Robert Street, Manchester

Environmental Statement Volume II: Appendices

April 2026

BURO HAPPOLD

Environmental Statement Volume II: Appendices - Greenhouse Gas Emissions

Appendix 6.1 Climate Change Resilience Risk Assessment

Appendix 6.2 Greenhouse Gas Emissions Calculations

Appendix 6.3 Scope 3 Emissions Considerations

Appendix 6.4 Legislation, Policy and Guidance

BURO HAPPOLD

APPENDIX 6.1: CLIMATE CHANGE RESILIENCE RISK ASSESSMENT

1.1 INTRODUCTION

1.1.1 Schedule 4, Clause 5(f) of the Town and Country Planning (EIA) Regulations 2017 states that information should be included in the ES on the likely significant effects of the development on the environment resulting from the vulnerability of the project to climate change.

1.1.2 In line with the IEMA EIA Guide to Climate Change Resilience and Adaptation (IEMA, 2020) (hereafter referred to as the "IEMA Resilience & Adaptation Guidance"), there are two key strands to assessing climate change resilience and adaptation issues within EIA:

- The risks of changes in the climate to the project (i.e. the resilience or conversely the vulnerability of a project to future climate changes). The IEMA Resilience & Adaptation Guidance states that this is generally better suited to a risk assessment type process than traditional EIA *'determination of significance'*. A climate change resilience risk assessment (CCRA) has therefore been undertaken for the proposed development and is reported in this appendix; and
- The extent to which climate exacerbates or ameliorates the effects of the project on the environment (i.e., *'in-combination'* effects). The IEMA Resilience & Adaptation Guidance states that this is best analysed in the existing chapters of the ES and is suited to using traditional significance criteria from the respective chapters. Therefore, this has been included throughout each of the technical ES chapters and has been completed by each technical specialist.

1.2 METHODOLOGY AND ASSESSMENT CRITERIA

Risk assessment

1.2.1 This climate change resilience risk assessment has been undertaken in line with the IEMA Resilience & Adaptation Guidance. The methodology has also been informed by other guidance documents referenced in the IEMA Resilience & Adaptation Guidance, including the C40 Cities Climate Change Risk Assessment Guidance (2018 & 2025), the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Climate Risk Assessment Methodology (2015), and the Highways England Design Manual for Roads and Bridges Sustainability & Environmental Appraisal (2020). Risks have been assessed based on both the probability of the event occurring and the severity of the consequences of the event, should it occur. The assessment is based on climate change projection data from UKCP18, as well as information provided in other submitted reports, including the Flood Risk Assessment (FRA) and Drainage, Ground Conditions Desk Top Study (Ridge & Partners, 2024). The list of climate hazards that has been considered has been adapted from the C40 Cities Climate Change Risk Assessment Guidance (2018).

Probability

1.2.2 Table 1 summarises the criteria that have been used to determine the likelihood rating for an effect, adapted from Appendix 1 of the IEMA 2020 guidance. The project lifetime includes both the construction and operational stages. In line with the principles set out in BS EN 15978, a Reference Study Period (RSP) of 60 years after opening (the opening year) has been used.

Table 1 Criteria used to determine likelihood

Score	Description (probability and frequency of occurrence)
1	The event occurs very rarely during the lifetime of the projects (60 years). For example, once every 60 years (1 event).
2	The event occurs a limited number of times during the lifetime of the project (60 years). For example, once every 25 years (2-3 events).
3	The event occurs regularly during the lifetime of the project (60 years) For example, once every 2-5 years (12-30 events).
4	The event occurs frequently during lifetime of the project (60 years). For example, once per year (60 events).
5	The event occurs very frequently during the lifetime of the project (60 years). For example, multiple times per year (more than 60 events).

Consequence

1.2.3 summarises the criteria used to determine the consequence rating for effects relating to a climate risk. Consequence has been determined based on the extent to which the climate risk may impact on the amenity value and function of the proposed development. The amenity value is the positive element or elements that contribute to the overall character or enjoyment of the proposed development. The function is the extent to which the proposed development meets the purpose or purposes that it is designed to fulfil.

1.2.4 Table 2 summarises the criteria used to determine the consequence rating for effects relating to a climate risk. Consequence has been determined based on the extent to which the climate risk may impact on the amenity value and function of the proposed development. The amenity value is the positive element or elements that contribute to the overall character or enjoyment of the proposed development. The function is the extent to which the proposed development meets the purpose or purposes that it is designed to fulfil.

Table 2 Criteria used to determine consequence

Score	Description
1	Very low but measurable effect on site users and the proposed development itself. Slight negative change in amenity value of the proposed development and slight negative change in function.
2	Low but measurable effect on site users and the proposed development itself. Low negative change in amenity value of the proposed development and slight negative change in function.
3	Moderate effect on site users and the proposed development itself. Moderate negative change in amenity value of the proposed development and slight negative change in function.
4	Moderate effect on site users and the proposed development itself. Major negative change in amenity value of the proposed development and low negative change in function.
5	Moderate effect on site users and the proposed development itself. Major negative change in amenity value of the proposed development and moderate negative change in function.
6	Major effect on site users and the proposed development itself. Major negative change in amenity value of the proposed development and major negative change in function.
7	Extreme effect on site users and the proposed development itself. Loss of asset.

Risk rating

1.2.5 Table 3 sets out the matrix that has been used to determine the risk rating, based on both the probability of the event occurring and the severity of the consequences of the event, should it occur.

Copyright © 1976 - 2026 Buro Happold. All rights reserved

Table 3 Risk rating determined based on the likelihood and consequence scores

	Probability					
Consequence		1	2	3	4	5
	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	18
	5	5	10	15	20	25
	6	6	12	18	24	30
	7	7	14	21	28	35

	Low risk
	Medium risk
	High risk

Limitations and assumptions

1.2.6 The main uncertainty regarding the CCRA surrounds the climate change projections that the scheme is assessed against. Climate change projections (e.g., UKCP18) are presented using a set of scenarios that capture the relationships between human choices, emissions, concentrations and temperature change. The UKCP18 climate change projections have been selected, as they are UK specific, and relatively conservative. Some scenarios are consistent with continued dependence on fossil fuels, while others are associated with deliberate actions to reduce GHG emissions. Therefore, these climate change projections contain inherent uncertainty, reflecting the uncertainty associated with quantifying human activities (including technological change) and their influence on climate. There are four Representative Concentration Pathway (RCP) scenarios available in the UKCP18 climate projections: RCP 2.6, RCP 4.5, RCP 6.0 and RCP 8.5. In line with the IEMA (2020) guidance, RCP 8.5 has been used, which represents the most conservative, highest-impact scenario.

1.3 LEGISLATION AND POLICY

Legislation

Paris Agreement 2015

1.3.1 Negotiations at the Conference of the Parties (COP) 21 led to the 2015 Paris Agreement, the aim of which is to maintain the increase in global average temperature at 'well below' 2oC and 'pursue efforts' to limit the temperature increase even further to 1.5oC.

1.3.2 A total of 160 parties, including the UK, made voluntary pledges to reduce emissions by 2030, however the cumulative effect of these would still lead to an estimated 3oC of warming or greater.

The Special Report on Global Warming of 1.5oC, International Panel on Climate Change (IPCC) 2018

1.3.3 The IPCC published a special report in response to the Paris Agreement, to present the impacts of the targeted 1.5ºC temperature rise. With regards to climate change resilience and adaptation it states the following:

D.3: *'Adaptation options specific to national contexts, if carefully selected together with enabling conditions, will have benefits for sustainable development and poverty reduction with global warming of 1.5ºC, although trade-offs are possible'*

A.3: *'Climate-related risks for natural and human systems are higher for global warming of 1.5°C than at present, but lower than at 2°C (high confidence). These risks depend on the magnitude and rate of warming, geographic location, levels of development and vulnerability, and on the choices and implementation of adaptation and mitigation options (high confidence)'*

UK Climate Change Act 2008 (2050 Target Amendment) (Order 2019)

1.3.4 Section 56 requires the UK Government to undertake a Climate Change Risk Assessment (CCRA) on a five-yearly cycle, with the subsequent development of an adaption programme to deliver resilience against these risks. The Act stipulates that the Government must assess '*the risks for the United Kingdom from the current and predicted impacts of climate change*'.

National policy and guidance

National Planning Policy Framework (NPPF), Ministry of Housing, Communities & Local Government (MHCLG (formerly DLUHC), 2025)

1.3.5 Section 14 of the NPPF 2024 focuses on meeting the challenge of climate change, flooding and coastal change. Paragraph 160 states that *'New developments should be planned for in ways that:*

a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through incorporating green infrastructure and sustainable drainage systems'.

National Planning Practice Guidance (NPPG) (MHCLG (formerly DLUHC), 2025)

1.3.6 The Climate Change Guidance states:

'Planning can also help increase resilience to climate change impact through the location, mix and design of development' and that there are *'requirements for local authorities to adopt proactive strategies to mitigate and adapt to climate change in line with the provisions and objectives of the Climate Change Act 2008, and co-operate to deliver strategic priorities which include climate change.'*

UK Climate Change Risk Assessment (HM Government, 2022)

1.3.7 The third and most recent UK-wide CCRA was published in 2022. The assessment outlines risks in the eight priority risk areas relating to the following topics:

- Risks to the viability and diversity of terrestrial and freshwater habitats and species from multiple hazards (Priority Risk Area 1);
- Risks to soil health from increased flooding and drought (Priority Risk Area 2);
- Risks to natural carbon stores and sequestration from multiple hazards, leading to increased emissions (Priority Risk Area 3);
- Risks to crops, livestock and commercial trees from multiple climate hazards (Priority Risk Area 4);
- Risks to supply of food, goods and vital services due to climate-related collapse of supply chains and distribution networks (Priority Risk Area 5);
- Risks to people and the economy from climate-related failure of the power system (Priority Risk Area 6);
- Risks to human health, wellbeing and productivity form increased exposure to heat in homes and other buildings (Priority Risk Area 7);

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- Multiple risks to the UK from climate change overseas (Priority Risk Area 8); and
- Additional More Action Needed Risks.

1.3.8 **The third National Adaptation Programme and the Fourth Strategy for Climate Adaptation Reporting (Defra, 2023)**

1.3.9 The third and most recent National Adaptation Programme sets out the UK government's response to the third CCRA, showing the actions it is, and will be, taking to address the risks and opportunities posed by a changing climate. This breaks down the likely risks associated with climate change in terms of the following themes:

- 'Infrastructure';
- 'Natural environment';
- 'Health, communities, and the built environment';
- 'Business and industry';
- 'International dimensions'; and
- 'Working together'.

Regional and Local policy

Places for Everyone Joint Development Plan Documents for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan 2022 to 2039

1.3.10 Development will consider sustainability at the forefront of its design, making use of previously-developed (brownfield) land and vacant buildings to meet development needs.

Objective 8: Improve the quality of our natural environment and access to green spaces.

1.3.11 Objective 8 includes an aim to*: 'enhance special landscapes, green infrastructure, biodiversity and geodiversity; improve access to the natural environment and green spaces including parks; promote the role of green space in climate resilience and reducing flood risk. '*

Policy JP-G2: Green Infrastructure

1.3.12 Where possible, new green infrastructure should be integrated into development design and the developer should make appropriate provision for its long-term management and maintenance.

Policy JP-P1: Sustainable Places

1.3.13 The city region aims to be visually stimulating, socially inclusive and distinctive in design and cultural preservation.

1.3.14 It also aims to be resilient in its perception of environmental hazards, adaptable, durable and resource efficient, ensuring low-carbon footprint and an efficient use of land.

1.3.15 Design should also be functional and convenient, safe and supported by inclusive design that tackles socioeconomic inequalities. It should also be well-connected, comfortable and incorporate well-managed green infrastructure.

Policy JP-G3: River Valleys and Waterways

1.3.16 They will form a central part of the protection and improvement of green infrastructure as contributing to the Nature Recovery Network.

1.3.17 Some of the key considerations to river valleys and waterways are to: retain the open character; promote enjoyment of the features of valleys such as access to the countryside; protect the semi-natural habitats and their unique features such as ancient woodland; preserve areas of relative tranquillity and seclusion; reduce flood risk management through Natural Flood Management (NFM); improve water quality such as through land decontamination; enhance the re-naturalisation of riverbanks and flood plains; increase active access to green space through promotion of canals and watercourses for walking and cycling; and ensure the development relates positively to nearby rivers and other waterways.

Guide to Development in Manchester Supplementary Planning Document (SPD) and Planning Guidance. Adopted April 2007.

1.3.18 This guide is an update to the original Guide to Development in Manchester that was published in 1997. This guidance aims to support sustainable development and enhance the quality of neighbourhoods in Manchester by providing principles for developers, designers and residents. This aligns with government strategies and policies on sustainable development.

1.3.19 The guidance advises on energy efficiency, sustainable materials, renewable energy, promoting sustainable transport methods and incorporating green infrastructure through the public realm design.

1.3.20 Policy E1.5 encourages high standards of energy efficiency in new development. Developers should aim to reduce CO_2 emissions by at least 25% more than the requirements of the current Building Regulations.

1.3.21 "The following design principles will assist developers in achieving energy efficiency targets

- *Minimise resilience on energy-using equipment for heating, cooling, lighting and natural ventilation.*
- *Position trees and soft landscaping on and around the development and within buildings to provide natural shading, insulation and air conditioning.*
- *Integrate energy efficient micro-generation and community heating schemes, such as combined heat and power (CHP).*
- *Site layout and building design principles should maximise the capture and use of daylight and passive solar energy, whilst avoiding excessive solar gain in summer*
- *Specify energy and water efficient appliances and systems."*

Manchester's Local Development Framework. Core Strategy Development Plan 2012 to 2027 (MCC, 2012) (as amended, 2024)

1.3.22 This framework was updated in March 2024, after the Places for Everyone joint development plan was adopted.

1.3.23 The 2024 version includes an addendum which lists sections of the Core Strategy policies replaced by Places for Everyone policies, allowing for broader alignment with regional development goals.

1.3.24 PfE policies that have been added in this 2024 addendum under the heading Adaptation to Climate Change are listed below:

- JP –S2: Carbon and Energy – The aim of delivering a carbon neutral Greater Manchester no later than 2038.
- JP-S4: Flood Risk and the Water Environment – An integrated catchment-based approach will be taken to protect the quantity of quality of water bodies with reference to the North West River Basin Management Plant and managing flood risk.
- JP-G8: A Net Enhancement of Biodiversity and Geodiversity – Through local planning and associated activities a net enhancement of biodiversity resources will be sought.

Copyright © 1976 - 2026 Buro Happold. All rights reserved

Manchester City Council Climate Change Action Plan 2020-2025

1.3.25 The Manchester City Council (MCC) Climate Change Action Plan sets out MCC's commitments to tackling climate change from 2020-2025 and builds on previous plans over the last decade.

1.3.26 The purpose of the plan is as follows:

- *"The document sets out MCC's commitments to tackling climate change over the next 5 years and builds on previous action plans over the las decade.*
- *It covers MCC's plans for adapting to the expected impacts of climate change and supporting and influencing others, including through the implementation of the Manchester Green and Blue Infrastructure strategy 2015-2025"*

1.3.27 Recommended targets and objectives of the plan are as follows:

- *"To adapt the city's buildings, infrastructure and natural environment to the changing climate and to increase the climate resilience of our residents and organizations.*
- *To improve the health and wellbeing of everyone in Manchester through actions that also contribute to our objective for CO_2 reduction and adaptation and resilience, with particular focus on those most in need.*
- *To ensure that Manchester establishes an inclusive, zero carbon and climate resilient economy where every can benefit from playing an active role in decarbonizing and adapting the city to the changing climate"*
- *"We recognise that limiting CO_2 emissions is not enough. Depending on how successful the world is at reducing emissions, global temperatures by 2100 are likely to rise by between 1.5°C and 4°C above pre-industrial levels. As such, we need to accept that some level of change is inevitable. Climate change is happening now, and we need to assess the risks to our communities in order to reduce their vulnerability to these changes. Adopting appropriate mitigation measures will be essential if we are to create resilient communities of the future in Manchester."*

1.3.28 The plan states the following in relation to adaptation to climate change:

- *Despite the increased international efforts to tackle climate change, we recognise that the world's climate is already changing and that adaptation is required to protect the city's people. We are committed to ensuring that climate change adaptation, including green and blue infrastructure, is included in new developments and across Council owned buildings and land.*
- *Further work needs to be done at a local level through ward plans and neighbourhoods to adapt to make communities more resilient to climate change. This will form part of the Council's work through Neighbourhoods Teams, Highways and also through the development of improved communication information and guidance."*

1.3.29 The plan states the following in relation to citywide emissions:

- *"The Council also recognises the importance of supporting and influencing our residents and organisations to take action to reduce their direct and indirect CO_2 emissions and to adapt to the changing climate."*

1.3.30 It is stated that the following is included in the 2020-2025 Action Plan:

- *"This action plan details the activity that we will undertake over the next five years but also includes activities that will need to be developed and investigated further in order to ensure that we are on the right path to being zero carbon by 2038. The actions include activities to deliver a reduction in emissions from energy, transport and consumption (mitigation) but also adaptation and promoting investment in nature based solutions and green infrastructure."*

Manchester Climate Change Framework 2020-2025

1.3.31 The Manchester Climate Change Framework 2020-25 is the city's high-level strategy for tackling climate change. It sets out how Manchester will 'play its full part in limiting the impacts of climate change', a commitment in the Our Manchester Strategy 2016-25.

1.3.32 The framework sets the following objectives and targets relevant to climate change resilience and adaptation:

- *'Climate adaptation and resilience:*

  Adapting the city's buildings, infrastructure and natural environment to the changing climate and increasing the climate resilience of our residents and organisations.'

- *'Inclusive, zero carbon and climate resilient economy:*

  Ensuring that Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit from playing an active role in decarbonising and adapting the city to the changing climate.'

1.3.33 The frameworks sets the following areas for action to meet the objectives and targets:

- *'Buildings (existing and new)*
- *Green infrastructure and nature-based solutions'*

Manchester City Council, Manchester Green and Blue Infrastructure Strategy (Implementation Plan Refresh 2021-2025)

1.3.34 The council aims to enhance and protect the recreational spaces of health and greenery such as gardens, golf courses and pond, placing emphasis on their incredible value and functionality.

1.3.35 This implementation plan for 2021-2025 supersedes the 2015-2025 version and continues to be focused on ensuring a greener, more climate resilient Manchester as well as being a better place for people and nature.

1.3.36 The city has developed a long-term vision that integrates the extent and value of the city's green and blue infrastructure.

- *'Manchester has announced a major park development programme, which will help improve these key green assets even further. '*
- *'The pace at which NBS and SuDS are being implemented across Manchester is beginning to quicken. One of the ways in which this is being done is through enforcing a stricter approach (at the planning stage) to the consideration of NBS and SuDS on new large developments. The Council is also beginning to work with developers to discover feasible ways of adopting more SuDS and adding these to the highway drainage network.'*
- *'Manchester's Nature Recovery Network is, and will be, everywhere. From a window box on a high rise, a tree in a garden, a park, to a river Valley or neighbourhood green space, we will all have a role to play in delivering the people's Nature Recovery Network.'*
- *'It aims to re-energise some of the city's most important natural spaces to make them 21st-century assets, drivers for growth, and places where people and nature can thrive'*

1.3.37 Four main objectives of the Implementation Plan include:

- '*Objective One: Improving GI quality and function, focusing on:*
  - River valley and canals;

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- Parks;
- Trees and woodlands;
- Gardens;
- Other land;
- Healthier and resilient communities; and
- Protecting and enhancing ecology.

- *Objective Two: Embedding GI in developments of any scale across the city, including retrofit:*
  - Embedding GI into key plans and policies;
  - Embedding GI into key strategic regeneration and infrastructure projects;
  - Embedding GI in developments of any scale across the city; and
  - Embedding GI into city centre development and planning initiatives.
  - Objective Three: Improving access and connectivity for people and wildlife, focusing on:
  - Green routes – neighbourhood and travel routes;
  - Blue routes – canals and river valley routes; and
  - Cross-boundary links.
- *Objective Four: Increasing understanding of GI with a focus on:*
  - Improving monitoring;
  - Increased research;
  - Equitable engagement and involvement; and
  - Showcasing best practice.'

1.3.38 The strategic plan acknowledges the challenges of COVID-19 and increases in extreme weather events, aiming to combat them through progressive resilience by protecting the climate functionality of existing spaces.

Manchester Climate Ready: The Plan (2025–2030).

1.3.39 Manchester Climate Ready (MCR) is the updated name for the Manchester's Climate Change Agency and Partnership. It provides the latest climate change strategy and vision for the city, by providing a framework to guide residents, organisations, and decision makers in taking the next steps towards a zero carbon and climate resilient city. It outlines the targets for Manchester to reach net zero carbon by 2038 and recognises the need to reduce greenhouse gas emissions and adapt to a changing climate.

1.3.40 The Plan covers how Manchester can reduce the direct emissions from buildings and transport, the indirect emissions from the goods and services and the aviation emissions. It also covers increase the city's resilience to a changing climate, protecting local communities, built environment, infrastructure, and economy.

1.3.41 The vision for Manchester includes;

- *By becoming zero carbon and climate resilient, we will create good green jobs, attract investment, spark innovation and build the skills needed for the industries of the future.*
- *People across the city will enjoy warm homes, clean air and thriving neighbourhoods, supported by affordable, reliable public transport and safe, accessible routes for walking, wheeling and cycling.*
- *Our buildings will be energy efficient and sustainable, and our infrastructure and most vulnerable communities will be protected from the impacts of extreme weather.*
- *Our energy will be clean, affordable and secure, with communities sharing in the benefits through local projects and ownership.*
- *Green and blue spaces will be woven into every neighbourhood, boosting health, wellbeing and biodiversity, and increasing our resilience to climate change.*
- *The way we eat, shop and use resources will reflect our commitment to sustainability, with greener products, less waste and smarter design, creating a thriving green economy and helping Manchester contribute to a greener future both locally and globally.*

1.3.42 To achieve this vision, Manchester Climate Ready establishes eleven long-term aim, alongside a series of short term priorities for the next five years, focused on achieving a zero carbon, climate resilient city. The Plan sets out quantitative targets that represent the scale of action required to meet these aims and priorities, including:

- *12,700 homes improved through energy-efficiency retrofit;*
- *600 non-residential buildings retrofitted;*
- *6,900 heat pumps installed (6,000 in homes, 900 in non-residential buildings);*
- *14% modal shift to walking, wheeling or cycling;*
- *6% modal shift to public transport (electric buses, trams, light rail);*
- *14,000 cars switched to electric;*
- *10% of HGVs switched to electric;*
- *99 MW solar energy generated;*
- *Increase tree canopy cover to 21.8% by 2050;*
- *Connect 100 miles of green and blue spaces by 2035 (via the City's Cyan Lines plan);*
- *Halve indirect (hidden) carbon emissions;*
- *Encourage residents and businesses to reduce consumption-based emissions;*
- *Meaningfully engage 50,000 residents in positive climate action;*
- *Meaningfully engage 5,000 businesses in tackling climate change; and*
- *Develop an initial pipeline of £100m in zero-carbon and climate-resilience projects.*

Climate Emergency Declaration

Manchester City Council Climate Emergency Declaration (2019)

1.3.43 Manchester City Council declared a Climate Emergency on 10th July 2019. The council meeting minutes read as follows:

'This Council notes:

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- *The serious risks to Manchester's people, of climate change/global heating affecting economic, social and environmental well-being, supply chains – including food security, financial systems and local weather, among many others.*
- *That in 2008 the 'Principles of Tackling Climate Change in Manchester' were agreed as a call to action to engage people from all walks of life in climate change action and, build support for a new way of thinking about climate change.*
- *That Manchester leads the way, with an agreed Paris compliant carbon budget set in December 2018 and an acceleration of the target for becoming a zero-carbon city by 12 years, setting 2038 as the new target for the city, based on research from the world-renowned Tyndall Centre for Climate Change.*
- *The recent and welcome upsurge of action by the young people of Manchester, exemplifying the radical traditions of which Manchester is proud.'*

1.3.44 This Council agrees (or to the extent that the below concern executive functions, recommends to the Executive) to:

Declare a Climate Emergency.

- *'Continue working with partners across Manchester and GMCA to deliver the 2038 target, and determine if an earlier target can be possible, through a transparent and open review. Become carbon neutral by the earliest possible date.*
- *Encourage involvement in all wards by April 2020 through meetings as part of the Our Manchester strategy, to identify residents and partners who want to be actively involved in achieving the target, with provision for those who cannot attend. Ensure ward plans contain specific, measurable, achievable steps.*
- *Review all policies, processes and procedures to ensure the council can become carbon neutral. Present an action plan by March 2020 detailing how the city can stay within its carbon budget. Report back regularly to the NESC. Review the corporate plan.*
- *Work with the Tyndall Centre to review the actual emissions from aviation. Investigate the best way to include aviation in our overall carbon reduction programme in the long term.*
- *Make climate breakdown and the environment, an integral part of activity throughout the Council, including all decision making, ensuring key decisions take into account the impact on achieving the zero-carbon target and including an environmental impact assessment in all relevant committee reports.*
- *Ensure that everyone in the council receives carbon literacy training by the end of 2020. Make attendance easier by varying times and length of sessions.*
- *Encourage all staff on council business to use the lowest carbon, appropriate, travel. Investigate measures to ensure future procurement is carbon neutral. Increase the percentage of social value with an additional environmental element.*
- *Work with suppliers to green their supply chains, and support local production.*
- *Work with training providers to ensure Manchester residents can take on green jobs.*
- *Investigate and introduce measures to help reach domestic zero carbon levels including addressing fuel poverty and retrofitting existing homes.*
- *Investigate ways to ensure that future local plans place a mandatory requirement for all new development to be net zero carbon by the earliest possible date.*
- *Push GMCA to decarbonise public transport, heat and energy as early as possible.*
- *Through our role on GMPF, encourage divestment in fossil fuels as early as possible.*
- *Call on the government to:*
    - *provide powers and resources to make the zero-carbon target possible including funding for big capital projects*
    - *accelerate the reduction of carbon emissions from aviation*
    - *accelerate the decarbonisation of the electricity grid, funding low carbon energy generation*
    - *ensure that the UK prosperity fund focuses on enable the transition to a low carbon economy.'*

Guidance documents

IEMA EIA Guide to: Climate Change Resilience and Adaptation (IEMA, 2020)

1.3.45 This document acts as a revision to the IEMA guidance on Climate Resilience and Adaptation in EIA (2015) and reflects lessons learnt from emerging practice. It provides a framework for the effective consideration of climate change resilience and adaptation in the EIA process.

ISO 14090:2019 Adaptation to Climate Change – Principles, Requirements and Guidelines (BSI, 2019)

1.3.46 The main purpose of this standard is to provide organisations and projects with a consistent, structured and pragmatic approach to prevent or minimise the harm that climate change could cause and also to take advantage of opportunities.

C40 Cities Climate Change Risk Assessment Guidance (C40 Cities, 2018 & 2025)

1.3.47 This document aims to provide a concise, easy-to-read guidance, to help cities to develop a climate risk assessment report. It provides the methodology and components of the assessment, as well as providing a comprehensive list of climate hazards or hazards exacerbated by climate change. The guidance document was updated in 2025. However, the list of climate hazards or hazards exacerbated by climate change has not been include in the updated guidance. Therefore the list from the previous iteration of the guidance has continued to inform this assessment.

1.4 CURRENT & FUTURE BASELINE CONDITIONS

Current Baseline Conditions

1.4.1 provides a summary of the current baseline climatic conditions, taken from the closest weather station, Rochdale weather station, approximately 14.5 km north east of the proposed development. The data provides historic average climatic conditions for 1991-2020, which is assumed to be representative of the baseline year of the assessment (i.e. 2026). The monthly mean minimum/maximum temperatures are calculated from the average of the daily maximum and daily minimum temperatures for each month. The warmest month on average was July and the coolest month on average was February. The wettest month on average was December and the driest month on average was May.

Copyright © 1976 - 2026 Buro Happold. All rights reserved

1.4.2 Table 4 provides a summary of the current baseline climatic conditions, taken from the closest weather station, Rochdale weather station, approximately 14.5 km north east of the proposed development. The data provides historic average climatic conditions for 1991-2020, which is assumed to be representative of the baseline year of the assessment (i.e. 2026). The monthly mean minimum/maximum temperatures are calculated from the average of the daily maximum and daily minimum temperatures for each month. The warmest month on average was July and the coolest month on average was February. The wettest month on average was December and the driest month on average was May.

Table 4 Summary of historic average climatic conditions for 1991-2020 taken from the Rochdale Met Office monitoring station.

Month	Mean daily maximum temperature (degrees C)	Mean daily minimum temperature (degrees C)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)
January	6.93	1.50	10.16	32.16	119.19
February	7.45	1.41	9.32	49.83	97.11
March	9.57	2.51	6.06	98.86	89.91
April	12.47	4.55	2.33	152.72	68.36
May	15.60	7.19	0.28	175.45	65.67
June	18.24	10.13	0	152.85	82.87
July	20.01	11.94	0	170.77	96.90
August	19.55	11.77	0	153.52	100.02
September	17.11	9.55	0	116.33	97.80
October	13.39	6.85	1.07	78.66	116.78
November	9.70	3.89	5.05	41.64	123.53
December	13.13	1.50	10.10	42.69	138.88

Climate Change Projections

1.4.3 The UK Climate Projections 2018 (UKCP18) (Met Office, 2018) provide the most up-to-date assessment of how the climate of the UK may change over the 21st century. UKCP18 uses Representative Concentration Pathways (RCPs). These are named according to the concentration of greenhouse gas modelled to occur in the atmosphere in 2100. There are four RCPs available in the UKCP18 climate projections: RCP 2.6, RCP 4.5, RCP 6.0 and RCP 8.5. In line with the IEMA (2020) guidance, RCP 8.5 has been used, which represents the most conservative, highest-impact scenario. Table 5 summarises the projected summer and winter mean temperature and precipitation changes up to the 2090s for RCP 8.5.

Table 5 UKCP18 data for north west England RCP 8.5

Season	Variable	Time Period	Projected Change At		
			10th percentile	50th percentile	90th percentile
Winter	Mean temperature (°C)	2020 - 2039	-1 to 0	0 to 1	1 to 2
		2040 - 2059	0 to 1	1 to 2	2 to 3
		2060 - 2079	0 to 1	2 to 3	4 to 5
		2080 – 2099	1 to 2	3 to 4	5 to 6
	Mean precipitation change (%)	2020 – 2039	-10 to 0	0 to 10	10 to 20
		2040 - 2059	-10 to 0	0 to 10	10 to 20
		2060 - 2079	-10 to 0	10 to 20	30 to 40
		2080 – 2099	-10 to 0	10 to 20	40 to 50
		2020 - 2039	-1 to 0	0 to 1	1 to 2
		2040 - 2059	0 to 1	1 to 2	2 to 3
Summer	Mean daily maximum temp change compared to 1981-2000	2060 - 2079	0 to 1	2 to 3	3 to 4
		2080 – 2099	1 to 2	3 to 4	5 to 6
	Mean daily minimum temp change compared to 1981-2000	2020 - 2039	-1 to 0	0 to 1	1 to 2
		2040 - 2059	0 to 1	1 to 2	2 to 3
		2060 - 2079	0 to 1	2 to 3	4 to 5
		2080 – 2099	1 to 2	3 to 4	5 to 6
	Mean temperature (°C)	2020 - 2039	0 to 1	1 to 2	1 to 2
		2040 - 2059	0 to 1	1 to 2	3 to 4
		2060 - 2079	1 to 2	3 to 4	5 to 6
		2080 – 2099	1 to 2	4 to 5	7 to 8
	Mean precipitation change (%)	2020 - 2039	-30 to -20	-10 to 0	10 to 20
		2040 - 2059	-40 to -30	-20 to -10	0 to 10
		2060 – 2079	-50 to -40	-30 to -20	0 to 10
		2080 – 2099	-60 to -50	-40 to -30	-10 to 0
	Mean daily maximum temp change compared to 1981-2000	2020 - 2039	-1 to 0	1 to 2	2 to 3
		2040 - 2059	0 to 1	2 to 3	3 to 4
		2060 - 2079	1 to 2	3 to 4	5 to 6
		2080 – 2099	2 to 3	5 to 6	8+
	Mean daily minimum temp change compared to 1981-2000	2020 - 2039	0 to 1	0 to 1	1 to 2
		2040 - 2059	0 to 1	1 to 2	2 to 3
		2060 - 2079	1 to 2	2 to 3	4 to 5
		2080 – 2099	2 to 3	4 to 5	6 to 7

Copyright © 1976 - 2026 Buro Happold. All rights reserved

1.4.4 According to UKCP18 data, over land the projected general trends of climate changes in the 21st century are similar to UKCP09, with a move towards warmer, wetter winters and hotter, drier summers. However, natural variations mean that some cold winters, some dry winters, some cool summers and some wet summers will still occur.

Temperature

1.4.5 UKCP18 projections show that there is more warming in the summer than in the winter.

Precipitation

1.4.6 Rainfall patterns across the UK are not uniform, varying on seasonal and regional scales, and will continue to vary in the future. While UKCP18 projections show a clear shift to higher probability levels of dry summers, they also suggest that the likelihood of individual wet summers reduces only slightly. The risk of heavy rainfall events is likely to increase.

Sea level rise

1.4.7 According to UKCP18 projections, global sea level has risen over the 20th century and will continue to rise over the coming centuries. The amount of sea level rise depends on the location around the UK and increases with higher emissions scenarios. Sea level rise over the coming centuries may affect tidal characteristics substantially (including tidal range).

Snow

1.4.8 According to UKCP18 projections, for the period 2061-2080, under a high emissions scenario (RCP8.5), the regional (12 km) and local (2.2 km) projections show a decrease in both falling and lying snow across the UK relative to the 1981-2000 baseline.

Wind

1.4.9 There are no compelling trends in storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. UKCP18 projections over the UK show an increase in near surface wind speeds over the UK for the second half of the 21st century for the winter season when more significant effects of wind are experienced. This is accompanied by an increase in frequency of winter storms over the UK. However, the increase in wind speeds is modest compared to interannual variability.

1.4.10 Winds associated with major storm events can be some of the most damaging and disruptive events for the UK with implications for property, power networks, road and rail transport and aviation.

1.5 IDENTIFICATION AND EVALUATION OF RISKS FROM CLIMATE CHANGE

Table 6 Climate change risk assessmentprovides a list of potential climate hazards (and hazards exacerbated by climate change), as adapted from the C40 Cities Climate Change Risk Assessment Guidance (C40 Cities, 2018). For each potential hazard, a risk assessment has been undertaken, prior to incorporation of mitigation, taking into account the probability of the event occurring and the potential consequence, in line with the methodology described earlier in this document. A risk rating has been assessed for each potential hazard, based on the matrix set out in Table 3.

Table 6 Climate change risk assessment

Climate Hazard	Description	Is it relevant to the proposed development	Likely consequences of climate risk occurring	Change in probability as a result of climate change	Probability rating (1-5)	Consequence rating (1-7)	Risk rating	Mitigation needed?
Rainstorm	Strong wind and heavy rain	Yes – rainstorms happen frequently in the UK and are likely to impact the proposed development	Damage and degradation of building materials through wetting and impact from rainfall. Discomfort for users of the proposed development.	The frequency of precipitation is likely to decrease, particularly in the summer. However, the risk of heavy rainfall events is likely to increase.	5 Rainstorms are likely to occur very frequently during the lifetime of the proposed development	1 Very low but measurable effect on site users and the proposed development. Damage and degradation of building materials through rainfall impacts.	5	No
Monsoon	*'A persistent seasonal wind, often responsible for seasonal precipitation regime.'* (National Weather Service, 2023)	No – Monsoons do not occur in the UK, and therefore do not present a risk to the proposed development.	N/A	N/A	N/A	N/A	N/A	N/A
Heavy snow	'*Large snowflakes that greatly reduce the visibility and falls at a rate exceeding 4cm per hour.'* (Wild, 2023)	Yes – Heavy snow can occur during winters in the UK and therefore has the potential to impact the proposed development.	Damage to building materials (e.g. roofs). Discomfort and potential injury to users of the proposed development.	The frequency of heavy snow events is likely to decrease.	2 Heavy snow is likely to occur a limited number of times during the lifetime of the proposed development	2 Low but measurable effect on site users and the proposed development. Damage to building materials and potential injury to users.	4	No
Fog	'*Water droplets which are suspended in the air near the Earth's surface and causing reduced visibilities.'* (National Weather Service, 2023)	Yes – Fog occurs under certain climatic conditions in the UK, and therefore has the potential to impact the proposed development.	Increased risk of accidents as a result of impaired vision.	It is unknown how climate change will affect the frequency of fog.	5 Fog is likely to occur very frequently during the lifetime of the proposed development	1 Very low but measurable effect on site users and the proposed development. Increased risk of accidents around the proposed development.	5	No

Copyright © 1976 - 2026 Buro Happold. All rights reserved

Climate Hazard	Description	Is it relevant to the proposed development	Likely consequences of climate risk occurring	Change in probability as a result of climate change	Probability rating (1-5)	Consequence rating (1-7)	Risk rating	Mitigation needed?
Hail	*'Precipitation of small balls or other pieces of ice (hailstones) falling separately or frozen together in irregular lumps. (Typically associated with thunderstorms and surface temperatures above freezing).'* (National Weather Service, 2023)	Yes – Hail occurs in the UK and therefore has the potential to impact the proposed development.	Discomfort for users of the proposed development.	The frequency of hailstorms is likely to increase.	5 Hail is likely to occur very frequently during the lifetime of the proposed development	1 Very low but measurable effect on site users and the proposed development. Discomfort for users of the proposed development.	5	No
Severe wind	Mean wind speed exceeding 23 m/s (Met Office, 2024a).	Yes – Severe wind occurs in the UK and therefore has the potential to impact the proposed development	Damage to building materials. Discomfort and potential injury to users of the proposed development, and immediate surroundings	The frequency of severe wind and storms is likely to remain similar.	4 Severe wind is likely to occur frequently during the lifetime of the proposed development.	2 Low but measurable effect on site users and the proposed development. Damage to building materials and potential injury to users.	8	Yes
Tornado	'*A violent rotating column of air, usually forming a pendant from a cumulonimbus cloud with the circulation reaching the ground. It nearly always starts as a funnel cloud and may be accompanied by a loud roaring noise. On a local scale, it is the most destructive of all atmospheric phenomena'* (National Weather Service, 2023)	No – Tornados are very rare in the UK. It is therefore very unlikely that they pose a climatic risk to the proposed development	N/A	N/A	N/A	N/A	N/A	N/A
Hurricane	'*A severe tropical cyclone with wind speeds in excess of 74 mph (64 knots).'* (National Weather Service, 2023)	No – Hurricanes cannot form at the latitudes of the UK, and therefore do not pose a climatic risk to the proposed development.	N/A	N/A	N/A	N/A	N/A	N/A
Extra tropical storm	'*Deep depressions that were originally hurricanes which have moved to higher latitudes.'* (Met Office, 2024b)	Yes – Extra tropical storms (such as ex-Hurricanes) can reach the UK, and therefore have the potential to impact on the proposed development.	Damage to building materials. Discomfort and potential injury to users of the proposed development and immediate surroundings	The frequency of severe wind and storms is likely to remain similar.	3 Extra tropical storms are likely to happen regularly during the lifetime of the proposed development	4 Moderate effect on site users and the proposed development. Damage to building materials and potential injury to users.	12	Yes
Tropical storm	'*An organised cyclone in the tropics with wind speed between 35 and 64 knots.'* (National Weather Service, 2023)	No – Tropical storms do not occur in the UK and therefore do not pose a climatic risk to the proposed development	N/A	N/A	N/A	N/A	N/A	N/A
Storm surge	'*A change in sea level that is caused by a storm.*' (Met Office, 2024c).	No – the proposed development is not located close to the coast, and is therefore not at risk of storm surge	N/A	N/A	N/A	N/A	N/A	N/A
Lightning	*'Electrical discharge cause by imbalances between storm clouds and the ground, or within clouds themselves.'* (National Geographic, 2024)	Yes – Lightening occurs during storms, and therefore has the potential to impact the proposed development	Potential damage to building materials. Injury to users of the proposed development unlikely but possible.	The frequency of lightning storms is likely to remain similar.	1 Lightening strikes within the site are likely to occur very rarely during the lifetime of the proposed development	6 If lightening were to strike a site user or structure within the site, it would have the potential to cause damage to building materials and potentially a serious injury to site users.	6	No
Extreme winter conditions	*'A combination of heavy snow, blowing snow and/or dangerous wind chills'* (NOAA, 2024c)	Yes – Extreme winter conditions sometimes occur in the UK, and therefore have the potential to impact the proposed development	Damage to building materials (e.g. pipes bursting). Discomfort and potential injury to users of the proposed development.	The frequency of extreme winter conditions is likely to decrease.	4 Extreme winter conditions are likely to occur frequently during the lifetime of the proposed development.	3 Moderate effect on site users and the proposed development. This could include thermal discomfort, damage to building materials and potential injury to users.	12	Yes

Copyright © 1976 - 2026 Buro Happold. All rights reserved

Climate Hazard	Description	Is it relevant to the proposed development	Likely consequences of climate risk occurring	Change in probability as a result of climate change	Probability rating (1-5)	Consequence rating (1-7)	Risk rating	Mitigation needed?
Cold wave	*'Average temperatures below 2°C for 5 days' or 'average temperatures below 0°C for 48hrs or more.'* (Met Office, 2023)	Yes – Cold waves happen during winter months, and therefore have the potential to impact the proposed development	Damage to building materials (e.g. pipes bursting). Discomfort and potential injury to users of the proposed development.	The frequency of cold waves is likely to decrease.	4 Cold waves are likely to occur frequently during the lifetime of the proposed development.	3 Moderate effect on site users and the proposed development. This could include a reduction in the outdoor activities available or thermal discomfort.	12	Yes
Extreme cold days	Average temperatures below 0°C (Met Office, 2023)	Yes – Extreme cold days occur during winter months, and therefore have the potential to impact the proposed development	Damage to building materials (e.g. pipes bursting). Discomfort and potential injury to users of the proposed development.	The frequency of extreme cold days is likely to decrease.	4 Extreme cold days are likely to occur frequently during the lifetime of the proposed development.	3 Moderate effect on site users and the proposed development. This could include thermal discomfort, damage to building materials and potential injury to users.	12	Yes
Heat waves	Three days *'of hot weather relative to the expected conditions of the area at that time of year, which may be accompanied by high humidity.'* (Met Office, 2024d)	Yes – Heat waves occur increasingly frequently in the UK, and therefore have the potential to impact the proposed development	Damage and degradation to building materials. Extended period of overheating in building affects comfort and health of occupants.	The frequency of heat waves is likely to increase.	4 Heat waves are likely to occur frequently during the lifetime of the proposed development.	4 Moderate effect on site users and the proposed development. This could include health impacts, particularly for children and the elderly. Damage to buildings (e.g., deterioration of materials) and overheating causing discomfort to occupants, particularly in external areas.	16	Yes
Extreme hot days	A day where temperatures exceed 30°C (Met Office, 2023)	Yes – Extreme hot days occur increasingly frequently in the UK, and therefore have the potential to impact the proposed development	Damage and degradation to building materials. Intense overheating in building affects comfort and health of occupants.	The frequency of extreme hot days is likely to increase.	4 Extreme hot days are likely to occur frequently during the lifetime of the proposed development.	4 Moderate effect on site users and the proposed development. This could include health impacts, particularly for children and the elderly. Damage to buildings (e.g., deterioration of materials) and overheating causing discomfort to occupants, particularly in external areas.	16	Yes
Drought	*'When rainfall in an area is below average for the region' or 'when water supplies such as streams and reservoirs are low, which is caused by low rainfall, lack of snowmelt, or other reasons'* (Met Office, 2024e)	Yes – Drought occurs in the UK and therefore has the potential to impact the proposed development	Potential damage to building foundations in areas with clay soils. Health of flora and fauna on the site affected.	The frequency of drought is likely to increase.	4 Drought is likely to occur frequently during the lifetime of the proposed development.	2 Low but measurable effect on site users and the proposed development, given the limited use of This could include impacts such as hosepipe bans, and impacts on local vegetation and the associated visual amenity.	8	Yes
Wild fire	*'Any uncontrolled vegetation fire which requires a decision, or action, regarding suppression'* (Scottish Government, 2013)	Yes – Wild fires do occur in the UK, and however within an urban environment such as the proposed development site, associated risks and effects are greatly reduced.	Damage to buildings and contents. Potential injury to users of the proposed development.	The frequency of land fire is likely to remain similar.	1 Wild fires are likely to occur very rarely if at all during the lifetime of the proposed development given the urban context.	6 Major effect on site users and the proposed development. Damage to buildings and contents. Potential injury to users.	6	No
Flash/surface flood	*'A flood that occurs within a few hours (usually less than six) of heavy or excessive rainfall, dam or levee failure.'* (National Weather Service, 2023)	Yes – flash/surface floods occur during periods of intense rainfall, there is the potential this could impact the proposed development	Damage to buildings and contents. Potential injury to users of the proposed development.	The frequency of flash/surface flooding is likely to increase.	1 Surface water flooding at the site is not anticipated. Flash/surface floods are likely to occur very rarely during the lifetime of the Proposed Development. There are some areas around the site at risk of surface water flooding, but these are contained within existing.	4 Moderate effect on site users and the Proposed Development. Damage to buildings and contents. Potential injury to users.	4	No

Copyright © 1976 - 2026 Buro Happold. All rights reserved

Climate Hazard	Description	Is it relevant to the proposed development	Likely consequences of climate risk occurring	Change in probability as a result of climate change	Probability rating (1-5)	Consequence rating (1-7)	Risk rating	Mitigation needed?
					Highways of Robert Street and Dutton Street (FRA and Drainage Strategy, Ridge & Partners, 2024)			
River/tidal flood	'*Where a rivers flow will exceed the bank sides and cause damage or obstruction to a nearby area.*' (Flood Guidance, 2024)	Yes – river flooding can occur during intense periods of rainfall, and therefore has the potential to impact the proposed development	Damage to buildings and contents. Potential injury to users of the proposed development.	The frequency of river/tidal flooding is likely to increase.	1 The site is located entirely within Flood Zone 1. River flooding is likely to occur very rarely, if at all, during the lifetime of the Proposed Development (FRA and Drainage Strategy, Ridge & partners, 2024)	4 Moderate effect on site users and the Proposed Development. Damage to buildings and contents. Potential injury to users.	4	No
Groundwater flood	The level of groundwater rises above the ground level as a result of increased rain, causing flooding on the surface (Flood Guidance, 2024)	Yes – groundwater flooding does occur in the UK, and therefore has the potential to impact the proposed development	Damage to buildings and contents. Potential injury to users of the proposed development.	The frequency of groundwater flooding is likely to remain at a similar level.	1 Based on the elevated nature of the site compared to surrounding ground to the south and east, groundwater flood risk is considered to be low. As such, groundwater flooding is likely to occur very rarely, if at all, during the lifetime of the Proposed Development (FRA and Drainage Strategy, Ridge & partners, 2024)	4 Moderate effect on site users and the Proposed Development. Damage to buildings and contents. Potential injury to users.	4	No
Permanent inundation	The increase of sea level over time to where an area is continuously covered by water (DEECA, formerly DELWP, 2021)	No – Permanent inundation is unlikely to happen at the location of the proposed development.	N/A	N/A	N/A	N/A	N/A	N/A
Salt water intrusion	When salt water (from the ocean) gets into fresh water coastal aquifers (USGS, 2024)	No – The proposed development is not close to the sea, and therefore salt water intrusion is unlikely to impact the proposed development	N/A	N/A	N/A	N/A	N/A	N/A
Ocean acidification	'*A reduction in the pH of the ocean over an extended period of time, caused primarily by uptake of carbon dioxide (CO2) from the atmosphere'*. (NOAA, 2024)	No – the proposed development is not located close to the ocean and is therefore unlikely to be impacted by ocean acidification	N/A	N/A	N/A	N/A	N/A	N/A
Landslide	'*The movement of a mass of rock, debris, or earth down a slope'* (USGS, 2024b)	No – the proposed development is located in a relatively flat location, and is therefore unlikely to be impacted by landslides	N/A	N/A	N/A	N/A	N/A	N/A
Avalanche	*'A mass of snow, rock, ice, soil, and other material slides swiftly down a mountainside*.' (National Geographic, 2024b)	No – the proposed development is not located in a location that is steep enough or receives enough snow for avalanches to be a risk	N/A	N/A	N/A	N/A	N/A	N/A
Rock fall	A '*type of fast-moving landslide that happens when rock or earth falls, bounces, or rolls from a cliff or down a very steep slope*.' (Colorado Geological Survey, 2024)	No – the proposed development is located in a relatively flat location, and is therefore unlikely to be impacted by rock fall	N/A	N/A	N/A	N/A	N/A	N/A

Copyright © 1976 - 2026 Buro Happold. All rights reserved

Climate Hazard	Description	Is it relevant to the proposed development	Likely consequences of climate risk occurring	Change in probability as a result of climate change	Probability rating (1-5)	Consequence rating (1-7)	Risk rating	Mitigation needed?
Subsidence	'*Sinking of the ground because of underground material movement*' (NOAA, 2024b)	Yes – subsidence does occur in the UK, and therefore has the potential to impact the proposed development	Damage to building materials. Potential injury to users of the proposed development.	The frequency of subsidence is likely to remain low.	1 As set out in the Ground Desktop Study (Ridge & Partners, 2024) there is moderate risk of collapsible deposits at the site, but very low to negligible risk of landslides, shrink swell sands, compressible deposits, and ground dissolution. However, there have been no notices of subsidence within 50m of the proposed development. In line with the Ground Desktop Study the is low likelihood of (Ridge & Partners, 2024) subsidence at the proposed development.	4 Moderate effect on site users and the proposed development. Damage to building materials. Potential injury to users.	4	No
Water-borne disease	'*Illnesses caused by microscopic organisms, like viruses and bacteria, that are ingested through contaminated water or by coming in contact with feces.*' (Lifewater, 2024)	Yes – water-borne diseases do occur in the UK, and therefore have the potential to impact the proposed development	Potential illness to users of the proposed development.	The frequency of water-borne disease is likely to increase but remain low.	1 Water-borne diseases are likely to occur a limited number of times during the lifetime of the proposed development	3 Moderate effect on site users and the proposed development. Potential illness to users.	3	No
Vector borne disease	'*Human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors'* (living organisms) (WHO, 2024)	Yes – Vector borne diseases do occur in the UK, and therefore have the potential to impact the proposed development	Potential illness to users of the proposed development.	The frequency of vector-borne disease is likely to increase but remain low.	1 Given the nature of the proposed development and the site, vector borne diseases, such as those transmitted through ticks, are very unlikely to occur.	3 Moderate effect on site users and the proposed development. Potential illness to users.	3	No
Airborne disease	*'Disease that is caused by a microorganism that is transmitted through the air.*' (Ather et al, 2013)	Yes – airborne diseases do occur in the UK, and therefore have the potential to impact the proposed development	Potential illness to users of the proposed development.	The frequency of air-borne disease is likely to increase but remain low.	3 Airborne diseases such the seasonal influenza and respiratory infections are likely to occur a number of times during the lifetime of the proposed development	3 Moderate effect on site users and the proposed development. Potential illness to users.	9	Yes
Insect infestation	'*Recently detected insect pest population, including an incursion, or a sudden significant increase of an established insect, disease agents or weed population in an area leading to damage to plants in production fields, forests or natural habitats and causing substantial damage to productivity, biodiversity, or natural resources'* (UNDRR, 2024)	Yes – Insect infestations do occur in the UK, and therefore have the potential to impact the proposed development	Potential illness to users of the proposed development.	The frequency of insect infestation is likely to increase but remain low.	2 Insect infestations are likely to occur a limited number of times during the lifetime of the proposed development	2 Low but measurable effect on site users and the proposed development. Potential illness to users.	4	No

Copyright © 1976 - 2026 Buro Happold. All rights reserved

1.6 INCREASING THE RESILIENCE OF THE PROPOSED DEVELOPMENT TO CLIMATE CHANGE

1.6.1

1.6.2 Table **7** summarises the mitigation measures that have been put in place for the proposed development that will increase resilience to the likely effects resulting from climate change. The mitigation measures included in this table are already included in the design, and do not require further implementation. These particularly focus on the hazards that are expected to be subject to higher risks in the risk assessment in

1.6.3 **Table 7**.

Table 7 Climate change resilience measures

Hazard	Mitigation measure
Severe winds Extreme tropical storm	• The proposed development will be built in line with current building regulations, and is therefore expected to be capable of withstanding severe wind and storm conditions.
Extreme winter conditions Cold wave Extreme cold days	• The proposed development will be built in line with current building regulations and will therefore have appropriate insulation and heating in place to withstand extreme winter and cold conditions. • The Energy Strategy report (Ridge & Partners 2026) details the uplift in fabric improvements and solar shading within the development to maximise the retention of heat in winter. • Air Source Heat Pumps (ASHP) are proposed, as an efficient and low-carbon cooling system which will reduce heating demand and help to aim to maintain comfort during extreme cold days.
Heat waves Extreme hot days	• Air Source Heat Pumps have been proposed, as an efficient and low-carbon cooling system which reduce cooling demand and help to maintain comfort during extreme hot days. • The Energy Strategy report (Ridge & Partners 2026) details the uplift in fabric improvements and solar shading within the development to reduce solar gains in summer. • The Landscape Strategy (Land Studio, 2025) includes the planting of mixed-native and non-native trees. It aims to increase the existing planting cover and establish a tree canopy. This will provide shading in hot periods, improving external comfort. The proposed shelter structure within the landscape plan will also provide elements of shading and cooling during hot periods.

Drought	• The Landscape Strategy (Land Studio, 2025), blue infrastructure is fully integrated into the landscape design using SuDS principles, ensuring surface water is managed sustainably. Further measures include
	  ○ Rain gardens and SuDS beds are proposed across the site within the forest gardens, in areas of open space, as part of the wider surface water management strategy;
	  ○ Use of planting suited to more variable moisture conditions;
	  ○ Attenuation of surface water within planted landscapes
	• This approach reduces the pressure on existing systems, which will reduce the requirement for irrigation of landscape elements.
	• Low water consuming sanitaryware (WC, urinals, taps, showers, baths, dishwashers) are to be specified within the proposed development to reduce water usage
	• Leak detection systems will be installed to identify and address water leaks quickly, reducing water wastage

Flash/surface flood	• The Landscape strategy (DAS, 2025) will include Sustainable Drainage Systems (SuDS) and attenuation ponds where feasible, ensuring that runoff is attenuated, treated, and discharged at greenfield or agreed rates to prevent an increase in flood risk downstream. • The FRA and Drainage report (Ridge & Partners 2026 indicates the use of SUDs in the form of Source Control and Site Control measures, with controlled (restricted) outflow, which will help to minimise the flood risk impact to the downstream network and the sewer network. Long term maintenance and annual inspections of the drainage networks are to be implemented and will be the responsibility of a private management company in order ensure maximum efficiency of the drainage systems.
All risks	• Since the effects of climate change are dynamic and constantly changing, an adaptive management approach is recommended. The climate change resilience risk assessment should be periodically revisited by the design team during construction in order re-assess likely effects.

1.7 RESIDUAL RISK

Table 8 provides a summary of the residual risks of climate hazards and hazards exacerbated by climate change on the proposed development. Mitigation measures outlined in Table 8 have been taken into account.

Table 8 Summary of residual risks ratings based on probability and consequence taking into account mitigation measures

Hazard	Risk rating pre-mitigation	Probability rating (1-5)	Consequence rating (1-7)	Risk rating
Rainstorm	5	5	1	5
Heavy snow	4	2	2	4
Fog	5	5	1	5
Hail	5	5	1	5
Severe wind	8	4	1	4
Extra tropical storm	12	3	3	9
Lightning	6	1	6	6
Extreme winter conditions	12	4	2	8
Cold wave	12	4	2	8
Extreme cold days	12	4	2	8
Heat waves	16	4	3	12
Extreme hot days	16	4	3	12
Drought	12	4	2	8
Wild Fire	6	1	6	6
Flash/surface flood	4	1	4	4
River flood	4	1	4	4
Groundwater flood	4	1	4	4
Subsidence	4	1	4	4
Water-borne disease	6	2	3	6
Vector borne disease	6	1	3	3
Air-borne disease	6	2	3	6
Insect infestation	4	2	2	4

1.8 CONCLUSION

1.8.1 Climate hazards and hazards exacerbated by climate change of relevance to the proposed development have been identified and the associated risks have been assessed, based on the probability of an event occurring and the consequence, if it did occur. Mitigation measures have been identified for risks where required, and with the appropriate mitigation measures in place, the risk ratings have been reduced. It is considered that the residual risks are in line with typical expectations for urban developments of this nature in the UK. Nevertheless, due to the nature and scale of many climate hazards, some level of residual risk remains.

1.9 REFERENCES

- Ather, B., Mirza, T.M. and Edemekong, P.F., 2018. Airborne precautions. Available at: https://pubmed.ncbi.nlm.nih.gov/30285363/;

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- Atkins (2010) Masterplanning Tool;
- British Standards Institution (BSI) (2019). ISO 14090:2019 Adaptation to Climate Change – Principles, Requirements and Guidelines;
- BSI (2011). BS EN 15978:2011 Sustainability of Construction Works – Assessment of Environmental Performance of Buildings – Calculation Method;
- Building Research Establishment. (2008). Green Guide;
- Building Services Research and Information Association (BSRIA) (2011). Rules of Thumb Guidance for Building Services;
- C40 Cities (2018) Climate Change Risk Assessment Guidance;
- C40 Cities (2025) Climate Change Risk Assessment Guidance;
- Chartered Institution of Building Services Engineers (CIBSE) TM46 for Office (CIBSE, 2008);
- Climate Change Committee. Progress in reducing emissions (2021). Report to Parliament. June 2021;
- Colorado Geological Survey (2024). Rockfall. Available at: https://coloradogeologicalsurvey.org/hazards/rockfall/;
- Committee on Climate Change (2020) Reducing UK emissions, Progress Report to Parliament;
- DEECA, formerly DELWP (2021). Cape to Cape Resilience Project. Available at: https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0033/544758/Factsheet3_Coastal_Processes_and_Hazards.pdf;
- Department for Energy Security & Net Zero (DESNZ) (2023). Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal. Available at: https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal;
- DESNZ (2023). Greenhouse Gas Reporting: Conversion Factors 2023;
- DESNZ (2023). Valuation of energy use and greenhouse gas emissions, background documentation. Available at: https://assets.publishing.service.gov.uk/media/656798672ee693001360cae9/guidance-on-valuation-of-energy-use-and-greenhouse-gas-emissions-background-documentation.pdf;
- Department for Environment Food & Rural Affairs (2023). The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting;
- Greater Manchester Combined Authority. (2021). Places for Everyone Joint Development Plan Document. Greater Manchester Combined Authority.
- Ministry of Housing, Communities and Local Government (MHCLG, formerly DLUHC) (2024). National Planning Policy Framework;
- MHCLG (formerly DLUHC). (2024). National Planning Practice Guidance;
- European Union (EU) (2017). Agri-environmental indicator – greenhouse gas emissions – Statistics Explained;
- Flood Guidance (2024). Types of flooding. Available at: https://www.floodguidance.co.uk/what-is-resilience/types-flooding/#River%20flooding;
- HM Government (2021). Net Zero Strategy: Build Back Greener;
- HM Government (2021). The Building Regulations, Part L, Conservation of fuel and power;
- HM Government (2022) UK Climate Change Risk Assessment;
- Institute of Environmental Management and Assessment (IEMA) (2020) Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation;
- IEMA (2022). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance Second Edition;
- International Panel on Climate Change (IPCC) (2018). The Special Report on Global Warming of 1.5ºC;
- Lifewater (2024). 7 Most Common Waterborne Diseases (and How to Prevent Them). Available at: https://lifewater.org/blog/7-most-common-waterborne-diseases-and-how-to-prevent-them/#:~:text=Waterborne%20diseases%20are%20illnesses%20caused,these%20diseases%20would%20not%20exist;
- LETI (2020). Climate Emergency Design Guide – How new buildings can meet UK climate change targets. Available at: https://www.leti.uk/cedg;
- Manchester City Council. (2012). Manchester's Local Development Framework. Core Strategy Development Plan 2012 to 2027. Manchester City Council.
- Manchester City Council. (2020). Manchester City Council Climate Change Action Plan 2020-2025. Manchester City Council.
- Manchester City Council. (2022). 2022 Green and Blue Infrastructure Refresh. Retrieved from https://www.manchester.gov.uk/downloads/download/7456/2022_green_and_blue_infrastructure_refresh.
- Manchester Climate Change Agency. (2020). Manchester Climate Change Framework 2020-2025. Manchester Climate Change Agency.
- Manchester Climate Change Partnership. (2025). Manchester Climate Ready: The Plan (2025–2030). Manchester Climate.
- Met Office (2018) UK Climate Projections 2018 (UKCP18);
- Met Office (2020) UK Climate Averages;
- Met Office (2024a). Beaufort wind force scale. Available at: https://www.metoffice.gov.uk/weather/guides/coast-and-sea/beaufort-scale
- Met Office (2024b). Hurricanes. Available at: https://www.metoffice.gov.uk/research/weather/tropical-cyclones/hurricane
- Met Office (2024c). Storm Surge. Available at: https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/storms/storm-surge
- Met Office (2024d). What is a heatwave? Available at: https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/temperature/heatwave
- Met Office (2024e). UK and Global extreme events – Drought. Available at: https://www.metoffice.gov.uk/research/climate/understanding-climate/uk-and-global-extreme-events-drought#:~:text=Meteorological%20drought%20%E2%80%93%20when%20rainfall%20in,the%20local%20environment%20as%20well;

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- Met Office (2023). User guide – Weather-health altering system. Available at: https://assets.publishing.service.gov.uk/media/65450c2b59b9f5001385a240/User-guide-impact-based-weather-and-health-alerting-system.pdf;
- National Geographic (2024a). Lightening. Available at: https://www.nationalgeographic.com/environment/article/lightning
- National Geographic (2024b). Avalanche. Available at: https://education.nationalgeographic.org/resource/avalanche/
- National Weather Service (2023). Weather Glossary. Available at: https://www.weather.gov/otx/Full_Weather_Glossary;
- NOAA (2024a). What is Ocean Acidification? Available at: https://oceanservice.noaa.gov/facts/acidification.html;
- NOAA (2024b). What is subsidence? Available at: https://oceanservice.noaa.gov/facts/subsidence.html; #
- NOAA (2024c). Severe Weather 101 – Winter Weather. Available at: https://www.nssl.noaa.gov/education/svrwx101/winter/types/;
- Public Infrastructure Engineering Vulnerability Committee (PIEVC) (2015). Climate Risk Assessment Methodology;
- Royal Institution of Chartered Surveyors (RICS). (2017). Whole Life Carbon Assessment for the Built Environment;
- Scottish Government (2013) Fire and Rescue Service Wildfire Operational Guidance. Available at: https://www.gov.scot/publications/fire-rescue-service-wildfire-operational-guidance/pages/4/;
- The Carbon Budget Order 2011. UK Statutory Instruments. s.l. : The Stationery Office Limited, 2011. 2016 No. 785 Whole Instrument;
- The Carbon Budget Order 2021. UK Statutory Instruments. s.l. : The Stationery Office Limited, 2021. 2021 No. 750;
- The Carbon Budgets Order 2009. UK Statutory Instruments. s.l. : The Stationery Office Limited, 2009. 2009 No. 1259;
- Town and Country Planning (EIA) Regulations 2017;
- UK Climate Change Act 2008 (2050 Target Amendment);
- UK Green Building Council (UKGBC). (2017). Embodied Carbon: Developing a Client Brief;
- UNDRR (2024). Insect Pest Infestations. Available at: https://www.undrr.org/hips-cluster/insect-infestation#:~:text=An%20insect%20pest%20infestation%20is,and%20causing%20substantial%20damage%20to;
- United Nations. (2015). Paris Agreement on Climate Change;
- USGS (2024a). Freshwater/Saltwater Interface. Available at: https://www.usgs.gov/mission-areas/water-resources/science/saltwater-intrusion;
- USGS (2024b) What is a landslide and what causes one? Available at: https://www.usgs.gov/faqs/what-landslide-and-what-causes-one;
- Waste and Resource Action Programme (WRAP). (2011a). Cutting Embodied Carbon in Construction Projects;
- WRAP (2011b). Procurement Requirements for Carbon Efficiency;
- WRAP (2017). Embodied Carbon Database;
- WHO (2024). Vector-borne diseases. Available at: https://www.who.int/news-room/fact-sheets/detail/vector-borne-diseases;
- Wild (2024). Snow Glossary. Available at: http://www.drrichardwild.co.uk/index.php?page=Snow_Glossary
- World Resources Institute and the World Business Council for Sustainable Development (2014). Greenhouse gas protocol suite of guidance documents.

Copyright © 1976 - 2026 Buro Happold. All rights reserved

1.10 Abbreviations and Glossary

Term	Definition
ASHP	Air Source Heat Pump
BSRIA	Building Services Research and Information Association
BSI	British Standards Institution
CIBSE	Chartered Institution of Building Services Engineers
CO2	Carbon dioxide
DEECA	Department of Energy, Environment and Climate Action
DEFRA	Department for Food & Rural Affairs
DELWP	Department of Environment, Land, Water and Planning
DESNZ	Department for Energy Security & Net Zero
DLUHC	Department for Levelling Up, Housing & Communities
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
FRA	Flood Risk Assessment
GHG	Greenhouse gas
IEMA	Institute of Environmental Management and Assessment
IPCC	International Panel on Climate Change
LETI	Low Energy Transformation Initiative
MCC	Manchester City Council
MHCLG	Ministry of Housing, Communities & Local Government
Mph	Miles per hour
NOAA	National Oceanic and Atmospheric Administration
NPPF	National Planning Policy Framework
PIEVC	Public Infrastructure Engineering Vulnerability Committee
RCP	Representative Concentration Pathway
RICS	Royal Institution of Chartered Surveyors
RSP	Reference Study Period
SuDS	Sustainable Urban Drainage
UKCP09	UK Climate Projections 2009
UKCP18	UK Climate Projections 2018
UKGBC	UK Green Building Council
UNDRR	United Nations Office for Disaster Risk Reduction
USGS	United States Geological Survey
WHO	World Health Organisation
WRAP	Waste and Resource Action Programme

Copyright © 1976 - 2026 Buro Happold. All rights reserved

APPENDIX 6.2 GREENHOUSE GAS CALCULATION INPUTS

General project inputs

The assessment considers a 60-year reference study period measured from the start of the operational stage (in line with the principles set out in BS EN 15978) covering all lifecycle stages (A, B, and C) that have been scoped into the assessment. Programme assumptions that have informed the assessment are provided in Table 1.

Table 1 Programme information

Reference Study period (RSP)	60 years
Construction Start Date*	July 2027
Construction End Date*	May 2028
Operation Start Date	July 2028
Operation End Date*	July 2088
**For the purposes of this assessment, it is assumed that the end of life (C1-C4) of the proposed development will occur within the 60-year RSP in July 2088.*	

The proposed development comprises 189 residential units, with a floorspace of 16,579m² Gross Internal Area (GIA). Commencement of construction is expected in July 2027. It is expected to be completed by May 2028, with the development expected to be fully operational by July 2028. Table 2 shows the number of proposed residential units, as well as their sizes and typologies.

Table 2 Proposed Residential Unit Numbers and Floorspace Quanta

Unit Type	Number of units	Proposed floorspace (m^2)
1 bed apartments	64	3,179
2 bed apartments	121	8,454
2 bed townhouse (ground & first floor)	4	359
Amenity Spaces (Bin storage, balconies, terraces, cycle storage circulation and plant)	-	4,587
Total	**189**	**16,579**

Embodied carbon

Table 3 provides a summary of the embodied carbon benchmark which has been sourced from the RIBA 2030 Climate Challenge benchmarks. The 2025 target has been selected over the 2030 target, as it is more conservative target.

To calculate the GHG emissions associated with demolition of the proposed development (lifecycle stage C1-C4), a demolition carbon intensity factor ($kgCO_2e/m^2$) which is detailed within the RICS considered standard assumption for the UK, applied to the GIA of the existing areas being demolished that fall within the development boundary line. This is detailed within Table 4 and has been used in absence of site-specific data for the proposed development.

Table 3 Embodied carbon benchmarks

Schedule typologies	Benchmark	Unit	Source
Residential and associated amenity areas	800	$kgCO_2e/m^2$.GIA	RIBA 2030 Climate Challenge (2021) - 2025 Target domestic/residential

Copyright © 1976 - 2025 Buro Happold. All rights reserved

Table 4 Demolition carbon intensity factor

Type	Factor	Unit	Source
Demolition carbon intensity factor	35	$kgCO_2e/m^2$	Whole Life Carbon Assessment for the Built Environment (RICS, 2023)

Operational Energy

Data to inform the operational energy GHG emissions (Lifecycle stage B6) calculations has been provided by Ridge & Partners (Maximum Energy use intensity per square metre of floorspace). Department for Energy Security and Net Zero (DESNZ) conversion factors for grid electricity for 2025 have then been applied to provide an estimate of the emissions operational energy and is outlined in Table 5. The 2025 DESNZ carbon factor has been applied consistently across the RSP and therefore this assessment does not account for any decarbonisation of the electricity grid over this period. This represents a conservative approach.

Table 5 Building energy intensity and carbon factors

Building	Value	Notes
Domestic (residential)	Energy use intensity: 45.64 $kWh/m^2/yr$	Maximum Energy use intensity per square metre of floorspace (kWh/m2/yr) has been applied from information provided by Ridge & Partners.
	DESNZ 2025 Conversion Factor for grid electricity: 0.19553 $kgCO_2e/kWh$	Department for Energy Security and Net Zero (DESNZ) Greenhouse Gas Reporting: Conversion Factors 2025 for grid electricity have then been applied to provide an estimate of operational energy emissions.

Operational Water Use

As shown in Table 6, operational water use has been calculated based on the maximum occupancy, as provided by the project Architect, and the water consumption benchmarks for from BSRIA BG 85_2024 Mechanical Criteria. Carbon factors have applied from DESNZ Greenhouse Gas Reporting: Conversion Factors 2025.

In accordance with the RICS Whole Life Carbon Assessment guidance, the water consumption benchmark represents an assumption for water supply only. Foul water emissions have been assessed using equivalent consumption assumptions as water supply, in line with RICS WLC guidance, with carbon factors taken from the DESNZ Greenhouse Gas Reporting: Conversion Factors 2025 for water supply and wastewater treatment respectively.

Table 6 Benchmarks and conversion factors used for GHG emissions associated with operational water consumption for the proposed development

Building/Use	Criteria	Value	Source
Residential	N/A	552 residents	Population figures calculated based on number of proposed bedrooms as provided by Tim Groom Architects.
	Water consumption benchmark for Residential Dwellings – 1 bedroom	210 L/day/person	BSRIA BG 85_2024 Mechanical Criteria Benchmark (Residential 1 bedroom (per bedroom))
	Water consumption benchmark for Residential Dwellings – 2 bedroom	130 L/day/person	BSRIA BG 85_2024 Mechanical Criteria Benchmark (Residential 2 bedroom (per bedroom))
All schedule typologies	Carbon factor for water supply	0.19130 kg CO_2 per m^3 of water supplied	Department for Energy Security and Net Zero (DESNZ) Greenhouse Gas Reporting: Conversion Factors 2025
	Carbon factor for the treatment of foul water	0.17088 kg CO_2 per m^3 of water supplied	

Copyright © 1976 - 2025 Buro Happold. All rights reserved

Operational Transport

Assumptions that have informed the assessment of operational transport emissions are provided in Table 7 below. Daily return trips (AADT) have been provided by SK Transport, the project transport consultant. Heavy goods vehicles (HGVs), light goods vehicles (LGVs), and cars have been considered, with assumptions also derived from Department for Transport data. Carbon emission factors have been sourced from the latest DESNZ 2025 conversion factors. The 2025 DESNZ carbon factor has been applied consistently across the RSP and therefore this assessment does not account for any decarbonisation of the electricity grid over this period. This represents a conservative approach.

Table 7 Assumptions and conversion factors used for GHG emissions associated with operational transport for the proposed development

Assumed mode of transport	Daily return trips (AADT)	Assumed Distance travelled (km)	Source of assumed distance travelled	Annual trips	Number of trips over 60-year lifecycle	Carbon factor (total kgCO_2e per km)*	Lifetime GHG emissions (tCO_2e)
HGV	2	107	Department for Transport Domestic road freight statistics, United Kingdom: 2023 - GOV.UK	730	43,800.00	0.891210 (All HGVs, average laden)	4,176.74
LGV	0	108	Department for Transport Domestic road freight statistics, United Kingdom: 2023 - GOV.UK	0	-	0.254300 (Van - Average (up to 3.5 tonnes) - unknown fuel type)	-
Car	74	13	Nimblefins Average Car Journeys in the UK | NimbleFins (based on Department for Transport data)	27,010	1,620,600.00	0.16725 (Average cars, unknown fuel)	3,523.59
Total							**7,700.33**
*Carbon factors have been sourced from the DESNZ 2025 conversion factors. Available at ghg-conversion-factors-2025-condensed-set.xlsx							

Copyright © 1976 - 2025 Buro Happold. All rights reserved

Appendix 6.3 Consideration of Scope 3 Emissions

Background

The Climate Change ES chapter has been prepared in line with the IEMA EIA Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition (Institute of Environmental Management and Assessment (IEMA), 2022) (the 'IEMA GHG Guidance') and other good practice industry guidance. With some minor exceptions (as explained and justified in the ES chapter), the assessment has included a consideration of all scope 1, 2 and 3 GHG emissions from all activities within lifecycle stages A, B, and C of relevance to the proposed development, as set out in the Whole Life Carbon Assessment for the Built Environment (RICS, 2023) (the "RICS 2023 Guidance") and BS EN 15978 Sustainability of Construction Works - Assessment of Environmental Performance of Buildings - Calculation Method ("BS EN 15978") guidance. This includes the following scope 3 emissions:

- Upstream emissions related to the extraction, manufacture and transport of building materials to the site during construction and construction-related emissions from subcontractors.
- Downstream emissions related to the future residents and homeowners, including purchased energy, water use, personal vehicle use and waste generated; as well as embodied carbon associated with use, maintenance, repair, refurbishment and replacement in the properties in the future. This may also include downstream emissions associated with the demolition and management of waste from the development at the end of its life.

The IEMA Guidance advocates for flexibility and proportionality to suit the specific development being assessed. The guidance states that '*certain life cycle modules (or stages) can be excluded if these exclusions are clearly highlighted and justified by the practitioner using professional judgement and in accordance with the materiality and cut-off guidance*.' The sources of GHG emissions excluded from the assessment have been excluded on this basis.

The 2024 Supreme Court judgement on the application of R (on the application of Finch on behalf of the Weald Action Group) v Surrey County Council and others [2024] UKSC 20 (judgement given on 20 June 2024) ("Finch") has raised implications for the assessment of scope 3 emissions from development projects in the EIA process, potentially requiring the consideration of additional indirect emissions that do not, to date, require consideration under the relevant industry good practice guidance, including the IEMA GHG Guidance, the RICS 2023 Guidance and BS EN 15978.

Finch Judgement

In the case, the Supreme Court considered whether, under the EIA Directive and the EIA Regulations 2017, it was lawful for Surrey County Council to grant planning permission for the expansion of an oil drilling facility in the Surrey Hills where the EIA for the project had only considered emissions from sources within the control of the developer (scope 1 emissions). The EIA had not considered emissions arising as a consequence of the activities at the site – specifically from future combustion by downstream users of the fuel into which the extracted oil would be refined (scope 3 emissions).

In its decision, the Supreme Court unanimously rejected the approach taken by the Court of Appeal – that it was for a local authority to determine whether there was a *'sufficient causal connection'* between the project and the scope 3 emissions. The majority of the Court considered that scope 3 emissions were effects of the project (because it was an agreed fact that the oil would be refined; burnt as fuel and release greenhouse gases). The Council's failure to take this into account meant that the planning permission granted was unlawful. The appeal was therefore allowed.

Some of the core considerations that led to this judgement included:

- The EIA Directive and EIA Regulations 2017 require an assessment of "likely" effects. In this case, it was not only likely, but "inevitable", that the extraction of oil would lead to combustion and the emission of greenhouse gases into the atmosphere;
- Although the terms "direct" and "indirect" are not defined in the legislation itself, the European Commission's Guidance for use by EIA practitioners states that an "indirect effect" was one which occurred '*away from the immediate location or timing of the proposed action*'. The judge therefore concluded that scope 3 emissions are indirect effects of the operation of the scheme; and
- The Directive does not impose a geographical limit on the scope of the environmental effects of a project. The majority therefore considered that there was "no justification" for limiting the EIA in this case to emissions which only occurred at the site. Further, it would not have been in keeping with the challenge posed by climate change to have approached the matter in this way.

In the judgment, Lord Leggatt confirmed that these requirements should apply to projects such as this, where the fossil fuel commodity being extracted will not be used in the creation of a different type of object. There should be an *'inevitable pathway from extraction to combustion'*, with no *'element of conjecture or speculation*' about what will ultimately happen to the commodity. '*It is agreed that it will inevitably be burnt as fuel. And a reasonable estimate can readily be made of the quantity of GHGs which will be released when that happens*.' As advised by the judge, this would therefore apply to projects such as oil extraction and coal mining projects but would not apply to projects such as facilities to manufacture iron or steel or to manufacture motor vehicle or aircraft components.

In the case of steel, the judge advised that it has *'many possible uses and can be incorporated into many different types of end product used for all sorts of different purposes. In the case of a facility to manufacture steel, it could reasonably be said that environmental effects of the use of products which the steel will be used to make are not effects of manufacturing the steel. That is because the manufacture of the steel is far from being sufficient to bring about those effects. Such effects will depend on innumerable decisions made "downstream" about how the steel is used and how products made from the steel are used. This indeterminacy regarding future use would also make it impossible to identify any such effects as "likely" or to make any meaningful assessment of them at the time of the decision whether to grant development consent for the construction and operation of the steel factory.'*

In the case of manufacturing components for use in the construction of motor vehicles or aircraft, the judge advised that '*where a component is manufactured which forms a small part of a much larger object, such as a motor vehicle or aircraft, the view might reasonably be taken that the contribution of the component is not material enough to justify attributing the impact on the environment of the end product to the activity of manufacturing the component part. In any event, the number of motor vehicles or aircraft in which such parts will be incorporated and the use which will subsequently be made of them may be so conjectural that no realistic estimate could be made of GHG emissions arising from such use on which a reasoned conclusion could be based. I have discussed above that the EIA process does not require that attempts be made to measure or assess putative effects which are incapable of such assessment.*'

Implications for GHG Emissions Impact Assessments in EIA

Based on this judgement, we consider that any additional assessment of upstream and downstream scope 3 GHG emissions in EIA, beyond those already recommended in current industry guidance, should be limited to situations where:

- The likely use of any products from the proposed development or likely nature/type and scale of any other upstream or downstream activities related to the proposed development can reasonably be determined, such that realistic estimates can be made of the GHG emissions arising from them; and
- In line with good EIA practice, where it is considered proportionate to scope them in (e.g. when they are expected to make a material contribution to a likely significant environmental effect).

Upstream scope 3 GHG emissions that do not typically require consideration in EIA, as set out in the industry guidance documents previously referenced, but which could now potentially require consideration, in line with the supreme court judgement, could include:

- GHG emissions associated with the manufacture of the plant and machinery used to construct the proposed development; and

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- GHG emissions associated with the proposed development's design and consenting process.

Any plant and machinery used in the demolition and construction of the proposed development would not be manufactured and used solely for the proposed development. Each item of construction plant or machinery would typically be used in the construction of other development projects over a number of years. The proportion of any embedded GHG emissions associated with the manufacture of such plant and machinery that could be attributed to the proposed development is therefore likely to be small. Given the uncertainty regarding the type, quantity, and design life of the various items of plant and equipment that would be used in the demolition and construction process, it would also be extremely difficult to realistically estimate their embedded GHG emissions and what proportion could be attributed to the proposed development. On this basis and given that GHG emissions from this source are not expected to be material in scale such that they could influence the overall significance of effects of the proposed development, this source has been scoped out.

Similarly, given the complexities of the proposed development design and consenting process and the number of parties that contribute to it, it would be extremely difficult to realistically estimate the GHG emissions associated with this process. It is also considered unlikely that the GHG emissions from this process would be material in scale such that they could influence the overall significance of effects of the proposed development. On this basis, this source has also been scoped out.

The proposed development, once complete and operational, is not expected to produce any “products”. Therefore, no additional downstream scope 3 GHG emissions that have not already been scoped into the assessment, in line with the industry good practice guidance documents previously referenced, have been identified. As such, no additional downstream scope 3 GHG emissions have been considered in the assessment.

On this basis, the assessment methodology employed in the ES chapter is considered to align with the recent Finch judgement.

Copyright © 1976 - 2026 Buro Happold. All rights reserved

Appendix 6.4 Legislation, Policy and Guidance

Legislation

Paris Agreement (United Nations Framework Convention on Climate Change, 2015)

Negotiations at the Conference of the Parties (COP) 21 led to the 2015 Paris Agreement, the aim of which is to maintain the increase in global average temperature at 'well below' 2°C and 'pursue efforts' to limit the temperature increase even further to 1.5°C.

A total of 160 parties, including the UK, made voluntary pledges to reduce emissions by 2030, however the cumulative effect of these would still lead to an estimated 3°C of warming or greater.

The Special Report on Global Warming of 1.5oC, international Panel on Climate Change (IPPC) 2018

The IPCC published a special report in response to the Paris Agreement, to present the impacts of the targeted 1.5°C temperature rise. The report highlighted that to achieve this, global emissions must decrease by 45% by 2030 (against a 1990 baseline), and that net zero global emissions (where emissions and removals from the atmosphere are balanced) must be achieved by 2050. This is noted to require rapid and far-reaching transitions of every sector on an unprecedented scale.

The Climate Change Act (2008) & The Climate Change Act 2008 (2050 Target Amendment) Order 2019

To support international efforts, the UK Climate Change Act set a legal GHG target for the year of 2050 for the reduction of GHG emissions. The target set by this Act is 'at least 80% lower than the 1990 baseline' by 2050.

The Act introduced a series of carbon 'budgets' to be implemented for succeeding five-year periods to gradually result in an overall reduction in GHGs.

In June 2019 the Climate Change Act was amended to set the overall reduction target to 100% by 2050 to ensure that the net UK carbon account is lower than the 1990 baseline.

According to the Progress in reducing emissions 2024 Report to Parliament, *'The UK has a successful track record of emissions reductions, having met all its targets so far'* for its first, second, and third carbon budget, however '*the previous Government signalled a slowing of pace and reversed or delayed key policies. The new Government will have to act fast to hit the country's commitments*.' Furthermore, with regards to the UK's 2030 target to reduce emissions by 68% compared to 1990, the report states that 'the country is not on track to hit this target despite a significant reduction in emissions in 2023'.

Section 56 of the Climate Change Act requires the UK Government to undertake a Climate Change Risk Assessment (CCRA) on a five-yearly cycle, with the subsequent development of an adaptation programme to deliver resilience against these risks. This act stipulates that the Government must assess 'the risks for the United Kingdom of the current and predicted impacts of climate change'.

Planning and Energy Act (2008)

The Planning and Energy Act allows local planning authorities to set requirements for energy use and energy efficiency in local plans. It states that a local planning authority may impose 'reasonable requirements for':

- *'a proportion of energy used in development in their area to be energy from renewable sources in the locality of the development';*
- *'a proportion of energy used in development in their area to be low carbon energy from sources in the locality of the development'; and*
- *'development in their area to comply with energy efficiency standards that exceed the energy requirements of building regulations'.*

Carbon Budgets Order (2021)

A series of Orders set the carbon budget for these five-year budgetary periods. These carbon budgets set a cap on the maximum level of the net UK carbon 'account' for each five-year budgetary period. The net UK carbon account is defined in section 27 of the Climate Change Act 2008.

There are budgets currently set up to 2037. The UK is currently in the fourth carbon budgetary period (2023 - 2027), the budget for which is 1,950 MtCO2e. The UK cannot legally emit more GHGs than this within this budgetary period. The future carbon budgets set are:

- 2023–2027: 1,950 MtCO2e;
- 2028-2032: 1,725 MtCO2e; and
- 2033-2037: 965 MtCO2e.

Recommendations for the Seventh Carbon Budget have been presented to the UK government, however this is undergoing consultation and yet to be set into legislation. There is legal requirement for the UK to reach 0 MtCO2e by 2050.

The Seventh Carbon Budget, Climate Change Committee (2025)

The Seventh Carbon Budget is a statutory report published by the UK's Climate Change Committee (CCC) on 26 February 2025, covering the period 2038 to 2042. It provides advice to the UK Government on the level of greenhouse gas emissions the UK should be allowed to emit during this five-year period to achieve Net Zero by 2050. The greenhouse gas (GHG) emissions limit recommended to be set for the seventh carbon Budget is 535 $MtCO_2e$. However, it should be noted that the UK Government has not yet formally adopted a seventh carbon budget.

Policy

National

National Planning Policy Framework (NPPF) Ministry of Housing Communities & Local Government (MHCLG, formerly DLUHC) (2025)

'In determining planning applications, local planning authorities should expect new development to:

- *Comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and*
- *take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.'*

Section 14 of the NPPF focuses on meeting the challenge of climate change, flooding and coastal change. Paragraph 164 states that new developments should be planned in ways that:

- *'avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through incorporating green infrastructure and sustainable drainage systems.'; and*

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- *'help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings in plans should reflect the Government's policy for national technical standards.'*

National Planning Practice Guidance (NPPG) (MHCLG, formerly DLUHC), 2025

The Climate Change Guidance states the importance of planning to consider climate change:

'Effective spatial planning is an important part of a successful response to climate change as it can influence the emission of greenhouse gases. In doing so, local planning authorities should ensure that protecting the local environment is properly considered alongside the broader issues of protecting the global environment. Planning can also help increase resilience to climate change impact through the location, mix and design of development.'

The Building Regulations Part L 2021 Edition

Building regulations Part L1A and Part L2A set out minimum legal requirements for energy efficiency in residential (Part L1A) and non-residential (Part L2A) building construction. These regulations are typically updated every 3 years with new minimum performance benchmarks set. The Proposed Development will have to comply with the relevant version of Part L.

An additional update was issued in February 2023; however, the modifications made within this update are not relevant to the assessment reported in this ES chapter.

The Carbon Plan: Delivering our Low Carbon Future (DESNZ, formerly DECC, 2011)

The Carbon Plan '*sets out how the UK will achieve decarbonisation within the framework of our energy policy: to make the transition to a low carbon economy while maintaining energy security*'.

To outline the methods available to achieve this, the Carbon Plan lists a series of "sectoral plans", which are provided below with highlights:

- Low carbon buildings:
    - *'Buildings will need to become better insulated, use more energy-efficient products and obtain their heating from low carbon sources.';*
- Energy efficiency:
    - Over the next decade, '*all cavity walls and lofts, where practical, will be insulated. Alongside this, the Government will support up to 1.5 million solid wall insulations and other energy efficiency measures such as double glazing.*'; and

'During the 2020s, deployment of solid wall insulation will increase and installation costs will fall';

- Low carbon heating:
    - *'During the 2020s, we need to begin the mass deployment of low carbon heat. Technologies such as heat pumps will begin to expand at scale into residential areas, overcoming current barriers such as cost and unfamiliarity';*
- Low carbon transport:
    - '*During the 2020s, we will move towards the mass market roll-out of ultra-low emission vehicles, although further improvements in the efficiency of conventional vehicles and sustainable biofuels are also anticipated to play a key role*'; and
    - '*To support people to make lower carbon travel choices, such as walking, cycling or public transport, the Government is providing a £560 million Local Sustainable Transport Fund over the lifetime of this Parliament*'
- Low carbon electricity:
    - '*Over the next decade, we need to continue reducing emissions from electricity generation through increasing the use of gas instead of coal, and more generation from renewable sources.*'

Net Zero Strategy: Build Back Greener (HM Government, 2021)

On 20th April 2021, the UK Government announced that it 'will set the world's most ambitious climate change target' to reduce emissions by 78% by 2035 compared to 1990 levels as part of its sixth carbon budget.

The Net Zero Strategy identifies the following commitments:

- Delivering a decarbonised power system by 2035;
- An ambition for 5 GW UK low carbon hydrogen production capacity by 2030;
- Ambition to deliver 6 $MtCO_2$ per year of industrial Carbon Capture, Utilisation and Storage (CCUS) by 2030, and 9 $MtCO_2$ per year by 2035;
- Making the transition to low carbon buildings affordable and achievable for all by:
    - Aiming to phase out the installation of new and replacement natural gas boilers by 2035;
    - Making heat pumps as cheap to buy and run as a gas boiler by growing the heat pump market to support 600,000 installations per year by 2028 and expanding UK manufacturing;
    - Consulting on phasing out the dirtiest and most expensive fossil fuels first – new oil, coal and liquefied petroleum gas heating - and replace with low carbon alternatives in non-domestic buildings from 2024 and homes from 2026, following natural appliance replacement cycles; and
    - Ensure the UK's charging infrastructure network is reliable, accessible, and meets the demands of all motorists.

Regional

Places for Everyone (PfE) Joint Development Plan for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan (2024)

The following policies in the joint development plan are of relevance to GHG emissions:

Policy JP-S 1 Sustainable development

'To help tackle climate change, development should aim to maximise its economic, social and environmental benefits simultaneously, minimise its adverse impacts, utilise sustainable construction techniques and actively seek opportunities to secure net gains across each of the different objectives.

In preparing plans, authorities should make as much use as possible of suitable previously-developed (brownfield) land and vacant buildings to meet development needs.'

Policy JP-S 2 Carbon and Energy states the following:

'The aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions, will be supported through a range of measures including:

1. Promoting the retrofitting of existing buildings with measures to improve energy efficiency and generate renewable and low carbon energy, heating and cooling;

Copyright © 1976 - 2026 Buro Happold. All rights reserved

2. Promoting the use of life cycle cost and carbon assessment tools to ensure the long-term impacts from development can be captured;

3. Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities;

4. Increasing the range of nature-based solutions including carbon sequestration through the restoration of peat-based habitats, woodland management, tree planting and natural flood management techniques;

5. An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable;'

    a. '*Be net zero carbon'*

    b. *'Incorporate adequate electric vehicle charging points'*

    c. *'Where practicable, prioritise connection to a renewable energy/heating/cooling network in the first instance or a low carbon energy/heating/cooling network that is adaptable to non-fossil fuels at a later date'*

    d. *'In residential developments, achieve energy demand reductions in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation'*

Policy JP-S6: Resource Efficiency states the following:

'The achievement of a circular economy and a zero-waste economy will play a key role in meeting Greater Manchester's ambition of becoming a leading green city region by 2038. The following measures will help achieve this:

6. *Development and implementation of the Zero Waste Strategy for Greater Manchester which promotes overall reduction in the level of waste produced and supports resource efficiency within the Plan area in order to gain the maximum value from the things we produce;*

7. *Recognition of the role of existing infrastructure in managing our waste and protecting such facilities to ensure adequate waste management capacity is maintained; and*

8. *Using sustainable design and construction techniques to reduce carbon emissions, adapt and future proof to the impact of climate change, reduce and recycle waste and minimise water use.'*

Local

Guide to Development in Manchester Supplementary Planning Document and Planning Guidance. Adopted April 2007

The Environmental Standards section states *'The Council is committed to making Manchester "the Greenest City in Britain". Climate change is the biggest challenge facing the future sustainability of the City and new developments play an important part in Manchester's ability to meet UK national and Kyoto commitments for tackling climate change.'*

The following is set out in relation to GHG emissions:

Energy Efficiency

'Part 1 Policy E1.5 encourages high standards of energy efficiency in new development.' [ ] 'Developers should aim to reduce CO_2 emissions by at least 25% more than the requirements of the current Building Regulations, which at present are Building Regulations: Approved Document L (2006) – 'Conservation of Fuel and Power.' The following design principles will assist developers in achieving energy efficiency targets:

- *Minimise reliance on energy-using equipment for heating, cooling, lighting and natural ventilation;*
- *Position trees and soft landscaping on and around the development and within buildings to provide natural shading, insulation and air conditioning*
- *Integrate energy efficient micro-generation and community heating schemes, such as combined heat and power (CHP)*
- *Site layout and building design principles should maximise the capture and use of daylight and passive solar energy, whilst avoiding excessive solar gain in summer Specify energy and water efficient appliances and systems'*

Renewable Energy

'To reduce energy demand and the harmful impact of using energy from non-renewables, in line with UDP Part 1 Policy E1.5, developers should aim for at least 20% of final site energy demand to be met by on-site renewable energy technologies. Renewable energy targets can be achieved more readily by undertaking the measures suggested above to reduce the total energy demand of the building. It is possible to produce developments that use 50% and even 100% energy from renewable sources. To achieve this, developers should:

- *Assess opportunities for integrating small and large scale renewable energy generation systems (i) to improve the energy security of occupants and the neighbourhood, including siting of energy generation businesses on-site and export of surplus energy*
- *Use a mix of technologies to help generation patterns match demand*
- *Investigate energy generation opportunities before designing building envelopes or fixing their location, to optimise utilisation of wind, solar and geothermal resources*
- *Consider final energy demand rather than building energy consumption in the selection and sizing of generation equipment*
- *Explore opportunities to tackle waste and energy issues collectively through use of anaerobic digesters linked to CHPs (Combined Heat and Power devices)*
- *Consider private wire networks as an alternative to grid connection and availability charges on larger developments.'*

Water Management and Water Resilience

'New developments should seek to use water efficiently, through specification of water efficient device and through the use of rainwater harvesting and grey water recycling'.

Construction Management

'UDP Part 1 Policy E1.6 requires the building materials used in new development and refurbishment schemes to be environmentally friendly wherever possible, and encourages the use of recycled building materials, which is also energy efficient. Site waste management plans should, therefore, be implemented to reduce the quantity of waste generated, and to increase re-use and recycling. Opportunities for reuse of existing structures should be explored, and where this is not appropriate, materials should be reused on site and incorporated into the new design where practicable. Materials that are environmentally friendly, of low embodied energy, locally sourced, and can be recycled or reclaimed when the building comes to the end of its life should be prioritised. Materials that contain environmentally damaging chemicals should be avoided.

In addition, activities carried out during the construction of new developments have the potential to cause significant environmental impact. In order to avoid such impacts it is important that appropriate measures are put in place to manage and control the waste generated, the amount of water and energy used, and any potential releases to water, land and air. Use of the Considerate Constructor scheme is recommended.'

Copyright © 1976 - 2026 Buro Happold. All rights reserved

Manchester's Local Development Framework. Core Strategy Development Plan Document (MCC, 2012) (as amended, 2024)

The Core Strategy was adopted in July 2012, and includes the following spatial objectives relating to the reduction of GHG emissions:

- SO1. Spatial Principles: Provide a framework within which the sustainable development of the city can contribute to halting climate change; and
- SO6. Environment: Protect and enhance both the natural and built environment of the city and ensure the sustainable use of natural resources, in order to mitigate and adapt to climate change, support biodiversity and wildlife, improve air, water and land quality, recreational opportunities and provide networks of high-quality green infrastructure, ensuring that the city is inclusive and attractive to residents, workers, investors and visitors.

Policies relevant to GHG emissions are set out below:

Policy EC 1 Employment and Economic Growth in Manchester states the following:

'*Development proposals should have regard to:*

Climate change resilience demonstrating how CO_2 emissions will be minimised with an aim of zero carbon emissions, through energy efficiency, renewable energy and contributing to low and zero carbon decentralised energy infrastructure.'

Policy C2 District centres states the following:

'New development should deliver improvements to the quality and accessibility of the centre environment. Opportunities should be taken to adopt sustainable building design and practices to assist in adapting to climate change.'

Policy EN 4 Reducing CO_2 Emissions by Enabling Low and Zero Carbon Development states the following:

'*The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO_2 emissions, and rising fossil fuel prices, through the following actions:*

- *All development must follow the principle of the Energy Hierarchy, being designed;*
    - *to reduce the need for energy through design features that provide passive heating, natural lighting and cooling;*
    - to reduce *the need for energy through energy efficient features such as improved insulation and glazing; and*
    - *to meet residual energy requirements through the use of low or zero carbon energy generating technologies.*
- *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; and*
- *The use of building materials with low embodied carbon in new development and refurbishment schemes.'*

Policy EN 6: Target Framework for CO_2 reductions from low or zero carbon energy supplies states the following:

'Applications for residential development of 10 or more units and all other development over 1,000 sq m will be expected as a minimum to meet the target shown in Tables 12.1 and 12.2, 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 CO_2 emissions for all phases of the development.'

Following the adoption of the PfE Joint Development Plan document in 2024, 'Tables 12.1' and '12.2' have been replaced by the strategies outlined in PfE Policy JP-S2 (see section 2.2.4) and have not been included within this report.

Policy EN 6 also states: 'The energy statement will be required to be submitted at the outset of any proposed development (outline application or before). Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO_2 mitigation, subject to the energy statement incorporating evidence such as modelling to demonstrate compliance.'

Policy EN 8 Adaptation to Climate Change states the following

'Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO_2 mitigation under Policy EN 6, subject to sufficient evidence to quantify their contribution to compliance.'

Manchester City Council Climate Change Action Plan 2020 – 2025

The Manchester City Council (MCC) Climate Change Action Plan sets out MCC's commitments to tackling climate change from 2020-2025 and builds on previous plans over the last decade.

It summarises the specific actions which are required to ensure that MCC reduces its direct emissions by at least 50% by 2025 (compared to 2019/20) whilst also playing its full part in supporting and influencing the city to do the same.

The purpose of the plan is as follows:

"The document sets out MCC's commitments to tackling climate change over the next 5 years and builds on previous action plans over the last decade; and

It covers MCC's plans for adapting to the expected impacts of climate change and supporting and influencing others, including through the implementation of the Manchester Green and Blue Infrastructure Strategy 2015-2025"

Specific commitments that MCC are making are:

- *'Deliver at least a 50% reduction in carbon emissions from our buildings, energy and transport by 2025 (from circa 30-32,000 tonnes in 2019/20 to circa 15-16,000 tonnes in 2024/25) via a 13% year on year reduction;*
- *Report quarterly on progress against the actions in the plan and provide quantitative reports on data in tonnes of CO_2; and*
- *Become zero carbon by 2038 at the latest (based on the Tyndall Centre for Climate Research definition of zero which is at least a 95% reduction i.e., a reduction of 35,547 tonnes CO_2 from the 2018/19 total which would mean that the Council's direct emissions in 2037/38 would be less than 1,871 tonnes CO_2).'*

The plan states the following in relation to citywide emissions:

'The Council also recognises the importance of supporting and influencing our residents and organisations to take action to reduce their direct and indirect CO_2 emissions and to adapt to the changing climate.'

In 2022, the Action Plan was refreshed to '*show progress made to date, set out new milestones and include new actions, to ensure the Council is remaining on track in reducing its own carbon emissions and importantly, leading by example, giving renewed focus on the City-wide actions, the Council's leadership role, and helping others to take action'*.

Commitments stated in this revised version of the action plan include*:*

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- '*Support building retrofit and energy generation across the city's buildings and ensure all future development across the city is as close to zero carbon as possible.';*
- *'To support external stakeholders to adopt more sustainable practices, including food and reducing the use of Single Use Plastics on Council land.';*
- *'Ensure that the city's infrastructure is resilient to climate change and that nature-based solutions are used to combat issues such as flooding. Develop an intelligence led approach to tree and hedge planting, and the implementation of Nature Based Solutions to support the delivery of the Green and Blue Infrastructure Strategy.'; and*
- *'Ensure that everyone across the city understands the scale of the challenge, they are positively engaged, empowered and supported in taking action to reduce emissions and increase resilience across the city.'*

Manchester Climate Change Framework 2020 – 2025

Produced by the Manchester Climate Change Partnership, the Manchester Climate Change Framework 2020-2025 is the city's high-level strategy for tackling climate change. It sets out how Manchester will 'play its full part in limiting the impacts of climate change'.

The objectives and targets include:

- '*Staying within our carbon budgets';*
- *'Climate adaptation and resilience'; and*
- *'Inclusiv*e, zero carbon and climate resilient economy.'

Areas for action to meet the objectives and targets include:

- *'Buildings (existing and new);*
- *Renewable energy; and*
- *Green infrastructure and nature-based solutions'*

In 2022, the Manchester Climate Change Framework was updated as '*Manchester has not been reducing its direct emissions by the targeted 13% per year and so we are not currently on track to stay within our carbon budget and are at risk of missing our first milestone: to reduce the city's direct emissions by 50% by 2025.'*

The updated framework summarises the actions MCC is committing to in response to this, including:

- *'We need to construct new buildings to high and rising standards of low carbon performance, covering operational and embodied energy';*
- *'We need to see a rapid shift away from fossil fuels to electricity for heating, transport, and industry. To support this, we need to increase renewable energy generation, both locally and at national level.';*
- *'This needs to be coupled with a step change in energy efficiency across all sectors, and increase adoption of smart grid technologies and local storage to balance energy supply and demand for maximum efficiency';*
- *'We need to reduce waste, including unnecessary food waste, and manage unavoidable waste as sustainably as possible, maximising reusing and recycling';*
- *'We need to understand our exposure to climate change risk and make detailed plans that support all our residents, and all parts of our city, its economy and natural environment to adapt'; and*
- *'We need to ensure all the investments we make are low carbon and resilient to climate change and we need to develop innovative models to unlock private investment into both climate mitigation and adaptation.'*

Manchester Climate Ready: The Plan (2025–2030).

Manchester Climate Ready (MCR) is the updated name for the Manchester's Climate Change Agency and Partnership. It provides the latest climate change strategy and vision for the city, by providing a framework to guide residents, organisations, and decision makers in taking the next steps towards a zero carbon and climate resilient city. It outlines the targets for Manchester to reach net zero carbon by 2038 and recognises the need to reduce greenhouse gas emissions and adapt to a changing climate.

The Plan covers how Manchester can reduce the direct emissions from buildings and transport, the indirect emissions from the goods and services and the aviation emissions. It also covers increase the city's resilience to a changing climate, protecting local communities, built environment, infrastructure, and economy.

The vision for Manchester includes;

- *By becoming zero carbon and climate resilient, we will create good green jobs, attract investment, spark innovation and build the skills needed for the industries of the future.*
- *People across the city will enjoy warm homes, clean air and thriving neighbourhoods, supported by affordable, reliable public transport and safe, accessible routes for walking, wheeling and cycling.*
- *Our buildings will be energy efficient and sustainable, and our infrastructure and most vulnerable communities will be protected from the impacts of extreme weather.*
- *Our energy will be clean, affordable and secure, with communities sharing in the benefits through local projects and ownership.*
- *Green and blue spaces will be woven into every neighbourhood, boosting health, wellbeing and biodiversity, and increasing our resilience to climate change.*
- *The way we eat, shop and use resources will reflect our commitment to sustainability, with greener products, less waste and smarter design, creating a thriving green economy and helping Manchester contribute to a greener future both locally and globally.*

To achieve this vision, Manchester Climate Ready establishes eleven long-term aim, alongside a series of short term priorities for the next five years, focused on achieving a zero carbon, climate resilient city. The Plan sets out quantitative targets that represent the scale of action required to met these aims and priorities, including:

- *12,700 homes improved through energy-efficiency retrofit;*
- *600 non-residential buildings retrofitted;*
- *6,900 heat pumps installed (6,000 in homes, 900 in non-residential buildings);*
- *14% modal shift to walking, wheeling or cycling;*
- *6% modal shift to public transport (electric buses, trams, light rail);*
- *14,000 cars switched to electric;*
- *10% of HGVs switched to electric;*
- *99 MW solar energy generated;*
- *Increase tree canopy cover to 21.8% by 2050;*
- *Connect 100 miles of green and blue spaces by 2035 (via the City's Cyan Lines plan);*

Copyright © 1976 - 2026 Buro Happold. All rights reserved

- *Halve indirect (hidden) carbon emissions;*
- *Encourage residents and businesses to reduce consumption-based emissions;*
- *Meaningfully engage 50,000 residents in positive climate action;*
- *Meaningfully engage 5,000 businesses in tackling climate change; and*
- *Develop an initial pipeline of £100m in zero-carbon and climate-resilience projects*.

Guidance

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

This is the second edition of the IEMA EIA Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance, published in 2022, which replaces the previous edition, published in 2017. The guidance sets out a best practice methodology for assessing the GHG emissions from a proposed development, across its lifecycle, including the assessment of effect significance.

The guidance document advises that 'GHG emissions should be assessed and reported as part of a good practice approach to EIA.' It provides the following justification for this position:

- *'All projects create GHG emissions that contribute to climate change';*
- *'climate change has the potential to lead to significant environmental effects'; and*
- *'there is a GHG emission budget that defines a level of dangerous climate change whereby any GHG emissions within that budget can be considered as significant'.*

The document states that the following factors should be considered when determining a proportionate approach to the assessment of GHG emissions in EIA:

- *'The type, size, location and temporal scale of the proposed project;*
- *Whether other assessment work has already considered life cycle GHG emissions;*
- *Whether mitigation has already been agreed with the design team, particularly if this is beyond minimum policy requirements;*
- *Whether the proposed project has specific goals or aspirations (e.g. achieving BREEAM certification)'*

One of the major updates in this version of the guidance is that the recommended methodology now gives greater prominence to the consideration of mitigation in the assessment. It is no longer an element to be considered in the later stages of the EIA process but should rather be considered at the outset and throughout the project's lifetime. The approach to the assessment of effect significance now also includes a consideration of mitigation at its core.

RIBA 2030 Climate Challenge (Royal Institute of British Architects (RIBA), 2021)

This guidance provides voluntary performance targets for operational energy use, water use and embodied carbon aligning with the UK's 2050 net zero aspirations. It 'has set RIBA Chartered Practices a challenge of achieving the following reductions as soon as possible but as a minimum for projects in operation in 2030':

- *'Reduce operational energy demand by at least 60% from current business as usual baseline figures, before offsetting';*
- *'Reduce embodied carbon by at least 40% from current business as usual baseline figures, before offsetting';*
- *'Reduce potable water use by at least 40% from CIRIA benchmark/ Building Regulation figures'; and*
- *'Achieve all core health and wellbeing metrics'.*

BS EN 15978 Sustainability of Construction Works – Assessment of Environmental Performance and Buildings – Calculation Method (British Standards Institution (BSI), 2024)

The purpose of this standard is to provide a consistent framework for the assessment of lifecycle GHG emissions from new and existing buildings. This follows a modular approach, breaking down the lifecycle of the development into the product stage, the construction stage, the in-use stage, the end-of-life stage, and elements beyond the building lifecycle.

Royal Institution of Chartered Surveyors (RICS) Whole Life Carbon Assessment for the Built Environment 2nd edition (RICS, 2023)

This guidance document aims to harmonise whole life carbon assessment by applying consistency to the interpretation and implementation of the methodology BS EN 15978 to achieve coherent and comparable results that can be used to benchmark whole lifecycle carbon performance of built assets across the industry.

UK Green Building Council (UKGBC) Embodied Carbon: Developing a Carbon Brief (UKGBC, 2017)

This document provides guidance on writing effective briefs for commissioning embodied carbon measurements and provides extensive information on the latest applications, standards and tools.

Waste and Resource Action Programme (WRAP) Cutting Embodied Carbon in Construction Projects (WRAP, 2011a)

This guidance document helps designers identify basic cost-effective actions to reduce the carbon impact of the materials used in construction projects.

WRAP Procurement Requirements for Carbon Efficiency (WRAP, 2011b)

This guidance document helps to set requirements for 'carbon efficiency' for low-carbon building projects and estates management when procuring design, construction, refurbishment and facilities management services for existing and new buildings.

Greater London Authority Construction Scope 3 (Embodied) Guidance on Greenhouse Gas Accounting and Reporting (GLA, 2013)

Although the Proposed Development is not located in London, this accounting and reporting guidance written for the Greater London Authority provides information on best practice that is relevant across the UK. The guidance contains a series of recommendations to improve the understanding and consistency of the accounting and reporting of embodied emissions within the construction sector from cradle-to-grave. The document provides guidance on how to carry out calculations to measure the embodied carbon impact of buildings.

Mayor of London Whole Life-Cycle Carbon Assessments Guidance (GLA, 2022)

Draft London Plan Policy SI 2 sets out a requirement for developments in London to calculate and reduce whole lifecycle carbon emissions. The guidance explains how the assessment of these carbon emissions should be approached and presented. Although the Proposed Development is not located in London, the best practice approach set out in the guidance is relevant across the UK.

Low Energy Transformation Initiative (LETI) Embodied Carbon Primer (LETI, 2020).

The Embodied Carbon Primer offers supplementary guidance to that already set out in the Climate Emergency Design Guide, for those exploring embodied carbon in more detail. There is a current lack of knowledge in the built environment industry surrounding embodied carbon reduction strategies and calculations. Therefore, the London Energy Transformation Initiative has produced this document to help project teams design buildings that deliver

Copyright © 1976 - 2026 Buro Happold. All rights reserved

ambitious embodied carbon reductions. Although the Proposed Development is not located in London, the best practice approach set out in the guidance is relevant across the UK.

LETI Climate Emergency Design Guide (2020)

The Climate Emergency Design Guide provides developers, designers and policy makers with a methodology to ensure that new developments meet the requirement of climate targets. It covers five key areas: operational energy, embodied carbon, the future of heat, demand response and data disclosure.

Copyright © 1976 - 2026 Buro Happold. All rights reserved

BURO HAPPOLD