tear.
- 5.2.32 The use of linear concrete block paving (as shown in **Figure 5.7**) to the public realm and in-situ concrete (as shown in **Figure 5.7**) to the atrium space will provide a quality surface and contemporary finish.

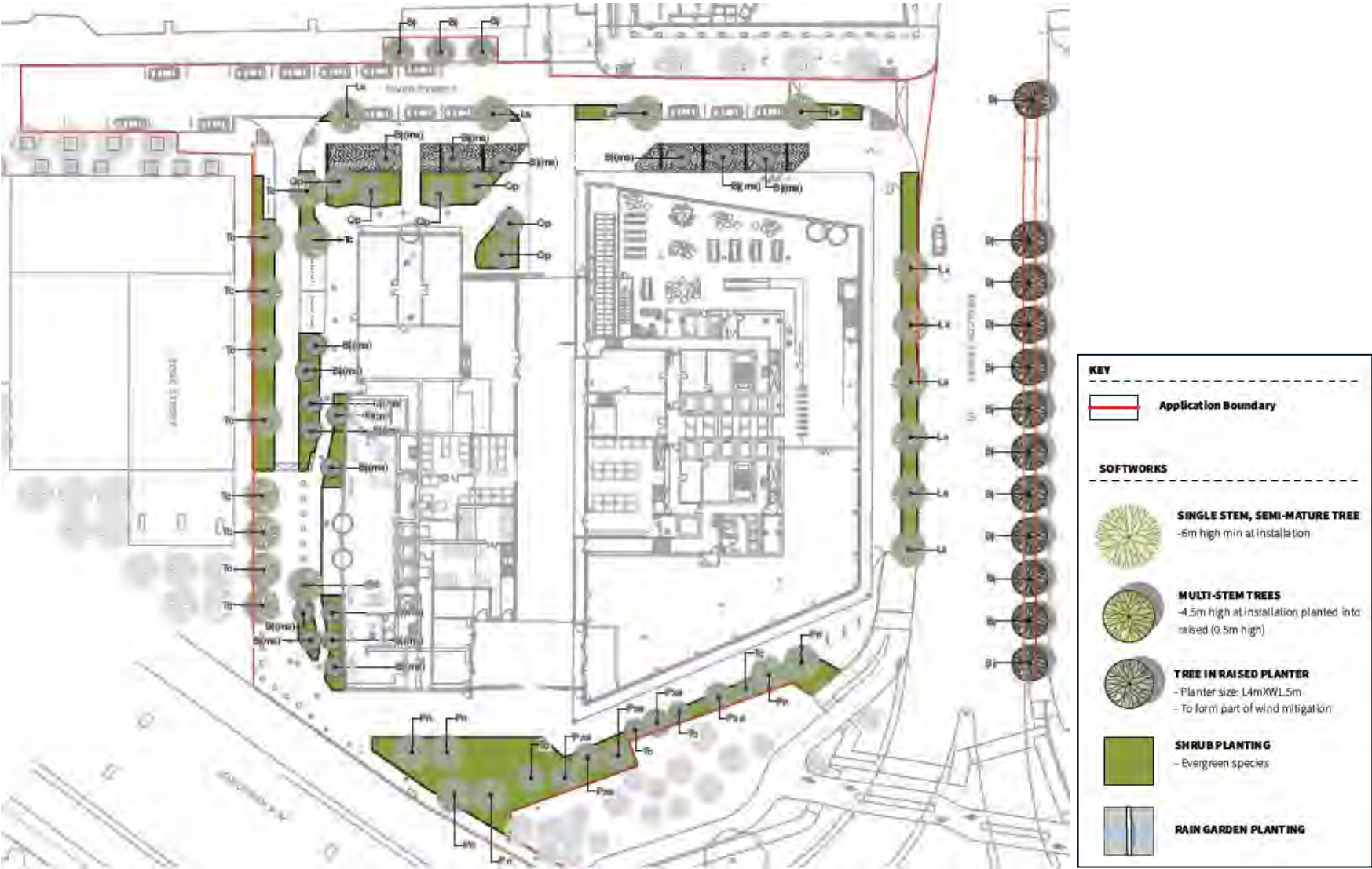
Figure 5.7: Proposed Hard Landscaping Materials



Soft Landscaping

- 5.2.33 The soft landscaping of the Proposed Development (as shown in **Figure 5.8**) will include:
- semi-mature trees;
 - trees in raised planters;
 - shrub planting; and
 - rain garden planting.
- 5.2.34 A total of 72 new trees will be planted (to mitigate the loss of 29 trees during the demolition and construction process), along with 1,102m² of planting.
- 5.2.35 The rain gardens proposed along River Street will consist of level areas of planting with the growing medium set slightly lower than the adjacent surface. Hard surfaces will be laid to fall towards the rain gardens and water will be stored within the rain garden at the surface and will soak into the soils before being absorbed by the plants.
- 5.2.36 The planted areas will contribute to a sustainable drainage network and also to the biodiversity and amenity value of the public realm.
- 5.2.37 Further detail is provided in the Design and Access Statement which forms part of the planning application package.

Figure 5.8: Proposed Soft Landscaping



Biodiversity Net Gain

- 5.2.38 The Department for Environment, Food and Rural Affairs (DEFRA) Biodiversity Metric 3.1 methodology was used to demonstrate the change in biodiversity value from pre-development to post-development, with a 59.79% increase in the biodiversity value delivered by the Proposed Development.
- 5.2.39 Further detail is provided in the Biodiversity Net Gain Assessment which forms part of the planning application package.

Energy Strategy

- 5.2.40 The Proposed Development will follow an energy strategy which follows MCC's Energy Hierarchy: 'Be Lean, Be Clean and Be Green'¹. The aim of the energy strategy has been to reduce regulated carbon dioxide emissions in a cost effective, viable and technically appropriate manner.
- 5.2.41 Air Source Heat Pumps (ASHPs) and photovoltaic (PV) panels will be provided to generate heating, hot water electricity within Block A (office building). The Proposed Development will use ASHPs to provide heating and hot water to Block B (the PBSA building). There will be no need to for an energy centre on the Site.
- 5.2.42 The abovementioned energy strategy will result in a 25.64% improvement on the current Part L 2021 Building Regulations target emission rate baseline from Block B (the PBSA building) and a 0.78% improvement on the current Part L 2021 Building Regulations target emission rate baseline from Block A (the office building).
- 5.2.43 Further information is provided in the Energy Strategy which forms part of the planning application package.

Sustainability

- 5.2.44 The Proposed Development will incorporate sustainable design and construction methods, energy and water saving measures, waste reduction techniques and measures to enhance the ecological value of the Site. Some of the key sustainability features of the Proposed Development include, but are not limited to, the following:
- **BREEAM:** the Proposed Development will achieve a 'very good' rating for all spaces;

¹ MCC, 2012; Core Strategy Development Plan

- **transport:** the provision of a Travel Plan for the Site will include measures to encourage the uses of sustainable modes of transport;
- **materials:** the Proposed Development will be designed to be durable and resilient, which will help reduce the need to repair and replace materials resulting from damage to exposed elements of the building and landscape;
- **waste:** the Proposed Development will minimise waste as much as possible in line with best practice efficiency benchmarks, through the provision of a communal bin store and dedicated recycling area; and
- **landscaping:** the maximisation of greening opportunities through the introduction of semi-mature trees, trees in raised planters, shrub planting and rain garden planting.

Drainage Strategy

- 5.2.45 The surface water Drainage Strategy will consider surface water runoff management and the solutions proposed will ensure that for the 100 year plus 40% climate change allowance event, surface water will be accommodated within the Site and will therefore prevent potential exceedance flows off Site.
- 5.2.46 The surface water Drainage Strategy will optimise the use of sustainable urban drainage (SuDS) features in line with best practice, national and local policy, and has been developed in discussion with relevant stakeholders. Key features that have been incorporated into the design include permeable paving/porous surfacing, green/brown roofs, blue roofs.
- 5.2.47 Below ground storage tanks and large diameter pipes will also be located on the Site as part of the surface water Drainage Strategy. Further information is provided in the Flood Risk and Drainage Strategy which forms part of the planning application package and is subject detailed design.

Waste Strategy

- 5.2.48 The proposed waste strategy for Block A (office building) is as follows:
- office waste will be collected by the cleaners at the end of the day and brought down by lift to the ground floor bin store;
 - other small office waste streams to be generated (including electrical WEEE (waste electrical and electronic equipment), printer and toner cartridges and batteries, will be managed separately as follows:
 - electrical WEEE items will be returned to the supplier;
 - printer and toner cartridges will be posted to the supplier for recycling;
 - batteries will be arranged for a free collection e.g. BatteryBack; and

- confidential office waste will be collected in appropriate sacks that are sealed and recorded, which will then be transferred to a waiting shredding lorry that will destroy the documents and confirm their destruction.

5.2.49 The proposed waste strategy for Block B (PBSA building) is as follows:

- on every floor, there will be a waste chute lobby and occupiers will use a waste chute to deposit their rubbish;
- occupiers will be briefed on the use of the chute and the need for correctly separating waste for recycling;
- at the waste chute, occupiers will press a button depending on the type of waste that is to be deposited; and
- at the base of the waste chute, there will be an automated tri-separator to segregate waste into three waste streams of pulpable recycling (e.g. paper/cardboard/tetrapak etc.), mixed recycling (e.g. glass/cans/plastics) and food waste/general waste.

5.2.50 Students may have large waste/rubbish items which cannot be sent down the waste chute. To avoid problems, the management company will arrange for the students to bring their waste via the lifts to specific bins in the refuse store, for collection under the supervision of the on-Site management team.

5.2.51 Further information is provided in the Waste and Servicing Strategy Report which forms part of the planning application package.

5.3 Demolition and Construction Overview

5.3.1 The information presented in this section is indicative and has been collated from experience of developing schemes of this type and scale. Therefore, it is for assessment purposes only and will be subject to change once the relevant principal contractor has been appointed.

Indicative Demolition and Construction Programme

5.3.2 The Proposed Development will consist of one overall construction phase and is anticipated to take place over a 3-year period, from Q4 2023 to Q4 2026, subject to securing planning permission.

5.3.3 An indicative demolition and construction programme is presented in **Figure 5.9**.

Figure 5.9: Indicative Demolition and Construction Programme

Activity	2023		2024				2025				2026			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Demolition and Excavation														
Piling														
Substructure Construction														
Superstructure Construction														
Roof Construction														
Internal Fit Out														
External (Open Space and Landscaping) Works														

5.3.4 Given that it is currently unknown whether Block A or Block B would come forward first (as this would be subject to further demolition and construction planning by the principal contractor, once appointed), for the purposes of this ES, it has been assumed that Block A and Block B would come forward at the same time, representing a worst-case scenario.

Description of Works

5.3.5 Demolition and construction works are anticipated to comprise the following key stages, broadly in chronological order:

- Site securement;
- temporary/permanent highways divisions/closure;
- establishment of demolition and construction access;
- establishment of demolition and construction compound;
- Site preparation works required for demolition activities;
- demolition and Site clearance works, including existing on-site structure and features to be removed, including utilities and below ground services/structures (where applicable);
- excavation for the basement and foundations and earthworks;
- construction of the proposed buildings and associated infrastructure (i.e. services and plant); and
- implementation of public realm, landscaping, lighting, internal and external finishing.

5.3.6 Where appropriate, the above listed activities are further detailed below.

Site Securement

5.3.7 Site securement will be achieved through a combination of secure fencing, barriers or hoarding, depending on the exact requirements and proximity to specific works. In addition, the principal contractor will be responsible for the provision of construction staff at key interfaces between the Site (and working

areas) and retained accesses to public areas at key stages of demolition and construction activities.

Demolition and Construction Compound Location

- 5.3.8 During demolition and construction, a temporary compound will be required for the contractor and appointed subcontractors (inclusive of material laydown, stores and temporary parking for demolition/construction staff and deliveries). The location of the demolition and construction compound(s) is unknown at this time, but it is assumed that it will be within the Site.

Existing Features for Retention/Demolition

- 5.3.9 The Site currently comprises an existing 5 storey Premier Inn in the east of the Site and surface car parking area with over 120 spaces. The Proposed Development will require mechanical demolition of the existing Premier Inn on Site, as shown in **Figure 5.10**. This will be demolished prior to the construction of either block of the Proposed Development commencing. The demolition of the building will likely comprise of the following general practices:

- internal 'soft-strip' exercise, with all waste arisings removed from the building and segregated into allocated skips for appropriate processing/recycling/disposal;
- any hazardous materials (including asbestos) will be removed, handled and disposed of in line with appropriate guidance and regulations;
- demolition works will be undertaken using mechanical demolition techniques (i.e. no form of explosive demolition will be required) from the highest point downward. All waste arisings will be separated into allocated skips to maximise material recycling;
- where required appropriate fencing/exclusion zones will be identified and implemented by the appointed contractor; and
- removal of floor slabs, foundations, and other areas of hardstanding.

- 5.3.10 There are 29 trees across the Site which will be removed.

- 5.3.11 It is assumed that there are no other features that will be retained on the Site.

Figure 5.10: Proposed Area for Demolition



Diversion of Utilities and Proposed Connections

5.3.12 There are a number of utility disconnections required to the Site to enable the Proposed Scheme, including:

- decommissioning of an existing electrical sub-station in the existing Premier Inn Building;
- disconnection and capping of existing gas, water and telecoms to the existing Premier Inn building;
- there are a number of disconnections and diversions of existing low voltage (LV) cables required that serve existing street lighting along Mancunian Way. In particular a main floodlight that serves the roundabout on the Mancunian Way;
- there is an existing gas easement from River Street to the Mancunian Way to the west of the Site that does not contain a gas main and this was proven via a series of strip & trenching;
- there are a number of LV cables that serve street lighting in the existing car park to the rear of the Premier Inn hotel; and
- there is a requirement to divert an existing 375mm diameter combined public sewer which passes through the site at a depth of approximately 5.2-6.0m below existing ground level. This diversion will require close liaison with the local sewer and highways authorities due to the proposed route being within the public highway, River Street. The diversion will require a Section 185 agreement (of the Water Industry Act 1991²) as a minimum and there will be a requirement to submit subsequent Section 106 (of the Town and Country Planning Act 1990³) applications for any new connections into the public sewer network. If possible, these connections will be made indirectly through the reuse of existing pipes at the point of communication with the public sewer.

5.3.13 The principal contractor will be responsible for ensuring these agreement(s) are in place prior to undertaking any works on/to the public sewer.

² Her Majesty's Stationery Office (HMSO), 1991; Water Industry Act

³ HMSO, 1990; Town and Country Planning Act.

Earthworks, Levels and Material Management

- 5.3.14 The existing ground (i.e. hardstanding) will be to be stripped and earthworks (excavation) undertaken to create a proposed basement area below Block A, which will be excavated to approximately 28m AOD.
- 5.3.15 There will be areas of localised excavation beyond 28m AOD for foundations or core structural elements (i.e. piled foundations).
- 5.3.16 A percentage of the concrete and brick associated with the demolition will be crushed and reused within the Site. Other materials and any contaminated material will be disposed to appropriate landfill facilities. The re-use of materials will be further developed as part of a best practice waste management strategy (i.e. adoption of the waste hierarchy). Overall, it is anticipated that that there will be a surplus of material for disposal off-site.
- 5.3.17 All waste arising during demolition and construction will be controlled through the implementation of a CEMP and a best practice Waste Management Strategy.
- 5.3.18 Given the level of demolition, there is anticipated to be an export of demolition material off-site.

Remediation

- 5.3.19 A desk-based study has identified potential risks of contamination on Site. A programme of remediation will be carried out prior to any demolition or breaking of ground in line with a Remediation Method Statement, which will be issued to MCC for approval prior to construction works commencing on-site.

Foundations

- 5.3.20 Piled foundations will be required for the construction of the buildings.

Site Working Hours

- 5.3.21 Demolition and construction working hours will be from 07:30 to 18:00 on Monday to Friday and from 08:30 to 14:00 on Saturdays, with no working on Sundays or Bank Holidays, unless agreed with MCC.
- 5.3.22 It may be necessary to vary hours for works for exceptional circumstances; however, these will be limited in duration. The timing and control of these specific works will be considered on a case-by-case basis and agreed in advance with MCC.

Plant and Equipment

- 5.3.23 During the demolition and construction of the Proposed Development, a range of plant and equipment will be utilised. This is outlined in **Table 5.3**; which does not provide an exhaustive list and will be developed by the contractors. Nevertheless, it is considered that the equipment required for the demolition and construction of the Proposed Development has been included, so as to determine the potential for environmental effects and required mitigation.

Table 5.3: Construction Plant and Equipment anticipated to be used during the Demolition and Construction of the Proposed Development

Plant and Equipment	Stage of Works					
	Demolition & Construction	Substructure Construction	Superstructure Construction	Roof Construction	Internal Fit Out	External Works
Hoists	✓	x	✓	✓	✓	x
Cutters, Drills and Small Tools	✓	✓	✓	x	✓	✓
360° Excavators	✓	✓	x	x	x	✓
Asphalt Planer	✓	x	x	x	x	✓
Breakers and Crunchers	✓	✓	✓	x	x	✓
Hand-held Breaker	✓	✓	✓	x	x	x
Dumper Trucks	✓	✓	x	x	x	
Scabbler	x	✓	✓	x	x	x
Tower Cranes, Mobile Cranes	x	✓	✓	✓	x	x
Skips and Skip Lorry	✓	✓	✓	x	✓	✓
Forklift Truck	✓	✓	✓	✓	✓	✓
Generators	✓	✓	✓	x	✓	✓
Hydraulic Benders and Cutters	✓	✓	✓	x	x	✓
Piling Rigs	x	✓	x	x	x	x
Scaffolding and Mobile Access Platforms	x	✓	✓	✓	✓	x

Plant and Equipment	Stage of Works					
	Demolition & Construction	Substructure Construction	Superstructure Construction	Roof Construction	Internal Fit Out	External Works
Ready-Mix Concrete Lorry	x	✓	✓	x	x	x
Concrete Pump	x	✓	✓	x	x	x
Mortar Batching Plant	x	x	x	x	✓	x
Water Pump	✓	✓	x	x	x	✓
Wheel Cleaning Plan, Road Sweeper	✓	✓	✓	x	x	✓
Air Compressors	✓	✓	✓	x	x	x

Demolition and Construction Traffic

- 5.3.24 The exact number of vehicle movements anticipated to be generated by the Proposed Development is currently not known and is subject to specific demolition and construction phasing and timings (which will be determined by the principal contractor, once appointed). However, it is considered that there will be approximately 56 HGVs arriving at and leaving the Site, as advised by the project's Transport Consultants (Vectos).
- 5.3.25 It is anticipated that demolition and construction traffic will take the A57 (Mancunian Way/Trinity Way) or the A5103 (Princess Road) towards the Site. The Site will then be accessed via Medlock Street and River Street.
- 5.3.26 During demolition and construction, the provision for demolition/construction vehicle parking will be provided within a temporary demolition and construction compound, the location of which is unknown at this time but will be within the Site. Where Site workers/contractors require specific plant/machinery etc. to undertake works, it is assumed that these will be delivered/dropped-off at the Site, with vehicles leaving shortly after. As such, during demolition, it is assumed that there will be a limited requirement for 'parking' and any parking will be accommodated within the Site where necessary. Following demolition and Site clearance, it is assumed that further temporary car parking will be provided within the Site subject to the works being undertaken at that time. Nevertheless, the access arrangements will remain the same.
- 5.3.27 All measures identified above will be controlled through a Demolition and Construction Logistics Plan (to be managed and updated as required by the principal contractor) which will be prepared in response to a suitably-worded planning condition.

Demolition and Construction Traffic Access and Management

- 5.3.28 All entrances to the Site will be managed by trained traffic marshals to segregate and organise all vehicle movements on and off the Site. This will involve the segregation of pedestrians using physical barriers to ensure vehicle movements are separated from members of the public.
- 5.3.29 Full details of construction vehicle access to the Site and management will be confirmed within a Demolition and Construction Logistics Plan, which will be prepared in response to a suitably worded planning condition.

Demolition and Construction Workers

- 5.3.30 The demolition and construction of the Proposed Development is estimated to generate 455 net Full Time Equivalent (FTE) jobs.

Materials and Resource Use

- 5.3.31 **Table 5.4** outlines the approximate volume of materials anticipated to be excavated from the Site.

Table 5.4: Approximate Quantum of Materials Excavated from Site

Excavation Works/Materials	Volume	Units
Excavation Materials	3,500	m ³

- 5.3.32 **Table 5.5** outlines the approximate volume of materials that are anticipated to be used during the construction of the Proposed Development.

Table 5.5: Approximate Quantum of Construction Materials used for the Proposed Development

Construction Materials	Quantity	Units
Concrete	84,000	Tonnes
Glazing	15,800	m ²
Steel	870	Tonnes
Plasterboard	52,900	m ²
Timber	16,200	m ²

Construction Waste

- 5.3.33 **Table 5.6** outlines the approximate volume of waste materials anticipated to be generated during the construction of the Proposed Development.

Table 5.6: Approximate Quantum of Construction Waste Materials Generated by the Proposed Development

Construction Materials	Quantity	Units
Concrete	12,600	Tonnes
Glazing	2,400	m ²
Steel	130	Tonnes
Plasterboard	7,900	m ²
Timber	2,400	m ²

Construction Environmental Management Plan

- 5.3.34 The Construction Environmental Management Plan (CEMP) sets out the standards and procedures for managing the environmental impacts of construction major projects and small projects. It covers the environmental public health and safety aspect of a project that may affect local residents, businesses and the general public in close proximity to the construction Site.

- 5.3.35 The CEMP identifies the main level responsibilities and requirements of the Applicant and contractors when constructing their projects. The CEMP also aims to assure residents and the general public that mitigation of the impacts on the environment are being implemented. Its aim is to minimise nuisance and disturbance to the public and safeguard the environment.
- 5.3.36 The Applicant will prepare a CEMP for the construction of the Proposed Development for approval by MCC, prior to the commencement of any construction on-site.

Considerate Constructors Scheme

- 5.3.37 The chosen principal contractor will be signed up to the Considerate Constructors Scheme, which will demonstrate that they agree to abide by the Code of Considerate Practice, designed to encourage best practice beyond statutory requirements.

Public Relations

Local Residents and Businesses

- 5.3.38 The Applicant will aim to establish contact with the various local landowners, residents and businesses. This will be done through periodic newsletters detailing project progress, specific works that may be relevant and contact details for the Site. It is proposed to hold periodic meetings to explain anticipated works for the forthcoming quarter and how these will impact upon Site neighbours.
- 5.3.39 The Site will be screened by 2.4m minimum high hoarding (higher in certain circumstances for marketing and security reasons) around the external boundary. The hoarding will be maintained to a high standard throughout the demolition and construction of the Proposed Development. As works progress above the hoarding, measures will be introduced to control work at heights by task specific method statements and collective proprietary barriers to protect adjacent properties from the risks of falling materials.
- 5.3.40 The Applicant will liaise with local residents to ensure any concerns are understood and mitigated. There will be local project information boards situated on hoardings, with contact information for raising comments or complaints.

One Medlock Street
Environmental Statement

Volume 2

November 2022



CHAPTER 6: SOCIO-ECONOMICS AND HEALTH

6 Socio-Economics and Health

6.1 Scope of Assessment

- 6.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of Socio-Economics and Health.
- 6.1.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the cumulative effects associated with the Proposed Development in combination with other developments within approximately 500m of the Site.
- 6.1.3 This chapter is intended to be read as part of the wider ES with particular reference to the introductory chapters of this ES (**Volume 2, Chapters 1 – 5**).

6.2 Key Legislation, Policy and Guidance Considerations

- 6.2.1 The Socio-Economics assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised below.

Legislation and Regulation

- 6.2.2 There is no relevant legislation or regulation which has informed the assessment of effects within this chapter.

Planning Policy

Draft Emerging Places for Everyone Joint Development Plan Document

- 6.2.3 The following planning policies from the Greater Manchester Combined Authority's (GMCA's) draft emerging Places for Everyone (ePfe) Joint Development Plan Document¹ are relevant to the assessment of effects within this chapter:
- Policy JP-Strat 1: Core Growth Area;
 - Policy JP-Strat 2: City Centre;
 - Policy JP-J 1: Supporting Long-Term Economic Growth;

¹ Greater Manchester Combined Authority (2021) Places For Everyone: Joint Development Plan Document – Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, Wigan (Publication Stage)

- Policy JP-J 2: Employment Sites and Premises;
- Policy JP-J 3: Office Development;
- Policy JP-H 3: Type, Size and Design of New Housing; and
- Policy JP-P 5: Education, Skills and Knowledge.

Manchester City Council's Core Strategy

6.2.4 The following planning policies from MCC's Core Strategy Development Plan Document² are relevant to the assessment of effects within this chapter:

- Policy EC 1: Employment and Economic Growth in Manchester;
- Policy EC 2: Existing Employment Space;
- Policy EC 3: The Regional Centre;
- Policy CC 1: Primary Economic Development Focus – City Centre and Fringe;
- Policy CC 4: Visitors – Tourism, Culture and Leisure;
- Policy CC 6: City Centre High Density Development;
- Policy CC 7: Mixed-use Development; and
- Policy CC 7: Change and Renewal.

First Street Strategic Regeneration Framework

6.2.5 MCC's First Street Strategic Regeneration Framework (SRF) sets out the development principles for the sites within the area. The SRF has seen multiple revisions, the most recent³ being published in July 2020; this defines the development principles applying to the Premier Inn Site, stating, with reference to appropriate uses that:

- Commercially-led mixed use development is considered to be appropriate on the site; and
- Alternative uses, including residential, may be deemed appropriate where they can be demonstrated to facilitate delivery of commercial office floorspace on the plot; where they meet the Council's planning and regeneration policies and objectives; and where it complements the emerging context in this part of the area.

² Manchester City Council (2012) Manchester's Local Development Framework: Core Strategy – Development Plan Document

³ Manchester City Council (2020) First Street Medlock Sites, Manchester: Development Framework Addendum (July 2020)

Technical Standards and Guidance

6.2.6 The following technical standards and guidance has informed the assessment of effects within this chapter:

- Homes and Communities Agency (HCA) (2014) Additionality Guide (4th Edition)⁴;
- HCA (2015) Employment Density Guide (3rd Edition)⁵;
- NHS Healthy Urban Development Unit (HUDU) (2019). Rapid Health Impact Assessment Toolkit (4th Edition)¹; and
- IEMA (2017). Health in Environmental Impact Assessment: A Primer for a Proportionate Approach⁶.

6.3 Assessment Methodology

Effects Assessed

6.3.1 This section provides confirmation on the scope of the assessment presented within this chapter, following submission of the EIA Scoping Report (**ES Volume 4, Appendix A1**) and receipt of the EIA Scoping Opinion (**ES Volume 4, Appendix A2**).

Effects Not Considered to be Significant

6.3.2 The following effects were not considered significant as part of the EIA Scoping Report and are not considered further in this chapter:

- increased demand for primary healthcare infrastructure;
- resident and workforce expenditure;
- provision of visitor accommodation;
- access to open space, public amenity space and facilities for sports and leisure activities;
- social and neighbourhood cohesion;
- crime levels and community safety;
- access to active travel and sustainable travel options; and
- access to healthy food.

⁴ Homes and Communities Agency (2014). Additionality Guide (4th Edition)

⁵ Homes and Communities Agency (2015). Employment Density Guide (3rd Edition)

⁶ IEMA (2017). Health in Environmental Impact Assessment: A Primer for a Proportionate Approach

Effects Considered Likely to be Significant

6.3.3 The following effects (**Table 6.1**) were considered likely to be significant and are reported within this chapter:

Table 6.1 Effects Considered Likely to be Significant

Likely Significant Effect	Applicable Development Stage
Employment generated during the demolition and construction phase	Demolition and construction
Employment generated during the operational phase	Operation

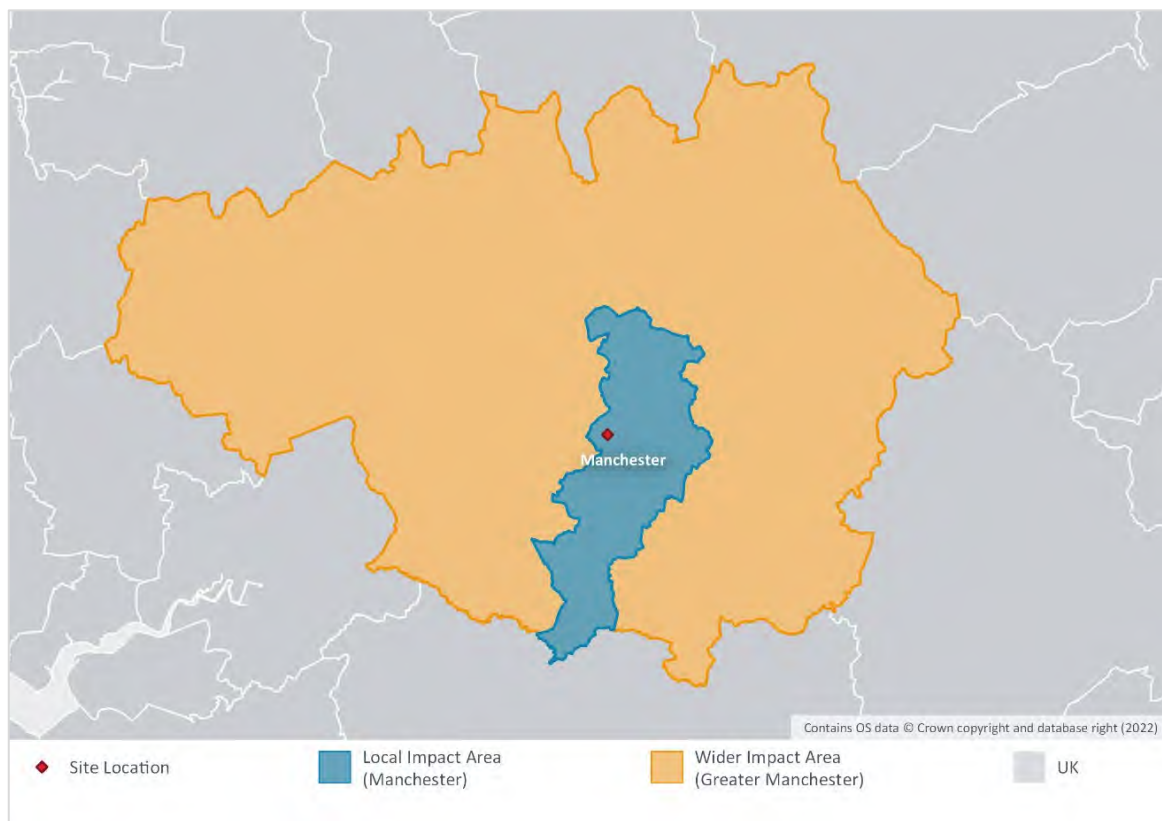
Defining the Study Area

6.3.4 In the absence of guidance or policy available to inform the definition of appropriate study areas, it is reasonable to define study areas based on an understanding of relevant local and wider economic geographies, and the extent to which socio-economic and human health effects are likely to be contained within these geographies. A plan of the Study Area is included at **Figure 6.1**, and shows:

- a **Local Impact Area** based on the administrative area of MCC. The 2011 Census⁷ indicates that 38% of people working in Manchester also live within the authority. All effects assessed within the chapter are relevant to analyse at the scale of the local impact area; and
- a **Wider Impact Area** defined to cover the Greater Manchester Combined Authority (GMCA) area. The 2011 Census⁸ found that the majority (84%) of people working in Manchester lived within the wider impact area, suggesting a high level of socio-economic containment within this geography.

⁷ ONS via Nomis (2011). 2011 Census: Table WU01UK - Location of usual residence and place of work by sex. Please note that equivalent data gathered by the ONS for the 2021 Census has not yet been published at time of writing.

Figure 6.1: Study Area



Determination of Baseline

6.3.5 The baseline was determined through desk-based research, relying primarily on data published by the Office for National Statistics (ONS), including the following datasets:

- Annual Population Survey⁸;
- Claimant Count⁹;
- Population Estimates¹⁰;
- Jobseekers Allowance by Occupation¹¹; and
- Business Register & Employment Survey¹².

6.3.6 Further contextual information with regard to the baseline is drawn from a range of sources¹³, including:

⁸ ONS via Nomis (2022) Annual Population Survey

⁹ ONS via Nomis (2022) Claimant Count

¹⁰ ONS via Nomis (2021) Population Estimates

¹¹ ONS via Nomis (2022) Jobseekers Allowance by Occupation

¹² ONS via Nomis (2022) Business Register & Employment Survey

¹³ Source references provided at the relevant points of the text.

- NHS Healthy Urban Development Unit (HUDU);
- Department for Work and Pensions (DWP);
- Office for Health Improvement and Disparities (OHID);
- ONS;
- HM Government;
- HM Treasury;
- MCC; and
- House of Commons Library.

6.3.7 No additional background studies have been undertaken to inform the findings presented in this chapter. The assessment does, however, rely upon economic impact modelling to understand the magnitude of effects. This assessment has been undertaken in accordance with best-practice guidance, as outlined above. The outputs of the economic impact modelling exercise inform the assessment of effects and are detailed within this chapter.

Prediction Methodology

Assessment Process

6.3.8 As outlined above, there is no overarching guidance which sets out the preferred methodology for the preparation of assessments of the likely effects of development proposals in terms of socio-economic or human health impact. However, there are several methodological guides which cover key elements of the assessment, all of which have been listed above. These have been drawn upon as appropriate within the assessment, with the HCA Additional Guide⁵, alongside statistical evidence published by organisations such as the ONS being of particular relevance to the assessment of economic impacts.

6.3.9 Drawing on the above guidance, the following methodology has been:

- **employment generated during the demolition and construction phase –** Gross full-time equivalent (FTE) construction jobs have been estimated by dividing construction costs by the average annual turnover for construction sector employees in the North West region¹⁴. This has then been divided by the length of the construction period (i.e. number of years) to estimate average gross FTE jobs supported on average throughout the construction. Allowances have

¹⁴ Department for Business, Energy and Industrial Strategy (2021). Business Population Estimates: 2021 (North West)

then made for leakage¹⁵ and displacement¹⁶, respectively taking into account Census commuting patterns⁸ and standards set out in recognised guidance⁵, in order to calculate net FTE jobs. Multipliers¹⁷ have also been applied to estimate indirect and induced employment, drawing on guidance⁵. The extent to which employment supported by the construction of the Proposed Development impacts on baseline levels and growth of local employment in the context of wider economic trends has informed the level of effect against this indicator; and

- **employment generated during the operational phase** – Existing gross on Site FTE jobs (‘the Reference Case’¹⁸) have been estimated through applying the appropriate employment density (i.e. hotel bedrooms per FTE worker) standards in line with recognised guidance⁶. The gross FTE operational phase jobs set to be supported on Site by the Proposed Development have been estimated by applying the appropriate employment density (i.e. sqm floorspace per FTE worker) standards in line with recognised guidance from the HCA⁶ and other published research¹⁹ to the quantum of floorspace by use-class proposed to be delivered by the Proposed Development. This comprises the ‘worst-case’ (i.e. lowest employment) employment densities for the respective proposed Use Class E office floorspace²⁰ and the Use Class E/F1/F2 flexible commercial/community floorspace²¹. A small additional allowance for employment supported by the PBSA element has also been made through professional judgement and experience of past similar schemes. Allowances have then been made for the Reference Case and leakage and displacement, taking into account the relevant data⁸ and guidance⁵, in order to calculate net direct FTE jobs. Multipliers have also been applied to estimate indirect and induced employment, drawing on guidance⁵. The extent to which employment supported by the construction of the Proposed Development impacts on baseline levels of local employment in the context of wider economic trends has informed the level of effect against this indicator.

¹⁵ Leakage is defined by the HCA Additionality Guide as “The proportion of outputs that benefit those outside of the intervention’s target area or group”. For example, the number of jobs which would be held by those living outside of the respective impact areas.

¹⁶ Displacement is defined by the HCA Additionality Guide as “The proportion of intervention outputs/outcomes accounted for by reduced outputs/outcomes elsewhere in the target area”.

¹⁷ Multipliers are defined by the HCA Additionality Guide as “Further economic activity (jobs, expenditure or income) associated with additional local income and local supplier purchases”.

¹⁸ The Reference Case is defined by the HCA Additionality Guide as “the position in terms of target outputs and outcomes that would occur at the end of the intervention life if the intervention was not implemented” (i.e. the ‘do nothing’ position).

¹⁹ CAG Consultants on behalf of the Greater London Authority (2017) London Employment Sites Database 2017: Final Report.

²⁰ Homes and Communities Agency (2015). Employment Density Guide (3rd Edition). Density of 1 FTE job per 13 sqm (NIA) floorspace applied.

²¹ CAG Consultants on behalf of the Greater London Authority (2017) London Employment Sites Database 2017: Final Report. Density of 1 FTE job per 45 sqm (GIA) floorspace applied.

Reporting of the Environmental Effect and Significance Criteria

6.3.10 The assessment of likely significant environmental effects, as a result of the Proposed Development, has accounted for the demolition and construction and operational phases. The following sections define the approach adopted within the assessment for the determination of sensitivity (or value/importance), magnitude of change (or impact), and the level of effect and significance.

Determining Sensitivity of Receptor

- 6.3.11 The sensitivity of affected receptors has been considered on a scale of high, medium, or low.
- 6.3.12 The sensitivity of receptors has been determined through a comparison with wider regional and national trends. Consideration has also been given to the priority and value attributed to specific receptors in strategy and policy terms. The assessment has been based on professional judgement.
- 6.3.13 In the absence of industry-wide guidance on assessing the significance of socio-economic effects, **Table 6.2** provides a general overview of the sensitivity criteria which have been applied in the assessment. The sensitivity of each specific receptor has been discussed and justified within the chapter, based on these general principles.

Table 6.2: Methodology for Determining Sensitivity of Receptors

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

Determining the Magnitude of Change/Impact

- 6.3.14 The magnitude of change/impact has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of high, medium, low or negligible, as set out in **Table 6.3**.
- 6.3.15 The absolute impact attributable to the Proposed Development has been benchmarked (where relevant) against the average annual rate of change in the corresponding socio-economic characteristics or baseline, in order to determine magnitude.

Table 6.3: Methodology for Determining Magnitude of Impact

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

Determining the Level of Effect

- 6.3.16 The level of effect has been informed by the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and **Table 6.4** has been a tool which has assisted with this process.
- 6.3.17 Whilst **Table 6.4** provides ranges, the level of effect was confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is '*beneficial*' or '*adverse*'.

Table 6.4: Effect Significance Matrix

Magnitude of Impact	Sensitivity or Value		
	High	Medium	Low
High	Major adverse/beneficial	Major-moderate adverse/beneficial	Moderate-minor adverse/beneficial
Medium	Major-moderate adverse/beneficial	Moderate-minor adverse/beneficial	Minor adverse/beneficial
Low	Moderate-minor adverse/beneficial	Minor adverse/beneficial	Minor-negligible
Negligible	Negligible	Negligible	Negligible

- 6.3.18 The following terms have been used to define the level of the effects identified and these can be 'beneficial' or 'adverse':
- **major effect:** where the Proposed Development is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;

- **moderate effect:** where the Proposed Development is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;
- **minor effect:** where the Proposed Development is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Development is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and
- **negligible:** where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

6.3.19 The temporal scope of effects has been assessed in terms of whether they are:

- temporary (i.e. occurring only during the demolition and construction phase); or
- permanent (i.e. lasting effects as a result of demolition and construction or occurring only during the operational phase).

6.3.20 The duration of effects has been assessed in terms of whether they are:

- short-term (<5 years);
- medium-term (5-10 years); or
- long-term (10-20+ years).

Categorising Likely Significant Effects

6.3.21 For each effect, a statement has been made as to whether the level of effect is '**Significant**' or '**Not significant**'. This determination has been based on professional judgement and/or relevant guidance/legislation where applicable.

6.3.22 Significance has only been concluded for residual effects (i.e. following the identification of additional mitigation).

Limitations and Assumptions

6.3.23 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- the assessment relies on secondary survey data such as the Census²², the Annual Population Survey (APS)⁹ and the Business Register & Employment Survey

²² ONS via Nomis (2011). Census 2011

(BRES)¹³. Each data source has methodological limitations related to data collection and surveys only represent the socio-economic context at a specific point in time; and

- the future baseline and assessment of future effects relies on employment forecast data drawn from Experian²³. There are known uncertainties related to using trend-based analysis (especially in the current context of economic uncertainty caused by factors such as the Covid-19 recovery, Brexit, the war in Ukraine and inflationary pressures); however, this is the best available data for drawing conclusions about how the economy and labour market is likely to change in the future.

6.4 Scoping and Consultation

- 6.4.1 An EIA Scoping Report (presented in **ES Volume 4, Appendix A1**) was submitted to MCC on 8th September 2022 with a formal request for an opinion on the proposed scope of the EIA and assessment methodologies. On 2nd November 2022, MCC subsequently issued their Scoping Opinion on the proposed scope and methodology of the topics for assessment within the EIA. A copy of MCC's Scoping Opinion is provided in **ES Volume 4, Appendix A2**.
- 6.4.2 A summary of the key points raised in MCC's Scoping Opinion, relevant to socio-economics and health, are presented in **Table 6.5** including a response as to where the comments have been addressed within this chapter.

Table 6.5: MCC Scoping Opinion Comments and Response

Summary of Comment	Response or location within the ES where comments are addressed
The comments within the EIA Scoping Report with respect to Socio-economics and Human Health are noted and are acceptable in terms of their consideration within the ES.	The methodology and scope set out in the EIA Scoping Report with respect to Socio-economics and Human Health are reflected throughout this ES Chapter.

6.5 Baseline Assessment and Identification of Key Receptors

Baseline Conditions

Site and Surrounds

- 6.5.1 The Site of the Proposed Development currently comprises an existing five-storey Premier Inn hotel, providing 200 rooms and designated surface parking for hotel

²³ Experian (2022). Local Market Forecasts Quarterly: June 2022

residents. Based on HCA guidance²⁴, it is estimated that the operations of the existing commercial uses at the Site (i.e. the 200-bedroom hotel) could support c. 40 FTE jobs within the accommodation sector²⁵.

- 6.5.2 The Site is bounded by River Street to the north; Medlock Street to the west and south-west; the Mancunian Way, its exit slip road and the Mancunian Way/Princess Parkway junction, to the south; and the River Street Tower PBSA development to the east.
- 6.5.3 The Site is situated within the 'Central Area' of the First Street SRF. This is an area of the city centre that has been transformed into a mixed-use location through the delivery of large-scale commercial office space, cultural and leisure development and residential uses along with high-quality public realm.

Economic Activity, Employment and Unemployment

- 6.5.4 Analysis of economic activity, employment and unemployment rates has been undertaken to provide an indication of the labour force either currently employed or unemployed available to start work.
- 6.5.5 Over the year of April 2021-March 2022, the ONS's APS⁹ indicated that 75% of the resident working-age (aged 16-64) population in the local impact area of Manchester was economically active. This was in line with that recorded in the GMCA area (also 75%), albeit the rate in both areas was slightly lower than those recorded across the wider North West region and nationally (respectively 77% and 79%). The working-age employment rate was lower locally (68%) than in the GMCA area (71%), regionally (73%) and nationally (75%).
- 6.5.6 Economic activity and employment rates in Manchester, Greater Manchester and wider comparator geographies are set out at **Table 6.6** below.

Table 6.6 Economic Activity and Employment Rates

Area	Economic Activity Rate (aged 16-64)	Employment Rate (aged 16-64)
Manchester	75%	68%
Greater Manchester	75%	71%
North West	77%	73%
England	79%	75%

Source: ONS via Nomis, 2022; Annual Population Survey: April 2021-March 2022

²⁴ Homes and Communities Agency (2015) Employment Density Guide (3rd Edition). Density of 1 FTE job per 5 hotel bedrooms applied.

²⁵ It should be noted that the approach for estimating current employment is indicative and done so through a desk-based approach, applying professional judgement and published employment density guidance to publicly-available information regarding the number of rooms at the existing hotel.

- 6.5.7 The APS also indicated that circa 26,900 economically active people of working age were unemployed in Manchester over this period, with there being a further 16,900 people in the area who were presently economically inactive but did want a job.
- 6.5.8 The latest Claimant Count data published by the ONS¹⁰ provided an up-to-date record of the number of people currently claiming benefits principally for the reason of being unemployed. This revealed that as of August 2022, there were c. 23,100 people claiming out-of-work benefits in Manchester, accounting for 5.9% of the resident working-age population¹¹.
- 6.5.9 In January 2020, the number of people claiming out-of-work benefits in Manchester was c. 16,400, accounting for 4.2% of the city's population. Whilst having fallen from the peak of c. 35,900 recorded (in March 2021) since the beginning of the Covid-19 pandemic, the number of people seeking work in Manchester therefore remains notably higher (by 41%) at latest count than prior to the pandemic. It is also noted that the proportionate change in the number of people claiming out-of-work benefits remains higher in Manchester than recorded across the GMCA area as a whole (albeit the wider area records a still-notable 32% increase in the number of registered claimants compared with prior to the pandemic).
- 6.5.10 Change in the number of claimants in Manchester and Greater Manchester is set out at **Table 6.7**.

Table 6.7 Change in Claimant Counts

Area	No. Claimants: January 2020	No. Claimants: August 2022	% Change in No. Claimants
Manchester	16,400	23,100	+41%
Greater Manchester	68,900	90,800	+32%

Source: ONS via Nomis, 2022; Claimant Count: January 2020-August 2022

- 6.5.11 Analysis of ONS data regarding Jobseeker's Allowance (JSA) claimants¹² (a sub-set of the overall claimant count profiled above) highlighted that circa 310 people were recorded as specifically seeking employment in construction-related trades in Manchester in August 2022, rising to 1,680 at the scale of the GMCA area. This indicates that there is available construction labour force supply in the local impact area and wider city-region.
- 6.5.12 The social impact of skills and employment is far reaching and has benefits at both the individual and wider societal level, shown clearly by the fact that the NHS's Healthy Urban Development Unit (HUDU) consider access to training and employment opportunities as a 'primary determinant' of health¹.
- 6.5.13 Gaining education and employment can have significant economic and wellbeing benefits for both individuals and society. This is exemplified by the fact that health expenditure on an unemployed person is reported to be double the average expenditure per person, given that an individual's overall health and wellbeing – in

terms of both physical mental health – is strongly associated with being in fulfilling and stable employment²⁶.

6.5.14 Research from the Government's Office for Health Improvement and Disparities (OHID, formerly Public Health England, PHE)²⁷ highlights the following benefits of having the necessary skills to obtain employment:

- employment is generally the key means of obtaining adequate economic resources, which are essential for material wellbeing and full participation in society; and
- work also meets important psychosocial needs in societies where employment is the norm and is central to individual identity, social roles and social status, with employment and socio-economic status being among the main drivers of health outcomes.

6.5.15 Whilst, conversely, research indicates that a lack of skills and unemployment:

- causes the loss of regular income, the material and psychosocial impacts of which contributes to the link between unemployment and poor health;
- causes additional psychological stressors related to status and self-esteem, identity and the loss of a core role in life, which impact on health;
- is also associated with unhealthy behaviours, including increased smoking and alcohol consumption and decreased physical exercise; and
- can have effects beyond the individual directly affected, with evidence suggesting that financial difficulties or associated stress can increase the risk of poor mental health among the families of those who are unemployed.

6.5.16 The ONS regularly monitors national wellbeing and their research²⁸ highlights a correlation between unemployment and people experiences feelings of loneliness. Put another way, higher unemployment rates in an area are linked to higher loneliness rates.

6.5.17 Unemployment, therefore, poses a real threat not only to people's economic means but also their health and wellbeing, and the need for workers to have the skills required to take up the jobs of the future is, therefore, one which meets both an economic and a social need.

²⁶ Department for Work and Pensions (2010), The Department for Work and Pensions Social Cost-Benefit Analysis framework

²⁷ Public Health England (now the Office for Health Improvement and Disparities) (2015), Local action on health inequalities: Increasing employment opportunities and improving workplace health

²⁸ ONS (2021). Opinions and Lifestyles Survey

Labour Market and Industry

- 6.5.18 The latest (2020) ONS Business Register & Employment Survey (BRES)¹³ recorded that Manchester accommodated a total of 412,000 workforce jobs. Greater Manchester as a whole supports a total of 1.35 million jobs. Total employment in Manchester grew by a total of 55,000 jobs over the period 2015-2020, equating to an average of 11,000 additional jobs per annum.
- 6.5.19 Change in the total number of jobs in Manchester is set out at **Table 6.8**.

Table 6.8 Change in Total Number of Jobs in Manchester

Employment	Manchester
2015	357,000
2020	412,000
Change 2015-2020	+55,000
Annual average change 2015-2020	+11,000

Source: ONS via Nomis, 2022; Business Register & Employment Survey 2015-2020

- 6.5.20 BRES data records that 1,000 additional jobs were supported by Manchester's construction sector as of 2020, in comparison with 2015 (growing from 7,000 to 8,000 jobs). This equates to average annual growth of 200 jobs per annum between 2015 and 2020. As of 2020, construction employment equated to 1.9% of total jobs in Manchester, which is lower than the sector's 4.0% contribution to the total workforce in Greater Manchester.
- 6.5.21 Primarily-office-based industries²⁹ supported employment for 174,000 people in Manchester in 2020, growing from 140,000 in 2015. This equates to average annual growth of 6,800 jobs per annum between 2015 and 2020. As of 2020, these industries supported 42% of the local area's total employment, which is a higher proportion than recorded in Greater Manchester (33%). It is also noted that annual average employment growth in these sectors over the past 5 years (6,800 additional jobs per annum) has equated to 62% of total annual average employment growth in the same period (11,000 additional jobs per annum), highlighting the importance of such industries to local employment growth and economic development.
- 6.5.22 BRES data also indicates that employment in hotels and similar accommodation accounted for 6,000 jobs as of 2020 (1.5% of Manchester's total number of jobs), in line with the sector's level of employment in 2015.
- 6.5.23 Change in the number of jobs by industry in Manchester is summarised at **Table 6.9**.

²⁹ These industries are defined as: Information & communication; Financial & insurance; Property; Professional, scientific & technical; Business administration & support services; and Public administration & defence.

Table 6.9 Change in Number of Jobs by Industry in Manchester

Employment	Construction	Primarily-office-based industries	Hotels and similar accommodation
2015	7,000	140,000	6,000
2020	8,000	174,000	6,000
Change 2015-2020	+1,000	+34,000	0
Annual average change 2015-2020	+200	+6,800	0
% of total employment: 2020	1.9%	42%	1.5%

Source: ONS via Nomis, 2022; Business Register & Employment Survey 2015-2020

- 6.5.24 The delivery of new employment opportunities is considered a local and national policy priority as an essential component of economic recovery following the Covid-19 pandemic and, more recently, to combat the growing inflationary pressures on essential goods and energy and the accompanying cost-of-living crisis.
- 6.5.25 The severity of the situation faced in the wake of the pandemic was reflected in the Government's 'Build Back Better: Our Plan For Growth'³⁰ strategy document, which places a strong emphasis on protecting jobs and livelihoods and continuing to support the long-term competitiveness of the UK economy through job creation and investment in infrastructure and skills development. The former Chancellor's 'Plan for Jobs'³¹ described the '*devastating*' effects of Covid-19 on businesses and announced a range of unprecedented fiscal stimulus and business support measures to assist in the UK's economic recovery.
- 6.5.26 The Levelling Up White Paper³² similarly outlines that a key objective of the Government over the period to 2030 is to '*boost productivity, pay, jobs and living standards by growing the private sector*' and to close the gap in economic opportunities and outcomes between those top-performing and other areas.
- 6.5.27 In November 2020, MCC published 'Powering Recovery: Manchester's Recovery and Investment Plan'³³, which sets out how the Council will seek to ensure that the city emerges reinvigorated from the Covid-19 pandemic and rises to other challenges, such as the uncertainties of Brexit. The Plan sets out the leading role that Manchester can play in the levelling-up agenda through building on investments in economic assets and infrastructure and accelerating growth in high-productivity sectors. Co-operation between public bodies, business, academia and other partners is identified

³⁰ HM Government (2021) Build Back Better: our plan for growth

³¹ HM Treasury (2020) Plan for Jobs

³² HM Government (2022) Levelling Up the United Kingdom

³³ Manchester City Council (2020) Powering Recovery: Manchester's Recovery and Investment Plan

as key to tackling the Council's priorities, which focus on people, assets, innovation, and investment.

- 6.5.28 The need for new jobs and a boost to pay and living standards remain of vital importance in the current context of inflationary pressures and the cost-of-living crisis, with ONS research indicating that 87% of adults in Great Britain having reported an increase in their living costs by September 2022³⁴. Indeed, it is noted that the high level of inflation has led to 'real wages' (i.e. wages adjusted to take account of inflation) falling in recent months; real wages were 2.5% lower in the second quarter of 2022 compared with a year earlier, and excluding bonuses, real wages fell by 3.0% – a record decline³⁵.
- 6.5.29 Government policies as of September 2022 aiming to address the rising cost of living include an energy price guarantee and energy bill deductions; means-tested payments to households; council tax rebates; cuts to fuel duty; and an increase to the amount someone can earn before National Insurance Contributions are charged³⁵.

Future Baseline (the 'do nothing' scenario)

- 6.5.30 It is anticipated that the Proposed Development will be delivered over a 3-year period from Q4 2023 to Q4 2026. The below, therefore, summarises employment forecasts sourced from Experian²⁴ for the future baseline at the commencement of construction (2023) and the start of the operational phase (2026).

Employment

- 6.5.31 Without any development in this location, it is not expected there will be an impact on employment in the local and wider impact areas from activities within the Site.
- 6.5.32 Total FTE employment is estimated to have fallen by 11% between 2019 and 2020 in both Manchester and the GMCA area (principally as a result of the Covid-19 pandemic). Whilst recovery (11% growth in both areas) to just under pre-pandemic levels in each area is anticipated by the end of 2022, employment is forecast to remain broadly at 2022 levels by the end of 2023.
- 6.5.33 Employment in Manchester's construction sector experienced decline of 21% between 2019 and the end of 2020, a notably higher fall than estimated across the wider economy. Over the period 2020-2023, FTE employment in the sector is anticipated to increase by 6%, thereby remaining lower than pre-pandemic levels. A

³⁴ House of Commons Library (2022) 'Rising cost of living in the UK' [Online]. Available at: <https://commonslibrary.parliament.uk/research-briefings/cbp-9428/>

³⁵ House of Commons Library (2022) 'Economic update: New Prime Minister faces challenging economic outlook' [Online]. Available at: <https://commonslibrary.parliament.uk/economic-update-new-prime-minister-faces-challenging-economic-outlook/>

3% contraction in construction employment is subsequently forecast over the period 2023-26.

- 6.5.34 Employment in primarily-office-based industries³⁶ fell to a lesser degree than employment in the wider economy in the wake of the pandemic, decreasing by 7% between 2019 and 2020. Employment in office-based sectors is forecast to recover to a greater extent than the wider economy in subsequent years, with the anticipated 15% growth indicating that pre-pandemic levels of employment will be exceeded by the end of 2022. Employment in these sectors is anticipated to hold at 2022 levels by the end of 2023, with 2% growth subsequently forecast to the end of 2026.
- 6.5.35 The Bank of England (BoE) forecasts that the national economy will go into recession³⁷ in 2022, and when growth resumes, it is anticipated to be 'very weak'. At a national level, the BoE forecasts unemployment to rise from 2023³⁸.

Identification of Receptors

- 6.5.36 **Table 6.10** below outlines the receptors identified in relation to the demolition and construction and operational phase effects to be considered within the assessment.

Table 6.10 Identification of Receptors

Likely Significant Effect	Applicable Development Stage	Sensitive Receptor
Employment generated during the demolition and construction phase	Demolition and construction	Labour force in the Local and Wider Impact Areas
Employment generated during the operational phase	Operation	Labour force in the Local and Wider Impact Areas

- 6.5.37 Conclusions in terms of the sensitivity of the receptor which will inform the assessment of effects are outlined at **Table 6.11**.

³⁶ These industries are defined as: Information & communication; Finance & Insurance; Professional & Other Private Services and Public Administration & Defence. Please note that, whilst Experian's sub-sectors comprising the definition of the primarily-office-based industries differ slightly from those set out previously in relation to ONS BRES data in terms of terminology, the types of employment supported remain functionally aligned.

³⁷ A recession is generally defined as two or more consecutive quarters of falling economic output.

³⁸ Bank of England (2022) 'Bank Rate increased to 1.75% - August 2022' [online]. Available at: <https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2022/august-2022>

Table 6.11 Identification of Sensitivity of Receptors

Sensitive Receptor	Sensitivity	Sensitivity Justification
Labour force in the Local and Wider Impact Areas	High	As outlined in the baseline, policy and strategy at all levels of Government highlight the importance of new employment opportunities and a boost to pay and living standards in order to drive recovery in the wake of the Covid-19 pandemic and the continuing economic uncertainty in the context of inflationary pressures and the cost-of-living crisis. It is also noted that economic activity and employment rates are lower locally than in wider geographies, and the number of people claiming benefits primarily associated with unemployment remains notably higher in the Local and Wider Impact Areas than prior to the pandemic. This is coupled with relatively low rates of employment growth forecast over the period 2023-26 in the Local and Wider Impact Areas as well as the BoE's forecasts of recession in 2022 and expectation of unemployment growth nationally from 2023. As also outlined in the baseline section, employment is considered a key determinant of health and wellbeing, helping meet both economic and social needs. It is therefore concluded that the sensitivity of the labour force in the Local and Wider Impact Areas is 'High'.

6.6 Identification and Description of Changes Likely to Generate Effect

- 6.6.1 The demolition and construction phase is anticipated to generate a change in employment – supported both directly in the construction sector and across the wider economy through indirect/induced effects – in the Local and Wider Impact Areas. This will impact on the identified receptor 'labour force in the Local and Wider Impact Areas'.
- 6.6.2 The operational phase is anticipated to generate a change in employment – supported both directly in primarily-office-based sectors and across the wider economy through indirect/induced effects – in the Local and Wider Impact Areas. This will impact on the identified receptor 'labour force in the Local and Wider Impact Areas'.

6.7 Assessment of Likely Significant Effect

Demolition and Construction Phase

Embedded Mitigation Measures

6.7.1 The following embedded mitigation, which has been evaluated as part of the demolition and construction phase assessment, is outlined below:

- Site security and health and safety arrangements for the Proposed Development during the demolition and construction phase will be in line with the requirements set out in the Construction (Design and Management) Regulations 2015³⁹.

Anticipated Effects

Employment Generated During the Demolition and Construction Phase

6.7.2 Based on estimated construction costs⁴⁰, and the average turnover per employee per annum in the construction sector in the north-west¹⁵, it is estimated that the Proposed Development has the capacity to support approximately 1,430 'person-years'⁴¹ of direct employment within the construction sector. Over the course of a build period of approximately 3 years, this equates to an annual average of 475 full-time equivalent (FTE) on and off-Site construction jobs during construction.

6.7.3 Of the new construction jobs created, not all will be additional to the local and wider impact area:

- a proportion of jobs will be taken by those living outside of the Local Impact Area of Manchester or the Wider Impact Area of the GMCA area (referred to as 'leakage'); and
- a proportion of jobs will be taken by those who, in the absence of the Proposed Development, could otherwise be working on alternative construction projects locally (referred to as 'displacement').

6.7.4 After assumptions regarding leakage and displacement have been applied respectively in line with published data⁸ and guidance⁴², it is estimated that 305 FTE

³⁹ UK Government (2015). UK Statutory Instruments: The Construction (Design and Management) Regulations 2015

⁴⁰ Construction cost estimates provided by the Applicant.

⁴¹ A person-year is defined as the amount of work done by an individual during a working year, on a specific job.

⁴² Homes and Communities Agency (2014) Additionality Guide (4th Edition). 'Low' (25%) assumptions for displacement applied at the scale of the Local and Wider Impact Areas, reflecting the available pool of construction labour in both areas and the policy priority at all scales of government to support private sector investment to drive economic growth established by the baseline analysis.

jobs will be directly supported across the Wider Impact Area, of which 145 FTE jobs could benefit residents of the Local Impact Area.

- 6.7.5 The beneficial economic impacts of the Proposed Development will extend beyond construction employment to include the generation of indirect benefits for the local economy. Investment in the Proposed Development will generate considerable expenditure on construction materials, goods and other services that will be purchased from a wide range of suppliers. This expenditure has far-ranging 'indirect' benefits both locally and further afield as it filters down the supply chain, and also via the 'induced' impacts of employment supported as a result of onward expenditure.
- 6.7.6 The result is that the initial investment in the Proposed Development is amplified in an economic 'multiplier' effect with linked benefits in terms of generated expenditure spent locally on goods and services. This will bring indirect employment and financial benefits for local individuals and firms involved in the skilled construction trades and associated professions. It could also help to sustain employment across the local and wider economies.
- 6.7.7 In line with recommendations set out in guidance regarding multiplier effects⁴³, it is estimated that the construction of the Proposed Development could be expected to support a further 150 FTE jobs within the Wider Impact Area via indirect and induced effects, including contracts within the supply chain, salaries and onward expenditure, inclusive of 35 FTE jobs in the Local Impact Area.
- 6.7.8 The total net additional impact represents the combined economic impact of both net direct and indirect/induced effects. An annual average of 455 net additional FTE positions could be supported throughout the 3-year construction period across the Wider Impact Area, inclusive of 180 jobs in the Local Impact Area. This is summarised at **Table 6.12**.

⁴³ Ibid. 'Medium' (applicable to the majority of interventions, as advised by the HCA) assumptions applied for multiplier effects applied at the scale of the Local and Wider Impact Areas (respectively 1.25 and 1.5).

Table 6.12 Construction Phase Employment

Employment Generated	Local Impact Area	Wider Impact Area
Person-years of Employment	1,430	
Construction Period (years)	3	
Gross FTE Employment	475	
Direct Net Additional FTE Employment	145	305
Indirect/Induced Net Additional FTE Employment	35	150
Total Net Additional FTE Employment	180	455

Note: Some figures appear not to sum due to rounding.

Source: Turley Economics

- 6.7.9 As set out previously in **Table 6.11**, the sensitivity of the labour force in the Local and Wider Impact Areas is considered to be high. The magnitude of change is considered to be medium, relative to baseline indicators relating to recent change in construction employment. It is noted that between 2015 and 2020 the construction sector supported annual average growth of 200 jobs in Manchester; the jobs generated by the Proposed Development will contribute to maintaining buoyancy in the sector over the 3-year construction period, supporting 305 net direct construction jobs for Greater Manchester residents (including 145 in Manchester), as well as 150 indirect/induced jobs in the wider economy (including 35 in Manchester). The concluded magnitude of change is also reflective of the sector's proportionate contribution to total employment locally in Manchester (which is lower than the Greater Manchester rate) and the temporary, short-term period over which the additional employment will be generated. Therefore, it is concluded that there is likely to be a direct, temporary, short-term, **moderate beneficial effect**.

Operational Phase

Embedded Mitigation Measures

- 6.7.10 The following embedded mitigation, which has been evaluated as part of the Operational phase assessment, is outlined below.
- the design of the Proposed Development will be informed by 'Secured by Design' principles and appropriate measures to enhance community safety; and
 - new employment supported by the Proposed Development (i.e. office floorspace).

Anticipated Effects

Employment Generated During the Operational Phase

- 6.7.11 As outlined in the baseline, through the application of standard employment densities²⁵, it is estimated that the existing hotel at the Site (the Reference Case) has the capacity to support 40 FTE jobs.
- 6.7.12 Through the application of standard employment densities and professional judgement, it is estimated that:
- 26,242 sqm (Net Internal Area, NIA) Class E office floorspace has the capacity to support 2,020 gross FTE jobs in primarily-office-based sectors (also including building management roles)⁴⁴;
 - 293 sqm (Gross Internal Area, GIA) Class E/F1/F2 floorspace has the capacity to support 5 FTE jobs in flexible commercial/community-related roles²⁰; and
 - the application of professional judgement and experience of past similar schemes indicates that, at 1,014 units, the purpose-build student accommodation (PBSA) component of the Proposed Development has the capacity to support 15 gross FTE jobs associated with building operations and management (e.g. concierge, cleaning and maintenance).
- 6.7.13 Therefore, it is estimated that a total of 2,040 gross FTE jobs could be supported at the Proposed Development, once fully operational and occupied.
- 6.7.14 After allowing for the Reference Case and the additionality factors of leakage, in line with relevant data⁴⁵, and displacement⁴³ and multiplier⁴⁴ effects (in line with guidance), it is estimated that a total of 1,900 direct net additional FTE jobs will be generated for residents of the GMCA area as the Wider Impact Area, including 740 FTE jobs for residents of the Local Impact Area of Manchester. This is summarised at **Table 6.13**.

Table 6.13 Operational Phase Employment

Employment Generated	Local Impact Area	Wider Impact Area
Gross On-site FTE Employment	2,040	
Reference Case FTE Employment	-40	
Net On-site FTE Employment	2,000	
Direct Net Additional FTE Employment	590	1,270

⁴⁴ Homes and Communities Agency (2015) Employment Density Guide (3rd Edition). Density of 1 FTE job per 13 sqm (NIA) floorspace applied (Class B1a use 'corporate').

⁴⁵ ONS via Nomis (2011) 2011 Census: Table WU01UK - Location of usual residence and place of work by sex. Rounded leakage rates of 60% and 15% applied at the respective scales of the Local and Wider Impact Areas, in line with commuting patterns.

Employment Generated	Local Impact Area	Wider Impact Area
Indirect/Induced Net Additional FTE Employment	150	630
Total Net Additional FTE Employment	740	1,900

Note: Some figures appear not to sum due to rounding.

Source: Turley Economics

- 6.7.15 As set out previously in **Table 6.11**, the sensitivity of the labour force in the Local and Wider Impact Areas is considered to be high. The magnitude of change is considered to be high, relative to baseline indicators relating to recent change in primarily-office-based (as well as these sectors' contribution to total employment growth) in the Local Impact Area.
- 6.7.16 The 2,000 net on-site jobs to be supported at the Proposed Development is equivalent to 18% of annual average rates of employment growth in Manchester over the past 5 years. The majority of jobs are to be supported within office-based industries, a significant driver of the city's economic development during this period; for example, it is noted that between 2015 and 2020, office-based industries supported 62% of total employment growth in Manchester, and as of 2020, accounts for 42% of total employment in the city. The jobs generated by the Proposed Development will therefore make a notable contribution to maintaining employment buoyancy, in total supporting 1,900 net additional jobs for Greater Manchester residents via direct, indirect and induced effects (including 740 in Manchester). The concluded magnitude of change is also reflective of the permanent, long-term period over which the additional employment will be generated. Therefore, it is considered that there is likely to be a direct, permanent, long-term, **major beneficial** effect.

6.8 Scope for Additional Mitigation Measures

Potential Additional Mitigation Measures

Employment Generated During the Demolition and Construction Phase

- 6.8.1 An outline 'Local Benefits Proposal' (LBP) has been prepared and submitted as part of the Proposed Development's planning application. This enhancement measure will seek to maximise the benefits to local communities as a result of the employment generated during the demolition and construction phase and could, for example, include liaison with local job centres and other private and third sector organisations and education providers, to advertise and promote uptake of available roles. Specific measures to be implemented as part of the LBP package are to be agreed and finalised through suitable worded planning conditions.
- 6.8.2 Notwithstanding the abovementioned additional enhancement measure, the residual effect for the labour force in the local and wider impact areas is the same (moderate

beneficial) as that reported in the pre-mitigation scenario. This effect is considered to be **Significant**.

Employment Generated During the Operational Phase

- 6.8.3 An outline LBP has been prepared and submitted as part of the Proposed Development’s planning application. This enhancement measure will seek to maximise the benefits to local communities as a result of the employment generated during the operational phase and could, for example, include liaison with local job centres and other private and third sector organisations and education providers to advertise and promote uptake of available roles. Specific measures to be implemented as part of the LBP package are to be agreed and finalised through planning conditions.
- 6.8.4 Notwithstanding the abovementioned enhancement measure, the residual effect for the labour force in the local and wider impact areas is the same (major beneficial) as that reported in the pre-mitigation scenario. This effect is considered to be **Significant**.

Likely Effectiveness of Additional Mitigation Measures

- 6.8.5 It is considered that the production of an LBP represents an effective enhancement measure, on the basis that initiatives (such as liaison with the relevant local employment-focused organisations) is likely to maximise the potential for local communities to access and benefit from the new jobs created during the demolition and construction and operational phases.
- 6.8.6 Notwithstanding the abovementioned enhancement measure, all residual effects are the same as reported in the pre-mitigation scenario.

6.9 Residual Effects

- 6.9.1 **Table 6.14** provides a summary of the residual effects resulting from the Proposed Development after effective implementation of embedded mitigation.

Table 6.14: Significant Residual Effects

Phase	Resource or Receptor Affected	Residual Effect
Demolition and construction	Labour force in the local and wider impact areas	Temporary, short-term, moderate beneficial effect which is Significant
Operation	Labour force in the local and wider impact areas	Permanent, long-term, major beneficial effect which is Significant

6.10 Cumulative Effects

- 6.10.1 Cumulative effects are the combined effects of several development schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 6.10.2 The ES has given consideration to 'Cumulative 'Effects' for schemes located within a 500m radius from the boundary of the Site, as listed in **ES Volume 2, Chapter 3: EIA Methodology**.
- 6.10.3 The assessment of cumulative effects is presented below at **Table 6.15**.

Table 6.15: Socio-Economics and Human Health Cumulative Effects Assessment

Cumulative Scheme No.	Cumulative Effects Assessment	Significant Cumulative effect (Yes/No)
1	<u>Demolition and Construction Phase</u> Employment generated during the demolition and construction phase (High sensitivity): Whilst timescales for the Cumulative Scheme are unconfirmed, the demolition and construction phase of the Cumulative Scheme may overlap with the Proposed Development in terms of timescales. If timescales overlap, in-combination effects with the relevant construction phase receptor (labour force in the local and wider impact areas) are therefore likely as a result of employment generated during the demolition and construction phase. The combined magnitude of change is anticipated to be medium, and therefore the Moderate beneficial effect will be in line with that assessed for the Proposed Development in isolation. This cumulative effect will be temporary and short-term and is considered to be Significant, in line with the level of significance assessed for the Proposed Development in isolation. Whilst the significance of the cumulative effects identified above will not be greater than anticipated at the scale of the Proposed Development in isolation (in terms of the definitions Negligible, Minor, Moderate or Major), it should albeit be noted that the quantifiable in-combination effect (i.e. number of jobs) will indeed be greater than the effect at the scale of the Proposed Development alone. This principle is applicable to all cumulative effects and the in-combination assessment of the Proposed Development with individual Cumulative	- Employment generated during the demolition and construction phase – YES - Employment generated during the operational phase – YES

Cumulative Scheme No.	Cumulative Effects Assessment	Significant Cumulative effect (Yes/No)
	Schemes and with all combined Cumulative Schemes. <u>Operational Phase</u> • Employment generated during the operational phase (High sensitivity): The operational phase of the Cumulative Scheme will provide new Class E office and other commercial floorspace and will overlap with the Proposed Development in terms of timescales. In-combination effects with the relevant operational phase receptor (labour force in the local and wider impact areas) are therefore likely as a result of employment generated during the operational phase. The combined magnitude of change is anticipated to be high, and therefore the Major beneficial effect will be in line with that assessed for the Proposed Development in isolation. This cumulative effect will be permanent and long-term and is considered to be Significant, in line with the level of significance assessed for the Proposed Development in isolation.	
2	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E office floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	• Employment generated during the demolition and construction phase – YES • Employment generated during the operational phase – YES
3	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E leisure floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	• Employment generated during the demolition and construction phase – YES • Employment generated during the operational phase – YES
4	<u>Demolition and Construction Phase</u>	• Employment generated during the

Cumulative Scheme No.	Cumulative Effects Assessment	Significant Cumulative effect (Yes/No)
	In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E office, retail, leisure and/or community floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	demolition and construction phase – YES • Employment generated during the operational phase – YES
5	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will not provide commercial floorspace and therefore will support a negligible number of operational phase jobs. Therefore, there will be no in-combination effect with the relevant operational phase receptor (labour force in the local and wider impact areas).	• Employment generated during the demolition and construction phase – YES
6	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E office, retail, leisure and/or community floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	• Employment generated during the demolition and construction phase – YES • Employment generated during the operational phase – YES
7	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new education floorspace with associated office and retail/leisure uses and will overlap with the	• Employment generated during the demolition and construction phase – YES • Employment generated during the operational phase – YES

Cumulative Scheme No.	Cumulative Effects Assessment	Significant Cumulative effect (Yes/No)
	Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	
8	<u>Demolition and Construction Phase</u> The construction phase of the Cumulative Scheme is almost complete. It is therefore anticipated that demolition and construction timescales will not overlap with the Proposed Development. Therefore, there will be no in-combination effect with the relevant demolition and construction phase receptor (labour force in the local and wider impact areas). <u>Operational Phase</u> The operational phase of the Cumulative Scheme will not provide commercial floorspace and therefore will support a negligible number of operational phase jobs. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 5.	No common receptors
9	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E office and retail and/or leisure floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	• Employment generated during the demolition and construction phase – YES • Employment generated during the operational phase – YES
10	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E retail, office, leisure and/or community floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	• Employment generated during the demolition and construction phase – YES • Employment generated during the operational phase – YES
11	<u>Demolition and Construction Phase</u>	• Employment generated during the

Cumulative Scheme No.	Cumulative Effects Assessment	Significant Cumulative effect (Yes/No)
	In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E retail, office, leisure and/or community floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	demolition and construction phase – YES • Employment generated during the operational phase – YES
12	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E retail, leisure and/or community floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	• Employment generated during the demolition and construction phase – YES • Employment generated during the operational phase – YES
13	<u>Demolition and Construction Phase</u> The construction phase of the Cumulative Scheme is almost complete. It is therefore anticipated that demolition and construction timescales will not overlap with the Proposed Development. Therefore, there will be no in-combination effect with the relevant demolition and construction phase receptor (labour force in the local and wider impact areas). <u>Operational Phase</u> The operational phase of the Cumulative Scheme will not provide commercial floorspace and therefore will support a negligible number of operational phase jobs. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 5.	No common receptors
14	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u>	• Employment generated during the demolition and construction phase – YES

Cumulative Scheme No.	Cumulative Effects Assessment	Significant Cumulative effect (Yes/No)
	The operational phase of the Cumulative Scheme will provide new Class E office floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	Employment generated during the operational phase – YES
15	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will not provide commercial floorspace and therefore will support a negligible number of operational phase jobs. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 5.	Employment generated during the demolition and construction phase – YES
16	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will provide new Class E commercial floorspace and will overlap with the Proposed Development in terms of timescales. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 1.	- Employment generated during the demolition and construction phase – YES - Employment generated during the operational phase – YES
17	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1. <u>Operational Phase</u> The operational phase of the Cumulative Scheme will not provide commercial floorspace and therefore will support a negligible number of operational phase jobs. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 5.	Employment generated during the demolition and construction phase – YES
18	<u>Demolition and Construction Phase</u> In relation to the demolition and construction phase, the same principles apply as outlined for Cumulative Scheme 1.	Employment generated during the demolition and construction phase – YES

Cumulative Scheme No.	Cumulative Effects Assessment	Significant Cumulative effect (Yes/No)
	<u>Operational Phase</u> The operational phase of the Cumulative Scheme will not provide commercial floorspace and therefore will support a negligible number of operational phase jobs. In relation to the operational phase, the same principles apply as outlined for Cumulative Scheme 5.	
All Cumulative Schemes	<u>Demolition and Construction Phase</u> • Employment generated during the demolition and construction phase (High sensitivity): Whilst timescales for the Cumulative Schemes are unconfirmed, the demolition and construction phase of all Cumulative Schemes except nos. 8 and 13 may overlap with the Proposed Development in terms of timescales. If timescales overlap, in-combination effects with the relevant construction phase receptor (labour force in the local and wider impact areas) are therefore likely as a result of employment generated during the demolition and construction phase. The combined magnitude of change is anticipated to be high, and therefore the Major beneficial effect will exceed that assessed for the Proposed Development in isolation. This cumulative effect will be temporary and short-term and is considered to be Significant, in line with the level of significance assessed for the Proposed Development in isolation. <u>Operational Phase</u> • Employment generated during the operational phase (High sensitivity): The operational phases of all Cumulative Schemes except nos. 5, 8, 13, 15, 17 and 18 will provide new employment-supporting commercial floorspace and will overlap with the Proposed Development in terms of timescales. In-combination effects with the relevant operational phase receptor (labour force in the local and wider impact areas) are therefore likely as a result of employment generated during the operational phase. The combined magnitude of change is anticipated to be high, and therefore the Major beneficial effect will be in line with that assessed for the Proposed Development in isolation. This cumulative effect will be permanent and long-term and is considered to be Significant, in	• Employment generated during the demolition and construction phase – YES • Employment generated during the operational phase – YES

Cumulative Scheme No.	Cumulative Effects Assessment	Significant Cumulative effect (Yes/No)
	line with the level of significance assessed for the Proposed Development in isolation.	

6.11 Summary and Conclusions

- 6.11.1 The baseline assessment noted that economic activity and employment rates are lower locally in Manchester in comparison with the wider Greater Manchester Combined Authority (GMCA) area and nationally. The number of people claiming benefits primarily associated with unemployment remains notably higher in Manchester and the GMCA area than prior to the pandemic. This is coupled with relatively low rates of employment growth forecast over the period 2023-26 in both geographies as well as the Bank of England's forecasts of recession in 2022 and expectation of unemployment growth nationally from 2023.
- 6.11.2 Since 2015, the construction sector has generated c. 200 additional jobs in Manchester every year. Primarily-office-based industries have generated c. 6,800 additional jobs annually over the same period, representing 62% of the total 11,000 new jobs created on average annually in Manchester during this time. It is estimated that the existing hotel at the Site has the capacity to support up to 40 full-time equivalent (FTE) jobs. Policy and strategy at all levels of Government highlight the importance of new employment opportunities and a boost to pay and living standards in order to drive recovery in the wake of the Covid-19 pandemic and the continuing economic uncertainty in the context of inflationary pressures and the cost-of-living crisis.
- 6.11.3 There is no overarching guidance which sets out the preferred methodology for the preparation of assessments of the likely effects of development proposals in terms of socio-economic or human health impact. However, there are several methodological guides which cover key elements of the assessment. These have been drawn upon as appropriate within the assessment, with the Government's Homes and Communities Agency's Additional Guide, alongside statistical evidence published by organisations such as the ONS, being of particular relevance to the assessment of economic impacts.
- 6.11.4 Impacts on the labour force in Manchester and the GMCA area, in relation to the following effects, were considered in the assessment:
- employment generated during the demolition and construction phase; and
 - employment generated during the operational phase.
- 6.11.5 Embedded mitigation implemented during the Proposed Development's respective phases includes:

- demolition and construction: Site security and health and safety arrangements will be in line with the requirements set out in the Construction (Design and Management) Regulations 2015; and
- operational: The Proposed Development will provide office floorspace and the design of the Proposed Development will be informed by 'Secured by Design' principles and appropriate measures to enhance community safety.

- 6.11.6 Throughout the 3-year demolition and construction phase, the Proposed Development has the capacity to support an average of 475 gross direct jobs. After accounting for the 'additionality' factors of leakage, displacement and multipliers, it is estimated that the Proposed Development could support a total of 455 direct, indirect and induced net additional jobs in the GMCA area, including 180 for Manchester residents, temporarily during construction. The impact on the labour force in Manchester and the GMCA area, as a result of employment generated during the demolition and construction phase, is considered to be a 'Moderate Beneficial', which is **Significant**. The cumulative effects assessment indicates that a cumulative 'Major Beneficial' and **Significant** effect will be generated.
- 6.11.7 Once operational, the Proposed Development has the capacity to support 2,200 gross direct on-site jobs. After accounting for the existing employment at the Site and the additionality factors outlined above, it is estimated that the Proposed Development could support a total of 1,900 direct, indirect and induced net additional jobs in the GMCA area, including 740 for Manchester residents, on a permanent basis. The impact on the labour force in Manchester and the GMCA area as a result of employment generated during the demolition and construction phase is considered to be a 'Major Beneficial', which is **Significant**. The cumulative effects assessment indicates that a cumulative 'Major Beneficial' and **Significant** effect will also be generated.
- 6.11.8 An outline 'Local Benefits Proposal' (LBP) has been prepared and submitted as part of the Proposed Development's planning application. This enhancement measure will seek to maximise the benefits to local communities as a result of the employment generated during the demolition and construction and operational phases and could, for example, include liaison with local job centres and other private and third sector organisations and education providers to advertise and promote uptake of available roles. Specific measures to be implemented as part of the LBP package are to be agreed and finalised through suitable worded planning conditions. Notwithstanding this additional enhancement measure, the residual effects for the labour force in Manchester and the GMCA areas are the same as that reported in the pre-mitigation scenario.
- 6.11.9 In summary, it is considered that the Proposed Development will result in the following effects:

- a Moderate Beneficial and **Significant** effect with respect to employment generated during the demolition and construction phase; and
- a Major Beneficial and **Significant** effect with respect to employment generated during the operational phase.

6.11.10 **Table 6.16** summarises the Socio-Economic effects resulting from the Proposed Development.

Table 6.16: Summary of Residual Effects

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Demolition and Construction								
Labour force in the local and wider impact areas	High	Employment generated during the demolition and construction phase	Site security and health and safety in line with Construction (Design and Management) Regulations 2015	Medium	Moderate Beneficial	Production of a Local Benefits Proposal to maximise job creation benefits for local communitie s	Medium	Moderate Beneficial (Significant)
				Local and wider impact areas				
				Temporary, Short-term				
				Likely				
Operation								
Labour force in the local and wider impact areas	High	Employment generated during the operational phase	i) Design informed by 'Secured by Design' principles to enhance community safety ii) New jobs supported by	High	Major Beneficial	Production of a Local Benefits Proposal to maximise job creation benefits for local communitie s	High	Major Beneficial (Significant)
				Local and wider impact areas				
				Permanent, Long-term				
				Likely				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
			the Proposed Development's office floorspace					
Cumulative Effects – Demolition and Construction								
Labour force in the local and wider impact areas	High	Employment generated during the demolition and construction phase	Site security and health and safety in line with Construction (Design and Management) Regulations 2015	High	Major Beneficial	N/A	High	Major Beneficial (Significant)
				Temporary, Short-term				
				Local and wider impact areas				
				Likely				
Cumulative Effects - Operation								
Labour force in the local and wider impact areas	High	Employment generated during the operational phase	i) Design informed by ‘Secured by Design’ principles to enhance community safety	High	Major Beneficial	N/A	High	Major Beneficial (Significant)
				Local and wider impact areas				
				Permanent, Long-term				
				Likely				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
			ii) New jobs supported by the Proposed Development's office floorspace					

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CHAPTER 7: AIR QUALITY

7 Air Quality

7.1 Scope of Assessment

- 7.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of air quality and is supported by **ES Volume 4, Appendix C1** and **ES Volume 4, Appendix C2**.
- 7.1.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the cumulative effects associated with the Proposed Development in combination with other developments within the vicinity of the Site.

7.2 Key Legislation, Policy and Guidance Considerations

- 7.2.1 The air quality assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised below.

Legislation and Regulation

- 7.2.2 The Air Quality Standards¹ and subsequent amendments include Air Quality Limit Values (AQLVs) for the following pollutants:
- nitrogen dioxide (NO₂);
 - sulphur dioxide;
 - lead;
 - particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
 - particulate matter with an aerodynamic diameter of less than 2.5µm (PM_{2.5});
 - benzene; and
 - carbon monoxide.
- 7.2.3 Air Quality Target Values have also been provided. It should be noted that the AQLV for PM_{2.5} stated in the Air Quality Standards Regulations¹ was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations².

¹ UK Government (2010) The Air Quality Standards Regulations 2010

² UK Government (2020) The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020

- 7.2.4 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007³. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.
- 7.2.5 **Table 7.1** presents the AQOs and AQLV for pollutants considered within the assessment.

Table 7.1: Air Quality Objectives/Air Quality Limit Value

Pollutant	Air Quality Objectives / Air Quality Limit Value	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean
	200	One-hour mean, not to be exceeded on more than 18 occasions per annum
PM ₁₀	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
PM _{2.5}	20	Annual mean

- 7.2.6 The Environment Act⁴ was published on 9th November 2021 and makes provision for the setting of lower PM_{2.5} targets. However, future criteria had not been formalised at the time of assessment and the AQLV outlined in **Table 7.1** remains the adopted air quality standard within the UK.
- 7.2.7 **Table 7.2** summarises the advice provided in DEFRA guidance⁵ on where the AQOs for pollutants considered within this report apply.

³ DEFRA (2007) Air Quality Strategy for England, Scotland, Wales and Northern Ireland

⁴ UK Government (2021) The Environment Act

⁵ DEFRA (2022) Local Air Quality Management (TG22)

Table 7.2: Examples of Where the Air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building facades of residential properties, schools, hospitals, care homes etc	Building facades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels and gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
One-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

Local Air Quality Management

- 7.2.8 Local Authorities (LA) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in **Table 7.2**, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each

AQMA, the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

Dust

- 7.2.9 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations⁶ and subsequent amendments, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act⁷. The Act defines nuisance as:

"Any dust, stream, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

- 7.2.10 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act⁷. The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

Planning Policy

National Planning Policy

National Planning Policy Framework

- 7.2.11 The revised National Planning Policy Framework⁸ (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.
- 7.2.12 The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives, including the following of relevance to air quality:

"c) An environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

⁶ UK Government (2016) Environmental Permitting (England and Wales) Regulations

⁷ UK Government (1990) Environmental Protection Act

⁸ Ministry of Housing, Communities & Local Government, UK Government (2021) NPPF

- 7.2.13 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

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

"[...]"

"e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality [...]"

- 7.2.14 The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

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

- 7.2.15 The implications of the NPPF have been considered throughout this assessment.

Planning Practice Guidance

- 7.2.16 The national Planning Practice Guidance⁹ (PPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 to support the NPPF and make it more accessible. The air quality pages were updated on 1st November 2019 and are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality considerations be relevant to the development management process?

⁹ Ministry of Housing, Communities & Local Government, UK Government (2019) PPG

6. What specific issues may need to be considered when assessing air quality impacts?

7. How detailed does an air quality assessment need to be?

8. How can an impact on air quality be mitigated?

7.2.17 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

Local Planning Policy

7.2.18 The Manchester Local Development Framework consists of a series of planning documents of which the Core Strategy¹⁰ is central. This was adopted by Manchester City Council (MCC) on 11th July 2012 and provides policies which guide the determination of planning applications within the city.

7.2.19 A review of the Core Strategy indicated the following policies of relevance to the assessment:

"Policy EN 16

"Air Quality

"The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local effect of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

"When assessing the appropriateness of locations for new development the Council will consider the effects on air quality, alongside other plan objectives. This includes cumulative effects, particularly in Air Quality Management Areas."

"Policy DM 1

"Development Management

"All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:-

"[...]

"Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise."

¹⁰ MCC (2012) Core Strategy

7.2.20 The implications of the above policies were taken into consideration throughout the undertaking of the assessment.

Technical Standards and Guidance

7.2.21 The following air quality related guidance was utilised through the assessment:

- Guidance on the Assessment of Dust from Demolition and Construction Version 1.1, Institute of Air Quality Management (IAQM)¹¹;
- Guidance of Land-Use Planning & Development Control: Planning for Air Quality, IAQM¹²;
- Local Air Quality Management Technical Guidance (TG22), DEFRA⁵;
- Design Manual for Roads and Bridges (DMRB) LA105: Air Quality, Highways England¹³;
- Air Quality and Planning Technical Guidance, MCC¹⁴;
- Mitigation of Development Air Quality Impacts V1.1, IAQM¹⁵; and
- Town and Country Planning (Environmental Impact Assessment) EIA Regulations, UK Government¹⁶.

7.3 Assessment Methodology

Effects Assessed

7.3.1 This section provides confirmation on the scope of the assessment presented within this chapter, following submission of the EIA Scoping Report (**ES Volume 4, Appendix A1**) and receipt of the EIA Scoping Opinion (**ES Volume 4, Appendix A2**).

Effects Not Considered to be Significant

7.3.2 The following effects were not considered significant within the EIA Scoping Report and are not considered further in this chapter:

- impacts on ecological receptors.

¹¹ IAQM (2016) Guidance on the Assessment of Dust from Demolition and Construction.

¹² IAQM (2017) Land-Use Planning & Development Control: Planning for Air Quality

¹³ Highways Agency (2019) Design Manual for Roads and Bridges Volume 11, Section 3, Part 1, LA 105

¹⁴ MCC (2022) Air Quality and Planning Technical Guidance

¹⁵ IAQM (2018) Mitigation of Development Air Quality Impacts V1.1

¹⁶ UK Government (2017) Town and Country Planning (EIA) Regulations

Effects Considered Likely to be Significant.

- 7.3.3 The effects set out in **Table 7.3** were considered likely to be significant and are reported on within this chapter.
- 7.3.4 It should be noted that whilst emissions from a potential energy centre were considered likely to be significant within the EIA Scoping Report; the Proposed Development does not include an energy centre; therefore, this has not been considered further in this chapter.
- 7.3.5 Additionally, the effects on local air quality from emissions anticipated to be generated by the Proposed Development's operational traffic was considered to be not significant within the EIA Scoping Report; however, following a review of further information, it was considered that the effects from emissions expected to be generated by the Proposed Development's operational traffic would likely be significant. Consequently, this has been assessed and reported on within this chapter.

Table 7.3: Effects Considered Likely to be Significant

Likely Significant Effect	Applicable Development Stage
Dust and particulate matter generated during the demolition and construction phase	Demolition and construction
Effects on local air quality from emissions from demolition and construction traffic	Demolition and construction
Effects on local air quality from emissions from operational traffic	Operation
Effects on future residents as a result of elevated pollution levels	Operation

Determination of Baseline

- 7.3.6 Baseline air quality conditions in the vicinity of the Site were determined through a desk top study utilising the following sources:
- The DEFRA Air Quality Resource Website¹⁷;
 - Consultation with the Environmental Health Department at MCC;
 - Greater Manchester Combined Authority (GMCA) 2021 Air Quality Annual Status Report¹⁸;
 - Aerial photography available from Google Maps¹⁹;

¹⁷ DEFRA (n.d) Air Quality Resource Website

¹⁸ Greater Manchester Combined Authority (2022) Air Quality Annual Status Report

¹⁹ Google (n.d) Google Maps <https://maps.google.co.uk>

- Ordnance Survey feature maps²⁰; and
- The Multi Agency Geographic Information for the Countryside (MAGIC) website²¹.

7.3.7 For the purposes of the Air Quality Assessment, a historical base year is necessary to allow predicted pollutant levels to be verified against monitored concentrations. As such, a base year of 2019 was adopted. This was the most recent year with representative survey results at the time of assessment. The choice of 2019 baseline year aligns with the IAQM position statement 'Use of 2020 and 2021 Monitoring Datasets'²².

Prediction Methodology

Demolition and Construction Phase Fugitive Dust Emissions

- 7.3.8 There is the potential for fugitive dust emissions to occur as a result of the demolition and construction phase activities. These have been assessed in accordance with the methodology outlined within the IAQM document 'Guidance on the Assessment of Dust from Demolition and Construction V1.1'¹¹.
- 7.3.9 Activities on the Site during the construction period have been divided into four types to reflect their different potential impacts. These are:
- demolition;
 - earthworks;
 - construction; and
 - trackout.
- 7.3.10 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:
- annoyance due to dust soiling; and
 - the risk of health effects due or a significant increase in exposure to PM₁₀.
- 7.3.11 The first stage of the assessment screened the requirement for a more detailed assessment. Should human receptors be identified within 350m from the Site boundary or 50m from the construction vehicle route up to 500m from the Site entrance, then the assessment proceeded to the next stage. It should be noted that if no human receptors are identified within the relevant screening distances, further assessment is not required.

²⁰ Ordnance Survey (n.d)| OS Open Map Local.

²¹ <http://magic.defra.gov.uk/MagicMap.aspx>

²² IAQM (2021) Use of 2020 and 2021 Monitoring Datasets

7.3.12 The second stage of the assessment screened the risk of potential dust impacts. The risk category was defined based on two factors:

- the sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity; and
- the scale and nature of the works, which determines the magnitude of dust arising as small, medium or large.

7.3.13 The two factors are combined in order to determine the risk of dust impacts without mitigation applied.

7.3.14 The influencing factors that define the sensitivity of the area to potential effects are shown in **Table 7.4**.

Table 7.4: Construction Dust - Examples of Factors Defining Sensitivity of an Area

Receptor Sensitivity	Examples
High	Users expect high levels of amenity High aesthetic or value property People expected to be present continuously for extended periods of time Locations where members of the public are exposed over a time period relevant to the AQO for PM ₁₀ . e.g. residential properties, hospitals, schools and residential care homes
Medium	Users would expect to enjoy a reasonable level of amenity Aesthetics or value of their property could be diminished by soiling People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work
Low	Enjoyment of amenity would not reasonably be expected Property would not be expected to be diminished in appearance Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads

7.3.15 The guidance also requires consideration of the following factors when determining the sensitivity of an area to potential dust impacts:

- any history of dust generating activities in the area;
- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between the source and receptors;
- any conclusions drawn from analysing local meteorological data which accurately represent the area and if relevant the season during which works will take place;
- any conclusions drawn from local topography;

- during of the potential impact, as a receptor may become more sensitive over time; and
- any know specific receptor sensitivities which go beyond the classifications given in the document.

7.3.16 These factors were considered in the undertaking of this assessment.

7.3.17 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in **Table 7.5**.

Table 7.5: Construction Dust - Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

7.3.18 **Table 7.6** outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 7.6: Construction Dust - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Background Annual Mean PM ₁₀ Conc.	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low

Receptor Sensitivity	Background Annual Mean PM ₁₀ Conc.	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
	Less than 24µg/m ³	1 - 10	Medium	Low	Low	Low	Low
		More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	More than 1	Low	Low	Low	Low	Low

7.3.19 The scale and nature of the construction works determine the magnitude of dust impacts arising from each activity. The relevant criteria are summarised in **Table 7.7**.

Table 7.7: Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	Total volume of building to be demolished greater than 50,000m ³ Potentially dusty material (e.g. concrete) On-site crushing and screening Demolition activities more than 20m above ground level
	Earthworks	Total site area greater than 10,000m ² Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) More than 10 heavy earth moving vehicles active at any one time Formation of bunds greater than 8m in height More than 100,000 tonnes of material moved

Magnitude	Activity	Criteria
	Construction	Total building volume greater than 100,000m ³ On site concrete batching Sandblasting
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day Potentially dusty surface material (e.g. high clay content) Unpaved road length greater than 100m
Medium	Demolition	Total volume of building to be demolished between 20,000m ³ and 50,000m ³ Potentially dusty construction material Demolition activities 10m to 20m above ground level
	Earthworks	Total site area 2,500m ² to 10,000m ² Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time Formation of bunds 4m to 8m in height Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	Total building volume 25,000m ³ to 100,000m ³ Potentially dusty construction material (e.g. concrete) On site concrete batching
	Trackout	10 to 50 HDV trips per day Moderately dusty surface material (e.g. high clay content) Unpaved road length 50m to 100m
Small	Demolition	Total volume of building to be demolished less than 20,000m ³ Construction material with low potential for dust release (e.g. metal cladding or timber) Demolition activities less than 10m above ground and during wetter months
	Earthworks	Total site area less than 2,500m ² Soil type with large grain size (e.g. sand) Less than 5 heavy earth moving vehicles active at any one time Formation of bunds less than 4m in height Total material moved less than 20,000 tonnes Earthworks during wetter months
	Construction	Total building volume less than 25,000m ³ Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	Less than 10 HDV trips per day Surface material with low potential for dust release Unpaved road length less than 50m

7.3.20 The dust emission magnitude was combined with the sensitivity of the area to determine the risk of unmitigated impacts.

7.3.21 **Table 7.8** outlines the dust risk category from demolition activities.

Table 7.8: Construction Dust - Dust Risk from Demolition Activities

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Low	Low	Negligible

7.3.22 **Table 7.9** outlines the dust risk category from earthworks and construction activities.

Table 7.9: Construction Dust - Dust Risk from Earthworks and Construction Activities

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

7.3.23 **Table 7.10** outlines the dust risk category from trackout activities.

Table 7.10: Construction Dust - Dust Risk from Trackout Activities

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

7.3.24 It should be noted that predicted effects from demolition and construction phase fugitive dust emissions are considered to be adverse but temporary in nature.

7.3.25 Specific mitigation measures were identified from IAQM guidance¹¹ to reduce potential dust effects based upon the predicted risk categories.

7.3.26 The significance of residual effects was determined based on professional judgement. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience¹¹ shows that this is normally possible, hence the residual effect will normally be negligible. This is regarded as not significant with respect to the EIA Regulations¹⁶.

Demolition and Construction Phase Road Traffic Exhaust Emissions

- 7.3.27 There is the potential for road traffic exhaust emissions associated with vehicles travelling to and from the Site during the demolition and construction phase to impact on existing air quality. Potential effects were defined by predicting NO₂, PM₁₀ and PM_{2.5} concentrations at sensitive locations using dispersion modelling for the following scenarios:
- 2019 - Verification;
 - demolition and construction phase Do-Minimum (CPDM) (predicted traffic flows in 2024 should construction works not proceed); and
 - demolition and construction phase Do-Something (CPDS) (predicted traffic flows in 2024 should construction works commence). It should be noted that whilst demolition and construction is anticipated to start in Q4, 2023 (as noted in **Chapter 5: The Proposed Development and Demolition and Construction Overview**), the year of 2024 has been assessed as this represents the first full year of construction.
- 7.3.28 The CPDM scenario (i.e. without construction of the Proposed Development) included baseline traffic data, inclusive of anticipated growth and consented/committed schemes, for the relevant assessment year. The CPDS scenario (i.e. with construction of the Proposed Development) included baseline traffic data, inclusive of anticipated growth and consented/committed schemes for the relevant assessment year, in addition to predicted traffic associated with the construction of the Proposed Development.
- 7.3.29 Reference should be made to **ES Volume 4, Appendix C1** for assessment input data and details of the verification process.
- 7.3.30 Locations sensitive to potential changes in pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided by National Highways¹³ on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance⁵ on where the AQOs apply, as summarised in **Table 7.2**, was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows, as a result of the Proposed Development.
- 7.3.31 The sensitivity of receptors to potential changes in pollutant concentrations, as a result of road vehicle exhaust emissions, is outlined in **Table 7.11**. It should be noted that these are based on the values provided within the IAQM guidance¹² with additional descriptors in ensure consistency throughout the ES.

Table 7.11: Construction Road Traffic Exhaust Emissions - Receptor Sensitivity

Receptor Sensitivity	Pollutant Concentration at Receptor in Assessment Year
Very High	110% or more of AQO or AQLV
High	103 - 109% of AQO or AQLV
Medium	95 - 102% of AQO or AQLV
Low	76 - 94% of AQO or AQLV
Very Low	75% or less of AQO or AQLV

7.3.32 The magnitude of predicted air quality impacts was calculated based on the predicted concentration change between CPDM and CPDS scenarios as a proportion of the AQO or AQLV. This is outlined in **Table 7.12**.

Table 7.12: Construction Road Traffic Exhaust Emissions - Magnitude of Impact

Change in Annual Mean NO ₂ , PM ₁₀ and PM _{2.5} Concentration as a Proportion of the AQO/AQLV	Pollutant Concentration at Receptor in Assessment Year
0	Negligible
1	Very Minor
2 - 5	Minor
6 - 10	Moderate
More than 10	Major

7.3.33 It should be noted that the categories in **Table 7.12** are intended to be used by rounding the change in percentage pollutant concentration to whole numbers.

7.3.34 The magnitude of impact and receptor sensitivity were combined to determine the significance of unmitigated effect. This is outlined in **Table 7.13**.

Table 7.13: Construction Road Traffic Exhaust Emissions - Effect Significance

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

7.3.35 It should be noted that predicted air quality effects from demolition and construction phase road vehicle exhaust emissions are considered to be adverse and temporary in nature.

- 7.3.36 The IAQM guidance¹² states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is moderate or major, the effect is likely to be considered significant in regards the EIA Regulations¹⁶, whilst if the impact is minor or negligible, the effect is likely to be considered not significant in regard to the EIA Regulations¹⁶.

Operational Phase

Road Traffic Exhaust Emissions

- 7.3.37 There is the potential for road traffic exhaust emissions associated with vehicles travelling to and from the Site during the operational phase to impact on existing air quality. Potential effects were defined by predicting NO₂, PM₁₀ and PM_{2.5} concentrations at sensitive locations using dispersion modelling for the following scenarios:
- operational phase Do-Minimum (OPDM) (predicted traffic flows in 2027 should the Proposed Development not proceed); and
 - operational phase Do-Something (OPDS) (predicted traffic flows in 2027 should the Proposed Development be completed).
- 7.3.38 The OPDM scenario (i.e. without the Proposed Development) included baseline traffic data, inclusive of anticipated growth and consented/committed schemes for the relevant assessment year. The OPDS scenario (i.e. with the Proposed Development) included baseline traffic data, inclusive of anticipated growth and consented/committed schemes for the relevant assessment year, in addition to predicted traffic associated with the operation of the Proposed Development.
- 7.3.39 Reference should be made to **ES Volume 4, Appendix C1** for assessment input data and details of the verification process.
- 7.3.40 The determination of the significance of operational phase road vehicle exhaust emission effects was undertaken using the approach defined for demolition and construction phase road vehicle exhaust emissions.
- 7.3.41 Predicted air quality effects from operational phase road vehicle exhaust emissions are considered to be adverse and permanent in nature.
- 7.3.42 Similar to demolition and construction phase road vehicle exhaust emissions, the IAQM guidance¹¹ states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is moderate or major, the effect is likely to be considered significant in regards the EIA Regulations¹⁶, whilst if the impact is minor or negligible, the effect is likely to be considered not significant in regard to the EIA Regulations¹⁶.

Potential Future Exposure

- 7.3.43 The Proposed Development has the potential to expose future occupants to poor air quality. Pollutant concentrations were, therefore, quantified across the Site using dispersion modelling. The results were subsequently compared with the relevant AQOs and AQLV to determine the potential for exceedance. Reference should be made to **ES Volume 4, Appendix C1** for a full description of the assessment input data.
- 7.3.44 Should the AQOs or AQLV be exceeded, then the IAQM guidance¹¹ considers potential air quality impacts associated with a development to be significant and mitigation is required. Should compliance with the AQOs be indicated then effects would be considered not significant with respect to the EIA Regulations¹⁶.

Energy Generation Emissions

- 7.3.45 Information provided within the project's Energy Strategy²³ indicated that air source heat pumps (ASHPs) will be utilised to provide heat and hot water for the Proposed Development. These do not produce emissions to atmosphere and, as such, have not been considered further within this chapter.

Limitations and Assumptions

- 7.3.46 A number of assumptions have been adopted in the undertaking of the assessment. These include the following:
- background pollutant concentrations change in accordance with current DEFRA estimates. This ensured results align with current national policy. Relevant values were obtained from local monitoring results and the DEFRA background mapping study, an industry standard database produced on behalf of the UK Government. This ensured the most accurate representation of background pollutant concentrations at the Site;
 - road traffic exhaust emissions change in accordance with current DEFRA estimates. This ensured results align with current national policy;
 - the meteorological data used for the assessment is representative of the conditions at the Site. Data from a nearby meteorological station was obtained for use in the model, as outlined in **ES Volume 4, Appendix C1**. This ensured a reasonable representation of meteorology at the Site; and
 - the traffic data obtained for the purpose of the assessment is accurate. Information was provided by Vectos, the project's Transport Consultants for the project based on relevant counts and calculations. Reference should be made to

²³ Ridge and Partners LLP (2022) One Medlock Street Energy Strategy Report

the Transport Statement (which forms part of the planning application) for further details adopted for the prediction of relevant traffic flows.

- 7.3.47 The above assumptions are similar to those required for any project of this nature and the adoption of worst-case parameters, where necessary, has ensured the assessment results can be considered sufficiently robust.

7.4 Scoping and Consultation

- 7.4.1 An EIA Scoping Report (presented in **ES Volume 4, Appendix A1**) was submitted to MCC on 8th September 2022 with a formal request for an opinion on the proposed scope of the EIA and assessment methodologies. MCC subsequently issued their Scoping Opinion on the proposed scope and methodology of the topics for assessment within the EIA. A copy of MCC's Scoping Opinion is provided in **ES Volume 4, Appendix A2**.
- 7.4.2 Additionally, the formal scoping exercise was supplemented by consultation with Laura Miller, Environmental Protection Officer at MCC, in order to agree the specific assessment methodology. A response was received on 22nd September 2022.
- 7.4.3 A summary of the key points raised in MCC's Scoping Opinion, relevant to Air Quality, and following consultation with Laura Miller is presented in **Table 7.14**, including a response as to where the comments have been addressed within this chapter.

Table 7.14: MCC Consultation Comments and Response

Summary of Comment	Response or location within the ES where comments are addressed
The comments within the scoping report are noted and are acceptable in terms of their consideration within the ES.	Undertook the air assessment (presented within this chapter) in accordance with agreed methodology.
The proposed methodology for the Air Quality Assessment is acceptable. Reference should be made to MCC's Air Quality and Planning Technical Guidance ¹⁴ as well as IAQM Good Practice Design Principles detailed in the IAQM Guidance ¹² .	Undertook the air assessment (presented within this chapter) in accordance with agreed methodology.

7.5 Baseline Assessment and Identification of Key Receptors

- 7.5.1 Existing air quality conditions in the vicinity of the Site were identified in order to provide a baseline for the assessment. These are detailed in the following sections.

Local Air Quality Management

- 7.5.2 As required by the Environment Act⁴, MCC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO₂ are above the AQO within the City. As such, a number of

roads within Manchester have been included within the GMCA AQMA. This is described as follows:

"This is the part of the Greater Manchester Combined Authority AQMA located within the Manchester City Council area."

- 7.5.3 The Site is located within the AQMA. As such, there is the potential for vehicle trips generated by the Proposed Development to increase pollution levels in this sensitive area, as well as exposure of future occupants to poor air quality. These factors have been considered throughout the chapter.
- 7.5.4 MCC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMA's have been designated.

Background Concentrations

- 7.5.5 Predictions of background pollutant concentrations on a 1km-by-1km grid basis have been produced for the UK by DEFRA to assist LAs in their Review and Assessment of air quality. The Site is located in grid square National Grid Reference (NGR): 383500, 397500. Data for this location was downloaded from the DEFRA website²⁴ for the base year of 2019 and is summarised in **Table 7.15**.

Table 7.15: 2019 Background Pollutant Concentration Predictions

Pollutant	2019 Predicted Background Pollutant Concentration (µg/m ³)
NO ₂	26.07
PM ₁₀	13.47
PM _{2.5}	8.69

- 7.5.6 As shown in **Table 7.15**, predicted background NO₂, PM₁₀ and PM_{2.5} concentrations are below the relevant AQOs and AQLV at the Site in 2019.

Local Air Quality Monitoring Data

- 7.5.7 Monitoring of pollutant levels is undertaken by MCC throughout their area of jurisdiction. Recent NO₂ concentrations recorded within the vicinity of the Site are shown in **Table 7.16**.

²⁴ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

Table 7.16: Monitoring Results - NO₂

Monitoring Site		Monitored NO ₂ Concentrations (µg/m ³)		
		2019	2020	2021
MAN1	Manchester, Oxford Road	59.0	36.0	44.0
MA29ANO	Oxford Street	55.4	39.0	44.8
MA77ANO	Hewitt Street	43.7	26.9	30.8
MA82 / 83 / 84NO	Manchester, Oxford Road	52.0	33.9	40.7

- 7.5.8 As shown in **Table 7.16**, annual mean NO₂ concentrations were above the relevant AQO of 40 µg/m³ at all locations during 2019. As these monitors are located adjacent to roads within an AQMA, elevated concentrations would be expected.
- 7.5.9 Concentrations of NO₂ during 2020 and 2021 were lower than previous years due to a reduction in traffic and associated emissions caused by the COVID-19 pandemic. The results should, therefore, be viewed with caution.
- 7.5.10 Recent annual mean PM₁₀ results recorded in the vicinity of the Site are shown in **Table 7.17**.

Table 7.17: Monitoring Results - PM₁₀

Monitoring Site		Monitored PM ₁₀ Concentrations (µg/m ³)		
		2019	2020	2021
MAN1	Manchester, Oxford Road	26.0	18.0	18.0

- 7.5.11 As shown in **Table 7.17**, the annual mean AQO for PM₁₀ was achieved at the MAN1 monitor in recent years.
- 7.5.12 Reference should be made to **Figure 7.1** (presented in **ES Volume 4, Appendix C2**) for a map of the survey positions.
- 7.5.13 Monitoring of PM_{2.5} concentrations is not undertaken within the vicinity of the Site.

Air Quality Receptors

- 7.5.14 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for construction dust and road vehicle exhaust emission impacts in the following sections.

Demolition and Construction Phase Fugitive Dust Emission Sensitive Receptors

- 7.5.15 Receptors sensitive to potential dust impacts during demolition, earthworks and construction were identified from a desk-top study of the area up to 350m from the Site boundary. These are summarised in **Table 7.18**.

Table 7.18: Construction Dust - Demolition, Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors
Up to 20	More than 100
Up to 50	More than 100
Up to 100	More than 100
Up to 350	More than 100

- 7.5.16 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the Site access. These are summarised in **Table 7.19**.

Table 7.19: Construction Dust - Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors
Up to 20	More than 100
Up to 50	More than 100

- 7.5.17 A number of additional factors have been considered when determining the sensitivity of the surrounding area to potential dust impacts. These are summarised in **Table 7.20**.

Table 7.20: Additional Area Sensitivity Factors to Potential Dust Impacts

Guidance	Comment
Whether there is any history of dust generating activities in the area	A review of Google Maps imagery indicated a development is currently being constructed approximately 30m southeast of the Site. It is possible that this may have caused dust generation in the area over recent months.
The likelihood of concurrent dust generating activity on nearby sites	There are a number of committed developments within 700m of the Site. It is therefore possible that these may result in concurrent dust generation should the construction phases overlap with that of the Proposed Development.

Guidance	Comment
Pre-existing screening between the source and the receptors	There is no significant screening around the boundary.
Conclusions drawn from analysing local meteorological data which accurately represents the area and if relevant the season during which the works will take place	As shown in Figure 7.2 (presented in ES Volume 4, Appendix C2), the predominant wind bearing at the Site is from south. As such, receptors to the north of the Site boundary are most likely to be affected by dust releases.
Conclusions drawn from local topography	There are no significant topographical constraints to dust dispersion.
Duration of the potential impact, as a receptor may become more sensitive over time	Construction of the Proposed Development is estimated to take approximately three years. It is considered unlikely that receptor sensitivity would change significantly over this time period.
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment.

7.5.18 Based on the criteria shown in **Table 7.20**, the sensitivity of the receiving environment to potential dust soiling and health impacts is classified as high. This was because identified receptors included residential properties.

7.5.19 The sensitivity of the receiving environment to specific dust impacts is shown in **Table 7.21**.

Table 7.21: Demolition and Construction Dust - Sensitivity of the Surrounding Area to Specific Dust Impacts

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Medium	Medium	Medium	Medium

Construction and Operational Phase Road Vehicle Exhaust Emission Sensitive Receptors

7.5.20 Receptors sensitive to potential construction and operational phase road vehicle exhaust emissions were identified from a desk top study and are summarised in **Table 7.22**. Receptor heights were selected based on the location of residential units to allow for less sensitive land uses, such as retail, at ground level.

Table 7.22: Road Vehicles Exhaust Emissions Sensitive Receptor Locations

Receptor		NGR (m)		Height (m)
		X	Y	
R1	Residential - River Street	383589.8	397230.0	1.5
R2	Residential - River Street	383578.1	397200.6	4.0
R3	Residential - River Street	383538.6	397179.9	4.0
R4	Residential - Garwood Street	383549.5	397158.3	4.0
R5	Residential - Garwood Street	383525.3	397200.9	1.5
R6	Residential - Mancunian Way	383457.4	397164.1	4.0
R7	Residential - Garwood Street	383490.7	397217.1	4.0
R8	Residential - City Road East	383480.2	397234.6	1.5
R9	Residential - City Road East	383507.5	397233.2	1.5
R10	Residential - City Road East	383410.9	397198.1	4.0
R11	Residential - City Road East	383353.5	397227.7	1.5
R12	Residential - Little Peter Street	383572.5	397466.5	4.0
R13	Residential - Whitworth Street	383651.3	397540.0	4.0
R14	Residential - River Street	383651.4	397262.5	1.5
R15	Residential - Medlock Street	383671.7	397271.2	1.5
R16	Residential - Medlock Street	383729.2	397182.5	4.0
R17	Residential - Mancunian Way	383249.9	397127.0	1.5
R18	Residential - Mancunian Way	383646.9	397091.7	1.5
R19	Residential - Rockdove Avenue	383688.5	396988.4	1.5
R20	Residential - Mancunian Way	383854.7	397114.3	1.5

Receptor		NGR (m)		Height (m)
		X	Y	
R21	Residential - Mancunian Way	383940.9	397061.6	1.5
R22	Residential - Mancunian Way	384039.1	397049.3	1.5
R23	Residential - Cavendish Street	384100.5	397016.1	1.5
R24	Residential - Mancunian Way	383981.8	397160.9	1.5
R25	Residential - Chester Street	383933.7	397183.3	1.5
R26	Residential - Wilmott Street	383849.5	397276.5	1.5
R27	Residential - Chester Street	384071.6	397276.5	1.5
R28	Residential - Oxford Road	384315.5	397173.6	1.5
R29	Manchester Metropolitan University	384209.4	397325.0	1.5
R30	Residential - City Road East	383537.1	397284.3	4.0
R31	Residential - City Road East	383582.5	397358.7	1.5
R32	Residential - Whitworth Street West	384072.1	397589.2	4.0

7.5.21 Reference should be made to **Figure 7.3** (presented in **ES Volume 4, Appendix C2**) for a map of construction and operational phase road vehicle exhaust emission sensitive receptor locations.

Future Baseline (the 'do nothing' scenario)

7.5.22 Predicted future annual mean NO₂, PM₁₀ and PM_{2.5} background concentrations were taken from the DEFRA mapping study for the grid square containing the Site in order to provide a future baseline for assessment. These are summarised in **Table 7.23** for the first full year of the demolition and construction phase of 2024 and the opening year of 2027.

Table 7.23: Future Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration ($\mu\text{g}/\text{m}^3$)	
	2024	2027
NO ₂	21.29	19.55
PM ₁₀	12.69	12.55
PM _{2.5}	8.13	8.03

- 7.5.23 As shown in **Table 7.23**, predicted background NO₂, PM₁₀ and PM_{2.5} concentrations are predicted to be below the relevant AQOs and AQLV at the Site in 2024 and 2027.
- 7.5.24 It is currently predicted that air quality will improve in future years. This is supported by the DEFRA 'Air Pollution in the UK 2020'²⁵ report published in September 2021, which indicates that ambient concentrations of NO₂, as measured by the Automatic Urban and Rural Network (AURN), have demonstrated a downward trend since the AURNs inception in 1992. In addition, in January 2019 the UK Government launched the Clean Air Strategy²⁵ which included a commitment to end the sale of new diesel and petrol cars and vans by the end of 2030. This will continue to aid the reduction of road vehicle exhaust emissions from combustion engines, including oxides of nitrogen (NO_x) and PM₁₀.

7.6 Identification and Description of Changes Likely to Generate Effect

Demolition and Construction Phase

- 7.6.1 Any increase in deposited dust levels above baseline as a result of demolition, earthworks, construction and trackout activities during the demolition and construction phase may generate an effect at existing receptor locations.
- 7.6.2 Any increase in concentrations of NO₂, PM₁₀ and PM_{2.5} above baseline as a result of road vehicle exhaust emissions during the demolition and construction phase may generate an effect at existing receptor locations.

Operational Phase

- 7.6.3 Any increase in concentrations of NO₂, PM₁₀ and PM_{2.5} above baseline as a result of road vehicle exhaust emissions during the operational phase may generate an effect at existing receptor locations.

²⁵ DEFRA (2019) Clean Air Strategy

7.7 Assessment of Likely Significant Effect

Demolition and Construction Phase

Embedded Mitigation Measures

- 7.7.1 Due to the size and nature of the Proposed Development, a Construction Environmental Management Plan (CEMP) will be produced to control potential air quality effects during the demolition and construction phase. This can be secured through a suitably worded condition. The mitigation measures outlined in **Table 7.24** will be included within the CEMP to mitigate fugitive dust emissions during construction. These are based on the advice provided within IAQM guidance¹¹ and are therefore considered suitable for the Site.

Table 7.24: Demolition and Construction Phase Fugitive Dust Emissions - Mitigation Measures

Issue	Control Measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on Site. Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary. Display the head or regional office contact information. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by MCC.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to MCC when asked Record any exceptional incidents that cause dust and/or air emissions, either on- or off-Site, and the action taken to resolve the situation in the log book.
Monitoring	Undertake daily on-Site and off-Site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results and make the log available to the LA when asked. Carry out regular Site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the LA when asked. Increase the frequency of Site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Issue	Control Measure
Preparing and maintaining the Site	Plan Site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on Site. Avoid Site runoff of water or mud. Keep Site fencing, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from Site as soon as possible. Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary, no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques. Ensure an adequate water supply on the Site for effective dust suppression, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights and use fine water sprays wherever appropriate. Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods.
Waste management	Avoid bonfires and burning of waste materials.
Demolition	Ensure effective water suppression is used during demolition operations. Avoid explosive blasting, using appropriate manual or mechanical alternatives. Bag and remove any biological debris or damp down such material before demolition.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos.

Issue	Control Measure
Trackout	Use water-assisted dust sweepers on the access and local roads, to remove, as necessary, any material tracked out of the Site. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving Sites are covered to prevent escape of materials during transport. Implement a wheel washing system, if necessary.

Demolition and Construction Phase Fugitive Dust Emissions Anticipated Effects

- 7.7.2 The undertaking of activities such as demolition, excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the demolition and construction phase. Vehicles movements both on the Site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.
- 7.7.3 The potential for impact at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.
- 7.7.4 The desk study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the Site. As such, a detailed assessment of potential dust impacts has been undertaken.

Demolition

- 7.7.5 Demolition will be undertaken at the start of the demolition and construction phase and will involve clearance of the existing buildings on Site. A review of the existing structures on the Site indicated that the total building volume to be demolished is between 20,000m³ and 50,000m³. In accordance with the criteria outlined in **Table 7.7**, the magnitude of potential dust emissions from demolition is, therefore, medium.
- 7.7.6 **Table 7.21** indicates the sensitivity of the area to dust soiling effects on people and property is high. In accordance with the criteria outlined in **Table 7.8**, the Proposed Development is considered to be a medium risk site for dust soiling as a result of demolition activities.
- 7.7.7 **Table 7.21** indicates the sensitivity of the area to human health impacts is medium. In accordance with the criteria outlined in **Table 7.8**, the Proposed Development is considered to be a medium risk site for human health receptors as a result of demolition activities.

Earthworks

- 7.7.8 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The Site covers an area between 2,500m² and 10,000m². In accordance with the criteria outlined in **Table 7.7**, the magnitude of potential dust emissions from earthworks is, therefore, medium.
- 7.7.9 **Table 7.21** indicates the sensitivity of the area to dust soiling effects on people of property is high. In accordance with the criteria outlined in **Table 7.9**, the Proposed Development is considered to be a medium risk site for dust soiling as a result of earthworks.
- 7.7.10 **Table 7.20** indicates the sensitivity of the area to human health impacts is medium. In accordance with the criteria outlined in **Table 7.9**, the Proposed Development is considered to be a medium risk site for human health impacts as a result of earthworks.

Construction

- 7.7.11 A review of the Proposed Development's design indicated that the total building volume will be greater than 100,000m³. In accordance with the criteria outlined in **Table 7.7**, the magnitude of potential dust emissions from construction is, therefore, large.
- 7.7.12 **Table 7.21** indicates the sensitivity of the area to dust soiling effects on people or property is high. In accordance with the criteria outlined in **Table 7.9**, the Proposed Development is considered to a high risk for dust soiling as a result of construction activities.
- 7.7.13 **Table 7.21** indicates the sensitivity of the area to human health is medium. In accordance with the criteria outlined in **Table 7.9**, the Proposed Development is considered to be a medium risk site for human health impacts as a result of construction activities.

Trackout

- 7.7.14 Based on the Site area and existing hard standing, it is anticipated that the unpaved road length is likely to be between 50m and 100m during certain stages of construction. In accordance with the criteria outlined in **Table 7.7**, the magnitude of potential dust emissions from trackout is, therefore, medium.
- 7.7.15 **Table 7.21** indicates the sensitivity of the area to dust soiling effects on people or property is high. In accordance with the criteria outlined in **Table 7.10**, the Proposed Development is considered to be a medium risk site for dust soiling as a result of trackout activities.
- 7.7.16 **Table 7.21** indicates the sensitivity of the area to human health is medium. In accordance with the criteria outlined in **Table 7.10**, the Proposed Development is

considered to be a low risk site for human health impacts as a result of trackout activities.

Summary of Dust Risk

- 7.7.17 A summary of the potential risk from each dust generating activity is provided in **Table 7.25**.

Table 7.25: Summary of Potential Unmitigated Construction Dust Risk

Potential Impact	Potential Unmitigated Dust Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	High	Medium
Human Health	Medium	Medium	Medium	Low

Demolition and Construction Phase Road Traffic Exhaust Emissions Anticipated Effects

- 7.7.18 Vehicle movements associated with the construction of the Proposed Development will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the Site.
- 7.7.19 Reference should be made to **ES Volume 4, Appendix C1** for assessment inputs.

Predicted Concentrations

- 7.7.20 Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the CPDM and CPDS scenarios. The results are summarised in **Table 7.26**.

Table 7.26: Demolition and Construction Phase Road Traffic Exhaust Emissions - Predicted Annual Mean NO₂ Concentrations

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		CPDM	CPDS	Change
R1	Residential - River Street	31.54	31.64	0.10
R2	Residential - River Street	32.80	32.98	0.18
R3	Residential - River Street	34.56	34.74	0.18
R4	Residential - Garwood Street	37.35	37.47	0.12
R5	Residential - Garwood Street	33.72	33.76	0.04

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		CPDM	CPDS	Change
R6	Residential - Mancunian Way	37.66	37.68	0.02
R7	Residential - Garwood Street	38.87	38.88	0.01
R8	Residential - City Road East	32.53	32.54	0.01
R9	Residential - City Road East	35.91	35.93	0.02
R10	Residential - City Road East	39.50	39.50	0.00
R11	Residential - City Road East	33.68	33.69	0.01
R12	Residential - Little Peter Street	29.51	29.51	0.00
R13	Residential - Whitworth Street	30.13	30.14	0.01
R14	Residential - River Street	33.72	33.82	0.10
R15	Residential - Medlock Street	36.35	36.40	0.05
R16	Residential - Medlock Street	36.27	36.32	0.05
R17	Residential - Mancunian Way	30.88	30.89	0.01
R18	Residential - Mancunian Way	36.11	36.15	0.04
R19	Residential - Rockdove Avenue	30.56	30.57	0.01
R20	Residential - Mancunian Way	40.50	40.53	0.03
R21	Residential - Mancunian Way	32.51	32.53	0.02
R22	Residential - Mancunian Way	30.20	30.22	0.02
R23	Residential - Cavendish Street	30.24	30.28	0.04
R24	Residential - Mancunian Way	36.41	36.45	0.04
R25	Residential - Chester Street	32.34	32.35	0.01

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		CPDM	CPDS	Change
R26	Residential - Wilmott Street	30.61	30.62	0.01
R27	Residential - Chester Street	30.52	30.53	0.01
R28	Residential - Oxford Road	34.43	34.43	0.00
R29	Manchester Metropolitan University	39.57	39.58	0.01
R30	Residential - City Road East	33.36	33.38	0.02
R31	Residential - City Road East	31.59	31.60	0.01
R32	Residential - Whitworth Street West	40.09	40.09	0.00

7.7.21 As shown in **Table 7.26**, predicted annual mean NO₂ concentrations were below the relevant AQO at 30 sensitive receptors and above at two locations in both the CPDM and CPDS scenarios. It should be noted there were no new exceedances within the CPDS scenario when compared to the CPDM.

7.7.22 Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the CPDM and CPDS scenarios. The results are summarised in **Table 7.27**.

Table 7.27: Demolition and Construction Phase Road Traffic Exhaust Emissions - Predicted Annual Mean PM₁₀ Concentrations

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		CPDM	CPDS	Change
R1	Residential - River Street	21.97	22.00	0.03
R2	Residential - River Street	22.33	22.38	0.05
R3	Residential - River Street	22.83	22.89	0.06
R4	Residential - Garwood Street	23.61	23.65	0.03
R5	Residential - Garwood Street	22.62	22.63	0.01
R6	Residential - Mancunian Way	23.70	23.71	0.01

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		CPDM	CPDS	Change
R7	Residential - Garwood Street	24.52	24.53	0.01
R8	Residential - City Road East	22.30	22.30	0.00
R9	Residential - City Road East	23.50	23.51	0.01
R10	Residential - City Road East	24.50	24.51	0.00
R11	Residential - City Road East	22.48	22.48	0.00
R12	Residential - Little Peter Street	21.45	21.45	0.00
R13	Residential - Whitworth Street	21.68	21.68	0.00
R14	Residential - River Street	22.73	22.76	0.03
R15	Residential - Medlock Street	23.64	23.65	0.02
R16	Residential - Medlock Street	23.45	23.47	0.02
R17	Residential - Mancunian Way	21.59	21.59	0.00
R18	Residential - Mancunian Way	23.46	23.47	0.01
R19	Residential - Rockdove Avenue	21.98	21.98	0.00
R20	Residential - Mancunian Way	24.59	24.61	0.01
R21	Residential - Mancunian Way	22.23	22.24	0.01
R22	Residential - Mancunian Way	21.61	21.62	0.01
R23	Residential - Cavendish Street	21.70	21.72	0.01
R24	Residential - Mancunian Way	23.41	23.42	0.01
R25	Residential - Chester Street	22.19	22.19	0.00
R26	Residential - Wilmott Street	21.75	21.75	0.00

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		CPDM	CPDS	Change
R27	Residential - Chester Street	21.65	21.65	0.00
R28	Residential - Oxford Road	22.52	22.52	0.00
R29	Manchester Metropolitan University	23.90	23.90	0.00
R30	Residential - City Road East	22.69	22.69	0.00
R31	Residential - City Road East	22.12	22.12	0.00
R32	Residential - Whitworth Street West	24.01	24.01	0.00

7.7.23 As shown in **Table 7.27**, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both the CPDM and CPDS scenarios.

7.7.24 Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for the CPDM and CPDS scenarios. The results are summarised in **Table 7.28**.

Table 7.28: Demolition and Construction Phase Road Traffic Exhaust Emissions - Predicted Annual Mean PM_{2.5} Concentrations

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		CPDM	CPDS	Change
R1	Residential - River Street	14.01	14.03	0.02
R2	Residential - River Street	14.23	14.25	0.03
R3	Residential - River Street	14.53	14.56	0.03
R4	Residential - Garwood Street	15.00	15.01	0.02
R5	Residential - Garwood Street	14.39	14.40	0.01
R6	Residential - Mancunian Way	15.06	15.07	0.01
R7	Residential - Garwood Street	15.46	15.46	0.00
R8	Residential - City Road East	14.20	14.20	0.00

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		CPDM	CPDS	Change
R9	Residential - City Road East	14.88	14.88	0.00
R10	Residential - City Road East	15.48	15.48	0.00
R11	Residential - City Road East	14.33	14.33	0.00
R12	Residential - Little Peter Street	13.70	13.70	0.00
R13	Residential - Whitworth Street	13.82	13.82	0.00
R14	Residential - River Street	14.43	14.45	0.02
R15	Residential - Medlock Street	14.94	14.95	0.01
R16	Residential - Medlock Street	14.86	14.87	0.01
R17	Residential - Mancunian Way	13.81	13.82	0.00
R18	Residential - Mancunian Way	14.88	14.88	0.01
R19	Residential - Rockdove Avenue	13.99	13.99	0.00
R20	Residential - Mancunian Way	15.57	15.57	0.01
R21	Residential - Mancunian Way	14.17	14.17	0.00
R22	Residential - Mancunian Way	13.80	13.80	0.00
R23	Residential - Cavendish Street	13.84	13.85	0.01
R24	Residential - Mancunian Way	14.85	14.86	0.01
R25	Residential - Chester Street	14.14	14.15	0.00
R26	Residential - Wilmott Street	13.87	13.88	0.00
R27	Residential - Chester Street	13.83	13.83	0.00
R28	Residential - Oxford Road	14.31	14.31	0.00

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		CPDM	CPDS	Change
R29	Manchester Metropolitan University	15.10	15.10	0.00
R30	Residential - City Road East	14.41	14.41	0.00
R31	Residential - City Road East	14.08	14.08	0.00
R32	Residential - Whitworth Street West	15.14	15.14	0.00

7.7.25 As shown in **Table 7.28**, predicted annual mean PM_{2.5} concentrations were below the relevant AQLV at all sensitive receptors in both the CPDM and CPDS scenarios.

Effect Significance

7.7.26 Predicted effects on annual mean NO₂ concentrations at sensitive receptor locations as a result of demolition and construction phase road vehicle exhaust emissions are summarised in **Table 7.29**.

Table 7.29: Demolition and Construction Phase Road Traffic Exhaust Emissions - Effect Significance - NO₂

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - River Street	Low	Negligible	Negligible
R2	Residential - River Street	Low	Negligible	Negligible
R3	Residential - River Street	Low	Negligible	Negligible
R4	Residential - Garwood Street	Low	Negligible	Negligible
R5	Residential - Garwood Street	Low	Negligible	Negligible
R6	Residential - Mancunian Way	Medium	Negligible	Negligible
R7	Residential - Garwood Street	Medium	Negligible	Negligible
R8	Residential - City Road East	Low	Negligible	Negligible
R9	Residential - City Road East	Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R10	Residential - City Road East	Medium	Negligible	Negligible
R11	Residential - City Road East	Low	Negligible	Negligible
R12	Residential - Little Peter Street	Very Low	Negligible	Negligible
R13	Residential - Whitworth Street	Low	Negligible	Negligible
R14	Residential - River Street	Low	Negligible	Negligible
R15	Residential - Medlock Street	Low	Negligible	Negligible
R16	Residential - Medlock Street	Low	Negligible	Negligible
R17	Residential - Mancunian Way	Low	Negligible	Negligible
R18	Residential - Mancunian Way	Low	Negligible	Negligible
R19	Residential - Rockdove Avenue	Low	Negligible	Negligible
R20	Residential - Mancunian Way	Medium	Negligible	Negligible
R21	Residential - Mancunian Way	Low	Negligible	Negligible
R22	Residential - Mancunian Way	Low	Negligible	Negligible
R23	Residential - Cavendish Street	Low	Negligible	Negligible
R24	Residential - Mancunian Way	Low	Negligible	Negligible
R25	Residential - Chester Street	Low	Negligible	Negligible
R26	Residential - Wilmott Street	Low	Negligible	Negligible
R27	Residential - Chester Street	Low	Negligible	Negligible
R28	Residential - Oxford Road	Low	Negligible	Negligible
R29	Manchester Metropolitan University	Medium	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R30	Residential - City Road East	Low	Negligible	Negligible
R31	Residential - City Road East	Low	Negligible	Negligible
R32	Residential - Whitworth Street West	Medium	Negligible	Negligible

7.7.27 As shown in **Table 7.29**, effects on annual mean NO₂ concentrations as a result of demolition and construction phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.

7.7.28 Predicted effects on annual mean PM₁₀ concentrations at sensitive receptor locations as a result of demolition and construction phase road vehicle exhaust emissions are summarised in **Table 7.30**.

Table 7.30: Demolition and Construction Phase Road Traffic Exhaust Emissions - Effect Significance - PM₁₀

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - River Street	Very Low	Negligible	Negligible
R2	Residential - River Street	Very Low	Negligible	Negligible
R3	Residential - River Street	Very Low	Negligible	Negligible
R4	Residential - Garwood Street	Very Low	Negligible	Negligible
R5	Residential - Garwood Street	Very Low	Negligible	Negligible
R6	Residential - Mancunian Way	Very Low	Negligible	Negligible
R7	Residential - Garwood Street	Very Low	Negligible	Negligible
R8	Residential - City Road East	Very Low	Negligible	Negligible
R9	Residential - City Road East	Very Low	Negligible	Negligible
R10	Residential - City Road East	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R11	Residential - City Road East	Very Low	Negligible	Negligible
R12	Residential - Little Peter Street	Very Low	Negligible	Negligible
R13	Residential - Whitworth Street	Very Low	Negligible	Negligible
R14	Residential - River Street	Very Low	Negligible	Negligible
R15	Residential - Medlock Street	Very Low	Negligible	Negligible
R16	Residential - Medlock Street	Very Low	Negligible	Negligible
R17	Residential - Mancunian Way	Very Low	Negligible	Negligible
R18	Residential - Mancunian Way	Very Low	Negligible	Negligible
R19	Residential - Rockdove Avenue	Very Low	Negligible	Negligible
R20	Residential - Mancunian Way	Very Low	Negligible	Negligible
R21	Residential - Mancunian Way	Very Low	Negligible	Negligible
R22	Residential - Mancunian Way	Very Low	Negligible	Negligible
R23	Residential - Cavendish Street	Very Low	Negligible	Negligible
R24	Residential - Mancunian Way	Very Low	Negligible	Negligible
R25	Residential - Chester Street	Very Low	Negligible	Negligible
R26	Residential - Wilmott Street	Very Low	Negligible	Negligible
R27	Residential - Chester Street	Very Low	Negligible	Negligible
R28	Residential - Oxford Road	Very Low	Negligible	Negligible
R29	Manchester Metropolitan University	Very Low	Negligible	Negligible
R30	Residential - City Road East	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R31	Residential - City Road East	Very Low	Negligible	Negligible
R32	Residential - Whitworth Street West	Very Low	Negligible	Negligible

- 7.7.29 As shown in **Table 7.30**, effects on annual mean PM₁₀ concentrations as a result of demolition and construction phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.
- 7.7.30 Predicted effects on annual mean PM_{2.5} concentrations at sensitive receptor locations as a result of demolition and construction phase road vehicle exhaust emissions are summarised in **Table 7.31**.

Table 7.31: Demolition and Construction Road Traffic Exhaust Emissions - Effect Significance - PM_{2.5}

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - River Street	Very Low	Negligible	Negligible
R2	Residential - River Street	Very Low	Negligible	Negligible
R3	Residential - River Street	Very Low	Negligible	Negligible
R4	Residential - Garwood Street	Low	Negligible	Negligible
R5	Residential - Garwood Street	Very Low	Negligible	Negligible
R6	Residential - Mancunian Way	Low	Negligible	Negligible
R7	Residential - Garwood Street	Low	Negligible	Negligible
R8	Residential - City Road East	Very Low	Negligible	Negligible
R9	Residential - City Road East	Low	Negligible	Negligible
R10	Residential - City Road East	Low	Negligible	Negligible
R11	Residential - City Road East	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R12	Residential - Little Peter Street	Very Low	Negligible	Negligible
R13	Residential - Whitworth Street	Very Low	Negligible	Negligible
R14	Residential - River Street	Very Low	Negligible	Negligible
R15	Residential - Medlock Street	Low	Negligible	Negligible
R16	Residential - Medlock Street	Low	Negligible	Negligible
R17	Residential - Mancunian Way	Very Low	Negligible	Negligible
R18	Residential - Mancunian Way	Low	Negligible	Negligible
R19	Residential - Rockdove Avenue	Very Low	Negligible	Negligible
R20	Residential - Mancunian Way	Low	Negligible	Negligible
R21	Residential - Mancunian Way	Very Low	Negligible	Negligible
R22	Residential - Mancunian Way	Very Low	Negligible	Negligible
R23	Residential - Cavendish Street	Very Low	Negligible	Negligible
R24	Residential - Mancunian Way	Low	Negligible	Negligible
R25	Residential - Chester Street	Very Low	Negligible	Negligible
R26	Residential - Wilmott Street	Very Low	Negligible	Negligible
R27	Residential - Chester Street	Very Low	Negligible	Negligible
R28	Residential - Oxford Road	Very Low	Negligible	Negligible
R29	Manchester Metropolitan University	Low	Negligible	Negligible
R30	Residential - City Road East	Very Low	Negligible	Negligible
R31	Residential - City Road East	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R32	Residential - Whitworth Street West	Low	Negligible	Negligible

- 7.7.31 As shown in **Table 7.31**, effects on annual mean PM_{2.5} concentrations as a result of demolition and construction phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.

Operational Phase

Embedded Mitigation Measures

- 7.7.32 The use of ASHPs will avoid emissions associated with the provision of heating and hot water for the Proposed Development.

Operational Phase Road Traffic Exhaust Emissions Anticipated Effects

- 7.7.33 Vehicle movements associated with the operation of the Proposed Development will generate exhaust emissions on the local and regional road networks. An assessment was, therefore, undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the Site.
- 7.7.34 Reference should be made to **ES Volume 4, Appendix C1** for assessment inputs.

Predicted Concentrations

- 7.7.35 Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the OPDM and OPDS scenarios. The results are summarised in **Table 7.32**.

Table 7.32: Operational Phase Road Traffic Exhaust Emissions - Predicted Annual Mean NO₂ Concentrations

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		OPDM	OPDS	Change
R1	Residential - River Street	28.02	28.04	0.02
R2	Residential - River Street	28.93	29.00	0.07
R3	Residential - River Street	30.20	30.28	0.08
R4	Residential - Garwood Street	32.26	32.29	0.03
R5	Residential - Garwood Street	29.60	29.61	0.01

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		OPDM	OPDS	Change
R6	Residential - Mancunian Way	32.47	32.47	0.00
R7	Residential - Garwood Street	33.39	33.43	0.04
R8	Residential - City Road East	28.73	28.74	0.01
R9	Residential - City Road East	31.21	31.26	0.05
R10	Residential - City Road East	33.85	33.87	0.02
R11	Residential - City Road East	29.57	29.57	0.00
R12	Residential - Little Peter Street	26.56	26.56	0.00
R13	Residential - Whitworth Street	27.01	27.01	0.00
R14	Residential - River Street	29.63	30.05	0.42
R15	Residential - Medlock Street	31.57	31.11	-0.46
R16	Residential - Medlock Street	31.50	31.42	-0.08
R17	Residential - Mancunian Way	27.52	27.52	0.00
R18	Residential - Mancunian Way	31.34	31.35	0.01
R19	Residential - Rockdove Avenue	27.31	27.32	0.01
R20	Residential - Mancunian Way	34.57	34.59	0.02
R21	Residential - Mancunian Way	28.71	28.72	0.01
R22	Residential - Mancunian Way	27.05	27.07	0.02
R23	Residential - Cavendish Street	27.09	27.13	0.04
R24	Residential - Mancunian Way	31.58	31.61	0.03
R25	Residential - Chester Street	28.60	28.61	0.01

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		OPDM	OPDS	Change
R26	Residential - Wilmott Street	27.36	27.35	-0.01
R27	Residential - Chester Street	27.28	27.29	0.01
R28	Residential - Oxford Road	30.03	30.03	0.00
R29	Manchester Metropolitan University	33.72	33.73	0.01
R30	Residential - City Road East	29.36	29.39	0.03
R31	Residential - City Road East	28.07	28.09	0.02
R32	Residential - Whitworth Street West	34.10	34.10	0.00

7.7.36 As shown in **Table 7.32**, predicted annual mean NO₂ concentrations were below the relevant AQO at all sensitive receptors in both the OPDM and OPDS scenarios.

7.7.37 It is noted that predicted annual mean NO₂ concentrations reduce at a number of receptors between the OPDM and OPDS scenarios. This is due to changes in street geometry and building massing as a result of the Proposed Development.

7.7.38 Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the OPDM and OPDS scenarios. The results are summarised in **Table 7.33**.

Table 7.33: Operational Phase Road Traffic Exhaust Emissions - Predicted Annual Mean PM₁₀ Concentrations

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		OPDM	OPDS	Change
R1	Residential - River Street	21.72	21.73	0.01
R2	Residential - River Street	22.07	22.10	0.03
R3	Residential - River Street	22.57	22.60	0.03
R4	Residential - Garwood Street	23.35	23.36	0.01
R5	Residential - Garwood Street	22.36	22.36	0.01

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		OPDM	OPDS	Change
R6	Residential - Mancunian Way	23.43	23.43	0.00
R7	Residential - Garwood Street	24.25	24.26	0.02
R8	Residential - City Road East	22.05	22.05	0.00
R9	Residential - City Road East	23.23	23.25	0.02
R10	Residential - City Road East	24.22	24.24	0.01
R11	Residential - City Road East	22.22	22.22	0.00
R12	Residential - Little Peter Street	21.21	21.21	0.00
R13	Residential - Whitworth Street	21.44	21.44	0.00
R14	Residential - River Street	22.48	22.67	0.19
R15	Residential - Medlock Street	23.37	23.15	-0.22
R16	Residential - Medlock Street	23.19	23.15	-0.04
R17	Residential - Mancunian Way	21.34	21.34	-0.00
R18	Residential - Mancunian Way	23.19	23.19	0.01
R19	Residential - Rockdove Avenue	21.73	21.73	0.00
R20	Residential - Mancunian Way	24.31	24.32	0.01
R21	Residential - Mancunian Way	21.98	21.98	0.00
R22	Residential - Mancunian Way	21.37	21.37	0.01
R23	Residential - Cavendish Street	21.46	21.48	0.01
R24	Residential - Mancunian Way	23.14	23.15	0.01
R25	Residential - Chester Street	21.94	21.94	0.01

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		OPDM	OPDS	Change
R26	Residential - Wilmott Street	21.51	21.50	-0.01
R27	Residential - Chester Street	21.40	21.41	0.00
R28	Residential - Oxford Road	22.24	22.25	0.00
R29	Manchester Metropolitan University	23.58	23.59	0.00
R30	Residential - City Road East	22.43	22.45	0.01
R31	Residential - City Road East	21.87	21.88	0.01
R32	Residential - Whitworth Street West	23.69	23.69	0.00

7.7.39 As shown in **Table 7.33**, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both the OPDM and OPDS scenarios.

7.7.40 Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for the OPDM and OPDS scenarios. The results are summarised in **Table 7.34**.

Table 7.34: Operational Phase Road Traffic Exhaust Emissions - Predicted Annual Mean PM_{2.5} Concentrations

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		OPDM	OPDS	Change
R1	Residential - River Street	13.82	13.83	0.01
R2	Residential - River Street	14.03	14.05	0.02
R3	Residential - River Street	14.32	14.34	0.02
R4	Residential - Garwood Street	14.78	14.79	0.01
R5	Residential - Garwood Street	14.19	14.20	0.00
R6	Residential - Mancunian Way	14.85	14.85	0.00
R7	Residential - Garwood Street	15.24	15.25	0.01

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		OPDM	OPDS	Change
R8	Residential - City Road East	14.01	14.01	0.00
R9	Residential - City Road East	14.67	14.68	0.01
R10	Residential - City Road East	15.26	15.27	0.01
R11	Residential - City Road East	14.13	14.13	0.00
R12	Residential - Little Peter Street	13.52	13.52	0.00
R13	Residential - Whitworth Street	13.64	13.64	0.00
R14	Residential - River Street	14.24	14.34	0.11
R15	Residential - Medlock Street	14.74	14.61	-0.12
R16	Residential - Medlock Street	14.65	14.63	-0.02
R17	Residential - Mancunian Way	13.63	13.63	0.00
R18	Residential - Mancunian Way	14.66	14.67	0.01
R19	Residential - Rockdove Avenue	13.80	13.80	0.00
R20	Residential - Mancunian Way	15.34	15.34	0.01
R21	Residential - Mancunian Way	13.97	13.98	0.00
R22	Residential - Mancunian Way	13.61	13.61	0.00
R23	Residential - Cavendish Street	13.66	13.66	0.01
R24	Residential - Mancunian Way	14.64	14.65	0.01
R25	Residential - Chester Street	13.95	13.95	0.01
R26	Residential - Wilmott Street	13.69	13.69	0.00
R27	Residential - Chester Street	13.64	13.64	0.01

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		OPDM	OPDS	Change
R28	Residential - Oxford Road	14.09	14.10	0.00
R29	Manchester Metropolitan University	14.84	14.85	0.01
R30	Residential - City Road East	14.21	14.22	0.01
R31	Residential - City Road East	13.89	13.89	0.01
R32	Residential - Whitworth Street West	14.88	14.88	0.00

7.7.41 As shown in **Table 7.34**, predicted annual mean PM_{2.5} concentrations were below the relevant AQLV at all sensitive receptors in both the OPDM and OPDS scenarios.

Effect Significance

7.7.42 Predicted effects on annual mean NO₂ concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions are summarised in **Table 7.35**.

Table 7.35: Operational Phase Road Traffic Exhaust Emissions - Effect Significance - NO₂

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - River Street	Very Low	Negligible	Negligible
R2	Residential - River Street	Very Low	Negligible	Negligible
R3	Residential - River Street	Low	Negligible	Negligible
R4	Residential - Garwood Street	Low	Negligible	Negligible
R5	Residential - Garwood Street	Very Low	Negligible	Negligible
R6	Residential - Mancunian Way	Low	Negligible	Negligible
R7	Residential - Garwood Street	Low	Negligible	Negligible
R8	Residential - City Road East	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R9	Residential - City Road East	Low	Negligible	Negligible
R10	Residential - City Road East	Low	Negligible	Negligible
R11	Residential - City Road East	Very Low	Negligible	Negligible
R12	Residential - Little Peter Street	Very Low	Negligible	Negligible
R13	Residential - Whitworth Street	Very Low	Negligible	Negligible
R14	Residential - River Street	Low	Very Minor	Negligible
R15	Residential - Medlock Street	Low	Very Minor	Negligible
R16	Residential - Medlock Street	Low	Negligible	Negligible
R17	Residential - Mancunian Way	Very Low	Negligible	Negligible
R18	Residential - Mancunian Way	Low	Negligible	Negligible
R19	Residential - Rockdove Avenue	Very Low	Negligible	Negligible
R20	Residential - Mancunian Way	Low	Negligible	Negligible
R21	Residential - Mancunian Way	Very Low	Negligible	Negligible
R22	Residential - Mancunian Way	Very Low	Negligible	Negligible
R23	Residential - Cavendish Street	Very Low	Negligible	Negligible
R24	Residential - Mancunian Way	Low	Negligible	Negligible
R25	Residential - Chester Street	Very Low	Negligible	Negligible
R26	Residential - Wilmott Street	Very Low	Negligible	Negligible
R27	Residential - Chester Street	Very Low	Negligible	Negligible
R28	Residential - Oxford Road	Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R29	Manchester Metropolitan University	Low	Negligible	Negligible
R30	Residential - City Road East	Very Low	Negligible	Negligible
R31	Residential - City Road East	Very Low	Negligible	Negligible
R32	Residential - Whitworth Street West	Low	Negligible	Negligible

7.7.43 As shown in **Table 7.35**, effects on annual mean NO₂ concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.

7.7.44 Predicted effects on annual mean PM₁₀ concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions are summarised in **Table 7.36**.

Table 7.36: Operational Phase Road Traffic Exhaust Emissions - Effect Significance - PM₁₀

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - River Street	Very Low	Negligible	Negligible
R2	Residential - River Street	Very Low	Negligible	Negligible
R3	Residential - River Street	Very Low	Negligible	Negligible
R4	Residential - Garwood Street	Very Low	Negligible	Negligible
R5	Residential - Garwood Street	Very Low	Negligible	Negligible
R6	Residential - Mancunian Way	Very Low	Negligible	Negligible
R7	Residential - Garwood Street	Very Low	Negligible	Negligible
R8	Residential - City Road East	Very Low	Negligible	Negligible
R9	Residential - City Road East	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R10	Residential - City Road East	Very Low	Negligible	Negligible
R11	Residential - City Road East	Very Low	Negligible	Negligible
R12	Residential - Little Peter Street	Very Low	Negligible	Negligible
R13	Residential - Whitworth Street	Very Low	Negligible	Negligible
R14	Residential - River Street	Very Low	Negligible	Negligible
R15	Residential - Medlock Street	Very Low	Minor	Negligible
R16	Residential - Medlock Street	Very Low	Negligible	Negligible
R17	Residential - Mancunian Way	Very Low	Negligible	Negligible
R18	Residential - Mancunian Way	Very Low	Negligible	Negligible
R19	Residential - Rockdove Avenue	Very Low	Negligible	Negligible
R20	Residential - Mancunian Way	Very Low	Negligible	Negligible
R21	Residential - Mancunian Way	Very Low	Negligible	Negligible
R22	Residential - Mancunian Way	Very Low	Negligible	Negligible
R23	Residential - Cavendish Street	Very Low	Negligible	Negligible
R24	Residential - Mancunian Way	Very Low	Negligible	Negligible
R25	Residential - Chester Street	Very Low	Negligible	Negligible
R26	Residential - Wilmott Street	Very Low	Negligible	Negligible
R27	Residential - Chester Street	Very Low	Negligible	Negligible
R28	Residential - Oxford Road	Very Low	Negligible	Negligible
R29	Manchester Metropolitan University	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R30	Residential - City Road East	Very Low	Negligible	Negligible
R31	Residential - City Road East	Very Low	Negligible	Negligible
R32	Residential - Whitworth Street West	Very Low	Negligible	Negligible

7.7.45 As shown in **Table 7.36**, effects on annual mean PM₁₀ concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.

7.7.46 Predicted effects on annual mean PM_{2.5} concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions are summarised in **Table 7.37**.

Table 7.37: Construction Road Traffic Exhaust Emissions - Effect Significance - PM_{2.5}

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - River Street	Very Low	Negligible	Negligible
R2	Residential - River Street	Very Low	Negligible	Negligible
R3	Residential - River Street	Very Low	Negligible	Negligible
R4	Residential - Garwood Street	Very Low	Negligible	Negligible
R5	Residential - Garwood Street	Very Low	Negligible	Negligible
R6	Residential - Mancunian Way	Low	Negligible	Negligible
R7	Residential - Garwood Street	Low	Negligible	Negligible
R8	Residential - City Road East	Very Low	Negligible	Negligible
R9	Residential - City Road East	Very Low	Negligible	Negligible
R10	Residential - City Road East	Low	Negligible	Negligible
R11	Residential - City Road East	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R12	Residential - Little Peter Street	Very Low	Negligible	Negligible
R13	Residential - Whitworth Street	Very Low	Negligible	Negligible
R14	Residential - River Street	Very Low	Very Minor	Negligible
R15	Residential - Medlock Street	Very Low	Minor	Negligible
R16	Residential - Medlock Street	Very Low	Negligible	Negligible
R17	Residential - Mancunian Way	Very Low	Negligible	Negligible
R18	Residential - Mancunian Way	Very Low	Negligible	Negligible
R19	Residential - Rockdove Avenue	Very Low	Negligible	Negligible
R20	Residential - Mancunian Way	Low	Negligible	Negligible
R21	Residential - Mancunian Way	Very Low	Negligible	Negligible
R22	Residential - Mancunian Way	Very Low	Negligible	Negligible
R23	Residential - Cavendish Street	Very Low	Negligible	Negligible
R24	Residential - Mancunian Way	Very Low	Negligible	Negligible
R25	Residential - Chester Street	Very Low	Negligible	Negligible
R26	Residential - Wilmott Street	Very Low	Negligible	Negligible
R27	Residential - Chester Street	Very Low	Negligible	Negligible
R28	Residential - Oxford Road	Very Low	Negligible	Negligible
R29	Manchester Metropolitan University	Low	Negligible	Negligible
R30	Residential - City Road East	Very Low	Negligible	Negligible
R31	Residential - City Road East	Very Low	Negligible	Negligible

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R32	Residential - Whitworth Street West	Low	Negligible	Negligible

7.7.47 As shown in **Table 7.37**, effects on annual mean PM_{2.5} concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.

Potential Future Exposure Anticipated Effects

- 7.7.48 The Proposed Development has the potential to cause the exposure of future occupants to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in **ES Volume 4, Appendix C1** to quantify air quality conditions at the Site. Reference should be made to **Figures 7.4 to 7.6** (presented in **ES Volume 4, Appendix C2**) for graphical representations of the results.
- 7.7.49 It is noted that the ground floor of the Proposed Development comprises flexible commercial/community floor space, amenity space and cycle storage. These are not considered locations of relevant exposure. As such, the assessment has focused on the Purpose-Built Student Accommodation (PBSA) units located from first floor upwards.
- 7.7.50 As shown in **Figure 7.4** (presented in **ES Volume 4, Appendix C2**), annual mean NO₂ concentrations were below the AQO of 40µg/m³ at all locations across the Site at first floor level.
- 7.7.51 As shown in **Figure 7.5** (presented in **ES Volume 4, Appendix C2**), annual mean PM₁₀ concentrations were below the AQO of 40µg/m³ at all locations across the Site at first floor level.
- 7.7.52 As shown in **Figure 7.6** (presented in **ES Volume 4, Appendix C2**), annual mean PM_{2.5} concentrations were below the AQLV of 20µg/m³ at all locations across the Site at first floor level.
- 7.7.53 Based on the results of the assessment, exposure of future occupants to exceedances of the relevant AQOs and AQLVs has not been predicted. As such, the predicted effect is **negligible (not significant)**.

7.8 Scope for Additional Mitigation Measures

Potential Additional Mitigation Measures

Demolition and Construction Phase Fugitive Dust Emissions

- 7.8.1 Following implementation of the embedded mitigation measures previously outlined within this chapter, air quality effects as a result of demolition and construction phase fugitive dust emissions were predicted to be **negligible (not significant)**. As such, additional mitigation measures were not considered necessary.

Demolition and Construction Phase Road Vehicle Exhaust Emissions

- 7.8.2 Air quality effects as a result of demolition and construction phase road vehicle exhaust emissions were predicted to be negligible. As such, additional mitigation measures were not considered necessary.

Operational Phase Road Vehicle Exhaust Emissions

- 7.8.3 Air quality effects as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)**. As such, additional mitigation was not considered necessary. However, a number of measures have been proposed in accordance with the requirements of the IAQM¹² guidance to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the Site. These include the following:
- provision of a Travel Plan to encourage sustainable modes of transport to and from the Site;
 - provision of green infrastructure throughout the Site to absorb pollution and increase deposition rates; and
 - provision of Electric Vehicle (EV) charging points for all car parking spaces.
- 7.8.4 The above methods can be secured through planning condition and would further reduce the overall pollutant burden of the Proposed Development.

Likely Effectiveness of Additional Mitigation Measures

Demolition and Construction Phase Fugitive Dust Emissions

- 7.8.5 No additional mitigation measures were required for demolition and construction phase fugitive dust emissions.

Demolition and Construction Phase Road Vehicle Exhaust Emissions

- 7.8.6 No additional mitigation measures were required for demolition and construction phase road vehicle exhaust emissions.

Operational Phase Road Vehicle Exhaust Emissions

- 7.8.7 No additional mitigation measures were required for operational phase road vehicle exhaust emissions.

7.9 Residual Effects

- 7.9.1 Following the effective implementation of the additional mitigation measures proposed above, there are no significant residual effects arising from the Proposed Development during the construction or operational phases.

7.10 Cumulative Effects

- 7.10.1 Cumulative effects are the combined effects of several development schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 7.10.2 The ES has given consideration to potential cumulative effects associated with schemes located within a 500m radius from the boundary of the Site, as listed in **Volume 2, Chapter 3: EIA Methodology**. Consideration to any further schemes within 700m radius from the boundary of the Site has also been provided in relation to potential demolition and construction phase fugitive dust emissions, in accordance with the requirements of the IAQM guidance outlined previously.

Demolition and Construction Phase

Fugitive Dust Emissions

- 7.10.3 Should permission be granted for other schemes within 700m of the Site, it is possible that cumulative dust impacts may occur during construction. However, fugitive dust emissions associated with the Proposed Development will be minimised through the outlined mitigation measures. A similar level of control would also be expected for any other scheme. Therefore, residual cumulative effects are predicted to be **not significant**.

Road Vehicle Exhaust Emissions

- 7.10.4 Cumulative vehicle exhaust emission effects may occur as a result of additional traffic movements associated with committed schemes in the vicinity of the Site. The traffic data utilised for the assessment of demolition and construction phase road vehicle exhaust emissions included predicted changes in flows as a result of relevant committed schemes. As outlined previously, residual effects were predicted to be not significant. As such, residual cumulative effects are also predicted to be **not significant**.

Operational Phase Road Vehicle Exhaust Emissions

- 7.10.5 Similar to demolition and construction phase road vehicle exhaust emissions, cumulative effects may occur as a result of additional traffic movements associated with committed schemes in the vicinity of the Site. The traffic data utilised for the assessment of operational phase road vehicle exhaust emissions included predicted changes in flows as a result of relevant committed schemes. As outlined previously, residual effects were predicted to be not significant. As such, residual cumulative effects are also predicted to be **not significant**.

7.11 Summary and Conclusions

- 7.11.1 An assessment of potential air quality effects associated with the Proposed Development was undertaken.
- 7.11.2 The Site is located within an Air Quality Management Area which has been declared by MCC due to elevated pollutant levels. Local monitoring results also indicate that concentrations in the vicinity of the Site are above the relevant air quality standards.
- 7.11.3 Consultation was undertaken with MCC, in order to agree the proposed assessment methodology and highlight any requirement to consider any additional elements.
- 7.11.4 A CEMP will be provided as embedded mitigation for the demolition and construction phase of the Proposed Development.
- 7.11.5 The use of ASHPs for the provision of heating and hot water has been considered as embedded mitigation for the operation phase of the Proposed Development.
- 7.11.6 During the demolition and construction phase of the Proposed Development, there is the potential for air quality impacts as a result of fugitive dust emissions from the Site. These were assessed in accordance with the relevant best practice guidance. This indicated that the potential risk of dust generated by demolition, earthworks, construction and trackout activities ranged between high to low.
- 7.11.7 During the demolition and construction phase of the Proposed Development, there is the potential for air quality impacts as a result of road traffic exhaust emissions associated with vehicles travelling to and from the Site. These were assessed using dispersion modelling and best practice guidance. Review of the results indicated that effects were predicted to be **negligible (not significant)** at all receptor locations.
- 7.11.8 During the operational phase of the Proposed Development, there is also the potential for air quality impacts as a result of road traffic exhaust emissions associated with vehicles travelling to and from the Site. These were assessed using dispersion modelling and best practice guidance. Review of the results indicated that effects were predicted to be **negligible (not significant)** at all receptor locations.
- 7.11.9 The potential for exposure of future occupants to poor air quality was also assessed using dispersion modelling. This indicated that pollutant concentrations were below

the relevant AQOs and AQLV across the Site. As such, mitigation measures were not considered necessary and the predicted effect is **negligible (not significant)**.

7.11.10 Following consideration of the relevant issues, air quality effects as a result of the operation of the Proposed Development were also considered to be not significant.

7.11.11 **Table 7.38** summarises the air quality effects resulting from the Proposed Development.

Table 7.38: Summary of Residual Effects

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Demolition and Construction								
Human receptors within 350m of Site	High	Dust soiling	Provision of a CEMP inclusive of outlined mitigation measures	High (risk)	Negligible	None	Negligible	Negligible (Not significant)
				Local				
				Temporary				
				Probable				
Human receptors within 350m of Site	High	Increases in PM ₁₀ concentratio ns	Provision of a CEMP inclusive of outlined mitigation measures	High (risk)	Negligible	None	Negligible	Negligible (Not significant)
				Local				
				Temporary				
				Probably				
Human receptors within the vicinity of the road network	Low to Medium	Road vehicle exhaust emissions	None	Negligible	Negligible	None	Negligible	Negligible (Not significant)
				Local				
				Temporary				
				Probable				
Operation								
			None	Negligible	Negligible	None	Negligible	

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Human receptors within the vicinity of the road network	Low to Medium	Road vehicle exhaust emissions		Local				Negligible (Not significant)
				Permanent				
				Probable				
Future occupants of the Proposed Development	Low to Medium	Exposure to AQO exceedances	None	Negligible	Negligible	None	Negligible	Negligible (Not significant)
				Local				
				Permanent				
				Probable				
Cumulative Effects – Construction								
Human receptors within 350m of Site	High	Dust soiling	Provision of a CEMP inclusive of outlined mitigation measures	High (risk)	Negligible	None	Negligible	Negligible (Not significant)
				Local				
				Temporary				
				Probable				
Human receptors within 350m of Site	High	Increases in PM ₁₀ concentratio ns	Provision of a CEMP inclusive of outlined mitigation measures	High (risk)	Negligible	None	Negligible	Negligible (Not significant)
				Local				
				Temporary				
				Probable				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Human receptors within the vicinity of the road network	Low to Medium	Road vehicle exhaust emissions	None	Negligible	Negligible	None	Negligible	Negligible (Not significant)
				Local				
				Temporary				
				Probable				
Cumulative Effects - Operation								
Human receptors within the vicinity of the road network	Low to Medium	Road vehicle exhaust emissions	None	Negligible	Negligible	None	Negligible	Negligible (Not significant)
				Local				
				Permanent				
				Probable				

One Medlock Street
Environmental Statement

Volume 2

November 2022



CHAPTER 8: NOISE AND VIBRATION

8 Noise and Vibration

8.1 Scope of Assessment

- 8.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of Noise and Vibration and is supported by **ES Volume 4, Appendix D**.
- 8.1.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the cumulative effects associated with the Proposed Development in combination with other developments within 500m of the Site.

8.2 Key Legislation, Policy and Guidance Considerations

- 8.2.1 The Noise and Vibration assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised below.

Legislation and Regulation

The Environmental Protection Act 1990

- 8.2.2 The Environmental Protection Act 1990¹ defines the fundamental structure for waste management and the control of emissions to the environment, including noise.

The Control of Pollution Act 1974

- 8.2.3 The Control of Pollution Act (CoPA)² provides Local Authorities with powers to control noise (and other pollutants) from construction and demolition works. The Act requires that 'best practicable means' are adopted to control noise from construction works. Section 61 of the Act outlines the required procedure for applying for 'prior consent for work on construction sites'.

¹The Environmental Protection Act 1990 c. 43 – Parliament of the United Kingdom

² The Control of Pollution Act 1974 c. 40 - Parliament of the United Kingdom

Planning Policy

National Planning Policy Framework

8.2.4 The overarching planning policy document which applies to the Proposed Development in respect of noise is the National Planning Policy Framework (NPPF) (July 2021)³.

8.2.5 The key statements of the NPPF relevant to the assessment are as follows:

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

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;"

180 Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the Site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."

Noise Policy Statement for England

8.2.6 With specific reference to noise effects, the NPPF refers to the Noise Policy Statement for England (NPSE) (2010)⁴. The NPSE provides guidance which enables decisions to be made regarding the acceptable noise burden to place on society, using three key phrases: the No Observed Effect Level (NOEL), the Lowest Observed Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL).

³ National Planning Policy Framework (July 2021) – Ministry of Housing, Communities & Local Government

⁴ Noise Policy Statement for England (NPSE) (2010) – Department for Environmental Food and Rural Affairs

Planning Practice Guidance

- 8.2.7 In March 2014, the Planning Practice Guidance (PPG)⁵ for noise was published, and most recently updated in June 2021. This online document advises on how planning can manage potential noise impacts in new development.

Manchester City Council's (MCC) Core Strategy Development Plan Document

- 8.2.8 MCC's Core Strategy (adopted July 2012)⁶ is the principal adopted Development Plan Document for Manchester City Council for the 15 year period 2012 – 2027. Policy DM 1 states the following in regard to development management and noise:

"All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:-

[..]

Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise."

MCC's Planning & Noise Technical Guidance

- 8.2.9 MCC's guidance on planning and noise is outlined in the 'Planning & Noise Technical Guidance' document (June 2022)⁷.
- 8.2.10 The aim of this document is to *"provide help and advice in relation to noise in a planning context to encourage good acoustic design. It outlines what is expected in relation to current guidance and policy with the aspiration that new developments achieve the highest possible standards without compromising the health and wellbeing of people that live and work within the City of Manchester."*
- 8.2.11 Section 3 of the document provides guidance and assessment criteria for the following relevant impacts:
- Internal ambient noise levels in new residential developments;
 - Guidance for controlling noise and vibration during construction/demolition phases; and
 - Noise and vibration limits from fixed plant/equipment.
- 8.2.12 Section 3.7.1.1 of the document relates to internal noise limits for residential properties and states:

⁵ Planning Practice Guidance – June 2021 – Department for Levelling Up, Housing and Communities

⁶ Manchester's Local Development Framework Core Strategy Development Plan Document Adopted 11th July 2012

⁷ Manchester City Council Planning & Noise technical Guidance – June 2022

"Manchester City Council has adopted the following internal noise limits for residential properties:

- *Bedrooms (night-time – 23.00 – 07.00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ more than 15 times); and*
- *Living Rooms (daytime – 07.00 – 23.00) 35 dB L_{Aeq} ".*

8.2.13 Section 5.3.1.5 of the document relates to ventilation and overheating. Specifically in the instance of overheating, the following is stated in relation to Approved Document O⁸:

"An entirely new Approved Document O was released in December 2021 covering overheating and comes into force on 15 June 2022. This Approved Document covers the overheating mitigation requirements of the building regulations as set out in Part O of Schedule 1 to the Building Regulations and in a number of specific building regulations. Technical guidance is contained in Approved Document O. Approved Document O applies to new residential buildings."

8.2.14 Section 3.6.1.5.1 of the document relates to noise limits for building services plant and states:

"Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."

8.2.15 Section 3.6.1.4 of the document relates to noise from construction or demolition works and states:

"All noisy works i.e. those that are audible beyond the site boundary) should be restricted to the following hours to minimise disruption:

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

These restrictions apply to deliveries/collections to the site."

8.2.16 Section 3.7.1.2 of the document relates to entertainment noise within structurally connected locations and states:

"...a criterion that would achieve a condition of 'inaudible' / 'virtually inaudible' which is applicable for new residential developments that are structurally connected to entertainment venues (or vice versa) would be:

⁸ The Building Regulations 2010 – Overheating Approved Document O

'Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (L_{eq}), respectively.'

- 8.2.17 Section 3.6.1.2 of the document also relates to entertainment noise within structurally detached locations and states:

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

The criterion here is: 'Entertainment noise (L_{Aeq}) should be controlled to 5dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location.'

Technical Standards and Guidance

- 8.2.18 The Noise and Vibration assessment has been undertaken within the context of relevant technical standards and guidance summarised within **Table 8.1**.

Table 8.1: Relevant British Standards and Technical Standards and Guidance

Source	Description
BS 5228-1:2009+A1:2014 & BS 5223-2:2009 Code of practice for noise and vibration control on construction and open Sites (BS 5228)	Recommendations for basic methods of noise and vibration control relating to construction sites where work activities may generate significant noise and/or vibration. It also provides guidance on methods of predicting and measuring noise and vibration, and assessing its impact on receptors.
BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233)	Recommendations for desirable internal and external ambient noise levels in dwellings that should not be exceeded for steady external noise sources.
Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O (ANC/IOA Issued July 2022)	Recommendations demonstrating compliance with Approved Document O to see that internal ambient noise levels in dwellings should not be exceeded for steady external noise sources during periods of overheating.
BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142)	Methods for determining, at the outside of a building, noise levels from industrial and manufacturing premises, fixed installations and other associated activities. The rating method takes into account specific source characteristics, such as tonality, impulsivity and intermittency.
BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from ground borne vibration (BS 7385).	Presents guide values or limits for transient vibration, above which there is a likelihood of cosmetic damage.

Source	Description
BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than Blasting (BS 6472)	Presents guide value ranges which might result in various probabilities of adverse comment within residential and non-residential buildings
Design Manual for Roads and Bridges, Sustainability & Environment LA 111 Noise and vibration Revision 2 (DMRB)	Advice on the assessment of noise and vibration impacts due to road traffic. The guidance provides a classification of magnitude of impacts related to changes in road traffic noise levels.
The Department of Transport/Welsh Office Memorandum 'Calculation of Road Traffic Noise' (CRTN)	Describes procedures for traffic noise calculation, and is suitable for environmental assessments of schemes where road traffic noise may have an impact.

8.3 Assessment Methodology

Effects Assessed

- 8.3.1 This section provides confirmation on the scope of the assessment presented within this chapter, in accordance with the EIA Scoping Report (**ES Volume 4, Appendix A1**) and EIA Scoping Opinion (**ES Volume 4, Appendix A2**).

Effects Not Considered to be Significant

- 8.3.2 The following effects were not considered to be significant within the EIA Scoping Report and are not considered further in this chapter:
- nuisance and disturbance to future users of the Site as a result of tactile vibration or re-radiated ground-borne noise during the operational phase; and
 - noise nuisance and disturbance from road traffic associated with the operational Proposed Development.

Effects Considered Likely to be Significant.

- 8.3.3 The effects shown in **Table 8.2** were considered likely to be significant in the EIA Scoping Report and are report on within this chapter.

Table 8.2: Effects Considered Likely to be Significant

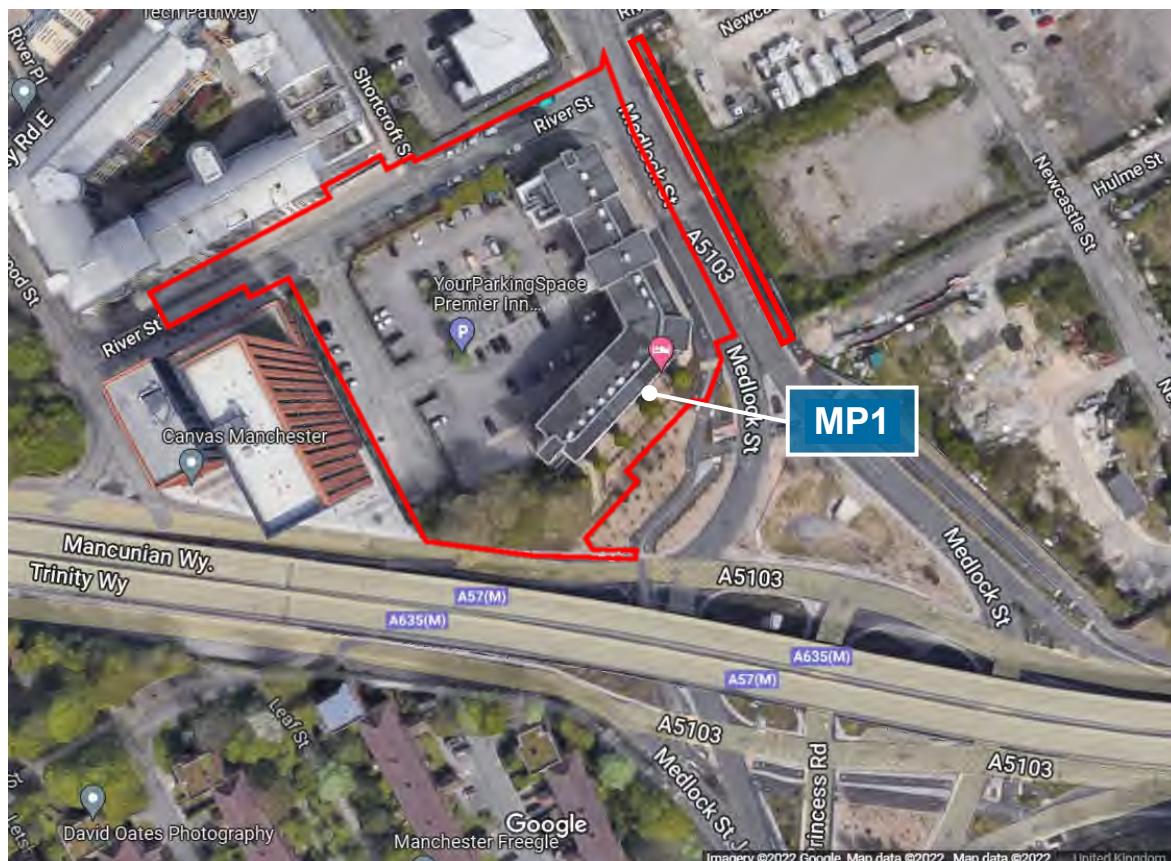
Likely Significant Effect	Applicable Development Stage
Disturbance to existing sensitive receptors from noise and vibration generated by demolition and construction activities (including construction traffic)	Demolition and construction

Likely Significant Effect	Applicable Development Stage
Disturbance to existing and future sensitive receptors from noise generated by building services plant servicing the Proposed Development	Operation
Disturbance to existing and future/proposed sensitive receptors from amplified music within the gym area	Operation
Disturbance to future/proposed sensitive receptors from prevailing external noise levels	Operation

Determination of Baseline

- 8.3.4 In order to assess the prevailing baseline levels of environmental noise affecting noise-sensitive receivers, a noise survey has been undertaken.
- 8.3.5 Continuous unattended noise logging measurements were undertaken at one measurement position.
- 8.3.6 Measurements were undertaken between 14th September and 22nd September 2022, in accordance with BS 7445.
- 8.3.7 The measurement position was located on the south-east side of the existing Site. The microphone protruded 1m from a second-floor window of the existing Premier Inn located on Site. The position was selected in order to capture noise from the two primary noise sources incident on the Site: from Medlock Street and Mancunian Way A635(M)/A57(M). The position was also considered to be representative of background noise levels at identified nearby noise sensitive receptors.
- 8.3.8 The location of the survey, including the indicative red line boundary, is presented in **Figure 8.1**.

Figure 8.1: Noise Measurement Location



Note: MP1 = Measurement Position 1

Prediction Methodology

- 8.3.9 There are a number of likely significant noise and vibration related environmental impacts, which have been fully assessed at sensitive receptors. These primarily relate to the impact of noise on existing residential and commercial receptors in the locality of the Site, during both the demolition and construction and operational phases of the Proposed Development, as well as impacts on future occupants of the Proposed Development itself.

Magnitude of Impact

Demolition and Construction Noise

- 8.3.10 BS 5228 provides practical information on demolition and construction noise and vibration reduction measures and promotes a 'Best Practice Means' approach to control noise and vibration. The calculation method provided in BS 5228 is based on the numbers and types of equipment operating, their associated Sound Power Levels (SWL), and the distance to receptors, together with the effects of any screening.
- 8.3.11 There are no current national standards or guidelines that give noise limits for construction sites. However, as a guide, typical daytime levels for noisy temporary works at neighbouring premises usually lie in the range of 70 – 80 dB L_{Aeq} .

- 8.3.12 The magnitude of impact criteria for demolition and construction noise have been derived from BS 5228 guidance. A semantic scale for description of the magnitude of construction noise effects is shown in **Table 8.3**.

Table 8.3: Demolition and Construction Noise Magnitude Criteria

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

- 8.3.13 Construction hours are proposed to be set as follows in line with the guidance from MCC:

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

Demolition and Construction Traffic Noise

- 8.3.14 Demolition and construction traffic noise will be assessed by considering the short-term increase in traffic flows during works, following the principles of CRTN and DMRB.
- 8.3.15 The criteria for the assessment of the magnitude of effect of traffic noise changes arising from the demolition and construction works associated with the Proposed Development have been taken from Table 3.1 of DMRB and are provided in **Table 8.4**.

Table 8.4: Demolition and Construction Traffic Noise Magnitude Criteria

Description (short-term change in dBA)	Magnitude of Impact
10 dBA or more	Major
5.0 – 9.9 dBA	Moderate
3.0 – 4.9 dBA	Minor
0.1 – 2.9 dBA	Negligible

Construction Vibration

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

8.3.17 **Table 8.5** details potential vibration levels measured in terms of 'Peak Particle Velocity' (PPV) and provides a semantic scale for the description of demolition and construction vibration impacts on human receptors.

Table 8.5: Guidance on Effects of Demolition and Construction Vibration (PPV) Levels

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

8.3.18 Demolition and construction activities that produce vibration may impact on adjacent buildings. The criteria used in this assessment relate to the potential for cosmetic damage, not structural damage. The principal concern is generally transient vibration due to piling. Cosmetic damage is most likely to occur within the first 20m of piling activities; at greater distances, damage is less likely to occur. Likely levels of vibration at given distances can be estimated from existing piling vibration data, as provided in BS 5228 Part 2.

8.3.19 BS 7385 establishes the basic principles for carrying out vibration measurements and processing the data, with regard to evaluating vibration effects on buildings. Recommended PPV vibration limits for transient excitation for different types of buildings are presented in **Table 8.6**.

Table 8.6: Peak Particle Velocity Limits for Cosmetic Damage to Non-Heritage Asset Buildings

Type of building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse ¹	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures	50 mm/s at 4 Hz and above	
Industrial and heavy commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz ²	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

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

Operational Industrial/Commercial Noise

8.3.20 Industrial/commercial noise emissions, such as those generated by associated external building services equipment, will be assessed by in accordance with the methodology set out in BS 4142. This standard provides an assessment methodology and criteria relating to the following industrial/commercial noise sources:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

8.3.21 The proposed criteria for the assessment of the magnitude of impact of industrial/commercial noise emissions from the Proposed Development are provided below in **Table 8.7** and are based on the relative level difference between the BS 4142 Rating Levels ($L_{Ar,Tr}$) and the representative background sound levels ($L_{A90,T}$).

Table 8.7: BS:4142 Noise Management Criteria

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

Operational Entertainment Noise

8.3.22 Should any entertainment noise be an aspect of the operation of the Proposed Development (for example, in the first floor gym of the student accommodation tower (Block 2)), it will be necessary to consider the significance of effect of this noise on nearby noise sensitive receptors and to the residential receptors within the same plot.

8.3.23 Section 3.6.1.2 of the MCC Planning & Noise Technical Guidance document relates to noise from entertainment noise at structurally detached, and structurally connected, locations and states:

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

The criterion here is: 'Entertainment noise (L_{Aeq}) should be controlled to 5dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location."

and

"...a criterion that would achieve a condition of 'inaudible' / 'virtually inaudible' which is applicable for new residential developments that are structurally connected to entertainment venues (or vice versa) would be:

'Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (L_{eq}), respectively'."

8.3.24 It is considered that a design to see that the above music criteria are achieved in the nearby detached noise sensitive receptors and within the structurally connected residential spaces would result in a negligible magnitude of impact.

Operational Noise Impacts on the Proposed Development

8.3.25 BS 8233 provides design guidelines for appropriate internal acoustic environments within buildings according to their function. It deals with control of noise from outside the building and noise from plant and services within it. Sections 3.6.1.1 of the MCC Planning & Noise Technical Guidance document to BS 8233 guidelines and sets the following noise limits for internal noise limits for residential properties, as shown in **Table 8.8**.

Table 8.8: Internal Noise Limits for Student Residential Bedrooms

Activity	Location	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$ 45 dB L_{AFmax} less than 15 times

8.3.26 It is considered that a design to see that the above ambient noise levels are achieved in new student bedrooms would result in a negligible magnitude of impact. Internal ambient noise levels in excess of the above limits would be considered as a moderate/major magnitude of impact.

Sensitivity of Receptor

8.3.27 In relation to the uses of nearby noise sensitive receptors, the following has been applied via professional judgement and accepted sensitivity categorisation undertaken on previous schemes:

- receptors that include accommodation facilities – this would include permanent residence as well as more temporary classes of residence such as hotels or student accommodation – high sensitivity; and
- Receptors of a commercial nature, such as offices – medium sensitivity.

Determining the Level of Effect

8.3.28 For the purpose of this chapter, the Effect Significance Matrix provided in **Table 8.9** for Magnitudes of Impact from 'Negligible' to 'Major' and Receptor Sensitivities of 'High' and 'Medium' has been adopted for the Noise and Vibration assessment.

Table 8.9: Effect Significance Matrix

Magnitude of Impact	Sensitivity or Value	
	High	Medium
Major	Major adverse/beneficial	Major-moderate adverse/beneficial
Moderate	Major-moderate adverse/beneficial	Moderate-minor adverse/beneficial
Minor	Moderate-minor adverse/beneficial	Minor adverse/beneficial
Negligible	Negligible	Negligible

Categorising Likely Significant Effects

8.3.29 Where the identified Significance of Effect is equal to or lower than Minor Adverse, noise and vibration impacts are considered a 'Not Significant' in EIA terms.

8.3.30 Where the Significance of Effect is equal to or higher than Moderate Adverse, noise and vibration impacts are be considered a 'Significant' in EIA terms.

Limitations and Assumptions

8.3.31 There are a number of limitations and uncertainties associated with modelling of noise and, where applicable, realistic worst-case scenarios will be assumed (based on professional judgement):

- All values which have been presented in this chapter will be the best possible estimates using professional judgement. To minimise uncertainty, a realistic worst-case approach has been taken; and

- The demolition and construction method/programme information provides overall estimates of noise generating items during entire construction phases, but cannot provide typical quantities on a more micro scale i.e. a day-to-day basis, which is what would dictate the L_{Aeq} levels in a real world scenario. Therefore, the demolition and construction programme (as set out in **Chapter 5: The Proposed Development and Demolition and Construction Overview**) will be used in conjunction with professional experience from similar developments to formulate construction phasing scenarios and select typical noisy activities for the assessment of noise. This will enable noise predictions to be made, but by its nature, demolition and construction noise is somewhat variable, and it is not possible to predict/model the noise exactly.

8.4 Scoping and Consultation

- 8.4.1 An EIA Scoping Report (presented in **ES Volume 4, Appendix A1**) was submitted to MCC on 8th September 2022 with a formal request for an opinion on the proposed scope of the EIA and assessment methodologies. MCC subsequently issued their Scoping Opinion on the proposed scope and methodology of the topics for assessment within the EIA. A copy of MCC’s Scoping Opinion is provided in **ES Volume 4, Appendix A2**.
- 8.4.2 A summary of the key points raised in MCC’s Scoping Opinion, relevant to noise and vibration, are presented in **Table 8.10** including a response as to where the comments have been addressed within this chapter.

Table 8.10 MCC Scoping Opinion Comments and Response

Summary of Comment	Response or location within the ES where comments are addressed
MCC confirmed that the approach to and scope of the Noise and Vibration assessment is acceptable.	N/A

8.5 Baseline Assessment and Identification of Key Receptors

Baseline Noise Survey Results

- 8.5.1 A summary of the average daytime (07:00 – 23:00 hours) and night-time (23:00 – 07:00 hours) ambient noise levels recorded for the 2022 survey is detailed within **Table 8.11**. The values are the logarithmically averaged $L_{Aeq,15min}$, the 10th highest $L_{AFmax,2min}$ for night-time periods and the range of $L_{A90,15min}$ dB values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and are given in dBA.

Table 8.10: Summary of Baseline Monitoring Results

Assessment Period	Period	Average $L_{Aeq, 15min}$ (dB)	10 th Highest night-time $L_{AFMax, 2min}$ (dB)	Range $L_{AF90, 15min}$ (dB)
Daytime	14/09/2022 15:00 – 14/09/2022 23:00	66	n/a	57 – 64
	15/09/2022 07:00 – 15/09/2022 23:00	66	n/a	60 – 65
	16/09/2022 07:00 – 16/09/2022 23:00	64	n/a	61 – 65
	17/09/2022 07:00 – 17/09/2022 23:00	65	n/a	57 – 63
	18/09/2022 07:00 – 18/09/2022 23:00	64	n/a	55 – 64
	19/09/2022 07:00 – 19/09/2022 23:00	66	n/a	57 – 62
	20/09/2022 07:00 – 20/09/2022 23:00	66	n/a	60 – 66
	21/09/2022 07:00 – 21/09/2022 23:00	67	n/a	61 – 66
	22/09/2022 07:00 – 22/09/2022 12:30	63	n/a	64 – 66
Night-time	14/09/2022 23:00 – 15/09/2022 07:00	61	75	47 – 63
	15/09/2022 23:00 – 16/09/2022 07:00	62	76	49 – 64
	16/09/2022 23:00 – 17/09/2022 07:00	63	76	54 – 62
	17/09/2022 23:00 – 18/09/2022 07:00	66	79	53 – 62
	18/09/2022 23:00 – 19/09/2022 07:00	64	78	51 – 62
	19/09/2022 23:00 – 20/09/2022 07:00	61	76	47 – 64
	20/09/2022 23:00 – 21/09/2022 07:00	64	75	50 – 65
	21/09/2022 23:00 – 22/09/2022 07:00	63	80	51 – 66

8.5.2 When assessing the level of adverse impact upon existing dwellings, due to the introduction of new industrial and commercial sound sources (such as external building services equipment), the relevant British Standard (BS 4142:2014) requires

that the predicted level of new impact (Rating Level) be compared against the existing ‘representative’ background sound level’.

8.5.3 Histograms of the $L_{A90,15min}$ values captured during the survey have been produced. Representative levels for each period are highlighted in **RED** on the histograms presented in **Figure 8.2** and **Figure 8.3** and are summarised in **Table 8.12**.

Figure 8.2: Daytime Background Levels

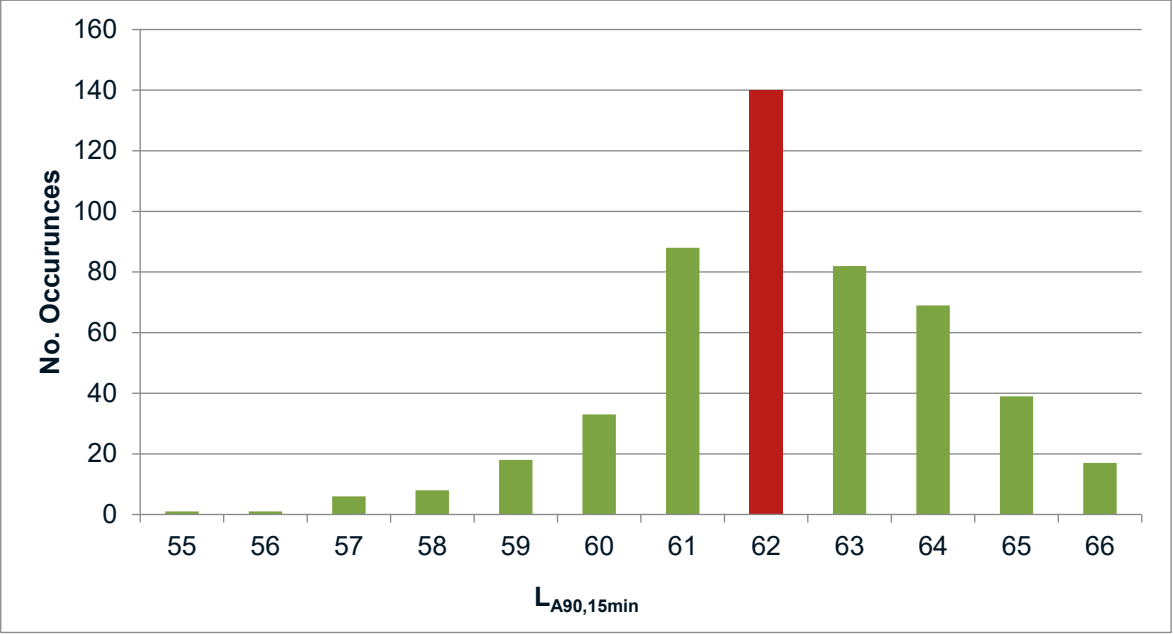


Figure 8.3: Night-time Background Levels

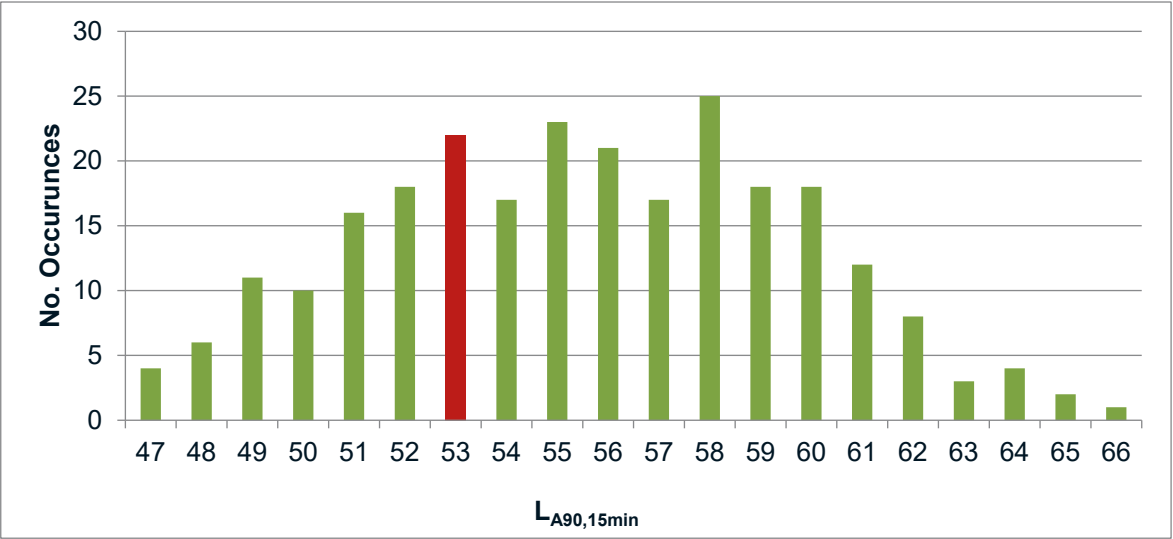


Table 8.11: Measured Representative Background Sound Levels

Period	Representative $L_{AF90,15min}$ (dB)
Daytime	62
Night-time	53

Key Receptors

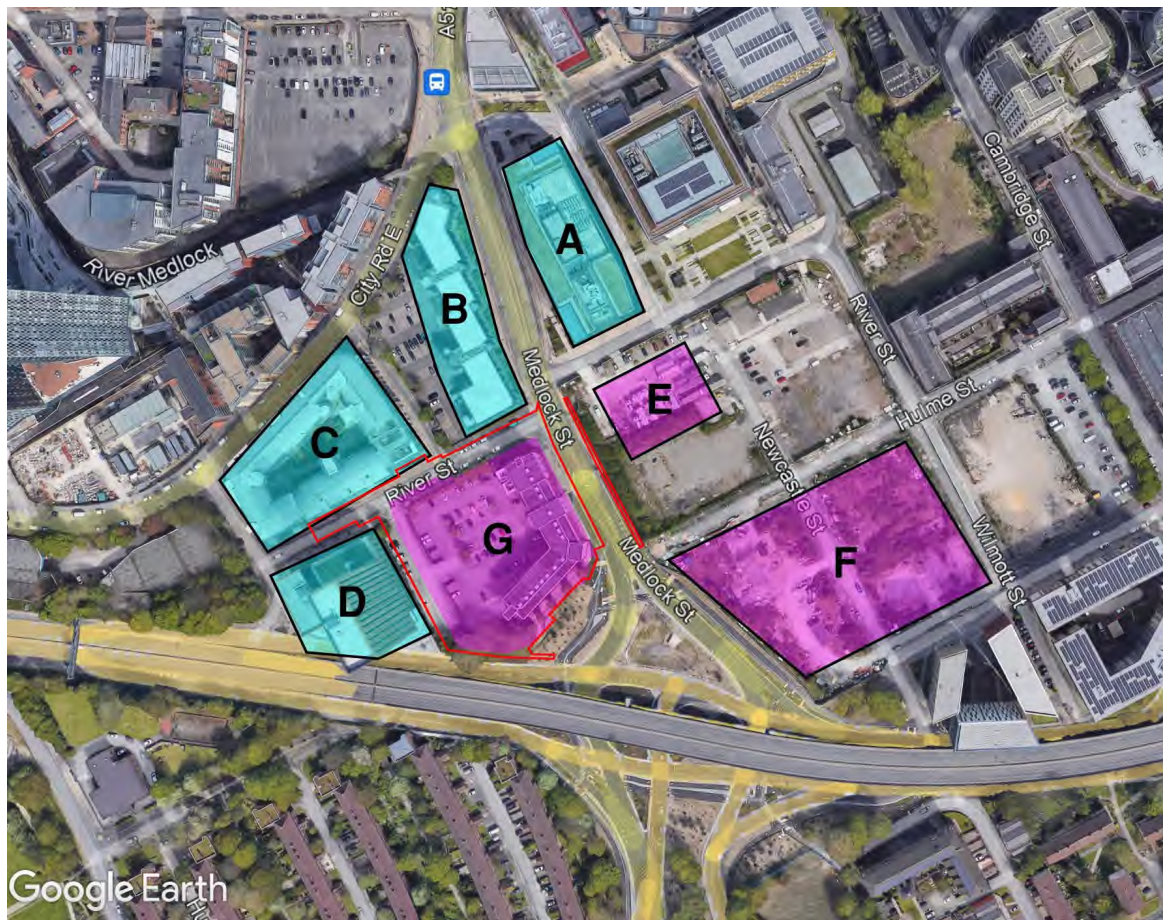
- 8.5.4 The noise and vibration sensitive receptors in proximity to the Site which have been taken into consideration in the assessment are summarised in **Table 8.13**.

Table 8.12: Noise and Vibration sensitive receptors

Receptor	Existing/Future Development	Description	Sensitivity
A. 8 First Street	Existing Development	Offices	Medium
B. People First/KJG Xeinadin group	Existing Development	Offices	Medium
C. City South/Tech Pathway	Existing Development	Residential dwelling	High
D. Canvas-Students Manchester	Existing Development	Residential dwelling	High
E. Plot 9a First Street	Future Development	Offices	Medium
F. First Street South	Future Development	Residential dwelling	High
G. PBSA within the Proposed Development	Future Development	Considered to be residential dwellings	High

- 8.5.5 The approximate location of identified sensitive receptors listed above which have been assessed in this chapter is presented in **Figure 8.4** below and **ES Volume 4, Appendix D** Receptors shaded in blue are existing receptors, whilst those shaded in pink are future receptors. An approximate Site boundary is provided in red.

Figure 8.4: Noise and Vibration Sensitive Receptors Plan



8.6 Identification and Description of Changes Likely to Generate Effect

8.6.1 Potential noise related environmental impacts which are considered most likely to generate effects during the demolition and construction are as follows:

- noise impacts associated with demolition and construction related fixed and mobile plant;
- vibration impacts associated with demolition and construction related fixed and mobile plant (e.g. piling); and
- noise impacts associated with increase in traffic on approach to the Site due to demolition and construction related vehicles.

8.6.2 Potential noise related environmental impacts which are considered most likely to generate effects during the operational phase are as follows:

- noise impact associated with the “industrial/commercial” noise emissions from the Proposed Development. This will be the operation of building services plant.
- noise impacts associated with entertainment noise, should it be included as part of the development. This could affect both surrounding receivers and structurally adjoined receivers at higher floor levels; and

- noise impacts on the Proposed Development associated with the surrounding noise environment, primarily from road traffic.

8.7 Assessment of Likely Significant Effect

Demolition and Construction Phase

Embedded Mitigation Measures

- 8.7.1 For demolition and construction, embedded mitigation measures will include the limitations on working hours as implemented in MCC's criteria.
- 8.7.2 This will limit working hours to:
- Monday – Friday 7.30am – 6pm;
 - Saturday: 8.30am – 2pm; and
 - Sunday/Bank holidays: No work.
- 8.7.3 These restrictions also apply to deliveries/collections to the Site.
- 8.7.4 Additionally, it is anticipated that the main contractor delivering the Proposed Development will be required to submit a detailed Construction Environmental Management Plan (CEMP), prior to commencement pursuant to a planning condition or obligation. They will therefore be committed to following Best Practicable Means (BPM) to minimise the noise and vibration impact on nearby noise sensitive properties. Such measures include the following:
- all construction plant and equipment should comply with EU noise emission limits;
 - machines in intermittent use should be shut down in the intervening periods between work or throttled down to a minimum;
 - proper use of plant with respect to minimising noise emissions and regular maintenance. All vehicles and mechanical plant used for the purpose of the works should be fitted with effective exhaust silencers and should be maintained in good efficient working order;
 - selection of inherently quiet plant where appropriate. All major compressors should be 'sound reduced' models fitted with properly lined and sealed acoustic covers which should be kept closed whenever the machines are in use and all ancillary pneumatic percussive tools should be fitted with mufflers or silencers of the type recommended by the manufacturers;
 - plant and equipment such as flatbed lorries, skips and chutes should be lined with noise attenuating materials. Materials should be handled with care and be placed, not dropped;

- care should be taken when erecting or striking scaffolds to avoid impact noise from banging steel. All operatives undertaking such activities should be instructed on the importance of handling the scaffolds to reduce noise to a minimum before access is possible;
- all ancillary plant such as generators, compressors and pumps should be positioned so as to cause minimum noise disturbance. If necessary, localised screens and enclosures should be used to reduce noise from particular noisy, static operations;
- wherever possible, the use of hydraulic attachments or other means of crushing concrete and hard materials should be used in preference to pneumatic breakers. Where the use of impact hammers is necessary, their attachment to larger and heavier excavators often can reduce the level of vibration;
- deliveries should be programmed to arrive during daytime hours wherever practicable. Care should be taken when unloading vehicles to minimise noise. Delivery vehicles should be routed so as to minimise disturbance to local residents. Delivery vehicles should be prohibited from waiting on the highway or within the Site with their engines running;
- demolition and construction contractors would be obliged to adhere to the codes of practice for construction working and piling given in British Standard BS 5228 and the guidance given therein minimising noise emissions from the Site; and
- piling should be avoided wherever possible and low vibration piling techniques such as continuous flight auger piling should be adopted wherever practicable.

Anticipated Effects

Demolition and Construction Noise

- 8.7.5 A 3D SoundPLAN noise model has been used to predict the noise impact created during the demolition and construction of the Proposed Development and associated infrastructure, in accordance with BS 5228.
- 8.7.6 The project's Noise Consultant's (Cundall's) extensive experience of similar developments has been used in conjunction with a table of likely plant and equipment anticipated to be used during each demolition and construction stage to formulate potential phasing scenarios and select typical noisy activities for the noise assessment.
- 8.7.7 To determine the worst-case demolition and construction noise impact, the noise model has simulated the following scenarios:
- scenario 1 – demolition and groundworks;
 - scenario 2 – substructure; and

- scenario 3 – superstructure.

8.7.8 demolition and construction plant noise source data has been taken from BS 5228.

Table 8.14 lists the source data used in the modelling process, as well as the percentage 'on time' during a working day.

Table 8.13: Demolition and Construction Noise Source Data

Demolition and Construction Phase	Plant Item	Sound Pressure Level @ 10m/dBA	On Time (%)	BS 5228:2009 Reference
Demolition and Groundworks	Caged material hoist	68	80%	C4.61
	Gas cutter	79	80%	C1.18
	Tracked Excavator	82	80%	C1.12
	Road planer	82	80%	C5.7
	Breaker mounted on wheeled backhoe	92	80%	C1.1
	Dump truck (tipping fill)	79	80%	C2.30
	Skip Wagon	78	80%	C8.21
	Diesel Generator	60	100%	C4.77
	Water Pump	65	80%	C2.45
	Road Sweeper	76	80%	C4.90
	Compressor for hand-held pneumatic breaker	65	80%	C5.5
Substructure	Gas cutter	79	80%	C1.18
	Caged material hoist	68	80%	C4.61
	Breaker mounted on wheeled backhoe	92	80%	C1.1
	Dump truck (tipping fill)	79	80%	C2.30
	Tower crane	77	80%	C4.49
	Skip Wagon	78	80%	C8.21

Demolition and Construction Phase	Plant Item	Sound Pressure Level @ 10m/dBA	On Time (%)	BS 5228:2009 Reference
	Diesel Generator	60	100%	C4.77
	Water Pump	65	80%	C2.45
	Concrete mixer truck (discharging) & concrete pump (pumping)	75	80%	C4.28
	Road Sweeper	76	80%	C4.90
	Compressor for hand-held pneumatic breaker	65	80%	C5.5
	Piling	68	80%	C3.6
Superstructure	Caged material hoist	68	80%	C4.61
	Gas cutter	79	80%	C1.18
	Breaker mounted on wheeled backhoe	92	80%	C1.1
	Tower crane	77	80%	C4.49
	Skip Wagon	78	80%	C8.21
	Diesel generator	60	100%	C4.77
	Concrete mixer truck (discharging) & concrete pump (pumping)	75	80%	C4.28
	Road Sweeper	76	80%	C4.90
	Compressor for hand-held pneumatic breaker	65	80%	C5.5

8.7.9 **Table 8.15** presents the magnitude of the predicted noise impact at existing nearby noise sensitive receptors, during the demolition and construction phases described above.

8.7.10 The magnitude of impact has been determined at each receptor by comparing predicted worst-case noise levels taken from the SoundPLAN noise model with the demolition and construction noise magnitude criteria shown in **Table 8.3** and significance effect matrix shown in **Table 8.9**.

Table 8.14: Demolition and Construction Noise Assessment

Demolition and Construction Phase	Receptor	Sensitivity	Predicted Worst Case Noise Level / $L_{Aeq,T}$ dB	Magnitude of Impact	Significance of Effect
Demolition and Groundworks	A	Medium	60	Negligible	Negligible
	B	Medium	71	Moderate	Moderate-minor adverse
	C	High	70	Moderate	Major – moderate adverse
	D	High	73	Moderate	Major – moderate adverse
	E	Medium	72	Moderate	Moderate-minor adverse
	F	High	68	Minor	Moderate-minor adverse
Substructure	A	Medium	59	Negligible	Negligible
	B	Medium	66	Minor	Minor Adverse
	C	High	67	Minor	Moderate-minor adverse
	D	High	70	Moderate	Major – moderate adverse
	E	Medium	73	Moderate	Moderate-minor adverse
	F	High	69	Minor	Moderate-minor adverse
Superstructure	A	Medium	59	Negligible	Negligible
	B	Medium	71	Moderate	Moderate-minor adverse

Demolition and Construction Phase	Receptor	Sensitivity	Predicted Worst Case Noise Level / $L_{Aeq,T}$ dB	Magnitude of Impact	Significance of Effect
	C	High	70	Moderate	Major – moderate adverse
	D	High	73	Moderate	Major – moderate adverse
	E	Medium	71	Moderate	Moderate-minor adverse
	F	High	67	Minor	Moderate-minor adverse

- 8.7.11 It can be seen from the results presented in **Table 8.15** that noise effects, as a result of demolition and construction, are predicted to be Negligible to Major – Moderate Adverse.
- 8.7.12 The predicted noise levels do not take account of the Best Practicable Means (BPM) of noise control – pragmatic demolition and construction noise mitigation measures detailed in the Embedded Mitigation section above. Actual noise impact magnitude is, therefore, likely to be lower than predicted when BPM are implemented. Noise effects, as a result of demolition and construction, are therefore predicted to be **Negligible to Moderate-Minor Adverse (not significant to significant)**.
- 8.7.13 These effects will be temporary, as they will only occur during the demolition and construction phases of the Proposed Development.

Demolition and Construction Traffic Noise

- 8.7.14 Based on information provided by the Transport Consultant, it is understood that the baseline number of annual average daily traffic flow movements along Medlock Street is 24,490, of which 467 are HGV movements.
- 8.7.15 Based on a reasonable worst-case scenario of 10% increase in HGV traffic flows due to demolition and construction traffic, the noise change in dB at affected receptors would be <1dB for HGVs only, with the overall increase in traffic in proportion to all vehicle movements being lower than this still. The magnitude of impact would therefore be Negligible. For the highest sensitivity of receptor, it is therefore predicted that the significance of effect, due to demolition and construction traffic noise will be **Negligible (not significant)**.

Demolition and Construction Vibration

- 8.7.16 BS 5228 indicates that demolition and construction activities (particularly piling) generally only generate vibration impacts when they are located less than 20m from sensitive locations. The impact depends on the type of piling, ground conditions, and receptor distance.
- 8.7.17 It is assumed that the substructure strategy would likely comprise of augered piles. Indicative vibration levels for this piling method, sourced from BS5228 Part 2, are presented in **Table 8.16**.

Table 8.15: Example Piling Vibration Levels

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

- 8.7.18 Based on the example vibration levels presented in **Table 8.16**, at a plan distance of 5m, potential vibration levels from auger piling affecting nearby human receptors (i.e. occupants of the closest adjacent residential dwellings to a potential development cell) is not expected to exceed a minor magnitude impact as described in **Table 8.5**. At a greater distance of approximately 20m from the piling vibration source (i.e. approximate distance to the nearest and most sensitive receptor D), the vibration levels may reduce even further to a magnitude of negligible impact.
- 8.7.19 Therefore, effects on people in nearby buildings, as a result of vibration generated by unmitigated piling (or other) activities, are predicted in relation to the to be moderate-minor adverse at worst case, though likely **negligible (not significant)** in practice.
- 8.7.20 In comparison to the BS 7385 vibration thresholds for cosmetic damage to structures (**Table 8.6**), example vibration levels from piling are below the BS 7385 thresholds for cosmetic damage to structures (i.e. surrounding residential structures). As such, it is considered very unlikely that cosmetic damage to the adjacent sensitive structures will occur and impacts on buildings (in terms of cosmetic damage) due to vibration from piling would be likely to have a negligible impact.
- 8.7.21 Therefore, it is considered that adverse effects related to building damage as a result of construction vibration are **unlikely to occur**.

Operational Phase

Embedded Mitigation Measures

Operational Industrial/Commercial Noise

- 8.7.22 For operational industrial noise, MCC states externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.
- 8.7.23 Methods for ensuring that the plant noise limits in are met should be investigated at a later stage when details of plant and equipment are known, but could include:
- selection of quiet items of plant and equipment;
 - locating plant and equipment away from sensitive receptors;
 - utilising specially designed acoustic enclosures for noisy items of plant;
 - locating plant and equipment in plant rooms or behind noise screens;
 - locating plant in positions which maximise available noise screening from existing and proposed structures in and around the Site; and
 - switching plant off or reducing operating levels (and subsequent noise output) when not required (e.g. at night).

Operational Entertainment Noise

- 8.7.24 To minimise the risk of adverse effects on new and existing sensitive receptors, it is recommended that amplified music sources are designed and, where appropriate, mitigated so that the MCC noise emission criteria identified in Paragraphs 8.2.16 and 8.2.17 of this chapter are not exceeded.
- 8.7.25 Methods for ensuring that entertainment noise limits are met should be investigated at a later stage should any amplified music be confirmed as part of the Proposed Development, but could include:
- amplified noise should be brought under control of an automatic volume control system to see that the noise limits are not exceeded. The installed noise limited should be capable of limiting noise at 1/1- octave band frequencies; and
 - to ensure that any noise limiting equipment operates effectively, it is advised that the installation of such equipment should be overseen by an appropriately experienced noise consultant. Furthermore, due to the uncertainty of factors such as on Site workmanship, it is advised that the process of establishing acceptable limiting values for the system (i.e. values compliant with the Local Authority criteria) should be determined via in-situ testing of the public announcement (PA) system.

Operational Noise Impacts on Proposed Development

- 8.7.26 An assessment has been made to identify the level of sound reduction that building façades would need to provide to meet the design targets. For transportation noise sources, if these noise levels are achieved in the respective spaces in the Proposed Development, it is considered unlikely that future occupants of the Proposed Development would be subject to adverse effects as a result of transportation noise. Compliance with MMC limits should, therefore, ensure that the residual effect is negligible.
- 8.7.27 For operational noise impacts on the Proposed Development, MCC states noise levels in residential spaces should be controlled to the following levels.
- bedrooms (night-time – 23.00 – 07.00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 15 times); and
 - living rooms (daytime – 07.00 – 23.00) 35 dB L_{Aeq}

Anticipated Effects

Operational Industrial/Commercial Noise

- 8.7.28 At this stage of the Proposed Development design, detailed information relating to noise levels generated by new items of plant and equipment is not available.
- 8.7.29 Notwithstanding the absence of specific plant data, all new items of plant and equipment will need to be selected, designed and, where appropriate, mitigated so that the MCC noise emission criteria identified in Paragraph 8.2.14 of this chapter are not exceeded.
- 8.7.30 Based on relevant representative background noise levels during the daytime and night-time periods (as presented in **Table 8.12**), the MCC plant noise limits to be achieved at 1m from the nearest noise-sensitive receptor can be defined as set out in **Table 8.17**.

Table 8.16: Rating Level Limits for Fixed Services Plant Noise at Sensitive Receptors

Period	Representative $L_{AF90,15min}$ (dB)	MCC Limiting Plant Noise Criterion – dB $L_{Ar,T}$
Daytime (07:00 – 23:00)	62	57
Night-time (23:00 – 07:00)	53	48

- 8.7.31 The noise limits set out in **Table 8.17** relate to the total cumulative noise level at receptors from all fixed plant noise sources associated with the Proposed Development, whilst the units are operating under their design duty conditions.

- 8.7.32 Assuming these requirements are met, adverse noise effects will not occur at noise sensitive receptors and the significance of effect will be **negligible (not significant)** for all receptors.

Operational Entertainment Noise

- 8.7.33 It is understood that the first floor of the student accommodation tower will include a gym. This may, therefore, include amplified music.
- 8.7.34 At this stage of the Proposed Development design, detailed information relating to noise levels generated by amplified music is not available.
- 8.7.35 Therefore, to minimise the risk of adverse effects on new and existing sensitive receptors, music sources will need to be designed and, where appropriate, mitigated so that the MCC noise emission criteria identified in Paragraphs 8.2.16 and 8.2.17 of this chapter are not exceeded.
- 8.7.36 Based on calculated overall octave band background noise levels determined during the survey for daytime and night-time periods, the MCC amplified noise limits to be achieved at 1m from the nearest noise-sensitive receptor can be defined as set out in **Table 8.18**.

Table 8.17: Limits for Amplified Noise at Nearest Sensitive Receptors

	MCC limiting amplified noise criterion – dB L _{Aeq,T}						
Period	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Daytime (07:00 – 23:00)	52	46	49	48	52	45	32
Night-time (23:00 – 07:00)	47	41	44	43	47	40	27

- 8.7.37 For amplified noise directly to student accommodation rooms above, music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed 47dB and 41dB (L_{eq}), respectively as per the MCC requirements.
- 8.7.38 Assuming these requirements are met, adverse noise effects will not occur at receptors and the significance of effect should be **negligible (not significant)**.

Operational Noise Impact on Proposed Development

- 8.7.39 External noise levels likely to be incident upon the Proposed Development are relatively high in some locations due to the proximity of heavily trafficked roads.
- 8.7.40 The likelihood of internal ambient noise levels in worst case student accommodation bedrooms throughout the Proposed Development exceeding the proposed criteria depends on the façade make-up of the building, especially glazing and ventilation elements.

- 8.7.41 In order to achieve internal noise levels provided in BS 8233 and the MCC criteria, glazing and ventilation elements should provide a level of attenuation dependent upon the noise level incident upon them. Therefore, attenuation requirements of glazing and ventilators have been estimated in accordance with the “more rigorous calculation method” outlined in BS 8233:2014.
- 8.7.42 Break in calculations have been undertaken for worst case noise levels incident on a student bedroom. These are;
- daytime 07:00 – 23:00 – 71 dB L_{Aeq} (determined via calibrating survey data in 3D SoundPLAN model to worst case daytime levels);
 - night-time 23:00 – 07:00 – 69 dB L_{Aeq} (determined via calibrating survey data in 3D SoundPLAN model to worst case night-time levels); and
 - night-time 15th highest max – 78 dB $L_{AF,max}$ (determined via worst case 15th highest night-time max measured at position MP1).
- 8.7.43 3D façade noise maps of the daytime and night-time L_{Aeq} noise levels across the student accommodation block are presented in **Figure 8.5** and **Figure 8.6**, respectively.

Figure 8.5: Daytime Facade Noise Map from South-West

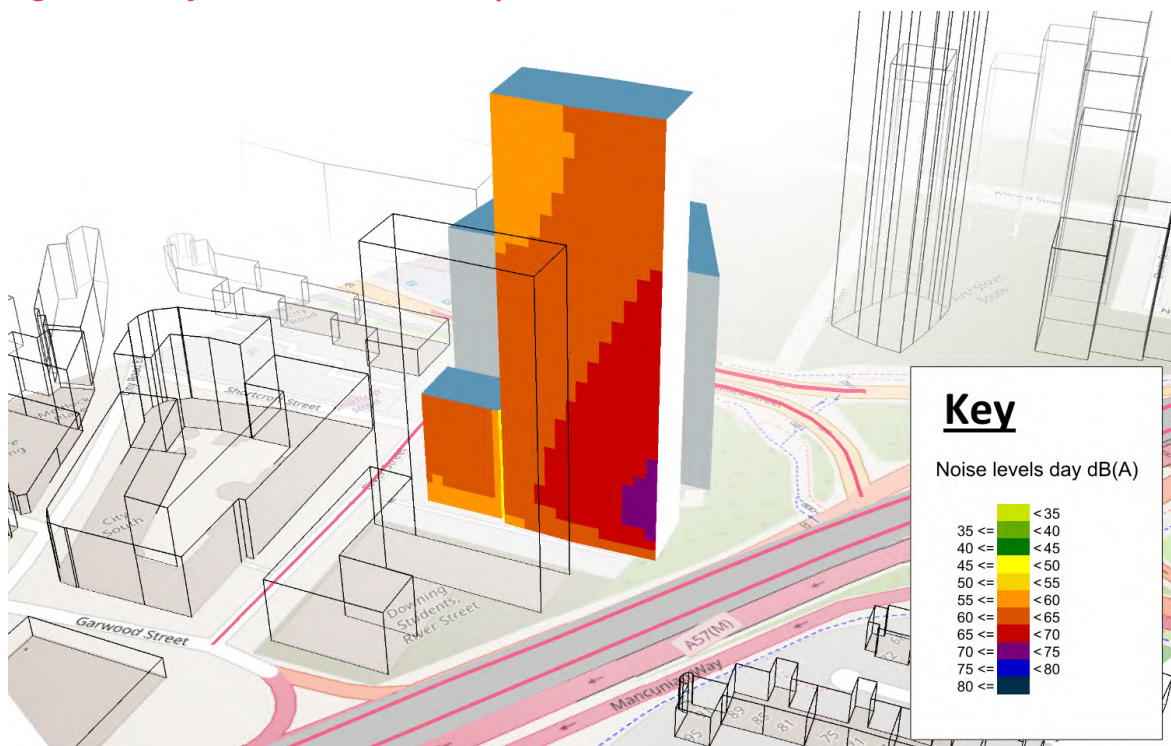
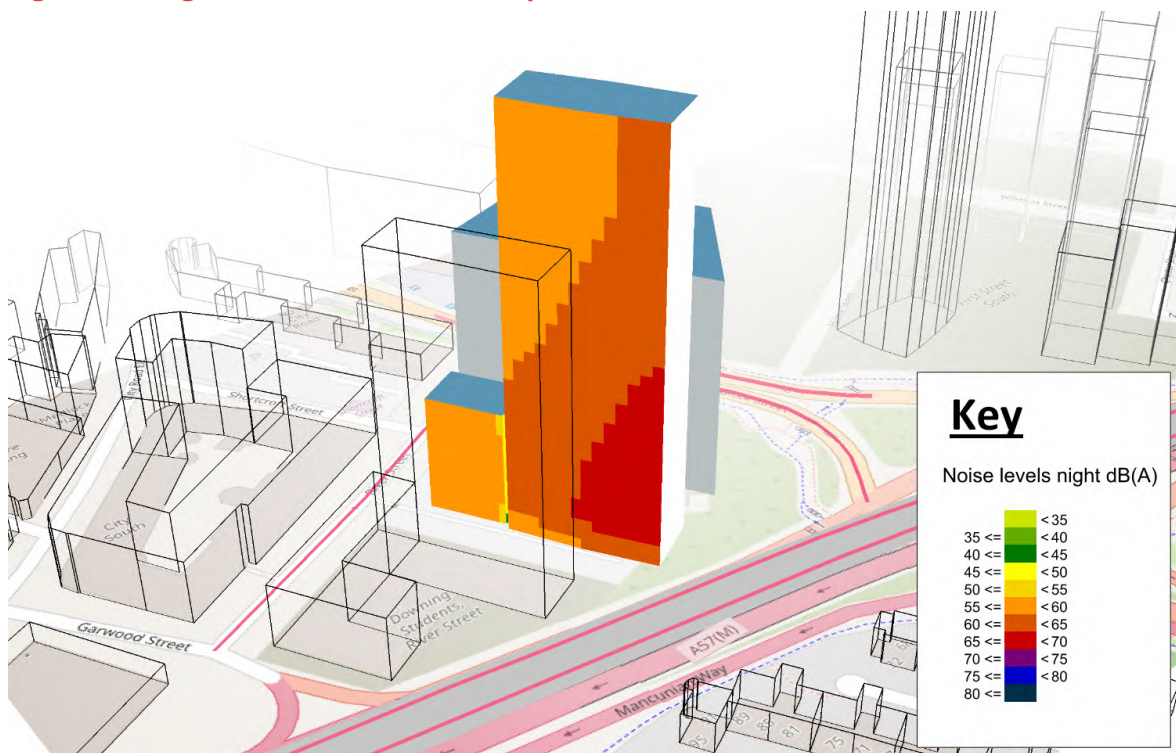


Figure 8.6: Night-time Facade Noise Map from South-West



8.7.44 Calculations have assumed the following room dimensions, as presented on the project architect's design drawings;

- bedroom floor area; 9m²;

- bedroom height; 2.9m²
- total façade area; 7.2 m²; and
- area of windows; 2.9 m².

- 8.7.45 Items of building services ducted to façade to provide background ventilation provide high levels of noise attenuation from outside. As such, the dominant noise break in will be via closed glazed windows.
- 8.7.46 Calculations have found that worst case student accommodation rooms require a Glazing Specification rated at **≥ 35 dB R_w + C_{tr}**.
- 8.7.47 Façade elements should be designed to be 10 dB above this rating, i.e. **≥ 45 dB R_w + C_{tr}**. Generally, façade build ups that are structurally and thermally suitable for residential accommodation will achieve this level of sound reduction by default.
- 8.7.48 A detailed glazing attenuation assessment will be implemented in further detail as part of the embedded design of the Proposed Development. Other alternative glazing specifications may be acceptable upon review, although all finalised glazing mitigation should be reviewed as part of detailed design.
- 8.7.49 The provision of suitable glazing will see that the resultant internal noise limits will mean the significance of effect will be **negligible (not significant)**.
- 8.7.50 It is understood that the overheating strategy has determined that for summertime overheating, the requirements of Part O will be satisfied with windows fully closed between the hours of 10pm and 7am.
- 8.7.51 As such, since noise requirements for Approved Doc O relate to open windows, during night-time hours (23:00 – 07:00), this element of the Building Regulations will be complied with by default and effects of noise during the control of overheating will be **negligible (not significant)**.
- 8.7.52 For office areas of the Proposed Development, there is no requirement with regards to local planning policies to achieve certain noise limits within these areas. However, the design process will implement relevant technical guidance and legislation, such as that provided in BS 8233, to see that by default noise impact on the proposed office spaces is controlled to an acceptable level with regards to all relevant guidance.

8.8 Scope for Additional Mitigation Measures

Potential Additional Mitigation Measures

Demolition and Construction

- 8.8.1 All mitigation measures for the demolition and construction phase are applicable via the CEMP as part of the embedded mitigation and, therefore, no potential additional mitigation measures can be applied.

Operation

- 8.8.2 All mitigation measures for the operational phase are based upon compliance with local and national policies via design and are, therefore, all considered embedded mitigation resulting in negligible effects. No further mitigation is, therefore, required.

8.9 Residual Effects

- 8.9.1 **Table 8.19** provides a summary of the significant residual effects resulting from the Proposed Development after effective implementation of the embedded and additional mitigation measures proposed above.

Table 8.18: Significant Residual Effects

Phase	Receptor	Residual Effect ¹	Temporary / Permanent
Demolition and Construction	D. Canvas-Students Manchester	Moderate - Minor adverse	Temporary
¹ Effects for demolition and construction phase have included a reduction in the actual calculated noise impact magnitude based on Best Practicable Means (BMP) of noise control being implemented.			

- 8.9.2 It can be seen that the worst-case residual effect is expected to be moderate – minor adverse, during the demolition and construction phase. Whilst significant in EIA terms, this is a temporary effect. Permanent effects as a result of the Proposed Development will be negligible and are, therefore, not significant in EIA terms.

8.10 Cumulative Effects

- 8.10.1 Cumulative effects are the combined effects of several development schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 8.10.2 The ES has given consideration to 'Cumulative 'Effects' for schemes located within a 500m radius from the boundary of the Site, as listed in **ES Volume 2, Chapter 3: EIA Methodology**.
- 8.10.3 All schemes listed have the potential to contribute to cumulative impact of noise and vibration at sensitive receptors.
- 8.10.4 This potential for increased cumulative noise impacts at nearby receptors is from an increased number of industrial/commercial noise sources, possible increases in traffic flows and concurrent construction operations.
- 8.10.5 Based on previous studies, cumulative schemes that are located beyond a 100m radius of the Proposed Development are unlikely to give rise to potential cumulative construction noise and vibration impacts. For committed developments that are within 100m of the Proposed Development, cumulative significant demolition and

construction effects would only exceed those already reported for the Proposed Development if similar works occurred on those sites at the same time and at the same distances to sensitive receptors as the works being undertaken on the Proposed Development. Any such cumulative effects would, however, be temporary effects that would not last past the demolition and construction phases.

- 8.10.6 For operational effects, it is assumed that all other developments will need to comply with the MCC planning policies that have been demonstrated herein to equate to a Negligible impact magnitude at any nearby noise sensitive receptor. Therefore, it is unlikely that significant cumulative effects would arise during the operational phase.

8.11 Summary and Conclusions

- 8.11.1 A noise and vibration assessment has been undertaken, based on environmental surveys, predictions and calculations for the Proposed Development.
- 8.11.2 The main sources of noise on the Site and surrounding receptors are road noise sources from Medlock Street and Mancunian Way.
- 8.11.3 The impact of noise during demolition and construction of the Proposed Development has been predicted and assessed in accordance with BS 5228 guidance. Impacts from demolition and construction activities are predicted at the closest noise sensitive receptors to the works, with temporary negligible to moderate-minor adverse effects (not significant to significant) anticipated to arise. This takes into account the implementation of Best Practicable Means (BPM) and a Construction Environmental Management Plan.
- 8.11.4 The impact of noise from demolition and construction traffic has been predicted and assessed in accordance with criteria presented in the Design Manual for Roads and Bridges (DMRB). The effect of demolition and construction traffic noise is anticipated to be negligible (not significant) at the highest sensitive receptor (i.e. residential properties).
- 8.11.5 The impact of vibration during demolition and construction of the Proposed Development has been predicted and assessed in line with BS 5228 guidance. At a distance of approximately 20m from the worst-case vibration source (i.e. the approximate distance between the worst-case vibration source and the nearest and most sensitive receptors), the effect of vibration is anticipated to be moderate-minor adverse at worst case, though likely negligible (not significant) in practice.
- 8.11.6 During the operation of the Proposed Development, plant noise is anticipated to have a negligible (not significant) effect on the nearest noise-sensitive (i.e. residential) receptors. Any noise from the proposed gym, to be located in the student accommodation tower, is predicted to have a negligible (not significant) effect on the nearest noise-sensitive receptors and structurally adjoined student accommodation.

- 8.11.7 A Site suitability assessment has also been undertaken, to predict traffic noise levels at the façade of the Proposed Development. Based on the assumption that internal noise levels provided in BS 8233 and MCC criteria will be achieved, the anticipated effect is predicted to be negligible (not significant).
- 8.11.8 The Proposed Development and committed developments within 100m of the Site may give rise to significant effects during the demolition and construction phase; this is based on a worst-case assumption that the demolition and construction of the Proposed Development and committed developments take place at the same time. The potential significant effects would, however, be temporary in nature.
- 8.11.9 For operational effects, it is assumed that all other developments will need to comply with the MCC planning policies, resulting in a negligible (not significant) effect on any nearby noise sensitive receptor.
- 8.11.10 **Table 8.20** summarises the Noise and Vibration effects resulting from the Proposed Development.

Table 8.20: Summary of Residual Effects

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Demolition and Construction								
A. 8 First Street	Medium	Demolition and Construction Noise and Vibration	MCC working hours and CEMP	Negligible	Negligible	None	Negligible	Negligible
				At worst case façade				
				Temporary				
				Likely				
B. People First / KJG Xeinadin group	Medium	Demolition and Construction Noise and Vibration	MCC working hours and CEMP	Moderate	Minor adverse	None	Moderate	Minor adverse - temporary
				At worst case façade				
				Temporary				
				Likely				
C. City South / Tech Pathway	High	Demolition and Construction Noise and Vibration	MCC working hours and CEMP	Moderate	Moderate – minor adverse	None	Moderate	Moderate - minor adverse – temporary
				At worst case façade				
				Temporary				
				Likely				
D. Canvas- Students Manchester	High	Demolition and Construction	MCC working	Moderate	Moderate – minor adverse	None	Moderate	Moderate - minor
				At worst case façade				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
		Noise and Vibration	hours and CEMP	Temporary Likely				adverse – temporary
E. Plot 9a First Street	Medium	Demolition and Construction Noise and Vibration	MCC working hours and CEMP	Moderate At worst case façade Temporary Likely	Minor adverse	None	Moderate	Minor adverse – temporary
F. First Street South	High	Demolition and Construction Noise and Vibration	MCC working hours and CEMP	Minor At worst case façade Temporary Likely	Minor adverse	None	Minor	Minor adverse – temporary
G. Residential dwellings within the Proposed Development	N/A	N/A	N/A	N/A N/A N/A N/A	N/A	N/A	N/A	N/A
Operation								
	Medium			Negligible	Negligible	None	Negligible	Negligible

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
A. 8 First Street		Operational Noise	Local and national planning policy	At worst case façade Permanent Likely				
B. People First / KJG Xeinadin group	Medium	Operational Noise	Local and national planning policy	Negligible At worst case façade Permanent Likely	Negligible	None	Negligible	Negligible
C. City South / Tech Pathway	High	Operational Noise	Local and national planning policy	Negligible At worst case façade Permanent Likely	Negligible	None	Negligible	Negligible
D. Canvas- Students Manchester	High	Operational Noise	Local and national planning policy	Negligible At worst case façade Permanent Likely	Negligible	None	Negligible	Negligible
	Medium			Negligible	Negligible	None	Negligible	Negligible

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
E. Plot 9a First Street		Operational Noise	Local and national planning policy	At worst case façade Permanent Likely				
F. First Street South	High	Operational Noise	Local and national planning policy	Negligible At worst case façade Permanent Likely	Negligible	None	Negligible	Negligible
G. Residential dwellings within the Proposed Development	High	Operational Noise	Local and national planning policy	Negligible At worst case façade Permanent Likely	Negligible	None	Negligible	Negligible
Cumulative Effects – Demolition and Construction								
All receptors	Medium / High	Demolition and Construction Noise and Vibration	MCC working hours and CEMP	Potentially significant At worst case façade Temporary	Potentially significant	None	Potentially significant	Potentially significant – temporary

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
				Likely				
Cumulative Effects - Operation								
All receptors	Medium / High	Operational Noise	Local and national planning policy	Negligible	Negligible	None	Negligible	Negligible
				At worst case façade				
				Permanent				
				Likely				

One Medlock Street
Environmental Statement
Volume 2
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CHAPTER 9: WIND MICROCLIMATE

9 Wind Microclimate

9.1 Scope of Assessment

- 9.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of Wind Microclimate and is supported by **ES Volume 4, Appendix E**.
- 9.1.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the cumulative effects associated with the Proposed Development in combination with other developments within 450m of the Site (which is deemed far enough to capture all effects of wind and exceed industry best practice guidance).

9.2 Key Legislation, Policy and Guidance Considerations

- 9.2.1 The Wind Microclimate assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised below.

Legislation and Regulation

- 9.2.2 There are no legislative policies or regulations relating to the assessment of environmental wind flows in the built environment.

National Planning Policy

National Planning Policy Framework, 2021

- 9.2.3 There are no national policies set out within the National Planning Policy Framework (NPPF)¹ relating to the assessment of environmental wind flows in the built environment.

¹ (Ministry of Housing, Communities & Local Government, 2021)

Planning Practice Guidance (PPG), 2019

- 9.2.4 The Planning Practice Guidance (PPG)² states, under 'Consider form', that: *"Some forms pose specific design challenges, for example how taller buildings meet the ground and how they affect local wind and sunlight patterns should be carefully considered."*
- 9.2.5 The PPG also states, under 'Consider scale', that *"Account should be taken of local climatic conditions, including daylight and sunlight, wind, temperature and frost pockets."*

National Design Guidance, 2022

- 9.2.6 Policy 41 of the National Design Guidance³ states that a new development *"enhances positive qualities and improves negative ones. Some features are physical, including:" "environment – including landscape and visual impact, microclimate, orientation, flood risk, noise, air and water quality."*
- 9.2.7 Policy 71 of the National Design Guidance also states that *"Proposals for tall buildings (and other buildings with a significantly larger scale or bulk than their surroundings) require special consideration. This includes their location and siting; relationship to context; impact on local character, views and sight lines; composition - how they meet the ground and the sky; and environmental impacts, such as sunlight, daylight, overshadowing and wind. These need to be resolved satisfactorily in relation to the context and local character."*

Regional Planning Policy

Greater Manchester Combined Authority's (GMCA's) Places For Everyone Joint Development Plan Document (Publication Stage)

- 9.2.8 GMCA's Places For Everyone Joint Development Plan Document⁴ Policy JP-S 4 states *"Development will be managed so as to increase considerably the capacity of its citizens, communities, businesses and infrastructure to survive, adapt and grow in the face of physical, social, economic and environmental challenges, including climate change. Key measures will include: Designing indoor and outdoor environments to provide a reduction and respite from more extreme temperatures and winds associated with climate change and greater urbanisation".*
- 9.2.9 Policy JP-P 1 states : *"We aim to become one of the most liveable city regions in the world, consisting of a series of beautiful, healthy and varied places, each having the following key attributes that all development, wherever appropriate, should be consistent with:*

² (Ministry of Housing, Communities & Local Government, 2019)

³ (Ministry of Housing, Communities & Local Government, 2021)

⁴ (Greater Manchester Combined Authority, 2021)

Comfortable and inviting, with indoor and outdoor environments: Addressing microclimate issues such as sunlight, indoor air quality, overheating, shade, wind and shelter”.

- 9.2.10 Policy JP-C 4 states: *“The design and management of streets will follow a Street for All approach, including by: Offering shelter from wind and rain, and shade from the sun”.*
- 9.2.11 It should be noted that the Places For Everyone Joint Development Plan Document is emerging local policy only has yet to be examined by an independent Inspector. The draft status of the document means that it is afforded less weight in the decision making process compared to the adopted Core Strategy, as referenced below.

Local Planning Policy

Manchester City Council's (MCC's) Core Strategy Development Plan Document

- 9.2.12 MCC's Local Development Framework, Core Strategy Development Plan Document⁵, Paragraph 12.14 states *“Tall buildings by their very nature can dominate the street scene and be highly visible over long distances. They can also have an impact on the local micro-climatic conditions, for example, by creating wind tunnels. It is for these reasons that it is considered particularly important that they are designed to the highest quality, both in terms of appearance and their impact on the functioning of surrounding space.”*
- 9.2.13 Policy EN 2 States *“Tall buildings are defined as buildings which are substantially taller than their neighbourhoods and/or which significantly change the skyline. Proposals for tall buildings will be supported where it can be demonstrated that they...*

- *Contribute positively to place making...*

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

Technical Standards and Guidance

- 9.2.14 The following guidance has informed the assessment of effects within this chapter:
- Quality Assurance Manual - Wind Engineering Studies of Buildings. 2001. AWES-QAM-1-2001⁶;

⁵ (Manchester City Council, 2012)

⁶ (Australian Wind Engineering Society, 2001)

- The American Society of Civil Engineers (ASCE) Manual of Practice No.67 for Wind Tunnel Studies. ASCE SEI 49/12⁷;
- Engineering Science Data Unit (2001) Computer Program for Wind Speeds and Turbulence Properties: Flat or Hilly Sites in Terrain with Roughness⁸; and
- Lawson, T.V. (1990) The determination of the wind environment of a building complex before construction⁹.

9.3 Assessment Methodology

Effects Assessed

- 9.3.1 This section provides confirmation on the scope of the assessment presented within this chapter, in accordance with the EIA Scoping Report (**ES Volume 4, Appendix A1**) and EIA Scoping Opinion (**ES Volume 4, Appendix A2**).

Effects Not Considered to be Significant

- 9.3.2 The following effects were not considered to be significant within the EIA Scoping Report and are not considered further in this chapter:
- temporary exceedance of the London Dockland Development Corporation (LDDC) wind safety and comfort criteria¹⁰ during demolition and construction. During the demolition and construction stage, the existing built form within the Site will be demolished and construction of the Proposed Development will occur gradually across the entire Site. In the first instance, when the demolition of the existing built form occurs, there is considered to be limited opportunity for accelerated wind due to channelling or downdraughts. Nonetheless, as the built form (specifically the massing) of the Proposed Development gradually occurs, there will be instances where accelerated wind conditions may occur, albeit these will be gradual over the course of the construction stage. As the massing nears completion of Block A and B, the level of effect is likely to be similar to that being considered/assessed (see scenarios below). In instances where mitigation measures are required to ensure appropriate wind conditions at the operational stage, it is assumed that these will be in place prior to occupation of the Site. Assuming the timely implementation of mitigation, the resulting level of effect during the construction stage would be less than reported at the operational stage. Therefore, it is considered that an assessment of operational effects

⁷ (The American Society of Civil Engineers (ASCE), 2012)

⁸ (ESDU (Engineering Science Data Unit), 2001)

⁹ (Lawson, 1990)

¹⁰ (Lawson, 1990)

represents an appropriate approximation of a ‘worst-case’ scenario during the construction stage. Therefore, for the purpose of the EIA and ES, only the operational stage of the Proposed Development has been modelled and assessed.

Effects Considered Likely to be Significant

9.3.3 The effects shown in **Table 9.1** were considered likely to be significant in the EIA Scoping Report and are reported on within this chapter.

Table 9.1: Effects Considered Likely to be Significant

Likely Significant Effect	Applicable Development Stage
Exceedance of the LDDC wind safety criteria	Operation
Exceedance of the LDDC wind comfort criteria	Operation

Determination of Baseline

Overview

9.3.4 The microclimate of any development is the distinctive climate of a small-scale area. The weather variables in a microclimate, such as wind, may be different to the conditions prevailing over the area as a whole. The study area comprised the Site plus buildings and spaces within a radius of 450m from the centre of the Site. For a development of this scale, this allows for approximately 450m of the surrounding area to be modelled, including relevant committed/consented and reasonably foreseeable developments.

Wind Tunnel Testing

- 9.3.5 Wind tunnel testing is the most well-established and robust means of assessing the pedestrian wind microclimate. It enables the wind conditions at a site to be quantified and classified in accordance with the widely accepted Lawson Criteria for comfort and safety, which require the assessment of mean and gust wind conditions. Gust wind conditions are those driven by the turbulent environment induced by the presence of buildings.
- 9.3.6 The principal steps within the procedure are as follows:
- undertake a wind tunnel test to identify the degree to which a proposed development increases or decreases local wind speeds, per wind direction, relative to a known reference point;
 - combine wind tunnel test data with meteorological data for the area to derive an accurate picture of the expected wind microclimate at the site in question; and

- using the Lawson Criteria, compare the expected conditions with the planned suitability of conditions, and assess the exceedance (or otherwise) of the safety criteria.

9.3.7 The atmospheric boundary layer as it approaches the Site, for each wind direction considered, was generated by a 2D barrier and spires placed at the entrance to the test section of the wind tunnel, plus roughness blocks distributed over the floor of the wind tunnel (as shown in **Figure 9.1**). The specific arrangement of these elements allows an accurate representation of the wind speed and turbulence properties, as they vary with height, when compared with the full-scale properties expected. Full-scale wind properties at the Site were derived using the industry standard method set out within ESDU (Engineering Sciences Data Unit) data item 01008¹¹.

Figure 9.1: Atmospheric Boundary Layer Creation



9.3.8 The wind tunnel had a working section which was 20m in length, with a 3m x 1.5m cross sectional area.

¹¹ (ESDU (Engineering Science Data Unit), 2001)

Site Wind Climate

- 9.3.9 Wind environment studies require that wind speed data obtained from a measurement station be transposed to the site of interest. The measurement station of choice for the assessment was that at Manchester Airport.
- 9.3.10 The wind speed history (for a period of 20 years), provided by weather organisations such as the UK Met Office or the National Oceanic & Atmospheric Administration, was reformatted into the number of observations of wind speeds within each of several wind speed ranges, for each wind direction and for each month of the year. The months were grouped into seasons and a Weibull distribution was fitted to the wind speed distribution for each wind direction, for each season. The resulting weather centre wind data was transposed to open country terrain at sea-level, accounting for upwind terrain. The open country wind data was then transposed to reference height at the Site.

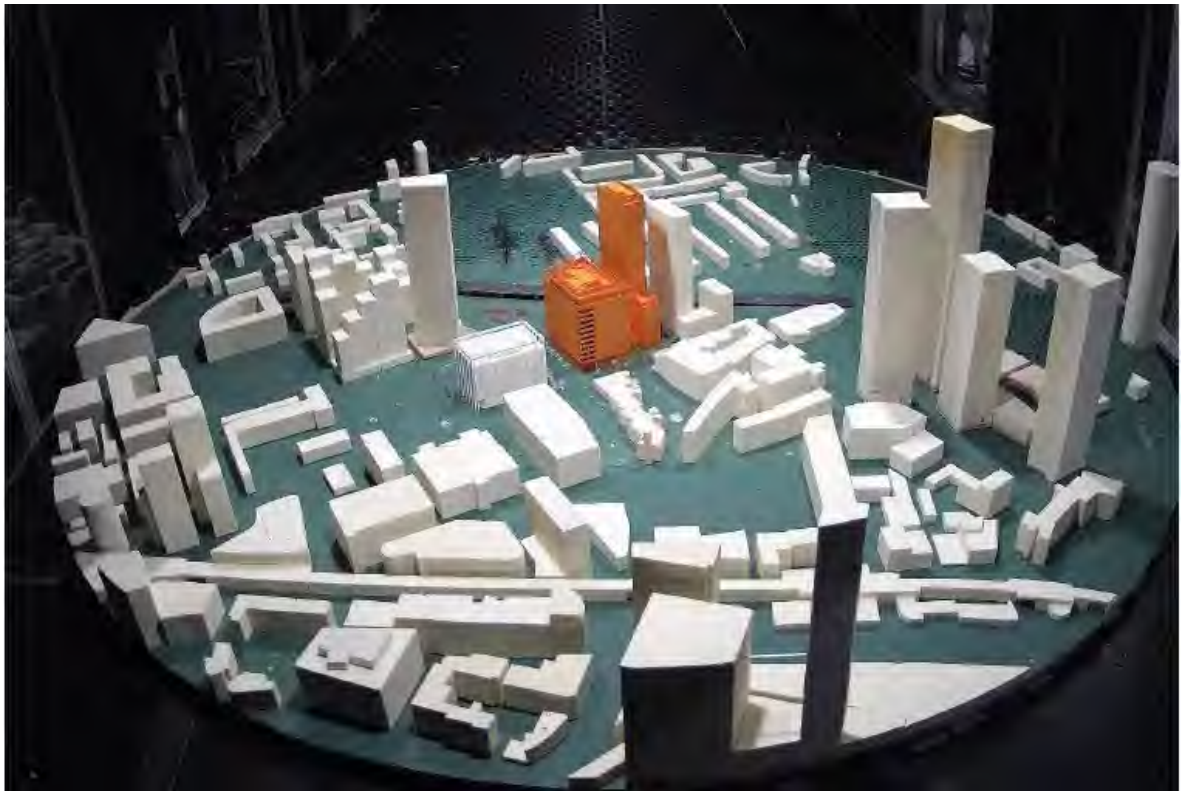
Baseline Conditions

- 9.3.11 A 3D model of the Site was constructed and baseline conditions were established by undertaking wind tunnel testing of the wind velocities at the existing Site for a full range of wind directions in 22.5 degree increments. Once combined with a statistical model that describes the wind climate prevailing across the area as a whole, predictions of pedestrian comfort and safety, classified in terms of the Lawson criteria, were derived.

Prediction Methodology

- 9.3.12 A 3D model of the Proposed Development was installed in an atmospheric boundary layer wind tunnel on an automated turntable (as shown in **Figure 9.2**). Measurements were taken for 16 wind directions, in increments of 22.5°, from 0° round to 337.5°.

Figure 9.2: 3D Wind Tunnel Model of the Proposed Development with the Existing Surrounds



9.3.13 The assessment predicted the proportion of time an area will experience wind speeds in excess of threshold values for safety as well as a series of typical activities such as walking, waiting and outdoor sitting. It was, therefore, shown within the various parts of the Proposed Development and the adjacent developments, whether wind conditions are suitable or unsuitable, and whether design adjustment or mitigation measures were required.

Assessment Scenarios

9.3.14 The wind tunnel model covered a radius of 450m from the Site. All features which are likely to impact the wind flow within the study area have been replicated. The assessment considered a full range of directions in 22.5° intervals, and considered the following configurations:

- the Baseline (the existing Site with existing surrounding conditions);
- the Proposed development with the existing surrounding conditions; and
- the Proposed development with the cumulative surrounding conditions.

Assessment Criteria

9.3.15 The industry standard criteria for wind microclimate assessments are commonly referred to in the UK as the Lawson criteria after one of their main authors. The

‘LDDC’ (London Docklands Development Corporation) variant of the Lawson Criteria was used for the purposes of the assessment.

- 9.3.16 The LDDC variant applies a single percentage probability of exceedance of a range of wind speeds and associates different wind speeds to different types of usage. This offers a relatively simple and practical manner for the assessment of wind comfort and safety.
- 9.3.17 The LDDC criteria also prescribes that a wind speed of 15m/s occurring once per year is rated as unsuitable, in terms of safety, with the potential to de-stabilise the less able members of the public including the elderly, cyclists and children.
- 9.3.18 The LDDC variant of the Lawson criteria prescribes that wind conditions are suitable for a given activity when the threshold is exceeded no more than 5% of the time. The value of 5% has been established as giving a reasonable allowance for extreme and relatively infrequent winds that are tolerable within each category.
- 9.3.19 Where certain activities are year-round, such as walking, entrance use or for waiting areas, comfort ratings are required to be met in all seasons. For more seasonal activities, such as outdoor recreation or for sitting spaces, the assessment focuses on relevant seasons where the expectation will exist for conditions to be suitable. The LDDC comfort threshold wind speed values are presented in **Table 9.2**.

Table 9.2: Lawson Comfort Criteria

Threshold Wind Speed (m/s)	Comfort Rating/Activity Qualifying Comments		
4	C4	Long-term sitting	Reading a newspaper and eating and drinking.
6	C3	Short-term standing/sitting	Appropriate for bus stops, window shopping and building entrances.
8	C2	Strolling	General areas of walking and sightseeing.
10	C1	Walking	Local areas around tall buildings where people are not likely to linger.

- 9.3.20 The assessment takes full account of seasonal variations in wind conditions and pedestrian activities. For example, conditions for recreational activities focus on summer (June, July, August), but also consider spring (March, April, May) and autumn (September, October, November), while conditions for pedestrian thoroughfare, access or waiting (e.g. bus stops) consider all seasons, with winter (December, January, February) usually being the critical season. The assessment is summarised in terms of suitability for various activities. The activities considered, and their relation to the LDDC, are summarised in **Table 9.3**.

Table 9.3: Suitability Assessment

Suitability	Lawson Comfort Criteria
For passage in areas where tolerance of less comfortable windy conditions is expected, e.g. in substantially built-up areas of commerce where transit from A to B is often prompt, with pedestrians unlikely to linger.	Walking in all seasons.
For access to and passage through the Development and surrounding area.	Strolling in all seasons.
For leisure uses excluding such as a park, children's play area, etc.	Standing or short-term sitting from spring to autumn.
For pedestrian ingress/egress at a building entrance, or short periods of sitting or standing such as at a bus stop, taxi rank, meeting point, etc.	Standing or short-term sitting in all seasons.
For long periods of sitting such as for an outdoor café.	Long-term sitting in summer.

Receptors and Receptor Sensitivity

- 9.3.21 Receptors are defined to be pedestrians around the Site and demolition and construction workers within the Site. During demolition and construction, sensitivity to wind is typically reduced. All receptors are considered to be medium sensitivity to the local wind microclimate conditions and are given an equal weighting.
- 9.3.22 With the Proposed Development in place, receptors are defined to be pedestrians within the Proposed Development and surrounding areas. For the avoidance of doubt, this includes other users of the Site who may be sitting at provided seating areas or otherwise using the Site. All receptors are equally sensitive to the presence or absence of an acceptable wind microclimate. An unacceptable microclimate exists at a receptor when either an exceedance of the safety criteria exists, or when the comfort criteria is not met for the existing/planned pedestrian use at a receptor. All receptors are considered to be highly sensitive to the local wind microclimate conditions and are given an equal weighting.

Magnitude of Impact

- 9.3.23 The magnitude of impact is defined by the severity of the deviation from the standards set out by the Lawson criteria. Exceedances of the safety criteria are deemed to be the most critical, given their potential effect on pedestrians' wellbeing, i.e. they may be unduly exposed to the potential for harm. Such effects are thus deemed to have a high impact magnitude. Where the comfort criteria are not met, i.e. where the conditions are too windy for a particular receptor to be sufficiently comfortable for existing or planned pedestrian uses and thus inconvenient but not unsafe, such impact are deemed to be of medium magnitude. Where the comfort

criteria are marginally exceeded, to the extent that the exceedance is expected to be perceptible, but tolerable, such impacts are deemed to be of low magnitude.

Scale of Effect

- 9.3.24 On the basis of the above, exceedances of the safety criteria are considered to be of major effect significance, while exceedances of the comfort criteria are considered to be of moderate or minor significance. Where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered to be sensitive to a change, this will be considered negligible.
- 9.3.25 The following are the scales of effects used to assess likely wind conditions, as a result of the introduction of the Proposed Development:
- major beneficial: any effect on wind conditions which is expected to improve pedestrian safety, namely an improvement in conditions from being considered unsafe to being considered safe;
 - moderate beneficial: any effect on wind conditions which is expected to improve pedestrian comfort from unsuitable to suitable for planned activities;
 - minor beneficial: any effect on wind conditions which is expected to improve pedestrian comfort from unsuitable to marginal/tolerable for planned activities, or from marginal/tolerable to suitable for planned activities;
 - negligible: any effect that does not alter the suitability of existing wind conditions with respect to planned activities;
 - minor adverse: any effect on wind conditions which worsens pedestrian comfort from suitable to marginal/tolerable for planned activities, or from marginal/tolerable to unsuitable for planned activities;
 - moderate adverse: any effect on wind conditions that worsens pedestrian comfort from suitable to unsuitable for planned activities; and
 - major adverse: any effect on wind conditions adversely affecting pedestrian safety, namely a deterioration in conditions from being considered safe to being considered unsafe.
- 9.3.26 The preceding descriptions of the scales of effect relates to a matrix defining scale of effect in relation to magnitude of change and sensitivity, on the basis that effects relating to safety are deemed to have a major magnitude of impact and high sensitivity, while effects relating to comfort are deemed to have moderate sensitivity with moderate or minor magnitude of change for non-marginal and marginal effects on wind conditions, respectively. This is shown in **Table 9.4**.

Table 9.4: Effect Significance Matrix

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major (Safety) Adverse/Beneficial	Moderate (Comfort) Adverse/Beneficial	Minor (Comfort) Adverse/Beneficial
Moderate	Moderate (Comfort) Adverse/Beneficial	Moderate (Comfort) Adverse/Beneficial	Minor (Comfort) Adverse/Beneficial
Minor	Minor (Comfort) Adverse/Beneficial	Minor (Comfort) Adverse/Beneficial	Minor (Comfort) Negligible
Negligible	Negligible	Negligible	Negligible

Categorising Likely Significant Effects

- 9.3.27 Major and moderate effects are considered to be significant in EIA terms. Minor effects, as noted above being tolerable, are not considered to be significant.

Limitations and Assumptions

- 9.3.28 The wind tunnel test approach has been adopted to inform the wind microclimate assessment and has adopted a discrete measurement approach, where sensors are positioned in sensitive locations and those locations that are expected by veteran practitioners to experience the most significant acceleration of winds. A longstanding approach of this nature is expected to capture worst-case conditions.
- 9.3.29 Unless otherwise specified, the wind tunnel model included deciduous trees in order to obtain conservative results during winter. Deciduous trees have been modelled in bare winter format.
- 9.3.30 Deciduous trees introduced as part of the Proposed Development will require a substantial retained solidity in winter, i.e. lots of twigs and branches that represent a robust ameliorative deterrent that effectively reduces wind speed. These have been modelled as such in the wind tunnel and landscaping proposals.
- 9.3.31 The conditions during the demolition and construction of the Proposed Development have not been directly assessed by the wind tunnel tests. Instead, professional judgement has been used to assess conditions during demolition and construction.
- 9.3.32 Assessment models have been constructed on the basis of the following drawing received from Jon Matthews Architects on 26th August 2022:
- 100_One Medlock Street Massing Model 220826.dwg.
- 9.3.33 The modelling of the gates to the south of the service yard for Block B of the Proposed Development are based on the following drawings received from Jon Matthews Architects on 23rd September 2022:
- 100_One Medlock Street Massing Model 220923.skp;

- 100_MP_02_2200.dwg; and
- 100_MP_02_2202.dwg.

9.3.34 The existing surrounding area was based upon information supplied by Jon Matthews Architects and supplemented by Ordnance Survey details for the area. Cumulative surrounds were based upon information contained within the MCC planning portal and provided by Temple.

9.4 Scoping and Consultation

- 9.4.1 An EIA Scoping Report (presented in **ES Volume 4, Appendix A1**) was submitted to MCC on 8th September 2022 with a formal request for an opinion on the proposed scope of the EIA and assessment methodologies. MCC subsequently issued their Scoping Opinion on the proposed scope and methodology of the topics for assessment within the EIA. A copy of MCC's Scoping Opinion is provided in **ES Volume 4, Appendix A2**.
- 9.4.2 A summary of the key points raised in MCC's Scoping Opinion, relevant to Wind Microclimate, are presented in **Table 9.5** including a response as to where the comments have been addressed within this chapter.

Table 9.5 MCC Scoping Opinion Comments and Response

Summary of Comment	Response or location within the ES where comments are addressed
Methodology agreed	N/A
Request to assess high sided vehicles on the Mancunian Way	Paragraph 9.5.7 and Paragraph 9.7.11.

9.5 Baseline Assessment and Identification of Key Receptors

- 9.5.1 The existing Site's wind conditions are dominated by the built-up nature of the area. Surrounding buildings (particularly River Street Tower development that is located to the west of the Site) have the potential to cause some downdraughts and accelerations at corners.
- 9.5.2 The results for the Site's baseline conditions are presented graphically within **Figure 4.1** and **Figure 4.2** of **ES Volume 4, Appendix E** for worst-seasonal and summer conditions respectively.

Safety

- 9.5.3 All areas within the Site and the surrounding areas satisfy the safety criteria for pedestrian safety.

Comfort

- 9.5.4 Wind conditions within the Site and the surrounding areas are substantially suitable for their existing uses, with conditions suitable for short periods of standing at entrances and at least strolling on thoroughfares and car park areas.
- 9.5.5 Minor exceedances are observed to the northeast corner of the River Street Tower development (Locations 48 and 49) where conditions are only suitable for walking in winter. Conditions are still suitable for strolling in excess of 92% of the time in winter and, thus, are considered tolerable for pedestrian thoroughfares.
- 9.5.6 Wind conditions at the southern terraces of the City South Apartment building are suitable for standing or better in summer and are, thus, suitable for their intended uses.

Sensitive Receptors

- 9.5.7 The following existing sensitive receptors were identified:
- general thoroughfares: probes 1-8, 10-29, 46-54, 56-68, 73-97, 100-101;
 - off Site building entrances: probes 99, 102;
 - existing terraces: probes 210, 211, 212; and
 - vehicles on the Mancunian Way: probe 9.
- 9.5.8 The following proposed sensitive receptors were identified:
- public realm: probes 5, 6, 8, 10-12, 15, 18, 19, 21, 22, 46-50, 54, 58-66, 73, 81-84, 90-98;
 - on Site building entrances: probes 5, 14, 59, 63, 90, 91, 94, 98, 202; and
 - amenity terraces: probes 30-32, 34, 36, 37, 39-43, 69-72, 204, 203.

Future Baseline (the 'do nothing' scenario)

- 9.5.9 A future baseline (in the absence of the Proposed Development) has not been quantitatively assessed but conditions within the 'do nothing' scenario can be qualitatively assessed, and is largely validated via results from the cumulative scenario described within the 'Cumulative Effects' section. All major committed/consented schemes lie within non-prevailing wind sectors, and as such are likely to have little impact on wind conditions within the Site and immediate surrounds. As such, whilst there may be marginal differences in wind conditions, they are not expected to be materially different from those within the baseline assessment.

9.6 Identification and Description of Changes Likely to Generate Effect

Operational Phase

- 9.6.1 The Proposed Development represents a significant structure with respect to wind and largely protrudes above its surroundings, particularly with respect to prevailing winds. The Proposed Development has the potential to introduce downdraughts into the public realm, which could then accelerate around existing and proposed building corners, creating exceedances of the wind comfort and safety criteria. The tallest element is oriented favourably with respect to prevailing winds, somewhat limiting the potential for significant downdraughts; Block A presents a large bluff face with the potential to channel winds northwards through Medlock Street.

9.7 Assessment of Likely Significant Effect

Operational Phase

Embedded Mitigation Measures

- 9.7.1 The wind microclimate has been assessed for the Proposed Development with current soft landscaping proposals as shown in **Figure 2.1** of **ES Volume 4, Appendix E**. The project's landscape architects, Planit, have advised that the current soft landscaping has been proposed to avoid the majority of existing below ground services. Where tree pits become close to any existing and retained services, root barriers will be used and the shape of the tree pit will be adjusted to maximise the root zone. New services will be coordinated to avoid tree pits and, where required, protected against future root damage.
- 9.7.2 All parapets/balustrades have been modelled based on the information from the architectural drawings.

Anticipated Effects

- 9.7.3 The results for the Proposed Development within existing surrounds are presented graphically within **Figure 4.3** and **Figure 4.4** of **ES Volume 4, Appendix E** for worst-seasonal (i.e. winter) conditions and **Figure 4.5** and **Figure 4.6** of **ES Volume 4, Appendix E** for summer conditions, respectively.

Safety

- 9.7.4 Upon the introduction of the Proposed Development, areas within the Site and immediate surrounds satisfy the safety criteria for wind. This represents a long-term, direct and **negligible effect** on all pedestrians within the Site and surrounds (highly sensitive).

Comfort

Thoroughfares

- 9.7.5 Wind conditions at thoroughfares within the Site are suitable for at least strolling and are, thus, for comfortable pedestrian access to and passage through the Site. This represents a long-term, direct and **negligible effect** on all pedestrians within the Site and surrounds (highly sensitive)

Entrances

- 9.7.6 Wind conditions at entrances to the Proposed Development are generally suitable for short-term standing and are, thus, for comfortable pedestrian ingress/egress.
- 9.7.7 An exception is observed to the main entrance to the western façade of Block 1 (Location 5), where conditions are only suitable for strolling from autumn to spring months and are, thus, too windy for comfortable ingress/egress. These exceedances represent a long-term, direct and **moderate adverse (significant) effect** on occupants (highly sensitive) accessing Block B through this entrance.
- 9.7.8 A further exception is observed to the main entrance to the northern façade of Block B (Location 91). This would be considered marginal, with conditions suitable for standing approximately 94% of the time in winter. Therefore, wind conditions would still be considered to be suitable for entrance use. This therefore represents a long-term, direct and **negligible effect** on occupants (highly sensitive) accessing Block B via this entrance.

Recreational Spaces

- 9.7.9 Wind conditions to the rooftop terraces of Block A and Block B are suitable for short-term sitting or better in summer and are, thus, comfortable for general recreational spaces. This represents a long-term, direct and **negligible effect** on occupants (highly sensitive) using these terraces.
- 9.7.10 Similarly, at the smaller terraces of Block A wind conditions would be suitable for short periods of sitting in summer and are, thus, suitable for their intended uses. Marginal exceedances are observed in autumn at the southern terraces, but these spaces would be still considered tolerable for use. This represents a long-term, direct and **negligible effect** on occupants (highly sensitive) accessing these terraces.

Surrounding Area

- 9.7.11 Upon the introduction of the Proposed Development, the wind conditions to the surrounding area remain substantially suitable for strolling and thus for comfortable pedestrian access to and passage through the site. Conditions also remain comfortable for pedestrian ingress/egress at surrounding entrances. This represents

a long-term, direct and **negligible effect** on pedestrians within the surrounding area and vehicles on the Mancunian Way (highly sensitive).

- 9.7.12 A single exception occurs to the west of Block A across Medlock Street (Location 23), where wind conditions are only suitable for strolling for 93% of the time in winter, rather than the 95% criteria. Since the exceedances are marginal, wind conditions are still considered tolerable for pedestrian thoroughfares. These exceedances, therefore, represent a long-term, direct and **negligible effect** on pedestrians (highly sensitive) accessing this area.
- 9.7.13 The wind conditions remain suitable for standing or better in summer at the southern terraces of City Apartment building and thus for their intended uses. This therefore represent a **long-term, direct and negligible effect** of the Proposed Development on occupants of the City South Apartments building (highly sensitive).

9.8 Scope for Additional Mitigation Measures

Potential Additional Mitigation Measures

- 9.8.1 Exceedances of the comfort criteria across the study area are not excessive but they benefit from the introduction of mitigation measures. The introduction of an entrance side screen to the south of the western entrance to Block B, and landscaping further south of the screen along the façade, would be successful in creating wind conditions suitable for entrance use throughout the year. These mitigation measures are presented in **Figure 2.2** in **ES Volume 4, Appendix E**.

Likely Effectiveness of Additional Mitigation Measures

- 9.8.2 With the introduction of the robust landscaping and side screen to the south of the main entrance to the western façade of Block B, wind conditions would be expected to be suitable for entrance use. This represents a long-term, direct and **negligible effect** on occupants (highly sensitive) accessing Block B via this entrance.

9.9 Residual Effects

- 9.9.1 Following the effective implementation of the additional mitigation measures above, no significant residual effects are expected as a result of the Proposed Development during the demolition and construction or operational phases.

9.10 Cumulative Effects

- 9.10.1 Cumulative effects are the combined effects of several development schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.

9.10.2 The ES has given consideration to 'Cumulative 'Effects' for schemes located within a 450m radius from the boundary of the Site, as listed in **ES Volume 2, Chapter 3: EIA Methodology**.

9.10.3 A number of committed/consented schemes listed in **ES Volume 2, Chapter 3: EIA Methodology** are substantially under construction, to the eastern sector of the Proposed Development. Therefore, these have been included within all assessment scenarios (including the baseline) and are listed in **Table 9.6** below.

Table 9.6: Committed/Consented Schemes Under Construction

Development Name	Planning Reference
Plot 9 First Street	132600/FO/2021
Plot 11 First Street	125573/FO/2019
John Dalton West	125799/FO/2019
Birley Plot E, Stretford Road	120896/FO/2018
Former Bauer Millet Site	115871/FO/2017
Land Bound by Silvercroft Street, Crown Street, And the Mancunian Way	126668/FO/2020

9.10.4 Committed/consented schemes that have been considered as part of the cumulative surrounding conditions are listed in **Table 9.7**.

Table 9.7: Committed/Consented Schemes

Development Name	Planning Reference
One City Road	128002/FO/2020
Great Jackson Street	116850/FO/2017
10-12 Whitworth Street	111003/FO/2016/C1
Hotspur Press 2	120635/FO/2018
Land Bounded by Trumpet Street, Albion Street & Great Bridgewater Street (Apex Tower)	133172/FO/2022
34 Great Jackson Street	129273/FO/2021
Land At Deansgate South	129406/FO/2021
Plot F Great Jackson Street	132199/FO/2021

9.10.5 The committed/consented developments that have not been considered as part of the cumulative surrounding conditions, since they sit outside of the 450m test radius, are listed in **Table 9.8**.

Table 9.8 Committed/Consented Schemes outside of the 450m Test Radius

Development Name	Planning Reference
325 - 327 Deansgate	125804/FO/2019
Land Bounded by Chester Road	119806/FO/2018

Development Name	Planning Reference
2 – 4 Chester Rd	113870/FO/2016
Great Marlborough Street Car Park	121252/FO/2018

- 9.10.6 The results for the Proposed Development within cumulative surrounding conditions are presented graphically within **Figure 4.7** and **Figure 4.8** for worst-seasonal (i.e. winter) conditions in **ES Volume 4, Appendix E** and **Figure 4.9** and **Figure 4.10** for summer conditions in **ES Volume 4, Appendix E**, respectively.
- 9.10.7 The majority of the committed/consented schemes lie to the north and to the west of the Site and do not coincide with the direction of the main prevailing winds. Correspondingly, cumulative wind conditions remain similar to those for the Proposed Development in existing surroundings. This, therefore, represents a cumulative long-term, direct and **negligible effect** on pedestrians within the Site and immediate surrounds (highly sensitive).
- 9.10.8 Exceptions exist, however, where minor exceedances were found upon the introduction of committed/consented schemes. These are the thoroughfares to the north of Block B (Location 48) and to the north of Plot 11, First Street (Location 87). The exceedances here are marginal, suitable for strolling for approximately 94% of the time in winter, rather than the required 95%, and would still be considered to be acceptable for their intended use. This, therefore, represents a cumulative long-term, direct and **negligible effect** on pedestrians within the immediate surrounds (highly sensitive).
- 9.10.9 Additionally, marginal exceedances were observed at the southern terrace of Level 12 of Block A (Location 34), with wind conditions being marginally windy for short-term sitting during autumn, suitable for approximately 94% of the time, rather than the required 95% of the time. However, wind conditions would still be considered to be comfortable for recreational use, particularly during the summertime. These, therefore, represent a cumulative long-term, direct and **negligible effect** on occupants (highly sensitive) accessing this terrace.
- 9.10.10 With the introduction of the proposed mitigation measures, the wind conditions to the main entrance on the western façade of Block B would become suitable for ingress/egress. This represents a cumulative long-term, direct and **negligible effect** on occupants (highly sensitive) accessing this entrance .
- 9.10.11 Elsewhere, conditions within the Site and surrounding areas remain suitable for the planned and existing pedestrian uses, representing a cumulative long-term, direct and **negligible effect** on pedestrians within the Site and surrounding areas (highly sensitive).

9.11 Summary and Conclusions

9.11.1 The following conclusions have been drawn as a result of the assessment:

- Wind conditions in the Baseline scenario meet the criteria for pedestrian safety and comfort;
- A boundary layer wind tunnel assessment was conducted. This assessment has provided a reliable quantification of wind speed probability at a variety of accessible spaces in and around the Proposed Development. The industry standard criteria for wind microclimate assessments, the LDDC variant of the Lawson criteria, has been employed for the assessment;
- The wind microclimate has been assessed for the Proposed Development with the current soft landscaping proposals and surrounding landscaping;
- Following the introduction of the Proposed Development, wind conditions are substantially suitable for designated pedestrian and occupant activities. Minor localised exceptions are predicted to occur to the main entrance on the western façade of Block B and at thoroughfares across Medlock Street. These conditions are very marginal, local and seasonal exceedances and are not expected to materially differ from more comfortable and are therefore still expected to be comfortable for use;
- Conditions on the balconies of Block A are similarly suitable, with only very marginal exceedances outside the summer months. These conditions are expected to be suitable for comfortable occupant use and no mitigation is therefore required;
- The introduction of robust landscaping to the south of the main entrance to the western façade of Block B will mitigate the exceedances and create conditions suitable for use;
- Following the effective implementation of the recommended mitigation measures proposed above, no significant residual effects are expected as a result of the Proposed Development during operational phases; and
- With the introduction of the committed schemes, wind conditions do not materially differ from wind conditions of the Proposed Development in existing surrounds.

9.11.2 **Table 9.9** summarises the wind microclimate effects resulting from the Proposed Development.

Table 9.9: Summary of Residual Effects

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Operation								
Users/Pedestrians at thoroughfares within the Site	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users/Pedestrians at entrances within the Site	High	Pedestrian safety & comfort	Proposed soft landscaping	Medium	Moderate adverse at Location 5, negligible at all other entrances	Robust landscaping to the south of the main entrance to the western façade of Block B	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users of Rooftop Terrace on Block B (Level 11)	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users of Rooftop Terraces on Block A (Levels 12 and 13)	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users of smaller terraces of Block A	High			No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
		Pedestrian safety & comfort	Proposed soft landscaping	Permanent				
				Likely				
Users/Pedestrians in the surrounding area	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users of southern terraces of City Apartment building	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Cumulative Effects - Operation								
Users/Pedestrians at thoroughfares within the Site	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users/Pedestrians at entrances within the Site	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Minor adverse at Location 5, negligible at all other entrances	Robust landscaping to the south of the main entrance to the western façade of Block B	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Users of Rooftop Terrace on Block B (Level 11)	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users of Rooftop Terraces on Block A (Levels 12 and 13)	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users of smaller terraces of Block A	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users/Pedestrians in the surrounding area	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				
Users of southern terraces of City Apartment building	High	Pedestrian safety & comfort	Proposed soft landscaping	No impact	Negligible	N/A	Negligible	Negligible (not significant)
				Site-wide				
				Permanent				
				Likely				

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CHAPTER 10: DAYLIGHT, SUNLIGHT, OVERSHADOWING, SOLAR GLARE AND LIGHT POLLUTION

10 Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution

10.1 Introduction

- 10.1.1 This chapter of the ES presents the assessment of the likely daylight, sunlight, overshadowing, solar glare and light pollution impacts of the Proposed Development upon the Site and surrounding area. This chapter also describes the methods used to assess these impacts; the existing baseline conditions; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been adopted.
- 10.1.2 This assessment and ES chapter is supported by the following technical results within **ES Volume 4, Appendix F**:
- **Appendix F1** – Drawings of the Baseline, Proposed and Cumulative Scenario;
 - **Appendix F2** – Daylight and Sunlight Results for Baseline v Proposed;
 - **Appendix F3** – Daylight and Sunlight Results for Cumulative v Proposed;
 - **Appendix F4** – Drawings of Mirrored Baseline;
 - **Appendix F5** – Daylight and Sunlight Results for Mirrored Baseline v Proposed;
 - **Appendix F6** – Solar Glare Assessment; and
 - **Appendix F7** – Light Pollution Assessment.

10.2 Key Legislation, Policy and Guidance Considerations

- 10.2.1 The daylight, sunlight, overshadowing, solar glare and light pollution assessments have been undertaken within the context of the relevant planning policies, guidance documents and legislative instruments. These are summarised below.

Legislation and Regulation

- 10.2.2 There is no legislation or regulation that is relevant to the proposed topic under consideration.

National Planning Policy

National Planning Policy Framework (2021)

10.2.3 The National Planning Policy Framework¹ stipulates that *“...Planning policies and decisions should ensure that developments... create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users.”*

10.2.4 The document also states that *“...planning policies and decisions should always seek to secure a good standard of amenity for existing and future occupants of land and buildings.”*

10.2.5 Paragraph 125 further states:

“Where there is an existing or anticipated shortage of land for meeting identified housing needs, it is especially important that planning policies and decisions avoid homes being built at low densities, and ensure that developments make optimal use of the potential of each site. In these circumstances:

[...]

c) when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards).”

Planning Practice Guidance (PPG) (2021)

10.2.6 The Planning Practice Guidance (PPG)² – Making Efficient Use of Land, published on 22 July 2019, Paragraph: 006 Reference ID: 66-006-20190722 states that:

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

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

“All developments should maintain acceptable living standards. What this means in practice, in relation to assessing appropriate levels of sunlight and daylight, will depend to some extent on the context for the development as well as its detailed design. For example in areas of high-density historic buildings, or city centre locations where tall modern

¹ Department for Communities and Local Government, 2021; National Planning Policy Framework.

² Department for Communities and Local Government, 2021; Planning Practice Guidance

buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings.”

Regional Planning Policy

Draft Places for Everyone Joint Development Plan Document – Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, Wigan (August 2021)

- 10.2.8 Policy JP-P 1 (Sustainable Places) of the draft Places for Everyone Joint Development Plan Document – Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, Wigan³ states that *“we aim to become one of the most liveable city regions in the world, consisting of a series of beautiful, healthy and varied places, each having the following key attributes that all development, wherever appropriate, should be consistent with:*

15. Comfortable and inviting, with indoor and outdoor environments: A. Offering a high level of amenity that minimises exposure to pollution; and B. Addressing microclimate issues such as sunlight, indoor air quality, overheating, shade, wind and shelter.”

Local Planning Policy

Manchester Core Strategy (2012 – 2027)

- 10.2.9 Policy DM1 – Development Management – of the Manchester Core Strategy⁴ states that all developments should have regard to the effects on amenity including privacy, light, noise, vibration, air quality and odours.
- 10.2.10 Policy EN2 – Tall Buildings – states that, by their very size, tall buildings can have a significant impact on the local environment and its micro-climate. It is therefore expected that this impact be modelled and that submissions for tall buildings also include appropriate measures to create an attractive, pedestrian friendly local environment.

³ Greater Manchester Combined Authority, 2021; Places for Everyone Joint Development Plan Document (Publication Stage) – Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, Wigan

⁴ Manchester City Council, 2012; Manchester’s Local Development Framework – Core Strategy Development Plan Document

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

10.2.11 The Guide to Development in Manchester Supplementary Planning Document (SPD) and Planning Guidance⁵ sets out a series of design principles which should be considered and implemented, where necessary. Those measures relevant to this assessment are:

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

Technical Standards and Guidance

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

10.2.12 The Building Research Establishment (BRE) Guidelines 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2022'⁶ provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. It is intended for use by building designers, developers, consultants and Local Planning Authorities (LPAs). The advice it gives is not mandatory and should not be used as an instrument of planning policy; it states:

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

10.2.13 It also states:

"The advice is given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. [...] In special circumstances the developer or planning authority may wish to use different target values... in an area with modern high rise buildings, a higher degree of obstruction maybe

⁵ Manchester City Council, 2007; Guide to Development in Manchester Supplementary Planning document and Planning Guidance.

⁶ Building Research Establishment (BRE), 2022; Guidelines Site layout planning for daylight and sunlight: a guide to good practice (BR 209).

unavoidable if new developments are to match the height and proportions of existing building" (para.1.6).

- 10.2.14 In addition, the BRE Guidelines state (para. 1.3) that, *"It is intended to be used in conjunction with the interior daylighting recommendations in BS EN 17037 Daylight in buildings, and in the CIBSE publication LG10 Daylighting – a guide for designers. This guide complements them by providing advice on the planning of the external environment."*

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

- 10.2.15 The CIE 146:2002 Collection on Glare⁷ states:

"Disability glare is glare that impairs vision (CIE, 1987). It is caused by scattering of light inside the eye [...]. The veiling luminance of scattered light will have a significant effect on visibility when intense light sources are present in the peripheral visual field and the contrast of objects to be seen is low."

"Disability glare is most often of importance at night when contrast sensitivity is low and there may well be one or more bright light sources near to the line of sight, such as car headlights, streetlights or floodlights. But even in daylight conditions disability glare may be of practical significance: think of traffic lights when the sun is close to them, or the difficulty viewing paintings hanging next to windows."

Institute of Lighting Professionals (ILP) Guidance Note: The Reduction of Obtrusive Light GN01:2021 (2021)

- 10.2.16 The ILP document entitled "Guidance Note GN01/21: The Reduction of Obtrusive Light"⁸ provides quantitative criteria for acceptable levels of light pollution and distinguishes between rural and dense urban areas.

10.3 Assessment Methodology

Effects Assessed

- 10.3.1 This section provides confirmation on the scope of the assessment presented within this chapter, following submission of the EIA Scoping Report (**ES Volume 4, Appendix A1**) and receipt of the EIA Scoping Opinion (**ES Volume 4, Appendix A2**).

⁷ Commission Internationale L'Eclairage (CIE) (2022) Collection on Glare 2002

⁸ The Institute of Lighting Practitioners (ILP), 2021; The Guidance Notes for the Reduction of Obtrusive Light.

Effects Not Considered to be Significant

10.3.2 The following effects were not considered significant as part of the EIA Scoping Report and are not considered further in this chapter:

- reduction in daylight and sunlight amenity on buildings of non-residential use as a result of the construction of the Proposed Development;
- reduction in daylight and sunlight amenity to the residential buildings on Rockdove Avenue, Hunmanby Avenue and Hulme Street; and
- reduction in daylight and sunlight amenity to the residential buildings known as Lumiere, The Nile, The Danube, The Rhine and 30 City Road East.

Effects Considered Likely to be Significant

10.3.3 The following effects (**Table 10.1**) were considered likely to be significant and are reported within this chapter.

Table 10.1: Effects Considered Likely to be Significant

Likely Significant Effect	Applicable Development Stage
Reduced daylight and sunlight amenity	Operation
Solar glare	Operation
Light pollution	Operation

Determination of the Baseline

Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution

Scenarios Assessed

10.3.4 The following scenarios have been assessed in relation to daylight, sunlight and overshadowing and are reported within this chapter of the ES:

- Baseline (pre-development);
- Proposed Development; and
- Proposed Development with cumulative surroundings.

10.3.5 A solar glare assessment is required owing to large areas of reflective material and surrounding sensitive road viewpoints. Additionally, owing to the provision of office space within the Proposed Development in close proximity to residential properties, a light pollution assessment has been considered necessary. Solar glare and light pollution assessments are not comparative and are, therefore, considered in absolute terms within the Proposed Development scenario.

- 10.3.6 Solar glare and light pollution have not been considered cumulatively, as they are not comparative assessments and have been assessed in the Proposed Development scenario in absolute terms only, as this represented a worse-case scenario.
- 10.3.7 The Baseline scenario considers the current baseline condition (as can be seen in September 2022). This scenario is depicted on drawing nos. 2226/01-03 presented in **ES Volume 4, Appendix F1**).
- 10.3.8 The Proposed Development scenario is illustrated on drawing nos. 2226/04-06 presented in **ES Volume 4, Appendix F1**).
- 10.3.9 The Proposed Development with cumulative surroundings scenario is illustrated on drawings nos. 2226/07-09 presented in **ES Volume 4, Appendix F1**).

Methodology for Determining Demolition and Construction Effects

- 10.3.10 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, sunlight, overshadowing and light pollution to surrounding properties, and solar glare to nearby road locations, has not been modelled.
- 10.3.11 Since the potential daylight, sunlight, overshadowing, solar glare and light pollution effects relating to demolition and construction works will vary throughout the demolition and construction programme and gradually increase to the potential effects identified for the completed Proposed Development, the interim demolition and 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, overshadowing, solar glare and light pollution impacts. Instead, a qualitative assessment has been undertaken using professional judgement and experience.
- 10.3.12 During demolition and construction, there is the potential for adverse daylight, sunlight, and overshadowing effects at neighbouring residential receptors. It is considered that the effects would not be any worse than those presented by the completed Proposed Development.
- 10.3.13 During demolition and construction, there is the potential for adverse solar glare effects at nearby road junctions as the proposed cladding is installed. It is considered that the effects would not be any worse than those presented by the completed Proposed Development.
- 10.3.14 During demolition and construction, artificial lighting would be used on the Site and therefore there is the potential for adverse light pollution effects at neighbouring residential receptors. The lighting design on Site is not known at this stage; however, the potential for any adverse effects would be controlled in the Construction Environmental Management Plan (CEMP) in line with the ILP Guidance Notes. It is

considered that the effects would be temporary and not be any worse than those presented by the completed Proposed Development without mitigation. The lighting design of the office, assessed in the 'Assessment of Likely Significant Effect' section of this chapter, is likely to only be used once the Proposed Development is operational; therefore, no effects from internal lighting would occur during the demolition and construction works.

10.3.15 On this basis, no technical analysis of the likely effects on the surrounding properties and amenity spaces during the demolition and construction phases has been carried out and the remainder of this ES chapter focuses on the effects relating to the completed Proposed Development.

Methodology for Determining Operational Effects

10.3.16 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

10.3.17 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.

10.3.18 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.

10.3.19 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

10.3.20 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”.

10.3.21 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.

10.3.22 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'.

10.3.23 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.

10.3.24 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

10.3.25 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, detailed floor plans were obtained for all.

10.3.26 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.

10.3.27 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. Therefore, it is implied that an NSL of at least 80% would be considered satisfactory.

- 10.3.28 In regard to deep rooms which are lit by windows on one side, the BRE Guidelines state (para. 2.2.10):

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

Sunlight

Annual Probable Sunlight Hours

- 10.3.29 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.
- 10.3.30 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.
- 10.3.31 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".*
- 10.3.32 In regards to existing surrounding receptors, the BRE Guidelines provide that a window may be adversely affected if a point at the centre of the window receives less than 25% of the APSH, including at least 5% of the APSH during the winter months (21 September to 21 March), or less than 0.8 times its baseline sunlight hours during either period, or if there is a reduction in total APSH which is greater than 4%.

- 10.3.33 As is often the case, it is not possible to determine the room uses within each of the neighbouring properties, nor is it clear which window should be considered as the 'main windows'. Therefore, unless the room 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

- 10.3.34 The BRE Guidelines note that:

"It is recommended that at least half of the amenity areas....should receive at least two hours of sunlight on 21 March."

"The above guidance applies both to new gardens and amenity areas and to existing ones that are affected by new developments. If an existing garden or outdoor space is already heavily obstructed then any further loss of sunlight should be kept to a minimum. In this poorly sunlit case, if as a result of new development the area that can receive two hours of direct sunlight on 21 March is reduced to less than 0.80 times its former size, then this further loss of sunlight is significant. The garden or amenity area will tend to look more heavily overshadowed."

Setting Alternative Baselines to the BRE Targets

- 10.3.35 The BRE guidelines in question are precisely that: guidelines which provide a recommendation to inform site layout and design. They are not mandatory, nor do they form planning policy and their interpretation may be treated flexibly depending on the specifics of each site.
- 10.3.36 Appendix F – Setting Alternative Values for Skylight and Sunlight Access, of the BRE Guide, addresses the application of the guidelines to dense, urban environments. Paragraph F1 of the appendix states: *"Sections 2.1, 2.2 and 2.3 give numerical target values in assessing how much light from the sky is blocked by obstructing buildings. These values are purely advisory and different targets may be used based on the special requirements of the proposed development or its location. Such alternative targets may be generated from the layout dimensions of existing development, or they may be derived from considering the internal layout and daylighting needs of the proposed development itself."*
- 10.3.37 Paragraph F2 further states *"there may be an extant planning permission for a site, but the developer wants to change the design. In assessing the loss of light to existing windows nearby, a local authority may allow the vertical sky component (VSC) and annual probable sunlight hours (APSH) for the permitted scheme to be used as alternative benchmarks"*.

- 10.3.38 Paragraph F5 states *“A similar approach may be adopted in cases where an existing building has windows that are unusually close to the site boundary and taking more than their fair share of light. Figure F3 shows an example, where side windows of an existing building are close to the boundary. To ensure that new development matches the height and proportions of existing buildings, the VSC, daylight distribution, and APSH targets for these windows could be set to those for a ‘mirror-image’ building of the same height and size, an equal distance away on the other side of the boundary.”*

Solar Glare

- 10.3.39 Solar reflections off a building are particularly important at road junctions including pedestrian crossings and traffic signals, as glare can cause temporary blinding of drivers and pedestrians. Typically, those elements of a Proposed Development considered reflective are either glazed elements or specular metal cladding. An assessment has been conducted to determine the time of day, period of year, duration and positioning of potential solar glare according to the driver’s line of sight.
- 10.3.40 The BRE Guidelines include the following statement in regard to the potential for reflected solar glare from a new development:
- “Glare or solar dazzle can occur when sunlight is reflected from a glazed façade. This can affect road users outside and the occupants of adjoining buildings. The problem can occur either when there are large areas of reflective glass or cladding on the façade, or when there are areas of glass or cladding which slope back so that high altitude sunlight can be reflected along the ground. Thus, solar dazzle is only a long-term problem only for some heavily glazed (or mirror clad) buildings...”*
- 10.3.41 The methodology for solar glare is not aimed at addressing the intensity of an instance of reflected solar glare, but rather its occurrence, duration throughout the year and the location of this occurrence in respect of an individual’s line of sight. It is also to be noted that the hours presented reflect solar time and therefore do not take Daylight Saving Hours into account.
- 10.3.42 At 3° (the fovea centralis), the potential for the reflected glare to cause a hazard is high and mitigation would be required. Between 3° and 30°, there is the potential that there could be an issue and mitigation may be necessary.
- 10.3.43 As stated in CIE 146:2002, occurrences at angles beyond 30° would be of little significance in most situations, but may be relevant in exceptional circumstances. When seated in a driving seat of a typical car, for example, the limits of the windscreen would generally obstruct the driver’s view at angles beyond 30° from the line of sight. Therefore, the risk of reflective solar glare causing a hazard is reduced.
- 10.3.44 Solar Glare is not a comparative assessment; the fact it may occur in the baseline does not necessarily justify its occurrence as a result of a Proposed Development.

Therefore, the assessment considers the effect of the Proposed Development in absolute terms.

- 10.3.45 It must be noted that the solar glare assessment undertaken assumes a worst-case scenario whereby the sun will shine every day during daylight hours which is not the case within the UK. Therefore, the solar glare undertaken represents a worst-case scenario.

Light Pollution

- 10.3.46 Light pollution is defined as any light emitting from artificial sources into spaces where it is unwanted, such as spillage of light from office or commercial buildings onto residential accommodation, where this would cause nuisance to the occupants. The ILP Guidance suggests lighting level values to ascertain the acceptability of lighting levels of light pollution.
- 10.3.47 It should be noted that artificial light is not always perceived as being negative, particularly in areas of high crime where good street lighting and light into street environments is seen as a positive attribute. Adverse effects caused as a result of electric lighting include the intrusion of light into sensitive locations such as adjacent residential accommodation, areas of special night-time interest, or needless spillage into the night sky.
- 10.3.48 It should also be noted that the ILP Guidance relates and refers to external luminaires. However, commercial buildings with large areas of glazing and possible night-time usage can sometimes cause light intrusion from their internal luminaires. For this reason, quantitative light pollution assessments can be undertaken in relation to these internal luminaires.
- 10.3.49 Potential light pollution effects of a new development are typically assessed in relation to four specific criteria:
- 'sky glow' is the brightening of the night sky over our towns, cities and countryside. It can be quantified by measuring the Upward Light Ratio (ULR), which is the maximum permitted percentage (%) of luminaire flux for the total installation that goes directly into the sky;
 - 'light intrusion' is the spilling of light beyond the boundary of a Proposed Development. It is assessed as vertical illuminance in lux (E_v) measured flat at the centre of the sensitive receptor;
 - 'luminaire intensity' is the uncomfortable brightness of a light source when viewed against a dark background. It is applied to each source visible from a sensitive receptor and is measured as source intensity (I) (kcd); and
 - 'building luminance' which can cause an increase in the brightness of a general area and is measured in cd per metre squared (L) as an average over the building facade caused only by external lighting.

- 10.3.50 Currently, the external lighting strategy is not known and as such the potential for sky glow cannot be assessed. However, any outdoor lighting will be designed in line with ILP Guidance.
- 10.3.51 For the purposes of this ES chapter, only an assessment of light intrusion has been necessary as the source of potential unwanted artificial light to surrounding sensitive receptors would emit from the proposed office space. Therefore, a light intrusion assessment of the office space has been undertaken.
- 10.3.52 Light pollution is not a comparative assessment; the fact it may occur in the baseline does not necessarily justify its occurrence as a result of the Proposed Development. Therefore, the assessment considers the effect of the Proposed Development in absolute terms, by reference to the relevant guidance levels.
- 10.3.53 **Table 10.2** sets out the environmental zones as per the ILP Guidance, which have been applied in this assessment.

Table 10.2: ILP Guidance Light Pollution Criteria for Environmental Zones

Environmental Zone	Sky Glow ULR (Max %) (1)	Light Intrusion (into windows) E_v (lux) (2)		Luminaire Intensity (candelas) (3)		Building Luminance Pre-curfew (4)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average L (cd/m^2)
E0 – Dark areas (e.g. UNESCO Starlight Reserves, IDA Dark Sky Parks)	0	0	0	0	0	0
E1 – Intrinsically dark areas (e.g. National Parks, areas of outstanding natural beauty)	0	2	0 (1*)	2,500	0	0
E2 – Low district brightness (e.g. rural or small village locations)	2.5	5	1	7,500	500	5
E3 – Medium district brightness (e.g. small town centres or urban locations)	5.0	10	2	10,000	1,000	10

Environmental Zone	Sky Glow ULR (Max %) (1)	Light Intrusion (into windows) E_v (lux) (2)		Luminaire Intensity (candelas) (3)		Building Luminance Pre-curfew (4) Average L (cd/m ²)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	
E4 – High district brightness (e.g. town/city centres with high levels of night time activity)	15.0	25	5	25,000	2,500	25
Notes: ULR = Upward Light Ratio of the Installation is the maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky E_v = Vertical Illuminance in lux and is measure flat on the glazing at the centre of the window I = Light Intensity in cd L = Luminance in cd/m² Curfew = The time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by the planning authority. If not otherwise stated – 23.00 hrs is suggested. * = From Public road lighting installations only.						

10.3.54 With reference to **Table 10.2** above, taken from ILP Guidance, the Site is classified as environmental zone E4. This zone allows for a maximum pre-curfew light intrusion level of 25 lux and a maximum post-curfew light intrusion level of 5 lux.

Summary of Assessment Criteria for Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution

10.3.55 **Table 10.3** provides a summary of the assessment criteria set out within the BRE Guidelines for daylight, sunlight and overshadowing.

Table 10.3: Summary of Daylight, Sunlight and Overshadowing Assessment Criteria

Assessment Approach	Criteria
VSC	A window may be adversely affected if its VSC measured at the centre of the window is less than 27% and less than 0.8 times is former value.
NSL	A room may be adversely affected if the daylight distribution (NSL) is reduced beyond 0.8 times its existing area.

Assessment Approach	Criteria
APSH	A window may be adversely affected if a point at the centre of the window received for the whole year, less than 25% of the APSH including at least 5% of the APSH during the winter months (21 September to 21 March) and less than 0.8 times its former sunlight hours during either period, and for existing neighbouring buildings, if there is a reduction in total APSH which is greater than 4%.
SHOG	An amenity area may be adversely affected if less than 50% of its area receives less than 2 hours of direct sunlight on 21st March and less than 0.8 times its former value.

- 10.3.56 The BRE Guidelines do not set out criteria for the assessment of solar glare and light pollution.
- 10.3.57 For solar glare, as stated in the CIE 146:2002, occurrences at angles beyond 30° would be of little significance in most situations, therefore, an adverse effect may only occur where reflections are situated within 30° of a driver's direct line of sight.
- 10.3.58 For light pollution, breaches of the ILP Guidelines may adversely affect neighbouring residential windows. For an environmental zone E4, the ILP thresholds are 25lux pre-curfew and 5lux post-curfew.

Significance Evaluation Methodology

Daylight, Sunlight and Overshadowing Magnitude of Impact

- 10.3.59 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."*

10.3.60 The classification of major adverse impact is documented within Paragraph 7 of the BRE Guidelines:

"Factors tending towards a major adverse impact include:

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

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 principles as adverse impacts."

10.3.61 The BRE Guidelines do not provide any guidance on what constitutes a moderate adverse impact, or specific guidance on the determination of impact for overshadowing.

10.3.62 Therefore, best practice guidance and professional judgment has been used to determine any impacts based on the guidance set out in Appendix I of the BRE Guidelines. Potential effects are identified as beneficial, adverse or negligible, and their associated magnitude of effects are set out as Negligible, Minor, Moderate and Major.

10.3.63 The initial numerical criteria for determining the magnitude of impact are based on percentage alterations, as set out in **Table 10.4:**

Table 10.4: Daylight, Sunlight & Overshadowing Magnitude of Impact

Magnitude of Impact	Percentage Reduction
Negligible	0-20%
Minor	20-29.9%
Moderate	30-39.9%
Major	40%+

Significance of Effects

Daylight, Sunlight and Overshadowing Significance of Effect

- 10.3.64 The significance of any identified environmental effects is determined by the assessment of their magnitude against their sensitivity of the receptor.
- 10.3.65 **Table 10.5** illustrates how the sensitivity of the receptors and the magnitude of any effect combine to determine the significance of an effect associated with daylight, sunlight and overshadowing.

Table 10.5: Daylight, Sunlight & Overshadowing Significance of Effect

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

- 10.3.66 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.

Solar Glare Significance of Effect

- 10.3.67 Solar Glare is not a comparative assessment; the fact it may occur in the baseline does not necessarily justify its occurrence as a result of a Proposed Development. Therefore, the assessment has considered the effect of the Proposed Development in absolute terms and not against a baseline condition.
- 10.3.68 There are no quantitative criteria within BRE Guidelines (2022) or elsewhere regarding acceptable levels of solar glare.
- 10.3.69 Professional judgement has, therefore, been applied to assign the significance of solar glare arising from the Proposed Development and to determine the criteria for assessing the scale and nature of solar glare effects. All effects greater than Minor Adverse are considered significant (Moderate Adverse and Major Adverse).
- 10.3.70 Multiple viewpoints are chosen for each of the traffic lanes or signals affected from a location. If, for example, one location has multiple lanes or traffic signals, multiple

viewpoints will be assessed from this single location to ensure that all effects are fully understood.

10.3.71 Whilst multiple viewpoints may be identified, professional judgement has been used to determine the effect at the location, rather than the individual perspectives at a signal traffic junction. Factors that could influence the nature, scale and resultant significance of effect may include:

- Sunlight availability probability;
- Area of façade off which reflections are visible;
- Period of time when reflections are visible;
- Angle at which reflections are visible from line of sight;
- Views of the development being obscured for example by trees; and/or
- The time of day at which the solar reflection will occur for example during peak traffic times.

10.3.72 The factors in **Table 10.6** have been used to ascertain the possible scale for each view and the factors listed above will then be taken into consideration to determine the overall significance for the designated viewpoint.

Table 10.6: Solar Glare Significance of Effect

Significance of Effect	Description
Negligible	No reflections are visible or if visible all occur at angles greater than 30° from the driver's line of sight and so, as stated by the CIE, will be of "little significance".
Minor	Solar reflections are visible within 30° to 10° or between 10° to 5° of the driver's line of sight for a short period of time.
Moderate	Solar reflections are visible within 10° and 5° of the driver's line of sight occurring for a long period of time.
Major	Solar reflections are visible within 5° of a driver's line of sight.

Light Pollution Significance of Effect

10.3.73 Light pollution is not a comparative assessment; the fact it may occur in the baseline condition does not necessarily justify its occurrence as a result of Proposed Development. Therefore, the assessment has considered the effect of the Proposed Development in absolute terms, by reference to ILP Guidance.

10.3.74 The ILP Guidance do not provide details on assigning the nature and scale of effects relating to light pollution. Therefore, the determination of the scale and nature of effect has been based on professional judgement, considering the extent of the residential façade adversely affected, as well as the extent to which the thresholds set

out in the guidance are exceeded. **Table 10.7** highlights the criteria used to assign the nature and scale of effect.

Table 10.7: Light Pollution Significance of Effect

Significance of Effect	Description
Negligible	No breaches of ILP criteria for pre-curfew or post-curfew.
Minor	Small breaches of ILP post-curfew criteria, marginally noticeable to the sensitive receptor. This may include marginal breaches of the ILP criteria which should be viewed in the context of the urban character of the area. No breaches in ILP pre-curfew criteria.
Moderate	Breaches in ILP post-curfew criteria which may cause a moderate noticeable change to the sensitive receptor. This may consist of a large proportion of marginal infringements of the numerical values suggested in the ILP guidance and/or a small percentage of significant infringements. No breaches in ILP pre-curfew criteria.
Major	Breaches in ILP post-curfew criteria which may cause a major noticeable change to the sensitive receptor. This may consist of a large proportion of significant breaches of both the pre-curfew and post-curfew criteria suggested within the ILP Guidance Notes.

Categorising Likely Significant Effects

- 10.3.75 Effects classified as Moderate or Major in scale are typically considered to be 'significant'. Effects classified as Minor or Negligible in scale are typically considered to be 'not significant'.

Limitations and Assumptions

- 10.3.76 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.
- 10.3.77 For solar glare, although great care has been taken in identifying typical viewpoints, this does not guarantee that there are no additional sensitive locations where reflected solar glare could present a particular risk. For practical reasons, the area of the assessment has been limited to the area surrounding the Proposed Development. This area extends to a distance of approximately 1km around the Site, in accordance with standard practice. At greater distances, the likelihood of solar reflections causing significant glare is reduced as the time that buildings will reflect is reduced and the area of façade visible constitutes a reduced angle and so reduces the possibility of the whole sun disk being reflected. This approach to solar glare assessment within EIA has been adopted using professional judgement and by reference to the CIE.
- 10.3.78 In addition, the methodology for solar glare is not aimed at addressing the intensity of an instance of reflected solar glare, but rather its occurrence, duration throughout

the year, and the location of this occurrence in respect of an individual's line of sight. It must also be noted that the hours presented reflect solar time and therefore do not take Daylight Saving Hours into account. This approach to solar glare assessment within EIA has been adopted using professional judgement and by reference to Commission Internationale L'Eclairage (CIE) Collection on Glare 2002.

- 10.3.79 Whilst noted in BRE Guidelines (2022) that solar reflections from a new development can affect occupants of adjoining, this has not been assessed within this ES chapter. Reflections to occupants at the surrounding buildings is not considered to present the same level of risk as to road and rail users.
- 10.3.80 The light pollution assessment has been undertaken by preparing a computer-generated 3D model of the Proposed Development and using specialist lighting simulation software. The light fittings used for this lighting simulation represent typical recessed office luminaires regularly spaced on the proposed office ceilings within the proposed commercial building in order to achieve an average illuminance of 500 lux across the working plane. This assessment assumes that all luminaires are switched on at once and no blinds or shading devices are deployed for the purpose of the light pollution assessment. The glazing specification is not yet known and therefore a worst-case assumption of clear double-glazing has been used. For these reasons, it should be considered a worst-case scenario.

10.4 Scoping and Consultation

- 10.4.1 An EIA Scoping Report (presented in **ES Volume 4, Appendix A1**) was submitted to MCC on 8th September 2022 with a formal request for an opinion on the proposed scope of the EIA and assessment methodologies. MCC subsequently issued their Scoping Opinion on the proposed scope and methodology of the topics for assessment within the EIA. A copy of MCC's Scoping Opinion is provided in **ES Volume 4, Appendix A2**.
- 10.4.2 A summary of the key points raised in MCC's Scoping Opinion, relevant to daylight, sunlight, overshadowing, solar glare and light pollution, are presented in **Table 10.8** including a response as to where the comments have been addressed within this chapter.

Table 10.8: MCC Scoping Opinion Comments and Response

Summary of Comment	Response or location within the ES where comments are addressed
The comments within your scoping report are noted and are acceptable in terms of their consideration in the ES.	N/A.

10.5 Baseline Assessment and Identification of Key Receptors

Sensitive Receptors

Daylight, Sunlight and Overshadowing

- 10.5.1 The BRE Guidelines suggest that residential properties have the highest requirement for daylight and sunlight and states that:
- “the guidelines are intended for use for rooms in adjoining dwellings where light is required, including living rooms, kitchens and bedrooms.”*
- 10.5.2 The scope of residential properties that have been assessed has been determined through professional judgement, considering their orientation and proximity to the Proposed Development. There is no set distance within which a building requires consideration however professional judgement has been used to set the scope, considering the height of the Proposed Development, the architecture and the orientation of the surrounding residential buildings.
- 10.5.3 A Site inspection was undertaken to determine the uses of the surrounding buildings, and desktop research was undertaken to ascertain the specific layouts of the residential properties, and to identify any relevant amenity area.
- 10.5.4 The following properties are defined as sensitive receptors and will be considered due to their proximity to the Site, and their residential use:
- City South Apartments; and
 - River Street Tower.
- 10.5.5 There are no living rooms within River Street Tower that face the Site and within 90° of due south, and as such, no sunlight assessment has been undertaken.
- 10.5.6 The BRE Guidelines suggest that *“the availability of sunlight should be checked for all open spaces where it will be required. This would normally include:*
- *gardens, such as the main back garden of a house or communal garden including courtyards and roof terraces;*
 - *parks and playing fields;*
 - *children’s playgrounds;*
 - *outdoor swimming pools and paddling pools, and other areas of recreational water such as marinas and boating lakes (the daylight and sunlight effects on permanent residential moorings may be assessed using the methods in sections 2.2 and 3.2); and*
 - *sitting out areas such as those between non-domestic buildings and in public squares.”*
- 10.5.7 The following amenity areas are defined as sensitive receptors and will be considered due to their proximity to the Site, and their residential use:

- City South Apartments roof terraces.

10.5.8 These properties and amenity areas are identified in the drawings contained in **ES Volume 4, Appendix F1**.

Solar Glare

10.5.9 Road junctions are considered sensitive in relation to solar glare and, therefore, the relevant viewpoints at traffic junctions from which the Proposed Development will be visible have been considered.

10.5.10 The sensitive locations assessed are presented in **ES Volume 4, Appendix F6**, where arrows indicate position and direction of road views.

10.5.11 The following 24 road locations have been identified. Where appropriate, relevant views have been grouped together:

- AS – Albion Street southbound, junction with Whitworth Street West;
- SS – Shortcroft Street southbound, junction with River Street;
- RS – River Street westbound, junction with Medlock Street;
- HS1 – Hulme Street westbound, junction with Great Marlborough Street;
- HS2 – Hulme Street westbound, junction with Cambridge Street;
- HS3 – Hulme Street westbound, junction with Wilmott Street;
- CS1 – Chester Street westbound, junction with Cambridge Street;
- CS2 – Chester Street westbound, junction with Wilmott Street;
- MW1 – Mancunian Way westbound viewpoint 1;
- MW2 – Mancunian Way westbound viewpoint 2;
- MW3 – Mancunian Way eastbound viewpoint 3;
- MW4 – Mancunian Way eastbound viewpoint 4;
- MW5 – Mancunian Way eastbound viewpoint 5;
- DGI – Deansgate Interchange Slip-road eastbound, junction with Mancunian Way;
- CBS – Cambridge Street northbound, junction with roundabout;
- ES – Epping Street northbound, junction with Stretford Road;
- NS – Newcastle Street northbound, junction with Loxford Street;
- PR1 – Princess Road northbound;
- PR2 – Princess Road northbound, Medlock Street roundabout;
- MS1 – Medlock Street northbound, roundabout junction;
- MS2 – Medlock Street northbound, roundabout junction;

- MS3 – Medlock Street northbound, roundabout junction;
- LS2 – Leaf Street northbound, junction with Clarendon Street; and
- NV – New Vine Street northbound, junction with Clarendon Street.

Light Pollution

10.5.12 Light Pollution effects are most likely to occur at receptors located within a 30m radius of the office elements of the Proposed Development. Therefore, the following three sensitive buildings, with the potential to see light pollution effects have been considered:

- City South Apartments (existing);
- River Street Tower (existing); and
- The Proposed Development, Block B (proposed purpose-built student accommodation (PBSA)).

Sensitivity of Identified Receptor

Daylight, Sunlight and Overshadowing

- 10.5.13 It is important that the location and nature of the Site and surroundings 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 a development could be deemed to be special circumstances in which the planning authority may wish to use different target values. This scope and view should also be followed through to the sensitivity of the surrounding receptors. There should be an expectation that a higher degree of obstruction is inevitable in an area with modern high-rise buildings. This point is also made in the NPPF and PPG.
- 10.5.14 For these reasons, the surrounding receptors may have a lower sensitivity to change in an urban location than those located in sub-urban, less dense areas. Sensitivity classification is assigned on how the proposed receptor is able to accommodate or adapt to the effect of a development. The existing residential receptors surrounding the Site reside in a city centre location where there is an expectation for a higher density of development. The Site is currently low density, meaning it is underdeveloped and there is an unusually open aspect given the city centre location. City South Apartments and their associated amenity areas are therefore deemed to have a medium sensitivity.
- 10.5.15 River Street Tower is PBSA, and the rooms overlooking the Site are all bedrooms. Student occupiers are transient, and only occupy the building during term times, and as such, they are less sensitive to changes in amenity than residential owner occupiers. Furthermore, the BRE Guide states that bedrooms have a lesser

requirement for daylight than other room uses, such as living rooms. River Street Tower is therefore deemed to have a low sensitivity.

Solar Glare

10.5.16 All viewpoints assessed for solar glare are considered to be of high sensitivity.

Light Pollution

10.5.17 In relation to light pollution, all the residential receptors assessed are of high sensitivity.

Baseline Assessment for Daylight, Sunlight and Overshadowing

10.5.18 The full Baseline daylight, sunlight and overshadowing results can be found in **ES Volume 4, Appendix F2** and are summarised in **Table 10.9** and **Figure 10.1** below.

10.5.19 A total of 564 windows facing the Site serving 447 rooms within two buildings were assessed for VSC and NSL for daylight and 33 rooms were assessed for APSH for sunlight within one building.

10.5.20 There are no living rooms within River Street Tower that face the Site and within 90° of due south, and as such, no sunlight assessment has been undertaken.

10.5.21 Out of the 564 windows assessed for daylight, 453 (80%) meet the BRE guidelines for VSC. For NSL, 433 (97%) of the 447 rooms assessed meet the BRE criteria. For sunlight, 28 (85%) of the 33 rooms assessed meet the BRE criteria for both Winter and Annual APSH.

Table 10.9: Baseline Daylight and Sunlight results to Surrounding Sensitive Receptors

Property Address	VSC		NSL		APSH	
	No. of Windows meeting 27% VSC Target	Total No. of Windows Tested	No. of Windows meeting 80% NSL Target	Total No. of Windows Tested	No. of Windows meeting 25%/5% APSH Target	Total No. of Windows Tested
City South Apartments	16	119	65	79	28	33
River Street Tower	437	445	368	368	-	-
Total	453	564	433	447	28	33

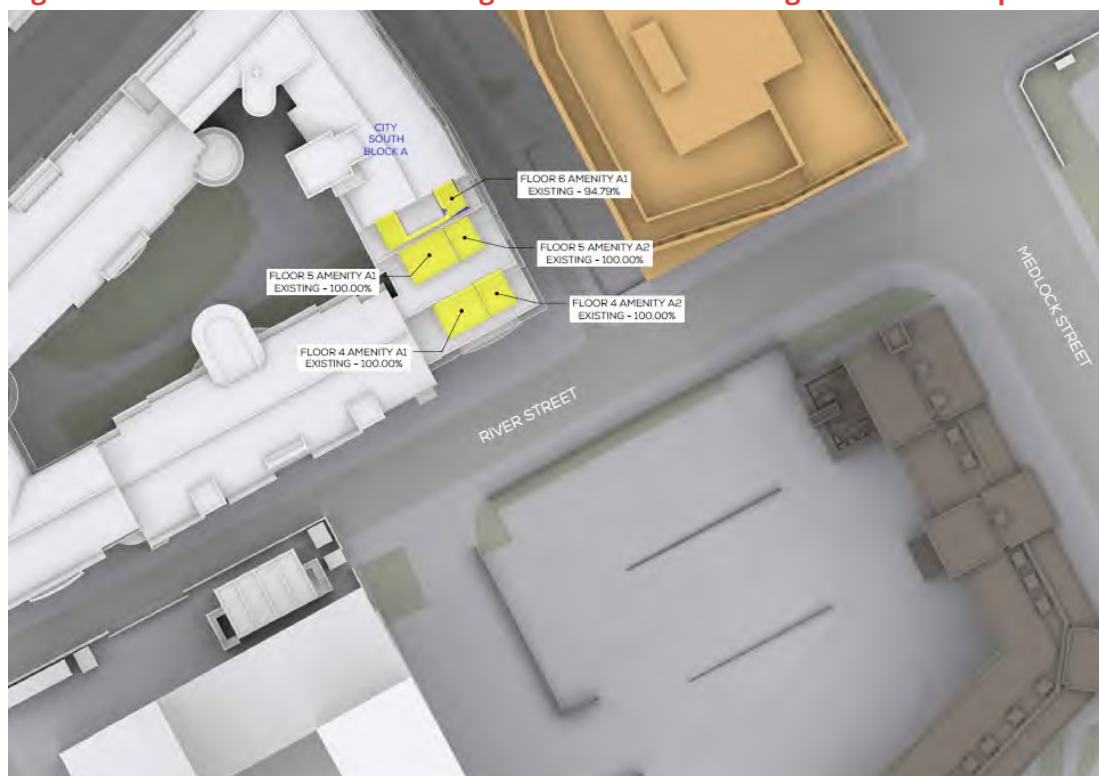
10.5.22 The assessment of baseline levels to the surrounding properties considers whether a window/room already meets the BRE criteria in the existing scenario only, whilst the BRE guide states that a window/room should not be reduced by any more than 0.8 times its former value (a 20% reduction) in the proposed scenario. As such, as the VSC target is 27%, if a window in the baseline has 25% VSC, it will be classed as not

meeting the BRE targets. In the proposed scenario, if the same window is reduced to 24%, it will be classed as meeting the VSC target as it is within 0.8 times its former value. Therefore, some windows/rooms may not meet the target criteria in the baseline but will in the proposed scenario.

10.5.23 A total of five amenity spaces facing the Site (as listed below) were assessed for SHOG. All five (100%) meet the BRE criteria for SHOG.

- City South apartments Floor 4 roof terrace A1;
- City South apartments Floor 4 roof terrace A2;
- City South apartments Floor 5 roof terrace A1;
- City South apartments Floor 5 roof terrace A2; and
- City South apartments Floor 6 roof terrace A1.

Figure 10.1: Baseline Overshadowing results to Surrounding Sensitive Receptors



Solar Glare

10.5.24 Solar glare assessments are not comparative and are therefore considered in absolute terms within the Proposed Development scenario.

Light Pollution

10.5.25 Light pollution assessments are not comparative and are therefore considered in absolute terms within the Proposed Development scenario.

Conclusions Regarding Baseline Environmental Quality and Key Receptors

- 10.5.26 Overall, this baseline scenario is considered a moderate level of compliance due to the city centre context of the Site.
- 10.5.27 The Site is underdeveloped in context to its city centre location, and therefore has an unusually open aspect, which contributes to higher baseline results to the surrounding receptors.

Future Baseline (the 'do nothing' scenario)

- 10.5.28 The future baseline considers an indeterminate point in the future where surrounding cumulative schemes are built out within the surrounding environment, in the absence of the Proposed Development. A qualitative approach has been taken, using professional judgement, informed the existing baseline and a review of surrounding cumulative schemes considered for assessment within this ES chapter.
- 10.5.29 Given the relative distance, scale and/or planning status of surrounding committed schemes, the adjacent office scheme (128002/FO/2020) will likely result in reduced baseline daylight and sunlight conditions to east-facing rooms within City South Apartments, however no other effects are anticipated to the existing baseline. Therefore, the future baseline conditions are likely to be similar to those described in the existing baseline section.
- 10.5.30 Solar glare is not a comparative assessment; the fact it may occur in the baseline does not necessarily justify its occurrence as a result of a Proposed Development. The existing building is five storeys in height so would only be visible within close range views and comprises a predominantly solid façade with small windows. Whilst reflections may occur from these glazed elements towards drivers at nearby road locations, they are unlikely to significantly impact driver visibility. Significant effects resulting from committed schemes within 500m of the Site should have been mitigated prior to their implementation.
- 10.5.31 Light pollution is not a comparative assessment; the fact it may occur in the baseline does not necessarily justify its occurrence as a result of a Proposed Development. Given the hotel use of the existing building within the Site, no light pollution would occur to neighbouring residential properties. The Site also contains a car park with pole top lighting; due to the highly directional nature of modern car park lighting, it is unlikely that neighbouring residential properties are impacted by the pole top car park lights. Significant effects resulting from the adjacent office scheme (128002/FO/2020) should have been mitigated prior to its implementation.
- 10.5.32 Given that the Site is within a developing city centre, it is likely that development of a similar scale would come forward, in which case the future baseline may be similar to that reported in the 'Assessment of Likely Significant Effect' section. Assuming the Site

is retained in its current condition, the future baseline would remain as reported in the “Baseline Assessment for Daylight, Sunlight and Overshadowing” section.

10.6 Identification and Description of Changes Likely to Generate Effect

10.6.1 The Proposed Development has the potential to lead to the following effects:

- loss of daylight to surrounding residential amenity;
- loss of sunlight to surrounding residential amenity;
- overshadowing of local amenity areas;
- solar glare impacting viewpoints for drivers at nearby road junctions; and
- light pollution to surrounding residential dwellings.

10.7 Assessment of Likely Significant Effect

Operational Phase

Embedded Mitigation

- 10.7.1 There were no embedded mitigation measures considered for the operational phase in daylight, sunlight, overshadowing and light pollution terms.
- 10.7.2 For solar glare, due to the location of the buildings within the field of view at multiple sensitive road locations, fixed shading devices have been incorporated within the facade design of Block A to reduce solar glare effects. For the eastern and western elevations of Block B, non-specular finish solid panels have been included within the design to break up reflections, whilst a non-reflective frit (50% frit/50% low reflectance glazing) has been applied to the outer surface of the glazing for the southern elevation of Block B to reduce the intensity of any reflections and thus reduce the solar glare effects.

Anticipated Effects

Daylight to Surrounding Sensitive Receptors

- 10.7.3 The full Proposed Development daylight results are presented within **ES Volume 4, Appendix F2** and are summarised in **Table 10.10** and **Table 10.11** below.
- 10.7.4 A total of 564 windows serving 447 rooms were assessed for daylight within two buildings considered to be sensitive receptors.
- 10.7.5 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 10.10: Summary of VSC Daylight Impact from the Completed Proposed Development

Property Address	Total No. of Windows Tested	No. of Windows Meeting Guidelines for VSC Impact	No. Below Guidelines for VSC		
			Minor Adverse	Moderate Adverse	Major Adverse
City South Apartments	119	47	20	2	50
River Street Tower	445	53	10	40	342
Total	564	91	31	41	392

Table 10.11: Summary of NSL Daylight Impacts from the Completed Proposed Development

Property Address	Total No. of Rooms Tested	No. of Rooms Meeting Guidelines for NSL Impact	No. Below Guidelines for NSL		
			Minor Adverse	Moderate Adverse	Major Adverse
City South Apartments	79	62	12	5	0
River Street Tower	368	93	21	21	233
Total	447	155	33	26	233

City South Apartments

- 10.7.6 A total of 119 windows serving 79 rooms were assessed for daylight within this building to compare the existing baseline against the Proposed Development.
- 10.7.7 For VSC, 47 (40%) of the 119 windows meet the BRE criteria. Twenty of the affected windows will experience an alteration between 20-30%, two of the affected windows will experience an alteration between 30-40%, and the remaining 50 windows will experience alterations in excess of 40% from the baseline value.
- 10.7.8 The VSC compliance level of 40% must be considered in the context of the baseline compliance level of 13%. Paragraph 10.5.22 clarifies that some windows/rooms may not meet the target criteria in the baseline but will in the Proposed Development scenario. The low baseline compliance levels mean that only small reductions in VSC will lead to a much larger Magnitude of Effect. For example, room F02, R6 is a bedroom on the second floor of Block A in City South apartments. In the baseline

scenario it will achieve 5.7% VSC. In the Proposed Development scenario, it will achieve 3.9% VSC. This is a reduction of 1.8% VSC, or 32% i.e. a moderate adverse effect. If the window achieved a baseline VSC of 27%, the BRE target, it could be reduced by 0.8 times to 21.6% and still comply with the BRE Guide. This is a reduction of 5.4% VSC, which would result in a negligible effect.

- 10.7.9 The low baseline levels therefore have a significant influence on the overall proportional reduction.
- 10.7.10 Furthermore, 45 of the 81 windows that do not meet the VSC targets serve bedrooms, which the BRE Guide recognises as having a lesser requirement for daylight. The remaining windows serve 13 living kitchen diners.
- 10.7.11 For NSL, 62 (79%) of the 79 rooms assessed will meet the BRE criteria. Twelve of the affected windows will experience an alteration between 20-30% and five of the affected windows will experience an alteration between 30-40%.
- 10.7.12 Only six of the rooms that do not meet the targets are living kitchen diners, the remaining rooms are bedrooms. The impact to all of these living kitchen diners is minor adverse, with the exception of one, which will be reduced by 30.3%, a very marginal moderate adverse impact.
- 10.7.13 Overall, considering the city centre location, emerging height and density in the locality and the flexibility with which the BRE is intended to be used, the effect on daylight to this property is considered to be **moderate adverse**, permanent and irreversible.
- 10.7.14 As referred to in paragraph 10.3.66 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. Whilst the BRE provides a list of factors that should be considered when assigning significance, the list is not exhaustive.
- 10.7.15 Whilst moderate adverse effects would typically be considered as significant, the effect on daylight is considered to be **not significant** for the following reasons:
- The receptor resides in a city centre, where higher density development is expected, and so the receptor has a medium sensitivity. Deviations from the published BRE targets are therefore inevitable;
 - Most impact falls to bedrooms, rather than the main living kitchen diners;
 - The overhanging balconies limit the existing availability of daylight available to the living kitchen diners and create a higher burden on the Site to maintain open views. This is evidenced by the low baseline compliance figures;

- Despite the current low density of the Site, the baseline compliance levels are very low, and place a high burden on the site to maintain the current levels;
- The NPPG states *“areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings”*;
- The overall impact is limited in context to the receptor as a whole, given that the assessment only considers only those windows/rooms which face the Site; and
- The receptor will retain good NSL daylight levels with the Proposed Development in place.

River Street Tower

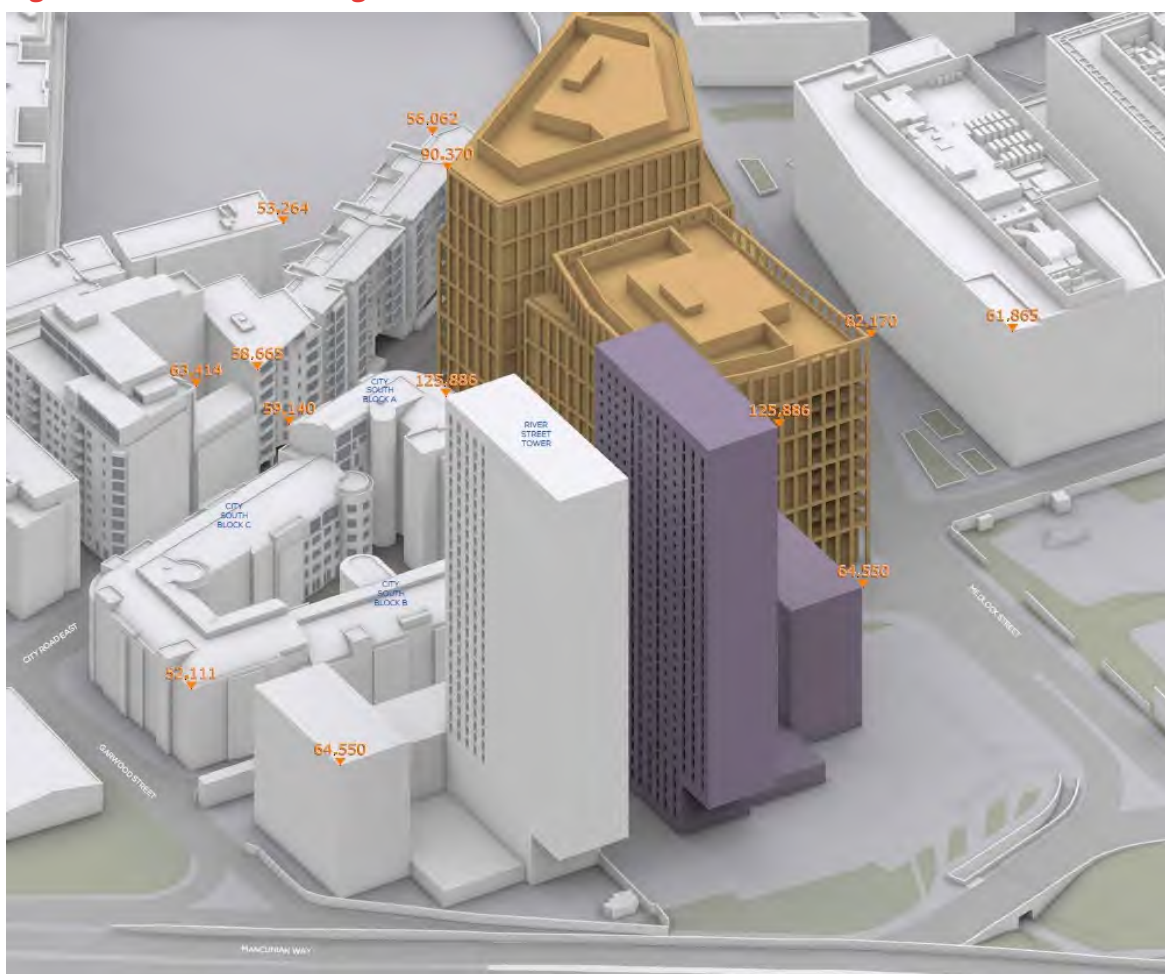
- 10.7.16 A total of 445 windows serving 368 rooms were assessed for daylight within this building to compare the baseline against the Proposed Development.
- 10.7.17 There are no living rooms within River Street Tower that face the Site and within 90° of due south, and as such, no sunlight assessment has been undertaken.
- 10.7.18 For VSC, 53 (12%) of the 445 windows meet the BRE criteria. Ten of the affected windows will experience an alteration between 20-30%, 40 of the affected windows will experience an alteration between 30-40%, and the remaining 342 windows will experience alterations in excess of 40% from the baseline value.
- 10.7.19 For NSL, 93 (25%) of the 368 rooms assessed will meet the BRE criteria. Twenty-one of the affected rooms will experience an alteration between 20-30%, 21 of the affected rooms will experience an alteration between 30-40%, and the remaining 233 rooms will experience alterations in excess of 40% from the baseline value.

Alternative Baseline Assessment

- 10.7.20 Appendix F – Setting Alternative Values for Skylight and Sunlight Access, of the BRE Guide, addresses the application of the guidelines to dense, urban environments. Paragraph F1 of the appendix states: *“Sections 2.1, 2.2 and 2.3 give numerical target values in assessing how much light from the sky is blocked by obstructing buildings. These values are purely advisory and different targets may be used based on the special requirements of the proposed development or its location. Such alternative targets may be generated from the layout dimensions of existing development, or they may be derived from considering the internal layout and daylighting needs of the proposed development itself.”*
- 10.7.21 Paragraph F2 further states *“there may be an extant planning permission for a site, but the developer wants to change the design. In assessing the loss of light to existing windows nearby, a local authority may allow the vertical sky component (VSC) and annual probable sunlight hours (APSH) for the permitted scheme to be used as alternative benchmarks”*.

- 10.7.22 Paragraph F5 states “A similar approach may be adopted in cases where an existing building has windows that are unusually close to the site boundary and taking more than their fair share of light. Figure F3 shows an example, where side windows of an existing building are close to the boundary. To ensure that new development matches the height and proportions of existing buildings, the VSC, daylight distribution, and APSH targets for these windows could be set to those for a ‘mirror-image’ building of the same height and size, an equal distance away on the other side of the boundary.”
- 10.7.23 A further assessment of the Proposed Development on River Street Tower has been undertaken using a building of equal size as River Street Tower mirrored on the boundary of the Site. **Figure 10.2** shows the mirror massing baseline adopted for this analysis.

Figure 10.2: Mirror Massing Baseline



- 10.7.24 The drawings and results for this scenario can be found in **ES Volume 4, Appendix F4** and **ES Volume 4, Appendix F5**. The results are summarised in **Table 10.12**.

Table 10.12: Mirror Massing Daylight and Sunlight results to surrounding sensitive receptors

Property Address	VSC		NSL	
	No. of Windows meeting 27% VSC Target	Total No. of Windows Tested	No. of Windows meeting 80% NSL Target	Total No. of Windows Tested
River Street Tower	256	445	199	368
Total	256	445	199	368

10.7.25 Using the mirrored massing as baseline, 256 (54%) of 445 windows assessed for VSC daylight will either achieve the BRE targets or be within 0.8 times of the value achieved with the Proposed Development built out. For NSL daylight, 199 (57%) of 368 rooms assessed will either achieve the BRE targets or be within 0.8 times of the value achieved with the Proposed Development built out.

10.7.26 This is a reasonable level of compliance given the context and location of the site.

10.7.27 In order to provide a transparent assessment of the effects, the assessment discussed in detail on a receptor by receptor basis below uses the existing Site as a baseline. However, the alternative baseline discussed above should be considered when reviewing the effects.

10.7.28 Overall, considering the city centre location, emerging height and density in the locality, assessment against the mirror baseline and the flexibility with which the BRE is intended to be used, the effect on daylight to this property is considered to be **moderate adverse**.

10.7.29 Whilst moderate adverse effects would typically be considered as significant, the effect on daylight is considered to be **not significant** for the following reasons:

- Most impact falls to student bedrooms, rather than residential living kitchen diners;
- The NPPG states “*areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings*”;
- The receptor has a low sensitivity to change based on the student use; and
- The mirrored baseline analysis demonstrates reasonable compliance levels against other city centre developments.

Sunlight to Surrounding Sensitive Receptors

10.7.30 The full Proposed Development sunlight results can be found within **ES Volume 4, Appendix F2** and are summarised in **Table 10.13** and **Table 10.14**.

- 10.7.31 A total of 33 rooms were assessed for sunlight within one building considered sensitive receptors.
- 10.7.32 There are no living rooms within River Street Tower that face the Site and within 90° of due south, and as such, no sunlight assessment has been undertaken.
- 10.7.33 Windows that are not within 90 degrees of due south, or do not serve living rooms, were excluded from the assessment. There are no living rooms within River Street Tower that face the Site, and as such, no sunlight assessment has been undertaken.
- 10.7.34 The City South apartment building is discussed in more detail below.

Table 10.13: Summary of APSH Impacts from the Completed Proposed Development

Property Address	Total No. of Rooms Tested	No. of Rooms Meeting Guidelines for APSH Impact	No. Below Guidelines For APSH		
			Minor Adverse	Moderate Adverse	Major Adverse
City South Apartments	33	20	0	0	10
Total	33	20	0	0	10

Table 10.14: Summary of Winter PSH Impacts from the Completed Proposed Development

Property Address	Total No. of Rooms Tested	No. of Rooms Meeting Guidelines for Winter PSH Impact	No. Below Guideline for Winter PSH		
			Minor Adverse	Moderate Adverse	Major Adverse
City South Apartments	33	20	0	1	6
Total	33	20	0	1	6

City South Apartments

- 10.7.35 A total of 33 rooms within this building were assessed for sunlight to compare the baseline against the Proposed Development.
- 10.7.36 20 (61%) of the 33 rooms meet the BRE criteria. For APSH, ten rooms will experience alterations in excess of 40% from the baseline value. For winter PSH, one room will experience alterations of 30%-40% and six rooms will experience alterations in excess of 40%.

- 10.7.37 The living rooms are all set beneath overhanging balconies, which restrict the availability of direct sunlight and place a higher burden on the Site to maintain an unobstructed view.
- 10.7.38 Overall, considering the city centre location, emerging height and density in the locality, the effect on sunlight to this property is considered to be **moderate adverse**.
- 10.7.39 Whilst moderate adverse effects would typically be considered as significant, the effect on sunlight is considered to be **not significant** for the following reasons:
- The impact on sunlight is limited in context to the property as a whole;
 - The NPPG states “*areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings*”; and
 - The overhanging balconies limit the availability of sunlight and create a higher burden on the Site to maintain open views.

Overshadowing to Surrounding Sensitive Receptors

- 10.7.40 The full Proposed Development overshadowing results can be found within **ES Volume 4, Appendix F2** and are summarised in **Table 10.15** below.

Table 10.15: Summary of Overshadowing Effects from the Completed Proposed Development

Amenity Space	Total Area Lit with Proposed Development	Meetings BRE Criteria
F04 A1	59.55%	YES
F04 A2	67.86%	YES
F05 A1	96.94%	YES
F05 A2	88.54%	YES
F06 A1	51.54%	YES

City South Apartments

- 10.7.41 A total of five amenity areas within this building were assessed for overshadowing to compare the baseline against the Proposed Development.
- 10.7.42 Five out of five (100%) of the amenity areas will meet the BRE criteria.
- 10.7.43 Overall, the effect on overshadowing to these amenity areas is considered to be **negligible** and **not significant**.

Solar Glare

- 10.7.44 The full solar glare assessment is provided in **ES Volume 4, Appendix F6**.

- 10.7.45 The assessment has been undertaken from nearby road locations which are considered sensitive in terms of solar glare. These include traffic junctions and pedestrian crossings. At locations where there is more than one traffic signal from which the Proposed Development is visible, several viewpoints have been tested (noted by the reference a, b, c etc.) in order to have a better understanding of the likely impact that the Proposed Development might have upon road users' responsiveness.
- 10.7.46 The number of viewpoints tested per location varies according to the number of lanes, direction of travel and number of traffic lights. This is specified in the discussion below, where appropriate.
- 10.7.47 Following a review of an extended area of investigation (approximately 500m radius from the Proposed Development), a total of 24 road locations were assessed. The assessment considers the potential occurrence of solar reflections from the Proposed Development owing to its size and large areas of glazing on the façade at these 24 locations. The duration of solar reflections as well as their proximity to a road driver's line of sight have been considered within the discussion below.
- 10.7.48 It is considered that no significant effects occur at one location. This is because the Proposed Development is visible but no solar reflections occur. Therefore, the following location below experiences a **negligible** and **not significant** effect and is not discussed further:
- NS – Newcastle Street northbound, junction with Loxford Street.
- 10.7.49 Therefore, a total of 23 locations remains where there is at least one viewpoint which sees the potential for solar glare within 30° of a road users' line of sight. At 16 of these locations, the effect is considered to be **minor adverse** and **not significant**. This is because reflections occur within 30° of a road users' line of sight but beyond 10° or between 5° and 10° for a short period of time. Additionally, most of these locations comprise more than one viewpoint looking towards multiple signals where at least one viewpoint is unaffected. These 16 locations comprise:
- SS – Shortcroft Street southbound, junction with River Street;
 - RS – River Street westbound, junction with Medlock Street;
 - CS1 – Chester Street westbound, junction with Cambridge Street;
 - CS2 – Chester Street westbound, junction with Wilmott Street;
 - MW1 – Mancunian Way westbound viewpoint 1;
 - MW2 – Mancunian Way westbound viewpoint 2;
 - MW3 – Mancunian Way eastbound viewpoint 3;
 - MW4 – Mancunian Way eastbound viewpoint 4;
 - MW5 – Mancunian Way eastbound viewpoint 5;

- DGI – Deansgate Interchange Slip-road eastbound, junction with Mancunian Way;
- CBS – Cambridge Street northbound, junction with roundabout;
- ES – Epping Street northbound, junction with Stretford Road;
- PR2 – Princess Road northbound, Medlock Street roundabout junction 2;
- MS3 – Medlock Street northbound, roundabout junction 5;
- LS2 – Leaf Street northbound, junction with Clarendon Street; and
- NV – New Vine Street northbound, junction with Clarendon Street.

10.7.50 At the remaining seven locations, reflections occur within 10° of a road user's line of sight which require further consideration. These seven locations are discussed in further detail below and comprise:

- AS – Albion Street southbound, junction with Whitworth Street West;
- HS1 – Hulme Street westbound, junction with Great Marlborough Street;
- HS2 – Hulme Street westbound, junction with Cambridge Street;
- HS3 – Hulme Street westbound, junction with Wilmott Street;
- PR1 – Princess Road northbound;
- MS1 – Medlock Street northbound, roundabout junction; and
- MS2 – Medlock Street northbound, roundabout junction.

Albion Street southbound, junction with Whitworth Street West (AS)

10.7.51 Two viewpoints have been assessed at this junction, ASa and ASb. Viewpoint ASa shows the view of drivers in the left lane looking at the traffic lights on the left side of the road, whilst viewpoint ASb shows drivers in the right lane looking at the traffic lights on the right side of the road. There is a third traffic light on the opposite side of the junction primarily for use by stationary vehicles.

10.7.52 **Table 10.16** provides a summary of the duration potential reflections could occur for any reflections within 10° of a drivers direct line of sight, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 10.3.671

10.7.53 Reflections at viewpoint ASb are outside 10° of a drivers' line of sight and so this viewpoint is Minor Adverse.

Table 10.16: Summary of Potential Reflections at Albion Street (ASa)

Viewpoint	Façade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect*
ASa	Block A: Northern	After 19:00 GMT	Mid-May to mid-July	5°-8°	Moderate
	Block B: Upper Eastern	07:00 to 09:00 GMT	Mid-January to mid-March and mid-September to mid-November	9°-16° and above 5° visor line	Minor
	Block B: Lower Eastern	08:00 to 09:00 GMT (inter-reflections)	Mid-January to mid-February and mid-October to mid-November	5°-6°	Minor
*Prior to consideration of any mitigating factors outlined below.					

10.7.54 At this junction, for the viewpoints (ASa and ASb) assessed:

- The junction is served by alternative traffic lights that could be used by drivers, during the short period that reflections from the Proposed Development are visible within 10° at viewpoint ASa;
- Most potential reflections occur above the driver's visor line, which would mitigate any effects when deployed;
- The potential reflections below the visor line only occur for small areas within the driver's field of view;
- Reflections occurring from the lower eastern elevation of Block B result from inter-reflection and so are low intensity reflections;
- The main reflections below the visor line occur outside peak traffic times; and
- The reflections occur in the early morning when the likelihood of the sun shining is less than 30%.

10.7.55 Therefore, based on professional judgement, in consideration of the initial significance of potential effects, and the factors outlined above, the overall effect in terms of solar glare to drivers at the junction of Albion Street with Whitworth Street West is considered to be **minor adverse** and **not significant**.

Hulme Street westbound, junction with Great Marlborough Street (HS1)

10.7.56 One viewpoint has been assessed at this junction, HS1. There is just one lane of traffic, and this is not a controlled junction; therefore, the viewpoint assessed (HS1) shows the view of drivers looking forward as they approach the junction.

10.7.57 **Table 10.17** provides a summary of the duration potential reflections could occur for any reflections within 10° of a drivers direct line of sight, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 10.3.71.

Table 10.17: Summary of Potential Reflections at Hulme Street (HS1)

Viewpoint	Façade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect*
HS1	Block A: Eastern	Before 05:00 GMT	Mid-May to mid-July	5°-9°	Moderate
	Block B: Upper Eastern	Before 06:00 GMT	Mid-May to mid-July	8°-13° and above 5° visor line	Moderate
*Prior to consideration of any mitigating factors outlined below.					

10.7.58 At this junction, for the viewpoint assessed:

- There are no signals where visibility can be affected by reflections from the Proposed Development;
- Most potential reflections occur above the driver's visor line, which would reduce any effects when deployed;
- The potential reflections only occur for small areas within the driver's field of view;
- Reflections from Block B are broken up by non-reflective elements of the façade;
- The reflections occur outside peak traffic times; and
- The reflections occur in the early morning when the likelihood of the sun shining is less than 30%.

10.7.59 Therefore, based on professional judgement, in consideration of the initial significance of potential effects, and the factors outlined above, the overall effect in terms of solar glare to drivers at the junction of Hulme Street with Great Marlborough Street is considered to be **minor adverse** and **not significant**.

Hulme Street westbound, junction with Cambridge Street (HS2)

10.7.60 One viewpoint has been assessed at this junction, HS2. There is just one lane of traffic, and this is not a controlled junction, therefore the viewpoint assessed (HS2) shows the view of drivers looking forward as they approach the junction.

10.7.61 **Table 10.18** provides a summary of the duration potential reflections could occur for any reflections within 10° of a drivers' direct line of sight, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 10.3.71.

Table 10.18: Summary of Potential Reflections at Hulme Street (HS2)

Viewpoint	Façade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect*
HS2	Block A: Eastern	Before 05:00 GMT	Mid-May to mid-July	5°-9° and above 5° visor line	Moderate
	Block B: Upper Eastern	05:00 to 06:00 GMT	Mid-May to mid-July	10°-13° and above 5° visor line	Minor
*Prior to consideration of any mitigating factors outlined below.					

10.7.62 At this junction, for the viewpoint assessed:

- There are no signals where visibility can be affected by reflections from the Proposed Development;
- All potential reflections occur above the driver's visor line, which would reduce any effects when deployed;
- The potential reflections only occur for small areas within the driver's field of view;
- The reflections occur outside peak traffic times; and
- The reflections occur in the early morning when the likelihood of the sun shining is less than 30%.

10.7.63 Therefore, based on professional judgement, in consideration of the initial significance of potential effects, and the factors outlined above, the overall effect in terms of solar glare to drivers at the junction of Hulme Street with Cambridge Street is considered to be **minor adverse** and **not significant**.

Hulme Street westbound, junction with Wilmott Street (HS3)

- 10.7.64 One viewpoint has been assessed at this junction, HS3. There is just one lane of traffic, and this is not a controlled junction, therefore the viewpoint assessed (HS3) shows the view of drivers looking forward as they approach the junction.
- 10.7.65 **Table 10.19** provides a summary of the duration potential reflections could occur for any reflections within 10° of a drivers' direct line of sight, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 10.3.71.

Table 10.19: Summary of Potential Reflections at Hulme Street (HS3)

Viewpoint	Façade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect
HS3	Block A: Southern	12:00 to 14:00 GMT	Mid-October to mid-February	13°-17° and above 5° visor line	Minor
	Block A: Eastern	Before 05:00 GMT	Mid-May to mid-July	5°-11°	Minor

- 10.7.66 Based on professional judgement, in consideration of the initial significance of potential effects, the overall effect in terms of solar glare to drivers at the junction of Hulme Street with Wilmott Street is considered to be **minor adverse** and **not significant**.

Princess Road northbound, junction 1 (PR1)

- 10.7.67 Two viewpoints have been assessed at this junction, PR1a and PR1b. Viewpoint PR1a shows the view of drivers on Medlock Street looking at the left traffic lights; additionally, there are two traffic lights on the right. Viewpoint PR1b shows drivers in the left-lane of Princess Road looking at the first traffic lights on the left; there is a second traffic light on left, one on the right side and a fourth further on the right, most likely to be used by stationary vehicles.
- 10.7.68 **Table 10.20** provides a summary of the duration potential reflections could occur for any reflections within 10° of a drivers' direct line of sight, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 10.3.71.

Table 10.20: Summary of Potential Reflections at Princess Road (PR1)

Viewpoint	Façade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect*
PR1a	Block A: Southern	06:00 to 07:00 GMT	Mid-March to mid-April and mid-August to mid-September	4°-15°	Major
	Block A: Southern Terraces	09:00 to 10:00 GMT	Mid-October to mid-February	3°-11°	Major
	Block B: Southern	09:00 to 11:00 GMT	Mid-September to mid-March	4°-24° and mostly above the 5° visor line	Major
PR1b	Block A: Southern	06:00 to 08:00 GMT	Mid-March to mid-April and mid-August to mid-September	4°-16°	Major
	Block A: Southern Terraces	09:00 to 10:00 GMT	Mid-October to mid-February	4°-11°	Major
	Block B: Southern	Just before 10:00 to 11:00 GMT	Mid-September to mid-March	4°-24° and almost all above the 5° visor line	Major
*Prior to consideration of any mitigating factors outlined below.					

10.7.69 At this junction, for both viewpoints (PR1a and PR1b) assessed:

- The junction is served by alternative traffic lights that could be used by drivers, during the short period that reflections from the Proposed Development are visible within 10° at viewpoints PS1a and PS1b;
- Reflections from the Block A southern façade and terraces within 10° are very broken up by the fixed shading devices incorporated as embedded mitigation, thus these reflections would not result in solar glare;
- The intensity of reflections from the Block B southern façade within 10° are very low, due to the incorporation of a frit on the outer glazing surface, as embedded mitigation; therefore, the reflections are unlikely to result in a significant instance of solar glare;

- Most potential reflections from Block B occur above the driver's visor line, which would reduce any effects when deployed;
- A number of mature trees within Rockdove Gardens are located behind the traffic lights in view PR1a; the trees are deciduous, but their branches would partially obstruct reflections occurring below the visor line. Similarly, reflections from Block B within view PR1b would be partially obscured by trees; and
- The reflections from Block B occur in the morning, during the winter months when the sun's intensity is lower, and the likelihood of the sun shining is 30% or less.

10.7.70 Therefore, based on professional judgement, in consideration of the initial significance of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers at the junction of Princess Road with Medlock Street is considered to be permanent, **minor adverse** and **not significant**.

Princess Road northbound/Medlock Street roundabout junction 1 (MS1)

10.7.71 Three viewpoints have been assessed at this junction, MS1a, MS1b and MS1c. Viewpoint MS1a shows the view of drivers in the left lane, looking at the traffic lights on the left side of the road, whilst viewpoint MS1b shows drivers in the right lane, looking at the traffic lights on the right side of the road. MS1c shows the view of drivers in the right lane, looking at a third traffic lights on the opposite side of the junction primarily for use by stationary vehicles.

10.7.72 **Table 10.21** provides a summary of the duration potential reflections could occur for any reflections within 10° of a drivers' direct line of sight, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 10.3.71.

Table 10.21: Summary of Potential Reflections at Medlock Street junction 1 (MS1)

Viewpoint	Facade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect*
MS1a	Block A: Southern	06:00 to 08:00 GMT	Mid-March to late-April and early-August to mid-September	0°-19°	Major
	Block A: Southern Terraces	09:00 to 10:00 GMT	Mid-October to mid-February	6°-8°	Moderate

Viewpoint	Facade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect*
	Block B: Southern	10:00 to 11:00 GMT	Mid-September to mid-March	From 17° and almost all above the 5° visor line	Minor
MS1b	Block A: Southern	06:00 to 08:00 GMT	Early-March to late-April and early-August to late-September	6°-26°	Moderate
	Block A: Southern Terraces	09:00 to 10:00 GMT	Mid-October to mid-February	16°-24°	Minor
	Block B: Southern	10:00 to 11:00 GMT	Mid-October to mid-February	From 25° and all above the 5° visor line	Minor
MS1c	Block A: Southern	06:00 to 08:00 GMT	Early-March to late-April and early-August to late-September	5°-25°	Moderate
	Block A: Southern Terraces	09:00 to 10:00 GMT	Mid-October to mid-February	14°-21°	Minor
	Block B: Southern	10:00 to 11:00 GMT	Mid-October to mid-February	From 24° and all above the 5° visor line	Minor
*Prior to consideration of any mitigating factors outlined below.					

10.7.73 At this junction, for the viewpoints (MS1a, MS1b and MS1c) assessed:

- Reflections from the Block A southern façade and terraces within 10° are very broken up by the fixed shading devices incorporated as embedded mitigation, thus these reflections would not result in solar glare;
- The junction is served by alternative traffic lights that could be used by drivers, during the short period that reflections from the Proposed Development are visible within 10°;
- The junction includes bends in the road; therefore, any instances of reflection would only be visible momentarily before the reflection angle changes;

- All potential reflections from Block B occur above the driver's visor line, which would reduce any effects when deployed;
- The reflections occur in the very early morning or during the winter months when the sun's intensity is lower; and
- For the reflections occurring within 10° of a driver's line of sight, the likelihood of the sun shining is 40% or less.

10.7.74 Therefore, based on professional judgement, in consideration of the initial significance of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers at the junction of Princess Road/Medlock Street roundabout junction 1 is considered to be permanent, **minor adverse** and **not significant**.

Medlock Street northbound, roundabout junction 2 (MS2)

10.7.75 Three viewpoints have been assessed at this junction, MS2a, MS2b and MS2c. Viewpoint MS2a shows the view of drivers in the left lane, looking at the traffic lights on the left side of the road, whilst viewpoint MS2c shows drivers in the right lane, looking at the traffic lights on the right side of the road. MS2b shows the view of drivers in the left lane, looking at a third traffic lights on the opposite side of the junction, primarily for use by stationary vehicles.

10.7.76 **Table 10.22** provides a summary of the duration potential reflections could occur for any reflections within 10° of a drivers' direct line of sight, where they would occur within the field of view of drivers, from which element of the Proposed Development the reflections could occur and finally, an initial significance of effect is given for each instance of reflection, prior to consideration being given to factors such as those outlined in paragraph 10.3.71.

Table 10.22: Summary of Potential Reflections at Medlock Street junction 2 (MS2)

Viewpoint	Façade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect*
MS2a	Block A: Southern	05:00 to 08:00 GMT	Mid-February to mid-May and mid-July to mid-October	0°-19°	Major
	Block A: Southern Terraces	09:00 to just after 10:00 GMT	Mid-November to mid-January	9°-18°	Minor

Viewpoint	Façade	Times of the day that reflections occur	Times of the year that reflections occur	Location within 30° of drivers' line of sight	Viewpoint Significance of Effect*
MS2b	Block A: Southern	05:00 to 08:00 GMT	Mid-February to mid-May and mid-July to mid-October	3°-28°	Major
	Block A: Southern Terraces	09:00 to just after 10:00 GMT	Mid-November to mid-January	17°-26°	Minor
MS2c	Block A: Southern	05:00 to 08:00 GMT	Mid-March to mid-May and mid-July to mid-September	From 7°	Moderate
	Block A: Southern Terraces	09:00 to just after 10:00 GMT	Mid-October to mid-February	From 26°	Minor
*Prior to consideration of any mitigating factors outlined below.					

10.7.77 At this junction, for the viewpoints (MS1a, MS1b and MS1c) assessed:

- Reflections from the Block A southern façade and terraces within 10° are very broken up by the fixed shading devices incorporated as embedded mitigation, thus these reflections would not result in solar glare;
- The junction is served by alternative traffic lights that could be used by drivers, during the short period that reflections from the Proposed Development are visible within 10°;
- The junction includes bends in the road; therefore, any instances of reflection would only be visible momentarily before the reflection angle changes;
- The potential reflections from the southern terrace glazing are almost all outside 10° and occur for a small area within the field of view. As such, the reflections would only occur for a very short period of time, during the winter when the likelihood of the sun shining is just 20%;
- The reflections from the main southern elevation of Block A occur outside peak traffic times;
- The reflections occur in the very early morning when the sun's intensity is lower; and
- For the reflections occurring within 10° of a driver's line of sight, the likelihood of the sun shining is 40% or less.

10.7.78 Therefore, based on professional judgement, in consideration of the initial significance of potential effects and the factors outlined above, the overall effect in terms of solar glare to drivers at the junction of Princess Road/Medlock Street roundabout junction 2 is considered to be permanent, **minor adverse** and **not significant**.

Light Pollution

10.7.79 The potential light pollution impacts arising from the Proposed Development upon the surrounding existing residential buildings have been assessed and the environmental zone is defined as E4 – High district brightness (e.g. town/city centres with high levels of night time activity).

10.7.80 The assessment undertaken has considered the light trespass pre- and post-curfew, with the technical assessment found within **ES Volume 4, Appendix F7**.

10.7.81 At both existing buildings assessed, City South Apartments and River Street Tower, the levels of illuminance pre-curfew (before 11pm) would be very limited and well within the 25-lux threshold set out within the ILP guidance for a city centre location (E4). The assessment also shows that post-curfew (after 11pm), the levels of light trespass would be below the 5-lux threshold set out within the ILP guidance for E4, for both of the existing buildings assessed.

10.7.82 Therefore, the light pollution effects to City South Apartments and River Street Tower are considered **negligible** and **not significant**.

10.7.83 At the remaining future building assessed, the proposed Block B (PBSA) building, located directly to the west of the Proposed Block A building, it can be seen that the levels of illuminance pre-curfew (before 11pm) would be very limited and well within the 25-lux threshold set out within the ILP guidance for a city centre location (E4), but the post-curfew levels (after 11pm) exceed the 5 lux threshold set out in ILP Guidance across the majority of the lower half of the building, with exceedance just over twice the threshold level. As noted in paragraph 10.3.80, the assessment is considered a worst-case scenario; the illuminances levels may be reduced once the glazing specification is known and the lighting design has been confirmed. Due to the compliance pre-curfew and magnitude of the transgression post-curfew, based on professional judgement, the effect to the proposed Block B (PBSA) building is considered **moderate adverse** and **significant**.

10.8 Scope for Additional Mitigation Measures

Potential Additional Mitigation Measures

Daylight, Sunlight and Overshadowing

10.8.1 No significant effects were reported in terms of daylight, sunlight or overshadowing; therefore, no additional mitigation measures are proposed.

Solar Glare

- 10.8.2 No significant effects were reported in terms of solar glare; therefore, no additional mitigation measures are proposed.

Light Pollution

- 10.8.3 Moderate adverse and significant effects have been reported for the proposed Block B eastern elevation, due to light pollution from the western elevation of the proposed Block A. It is considered necessary to include mitigation measures to reduce the light pollution to eliminate any exceedances of the ILP guidelines.
- 10.8.4 The light pollution assessment is based upon the indicative façade materials and office lighting layouts and is therefore a worst-case assessment. As the façade details and office light layouts progress during the detailed design and fit-out design, the assessment will be refined. Where light pollution effects remain, additional mitigation would be incorporated. The likely effects of Block A of the Proposed Development on Block B are negligible pre-curfew and so no mitigation is required during these times.
- 10.8.5 Effective post-curfew mitigation could comprise:
- low visible light transmittance glazing;
 - occupancy sensors to all lighting;
 - providing a detailed lighting design designed to minimise the illuminance levels to the west of the floor plan;
 - the dimming of lights at the perimeter of the floor plan post-curfew; and
 - automatic blinds post-curfew.

Likely Effectiveness of Additional Mitigation Measures

Light Pollution

- 10.8.6 Based on professional judgement and experience on schemes of a similar nature with comparable light pollution effects, the incorporation of the above listed additional mitigation measures to the relevant facades and lighting layouts at the detailed design stage would reduce the potential for significant breaches of ILP guidance to occur. With the incorporation of a combination of the proposed additional mitigation measures, the residual light pollution effects would be negligible to the one future receptor.

10.9 Residual Effects

- 10.9.1 No additional mitigation measures are proposed with regard to daylight, sunlight, overshadowing and solar glare; therefore, the effects remain as per those reported

and no significant residual effects are anticipated to arise from the Proposed Development in terms of daylight, sunlight, overshadowing or solar glare.

- 10.9.2 Significant adverse effects have been reported regarding light pollution, but with the incorporation of the additional mitigation measures outlined above, no significant residual effects are anticipated to arise from the Proposed Development in terms of light pollution.

10.10 Cumulative Effects

- 10.10.1 Where committed/consented schemes have the potential to be affected by the Proposed Development or have the potential to cause a cumulative impact on the existing surrounding sensitive receptors, a further technical assessment has been undertaken.
- 10.10.2 The committed/consented scheme included within the assessment are presented within **ES Volume 4, Appendix F1**.
- 10.10.3 The development site located immediately to the north of the Site has consent for an office building: *"128002/FO/2020 - Full Planning Application for demolition of existing structures on site, erection of one 11-storey plus basement office building (Use Class E) and one 14-storey plus basement office building with ground floor commercial unit (Use Class E), landscaping, highways works, and associated works."*
- 10.10.4 The BRE Guidelines does not require the assessment of commercial buildings, and so no separate technical analysis has been undertaken. The orientation of the committed development does mean that there is potential for cumulative effects to City South Apartments, and so additional cumulative analysis has been undertaken.

Cumulative Daylight to Surrounding Sensitive Receptors

- 10.10.5 The full cumulative daylight results are presented within **ES Volume 4, Appendix F3** and are summarised in **Table 10.23** and **Table 10.24** below.
- 10.10.6 A total of 199 windows serving 79 rooms were assessed for daylight within one building considered to be a sensitive receptor.
- 10.10.7 The breakdown of the baseline results against the Cumulative Scenario are discussed in more detail below.

Table 10.23: Summary of VSC Daylight Impact from the Cumulative Scenario

Property Address	Total No. of Windows Tested	No. of Windows Meeting Guidelines for VSC Impact	No. Below Guidelines for VSC		
			Minor Adverse	Moderate Adverse	Major Adverse
City South Apartments	119	38	19	3	59
Total	119	38	19	3	59

Table 10.24: Summary of NSL Daylight Impacts from the Cumulative Scenario

Property Address	Total No. of Rooms Tested	No. of Rooms Meeting Guidelines for NSL Impact	No. Below Guidelines for NSL		
			Minor Adverse	Moderate Adverse	Major Adverse
City South Apartments	79	62	10	7	0
Total	79	62	10	7	0

City South Apartments

- 10.10.8 A total of 119 windows serving 79 rooms were assessed for daylight within this building to compare the existing baseline against the Cumulative Scenario.
- 10.10.9 For VSC, 38 (32%) of the 119 windows meet the BRE criteria. Nineteen of the affected windows will experience an alteration between 20-30%, three of the affected windows will experience an alteration between 30-40%, and the remaining 59 windows will experience alterations in excess of 40% from the baseline value.
- 10.10.10 The VSC compliance level of 32% must be considered in the context of the baseline compliance level of 8%. Paragraph 10.5.22 clarifies that some windows/rooms may not meet the target criteria in the baseline but will in the Cumulative Scenario. The low baseline compliance levels mean that only small reductions in VSC will lead to a much larger magnitude of effect. For example, room F03, R1 is a bedroom on the first floor. In the baseline scenario it will achieve 6.5% VSC. In the Proposed Development scenario, it will achieve 1.3% VSC. This is a reduction of 5.2% VSC, or 80% i.e. a major adverse effect. If the window achieved a baseline VSC of 27%, the BRE target, it could be reduced by 0.8 times to 21.6% and still comply with the BRE Guide. This is a reduction of 5.4% VSC, which would result in a negligible effect.
- 10.10.11 The low baseline levels therefore have a significant influence on the overall proportional reduction.

- 10.10.12 Furthermore, 49 of the 81 windows that do not meet the VSC targets serve bedrooms, which the BRE Guide recognises as having a lesser requirement for daylight. The remaining 32 windows serve 19 living kitchen diners.
- 10.10.13 For NSL, 62 (79%) of the 79 rooms assessed will meet the BRE criteria. Ten of the affected windows will experience an alteration between 20-30% and seven of the affected windows will experience an alteration between 30-40%.
- 10.10.14 Only six of the rooms that do not meet the targets are living kitchen diners, the remaining rooms are bedrooms. The impact to all of these living kitchen diners is minor adverse, with the exception of one, which will be reduced by 30.3%, a moderate adverse effect.
- 10.10.15 Overall, considering the city centre location, emerging height and density in the locality and the flexibility with which the BRE is intended to be used, the effect on daylight to this property is considered to be **moderate adverse**.
- 10.10.16 Whilst moderate adverse effects would typically be considered as significant, the effect on daylight is considered to be **not significant** for the following reasons:
- The receptor resides in a city centre, where higher density development is expected, and so the receptor has a medium sensitivity. Deviations from the published BRE targets are therefore inevitable;
 - Most impact falls to bedrooms, rather than the main living kitchen diners;
 - The overhanging balconies limit the existing availability of daylight available to the living kitchen diners and create a higher burden on the Proposed Development to maintain open views. This is evidenced by the low baseline compliance figures;
 - Despite the current low density of the Site, the baseline compliance levels are very low, and place a high burden on the site to maintain the current levels;
 - The NPPG states *“areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings”*;
 - The overall impact is limited in context to the receptor as a whole, given that the assessment only considers only those windows/rooms which face the Site; and
 - The receptor will retain good NSL daylight levels with the Proposed Development and committed/consented schemes in place.

Sunlight to Surrounding Sensitive Receptors

- 10.10.17 The full Cumulative Scenario sunlight results can be found within **ES Volume 4, Appendix F3** and are summarised in **Table 10.25** and **Table 10.26**.

- 10.10.18 A total of 33 rooms were assessed for sunlight within one building considered sensitive receptors.
- 10.10.19 Windows that are not within 90 degrees of due south, or do not serve living rooms, were excluded from the assessment.
- 10.10.20 The building is discussed in more detail below.

Table 10.25: Summary of APSH Impacts from the Cumulative Scenario

Property Address	Total No. of Rooms Tested	No. of Rooms Meeting Guidelines for APSH Impact	No. Below Guidelines For APSH		
			Minor Adverse	Moderate Adverse	Major Adverse
City South Apartments	33	20	0	0	12
Total	33	20	0	0	12

Table 10.26: Summary of Winter PSH Impacts from the Cumulative Scenario

Property Address	Total No. of Rooms Tested	No. of Rooms Meeting Guidelines for Winter PSH Impact	No. Below Guideline for Winter PSH		
			Minor Adverse	Moderate Adverse	Major Adverse
City South Apartments	33	20	0	1	6
Total	33	20	0	1	6

City South Apartments

- 10.10.21 A total of 33 rooms within this building were assessed for sunlight to compare the baseline against the Cumulative Scenario.
- 10.10.22 20 (61%) of the 33 rooms meet the BRE criteria. For APSH, 12 rooms will experience alterations in excess of 40% from the baseline value. For winter PSH, one room will experience alterations of 30%-40% and six rooms will experience alterations in excess of 40%.
- 10.10.23 The living rooms are all set beneath overhanging balconies, which restrict the availability of direct sunlight and place a higher burden on the Proposed Development to maintain an unobstructed view.
- 10.10.24 Overall, considering the city centre location, emerging height and density in the locality, the effect on sunlight to this property is considered to be **moderate adverse**.

10.10.25 Whilst moderate adverse effects would typically be considered as significant, the effect on sunlight is considered to be **not significant** for the following reasons:

- The impact on sunlight is limited in context to the property as a whole;
- The NPPG states “*areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings*”; and
- The overhanging balconies limit the availability of sunlight and create a higher burden on the Proposed Development to maintain open views.

Cumulative Overshadowing to Surrounding Sensitive Receptors

10.10.26 The full cumulative overshadowing results can be found within **ES Volume 4, Appendix F3** and are summarised in **Table 10.27** below.

Table 10.27: Summary of Overshadowing Impacts from the Completed Proposed Development

Amenity Space	Total Area Lit with Proposed Development	Meetings BRE Criteria
F04 A1	59.55%	YES
F04 A2	67.86%	YES
F05 A1	96.94%	YES
F05 A2	88.54%	YES
F06 A1	51.54%	YES

City South Apartments

10.10.27 A total of five amenity areas within this building were assessed for overshadowing to compare the baseline against the Proposed Development.

10.10.28 Five out of five (100%) of the amenity areas will meet the BRE criteria.

10.10.29 Overall, the effect on overshadowing to these amenity areas is considered to be **negligible** and **not significant**.

10.11 Summary and Conclusions

10.11.1 The daylight, sunlight and overshadowing assessments have been undertaken by reference to the BRE Guidelines and for all of the sensitive receptors surrounding the Site. To assess the surrounding existing residential properties, the BRE Guidelines provide two main methods for assessing daylight: ‘Vertical Sky Component’ (VSC) and ‘No Sky Line’ (NSL). For the assessment of sunlight, the approach considers the

‘Annual Probable Sunlight Hours’ (APSH) on a window. For the assessment of overshadowing, the approach considers the ‘Sun Hours on Ground’ (SHOG).

- 10.11.2 For the assessment of solar glare, an assessment of the duration and location of reflections visible to drivers at surrounding road junctions has been undertaken.
- 10.11.3 For the assessment of light pollution, the approach considers the ILP Guidelines for pre-curfew (6am-11pm) and post-curfew (11pm-6am) light levels hitting the residential windows.
- 10.11.4 For daylight in the baseline condition, out of the 564 windows assessed for daylight, 453 (80%) meet the BRE guidelines for VSC. For NSL, 433 (97%) of the 447 rooms assessed meet the BRE criteria. For sunlight, 28 (85%) of the 33 rooms assessed meet the BRE criteria for both Winter and Annual APSH.
- 10.11.5 Overall, this baseline scenario is considered a moderate level of compliance due to the city centre context of the Site.
- 10.11.6 In relation to overshadowing, all five amenity spaces facing the Site meet the BRE criteria for SHOG which is very good level of compliance for the city centre context of the Site.
- 10.11.7 Solar glare and light pollution are not comparative assessments and so they are not considered in the baseline condition.
- 10.11.8 The potential daylight, sunlight, overshadowing, solar glare and light pollution effects during demolition and construction would gradually increase in magnitude as the massing of the Proposed Development increases. When considering the construction of the Proposed Development, the effects would be noticeable; however, such effects would be less than that of the completed Proposed Development.
- 10.11.9 With regards to the operations phase, for daylight, a total of 2 buildings were assessed: City South Apartments and River Street Tower. Out of the 564 windows assessed for daylight across both buildings, 100 (18%) meet the BRE guidelines for VSC. 155 (35%) of the 447 rooms assessed meet the BRE criteria for NSL. Both buildings would experience overall moderate adverse effects, which are considered not significant given the context of the Site.
- 10.11.10 In terms of sunlight, one building was assessed and it would see an overall moderate adverse effect, which is considered not significant given the context of the Site. For this building, 20 (61%) of the 33 rooms assessed meet the BRE criteria for both Winter and Annual PSH.
- 10.11.11 For overshadowing, the five amenity areas assessed remain BRE compliant so would see a negligible and not significant effect.
- 10.11.12 In the cumulative scenario, whilst isolated additional impacts would occur to City South Apartments as a result of committed developments coming forward, these

would not change the scale of impact overall and the overall effects, which therefore remain as reported for the Proposed Development scenario.

- 10.11.13 The solar glare assessment found that of the 24 road locations identified, one would experience a negligible effect and 23 would experience minor adverse effects, which are not significant.
- 10.11.14 The light pollution assessment undertaken has shown no impact from the office building (Block A) to City South Apartments and River Street Tower. The proposed Block B student accommodation would experience a significant effect which is moderate adverse but will be reduced to not significant with the incorporation of mitigation measures, which could include the below:
- low visible light transmittance glazing;
 - occupancy sensors to all lighting;
 - providing a detailed lighting design designed to minimise the illuminance levels to the west of the floor plan;
 - the dimming of lights at the perimeter of the floor plan post-curfew; and
 - automatic blinds post-curfew.
- 10.11.15 With the incorporation of one or more of the proposed additional mitigation measures, the residual light pollution effects would be negligible to the three existing receptors and future receptors.
- 10.11.16 No significant residual effects would occur regarding daylight, sunlight and overshadowing amenity to surrounding residential properties, solar glare to surrounding road locations, and light pollution to surrounding and future residential properties.

Table 10.28 summarises the daylight, sunlight, overshadowing, solar glare and light pollution effects resulting from the Proposed Development.

Table 10.28: Summary of Residual Effects

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Operation								
City South Apartments	Medium	Neighbouring Daylight and Sunlight	None Required	High	Moderate Adverse (not significant)	None Required	Medium	Moderate Adverse (not significant)
				Direct				
				Local				
				Permanent				
				Likely				
River Street Tower	Low	Neighbouring Daylight	None Required	High	Moderate Adverse (not significant)	None Required	Medium	Moderate Adverse (not significant)
				Direct				
				Local				
				Permanent				
				Likely				
Road users at nearby road junctions	High	Solar Glare	Fixed external shading devices to break up reflections from the southern elevation of Block A,	High	Negligible to Minor Adverse (not significant)	None Required	High	Negligible to Minor Adverse (not significant)
				Direct				
				Local				
				Permanent				
				Likely				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
			non-reflective panels to the eastern and western elevations of Block B to break up reflections and a non-reflective frit applied to the outer surface of the glazing of the southern elevation of Block B, to lower the intensity of reflections.					
	High	Light Pollution	None	High Direct	Negligible to Moderate	Low-transmittan	High	

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Neighbouring residential properties				Local	Adverse (not significant to significant)	ce glazing lighting designed to minimise the illuminance levels to the west of the floor plan; perimeter dimming; occupancy sensors; and/or automated blinds to the westerly elevation of Block B.		Negligible (not significant)
				Permanent				
				Likely				
Cumulative Effects - Operation								
City South Apartments	Medium	Neighbouring Daylight and Sunlight	None Required	High	Moderate Adverse (not significant)	None Required	Medium	Moderate adverse (not significant)
				Direct				
				Local				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
				Permanent				
				Likely				

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CHAPTER 11: BUILT HERITAGE

11 Built Heritage

11.1 Scope of Assessment

- 11.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of Built Heritage and is supported by **ES Volume 4, Appendix G**.
- 11.1.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the cumulative effects associated with the Proposed Development in combination with other developments within 500m of the Site.

11.2 Key Legislation, Policy and Guidance Considerations

- 11.2.1 The Built Heritage assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised below.

Legislation and Regulation

- 11.2.2 The following legislation has informed the assessment of effects within this chapter, and is detailed further in **ES Volume 4, Appendix G**:

- The Planning (Listed Buildings and Conservation Areas) Act 1990.

Planning Policy

- 11.2.3 The following policy and guidance have informed the assessment of effects within this chapter, and are detailed further in **ES Volume 4, Appendix G**:

- National Planning Policy Framework (NPPF) 2021¹ and supporting National Planning Policy Guidance (PPG) 2021²; and
- Manchester Core Strategy and saved Citywide Development Control Policies³.
- Greater Manchester Combined Authority's draft Places for Everyone Joint Development Plan⁴

¹ MHCLG 'National Planning Policy Framework' (2021)

² MHCLG 'National Planning Practice Guidance' (2021)

³ Manchester City Council 'Manchester's Local Development Framework Core Strategy Development Plan Document (2012) and Extant Unitary Development Policies (UDP)

⁴ Greater Manchester Combined Authority 'Places for Everyone Joint Development Plan' (draft) (August 2021)

Technical Standards and Guidance

11.2.4 The following guidance has informed the assessment within the Heritage Assessment (**ES Volume 4, Appendix G**), which in turn informs the assessment of likely significant effects within this chapter:

- Historic England Good Practice Advice Note 3: The Setting of Heritage Assets (2017)⁵; and
- Historic England Good Practice Advice Note 2: Managing Significance in Decision Taking in the Historic Environment (2015)⁶.

11.3 Assessment Methodology

Effects Assessed

11.3.1 This section provides confirmation on the scope of the assessment presented within this chapter, following submission of the EIA Scoping Report (**ES Volume 4, Appendix A1**) and receipt of the EIA Scoping Opinion (**ES Volume 4, Appendix A2**).

Effects Not Considered to be Significant

11.3.2 The following effects were not considered significant as part of the EIA Scoping Report and are not considered further within this chapter:

- change in the setting of heritage assets outside the 500m Study Area at both demolition and construction and operational phases; and
- change in the setting of heritage assets within the 500m Study Area at both demolition and construction and operational phases, with the exception of the assets identified in Table 11.1.

Effects Considered Likely to be Significant

11.3.3 The following effects (**Table 11.1**) were considered likely to be significant and are reported on within this chapter:

Table 11.1: Effects Considered Likely to be Significant

Likely Significant Effect	Applicable Development Stage
Change in the setting of heritage assets*: • Former Cotton Mill on west side of junction with Cambridge Street (Grade II listed)	Demolition and construction

⁵ Historic England Good Practice Advice Note 3: The Setting of Heritage Assets (2017)

⁶ Historic England Good Practice Advice Note 2: Managing Significance in Decision Taking in the Historic Environment (2015)

Likely Significant Effect	Applicable Development Stage
• Mill chimney stack on west side of junction with Cambridge Street (Grade II listed) • Chorlton New Mill and attached chimney (Grade II listed) • Chorlton Old Mill (Grade II listed) • Mill on north east corner of junction with Chester Street (Grade II listed)	
Change in the setting of heritage assets*: • Former Cotton Mill on west side of junction with Cambridge Street (Grade II listed) • Mill chimney stack on west side of junction with Cambridge Street (Grade II listed) • Chorlton New Mill and attached chimney (Grade II listed) • Chorlton Old Mill (Grade II listed) • Mill on north east corner of junction with Chester Street (Grade II listed)	Operation

*It should be noted that these assets have potential to experience a significant environmental effect and are thus reported on within this chapter. Other assets within the Study Area with potential to be affected (not a significant environmental effect) has been appropriately considered within the Heritage Assessment (presented in **ES Volume 4, Appendix G**), in line with the NPPF.

Determination of Baseline

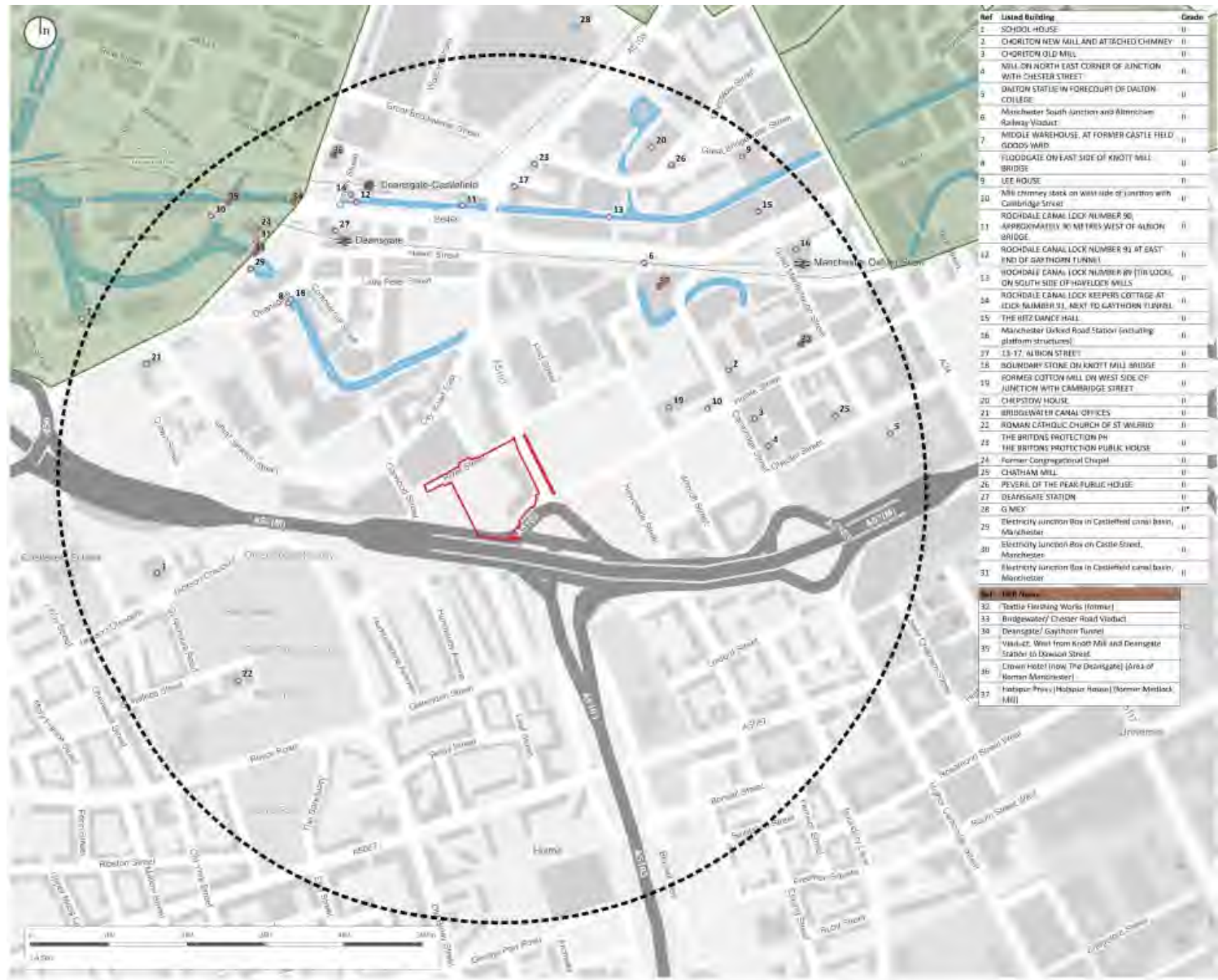
- 11.3.4 The following provides an explanation of methods used in undertaking the assessment, with reference to published standards, guidelines and best practice.

Defining the Study Area

- 11.3.5 A Study Area of 500m from the Site boundary has been defined following Site visits and inspection of designated and non-designated heritage assets with potential to experience significant environmental effects. A Zone of Theoretical Visibility (ZTV) has been prepared (**ES Volume 4, Appendix G**) and this shows that the visual impact of the Proposed Development, although not exclusively, is concentrated within a 500m radius of the Site boundary. This and the following factors have informed definition of the Study Area:
- the nature and scope of the Proposed Development (scale, mass, height, form, design/appearance and materials);
 - the proximity of heritage assets to the Site;
 - the degree of inter-visibility between the heritage assets and the Site, taking into consideration, for example, changes in topography as well as interposing townscape and landscape features; and
 - the heritage significance of the relevant heritage assets and the contribution made by their setting.

- 11.3.6 The ZTV (**ES Volume 4, Appendix G**) indicates that the Proposed Development may be visible from beyond the 500m Study Area but due to distance, heritage assets in these areas are unlikely to experience significant environmental effects. Where the Proposed Development is visible, it will be experienced as part of the wider city centre context or skyline and in combination with existing tall buildings. There are no known historic or functional associations with assets beyond the Study Area that would suggest there will be an impact.
- 11.3.7 Site visits, together with the consideration of the above factors, has affirmed that the proposed 500m Study Area is appropriate. Heritage assets with potential to experience significant environmental effects are discussed and evaluated below and are shown on the Heritage Asset Plan, included in **ES Volume 4, Appendix G** but also presented in **Figure 11.1**.

Figure 11.1: Heritage Asset Plan



Background Studies to Inform the ES/Establishing the Baseline

11.3.8 The following background studies have informed this chapter:

- Heritage Assessment: A detailed Heritage Assessment (**ES Volume 4, Appendix G**) has been prepared. This assessment has been carried out to address the statutory duty of the Planning (Listed Buildings and Conservation Areas) Act 1990 and in accordance with planning policy and best practice guidance. The Heritage Assessment (**ES Volume 4, Appendix G**) identifies the heritage significance and setting of assets within the Study Area and assesses the impact of the Proposed Development upon that significance; and
- inspections of the Site and heritage assets within the Study Area were undertaken in November 2020 and October 2022.

Prediction Methodology

Assessment Process

- 11.3.9 In the absence of specific prescribed criteria for the assessment of impacts on built heritage, the methodology for establishing the relative value or importance of heritage assets; the magnitude of change; and the significance of effect will be taken from the Design Manual for Roads and Bridges 2020 (DMRB) ((LA 104 Environmental Assessment and Monitoring) and (LA 106 Cultural Heritage Assessment))⁷ and informed by Historic England guidance.
- 11.3.10 Analysis has also been informed by Site visits. These sought to gauge potential effects of the Proposed Development on the identified heritage assets, inform judgements on their relative heritage significance and importance within any grouping, and also how sensitive they would be to change within their setting.

Reporting of the Environmental Effect and Significance Criteria

- 11.3.11 The assessment of likely significant environmental effects, as a result of the Proposed Development, has been taken into account for the demolition and construction and operational phases.
- 11.3.12 The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

⁷ Design Manual for Roads and Bridges 2020 (DMRB) ((LA 104 Environmental Assessment and Monitoring) and (LA 106 Cultural Heritage Assessment))

Determining Sensitivity of Receptor

11.3.13 The heritage significance (value or importance) of the heritage assets (receptors) (also referred to as the 'sensitivity' of a receptor for the purposes of this assessment) is defined on the basis of **Table 11.2**. This has been informed by the DMRB and a clear understanding and appreciation of the heritage significance of each asset and the contribution of setting to that heritage significance. This has been undertaken in accordance with Historic England guidance and informed by Site visits, research and professional judgement. The Heritage Assessment (**ES Volume 4, Appendix G**) establishes the heritage baseline and heritage significance of the heritage assets and this has informed the sensitivity of the receptor.

Table 11.2: The Heritage Significance/Sensitivity of a Receptor

Heritage Significance /Sensitivity of Receptor	Asset Type
High	Scheduled monuments with standing remains Registered Battlefields Grade I and II* listed buildings Other listed buildings that can be shown to have exceptional qualities in their fabric or historical association not adequately reflected in the listing grade Grade I and II* registered parks and gardens Conservation areas containing very important buildings
Medium	Grade II listed buildings Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical association Grade II registered parks and gardens Conservation areas containing important buildings Historic townscape or built-up areas with historic integrity in their buildings, or built settings (e.g. including street furniture and other structures)
Low	'Locally listed' buildings and landscapes Historic (unlisted) buildings of modest quality in their fabric or historical association Historic townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures)
Negligible	Assets of no architectural or historic note; buildings of an intrusive character

Determining the Magnitude of Change

11.3.14 The magnitude of change to heritage assets is assessed using the criteria outlined in **Table 11.3**. The terminology used in **Table 11.3** (large, medium, small or negligible)

differs to the DMRB (major/large, moderate/medium, minor/small); however, it has been adopted to ensure consistency across the ES.

Table 11.3: The Magnitude of Change to Heritage Assets

Magnitude of Change	Definition
Large	Change to key historic building elements, such that the asset is totally altered and much of its heritage significance is lost. Substantial change within the setting of an historic building leading to considerable loss or enhancement of heritage significance of the asset.
Medium	Change to many key historic building elements, such that the asset is clearly modified and there is some loss of heritage significance. Change within the setting of an historic building leading to some loss or enhancement of heritage significance of the asset.
Small	Changes to key historic building elements, such that the asset is slightly altered and there is some loss or enhancement of heritage significance. Change within the setting of an historic building leading to a slight loss or enhancement of heritage significance of the asset.
Negligible	Slight changes to historic building elements or within its setting that hardly affect the heritage significance of the asset.

Determining the Level of Effect

- 11.3.15 The level of effect attributed has been assessed based on the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been based on professional judgement.
- 11.3.16 The level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'.
- 11.3.17 The following terms have been used to define the significance of the effects identified and these can be 'beneficial' or 'adverse':
- **major effect:** where the Proposed Development is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity.;
 - **moderate effect:** where the Proposed Development is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability.;
 - **minor effect:** where the Proposed Development is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Development is likely to cause a considerable change from the

baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change.; and

- **negligible:** where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

11.3.18 The magnitude of the change against value of the heritage assets is assessed as outlined in the criteria in **Table 11.4**, taken from the DMRB and adapted to enable consistency across the ES.

Table 11.4: Level of Effect Matrix

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

11.3.19 The level of effect to heritage assets is quantified based upon the particular heritage significance and setting of the asset and the nature of the effect on that heritage significance (i.e. sensitivity of receptor). A detailed discussion is set out within the accompanying Heritage Assessment (**ES Volume 4, Appendix G**). The assessor has, therefore, exercised professional and reasoned judgment in determining which of the levels of effect is more appropriate and this chapter should be read in conjunction with the accompanying Heritage Assessment (**ES Volume 4, Appendix G**).

Categorising Likely Significant Effects

11.3.20 Following the determination of the level of effect, a statement has also been made as to whether the level of effect is '**Significant**' or '**Not Significant**', based on professional judgement.

11.3.21 Consistent with the guidance set out in the DMRB, the effect on heritage assets is generally considered as not significant when the impact does not substantially diminish or enhance the heritage interest of the cultural heritage resource.

11.3.22 In view of the above, major effects are typically considered significant, whilst moderate effects can be significant or not significant. Minor effects are considered less likely to be significant and negligible effects are not significant. All are subject to professional judgement.

Limitations and Assumptions

- 11.3.23 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:
- the list of heritage and non-heritage asset assets within the Study Area has been compiled from information provided by the Greater Manchester Historic Environment Record, MCC and the National Heritage List for England; and
 - this chapter is focussed on built heritage only. An **Archaeological Desk-Based Assessment** has been submitted as a standalone document with the planning application, which considers the potential impacts on buried archaeological remains.

11.4 Scoping and Consultation

- 11.4.1 An EIA Scoping Report (presented in **ES Volume 4, Appendix A1**) was submitted to MCC on 8th September 2022 with a formal request for an opinion on the proposed scope of the EIA and assessment methodologies. MCC subsequently issued their Scoping Opinion on the proposed scope and methodology of the topics for assessment within the EIA. A copy of MCC’s Scoping Opinion is provided in **ES Volume 4, Appendix A2**.
- 11.4.2 A summary of the key points raised in MCC’s Scoping Opinion, relevant to Wind Microclimate, are presented in **Table 11.5** including a response as to where the comments have been addressed within this chapter.

Table 11.5 MCC Scoping Opinion Comments and Response

Summary of Comment	Response or location within the ES where comments are addressed
Summary of comments from Historic England dated 13 October 2022: This development could, potentially, have an impact upon a number of designated heritage assets and their settings in the area around the site. In line with the advice in the National Planning Policy Framework (NPPF), we would expect the Environmental Statement to contain a thorough assessment of the likely effects which the proposed development might have upon those elements which contribute to the significance of these assets. We would also expect the Environmental Statement to consider the potential impacts on non-designated features.	This Built Heritage ES Chapter and the Heritage Assessment (ES Volume 4, Appendix G) contains a thorough assessment of the likely effects of the Proposed Development. It also addresses effects on non-designated built heritage assets. It demonstrates that the proposed study area is appropriate and that assets with potential to be affected have been assessed. Section drawings and photomontages (verified views) have informed

Summary of Comment	Response or location within the ES where comments are addressed
Given the heights of the structures associated with the proposed development and surrounding landscape and townscape character, this development is likely to be visible across a very large area and could as a result affect the significance of heritage assets at some distance from the site itself. We would expect the assessment to clearly demonstrate that the extent of the proposed study area is of the appropriate size to ensure that all heritage assets likely to be affected by this development have been included and can be properly assessed. It is important that the assessment is designed to ensure that all impacts are fully understood. Section drawings and techniques such as photomontages are a useful part of this. The assessment should also take account of the potential impact which associated activities (such as construction, servicing and maintenance, and associated traffic) might have upon perceptions, understanding and appreciation of the heritage assets in the area. The assessment should also consider, where appropriate, the likelihood of alterations to drainage patterns that might lead to in situ decomposition or destruction of below ground archaeological remains and deposits and can also lead to subsidence of buildings and monuments.	the assessment and 'associated activities', have been taken into consideration.
Summary of comments from MCC dated 2 November 2022: The comments within your scoping report are noted and are acceptable in terms of their consideration in the ES. In addition, you should take note of the comments made by Historic England and include the matters they suggest within the ES.	A response to the matters raised by Historic England is made above.

11.5 Baseline Assessment and Identification of Key Receptors

Baseline Conditions

- 11.5.1 Desktop analysis was confirmed through a review of Historic England's National Heritage List for England, Greater Manchester Historic Environment Record (provided

by Greater Manchester Archaeological Advisory Service (GMAAS) on 03 October 2022) and other local resources. Desktop and archival research have contributed to an understanding of the historic development of the Site, heritage assets and surrounding area.

- 11.5.2 The Heritage Assessment (**ES Volume 4, Appendix G**) sets out the historic development of the Site in detail, with an overview provided below.
- 11.5.3 Historic maps illustrate that the Site formed part of an area of dense court, back-to-back and terraced housing during the 19th century. Such housing was arranged around a grid network of streets and interspersed with public houses and industry closer to the River Medlock, located to the north of the Site.
- 11.5.4 Former buildings were largely demolished as part of extensive clearance in this area of Manchester during the 1930s and the Site remained vacant until the existing hotel was built in circa 2000, fronting Medlock Street with surface level car parking to the rear.
- 11.5.5 Since the 1970s, the city has extended southwards and the area around the Site has become a mixed use location, including the delivery of cultural and leisure developments, commercial office space and public realm as part of the First Street Strategic Regeneration Framework⁸.
- 11.5.6 To the west and north west of the Site lies the Great Jackson Street Strategic Regeneration Framework area⁹, comprising a new residential led neighbourhood and including tall buildings of 37 to 64 storeys (Deansgate Square).
- 11.5.7 There are no designated or non-designated built heritage assets within the Site; however, there are assets within the wider area.
- 11.5.8 The sensitive heritage assets with potential for significant environmental effects are briefly described below. A more detailed assessment of their significance is provided in the Heritage Assessment (**ES Volume 4, Appendix G**).
- 11.5.9 Directly to the east of the Site is a grouping of five grade II listed former mills and an associated mill chimney stack, dating to the late 18th or early 19th century; these five buildings comprise:
- Chorlton New Mill and attached chimney (grade II);
 - Chorlton Old Mill (grade II);
 - Mill on North East corner of junction with Chester Street (grade II);

⁸ First Street Medlock Sites, Manchester Development Framework Addendum (2020) Accessed at https://www.manchester.gov.uk/downloads/download/7213/first_street

⁹ Great Jackson Street Development Framework (2018) Accessed at https://www.manchester.gov.uk/downloads/download/6903/great_jackson_street_srf_may_2018

- Mill Chimney Stack on west side of Junction with Cambridge Street (grade II); and
- the Former Cotton Mill on west side of junction with Cambridge Street (grade II)).

11.5.10 The above listed buildings are focussed around the junction of Cambridge Street and Hulme Street, and although they are individually of special interest, they also derive significance from their group value. Historically occupying a densely developed setting, the grouping is now more exposed due to the extent of vacant land to the south-west.

Designated Heritage Assets

11.5.11 Designated heritage assets with the potential to experience significant environmental effects and which have been considered within this chapter are set out in **Table 11.6**.

Table 11.6: Designated Heritage Assets

Asset Type	Name	Grade	Sensitivity
Listed Building	Chorlton New Mill and attached chimney	II	Medium
Listed Building	Chorlton Old Mill	II	Medium
Listed Building	Mill on north-east corner of junction with Chester Street	II	Medium
Listed Building	Mill Chimney Stack on west side of Junction with Cambridge Street	II	Medium
Listed Building	Former Cotton Mill on west side of junction with Cambridge Street	II	Medium

11.5.12 The above designated heritage assets are identified on a Heritage Asset Plan, with other assets within the Study Area, presented in **ES Volume 4, Appendix G**.

Future Baseline (the 'do nothing' scenario)

11.5.13 If the Proposed Development did not go ahead, it is considered that the Site conditions would not change. Development would, however, be expected to come forward in the surrounding area, where planning permissions have been granted. This would mean (for example) that existing open land to the south and west of the designated heritage assets (identified in **Table 11.6**) would be developed, which could affect their setting.

11.6 Identification and Description of Changes Likely to Generate Effect

11.6.1 The changes likely to generate an effect at the demolition and construction phase will be temporary and will consist of the temporary diminution in the quality of the setting of heritage assets, from the presence of mobile cranes, visible machinery,

earthworks and material management and demolition and construction traffic movements. These may result in changes in the setting of heritage assets and increased visual intrusion and noise.

- 11.6.2 The changes likely to generate an effect at the operational phase will consist of visual changes associated with the Proposed Development, which could affect the setting and therefore significance of heritage assets.

11.7 Assessment of Likely Significant Effect

Demolition and Construction Phase

Embedded Mitigation Measures

- 11.7.1 The following embedded mitigation which has been evaluated as part of the demolition and construction phase assessment are outlined below.
- The Site will be secured using hoardings/fencing; and
 - A Construction Environmental Management Plan (CEMP) will be prepared and implemented.

Anticipated Effects

- 11.7.2 The assessment below is in accordance with the guidance set out in **Table 11.2, Table 11.3** and **Table 11.4**. As set out within **Chapter 5: The Proposed Development and Demolition and Construction Overview**, it is assumed that there will be a 3-year demolition and construction period from Quarter (Q) 4, 2023 to Q4, 2026.
- 11.7.3 Due to the extent of current inter visibility between the listed buildings located to the east of the Site, it is concluded that there would be a temporary adverse effect on Chorlton New Mill and attached chimney, Chorlton Old Mill, Mill on north east corner of junction with Chester Street, Mill Chimney Stack on west side of Junction with Cambridge Street and the Former Cotton Mill on west side of junction with Cambridge Street.
- 11.7.4 The sensitivity of these listed buildings is considered to be medium. The magnitude of change is considered to be small. Therefore, there is likely to be an indirect, temporary, medium term effect which is considered to be **minor adverse (not significant)**.

Operational Phase

Embedded Mitigation Measures

- 11.7.5 The following embedded mitigation which has been evaluated as part of the operational phase assessment is outlined below.

- The scale and massing of the Proposed Development has been stepped with the lower Block A fronting Medlock Street, closer to the identified listed buildings. Block B is positioned to the rear of the Site, closer to existing tall buildings (River Street and Deansgate Square). The design of Block A with an external expressed grid of Corten steel resonates with the warm brick tones and repetitive facades of the former mill buildings to the east. Block B will be lighter in appearance.

Anticipated Effects

- 11.7.6 The identified heritage assets (**Table 11.6**) are all located to the east of the Site and comprise a group of 18th or early 19th century former mills and associated stack(s). As shown by the ZTV presented in **ES Volume 4, Appendix G**, views of the Proposed Development will be restricted from Chorlton New Mill, due to the degree of enclosure on Cambridge Street and intervening buildings. Whilst the Proposed Development would be clearly visible in views westwards from the remainder of the grouping, it would not impede the experience of or ability to appreciate the industrial significance of these buildings, individually or collectively, due to distance and orientation. In these westward views, the stepped form of the Proposed Development will create depth to the Proposed Development, with Block B set back from Medlock Street and the simple expressed grid façade of the lower Block A resonating with the warm brick of the listed buildings and repetitiveness of their facades.
- 11.7.7 Verified View 7 (presented in **ES Volume 3: Townscape and Visual Impact Assessment**) shows the relationship that the Proposed Development will have with the Mill Chimney Stack and mill complexes in views westwards from Hulme Street. The Mill Chimney Stack currently has an uninterrupted silhouette in these viewpoints and a degree of prominence due to its form, height and tapered crown. Although appearing in combination with, and behind the chimney in views westwards, the proposed viewpoint illustrates that the stepped and layered form of the Proposed Development will appear as a backdrop and is unlikely to detract from the distinctive form of the industrial structure, such that its functional, industrial or operational significance would be eroded or less appreciable. Although visibility of the Development will change with closer proximity and perspective, the selected viewpoint (Verified View 7) demonstrates that the silhouette of the chimney will remain appreciable and the legibility of its relationship with the wider grouping of mills would be unaffected.
- 11.7.8 Visual impact of the Proposed Development is principally in views westwards. It would not impede appreciation of the mill complexes in views eastwards from Hulme Street and views northwards and southwards on Cambridge Street would be unaffected.
- 11.7.9 The sensitivity of the grade II listed mill buildings and chimney is considered to be medium. The magnitude of change is considered to be negligible. Therefore, the indirect, permanent, long term effect is considered to be **negligible (not significant)**.

11.8 Scope for Additional Mitigation Measures

Potential Additional Mitigation Measures

- 11.8.1 No additional mitigation or enhancement over and above that which has been evaluated as part of the Proposed Development is required.

11.9 Residual Effects

- 11.9.1 Following the effective implementation of the embedded mitigation measures proposed above, there are no significant residual effects arising from the Proposed Development during construction or operational phases.

11.10 Cumulative Effects

- 11.10.1 Cumulative effects are the combined effects of several committed/consented schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 11.10.2 The ES has given consideration to 'Cumulative 'Effects' for schemes located within a 500m radius from the boundary of the Site, as listed in **ES Volume 2, Chapter 3: EIA Methodology**.
- 11.10.3 For a number of the committed/consented scheme, there was no consideration of demolition and construction related effects in the application documents submitted to MCC, which has limited the ability to conclude on likely cumulative effects during the demolition and construction phase. As such, professional judgement has also been used to determine cumulative effects.
- 11.10.4 It is considered that during the demolition and construction phase, the likelihood of cumulative effects occurring with the Proposed Development would largely be limited to committed/consented schemes 1, 2 and 3 (refer to **ES Volume 2, Chapter 3: EIA Methodology**) given their proximity to the Site and relationship with the sensitive receptors identified within this chapter. It is likely that each of the committed/consented schemes individually would result in a minor adverse effect, which when considered with the Proposed Development would remain minor adverse and, therefore, be no greater than that considered for the Proposed Development in isolation.
- 11.10.5 In the scenario where all committed/consented schemes come forward simultaneously with the Proposed Development, it is considered that such a cumulative effect would be **moderate adverse (significant)**, but temporary.
- 11.10.6 With respect to the operational phase, technical documentation submitted in support of committed/consented schemes 6, 10, 12, 13, 15 and 17 (refer to **ES Volume 2, Chapter 3: EIA Methodology**) did identify some level of effect on heritage assets. However, the affected assets identified within the technical documentation have not

been considered within this chapter and, as such, there is no common receptor between the Proposed Development and the committed/consented schemes.

- 11.10.7 For committed/consented schemes 1, 2, 3, 4, 5, 7, 8, 9, 11, 14, 16 and 18 (refer to **ES Volume 2, Chapter 3: EIA Methodology**), the technical documentation submitted in support of the associated planning applications concluded that the committed/consented schemes would either not cause any harm to the significance of heritage assets (including special architectural or historic interest) or have a negligible/neutral impact on heritage assets. Based on these conclusions, it is considered that any cumulative effect of the Proposed Development with these committed/consented schemes, would be no greater than the level of effect reported for the Proposed Development in isolation (i.e. **negligible adverse (not significant)**).

11.11 Summary and Conclusions

- 11.11.1 A built heritage assessment has been undertaken to assess the likely significant environmental effects of the Proposed Development on the above ground historic built environment of the Site and the surrounding area during the demolition and construction and operational phases.
- 11.11.2 There are no designated or non-designated built heritage assets within the Site; however, there are assets within the wider area.
- 11.11.3 Directly to the east of the Site is a grouping of five grade II listed former mills and an associated mill chimney stack, dating to the late 18th or early 19th century. These comprise the following:
- Chorlton New Mill and attached chimney (grade II);
 - Chorlton Old Mill (grade II);
 - Mill on north-east corner of junction with Chester Street (grade II);
 - Mill Chimney Stack on west side of Junction with Cambridge Street (grade II); and
 - the Former Cotton Mill on west side of junction with Cambridge Street (grade II).
- 11.11.4 An assessment of the significance of designated and non-designated built heritage assets within a 500m radius Study Area of the Proposed Development has been undertaken, including an assessment of the contribution made by their setting. This is set out within the accompanying Heritage Assessment (**ES Volume 4, Appendix G**) and has been undertaken in accordance with best practice guidance and advice contained within the NPPF 2021, PPG 2021, DMRB 2020 and Historic England guidance.
- 11.11.5 Embedded mitigation has been proposed for both the demolition and construction and operational phases, including the use of hoardings during the demolition and construction phase that will secure the Site and the use of appropriate scale, mass and materiality during the operational phase.

- 11.11.6 Due to the extent of current inter visibility between the listed buildings to the east of the Site it is concluded that that there would be a temporary **minor adverse (not significant)** effect on the identified heritage assets during the demolition and construction phase.
- 11.11.7 During the operation of the Proposed Development, it is concluded that that there would be a **negligible (not significant)** effect on the identified heritage assets.
- 11.11.8 The cumulative effect of the Proposed Development with committed/consented schemes, however, will result in a temporary **moderate adverse (significant)** effect during the demolition and construction phase. Nevertheless, the cumulative effect of the Proposed Development with committed/consented schemes will result in a **negligible adverse (not significant)** effect during the operational phase.
- 11.11.9 **Table 11.7** summarises the Built Heritage effects resulting from the Proposed Development.

Table 11.7: Summary of Residual Effects

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Demolition and Construction								
Heritage assets listed in Table 11.6	Medium	Temporary diminution in the quality of the setting of heritage assets, from the presence of mobile cranes, visible machinery, earthworks and material management and demolition and construction traffic movements.	Hoarding erected around Site and implementa tion of CEMP	Small	Minor Adverse	None	Small	Minor Adverse (not significant)
				Within the study area				
				Temporary				
				Likely				
Operation								
Heritage assets listed	Medium	Visual changes associated	Appropriate design of	Negligible	Negligible	None	Negligible	

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
in Table 11.6		with the Proposed Development affecting the setting and therefore significance of heritage assets.	massing, scale and materiality.	Within the study area				Negligible (not significant)
				Permanent				
				Likely				
Cumulative Effects – Demolition and Construction								
Heritage assets listed in Table 11.6	Medium	Temporary diminution in the quality of the setting of heritage assets, from the cumulative presence of mobile cranes, visible machinery, earthworks and material management and	Hoarding erected around the Site and committed/ consented schemes	Small	Moderate Adverse	None	Small	Moderate Adverse (significant)
				Within the study area				
				Temporary				
				Likely (if all under construction at the same time)				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
		demolition and construction traffic movements.						
Cumulative Effects – Operation								
Heritage assets listed in Table 11.6	Medium	Visual changes associated with the Proposed Development and the committed/co nsented schemes affecting the setting and therefore significance of heritage assets.	Appropriate design of massing, scale and materiality.	Negligible	Negligible	None	Negligible	Negligible adverse (not significant)
				Within the study area				
				Permanent				
				Likely				

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CHAPTER 12: CLIMATE CHANGE

12 Climate Change

12.1 Scope of Assessment

- 12.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of Climate Change.
- 12.1.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed
- 12.1.3 A separate assessment of cumulative effects associated with the Proposed Development in combination with other developments within 500m has not been undertaken as the approach taken to report on greenhouse gas (GHG) emissions from the Proposed Development, in the context of baseline local emissions and future carbon budgets, is inherently a cumulative effects assessment (given that these baseline and future emissions account for GHG emissions from all sectors of the economy).
- 12.1.4 This chapter is intended to be read as part of the wider ES with particular reference to the introductory chapters ES (**ES Volume 2, Chapters 1 – 5**), as well as the Environmental Standards Statement, BREEAM Pre-assessment, Lifecycle Assessments (LCAs), Energy Strategy Report and Circular Economy Statement submitted as part of the planning application.
- 12.1.5 The terms "carbon", "carbon dioxide (CO₂)", "carbon dioxide equivalent (CO₂e)" and "greenhouse gases (GHGs)" are used interchangeably in this chapter, depending on the terminology of referenced documents.

12.2 Key Legislation, Policy and Guidance Considerations

Legislation and Regulation

- 12.2.1 The Climate Change Act 2008 was revised in 2019¹ to set a 100% carbon reduction target (net zero) for the UK by 2050 at the latest.
- 12.2.2 The Government's response to the Future Homes Standard consultation² sets out that, from June 2022 as part of the Building Regulation Part L 'Conservation

¹ UK Government (2019). Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111187654>. [Accessed 19/09/2022].

² MHCLG (2021). The Future Homes Standard: 2019: Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for new dwellings: Summary of responses received and Government

of Fuel & Power' 2021 update, all new dwellings must achieve a minimum 31% CO₂ emissions reduction relative to previous Part L 2013 standards. This is to provide a "meaningful stepping stone" in performance ahead of the Future Homes Standard 2025.

- 12.2.3 The Government's Future Buildings Standard consultation³ confirms that new non-domestic buildings delivered from June 2022 are required to achieve a 27% CO₂ improvement (on average across all non-domestic building types) beyond Part L 2013 as a stepping-stone in advance of the Future Buildings Standard 2025.

Planning Policy

- 12.2.4 National Planning Policy Framework⁴ ("NPPF") paragraph 8(c) recognises the key role planning has regarding mitigating climate change and supporting the transition to a low carbon economy;
- 12.2.5 The Manchester Climate Change Framework 2020-2025⁵ advocates for all new development to be zero carbon from 2023 when the new Manchester Local Plan is expected to have been adopted. Key framework objectives including staying within the city's carbon budget of 15 million tonne CO₂ to the year 2100;
- 12.2.6 Manchester's adopted Core Strategy⁶ includes the following policies of relevance to this chapter:
- Policy EN4: all development must follow the Energy Hierarchy and reduce energy demand and CO₂ emissions through: passive heating, natural lighting and cooling; improved insulation and glazing; meet residual energy demand through the use of low or zero carbon energy technologies, and; use building materials with low embodied carbon; and

response. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/956094/Government_response_to_Future_Homes_Standard_consultation.pdf. [Accessed 15/09/2022].

³ MHCLG (2021). The Future Buildings Standard Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for non-domestic buildings and dwellings; and overheating in new residential buildings. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/956037/Future_Buildings_Standard_consultation_document.pdf. [Accessed 15/09/2022].

⁴ UK Government. National Planning Policy Framework; July 2021. Available at:

<https://www.gov.uk/government/publications/national-planning-policy-framework--2> [Accessed 15/09/2022].

⁵ Manchester Climate Change Partnership & Manchester Climate Change Agency (2020). Manchester Climate Change Framework 2020-2025. Available at:

<https://www.manchesterclimate.com/sites/default/files/Manchester%20Climate%20Change%20Framework%202020-25.pdf>. [Accessed 15/12/2020].

⁶ Manchester City Council (2012). Manchester's Local Development Framework Core Strategy Development Plan Document. Available at: http://www.manchester.gov.uk/download/downloads/id/18981/final_core_strategy.pdf. [Accessed 15/12/2020].

- Policy EN6: Major development to target a minimum 15% CO₂ reduction on Building Regulations Part L 2010.

Technical Standards and Guidance

12.2.7 The following legislation, policy and guidance has informed the assessment of effects within this chapter:

- IEMA's *EIA Guide to: Assessing Greenhouse Gas Emissions & Evaluating their Significance (2022)*⁷ is the key guidance document for this chapter; and
- RIBA [Royal Institute of British Architects] *2030 Climate Challenge; Version 2 (2021)*⁸ providing voluntary performance targets for embodied carbon and operational energy which align with the future legislative horizon and set a challenging but achievable trajectory to achieve significant reductions in GHG emissions necessary by 2030 in order to have a realistic prospect of achieving net zero carbon for the whole UK building stock by 2050.

12.3 Assessment Methodology

Effects Assessed

Effects Not Considered to be Significant

12.3.1 The following effects were not considered significant as part of the EIA Scoping Report and are not considered further in this chapter:

- summertime overheating in buildings;
- impacts to Site species and habitats from changes to seasonal rainfall and temperature;
- heat stress on construction workers;
- water availability during construction and operation;
- flood impacts during construction and operation;
- contamination impacts from construction run-off; and
- reduction in heating demand as a result of climate change.

⁷ IEMA (2022). EIA Guide to: Assessing Greenhouse Gas Emissions & Evaluating their Significance. <https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions> [Accessed 15/09/2022].

⁸ RIBA (2021). 2030 Climate Challenge; Version 2 (2021). Available at: <https://www.architecture.com/-/media/files/Climate-action/RIBA-2030-Climate-Challenge.pdf>. [Accessed 22/09/2022].

Effects Considered Likely to be Significant

- 12.3.2 **Table 12.1** outlines the effects considered likely to be considered significant, which are reported on within this chapter.

Table 12.1: Effects Considered Likely to be Significant

Likely Significant Effect	Receptors	Applicable Phase
GHG emissions from demolition and construction	Global climate system	Demolition and Construction
GHG emissions from energy consumption	Global climate system	Operation

Defining the Study Area

- 12.3.3 For the purposes of assessing effects of the Proposed Development on climate change, the study area largely comprises the Site. Given upstream/downstream GHG emissions (such as from the manufacture of construction materials and the generation at a power station of mains electricity consumed by the operational development), however, the study area extends off Site. Although the study area extends off Site, the location of these off-Site emissions cannot be determined at this stage, as the source of materials, location of materials manufacture or location of electricity generation (power station, renewable energy project etc) is not known.

Determination of the Baseline

- 12.3.4 Baseline conditions regarding GHG emissions have been established by estimating existing GHG emissions occurring at the site from energy consumed by the operation of the existing hotel. Baseline GHG emissions for the MCC administrative area and North West England are sourced from UK Government Local Authority & Regional Carbon Dioxide Emissions National Statistics 2005-2020⁹. Future baseline conditions regarding GHG emissions in MCC's administrative area are sourced from the Manchester Climate Change Framework 2020-2025 in the form of Manchester's future carbon budgets, whilst future UK carbon budgets are sourced from the UK's Sixth Carbon Budget¹⁰.

⁹ UK Government (2022). Local Authority and Regional Carbon Dioxide Emissions National Statistics 2005-2020. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1086980/UK-local-authority-ghg-emissions-2020.xlsx. [Accessed 19/09/2022].

¹⁰ BEIS (2021). Press Release: UK enshrines new target in law to slash emissions by 78% by 2035. Available at: <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>. [Accessed 19/09/2022].

Prediction Methodology

Assessment Process

- 12.3.5 The assessment methodology adopted is based on IEMA's guidance referenced above, in conjunction with professional judgement. It comprises calculating GHG emissions from the construction (including demolition) and operation of the Proposed Development and evaluating these emissions in the context of baseline GHG emissions at the local authority administrative area (MCC) level and regional (north-west) level, as well as to future UK and MCC carbon budgets, in order to establish their magnitude.
- 12.3.6 Consideration is also given to the contribution (or otherwise) of the Proposed Development to the science-based net zero trajectory to the UK's 2050 net zero target. In order to evaluate this contribution, the construction (including demolition) and operational phase carbon performance of the Proposed Development is evaluated against *RIBA's 2030 Climate Challenge* targets for embodied and operational carbon.
- 12.3.7 The applied methodology comprises the following components:
- Review of the legislation, planning policy and guidance relating to GHG emissions/climate change mitigation;
 - Establish the GHG assessment scope and boundaries;
 - Establish current and future baseline conditions (i.e. carbon budgets) in respect of GHG emission;
 - Calculate GHG emissions from the construction and operational phases of the proposed buildings;
 - Consider legislative and policy requirements and wider opportunities for GHG emissions reductions through appropriate mitigation measures;
 - Evaluate the net GHG emissions effect following mitigation in the context of baseline local (MCC) and regional (north-west) GHG emissions and also future UK and MCC carbon budgets (to establish their context and magnitude); and
 - Determine significance of effect based on the magnitude of net GHG emissions above and also whether the Proposed Development makes an appropriate contribution to the UK's net zero trajectory through comparison with RIBA 2030 Climate Challenge targets.

Reporting of the Environmental Effect and Significance Criteria

- 12.3.8 The assessment of likely significant environmental effects as a result of the Proposed Development has taken into account the demolition and construction

and operational phases. The timescales assessed for the demolition and construction and operation of the Proposed Development are set out in **Table 12.2**.

Table 12.2: Assessed Timescales

Development Phase	First Year	Completion/ Assessment Period	Summary
Demolition & Construction	2023	2026	Demolition of the existing buildings on Site and construction of the Proposed Development is scheduled to commence in 2023 and be completed within approximately 3 years.
Operation	2027	2037	The Proposed Development is scheduled to become operational in 2027. The operational phase is assessed up to 2037 (11 years) to facilitate comparison with UK and MCC carbon budgets (see Table 7.8).

Determining Sensitivity of Receptor

- 12.3.9 The sensitivity of affected receptors has been considered on a scale of high, medium, low or negligible.
- 12.3.10 In accordance with IEMA guidance, the global climate system is considered potentially sensitive to any increase in GHG emissions. This sensitivity may vary, however, depending on the global response to climate change; for example, should a significant reduction in GHG emissions be achieved globally over time.
- 12.3.11 Given that it is not possible to predict the future global response to climate change and associated GHG emissions, the Met Office's latest *UK Climate Projections (UKCP18)*¹¹ include assumptions regarding future economic, social and physical changes that will influence climate change known as Representative Concentration Pathways (RCPs). In accordance with IEMA guidance, the high emissions scenario (RCP8.5) has been assumed within this assessment.

¹¹ Met Office (2018). UK Climate Projections 2018¹² IPCC (2018), Global Warming of 1.5°C.¹³ BEIS (2021). Data tables 1 to 19. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1024043/data-tables-1-19.xlsx. [Accessed 19/09/2022].

Determining Duration of Effect

- 12.3.12 The duration of effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.
- 12.3.13 Carbon dioxide equivalency (CO₂e) is a quantity that describes, for a given mixture and amount of GHGs, the amount of CO₂ that would have the same global warming potential (GWP), when measured over a specified timescale, which is generally 100 years. In view of this timescale and the findings of the Intergovernmental Panel on Climate Change (IPCC) 1.5°C Report¹² that some effects from climate change may be long-lasting or irreversible, the duration of effect is assumed to be long term and permanent.

Determining the Magnitude of Change

- 12.3.14 The magnitude of change has been considered as the change experienced from the baseline conditions at the sensitive receptor and has been considered on a scale of large, medium, small or negligible.
- 12.3.15 The magnitude of change of GHG emissions has been determined by establishing the scale of change relative to baseline GHG emissions from MCC's administrative area and the north-west region, and also to future UK and MCC carbon budgets as presented in **Table 12.3**, together with professional judgement.

Table 12.3: Determining Magnitude of Change

Description of Change	Magnitude of Change
A large increase/decrease in GHG emissions (e.g. >10%) relative to baseline local/regional emissions and/or future carbon budgets	Large
A moderate increase/decrease in GHG emissions (e.g. 5 to 10%) relative baseline local/regional emissions and/or future carbon budgets	Medium
A small increase/decrease in GHG emissions (e.g. 1 to 5%) relative to baseline local/regional emissions and/or future carbon budgets	Small
A negligible increase/decrease in GHG emissions (e.g. <1%) relative to baseline local/regional emissions and/or future carbon budgets	Negligible

¹² IPCC (2018), Global Warming of 1.5°C.¹³ BEIS (2021). Data tables 1 to 19. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1024043/data-tables-1-19.xlsx. [Accessed 19/09/2022].

Determining the Level of Effect

12.3.16 The level of effect attributed has been assessed based on the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been based on professional judgement and **Table 12.4** has been a tool which has assisted with this process.

Table 12.4: Matrix to Support Determining the Level of Effect

Magnitude of Change	Sensitivity (or value / importance)			
	High	Medium	Low	Negligible
Large	Major	Moderate to Major	Minor to Moderate	Negligible
Medium	Moderate to Major	Moderate	Minor	Negligible
Small	Minor to Moderate	Minor	Negligible to Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

12.3.17 Whilst **Table 12.4** provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'. A statement is also made as to whether the level of effect is '**Significant**' or '**Not Significant**', again based on professional judgement.

12.3.18 The magnitude of net GHG emissions (or savings) from a project and how this effect changes (or otherwise) baseline conditions at the local, regional and national level are important components when establishing the magnitude of change, which feeds into determining the level of effect. However, how the project contributes (or otherwise) to the UK's net zero trajectory is a key additional component. The following terms have therefore been used to define the level of effect, in accordance with IEMA guidance:

- **Major adverse:** GHG mitigation measures are not in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a large increase (e.g. $\geq 10\%$) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with major adverse effects is locking in GHG emissions and does not make a meaningful contribution to the national trajectory to net zero;
- **Moderate adverse:** GHG mitigation measures are partly in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a medium increase (e.g. $> 5\%$) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with moderate adverse effects complies with some up-

to-date policy and good practice but is locking in some emissions and makes only a partial contribution to the national trajectory to net zero;

- **Minor adverse:** GHG mitigation measures are in line with a science-based 1.5°C aligned transition to net zero for that project type, and net GHG emissions equate to a small increase (e.g. <5%) relative to baseline local/regional/national emissions and/or future local carbon budgets. A project with minor adverse effects complies with up-to-date and emerging policy and good practice reduction measures and makes a contribution to the national trajectory to net zero;
- **Negligible:** GHG mitigation measures are in line with a science-based 1.5°C aligned transition to net zero for that project type, with minimal residual emissions. A project with negligible effects complies with up-to-date and emerging policy and best practice and plays a part in achieving the rate of transition required by nationally set policy e.g. net zero; and
- **Beneficial:** net GHG impacts are below zero and the project results in a reduction in atmospheric GHG concentrations, 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.

Categorising Likely Significant Effects

12.3.19 Effects which are major adverse, moderate adverse or beneficial are considered to be 'significant'. Effects which are minor adverse or negligible are considered to be 'not significant', in accordance with IEMA guidance.

Limitations and Assumptions

12.3.20 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- Emissions Factors:
 - The future UK electricity grid factors published by the Department for Business, Energy & Industrial Strategy (BEIS)¹³ are projections which may not reflect the actual carbon emissions associated with grid electricity consumption in future. That said, BEIS projections have slightly underestimated the rate of grid decarbonisation in recent years, and as a result any inaccuracy in these projections may actually

¹³ BEIS (2021). Data tables 1 to 19. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1024043/data-tables-1-19.xlsx. [Accessed 19/09/2022].

over-estimate (rather than under-estimate) GHG emissions associated with the Proposed Development;

- Embodied Carbon Emissions:
 - The embodied carbon emissions associated with the construction, maintenance and end of life of the office and PBSA buildings are based on results of the BREEAM Mat 01 LCA analysis undertaken by the project's M&E engineers (Ridge). The BREEAM LCA scope excludes finishes and building service (MEP), which according to the London Energy Transformation Initiative's (LETI's) Climate Emergency Design Guide, typically represent 20% of total embodied carbon impacts for medium and large residential developments. Ridge has, therefore, uplifted the BREEAM LCA results by a factor of 25% in order to provide a reasonable worst case figure for total embodied carbon emissions for both buildings (i.e. including for finishes and MEP excluded from the BREEAM LCA)
- Energy Strategy:
 - Annual operational GHG emissions for the Proposed Development are estimated from information on the Building Emissions Rate (for the offices) or Dwelling Emissions Rate (for the purpose-built student accommodation (PBSA) units) as provided by the Energy Strategy Report. It is possible that the energy strategy further develops as part of detailed design; however, any such changes are considered unlikely to materially change the determined magnitude of change or significance of effect identified within this chapter.
 - Energy demand for the PBSA block (Block B) is compared to the *RIBA 2030 Climate Challenge* targets for residential buildings to establish if the Proposed Development makes an appropriate contribution to the UK's net zero trajectory. These RIBA residential targets are likely to relate to traditional residential buildings (e.g. houses and apartments) and therefore are considered likely to be worst case when applied to PBSA, where unregulated loads from appliances etc are likely to be lower.
- Transport GHG Emissions:
 - The Proposed Development will generate vehicle trips on the local road network during demolition and construction and operational phases. Demolition and construction phase transport CO₂ emissions are accounted for in the embodied carbon LCAs undertaken for the project (RICS lifecycle stage A4). Operational phase transport CO₂ emissions have not been calculated due to the challenge of identifying with any

accuracy the proportion of such trips that are wholly additional and the proportion that are simply relocated from elsewhere on the road network as a result of the Proposed Development. However, the Proposed Development will result in an overall reduction in vehicle trips once operational as a result of the loss of the existing car park on Site.

12.4 Scoping and Consultation

- 12.4.1 An EIA Scoping Report (presented in **ES Volume 4, Appendix A1**) was submitted to MCC on 8th September 2022 with a formal request for an opinion on the proposed scope of the EIA and assessment methodologies. MCC subsequently issued their Scoping Opinion on the proposed scope and methodology of the topics for assessment within the EIA. A copy of MCC's Scoping Opinion is provided in **ES Volume 4, Appendix A2**.
- 12.4.2 A summary of the key points raised in MCC's Scoping Opinion, relevant to climate change, are presented in **Table 12.5** including a response as to where the comments have been addressed within this chapter.

Table 12.5 MCC Scoping Opinion Comments and Response

Summary of Comment	Response or location within the ES where comments are addressed
MCC's Scoping Opinion agrees that the scope of work set out in the EIA Scoping Report in relation to climate change is acceptable.	The ES chapter aligns with the scope of work set out in the EIA Scoping Report and as such no responses to MCC Scoping comments are required.

12.5 Baseline Assessment and Identification of Key Receptors

- 12.5.1 The Site currently comprises an existing 5-storey Premier Inn hotel and associated surface car park. The operation of this existing building will result in the release of GHG emissions, both on Site from the combustion of mains gas, and also off Site from the generation of consumed mains electricity. These baseline GHG emissions have been estimated, as presented in **Table 12.6**, through the use of energy benchmarks so they can be considered in the assessment of net GHG emissions from the Proposed Development.

Table 12.6: Existing Site GHG Emissions

Parameter	Value
Existing hotel annual electricity demand estimate ¹	923,360 kWh
Existing hotel annual gas demand ¹	346,260 kWh
Estimated annual GHG emissions ²	147 tCO ₂

Parameter	Value
Notes:	
¹ From <i>CIBSE Guide F (2012) Energy Benchmarks</i> ¹⁴ , business/holiday hotel, good practice, no pool or air conditioning (4,640 kWh/room/year). Based on 199 rooms and 40 sqm per room.	
² Based on UK Government 2022 GHG Conversion Factors for natural gas (0.1825 kgCO ₂ e/kWh, gross CV basis) ¹⁵ and BEIS grid electricity projection for 2026 (0.09067 kgCO ₂ e/kWh, commercial/public sector)	

Sensitive Receptor

- 12.5.2 In accordance with IEMA guidance, the high emissions scenario (RCP8.5) has been assumed and therefore the sensitivity of the global climate system is considered to be **high**.

Baseline Local Authority & Regional GHG Emissions

- 12.5.3 **Table 12.7** presents the most recent (2020) baseline GHG emissions data for the MCC administrative area and north-west England as sourced from *UK Government Local Authority & Regional Carbon Dioxide Emissions National Statistics 2005-2020*.

Table 12.7: Local Authority & Regional GHG Emissions

Administrative Area/Region	2020 GHG Emissions (tCO ₂)
MCC	2,186,764
North West England	41,921,901

Future Carbon Budgets

UK Carbon Budget

- 12.5.4 The *Climate Change Act 2008* was revised in 2019 to set a 100% carbon reduction target (net zero) for the UK by 2050 at the latest. It is the duty of the Secretary of State to set for each succeeding period of five years (beginning with the period 2008 to 2012) an amount for the net UK carbon account (the “carbon budget”) and to ensure the net quantity of emissions does not exceed the carbon budget. The UK carbon budgets are, therefore, effectively a future baseline of national GHG emissions required to achieve our net zero 2050 target.

¹⁴ CIBSE (2012). Guide F Energy Benchmarks

¹⁵ UK Government (2022). GHG Conversion Factors for Company Reporting; June 2022. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1083855/ghg-conversion-factors-2022-full-set.xls. [Accessed 19/09/2022].

- 12.5.5 The UK's *Sixth Carbon Budget* was implemented in April 2021, enshrining in law a new target to reduce GHG emissions by 78% by 2035 and for the first time, incorporating the UK's share of international aviation and shipping emissions.

MCC Carbon Budget

- 12.5.6 A carbon budget of 15 million tCO₂e up to the year 2100 has been set for Manchester by the *Manchester Climate Change Framework 2020-2025*.
- 12.5.7 **Table 12.8** presents the UK and Manchester carbon budgets which, together with baseline GHG emissions reported above, are used to determine the magnitude of change in GHG emissions resulting from the Proposed Development.

Table 12.8: UK and Manchester Carbon Budgets

Period	UK Carbon Budget	Manchester Carbon Budget
	GHG Emissions [million tCO ₂ e]	
4th carbon budget (2023 – 2027)	1,950	3.59
5th carbon budget (2028 – 2032)	1,725	1.95
6th carbon budget (2033 – 2037)	965	1.10
7th carbon budget (2038 – 2042)	Not yet set	0.64
8th carbon budget (2043 – 2047)	Not yet set	0.38
9th carbon budget (2048 – 2100)	Not yet set	0.59

- 12.5.8 On the basis of the above and assuming an even split of emissions annually within each five-year budget period, the UK and MCC carbon budget for the construction phase (2023-26) are estimated to be 1,170 million tCO₂ and 2.154 million tCO₂ respectively. For the assessed operational phase (2027-37), the UK and MCC carbon budget are estimated to be 3,080 million tCO₂ and 3.768 million tCO₂ respectively.

Trajectory towards Net Zero

- 12.5.9 In order to determine whether the Proposed Development is aligned with the UK's net zero trajectory as required by the new IEMA guidance, embodied (construction) carbon and operational energy performance of the office and PBSA blocks, as provided by the BREEAM Mat01 LCA results, Energy Strategy Report, have been compared to the *RIBA 2030 Climate Challenge* targets as presented in **Table 12.9**.

Table 12.9: Comparison of the Proposed Development against RIBA 2030 Climate Challenge Targets

Building Type / Target	Business As Usual	2025 Target	2030 Target
New Build Offices (Block A)			
Embodied Carbon (kgCO ₂ e/m ²)	1,400	<970	<750
Operational Energy (kWh/m ² /year)	130	<75	<55
New Build PBSA (Block B)			
Embodied Carbon (kgCO ₂ e/m ²)	1,200	<800	<625
Operational Carbon (kWh/m ² /year)	120	<60	<35

Future Baseline (the 'do nothing' scenario)

12.5.10 In the 'do nothing' scenario, Site emissions would continue to be circa 147 tCO₂/year estimated from energy consumed from operation of the existing hotel as presented in **Table 12.6**.

12.6 Identification and Description of Changes Likely to Generate Effect

12.6.1 The Proposed Development would result in the demolition of the existing hotel and the construction and operation of the new office and PBSA blocks, resulting in a change in GHG emissions from the current baseline.

12.7 Assessment of Likely Significant Effect

Demolition and Construction Phase

Embedded Mitigation Measures

- 12.7.1 The following embedded mitigation has been evaluated as part of the demolition and construction phase assessment:
- The principal contractor will be responsible for producing a Site Waste Management Plan (SWMP) to reduce and appropriately manage demolition and construction waste arisings;
 - A Construction Environmental Management Plan (CEMP) will be prepared to manage general environmental related effects during the construction phase. The CEMP will include measures to reduce GHG emissions during demolition and construction, including the monitoring, management and dissemination of energy consumption and transport emissions;
 - A total of 7 credits (available under BREEAM issue *Mat 01 Environmental impacts from construction products – Building life cycle assessment (LCA)*) are targeted for the office and PBSA buildings to ensure construction carbon is

assessed and where possible reduced. This performance relates to undertaking an LCA for each building at RIBA Stage 2 and evaluating at least 4 different superstructure options and 6 different substructure or hard landscaping options, updating the LCA at RIBA Stage 4 including a further three options (superstructure) two options (substructure or hard landscaping) based on the Stage 2 choice, and integrating the appraisal outcomes into the design process; and

- The adoption of circular economy principles as set out in the Circular Economy Statement submitted as part of the planning application.

Anticipated Effects

GHG Emissions from Demolition and Construction

12.7.2 The proposed demolition will result in the release of GHG emissions from sources including the on-Site consumption of fossil fuels by plant, the transport of demolition wastes and their subsequent treatment. **Table 12.10** presents estimated demolition GHG emissions and associated assumptions including the transport of all demolition waste for off-Site treatment (as a worst-case scenario). Total demolition GHG emissions of circa 41 tCO₂ are estimated, which excludes on Site emissions from fuel consumption by Site plant, given the challenge in estimating these emissions due to a lack of suitable benchmarks.

Table 12.10: Demolition GHG Emissions

Parameter	Value
Demolition waste weight ¹	7,140 tonnes
Demolition waste transport emissions ²	38 tCO ₂
Demolition waste processing emissions ³	3 tCO ₂
Total demolition GHG emissions	41 tCO ₂
Notes:	
¹ US EPA estimate of 158 lb/sq ft demolition waste from non-residential buildings ¹⁶	
² UK Government 2021 factor for average HGV average laden (0.10614 kgCO ₂ e/tkm) and assumed 50km distance	
³ UK Government 2021 factor for concrete/aggregates landfilled (1.234 kgCO ₂ e/tonne)	

12.7.3 The proposed construction will also generate GHG emissions from the manufacture and transport of construction materials, the combustion of fossil fuels by plant and vehicles, and the transport and treatment of construction waste. **Table 12.11** presents embodied carbon emissions calculated by Ridge

¹⁶ US EPA (2003). Estimating Building Related Construction and Demolition Materials Amounts.

for the proposed office and PBSA buildings as part of the BREEAM Mat01 LCA, along with the GHG emissions estimated from the demolition of the existing hotel building.

- 12.7.4 It should be noted that the LCA results cover total embodied carbon which includes building use phases beyond construction (i.e. maintenance and end of life). However, the use of these results enables direct comparison with the RIBA climate challenge targets (which also cover these later lifecycle stages) and have been taken as a proxy for construction phase impacts to ensure a worst case approach.

Table 12.11: Estimated Construction GHG Emissions

Parameter	Value
Embodied carbon Office Building (36,494m ²)	509.0 kgCO ₂ e/m ²
Embodied carbon PBSA Building (including the community space) (30,883m ²)	630.6 kgCO ₂ e/m ²
Total embodied carbon	38,050 tCO ₂ e
Demolition GHG emissions	41 tCO ₂ e
Total demolition & construction GHG emissions	38,091 tCO ₂ e
Annual average demolition & construction GHG emissions (3 years)	12,697 tCO ₂ e

- 12.7.5 Total GHG emissions of circa 38,050 tCO₂e are predicted to be generated by the construction of the Proposed Development. Combined with demolition GHG emissions from **Table 12.10**, total demolition and construction phase GHG emissions of 38,091 tCO₂e are estimated, equating to annual emissions of circa 12,697 tCO₂e over the 3-year timeframe scheduled for this phase.
- 12.7.6 Embodied carbon of construction materials such as concrete and steel represents the main source of demolition and construction phase GHG emissions for the Proposed Development. The origin of these construction materials (and their raw materials inputs) and the date, location and timeframe of their manufacture is unlikely to be known until a contractor is appointed to commence this work. As a result, there is significant inherent uncertainty regarding the geographical and temporal boundaries within which these GHG emissions will occur.
- 12.7.7 Assessing construction stage GHG emissions with the context of baseline annual local and regional GHG emissions, and also future carbon budgets, is therefore likely to over-estimate their magnitude. A proportion of construction materials use in the Proposed Development is likely to have been exported from outside the UK, for example, or manufactured in the UK a number of years previously, and as such would not contribute to local, regional or national GHG emissions.

12.7.8 **Table 12.12** presents estimated demolition and construction phase GHG emissions as a proportion of baseline local and regional GHG emissions, and also future Manchester and UK carbon budgets. Annual average demolition and construction phase GHG emissions have been compared against the Manchester and north-west England baseline emissions (given that these are annualised data), whereas total demolition and construction phase GHG emissions have been compared with future Manchester and UK Carbon Budgets (given that these are not annualised data).

Table 12.12: Demolition & Construction GHG Emissions in Context

Context	Proposed Development Emissions (as a %)
MCC 2020 GHG Emissions	0.581%
North-west England 2020 GHG Emissions	0.030%
Manchester Carbon Budget 2023-26 (estimated to be 2.154 million tCO ₂ e)	1.768%
UK Carbon Budget 2023-26 (estimated to be 1,170 million tCO ₂ e)	0.001%

12.7.9 Demolition and construction phase GHG emissions from the Proposed Development represent circa 0.581% of baseline local GHG emissions (MCC, 2020), reducing to circa 0.030% of baseline regional GHG emissions (north-west England, 2022). When compared to MCC's carbon budget estimated for the period 2023-26, these emissions represent circa 1.768%, or 0.001% of the UK carbon budget estimated for the 2023-26 construction phase.

12.7.10 Regarding the contribution of the Proposed Development's embodied carbon emissions to the UK net zero trajectory, **Table 12.13** presents the extrapolated BREEAM Mat01 LCA results for the proposed office and PBSA buildings to the RIBA climate challenge embodied carbon targets for new build offices and domestic/residential development respectively.

Table 12.13: Construction GHG Performance & RIBA Climate Challenge Targets

Proposed Development Element	Embodied Carbon (kgCO ₂ e/m ² , RICS lifecycle modules A1-C4)			
	RIBA Business As Usual	RIBA 2025 Target	RIBA 2030 Target	Proposed Development
Offices	1,400	<970	<750	509.0
PBSA	1,200	<800	<625	630.6

12.7.11 It can be seen that embodied carbon performance predicted for the office block (509.0 kgCO₂e/m²) meets RIBA's 2030 target for new build offices (<750 kgCO₂e/m²) by a significant margin. Whilst embodied carbon performance predicted for the PBSA block (630.6 kgCO₂e/m²) exceeds RIBA's 2030 target for

new build domestic/residential development ($<625 \text{ kgCO}_2\text{e/m}^2$), it should be noted that this is based on a conservative extrapolation of the BREEAM LCA result (i.e. a 25% uplift, whereas LETI estimates excluded building elements (finishes and building services) which typically represent only 20% of embodied carbon emissions).

- 12.7.12 On balance, the Proposed Development's construction carbon performance is considered consistent with existing and emerging policy and good to best practice design standards for projects of this type. Therefore, the Proposed Development is in line with measures necessary for the UK's net zero trajectory.
- 12.7.13 The sensitivity of the global climatic system is considered to be high. The magnitude of change is considered to be small (at the Manchester carbon budget level, reducing to negligible at the UK carbon budget level and in the context of MCC's and North West's baseline emissions). Therefore, there is likely to be a direct, temporary and adverse effect which is considered to be **minor (not significant)**.

Operational Phase

Embedded Mitigation Measures

- 12.7.14 The following embedded mitigation has been evaluated as part of the operational phase assessment as set out in the **Energy Strategy Report** submitted with the application:
- A "fabric first" approach in accordance with the energy hierarchy including fabric specifications (U values, air tightness, thermal bridging etc) better than the new Part L 2021 backstop values;
 - An all-electric energy strategy which will avoid locking the development in to long-term fossil fuel use. This provision is in advance of legislative requirements to not use fossil fuels in new buildings (scheduled for 2025 as part of the Future Homes Standard and Future Buildings Standard) and will furthermore enable operational emissions to reduce year-on-year as the UK electricity grid continues to decarbonise;
 - On Site low/zero carbon energy technology to meet a proportion of energy demand in the form of air source heat pumps and solar photovoltaic (PV) arrays; and
 - Performance beyond new Part L 2021 standards for both the office (0.78% CO₂ emissions improvement) and PBSA buildings (25.64% CO₂ emissions improvement).

Anticipated Effects

GHG Emissions from Energy Consumption

12.7.15 The operation of the Proposed Development will result in the release of GHG emissions from the off-Site generation of consumed mains electricity. No on-Site combustion of mains gas will occur due to the 'all-electric' energy strategy that is proposed. **Table 12.14** presents the energy consumption and carbon emissions calculated for the office and PBSA blocks, based on data provided by the **Energy Strategy Report**.

Table 12.14: Operational Carbon & Energy Performance

Element	Floor Area (m ²)	Building Emissions Rate (BRE, kgCO ₂ /m ² /year)	Emissions (tCO ₂ /year)	% improvement on Part L 2021	Total energy demand (kWh/m ² /year)
Offices	36,500	3.80	139	0.78%	62.79
PBSA	30,830	5.83	180	25.6%	72.17
Total	67,330	--	318	--	--

12.7.16 **Table 12.15** presents the operational GHG emissions calculated for the first year of operation (2027), and also cumulatively across the assessed operational period (2027 – 2037). Account is also taken of existing operational emissions from the hotel to establish the net operational GHG effect of the Proposed Development; however, no account is taken of further decarbonisation of the UK electricity grid over this time and, therefore, results are considered to be a worst-case scenario.

Table 12.15: Operational GHG Emissions

Period	GHG Emissions (tCO ₂)
Proposed Development Operational GHG Emissions Year 1 (2027)	318
Existing Hotel Operational GHG Emissions Year 1 (2027)	147
Net Operational GHG Emissions Year 1 (2027)	172
Cumulative Net Operation GHG Emissions Year 12 (2027-37)	1,887

12.7.17 The Proposed Development is estimated to result in GHG emissions of 318 tCO₂ during the first year of operation (2027). Subtracting emissions from the existing hotel (147 tCO₂/year), which will cease as a result of the Proposed Development, gives net annual operational emissions from the Proposed Development of 172 tCO₂/year. Extrapolating these emissions across the assessed operational phase (2027-37) gives net cumulative operational emissions of 1,887 tCO₂ during this period.

12.7.18 **Table 12.16** presents the net operational GHG emissions presented above as a proportion of baseline local and regional GHG emissions, and also Manchester and UK carbon budgets estimated for the period 2027-37, to establish their magnitude. GHG emissions for the first year of operation (2027) are compared with baseline Manchester and north-west England emissions (given that these are also annual data), whereas cumulative GHG emissions over the period 2027-37 are compared with future Manchester and UK Carbon Budgets (given that these are not annual emissions data).

Table 12.16: Operational GHG Emissions in Context

Context	Proposed Development Emissions (as a %)
MCC 2020 GHG Emissions	0.008%
North West England 2020 GHG Emissions	<0.001%
Manchester Carbon Budget (2027-37)	0.050%
UK Carbon Budget (2027-37)	<0.001%

12.7.19 Net operational GHG emissions in the first year of operation of the Proposed Development (2027) represent circa 0.008% of baseline (2020) MCC emissions, reducing to <0.0001% of baseline (2020) emissions from north-west England. Cumulative operational emissions across the assessed period (2027-37) represent circa 0.050% of MCC carbon budget, or <0.001% of the UK carbon budget, estimated for this period.

12.7.20 In summary, therefore, GHG emissions from the operation of the Proposed Development (both annually and cumulatively) are negligible in the context of baseline MCC and north-west England emissions and also the MCC and UK carbon budgets.

12.7.21 A final consideration to determine the significance of effect is whether the Proposed Development makes an appropriate contribution to the UK's net zero 2050 trajectory. **Table 12.17** compares the total energy demands predicted for the office and PBSA blocks (as derived from the Energy Strategy Report) to the *RIBA 2030 Climate Challenge* targets for operational energy.

Table 12.17: Operational Energy Performance & RIBA Climate Challenge Targets

Proposed Development Element	Operational Energy (kWh/m2/year)			
	RIBA Business As Usual	RIBA 2025 Target	RIBA 2030 Target	Proposed Development
Offices	130	<75	<55	62.79
PBSA	120	<60	<35	72.17

- 12.7.22 It can be seen that the total energy demand predicted for the office block (62.79 kWh/m²/year) meets RIBA's 2025 target for new build offices (<75 kWh/m²/year) and is actually closer to the 2030 target for this building type (<55 kWh/m²/year). Energy demand predicted for the PBSA building (72.17 kWh/m²/year) is above RIBA's 2025 residential target (<60 kWh/m²/year); however, this target relates to 2025 (not the present day, 2022) and the Proposed Development performs much closer to this future target than it does to RIBA's Business As Usual benchmark (130 kWh/m²/year).
- 12.7.23 On balance and in view of wider operational mitigation measures (including an all-electric energy strategy in advance of this requirement under the Future Homes Standard/Future Buildings Standard 2025, and the significant betterment of Part L 2021 standards for the PBSA), the Proposed Development's operational performance is considered consistent with existing and emerging policy and good practice design standards (as a minimum) for projects of this type and, therefore, is in line with measures necessary for the UK's net zero trajectory.
- 12.7.24 In summary, therefore, the sensitivity of the global climate system is considered to be high, the magnitude of change is negligible, and the Proposed Development makes an appropriate contribution to the UK's net zero trajectory. Therefore, there is likely to be a direct, permanent and long-term adverse effect which is considered to be **minor (not significant)**.

12.8 Scope for Additional Mitigation Measures

Potential Additional Mitigation Measures

- 12.8.1 No specific additional mitigation is proposed during the demolition and construction phase that could help to reduce, offset or mitigate the identified effect further.
- 12.8.2 No specific additional mitigation is proposed during the operational phase that could help to reduce, offset or mitigate the identified effect further.

Likely Effectiveness of Additional Mitigation Measures

- 12.8.3 In the absence of additional mitigation, the residual effect of the demolition and construction assessment is the same as that reported within the pre-mitigation scenario. This effect is considered to be **Not Significant**.
- 12.8.4 In the absence of additional mitigation, the residual effect of the operational assessment is the same as that reported within the pre-mitigation scenario. This effect is considered to be **Not Significant**.

12.9 Residual Effects

- 12.9.1 Following the effective implementation of the embedded mitigation measures proposed above, there are no significant residual effects arising from the Proposed Development during demolition and construction or operational phases.

12.10 Cumulative Effects

- 12.10.1 As noted in paragraph 12.1.3, a separate cumulative effects assessment has not been undertaken, as the main assessment is inherently a cumulative effects assessment (given that the baseline and future emissions account for GHG emissions from all sectors of the economy).

12.11 Summary and Conclusions

- 12.11.1 The contribution of the Proposed Development to climate change from the release of greenhouse gases (GHGs) during construction (including demolition of the existing hotel building) and its subsequent operation has been evaluated.
- 12.11.2 Predicted construction and operational GHG emissions have been considered in the context of existing GHG emissions from the operational hotel on Site, the MCC administrative area and North-West England, and also to future carbon budgets set for Manchester and to help achieve “carbon neutrality” by 2050.
- 12.11.3 Within this context, emissions from the construction and operation of the Proposed Development are largely of negligible magnitude (i.e. less than a 1% change in emissions), except when comparing construction emissions of the Proposed Development to Manchester’s carbon budget for that demolition and construction period (i.e. 2023-26), where a small increase (i.e. between a 1% and 5% change in emissions) is predicted.
- 12.11.4 Furthermore, the construction and operational stage GHG emissions performance of the Proposed Development is in line with, or better than, benchmarks published by the Royal Institute of British Architects (RIBA) to help ensure new buildings meet the UK’s “net zero carbon” target by 2050. As a result, the Proposed Development is considered to make an appropriate contribution to the UK’s net zero trajectory for a project of this type during both demolition and construction and operation.
- 12.11.5 Embedded mitigation measures contributing to this performance include an “all-electric” energy strategy, including solar panels and low carbon heating (such as heat pumps) in place of traditional heating systems which use fossil fuels (e.g. gas boilers) and, therefore, have greater climate change impacts.

12.11.6 In view of the above, the Proposed Development is considered to have only a minor adverse effect in relation to climate change, which is not significant (in accordance with guidance from the Institute of Environmental Management & Assessment (IEMA)).

12.11.7 **Table 12.18** summarises the Climate Change effects resulting from the Proposed Development

Table 12.18: Summary of Residual Effects

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Demolition and Construction								
Global climate system	High	GHG emissions from demolition and construction of the Proposed Development		Small	Minor	N/A	Minor	Minor Adverse (not significant)
				Global				
				Long-term, temporary				
				Likely				
Operation								
Global climate system	High	GHG emissions from operation of the Proposed Development	An all- electric energy strategy, on Site low/zero carbon energy technology etc.	Negligible	Minor	N/A	Minor	Minor Adverse (not significant)
				UK				
				Long-term, permanent				
				Likely				

Receptor/ Affected Group	Value or Sensitivity (Significance) of Receptor	Activity or Impact	Embedded Design Mitigation	Magnitude/ Spatial Extent/ Duration/ Likelihood of Occurrence	Significance of effect	Additional Mitigation	Residual Magnitude of Impact	Significance of Residual effect
Cumulative Effects – Demolition and Construction								
N/A, as inherent in the main assessment.								
Cumulative Effects – Operation								
N/A, as inherent in the main assessment.								

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CHAPTER 13: EFFECT INTERACTIONS

13 Effect Interactions

13.1 Introduction

- 13.1.1 This chapter provides an assessment of the likely cumulative effects of the Proposed Development as required by the EIA Regulations.
- 13.1.2 There are two types of cumulative effects:
- Type 1, intra-project effects which are the combined effects of individual topic effects on a particular sensitive receptor; and
 - Type 2, inter-project effects which are the combined effects of several committed schemes (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 13.1.3 Type 2 Cumulative Effects: Inter-project effects have been considered for committed schemes located within a 500m radius from the boundary of the Site, the full list is provided in **ES Volume 2, Chapter 3: EIA Methodology, Table 3.8** of this ES. These effects have been assessed in each technical chapter of this ES and are summarised in **Table 13.3**.

13.2 Intra-Project Effects

- 13.2.1 There is potential during both demolition and construction and operation of the Proposed Development for a combination of environmental effects to arise at the same time, affecting the same receptor or location.
- 13.2.2 There is no established EIA methodology for assessing effect interactions on a particular receptor, although the European Commission (EC)¹ has produced guidelines to assist EIA practitioners in developing an approach which is appropriate to a project. This approach has been modified and applied to determine the potential for effect interactions.
- 13.2.3 **Table 13.1** and **Table 13.2** identify the potential residual effects on relevant groups of sensitive receptors, as a result of the Proposed Development, as previously identified through the individual topic assessments. Both tables define anticipated effects across both demolition and construction and operation, further identifying anticipated effect interactions (cumulative effects) during each of these phases. The identification of effect interactions is based on the combined professional judgement of the topic specialists and EIA

¹ European Community (1999); Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.

coordination team. Residual effects that are beneficial or adverse in nature and that are minor, moderate or major in scale have been considered.

- 13.2.4 Having identified a potential for an effect interaction, that effect interaction is evaluated qualitatively. Considerations may include the exact location and duration where residual effects are anticipated and the sub-division of receptors into smaller categories (for example, residents of a particular street, or specific species or habitats). For each likely effect interaction, it is noted whether the interaction is sufficient for the significance of the interactive effect to be greater than the individual residual effects in isolation and, where this is the case, an effect interaction significance is given. Even where the effect interaction is no more significant than the residual effects in isolation, the nature of the effect is further explained and summarised in this chapter and in the **Non-Technical Summary (ES Volume 1)** so that the nature of the interactive effect can be fully understood.

Potential for Intra-Project Effects during Demolition and Construction

Table 13.1: Summary of Intra-Project Effects – Demolition and Construction Phase

Receptor	Residual Effect	Potential for Intra-Project Effects
Residential	Noise and Vibration Demolition and construction noise and vibration on City South (Moderate-minor adverse). Demolition and construction noise and vibration on Canvas Students Manchester (i.e. the River Street Tower purpose-built student accommodation (PBSA) development to the west of the Site) (Moderate-minor adverse).	No potential for interactive effects.
Commercial	Socio-Economics Employment generation (Moderate beneficial).	No potential for interactive effects.
Community (public open spaces)	None.	No potential for interactive effects.
Heritage assets	Built Heritage Diminution in the quality of the setting of heritage assets, from the presence of mobile cranes, visible machinery, earthworks and material management and demolition and construction traffic movements (Minor adverse).	No potential for interactive effects.

Receptor	Residual Effect	Potential for Intra-Project Effects
Global climate system	Climate Change Greenhouse gas emissions from demolition and construction of the Proposed Development (Minor adverse).	No potential for interactive effects.
Road users	None.	No potential for interactive effects.
Townscape and Views	Townscape and Visual Impact Assessment Changes to the townscape character (Minor adverse). Effects on the Site character (Minor adverse). Changes to the character and amenity of viewpoint 1 (Minor adverse). Changes to the character and amenity of viewpoint 3 (Minor adverse). Changes to the character and amenity of viewpoint 4 (Minor adverse). Changes to the character and amenity of viewpoint 5 (Minor adverse). Changes to the character and amenity of viewpoint 6 (Minor adverse). Changes to the character and amenity of viewpoint 7 (Moderate adverse). Changes to the character and amenity of viewpoint 8 (Minor adverse). Changes to the character and amenity of viewpoint 9 (Minor adverse). Changes to the character and amenity of viewpoint 10 (Moderate adverse). Changes to the character and amenity of viewpoint 11 (Moderate adverse). Changes to the character and amenity of viewpoint 12 (Moderate adverse). Changes to the character and amenity of viewpoint 13 (Minor adverse). Changes to the character and amenity of viewpoint 18 (Moderate adverse). Changes to the character and amenity of viewpoint 19 (Moderate adverse).	No potential for interactive effects.

13.2.5 No interactive effects are anticipated during the demolition and construction phase of the Proposed Development.

Potential for Intra-Project Effects during Operation

Table 13.2: Summary of Intra-Project Effects – Operational Phase

Receptor	Residual Effect	Potential for Intra-Project Effects
Residential	<u>Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution</u> Daylight and sunlight to City South Apartments (Moderate adverse). Daylight and sunlight to River Street Tower (Moderate adverse).	No potential for interactive effects.
Commercial	<u>Socio-Economics</u> Employment generation (Major beneficial).	No potential for interactive effects.
Community (public open spaces)	None.	No potential for interactive effects.
Heritage assets	None.	No potential for interactive effects.
Global climate system	<u>Climate Change</u> Greenhouse gas emissions from operation of the Proposed Development (Minor adverse).	No potential for interactive effects.
Road users	<u>Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution</u> Solar glare on road users at nearby road junctions (Negligible to minor adverse).	No potential for interactive effects.
Townscape and Views	<u>Townscape and Visual Impact Assessment</u> Changes to townscape character (Moderate beneficial). Changes to urban grain (Minor beneficial). Changes to land use (Minor beneficial). Changes to building heights (Moderate beneficial). Changes to movement and linkages (Minor beneficial). Changes to public open space and public realm (Moderate beneficial). Changes to Site character (Moderate beneficial). Changes to the character and amenity of viewpoint 1 (Minor beneficial). Changes to the character and amenity of viewpoint 2 (Moderate beneficial).	No potential for interactive effects.

Receptor	Residual Effect	Potential for Intra-Project Effects
	Changes to the character and amenity of viewpoint 3 (Minor beneficial). Changes to the character and amenity of viewpoint 4 (Minor beneficial). Changes to the character and amenity of viewpoint 5 (Moderate beneficial). Changes to the character and amenity of viewpoint 6 (Moderate beneficial). Changes to the character and amenity of viewpoint 7 (Moderate beneficial). Changes to the character and amenity of viewpoint 8 (Minor beneficial). Changes to the character and amenity of viewpoint 9 (Minor beneficial). Changes to the character and amenity of viewpoint 10 (Moderate beneficial). Changes to the character and amenity of viewpoint 11 (Moderate beneficial). Changes to the character and amenity of viewpoint 12 (Moderate beneficial). Changes to the character and amenity of viewpoint 13 (Minor beneficial). Changes to the character and amenity of viewpoint 18 (Moderate beneficial). Changes to the character and amenity of viewpoint 19 (Moderate beneficial). Changes to the character and amenity of viewpoint 20 (Minor beneficial).	

13.2.6 No interactive effects are anticipated during the operational phase of the Proposed Development.

13.3 Inter-Project Effects

13.3.1 Cumulative effects resulting from the in-combination impacts from other committed schemes alongside the Proposed Development have been considered by each discipline in their respective chapters (**Chapter 6 to 12 and Volume 3: Townscape and Visual Impact Assessment**). Where there are additional effects beyond the effect of the Proposed Development in isolation, these are summarised in **Table 13.3**. The list of committed schemes assessed is included in **Chapter 3: EIA Methodology**.

Table 13.3: Summary of Inter-Project Effects

EIA Topic	Description
Socio-Economics	Demolition and construction: • Employment generation (Major Beneficial). Operation: • Employment generation (Major Beneficial).
Air Quality	None
Noise and Vibration	Demolition and construction: • Demolition and construction noise and vibration (Moderate adverse). Operation: None.
Wind Microclimate	None.
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution	None.
Built Heritage	Demolition and construction: • Diminution in the quality of the setting of heritage assets, from the presence of mobile cranes, visible machinery, earthworks and material management and demolition and construction traffic movements (Moderate adverse). Operation: None.
Climate Change	None.
Townscape and Visual Impact Assessment	Demolition and Construction: None. Operation: • Changes to the urban grain (Moderate beneficial). • Changes to land use (Moderate beneficial). • Changes to movement and linkages (Moderate beneficial). • Changes to the character and amenity of viewpoint 13 (Moderate beneficial). • Changes to the character and amenity of viewpoint 14 (Minor beneficial). • Changes to the character and amenity of viewpoint 17 (Minor beneficial).

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CHAPTER 14: SUMMARY OF MITIGATION MEASURES AND RESIDUAL EFFECTS

14 Summary of Mitigation Measures and Residual Effects

14.1 Introduction

- 14.1.1 This chapter provides a summary of the mitigation identified by the environmental assessments in the ES along with a summary of the residual effects following the implementation of the mitigation measures. Full details of the assessment can be found in the respective ES chapters.

14.2 Summary of Mitigation Measures

- 14.2.1 Schedule 4, Part 1 of the EIA Regulations requires an ES to include:
“a description of the measures envisaged to prevent, reduce and where possible offset any significance adverse effects on the environment.”
- 14.2.2 The mitigation, monitoring and enhancement measures included in this ES fall into one of two categories:
- Embedded mitigation: this includes committed measures incorporated into the design which make up the Proposed Development; and
 - Additional mitigation: further mitigation beyond that included in the embedded mitigation which seeks to further prevent, reduce and where possible offset anticipated adverse significant effects.
- 14.2.3 **Table 14.1** outlines a topic-by-topic summary of the key issues addressed by the ES and the key mitigation measures identified. The mitigation measures are separated into the above listed categories. The Applicant anticipates that, where appropriate, MCC will seek to ensure the effective delivery of these mitigation measures, via legal agreement, obligation or conditions attached to any planning permission.

Table 14.1: Summary of Key Embedded and Additional Mitigation Measures

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
Socio-Economics	Demolition and construction: • Employment generation. Operation: • Employment generation.	Embedded • Site security and health and safety arrangements for the Proposed Development during the demolition and construction phase will be in line with the requirements set out in the Construction (Design and Management) Regulations 2015¹. Additional: • N/A	Embedded: • The design of the Proposed Development will be informed by 'Secured by Design' principles and appropriate measures to enhance community safety. • New employment supported by the Proposed Development (i.e. office floorspace). Additional: • N/A
Air Quality	Demolition and construction: • Generation of dust and	Embedded • Production of a Construction Environmental Management Plan (CEMP), including measures in line with the Institute of Air	Embedded: • Energy Strategy, proposing Air Source Heat Pumps (ASHPs) and photovoltaic (PV) panels.

¹ UK Government (2015). UK Statutory Instruments: The Construction (Design and Management) Regulations 2015.

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	particulate matter. - Generation of traffic emissions. Operation: - Generation of emissions from a potential energy centre (not assessed – please refer to Chapter 7: Air Quality for further details). - Generation of traffic emissions.	Quality Management (IAQM) guidance². Additional: N/A	Additional: - Provision of a Travel Plan. - Provision of green infrastructure throughout the Site to absorb pollution and increase deposition rates. - Provision of Electric Vehicle (EV) charging points for all car parking spaces.
Noise and Vibration	Demolition and construction:	Embedded Production of a CEMP, including Best Practicable Means (BPM).	Embedded: Manchester City Council (MCC) criteria for noise, as per

² IAQM (2016) Guidance on the Assessment of Dust from Demolition and Construction.

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	- Noise and vibration generated by demolition and construction activities (including traffic). Operation: - Noise generated by building services plant servicing the Proposed Development. - Disturbance from amplified music within the gym area. - Disturbance from prevailing external noise levels.	- Limitations on working hours. Additional: - N/A.	standard conditions, relating to operational industrial/commercial noise, operational entertainment noise and operational noise impacts on the Proposed Development. Additional: N/A.

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
Wind Microclimate	Demolition and construction: - Not assessed (please refer to Chapter 9: Wind Microclimate for further details). Operation: - Effects on pedestrian safety and comfort of users/pedestrians at thoroughfares within the Site. - Effects on pedestrian safety and comfort of users/pedestrians at entrances within the Site. - Effects on pedestrian safety	Embedded - N/A. Additional: - N/A.	Embedded: - Proposed soft landscaping. Additional: - Robust landscaping to the south of the main entrance to the western façade of Block B.

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	and comfort of users of the rooftop terraces on Block A (Levels 12 and 13). • Effects on pedestrian safety and comfort of users of the smaller terraces of Block A • Effects on pedestrian safety and comfort of users of the rooftop terrace on Block B (Level 11). • Effects on pedestrian safety and comfort of users/pedestrians		

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	in the surrounding area. Effects on the pedestrian safety and comfort of users of southern terraces of City South Apartments.		
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution	Demolition and construction: - N/A. Operation: - Reduction in neighbouring daylight and sunlight. - Solar glare from the Proposed Development.	Embedded - N/A. Additional: - N/A.	Embedded: - Fixed external shading devices to break up reflections from the southern elevation of Block A. - Non-reflective panels to the eastern and western elevations of Block B to break up reflections. - A non-reflective frit applied to the outer surface of the glazing of the southern elevation of Block B, to lower the intensity of reflections.

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	Light pollution from the Proposed Development.		<u>Additional:</u> Low visible light transmittance glazing; occupancy sensors to all lighting; detailed lighting design to minimise the illuminance levels to the west of the floorplan; dimming of lights at the perimeter of the floorplan post-curfew; and automatic blinds post-curfew.
Built Heritage	Demolition and construction: Diminution in the quality of the setting of heritage assets, from the presence of mobile cranes, visible machinery, earthworks and material management and demolition and	Embedded - Hoarding erected around the Site. - Implementation of a CEMP. <u>Additional:</u> - N/A.	Embedded: - Design of massing, scale and materiality of the Proposed Development. <u>Additional:</u> - N/A.

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	construction traffic movements. Operation: Visual changes associated with the Proposed Development affecting the setting and therefore significance of heritage asset.		
Climate Change	Demolition and construction: Greenhouse gas (GHG) emissions from demolition and construction. Operation:	Embedded - Production of a Site Waste Management Plan (SWMP). - Production of a CEMP, including measures to reduce GHG emissions during demolition and construction (including the monitoring, management and dissemination of energy	Embedded: - A 'fabric first' approach in accordance with the energy hierarchy, including fabric specifications being better than the new Part L 2021 backstop values. - An all-electric Energy Strategy.

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	GHG emissions from energy consumption.	consumption and transport emissions). Additional: N/A.	- On Site low/zero carbon energy technology, in the form of ASHPs and PV panels. - Performance beyond part L 2021 standards for both the office and purpose-built student accommodation (PBSA) buildings. Additional: - N/A
Townscape and Visual Impact Assessment	Demolition and construction: Changes to townscape character within the study area, due to the demolition and construction of the Proposed Development and	Embedded - Enclosure of the Site with hoarding/fencing. - A Traffic Logistics Plan (TLP). - Obtrusive light will be controlled through the implementation of best practice measures, informed by the Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light.	Embedded: - The Proposed Development's modern buildings. - Active frontages, high quality façade design, as well as an improved area of public realm. - New high-quality landscape and street tree planting to all sides of the Proposed Development Additional:

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	associated activities. - Effects during demolition and construction from Site clearance, disruption and noise. - Changes to the character and amenity of views due to the demolition and construction of the Proposed Development. <u>Operation:</u> - Changes to townscape character area within the study area.	<u>Additional:</u> N/A.	N/A.

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	• Changes to urban grain within the study area. • Changes to land use within the study area. • Changes to building heights within the study area. • Changes to movement and linkages within the study area. • Changes to public open space and public realm within the study area. • Changes to the Site character. • Changes to the character and		

Topic	Effect	Measures	
		To Reduce Effects During Demolition and Construction	To Reduce Effects During Operation
	amenity of views due to the operation of the Proposed Development.		

14.3 Significant Residual Effects

- 14.3.1 The significant residual effects of the Proposed Development following implementation of both embedded and additional mitigation measures have been assessed. Although each technical chapter (**Chapters 6 to 12** and **Volume 3: Townscape and Visual Impact Assessment (TVIVA)**) contains detailed consideration of residual effects, **Table 14.2** summarises these. It is assumed for the purposes of this EIA that any effects categorised as moderate or major will be considered a significant effect unless otherwise stated. The significance criteria are set within relevant technical chapters, where a different approach has been followed.
- 14.3.2 It should be noted that where 'none' is stated in **Table 14.2**, this does not necessarily mean that effects will not occur, as **Table 14.2** only presents 'significant' effects. Effects that are 'not significant' are presented within each topic chapter (**Chapters 6 to 12** and **Volume 3: TVIA**).

Table 14.2: Summary of Significant Residual Effects

EIA Topic	Stage of Development	Residual Effects	Duration of Effect	Significance of Residual Effect
Socio-Economics	Demolition and Construction	Employment generation	Temporary	Moderate beneficial
	Operation	Employment generation	Permanent	Major beneficial
Air Quality	Demolition and Construction	None	None	None
	Operation	None	None	None
Noise and Vibration	Demolition and Construction	Demolition and construction noise and vibration on City South	Temporary	Moderate-minor adverse
		Demolition and construction noise and vibration on Canvas Students Manchester (i.e. the River Street Tower purpose-built student accommodation (PBSA) development to the west of the Site)	Temporary	Moderate-minor adverse
	Operation	None	None	None
Wind Microclimate	Demolition and Construction	None	None	None
	Operation	None	None	None

EIA Topic	Stage of Development	Residual Effects	Duration of Effect	Significance of Residual Effect
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution	Demolition and Construction	None	None	None
	Operation	None	None	None
Built Heritage	Demolition and Construction	None	None	None
	Operation	None	None	None
Climate Change	Demolition and Construction	None	None	None
	Operation	None	None	None
Townscape and Visual Impact Assessment	Demolition and Construction	Changes to the character and amenity of viewpoint 7	Temporary	Moderate adverse
		Changes to the character and amenity of viewpoint 10	Temporary	Moderate adverse
		Changes to the character and amenity of viewpoint 11	Temporary	Moderate adverse
		Changes to the character and amenity of viewpoint 12	Temporary	Moderate adverse
		Changes to the character and amenity of viewpoint 18	Temporary	Moderate adverse

EIA Topic	Stage of Development	Residual Effects	Duration of Effect	Significance of Residual Effect
		Changes to the character and amenity of viewpoint 19	Temporary	Moderate adverse
	Operation	Changes to townscape character area	Permanent	Moderate beneficial
		Changes to building heights	Permanent	Moderate beneficial
		Changes to public realm and open space	Permanent	Moderate beneficial
		Changes to Site character	Permanent	Moderate beneficial
		Changes to the character and amenity of viewpoint 2	Permanent	Moderate beneficial
		Changes to the character and amenity of viewpoint 5	Permanent	Moderate beneficial
		Changes to the character and amenity of viewpoint 6	Permanent	Moderate beneficial
		Changes to the character and amenity of viewpoint 7	Permanent	Moderate beneficial
		Changes to the character and amenity of viewpoint 10	Permanent	Moderate beneficial

EIA Topic	Stage of Development	Residual Effects	Duration of Effect	Significance of Residual Effect
		Changes to the character and amenity of viewpoint 11	Permanent	Moderate beneficial
		Changes to the character and amenity of viewpoint 12	Permanent	Moderate beneficial
		Changes to the character and amenity of viewpoint 18	Permanent	Moderate beneficial
		Changes to the character and amenity of viewpoint 19	Permanent	Moderate beneficial