



Ev0, Didsbury Technology Park Environmental Statement

October 2022

Contents

List of Appendices	1
List of Figures	2
1. Introduction	3
2. Environmental Impact Assessment Methodology	9
3. Alternatives and Design Evolution	16
4. Site, Surroundings and Description of Proposals	19
5. Construction Management and Phasing	28
6. Traffic and Transport	39
7. Air Quality	61
8. Human Health	95
9. Climate Change	109
10. Residual Impacts	140
11. Type 1 Cumulative Assessment	144

List of Appendices

Chapter 1: Introduction

No appendices

Chapter 2: Environmental Impact Assessment Methodology

Appendix 2.1 – ES Scoping Report

Appendix 2.2 – Committed Developments

Appendix 2.3 – Scoping Opinion

Chapter 3: Alternatives and Design Evolution

No appendices

Chapter 4: Site, Surroundings and Description of Proposals

No appendices

Chapter 5: Construction Management and Phasing

No appendices

Chapter 6: Traffic and Transport

Appendix 6.1 – Transport Assessment

Appendix 6.2 – Framework Travel Plan

Chapter 7: Air Quality

Appendix 7.1 – Detailed Methodology, Modelling Approach and Data

Chapter 8: Human Health

No appendices

Chapter 9: Climate Change

Appendix 9.1 – Climate Change Resilience (CCR) Assessment

Appendix 9.2 - In-Combination Climate Change Impacts (ICCI) Assessment

Appendix 9.3 – Preliminary Lifecycle Assessment

List of Figures

Chapter 1: Introduction

Figure 1.1 – Site Location Plan

Chapter 2: Environmental Impact Assessment Methodology

No figures.

Chapter 3: Alternatives and Design Evolution

No figures.

Chapter 4: Site, Surroundings and Description of Proposals

No figures.

Chapter 5: Construction Management and Phasing

No figures.

Chapter 6: Traffic and Transport

No figures.

Chapter 7: Air Quality

Figure 7.1 - Air Quality Study Area

Figure 7.2 – Air Quality Monitoring Locations

Figure 7.3 – Air Quality Existing Receptor Locations

Chapter 8: Human Health

Figure 8.1 - The Determinants of Health and Wellbeing (London HUDU developed from Barton & Grant 2007)

Chapter 9: Climate Change

Figure 9.1 – North West Climate Projections

1. Introduction

- 1.1. This Environmental Statement (ES) has been prepared on behalf of Bruntwood (Didsbury TP) Ltd, which is submitting a Full Planning Application and Environmental Impact Assessment in its capacity as 'Bruntwood Works' ('the Applicant').
- 1.2. The Site is bounded by Sir Williams Siemens House to the north, surface level car parking to the east, Spire Manchester Private Hospital to the south and a lawned area to the west (with Princess Parkway beyond). The boundary of the Site is set out in **Figure 1.1**.
- 1.3. The Proposed Development proposes 10,409 sq. m GEA commercial floorspace for flexible Grade A offices with ancillary ground floor café, in addition to a car park deck, reconfigured surface parking, junction improvements and landscaping. Further details are provided within Chapter 3 of this ES.
- 1.4. This ES sets out the findings of an EIA carried out in respect of the development of the Site.

Requirement for EIA

- 1.5. The EIA process is the mechanism by which development proposals are appraised in terms of their likely environmental and socio-economic effects, in addition to engineering and technical considerations.
- 1.6. The purpose of the EIA is to establish the nature of the Proposed EIA Development and the environment in which it is likely to take place, during both construction and operational phases, so as to identify the likely significant effects on the environment. The assessment compares the existing situation at the start of the work (baseline) with the situation during demolition and construction, and when the Proposed Development is operational.
- 1.7. The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the "EIA Regulations") require that any Proposed Development falling within the description of a 'Schedule 2 development' (as defined within the meaning of the EIA Regulations), will be subject to an EIA where such development is likely to have 'significant' effects on the environment by virtue of such factors as its nature, size or location (EIA Regulation Schedule 3).
- 1.8. The Proposed Development is considered to fall under the category of 'urban development projects' (EIA Regulations Schedule 2, 10, (b)) where:
 - The development includes more than 1 hectare of urban development which is not a dwellinghouse development; or
 - The development includes more than 150 dwellings; or
 - The overall area of the development exceeds 5 hectares.
- 1.9. In accordance with the EIA Regulations, this ES sets out the following information:
 - A description of the development, including in particular:
 - a) a description of the location of the development;
 - b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
 - c) a description of the main characteristics of the operational phase of the development; and,
 - d) an estimate, by type and quantity, of expected residues and emissions during the construction and operation phases.

- A description of the reasonable alternatives studied, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.
- 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.
- A description of the factors specified in regulation 4(2) likely to be significantly affected by the development.
- A description of the likely significant effects of the development on the environment resulting from, inter alia:
 - a) the construction and existence of the development, including, where relevant, demolition works;
 - b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
 - c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
 - d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
 - e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
 - f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; and,
 - g) the technologies and the substances used.
- A description of the likely significant effects on the factors specified in Regulation 4(2) that covers the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.
- 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.
- 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).
- 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.
- A non-technical summary of the information.
- A reference list detailing the sources used for the descriptions and assessments included.

Project Team

- 1.10. Deloitte has extensive experience and expertise in managing the EIA process and holds the IEMA EIA Quality Mark. Deloitte has managed the EIA process and the production of the ES for the Proposed Development and has received technical input from a range of suitably qualified and experienced technical consultees, together “the Consultants”.

Table 1.1. ES Project Team

Topic	Consultant
Town Planning, EIA Coordination	Deloitte LLP
Architect	Sheppard Robson
Air Quality	Ramboll
Climate Change	Ramboll
Human Health	Enfusion
Traffic and Transport	Curtins

Organisation of the Environmental Statement

- 1.11. This ES comprises 11 chapters and is supported by figures (located at the back of each chapter within Volume 1) and technical appendices (within a separate Volume 2). A Non-Technical Summary (‘NTS’) of the full ES is provided as a separate standalone document.
- 1.12. Figures have been referenced using the chapter numbers as a prefix followed by the number of the figure within a given chapter. Appendices have been referenced in the same way but due to their size they are constrained separately in Volume 2.
- 1.13. **Important notice:** This Environmental Statement has been prepared by Deloitte, with technical input from the Consultants. Table 1.2 below sets out the parties responsible for the technical content within Chapters 5- 9 of this ES. Although we have read the Consultants’ reports for consistency and provide our observations based on our knowledge and experience, we accept no liability or responsibility for the Consultants’ Reports and the technical content within Chapters 5-19 of this ES.
- 1.14. Table 1.2 sets out the structure of the ES.

Table 1.2 ES Structure

Chapter No.	Chapter Title	Responsibility	Description
1.	Introduction	Deloitte	Introduction to the ES, EIA requirements, details of the project team, ES organisation and availability.
2.	EIA Methodology	Deloitte	Methods used to prepare each chapter, description of ES structure and content, generic significance criteria, scoping and consultation.
3.	Alternatives and Design Evolution	Deloitte with input from Sheppard Robson	Outline of the main alternatives considered by the Applicant.

Chapter No.	Chapter Title	Responsibility	Description
4.	Site, Surroundings and Description of Development	Deloitte with input from Sheppard Robson	Site description and details of the Proposed Development.
5.	Construction Management and Phasing	WWA	Details of anticipated programme for development and construction methodology are also included.
6.	Traffic and Transport	Curtins	Assessment of the effects on traffic and transport as a result of the proposed development. Includes Transport Assessment (Appendix).
7.	Air Quality		Assessment of the potential air quality impacts associated with construction of the Development as well as potential operational impacts from traffic emissions. Includes Air Quality Assessment (Appendix).
8.	Human Health	Enfusion	Assess the potential impact the Proposed Development may have on human health.
9.	Climate Change	Ramboll	Assessment of the Proposed Development and its potential impact in relation to climate change.
11.	Residual Impacts	Based on conclusions of technical chapters	Summary of the effects that remain after mitigation.
12.	Type 1 Cumulative Impacts	Deloitte	Review of inter project effects, which are combined effects arising from the Proposed Development on defined sensitive receptors.
Volume 2 – Technical Appendices			
Volume 3 – Non-Technical Summary			

Environmental Statement Availability

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

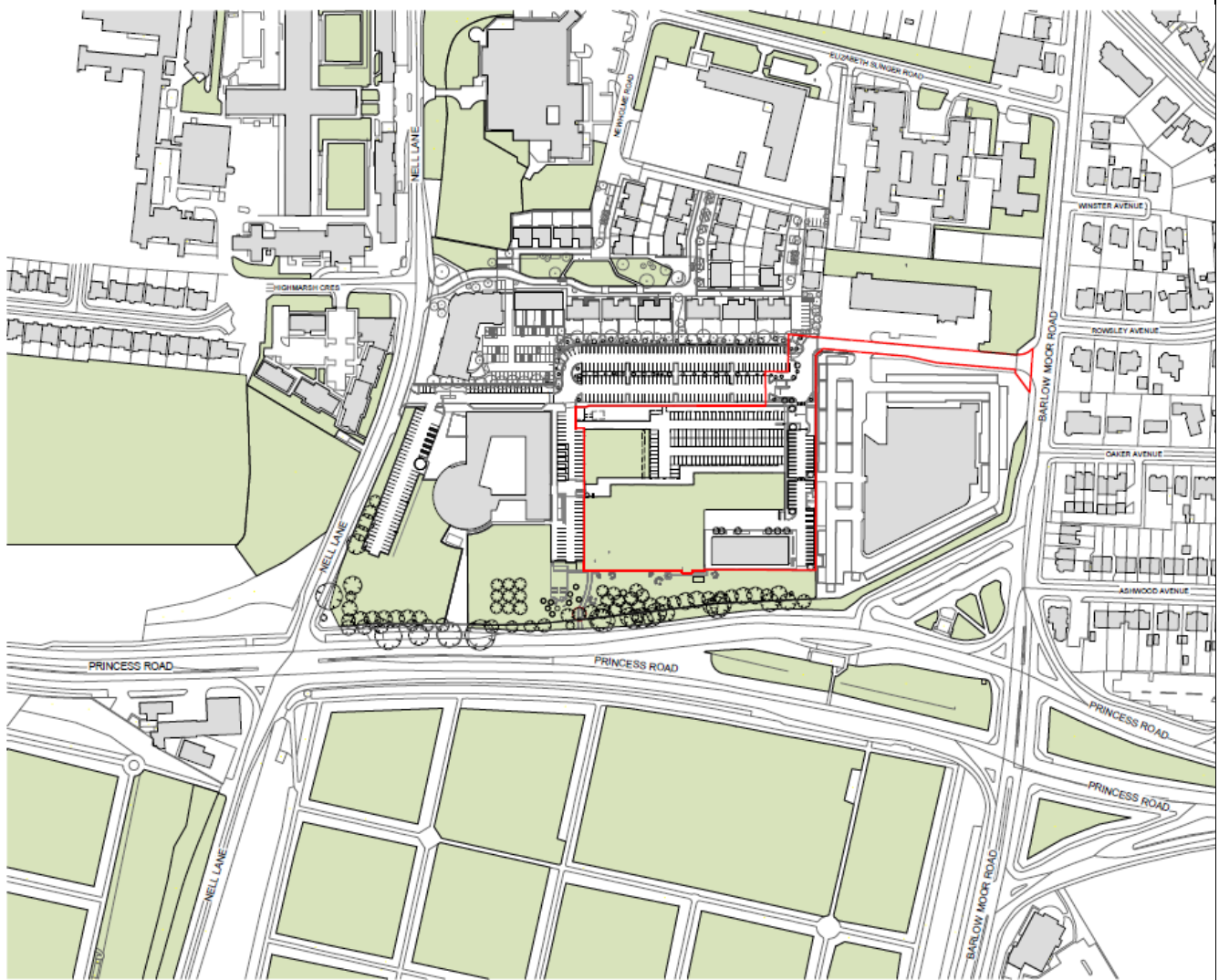
1.15. The ES may be purchased in volumes, the costs of which are set out below:

- Volume 1: ES Main Text and Figures - £150
- Volume 2: ES Appendices - £150

- Volume 3: Non-Technical Summary (NTS) - £15
- Full Copy (Volumes 1, 2 and 3) of the ES on CD - £15

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

Didsbury Technology Park – Phase 3 Team – Planning and EIA
Deloitte
The Hanover Building
Corporation Street
Manchester
M4 4AH



Site Location Plan
1 : 1250

	Figure:	1.1		
	Title:	Site Plan (Sheppard Robson)		
	Project:	Ev0 – Didsbury Technology Park		
	Date:	September 2022	Scale:	NTS

2. Environmental Impact Assessment Methodology

Introduction

- 2.1. This Chapter sets out the methodology used to prepare each Chapter of the ES and describes its structure and content. In particular, it sets out the process of identifying and assessing the likely significant effects of the Proposed Development on the environment as defined in Chapter 1 and described in detail in Chapter 4.
- 2.2. It is accompanied by the following technical appendices:
- Appendix 2.1 –ES Scoping Report
 - Appendix 2.2 – Committed Developments
 - Appendix 2.3 – ES Scoping Opinion

Legislation and Guidance

- 2.3. The ES has been prepared to comply with EIA Regulations, which implement European Council Directive No. 85/337/EEC as amended by Directive 2014/52/EU and entered into force on 17 May 2017.
- 2.4. Reference has also been made to currently available good practice guidance in EIA including:
- The European Commission’s numerous EIA guidance documents available here: <http://ec.europa.eu/environment/eia/eia-support.htm>
 - National Planning Practice Guidance – Department for Communities and Local Government (March 2014 and continuously updated as a ‘live’ resource)
 - Reference has been made to the Institute of Environmental Management and Assessment (IEMA) publications, including:
 - IEMA ES Review Criteria
 - IEMA Guidelines for Environmental Impact Assessment (2004)
 - IEMA Special Report into the State of Environmental Impact Assessment Practice in the UK (2011)
 - IEMA Shaping Quality Development (2015)
 - IEMA Delivering Quality Development (2016)
 - IEMA Delivering a Proportionate EIA (2017)
- 2.5. The ES has also had regard to the National Planning Policy Framework 2021 (NPPF). The NPPF sets out the Government’s economic, environmental and social planning policies for England, articulating the Government’s aspiration for sustainable development. The NPPF has been considered where it is relevant to EIA.
- 2.6. It is considered that there is no relevant regional planning policy and guidance of relevance to this ES.
- 2.7. As relevant to the ES technical chapter’s scope, methodology and assessment of effects, key local planning policy and guidance documents have been considered. These include:
- Manchester City Council Core Strategy (2012)
 - Saved Unitary Development Plan Policies (1995)

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

Screening, Scoping and Consultation

- 2.9. An Environmental Impact Assessment (EIA) Screening and Scoping Request was submitted to MCC on 31 May 2022 (Appendix 2.1) and a Formal Scoping Opinion was issued on 21 October 2022 (see Appendix 2.3). As part of this process the following disciplines were expected to not give rise to likely significant effects on the environment and were recommended to be scoped out of the EIA:
- Ground Conditions
 - Water Resources, Drainage and Flood Risk
 - Ecology
 - Acoustics
 - Agricultural Circumstances
 - Archaeology
 - Heritage
 - Electronic Interference - Television, FM Radio and DAB Radio Reception
 - Socio-Economic
 - Solar Glare
 - Aviation
 - Major Accidents and Disasters
 - Daylight, Sunlight and Overshadowing
 - Townscape and Visual Impact
 - Wind
- 2.10. In response to the Screening and Scoping Request, statutory consultee responses were received from United Utilities, GMEU, MCC Highways, MCC Flood Risk Team, GMAAS, MCC Conservation Officer and Natural England. All responses received have been considered by the technical team in the preparation of their assessments.

Approach to Technical Studies

- 2.11. Various technical studies were commenced at an early stage in the development process. The findings of the baseline environmental studies have played an important role in the design of the Proposed Development by defining the environmental sensitivities, constraints and opportunities associated with the Site.
- 2.12. Design team reviews, attended by members of the project team, were held throughout the pre-application process. These reviews provided a valuable forum for the exchange of information and ensured that the design team was fully aware of the environmental constraints and opportunities and of the interactions between disciplines. Meetings were also held with MCC as the Local Planning and Highway Authority.
- 2.13. The technical studies have been undertaken in accordance with current best practice. Specific guidance used is referenced within each of the respective assessment chapters.
- 2.14. The majority of assessments involved consultations with statutory and non-statutory bodies, desk-based research, site inspections and surveys, impact prediction and mitigation.

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

Structure of Technical Chapters

- 2.16. Each technical chapter of the ES (Chapters 6 to 9) has been set out broadly in line with Table 2.1; any variation from this structure is explained within the chapter.

Table 2.1: Structure of ES Technical Chapters

Technical Chapter Structure	
Introduction	Each of the technical chapters begins with an introduction providing context to the EIA completed.
Policy Context	This section includes a summary of legislation and of national and local policies relevant to the environmental discipline and explains its purpose in the context of the Proposed Development and the ES.
Assessment Methodology and Significance Criteria	This section describes the method or approach employed in the assessment of impacts, the criteria against which the significance of effects has been evaluated, the sources of information used and any technical difficulties encountered. Relevant legislation is also identified.
Assumptions and Limitations	This section describes any assumptions and limitations which have been made that are relevant to the environmental disciplines.
Baseline Conditions	This section describes and evaluates the baseline environmental conditions i.e. the current situation and anticipated changes over time assuming the Site remains unchanged. This is a critical part of the EIA process as it provides a measure against which potential environmental effects can be assessed.
Identification and Evaluation of Key Impacts	This section identifies the likely significant effects on the environment resulting from the Proposed Development. A description of the likely effects of the Proposed Development and an assessment of their predicted significance is provided. The assessment of effect significance has been undertaken using appropriate national and international quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.
Mitigation Measures	One of the main aims of the EIA process is to develop suitable mitigation measures to avoid, reduce or compensate for any significant adverse effects of a project. This section of each technical chapter describes the measures which would be implemented to mitigate potential adverse effects. Where possible, enhancement measures have also been proposed.
Cumulative Effects	This section considers the cumulative effects of the Proposed Development identified within the vicinity of the Site. Any likely significant effects on the environment arising in this respect are set out in this section. There are two distinct types of cumulative effects:

Technical Chapter Structure

Type 1 - Cumulative effects are the interactions between effects of the Proposed Development on a single receptor. These are addressed in Chapter 16.

Type 2 - Cumulative effects are those that arise from incremental changes caused by other consented or reasonably foreseeable activities ('committed developments') together with the Proposed Development.

Residual Effects

The residual effects, i.e. the remaining effects of the Proposed Development assuming implementation of the proposed mitigation measures, have been estimated and presented.

The methods used to make these estimates are described and proposed methods of treatment for any residual effects have been identified and quantified where possible.

Summary

Each technical chapter concludes with a brief summary outlining the potential residual effects of the Proposed Development.

- 2.17. Chapter 5 provides information to allow the construction phase of the Proposed Development to be assessed by the disciplines set out in Chapters 6 to 9.

Assessment and Evaluation of Significant Effects

- 2.18. The assessment of effect significance has been undertaken using appropriate national and international quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.

Magnitude

- 2.19. The methodology for determining the scale, or magnitude of effect as set out in Table 2.2.

Table 2.2: Methodology for Assessing Magnitude

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

Sensitivity

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

Table 2.3: Methodology for Assessing Sensitivity

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

Significance

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

Table 2.4: Methodology for Assessing Significance

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

- 2.22. The above magnitude and significance criteria have been provided as a guide for technical specialists to assess impact significance. Where discipline specific methodology has been applied that differs from the generic criteria above, this has been clearly explained within the given chapter under the heading of 'Assessment Methodology and Significance Criteria'.
- 2.23. For the purposes of this ES, an effect will be considered to be 'significant' if it is classed as either 'moderate' or 'major'.

Baseline Conditions

- 2.24. Each technical chapter includes a section which describes and evaluates the baseline environmental conditions (i.e. the current situation and anticipated changes over time assuming the Site remains unchanged). Baseline data has been obtained from a variety of sources, including published documents, maps, historical information and site survey data. Given the complex nature of the Site and surroundings, each technical chapter (Chapters 6 - 9) includes a clear description of what is assumed as the baseline against which the assessment is being made.
- 2.25. The baseline includes nearby schemes under construction.
- 2.26. The method used to obtain baseline information, where relevant and possible, has been clearly identified within each technical chapter and agreed in advance with statutory consultees.

Mitigation

- 2.27. Any adverse environmental effects have been considered for mitigation at the design stage and, where practicable, specific measures have been put forward. Measures have been considered based on the following hierarchy of mitigation:
- Avoidance.
 - Reduction.
 - Compensation.
 - Remediation.
 - Enhancement.
- 2.28. Where the effectiveness of the mitigation proposed has been considered uncertain, or where it depends upon assumptions of operating procedures, data and/or professional judgement has been introduced to support these assumptions.
- 2.29. Detailed mitigation recommended during the construction phase will be set out in the Construction Environmental Management Plan (CEMP) to be agreed with MCC prior to the commencement of work and implemented throughout the duration of the works. Outline mitigation measures to be included in a future CEMP are set out in Chapter 5: Construction Methodology and Programme.
- 2.30. Mitigation to be implemented during the operational phase will be secured through approved documents, planning conditions and obligations.

Residual Effects

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

Cumulative Effects

- 2.32. The ES considers the potential for likely significant effects on the environment resulting from consented or reasonably foreseeable activities or developments in the area, which could lead to potentially significant cumulative effects in conjunction with the Proposed Development ('Committed Developments').
- 2.33. These include:
- Approved but unimplemented projects;
 - Plans or projects for which an application has been made and which are under consideration by the consenting authorities; and,

- Certain projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative effects.

- 2.34. A search of MCC's planning applications database and knowledge of the area has identified a number of schemes for which cumulative effects are considered likely. A full list, as of July 2022, is contained at Appendix 2.2.
- 2.35. Each technical chapter (Chapters 5 -9) has assessed the potential for likely significant effects on the environment as a result of the above committed developments, together with the Proposed Development.
- 2.36. In addition, Chapter 10 identifies Residual effects and Chapter 11 assesses the Type 1 Cumulative effects.

Assumptions and Limitations

- 2.37. The principal assumptions that have been made and any limitations that have been identified in preparing the ES are set out in each technical chapter. General assumptions include the following:
- All of the principal land uses adjoining the Site remain. Where redevelopment proposals have been granted Planning Permission, the effect of those proposals are considered as part of the Cumulative Impacts;
 - Baseline conditions have been established in 2022 from a variety of sources, including historical data, but due to the dynamic nature of certain aspects of the environment, conditions will change during the Proposed Development;
 - Information received from third parties is complete and up to date;
 - The various stages of the Proposed Development will satisfy minimum environmental standards, consistent with contemporary legislation, practice and knowledge;
 - Assessments are based upon, and conclude, the "worst case" effects that would arise from the application as defined by the description of development set out in Chapter 4, Site Surroundings and Description of the proposals;
 - Construction and demolition methods and phasing will follow the timetable and methods set out in Chapter 5, Construction Management and Phasing.
 - Conditions will be attached to the Planning Permission that will control disturbance during the Proposed Development; and
 - Necessary off-site services infrastructure for the Proposed Development will be provided by statutory undertakers.

Objectivity

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

3. Alternatives and Design Evolution

Introduction

- 3.1. Regulation 18(3) and Paragraph 2 of Schedule 4 of the EIA Regulations requires the Applicant to provide an outline of the main alternatives studied and an indication of the main reasons for the choice made, taking into account the environmental effects.
- 3.2. The form of the Proposed Development has been influenced by a range of factors, including location, surrounding land use and input from MCC, Statutory and Non-Statutory Consultees and other stakeholders.
- 3.3. This chapter reviews the principal land use and siting options explored and the reasoning for the selection of the current design for the Proposed Development which forms the subject of assessment within the ES.
- 3.4. This chapter considers the following four options in the context of the existing Development Brief:
 - The ‘do nothing’ alternative where the Proposed Development is not progressed.
 - Alternative locations for the Proposed Development.
 - Alternative Uses for the Site.
 - Alternative Scale and Massing for the Proposed Development.

The ‘do nothing’ Alternative

- 3.5. The “do nothing” scenario refers to the option of leaving the Site in its current state, being a surface car park to serve the existing Siemens Buildings with associated soft landscaping.
- 3.6. Policy DB12b of the UDP allocates part of the EIA Site for commercial development. Furthermore, Manchester City Council endorsed the 2014 Development Framework which established the principle of a mixed use commercial development on the Site. A historic planning permission was also approved by Manchester City Council for full redevelopment of the site (Ref: 030677).
- 3.7. The “do nothing” scenario has been discounted due to the established need for regeneration of the Site, and the benefits it will bring. The EIA Site is considered suitable for the development as it is allocated within the Development Plan, and suitable for residential and commercial development in terms of its urban location and good transport links.

Consideration of Alternative Locations

- 3.8. The EIA Site is a large strategic site within South Manchester, which has high levels of accessibility and is in close proximity to established residential and commercial locations.
- 3.9. The EIA Site is a currently underutilised site within South Manchester, and at this strategic location has the potential to provide economic, regeneration, and employment benefits which will contribute to wider strategic aims of the region.
- 3.10. The Site is previously developed land, which has predominantly been used for car parking. The Site has been allocated for development since Manchester City Council adopted the UDP in 1995. The allocation was saved and further detailed guidance on the future development was identified in the endorsed the 2014 Siemens Campus Regeneration Framework, establishing the principle for development on this site, and acknowledging that the Site is suitable for the proposed development.

- 3.11. It is also an allocated site within saved UDP policies and development of the type proposed is supported in principle by the Development Framework.
- 3.12. The Site's urban location, transport links, previously developed nature, and ability to sustainably contribute to wider strategic aims are key elements in its selection as a suitable site for commercial development. Furthermore, the location of the proposed EIA development adjacent to the existing Siemens buildings and Spire Hospital will support the existing uses and have cumulative benefits by clustering similar land uses.
- 3.13. Therefore, this chapter does not consider alternative sites within the context of the planning application, as the Site's appropriateness for commercial development has previously been assessed and adopted via planning policy.

Consideration of Alternative Uses for the Site

- 3.14. The Proposed Development will comprise of commercial office use with supporting café on ground floor in accordance with the Siemens Campus Development Framework, as well as the requirements of the Manchester Core Strategy, the Manchester Strategy (2016) and the Residential Growth Strategy and City Centre Strategic Plan.
- 3.15. The Siemens Campus Development Framework identifies the suitable mix and quantum of uses for development on the site. The Proposed Development has sought to remain consistent with the principles of the Development Framework.
- 3.16. Given the size and strategic location of the Site, it was considered best to accommodate a mix of uses that would complement the existing uses on-site, increase the sustainability of the scheme, complement surrounding uses in an established residential area, while also maximising wider economic benefits.
- 3.17. The EIA Site is allocated as an employment location, as identified in Manchester's UDP and it is therefore well suited to commercial uses. The Proposed Development will help to deliver against the Places For Everyone joint target of at least 1,900,000 sqm of accessible new office floorspace over the period 2021 – 2037 whilst continuing the economic success of South Manchester.
- 3.18. For the reasons above, alternative uses were discounted as the proposed commercial development contributes to the Site's viability and deliverability. The employment and retail uses and public realm provision will provide an important asset to the local and regional community.

Consideration of Alternative Scale and Massing

- 3.19. The scheme design has evolved over time during the design process and a number of alternative design options and proposals have been considered by the design team prior to settling on the final layout and design presented within this application.
- 3.20. The development framework sets out that the scale and massing of the new buildings should reflect the sites strategic location and its role as an employment-led mixed use development. It identifies that the development framework is not prescriptive about precise scale and massing of future development on the site, but rather to indicate an appropriate building envelope within which future development proposals will come forward. With this, the development framework sets out that the office / research buildings would be an indicative height of between 2 to 5 storeys in height.
- 3.21. The Ev0 Building will be six stories in height (ground plus five) which is one storey taller than the SWSH building. However, the scale and massing of the Ev0 Building is necessary to support the additional viability challenges presented by delivering one of the most sustainable buildings in the UK.
- 3.22. The aim of the massing of D1 is to read as an interesting building on its own, whilst also being sympathetic to SWSH and its distinctive architectural language as well as the recently completed OHM Building and proposals which may come forward in the future. The proposed development references the modernist principles behind the architecture of SWSH.

- 3.23. The Design and Access Statements submitted with the applications sets out the options appraisal for the development, which details how design of the proposed development has been formulated. The options considered for the development were considered within the context of the Site and the site and the final design is considered to respond most appropriately to the context.

Summary

- 3.24. Where possible, alternative options have been considered throughout the design process. The above has set out why the Site is considered suitable for the Proposed Development. This process has been informed by the Siemens Princess Road Campus Development Framework and the desire to create a positive relationship with the wider masterplan site. The Proposed Development has been influenced by pre-application consultation with key stakeholders including local landowners, residents, businesses, statutory consultees, as well as with MCC. On this basis, Regulation 18(3) and Paragraph 2 of Schedule 4 of the EIA Regulations has been addressed.

4. Site, Surroundings and Description of Proposals

- 4.1. This Chapter includes a description of the Site, its surrounding context, a more detailed description of the Proposed Development as well as the Site's suitability for the Proposed Development.

Masterplan Site Description

- 4.2. The wider Masterplan Site is bound by Princess Road and the Southern Cemetery to the west, Barlow Moor Road and residential properties to the south and Nell Lane and the former Withington Hospital residential development to the north. The Birches and Lancasterian schools and a police station adjoin the site to the east.
- 4.3. The Masterplan Site extends to approximately nine hectares and is comprised of a mixture of buildings from residential, commercial and healthcare uses. In February 2015, Planning Permission was granted (ref: 107473/FO/2014/S1) for the redevelopment of the southern part of the wider site for the erection of a four storey building to form **Spire Manchester Private Hospital** along with associated car parking and landscaping.
- 4.4. The Masterplan Site was subject to two further planning applications forming the first two phases of the adopted Illustrative Masterplan (**Figure 2.1**) which have now been fully completed and occupied:
- **OHM Building (Phase 1)** – Three storey commercial building containing office space for Siemens and The Orth Team with associated car parking and landscaping located to the southwest of the Masterplan Site.
 - **Green Walk and Quantum House (Phase 2)** – Residential development including apartment building comprising 50 apartments and 45 new homes with associated car parking and landscaping located to the east of the Masterplan Site.
- 4.5. There are, however, buildings that existed prior to the adoption of the Illustrative Masterplan. To the south east of the Masterplan Site is The **Renewable Energy Engineering Centre** (the REEC Building) whilst to the north west is **Sir William Siemens House** (SWSH) and associated car parking.
- 4.6. This planning application relates to the next phase of development within Didsbury Technology Park (**Phase 3**) and will deliver flexible Grade A office space with ancillary ground floor café, in addition to a car park deck, reconfigured surface parking, junction improvements and landscaping within D1 and the MSCP of the Illustrative Masterplan. The framework identifies that Plot D2 of the Illustrative Masterplan will be suitable for additional commercial / office space but these do not form of the Proposed Development.
- 4.7. The Masterplan Site has been allocated by Manchester City Council for economic development under Saved UDP Policy DB12b. It states that further development will be permitted at Siemens, Princess Road however proposals should have regard to the need to minimise impact on environmental quality, the character of the area, residential amenity and traffic movements.

Figure 2.1 – Illustrative Masterplan (as approved through PP Ref: 114283/FO/2016)



Application Site Description

- 4.8. The Phase 3 Site extends to approximately 1.67 hectares and is bounded by Sir Williams Siemens House to the north, surface level car parking to the east, Spire Manchester Private Hospital to the south and a lawned area to the west (with Princess Parkway beyond). A Site Location Plan is included in Figure 1.1 of Section 1.
- 4.9. The Site currently comprises a surface level car park for c. 189 car parking spaces to the east. A managed lawn area forms part of the northern end of the Site, with the OHM building and associated landscaping and car parking in the south west. The Site can be accessed via Nell Lane to the north, or from the south via Barlow Moor Road.

Surroundings

- 4.10. The Site is located within the Didsbury West Ward, but also lies adjacent to the Chorlton Park Ward to the west. Beyond Princess Road (A5103) to the west lies the Southern Cemetery and the Christie Fields commercial development on the junction of Princess Street and Barlow Moor Road.
- 4.11. West Didsbury is located to the east of the Site, with two schools (The Birches School and Lancasterian School), a number established residential developments and West Didsbury police station within the immediate vicinity.
- 4.12. Beyond Nell Lane, to the north of the Site, lies a predominantly residential area comprising new build properties and the redeveloped Withington Hospital (Grade II). A small area of planting also lies immediately to the north of Nell Lane, on the junction of Princess Road and Nell Lane with Didsbury High School just beyond.

- 4.13. To the south and east of the Site, beyond the old hospital site, across Barlow Moor Road, and across Elizabeth Slinger Road the area is predominantly within residential use.
- 4.14. The Albert Park Conservation Area is located approximately 400m from the Site. The nearest listed buildings are the old Withington Hospital site (Grade II) to the north and the Alcock Monument (Grade II), Church of England Chapel (Grade II) and Roman Catholic Chapel (Grade II) within Manchester Southern Cemetery to the west.
- 4.15. West Didsbury local centre is located approximately 400m to the east of the Site on Burton Road, providing a mix of shops, bars and restaurants.

Highways and Transport

- 4.16. Princess Road (A5103) provides direct access to Manchester City Centre to the north and the M60 to the south. Princess Road is a key arterial route into the city centre from Manchester Airport, the M6 and M60. Barlow Moor Road (A5145) to the south of the Site is also a major access road within south Manchester.
- 4.17. The Site's location on these major access roads provides excellent access to bus services running along Princess Road, Barlow Moor Road, Burton Road and Palatine Road. The Site is also within half a mile of the Withington Metrolink stop and within walking distance of Burton Road Metrolink stop, providing access via public transport to Manchester City Centre and Manchester Airport.

Environmental Designations

Ecology

- 4.18. There are no sites with Environmental Designations with respect to Ecology within the proposed EIA development. Furthermore, there are no identified sites within the vicinity of the site.

Flood Risk

- 4.19. According to the Environment Agency Flood Map, the Site is located within Flood Zone 1 which is defined as land having less than 1 in 1,000 annual probability of river or sea flooding. The Rochdale Canal is located circa 50m southeast of the Site, behind Brownsfield Mill.
- 4.20. The Site also falls within the Conurbation Core Critical Drainage Area in the Salford and Trafford Critical Drainage Area (CDA), designated in 2011.

Heritage

- 4.21. The Site is not located within a Conservation Area. The Albert Park Conservation Area is located approximately 500m to the east of the Site.
- 4.22. There are no Listed Buildings located on the Site; however, some heritage assets have been identified in the vicinity of the Site within a 500m radius:
- Manchester Southern Cemetery – Grade II Listed
 - Entrance Lodges, Piers, Screen and Gates of Withington Hospital – Grade II Listed
 - Withington Hospital (Principal Administrative Block) – Grade II Listed
 - Roman Catholic Chapel in Manchester Southern Cemetery – Grade II Listed
 - Church of England Chapel in Manchester Southern Cemetery – Grade II Listed
 - Alcock Monument in Centre of Manchester Southern Cemetery – Grade II Listed
 - Christ Church – Grade II Listed

Air Quality

- 4.23. A small part of the Site is located in the Greater Manchester Air Quality Management Area (AQMA), owing to the high volumes of vehicular traffic on Princess Road on the site's western boundary.

Ground Conditions

- 4.24. Ian Farmer Associates prepared a Preliminary Investigation Report (dated December 2015) and Ground Investigation Report (dated January 2017) for the planning application approved on 17 March 2017 for the OHM Building. This information covers the entire masterplan area (which includes Phase 3 and Building D1).
- 4.25. The results of soil analysis indicate that there is only a very low risk to end users of the site from soil contamination.
- 4.26. There was no visual evidence of bulk asbestos contamination or evidence of ACM's during site work. The extremely low fibre concentrations indicate that there would not be significant risks to end-users or construction workers from asbestos.
- 4.27. The ground conditions encountered at the site indicate that the risks to ground water would be very low and it is considered unlikely that further assessment of the risks to controlled waters may be required.
- 4.28. Initial gas monitoring determined the presence of methane and carbon dioxide, however these can be considered as Characteristic Situation 2; low risk.
- 4.29. As part of the pre-application process, the EHO was consulted on the basis of the Ian Farmer survey and the supporting letter (dated 12 May 2022).
- 4.30. On the basis of the above it can be concluded that ground conditions of the Site are suitable for the Proposed Development and will not pose any risk to the users.

Planning History

- 4.31. A planning history search for the Site has been undertaken using Manchester City Council's Public Access system. The results of the search have identified the following planning permission which is of relevance to the current application:

Table 4.1 – Planning History

Planning Application Reference	Description	Decision	Decision Date
114283/FO/2016	Erection of three storey commercial building (for a flexible B1 office or D1 non-residential healthcare use) together with associated car parking, landscaping, highway works, associated works and the reconfiguration of existing car parking	Approved	17 March 2017
118252/NMC/2017	Non-material amendment application to planning approval 114283/FO/2016 to allow for amendments to the car parking layout as a result of water easements, surface of the car park, introduction of electric vehicle charging points, and omission of link footpath	Approved	20 December 2017
118086/JO/2017	Variation of condition 2 (approved plans) from planning approval reference 114283/FO/2016 to allow for amendments to the proposed landscaping, extension to plant screen area at roof top level of building, and elevational alterations	Approved	25 January 2018
119674/FO/2018	Construction of a new footpath link with low level lighting bollards, a new plinth for proposed condenser units and a motorcycle shelter for 6 spaces	Approved	25 May 2018

The Proposals

4.32. The description of development is:

“Construction of a ground plus five storey commercial office building (Use Class E(c)(i,ii,iii), Use Class E (g)(i,ii)), with ancillary café on ground floor (Use Class E(b)), erection of ground plus two storey car park deck (Sui Generis) together with landscaping and highway works, and other associated works.”

4.33. Table 4.2 sets out the application proposals for the commercial element:

Table 4.2 – Ev0 Building Development Quantum

Proposed Development	
<i>Proposed Uses</i>	Office building (Use Class E(c)(i,ii,iii), Use Class E (g)(i,ii)), with ancillary ground floor Café (Use Class E (b))
<i>Proposed Height</i>	Ground plus five storeys, rising to approximately 26.75m AGL
<i>Proposed Floorspace</i>	Office: 10,409 sqm (GEA) / 10,152 sqm (GIA) Café: 185 sqm (NIA)
<i>Proposed Cycle Parking</i>	10 visitor cycle parking spaces outside the building and 100 cycle parking spaces located within the proposed car park deck adjacent to the office building.
<i>Parking Provision</i>	See table 3.2 and 3.3 below for further info.

4.34. Table 4.3 sets out the application proposals for the car park deck:

Table 4.3 – Car Park Deck Development Quantum

Proposed Development	
<i>Proposed Uses</i>	Car park deck (Sui Generis)
<i>Proposed Height</i>	Ground plus two storeys, rising to approximately 10.5 AGL
<i>Proposed Floorspace</i>	6,390 sqm (GEA)
<i>Proposed Cycle Parking</i>	100 cycle parking spaces.

4.35. Table 4.4 sets out the proposed car parking figures:

Table 4.4 – Proposed Car Park Deck

Zone	Allocated To	Proposed Car Parking				Location	Access Control
		Standard	Accessible	EV	Total		
Commercial (DTP)	Siemens	100 (-21)	0 (0)	0 (0)	100 (-21)	Plot for building D2	Barriers

Commercial (DTP)	Ohm Building	64 (0)	4 (0)	0 (0)	68 (0)	Adjacent to OHM	Barriers
Commercial (DTP)	Ev0 Building	220 (+220)	12 (+12)	46 (+46)	232 (+232)	Within the Site	Barriers
Commercial (DTP)	Spaces for Building D2	62 (+62)	3 (+34)	13 (+13)	65 (+65)	Within the Site	Barriers
Total		446	19	59	465		

N.B. The figures in brackets represent the change the existing provision.

Layout and Orientation

- 4.36. A main principle of the masterplan design is to improve safe permeability through the site for pedestrians and cyclists. A series of clearly defined and accessible areas are therefore proposed to ensure the site promotes active travel and knits the proposals into the surrounding area.
- 4.37. Vehicular movements have been an integral consideration to the masterplan and those wishing to access the Ev0 building or The Ohm Building will only be able to access or exist the site via the entrance on Barlow Moor Road.
- 4.38. The creation of a welcoming external environment to provide amenity for users of the new users and the established campus community including the Sir William Siemens House and Ohm buildings, as well as users of the adjacent Spire Hospital.
- 4.39. The development of the site aims to create a central landscaped space which connects Ev0, D2 (future office development) and Ohm and the car park deck.
- 4.40. The entrance to Ev0 is located on the South façade of the building providing an important connection to the landscaped heart of the site. This will create a sheltered entrance area with a connection to the entrance to the Car Park. The building interior has been designed to provide an active frontage which further enhances this connection between the space and landscape.

Scale and Massing

- 4.41. The proposed office building (Unit D1) is six storeys (ground plus five). The height of the building will be 26.75m AGL. The building has been designed to respect the building heights of the surrounding area. It is considered that building heights around SWSH and Nell Lane would be highest in this location whilst plots closest to the residential area would be lower.
- 4.42. The proposed car park deck is three storeys (ground plus two). The height of this building will be 10.5m A(GL). The car park deck is closer to the low-rise buildings that exist to the north of the Site and as such the location, scale and massing are appropriate as they help to reduce the visual impact onto these residents.
- 4.43. Further details on the external appearance and materials can be found in the Design and Access Statement prepared by Sheppard Robson.

Use and Amount

- 4.44. The Proposed Development comprises a ground plus five storey commercial building comprising a total of 10,409 sq.m (GEA). The proposed building will be for office use within Use Class E(c)(i,ii,iii), Use Class E (g)(i,ii)), with the addition of ancillary space on the ground floor for a café (Use Class E(b)). These uses will allow enough flexibility to secure an appropriate occupier for the separate units which will complement the wider site and its overall purpose.
- 4.45. The quantum of available floorspace per floor for the proposed building is as follows:
- Office: 10,409 sqm (GEA) / 10,152 sqm (GIA)
 - Café: 185 sqm (NIA)

- The Proposed Development also includes the erection of a car park deck 'Sui Generis' . Further information can be found within this section

External Appearance and Materials

Ev0 (office) Building

- 4.46. Multiple cladding approaches were tested in conjunction with the M&E Engineer before concluding that a built out facade providing self-shading was the chosen solution.
- 4.47. This design approach offered a solution to respond differently on each facade whilst still maintaining a consistent aesthetic.
- 4.48. Combined with the aspiration for a high quality facade with robust detailing and materiality to achieve a strong design language which will also aid the building's thermal performance.
- 4.49. The main aspiration is for a high quality facade with robust detailing and materiality to achieve a strong design language which will also aid the building's thermal performance. The articulation to the facade at ground floor creates an active and human scale frontage, which will positively contribute to the continuity and vibrancy of Didsbury Technology Park and connect with the contextual buildings.
- 4.50. The roof top plant area will be screened by vertical cladding panels to provide the necessary visual and acoustic screening for the equipment.

Car Park Deck

- 4.51. The car park deck has been designed to ensure natural ventilation throughout, helping to reduce energy usage. The ground floor is left open for ventilation and visibility through the parking structure whilst the raised roof provides ventilation to the 2nd floor parking.
- 4.52. With a facade of flat solid panels this provides a visual barrier into the car park and prevents light from car headlights shining out towards the residential properties. However, this approach prevents ventilation to the first floor.
- 4.53. Using a similar faceted profile to the cladding on Ev0 ventilation is provide through the top of the cladding panel and also through the perforated side panel.
- 4.54. Further details on the external appearance and materials can be found in the Design and Access Statement prepared by Sheppard Robson.

Public Realm and Landscaping

- 4.55. The Proposed Development is a great opportunity to diversify and enrich the external environment for people and wildlife that have access to it. The proposed building will be supported by external public realm, providing employees and the community with amenity space to enjoy.
- 4.56. This will include a generous frontage to Ev0 comprising hard and soft landscape accommodating fixed and loose furniture to enable people to meet, dine and work outdoors. The wide green corridor will incorporate pockets of seating, enabling building users options to sit in amongst the soft landscape.
- 4.57. In the interest of a cohesive campus, the selection of paving materials will be founded on the existing palette. The pedestrian realm will be defined using concrete block paving, applied in varying bonds and colour tones, to match the palette established elsewhere on the technology park. There may also be opportunity to use resin bound gravel and pebbles which are also prevalent on site. Kerb edging will be predominantly concrete with the introduction of stone alongside rain gardens.
- 4.58. Driving the concept for green infrastructure is the creation of corridors of vegetation that traverse the site for both the benefit of biodiversity and visual interest. The strongest green axis runs east/west making a connection between established vegetation on the boundary with residential properties of Kensal Drive and the mature tree belt that flanks Princess Road. This is complemented by soft landscape aligned north/ south to mirror the avenue of trees outside Ohm. This corridor continues via trees in planters along the pedestrian spine directly east of Ev0.

- 4.59. There will be minimal impact on existing trees with the felling of two required to facilitate the Proposed Development. One will be removed and replaced in proximity to the new car park barrier and another will be removed to make way for the transformer.
- 4.60. A total of 49 new trees will be planted comprising a range of species that reflect those that are already present on site and the growing conditions presented by the new external works. The general approach is to use trees with fastigate form to create structure whilst minimising canopy overhang on the carriageway and car parking
- 4.61. For further information on the public realm and landscaping please refer to the Landscape Strategy prepared by Layer Studios submitted with this application.

Access and Servicing

- 4.62. The Proposed Development provides a safe, legible, high quality environment that will be easily used by a wide range of people without undue effort, special treatment or separation.
- 4.63. Movement patterns in and around the Site have been considered to give priority to the pedestrian, with access to the public realm and level access to the buildings.
- 4.64. The proposed building is easily accessible for those choosing to travel by bike or on foot. New routes support pedestrian permeability and connect D1 to other buildings of the technology park, as well as local public transport hubs.
- 4.65. Pedestrians may approach Ev0 using the existing path network from Nell Lane and Barlow Moor Road. The pedestrian spine to the east of D1 establishes a strong connection with the SWSH building and the main car park. A new connection utilising public realm outside the main building frontage as an easily navigable route aligned east/west.
- 4.66. Cyclists will access D1 using the internal road network and the new untrafficked connection from Princess Road. To minimise disruption to cycle movements, bypasses are positioned alongside new vehicle barriers on entry and exit to the D1 car park. Secure cycle storage is located within the car park deck. Additional short stay cycle stands are located close to the main door under positive natural surveillance from overlooking windows.
- 4.67. The existing access to the Site is via a priority-controlled junction with the A5145 Barlow Moor Road and an internal spine road. Staff and visitors at the Proposed Development would only access the Application Site via Barlow Moor Road, with the Nell Lane access solely for Siemens use. Existing access will be improved by upgrading the junction to a signal controlled junction. This would include signalised pedestrian crossing facilities on the Site access approach and the western side of Barlow Moor Road, cycle lane/advanced cycle stop facilities and a right turn lane for westbound traffic. The existing footways on the internal spine road would be retained to facilitate safe pedestrian movement towards the Site.

Waste Management

- 4.68. A Waste Management Strategy has been prepared by Sheppard Robson for the development (located within the Design and Access Statement) which has been designed in accordance with Manchester City Council's guidance document "GD04 Waste Storage and Collection Guidance for New Developments" (September 2017).
- 4.69. The waste strategy is based on daily collections and 1 day storage for office space. Regarding office use, BS 5906:2005 advises an allowance of 50 litres capacity per employee per week. The following calculation is based on the net occupation density at 1:10m²
 Total NIA = 7,669sqm, At 1:10 density = 767 persons
 50 litres per person per week = 767 x 50 = 38,345 litres per day
 Based on 5 working days this is 38345/5 = 7669 litres per day
- 4.70. This is equivalent to 7 x 1100 litre Eurobins which will be provided in the bin store. At least 2 Eurobins (25% of 7) will be provided for Dry Mixed Recycling to suit BREEAM

- 4.71. The bin store is to be combined with the existing bin store for the OHM Building which is located to the south of the OHM building, please see section 8.3 of the Design and Access Statement for exact location and vehicle access.

Parking

- 4.72. The Proposed Development will include the erection of a three storey (ground plus two) car park deck that will provide car and cycle parking spaces to serve the Didsbury Technology Park occupants (both existing and in future) but will also accommodate additional spaces available for the use of the public. The existing surface level car parking spaces will be reconfigured to enable the Proposed Development.
- 4.73. The area to the north west of the Site which forms Plot D4 of the Illustrative Masterplan will be reserved as temporary surface level car parking until it comes forward in the next phase of development at Didsbury Technology Park.
- 4.74. Within the car park deck there will be 100 secure cycle parking spaces with an additional 10 visitor cycle parking spaces within the public realm.
- 4.75. A summary of the proposed car parking figures has been collated in the table below:

Figure 4.5 – Car Park Deck Quantum

Zone	Allocated To	Proposed Car Parking				Location	Access Control
		Standard	Accessible	EV	Total		
Commercial (DTP)	Siemens	100 (-21)	0 (0)	0 (0)	100 (-21)	Plot for building D2	Barriers
Commercial (DTP)	Ohm Building	64 (0)	4 (0)	0 (0)	68 (0)	Adjacent to OHM	Barriers
Commercial (DTP)	Ev0 Building	220 (+220)	12 (+12)	46 (+46)	232 (+232)	Within the Site	Barriers
Commercial (DTP)	Spaces for Building D2	62 (+62)	3 (+34)	13 (+13)	65 (+65)	Within the Site	Barriers
Total		446	19	59	465		

N.B. The figures in brackets represent the change the existing provision.

- 4.76. The application is also supported by a Transport Assessment and Framework Travel Plan prepared by Curtins which contains full details on the parking strategy.

Safety and Security

- 4.77. A Crime Impact Statement (CIS) has been prepared by Greater Manchester Police, which confirms that the proposed scheme has been found to be acceptable in terms of design security. Preparation of the CIS followed a briefing with GMP, which took place on 17 May 2022.
- 4.78. The CIS highlights positive aspects of the proposals and identifies a number of recommendations to be considered as the detailed design of the proposed development is progressed. The design team will continue to work with officers from GMP through the detailed design stage.
- 4.79. For further details of the proposals, please refer to the CIS submitted with this application.

5. Construction Management and Phasing

Introduction

- 5.1. This chapter of the ES describes the anticipated demolition and construction methodology and phasing of the Development.
- 5.2. Consideration of likely significant effects on the environment that may arise during the construction phases and any necessary mitigation measures are provided within this ES.
- 5.3. Planning for construction is necessarily broad at this stage and may be subject to modification at the detailed stage or during development of the EIA Site.

Anticipated Phasing and Timescales

- 5.4. The Proposed EIA Development will be subject to a series of standalone planning applications, which may each include multiple development phases
- 5.5. As the timing and delivery sequence are not known, the Proposed EIA Development has been split into five development phases, thus allowing consideration of any sequence. This approach also enables qualitative consideration of a full range of development phase combinations that could be contained within future planning applications.
- 5.6. Although some elements of sequencing may be subject to change as the Proposed EIA Development comes forward. The most likely application and delivery scenario is set out below, as informed by the Applicants, and further detail is contained within the Illustrative Masterplan Design and Access Statement

Table 5.1 DTP Phasing

Application	Development phase	Target submission	Target construction
Phase 1	DP1	October 2016	2017-2018
Phase 2	DP2	August 2017	2018-2020
Phase 3	DP3	October 2022	2023-2024
Phase	DP4	TBC	TBC

- 5.7. The technical assessments and analysis within the ES have broadly assessed the most likely delivery scenario as outlined above, however, qualitative consideration has been given to the event that an alternative phasing delivery scenario were to proceed and the potential for significant impacts arising is also considered in this regard. Given the availability of information at present, and the nature of phased construction projects, this approach to the assessments is considered to be reasonable and robust.
- 5.8. The currently anticipated construction programme is between a start on-site in Q1 2023 to completion in Q2 2024, representing an indicative construction period of 18 months.

Construction Machinery

- 5.9. Consideration has been given to the types of plant that are likely to be used during the construction works. The plant and equipment likely to be associated with each key element of the construction process is set out in the table below:

Table 5.2 Construction Machinery

Type of Machine	Required for Construction Phase
Tracked/wheeled 360 degree excavators	✓
Excavator mounted hydraulic breakers	
Excavator mounted hydraulic crushers	
Dumpers	✓
Concrete crushing plant	✓
Mobile / Tower cranes	✓
Eight-wheel trucks	✓
Air compressors	✓
Diamond cutting tools	✓
Handheld tools including breakers (pneumatic and hydraulic)	✓
Power tools including percussion drills, cutting disks, pipe-threaders	✓
Wheel washing plant	✓
Piling rigs	✓
Scaffold	✓
Mobile access platforms	✓
Delivery trucks	✓
Skips / Skip trucks	✓
Forklift trucks	x
Hoists (Goods & Goods / Passenger)	✓
Ready mix concrete wagons	✓
Concrete placing booms & pumps	✓
Road sweepers	✓

Demolition

- 5.10. The demolition works are minimal within the EIA Site, with the existing carpark/hard standing requiring grubbing up and removing. There are no other planned demolition activities.
- 5.11. The works will include the use of heavy plant, with the potential for on-site material selection, dependent on site establishment and space to facilitate necessary plant. All works will be strictly managed to ensure that vehicle movement and dust is controlled and kept to a minimum. Further details on the management of dust are included at Chapter 7: Air Quality.

Site Enabling

- 5.12. Initial site preparation works will comprise removal of existing hard standing, site clearance and enabling works
- 5.13. Waste would be managed in line with the principles of the Construction Environmental Management Plan (CEMP). The reuse of building materials will be utilised where appropriate in line with sustainable

building practice. Materials that cannot be reused will be transported off site for (preferably) reuse / recycling or (if not) disposal, acknowledging the Duty of Care provisions.

Highways

- 5.14. Any off site highways works will be commenced during the Construction Works of each phase and will be completed prior to first occupation or as otherwise specified in the Transport Assessment as contained in Appendix 6.1.

Substructure

- 5.15. Pile foundations and Pile caps have been specified for the main office building. Foundation design will be completed by the Contractor in due course.
- 5.16. Spoil arisings will be checked for contamination and will be classified for removal off-site.
- 5.17. Foundations shall be formed using concrete, placed either by pumping or directly from the concrete wagon.
- 5.18. Vibro-compaction may be used in the event that additional work needs to be carried out to provide an adequate bearing capacity. This method is used to densify clean, cohesionless soils.

Substructure and Landscaping

- 5.19. The superstructure will commence following the sufficient progression of the substructure
- 5.20. The external envelope of the commercial building and the MSCP will be likely installed using cranes. It is likely that the cladding envelope to the ground and lower floor levels (1F & 2F) of the Office building will be left out initially to facilitate improved access on and around the Site. This would reduce the potential for damage at these heavily trafficked lower levels
- 5.21. Landscaping of the development site will likely commence following the completion of the Main Construction Works and MSCP

Proposed Alterations to Incoming Services

- 5.22. Statutory services will be brought into the Site as and when the programme dictates, although the trenching works will be carried out alongside the substructure work.
- 5.23. Where possible the trenches will be left open so that the pipes and cables can be placed in directly. Where this is not possible, a series of ducts and draw pits will be installed to facilitate the introduction of the services at a later date. Generally, this only applies to small pipes and cables and is not a suitable method for large and heavy installations

Construction Effects

- 5.24. Detailed assessments of the likely significant effects on the environment that could result from the construction works are considered within the respective ES chapters. However, a brief summary (without mitigation in place) is presented below.

Noise

- Increased road noise levels from vehicles;
- Increased noise levels from plant during general construction works.

Vibration

- Increased vibration levels from vehicles; and
- Increased vibration levels from plant during general construction works.

Dust / Air Quality

- Generation of windblown dust nuisance from ground surfaces, stockpiles, vehicles, workforces and cutting and grinding of materials; and

- Generation of exhaust emissions from lorries and plant delivering and removing materials including dust and particulates which have the potential to impact upon local air quality.

Waste / Sustainability

- Demolition, excavation and construction waste will be generated and appropriate disposal required.

Traffic

- Traffic congestion caused by Site traffic and an increase in heavy goods vehicle (HGV) movement;
- Traffic disruptions from abnormal or hazardous loads; and
- Transfer of mud and material from vehicles onto the public highway creating pollution hazards.

Storage of fuels and construction materials

- Accidental spills and discharges to drains which may create pollution hazards

Pedestrian access to Site and surroundings

- Disruptions to pedestrian access and routes within the locality of the Site.

Hazardous materials and contaminated land

- Exposure of the workforce to hazardous materials and ground contamination.

Water Quality

- Water demand for construction activities and domestic use by the contractor (however, this is anticipated to be low);
- Generation of domestic foul effluent by contractors; and
- Increase in run-off due to creation of impermeable areas for contractor's site facilities.

Controls to Protect the Environment

- 5.25. The environmental controls (or mitigation measures) to eliminate, reduce or offset likely significant adverse environmental effects during the construction phase (as identified above) are identified below. It is anticipated that these controls would be secured by appropriate planning condition or obligation.
- Preparation of a Construction Environmental Management Plan (CEMP) Which clearly sets out the methods of managing environmental issues for all involved with the construction works, including supply chain management;
 - Requirement to comply with the CEMP included as part of the contract conditions for each element of the work. All contractors tendering for work will be required to demonstrate that their proposals can comply with the content of the CEMP and any conditions or obligations secured through the planning permission;
 - In respect of necessary departures from the above, procedures for prior notification to the Council and affected parties would be established;
 - Establishing a dedicated point of contact and assigning responsibility to deal with construction related issues if they arise. This would be a named representative from the construction team;
 - Production of a regular newsletter to be circulated to the surrounding neighbors and authorities; and
 - Regular dialogue with the Council and the local community.

Construction Environmental Management Plan (CEMP)

- 5.26. The preparation of a CEMP is an established method of managing environmental impacts resulting from construction works.
- 5.27. The CEMP would be submitted to MCC (and other statutory authorities) prior to the commencement of the works. Compliance with the CEMP is anticipated to be secured by appropriate planning conditions or obligations, and the obligations contained within it passed onto the main contractors as 'Employer's Requirements' within the contract for the works. The CEMP will be developed and finalised by the Contractor during the Stage 4 design period.
- 5.28. The structure of the CEMP would include the following:
- A table (logical framework) showing the objectives, expected results, activities (mitigation/optimization measures), and responsibilities for the implementation of those activities.
 - The broad plan of the phasing of the work and its context within the whole project;
 - Inclusion of baseline levels for noise, vibration and dust and monitoring protocols;
 - Setting of 'Threshold' and Action Levels' for noise, vibration and dust to warn of activities that may require particular care and control;
 - Details of prohibited or restricted operations (location, hours etc.);
 - Institutional arrangements for its implementation and for environmental monitoring: responsibilities, role of the environmental authorities, participation of stakeholders;
 - Suggestions for contracts (environmental clauses and standards) and contracting modalities;
 - A monitoring and supervision plan (including appropriate indicators, frequency of monitoring, means to gather and analyse the data, reporting system);
 - A response plan in case of accidents or unexpected results from the environmental monitoring;
 - Reference to ground conditions and remedial measures and/or mitigation associated with ground contamination if necessary;
 - Contact during normal working hours and emergency details outside working hours;
 - Provision for reporting, public liaison, and prior notification of particular construction related activities;
 - The mechanism for the public to register complaints and the procedures for responding to such complaints;
 - The details of proposed routes for heavy goods vehicles travelling to and from the Site; and
 - Reference to management of material resources and waste (see further details in Waste Management section below).
- 5.29. Further details are provided below.

Artificial Lighting

- 5.30. The main contractor will ensure that any artificial lighting of the Site and its perimeter is sufficient to ensure the safety of pedestrians. In addition, artificial lighting will be located and orientated so that it does not cause intrusion to adjacent residential property, distract passing motorists or adversely affect nearby wildlife.

Construction Traffic

- 5.31. The Main Contractor will be required to provide a Construction Management Plan prior to Works Commencing.

Level of Construction Traffic

- 5.32. The number of HGV movements associated with construction will depend upon the construction techniques employed and will vary between construction phases. As with the number of HGV movements, the estimated number of construction workers on the EIA Site are based upon experience of similar schemes. Workers arrive by a range of means and the numbers are difficult to estimate with any certainty
- 5.33. Whilst for certain tasks there may be a considerable number of lorry movements it should be recognised that these will occur intermittently over a long period of time. Therefore, the actual number of vehicle movements at any one time may not be significant. Equally, whilst there will undoubtedly be periods during construction where vehicle movements will be concentrated, there will be other times when there will be very little traffic due to the programme of works
- 5.34. As well as HGV movements associated with the construction work there will also be light goods and car movements generated by workers on the site. Again, the level of these movements will depend on the activity being carried out.
- 5.35. A forecasting exercise has been undertaken to assess the numbers of heavy goods vehicles, which are anticipated to access the EIA Site during the various stages of construction.
- 5.36. This forecasting process began by establishing which of the construction operations would involve the use of large vehicles. From a review of the overall construction programme, it was recognised that the activities which will generate the most significant numbers of heavy goods vehicle movements are those at the earlier stages of construction, including:
- Site clearance
 - Excavation
 - Deliveries
- 5.37. The CEMP would encourage the majority of staff to use the convenient public transport facilities for journeys to and from the Site.
- 5.38. From previous experience, urban sites commonly generate between 10 and 15 daily vehicle movements on the highway network (journey to and from the Site is one movement). 15 daily vehicle movements have been assumed to calculate the worst case for construction traffic effects relating to each phase.

Construction Traffic Access

- 5.39. Construction vehicles will arrive and depart from the Site via the existing accesses. HGV movements will use the Site access off Barlow Moor Road.

Off-Site Construction Routing

- 5.40. The key principle of the construction traffic routing is to ensure that vehicles can access the site of each development phase directly from the main road.
- 5.41. The CEMP will set out specific routes for construction traffic. Construction traffic will approach the EIA Site from Princess Parkway and then use Barlow Moor Road.

Traffic Management

- 5.42. Notice regarding planned closures and diversions of roads and footpaths forming part of the Site will be given by the Construction Manager or Construction Liaison Officer to the Council, the Police, the Fire Brigade, and other emergency services, sufficiently in advance of the required closure or diversion dates.
- 5.43. Provision will be made, wherever possible, to ensure that vehicle unloading can be carried out on-site rather than on the adjacent roads. If at any stage this becomes problematic procedures would be reviewed with the relevant authorities at the appropriate time

- 5.44. The ingress and egress of construction traffic will be carefully located to minimise impact on surrounding highway and local road users. Access and egress for construction vehicles will vary according to the particular stage of construction, but always complying to the principles set out in this chapter.
- 5.45. All construction traffic entering and leaving the Site will be closely controlled. Vehicles making deliveries to the Site or removing spoil or other material will travel via designated routes, which will have been previously agreed with MCC and other relevant bodies.
- 5.46. Construction traffic impacts have been assessed in terms of traffic movements and effects on local air quality within the following sections of this ES:
- Chapter 6: Traffic & Transport; and
 - Chapter 7: Air Quality.

Temporary Hoardings

- 5.47. Each construction site will be fully enclosed to protect the general public and deter unauthorised entry. Initial enabling works will be hoarded by Heras fencing, to enable flexibility to be moved around the site in relation to each part of enabling works. Construction site hoarding is proposed to comprise plywood faced on a timber frame. The hoardings would rise to approximately 2.4 meters above pavement level.
- 5.48. Temporary hoarding may be used to display details of the development including project name and duration, name, address and telephone number of the main contractor's liaison office and/or Site agent. The provision of viewing points for the public through the hoardings will be considered.
- 5.49. Permission to erect a temporary hoarding on the public highway will be sought, where appropriate, in accordance with Section 172 of the Highways Act 1980

Site Office & Welfare Accommodation

- 5.50. It will be necessary during the course of the Phased construction to provide and progressively extend and adapt the on-site office and welfare accommodation
- 5.51. For the initial stages of the construction the requirements for on-site accommodation will be minimal, due to the relatively low levels of site resources. The required facilities will be provided through a number of portacabins located within boundary of each Phase.
- 5.52. As works on-site progress towards completion and the on-site resource levels diminish, the Site facilities and accommodation will be progressively reduced.

Contractor Parking

- 5.53. Although the EIA Site has good access to public transport, it is expected that a high proportion of the construction workforce will travel by private car. Due to the size of the site and location, it has been suggested that the Contractor will be required to park remotely and utilise shuttle-buses to travel to and from site, to avoid on street parking in surrounding residential areas. The Contractor is to confirm their Parking/logistics arrangements prior to commencement of the works.
- 5.54. A temporary parking phasing plan will be included within the CEMP, which will demonstrate how parking will be accommodated at the relevant point in the construction process.
- 5.55. The contractors will seek to encourage use of public transport in order to reduce demand for parking spaces

Hours of Works

- 5.56. Working hours for each development Phase will be agreed with MCC through the CEMP. However, it is likely that the standard hours of work will be adhered to. These are:
- Monday to Friday, 7.30am to 6pm;
 - Saturday, 8.30am to 2pm; and

- Sunday and Bank Holidays, no noisy activities on-site.

- 5.57. All work outside these hours will be subject to prior agreement of, and/or reasonable notice to MCC
- 5.58. Night-time working will be restricted to exceptional circumstances and work internally with buildings. By arrangement, there may be some out of hours construction deliveries made in respect of specific development Phases.

Management of Sub-contractors

- 5.59. Individual contracts (for example for waste removal) will incorporate relevant requirements in respect of environmental control, based largely on the standard of 'good working practice' as well as statutory requirements. Sub-contractors will be required to demonstrate how they will achieve best practice, how targets will be met and how potential effects will be minimized.

Management of Construction Works

- 5.60. There will be a designated liaison officer (the "Construction Liaison Officer") who will deal with the public and other complaints and enquiries. The nominated individual will be named at the Site's entrance, with a contact number, and will be identified to MCC and community groups prior to the start of site activities, and whenever a change of responsibility occurs

Response to Complaints

- 5.61. Any complaints will be logged on-site and, where necessary, reported to the relevant individual within MCC (and vice versa) as soon as practicable.

Prior Notice

- 5.62. In the event of unusual activities or events, these will be notified to MCC and relevant property owners or occupiers in advance. The relevant activities will be agreed with MCC once the detailed programme of construction is defined. This will include:
- Commencement of construction in certain areas;
 - Necessary night-time, weekend or evening working (outside core areas) of a type which may affect properties;
 - Road or footpath closures/diversions and movements of wide loads; and
 - Work on roads by others to ascertain land.
- 5.63. The use of both regular community liaison meetings and monthly newsletters / flyers will be adopted throughout the full course of the construction works

Management of Material Resources and Waste

- 5.64. Waste will be generated during all stages of the construction programme. However, this will be carefully managed and cleared to prevent nuisances such as litter, dust, odour and vermin, and to maintain a "clean" working and Site environment. Major sources of waste within the construction process are anticipated to include:
- Spoil from reprofiling;
 - Packaging – plastics, pallets, expanded foams etc;
 - Waste materials generated from inaccurate ordering, poor usage, badly stored materials, poor handling, spillage etc; and
 - Liquid wastes, other than surface water run-off and foul drainage, such as waste oils and chemicals.

- 5.65. During the construction phase, requirements for the management of waste will be communicated to all contractors and sub-contractors to ensure that waste is managed in accordance with the waste hierarchy and relevant statutory controls. These measures will be controlled through the CEMP in consultation with the relevant authorities

Roles and Responsibilities

- 5.66. All parties will have a duty of care to ensure that waste arisings are handled in accordance with the relevant legislation governing their storage, transfer, treatment and disposal.
- 5.67. A nominated person(s) will be appointed with overall responsibility for waste management handling, inspection and reporting and will be adequately trained for this purpose.
- 5.68. All relevant contractors will be required to investigate opportunities to minimise waste arisings at source and, where such waste generation is unavoidable, to maximize the recycling and reuse potential of construction materials. Recycling of materials will largely take place off-site where noise and dust are less likely to result in effects to the occupants of surrounding properties

Materials Management Plan

- 5.69. A Materials Management Plan will form part of the CEMP and will outline the measures to be implemented to prevent waste arisings at source. This will include the use of just-in-time deliveries where possible, appropriate storage to prevent damage occurring to materials, and use of take-back schemes for surplus materials and/or packaging.

Management of Sub-Contractors

- 5.70. Where individual contracts are required (for example for waste removal) these will incorporate relevant requirements in respect of environmental controls, based largely on the standard of 'good working practice' as outlined in the CEMP as well as statutory requirements
- 5.71. Potential sub-contractors will also be required to demonstrate how they would achieve the provisions of the CEMP, how targets will be met and how potential effects will be minimized.
- 5.72. Whilst the selection of construction procurement has not been made at this stage, it is likely that several specialist trade contractors would be used under the control of a 'main contractor'.
- 5.73. The contractor will be required to comply with all provisions of relevant legislation including:
- The Control of Pollution Act, 1974, Part iv;
 - The Health and Safety at Work Act, 1974;
 - The Clean Air Act, 1993; and
 - The Environmental Protection Act, 1990

Identification and Classification of Waste

- 5.74. A Site Waste Management Plan (SWMP) will be produced for the project in accordance with the requirements of the Site Waste Management Plan Regulations 2008 and will form part of the CEMP requirements. The SWMP will be used to:
- Specify the types and quantities of waste to be generated during the construction process. Wastes will be identified in accordance with the List of Wastes (England) Regulations 2005 (as amended);
 - Identify opportunities for waste reduction and specify how the waste that is generated is to be managed, i.e. re-used, recycled, recovered or sent to landfill; and
 - Record how much of each type of waste is generated and the quantity re-used, recycled, recovered or sent to landfill

Segregation and Storage of Waste

- 5.75. Procedures for the segregation and storage of waste will be detailed in the CEMP. This will include the use of colour-coded skips to facilitate segregation for re-use and recycling; inspection of containers to ensure they are fit for purpose; and the use of plastic sheeting to prevent leaching from waste soils and aggregates. Mixing of hazardous and non-hazardous wastes will not be permitted

Waste Transfer and Duty of Care Requirements

- 5.76. For waste removed from the Site, notification by the Contractor/Construction Manager for approval (via consultation with the authorities) will take place. Loads will only be deposited at authorised waste treatment and disposal sites. Deposition will be in accordance with the requirements of the Environment Agency and all relevant legislation
- 5.77. Any person removing waste from the Site will hold a current waste carriers license and all waste shall be received at an authorised waste treatment or disposal facility. The nominated person(s) with responsibility for waste will ensure that all relevant authorisations are in place prior to off-site removal. No burning of construction waste will be undertaken on the Site.
- 5.78. In addition, removal of any inert or non-hazardous waste from the Site will be accompanied by a Waste Transfer Note (WTN, signed by both the producer and the carrier of the waste, and correctly completed in accordance with the Environmental Protection (Duty of Care) Regulations 1991 (as amended). This will apply to the removal of both solid and liquid wastes (other than surface water run-off and foul drainage).
- 5.79. To prove the correct depositing of waste material and to prevent the occurrence of fly-tipping, removal of any hazardous waste from the Site will be accompanied by a Hazardous Waste Consignment Note (HWCN), signed by both the producer and the carrier of the waste, and correctly completed in accordance with the Hazardous Waste Regulations (England and Wales) Regulations 2005. This will apply to the removal of both solid and liquid wastes (other than surface water run-off and foul drainage).
- 5.80. Where it is identified that at least 200kg of hazardous waste will be generated in any twelve month period, the Site will be registered with the Environment Agency and a hazardous waste premises notification code obtained.

Site Drainage and Effects on Water Resources

- 5.81. Ponded water from excavations will be pumped into temporary (baffled) holding tanks within each development Phase to remove suspended sediment before a temporary discharge (subject to consent) to the local surface water sewer network. If oil is detected in the water from the excavation sites, it will be diverted through temporary oil interceptors prior to being discharged. Dewatering activities may require a temporary abstraction license and this would need to be discussed with the Environment Agency prior to commencement of construction works
- 5.82. Where required, interceptors will be regularly inspected, cleaned and maintained. Full records will be kept of inspections, maintenance works and measures undertaken to sustain equipment performance. These provisions should ensure no significant impacts occur on water quality. The use of settlement facilities will aid the removal of any contaminated particulate material that might be derived from construction materials.
- 5.83. All site works will be undertaken in accordance with the EA's Pollution Prevention Guidance Note 6 'Working at Construction and Demolition Sites'. Construction vehicles will be properly maintained to reduce the risk of hydrocarbon contamination and will only be active when required. Construction materials will be stored, handled and managed with due regard to the sensitivity of the local aquatic environment and thus the risk of accidental spillage or release will be minimized.
- 5.84. Construction contractors will also take full account of the requirements of the EA's General Guide to the Prevention of Pollution of Controlled Waters (PPG1) and guidance set out in PPG2 (Above Ground Oil Storage Tanks) and PPG3 (The Use and Design of Oil Separators).

- 5.85. In accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001, any tanks storing more than 200 litres of oil will have secondary bunding. Bunding will be specified having a minimum capacity of “not less than 110% of the container's storage capacity or, if there is more than one container within the system, of not less than 110% of the largest container's storage capacity or 25% of their aggregate storage capacity, whichever is the greater.” Above ground storage tanks will be located on a designated area of hard standing. No underground storage tanks will be used during the construction period. Storage of liquids such as degreasers, solvents, lubricants and paints would be in segregated, bunded enclosures.
- 5.86. The construction drainage system will be designed and managed to comply with BS6031:198 “The British Standard Code of Practice for Earthworks”, which details methods that should be considered for the general control of drainage on construction sites. Further advice is contained within the British Standard Code of Practice for Foundations (BS8004, 1986).
- 5.87. Furthermore, these mitigation measures will be incorporated into a Construction Environmental Management Plan (CEMP), which will set out measures for the control of site drainage, reducing the risk of accidental spillages and the storage and handling of materials.

Committed Developments

- 5.88. There are no other existing Planning Permissions on the Site or within the vicinity which should be taken into account within the assessment of cumulative effects.

6. Traffic and Transport

Introduction

- 6.1. This Chapter of the ES has been prepared by Curtins and examines the potential impacts of traffic generated by the Proposed Development. This Chapter also describes the methods used to assess these impacts, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce or offset any significant negative impacts and the likely residual impacts after these methods have been adopted.
- 6.2. This Chapter is accompanied by two technical appendices, a Transport Assessment (TA) (Appendix 6.1) and Framework Travel Plan (FTP) (Appendix 6.2). The study area, scenarios for assessment and traffic data sources for this Chapter of the ES are based on the TA.
- 6.3. The TA considers the impact of the Proposed Development and considers the impact of an additional sensitivity scenario known as the Meanwhile Use. There is 65 additional parking spaces proposed which are for future potential phases of development and are not proposed to be utilised as part of the current application; however, a separate future planning application may be brought forward to allow these spaces to be used on a meanwhile basis. This sensitivity scenario is considered as a worst-case and is used in both the TA and this Chapter of the ES.
- 6.4. This Chapter has been prepared in accordance with the EIA Scoping Report and the scope of assessment discussed and agreed with the Local Highways Authority during pre-application consultation.

Limitations and Assumptions

- 6.5. Junction capacity assessments have been undertaken using the industry-standard junction modelling software packages JUNCTIONS and LinSig, more details of which are provided within the accompanying TA (Appendix 6.1). There are various inputs to these models, such as geometric measurements and traffic data, as well as assumptions about driver behaviour, but when used appropriately these programs provide an accurate reflection of junction capacities, queueing and delay.
- 6.6. Annual Average Daily Traffic (AADT) factors have been calculated from peak hour flows and there are both limitations and assumptions associated with factoring traffic counts from peak hours to 24-hour AADT flows. Notwithstanding, this is common practice and the factors provide a means of deriving and comparing daily traffic flows in the study area.

Legislative and Policy Context

- 6.7. This section of the report sets out the key transport policy and guidance documents that are relevant to the Proposed Development.
- 6.8. The relevant sections of the following key transport policy documents are summarised in the TA:
 - National Planning Policy Framework (2021);
 - National Planning Practice Guidance (2020);
 - Manchester Core Strategy (2012 – 2027); and
 - Greater Manchester Transport Strategy 2040.
- 6.9. Additionally, the key guidance documents that are relevant to the Proposed Development are set out below:
 - Guidelines for the Environmental Assessment of Road Traffic (1993);
 - Guidelines for Providing for Journeys on Foot (2000);

- Integrating Cycling into Development Proposals (2009);
- Buses in Urban Developments (2018);
- Manual for Streets 1 & 2 (2007 & 2010 respectively);
- Design Manual for Roads and Bridges (Various Dates); and
- Transport Analysis Guidance (TAG) (Various Dates).

6.10. The above policy and guidance documents have been taken into account in the preparation of this Chapter of the ES.

Assessment Methodology and Significance Criteria

6.11. The assessment methodology will consist of the following key stages:

- Establishment of baseline conditions;
- Assessment of demolition and construction effects;
- Assessment of operational effects; and
- Assessment of residual and cumulative effects.

6.12. The extent of the study area has been defined using a combination of IEMA Guidelines¹ and the extent of the network being considered as part of the TA. Locations on the highway network surrounding the Application Site will be identified and assessed in terms of the potential impact of the Proposed Development relative to baseline traffic flows, considering the potential for both arriving and departing vehicles at the Application Site.

6.13. The environmental impacts of traffic generated by the Proposed Development will be assessed in line with the criteria set out in the IEMA Guidelines, which provide two broad rules to define the need for an environmental impact assessment:

- Rule 1 - Highway links where traffic flows will increase by more than 30% (or the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%); and
- Rule 2 - Any other specifically sensitive areas where traffic flows have increased by 10% or more.

6.14. These thresholds will be used to identify the links and junctions where an assessment of the potential impacts of the Proposed Development on driver delay, public transport users, pedestrian delay and amenity, fear and intimidation, severance, and collisions and road safety will be required.

6.15. An assessment of 'hazardous loads' has not been undertaken as it is not anticipated that the construction process would require carriage of material listed in 'The Carriage of Dangerous Goods in the UK'. If these materials become needed during the course of construction, the legal requirements associated with their transit would be strictly enforced.

6.16. In accordance with the IEMA Guidelines, the impact of traffic is dependent upon a wide range of factors, including:

- Volume of traffic;
- Traffic speeds and operational characteristics; and
- Traffic composition (e.g. percentage of HGVs).

6.17. The assessment methodology for each potential impact is set out below.

¹ Institute of Environmental Management and Assessment, (1993). 'Guidelines for the Environmental Assessment of Road Traffic'.

Driver Delay

- 6.18. The accompanying TA (Appendix 6.1) includes junction capacity assessments for the study area using industry standard software packages. These programs give output ratios of flow to capacity (RFC), degrees of saturation (DoS), queue lengths and delays, which give an indication of the overall operational capacity and performance of the junctions.
- 6.19. Changes in delay to drivers have been considered with reference to the delay statistics from the junction capacity assessments. This has been used to inform the criteria for determining the impact of the Proposed Development on driver delay, as set out in Table 6.1 below:

Table 6.1 – Driver Delay Thresholds

Magnitude of Change (Impact)	Threshold
Major	Over 2 minute change in driver delay
Moderate	1-2 minute change in driver delay
Minor	30 second to 1 minute change in driver delay
Negligible	Less than 30 second change in driver delay

Public Transport Users

- 6.20. The potential impacts on road-based public transport (bus) users in the vicinity of the Application Site have been assessed in a similar way to driver delay. The increase in delays have been calculated based on the junction capacity assessment results for junctions that key bus services pass through in the study area.
- 6.21. Changes in delay to public transport users have been considered with reference to the delay statistics from the junction capacity assessments. This has been used to inform the criteria for determining the impact of the Proposed Development on public transport users, as set out in Table 6.2 below:

Table 6.2 – Public Transport Delay Thresholds

Magnitude of Change (Impact)	Threshold
Major	Over 2 minute change in delay at junctions along bus routes
Moderate	1-2 minute change in delay at junctions along bus routes
Minor	30 second to 1 minute change in delay at junctions along bus routes
Negligible	Less than 30 second change in delay at junctions along bus routes

Pedestrian Delay

- 6.22. A change in vehicular demand affects the ability of pedestrians to cross local routes, which results in an impact on delay and on an individual's desire to make a particular walking journey.

- 6.23. The Guidelines for the Environmental Assessment of Road Traffic indicate that a 10 second pedestrian delay in crossing a road broadly equates to a two-way link flow of approximately 1,400 vehicles per hour. This has been used to inform the criteria for determining the impact of the Proposed Development on pedestrian delay, as set out in Table 6.3 below:

Table 6.3 – Pedestrian Delay Thresholds

Magnitude of Change (Impact)	Threshold
Major	Over 40 second change in pedestrian delay
Moderate	30-40 second change in pedestrian delay
Minor	20-30 second change in pedestrian delay
Negligible	Less than 20 second change in pedestrian delay

Pedestrian Amenity

- 6.24. Pedestrian amenity can be described as the relative pleasantness of a journey and an individual's desire to make that particular walking journey. Changes in the volume, speed or composition of traffic and the physical condition at crossing points affect pedestrian amenity.
- 6.25. The Guidelines for the Assessment of Environmental Impact of Road Traffic refers to a threshold for judging the significance of changes in pedestrian amenity where the traffic flow, or the Heavy Goods Vehicle (HGV) component, doubles. This has been used to inform the criteria for determining the impact of the Proposed Development on pedestrian amenity, as set out in Table 6.4 below:

Table 6.4 – Pedestrian Amenity Thresholds

Magnitude of Change (Impact)	Threshold
Major	Doubling of traffic flow or HGV component where the footway width is sub-standard (versus current design standards)
Moderate	Less than a 100% increase in traffic flow or HGV component where the footway width is sub-standard
Minor	Doubling of traffic flow or HGV component where the footway width is satisfactory
Negligible	Less than a 100% increase in traffic flow or HGV component where the footway width is satisfactory

Fear and Intimidation

- 6.26. Fear and intimidation can also increase as a result of rising traffic flows. This is influenced by a number of factors, including the volume of traffic, HGV content, nature and frequency of cycle infrastructure, and the width of the footway.

6.27. In addition, The Guidelines for the Environmental Assessment of Road Traffic gives the following example of fear and intimidation hazard definition:

Table 6.5 – Fear and Intimidation Hazard Definition

Degree of Hazard	Average Traffic Flow over 18 hr Day (vehicles/hour)	Total 18 hr HGV Flow	Average Speed over 18 hr day (mph)
Extreme	1,800 +	3,000 +	20 +
Great	1,200 – 1,800	2,000 – 3,000	15 – 20
Moderate	600 – 1,200	1,000 – 2,000	10 – 15

6.28. This has been used to inform the criteria for determining the impact of the Proposed Development on fear and intimidation, as set out in Table 6.6 below:

Table 6.6 – Fear and Intimidation Thresholds

Magnitude of Change (Impact)	Threshold
Major	Change in degree of hazard between moderate and extreme
Moderate	Change in degree of hazard between great and extreme
Minor	Change in degree of hazard between moderate and great
Negligible	No change in degree of hazard

Severance

6.29. Severance is a perceived division that occurs when a traffic link separates part of an existing community. This can occur when a road becomes too heavily trafficked (making crossing the road difficult) or when a new route divides existing land creating a physical barrier.

6.30. The Guidelines for the Environmental Assessment of Road Traffic states that:

6.31. *“The measurement and prediction of severance is extremely difficult. The correlation between the extent of severance and the physical barrier of a road is not clear and there are no predictive formulae which give simple relationships between traffic factors and levels of severance.”*

6.32. The following indicators are set out in the Guidelines:

- 30% flow increase – slight separation effects;
- 60% flow increase – moderate separation effects; and
- 90% flow increase – substantial separation effects.

6.33. This has been used to inform the criteria for determining the impact of the Proposed Development on fear and intimidation, as set out in Table 6.7 below:

Table 6.7 – Severance Thresholds

Magnitude of Change (Impact)	Threshold
Major	Over 90% change in traffic flows on relevant links
Moderate	Between 60%-90% change in traffic flows on relevant links
Minor	Between 30%-60% change in traffic flows on relevant links
Negligible	Less than 30% change in traffic flows on relevant links

Collisions and Road Safety

- 6.34. The assessment of collision risk and highway safety is based upon knowledge of existing accident rates for particular classifications of roads and junction types and specific local circumstances. These are used to identify locations of specific concern (commonly referred to as 'collision blackspots'). For example, should a particular link or junction be found to have a high existing collision rate, then the addition of significant traffic volumes could have a further detrimental impact on highway safety and mitigation measures may be required.
- 6.35. Personal Injury Collision data for the major junctions along the highway network adjacent to the Application Site has been obtained from the TfGM for the most recent five-year period up until September 2021. This has been used to inform the criteria for determining the impact of the Proposed Development on collisions and road safety, as set out in Table 6.8 below:

Table 6.8 – Collisions and Road Safety Thresholds

Magnitude of Change (Impact)	Threshold
Major	Over 50% change in traffic flows at location with existing adverse collision record (blackspot).
Moderate	30%-50% change in traffic flows at location with observed collision rate above COBALT default for junction type
Minor	10%-30% change in traffic flows at location with observed collision rate above COBALT default for junction type
Negligible	Less than 10% change in traffic flows at location with observed collision rate above COBALT default for junction type

Impact Categories

- 6.36. For each of the potential effects above, impacts are categorised in terms of the following:
- **Positive or Negative** – positive impacts will be associated with a reduction in traffic flows along a link, whereas negative impacts will be associated with an increase in flows;

- **Value (Importance)** – will be assessed in accordance with the IEMA guidance by effect, see Table 6.9 below;
- **Magnitude** – relates to the degree of alteration from the baseline in accordance with the IEMA guidance by effect;
- **Duration** – short-term impacts are considered to be 0 to 5 years including the construction period and on completion, medium-term impacts are considered to be 5 to 15 years including mitigation establishment and long-term impacts are considered to be 15 years onwards for the life of the development;
- **Reversibility** – any construction impacts are considered reversible, whereas any operational impacts are considered permanent unless suitable mitigation is provided; and
- **Likelihood** – all assessments in this Chapter are based on a series of assumptions and calculations using surveyed datasets. These assessments give an accurate reflection of the forecast conditions and are therefore considered likely to occur.

6.37. Receptors will comprise pedestrians, cyclists, public transport users and drivers affected by the impacts of traffic generated by the Proposed Development. The receptors and their value (importance) are defined below:

Table 6.9 – Value (Importance) of Receptors

Importance	Receptors
International	None
National	None
Regional	Drivers along the A5103 Princess Road
Local	Pedestrians, cyclists, and public transport users within the vicinity of the Proposed Development Drivers along the local highway network

- 6.38. The IEMA Guidelines gives examples of sensitive locations as locations where specific environmental problems may occur such as accident (collision) black-spots, conservation areas, hospitals, and links with high pedestrian flows (e.g. near to schools).
- 6.39. The sensitivity of each receptor in the study area will be defined on the following scale, with reference to the IEMA Guidelines and the local context of each receptor; professional judgement will also be used to determine the sensitivity of the receptor:
- **High** – The receptor has little ability to absorb change without fundamentally altering its present character, or is of international or national importance;
 - **Medium** – The receptor has moderate capacity to absorb change without significantly altering its present character, or is it of high importance; and
 - **Low** – The receptor has considerable capacity to absorb change without significantly altering its present character, or is of low or no local importance.
- 6.40. Sensitivity judged as High or Medium results in Rule 2 being considered for that highway link. Sensitivity judged as Low results in Rule 1 being considered for that highway link.
- 6.41. The magnitude of change (impact) resulting from the Proposed Development, will be assessed using the following scale, based on the assessments contained within the TA and with consideration to relevant guidance:
- Major;
 - Moderate;

- Minor; and
- Negligible.

6.42. Determining the significance criteria of effects will be undertaken using professional judgement that underpins the attribution of significance. Each effect will be assessed against the sensitivity of the receptor and the magnitude of change, as shown in the Table 6.10 below.

6.43. Where more than one effect classification exists for any given scenario (e.g. minor or moderate), professional judgement will be used to assign a single significance criterion.

Table 6.10 – Matrix for Classifying Effects

Magnitude	Sensitivity		
	High	Medium	Low
Major	Major - significant	Major - significant	Moderate - significant
Moderate	Major - significant	Moderate - significant	Minor – not significant
Minor	Moderate - significant	Minor – not significant	Negligible – not significant
Negligible	Minor – not significant	Negligible – not significant	Negligible – not significant

6.44. The following scale of significance will be adopted for the effects, noting whether the effects will be permanent or temporary, direct or indirect, short, medium or long-term, and significant or not significant:

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

6.45. Effects that are classified as moderate or above are considered to be significant. Effects classified as below moderate are considered to be not significant.

Baseline Conditions

Local Highway Network

A5145 Barlow Moor Road

6.46. The recently constructed Ohm Building, which forms part of Didsbury Technology Park, is located to the south of the Siemens Campus and is accessed via a priority junction with Barlow Moor Road on the northern side of the carriageway.

- 6.47. Barlow Moor Road lies to the south of the site and comprises a two-way single carriageway that is c.10m-wide in the vicinity of the site. Notwithstanding, the usable width of the carriageway differs as there are cycle lanes, bus laybys, and turning lanes located along the road. Barlow Moor Road is a local distributor road providing access to residential properties and local facilities, and benefits from a c. 3m-wide shared footway/cycleway on the northern side of the carriageway and a c. 2m footways on the southern side of the carriageway.
- 6.48. Barlow Moor Road runs along an east to west alignment and links West Didsbury in the east to Chorlton the west. The carriageway benefits from street lighting and is subject to a 30mph speed limit along its length.
- 6.49. Barlow Moor Road benefits from on-road cycle lanes in an eastbound direction in the vicinity of the site, as well as a shared use footway / cycleway along the north side of the road. It is noted that there are no parking restrictions for the majority of Barlow Moor Road adjacent to the site; however, Traffic Regulation Orders (TROs) in the form of double yellow lines (no waiting at any time) are provided at junctions along the road to prevent on-street parking.
- 6.50. There are also several bus stops located along Barlow Moor Road, of which those located closest to the site comprise shelter, a flag and pole, and a notice board detailing bus timetables. The location of the bus stops is also clearly marked on the road. This bus corridor hosts frequent services between Piccadilly Gardens, Stockport, Newton Heath, Chorlton, and The Trafford Centre.

Nell Lane

- 6.51. Nell Lane is a two-way single carriageway road and with width ranging between 10m and 12m in the vicinity of the Application Site. Sir William Siemens House and the residential development (Green Walk Didsbury) are accessed via priority junctions on the southern side of the carriageway.
- 6.52. Nell Lane runs along an east to west alignment and links West Didsbury in the east to the A5103 Princess Road in the west and continues through the Southern Cemetery to Mauldeth Road West on the outskirts of Chorlton-cum-Hardy.
- 6.53. The carriageway has wide footways on both sides of the road, benefits from street lighting and is subject to a 30mph speed limit along its length. Nell Lane has TROs in the form of double yellow lines, on both sides of the road, along the length of the carriageway from the junction with Princess Road to its termination with Burton Road.
- 6.54. It is noted at the signalised junction with Princess Road, restrictions are in place that prevent right turn movements to the north; only left turns and ahead movements are permitted.

A5103 Princess Road

- 6.55. The A5103 Princess Road is a strategic route connecting with the M60/M56 Motorways to the south and Manchester city centre to the north. The Princess Road corridor regulates traffic flow along its length by traffic signals. Locally, Princess Road is accessed via signalised junctions with Barlow Moor Road and Nell Lane.
- 6.56. In the vicinity of the Application Site, the carriageway extends along a north-south alignment, with up to three lanes in either direction, and additional flared lanes at junction stoplines. The total carriageway width adjacent to the Application Site is approximately 25m, including the central reservation and central hatching, although the road widens to accommodate various turning lanes.
- 6.57. There are wide footways of varying width on either side of the carriageway which are separated from the road via grassed verges. These footways have additional pedestrian infrastructure such as pedestrian guard rails, dropped kerbs, tactile paving and signalised crossings as part of junctions to enable pedestrians to cross the road in a safe manner.
- 6.58. Princess Road is subject to a 30mph speed limit in the vicinity of the Application Site, with street lighting provided along both sides of the carriageway. Princess Road benefits from a shared use footway / cycleway along the east side of the road. Advanced cycle stop lanes are also available at the junctions with Barlow Moor Road and Nell Lane.

- 6.59. There are a number of bus stops located along Princess Road hosting services to various destinations in Manchester city centre and across Greater Manchester. These stops comprise shelter, a flag and pole, and a notice board detailing bus timetables. Furthermore, there is a bus layover/change facility located to the eastern side on the southbound carriageway of Princess Road (to the north of the signalised junction with Barlow Moor Road).
- 6.60. There are various TROs along Princess Road in the form of single and double yellow lines, and yellow box junctions. Due to the level of vehicular activity along Princess Road, it is observed that parking does not occur.

Highway Safety

- 6.61. Personal Injury Collision (PIC) data for the key junctions on the highway network adjacent to the Application Site has been obtained from the TfGM Reported Road Accident Database for the most recent five-year period up until September 2021. This comprises the existing Application Site Access/Barlow Moor Road priority junction, the Barlow Moor Road link to the east and west, the Barlow Moor Road/Princess Road signalised junction and the Nell Lane/Princess Road signalised junction.
- 6.62. Records show that there was a total of 31 recorded incidents in the latest five-year period, where 27 were classified as slight (87%) and 4 (13%) was classified as serious. There were no fatal accidents in the study area and period.

Table 6.11 – Personal Injury Collision Data Summary

Junction/Link	Slight	Serious	Fatal	Total
A5103 Princess Road / A5145 Barlow Moor Road	12	0	0	12
A5145 Barlow Moor Road / Ashwood Avenue	1	0	0	1
A5145 Barlow Moor Road / Siemens Road (Site Access)	1	1	0	2
A5103 Princess Road / Nell Lane	6	0	0	6
Nell Lane	1	0	0	1
A5103 Princess Road / The Boulevard	1	0	0	1
A5103 Princess Road	3	1	0	4
A5103 Princess Road / Derwent Avenue	2	2	0	4
Total	27	4	0	31

- 6.63. Whilst all collisions are regrettable, the serious incidents appear to have been isolated incidents which were mostly caused by either drivers or pedestrians who failed to look properly / experienced a lapse in judgement. Road layouts were not cited as contributory factors in any of the serious incidents. The collisions were dispersed across the study area with varying circumstances and contributory factors.
- 6.64. The majority of the collisions occurred on the A5103 Princess Road, which carries the highest volume of traffic in the study area. Notably the majority of the incidents were slight in severity.
- 6.65. This review does not highlight any other clusters of collisions which would warrant further investigation, and there are no concentrations of vehicle collisions or irregular casualties that would suggest an existing safety issue that would be exacerbated by the proposed development.

- 6.66. Whilst there were two recorded collisions at the site access junction on Barlow Moor Road, improvements are proposed to this junction as part of the site access proposals, which would improve the operation and safety of this junction for all users.

Pedestrian Accessibility

- 6.67. Research has indicated that acceptable walking distances depend on a number of factors, including the quality of the development, the type of amenity offered, the surrounding area, and other local facilities. The Chartered Institution for Highways and Transportation (CIHT) document *entitled 'Providing for Journeys on Foot'* suggests walking distances which are relevant to this Chapter; being 500m as a 'desirable' catchment, 1,000m as an 'acceptable' catchment and 2,000m as the 'preferred maximum'.
- 6.68. The site is located within a wider residential area of Manchester, with West Didsbury situated to the immediate east and Chorlton located a short walk to the west. Additional residential areas and associated facilities / amenities can be accessed within 1,000m – 2,000m of the site, including parts of Withington, Didsbury, and Whalley Range in addition to all of West Didsbury and Chorlton. Local amenities and facilities associated with residential areas in the vicinity of the site include convenience stores, hospitals, places of worship, places of education, local shops, hot food takeaways and restaurants that future staff and visitors could utilise.
- 6.69. Footways in the area are of good quality, well-lit and at least 2m wide. There are dropped kerbs, tactile paving and pedestrian guard rails at key junctions, such as those on the A5103 Princess Road. The walking environment is enhanced by the fact that 20-30mph speed restrictions are in operation along most of the road corridors.
- 6.70. Bus stops are located at a short walk from the site on Princess Road and Barlow Moor Road, whilst the Withington Metrolink stop is situated at a c. 700m walk to the north of the site.
- 6.71. Overall, it is considered that the Application Site is situated within a highly accessible area, with a number of complementary land uses within walking distance.

Cycle Accessibility

- 6.72. In order to assist in assessing the accessibility of the Application Site by cycle, an 8km cycle catchment for the Application Site has been considered.
- 6.73. The 8km catchment (5 miles) considered to be the maximum acceptable cycling distance for most people and is based on the 2019 National Travel Survey statistics, which demonstrates that 82% of cycling trips were under 5 miles (8km).
- 6.74. The National Model Design Code – Part 2 (DLUHC, 2021) also references this distance, expressing “the aim that walking and cycling should be the first choice for short local journeys, particularly those of 5 miles or less.” The average cyclist travels at approximately 12mph, according to CD195 of the Design Manual for Roads and Bridges, so they could travel 5 miles in approximately 25 minutes.
- 6.75. The 8km catchment encompasses all of West Didsbury and Chorltonville including key transport links, convenience stores, bars, restaurants, and leisure centres. The catchment also extends as far as Manchester city centre to the north, Heaton Chapel to the east, Wythenshawe to the south, and Sale and Stretford to the west.
- 6.76. The Application Site is well situated to benefit from existing cycle provision, with the wider local highway network in the vicinity of the Application Site comprising on-road cycle facilities such as cycle lanes along Barlow Moor Road for ease of cycling on the carriageway, and shared footway / cycleways along Barlow Moor Road and Princess Road offering traffic-free cycling.
- 6.77. Route 85 on the National Cycle Network (NCN) runs along the western boundary of the Application Site, which takes the form of a 3m wide shared footway/cycleway running along the eastern side of Princess Road. This route travels in a southerly direction the via the Southern Cemetery Bus Station, utilising cycle lane provision on Barlow Moor Road, before travelling on Rowsley Avenue, Borrowdale Crescent and Mersey Crescent and continuing as 3m wide shared footway / cycle along Princess Road.

- 6.78. The path then becomes entirely traffic-free on approach to the River Mersey bank, where Route 62 lies. Route 62 extends to Chorlton and Stretford to the west, and to Northenden and East Didsbury to the east. Towards the north of the site, Route 85 also connects with Route 6 at Whalley Range, which continues via on and off-road routes towards Manchester City Centre and Radcliffe further beyond.
- 6.79. Cyclists can also utilise the existing local roads to gain access to the site; it is considered that local roads are of sufficient width with low speed limits to encourage staff and visitors to cycle.
- 6.80. The local cycle network shown above is also a part of Greater Manchester’s cycling and walking infrastructure proposal, named the “Bee Network”. The Bee Network comprises signed routes that mark the most direct and pleasant way to navigate an area on foot or by bike. The proposal is a vision for Greater Manchester to become the very first city-region in the UK to have a fully joined-up cycling and walking network.
- 6.81. These include the Chorlton Busy Beeway (Area 4) along Barlow Moor Road from Sandy Lane to Hardy Lane, upgrades to the existing Fallowfield Loop Line (Floop) to the north of the site, Parsonage Road Safer Streets (an active neighbourhood plan), and the Sale Water Park scheme, providing a segregated cycle route along Northenden Road and Old Hall Road.
- 6.82. The Application Site is therefore ideally placed to take advantage of the cycle connections around West Didsbury and Chorlton. Furthermore, the development will provide secure cycle parking spaces for both staff and visitors (located near the entrance to the building) to encourage cycling. In summary, it is considered that cycling is a highly realistic mode of travel to and from the Application Site.

Public Transport Accessibility

- 6.83. Developed by Transport for Greater Manchester (TfGM), Greater Manchester Accessibility Levels (GMAL) are a measure of the accessibility of a point to both the conventional public transport network (i.e. bus, Metrolink and rail) and Greater Manchester’s Local Link (flexible transport service), considering walk access time, service availability, and average waiting time.
- 6.84. The method is essentially a way of measuring the density of the public transport provision at any location within the Greater Manchester region. The accessibility index score is categorised into eight levels (1 to 8), where level 8 represents a high level of accessibility (described as ‘excellent’) and level 1 a low level of accessibility (described as ‘very poor’).
- 6.85. The Application Site is located in an area with a GMAL rating of 7. This demonstrates that the Application Site offers very good levels of multi-modal accessibility to Manchester city centre and across Greater Manchester.

Bus Accessibility

- 6.86. Guidance within the National Model Design Code – Part 2 (DLUHC, 2021) states: “Generally, people are prepared to walk further to a railway station or tram stop (10 minutes) [800m walking distance] than to a bus stop (5 minutes) [400m walking distance].” These distances are also cited in the CIHT document ‘Planning for Walking’ (2015).
- 6.87. The nearest bus stop to the Application Site is located within a 350m walk from the centre of the Application Site, along Barlow Moor Road, followed by the bus stop on the southbound lane of Princess Road, and the Southern Cemetery Bus Circle and Barlow Moor Road (c. 450m and 500m respectively). Table 6.12 details the services that call at this stop, and their associated frequencies.

Table 6.12 – Summary of Bus Service Frequencies in the Vicinity of the Application Site

Bus Service	Route	Peak Hourly Frequency		
		Mon – Fri	Sat	Sun/Hols
From A5145 Barlow Moor Road:				

Bus Service	Route	Peak Hourly Frequency		
		Mon – Fri	Sat	Sun/Hols
23	Stockport – Stretford – Urmston – The Trafford Centre	20 mins	20 mins	30 mins
84	Withington – West Didsbury – Mersey Bank Estate – Chorlton	Hourly from 09:00 – 15:00	No Service	No Service
111	Chorlton – Withington – Moss Side – Piccadilly Gardens	12 mins	12 mins	20 mins
172	Chorlton – Didsbury – Gorton – Droylsden – Newton Heath	Hourly	Hourly	Hourly
From A5103 Princess Road SB (172 as above, with the addition of):				
101	Wythenshawe – Baguley – Moss Side – Piccadilly Gardens	15 mins	15 mins	20 mins
102	Chorlton – Withington – Moss Side – Piccadilly Gardens	No Service	No Service	Hourly
103	Manchester Airport – Wythenshawe – Piccadilly Gardens	30 mins	30 mins	Hourly
From Southern Cemetery Bus Circle (111 and 172 as above).				

- 6.88. These stops provide frequent access to and from residential areas, as well as larger public transport interchanges (such as Manchester city centre) all 7 days of the week. It is considered that the Application Site is accessible by bus.
- 6.89. It is noted that the provision of bus services will change over time in response to current circumstances. The bus times are accurate at the time of writing, whereas up-to-date bus times can be found on TfGM's website: [tfgm.com/public-transport/bus](https://www.tfgm.com/public-transport/bus).
- 6.90. Overall, the Application Site is highly accessible by bus with a large number of services available within walking distance of the site.

Rail Accessibility

- 6.91. The Chartered Institution of Highways and Transportation (CIHT) document, *'Planning for Public Transport in Developments'* notes that those travelling to a site by rail will typically be prepared to walk further to the site than those travelling by bus, with a preferred distance of 800m.
- 6.92. The East Didsbury rail station is located c. 4km to the south-east of the site. This lies outside the CIHT recommended distance; however, the station is also served by the no. 23 bus service, the Pink Line from Withington Metrolink station, and can also be accessed by cycle. Northern Rail offers space for up to two bikes on all trains for no extra charge, however these are allocated on a first-come, first-serve basis. There is step-free access across the whole station in the form of ramps to the platforms, along with a ticket hall at the northbound platform (Platform 1), and seating on both platforms.
- 6.93. There is also a station car park adjacent to the southbound platform (Platform 2) with 15 spaces including 2 accessible spaces, operating 24 hours a day with no charge for parking.
- 6.94. A summary of rail services from the rail station is outlined in Table 6.13 below:

Table 6.13 – Summary of Rail Services calling at East Didsbury

Destination	Service Frequency		
	Peak Weekday	Peak Saturday	Peak Sunday
Manchester to Manchester Airport local stopping services and Manchester to Crewe			
Calling at but not limited to: Manchester Oxford Road, Manchester Piccadilly, Mauldeth Road, East Didsbury, Manchester Airport, Wilmslow, Alderley Edge, Crewe	Every 30 mins	Hourly	Hourly

- 6.95. The trains that service East Didsbury rail station operate regularly 7 days a week to a number of different locations and residential areas within Greater Manchester and the North West; this provides frequent access for users of the Application Site and is a viable alternative to private car use.
- 6.96. It is noted that the provision of rail services will change over time in response to current circumstances. The rail frequencies are accurate at the time of writing, whereas up-to-date rail times can be found on Northern Rail's website: northernrailway.co.uk/travel/timetables.

Metrolink (Light Rail) Accessibility

- 6.97. The nearest Metrolink stop is Withington, located c. 700m to the north-west of the Application Site. There is step-free access to both platforms in the form of lifts and ramps. The **Pink Line** between East Didsbury and Rochdale, and the **Brown Line** between Rochdale Town Centre and East Didsbury call at this stop.
- 6.98. All lines run at an approximate frequency of every 12 minutes between 06:00 – 00:00 on Mondays to Saturdays, and 07:00 – 00:00 on Sundays.
- 6.99. The start and end times for the specific station that staff and visitors wish to call at will change over time in response to current circumstances. The Metrolink frequencies are accurate at the time of writing, whereas up-to-date times can be found on the Metrolink website at: tfgm.com/public-transport/tram/tram-times.
- 6.100. Overall the Metrolink network is available within walking distance of the site and is readily accessible by staff and visitors at the site.

Accessibility by Sustainable Modes Summary

- 6.101. The above sections have demonstrated that the Application Site is highly accessible by active and sustainable modes of transport; the surrounding area exhibits excellent levels of pedestrian and cycling infrastructure, and there are a number of public transport opportunities within walking distance of the Application Site.
- 6.102. The Application Site is well located to take advantage of the excellent existing public transport facilities, including both bus and Metrolink, in addition to walking and cycling opportunities, which will therefore provide viable alternatives to travel by car.

Identification and Evaluation of Significant Effects

Construction

- 6.103. The construction of the Proposed Development will result in a temporary increase of HGVs and cars/vans carrying construction workers and materials on roads surrounding the Application Site. This has potential impacts in relation to noise, air, dust and dirt and ground conditions which are considered elsewhere within the wider ES and standalone reports.

- 6.104. Vehicles would arrive via links that have significant baseline flows (such as the A5103 Princess Road and the A5145 Barlow Moor Road) before entering the Application Site. It is considered that the volume of construction traffic, when compared to the existing traffic flows on the local highway network, would fall below the IEMA assessment thresholds detailed earlier in this Chapter. Moreover, the level of construction traffic is likely to be less than the completed and operational development, which is the focus of the assessment in this Chapter.
- 6.105. The construction phase is therefore likely to have a direct, temporary, short-term (reversible), **Minor Adverse** effect at a local level for the following, which is **not significant**:
- Driver delay;
 - Public transport users;
 - Pedestrian delay;
 - Pedestrian amenity;
 - Fear and Intimidation;
 - Severance; and
 - Collisions and road safety.

Completed and Operational Development

Percentage Impact

- 6.106. In line with the IEMA Guidelines, the percentage impact of the development proposals has been calculated for each link in the following table. This assessment compares the 'Base' with the 'Base + Development' scenarios; the 'Base + Development' scenario is a worst-case assessment which includes both the impact from the Proposed Development and the potential Meanwhile Use of the additional parking spaces. As such, the scenarios are as follows:
- Base = 2022 Surveys + Committed Development flows; and
 - Base + Development = 2022 Surveys + Committed Development + Proposed Development + Meanwhile Use flows.

- 6.107. The junctions and links for assessment are shown in Table 6.14 below:

Table 6.14 – Peak Hour and AADT Assessment Flows

Junction Ref.	Link	Base			Base + Development			% Change		
		AM Peak	PM Peak	24 Hour AADT	AM Peak	PM Peak	24 Hour AADT	AM Peak	PM Peak	24 Hour AADT
- 1 – Application Site Access / Barlow Moor Rd	- Barlow Moor Rd (E)	1,489	1,440	21,030	1505	1454	21,254	1.12%	1.01%	1.06%
	- Application Site Access	177	172	2,506	362	334	4,994	104.42%	93.99%	99.28%
	- Barlow Moor Rd (W)	1,596	1,518	22,358	1,764	1,665	24,622	10.54%	9.69%	10.13%
	- Barlow Moor Rd (E)	1,637	1,590	23,172	1,807	1,739	25,461	10.39%	9.36%	9.88%
	- Princess Rd (S)	5,805	6,285	86,823	5,920	6,386	88,365	1.97%	1.59%	1.78%
	- Barlow Moor Rd (W)	1,881	1,815	26,538	1,897	1,829	26,762	0.88%	0.80%	0.84%

Junction Ref.	Link	Base			Base + Development			% Change		
		AM Peak	PM Peak	24 Hour AADT	AM Peak	PM Peak	24 Hour AADT	AM Peak	PM Peak	24 Hour AADT
- 2 – A5145 Barlow Moor Rd / A5103 Princess Rd	- Princess Rd (N)	4,287	4,672	64,335	4,326	4,706	64,857	0.91%	0.73%	0.81%
- 3 – Nell Lane / A5103 Princess Rd	- Nell Lane (E)	585	494	7,748	585	494	7,748	0.00%	0.00%	0.00%
	- Princess Rd (S)	4,283	4,674	64,320	4,322	4,708	64,843	0.91%	0.73%	0.81%
	- Nell Lane (W)	709	805	10,872	726	820	11,096	2.35%	1.81%	2.06%
	- Princess Rd (N)	3,833	4,179	57,534	3,855	4,198	57,833	0.58%	0.46%	0.52%

- 6.108. In line with the IEMA assessment criteria detailed earlier in this Chapter, the effects of the development will be assessed based on two rules.
- 6.109. It is considered that sensitivity of the Application Site Access link is Medium due to the existing vehicular and pedestrian access to the adjacent Spire Hospital (as per Paragraph 6.37). The sensitivity of all other links in the study area are considered Low as the receptors will be tolerant of change without any detriment.
- 6.110. Rule 2 is applied to the Application Site Access link as sensitivity of Medium or above is considered to be a sensitive area as per the criteria set out within IEMA Guidelines. This states there is a need for an environmental impact analysis if traffic flows have increased by more than 10%.
- 6.111. Rule 1 is applied to all other links within the study area, which states there is a need for an environmental impact analysis if traffic flows have increased by more than 30% (or the number of HGVs will increase by more than 30%).
- 6.112. As the impact of the completed development is above 10% on the Site Application Link (as per Rule 2) but less than 30% across all the remaining links (as per Rule 1) only further assessment of the Site Application Link is necessary.
- 6.113. Notwithstanding the thresholds, all the above junctions have been assessed for capacity and delay in the accompanying TA (Appendix 6.1).
- 6.114. Further assessment of driver delay, pedestrian delay, pedestrian amenity, fear and intimidation, severance, and collisions and road safety are provided in the following sub-sections.

Driver Delay

- 6.115. The delay statistics from the junction capacity assessments in the TA (Appendix 6.1) have been used for this assessment.

Existing Priority Junction

- 6.116. Initially the Application Site Access link has been assessed as per the existing situation, which comprises a priority junction, and has been assessed using JUNCTIONS software. The results are shown in Table 6.15 below:

Table 6.15 – Driver Delay (Existing Priority Junction) – Change in Delay per Vehicle

Link / Delay	Base (in s)		Base + Development (in s)		Change (in s)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Application Site Access	26.55	30.22	31.18	124.51	+4.63	+83.56

- 6.117. The results show an increase in delay of greater than 60 seconds but less than 120 seconds; therefore, as the sensitivity of the link is medium, the magnitude of the effect would be moderate adverse.
- 6.118. However, whilst the priority junction continues to operate within practical capacity in the Base + Development scenario, it is noted that queues and delays will increase on the Application Site Access approach. Due to this increase in delay, a mitigation scheme has been explored, as set out in the TA (Appendix 6.1).

Proposed Signalised Junction

- 6.119. As part of the development proposals, the Application Site will benefit from an alternative access design of the Application Site Access / Barlow Moor Road junction inclusive of signal control. The design includes signalised crossing facilities and advanced cycle stop lines on the northern and western arms of the junction, and the provision of ghost island right turn lanes for general traffic. The existing footways on the internal spine road would be retained to facilitate safe pedestrian movement to the site.
- 6.120. The Application Site Access link has therefore also been assessed for the proposed signalised access arrangement, which has been assessed using LinSig software. The results are shown in Table 6.16 below:

Table 6.16 – Driver Delay (Proposed Signalised Junction) – Change in Delay per Vehicle

Link / Delay	Base (in s)		Base + Development (in s)		Change (in s)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Application Site Access	62.70	74.80	67.60	70.60	+4.90	-4.20

- 6.121. Whilst it is acknowledged that the driver delay is lower in the Base scenario for the existing priority junction, the delay for the Base situation shown in Table 6.16 is higher due to the change in junction type to a signalised junction. This is due to the proposed signalised junction regulating traffic flows and reduce the conflict between traffic streams, resulting in a more efficient operation. As such, the Baseline delay for this approach increases. The proposed junction will also provide other benefits such as signalised crossing facilities to aid safe pedestrian movements across the Application Site Access arm.
- 6.122. The results in Table 6.16 show a change in delay from the Base scenario to the Base + Development scenario of less than 30 seconds; therefore, the magnitude of the effect is negligible.
- 6.123. In the Base + Development scenario, the change in the PM Peak is a reduction in delay; this is due to the optimisation of the signal timings with green time being reallocated to the Site Access approach leading to a reduction in driver delay.
- 6.124. The sensitivity of the link is medium, and the significance of the effect is therefore **Negligible** in the long-term (permanent), at a local level, which is **not significant**.

Public Transport Users

- 6.125. There are currently no bus services that utilise the Site Application Access; hence, there would be no impacts on public transport users.

Pedestrian Delay

- 6.126. Changes in delay to pedestrians considers the increase in traffic flow and IEMA guidelines indicate that a 10 second pedestrian delay in crossing a road broadly equates to a two-way link flow of approximately 1,400 vehicles per hour. The Application Site Access link has been assessed and the results are shown below:

Table 6.17 – Pedestrian Delay – Change in Delay

Link / Delay	Base (in s)		Base + Development (in s)		Change (in s)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Application Site Access	1.26	1.23	2.59	2.39	+1.33	+1.16

- 6.127. The results show an increase in delay of less than 20 seconds; therefore, the magnitude of the effect is negligible. The sensitivity of the link is medium, therefore the significance of the effect is **Negligible** in the long-term (permanent), at a local level, which is **not significant**.

Pedestrian Amenity

- 6.128. Changes in amenity to pedestrians considers the Guidelines for the Assessment of Environmental Impact of Road Traffic, which state that a threshold for judging the significance of changes in pedestrian amenity is where the traffic flow, or the HGV component, changes by more than 50%.
- 6.129. The Application Site Access link has been assessed for change in total vehicle flow in the above tables, and the results for change in HGV traffic flows are shown below.

Table 6.18 – Pedestrian Amenity – Change in HGV Traffic Flows

Link	Base			Base + Development			% Change		
	AM Peak	PM Peak	24 Hour HGV AADT	AM Peak	PM Peak	24 Hour HGV AADT	AM Peak	PM Peak	24 Hour HGV AADT
Application Site Access	4	0	29	4	0	29	0%	0%	0%

- 6.130. The results in the earlier tables show an increase in traffic flows of less than 100%; however, no change in HGV flows is expected. Furthermore, the footway width on the Site Application link is considered to be satisfactory. The sensitivity of the link is medium, therefore the significance of the effect is therefore **Negligible** in the long-term (permanent), at a local level, which is **not significant**.

Fear and Intimidation

- 6.131. The assessment of fear and intimidation considers the potential change in the degree of hazard. The Application Site Access link has been assessed and the results are shown below:

Table 6.19 – Fear and Intimidation – Change in Degree of Hazard

Link	Base			Base + Development			% Change		
	18 Hour AAWT (veh/hr)	Total 18 Hour HGV Flow (veh)	Avg Speed (mph)	18 Hour AAWT (veh/hr)	Total 18 Hour HGV Flow (veh)	Avg Speed (mph)	18 Hour AAWT (veh/hr)	Total 18 Hour HGV Flow (veh)	Avg Speed (mph)
Application Site Access	125 Hazard: N/A	29 Hazard: N/A	10 Hazard: Moderate	249 Hazard: N/A	29 Hazard: N/A	10 Hazard: Moderate	+124 Hazard: N/A	0 Hazard: N/A	0

- 6.132. The results show no change in the degree of hazard; therefore, the magnitude of the impact is negligible. The sensitivity of the link is medium, therefore the significance of the effect is therefore **Negligible** in the long-term (permanent), at a local level, which is **not significant**.

Severance

- 6.133. The assessment of severance has been undertaken at link level and considers the potential change in traffic flows. The Application Site Access link has been assessed and the results are shown below:

Table 6.20 – Severance – Change in Traffic Flows

Link	Base			Base + Development			% Change		
	AM Peak	PM Peak	24 Hour AADT	AM Peak	PM Peak	24 Hour AADT	AM Peak	PM Peak	24 Hour AADT
Application Site Access	177	172	2,506	362	334	4,994	104.42%	93.99%	99.28%

- 6.134. The results show an increase in traffic flows of over 90%, therefore the magnitude of the effect equates to major. However, it should be noted that this percentage increase is due to the very low baseline flows that are currently experienced on the Application Site Access approach. During the AM Peak, there are 177 two-way vehicles which travel on this approach, and 172 two-way vehicles during the PM Peak, which equates to approximately three vehicles every minute. This is a very low level of traffic flow.
- 6.135. The increase to 362 two-way movements in the AM Peak (+185) and to 334 two-way movements in the PM Peak (+162) represents an increase of a further three vehicles every minute. This would result in a maximum of six two-way vehicles travelling on the Application Site Access approach during peak hours. Whilst this an increase of over 90% change in traffic flow, the actual traffic flows remain very low and it is not considered that this increase would materially impact on severance.
- 6.136. On this basis, noting there will only be a small increase in the number of vehicles using the Application Site Access approach, it is considered that the magnitude would be minor. The sensitivity of the link is medium, therefore the significance of the effect is therefore **Minor Adverse** in the long-term (permanent), at a local level, which is **not significant**.

Collisions and Road Safety

- 6.137. The assessment of collisions and road safety considers both the collision rate and the change in traffic flows.

- 6.138. There has been one recorded 'slight' severity collision on the Application Site Access link in the last five years. It is therefore not considered that there is an existing safety issue that is likely to be exacerbated by the Proposed Development.
- 6.139. Moreover, improvements are proposed at the Application Site Access / Barlow Moor Road junction with signal controls, which will offer road safety benefits to all users. As such, the magnitude of the effect is negligible.
- 6.140. The sensitivity of the link is medium, therefore the significance of the effect is therefore **Negligible** in the long-term (permanent), at a local level, which is **not significant**.

Mitigation Measures

Construction

- 6.141. As previously identified, the construction phase is likely to have a direct, temporary, short-term (reversible), **Minor Adverse** effect at a local level, which is **not significant** overall. No specific mitigation measures are therefore required.
- 6.142. Notwithstanding, as best practice, a Construction Environmental Management Plan (CEMP) will be prepared to support the Proposed Development, and this will seek to minimise the level of disruption caused during the construction phase of the development. Precise details of the plan will be agreed via condition, but it is envisaged that the plan will predominantly consist of:
- Agreed traffic management measures to restrict construction vehicles in certain locations and routes at certain times of the day;
 - Travel Plan initiatives to encourage workers to travel to the Application Site in a sustainable manner;
 - Considerate construction practices (such as wheel washing) to mitigate impacts which are considered elsewhere in the noise, air and dust and dirt section of this ES; and
 - Ensuring managed access to all commercial buildings within the Site throughout construction.

Completed and Operational Development

- 6.143. As previously identified, the completed and operational phase is likely to have a direct, permanent, long-term, **Negligible** to **Minor Adverse** effect at a local level, which is **not significant** overall.
- 6.144. As part of the development proposals, once operational, the Application Site will benefit from an alternative access design of the Application Site Access / Barlow Moor Road junction inclusive of signal control. This will improve the operation and safety of the junction. This embedded mitigation measure has been considered as part of the above assessments.
- 6.145. The Proposed Development will also be supported by a Framework Travel Plan (FTP) (Appendix 6.2), which aims to minimise the number of car trips generated by the development and encourage staff and visitors to use sustainable modes of transport. A range of short to medium-term initiatives and long-term initiatives are detailed in the FTP that will help to mitigate the impacts of the traffic associated with the Proposed Development and encourage modal shift over time. These include initiatives grouped into the following categories:
- FTP Policies;
 - Car Park Management;
 - Marketing and Promotion;
 - Measures to Encourage Walking;
 - Measures to Encourage Cycling;
 - Measures to Encourage Public Transport Use; and
 - Reducing the Need to Travel.

Cumulative Effects

- 6.146. As outlined above, the study area, scenarios for assessment and traffic data sources for this Chapter of the ES are based on the TA. The traffic flow scenarios for assessment include committed developments, as discussed with Highways Officers at MCC and TfGM as part of pre-application discussions.
- 6.147. It is noted that the Base + Development also assesses the potential Meanwhile Use of the additional parking spaces that may be brought forward as part of a separate future planning application.
- 6.148. The traffic flows that have been used for the TA and the ES are therefore consistent and considered a worst case, cumulative assessment.

Residual Effects

- 6.149. Curtins has considered the anticipated effects of the Proposed Development on existing traffic conditions in the study area. The assessments have been informed by a combination of numerical analysis and professional judgement/experience.
- 6.150. The construction phase is likely to have a direct, temporary, short-term (reversible), **Minor Adverse** effect at a local level for the following, which is **not significant**. Notwithstanding, it is considered best practice to provide a CEMP with various measures that promote travel planning, considerate construction practices and agree traffic management measures.
- 6.151. Following the implementation of these measures, the impacts of the construction phase would remain as **Minor Adverse** and **not significant**.
- 6.152. The completed and operational phase is likely to have a direct, permanent, long-term, **Negligible to Minor Adverse** effect at a local level, which is **not significant** overall.
- 6.153. Improvements to the Application Site access junction have been proposed as a mitigation measure, inclusive of signal controls, to improve the operation and safety of the junction.
- 6.154. An FTP has also been prepared to minimise the number of car trips generated by the development and encourage staff and visitors to use sustainable modes of transport.
- 6.155. Following the implementation of these measures, the impacts of the operational phase would remain **Neutral to Minor Adverse**, which is **not significant**.

Reference List

- 6.156. This ES Chapter has been prepared by reference to the following:
- Ministry of Housing, Communities & Local Government, (2019). 'National Planning Policy Framework'. GOV.UK, London. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>. [Accessed: 27/06/2022];
 - Ministry of Housing, Communities & Local Government, (2020). National Planning Practice Guidance. GOV.UK, London. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>. [Accessed: 27/06/2022];
 - Manchester City Council, (2012). 'Manchester Core Strategy 2012 – 2027'. Available at: https://secure.manchester.gov.uk/info/200074/planning/6573/core_strategy_2012-2027. [Accessed: 27/06/2022];
 - Transport for Greater Manchester, (2021). 'Greater Manchester Transport Strategy 2040'. Available at: <https://tfgm.com/2040>. [Accessed: 27/06/2022];
 - Institute of Environmental Management and Assessment, (1993). 'Guidelines for the Environmental Assessment of Road Traffic'. IEMA, East Kirkby;

- The Institution of Highways & Transportation, (2000). 'Guidelines for Providing for Journeys on Foot'. IHT, London;
- Cycling England, (2009). 'Integrating Cycling into Development Proposals'. Cycling England, London. Available at: <https://www.cycling-embassy.org.uk/document/c07-integrating-cycling-development-proposals>. [Accessed: 27/06/2022];
- The Chartered Institution of Highways & Transportation, (2018). 'Buses in Urban Developments'. Available at: https://www.ciht.org.uk/media/4459/buses_ua_tp_full_version_v5.pdf. [Accessed: 27/06/2022];
- Department for Transport and Ministry of Housing, Communities & Local Government, (2007). 'Manual for Streets'. GOV.UK, London. Available at: <https://www.gov.uk/government/publications/manual-for-streets>. [Accessed: 27/06/2022];
- Department for Transport, (2010). 'Manual for Streets 2'. GOV.UK, London. Available at: <https://www.gov.uk/government/publications/manual-for-streets-2>. [Accessed: 27/06/2022];
- National Highways, (2022). Design Manual for Roads and Bridges. Available at: <https://www.standardsforhighways.co.uk/dmrb/>. [Accessed: 27/06/2022];
- Department for Transport, (2021). 'Transport Analysis Guidance'. GOV.UK, London. Available at: <https://www.gov.uk/guidance/transport-analysis-guidance-tag>. [Accessed: 27/06/2022];

7. Air Quality

Introduction

- 7.1. This Chapter of the ES has been prepared by Ramboll and reports on the likely significant air quality effects to arise from the demolition and construction stage and the completed development stage of the Proposed Development. The chapter describes the air quality policy context; the methods used to assess the potential impacts and likely effects; the baseline conditions at and surrounding the Site; the likely air quality effects taking into consideration embedded mitigation; the need for additional mitigation and enhancement; the significance of residual effects; and inter-project cumulative effects.
- 7.2. The main air pollutants of concern are dust and particulate matter with an aerodynamic diameter of less than 10 micrometres (μm) (PM10), typically generated during demolition and construction activities and from industrial sources, and nitrogen dioxide (NO₂), and particulate matter with an aerodynamic diameter of less than 2.5 μm (PM2.5), typically generated by road traffic emissions.
- 7.3. This Chapter is accompanied by one technical appendix, Detailed Methodology, Modelling Approach and Data (appendix 7.1).

Table 7.1 – Qualifications and professional memberships of Ramboll Consultants

EIA Team Member	Qualifications	Relevant Memberships	Relevant Experience and Accreditation
Graham Harker	BSc (Hons) in Mechanical Engineering (Imperial College, University of London)	Member of the Institute of Air Quality Management (MIAQM). Member of the Institution of Environmental Sciences (MIEnvSc). Chartered Engineer, Member of the Institution of Mechanical Engineers (MIMechE).	- Graham has over 20 years' air quality experience. As one of Ramboll's principal air quality scientists within the UK he manages a team of air quality practitioners. - Graham is extensively involved in carrying out ambient air quality assessments, either as standalone studies or as part of environmental statements and permit applications. - Graham has previously been a committee member of the IAQM.
Ana Gomes	MSc in Environmental Engineering (Technical University of Madrid, Spain) MSc in Environmental Sciences and Technology (University of Porto, Portugal)	Member of the Institute of Air Quality Management (MIAQM). Member of the Institution of Environmental Sciences (MIEnvSc).	- Ana has over 10 years' experience as an environmental professional with a strong technical background in the field of air quality and knowledge in natural resources management. - Ana has produced several air quality assessments, including EIA and non-EIA, for a wide variety of large residential, mixed-use, commercial and industrial development across the UK.

EIA Team Member	Qualifications	Relevant Memberships	Relevant Experience and Accreditation
	BSc (Hons) in Environmental Sciences and Technology (University of Porto, Portugal)		
Ellie Hathaway	BSc (Hons) Geography (University of Sheffield)	Associate Member of the Institute of Air Quality Management (AMIAQM). Associate Member of the Institution of Environmental Sciences (AMIEEnvSc).	· Ellie has over four years' environmental consultancy experience. · Ellie has produced air quality assessments for numerous development types, including, residential, mixed use, industrial and commercial facilities. · Ellie is an associate member of the IES and IAQM.

Legislative and Policy Context

7.4. The assessment has been informed by the following legislation, policies and published guidance:

Legislation

European Union Ambient Air Quality and Clean Air for Europe, 2008

- 7.5. EU Directive 2008/50/EC² on ambient air quality and cleaner air for Europe (the CAFE directive) sets out the ambient air quality standards for nitrogen dioxide (NO₂) and particulate matter with an aerodynamic diameter of less than 10 µm (PM₁₀) to be achieved by 1 January 2010 and 2005 respectively. The Air Quality Standards Regulations 2010³ implements the requirements of the Directive into United Kingdom (UK) legislation.
- 7.6. The Directive contains a series of limit values for the protection of human health and critical levels for the protection of vegetation. Compliance with the European Union (EU) Limit Values is mandatory. However, Member States can apply for a time extension for compliance, subject to approval of an action plan by the European Commission.
- 7.7. In December 2015, the Department for Environment Food and Rural Affairs (Defra) on behalf of the UK Government produced plans to improve air quality in the UK in order to meet the EU targets in the shortest possible time⁴. The adequacy of these plans to bring about the necessary improvements in air quality to meet the relevant NAQOs within the shortest time possible were successfully challenged within the High Court in 2016.
- 7.8. Subsequently, in 2017 a plan for the reduction in roadside NO₂ concentrations was released⁵ which requires local authorities to identify local actions to accelerate the improvement in air quality in their jurisdictions. It also includes the national measures, including banning the sale of conventionally powered cars and light goods vehicles by 2035 and further investment in cleaner transport.

² Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

³ Secretary of State, 2010. Statutory Instrument 2010 No. 1001, Air Quality Standards Regulations 2010. HMSO.

⁴ Defra, December 2015. Improving air quality in the UK, Tackling nitrogen dioxide in our towns and cities, UK overview document. Defra.

⁵ Department for Environment, Food and Rural Affairs, 2017. UK plan for tackling roadside nitrogen dioxide concentrations. Defra.

National Planning Policy

Local Air Quality Management (LAQM)

- 7.9. Part IV of the Environment Act 1995⁶, requires the UK Government to publish an Air Quality Strategy and local authorities to review, assess and manage air quality within their areas. This is known as Local Air Quality Management (LAQM).
- 7.10. The 2007 Air Quality Strategy⁷ establishes the policy for ambient air quality in the UK. It includes the Air Quality Objectives (AQOs) for the protection of human health and vegetation for 11 pollutants. Those AQOs included as part of LAQM are prescribed in the Air Quality (England) Regulations 2000 and the Air Quality (Amendment) (England) Regulations 2002. Table 7.2 presents the AQOs for NO₂ and PM₁₀ the two pollutants of most concern in urban areas.

Table 7.2 – Objectives Included in Air Quality Regulations (England) 2000 for Purpose of Local Air Quality Management

Pollutant	Air Quality Objective		
	Concentration	Measured As	Date to be Achieved By
NO ₂	200 micrograms per metre cubed (µg/m ³) not to be exceeded more than 18 times per year	1 hour	31 December 2005
	40 µg/m ³	Annual mean	
PM ₁₀	50 µg/m ³ not to be exceeded more than 35 times per year	24 hour mean	31 December 2004
	40 µg/m ³	Annual mean	

- 7.11. Analysis of long-term monitoring data suggests that if the annual mean NO₂ concentration is less than 60 µg/m³ then the one-hour mean NO₂ objective is unlikely to be exceeded where road transport is the main source of pollution. Therefore, in this assessment this concentration has been used to screen whether the one-hour mean objective is likely to be achieved (Defra, 2016). Similar to NO₂, a PM₁₀ annual mean below 32 µg/m³ is used to screen whether the 24-hour PM₁₀ mean objective is likely to be achieved (Defra, 2016).
- 7.12. The 2007 Air Quality Strategy also introduced a new policy framework for tackling PM_{2.5} which included an exposure reduction target and a ‘backstop’ annual mean NAQO. The exposure reduction target is focussed on reducing average concentrations across the most polluted urban areas and is therefore not applicable to individual schemes, whilst the annual mean NAQO can be considered a concentration cap to ensure environmental compliance. The UK NAQO for PM_{2.5} are provided in Table 7.3.

Table 7.3 – UK Objectives for PM_{2.5}

Averaging Period	Objective	Target Date
Annual mean	25 µg/m ³	2020
3 year running annual mean	15 % reduction in concentrations measured at urban background sites	Between 2010 and 2020

⁶ Secretary of State, 1995. The Environment Act part IV Air Quality, HMSO.

⁷ Department for Environment, Food and Rural Affairs, 2007. Air Quality Strategy for England, Scotland, Wales and Northern Ireland. HMSO.

- 7.13. The NAQOs apply to external air where there is relevant exposure to the public over the associated averaging periods within each NAQO. Guidance is provided within LAQM.TG (16)⁸ issued by Defra for Local Authorities, on where the NAQOs apply, as detailed in Table 7.4. The NAQOs do not apply in workplace locations, to internal air or where people are unlikely to be regularly exposed (i.e. centre of roadways).

Table 7.4 – Locations Where National Air Quality Objectives Apply

Averaging Period	Objectives should apply at	Objectives should generally not apply at
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades 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.
24 Hour Mean	All locations where the annual mean objective would apply, together with hotels. 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.
1 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 expect to spend one hour or longer.	

- 7.14. It should be noted that the EU Limit Values are numerically the same as the NAQO values but differ in terms of compliance dates, locations where they apply and legal responsibility. The compliance date for the NO₂ Limit Values was 1 January 2010, which is five years later than the date for the NAQO.
- 7.15. The Limit Values are mandatory whereas the NAQOs are policy objectives. Local authorities are not required to achieve them but have to demonstrate effort of working towards their achievement. In addition, the Limit Values apply in all locations except:
- where members of the public do not have access and there is no fixed habitation;
 - on factory premises or at industrial installations; and
 - on the carriageway/central reservation of roads except where there is normally pedestrian access.

⁸ Department for Environment, Food and Rural Affairs, 2016. Local Air Quality Management Technical Guidance LAQM.TG (16). HMSO.

- 7.16. Where a local authority's review and assessment of its air quality identifies that air quality is likely to exceed the NAQOs, it must designate these areas as AQMAs and draw up an Air Quality Action Plan (AQAP) setting out measures to reduce pollutant concentrations with the aim of meeting the NAQOs.

Clean Air Strategy, 2019

- 7.17. Defra published a new Clean Air Strategy 2019 in January 2019, setting out how the UK will significantly reduce harmful air pollutant emissions by 2020 and 2030. The Clean Air Strategy contains an intention of working towards the World Health Organisation guideline value for PM_{2.5} of 10µg/m³. The timetable for this has not been set.

National Planning Policy Framework, 2021

- 7.18. The revised National Planning Policy Framework (NPPF) 10 sets out the Government's planning policies for England and how they are expected to be applied (Ministry of Housing, Communities & Local Government, 2021). In relation to achieving sustainable development, paragraph 8 states that:
- 7.19. *"Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):...*
- 7.20. *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."*
- 7.21. *So that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development. Paragraph 11 states that plans and decisions should apply a presumption in favour of sustainable development, which for decision-taking means:*
- 7.22. *"... d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless: ...*
- 7.23. *ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole."*
- 7.24. Paragraph 55 on planning conditions and obligations states:
- 7.25. *"Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition."*
- 7.26. Paragraph 104 on promoting sustainable transport states:
- 7.27. *"Transport issues should be considered from the earliest stages of plan-making and development proposals, so that: ...*
- 7.28. *d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; ..."*
- 7.29. Paragraph 105 continues to state:
- 7.30. *"Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health."*
- 7.31. Paragraph 174 on conserving and enhancing the natural environment states:
- 7.32. *"Planning policies and decisions should contribute to and enhance the natural and local environment by: ...*
- 7.33. *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; and..."*
- 7.34. Paragraph 185 within ground conditions and pollution states:

- 7.35. *“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.”*
- 7.36. Paragraph 186 states that:
- 7.37. *“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.”*
- 7.38. Paragraph 187 states that:
- 7.39. *“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”*

Planning Policy Guidance (PPG)

- 7.40. The Planning Practice Guidance (PPG)¹¹ was launched as an online resource in March 2014 to support the NPPF and has separate guidance on air quality. Paragraph 001, Reference 32-001-20191101 06 (revision date 1 November 2019) of the PPG provides the following summary as to why air quality is a consideration for planning:
- 7.41. *“... It is important that the potential impact of new development on air quality is taken into account in planning where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified.”*
- 7.42. The PPG identifies when air quality could be relevant for a development management process, provides guidance on how detailed an assessment needs to be and provides guidance on how an impact on air quality can be mitigated.

Sub-Regional Planning Policy

Greater Manchester Air Quality Action Plan 2016-2021

- 7.43. The Greater Manchester Air Quality Action Plan¹² was produced by the Greater Manchester Combined Authority (GMCA) and identifies the controls in place to ensure the individual and cumulative impacts on air quality from new developments are quantified. It states:
- 7.44. *“GM local authorities will adopt the most recent IAQM/EPUK guidance for air quality assessment as current best practice, to help ensure that planning applications consider potential local air quality impacts and opportunities to improve air quality are realised.”*

⁹ Defra, 2019. Clean Air Strategy.

¹⁰ Ministry of Housing, Communities and Local Government, 2021. National Planning Policy Framework. HMSO.

¹¹ Ministry of Housing, Communities and Local Government, 2021. Planning Practice Guidance [online]. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>.

¹² Greater Manchester Combined Authority and Transport For Greater Manchester. Greater Manchester Air Quality Action Plan 2016-2021.

i. Where a Key Priority Area is significantly adversely affected by a proposed scheme, a high level of mitigation control will be requested.

ii. The IAQM/EPUK guidance will also be used to screen and assess industrial sources, such as boilers or large stationary engines.

GM local authorities to recommend mitigation controls in accordance with the most recent guidance and the other actions in this document for new developments that contribute to a deterioration of air quality in Air Quality Management Areas (AQMAs)."

Greater Manchester Low-Emission Strategy (2016);

- 7.45. The Low-Emission Strategy¹³ was published alongside the Air Quality Action Plan to establish a framework to develop detailed plans to reduce carbon emissions and improve air quality.

Clean Air Plan, 2022

- 7.46. The GMCA's new Clean Air Plan will supersede the 2016-2021 Air Quality Action Plan once published. Government has agreed that the Greater Manchester charging Clean Air Zone will not go ahead on 30 May 2022. The new Clean Air Plan for Greater Manchester is estimated to be delivered by July 2022.

Local Planning Policy

MCC Local Development Framework Core Strategy, 2012

- 7.47. The MCC Core Strategy¹⁴, was adopted on 11th July 2012 to guide the use of land and new development throughout the city over a 15-year period up until 2027. Development plan policies relevant to this assessment are as follows:
- 7.48. Policy EN 16 Air Quality states:
- 7.49. "The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant. When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas."

MCC Air Quality and Planning Technical Guidance, 2022

- 7.50. The Technical Guidance¹⁵ was adopted in February 2022 and sets out what is expected from a new development in relation to current air quality guidance and policy.

National guidance and industry standards:

Institute of Air Quality Management: Construction Dust Guidance, 2016

- 7.51. The IAQM produced guidance¹⁶ to assist in the assessment of air quality impacts from demolition and construction activities. This guidance provides a consistent methodology for assessing the risks of dust impacts from demolition and construction activities and for identifying the correct level of mitigation which should be applied to avoid significant air quality effects.

¹³ Greater Manchester Combined Authority and Transport For Greater Manchester. Greater Manchester Low Emission Strategy.

¹⁴ Manchester City Council, 2012. Manchester's Local Development Framework Core Strategy Development Plan Document.

¹⁵ Manchester City Council, 2022. Air Quality & Planning Technical Guidance.

¹⁶ Holman et al, 2014. IAQM Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management. London.

Environmental Protection UK/Institute of Air Quality Management Guidance, Land-Use Planning Guidance, 2017

- 7.52. Environmental Protection UK (EPUK), together with the IAQM, produced updated guidance in 2017¹⁷ on how air quality impacts should be assessed within the land-use planning and development control process. This guidance provides clear criteria to determine when a detailed air quality assessment is required and a methodology for assessing the significance of air quality effects.

Defra, Local Air Quality Management Technical Guidance (LAQM TG16), 2016

- 7.53. Defra, in association with devolved regional environmental protection agencies, has produced technical guidance¹⁸ designed to support local authorities in pursuit of their duties under the Environment Act 1995. It provides the methodology by which key air pollutants such as NO₂, PM₁₀ and PM_{2.5} should be monitored, assessed and reported for the purposes of local air quality management, and provides guidance on the actions to be taken by local authorities to improve local air quality.

Limitations and Assumptions

- 7.54. Pollutant concentrations arising from road traffic emissions have been predicted by atmospheric dispersion modelling. There are many components that contribute to the uncertainty in predicted concentrations. Although the model has been extensively validated against field data sets and their use has gained wide acceptance throughout the UK, no computer-based model is able to totally replicate actual conditions as it is required to simplify real-world conditions into a series of algorithms. The model used in this assessment is also dependent upon several sources of data which will have inherent uncertainties associated with them. The model uncertainty has been estimated using the root mean square error and is presented in Appendix 7.1.
- 7.55. The assessment has relied on data provided by Manchester City Council (MCC), Transport for Greater Manchester (TfGM) and Defra to characterise baseline conditions on the study area. It has been assumed that these data have been reported correctly and the instruments used have been calibrated.
- 7.56. The assessment of the air quality effects is based on a worst-case interpretation of the Proposed Development parameters. The Proposed Development traffic impacts have been assessed using predicted traffic flows provided by the Applicant's Transport Modelling Consultant, Curtins.
- 7.57. The traffic modelling has used 2019 background data, monitoring data and meteorological data. Traffic data provided for 2022 was considered representative of the baseline year. As agreed with MCC Highways and TfGM no traffic growth is to be included in any future completed development year, therefore 2022 traffic flows have been used for all baseline scenarios.
- 7.58. The modelling has assumed a level site and has not taken terrain impacts into account.
- 7.59. It is difficult to predict impacts on short-term objectives from traffic impacts as the air quality model (as set up for the assessment) does not provide reliable prediction of one-hour mean NO₂ concentrations. The relationship between annual mean concentrations and one-hour concentrations was used to assess whether exceedances of the hourly mean objective for NO₂ and PM₁₀ are likely¹⁹.
- 7.60. The air quality at background and roadside locations is expected to improve in future years due to the gradual renewal of the vehicle fleet with less polluting and more efficient models. Air Quality Consultants (AQC) has published three studies that support the overall assumption that air quality is anticipated to improve in the future and that the tools and methodology used in this assessment are conservative. In 2020, AQC published a study looking at trends in NO_x in the UK between 2013-2019²⁰. The study concluded that there is an overall reduction trend in NO_x concentrations that have continued through 2019, stating: "NO_x concentrations at roadside sites have reduced by an average of 5.14 % per year since 2013". Another study

¹⁷ Institute of Air Quality Management and Environmental Protection UK, 2017. Land-Use Planning & Development Control: Planning for Air Quality.

¹⁸ Department for Environment, Farming and Rural Affairs, 2016. Local Air Quality Management Technical Guidance (England) 2016 (TG16). HMSO.

¹⁹ Local Air Quality Management Technical Guidance (TG16) February 2018. Defra. Available at: <https://laqm.defra.gov.uk/documents/LAQM-TG16-April-21-v1.pdf>

²⁰ Air Quality Consultants (2020). Nitrogen Oxides Trends in the UK 2013 to 2019. January 2020. Available at: <https://www.aqconsultants.co.uk/resources>

by AQC shows that EFT is most likely to over-predict drive-cycle average NO_x emissions from Euro 6 diesel cars in the future²¹. A further study concluded that the latest version of the EFT was suitable for the prediction of future pollutant concentrations without the need to undertake a sensitivity test²².

- 7.61. The completed development stage modelling has been based on emission factors and background concentrations for 2022. This is considered to provide a conservative assessment as air quality is expected to improve in future years. Traffic emissions were calculated using the latest Emission Factor Toolkit (EFT) v11, which utilises emission factors from the European Environment Agency COPERT 5.3 emission tool²³.

Assessment Methodology and Significance Criteria

Consultation

- 7.62. An EIA Scoping Report was submitted to MCC in support of a request for a formal EIA Scoping Opinion. Whilst the formal Scoping Opinion has not been received in advance of compiling this ES for planning submission, consultation with the MCC Environmental Protection Officer (EPO) has been undertaken regarding the Scoping Report and the assessment methodology. Table 7.5 summarises the consultation that has been undertaken with respect to the air quality assessment.

Table 7.5 – Summary of Consultation

Consultee and Form/Date of Consultation	Summary of Comments	Action Taken
MCC EPO. Consultation e-mail sent 5 November 2020 to confirm the Air Quality Assessment Methodology. A response was received from EPO on 19 November 2020.	Qualitative assessment of the potential impact on local air quality from demolition and construction activities to be scoped in to assessment.	A construction dust assessment has been undertaken and reported in the Identification and Evaluation of Significant Effects Section.
	Potential impacts on local air quality from the Proposed Development associated traffic emissions to be scoped in to assessment.	The proposed methodology has been agreed and followed. An assessment of potential on- and off-site impacts from road traffic has been undertaken and reported in the Identification and Evaluation of Significant Effects Section.
	Potential impacts from existing road traffic on the Proposed Development to be scoped in to assessment.	
	No heating plant is being proposed as part of the Proposed Development.	Energy Plant emissions impacts have been scoped out of the assessment.
	Modelled concentrations compared against the closest local monitoring data in order to verify the model output.	The ADMS model outputs have been verified as detailed in Appendix 7.1.

²¹ Air Quality Consultants, 2020. Performance of Defra's Emission Factor Toolkit 2013-2019. February 2020. Available at:

<https://www.aqconsultants.co.uk/resources>

²² Air Quality Consultants, 2020. Comparison of EFT v10 with EFT v9. September 2020. Available at: <https://www.aqconsultants.co.uk/resources>

²³ Department for Environment Food and Rural Affairs. Emissions Factors Toolkit. <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.htm>.

Natural England, consultee response was received on 10th June 2022.	The ES should take account of the risks of air pollution and how these can be managed or reduced. This should include taking account of any strategic solutions or Shared Nitrogen Action Plans (SNAPs), which may be being developed or implemented to mitigate the impacts on air quality	An air quality assessment of the impacts of the proposed development on ecological receptors was screened out of the ES as there are no sensitive ecological receptors within the study area and mitigation for air quality impacts on ecological sites is not required.
---	---	--

Assessment Scope

- 7.63. The study area for the demolition and construction stage assessment is defined as up to 350 m from the Site boundary for the assessment of demolition and construction dust emissions, and 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance(s) as per the IAQM Dust Guidance²⁴.
- 7.64. At present, detailed information regarding the construction methodology for the development, specific activities and traffic movements is not available. However, a Construction Environmental Management Plan (CEMP) would outline measures to control and minimise the risk of adverse effects from construction activities. The CEMP would be submitted to MCC for its approval. The CEMP would consider Heavy Goods Vehicles (HGVs) and other construction traffic movements, including details of routing and times of day of movements. HGV access would be prevented or minimised, where possible, on traffic sensitive roads, residential streets, congested roads or unsuitable junctions.
- 7.65. Vehicle movements associated with access, demolition and construction would vary throughout the construction programme, with short periods of peak HGV movements associated with the delivery of materials during the construction phase. However, when the HGV movements are averaged over a full year period (AADT), these will be significantly lower than peak movements. Together with the implementation of the CEMP, the construction vehicle movements' impacts on human health receptors in the area are considered to be temporary and not significant, and have therefore been scoped out of this assessment. Moreover, vehicle movements associated with construction are typically significantly lower than the number of vehicle movements associated with operation of the Proposed Development, which have been taken into account in this assessment.
- 7.66. For the completed development stage assessment, the study area for human health receptors for road traffic and river vessel emissions is defined as roads within 250 m of the Site, existing receptors and those roads which experience a significant increase in development traffic leading to adverse effects on local air quality, as per IAQM guidance²⁵ and Local Air Quality Management Technical Guidance²⁶. The guidance provides the following indicative criteria for when an air quality assessment might be required:
- 7.67. A change of Light Duty Vehicle (LDVs) flows of more than 100 annual average daily traffic (AADT) within or adjacent to an Air Quality Management Area (AQMA) or more than 500 AADT elsewhere.
- 7.68. A change of Heavy Duty Vehicle (HDVs) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.
- 7.69. There are no designated habitats, under the Habitats Regulations²⁷, within 350m from the Proposed Development or within 200 metres from roads with a predicted traffic level increase brought about by the Proposed Development. The impact of traffic emissions on ecological receptors will therefore not be assessed as part of the Chapter.

²⁴ Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London.

²⁵ IAQM and EPUK, 2017. Land-Use Planning & Development Control: Planning for Air Quality.

²⁶ Defra, 2016. Local Air Quality Management Technical Guidance (England) 2016 (TG16). HMSO.

²⁷ Institute of Air Quality Management, 2020. A guide to the assessment of air quality impacts on designated nature conservation sites Institute of Air Quality Management. V1.1

- 7.70. The approximate extent of the study area is shown in Figure 7.1. The modelled road network is shown in Appendix 7.1.
- 7.71. The Proposed Development's Energy Strategy presented within the standalone Environmental Standards Statement²⁸ that accompanies the application proposes that heating and cooling will be provided by a mixture of high efficiency Air-Source Heat Pumps, Water-Source VRF Heat Pumps and High Temperature Hot Water Heat Pumps (for Domestic Hot Water production). Therefore, the energy strategy is based on electrically-fuelled systems and no combustion sources are being proposed. Accordingly, significant energy plant emissions are unlikely to arise and an assessment of an energy plant emissions have therefore not been considered further within this chapter.
- 7.72. A standby diesel generator is proposed to be located within the ground floor generator room of building D1. The generator testing regime is not currently known but based on professional experience, it would typically be tested weekly for a short period of time between 15 to 30 minutes. The generator exhaust is expected to discharge through a raised stack at roof level, which at a height of 25.3 m, would ensure adequate dispersion of emissions. Given the short period of operation and the adequate dispersion from roof level, there is no potential that the annual mean and hourly mean NO₂ objectives would be exceeded. Significant plant emissions are therefore unlikely and an assessment of the generator emissions have not been considered further within this chapter.

Baseline Characterisation Method

- 7.73. In order to establish baseline air quality within the study area, relevant monitoring data was reviewed and assessed. Data was obtained from the following sources:
- Continuous and passive air quality monitoring conducted by MCC, covering up to 2019 and reported in the Greater Manchester Combined Authority 2019 Air Quality Annual Status Report (ASR)²⁹;
 - Passive air quality monitoring conducted by Jacobs on behalf of TfGM and reported in the Air Quality Monitoring Report - 2019³⁰; and
 - National pollution maps published by Defra³¹. These cover the whole country on a 1x1 km grid.
- 7.74. No additional site-specific air quality monitoring was carried out.

Demolition and Construction Methodology

Dust and Amenity

- 7.75. During the demolition and construction stage, the main potential effects are dust annoyance and locally elevated concentrations of PM₁₀. The suspension of particles in the air is dependent on surface characteristics, weather conditions and on-site activities. Impacts have the potential to occur when dust generating activities coincide with dry, windy conditions, and where sensitive receptors are located downwind of the dust source. Separation distance is also an important factor as significant dust annoyance is usually limited to within a few hundred metres of its source. This is due to the rapid decrease in concentrations with distance from the source due to dispersion.
- 7.76. The assessment of potential construction dust impacts follows the guidance published by the IAQM on the assessment of the impacts of construction on air quality³². The guidance recommends that the risk of dust emission magnitude is combined with the sensitivity of the area surrounding the site to determine the risk of dust impacts from demolition and construction stage activities. The risk of dust arising in sufficient quantities to cause annoyance and/or health impacts is determined using four risk categories: high, medium, low or negligible. Depending on the level of risk for each activity, appropriate mitigation is selected.

²⁸ Ramboll, 2021. Didsbury Technology Park – D1 Environmental Standards Statement. Version P01.

²⁹ Greater Manchester Combined Authority, 2020. 2019 Air Quality Annual Status Report (ASR).

³⁰ Transport for Greater Manchester, 2021. Greater Manchester's Outline Business Case to tackle Nitrogen Dioxide Exceedances at the Roadside Air Quality Monitoring Report - 2019.

³¹ Department for the Environment, Food and Rural Affairs (Defra), 2020. 2018 Based Background Maps for NO_x, NO₂, PM₁₀ and PM_{2.5}.

³² Holman et al, 2014. IAQM Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, London.

Completed Development Stage Methodology

Impact Predictions

- 7.77. The changes to air quality due to operational traffic emissions have been predicted using the ADMS Roads (version 5)³³ dispersion model. This model has been extensively validated against both field and laboratory data sets and against monitoring data in cities throughout the UK.
- 7.78. The model requires the user to provide various input data, including the AADT flow, the proportion of HDV, road characteristics (including road width and street canyon height, where applicable), and the vehicle speed. The model has been run using 2019 meteorological data from the Manchester Airport meteorological station, which are considered suitable for this area. Traffic emissions are calculated using the Emission Factor Toolkit (EFT) v11, which utilises nitrogen oxides (NOx), PM10 and PM2.5 emission factors from the European Environment Agency COPERT 5 emission tool.
- 7.79. The traffic data is entered into the ADMS Roads model, along with speed data to provide combined emission rates for each of the modelled road links. The predicted concentrations of roadside NOx are converted to roadside NO2 using the LAQM conversion calculator available from the Defra air quality website³⁴.

Model Verification

- 7.80. The accuracy of the modelled concentrations is verified by comparing the concentrations predicted for the existing baseline scenario with monitored concentrations. Where the model is observed to be under predicting the modelled concentrations are adjusted following the methodology outlined in LAQM TG(16). Model verification was undertaken using monitoring data for 2019, provided in the Greater Manchester Combined Authority (2020), 2019 Air Quality Annual Status Report (ASR) and the TfGM (2021), Air Quality Monitoring Report - 2019. Concentrations were predicted at one MCC diffusion tube monitor (MA37NO) and three TfGM diffusion tube monitors (MAN 1-2, MAN 1-3 and MAN1-5) on the A5103 Princess Road (see Appendix 7.1 for further details on the verification method). The monitoring site locations were cross-checked using Street View imagery. Monitoring data for the year 2019 was combined with traffic data representative of 2019.

Traffic Data

- 7.81. AADT flows and the proportions of HGVs, for roads within 250 m of the Site, existing receptors and monitoring sites (DT37) have been provided by the project's transport consultants, Curtins. As agreed with TfGM and MCC, no traffic growth was included for the Proposed Development year of opening, therefore traffic data from the 2022 surveys has been used for verification and modelling of the future baseline. Traffic data used in this assessment are summarised in Appendix 7.1.

Model Scenarios

- 7.82. The anticipated year of opening for the completed development is 2024. The assessment of future year impacts has been carried out utilising 2022 emission factors and background concentrations. As agreed with MCC Highways and TfGM no traffic growth is to be included in any future completed development year, therefore 2022 traffic flows have been used for all baseline and future baseline scenarios.
- 7.83. In carrying out the assessment of completed development stage traffic impacts, the following temporal scope for the assessment scenarios has been assessed:
- Scenario 1: Existing Baseline 2019 (2022 traffic flows with 2019 emission factors and background concentrations to allow verification of the model predictions);
 - Scenario 2: Future Baseline 2024 (2022 traffic flows due to no traffic growth predicted, 2022 emission factors and background concentrations);
 - Scenario 3: Future Baseline 2024 + Proposed D1 Development (using 2022 emission factors and background concentrations); and

³³ <https://www.cerc.co.uk/environmental-software/ADMS-Roads-model.html>.

³⁴ Department for Environment Food and Rural Affairs. NOx to NO2 calculator. <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc>

- Scenario 4: Future Baseline 2024 + Proposed D1 Development + temporary parking on the D2 Development site (using 2022 emission factors and background concentrations).

7.84. As the D1 and temporary parking on the D2 development site generates more traffic than the D1 development alone, the assessment of significance of effects in the chapter has been based on Scenario 4. However, the results of the Scenario 3 modelling are contained in Appendix 7.1 for completeness.

Assessment Criteria

- 7.85. The criteria used to assess if an effect is significant or not, is set out in subsequent sub-sections. This is determined by consideration of the sensitivity of the receptor, magnitude of impact and scale of the effect. In considering the significance of an effect, consideration has been given to the duration of the effect, the geographical extent of the effect and the application of professional judgement.
- 7.86. The air quality significance criteria have been informed by specific published IAQM guidance, which differs slightly from that used in other assessments within the ES, as highlighted in Chapter 2: EIA Methodology of this Volume. In particular, in accordance with IAQM guidance there are no degrees of significance of effects; an air quality effect is either significant or not-significant.

Receptor Sensitivity/Value Criteria

Demolition and Construction Stage Dust and Amenity

- 7.87. The sensitivity of receptors for construction dust effects has been classified as low, medium or high, in line with the IAQM guidance criteria³⁵ in accordance with the criteria set out in Table 7.6.

Table 7.6 – Sensitivities of People to Dust Soiling Effect– Demolition and Construction Stage

Sensitivity	Criteria
Low	The enjoyment of amenity would not reasonably be expected; or Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or First occupants moving into residential dwellings on a large phased housing development; or The appearance, aesthetics or value of their property could be diminished by soiling; or The 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. Indicative examples include parks and places of work.
High	Users can reasonably expect enjoyment of a high level of amenity; or

³⁵ Holman et al, 2014. IAQM Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, London.

	The appearance, aesthetics or value of their property would be diminished by soiling; and The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Indicative examples include dwellings, schools, museums and other culturally important collections, medium- and long-term car parks and car showrooms.
--	---

- 7.88. Using the IAQM assessment methodology to identify the appropriate level of mitigation, and on the assumption that the identified mitigation measures are applied and are commensurate with the risk of potential dust impacts, the guidance indicates that that the potential for dust impacts to arise during the demolition and construction stage would be at worst 'slight adverse' and would be temporary in nature.
- 7.89. The IAQM guidance recommends that no assessment of the significance of dust effects is made without mitigation in place, as mitigation is assumed to be secured by industry best practice, planning conditions, legal requirements or required by regulations. With appropriate mitigation in place, the effect of demolition and construction stage dust emission impacts on air quality is always assessed as not significant.

Completed Development Stage Traffic

Human Health Air Quality Objectives

- 7.90. The National Air Quality Objectives (NAQOs) are the concentrations of pollutants in the atmosphere which can broadly be taken to achieve an acceptable level of environmental quality. The standards are based on the assessment of the effects on human health (including sensitive sub-groups) or ecosystems. In general, these are concentration limits, above which sensitive members of the public (e.g., children, the elderly and the unwell) might experience adverse health effects. Objectives are policy targets often expressed as maximum concentrations not to be exceeded either without exception or with a limited number of exceedances within a specified timescale.
- 7.91. For some pollutants, there are both long-term (e.g., annual mean) and short-term (e.g., one hour mean) objectives. These periods reflect the varying impacts on health of differing exposures to pollutants. Long-term objectives are generally lower than short-term objectives owing to the chronic health effects associated with exposure to low concentrations of pollutants for longer periods of time.
- 7.92. The NAQOs relevant for this assessment are presented in Table 7.7.

Table 7.7 – Human Health Air Quality Objectives

Pollutant	Time Period	Objective
NO ₂	Annual Mean	40 µg/m ³
	1-hour mean	200 µg/m ³ not to be exceeded more than 18 times a year
PM ₁₀	Annual mean	40 µg/m ³
	24-hour mean	50 µg/m ³ not to be exceeded more than 35 times a year
PM _{2.5}	Annual Mean	25 µg/m ³ (to be achieved by 2020)

- 7.93. The 2007 Air Quality Strategy³⁶ also introduced a new policy framework for tackling PM_{2.5} which included an exposure reduction target and a 'backstop' annual mean NAQO. The exposure reduction target is focussed on reducing average concentrations across the most polluted urban areas and is therefore not applicable to individual schemes, whilst the annual mean NAQO can be considered a concentration cap to ensure environmental compliance.
- 7.94. There are no degrees of sensitivity of receptors to poor air quality, rather, the assessment has been based on whether or not members of the public are likely to be present for the proposed averaging period of the objective. This is dependent on the land use at a particular location, i.e., the annual mean objective is applicable at residential locations, schools, and hospitals, whilst the short-term objectives apply to locations where people are likely to be present for shorter periods such as commercial buildings, gardens, parks and shopping streets.
- 7.95. The NAQOs have been applied to external air where there is relevant exposure to the public over the associated averaging periods within each NAQO, as detailed in Table 7.8 and specified by LAQM.TG (16)³⁷. The NAQOs have not been applied in indoor workplace locations, to internal air or where people are unlikely to be regularly exposed (i.e. centre of roadways).

Table 7.8 – Locations Where Air Quality Objectives Apply

Averaging Period	Objectives Should Apply at	Objectives Should Generally Not Apply at
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes, etc.	Building façades 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.
24-hour mean	All locations where the annual mean objective would apply, together with hotels. 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.
1-hour mean	All locations where the annual mean and 24- 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 expect to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

Impact Magnitude Criteria

Demolition and Construction Stage Dust and Amenity

³⁶ Department for Environment, Food and Rural Affairs, 2007. Air Quality Strategy for England, Scotland, Wales and Northern Ireland. HMSO.

³⁷ Department of the Environment, Food and Rural Affairs in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland, 2016. Local Air Quality Management Technical Guidance, LAQM.TG(16). HMSO, London.

- 7.96. The criteria provided in the guidance produced by the IAQM was used to assess the potential risk of impacts to air quality from demolition and construction stage activity in the absence of mitigation during demolition and construction stage of the Proposed Development as outlined in Appendix 7.1. The methodology combines the magnitude of dust emissions together with the sensitivity of the receptor to identify low, medium or high risk of dust impacts in the absence of mitigation for the four stages of construction: demolition, earthworks, construction and trackout.

Completed Development Stage Traffic

- 7.97. The assessment of the Proposed Development impacts on local air quality has used the approach developed by the IAQM and EPUK guidance³⁸, which considers the change in air quality as a result of a new development on existing receptors. The guidance has produced a matrix which is used to calculate the impacts at individual receptor locations, as shown in Table 7.9.
- 7.98. The guidance considers both the magnitude of change at each receptor and the resulting overall concentration. The absolute concentration at the receptor is also taken into consideration i.e., if the receptor is close to or above the UK air quality objective level, marginal changes in magnitude may be determined to be moderate; however, if the receptor is less than 75 % of the UK AQO level marginal changes in magnitude may be determined to be negligible.

Table 7.9 – EPUK/IAQM Impact Descriptors for Individual High Sensitivity Receptors

Long-Term Average Concentration at Receptor with Development	Percentage (%) Change in Concentration Relative to Annual Mean AQO			
	<1	2 – 5	6 – 10	>10
75 % or less of AQO	Negligible	Negligible	Slight	Moderate
76 – 94 % of AQO	Negligible	Slight	Moderate	Moderate
95 – 102 % of AQO	Slight	Moderate	Moderate	Substantial
103 – 109 % of AQO	Moderate	Moderate	Substantial	Substantial
110 % or more of AQO	Moderate	Substantial	Substantial	Substantial
Notes: Where concentrations increase, the impact is described as adverse, and beneficial where it decreases. *% change rounded to nearest whole number. Where the % change is less than 0.5 % the impact would be Negligible.				

- 7.99. Similar criteria have not been provided for locations where the short-term AQOs would apply, i.e., amenity and commercial locations. In urban areas, particularly where residential receptors are widespread, it is generally accepted that the annual mean objectives, applicable at high sensitivity receptors, are the most reliable for evaluating the severity of impacts. Research has concluded that exceedances of the one-hour mean NO₂ objective are unlikely to occur where annual mean concentrations do not exceed 60 µg/m³ ^{39,40}. This relationship was used to assess whether exceedances of the NO₂ hourly mean objective

³⁸ Moorcroft and Barrowcliffe. et al., 2017. Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.

³⁹ A, Cook, 2008. Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedances of the one-hour mean.

⁴⁰ Marner, D Laxen and B, 2003. Analysis of the relationship between one-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites.

are likely. Similarly, PM10 annual mean concentrations below 32 µg/m3 were used to screen the 24-hour PM10 mean objective.

Scale of Effect Criteria

Demolition and Construction Stage

- 7.100. Following the IAQM assessment methodology, with mitigation in place, demolition and construction stage effects would be medium-term due to the approximate 18 months of the demolition and construction stage programme and not significant.

Completed Development Stage

- 7.101. The IAQM guidance states that the overall significance of the effect on air quality should be based on professional judgement, considering the predicted impacts at the modelled receptor locations and "...will need to take into account such factors as:
- The existing and future air quality in the absence of the development;
 - The extent of current and future population exposure to the impacts; and
 - The influence and validity of any assumptions adopted when undertaking the prediction of impacts."
- 7.102. At individual receptor locations, a moderate or substantial impact is judged to be significant, where-as a negligible or slight impact is not significant. The IAQM guidance states that the overall significance of the effect on local air quality, is a binary judgement, i.e., the overall effect is either significant or it is not significant, and there are no degrees of significance scale of the overall effect.

Table 7.10: Air Quality Impact descriptors and associated significance of effect for Receptors Considered

Impact Descriptor	Significance
Negligible	Not Significant
Slight	
Moderate	Significant
Substantial	

- 7.103. There is no official guidance in the UK on how to assess the significance of air quality impacts of existing sources on proposed receptors introduced by a new development. The assessment of the site suitability for the Proposed Development has been limited to predicting air quality at the site and the significance of this is based on whether the NAQOs for each pollutant are exceeded or not.

Nature of Effect Criteria

- 7.104. The nature of the effect has been described as either adverse, neutral or beneficial as follows:
- Beneficial – An advantageous effect to a receptor;
 - Neutral – An effect that on balance, is neither beneficial nor adverse to a receptor; or
 - Adverse – A detrimental effect to a receptor.
- 7.105. Negligible can also be used in isolation when achieving a particular threshold, absolute value or target criterion.

Baseline Conditions

Existing Baseline Conditions

Local Air Quality Monitoring

- 7.106. Greater Manchester has declared one AQMA covering Manchester City Centre and major radial routes into Manchester due to exceedances of the NO₂ annual mean and PM₁₀ 24 hour objectives. The north western site area is located within the Greater Manchester AQMA.
- 7.107. MCC operate both continuous automatic monitoring and passive diffusion tube monitoring of air quality at a number of locations within the area. A baseline air quality diffusion tube monitoring survey at roadside locations around Greater Manchester has also been undertaken by Jacobs, on behalf of TfGM since 2018. A summary of the closest and most representative monitoring locations is presented in Table 7.11 and the location shown in Figure 7.2.

Table 7.11 – Measured NO₂ concentrations (µg/m³)

Site ID	Location	Type	Distance to Site (m)	Annual mean (µg/m3)				
				2015	2016	2017	2018	2019
MCC Diffusion Tube								
MA37NO*	Princess Road	R	670	42	46.3	42.6	39.3	38.7
TfGM Diffusion Tube								
MAN 1-2*	Princess Road	R	830	-	-	-	35.8	35.8
MAN 1-3*			575	-	-	-	48.4	50.1
MAN 1-4			355	-	-	-	-	-
MAN 1-5*			750	-	-	-	41.3	41.1
Objective				40				
Notes: Exceedances highlighted in bold.								
R: roadside								
*Used in Verification								

- 7.108. Measured NO₂ concentrations at the MA37NO and MAN 1-2 roadside monitoring locations in close proximity to the Site, have been elevated but below the annual mean NO₂ objective between 2018-2019. Exceedances of the objective have occurred at MAN 1-3 and MAN 1-5 in this time period.
- 7.109. Diffusion tubes only monitor long-term exposure and therefore results from this monitoring cannot be used for direct comparison with the short-term 1-hour objective for NO₂. However, studies conducted into the relationship between long-term monitored concentrations and short-term concentrations have indicated that where annual mean concentrations of less than 60 µg/m³ are recorded an exceedance of the hourly NO₂ objective is unlikely. On this basis, no exceedance of the short-term one-hour objective would be expected at the monitoring sites or within the Site.

Background Maps

- 7.110. Background concentrations are those levels that would be observed away from specific sources such as roads and industry. Defra provides modelled predictions of background concentrations of air pollutants over the whole of the UK with a grid resolution of 1 km².
- 7.111. Mapped background concentrations were calibrated against background concentrations measured at the Trafford Metropolitan Borough Council Trafford (TRAF) automatic monitoring site (see Appendix 7.1, for more details). Table 7.12 details the NO₂, PM₁₀ and PM_{2.5} background levels in the study area for 2019.

Table 7.12 – DEFRA 2019 Annual Mean Background Concentrations (µg/m³)

Year	Grid Reference (x, y)	NO ₂	PM ₁₀	PM _{2.5}
2019	382500, 391500a	18.7	14.6	9.7
	383500, 392500b	19.2	14.9	9.9
	383500, 391500c	18.5	14.4	9.6
Objective		40	40	25
A: Monitoring sites MA37NO, MAN 1-2, MAN 1-3 and MAN 1-5, Receptor R12, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23				
B: Site, Receptors R1, R2, R3, R7, R8, R9, R10, R11, R24, R25, R26 & R27				
C: Receptors R4, R5, R6, R13				

- 7.112. The background concentrations are all below the relevant objectives for all pollutants.

Assessment of Monitoring Data

- 7.113. NO₂ concentrations at the Site would be expected to be lower than measured concentrations at the reported monitoring location, due to the Site being set further back from the road. As concentrations fall-off rapidly on moving away from an emissions source, such as a main road, some variation in NO₂, PM₁₀ and PM_{2.5} concentrations across the Site are expected. Concentrations at the Site are likely to be highest closest to the A5103 Princess Road, reducing gradually as distance from the main road increases.
- 7.114. Although particulate monitoring is not undertaken near the Proposed Development, Defra background map data for the Site indicates that the NAQOs for PM₁₀ and PM_{2.5} would be met within the Site.
- 7.115. For the Proposed Development site uses, only the short-term objectives apply (1-hour mean NO₂ and 24-hour mean PM₁₀) as there is no proposed uses relevant to long-term annual average exposure such as residential properties. NO₂ concentrations in 2019 are below the levels which would indicate breaches of the relevant short-term NAQOs. Air quality across the Proposed Development would therefore be expected to meet all relevant NAQOs.

Future Baseline

- 7.116. Air quality at background and roadside locations is expected to gradually improve in future years due to the renewal of the vehicle fleet with lower emission factors. National policies, such as the intention to ban new combustion engine private vehicle sales by 2035, would hasten and enforce this process.
- 7.117. Table 7.13 presents the NO₂, PM₁₀ and PM_{2.5} background levels used to assess the completed development stage for 2024.

Table 7.13 – DEFRA 2022 Annual Mean Background Concentrations (µg/m3)

Year	Grid Reference (x, y)	NO2	PM10	PM2.5
2024 Completed Development	382500, 391500a	16.3	14.0	9.4
Assessment year (based on 2022 backgrounds)	383500, 392500b	16.9	14.4	9.5
	383500, 391500c	16.2	13.9	9.3
Objective		40	40	25
A: Monitoring sites MA37NO, MAN 1-2, MAN 1-3 and MAN 1-5, Receptor R12, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23 B: Site, Receptors R1, R2, R3, R7, R8, R9, R10, R11, R24, R25, R26 & R27 C: Receptors R4, R5, R6, R13				

7.118. The background concentrations are all well below the relevant objectives and confirm a predicted decrease in background concentrations between 2019-2022.

7.119. Air quality across the Proposed Development Site would therefore be expected to meet all relevant NAQOs in the future.

Human Health Receptors

7.120. The Site is located in an urban area, with numerous sensitive receptors located in the immediate vicinity of the Site. Sensitive receptors were chosen to reflect places where members of the public would receive relevant exposure to annual mean and hourly pollutant concentrations from road traffic. The locations of existing receptors were chosen to represent worst-case locations where impacts from road traffic related to the proposed development are likely to be the greatest, i.e. as a result of development traffic at junctions, where traffic may become congested, and where there is a combined effect of several road links.

7.121. The existing receptors identified as being sensitive to the Proposed Development and which have been 'scoped-in' to the assessment as being worst-case are summarised in Table 7.14 and displayed on Figure 7.3. Receptor locations were modelled at a height of 1.5 m and 4.5 m representing exposure at ground floor and first floor levels.

Table 7.14 – Summary of Sensitive Human Health Receptors

Receptor ID	Location	Type	X (m)	Y (m)	Height (m)
R1	30 Kensal Drive	Residential	383398	392116	1.5
R2	2 Bushmill Close	Residential	383386	392095	1.5
R3	Lancasterian School playground	School	383413	392027	1.5
R4	Lancasterian School S facade	School	383400	391936	1.5
R5	153 Rowsley Avenue	Residential	383307	391955	1.5
R6	Ashley House Residential Home	Residential	383276	391973	1.5

Receptor ID	Location	Type	X (m)	Y (m)	Height (m)
R7	Hospital southern facade	Hospital	383305	392014	1.5
R8	Hospital western facade	Hospital	383249	392067	1.5
R9	169 Barlow Moor Road	Residential	383204	392011	1.5
R10	Ashwood Court Flats	Residential	383171	392028	1.5
R11	Ashwood Court Flats	Residential	383155	392029	1.5
R12	Kids Allowed Christie Fields School	School	382988	391951	1.5
R13	Ambrose Gardens	Residential	383006	391868	1.5
R14	St Ambrose R C Primary School	School	382918	391775	1.5
R15	534 Princess Road	Residential	382901	391734	1.5
R16	815 Princess Road	Residential	382940	391711	1.5
R17	833 Princess Road	Residential	382897	391611	1.5
R18	564 Princess Road	Residential	382848	391610	1.5
R19	856 Princess Road	Residential	382878	391568	1.5
R20	88 Princess Road	Residential	382838	391493	1.5
R21	570 Princess Road	Residential	382788	391494	1.5
R22	592 Princess Road	Residential	382743	391412	1.5
R23	911 Princess Road	Residential	382765	391354	1.5
R24	Didsbury High School	School	383389	392528	1.5
R25	Didsbury High School	School	383421	392596	1.5
R26	The Boulevard Flats	Residential	383473	392689	4.5
R27	Montmano Drive Flats	Residential	383510	392754	1.5

Identification and Evaluation of Significant Effects

Demolition and Construction Effects

Dust and Amenity

- 7.122. There are multiple off-site residential properties within 350 m of the Site and within 50 m of the routes proposed to be used by demolition and construction traffic, thus using the IAQM guidance, a detailed assessment of demolition and construction stage dust impacts is required.

- 7.123. Using the evaluation criteria within the IAQM's Guidance, the potential dust emission magnitude has been identified for each stage of the Proposed Development as shown in Table 7.15.

Table 7.15 – Dust Emission Impact Magnitude for Proposed Development Works

Activity	Dust Emission Magnitude	Justification
Demolition	n/a	There are no existing structures on the Site. The existing Site is made up of hardstanding tarmac area currently used as car parking and soft landscaped grassland
Earthworks	Large	Total Site area greater than 10,000 m ² .
Construction	Large	The Proposed Development would have a total estimated construction volume of over 100,000 m ³ .
Trackout	Medium	Maximum HDV movements over the course of the programme are estimated to be between over 10-50 HDV outward movements per day.

- 7.124. The closest sensitive receptors to construction activity within 350 m of the Site will be Spire Manchester Hospital, the Ohm building, Sir William Siemens House, Lancasterian School and residential properties along Kensal Drive, Bushmill Close and Barlow Moor Road. The residential properties, school and hospital are considered to be high sensitivity receptors whilst commercial properties are considered to be medium sensitivity receptors.
- 7.125. The next stage of the process is to define the sensitivity of the assessment area to dust soiling and human health impacts. This process combines the sensitivity of the receptor with the distance from the source to determine the overall sensitivity. The sensitivity of the area to dust impacts (considering distance to construction activity) is provided in Table 7.16.

Table 7.16 – Sensitivity of Study Area to Dust Impacts

Sensitivity to Dust Soiling	Sensitivity to Human Health Impacts
Medium: 1-10 existing residential receptors located within 20 m of the Site.	Low: 1-10 existing residential receptors located within 20 m of the Site. The background PM ₁₀ concentration at the Site was 14.9 µg/m ³ in 2019 (see Table 7.12).

- 7.126. The dust emission magnitude determined in Table 7.15 has been combined with the sensitivity assessment in Table 7.16 to define the risk of impacts for each stage of the Proposed Development works in the absence of mitigation, as shown in Table 7.17.

Table 7.17 – Risk of Dust Impacts in the Absence of Mitigation at Proposed Development

Sensitivity of Study Area	Dust Emission Magnitude for Each Stage		
	Earthworks (Large)	Construction (Large)	Trackout (Medium)
Dust Soiling (Medium)	Medium Risk	Medium Risk	Low Risk
Human Health (Low)	Low Risk	Low Risk	Low Risk

- 7.127. In accordance with the IAQM guidance, mitigation measures associated with a medium level of risk should be applied, i.e. a medium-risk site.

Embedded Mitigation and Standard Good Practice

- 7.128. The control of dust and construction traffic emissions from a demolition and construction site relies upon good site management and mitigation techniques to reduce emissions of dust and limit dispersion. A summary of the mitigation measures recommended in the IAQM guidance to reduce impacts from medium risk sites is provided in Table 7.18 of this chapter, which also includes mitigation measures to minimise impacts from construction traffic. The mitigation measures for both direct impacts and those from traffic would be detailed within the Site's CEMP, which would be secured by means of an appropriately worded planning condition.

Table 7.18 – Recommended Dust Mitigation Measures for Medium Risk Sites

Phase	Mitigation Measure
Communications	Develop and implement a stakeholder communications plan. Display the name and contact details of the responsible person for dust issues on site boundary in addition to head/regional office contact information
Dust Management Plan	Develop and implement a Dust Management Plan (DMP) which would be included as part of the CEMP, to be approved by MCC.
Site Management	Record all complaints and incidents in a site log. Make the complaints log available to the Local Planning Authority if requested. Record any exceptional dust incidents on- or off-site.
Monitoring	Undertake daily on- and off-site visual inspections where there are nearby receptors. Carry out regular inspections to ensure compliance with the DMP and record results in the site logbook. Increase the frequency of inspections during activities with a high potential to create dust or in prolonged dry weather. Confirm with MCC if dust deposition, dust flux, or real-time PM10 continuous monitoring is required.
Preparing and Maintaining Site	Plan site layout to locate dust generating activities as far as possible from receptors. Use solid screens around dusty activities and around stockpiles. Avoid site runoff of water and mud. Fully enclose the site or specific operations where there is a high potential for dust production and the site is active for an extensive period. Keep site fencing barriers and scaffolding clean using wet methods. Remove dusty materials from site as soon as possible. Minimise emissions from stockpiles by covering, seeding, fencing or damping down.

Phase	Mitigation Measure
Operating Vehicle/Machinery and Sustainable Travel	Ensure vehicles switch off engines when stationary. Avoid use of generators where possible. Enforce an on-site speed limit of 15 mph on surfaced roads and 10 mph on unsurfaced areas. Produce a Construction Logistics Plan (CLP) to manage the sustainable delivery of materials. Implement a Travel Plan that supports and encourages sustainable travel.
Operations	Only use cutting, grinding or sawing equipment with suitable dust suppression equipment or techniques. Ensure adequate water supply for effective dust and particulate matter suppression. Use enclosed chutes, conveyors and covered skips. Minimise drop heights of materials. Ensure suitable cleaning material is available at all times to clean up spills.
Waste Management	Avoid bonfires
Measures Specific to Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use hessian, mulch or trackifiers where it is not possible to re-vegetate or cover with topsoil. Only expose small areas of ground or stockpile when working.
Measures Specific to Construction	Avoid scabbing 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 silos with suitable emissions control systems. Smaller supplies of fine powder material to be in sealed containers and stored appropriately.
Measures Specific to Trackout	Use water assisted dust sweepers on the site access and local roads. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving the site are covered to prevent escape of materials. Record inspection of on-site haul routes including any remedial action taken. Install hard surfaced haul routes which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

Phase	Mitigation Measure
	Implement a wheel wash system. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. The site access gate to be located at least 10 m from receptors where possible.

- 7.129. Given that predicted PM10 concentrations within the study area are well below the objective, exceedances of the PM10 objectives at relevant off-site and on-site receptors are unlikely and therefore a real-time monitoring programme is not considered necessary mitigation during the demolition and construction stage. However, the need to monitor dust deposition, dust flux, or real-time PM10 continuous monitoring would be confirmed with MCC once the principal contractor has been appointed.

Significance of Demolition and Construction Stage Emissions

- 7.130. The IAQM guidance recommends that no assessment of the significance of demolition and construction stage effects is made without mitigation in place. With the implementation of the CEMP and measures outlined in Table 7.18 of this chapter, the construction and demolition stage dust effects in the study area would be medium-term, temporary, **adverse** and **not significant**. The impacts of demolition and construction vehicle emissions are likely to be negligible and therefore effects in the study area would be medium-term, temporary, **adverse** and therefore **not significant**.

Completed Development Effects

Existing Receptors

- 7.131. Completed development stage impacts on local air quality would primarily arise from exhaust emissions associated with vehicle movements generated as a result of the Proposed Development. The potential impacts associated with additional vehicle trips generated by the Proposed Development including both the D1 development and temporary parking to be sited in the D2 development location have been considered within this assessment. Traffic data for this scenario is higher than traffic flows for just the D1 building, and therefore this is considered a worst case assessment.
- 7.132. The results of the dispersion modelling at existing receptors as a result of the D1 building and temporary car parking at D2 Proposed Development traffic flows are shown in Table 7.19, Table 7.20 and Table 7.21 of this chapter.

Table 7.19 – Completed Development Stage Predicted Annual Mean NO2 at Existing Receptors (µg/m3)

Receptor	Type	Scenario 2: 2024 future base	Scenario 4: 2024 future base + d1 development & d2 temporary parking	D1 development & d2 temporary parking traffic contribution	% change naqo	Impact descriptor
R1	Residential	19.0	19.6	0.55	1.4%	Negligible
R2	Residential	19.9	21.1	1.27	3.2%	Negligible
R3	School	18.9	19.1	0.19	0.5%	Negligible
R4	School	23.7	23.9	0.13	0.3%	Negligible
R5	Residential	20.3	20.6	0.24	0.6%	Negligible

Receptor	Type	Scenario 2: 2024 future base	Scenario 4: 2024 future base + d1 development & d2 temporary parking	D1 development & d2 temporary parking traffic contribution	% change naqo	Impact descriptor
R6	Residential	21.0	21.4	0.41	1.0%	Negligible
R7	Hospital	21.4	22.0	0.60	1.5%	Negligible
R8	Hospital	21.5	21.8	0.31	0.8%	Negligible
R9	Residential	22.2	22.5	0.35	0.9%	Negligible
R10	Residential	25.2	25.7	0.48	1.2%	Negligible
R11	Residential	25.9	26.3	0.43	1.1%	Negligible
R12	School	30.6	30.9	0.23	0.6%	Negligible
R13	Residential	28.8	29.0	0.22	0.5%	Negligible
R14	School	34.7	35.0	0.30	0.7%	Negligible
R15	Residential	31.6	31.9	0.26	0.6%	Negligible
R16	Residential	27.9	28.1	0.21	0.5%	Negligible
R17	Residential	28.3	28.5	0.21	0.5%	Negligible
R18	Residential	34.6	34.9	0.29	0.7%	Negligible
R19	Residential	28.4	28.7	0.21	0.5%	Negligible
R20	Residential	27.8	28.0	0.20	0.5%	Negligible
R21	Residential	35.3	35.6	0.30	0.7%	Negligible
R22	Residential	32.5	32.8	0.26	0.6%	Negligible
R23	Residential	25.6	25.8	0.17	0.4%	Negligible
R24	School	24.0	24.1	0.08	0.2%	Negligible
R25	School	22.7	22.7	0.06	0.1%	Negligible
R26	Residential	22.7	22.8	0.05	0.1%	Negligible
R27	Residential	25.6	25.7	0.07	0.2%	Negligible
Objective		40			-	

Table 7.20 – Completed Development Stage Predicted Annual Mean PM10 at Existing Receptors (µg/m3)

Receptor	Type	Scenario 2: 2024 future base	Scenario 4: 2024 future base + d1 development & d2 temporary parking	D1 development & d2 temporary parking traffic contribution	% change naqo	Impact descriptor
R1	Residential	14.9	15.0	0.11	0.3%	Negligible
R2	Residential	15.0	15.3	0.25	0.6%	Negligible
R3	School	14.9	14.9	0.04	0.1%	Negligible
R4	School	15.9	15.9	0.03	0.1%	Negligible
R5	Residential	14.9	15.0	0.06	0.1%	Negligible
R6	Residential	15.1	15.2	0.10	0.3%	Negligible
R7	Hospital	15.5	15.6	0.13	0.3%	Negligible
R8	Hospital	15.4	15.5	0.07	0.2%	Negligible
R9	Residential	15.6	15.7	0.08	0.2%	Negligible
R10	Residential	16.3	16.4	0.11	0.3%	Negligible
R11	Residential	16.4	16.5	0.10	0.2%	Negligible
R12	School	17.3	17.4	0.06	0.1%	Negligible
R13	Residential	16.8	16.9	0.06	0.1%	Negligible
R14	School	19.2	19.3	0.09	0.2%	Negligible
R15	Residential	18.2	18.3	0.07	0.2%	Negligible
R16	Residential	17.2	17.2	0.06	0.1%	Negligible
R17	Residential	17.1	17.1	0.06	0.1%	Negligible
R18	Residential	18.6	18.7	0.08	0.2%	Negligible
R19	Residential	16.8	16.9	0.05	0.1%	Negligible
R20	Residential	16.8	16.8	0.05	0.1%	Negligible
R21	Residential	18.8	18.9	0.08	0.2%	Negligible
R22	Residential	18.6	18.6	0.08	0.2%	Negligible
R23	Residential	16.5	16.6	0.05	0.1%	Negligible

R24	School	16.0	16.0	0.02	0.0%	Negligible
R25	School	15.8	15.8	0.01	0.0%	Negligible
R26	Residential	15.7	15.7	0.01	0.0%	Negligible
R27	Residential	16.5	16.5	0.01	0.0%	Negligible
Objective		40			-	

Table 7.21 – Completed Development Stage Predicted Annual Mean PM2.5 at Existing Receptors (µg/m3)

Receptor	Type	Scenario 2: 2024 future base	Scenario 4: 2024 future base + d1 development & d2 temporary parking	D1 development & d2 temporary parking traffic contribution	% change naqo	Impact descriptor
R1	Residential	9.8	9.9	0.06	0.2%	Negligible
R2	Residential	9.9	10.0	0.14	0.6%	Negligible
R3	School	9.8	9.8	0.02	0.1%	Negligible
R4	School	10.4	10.4	0.02	0.1%	Negligible
R5	Residential	9.8	9.9	0.03	0.1%	Negligible
R6	Residential	9.9	10.0	0.06	0.2%	Negligible
R7	Hospital	10.2	10.2	0.08	0.3%	Negligible
R8	Hospital	10.1	10.2	0.04	0.2%	Negligible
R9	Residential	10.2	10.3	0.05	0.2%	Negligible
R10	Residential	10.6	10.7	0.06	0.3%	Negligible
R11	Residential	10.7	10.7	0.06	0.2%	Negligible
R12	School	11.2	11.3	0.03	0.1%	Negligible
R13	Residential	10.9	11.0	0.03	0.1%	Negligible
R14	School	12.3	12.3	0.05	0.2%	Negligible
R15	Residential	11.7	11.8	0.04	0.2%	Negligible
R16	Residential	11.1	11.2	0.03	0.1%	Negligible
R17	Residential	11.1	11.1	0.03	0.1%	Negligible
R18	Residential	12.0	12.0	0.05	0.2%	Negligible

R19	Residential	10.9	11.0	0.03	0.1%	Negligible
R20	Residential	10.9	10.9	0.03	0.1%	Negligible
R21	Residential	12.1	12.1	0.05	0.2%	Negligible
R22	Residential	11.9	11.9	0.04	0.2%	Negligible
R23	Residential	10.8	10.8	0.03	0.1%	Negligible
R24	School	10.5	10.5	0.01	0.0%	Negligible
R25	School	10.3	10.3	0.01	0.0%	Negligible
R26	Residential	10.3	10.3	0.01	0.0%	Negligible
R27	Residential	10.7	10.7	0.01	0.0%	Negligible
Objective		25			-	

- 7.133. The predicted NO₂, PM₁₀ and PM_{2.5} concentrations in 2024 without and with the Proposed Development in place would be below the relevant objectives at all assessed existing receptor locations. The changes in annual mean NO₂, PM₁₀ and PM_{2.5} would vary between a decrease of 1.7 % and an increase of 1.3 %.
- 7.134. The predicted annual mean NO₂ concentrations for all receptors is below 60 µg/m³, which indicates that the hourly mean objective is unlikely to be exceeded. None of the predicted annual mean PM₁₀ concentrations exceed 32 µg/m³ and therefore the 24-hour mean PM₁₀ objective is not predicted to be exceeded.
- 7.135. The impact on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations are described as negligible for all receptors.
- 7.136. Overall, considering the conservative nature of the assessment, combining 2022 emission factors and backgrounds with the traffic data, and the IAQM criteria for assessing significance, the air quality effects of the Proposed Development on existing receptors is considered to be long-term, permanent and therefore **not significant**.

Site Suitability

- 7.137. For the Proposed Development, only the short-term objectives apply (1-hour mean NO₂ and 24-hour mean PM₁₀) as there is no long-term exposure. Receptor R2 which is located just beyond the Site's eastern predicts annual mean NO₂ concentrations below 60 µg/m³, which indicates that the hourly mean objective is unlikely to be exceeded at this locations. Defra background map data for the Site indicates that the short term objective for PM₁₀ would also be met within the Site.
- 7.138. Air quality across the Proposed Development would therefore be expected to comfortably meet all relevant NAQOs.
- 7.139. The Proposed Development will not introduce sensitive receptors into an area with poor air quality.

Mitigation Measures

Proposed Mitigation

- 7.140. The development proposals will be supported by a package of sustainable travel measures, which will be implemented to encourage a shift in travel away from private cars to sustainable modes (i.e. walking, cycling and public transport use). Development proposals that would reduce the number of vehicle movements associated with the Proposed Development and subsequent emissions are presented below:

- Provision of 100 cycle spaces for staff within the car park area and 10 spaces in the public realm for visitors.
- Electric Vehicle Charging will be provided for 20% of car parking spaces, based on D1 and D3 development site parking numbers).

Additional Mitigation

Demolition and Construction Stage

7.141. No significant adverse effects are predicted, and consequently no additional mitigation is required.

Completed Development Stage

7.142. No significant adverse effects are predicted, and consequently no additional mitigation is required.

Residual Effects

Demolition and Construction Residual Effects

- 7.143. As no additional mitigation would be required, the residual demolition and construction stage effects remain as reported in the Identification and Evaluation of Significant Effects section:
- Dust and amenity: be medium-term, temporary, **adverse** and **not significant** for off- and on-site receptors; and
 - Traffic emissions: be medium-term, temporary, **adverse** and **not significant** for off- and on-site receptors.

Completed Development Residual Effects

- 7.144. As no additional mitigation would be required, the residual completed development effects remain as reported in Identification and Evaluation of Significant Effects section:
- Traffic emissions: direct, permanent, **adverse** and **not significant** at off- and on-site receptors.
- 7.145. The Site is considered suitable for the Proposed Development without the need for specific mitigation in relation to road traffic emissions and dust and amenity.
- 7.146. Pollutant concentrations at background and roadside locations is predicted to decrease in future years due to the gradual improvement in vehicle emissions associated with the introduction of Euro 6/VI vehicle emission standards. Roadside concentrations alongside the road network adjacent to the application site would be expected to remain below air quality objective levels as potential increases in road traffic volume would be more than offset by the gradual renewal of the road transport fleet with less polluting models. National policies such as the intention to ban new combustion engine private vehicle sales by 2030 will hasten and enforce this process

Summary of Residual Effects

- 7.147. Table 7.22 provides a tabulated summary of the outcomes of the air quality assessment of the Proposed Development.

Table 7.22 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Receptor	Likely Significant Effects	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
				+	D	P	R	St
				-	I	T	IR	Mt
								Lt
Demolition and Construction								
Existing Off-site Human Health and Amenity	Dust Soiling and PM10 due to demolition and construction stage works	None required	Not significant	-	D	T	R	Mt
Existing Off-site Human Health	Change in NO2, PM10 and PM2.5 levels due to demolition and construction stage vehicle emissions	None required	Not significant	-	D	T	R	Mt
Completed Development								
Existing Off-site Human Health	Change in NO2, PM10 and PM2.5 levels due to completed development stage vehicle emissions	None required	Not significant	-	D	P	IR	Lt
Existing Future On-site Human Health	Change in NO2, PM10 and PM2.5 levels due to vehicle emissions.	None required	Not significant	-	D	P	IR	Lt
Notes:								
* - = Adverse/ + = Beneficial/ +/- Neutral; D = Direct/ I = Indirect; P = Permanent/ T = Temporary; R=Reversible/ IR= Irreversible; St- Short term/ Mt –Medium term/ Lt –Long term.								
**Air quality effects are deemed to significant or not significant, there are no degrees of significance								

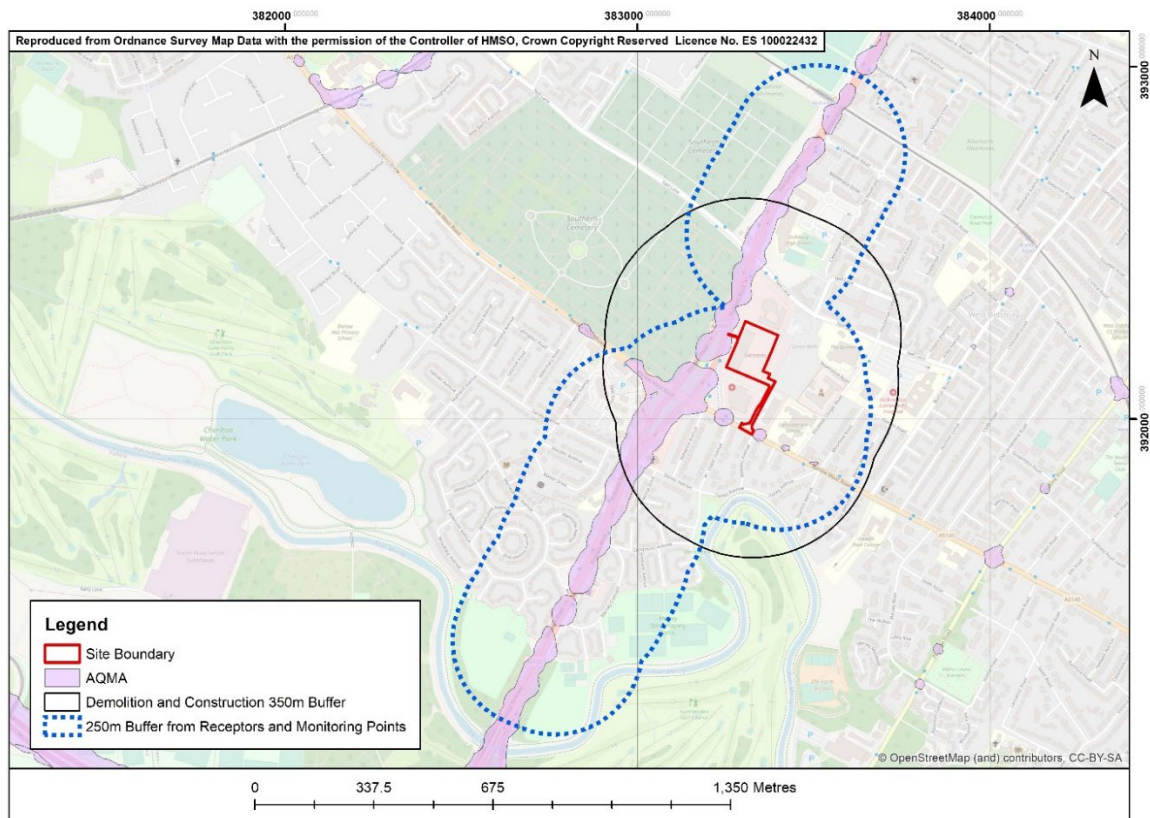


Figure:

7.1

Title:

Air Quality Study Area

Project:

EVO – Didsbury Technology Park

Date:

September 2022

Scale:

NTS

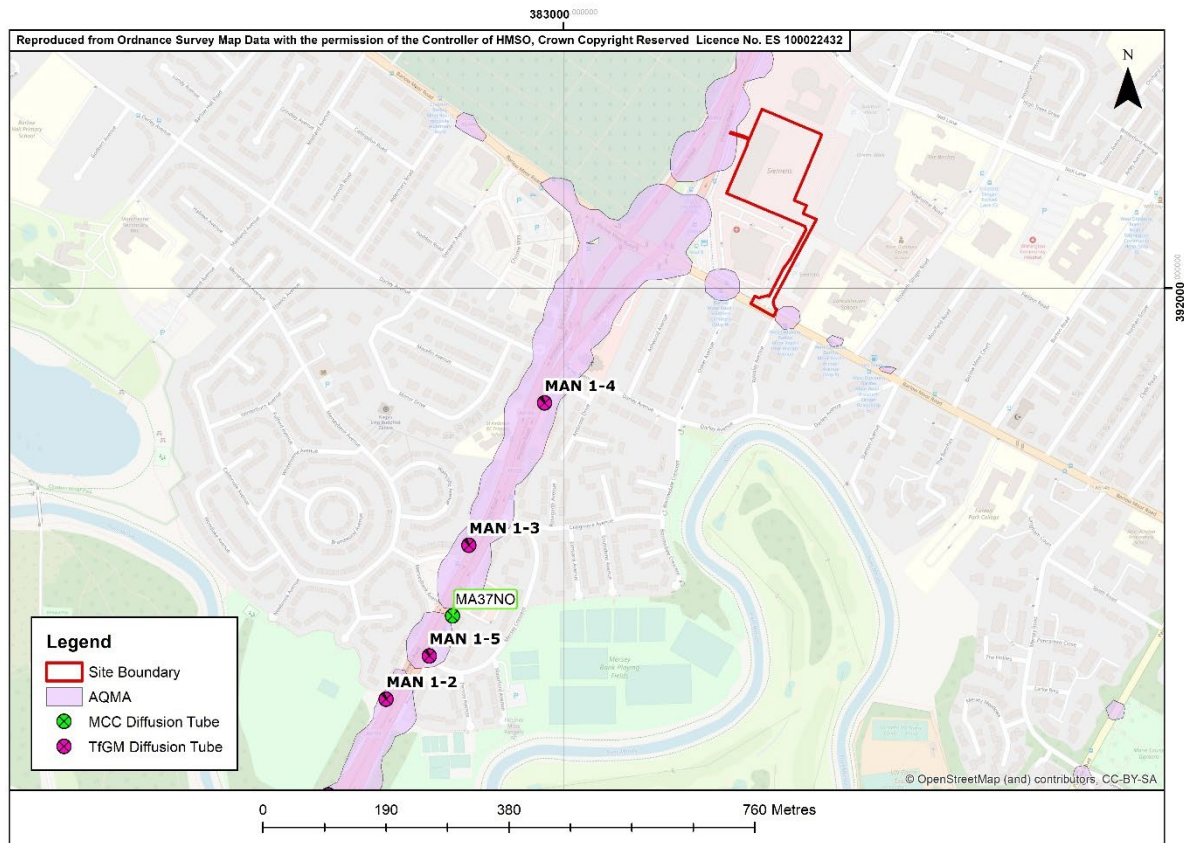


	Figure:	7.2		
	Title:	Air Quality Monitoring Locations		
	Project:	EVO – Didsbury Technology Park		
	Date:	September 2022	Scale:	NTS

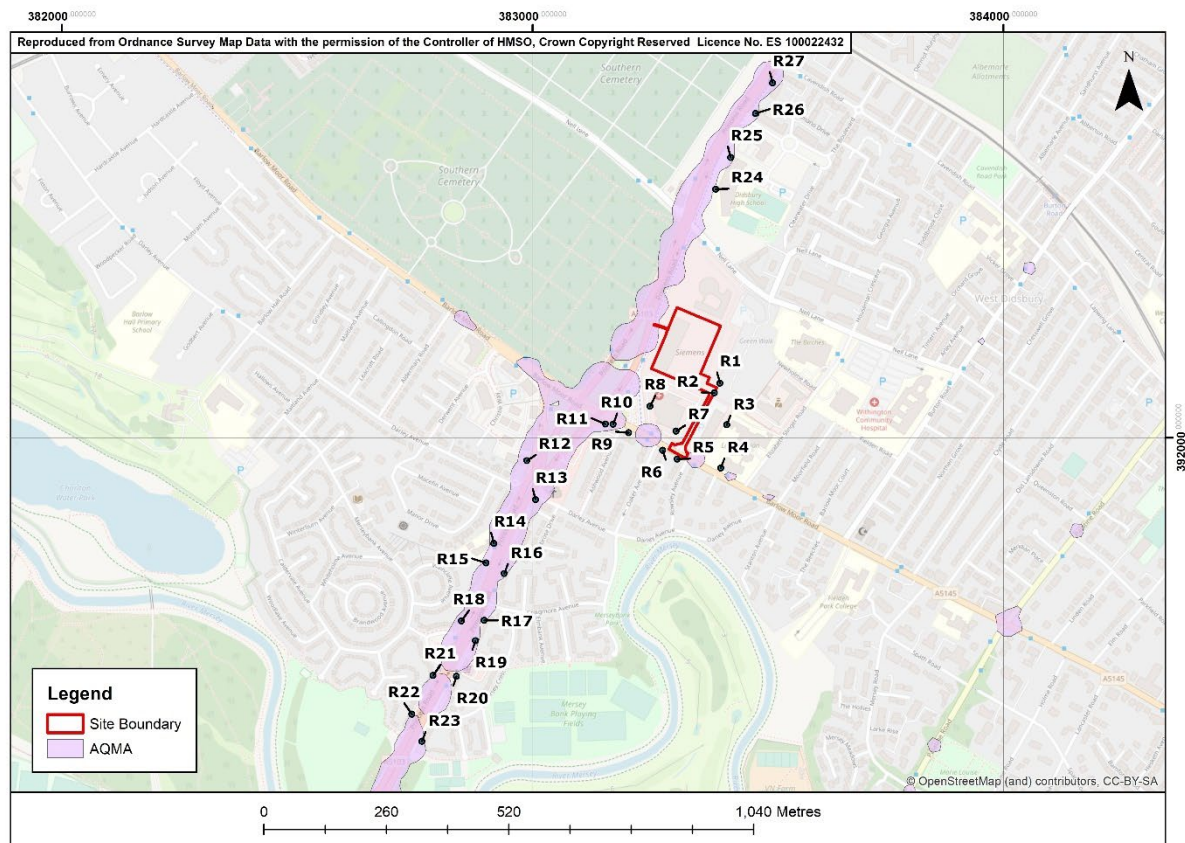


	Figure:	7.3		
	Title:	Air Quality Existing Receptor Locations		
	Project:	EVO – Didsbury Technology Park		
	Date:	September 2022	Scale:	NTS

7.148.

8. Human Health

Introduction

- 8.1. This Chapter of the ES has been prepared by Enfusion and assesses the likely impacts of the proposals upon human health for the site and surrounding area. This Chapter also describes the methods used to assess these impacts, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce or offset any significant negative impacts and the likely residual impacts after these methods have been adopted.
- 8.2. The chapter has been prepared by Barbara Carroll BSc MSc CEnv FIEMA with over 25 years' experience of assessing plans and projects for their impacts on the environment, including effects on human health and wellbeing. She has prepared health chapters for other Environmental Statements supporting various development project proposals in Manchester and other urban locations. She is a co-author of the practical guide - The EIA Handbook (Telfords, Third Edition, November 2019).

Legislative and Policy Context

National Planning Policy

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

- 8.3. The revised NPPF acknowledges the importance of considering health impacts during the planning process and covers many issues that are directly related to the determinants of health. The NPPF identifies the three overarching objectives – economic, social, and environmental – that are interdependent and need to be pursued in mutually supportive ways in order to achieve sustainable development (paragraph 8). The social objective should support “strong, vibrant and healthy communities... by creating a high quality built environment, with accessible local services that reflect the community’s needs and support its health, social and cultural well-being.”
- 8.4. Chapter 8 covers promoting healthy and safe communities, acknowledging that planning policies and decisions should aim to achieve healthy, inclusive, and safe places which:
 - “a) promote social interaction, including opportunities for meetings between people who might not otherwise come into contact with each other – for example through mixed-use developments, strong neighbourhood centres, street layouts that allow for easy pedestrian and cycle connections within and between neighbourhoods, and active street frontages.*
 - “b) are safe and accessible, so that crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion – for example through the use of clear and legible pedestrian routes, and high quality public space, which encourage the active and continual use of public areas; and*
 - “c) enable and support healthy lifestyles, especially where this would address identified local health and well-being needs – for example through the provision of safe and accessible green infrastructure, sports facilities, local shops, access to healthier food, allotments and layouts that encourage walking and cycling.” (paragraph 92).*
- 8.5. Social, recreational, and cultural facilities and services should ‘support the delivery of local strategies to improve health, social and cultural wellbeing for all sections of the community (paragraph 93). It is important that sufficient choice of school places is available to meet the needs of existing and new communities (paragraph 95). Public safety should be promoted and “take into account wider security and defence requirements” (paragraph 97).

- 8.6. “Access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and wellbeing of communities” (paragraph 98). Sustainable transport should be promoted and this “can help improve air quality and public health” (paragraph 105). “An effective use of land should be promoted in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions” (paragraph 119). “Developments should create places that are safe, inclusive, and accessible and which promote health and wellbeing...” (paragraph 130). “New development must be appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health...” (paragraph 185).

Public Health England (PHE) Strategy (2019)

- 8.7. Sets out how PHE intends to protect and improve the public’s health and reduce inequalities during 2020 to 2025. The Strategy recognises that the longer term, societal drivers of change represent the principal challenge facing the public’s health. However, there are opportunities now, including “place-based approaches”. The ten priorities include healthier diets, healthier weight; cleaner air; and better mental health” with the aim to incorporate the reduction of health inequalities into each of the ten priorities. The purpose of PHE is to protect and improve the nation’s health and reduce health inequalities. This is guided by aims – “to keep people safe; to prevent poor health; to narrow the health gap; and the support a strong economy”.

Local Planning Policy

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

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

- Policy DM1 Development Management requires that all development should have regard to specific issues including “Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation”; Accessibility: buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes”; “Community safety & crime prevention”; and “Design for Health.

Siemens Development Framework (endorsed by MCC in 2014)

- 8.9. The Development Framework aligns with the concept of a sustainable technology hub and the provision of goods and services to develop the Siemens healthcare business. Key principles include creation of a safe and secure environment, a sense of place compatible with the wider community, and promotion of sustainable development with sustainable transport and through building design. Various elements of the Development Framework have already been delivered, including the private hospital (Spire, 90 beds) to the south of the Site, the delivery of the residential units (50 apartments and 45 houses) to the east of the Site, and 2,184 sq.m. (GIA) of commercial office space, located within the Site.

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

- 8.10. The Greater Manchester Spatial Framework (GMSF, Publication Draft, 2020) has now been withdrawn but nine of the previous ten Councils have agreed to progress with a Joint Plan that will build upon the evidence base already collected. It may be noted that the GMSF Vision includes GM as “*a place where people live healthy lives*”; and Strategic Objectives include No 10 “*to promote the health and wellbeing of communities*”. The overall draft Strategy and many of the policies in the plan support improvements in health and wellbeing, and reductions in health inequalities, such as by “*promoting a successful economy; increasing supply of high quality and affordable homes; enabling people to adopt healthier lifestyles; and reducing risks to human health*”.

Other Relevant Policy, Strategy & Guidance

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

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

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

- 8.12. Provides a guide for local authority public health and planning teams setting out process and practice with regard to the wider determinants of health and wellbeing for plan-making and the planning application process. It identifies eight categories of health and wellbeing outcomes in planning: reduce health inequalities; improve mental health & wellbeing; improve diet & weight; improve musculoskeletal health; improve respiratory health; improve cardiovascular health; protect environmental health; and provide access to health & care infrastructure and services. The guide is mostly associated with the plan-making and associated strategic environmental assessment processes. However, it does include an annex on integrating HIA in EIA and it does confirm the importance of a “*proportionate and justified approach*”.

The Manchester Strategy - Our Manchester (2016)

- 8.13. The Manchester Strategy to 2025 comprises the Vision and five themes for the strategy including a progressive and equitable city where “*health will improve...*”.

Assessment Methodology and Significance Criteria

- 8.14. Health Impact Assessment (HIA) and health in EIA are separate processes, and there is no standard methodology for assessing health in EIA. The coverage of health in EIA need not be so comprehensive as the HIA that is used to inform detailed project design, but guidance documents for good practice in HIA can inform EIA practice in relation to human health and well-being. It is important that health in EIA is proportionate, balanced, and relevant. The approach here is proportionate - based on consultation

responses, the Scoping Opinion, professional experience, and assessment of impacts against relevant baseline information.

- 8.15. *Shaping Neighbourhoods: For Local Health and Global Sustainability* (2003, 2010 & 2021) sets out the complexities of planning for health due to the multiple determinants and the need for cross-sectoral understanding and collaboration. This guide established a health map demonstrating the linkages between the global ecosystem, the natural and built environments, the local economy with communities, people, and their lifestyles. It explains the likely interactions between different sectors and seeks a common language for spatial planning and public health practitioners.
- 8.16. The complexities of investigating health impacts are recognised by Public Health England (PHE) and the Wider Determinants of Health tool is an ongoing project that provides resources for categories of factors that affect health, as follows: built & natural environment; work & the labour market; vulnerability; income; crime; education.
- 8.17. The London Healthy Urban Development Unit (HUDU) '*Healthy Urban Planning Checklist*' (2017) provides a useful checklist that was developed for London but is applicable to housing development in urban city centres elsewhere in the UK. The checklist aims to promote healthy urban planning by ensuring that the health and wellbeing implications of major planning applications are consistently taken into account, through providing a set of themes and planning issues that can be used to assess development proposals. For the purposes of this assessment, we have applied the checklist to the proposals.
- 8.18. This checklist recognises that health and wellbeing can be affected by multiple determinants as shown in Figure 8.1.
- 8.19. Changes in certain determinants caused by development may affect the health and wellbeing of existing and new residents. The HUDU checklist interprets these determinants into a set of four themes for healthy urban living that can be used to assess residential development, as follows:
- Healthy Housing
 - Active Travel
 - Healthy Environment
 - Vibrant Neighbourhoods
- 8.20. Specific criteria sit under each of these themes to cover a fuller range of determinants. These include access to health and social care, healthy food, freedom from pollution, open space, reducing crime and fear of crime, and access to employment and services. The checklist and criteria were used to inform the proposed scope of the Health Chapter of this EIA and then provided the basis for the assessment stage, where the proposals (including embedded mitigation such as through the design of the project with reduced carbon emissions and using energy more efficiently in the building, and with an increase in the number of on-site trees and biodiversity) were considered for each of the relevant determinants to identify the receptors that would be affected.
- 8.21. The use of checklists helps identify the topics that are relevant to the health impact assessment for the proposed development. This Health Chapter considers the direct implications for health such as the provision of employment opportunities, highways improvements and to the environment. Also, direct effects such as those arising through pollution, air quality, climate change, and safety risks, as well as accessibility to healthcare facilities and sustainable transport (public, cycling and walking) for healthy living. It further considers the wider implications for health and well-being, such as disturbance/nuisance, provision and accessibility to green infrastructure, amenity, cultural, leisure, and recreational facilities.
- 8.22. This health assessment considers the proximity, accessibility, and capacity (where possible) of health and medical centres and dentists in the vicinity of the proposed development. It considers the proximity and accessibility of gyms, leisure centres, sports/recreational and cultural facilities nearby since such activities are important contributors to health and wellbeing. Searches were made through web-based sources and using Google Maps to measure approximate distances by walking or public transport from the centre of the development area to the facility. The proximity of open spaces and walking routes is investigated since access to open space and healthy modes of transport also contributes to healthier lifestyles and wellbeing.

- 8.23. Provision of good quality housing, and access to employment and social infrastructure/open space are known to have positive effects on health and wellbeing. The Proposed Development includes commercial office space over six floors with associated amenity areas. There is no residential development proposed for this stage; however, there are residential homes nearby – delivered as part of earlier stages of the Siemens Framework. The likely impacts of the proposals on socioeconomic and townscape/landscape factors were identified to not be significant for EIA purposes and were scoped out of the EIA. Therefore, these topics are not considered separately as significant topics for this human health chapter; however, they are integrated into the implications for the four themes for healthy urban living since these topics are key contributors to improvements in health and wellbeing.
- 8.24. The key findings from the Climate Change (Chapter 9); Transport (Chapter 6); and Air Quality (Chapter 7) assessments are considered in order to integrate within this Health chapter the key impacts associated with any pollution and future climate change effects that can affect human health and wellbeing. Access to sustainable modes of transport is a key contributor to improvements in health and wellbeing. Risk and vulnerabilities to pollution and/or the effects of climate change are key factors for human health and wellbeing. It was agreed through the EIA scoping process that significant adverse environmental effects were unlikely for flood risk, noise, ground conditions, daylight, and wind microclimate, and these topics were scoped out of the EIA process. However, studies were undertaken to inform the project design process and their findings are referred to in the themes for healthy urban living since these factors are so inter-related and they contribute to positive effects for health and wellbeing.
- 8.25. Each technical impact assessment is subject to its own standards, regulations, and methods of assessment. The key findings from each are considered and integrated into the four themes of - Healthy Housing; Active Travel; Healthy Environment; and Vibrant Neighbourhoods. Thus, any significant impacts for human health are clearly presented in a separate chapter.
- 8.26. This chapter on health is not a Health Needs Assessment and does not attempt to quantify health care contributions. The geographical scope is determined by receptor groups that are likely to be significantly affected by the proposed development. The scope of the Health Chapter is in part dependent upon the study areas and potential receptors identified in the other technical assessments (climate change, transport, and air quality). Thus, the study area comprises the proposed development site with local surrounds and the wider study area of Manchester City – as applicable to each of the factors relevant to human health and wellbeing for the proposed project. The scope of the human health impact assessment chapter is as outlined above and is undertaken in consideration of identified sensitive receptors.
- 8.27. Receptors were identified, as follows:
- construction workers
- 8.28. existing residents, businesses, communities around the site, and including any sensitive receptors such as hospitals, nurseries, schools, care homes identified by the technical assessments. These include, but are not limited to, local residents, the Spire Hospital, Lancastrian School, The Birches School, The Wood Forest School, Didsbury High School and existing employees on-site.
- future users and visitors of the site
 - pedestrians in the vicinity of the site
- 8.29. The baseline informing the assessment draws upon local health and wellbeing information and priorities, such as those set out in the Manchester City Joint Strategic Needs Assessment (JSNA 2021), published local authority health profiles through Public Health England (PHE, 2018-2020), and as reported by Manchester City Council, for example, through the MCC Intelligence Hub. The key baseline from the other technical topics is considered, including risks to health/wellbeing such as from air quality, and risks associated with the effects of climate change. It has not been necessary for this assessment to undertake primary research or surveys and this desk-based approach using published information and professional judgment provides an appropriate level of detail.

- 8.30. The Institute of Environmental Management & Assessment (IEMA) paper on Health in EIA (2017) explains the complexities associated with defining significance for population and human health. This guidance notes that there is an absence of specific significance criteria or defined thresholds for determining significance for population and health in UK EIA practice. Given the multitude of factors that contribute to an individual's health outcomes, it is difficult to draw a quantified conclusion regarding the contribution of a particular development to an increase or decrease in the number of additional cases of a particular physical or mental health outcome.
- 8.31. Therefore, a significant effect is reported in this assessment where, based on professional judgment, the proposed development is likely to contribute to a material change in health outcomes associated with the health issue being assessed and, in determining this, the following questions have been considered:
- Have significant effects been identified in other assessments undertaken as part of the EIA that are linked to human health (i.e. are environmental or health standards threatened)?
 - Are vulnerable groups affected?
 - Is the effect reversible or irreversible?
 - Does the effect occur over the short (less than one year), medium (one to five years) or long (over five years) term?
 - Is the effect permanent or temporary?
 - Does it increase or decrease with time?
 - Is the effect at an individual or population level?
 - Are mitigating measures available and is it reasonable to require these?
- 8.32. Effects that are described as 'minor' or 'negligible' are determined to be 'Not Significant' and effects that are described as 'moderate' or 'major' are determined to be 'Significant'. This takes into account the sensitivities of receptors (high, moderate, low) and as set out previously in Table 2.4 in the EIA Methodology (Chapter 2). The criteria and categories of significance applied in the health impact assessment are, as follows:
- Major Adverse/Beneficial – important considerations at local or district scale; if adverse, are potential concerns to the project and may become key factors in the decision-making process
 - Moderate Adverse/Beneficial – modest important local effects that, if adverse, are not likely to be key issues for decision-making
 - Minor Adverse/Beneficial – Slight, short, or highly localised effects that, if adverse, are unlikely to be important in the decision-making process
 - Negligible – no appreciable effects on health factors
- 8.33. Standardised sectoral thresholds and significance criteria have been used for each of the relevant technical factors that contribute to health and well-being, according to recognised guidance, standards, and assessment methods for climate change; transport; and air quality. Then, the overall likely significant effects on health have been determined in a qualitative way using professional judgment.

Limitations and Assumptions

- 8.34. This Health Chapter considers the findings relevant to human health of each technical impact assessment scoped into the Environmental Statement – Climate Change (Chapter 9); Transport (Chapter 6); and Air Quality (Chapter 7) – and, as such, any key assumptions or limitations associated with each technical impact assessment are addressed within the individual chapters. The overall approach for collating, assessing, and reporting impacts on human health and well-being is considered to be appropriate and proportionate such that there are no limitations. The assessment, set out in this ES Chapter, is desk-based and with professional judgment using published information.

Baseline Conditions

- 8.35. The Site is located in Didsbury Technology Park, adjacent to Princess Road (A5103), within the Didsbury West Ward and to the south of Manchester City Centre. The Site is located within the area covered by the Siemens Development Framework, endorsed by MCC in 2014. Various elements have already been delivered, including the private hospital (Spire, 90 beds), residential units (50 apartments and 45 houses) to the east of the Site, and 2,184 sq. m. (GIA) of commercial office space within the Site. The Site currently comprises surface level car parking with areas of soft landscaping and includes the recently developed 3 storey commercial office building.
- 8.36. **Population:** In 2020, the total population of Manchester was 555,741 people, an increase of 10.51% since 2011. This growth exceeded the levels of population in Greater Manchester at 6.07% and nationally in Great Britain at 6.04% during the same period. The rate of city population growth is likely to increase to over 627,000 by 2025. The Manchester State of the City Report (2020) notes that Manchester has a much younger age profile than England with an annual growth of twice the national population for residents aged 20-39. The Report summarises that despite recent improvements, Manchester still has some of the worst health outcomes in the country and there are significant inequalities within the city (health and unemployment). The population of Didsbury West Ward (2020) was 7,947 males and 7,523 females, with 11,799 of working age and 1,581 people aged over 65 years. 12,712 people are white ethnicity according to the 2011 census, proportionately higher than other adjacent Wards.
- 8.37. **Health Profiles:** According to PHE data (2018-2020), life expectancy at birth for Manchester is 75.5 (males) & 79.9 (females) compared with 79.4 (males) & 83.1 (females) averaged for England. Physically active adults (2019-20) are recorded at 62.4% for Manchester, lower than that averaged for England at 66.4%. Percentage of adults classified as overweight or obese are recorded at 61.0%, slightly lower than the 62.8% averaged for England. The excess winter deaths index (2019-20) at 18.3% was slightly higher than the averaged value of 17.4% for England.
- 8.38. The proposed development is located in Disbury West Ward. According to MCC Intelligence Hub information using Ward profiles, the Didsbury West Ward has very good health (2011 self-assessment from residents of the state of their general health), within the highest range for the City and higher than adjance Wards. The Index of Multiple deprivation (IMD) is an overall relative measure of deprivation constructed by combining seven domains of deprivation – Income; Employment; Education; Skills & Training; Health & Disability; Crime; Barriers to Housing Services and Living Environment. The Didsbury West Ward has a IMD score (2019) of 15.51, (the least deprived is in the range 15.5-31.1 with 48.4-62.7 indicating the most deprived) indicating that Didsbury West is the least deprived Ward in the City.
- 8.39. The Didsbury West Ward also shows good health when other indicators are considered. The number of estimated households in fuel poverty (2020) was 1,018 which is within the lowest range for the City, lower than surrounding Wards except for Didsbury East which is also in the lowest range. Childhood obesity is low (2017-20) at 16.4% and similar to adjacent Wards to the east and west. Incidence of all cancer (2014-18) is 101.3 and at the lower end of the range 70.8-142.1 for MCC. The total reported street crimes for 2018 was 2,123, similar to adjacent Wards, and at the lower end of the range from 1,343 – 16,552 for all Wards.
- 8.40. **Housing:** There are no existing residential units, and no people live on the Site. Immediately to the east of the Site on Kensal Drive are the residential units (50 aptmnts and 45 houses) deleivered as part of the Siemens Development Framework. Further east beyond Elizabeth Slinger Road, and south beyond Barlow Moor Road, are residential areas.
- 8.41. **Employment:** The Site is designated as a Core Employment Area. Unemployment in the Didsbury West Ward is low at 240 (April 2020) within the range of 155-1,415 for residents aged 16+ claiming unemployment benefit, and slightly lower than nearby Wards.
- 8.42. **Healthcare Facilities:** There are seven GP practices, including the private GP surgery at the Spire, within 1.5-mile radius of the Site. There are some 12 dental practices within around a 1.5-mile radius of the Site. The Withington Community Hospital is located nearby about 0.5 miles to the east and the new private Spire Hospital is adjacent to the south and was delivered as part of the Siemens Development Framework. There are two care homes within 0.5 miles of the Site – Ashley House and Holmfield to the south on Barlow Moor Road. There is a further nursing home within 1 mile to the north on Cavendish Road.

- 8.43. **Educational Facilities:** There are two schools nearby within less than 0.5 mile – Lancastrian School (primary) and The Birches (special education). There are several other schools within 1.5 miles of the Site, including primary schools St Ambrose, Cavendish, and the independent preparatory Moor Allerton; also, Didsbury High School to the north of the Site. There is one nursery within about 0.5 miles – Bright Horizons on Barlow Moor Road to the south-east of the Site.
- 8.44. **Crime:** The total reported street crimes (2018) in Didsbury West Ward are relatively low at 2,123 within the range of 1,343 – 16,552 for all Wards in Manchester.
- 8.45. **Open Space, Recreation & Amenity:** There are several public green spaces within a 2-mile radius of the Site including playing fields, Chorlton Water Park, Kenworthy Woods, Didsbury Park, and Fog Lane Park. There is good access to walking/cycling routes, for example, along the River Mersey and with links to wider sustainable transport networks. There are various gyms and leisure/sports centres within 2 miles of the Site.
- 8.46. **Climate Change:** Greenhouse gas (GHG) emissions occur constantly and widely as a result of human and natural activity. The current use of the site as a surface level car park generates some traffic flows and associated carbon emissions that have been calculated at around 1,805 tCO₂e per year. **Transport:** Barlow Moor Road lies to the south of the site and is a local distributor road providing access to residential properties and local facilities; 2m wide footways are provided on both sides of the carriageway. There are also cycle lanes, bus laybys, and turning lanes along the road. There are several bus stops along Barlow Moor Road and the bus corridor host frequent services into the city centre and elsewhere. Personal Injury Collision (PIC) data for the key junctions on the highway network adjacent to the site indicated that there were 31 incidents recorded in the latest 5 year period with no fatalities. Road layouts were not cited as contributory factors for the incidents. Footways in the area are good quality, well-lit, and at least 2m wide; the site is considered to be within a highly accessible area. The site is well situated for local cycle lanes including with Route 85 on the National Cycle Network along the western boundary of the site – with connections to Route 62 and Route 6 – and thus linking to the city centre and the rural beyond. Overall, the site is within an area with very good levels of multimodal accessibility to the city centre and across GM.
- 8.47. **Air Quality:** Greater Manchester has declared one Air Quality Management Area (AQMA) covering the city centre and major radial routes into Manchester due to exceedances of the NO₂ annual mean and the PM₁₀ 24 hour objectives. The site is located within the AQMA. Air quality at background and roadside locations is expected to gradually improve in future years due to the renewal of the vehicle fleet with lower emission factors.

Identification and Evaluation of Significant Effects; Mitigation Measures

- 8.48. The proposed development comprises a 6 storey 9,823 sqm commercial office building with associated two storey car parking deck and landscaping, including provision of tree planting. There are 189 existing car parking spaces, and it is proposed to increase this to 465 total car parking spaces, including provision of EVC at 20%.
- 8.49. **Climate Change:** Activities during the construction phase would generate GHG emissions, particularly from the manufacture of construction materials, but also from transport to the construction site and from on-site works. Activities during the operational phase would generate GHG emissions, particularly from the replacement and/or refurbishment of building elements. Activities during the end of life phase of the Proposed Development would generate GHG emissions, particularly from the demolition, waste processing and the disposal of building elements.
- 8.50. The Climate Change Resilience (CCR) assessment relating to the construction phase has identified no new significant effects as a result of climate change during the construction stage given existing design mitigation measures. All effects would be of low magnitude and Not Significant. The CCR assessment for the Proposed Development has not identified significant effects for the completed development stage taking into account embedded mitigation measures. All effects are considered to be Not Significant.

- 8.51. The significance of the GHG emissions generated by the Proposed Development were assessed according to national targets for embodied carbon, operational carbon (energy) and transport carbon. For the construction stage, the scale of the GHG effects of the Proposed Development aligning with a 1.5oC coOmpatible trajectory and achieving net zero by 2050, is considered to be Minor Adverse which is Not Significant in EIA terms. Based on GHG calucations and assuming that the GHG mitigation measures are implemented, and the net zero carbon operational energy targets are met, the operation of the Proposed Development is assessed as being Minor Adverse (Significant). The Proposed Development's GHG emissions meet the applicable existing and emerging policy requirements, and therefore, will contribute to decarbonisation in line with policy goals for MCC and the UK for projects of this type.
- 8.52. **Transport:** The construction phase is likely to have temporary Slight Adverse effects at the local level which is Not Significant. Assessments indicate that for the operational phase, only the site access link would experience an increase in traffic of 30% or more. Improvements to the junction with signalling will have added benefits for pedestrians and cyclists, together with the provision of a Framework Travel Plan to encourage more sustainable transport – overall, traffic impacts were found to be acceptable at Neutral – Minor Adverse which is Not Significant.
- 8.53. **Air Quality:** Sensitive human receptors to air quality were identified at 19 locations for residential, 6 locations for schools, and 2 locations for hospital. During construction, dust effects and vehicle emissions were found to be temporary adverse and Not Significant with effects being managed through the Construction Method Statement. For the occupation phase, the impacts on annual mean NO₂, PM₁₀ and PM₂₅ concentrations were found to be Negligible for all receptors.

Cumulative Effects:

Temporary during Construction Phase

- 8.54. Each separate technical topic has considered the relevant effects for health and wellbeing that could be cumulative with other nearby development projects. Each development project is designed and constructed with ways of working that are approved according to regulatory requirements that aim to protect human health and wellbeing. The implementation of such mitigation measures to reduce impacts to acceptable levels is ensured through the Construction Method Statement and Environmental Management Plan (CEMP), and such Plans are applied to the construction of each development project.
- 8.55. During the approximately 18 month construction time period, there are the possibilities for cumulative adverse impacts on air quality - dust soiling from activities and emissions from transport; transport disturbance; and loss of amenity for pedestrians and motorists. However, cumulative effects were identified to be Negligible through implementation of the CEMP.

Operational Phase

- 8.56. Taking into account residential and other sensitive developments within 500m of the proposed site, the cumulative impacts are
- 8.57. The cumulative impact of air quality due to changes in road traffic flows is expected to be negligible.

Residual Effects

- 8.58. Post-mitigation residual effects are summarised in Table 8.2, as follows:

Table 8.2 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Summary of Health-Related Topics, Likely Significant Effects, Mitigation Measures, and Residual Effects

Significant Receptors listed as identified from each technical chapter and as relevant according to those presented in paragraph x.27 previously – workers, residents & visitors (nearby & site), and pedestrians – during construction and operational phases

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e Temporary/Permanent)
Construction Phase				
Climate Change Resilience – high temperatures	Site personnel	None required	None	Not Significant
Climate Change Resilience – strong winds	Site personnel & nearby pedestrians	None required	None	Not Significant
GHG emissions	Global climate	Carbon offset payments to ensure construction is net zero		Minor Adverse (Not Significant)
Transport	Drivers, cyclists & pedestrians	Agreed traffic management	Construction Method Statement	Slight Adverse (Not Significant)
Air quality	Site personnel & nearby residential, schools & hospital	Agreed construction methods & traffic management	Construction Method Statement	Adverse, Not Significant
Operational Phase				
Health care provision	Healthcare	None	None	Negligible on healthcare provision
Crime	Crime	None	None	Negligible on crime
Open space & recreation facilities	Open space & recreational facilities	None	None	Negligible on open space & recreational facilities
Climate Change Resilience – high temperatures	Building users	None required	None	Not Significant
Climate Change Resilience – strong winds	Building users & nearby pedestrians	None required	None	Not Significant
GHG emissions	Global climate	Proposed Development in line with measures to achieve UK's trajectory towards net zero carbon		Minor Adverse (Significant)
Transport	Drivers, cyclists & pedestrians	Improvements to site access junction including signalling	Travel Framework Plan	Neutral – Slight Adverse (Not Significant)
Air Quality	Nearby residential,	None required	None	Adverse, Not Significant

	schools & hospital			
--	--------------------	--	--	--

Summary for Healthy Urban Living

Healthy Housing:

- 8.59. The Proposed Development does not include any residential development in this phase. However, there is residential development nearby on Kensal Drive. The studies undertaken for the project design have taken into account the likely impacts on the nearby residential areas and this is discussed later under Healthy Environment.

Active Travel:

- 8.60. The proposed development is located to the south of the City Centre and is rich in choice and accessibility to sustainable transport modes – walking, cycling, bus, Metrolink, rail – with routes and interchanges for daily movement to work, retail and leisure activities. There are bus stops supporting diverse bus routes on Princess Road and Barlow Moor Road, and the Metrolink is on Princess Road. There is easy access to wider routes for active travel such as the River Mersey path (less than 0.5 mile). The proposals include car parking (20% with electric vehicle charging). There are 100 bike spaces in the car park with the option to increase to 200 at a later date, with 10 bike spaces in 5 stands in the public realm for visitors making 110 bike spaces overall.
- 8.61. Currently the Site is accessed from Barlow Moor Road. The Proposed Development will provide new public realm and the new signalised pedestrian crossing provided across Barlow Moor Road will improve safety and connectivity, supporting active travel. Overall, the location of the site in an area with excellent accessibility to public transport, and with varied access to pedestrian and cycle networks for employment, services, and facilities in the city centre, will encourage active travel with likely major positive effects in the local area that may be synergistic and cumulative in the longer-term. The Proposals are supported by a Sustainable Travel Plan that identifies longer term objectives to achieve reduction in parking demand and increase in the use of sustainable transport and active travel.

Healthy Environment:

- 8.62. The majority of the site was undeveloped until the 1950s when it became a playing field and then the 1990s when it was redeveloped to its current layout. Therefore, there is unlikely risk of pollution from previously developed land. Any associated risk to human health has been considered through ground condition studies and found to be not significant – the results are below the relevant guideline levels for both residential and commercial uses. The site is located within flood zone 1 with a low probability of flooding and therefore, there is low risk to human health and wellbeing from flooding.
- 8.63. During construction, risks to their health and safety for construction personnel and the public are minimised through the implementation of a Construction Method Statement (CMS) that is monitored and periodically reviewed. Site security and safety is secured through perimeter fencing and various activities to ensure that the site is safe from unauthorised access. The site is open at all times with 24 hr security and lighting. The potential risks to health for workers and nearby residents from dust and particulates are controlled through the implementation of the CMS such that residual effects on human health are Negligible. Waste will be segregated, and waste generated during construction will be cleared on a daily basis to a main holding skip, thus minimising risks to health and safety. The contractor will ensure that regular contact is made with local residents, and community groups so that they are kept up to date with the general progress on the site and this will help ameliorate any concerns for wellbeing.

- 8.64. During construction, there is the potential for dust and noise effects, but these will be minimised through the CEMP such that impacts are considered to be not significant. Pollution from vehicle exhausts is the main source of air quality effects in the vicinity of the site. It was determined that the air quality impacts associated with the proposed development are not predicted to be significant. Noise studies undertaken to inform the project design considered impacts on existing sensitive receptors and noise generated by additional road traffic. Noise levels will be within the relevant limits for the externally located plant during operation and the likely impacts on any sensitive receptors was identified to be negligible such that noise was scoped out of this EIA.
- 8.65. Lack of daylight or sunlight, and the wind microclimate can adversely affect health and well-being with regard to a healthy environment. However, the proposed building is only six storeys and thus these factors were found to be not significant and were scoped out of the EIA. The provision of enhanced public realm with new trees and landscaping will contribute to a healthier environment – for both physical and mental wellbeing. Over the 60-year life of the building, there will be changing effects on climate with potential associated risks for human health with more extreme weather conditions. Mitigation measures, particularly the transition to sustainable transport, should limit such effects in the longer term and contribute to a healthier environment. Climate Change Resilience assessments have considered risks to human health from flooding, drought, increased temperatures, and extreme winds for both workers and nearby pedestrians during construction and building users and nearby pedestrians during the occupation stage – all effects found to be not significant.
- 8.66. The proposals include some Electric Vehicle Charge (ECV) car parking spaces. GHG emissions from buildings and transport were found to be minor adverse which is significant for effects on the global climate. However, the Proposed Development is in line with applicable existing and emerging policy requirements for projects of this type to achieve the UK's trajectory towards net zero carbon.

Vibrant Neighbourhoods:

- 8.67. The delivery of the good-quality employment/commercial building on the site will contribute to the continuing vibrancy of the local neighbourhood as this stage of the Development Framework is progressed. Provision of and access to employment is known to have a positive effect on health and wellbeing. The change from a site for car parking to a commercial building that is used and securely managed will contribute to a reduction in crime and an improvement in community safety.

Reference List

- 8.68. This ES Chapter has been prepared by reference to the following:
- National Planning Policy Framework (NPPF, updated 2019 & revised 2021)
<https://www.gov.uk/government/publications/national-planning-policy-framework--2>
 - Public Health England (PHE) Strategy (2019) *Public Health England (2019) Strategy 2020-2025*
<https://www.gov.uk/government/publications/national-planning-policy-framework--2>
 - Public Health England (PHE) Strategy (2019) <https://www.gov.uk/government/publications/phe-strategy-2020-to-2025>
 - Manchester City Council (MCC) Core Strategy (adopted 2012)
https://secure.manchester.gov.uk/info/200074/planning/3301/core_strategy
 - Manchester City Council (MCC) Piccadilly Basin Strategic Development Framework (adopted 2016)
 - Places for Everyone – Joint Development Plan (Greater Manchester Councils 2021)
<https://greatermanchester-ca.gov.uk/news/greater-manchester-councils-to-set-out-next-steps-with-places-for-everyone-joint-plan/>
 - Manchester City Council (MCC) Manchester State of the City Report (2020)
https://www.manchester.gov.uk/info/200088/statistics_and_intelligence/8083/state_of_the_city_report_2020
 - Public Health England (PHE) Spatial Planning for Health (2017) *Public Health England (2017) Spatial Planning for Health: an evidence resource for planning designing healthier places*

- Public Health England (PHE) Health Impact Assessment in Spatial Planning (2020)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929230/HIA_in_Planning_Guide_Sept2020.pdf
- The Manchester Strategy - Our Manchester (2016) <https://www.manchester.gov.uk/mcrstrategy>
- IEA Cave, B. Fothergill, J., Pyper, R. Gibson, G. and Saunders, P. (2017) *Health in Environmental Impact Assessment: A Primer for a Proportionate Approach*. Ben Cave Associates Ltd, IEMA and the Faculty of Public Health. Lincoln, England www.iema.net
- <https://www.iema.net/resources/reading-room/2017/05/01/get-primed-for-health-in-eia> *Shaping Neighbourhoods: For Local Health and Global Sustainability* (2010) Barton H, Grant M & Guise R (2nd edition 2010) *Shaping Neighbourhoods: for local health and global sustainability* Taylor & Francis Ltd, England
- Wider Determinants of Health Public Health England (PHE)
<https://fingertips.phe.org.uk/profile/wider-determinants>
- The London Healthy Urban Development Unit (HUDU) 'Healthy Urban Planning Checklist' (2017)
- <https://www.healthyurbandevelopment.nhs.uk/wp-content/uploads/2019/10/HUDU-Rapid-HIA-Tool-October-2019.pdf>
- Manchester City Joint Strategic Needs Assessment (JSNA 2021)
https://www.manchester.gov.uk/info/500230/joint_strategic_needs_assessment
- Public Health England (PHE, 2017-2019) <https://fingertips.phe.org.uk/profile/health-profiles>
- Office for National Statistics (ONS) for health and life expectancies (2017-2019)
<https://www.ons.gov.uk/peoplepopulationandcommunity>
- Manchester City Council
https://secure.manchester.gov.uk/info/200088/statistics_and_intelligence/2178/health_and_wellbeing
- Manchester City Council
https://secure.manchester.gov.uk/info/200088/statistics_and_intelligence/438/population/2
- Manchester City Council
https://www.manchester.gov.uk/downloads/download/7316/state_of_the_city_report_2020

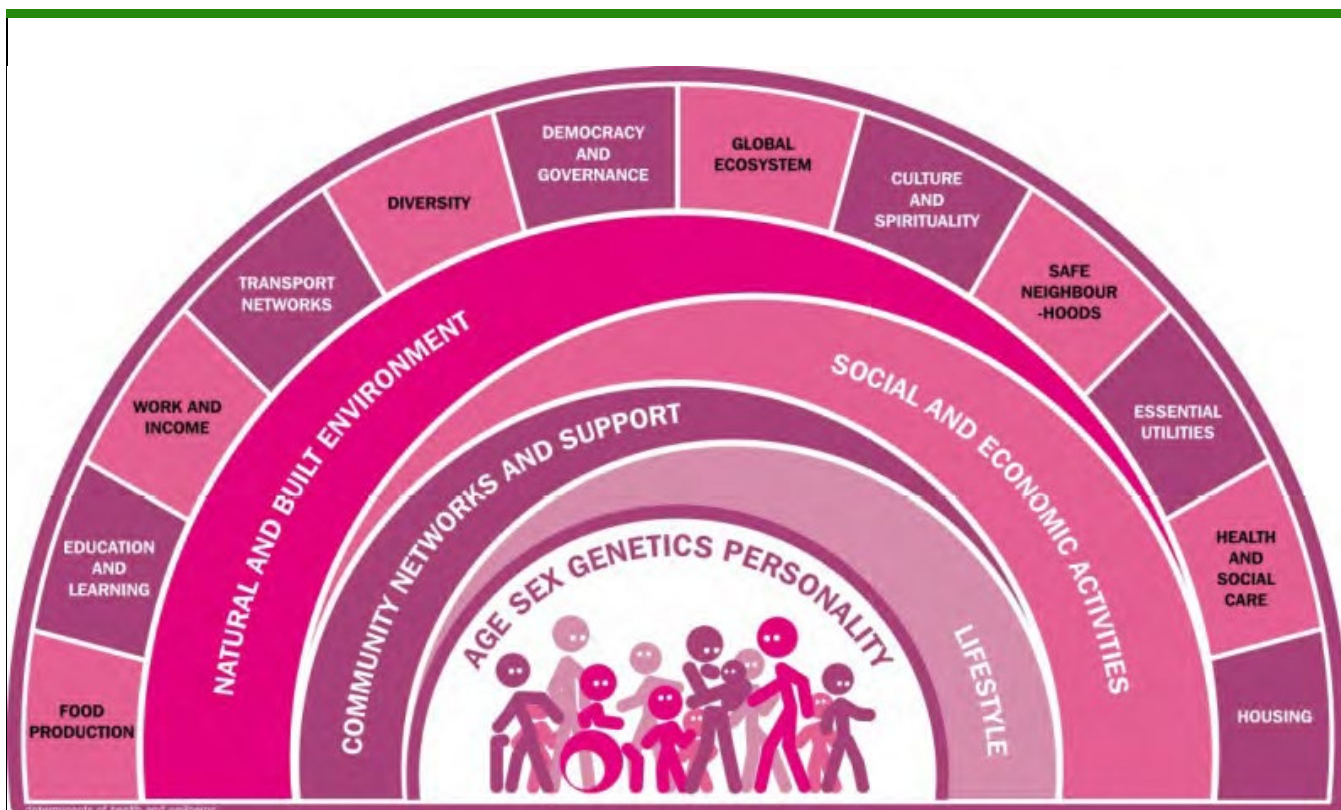


	Figure:	8.1		
	Title:	The Determinants of Health and Wellbeing (London HUDU developed from Barton & Grant 2007)		
	Project:	Ev0 – Didsbury Technology Park		
	Date:	August 2022	Scale:	NTS

9. Climate Change

Introduction

- 9.1. This Chapter of the ES has been prepared by Ramboll and assesses the likely Climate Change impacts of the Proposed Development upon the Site and surrounding area. This Chapter also describes the methodology used to assess these impacts, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce or offset any significant negative impacts and the likely residual impacts. This Chapter is accompanied by two technical appendices, a Climate Change Resilience (CCR) Assessment (Appendix 9.1), an In-Combination Climate Change Impacts (ICCI) Assessment (Appendix 9.2) and Preliminary Lifecycle Assessment (Appendix 9.3).
- 9.2. This assessment has been undertaken by Thomas Mitchell MEnvSci (Hons) GradIEMA, checked by Ben Alston BSc (Hons) PIEMA, and approved by Natalia Fernandez Ferro BEng (Hons) MSc PIEMA on behalf of Ramboll.

Legislative and Policy Context

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

International Legislation

The Paris Agreement

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

Kyoto Protocol

- 9.5. The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) was adopted on 11 December 1997 and ratified on 16 February 2005, there are 192 Parties signed up to the Kyoto Protocol. The protocol commits industrialized countries and economies in transition to limit and reduce GHG emissions in accordance with agreed individual targets. The protocol binds developed countries such as the United Kingdom and places a heavier burden on them under the principle of “common but differentiated responsibility and respective capabilities”. This is because the protocol recognizes that they are largely responsible for the current high levels of GHG emissions in the atmosphere.

National Legislation and Planning Policy

The Climate Change Act

- 9.6. The Climate Change Act 2008 (2050 Target Amendment) Order (2019) provides a framework to meet the UK’s GHG emission reduction goals through legally binding national carbon emission caps within five-year periods. The Climate Change Act 2008 (2050 Target Amendment) Order notes that United Kingdom carbon emissions must be reduced by 100% (net zero) by 2050, relative to the 1990 baseline.
- 9.7. The Climate Change Act includes UK Carbon Budgets (2019) which set out the five-yearly, legally binding, carbon budgets from 2008 to 2037 to achieve net zero GHG emissions by 2050.

UK’s Nationally Determined Contribution

- 9.8. On 12 December 2020, the UK communicated its new Nationally Determined Contribution (NDC) to the UNFCCC under the Paris Agreement to the UNFCCC. The NDC commits the United Kingdom to reducing economy-wide GHG emissions by at least 68% by 2030, compared to 1990 levels. As well as the NDC, the UK has published an Adaptation Communication and a Biennial Finance Communication. These are complementary to the NDC and also required under the Paris Agreement.

UK Climate Change Risk Assessment: Government Report (2022)

- 9.9. As required by the Climate Change Act 2008, the UK government has undertaken the third five-year assessment of the risks of climate change on the UK. This is based on the Independent Assessment of Climate Change Risk (2021), the statutory advice provided by the Climate Change Committee (CCC), commissioned by the UK government and devolved administrations. The risk assessment considers sixty-one UK-wide climate risks and opportunities cutting across multiple sectors of the economy.

National Planning Policy Framework (2021)

- 9.10. The revised National Planning Policy Framework (NPPF) summarises in a single document, the Government's planning policies for England and how these are expected to be applied. The NPPF was updated in July 2021, superseding the previous version published in February 2019.
- 9.11. The NPPF introduces the presumption in favour of sustainable development at the heart of the framework, where Section 2, Paragraph 11 states that local planning authorities should promote a sustainable pattern of development when creating plans, and assessing and determining development proposals. Paragraph 152 of the NPPF states that:

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

Planning Practice Guidance (2019)

- 9.12. The Planning Practice Guidance (PPG) was published in March 2014 to provide more in-depth guidance to the NPPF. The PPG aims to make planning guidance more accessible, and to ensure that the guidance is kept up to date.
- 9.13. PPG: Climate Change (last updated in March 2019) advises how to identify suitable mitigation and climate adaptation measures to incorporate into the planning process. It states:
- "effective spatial planning is an important part of a successful response to climate change as it can influence the emission of greenhouse gases... Planning can also help increase resilience to climate change impact through the location, mix and design of development."*

A Green Future: Our 25 year Plan to Improve the Environment (2019)

- 9.14. The 25 Year Environment Plan, published in January 2018 and updated in 2019, sets out the actions the UK Government will take to help the natural world regain and retain good health. It sets out how the Government will work with communities and business to improve the environment over the next 25 years. The goals include clean air, minimising waste and mitigation against climate change.
- 9.15. The Plan states:
- "We will take all possible action to mitigate climate change, while adapting to reduce its impact. We will do this by:*
- Continuing to cut greenhouse gas emissions including from land use, land use change, the agriculture and waste sectors and the use of fluorinated gases. The UK Climate Change Act 2008 commits us to reducing total greenhouse gas emissions by at least 80 per cent by 2050 when compared to 1990 levels.*
- Making sure that all policies, programmes and investment decisions take into account the possible extent of climate change this century.*
- Implementing a sustainable and effective second National Adaptation Programme."*

Regional Planning Policy

Greater Manchester Combined Authority Five-Year Environment Plan

- 9.16. Greater Manchester Combined Authority Five-Year Environment Plan. This plan sets out Greater Manchester Combined Authority's long-term environmental vision. The two main aims of the Plan in relation to climate include:
- *"Aim for our mitigation of climate change: For our Manchester city region to be carbon neutral by 2038 and meet carbon budgets that comply with international commitments; and*
 - *Aim for resilience and adaptation to climate change: To be prepared for the impacts of climate change and already be adapting to the future changes from any increase in climate shocks and stresses."*

Local Planning Policy

Manchester City Council Core Strategy

- 9.17. Manchester City Council (MCC) Core Strategy 2012 – 2027 (2012) is a key document in the Manchester Local Plan that sets out the long term strategic policies for Manchester's future development and forms the framework that planning applications will be assessed against.
- 9.18. The following policies of the Strategy are of particular relevance to climate:
- **Policy EN 4:** *All development must follow the principle of the Energy Hierarchy, being designed:*
 - *Wherever possible new development and retrofit projects, including energy generation plant, must be located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.*
 - *Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings.*
 - *Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing / potential decentralised energy schemes.*
 - *The use of building materials with low embodied carbon in new development and refurbishment schemes.*
 - **Policy EN 6:** *Applications for residential development of 10 or more units and all other development over 1,000 m2 will be expected as a minimum to meet the target shown below, unless this can be shown not to be viable. This should be demonstrated through an energy statement, submitted as part of the Design and Access Statement. Such a statement will be expected to set out the projected regulated energy demand and associated CO2 emissions for all phases of the development:*
 - *Network development area: CHP/district heating anchor or connection or where not feasible, a 15% increase on Part L 2010.*
 - *Electricity intense buildings: +10% increase on Part L 2010.*
 - *Micro generation area: +15% increase on Part L 2010.*
 - **Policy EN 8:** *All new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:*

- *Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rain water permeability*
- *Reduction in urban heat island effect through the use of Green Infrastructure such as green roofs, green walls, increased tree cover and waterways*
- *The need to control overheating of buildings through passive design*
- *The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation*

Manchester City Council (MCC) Sustainability Appraisal Report

- 9.19. The purpose of the MCC Sustainability Appraisal Report (2011) is to promote sustainable development through better integration of sustainability (economic, social and environmental) considerations in the preparation and adoption of plans. The SA was prepared to fulfil SA requirements arising from the Planning and Compulsory Purchase Act 2004, and Strategic Environmental Assessment (SEA) requirements arising from the SEA Directive.

Manchester Climate Change Framework 2020 – 2025

- 9.20. Manchester Climate Change Framework 2020 – 2025 (2020) is a strategy prepared jointly by the Manchester Climate Change Agency and Manchester Climate Change Partnership. With the aim of making Manchester a thriving, zero carbon, climate resilient city by 2038. The strategy includes four objectives to be met by 2025:
- Staying within our carbon budgets;
 - Climate adaptation and resilience;
 - Health and wellbeing; and
 - Inclusive, zero carbon and climate resilient economy.

Assessment Methodology and Significance Criteria

Assessment Scope

- 9.21. For assessing climate within this chapter, a combination of professional judgement, consideration of IEMA guidance, and technical experience has been used throughout the assessment.
- 9.22. Account has been taken of all applicable guidance and policy.

Technical Scope

- 9.23. The Environmental Impact Assessment (EIA) Regulations require an assessment of the likely significant effects of a project on climate and vice versa. A climate assessment in the context of EIA comprises three separate assessments:
- CCR Assessment – considers the vulnerability of the Proposed Development to extreme weather and projected climate change;
 - ICCI Assessment – considers how extreme weather and projected climate change could have an additive effect on impacts identified by other technical disciplines as a result of the Proposed Development; and
 - GHG Emissions Assessment – considers the potential for significant effects to arise from the Proposed Development in terms of GHG emissions during the construction, operational and end of life stages.

- 9.24. Due to the nature of a climate assessment, it is necessary to define a separate study area, baseline and methodology for each assessment to ensure proportionate identification of effects and the potential significance of these.
- 9.25. The technical scope is consistent with the scope outlined as part of the submitted Scoping Opinion request.

Spatial Scope

Climate Change Resilience

- 9.26. The study area for the CCR assessment has not gone beyond the boundary of the Site. This is to capture the risks to the Proposed Development itself from climate change.

In-Combination Climate Change Impacts

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

Greenhouse Gas Emissions

- 9.28. The study area for the GHG emissions assessment includes emissions arising from construction and operational activities within the boundary of the Site, emissions associated to transport and disposal of materials, and emissions associated to waste disposal and treatment.

Temporal Scope

Climate Change Resilience

- 9.29. The CCR assessment has considered the impacts of climate change during the construction stage (the Proposed Development works are anticipated to be undertaken over 18 months, considered to be short-term) and the operational stage (with an anticipated opening year of 2024 and a 60-year design life, considered to be long-term).
- 9.30. Adverse effects associated with climate change are likely to be in the medium to long-term and so the focus within this assessment is on the operational stage, although extreme weather events during construction have also been considered. A future baseline has been used to ensure the potential effects associated with climate change are considered over the proposed design life of the Proposed Development (60 years for structures).

In-Combination Climate Change Impacts

- 9.31. The temporal scope for the ICCI assessment matches that of the relevant discipline. This is to take account of the fact the assessment looks at considers the additive effect of climate change on each discipline.

Greenhouse Gas Emissions

- 9.32. The GHG assessment has considered impacts arising during the construction stage (the development works are anticipated to be undertaken over 18 months, considered to be short-term) and the operational stage (with an anticipated opening year of 2024 and a 60-year design life, considered to be long-term).

Baseline Characterisation Method

Desk Study

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

Climate Change Resilience and In-Combination Climate Change Impacts

- 9.34. For the CCR and ICCI assessments, data has been obtained from the following sources:
- Met Office Historic Climate data; and
 - UKCP18 climate projections.

Greenhouse Gas Emissions

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

- Local Authority (MCC) and national carbon dioxide emissions statistics;
- UK Carbon Budgets (2019); and
- GHG emissions associated with the existing traffic onsite, provided by Ramboll (2022).

Construction Assessment

Climate Change Resilience and In-Combination Climate Change Impacts

9.36. The approach for the construction and end of life stages assessment is the same as that for the operational stage and therefore covered below under the Operational Assessment sub-heading to avoid repetition.

Greenhouse Gas Emissions

- 9.37. The sources of GHG emissions associated with the construction stage of the Proposed Development included within the scope of the assessment are summarised in Table 9-1. GHG emissions are measured in CO₂e. This is a measure used to compare the emissions from various GHG emissions based upon their global warming potential.
- 9.38. For each of the items presented within Table 9-1, input data provided by the Design Team, or reasonable assumptions made using professional judgement, has been used in calculations along with GHG emissions factors to estimate the GHG emissions associated to the construction stage.

Table 9-1 Construction GHG Assessment Scope

Item	Description	Input Data	Emissions Factors
Materials	GHG emissions which are emitted during the extraction and manufacture of materials used in the construction works.	Estimated volumes of construction materials. Proposed Development Preliminary Lifecycle Assessment (Appendix 9.3).	OneClickLCA
Waste disposal	GHG emissions associated with the disposal of waste from excavation works and construction process.	Volumes of waste arisings and RICS guidance. Proposed Development Preliminary Lifecycle Assessment (Appendix 9.3).	OneClickLCA
On-site activities	GHG emissions from the direct on-site construction works	Estimated usage of construction plant using RICS guidance. Proposed Development Preliminary Lifecycle Assessment (Appendix 9.3).	OneClickLCA
Transport	GHG emissions associated with vehicles transporting resources to and from the construction site.	Estimated usage of construction plant using RICS guidance. Proposed Development Preliminary Lifecycle Assessment (Appendix 9.3)/ RICS Professional Standards.	OneClickLCA

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

Operational Assessment

Climate Change Resilience

- 9.40. The CCR assessment has considered how current and future climate trends in the study area could affect the Proposed Development. The CCR assessment has comprised:
- Identification of sensitive receptors;

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

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

In-Combination Climate Change Impacts

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

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

- A review of current climate in the study area and future trends using data from the Met Office and UKCP138 and assessment of projected changes on climate variables;
- Review of potential effects associated with the Proposed Development which could be exacerbated by the impacts of climate change;
- Review of design and mitigation measures that have been identified;
- Qualitative assessment, based on professional judgement, of the implications of extreme weather and potential future climate change on effects identified by the other technical assessments during the construction and operational stages;
- Additional mitigation that may be required to address the effects of climate change; and
- Identification of any residual effects taking account of climate change.

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

Greenhouse Gas Emissions

9.45. The GHG emissions assessment considers the GHG emissions associated with the operation of the Proposed Development based on typical annual consumption.

9.46. The sources of GHG emissions, associated with the operation of the Proposed Development, included within the scope of the assessment are summarised in Table 9-2. For each of the items presented within Table 9-2, input data provided by the Design Team, or reasonable assumptions made using professional judgement, have been used in calculations along with GHG emissions factors to estimate the GHG emissions associated to the operational stage.

Table 9-2 Operational Proposed Development GHG Assessment Boundaries

Item	Description	Input Data	Emissions Factors
Use of Proposed Development	GHG emissions associated with users of the building.	N/A- Not included due to a lack of information associated with this component, e.g. use of refrigerants	N/A- Not included due to a lack of information associated with this component, e.g. use of refrigerants
Materials associated to repairs of Proposed Development	GHG emissions associated with the repair of the main building.	Estimated volumes of construction materials and average distance travelled by construction vehicles Preliminary Lifecycle Assessment (Appendix 9.3).	OneClickLCA
Materials associated to maintenance of Proposed Development	GHG emissions associated with the maintenance of the main building.	Estimated volumes of construction materials and average distance travelled by construction vehicles Preliminary Lifecycle Assessment (Appendix 9.3).	OneClickLCA
Proposed Development regulated energy demands	GHG emissions from regulated energy demands which includes heating, cooling, domestic hot water, auxiliary power (pumps, fans etc.) and lighting.	Kilowatt hours of energy consumption	UK Government Greenhouse Gas Reporting: Conversion Factors 2022
Proposed Development unregulated energy demands	GHG emissions from unregulated energy demands which includes plug-in systems not in the main building heating, ventilation, air conditioning (HVAC) and lighting.	Kilowatt hours of energy consumption	UK Government Greenhouse Gas Reporting: Conversion Factors 2022
Water consumption	GHG emissions associated with water consumption	Based on KPIs from the RICS guidance. Preliminary Lifecycle Assessment (Appendix 9.3).	RIBA benchmark data
Waste	GHG emissions associated with the processing and transport of waste from the use of the Proposed Development	BS5906:2005 Waste management in buildings Greater Manchester Combined Authority recycling rates	UK Government Greenhouse Gas Reporting: Conversion Factors 2022
Operational Transport	GHG emissions associated with vehicles travelling to and from the proposed development	Distances travelled by operational vehicles	EFT V11

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

Assessment Criteria

General

Climate Change Resilience

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

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

In-Combination Climate Change Impacts

- 9.50. Climate change can also result in additive effects for the other topics assessed in the EIA. For example, drought conditions could increase the production of dust during construction, worsening local air quality. Similarly, higher temperatures could lead to failure of mitigation planting and re-instatement of soft landscaping features.
- 9.51. The basis of this assessment is to review the identified effects, the receptors and embedded mitigation measures for each discipline contained within the ES. Professional judgement has been used to assess whether projected climate change could increase the scale of the effects as identified by the disciplines, change the sensitivity of the receptors, or reduce the effectiveness of embedded mitigation measures.

Greenhouse Gas Emissions

- 9.52. The potential for the Proposed Development to contribute to GHG emissions levels is determined by the construction works of the Proposed Development, and the way the office space is used during operation.
- 9.53. For the construction stage, the GHG emissions have included embodied carbon in the materials used, as well as vehicle and plant emissions.
- 9.54. For the operational stage, GHG emissions have resulted from the annual operation, activities and services of the Proposed Development, upon completion. This has included the operational energy usage, such as heating and lighting.
- 9.55. In line with the updated IEMA guidance, the GHG assessment seeks to evaluate the significance of GHG emissions based on the whole life GHG emissions of the Proposed Development and how these align with the UK's net zero compatible trajectory. Therefore, the crux of significance for the GHG assessment is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050.

Receptor Sensitivity/Value Criteria

Climate Change Resilience

- 9.56. In line with IEMA guidance, the sensitivity of receptors to potential climate change impacts should be considered. In determining the sensitivity of receptors, the following factors have been considered as well as the value or importance of the receptor:
- Susceptibility of the receptor (e. g. ability to be affected by a change); and
 - Vulnerability of the receptor (e. g. potential exposure to a change).
- 9.57. Table 9-3 provides the criteria for sensitive receptors to be 'scoped in' to this assessment.

Table 9-3 Summary of Sensitive Receptors

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

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

In-Combination Climate Change Impact

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

Greenhouse Gas Emissions

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

Impact Magnitude Criteria

Climate Change Resilience

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

Probability of Climate Impact

- 9.62. In line with IEMA guidance, the probability of the impact refers to the likelihood of a climate impact occurring and having an impact on the Proposed Development, over its lifespan. This includes consideration of existing and embedded mitigation measures within the design. The probability of the impact is classified as unlikely, possible (as likely as not) and likely in accordance with the criteria set out in Table 9-4.

Table 9-4 CCR Probability of Impact Criteria

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

Consequence of Climate Impact

- 9.63. In line with IEMA guidance, consequence takes into account the geographical extent of the effect, or the number of receptors affected (e. g. scale), the complexity of the effect, degree of harm to those affected and the duration, frequency and reversibility of effect. The consequence of the impact is classified as very low, low, medium, high and very high in accordance with criteria set out in Table 9-5.

Table 9-5 CCR Impact Consequence Criteria

Consequence Level	Health and Safety	Public Perception	Disruption to Construction / Operations	Cost
Very High	Multiple fatalities	Extensive and prolonged negative reporting nationally and or public disputes with key stakeholders	Site-wide disruption lasting more than one week	>10 % of the Proposed Development construction value
High	Single fatality / multiple long-term injuries	Extensive and prolonged negative reporting national and/or public disputes with key stakeholders	Site-wide disruption lasting more than one day but less than one week	8-10 % of the Proposed Development construction value
Medium	Long-term injury or illness, prolonged hospitalisation or inability to work	Prolonged negative local and/or regional report	Partial disruption across elements of the site / Proposed Development lasting more than one day but less than one week	4-8 % of the Proposed Development construction value

Consequence Level	Health and Safety	Public Perception	Disruption to Construction / Operations	Cost
Low	Lost time injury or medical treatment required, short term impact on persons affected	Negative local media reports and/or localised stakeholder concern over sustained period	Partial disruption across elements of the site / Proposed Development lasting less than a day	1–3 % of the Proposed Development construction value
Very Low	Minor harm or near miss	Short-term negative local stakeholder reaction, e. g. isolated complaints	Disruption to an isolated section of the site / Proposed Development lasting less than a day	<1 % of the Proposed Development construction value

9.64. Climate change impacts have been assessed on the basis of the likelihood of impact and consequence as presented in matrix shown in Table 9-6.

Table 9-6 CCR Impact Magnitude Criteria

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

In-Combination Climate Change Impacts

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

Greenhouse Gas Emissions

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

Scale of Effect Criteria

Climate Change Resilience

9.67. As stated within IEMA guidance, there is no legislative definition of ‘significance’. The significance of effects has therefore been assessed using professional judgement on the basis of the value/sensitivity of receptors against the magnitude of impact (see Table 9-6). On the basis that receptors are considered to be of high sensitivity, any impacts that are of high magnitude are ‘significant’ in EIA terms.

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

In-Combination Climate Change Impacts

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

Greenhouse Gas Emissions

9.70. In line with the updated IEMA guidance, the scale of effects for the GHG assessment has been described as either major, moderate, minor, negligible or beneficial, as presented in Table 9-7.

Table 9-7 Greenhouse Gas Scale of Effect Criteria

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

Nature of Effect Criteria

Climate Change Resilience and In-Combination Climate Change Impacts

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

- Beneficial – An advantageous effect to a receptor;
- Neutral – An effect that on balance, is neither beneficial nor adverse to a receptor; or
- Adverse – A detrimental effect to a receptor.

Greenhouse Gas Emissions

- 9.72. In line with the updated IEMA guidance, the nature of effects for the GHG assessment has been described as either adverse, negligible or beneficial, as follows:
- Adverse – when the project follows a ‘business-as-usual’ or ‘do minimum’ approach and is not compatible with the UK’s net zero trajectory or follows accepted aligned practice or area-based transition targets. Similarly, a project that is compatible with the budgeted, science-based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and ‘good practice’ reduction measures to achieve that can also be considered to have an adverse effect.
 - Negligible – when the project achieves emissions mitigation that goes substantially beyond the UK’s GHG reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory and has minimal residual emissions.
 - Beneficial – when the project causes GHG emissions to be avoided or removed from the atmosphere. Only projects that actively reverse (rather than only reduce) the risk of severe climate change can be judged as having a beneficial effect.

Limitations and Assumptions

Climate Change Resilience

- 9.73. The assessment has relied on data provided by the Met Office and United Kingdom Climate Projections 18 (UKCP18). It has been assumed that these data sets have been reported correctly.
- 9.74. Climate projections can be used to determine likely future trends in climate conditions in the locality of the Proposed Development through its lifetime. The climate trends included in this assessment are based on a range of greenhouse gas (GHG) emissions scenarios which are subject to a degree of uncertainty. How the climate would react to different levels of emissions is also uncertain. There are three key sources of uncertainty within climate projections:
- Natural climate variability: either from natural external influences on climate (e. g. change in atmospheric particulates due to volcanic activity), or changes in the energy received from the sun;
 - Incomplete understanding of Earth system processes and their imperfect representation in climate models (modelling uncertainty); and
 - Uncertainty in future man-made emissions of GHGs and other pollutants.
- 9.75. However, the use of data for the high emissions scenario (RCP 8.5) is likely to have provided a more conservative assessment of potential climatic changes.

In-Combination Climate Change Impacts

- 9.76. The ICCI assessment has relied on the data and professional judgement of other chapters within this report.

Greenhouse Gas Emissions

- 9.77. The GHG emissions assessment presented in this chapter considers the construction, operational and end of life GHG emissions. It has been assumed that the design life of the Proposed Development is 60 years.
- 9.78. GHG emissions associated with the materials, on-site activities, transport, repairs, maintenance and water consumption have been sourced from Preliminary Lifecycle Assessment (Appendix 9.3). This appendix also provides an overview of the building elements that have been scoped in and out of the lifecycle assessment as per the RICS Professional Statement ‘Whole life carbon assessment for the built environment’.
- 9.79. Furthermore, the Preliminary Lifecycle Assessment (Appendix 9.3), and therefore the GHG emissions assessment, has been carried out assuming the following:

EVO building

- A gross internal area (GIA) of 10,155 m² (RIBA Stage 3 Proposed Development floor area);
- Substructure: In-situ concrete using 25% ground granulated blast-furnace slag (GGBS) replacement;
- Frame, upper floors & stair/ramp: Glulam frame with cross laminated timber (CLT) floors and concrete core, and a single story steel frame at the top floor;
- Façade: inclusion of solar photovoltaic (PV) panels on two sides of the building;
- Roof: CLT floor with waterproof membrane and solar PV;
- Internal Walls & Partitions: Concrete and CLT walls to core, blockwork walls, studwork plasterboard partitions and glazing partitions;
- Finishes: Recycled carpet tiles, ceramic tiles, raised access floor, timber slatting, PVC, fire lined ceilings & suspended ceilings; and
- Services: Approximate rates for electrical services, estimated from OneClick benchmarks for building type and GIA;
- Furniture, Fixtures, and Equipment: Approximate rates, estimated from OneClick benchmarks for building type and GIA.

Multistorey car park (MSCP)

- A GIA of 6,234 m² (RIBA Stage 3 Proposed Development floor area);
- Frame: 2 storey (ground floor and two additional levels) steel frame supporting precast concrete floor slabs;
- Core: concrete cores and steel bracing;
- Façade: 3mm thick naturally anodized aluminium to the upper two levels supported from a steel framing system (SFS) type system;
- Roof: PVs are located over the footprint of the structure at roof level;
- Finishes: paint and car park surfacing only; and
- Services: approximate rates for electrical services of the Proposed Development estimated using OneClick benchmarks.

External Works & Hard Landscaping

- A GIA of 10,155 m² (RIBA Stage 3 Proposed Development floor area); and
- External works and hard landscaping comprise, excavation works, natural stone pavers & planting.

9.80. GHG emissions associated with energy consumption during the operation of the Proposed Development were calculated using the UK Government Carbon Conversion Factors and the expected operational energy usage. For the purposes of this assessment, and in order to estimate the expected energy required from the grid to meet the requirements of the Proposed Development, the energy provided by the Proposed Development solar PV (54 kWh/m²) was taken into consideration. As the total energy consumption of the Proposed Development has been estimated to be around 107 kWh/m², it has been assumed that the Proposed Development would require 53 kWh/m² from the grid.

- 9.81. Vehicle movements associated with the operation of the Proposed Development have been calculated using the Emissions Factors Toolkit (EFT) published by Defra. The EFT is updated periodically due to updates to underlying data including vehicle fleet composition and emissions factors.
- 9.82. The operational Proposed Development's predicted traffic flows, including the D1 development and residual parking, have been used to estimate the annual GHG emissions. As agreed with MCC Highways and TfGM no traffic growth has been included in any future operational year. Therefore, 2022 traffic flows have been used for the future baseline scenario of 2024. This represents the year that the Proposed Development would be completed and fully occupied. This approach presents a reasonable worst-case scenario and take account of uncertainties relating to future vehicle emissions. However, this assessment is likely to be an overestimate of actual emissions as the assessment has not taken into account the decline of road traffic emissions over time.
- 9.83. The average trip distance for the complete development has been based on Department of Transport 2011 census database which identifies an average 15.6 km distance travelled to work for the Manchester District. Given the Proposed Development location and traffic distribution, the complete Proposed Development traffic flows are expected to travel mainly within urban area using a combination of link roads and A roads with average speed limit of 30mph and therefore average trip speed has been assumed as 50 kph. Operational traffic flows have been provided by Transport Consultant, Curtins.
- 9.84. Estimated waste arisings associated to the operation of the Proposed Development have been based on waste benchmarks presented within BS5906:2005 Waste management in Buildings - Code of Practice. Additionally, waste density conversion factors from the Environment Agency have been utilised as well as landfill diversion rates achieved by the Greater Manchester Combined Authority in 2021 to estimate end treatment of waste. Furthermore, it has been assumed that waste processing plants would be 10 miles away from the Proposed Development.
- 9.85. In line with IEMA guidance, emissions from the "do something" scenario, i.e. the proposed development is built, was compared with the "do minimum" scenario, i.e. the existing development remains in operation.
- 9.86. As the existing development use of the Site includes a car park, operational transport and energy requirements (e.g. lighting) will generate GHG emissions. However, due to the lack of lighting requirements information and as a reasonable worst case scenario, only GHG emissions associated to the operational transport have been accounted for within this assessment.

Baseline Conditions

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

Existing Baseline

Climate Change Resilience

- 9.88. This section contains information about average and extreme climate variables. The CCR assessment includes risks associated with changes in seasonal or annual average temperature and rainfall as well as risks associated with extreme events (e.g., intense rainfall events or heatwaves).
- 9.89. Average monthly climate data for Ringway climate station (nearest possible representative weather station) for the period 1991-2004 is summarised in Table 9-8.

Table 9-8 Average Monthly Climate Data for Ringway Climate Station

Month	Maximum temperature (°C)	Minimum temperature (°C)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)
January	6.57	1.19	10.39	45.78	68.39

Month	Maximum temperature (°C)	Minimum temperature (°C)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)
February	7.06	1.20	9.84	66.05	53.44
March	9.42	2.69	5.71	102.76	57.72
April	12.08	4.40	2.07	140.25	54.01
May	15.74	7.37	0.16	186.81	60.26
June	18.48	10.14	0	181.09	65.25
July	19.97	12.08	0	170.25	63.38
August	19.86	11.96	0	162.65	76.85
September	17.30	10.02	0	125.42	73.28
October	13.72	7.22	1.02	96.88	82.62
November	9.44	3.77	4.62	55.68	80.07
December	7.25	1.89	8.56	42.03	79.99
Annual	13.09	6.17	3.52	114.82	67.89

9.90. Table 9-9 shows the average monthly temperature for the Ringway climate station, north-west England and north Wales regions, and for the UK between 1991-2020. It shows that north-west and Wales England regions are slightly colder as compared to UK average, and the area around the Proposed Development is warmer as compared to both the north-west England and north Wales regions and rest of the UK.

Table 9-9 Maximum Average Temperatures

Season	Maximum Average Temperature (°C)		
	Ringway climate station	North-west England/ north Wales region	UK
Summer	19.43	18.53	18.87
Winter	6.96	6.94	6.95
Annual	13.09	12.66	12.79

Greenhouse Gas Emissions from the Proposed Development

- 9.91. The current site comprises primarily surface car parking and vehicle access routes. The north of the site is Nell Lane. To the east is the Green Walk residential development. To the south is the Spire Hospital and Barlow Moor Road beyond. To the west is Princess Parkway, which is a major arterial road into the city centre.
- 9.92. The operational GHG emissions of the existing development have been referred to as the “Do Minimum” scenario and are presented within this ES Chapter. The existing development GHG emissions are around 1,805 tCO₂e per year as a result of tailpipe emissions associated to the use of the existing car park and electric charging points.

- 9.93. National carbon dioxide emissions statistics, which have been published by the UK Government to present historic GHG emissions covering from 2007 until 2019 show that MCC emitted 2,019.8 kt CO₂ in 2019. Being 716.8 kt CO₂ from transport, 599.1 kt CO₂ from domestic sources, 172.7 kt CO₂ from the public sector, 362.0 kt CO₂ from commercial, and 172.7 kt CO₂ from industry. Additionally, in 2019, MCC achieved an approximate 60% reduction target compared to the 2005 baseline of 3,273.4 kt CO₂.

Carbon Budgets

- 9.94. The UK Government has set six-yearly carbon budgets which currently run until 2037. The UK national GHG emission fourth carbon budget of 1,950 Mt CO₂e covers the five-year period of 2023-2027. This carbon budget covers the majority to the construction period of the proposed development which is expected to be between 2023 and 2024 (18 months). As shown in Table 9-10, this carbon budget also covers the GHG emissions anticipated during the opening year of the Proposed Development in May 2024.

Table 9-10 UK and Greater Manchester third, fourth, fifth and sixth carbon budgets

1 Carbon Budget	2 National Carbon budget level (MtCO ₂ e)	3 Recommended Greater Manchester budget level (MtCO ₂ e)
- Third (2018-2022)	- 2,544	- 36
- Fourth (2023-2027)	- 1,950	- 17
- Fifth (2028-2032)	- 1,725	- 8
- Sixth (2033-2037)	- 965	- Not released

- 9.95. Additionally, the Tyndall Centre has recommended regional budgets for Greater Manchester, to ensure that Greater Manchester meets its target of being carbon neutral by 2038. These have been specified as 36 MtCO₂e for 2018-2022, 17 MtCO₂e for 2023-2027, and 8 MtCO₂e for 2028-2032. The regional carbon budgets for Greater Manchester have not been released beyond 2032.
- 9.96. Furthermore, the Climate Change Committee's Sixth Carbon Budget provides data on projected emissions pathways for the buildings sector through to 2050. The Balanced Net Zero Pathway has been aligned with reaching net zero by 2050 and is compatible with global efforts to limit the rise in global average temperature to well below 2°C and to pursue efforts to limit warming to 1.5°C, as set out in the Paris Agreement. These have been specified as 456 MtCO₂e for 2018-2022; 419 MtCO₂e for 2023-2027; 334 MtCO₂e for 2028-2032; and 237 MtCO₂e for 2033-2037.

Future Baseline

Climate Change Resilience

- 9.97. Future climate projections are published by the Met Office through the UKCP18 website. Climate projections can be used to determine the likely future climate conditions in the locality of the Proposed Development through its operational life.
- 9.98. Climate projections take into account uncertainty due to natural variability and an incomplete understanding of the climate system and its imperfect representation in models. The projections do this by giving the probabilities of a range of possible outcomes, as estimated by scientific methodology. Good practice in the UK uses UKCP18 projections and published literature such as UK Climate Change Risk Assessment 2022. UKCP18 includes projections of a range of climate variables for different time slices until the end of the century.
- 9.99. The probabilistic projections in the UKCP18 provide local low, central and high changes across the UK, corresponding to various probability levels (e. g. 10 %, 50 % and 90 %). There are also a number of Representative Concentrations Pathways (RCPs) available for UKCP18 with each pathway resulting in a different range of global mean temperature increases over the 21st century. IEMA Guidance recommends the use of RCP 8.5 at the 50 % percentile, for the 2080 timeline to ensure a suitably conservative approach.
- 9.100. The general climate trends for the UK are summarised within the UKCP18 Factsheet projections and have been provided in Table 9-11 below.

Table 9-11 UKCP18 Projections

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

- 9.101. As shown in Figure 9.1 which supports this ES chapter, UKCP18 projections indicate for North West England an increased likelihood of warmer, drier summers for the future assessment period in comparison to the UKCP18 baseline.
- 9.102. As shown in 9.1 which supports this ES chapter, UKCP18 projections indicate for North West England increased likelihood of milder, wetter winters for the future assessment period in comparison to the UKCP18 baseline. However, due to natural variability, some cold and dry winters will still occur.

Greenhouse Gas Emissions

- 9.103. It has been assumed that the future baseline GHG emissions associated to energy consumption, without the Proposed Development, would be the same as the existing baseline, 1,805 tCO₂e per year.
- 9.104. It has also been assumed that the existing GHG emissions associated to the operational transport of vehicle trips to and from the car park would be the same in the future. This assumptions represents a reasonable worst case scenario as due to the gradual improvement in vehicle combustion technologies and enforcement of national policies such as the DfT Decarbonising Transport Plan, Highways Agency (HA) Net Zero highways 2030/2040/2050 plan and The Climate Change Strategy the GHG emissions associated to the existent development would decrease.

Identification and Evaluation of Significant Effects

Construction

Climate Change Resilience

- 9.105. The Climate Change Resilience assessment relating to construction has been presented within Appendix 9.1. The CCR assessment for the Proposed Development has not identified any significant effects for the construction stage once existing design mitigation measures are taken into account. All effects would be of low magnitude and would therefore be **Not Significant**.

In-Combination Climate Change Impacts

- 9.106. The In-Combination Climate Impacts and Effects assessment relating to construction have been presented within Appendix 9.2. The ICCI assessment for the proposed development has identified no new significant effects as a result of climate change during the construction stage given existing design mitigation measures. Accordingly the conclusion of the assessment is that in-combination climate effects would be **Not Significant**.

Greenhouse Gas Emissions

- 9.107. The construction GHG emissions have been reported in tonnes of CO₂e for the duration of the 18 months construction works. The results of the GHG assessment have been summarised in Table 9-12.

Table 9-12 Construction GHG Assessment Summary

Item	Estimated GHG emissions (tCO ₂ e) during construction stage
Construction materials	5,695
Construction site impacts	971
Transportation	985
Total	7,651

- 9.108. The construction of the Proposed Development is expected to contribute to 0.0002% of the UK's fourth carbon budget for 2023-2027 and 0.024% of Greater Manchester's carbon budget for 2023-2027. Additionally, the construction of the Proposed Development is expected to contribute 0.001% of the projected buildings sector carbon budget for 2023 to 2027. All GHG emissions contribute towards climate change, however, emissions from the Proposed Development are low in comparison the UK's, Greater Manchester's and buildings sector carbon budgets.
- 9.109. Due to the low percentage of the construction GHG emissions in comparison to the national, regional and projected buildings sector carbon budgets, the Proposed Development is assessed as compatible with the budgeted, science-based 1.5 °C trajectory in terms of rate of emissions reduction. The Proposed Development's GHG emissions impacts have been mitigated at this stage and meets the applicable existing and emerging policy requirements. The Proposed Development contributes to decarbonisation in line with the MCC's and UK's policy goals for projects of this type. Therefore, whilst all GHG emissions are significant (due to their cumulative contribution to climate change), the scale of effect of the Proposed Development on the likelihood of avoiding severe climate change, aligning with a science-based 1.5 °C compatible trajectory and achieving net zero by 2050, is considered to be **Minor Adverse (not significant)**.

Operation

Climate Change Resilience

- 9.110. In line with IEMA guidance, mitigation (including existing design measures) has been considered within this assessment and a summary of the significance has been provided. The assessment is based on professional judgment and presented in Appendix 9.1. The CCR assessment for the Proposed Development has not identified significant effects for the operational stage taking into account embedded mitigation measures. All effects have been considered to be **Not Significant**.

In-Combination Climate Impacts

- 9.111. A summary of potential ICCI and effects during the operational stage is provided in Appendix 9.2. The assessment is based on professional judgment informed by a review of individual technical assessments within the ES. The ICCI assessment for the Proposed Development has not identified any significant effects for the operational stage once existing design mitigation measures are taken into account. All effects are therefore considered to be **Not Significant**.

Greenhouse Gas Emissions

- 9.112. The operational GHG emissions have been reported in tonnes of CO₂e for estimated design life (60 years) of the operational stage. However, it is expected GHG emissions would continue to decrease year on year, primarily due to increasing generation of electricity from sources that produce less GHG emissions and the development of cleaner fuels.

9.113. Additionally, within the Environmental Standards Statement, which supports this planning application, a Net Zero carbon target has been stipulated for the Proposed Development. Table 9-13 shows the interim and Paris proof targets, defined by the UK Green Building Council for Whole Building Energy, against the Proposed Development achievements. Table 9-13 demonstrates that the Proposed Development's GHG emissions impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. Therefore, the project is fully in line with measures necessary to achieve the UK's trajectory towards net zero.

Table 9-13 Interim and Paris Proof Targets in comparison to the EV0 Building D1 Stage 3

Scope	Metric	Interim Targets			Paris Proof Target	EVO Building D1
		2020 - 2025	2025 - 2030	2030 - 2035	2035 - 2050	Stage 3 (with solar PV)
Whole building energy	kWh/m ² (NLA)/ year	160	115	90	70	68
	kWh/m ² (GIA)/ year	130	90	70	55	53
	DEC rating	D90	C65	B50	B40	
Base building energy	kWh/m ² (NLA)/ year	90	70	55	35	-1
	kWh/m ² (GIA)/ year	70	55	45	30	-1
	NABERS UK star rating	4.5	5	5.5	6	
Tenant energy	kWh/m ² (NLA)/ year	70	45	35	35	69
NLA = Net Lettable Area, GIA = Gross Internal Area						

9.114. In order to achieve the targets presented within Table 9-13, a number of mitigation measures have been embedded within the Proposed Development. These include:

- Solar PV have been included across the car park and roof of the D1 building to provide an estimated 50% (54 kWh/m²/yr) of the total energy consumption of the Proposed Development. This has been taken into account when assessing the GHG emissions of the operational Proposed Development, and within EVO Building D1 Stage 3 figures in Table 9-13.
- Provision of 100 cycle spaces for staff within the car park area and 10 spaces in the public realm for visitors.
- Electric Vehicle Charging will be provided for 20% of car parking spaces.
- Improvement of thermal performance of building fabric (U-values) to reduce heat loss.
- High performance and careful glazing design to maximise daylight.
- Use of thermal modelling software to optimise heating system efficiency.
- Efficient air handling units.
- Use of air source heat pumps, heat recovery and variable refrigerant flow (VRF) water-source systems to reduce heating demand.

- Mechanical ventilation and heat recovery measures to reduce electricity consumption and heating demands, including a CO2 sensor control to adapt demand to occupancy.
- Demand matched ventilation system to ensure ventilation only occurs when required.
- High efficiency light emitting diode (LED) lights for internal lighting.
- Internal LEDs would be smart controlled via an app and linked to occupancy sensors that detect internal movement, and daylight linking technology which turns off lights when there is sufficient light externally.
- Daylight sensors and time controls implemented for external lighting to reduce operating time.
- Ensuring water efficiency by water efficient sanitary ware, sub metering, leak detection and presence-controlled solenoid valves which will shut-off the water supply to the toilet areas when unoccupied.

9.115. The estimated GHG and net GHG emissions associated to the operation of the Proposed Development have been summarised in Table 9-14 and Table 9-15, respectively.

Table 9-14 Proposed Development Operational GHG Emissions

Item	Estimated GHG Emissions (tCO ₂ e) for the Expected Design Life (60 years)
Use, Maintenance, Repair, Replacement and Refurbishment	4,838
Energy Consumption	6,245
Water Consumption	41
Waste	869
Transport	224,208
TOTAL for Proposed Development	236,201

Table 9-15 Proposed Development Operational Net GHG Assessment Summary

Introduction	Introduction
TOTAL GHG emissions associated to Proposed Development	236,201
TOTAL GHG emissions associated to existing car park	108,302
TOTAL net GHG emissions (Proposed Development – existing car park)	127,899

- 9.116. When comparing the “do something” scenario against the “do minimum scenario”, i.e. the operational emissions of the existing development, the net contribution of the Proposed Development during operation is expected to contribute to 0.0003% of the UK’s carbon budgets for 2023-2027, 0.0006% of the UK’s carbon budget for 2028-2032, and 0.0011% of the UK’s carbon budget for 2033-2037. The operation of the Proposed Development is expected to contribute 0.001% of the projected buildings sector carbon budget for 2023 to 2027, 0.003% of the project buildings sector carbon budget for 2028-2032, and 0.005% of the project buildings sector carbon budget for 2033-2037.
- 9.117. The operation of the Proposed Development is expected to contribute to 0.037% of Greater Manchester’s carbon budget for 2023-2027, 0.13% of Greater Manchester’s carbon budget for 2028-2032 and 0.27% of Greater Manchester’s carbon budget for 2033-2037.
- 9.118. The IEMA guidance indicates GHG emissions should be considered as ‘significant’ if they are not compatible with the budgeted, science-based 1.5°C trajectory in terms of rate of emissions reduction and do not comply with up-to-date policy and ‘good practice’ reduction measures.
- 9.119. Based on GHG calculations and assuming that the GHG mitigation measures listed below are implemented and the net zero carbon operational energy targets are met, the operation of the proposed development is assessed as being **Minor Adverse (Not Significant)**.

Contextualisation of the Proposed development GHG emissions against carbon budgets

- 9.120. The total GHG emissions from the construction, operation and end of life of the Proposed Development, based on a 60-year design life, are estimated to be around 244,269 tCO₂e.
- 9.121. Table 9-16 shows a contextualisation of the results of the net GHG emissions assessment for all stages of the Proposed Development against the national, regional and sectoral carbon budgets.

Table 9-16 Contextualisation of estimated net GHG emissions for all stages of the Proposed Development against the UK, Greater Manchester and building sector carbon budgets

Item	2023-2027 (4 th Carbon Budget)	2028-2032 (5 th Carbon Budget)	2033-2037 (6 th Carbon Budget)
Estimated GHG emissions (tCO ₂ e)	10,272	10,658	10,658
UK Carbon Budget (tCO ₂ e)	1,950,000,000	1,725,000,000	965,000,000
Percentage of UK Carbon Budget	0.00053%	0.00062%	0.00110%
Greater Manchester Carbon Budget (tCO ₂ e)	17,000,000	8,000,000	4,000,000
Percentage of Greater Manchester Carbon Budget	0.06042%	0.13323%	0.26645%
Buildings Sector Projected Budget (tCO ₂ e)	419,484,776	334,204,192	236,731,666
Percentage of Buildings Sector Projected Budget	0.00245%	0.00319%	0.00450%

- 9.122. When comparing the “do something” scenario against the “do minimum” scenario, i.e. the operational emissions of the existing development, the net contribution of the proposed development during construction and operation is expected to contribute to 0.0005% of the UK’s carbon budgets for 2023-2027, 0.0006% of the UK’s carbon budget for 2028-2032, and 0.0011% of the UK’s carbon budget for 2033-2037. The construction and operation of the Proposed Development expected to contribute to 0.061% of Greater Manchester’s carbon budget for 2023-2027, and 0.133% of Greater Manchester’s carbon budget for 2028-2032, and 0.266% of the Greater Manchester’s carbon budget for 2033-2037. The construction and operation of the Proposed Development is expected to contribute 0.002% to the buildings sector carbon budget for 2023 to 2027, 0.003% for 2028 to 2032, and 0.005% for 2033 to 2037.
- 9.123. Due to the low percentage of the construction and operation net GHG emissions in comparison to the national, regional and projected buildings sector carbon budgets and embedded mitigation measures, the Proposed Development is assessed as compatible with the budgeted, science-based 1.5 °C trajectory in terms of rate of emissions reduction.
- 9.124. Based on GHG calculations and assuming that the GHG mitigation measures listed below are implemented and the net zero carbon operational energy targets are met, the proposed development is assessed as being Minor Adverse (Significant). The Proposed Development’s GHG emissions impacts have been mitigated at this stage and meet the applicable existing and emerging policy requirements. Therefore, the Proposed Development would contribute to decarbonisation in line with MCC’s and UK’s policy goals for projects of this type and is considered to be **Minor Adverse (Not significant)**.

Mitigation Measures

- 9.125. The ES chapter has provided details of the proposed mitigation as detailed in other ES chapters for both the construction and operational stages as well as any additional mitigation that may be required as a result of the CCR, ICCL and GHG assessments.

Climate Change Resilience

- 9.126. Good practice and potentially embedded measures that would be considered during the construction stage have been included within Table 1 of Appendix 9.1: Climate Change Resilience Assessment. A non-exhaustive list of mitigation measure has also been included below:
- The contractor/s would conduct a high-level risk assessment of severe weather impacts, considering the UKCP18, on the construction process to inform any required mitigation. Any receptors and/or construction related operations and activities potentially sensitive to severe weather events would be considered in the assessment.
 - The contractors would use a short to medium range weather forecasting service from the Met Office (or other approved meteorological data and weather forecast provider), to inform short to medium term programme management, environmental control and impact mitigation measures.
 - The main contractors’ Environmental Management System (EMS) would consider all measures deemed necessary and appropriate to manage severe weather events and would, as a minimum, cover training of personnel and prevention and monitoring arrangements. As appropriate, construction method statements would also consider severe weather events where risks have been identified.
 - The contractors would, as far as is reasonably practicable, use construction materials with superior properties that offer increased tolerance to fluctuating temperatures, heavy precipitation and other extreme weather events such as storms.
 - The Principal Contractor will produce a Construction Phase Health and Safety Plan and a Construction Management Plan (CMP) prior to construction works on-site, to address construction risks in more detail.
- 9.127. Good practice and potentially embedded measures that would be considered during the operation stage have been included within Table 2 of Appendix 9.1: Climate Change Resilience Assessment. A non-exhaustive list of mitigation measure has also been included below:

- The Drainage Strategy for the Proposed Development recommends blue roof with landscaped features on building D1 (temporary attenuation), and infiltration via tree pits.
- External shading would be included on southern façade to reduce heat stress.
- Assets would be maintained regularly to detect deterioration and damage caused by extreme weather events such as storms through maintenance and monitoring in contracts.
- Water efficiency measures are provided including time restricted taps.

In-combination Climate Change Impacts

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

Greenhouse Gas Emissions from the Proposed Development

- 9.129. Potential mitigation measures for GHG emissions during the construction stage could include:
- A requirement for energy efficient, low carbon design in buildings/new assets using low carbon materials to reduce GHG emissions from embodied carbon in materials.
 - Follow the structure (do not build, build less, design clever, construct efficiently and offset and sequester) for working through and identifying potential opportunities and interventions from early stage.
 - Measures to reduce construction waste arisings through sustainable procurement, designing out waste, recycling onsite, reusing landfill materials, balancing the cut and fill and setting waste targets in order to minimise GHG emission from the transportation of waste.
 - Minimising water uses during construction.
- 9.130. Potential mitigation measures for GHG emissions during the operational stage include:
- Applying measures to reduce operational waste, such as providing adequate provision for internal and external waste storage and setting waste recycling targets to reduce GHG emissions from the transportation of waste.
 - Encouraging public transport use and active travel via the implementation of a Sustainable Travel Plan.
 - Improving and enhancing the safety and provision of the public realm, which would attract members of the community to take more sustainable modes of travel, such as walking and cycling, to access surrounding areas. This has the potential to reduce reliance on private car journeys.
 - The Applicant to select tenants who have stringent net zero targets and strategies to reduce GHG emissions associated to the Proposed Development.

Cumulative Effects

Climate Change Resilience

- 9.131. The climate resilience effects identified as a result of the construction and operational stages are limited in their spatial extent to the Site boundary and the Proposed Development in isolation. Therefore, cumulative climate change resilience effects with other schemes have been considered.

In-combination Climate Change Impacts

- 9.132. The climate change chapter has considered potential in-combination cumulative climate impacts affecting environmental receptors identified by other topic chapters. It includes consideration of existing potential impacts on environmental receptors that could be intensified by climate change as well as environmental impacts that could potentially emerge in the future.
- 9.133. The ICCL's resulting from the construction, and operational stages would be limited in their spatial extent to the relevant technical assessments in the ES for the Proposed Development. Therefore, ICCL cumulative effects have not been considered with other cumulative schemes.

Greenhouse Gas Emissions from the Proposed Development

- 9.134. The atmospheric concentration of GHGs and resulting effect on climate change is affected by all sources and sinks globally, anthropogenic and otherwise. As GHG emission impacts and resulting effects are global rather than affecting one localised area, the approach to cumulative effects assessment for GHGs differs from that for many EIA topics where only projects within a geographically bounded study area of, for example, 10km would be included.
- 9.135. Therefore, effects of GHG emissions from specific cumulative projects have not been individually assessed. However, GHG emissions, have been contextualised within the UK and Manchester City Council and relevant sector-based carbon budgets.

Residual Effects

Table 9-17 Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Receptor(s)	Likely Significant Effects	Mitigation Measures	Residual Effects
Construction			
Climate Change Resilience			
Buildings	Heavy rainfall leading to stockpile erosion and siltation of drainage assets	None required	Not significant
Buildings	Heavy rainfall leading to inability to undertake construction activity and programme delays	None required	Not significant
Environmental and human health receptors	Heavy rainfall spreading contaminated soil during ground excavations	None required	Not significant
Human Health	Heavy rainfall leading to groundwater flooding, affecting site personnel undertaking groundworks	None required	Not significant
Human Health	Heatwaves and high temperatures affecting site personnel welfare	None required	Not significant
Human Health	Heatwaves and high temperatures leading to increased dust generation	None required	Not significant
Buildings	Heatwaves and high temperatures leading to inability to undertake construction activity and programme delays	None required	Not significant

Receptor(s)	Likely Significant Effects	Mitigation Measures	Residual Effects
Buildings	Strong winds leading to damage of stockpiles	None required	Not significant
Human Health	Strong winds leading to site personnel and nearby pedestrian harm	None required	Not significant
Human Health	Strong winds affecting on-site crane operations	None required	Not significant
Buildings	Strong winds leading to damage to site hoardings	None required	Not significant
In-Combination Climate Change Impact			
Traffic and Transport	Potential interactions of climate change with the identified Traffic and Transport effects	None required	Not significant
Air Quality	Potential interactions of climate change with the identified Air Quality effects	None required	Not significant
Noise	Potential interactions of climate change with the identified Noise effects	None required	Not significant
Human Health	Potential interactions of climate change with the identified Human Health effects	None required	Not significant
Greenhouse Gas Emissions			
Global Climate	GHG Emissions	Carbon offset payments to ensure the construction is net zero.	Minor Adverse (Not significant)
Operational			
Climate Change Resilience			
Buildings	Increased frequency of intense rainfall leading to overwhelming of drainage assets and potential flooding	None required	Not significant
Buildings	Wetter winters and increased frequency of intense rainfall leading to elevated groundwater levels and potential flooding	None required	Not significant
Building and human health receptors	River level rise leading to flooding	None required	Not significant
Environment	Drought conditions affecting landscape design and planting	None required	Not significant
Building	Increased mean temperatures and heatwaves leading to failure of M&E equipment	None required	Not significant

Receptor(s)	Likely Significant Effects	Mitigation Measures	Residual Effects
Human Health	Increased mean temperatures and heatwaves leading to overheating in residential element	None required	Not significant
Building and Human Health	Drought conditions affecting potable water availability	None required	Not significant
Human Health	Windstorm events and extreme winds leading to damage to the development	None required	Not significant
In-Combination Climate Change Impact			
Traffic and Transport	Potential interactions of climate change with the identified Traffic and Transport effects	None required	Not significant
Air Quality	Potential interactions of climate change with the identified Air Quality effects	None required	Not significant
Noise	Potential interactions of climate change with the identified Noise effects	None required	Not significant
Human Health	Potential interactions of climate change with the identified Human Health effects	None required	Not significant
Greenhouse Gas Emissions			
Global Climate	GHG Emissions	The Proposed Development is fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. The Proposed Development should be fully in line with measures necessary to achieve the UK's trajectory towards net zero.	Minor Adverse (Not significant)

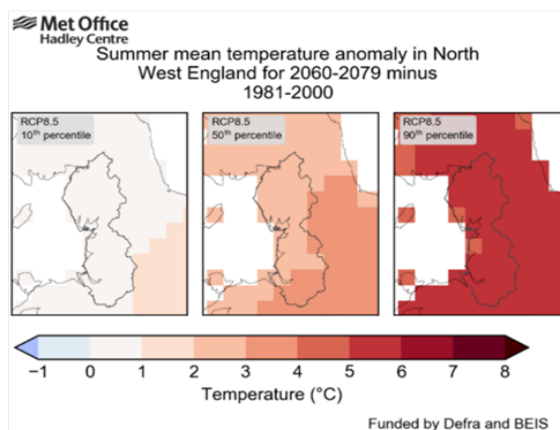
Reference List

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

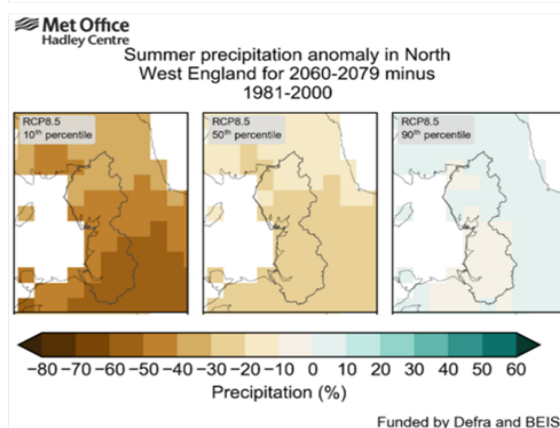
- BEIS, 2021, UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2019, Available from: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fassets.publishing.service.gov.uk%2Fgovernment%2Fuploads%2Fsystem%2Fuploads%2Fattachment_data%2Ffile%2F996057%2F2005-19_UK_local_and_regional_CO2_emissions.xlsx&wdOrigin=BROWSELINK [Accessed 25/05/2022].
- BRE Standard Assessment Procedure (SAP) 10.1. Available at: <https://bregroup.com/sap/sap10/> [Accessed 23/06/2022]
- CIBSE, TM54 Evaluating Operational Energy Use at the Design Stage, 2022
- Climate Change Committee, 2020. Sixth Carbon Budget 4. Supporting Information, charts and data. Available at: <https://www.theccc.org.uk/publication/sixth-carbon-budget/> [Accessed 25/05/2022]
- Climate Change Committee, 2021. Independent Assessment of UK Climate Risk. Available at: <https://www.theccc.org.uk/publication/independent-assessment-of-uk-climate-risk/> [accessed 19/04/2022]
- DEFRA, 2021. Emissions Factors Toolkit. Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html> [Accessed 08/03/2022]
- Department for Business, Energy and Industrial Strategy, 2020. The UK's Nationally Determined Contribution communication to the UNFCCC. Available at: <https://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc> (accessed 12/05/2022).
- Department for Communities and Local Government, 2021; National Planning Policy Framework. July 2021 (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/100575/9/NPPF_July_2021.pdf [Accessed 27/05/2022].
- Greater Manchester Combined Authority, 2019. Five-Year Environment Plan. Available at: <https://www.greatermanchester-ca.gov.uk/what-we-do/environment/five-year-environment-plan/#:~:text=Greater%20Manchester%20is%20taking%20action%20with%20the%20Five-Year,the%20next%20five%20years%20to%20help%20achieve%20this.> [Accessed 25/04/2022].
- <https://etoolglobal.com/>
- IEMA, Assessing Greenhouse Gas Emissions and Evaluating their Significance, Feb 2022
- Manchester City Council, Core Strategy Development Plan Document 2012 – 2027, 2012, https://www.manchester.gov.uk/info/200074/planning/6573/core_strategy_2012-2027
- Manchester City Council, Sustainability Appraisal Report, 2011, https://www.manchester.gov.uk/downloads/download/5949/documents_supporting_the_core_strategy
- Met Office Historic Station Data. Available from: <https://www.metoffice.gov.uk/research/climate/maps-and-data/historic-station-data>. [Accessed 27/05/2022]
- Met Office, 2018. UK Climate Projections 2018 (UKCP18). Factsheet: Wind. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-wind_march21.pdf [Accessed 11/05/2022].
- Ministry of Housing, Communities and Local Government, 2019; National Planning Policy Guidance, Climate Change (online). Available at: <https://www.gov.uk/guidance/climate-change> [Accessed 27/05/2022]
- Ramboll, Didsbury Technology Park, Environmental Standards Statement, Feb 2021
- RICS professional standards and guidance, UK. Whole life carbon assessment for the built environment. (1st edition, November 2017) Available at: <https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the-built-environment-november-2017.pdf> [Accessed 01/06/2022]
- RICS Professional Statement, Whole life carbon assessment for the built environment, November 2017, Table 3.
- Secretary of State, 2019. Climate Change Act 2008 (2050 Target Amendment) Order 2019.
- The Manchester Climate Change Partnership, Manchester Climate Change Framework 2020 – 2025, 2020, <https://www.manchesterclimate.com/sites/default/files/Manchester%20Climate%20Change%20Framework%202020-25.pdf>
- The Tyndall Centre. 2018. Quantifying the implications of the Paris Agreement for Greater Manchester. Available at: <https://www.manchesterclimate.com/sites/default/files/Greater%20Manchester%20Carbon%20Budget.pdf#:~:text=Within%20this%20range%20of%20budgets%20a%20%E2%80%98recommended%20carbon,104%20MtCO2%2C%20for%20the%20period%20from%202018%20onwards.> [Accessed 25/05/2022].
- The UKCP18 projections are available from the Met Office website: <https://www.metoffice.gov.uk/research/collaboration/ukcp/download-data>
- UK Carbon Budgets, 2019. House of Commons Library. www.parliament.uk/commons-library

- UK Government, 2018. A Green Future: Our 25 Year Plan to Improve the Environment (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf [Accessed 27/05/2022]
- UK Government, 2019. UK Carbon Budgets, House of Commons Library. Available at: www.parliament.uk/commons-library [Accessed 12/05/2022].
- UK Government, 2022. UK Climate Change Risk Assessment 2022 (Policy Paper) Presented to Parliament pursuant to Section 56 of the Climate Change Act 2008. Available at: <https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2022>. [Accessed 27/05/2022].
- UK Government. 2022. Greenhouse Gas Conversion Factors. Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fassets.publishing.service.gov.uk%2Fgovernment%2Fuploads%2Fsystem%2Fuploads%2Fattachment_data%2Ffile%2F1083854%2Fghg-conversion-factors-2022-condensed-set.xls&wdOrigin=BROWSELINK [Accessed 11/10/2022].
- UK local authority and regional carbon dioxide emissions national statistics: 2005-2017. UK Government. Available at: <https://www.gov.uk/government/collections/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics>. [Accessed 27/05/2022]
- UNFCCC, 1998. Kyoto Agreement. Available at: https://unfccc.int/kyoto_protocol [Accessed 11/05/2022].
- UNFCCC, 2015. Paris Agreement. Available at: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> [Accessed 11/05/2022].
- UNFCCC, 2016. NDC User Guide. Available at: [https://unfccc.int/files/focus/indc_portal/application/pdf/ndc_parties_userguide_version_1__may_2016_\(2\).pdf](https://unfccc.int/files/focus/indc_portal/application/pdf/ndc_parties_userguide_version_1__may_2016_(2).pdf) (accessed 22/05/2022).

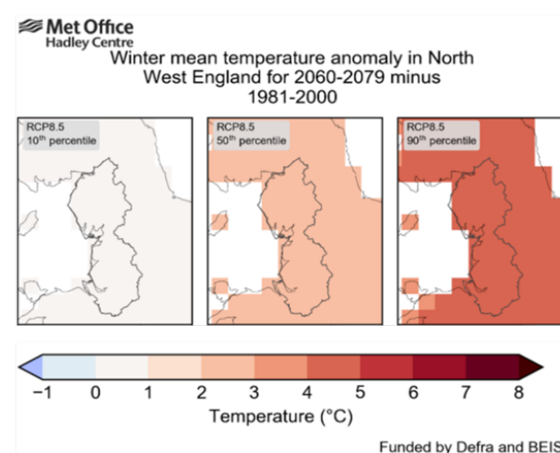
Summer Mean Temperature
Projected for North West
England 2060-2079 (RCP 8.5 and
50th percentile)



Summer Precipitation Projected
for North West England 2060-
2079 (RCP 8.5 and 50th
percentile)



Winter Mean Temperature
Projected for North West
England 2060-2079 (RCP 8.5 and
50th percentile)



Winter Precipitation Projected
for North West England 2060-
2079 (RCP 8.5 and 50th
percentile)

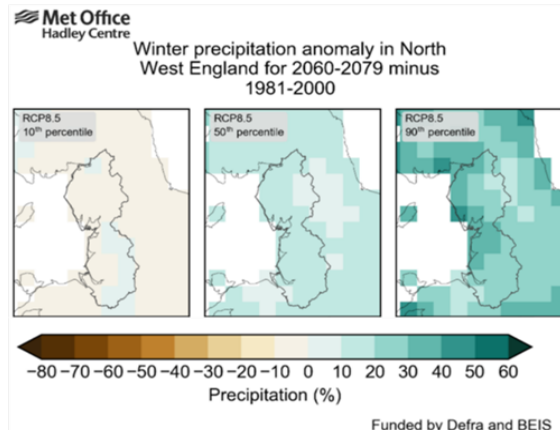


Figure: 9.1

	Title:	North West Climate Projections		
	Project:	Ev0		
	Date:	June 2022	Scale:	N/A

10. Residual Impacts

Traffic and Transport

- 10.1. Curtins has considered the anticipated effects of the Proposed Development on existing traffic conditions in the study area. The assessments have been informed by a combination of numerical analysis and professional judgement/experience.
- 10.2. The construction phase is likely to have a direct, temporary, short-term (reversible), **Minor Adverse** effect at a local level for the following, which is **not significant**. Notwithstanding, it is considered best practice to provide a CEMP with various measures that promote travel planning, considerate construction practices and agree traffic management measures.
- 10.3. Following the implementation of these measures, the impacts of the construction phase would remain as **Minor Adverse** and **not significant**.
- 10.4. The completed and operational phase is likely to have a direct, permanent, long-term, **Negligible to Minor Adverse** effect at a local level, which is **not significant** overall.
- 10.5. Improvements to the Application Site access junction have been proposed as a mitigation measure, inclusive of signal controls, to improve the operation and safety of the junction.
- 10.6. An FTP has also been prepared to minimise the number of car trips generated by the development and encourage staff and visitors to use sustainable modes of transport.
- 10.7. Following the implementation of these measures, the impacts of the operational phase would remain **Neutral to Minor Adverse**, which is **not significant**.

Air Quality

Receptor	Likely Significant Effects	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
				+	D	P	R	St
				-	I	T	IR	Mt
								Lt
Demolition and Construction								
Existing Off-site Human Health and Amenity	Dust Soiling and PM10 due to demolition and construction stage works	None required	Not significant	-	D	T	R	Mt
Existing Off-site Human Health	Change in NO2, PM10 and PM2.5 levels due to demolition and construction stage vehicle emissions	None required	Not significant	-	D	T	R	Mt
Completed Development								
Existing Off-site Human Health	Change in NO2, PM10 and PM2.5 levels due to	None required	Not significant	-	D	P	IR	Lt

	completed development stage vehicle emissions							
Existing Future On-site Human Health	Change in NO2, PM10 and PM2.5 levels due to vehicle emissions.	None required	Not significant	-	D	P	IR	Lt
Notes: * - = Adverse/ + = Beneficial/ +/- Neutral; D = Direct/ I = Indirect; P = Permanent/ T = Temporary; R=Reversible/ IR= Irreversible; St- Short term/ Mt –Medium term/ Lt –Long term. **Air quality effects are deemed to significant or not significant, there are no degrees of significance								

Human Health

Likely Significant Effect	Receptor(s)	Mitigation Measure	Means of Implementation of Mitigation	Post Mitigation Residual Effect – Significance and Duration (i.e Temporary/Permanent)
Construction Phase				
Climate Change Resilience – high temperatures	Site personnel	None required	None	Not Significant
Climate Change Resilience – strong winds	Site personnel & nearby pedestrians	None required	None	Not Significant
GHG emissions	Global climate	Carbon offset payments to ensure construction is net zero		Minor Adverse (Not Significant)
Transport	Drivers, cyclists & pedestrians	Agreed traffic management	Construction Method Statement	Slight Adverse (Not Significant)
Air quality	Site personnel & nearby residential, schools & hospital	Agreed construction methods & traffic management	Construction Method Statement	Adverse, Not Significant
Operational Phase				
Health care provision	Healthcare	None	None	Negligible on healthcare provision
Crime	Crime	None	None	Negligible on crime
Open space & recreation facilities	Open space & recreational facilities	None	None	Negligible on open space & recreational facilities
Climate Change Resilience – high temperatures	Building users	None required	None	Not Significant
Climate Change Resilience – strong winds	Building users & nearby pedestrians	None required	None	Not Significant

GHG emissions	Global climate	Proposed Development in line with measures to achieve UK's trajectory towards net zero carbon		Minor Adverse (Significant)
Transport	Drivers, cyclists & pedestrians	Improvements to site access junction including signalling	Travel Framework Plan	Neutral – Slight Adverse (Not Significant)
Air Quality	Nearby residential, schools & hospital	None required	None	Adverse, Not Significant

Climate Change

Receptor(s)	Likely Significant Effects	Mitigation Measures	Residual Effects
Construction			
Climate Change Resilience			
Buildings	Heavy rainfall leading to stockpile erosion and siltation of drainage assets	None required	Not significant
Buildings	Heavy rainfall leading to inability to undertake construction activity and programme delays	None required	Not significant
Environmental and human health receptors	Heavy rainfall spreading contaminated soil during ground excavations	None required	Not significant
Human Health	Heavy rainfall leading to groundwater flooding, affecting site personnel undertaking groundworks	None required	Not significant
Human Health	Heatwaves and high temperatures affecting site personnel welfare	None required	Not significant
Human Health	Heatwaves and high temperatures leading to increased dust generation	None required	Not significant
Buildings	Heatwaves and high temperatures leading to inability to undertake construction activity and programme delays	None required	Not significant
Buildings	Strong winds leading to damage of stockpiles	None required	Not significant
Human Health	Strong winds leading to site personnel and nearby pedestrian harm	None required	Not significant
Human Health	Strong winds affecting on-site crane operations	None required	Not significant
Buildings	Strong winds leading to damage to site hoardings	None required	Not significant
In-Combination Climate Change Impact			
Traffic and Transport	Potential interactions of climate change with the identified Traffic and Transport effects	None required	Not significant
Air Quality	Potential interactions of climate change with the identified Air Quality effects	None required	Not significant
Noise	Potential interactions of climate change with the identified Noise effects	None required	Not significant
Human Health	Potential interactions of climate change with the identified Human Health effects	None required	Not significant
Greenhouse Gas Emissions			
Global Climate	GHG Emissions	Carbon offset payments to ensure	Minor Adverse (Not significant)

Receptor(s)	Likely Significant Effects	Mitigation Measures	Residual Effects
		the construction is net zero.	
Operational			
Climate Change Resilience			
Buildings	Increased frequency of intense rainfall leading to overwhelming of drainage assets and potential flooding	None required	Not significant
Buildings	Wetter winters and increased frequency of intense rainfall leading to elevated groundwater levels and potential flooding	None required	Not significant
Building and human health receptors	River level rise leading to flooding	None required	Not significant
Environment	Drought conditions affecting landscape design and planting	None required	Not significant
Building	Increased mean temperatures and heatwaves leading to failure of M&E equipment	None required	Not significant
Human Health	Increased mean temperatures and heatwaves leading to overheating in residential element	None required	Not significant
Building and Human Health	Drought conditions affecting potable water availability	None required	Not significant
Human Health	Windstorm events and extreme winds leading to damage to the development	None required	Not significant
In-Combination Climate Change Impact			
Traffic and Transport	Potential interactions of climate change with the identified Traffic and Transport effects	None required	Not significant
Air Quality	Potential interactions of climate change with the identified Air Quality effects	None required	Not significant
Noise	Potential interactions of climate change with the identified Noise effects	None required	Not significant
Human Health	Potential interactions of climate change with the identified Human Health effects	None required	Not significant
Greenhouse Gas Emissions			
Global Climate	GHG Emissions	The Proposed Development is fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. The Proposed Development should be fully in line with measures necessary to achieve the UK's trajectory towards net zero.	Minor Adverse (Not significant)

11. Type 1 Cumulative Assessment

Introduction

- 11.1. This section gives consideration to 'Type 1' cumulative effects.
- 11.2. The assessment is informed by the results of the technical assessments as set out in Chapter 6 - 9 of the ES.
- 11.3. Type 1 cumulative effects are also known as 'inter-project' effects, which are the combined effects arising from the Proposed Development upon a set of defined sensitive receptors.
- 11.4. Type 2 cumulative effects are considered within the ES technical chapters. The technical chapters also had regard to the potential for Type 1 cumulative effects, however for robustness the results of a standalone assessment of these is provided below. The standalone assessment is based on the professional opinion and experience of Deloitte, in its capacity as the EIA coordinator.

Legislation, Policy and Guidance

Legislation

- 11.5. There is no legislation outlining how cumulative effects should be assessed or determined as significant. However, there is a requirement in Part 1, Schedule 4 of the EIA Regulations to consider cumulative effects. Cumulative is not defined in the EIA Directive or Regulations however a dictionary definition is 'increasing by one addition after another'.
- 11.6. The EIA Regulations require 'a description of the likely significant effects', including cumulative effects.
- 11.7. In the context of this assessment, 'cumulative effects' refers to the interactions between different likely residual effects resulting from the Proposed Development (Type 1). Both positive and negative effects are considered across the construction and operational phases.

Policy

As this chapter considers the cumulative effects of the technical areas within the ES, all relevant policy has already been reviewed within the individual technical chapters. Guidance 19.9. A number of guidance documents which relate to assessing cumulative effects have been used to inform the assessment and include:

- European Commission (EC) Environment DG (May 1999), 'Study on the Assessment of Indirect and Cumulative Impacts as well as Impact Interaction', Hyder Consulting; and
 - Institute of Environmental Management and Assessment (1992), Guidelines for the Environmental Assessment of Road Traffic.
- 11.8. The EC guidelines 'are not intended to be formal or prescriptive, but are designed to assist EIA practitioners in developing an approach which is appropriate to a project'.
- 11.9. Paragraph 24 of the National Planning Practice Guidance (NPPG) (Reference ID: 4-024-20170728) outlines the consideration to be given to cumulative effects in the context of EIA:

"Each application (or request for a screening opinion) should be considered on its own merits. There are occasions, however, when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a Proposed Development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development."

Assessment Methodology and Significance Criteria

Methodology

- 11.10. This assessment is primarily concerned with where there is a likelihood of significant Type 1 cumulative effects occurring, in accordance with EIA practice and the NPPG guidance.
- 11.11. The assessment is based on experience and professional judgement, drawing upon relevant guidance set out above and the residual environmental effects identified within the results of the EIA technical assessments. The assessment has been undertaken by suitably qualified and experienced EIA practitioners.
- 11.12. The assessment has primarily focused on sensitive receptors identified within close proximity to the Site (e.g. local residents and businesses located in close proximity to the Site), likely cumulative effects, and their capacity to accommodate changes that will occur as a result of the combined residual environmental effects.
- 11.13. Relevant guidance has been reviewed, and an approach has been developed which uses the residual environmental effects identified within the ES. An exercise which tabulates the residual effects against receptors or receptor groups has then been carried out in order to identify the potential for Type 1 cumulative effects.
- 11.14. Negligible or neutral residual effects have been excluded from the assessment as, by their nature, they are considered to be imperceptible. Therefore, only minor, moderate or major effects have been given consideration during the assessment.
- 11.15. For the purposes of the assessment, receptor groups have been identified as those surrounding the Site and those identified within the individual technical assessments.

Significance Criteria

- 11.16. The following terms have been used to define the significance of the effects identified:
- Major effect: where the Proposed Development could be expected to have a very significant effect (either positive or negative) cumulatively;
 - Moderate effect: where the Proposed Development could be expected to have a noticeable effect (either positive or negative) cumulatively;
 - Minor effect: where the Proposed Development could be expected to result in a small, barely noticeable effect (either positive or negative) cumulatively; and
 - Negligible: where no discernible effect is expected as a result of the Proposed Development cumulatively.
- 11.17. The significance level attributed to each effect has been assessed based on the magnitude of change due to the combination of residual effects and the sensitivity of the affected receptor/receiving environment to change, as outlined in Chapter 2 of the ES. Magnitude of change is assessed on a scale of major, moderate, minor and negligible and the sensitivity of the affected receptor/receiving environment is assessed on a scale of high, medium, low and negligible.

Limitations and Assumptions

- 11.18. Due to the reliance on qualitative data and subjective opinion, there are limitations related to the range and depth in which the cumulative effects have been investigated. It must be realised that analysing the cumulative effects of developments is often speculative and cannot be predicted as clearly as individual effects such as the effects upon traffic of a development, which relies heavily upon quantitative data to inform the assessment.
- 11.19. As a result, a number of assumptions have been made throughout in terms of the outcome of the accumulation of effects and based upon professional judgement. This section and the assessment process of identifying the likely significant Type 1 cumulative effects have, however, provided a reasoned consideration of and insight into the potentially significant Type 1 cumulative effects of the Proposed Development.

Identification of Likely Significant Type 1 Cumulative Effects

Construction Phase

11.20. Based on the methodology detailed above, Table 11.1 presents the results of the review of the potential for interactions of individual effects during the construction phase of development. The potential effect interactions are then discussed further.

Table 11.1 Type 1 Cumulative Effects – Construction Phase

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Effects
Construction site workers	Air Quality: Non-significant impacts on local air quality during construction. Transport: Minor adverse impact on local traffic levels during construction phase.	No likely significant Type 1 cumulative effects.
Neighbouring users	Air Quality: Non-significant impacts on local air quality during construction. Transport: Minor adverse impact on local traffic levels during construction phase.	No likely significant Type 1 cumulative effects.
Carbon Emissions	Climate Change: Minor adverse impacts on GHG emissions	No likely significant Type 1 cumulative effects.

11.21. Table 11.1 shows that there is unlikely to in-combination construction phase Type 1 cumulative effects. The proposals construction methods are typical of an urban construction project and the ES has identified a number of key mitigation measures to be employed during the construction phase to mitigate and minimise construction impacts. These mitigation measures are expected to be secured by a Construction and Environmental Method Plan, which is standard construction best practice, to be agreed between the Applicant and MCC as a planning condition.

Operational Phase

11.22. Based on the methodology detailed above, Table 11.2 presents the results of the review of the potential for interactions of individual effects during the operational phase of development. The potential effect interactions are then discussed further.

Table 11.2 Type 1 Cumulative Effects – Operational Phase

Sensitive Receptor Group	Operational Phase Residual Effects	Likely Significant Effects
Local Population	Air Quality: Non-significant impacts on local air quality during construction. Local Amenity: Negligible impact on local amenity, including crime and open space	No likely significant Type 1 cumulative effects.
Carbon Emissions	Climate Change: Minor adverse impacts on GHG emissions	No likely significant Type 1 cumulative effects.

11.23. Table 11.2 shows that there is unlikely to be in-combination operational phase Type 1 cumulative effects to arise. This is due to the extensive technical assessments throughout the design process and the identified mitigation in-built into the design.

Mitigation Measures

- 11.24. Where relevant, the individual residual effects which contribute to the potential cumulation have been considered within the ES and mitigated where necessary and feasible.
- 11.25. No mitigation is proposed for the identified Type 1 cumulative effects.



This report has been prepared for Bruntwood (Didsbury TP) Ltd and on the understanding that it will be made publicly available.

All copyright and other proprietary rights in the report remain the property of Deloitte LLP and any rights not expressly granted in these terms or in the Contract are reserved. No party other than Bruntwood (Didsbury TP) Ltd is entitled to rely on the report for any purpose whatsoever and thus we accept no liability to any other party who is shown or gains access to this document. The information contained within this report is provided to assist Bruntwood (Didsbury TP) Ltd with this Application. The report makes use of a range of third-party data sources.

Whilst every reasonable care has been taken in compiling this report, Deloitte LLP cannot guarantee its accuracy. If this document contains details of an arrangement that could result in a tax or National Insurance saving, no such conditions of confidentiality apply to the details of that arrangement (for example, for the purpose of discussion with tax authorities). The scope of our Services does not include any consideration of the likely impact of Coronavirus (COVID-19) on the project or transaction to which our Services relate (including but not limited to any impact on valuation, planning, construction, maintenance, or costs). We recommend that if you have not done so already, you should consider the increasingly broad effects of COVID-19 and its negative impact on the UK and global economy and major financial markets.

Deloitte LLP is a limited liability partnership registered in England and Wales with registered number OC303675 and its registered office at 1 New Street Square, London, EC4A 3HQ, United Kingdom. Deloitte LLP is the United Kingdom affiliate of Deloitte NSE LLP, a member firm of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"). DTTL and each of its member firms are legally separate and independent entities. DTTL and Deloitte NSE LLP do not provide services to clients.

Please see www.deloitte.com/about to learn more about our global network of member firms. Real Estate Services regulated by RICS.

© 2022 Deloitte LLP. All rights reserved. This publication has been written in general terms and we recommend that you obtain professional advice before acting or refraining from action on any of the contents of this publication. Deloitte LLP accepts no liability for any loss occasioned to any person acting or refraining from action as a result of any material in this publication.