Appendix 3 – Flooding within the vicinity of the Site

Deloitte.

Former Boddington Brewery Site

Environmental Impact Assessment (EIA) Screening and Scoping Report

October 2021

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1. Introduction

1.1 This Environmental Impact Assessment (EIA) Screening and Scoping Report has been prepared in respect of the proposals for the development of the former Boddington Brewery Site ('The Site') as identified within the Great Ducie Street Strategic Regeneration Framework (SRF) and the Former Boddingtons Brewery Strategic Regeneration Framework (SRF). The Site is bounded by the Travelodge and surface level carparking to the north, the remainder of the surface level carparking and beyond this Dutton Street to the east, the under construction Manchester College to the south, and Bury New Road to the west in Manchester.

1.2 Latimer Development Ltd. (the 'Applicant') will be submitting an application for Full Planning Permission to deliver a residential-led development with ground floor commercial uses and public realm. The term "Proposed Development" used within this Report refers to all stages of construction and operation of the development.

1.3 This Screening and Scoping Report has been prepared on an informal basis to guide the technical team.

1.4 In accordance with Regulation 15, paragraph 2(a), this report contains:

- A plan sufficient to identify the land enclosed at Appendix 1.
- A brief description of the nature and purpose of the Proposed Development and of its possible effects on the environment.
- An explanation of the likely significant effects of the development on the environment.

EIA Requirements

1.5 The EIA process is the mechanism by which development proposals are appraised in relation to the environmental criteria as well as socio-economic, engineering and technical considerations. The EIA process defines the context of the Proposed Development and examines the issues considered pertinent.

1.6 The purpose of the EIA is to establish both the nature of the Proposed Development and the environment within which it is likely to take place in order to identify likely significant effects on the environment that may arise. This is also undertaken by comparing the existing situation at the start of the work (baseline) with the situation once the Proposed Development is in place.

1.7 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 require that any proposed development falling within the description of a 'Schedule 2 development' within the meaning of the Regulations, will be subject to an EIA where such development is likely to have 'significant' effects on the environment by virtue of such factors as its nature, size or location (Regulation 4(2)).

1.8 The Proposed Development falls under the category of "Infrastructure Projects – Urban Development Projects" (Schedule 2, 10, (b)) as described in the Regulations. The applicable threshold above which EIA is likely to be required for a site of over 5 hectare (ha) or if the development includes more than 150 dwellings. The indicative thresholds and criteria state that:

"In addition to the physical scale of such developments, consideration should be given to the potential increase in traffic, emissions and noise. EIA is unlikely to be required for the redevelopment of land unless the new development is on a significantly greater scale than the previous use, or the types of impact are of a markedly different nature or there is a high level of contamination."

1.9 The Proposed Development comprises up to 450 residential units (Use Class C3), approximately 800 sqm of commercial and leisure uses (Use Class E and Sui Generis), and approximately 0.5 ha of open space, landscaping, access and other associated works. Therefore, it is considered the proposals exceed the applicable Schedule 2 thresholds as outlined above, indicating that an EIA is more likely to be required.

1.10 Given the nature of the Proposed Development, an EIA is considered appropriate to test the likely significant effect of the Proposed Development. The Applicant therefore proposed to submit an Environmental Statement (in relation to certain topic areas where there is less likely to be a significant effect of the environment) in support of the planning application.
Purpose of the Scoping Report

1.11 The process of identifying likely significant effects on the environment which should be addressed by the EIA is termed 'scoping' and the results are presented as a Scoping Report. During pre-application discussions with the LPA it was agreed tha the development constituted as an EIA development

1.12 This Scoping Report sets out the framework within which the Environmental Statement ('ES') will be produced and the topic areas and information that will be contained within the document.

1.13 The intention would be that any future application relating to the Proposed Development would be accompanied by an EIA which would be produced by the team as set out in Table 1 and coordinated by Deloitte LLP (IEMA EIA Quality Mark registered). The consultants have provided technical input to this initial EIA Scoping Report.

Note: although Deloitte LLP has read the input of, Air Pollution Services, GIA and Barton Willmore, (together "the Consultant Inputs") for consistency and provide observations based on our knowledge and experience, we accept no liability or responsibility for the Consultant's Inputs and will not be responsible for the technical content.

Table 1.1: EIA Project Team

Topic	Assessment carried out by
The Applicant	Latimer Development Limited
Town Planning, EIA Coordination	Deloitte LLP
Architect	Asseal
Air Quality	Air Pollution Services
Archaeology	University of Salford
Climate Change	Atkins
Daylight, Sunlight and Overshadowing	GIA
Built Heritage	University of Salford
Human Health	Atkins
Noise and Vibration	Cundall
Townscape and Visual Impact	Barton Willmore
Traffic and Transport	Curtins
Water Resources	SGI Consulting
Wind Microclimate	GIA

1.14 Section 2 of this report provides a site description and outlines the nature of the Proposed Development. Section 3 sets out the proposed scope and structure of that an ES would take and who might need to be consulted. Section 4 provides details of the proposed EIA methodology, which would be used in assessing the Proposed Development. Section 5 sets out the key issues that would be addressed by the EIA.

2. Site Description and Proposed Development

Site Description

2.1 As set out in Section 1, the Site comprises the former Boddingtons Brewery Site ('The Site') as identified within the Great Ducie Street Strategic Regeneration Framework (SRF) and the Former Boddingtons Brewery Strategic Regeneration Framework (SRF). It is situated at the edge of Manchester City Centre, bounded by Southall Street to the north, Dutton Street to the east and Bury New Road to the west. It is lies within Cheetam Ward.

2.2 The Site comprises approximately 1.43 acres of brownfield land in the form of a surface car park, as per the red line boundary plan. The Site accommodates approximately 192 car parking spaces.

2.3 A Site Plan is provided at Appendix 1.

Site Specific Environmental Designations

Air Quality

2.4 The Site is situation in the Greater Manchester Combined Authority Air Quality Management Area (AQMA).

Ecology

2.5 There are no ecological designations within the Site. The closest Special Area of Conservation (SAC) and Sites of Special Scientific Interest (SSSI) is the Rochdale Canal SSSI and SAC. This designation refers to the part of the canal located 5.5km north east of the Site.

Flood Risk and Drainage

2.6 According to the Environment Agency Flood Map, the entire site is located in Flood Zone 2, which is defined as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding.

2.7 The Site also falls within the Conurbation Core Critical Drainage Area in the Salford and Trafford Critical Drainage Area (CDA), designated in 2011.

Heritage

2.8 The Site is not located within a Conservation Area and there are no listed buildings on Site. However, the Site is located approximately 180m to the north of the Cathedral Conservation, and there are a number of Listed Buildings within a 250m radius. These are:

- Former Synagogue Grade II (List Entry: 1208420)
- Gatehouse Of HMP Manchester Grade II (List Entry: 1254670)
- Main Prison Block Of HMP Manchester Grade II (List Entry: 1254636)
- Manchester Parcel Post Office Grade II (List Entry: 1389630)
- North Bridge Grade II (List Entry: 1392698)
- Middle Bridge Grade II (List Entry: 1392488)
- Victoria Station Including Concourse To Rear With Restaurant And Booking Hall Grade II (List Entry: 1254725)

- Stephenson Bridge Grade II (List Entry: 1392489)

Site Context

2.9 The Site is adjacent to Great Ducie Street to the western boundary. Across Great Ducie Street are a number of warehouse buildings and beyond these is the River Irwell. Whilst not in the city centre itself, the Site is only c. 100m from the city centre boundary and so benefits from access to all the amenities and employment market which that offers.

2.10 Immediately to the south is another brownfield site, which was granted planning permission in 2019 for the erection of a five-storey educational building (18,495 sqm) (Use Class D1) with associated access, servicing, landscaping, public realm and other associated works following removal of existing car park (App Ref: 124995/FO/2019). This is currently under construction and will become the future main campus of Manchester College. Further south lies the Manchester Arena and Victoria Station as well as a number of other commercial uses within the city centre.

2.11 The area to the east of the Site was granted planning permission in 2018 for redevelopment to provide 556 apartments and 3,490sqm of commercial space (App Ref: 118831/FO/2018). This was known as 'Old Brewery Gardens' at the time of its planning submission.

2.12 Bordering the Site to the north is a Travelodge and a surface level car park. Further north and to the west is a mixture of warehouses and industrial uses. HMP Manchester is located approximately 250m north of the Site on Southall Street. The Site is located within in an area the LPA has earmarked for regeneration, as outlined in documents called Strategic Regeneration Frameworks (SRF). The Site falls within the Great Ducie Street SRF and the Former Boddingtons Brewery Site SRF. These regeneration ambitions are discussed in more detail below.

Great Ducie Street Strategic Regeneration Framework (2019)

2.13 The Great Ducie Street Strategic Regeneration Framework (SRF) was endorsed by Manchester City Council in 2019 to guide the regeneration and revitalisation of the Great Ducie Street area. The SRF sets out a key vision for the area as well as a number of key objectives:

- An Enhanced Economic Role for the Area: Higher density mixed use development set within a high quality environment is envisaged for the area. This form of development should significantly increase the quantum and quality of employment floorspace and jobs within this area via replacement of the existing low density, low quality employment uses.
- Providing High Quality, Sustainable New Homes, contributing to a Balanced Housing Supply: A key objective is to diversify the land use within the SRF area as a means of driving regeneration and delivering high quality sustainable hew housing. New residential development must demonstrate that the scheme will deliver a finished project of the highest quality.
- Building Inclusive Communities: Delivering residential amenity facilities will be encouraged within residential developments.
- Sustainability and Resilience: All development must include measures to reduce carbon emissions and include sustainable features.
- Density and Place-Making: Increasing the density of development is crucial to provide sustainable growth, long term economic competitiveness, vibrancy and the opportunity to incorporate multiple land uses. The appropriate density of urban development should therefore balance economic viability, urban density and policy objectives.
- Street Hierarchy: Priority should be given to pedestrians over vehicles. This can be achieved through ensuring that vehicles only circulate where needed and that pedestrians can permeate to as many parts as possible.
- Residential Amenity: The combination of employment and residential uses will need to be carefully designed and managed. New development should create an environment where the amenity of residents and the environment within the Site with regard to privacy, microclimate, noise, refuse management, safety and vehicular movement.

2.14 Since the implementation of the SRF, a number of key development have been approved such as Manchester College which is under-construction and well progressed, and the Old Brewery Gardens development as discussed above.

Former Boddingtons Brewery Site Strategic Regeneration Framework (2019)

2.15 The Former Boddingtons Brewery Site Strategic Regeneration Framework (SRF) was original endorsed in April 2015. Further to this an Addendum was then endorsed in 2019 to update the ambitions following the introduction of Manchester College. The SRF has established a vision and set of development principles for the area:

- Uses: Create opportunities to deliver a range of complementary uses that will combine to create a distinctive neighbourhood, with a clear sense of place, which will provide life and vitality during the working day and at evenings and weekends.
- Density, Massing and Scale: the scale and massing of building form within the SRF should respond to existing buildings in surrounding areas, to the indicative proposals contained within the Great Ducie Street SRF and to the Old Brewery Gardens scheme.
- Place Making and Public Realm: An appropriate landscaping scheme that creates a positive and welcoming character should be included as part of any development. This should be linked to a legible public realm strategy to create spaces that can be used by learners, residents and visitors to the area.
- Connections: Re-establishing connections through the area is important. Strong connections are crucial for creating a neighbourhood which is attractive to occupants and the consideration of connections should extend to reviewing routes into the City Centre via the existing public highway system.

Regional Strategic Context

2.16 Manchester's ambition and vision for the City for the next decade is to be in the top flight of world-class cities by 2025. It is one of the fastest growing cities in Europe and by 2024 the population of the city is expected to reach over 570,000. This growth in population will be supported by employment growth, which is expected to see 15,000 more workers within the City Centre alone over the next ten years.

2.17 Residential development in the City Centre therefore has a key role to play in the city achieving this aspiration. The City Centre performs a number of key functions for both the city and the Greater Manchester City Region and is a driver of economic growth through an increasingly popular residential centre and its associated access to work, leisure facilities and high-quality public transport connections. A number of key documents that reflect this are as follows:

- Design for Access 2 (2003)
- Guide to Development in Manchester SPD (2007) and Technical Guidance (2015)
- Providing for Housing Choice SPD and Guidance (2008)
- Manchester Core Strategy (2012 – 2027)
- Manchester's Green and Blue Infrastructure Strategy (2015)
- The Greater Manchester Strategy (2016)
- Manchester City Centre Strategic Plan (2016)
- Manchester Residential Quality Design Guidance SPD (2017)
- Climate Change Emergency and Playing Our Full Part on Climate Change (2018)
- Manchester Climate Change Framework: 2020-2025 (2020)
- Draft Places for Everyone (2021)
- City Centre Transport Strategy to 2040 (2021)
- Our Manchester Strategy – Forward to 2025 (2021)

2.18 In addition to the above documents that offer an overall strategic objective for both the city and the wider region, the Great Ducie Street SRF (2018) supports the redevelopment of the Site for residential development.

Planning History

2.19 There are no recent planning permissions of relevance on the Site. The planning history search only details a number of historic planning applications which renew the temporary car park use on site and in respect of the former brewery use.

2.20 A full list of all baseline and cumulative developments both within and beyond the boundary of the Site are set out in Appendix 2 of this EIA Scoping Report for agreement with the LPA.

The Proposed Development

2.21 The Proposed Development would involve the construction of two new residential buildings between circa 13 and 29 storeys to provide up to 450 apartments with retail, commercial and leisure uses on the lower levels. It should be noted that the proposed figures are not fixed and are part of an evolving design.

2.22 Table 2.1 sets out the parameters of the Proposed Development.

Table 2.1: Parameters of Proposed Development

Measurement	Proposed
Proposed Site Area	Total: 1.43 acres (0.58 ha)
Residential Use	Up to 450 residential units
Commercial Use	Approximately 800 sqm of retail, commercial and leisure uses (Use Classes E [a,b,d] and Sui Generis).
Open Space	Approximately 1.3 ha of open space including new public realm space at ground and riverside level.
Development Height	Indicative heights of between: B1: up to 13 storeys B2: up to 29 storeys
Car and Cycle Parking Spaces	No car parking is being provided on the Site, aside from up to 5 disabled access spaces Secure Cycle Parking Spaces: 1 cycle parking space per apartment.

3. Scope, Structure and Consultation

Scope

3.1 A scoping exercise has been carried out in order to determine the likely significant effects on the environment that may arise as a result of the Proposed Development. This process has enabled the team to determine which technical disciplines are pertinent to the Proposed Development and the scope of assessment required in order for any likely significant effects on the environment to be addressed as part of a future EIA process.

3.2 This process has taken account of the proposed construction activities, relevant planning policy, knowledge of the Site, and the professional opinion of the project team.

3.3 The information presented in the ES will be provided in accordance with Schedule 4 of the EIA Regulations and will include:

- A description of the Proposed Development;
- An outline of the main alternatives studied;
- A description of the aspects of the environment likely to be significantly affected by the Proposed Development;
- A description of the likely significant effects of the Proposed Development on the environment;
- A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment;
- A non-technical summary; and
- An indication of any difficulties encountered by the applicant in compiling the required information.

3.4 The introductory chapters of the ES will provide the following information:

- An introduction to the ES in a legislative and site-specific context;
- Description of the Site and Proposed Development;
- Alternatives considered and project design evolution;
- EIA methodology;
- Construction methodology and programme;
- Stakeholder engagement;
- ES structure; and
- Details of the EIA project team.

3.5 The geographical coverage of the EIA will be determined by a number of factors including:

- The physical extent of work;
- The nature of the baseline environment, including the location of sensitive receptors;
- The distance over which effects will be significant; and
- The presence and type of “pathways” along which impacts may be spread.

Environmental Disciplines to be Scoped Out of the EIA

3.6 It is considered that the following disciplines will not give rise to likely significant effects on the environment and would therefore not require inclusion in the ES. An explanation for each discipline is given below.

Agricultural Circumstances

3.7 The Site is entirely on brownfield land so there would be no effects in respect to agriculture. This discipline can therefore be scoped out of the EIA and will not be assessed as part of the planning application.

Archaeology

3.8 The Site lies on the fringe of Manchester's historic core but does not form part of a conservation area. There are no designated heritage assets, such as listed buildings, within the Site and there are no below-ground archaeological remains that are afforded statutory protection as designated heritage assets that would require preservation in-situ.

3.9 The Site lies to the north of the area of medieval Manchester. During the eighteenth century, the Site was occupied by Mr Smith' Printing Works. During the nineteenth century, Great Ducie Street and houses fronting the street were constructed along the western boundary of the Site, and Mr Smiths Printworks was replaced by the Strangeways Finishing Works. Other nineteenth-century buildings within the Site include various stores, warehouses and yards. On this basis it is considered that there are potential remains dating to the eighteenth-century printworks. This is based on an assumption that the scale of impact will be substantial, and the value of the resource is likely to be high local.

3.10 Whilst there is some potential for below-ground remains of high local importance to survive in-situ, it is unlikely that the predicted impact of development will be significant. It would thus be appropriate for archaeological issues to be 'scoped out' of an Environmental Statement, given that a comprehensive archaeological desk-based assessment to assess the potential impact of the Proposed Development on the sub-surface archaeological resource is in the process of being prepared. If required, intrusive archaeological investigation of the Site will also be carried out in advance of development; the presence or absence of archaeological remains requires verification through archaeological evaluation, prior to development and, pending the extent and significance of any surviving buried remains, further archaeological excavation may be required to mitigate the loss of buried remains during the proposed construction programme.

3.11 Therefore, archaeology can be scoped out of the EIA based on the findings of the initial assessment undertaken by the University of Salford. A comprehensive archaeological desk-based assessment is being prepared to assess the potential impact of the Proposed Development on the sub-surface archaeological resource. This will enable a decision regarding any further works to be made in consultation with GMAAS. This approach is in line with the National Planning Policy Framework (NPPF) and local planning policies.

Aviation

3.12 At up to 29 storeys (120AOD), the Proposed Development is unlikely to be an aviation safeguarding challenge. Manchester Airport Group (MAG), Barton Aerodrome and NATS will need to be contacted for consultation advice. It is considered from professional experience of similar scale developments within this area of MCC that the Proposed Development will not give rise to aviation conflicts which cannot be resolved via appropriate mitigation to avoid any residual impacts arising.

3.13 Therefore, it is considered that the aviation discipline will not give rise to likely significant effects on the environment and would therefore not require inclusion in the ES. This discipline is therefore scoped out of the EIA.

Built Heritage

3.14 The Site is located approximately 180m to the north of the Cathedral Conservation Area in central Manchester. There are four listed buildings within a 250m radius of the Site. These listed buildings include the North Bridge (list entry: 1392698), Manchester Parcel Post Office (list entry: 1389630), Former Synagogue (list entry: 1208420) and

Gatehouse of HMP Manchester (list entry:1254670). These buildings are all grade II listed and are located over 100m from the Site. The Site does not contain any Scheduled Monuments, or Registered Parks and Gardens. There are no non-designated heritage assets within the Site and the settings of those identified beyond the Site boundary have already been altered due to the rapid development in the area during the late twentieth and early twenty-first centuries.

3.15 Built heritage can be scoped out of the ES chapter based on the findings of the initial assessment undertake by University of Salford. A comprehensive heritage statement is being prepared to assess the potential impact of the Proposed Development on the listed buildings and conservation area located over 100m from the Site. Whilst these heritage assets will not be directly affected, views of the listed buildings and the Cathedral Conservation Area may be affected by the Proposed Development. The impact of the development upon these views will be assessed within the heritage statement. This approach is in line with the National Planning Policy Framework (NPPF) and local planning policies.

Ecology

3.16 The Proposed Development site is not subject to any statutory or non-statutory nature conservation designations. There are no international designated sites within 15km of the Site and there are no nationally designated sites within 2km. Therefore, there are unlikely to be direct or indirect impacts from the Proposed Development on any statutory designated sites during construction and operational phases of the development.

3.17 The Site itself predominantly consists of hardstanding and bare ground, there is a low-quality hedgerow adjacent to the Site. The Site was cleared over 10 years ago and currently functions as a temporary car park. There are no habitats on the Site which function as priority habitats.

3.18 Current survey efforts from August 2021 confirmed that the habitats on site do not offer suitability to support species of principal importance or protected species. Therefore, there will be no direct impacts from the Proposed Development on any protected species or species and habitats of principal importance during construction and operational phases of the development. The Proposed Development would have a negligible impact on terrestrial ecology. On this basis, Ecology can be scoped out of the ES and will be addressed in a stand-alone report.

Flood Risk

3.19 SGi consulting have assessed the potential risk and impact of flooding for the Proposed Development and has been considered on the basis of the Site Plan Proposed Layout (Appendix 1). It is envisaged that the development will comprise two high-rise mixed-use buildings incorporating retail and commercial uses on the ground floor and residential development in the upper floor.

3.20 The Site is located on a previously developed site. Based on reviews of nearby intrusive investigations, it is expected that the Site is underlain by made ground underlain by weathered Sandstone. The Site Plan and Proposed Layout represents a preliminary proposal at this stage and remains subject to changes and refinement as further background studies and detailed design work progresses.

3.21 Catchment areas have been taken from the preliminary Architects sketch and can be broken down as follows.

- Building roof areas 0.278Ha
- Hard landscaping and verges 0.18 Ha
- Soft Landscaping 0.062Ha
- Total area of development = 0.52 Ha. Please note that these are estimates at this stage and subject to change.

3.22 A topographical survey of the Site is currently being undertaken; however, a historic survey confirms that the Site level is generally set at a minimum level of 29.0m AOD.

Flood Data and Analysis

3.23 SGi contacted the EA requesting data on flooding within the vicinity of the Site. The data return is included in Appendix 3 of this report.

3.24 The Site is in Flood Zone 2 and is currently set a level 2.5m above the 1 in 100-year flood event (26.57mAOD). Based on the Vulnerability classification of the proposed use, the Site does not fall within the sequential test criteria as detailed in the NPPF (2021) table 3.

Sustainable Urban Drainage Systems (SuDs) Analysis

3.25 It is anticipated that the onsite development will be set to raise from the western boundary with Great Ducie Street up to the Eastern boundary.

3.26 On receipt of the intrusive site investigation a review will be undertaken on the possible use of impermeable surfacing within the hard landscaping areas. This will ensure that surface water runoff is dealt with at source via soakaways.

3.27 At this stage, an estimate as to the amount of attenuation that may be required for the development has been determined. The nature of the attenuation will be determined during the course of detailed design. The criteria used for estimating the amount of attenuation is as follows:

- Overall Site Area 0.52Ha
- Worst case proposed impermeable surfacing of development = 0.52Ha
- Storm return period: 1:100 year event plus climate change
- Greenfield runoff rate 5 litres /second/hectare (Minimum applied rate 3l/s)
- Allowance for climate change: 40% for More Vulnerable development.

3.28 Utilising MicroDrainage storage estimate the attenuation for a 1:100 year storm with an appropriate allowance for climate change is 550m3. Drawing C1467-SK102 (Appendix 4) details the extent of the possible attenuation and demonstrates how it can be achieved in the central courtyard area. With the storage volumes known for the development area, a strategy can be developed at the detailed design stage to accommodate the water in both a sustainable and environmentally sensitive way.

3.29 Subject to the results of the detailed Site Investigation, the storage will be designed as a lined attenuation tank. If porosity allows, the tank will be designed to allow the water to soak into the underground site and encourage direct source control.

3.30 The Proposed Development is located outside of any floodplain within the local area and the Site's topographical levels indicates that the Site can be drained by gravity into the nearby public sewer which minimises the risk of flooding caused by mechanical failure.

3.31 It can therefore be concluded that in Flood Risk terms the Proposed Development is appropriate. Subject to the results of the intrusive site investigation a variety of sustainable drainage designs can be considered at detailed design stage. It is therefore the concluded that the Site has the potential to deliver a sustainable surface water management system and poses no significant risk to surrounding sites in Flood Risk terms. On this basis Flood Risk and Drainage is scoped out of the ES and will be addressed in a standalone report.

Ground Conditions

Introduction

3.32 A Phase 1 GeoEnvironmental Assessmetn has been prepared and assesses the likely Ground Condition impacts of the proposals upon the Site and surrounding area.

3.33 This report identifies that the Site is not located within a groundwater source protection zone and although there are records of 21 groundwater abstraction licenses, those relating to the subject site are old records as these are likely to have been surrendered when the Site was closed. It is, however, not know if the abstraction well(s) have been backfilled.

3.34 Coal Authority records indicate that the Site is located within a Coal Mine Reporting Area, but a review of geological records indicates that any seams are likely to be at significant depth and as such, there is considered to be a low risk associated with coal mine related subsidence.

3.35 No current or historical landfill sites have been identified within the surrounding area.

3.36 During the construction phases, there is a potential moderate effect on human health as construction workers and adjacent site users could be exposed to contaminated dust, soils, and fibers. These risks can be mitigated through the creation of detailed Construction and Environmental Management Plan (CEMP) that considers dust suppression, soil management and site drainage. The CEMP will also consider and specify the requisite PPE needed by construction workers.

3.37 Should contaminated soils be present these could pose a potential moderate effect to controlled waters either through preferential pathways generated by the formation of foundation structures (piles) or through migration through relict structures such as relict well. The risk to controlled waters will need to be determined through additional intrusive ground investigation but if determined, localised remediation of soils or groundwater will be required in addition to the sealing or removal of any preferential pathways created by relict structures.

3.38 Upon providing mitigation, there is not considered to be any likely effects associated with or to ground conditions from the Proposed Development.

Summary

3.39 Baseline studies have yet to be completed however for this scoping exercise it is envisaged that the risk to construction workers, adjacent land users and to controlled waters will be scoped into the EIA.

Table 5.12: Summary of Assessment Scope

Receptor	Impact	Potential Effect	Scoped In / Out
Construction Worker	Exposure to contaminated soil during construction	Short term risk to health. Moderate effect	In
Adjacent site users Great Ducie Street, Trinity Way and Jubilee Way	Exposure to contaminated dust during construction	Long term risk to health. Moderate effect.	In
Future site users	Exposure to contaminated soil within landscaped areas	Negligible effect	Out
Future site users	Exposure to ground gas	Negligible effect	Out
Controlled Waters	Migration of contamination to the underlying principal aquifer	Long term risk to controlled waters. Moderate effect	In

Noise and Vibration

Baseline conditions

3.40 The Site is currently occupied by Boddingtons Car Park at a fringe city centre location and which would be expected to experience consistently high levels of noise during the day and at night. The primary noise source at the Site is road traffic (including bus routes) along Great Ducie Street (A56).

3.41 The nearest identified noise-sensitive receptors to the application site are the Travelodge Manchester Central Arena to the north and The Manchester College City Centre Campus Phase 1 education building (currently under construction) to the south.

3.42 An environmental noise survey will be undertaken to determine existing ambient noise levels impacting the Site itself and background noise levels at the nearest noise-sensitive receptors. The survey would be carried out in compliance with BS 7445-1:2003 'Description and measurement of environmental noise. Guide to quantities and procedures'. The scope of the noise surveys would be agreed with Manchester City Council's Environmental Health Officers.

3.43 The assessment of any potential noise & vibration impacts and effects will focus on the following:

- Noise and vibration during the construction phase;
- Noise from existing noise sources on sensitive areas (i.e. dwellings) of the Proposed Development;
- Noise from future operation of the Proposed Development on the development itself; and
- Noise from future operation of the Proposed Development on existing nearby receptors, potential sources include:
  - noise impacts due to changes in road traffic flows;
  - noise from proposed new commercial uses (e.g. amplified music, commercial kitchens, patrons); and
  - noise from items of external building services plant.

3.44 The Manchester City Council Planning and Noise Technical Guidance (December 2015) presents 'good acoustic design' guidance and proposed criteria for each of the above potential effects. The Table 3.1 identifies the relevant sections within the Noise Technical Guidance which will be considered within the assessment, as well as other relevant guidance documents which will be considered (e.g. good acoustic design as highlighted within the Ventilation and Overheating Residential Design Guide will also be adopted for the scheme).

Table 3.1: Sections of Noise Technical Guidance to be considered

Potential effect	Relevant clause(s) within MCC Noise Technical Guidance	Other relevant guidance
Noise impacts at the Proposed Development	Section 3.6.1.1: Residential developments	'BS 8233: 2014, Guidance on sound insulation and noise reduction for buildings' 'ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise (May 2017)' 'Acoustics Ventilation and Overheating Residential Design GuideV1.1. (January 2020)'

Potential effect	Relevant clause(s) within MCC Noise Technical Guidance	Other relevant guidance
Noise impacts from new commercial units at existing noise-sensitive receptors	3.6.1.2 Entertainment Venues	Draft Good Practice Guide on the Control of Noise from Places of Entertainment December 2016
Noise impacts from commercial units at proposed new dwellings	3.6.1.2 Entertainment Venues	Draft Good Practice Guide on the Control of Noise from Places of Entertainment December 2016
Noise from new building services plant	Clause 3.6.1.5 Industrial / commercial development 3.6.1.5.1 Noise and Vibration from Fixed Plant / Equipment	'BS 4142: 2014, Methods for rating and assessing industrial and commercial sound'

3.45 A 3D noise model of the Site will be built to calculate potential future noise levels at each façade of the Proposed Development and develop appropriate mitigation strategies for the façade and ventilation design strategy. The 3D noise model will be used to predict operational noise levels from the Proposed Development (e.g. building services plant, entertainment noise break-out) at sensitive areas of the development itself and at nearby sensitive receptors. The model will predict noise levels in compliance with ISO 9613-2:1996 'Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation'.

3.46 Noise impacts on noise sensitive receptors as a result of changes in traffic flows on the local road network are expected to be negligible, as are any vibration impacts associated with the operational phase of the scheme. A Construction Management Plan (CMP) will be submitted for the Proposed Development. Façade treatments will be developed to see compliant internal ambient noise levels are achieved within habitable rooms. The building will also be appropriately designed so that demise walls and floors provide adequate acoustic separation between commercial and residential areas, and between adjacent tenanted spaces.

3.47 Nearby noise-sensitive receptors to the Proposed Development are likely to already be subjected to high levels of ambient and background noise. Suitable limiting emission levels for and new noise sources (e.g. external services plant, entertainment noise) can be identified in accordance with MCC policy. For mechanical services, suitable mitigation and attenuation measures can be developed to appropriately control noise emissions. For entertainment noise, clauses can also be included in future tenancy / lease agreements to control or limit noise output from specific premises and ensure that noise limiter devises are installed, as required.

3.48 Considering existing traffic flows on roads around the Site, and that the Site already contains an open car park, it is unlikely that any changes in traffic flows associated with the Proposed Development would lead to increased noise impacts. Operational road traffic noise changes associated with the Proposed Development are expected to be negligible and operational vibration associated with the Proposed Development is expected to be negligible.

3.49 The Proposed Development itself is sensitive to noise and any noise it produces may impact on nearby sensitive receptors. However, existing noise policy guidance provided by Manchester City Council sets clearly defined criteria for demonstrating 'good acoustic design' for these matters and design compliance should see that the Poprosed Development is unlikely to lead to significant environmental impacts in EIA terms.

3.50 On the basis of the above, it is proposed that noise is not required to be considered within an EIA and will instead addressed within a standalone Noise Impact Assessment report.

Socio-Economic

3.51 The Proposed Development is residential-led with commercial space at ground floor. The proposals will establish the next phase of regeneration at the Boddingtons SRF area and contribute to establishing the area as a mixed-use neighbourhood. The socio-economic effects will be considered in detail as part of the supporting Planning and

Tall Building Statement for the proposals. This will include a consideration of construction impacts and operational impacts such as job creation, access to healthcare and meeting housing needs. It is anticipated that these impacts will not be considered adverse significant in EIA terms based on minimal amount of commercial space being created at ground floor and limited residential population in the area. Therefore, it is considered that a standalone ES chapter is not required.

Telecommunications

3.52 GTech Surveys Limited have undertaken an initial assessment of the likely Telecommunications impacts of the proposals upon the Site and surrounding area which shows that the Proposed Development would not give rise to significant environmental effects in relation to telecommunications interference. There are no local planning policies relating to Telecommunications. However, under Manchester City Council (MCC) planning guidance, any development over four storeys requires a TV and radio reception impact assessment. Further guidance can be found in this document; "Full, Outline, Reserved Matters & Variation/Removal of Conditions Planning Applications - Is Your Application Valid?", September 2018, MCC.

3.53 A Telecommunication Interference technical assessment is proposed to be scoped-out of the ES. It is considered that the Proposed Development would not give rise to significant environmental effects in relation to telecommunications interference. Should any effects arise as a result of the Proposed Development then suitable mitigation can be introduced such as providing satellite services to the affected properties. This mitigation will be established from a post-completion survey and is anticipated to be required in as part of a planning condition.

Traffic and Transport

3.54 Historically, a brewery was located on the Site from 1778 to 2005. All the buildings associated with the brewery were demolished in 2007. Since this time, the former Boddington Brewery site has been used as a temporary surface car park comprising 852 spaces. The Site is currently occupied by approximately 192 of these parking spaces.

3.55 Access to the Site will be provided on the western boundary of the Site from a ghost-island priority arrangement from Great Ducie Street (A56) which is being delivered as part of the Manchester Collage development (App Ref: 124995/FO/2019. Additional pedestrian access will be provided along the Great Ducie Street frontage.

3.56 The highway network to the north and east of the Site is industrial in character and provide access to surrounding commercial properties. The roads have footways and street lighting is present.

3.57 Immediately to the southeast of the Site, Great Ducie Street meets the Inner Ring Road (A6042 Trinity Way and A6042 New Bridge Street) at a large signalised junction. Signalised crossings are present on the Great Ducie Street, New Bridge Street and Queen Street arms of the junction. All crossings have tactile paving, dropped kerbs and pedestrian refuge facilities, with New Bridge Street and Queen Street also providing staggered and guard-railing arrangements. Advanced cycle stop lines are present on all approaches.

3.58 A pedestrian refuge crossing is in place 200m to the north of the Site and a signalised crossing facility is in place further north adjacent to Strangeways, 350m from the Site.

3.59 The Proposed Development will result in the overall loss of 192 parking spaces within the defined red line boundary, and create a maximum of 5 disabled access arking spaces. The loss of parking spaces will result in a net reduction in the number of vehicle movements accessing the Site on a daily basis therefore representing a net benefit in traffic terms. The loss of car parking will be supplemented by cycle parking provision in accordance with Manchester City Council guidance, currently 1 space per residential unit.

3.60 The reduction in vehicle movements to/from the Site following completion of the Proposed Development will result in overall benefits to the surrounding highway network including reduced congestion at the Great Ducie Street junction with the Inner Ring Road as well as reduced vehicle conflicts with pedestrians and cyclists.

3.61 On the above, it is considered that the proposals would have no residual adverse impact in terms of transport and accessibility.

Scoping Summary

3.62 Table 3.2 provides a summary of the scoping exercise undertaken and what disciplines will be considered within the EIA and which are proposed to be scoped out of the EIA (and subject to a standalone technical report).

Table 3.2: EIA Scoping Summary

Discipline	ES Chapter	Non EIA Assessment	Consultant
Agricultural Circumstances	×	×	n/a
Air Quality	✓	×	Air Pollution Services
Archaeology	×	✓	Salford Archaeology
Aviation	×	×	n/a
Heritage	×	✓	Salford Archaeology
Climate Change	✓	×	Design 2e
Daylight, Sunlight and Overshadowing	✓	×	GIA
Ecology	×	✓	Temple Group
Television, FM Radio and DAB Radio Reception	×	✓	GTech Surveys
Human Health	✓	×	Atkins
Flood Risk and Drainage	×	✓	SGI Consulting
Ground Conditions	✓	×	SGI Consulting
Noise and Vibration	×	✓	Cundall
Socio-Economic Issues	×	×	n/a
Townscape and Visual Impact	✓	×	Barton Willmore
Traffic and Transport	×	✓	Curtins
Wind Microclimate	✓	×	Design 2e

Cumulative Effects Assessment

3.63 An assessment of the cumulative effect of the Proposed Development and other committed developments within a defined radius of the Site, including those with recent Planning Permissions and reasonably foreseeable to come forward in the near future will be undertaken as part of the EIA.

3.64 There is no agreed / standard threshold for how far the assessment should go; therefore, a professional judgement has been taken regarding which schemes to highlight, taking into consideration the surrounding context of the Site.

3.65 Where the construction of schemes is well progressed, these will be treated as part of the baseline and not as committed developments.

3.66 Full details of the committed developments to be included as part of the cumulative effects assessment are set out at Appendix 2.

3.67 The Applicant seeks the agreement from the LPA to the scope of committed developments and invites guidance on any additional schemes not listed.

Consultation

3.68 The following statutory consultees should be consulted through the EIA Scoping process:

- Manchester City Council (MCC) – Contaminated Land, Environmental Health, Flood Risk, Highways (Technical Officers);
- Transport for Greater Manchester (TfGM);
- Environment Agency (EA);
- Canal and River Trust;
- Historic England;
- Greater Manchester Archaeological Advisory Service;
- Manchester Airport Safeguarding;
- Natural England;
- NATS;
- Greater Manchester Ecological Unit; and,
- United Utilities.

3.69 We would grateful for confirmation of which stakeholders have been consulted as part of the Scoping Opinion.

4. Proposed EIA Methodolgy

4.1 The EIA would assess both the construction and operational phases of the Proposed Development.

4.2 The ES would comprise two volumes, the first of would set out the findings with respect to each of the environmental disciplines that have been examined as part of the EIA. Volume 2 would include all the supporting documents and technical appendices relating to the chapters. A Non-Technical Summary (NTS) would be produced and form a standalone document.

4.3 Each ES chapter would follow the headings set out below to ensure the final document is transparent, consistent and accessible.

- Introduction;
- Legislative and Policy Context;
- Assessment Methodology and Significance Criteria;
- Baseline Conditions;
- Identification and Evaluation of Key Effects;
- Mitigation Measures;
- Cumulative Effects;
- Residual Effects; and
- Summary.

4.4 Each chapter sub-heading is explained in further detail below.

4.5 A reference list will also be provided as relevant with each ES chapter.

Introduction

4.6 This section will introduce the assessment discipline and the purpose for which it is being undertaken.

Legislative and Policy Context

4.7 This section will include a summary of national, regional and local policies of relevance to the environmental discipline and assessment. Relevant legislation will be summarised where applicable.

Assessment Methodology and Significance Criteria

4.8 This section will provide an explanation of methods used in undertaking the technical study with reference to published standards, guidelines and best practice. The application of significance criteria will also be discussed.

4.9 It will also outline any difficulties encountered in compiling the required information.

Baseline Conditions

4.10 This will include a description of the environment as it is currently and as it is expected to change given the project were not to proceed (i.e. 'do-nothing' scenario). The method used to obtain this information will be clearly identified. Baseline data will be collected in such a way that the importance of the particular subject area to be affected can be placed in its context and surroundings so that the effects of the proposed changes can be predicted.

Identification and Evaluation of Likely Significant Effects

4.11 This section will identify the likely significant effects on the environment resulting from the Proposed Development.

4.12 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the effects can be positive or negative. The criteria to be used in carrying out this process are detailed below; it should be noted that these tables provide a standardised set of criteria, which may not be applicable to all technical disciplines considered within the EIA – where relevant, individual consultants may use a variation of the criteria and this will be clearly explained within the methodology.

Prediction of Impact Magnitude

4.13 The methodology for determining the scale or magnitude of change caused by the impact is set out in Table 4.1.

Table 4.1: Methodology for Assessing Magnitude of Change

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

Prediction of Receptor Sensitivity

4.14 The sensitivity of a receptor is based on the relative importance of the receptor using the scale set out in Table 4.2.

Table 4.2: Methodology for Determining Sensitivity

Sensitivity	Examples of receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character or is of international or national importance.

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

Assessment of Effect Significance

4.15 Effect significance will be calculated using the matrix in Table 4.3. This illustrates the interaction between impact magnitude and receptor sensitivity.

Table 4.3: Effect Significance Matrix

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

Mitigation Measures

4.16 Adverse effects will be considered for mitigation and specific mitigation measures put forward, where practicable. Mitigation measures considered may include modification of the project, compensation and the provision of alternative solutions as well as pollution control. The extent of the mitigation measures and how these will be effective will be discussed. Where the effectiveness is uncertain or depends upon assumptions about operating procedures, data will be introduced to justify the acceptance of these assumptions.

4.17 The approach to mitigation will follow best practice guidance, which suggests a hierarchical approach. The UNEP EIA Training Resource Manual (2002) advises that impacts should ideally be:

- Avoided; if not
- Minimised; and/or
- Compensated.

4.18 Three 'types' of mitigation are characterised in IEMA's Special Report – The State of Environmental Impact Assessment Practice in the UK (2011):

- EIA influence at design stage;
- Standard construction practices for minimising effects; and
- Follow-up actions for implementation post-consent.

4.19 Clear details of when and how the mitigation measures were carried out, or will be carried out, are to be given within the Environmental Statement. When certainty of impact magnitude and/or effectiveness of mitigation over time exists, monitoring programmes will be proposed to enable subsequent adjustment of mitigation measures, as necessary.

4.20 The opportunity for enhancement measures will also be considered where appropriate.

Cumulative Effects

4.21 Two types of cumulative effect will be assessed:

- Type 1 - Cumulative effects are the interactions between effects of the construction and development works on a single receptor.
- Type 2 - Cumulative effects are those that arise from incremental changes caused by other past, present or reasonably foreseeable actions together with the construction and development works.

4.22 The cumulative effects of the Proposed Development and the identified committed developments will be assessed. A list of known committed developments is set out at Appendix 2. The Council are requested to review and comment on this list in their Scoping Opinion.

Residual Effects

4.23 The residual effects, i.e. the effects of the Proposed Development assuming implementation of proposed mitigation, will be determined. The residual effects represent the overall likely significant effect of the Proposed Development on the environment having taken account of practicable/available mitigation measures.

Phasing and Delivery

4.24 The Proposed Development is proposed to be delivered in one phase.

4.25 As a result of this it will be necessary to test a number of scenarios within the Environmental Impact Assessment. This is to ensure robustness that all impacts that may arise as a result of partial delivery of the proposals (due to phasing) are assessed.

4.26 Our identified EIA scenarios are:

- Scenario 1: Existing Baseline (including buildings under construction)
- Scenario 2: Completed Development
- Scenario 3: Completed Development and Cumulative Schemes (i.e. those with planning permission)

5. Environmental Statement Chapters

5.1 Under each section topic, a summary of the content of the section, the methodology and scope of assessment is given. Where relevant, the assumptions of the assessment are described. Current relevant legislation or recognised guidance for individual assessments will be adhered to, where necessary.

Air Quality

Introduction

5.2 This chapter of the Environmental Statement (ES) will be prepared by Thomas Wescott and Kieran Laxen of Air Pollution Services (APS) and will address the key air quality impacts and effects associated with the demolition and construction and the operation of the Proposed Development and will identify appropriate mitigation measures as necessary.

Legislative and Policy Context

5.3 The following legislation and policy will be taken account of in the ES chapter.

Legislation & National Air Quality Policy

5.4 Part IV of The Environment Act 1995[1] sets out the requirements of the Local Air Quality Management (LAQM) regime and the requirement for the Government to produce an Air Quality Strategy including standards and objectives.

5.5 The latest Air Quality Strategy[2] sets out the Air Quality Standards (AQS), which consider the effects on human health and ecosystems, and the national Air Quality Objectives (AQOs) for ambient pollution. The AQOs for use by local authorities when considering human health and ecosystems were incorporated into UK legislation within the Air Quality (England) Regulations, 2000, Statutory Instrument 928[3] and the Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument 3043[4]. The Local Air Quality Management (LAQM) regime, introduced by the Environment Act 1995, requires local authorities to review air quality within their boundary and work towards achieving and maintaining the AQO.

5.6 In additional to the AQOs set within the Air Quality Strategy, the European Union (EU) has also set limit values for the protection of human health. These were transposed into the Air Quality Standards Regulations[5], which sets out the UK limit values for specific pollutants. While the AQO are policy targets, the government has the duty to ensure compliance with the legally binding limit values which is a national obligation rather than a local one. Upon leaving the European Union, the UK Government still has a legally binding commitment to comply with the air quality objectives through environmental provisions with the EU (withdrawal) Bill[6].

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[1] HMSO. (1995). Environment Act.

[2] Defra. (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

[3] HMSO. (2000). The Air Quality Regulations, 2000, Statutory Instrument 928. HMSO.

[4] HMSO. (2002). The Air Quality (England) (Amendment) Regulations, 2002, Statutory Instrument 3043. HMSO.

[5] HMSO. (2010). The Air Quality Standards Regulations 2010, Environmental Protection, 2010 No. 1001, Statutory Instruments and subsequent amendments.

[6] HMSO. (2017). European Union (Withdrawal) Bill (2017), available at: https://commonslibrary.parliament.uk/research-briefings/cbp-8079/

5.7 The 2019 Clean Air Strategy[7] includes a commitment to set a "new, ambitious, long-term target to reduce people's exposure to PM2.5" which the proposed Environment Bill 2019-2021 commits the Secretary of State to setting. The WHO acknowledges that current evidence suggests no safe level for PM2.5. However, the WHO set a guideline, which is 10 µg/m3 as an annual mean and more stringent than the current AQOs, reflects the level at which increased mortality from exposure to PM2.5 is likely. Following the UK leaving the EU the Government have drafted a new Environment Bill which is not currently finalised, however, early indication is that the UK Government also intend to benchmark the PM2.5 target against the WHO guideline.
National Planning Policy

5.8 The National Planning Policy Framework (NPPF)[8] sets out planning policy for England. It includes advice on when air quality should be a material consideration in development control decisions. Local Plans produced by local authorities are based on the policy within it.

5.9 Guidance[9] to ensure adequate consideration of air quality in land-use planning and development control processes has been published by Environmental Protection UK (EPUK) in partnership with The Institute for Air Quality Management (IAQM).

Regional Planning Policy

5.10 The Places for Everyone Joint Development Plan Document[10] produced by the Greater Manchester Combined Authority (GMCA) is out for a final local consultation. The plan sets out the spatial framework for development in the region to guide appropriate development, investment and infrastructure. The plan has a policy on clean air and several other mentions relating to air quality. However at this stage it has very limited weight in the decision making process.

5.11 The Greater Manchester Clean Air Zone (CAZ)[11], which will restrict highly polluting vehicles (not private cars) on most roads within the combined authority boundary via a charging mechanism, will be implemented in 2022 by the GMCA. The CAZ is aimed at reducing pollutant values in exceedance of the AQOs in the shortest timeframe possible.

Local Planning Policy

5.12 Manchester City Council's Local Development Framework Core Strategy[12] guides the spatial strategy for development within Manchester. As part of the assessment the following policies will be considered: EN16 Air Quality, CC 5 Transport, and DM1 Design Management.

Guidance

5.13 The assessment will follow the relevant guidance set out below.

National Planning Practice Guidance

5.14 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019b). The PPG on air quality published in November 2019 states:

[7] Defra. (2019). Clean Air Strategy.

[8] Ministry of Housing, Communities & Local Government. (2021). National Planning Policy Framework.

[9] EPUK/IAQM. (2017). Land-Use Planning & Development Control: Planning For Air Quality.

[10] Greater Manchester Combined Authority. (2021). Places for Everyone, Joint Development Plan Document. (Out for local consultation).

[11] Clean Air for Greater Manchester (website), address: https://cleanairgm.com/ , accessed on 17/08/2021.

[12] Manchester City Council. (2012). Manchester's Local Development Framework, Core Strategy, Development Plan Document.

Paragraph: 001 Reference ID: 32-001-20191101:

"The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with Limit Values. It is important that the potential impact of new development on air quality is taken into account in planning where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified."

Paragraph: 002 Reference ID: 32-002-20191101:

"It is important to take into account air quality management areas, Clean Air Zones and other areas including sensitive habitats or designated sites of importance for biodiversity where there could be specific requirements or limitations on new development because of air quality".

Paragraph: 005 Reference ID: 32-005-20191101:

"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.

Where air quality is a relevant consideration the local planning authority may need to establish:

the 'baseline' local air quality, including what would happen to air quality in the absence of the development;

whether the proposed development could significantly change air quality during the construction and operational phases (and the consequences of this for public health and biodiversity); and

whether occupiers or users of the development could experience poor living conditions or health due to poor air quality".

Paragraph: 007 Reference ID: 32-007-20191101:

"Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific".

Paragraph: 008 Reference ID: 32-008-20191101:

"Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented".

Defra 'Local Air Quality Management Technical Guidance (LAQM.TG(16))'

5.15 Defra and the devolved administrations have published a guidance document on Local Air Quality Management (LAQM) - Local Air Quality Management Technical Guidance (TG16), Revised April 2021[13]. This document is designed to support local authorities in carrying out their duties under the Environment Act 1995, the Environment (England) Order 2002, and subsequent regulations. LAQM is the statutory process by which local authorities monitor, assess, and take action to improve local air quality. The Technical Guidance provides tools, approaches and technical information related to air quality.

[13] Defra (2021), Local Air Quality Management (LAQM) - Local Air Quality Management Technical Guidance (TG16), Revised April 2021

EPUK / IAQM ‘Land-Use Planning & Development Control: Planning for Air Quality’

5.16 Environmental Protection UK (EPUK) in partnership with The Institute of Air Quality Management (IAQM) have produced guidance on Land-Use Planning & Development Control: Planning For Air Quality[9] EPUK and IAQM have produced this guidance to ensure that air quality is adequately considered in the land-use planning and development control processes. It provides a means of reaching sound decisions, having regard to the air quality implications of development proposals and provides guidance on how air quality considerations of individual schemes may be considered within the development control process, by suggesting a framework for the assessment of the impacts of developments on local air quality.

IAQM 'Guidance on the Assessment of Dust from Demolition and Construction'

5.17 Guidance on the assessment of dust from demolition and construction has been published by the IAQM[14.] The guidance provides a series of matrices to determine the risk magnitude of potential dust sources associated with construction activities in order to identify appropriate mitigation measures that are defined within further IAQM guidance.

5.18 IAQM ‘A Guide to the Assessment of Air quality Impacts on Designated Nature Conservation Sites’

5.19 The Institute of Air Quality Management (IAQM) have produced guidance[15] to assist in the assessment of the air quality impacts of development on designated nature conservation sites (IAQM, 2020). The guidance focuses on air quality assessments in support of Habitats Regulations Assessments (HRA), but also considers the approach for assessing the air quality impact on national or local designated nature conservation sites.

5.20 The IAQM guidance adopts a similar procedure to that detailed in Natural England guidance on the assessment of road traffic emissions (Natural England, 2018) and identifies that exhaust pipe emission of ammonia is an additional relevant pollutant when assessing nitrogen deposition to sensitive ecological features.

Baseline Conditions

5.21 In 2016 the Greater Manchester Combined Authority (GMCA) declared an Air Quality Management Area (AQMA), encompassing all 10 districts of Greater Manchester including district centres, arterial routes and the airport, for exceedances of the annual mean NO2 air quality objective. The AQMA splits through the Proposed Development site (as shown in Figure 5.1) which implies the local authority are concerned that there is a potential for poor air quality at the Site location.

5.22 The district councils within the GMCA measure concentrations of NO2 at multiple automatic monitoring locations within Greater Manchester, the majority of these automatic monitors also measure PM10 concentrations. The district councils also measure NO2 using passive monitors (diffusion tubes). The nearest monitoring site (MAN26ANO) is located approximately 400 metres southeast of the Proposed Development at Chethams School. The monitoring locations within approximately 1.5 kilometres of the Site are shown in Figure 5.1 below. The measured annual mean NO2 concentrations (µg/m3), shown in the figure for the year 2019, have been taken from the 2019 Air Quality Annual Status Report[16.]

5.23 Measured NO2 concentrations exceeded the annual mean AQO of 40 µg/m3 at six of the nearby monitoring stations. Although, the measured NO2 concentration at the closest monitoring site was below the annual mean AQO. The Proposed Development is located within a similar setting.

5.24 Baseline concentrations of NO2, PM10 and PM2.5 at sensitive receptors will be predicted using dispersion modelling (see ‘Scope of Assessment’ section below), based on existing relevant traffic flows on local roads and taking account of current background pollutant concentrations.

[14] IAQM (2016) Guidance on the Assessment of Dust from Demolition and Construction v1.1

[15] IAQM (2020), A guide to the assessment of air quality impacts on designated nature conservation sites 2020

[16] Greater Manchester Combined Authority (2019), 2019 Air Quality Annual Status Report.

Figure 5.1: Monitoring Station Locations (with 2019 Annual Mean NO2 Concentrations), Air Quality Management Areas and Proposed Development Site Location

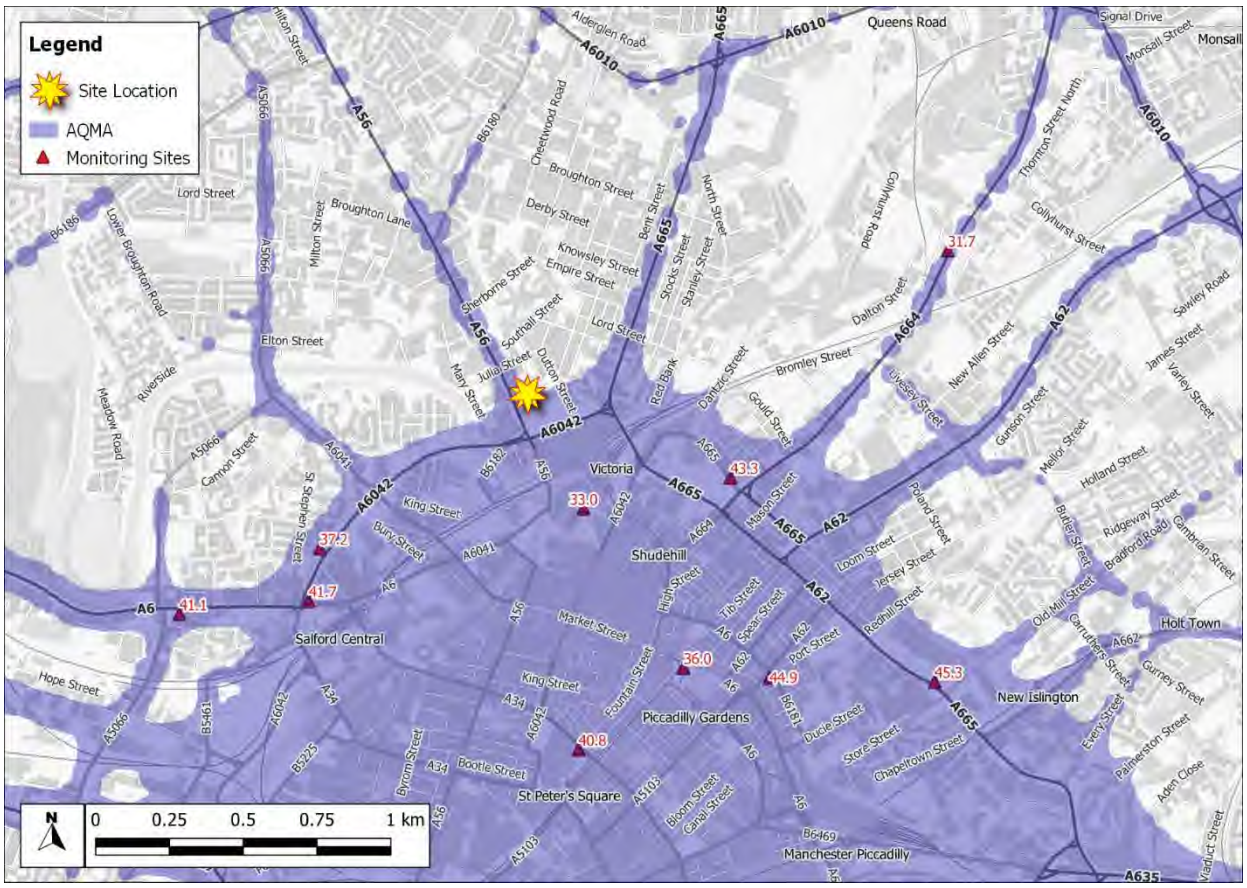

Figure notes: Contains OS data © Crown copyright and database right (2021).

Potentially Sensitive Receptors

5.25 The Proposed Development is not due to be occupied by any residences until the construction is complete, therefore there will be no sensitive receptors on site during the demolition and construction phase of works. However, there will be potentially sensitive receptors in the local area which will include residential dwellings and retail units (high sensitivity receptors) and offices (medium sensitivity receptors). Receptor locations will be identified following a desk-based exercise using detailed maps, satellite imagery, and plans of the Site. Following the IAQM guidance, the assessment will consider the potential for impacts within 350 m of the Proposed Development site boundary, and within 50 m of the routes to be used by construction vehicles up to 500 m from the Proposed Development site entrance(s).

5.26 Once the Proposed Development is completed and operational, potentially sensitive receptors in the local area and within the Proposed Development itself will include residential dwellings and locations where members of the public would be expected to spend one hour or more, such as locations of amenity. These selected receptors will be classified as being high sensitivity receptors. Receptor locations will be identified following a desk-based exercise using detailed maps, satellite imagery, and plans of the Site. The locations selected will be dependent on the layout of the Proposed Development and the volume and routing of traffic generated by the Proposed Development. The receptors will be identified to represent a range of exposure but will focus on likely worst-case locations closest to the sources of emissions based on professional judgement. The desk-based exercise will review receptors up to 200 m from the relevant roads and up to 500 m from the location of any significant on-site combustion plant exhaust locations.

Potential Significant Effects

Construction

5.27 Potential significant air quality effects as a result of demolition works and the subsequent construction of the Proposed Development relate to the following:

- Impacts of dust and PM_{10} emissions during demolition and the construction of the Proposed Development;
- Impacts from non-road mobile machinery (NRMM) emissions; and
- Impacts of emissions from construction traffic.

5.28 Appropriate mitigation measures associated with the minimisation of potential dust and elevated PM10 concentrations, to be applied during demolition and construction works, will be identified within the air quality assessment. With the mitigation measures in place, it is expected that residual demolition and construction dust and PM10 effects will be 'not significant' in accordance with the IAQM guidance.

5.29 Suitable mitigation measures for construction plant will be identified based on advice presented in IAQM14 guidance documents. It is expected that residual NRMM effects as a result, will be 'not significant'.

5.30 If construction traffic impacts cannot be screened out, the potential for significant air quality effects resulting from changes in vehicle emissions on local roads will be assessed and, if necessary, appropriate mitigation measures will be identified. This will be determined upon evaluation of construction traffic data, however, given the size of the Proposed Development it is anticipated that the effects will be 'not significant'.

Operational

5.31 Based on the current design of the Proposed Development a net increase in traffic generation will not be expected, therefore impacts at local existing human health sensitive receptors from pollutant emissions from additional traffic generated during the operation of the Proposed Development will be able to be screened out based on the IAQM guidance. Impacts on designated ecological habitats due to road traffic emissions are also anticipated to be screened out following the IAQM guidance and based on the likely limited changes in traffic flows and the distance to any sensitive habitats. Although both of these this may be subject to change if the design is altered to implement more parking provision.

5.32 As there is an ambition to heat the Proposed Development with electric methods there will not be expected to be any on-site emissions from combustion plant. However, should this plan change or should diesel backup generators be implemented, then potential impacts from on-site plant on local existing sensitive receptors will need to be assessed.

5.33 There is a potential for air quality impacts at the facades of future residential properties, representing future residents' exposure within the Proposed Development, due to road traffic emissions. The assessment methodology to consider this is outlined within paragraph 0.

5.34 Should there be any significant combustion plant emitting pollutants on site, then potential impacts from on-site plant on future occupants and users of the Proposed Development will need to be assessed.

5.35 Cumulative air quality impacts of the Proposed Development in combination with other 'Cumulative Schemes' will be considered.

5.36 The potential for significant air quality effects associated with the operation of the Proposed Development will be determined based on predicted impacts at potentially sensitive receptors, impacts on compliance with the UK's limit values, the concentrations in relation to the health-based WHO guidelines and professional judgment, using the relevant EPUK and the IAQM guidance9. If significant effects are identified, appropriate mitigation measures will be identified to reduce the potential impact so that, where possible, residual air quality effects are not significant.

Assessment Methodology

Determination of Significant Effects

5.37 The effects need to consider the impacts on the local area and the impacts on the future occupants of the Proposed Development.

5.38 Standard practice is to assess the impacts of a Proposed Development on local air quality using the EPUK and IAQM9 guidance on 'Land-Use Planning & Development Control: Planning For Air Quality' (2017). This guidance refers to impacts rather than effects for the descriptors at specific locations, and this approach will be used within the assessment.

5.39 Where impacts are not screened out at initial stages and detailed modelling is carried out, the approach set out in the guidance provides a method for describing the impacts on local air quality, in relation to human health, arising from development. Impact descriptors for individual receptors are used to express the magnitude of incremental change as a proportion of a relevant assessment level. This is then examined in the context of the new total concentration and its relationship with the assessment criterion (i.e. the sensitivity of receptor).

5.40 This approach is similar to the approach for describing significant effects within the wider ES (as set out in section 5.1), though the percentages outlined in **Error! Reference source not found.** below are specific to this assessment. REF _Ref80692062 \h * MERGEFORMAT **Error! Reference source not found.** sets out the matrix for determining the impact descriptor for annual mean concentrations at individual existing receptors, as outlined in Table 6.3 of the guidance document[9]. Where the percentage change is positive (i.e. an increase) the nature of the impact is described as adverse, conversely where the percentage change is negative (i.e. a decrease) the nature of the impact is described as beneficial. Where the impacts are negligible the nature of the impact is descripted as neutral.

Table 5.1: Annual Mean Impact Descriptors for Individual Receptors

Annual Mean Concentration with Proposed Development (µg/m³)	% Change in Concentration relative to the AQO (µg/m3)			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76-94% of AQO	Negligible	Slight	Moderate	Moderate
95-102% of AQO	Slight	Moderate	Moderate	Substantial
103-109% of AQO	Moderate	Moderate	Substantial	Substantial
75% or less of AQO	Moderate	Substantial	Substantial	Substantial

5.41 In consideration of the impacts on the short-term (1-hour or 24-hour AQOs), where no breach of the objective is predicted the short-term impacts are considered negligible.

5.42 Should impacts on sensitive ecological impacts be explicitly considered (not screened out based on traffic flows), where changes in concentrations and deposition fluxes at nationally and internationally designated sites are below the following thresholds the impacts are determined to be negligible based on the IAQM guidance15, no magnitude:

- 1% of the long-term habitat specific assessment level; and
- 10% of the short-term habitat specific assessment level.

5.43 For locally designated ecological sites, where changes in concentrations and deposition fluxes are less than 100% of the habitat specific assessment level, impacts are described as negligible.

5.44 No magnitude descriptor is used for short-term human health impacts or for ecological impacts.

5.45 In terms of the impacts on the Proposed Development, the impact descriptors set out in **Error! Reference source not found.**. are not relevant. Instead, where a breach of either the annual mean or short-term AQOs is predicted, the impacts on the Proposed Development will be considered to be significant, however, professional judgement will be used to determine if any mitigation by design will negate the potential significant effects.

5.46 The approach developed by EPUK and the IAQM[9] and other IAQM guidance documents will be used for assessing the overall significance of effects based on the predicted impacts upon AQOs, limit value and WHO guidelines compliance. The guidance states that the assessment of significance should be based on professional judgement, with the overall air quality effect of the Proposed Development described as either 'significant' or 'not significant'.

5.47 In determining the significance, the following factors will be taken into account:

- the existing and future air quality in the absence of the Proposed Development;
- the extent of current and future population exposure to the air quality impacts associated with the Proposed Development;
- the introduction of new exposure to poor air quality within the Proposed Development;
- the influence and validity of any assumptions adopted when predicting impacts;
- the potential for cumulative impacts:
  - When considering the cumulative interaction of impacts, a number of different components are considered to identify whether effects should be considered significant, with the resulting classification based on professional judgement. E.g. where several impacts that are described individually as "slight" could, when considered together, have a significant effect overall, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a "moderate" or "substantial" impact may not result in a significant effect if confined to a very small area, and where it is not obviously the cause of harm to human health;
- the judgement on significance relates to the consequences of the impacts:
  - i.e. will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals; and
- consideration of World Health Organization's (WHO) guideline values for pollutants, for which the proposed Environment Bill 2019-2021 may adopt. These are particularly important to consider where there is a high density of people, such as for residential apartments. In addition, the recent (December 2020) coroners court case investigating a young girl's death in 2013 concluded that air pollution was a significant contributing factor to both the induction of her asthma and the exacerbation of her symptoms, due to exposure in exceedence of WHO guideline values for pollutants.

5.48 Where air quality impacts on ecological receptors are considered, the effects cannot be determined exclusively based on the air quality assessment, however, impacts can be discounted as eligible below the relevant habitat specific screening threshold, where this is the case, the effects are determined as not significant.

5.49 Where mitigation measures are identified to either eliminate or reduce likely significant adverse effects, these will be incorporated into the ES.

5.50 The assessment will then highlight the 'residual' likely significant impacts (those effects which remain following the implementation of suitable mitigation measures) and classify these in accordance with the approach set out above.

5.51 The potential for cumulative air quality effects from road traffic associated with the Proposed Development in combination with other Cumulative Schemes, as identified by the Project team, within the local area will be considered, both in relation to cumulative demolition and construction related air quality effects and effects associated with the completed and operational scheme.

Baseline Assessment

5.52 Consideration of the baseline conditions within the area of the Proposed Development will be made based on the following:

- Industrial and waste management sources that may affect the area have been identified using the European Pollutant Release and Transfer Register (European Environment Agency, 2019). Local sources have also been identified through examination of maps and the Council's Air Quality Review and Assessment reports.
- Information on existing air quality will be obtained by collating the results of monitoring carried out by the local authority and where available other monitoring networks. This covers both the proposed site and the surrounding area, the latter will be used to provide context to the assessment.
- Background concentrations of NO2, PM10 and PM2.5 will be defined using the national pollution maps published by Defra (Defra, 2021b). These cover the whole of the country on a 1x1 km grid of average concentrations.
- Predicted roadside concentrations of NO2 in the study area will be identified using the maps of roadside concentrations published by Defra (2021a) as part of its 2017 Air Quality Plan for the baseline year 2015 and for the future years 2017 to 2030. These maps are used by the UK Government, to report exceedances of the limit value to the EU. The national maps of roadside PM10 and PM2.5 concentrations (Defra, 2021c), which are available for the years 2009 to 2015, show no exceedances of the limit values anywhere in the UK in 2015.

5.53 A review of the likely baseline conditions in the future (opening) year will be carried out based on professional judgement and published forecasts.

Construction

5.54 During demolition and construction, dust and PM10 emissions can be released into the air. Emissions will vary substantially from day to day, depending on the level of activity and the specific operations being undertaken, along with the influence of the weather conditions. An assessment of potential dust impacts will be carried out using a risk-based approach developed by the IAQM.

5.55 Mitigation measures will be incorporated into a Dust Management Plan (DMP) and/or Construction Environmental Management Plan (CEMP) (or equivalent).

5.56 Guidance from the IAQM[Error! Bookmark not defined.] states that "experience from assessing the exhaust emissions from o n-site plant (also known as non-road mobile machinery or NRMM) […] suggests that they are unlikely to make a significant impact on local air quality and in the vast majority of cases they will not need to be quantitatively assessed". On this basis, significant effects as a result of NRMM emissions can thus be discounted. However, suitable mitigation measures for construction site plant will be presented as part of the mitigation measures based on advice presented in IAQM[Error! Bookmark not defined.] guidance documents. IAQM are in the process of updating t heir construction dust guidance and if published in time the new version will be used.

5.57 The number of vehicles associated with the demolition and construction works will be compared to screening criteria set out in EPUK and IAQM guidance[9]Error! Bookmark not defined.. If the number of vehicle movements is a bove this threshold, a detailed assessment will be undertaken using the ADMS-Roads dispersion model[17] with the latest vehicle emission factors available. The focus of the assessment would be on NO2, PM10 and PM2.5 concentrations, as these are likely to be the main pollutants of concern. This will include predicting concentrations

[17] CERC (2018) ADMS-Roads, Comprehensive software for modelling road traffic pollution, https://www.cerc.co.uk/environmental-software/ADMS-Roads-model.html

at potentially sensitive receptors in the local area and the significance of the air quality effects would be determined following the EPUK and IAQM guidance[9].

Operational

Impacts on the Local Area

5.58 Should the changes in traffic flows on the local roads as a result of the Proposed Development not be screened out based on the flow or should the Proposed Development include significant on-site combustion plant then pollutant emissions will be predicted using the ADMS dispersion modelling software package. Where this is the case the impacts will be reviewed and effects determined.

5.59 For the road traffic modelling this would use the latest Defra EFT vehicle emission factors available. For combustion plant modelling, this would be based on information relating to the plant and their emissions, as well as utilisation of the plant and location of the exhaust flues. Concentration would be predicted at the relevant sensitive receptors in the local area.

5.60 The impacts of the Proposed Development on local air quality will be described using the EPUK and IAQM9 guidance.

Site Suitability

5.61 The suitability of the Site will be reviewed based on the impacts on the future occupants and users of the Proposed Development from existing sources of pollution and new sources as a result of the Proposed Development. Road traffic emissions will be assessed using the ADMS-Roads dispersion model with the latest vehicle emission factors available and accounting for the restriction in dispersion in urban settings due to streetscape massing (known as the 'canyon effect').

5.62 If the pollutants from any on-site combustion plant cannot be screened out against criteria set out within the EPUK and IAQM guidance9, then a quantitative assessment of the impacts of the emissions from combustion plant will be carried out using the ADMS-5 dispersion model. This will be based on information relating to the plant and their emissions, as well as utilisation of the plant and location of the exhaust flues. This will include predicting concentrations at potentially sensitive receptors in the local area assuming the Proposed Development is operational.

5.63 Where there a breach of either the annual mean or short-term AQOs is predicted, the impacts on the Proposed Development will be considered to be significant, however, professional judgement will be used to determine if any mitigation by design will negate the potential significant effects.

Dispersion Modelling

5.64 The road traffic dispersion modelling carried out for the Proposed Development will include a model performance verification considering local monitoring data to validate the model (model verification). The verification will use the latest relevant full calendar year of data which is not influenced by the COVID-19 pandemic, along with the year specific emission factors and meteorological data.

5.65 Consideration will be given to account for the likelihood of predicted vehicle emission reductions not occurring in line with Defra's forecasts.

5.66 The focus of the assessment will be on NO2, PM10 and PM2.5 concentrations, as these are likely to be the main pollutants of concern. Where impacts on the local area are modelled (i.e. where impacts ae not screened out based on the changes in flows) this will include predicting concentrations at potentially sensitive receptors in the local area for three scenarios;

- Baseline year, which will be based on the most recent relevant full year of monitoring data available which is not influenced by the COVID-19 pandemic, i.e. 2019;

- Opening year (future baseline) without the Proposed Development, including traffic generated by relevant cumulative schemes; and
- Opening year (future) with the Proposed Development, including traffic generated by relevant cumulative schemes and the Proposed Development itself.

5.67 For the Site suitability assessment, the concentrations of pollutants will be predicted in the opening year (future) with the Proposed Development.

Summary of Assessment Scope

Table 5.2: Summary of Assessment Scope

Assessment	Receptor	Impact	Potential Effect	Scoped in / out
Demolition and construction generated dust impacts.	Sensitive receptors including residential properties surrounding the Proposed Development (distance related to IAQM Construction Dust Guidance).	Residual impacts not expected to be significant.	Residual effects not expected to be significant.	In.
Construction NRMM.	Sensitive receptors including residential properties surrounding the Proposed Development (distance related to IAQM Construction Dust Guidance).	Impacts not expected to be significant.	Effects not expected to be significant.	In (a review of the construction plan is required to screen out impacts).
Construction traffic.	Residential properties in within 200 meters of the roads where significant changes in traffic flows occur due to the Proposed Development.	Impacts not expected to be significant.	Effects not expected to be significant.	In (a review of the construction traffic data is required to screen out impacts).
Changes in concentrations at locations of relevant human health exposure in the local area.	Residential properties (and in places where people would be expected to spend more than 1-hour) in the local area within 200 meters of any roads where significant changes in traffic flows occur (changes related to EPUK / IAQM Guidance) or within 500m of the pollution exhaust due to significant on-site combustion plant emissions.	Impacts not expected to be significant based on low traffic scheme and no proposed on-site combustion plant.	Effects not expected to be significant.	In (a review of the traffic data and proposed combustion plant is required to screen out impacts).
Changes in concentrations at locations of relevant ecological sites in the local area.	Relevant designated ecological sites within 200 m of the roads where significant changes in traffic flows occur (changes related to IAQM Guidance) due to the Proposed Development.	Impacts not expected to be significant.	Effects not expected to be significant.	In (a review of the traffic data and proposed combustion plant is required to screen out impacts).
Impacts on the Users and future occupants of the	Residential properties in the Proposed Development, representing impacts on future occupants and users	Impacts potentially significant.	Effects potentially significant.	In.

Proposed Development.	of the scheme from the operation of the scheme and existing pollutant sources.

Climate Change

Introduction

5.68 This chapter describes the climate change scoping assessment for the Proposed Development. The assessment was undertaken to ascertain the likely potential effects on climate, and the vulnerability of the Proposed Development to climate change, due to the Proposed Development during construction and operation.

5.69 This section has been divided into two sub-sections in order to address the climate change requirements outlined in The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations 2017'), which transposes changes made to EU Directive 2011/92/EU1 ("the EIA Directive 2011") by EU Directive 2014/52/EU2:

- Effects of the Proposed Development on climate; and
- Vulnerability of the Proposed Development to climate change.

Effects of the Proposed Development on Climate Change

5.70 The Proposed Development has the potential to affect the earth's climate by increasing the emission of greenhouse gases (GHGs) into the atmosphere, which will occur during construction and throughout its operational life. The earth absorbs energy from the sun and re-emits it as thermal infrared radiation. GHGs in the atmosphere absorb this radiation, preventing it from escaping into space. The higher the concentration of GHGs, the more heat energy is retained, and the higher global temperatures become. Due to human activities the concentration of GHGs in the atmosphere has increased dramatically, leading to global warming. This leads to myriad indirect impacts as the climate responds to the increased atmospheric temperature.

5.71 The UK has made commitments to tackle the root cause of climate change by reducing GHG emissions, as well as to increase the resilience of development and infrastructure to the changing climate. The Climate Change Act 2008 (as amended in 2019) sets a target to reduce net GHG emissions by at least 100% from 1990 levels by the year 2050.

5.72 The effective assessment and management of impacts on climate offers the opportunity to reduce the impact of projects on climate by minimising the magnitude of GHG emissions as far as possible.

Legislative and Policy Context

5.73 Human activities contribute to the emission of GHGs such as carbon dioxide (CO2) to the atmosphere, primarily by the combustion of fossil fuels. Greenhouse gases trap heat in the atmosphere, with higher concentrations leading to increased global temperatures. Atmospheric CO2 concentrations now exceed 400 parts per million for the first time in around 3 million years, and increased emissions have led to global average surface temperatures of 1°C higher than pre-industrial levels. There is a global consensus that emissions must be reduced dramatically. Relevant international, national and local policies are cited below in Table 5.3.

Table 5.3: Summary of Assessment Scope

Scale	Legislation/Regulation	Summary of Requirements
National	National Planning Policy Framework (NPPF) (2021)	Paragraph 148 outlines its support for transitioning to a low carbon future, by way of reducing greenhouse gas emissions and

Scale	Legislation/Regulation	Summary of Requirements
		supporting renewable and low carbon energy and associated infrastructure. Building on the NPPF, planning practice guidance published in June 2014 advises on how to identify suitable measures in the planning process to mitigate for and adapt to climate change.
	Environmental Impact Assessment Regulations, 2017	The Regulations require a description of the likely significant effects of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change.
	Climate Change Act 2008 (2050 Target Amendment) Order 2019	To support international efforts, the UK Climate Change Act (2008) set a legal reduction target of 80% against 1990 levels by 2050. It also introduced a series of carbon 'budgets' for five-year periods, to act as stepping-stones to the overall reduction. There are budgets currently set up to 2032. In response to the ambitions of the Paris Agreement, in 2019 the Climate Change Act was amended to set the overall reduction target by 2050 to at least 100% in net emissions against 1990 levels . The UK has so far outperformed its budgets, but progress is slowing, and the country is not on track to meet its future budgets or the overall reduction target, according to the most Recent Progress to Parliament by the Committee on Climate Change.
Regional	Climate Change and Low Emission Strategies' Whole Place Implementation Plan for Greater Manchester (2016-2020)	The plan sets out priorities to 2020 and beyond. It includes actions to both address climate change and improve Greater Manchester's air quality. The objectives extend beyond achieving a challenging 48% carbon reduction target (by 2020) to preparing the city region to adapt to unavoidable climate change, promoting carbon literacy and transitioning Greater Manchester (GM) into a low carbon and low emissions economy with clean air and sustainable lifestyles.
	5 Year Environment Management Plan for Greater Manchester (2019-2024)[18]	The plan identifies "the threat of climate change – reducing carbon dioxide (CO2) emissions" as the most significant of environmental challenges. It highlights the need to make fair contribution to global commitments aimed at

[18] 5 Year Environmental Management Plan for Greater Manchester (2019-2024)

Scale	Legislation/Regulation	Summary of Requirements
		limiting global temperature rise. The vision statement includes neutral, climate resilient city region with a thriving natural environment and circular, zero-waste economy requirements with the aim for 'mitigating climate change: For our city region to be carbon neutral by 2038 and meet carbon budgets that comply with international commitments'. The plan contains priorities around increasing the use of public transport and active travel modes and phasing out fossil-fuelled private vehicles.
	Manchester City Council Climate Change Action Plan 2020-2025[19]	Manchester City Council declared a Climate Emergency in July 2019 and developed a Climate Change Action Plan which was approved in March 2020. In the document the City Council declares its commitments to tackling climate change over the period 2020 to 2025. The document summarises the specific actions which are required to ensure that the Council reduces its direct emissions by at least 50% by 2025, as well as the Council's plans for adapting to the expected impacts of climate change. (http://www.manchesterclimate.com/plan). It summarises the specific actions which are required to ensure that the Council reduces its direct emissions by at least 50% by 2025 whilst also playing our full part in supporting and influencing the city to do the same. It also covers the Council'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 2015-25.
	Manchester Climate Change Framework (2020-2025)	The document outlines the strategy towards making Manchester a thriving, zero carbon, climate resilient city. It sets out the priority areas for action are: Buildings (existing and new) Renewable energy Transport and flying Food

[19] MCC Climate Change Action Plan 2020-25 | Manchester City Council

Scale	Legislation/Regulation	Summary of Requirements
		Consumer goods and waste Green infrastructure and nature-based solutions

Baseline Conditions

UK Emissions

5.74 The existing environment regarding greenhouse emissions consists of the global greenhouse gas emissions, from all sources; these amount to approximately 50 billion tonnes of CO2e20 per year. The UK is the world's 8th largest emitter[21] of CO2e, with the total UK emissions for 2019 (the last reported year) being 454.8 million tonnes of CO2e[22]

5.75 The UK has in place carbon budgets for five-year periods up to 2037. The UK's carbon reduction targets and carbon budgets are presented in Table 5.4.

5.76 The UK is currently in the third carbon budgetary period (2018-2022), the budget for which is 2,544 MtCO2e. The UK cannot legally emit more greenhouse gases than this within the budgetary period. Whilst budgets are not set beyond the year 2037, there is a legal requirement for the UK to reach 0 MtCO2e by 2050.

5.77 Interim emissions reductions have been announced by the UK Government recently, namely 68% by 2030 and 78% by 2035 to ensure the UK meets the 5th and 6th UK Carbon budgets.

Table 5.4: UK Carbon Redution Targets and Budgets

UK Carbon budget period	UK Carbon budget level	% reduction from 1990 levels
3rd carbon budget (2018 to 2022)	2,544 $MtCO_2e$	37% by 2020
4th carbon budget (2023 to 2027)	1,950 $MtCO_2e$	51% by 2025
5th carbon budget (2028 to 2032)	1,725 $MtCO_2e$	68% by 2030
6th carbon budget (2033 to 2037)	965 $MtCO_2e$	78% by 2035

Regional Emissions

5.78 In July 2019, Manchester City Council declared a climate emergency[23]. This declaration recognises the need for the Council and the city as a whole to do more to reduce its carbon emissions and mitigate the negative impacts of climate change and demonstrated the Council's commitment to be at the forefront of the global response to climate change and to lead by example.

5.79 The Tyndall Centre for Climate Research has calculated carbon budgets for each local authority in the UK for the period 2018 to 2100, in order for each to make a 'fair' contribution to overall UK national carbon reduction. The

[20] http://themasites.pbl.nl/publications/pbl-2017-summary-trends-in-global-co2-and-total-greenhouse-gas-emissions-2983.pdf
[21] https://www.ucsusa.org/resources/each-countrys-share-co2-emissions
[22] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957887/2019_Final_greenhouse_gas_emissions_statistical_release.pdf
[23] MCC Climate Change Action Plan 2020-25 | Manchester City Council

budget for Manchester City Council is presented in Table 5.5. The combined carbon budget for 2018 to 2100 is 18.1 MtCO224.

Table 5.5: MCC Carbon Redution Targets and Budgets

Manchester carbon budget period	Recommended Carbon Budget ($MtCO_2$)
2108 – 2022	8.6
2023 – 2027	4.6
2028 – 2032	2.4
2033 – 2037	1.2
2038 – 2042	0.6
2043 – 2047	0.3
2048 – 2100	0.3

5.80 The recommended targets and objectives are set out in the Manchester Climate Change Framework 2020-25 but the headline recommendations are referenced below:

- To ensure that Manchester plays its full part in helping to meet the Paris Agreement objectives by keeping our direct CO2 emissions within a limited carbon budget, taking commensurate action on aviation CO2 emissions and addressing our indirect / consumption-based carbon emissions.
- To adapt the city's buildings, infrastructure and natural environment to the changing climate and to increase the climate resilience of our residents and organisations.
- To improve the health and wellbeing of everyone in Manchester through actions that also contribute to our objectives for CO2 reduction and adaptation and resilience, with particular focus on those most in need.

5.81 To ensure 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.

Potential Effects

5.82 Buildings energy demand and consumption should be minimised through adopting the UK Green Building Council (UKGBC) framework definition for net zero carbon buildings developed in 2019. The primary focus of the framework is to set in place a path to achieve net zero carbon buildings in both construction and operation (in-use energy consumption) while also beginning to provide direction for addressing whole life carbon in the industry. The framework sets out definitions and principles around two approaches to net zero carbon which are of equal importance:

5.83 Net zero carbon for construction - "When the amount of carbon emissions associated with a building's product and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of on-site renewable energy."

5.84 Net zero carbon for operational energy - "When the amount of carbon emissions associated with the building's operational energy on an annual basis is zero or negative. A net zero carbon building is highly energy efficient and powered from on-site and/or off-site renewable energy sources, with any remaining carbon balance offset."

[24] Local and Regional Implications of the United Nations Paris Agreement on Climate Change (manchester.ac.uk)

5.85 The framework outlines where the principles should be followed to demonstrate alignment with net zero carbon for both construction and operational energy across five key steps. All new buildings should target net zero carbon for both construction and operational energy by considering these principles and following the steps to achieve a net zero carbon building.

5.86 Reaching Net Zero targets will require setting out and following a zero-carbon trajectory. For example, A Zero Carbon Trajectory is set out in the LETI Design Guide[25] to illustrate the key milestones that must be achieved in order to ensure that the UK will have a zero-carbon built environment by 2050.

Potential effects – Construction Phase

5.87 The construction of the Proposed Development will affect the climate by causing the emission of greenhouse gases in the following activities:

- production of construction materials, including primary raw material extraction, manufacturing and intra-manufacturing transportation (embodied carbon);
- transportation of materials and workforce to the construction site;
- combustion of fuel to generate energy for use during construction;
- treatment and transport of water for use during construction; and
- transport, treatment and/or disposal of waste generated during construction.

Potential effects – Operational Phase

5.88 The operation of the Proposed Development has the potential to affect the climate by causing the emission of greenhouse gases in the following activities:

- use of energy in the buildings and infrastructure by the end-user;
- operation and maintenance of the buildings and infrastructure (including repair, replacement and refurbishment);

Assessment Methodology

5.89 The assessment will calculate the greenhouse gas emissions associated with the construction and operation of the Proposed Development, with reference to the framework set out in PAS 2080:2016 (Carbon Management in Infrastructure)

5.90 Emissions will be calculated using Atkin's Carbon Knowledgebase tool, which contains a detailed library of calculation formulae and over 1,000 emissions factors from authoritative sources such as the Inventory of Carbon and Energy (ICE, versions 1.6(a), 2.0 and 3.0), the Defra Greenhouse Gas Reporting Conversion Factors, and the EMEP/ CORINAIR Emission Inventory Guidebook. Table 5.5 and Table 5.6 show the proposed scope of assessment for effects on climate.

5.91 The overall lifecycle emissions or emissions reductions will be expressed as a percentage of the carbon budgets for Manchester City Council and the UK.

5.92 A level of significance will be assigned based on the extent to which the Proposed Development would impact the UK's and Manchester City Council borough's ability to meet their carbon budgets.

Table 5.6: MCC Carbon Redution Targets and Budgets

[25] https://www.leti.london/cedg

Phase	Life Cycle Module		PAS 2080:2016 Reference	Assessment Boundary
Construction	Product stage Raw material supply Transport Manufacture		A1-3	Emissions from the production of construction materials, including primary raw material extraction, manufacturing and intra-manufacturing transportation.
	Transport to works site		A4	Direct vehicle emissions from the transportation of construction materials from the primary site of manufacturing to site.
	Construction processes	Fuel, energy and water use	A5	Direct and well-to-tank emissions from the operation of construction plant on-site. The boundary is the same as that used for the noise assessment. On-/off-site construction worker facilities (temporary offices, etc.) emission (from lighting, heating, etc.). Emissions from all activities for the treatment and supply of water to site.
		Business and employee transport		Direct vehicle emissions from the transportation of workers to the Site for the duration of the construction works.
		Waste		Direct vehicle emissions from the transportation of bulk construction waste from the construction site to the primary processing site, and processing of bulk construction waste.

Table 5.7 - Emission Sources Included in Scope of the Assessment of Effects of Operation Phase on Climate (adapted from PAS 2080:2016)

Phase	Life Cycle Module	PAS 2080:2016 Reference	Assessment Boundary
Operation	Maintenance/refurbishment	B2-5	Emissions from the ongoing maintenance, repair, replacement and refurbishment activities. This potentially includes the same modules/ activities as in the construction phase.
	Operational energy use	B6	Emissions from the generation and supply of energy used by infrastructure-integrated technical systems to enable it to deliver its service.
	Operation water use	B7	Emissions resulting from the consumption of water required by the infrastructure to enable it to operate and deliver its service.
	Other operational processes	B8	Direct vehicle emissions from the transportation of bulk waste from the proposed development to the primary processing site, and processing of bulk waste.

Potential effects

5.93 Strategically, greenhouse gas emissions are mitigated by applying the carbon reduction hierarchy in PAS 2080, covering:

- Build nothing – challenge the root cause of the need; explore alternative approaches to achieve the desired outcome;
- Build less -maximise the use of existing assets; optimise asset operation and management to reduce the extent of new construction required;
- Build clever -design in the use of low carbon materials, streamline delivery processes, minimise resource consumption; and
- Build efficiently -embrace new construction technologies; eliminate waste.

Conclusion

5.94 Assessment of effects on climate has been scoped into the EIA as there is a need to show that emissions from new development are being driven down and will comprise a quantification of the magnitude of greenhouse gas emissions from the across the lifecycle of the Proposed Development, construction and operation. An assessment of the Proposed Development effect on climate from emissions of GHGs will be carried out as set out above.

Vulnerability of the Proposed Developed on climate change

Legislative and policy framework

5.95 The following legislation and policies govern assessment of vulnerability to climate change and have been consulted in preparing this chapter, with the relevant portions summarised in 5.8.

Table 5.8 - Legislation, regulatory and policy framework for the vulnerability to climate change assessment

Legislation/ Regulation/ Policy	Summary of requirements
National	
Climate Change Act, 2008[26]	The UK passed legislation that introduced the world's first long term legally binding framework to tackle the risks posed by climate change. The Climate Change Act (2008) created a new approach to managing and responding to climate change in the UK, by: • Setting ambitious, legally binding reduction targets; • Taking powers to help meet those targets; • Strengthening the institutional framework; • Enhancing the UK's ability to adapt to the impacts of climate change; and • Establishing clear and regular accountability to the UK Parliament and to the developed legislatures. Key provisions of the Act in respect of climate change adaptation include a requirement for Government to report, at least every five years, on the risks to the UK of climate change, and to publish a programme setting out how these will be addressed. This Act also introduces powers for Government to require public bodies and statutory undertakers to carry out their own risk assessment and make plans to address those risks. The Adaptation Sub-Committee of the Committee on Climate Change will provide advice to, and scrutiny of, the Government's adaptation work.
Environmental Impact Assessment Regulations, 2017[27]	The Regulations require a description of the likely significant effects of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change.
Local	

[26] http://www.legislation.gov.uk/ukpga/2008/27/contents
[27] http://www.legislation.gov.uk/ukpga/2008/27/contents

Legislation/ Regulation/ Policy	Summary of requirements
Manchester City Council Climate Change Action Plan 2020-2025[28]	Manchester City Council declared a Climate Emergency in July 2019 and developed a Climate Change Action Plan which was approved in March 2020. In the document the City Council declares its commitments to tackling climate change over the period 2020 to 2025. The document summarises the specific actions which are required to ensure that the Council reduces its direct emissions by at least 50% by 2025, as well as the Council's plans for adapting to the expected impacts of climate change.
Manchester Climate Change Framework (2020-2025)[29]	The document outlines the strategy towards making Manchester a thriving, zero carbon, climate resilient city. This is planned across four objectives: Objective 1 – Staying within our carbon budgets Objective 2 – Climate adaptation and resilience Objective 3 – Health and wellbeing Objective 4 – Inclusive, zero carbon and climate resilient economy Across the priority areas for action are: 1. Buildings (existing and new) 2. Renewable energy 3. Transport and flying 4. Food 5. Consumer goods and waste 6. Green infrastructure and nature-based solutions
Manchester Green and Blue Infrastructure Strategy (2015-2025)[30]	The Manchester Green and Blue Infrastructure Strategy sets out the city's green spaces and waterways as critical for the city's high quality of life, further growth and development over the period 2015 to 2025. The Strategy's main objectives are: 1. Improve the quality and function of existing green and blue infrastructure 2. Use appropriate green and blue infrastructure as a key component of new developments to help create successful neighbourhoods and support the city's growth 3. Improve connectivity and accessibility to green and blue infrastructure within the city and beyond 4. Improve and promote a wider understanding and awareness of the benefits that green and blue infrastructure provides to residents, the economy and the local environment.

[28] https://democracy.manchester.gov.uk/documents/s16275/Final%20MCC%20Climate%20Change%20Action%20Plan%202020-25.pdf
[29] https://www.manchesterclimate.com/sites/default/files/Manchester%20Climate%20Change%20Framework%202020-25.pdf
[30] https://www.manchester.gov.uk/downloads/download/6314/manchester_green_and_blue_strategy

Baseline Climate

5.96 There have been a series of recent significant current climate events across the city of Manchester.[31] The city's residents and businesses are seeing more frequent flash flooding, travel disruptions, health impacts from poor air quality and extreme heat episodes in the summer.[32] The below categories summarise the events by event type across relevant periods and specific locations.

Floods

5.97 In the past decade, Manchester has experienced several notable floods. Storm Christoph in January 2021 threatened flooding in Didsbury and Northenden, with reports that the flood defences in the area were close to over-topping in places.

5.98 Significant flooding occurred across Greater Manchester in December 2015. Across the city region 2,225 properties were internally flooded. In Manchester, 37 properties were internally flooded in Cheetham and Hendham Vale.

High temperature events and heat waves

5.99 In 2018 Manchester, along with other parts of the UK, experienced a prolonged period of drought. Throughout the summer, moorlands across several parts of the country suffered a series of wildfires, with two wildfires on Saddleworth Moor in Greater Manchester, lasting for three weeks, damaging the peatland. The event caused a significant decline in air quality across Manchester and Greater Manchester.

5.100 Previous heatwaves have been recorded in 2006 and 2013.

Snowstorms

5.101 Over the past 15 years, the city of Manchester has experienced several major snowfall and cold weather events. Most recently was the so-called Beast from the East in February and March of 2018. Notable events in terms of severity were recorded in December 2009, November/December 2010 and March 2013.

5.102 Although the impact of these weather events in Manchester varied, they did bring extended period of very cold winds and in some instances heavy snowfalls. As a consequence, transport networks and mobility across the city was severely disrupted.

Storms and high winds

5.103 In February 2014, the Met Office issued a red warning for wind in Manchester. The event did not cause major damage however, people were advised to avoid traveling and remain indoors. Many premises closed and employees were sent home early.

5.104 Table 5.9 summarises the current frequency of occurrence of extreme weather and climate change impacts to Greater Manchester, alongside their respective impact on housing.

Table 5.9 - Extreme weather and climate change impacts to Greater Manchester's (GM) critical infrastructure. Adapted from: Climate change risk assessment of Greater Manchester's critical infrastructure[33]

	Flooding	High temperatures and heat waves	Water scarcity	Storms and high winds	Subsidence and landslides
Current frequency of	Relatively high: Events have	Relatively high: Events have	Relatively low: Events linked to	Relatively low: There are few	Relatively high: Storms are the

[31] https://www.manchesterclimate.com/sites/default/files/Climate%20vulnerability%20framework.pdf
[32] https://democracy.manchester.gov.uk/documents/s16275/Final%20MCC%20Climate%20Change%20Action%20Plan%202020-25.pdf
[33] https://resin-cities.eu/fileadmin/user_upload/Resources/City_report_GM/GMCCRA_report_final.pdf

occurrence of the event in GM (relative to other hazards)	become slightly less frequent over recent years.	become more frequent over recent years.	high temperatures are uncommon in GM.	records of drought related hazard events in GM.	second most common hazard facing GM.
Potential impact on housing	Flooding of properties	Overheating of buildings	Reduced water availability.		Subsidence

Adapted from: Climate change risk assessment of Greater Manchester's critical infrastructure[34]

Climate projections

Overview Climate Projections

5.105 Future climate change was assessed using analysis of statistically downscaled climate projections from the U.S. National Aeronautics and Space Administration (NASA). Climate projections were analysed until the year 2065 to produce the risk ratings presented in Table . The results are presented within Table . RCP4.5 represents a medium-low scenario in which the concentration of greenhouse gasses is stabilised by 2100, whereas RCP8.5 is a high emissions scenario, with no effective mitigation measures. There is always a degree of uncertainty with regards to the exact nature of changes in climate, and precipitation in particular, however, there are several clear messages that are relevant for the current development. Table highlights the main climate risks for Manchester. Manchester City Council recognises climate variability and climate change as an emerging threat to the sustainable development of the city.

Main Climate Risks

Table 5.10 - Climate exposure ratings for Manchester (High, Medium, Low)

Climate variable / Climate-related hazard		Rating	Impact
Wildfire	Wildfires		The wildfire hazard in Greater Manchester is classified as Medium[35]. This means that there is between a 10% and 50% chance of encountering weather that could support a significant wildfire that is likely to result in both life and property loss in any given year[36]. It is likely that the frequency of fire weather occurrence will increase due to climate change. The impact of wildfire must be considered in all phases of the project, in particular during design and construction. Project planning decisions, project design, construction methods and emergency response planning should take into account the level of wildfire hazard.
Urban flood	Extreme rainfall events (river and urban flooding)		River flood hazard in Greater Manchester is classified as low.[37] There is a chance of more than 1% that potentially damaging and life-threatening river floods occur in the coming 10 years. Project planning decisions, project design, and construction methods must take into account the level of river flood hazard.

[34] https://resin-cities.eu/fileadmin/user_upload/Resources/City_report_GM/GMCCRA_report_final.pdf
[35] https://thinkhazard.org/en/report/40111-united-kingdom-england-greater-manchest/WF
[36] https://thinkhazard.org/en/report/40111-united-kingdom-england-greater-manchest/WF
[37] https://thinkhazard.org/en/report/40111-united-kingdom-england-greater-manchest/UF

Climate variable / Climate-related hazard		Rating	Impact
Water scarcity	Drought		Water scarcity in Greater Manchester is classified as medium.[38] This means that there is a 1% chance drought will occur in the coming 10 years. The impact of drought should be considered in all phases of the project, in particular its effect on personnel and stakeholders, and during the design of buildings and infrastructure. Project planning decisions, project design, and construction methods should take into account the level of drought hazard.
River flood	Fluvial flooding		River flood hazard in Greater Manchester is classified as very low, based on modelled flood information currently available. This means that there is a chance of less than 1% that potentially damaging and life-threatening river floods occur in the coming 10 years.[39] Flood hazard does not need to be explicitly considered for this project. Surface flood hazard in urban and rural areas is not included in this hazard classification and may also be possible in this location.
Extreme heat	Extreme temperature events		Extreme heat hazard in Greater Manchester area is classified as very low based on modelled heat information currently available.[40] This means that there is less than a 5% chance that at least one period of prolonged exposure to extreme heat, resulting in heat stress, will occur in the next five years. Although the hazard is considered to be very low in the project location, local or additional information may suggest that there is extreme heat hazard.

Conclusion

5.106 Our recommendations is to scope in all high and medium risk. The impacts linked with the risks identified (see 5.10 for more detail) would need to be further analysed. A climate risk assessment including the likelihood and impact analysis in accordance with relevant guidance needs to be prepared. This assessment needs to include:

- Address the significant climate risks through the identification, appraisal, planning and implementation of relevant adaptation measures. The level of these risks may change in the later stages of the EIA and be downgraded if appropriate adaptation measures are put in place.
- Assess the scope and need for regular monitoring and follow-up for example of critical assumptions in relation to future climate change.
- Verify consistency with national, regional and local strategies and plans on the adaptation to climate change (see
- Table 5.8 - Legislation, regulatory and policy framework for the vulnerability to climate change assessment)

[38] https://thinkhazard.org/en/report/40111-united-kingdom-england-greater-manchest/DG
[39] https://thinkhazard.org/en/report/40111-united-kingdom-england-greater-manchest/FL
[40] https://thinkhazard.org/en/report/40111-united-kingdom-england-greater-manchest/EH

Daylight, Sunlight and Overshadowing

Introduction

5.107 This Chapter of the ES will be prepared by GIA and assesses the likely daylight, sunlight and overshadowing impacts of the proposals upon the Site and surrounding area.

Legislative and Policy Context

National Planning Policy

Revised National Planning Policy Framework 2021

5.108 The National Planning Policy Framework stipulates that "…Planning policies and decisions should ensure that developments… create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users."

5.109 The National Planning Policy Framework (NPPF) adopted on the 27th March 2012, and updated in July 2021 stipulates that "…planning policies and decisions should always seek to secure a good standard of amenity for existing and future occupants of land and buildings."

5.110 Paragraph 123 further states:

"Where there is an existing or anticipated shortage of land for meeting identified housing needs, it is especially important that planning policies and decisions avoid homes being built at low densities, and ensure that developments make optimal use of the potential of each site. In these circumstances:

[…]

c) In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)."

The National Planning Policy Guidance (NPPG) 2019

5.111 The National Planning Practice Guidance (NPPG) – Making Efficient Use of Land, published on 22 July 2019, Paragraph: 006 Reference ID: 66-006-20190722 states that:

"Where a planning application is submitted, local planning authorities will need to consider whether the proposed development would have an unreasonable impact on the daylight and sunlight levels enjoyed by neighbouring occupiers, as well as assessing whether daylight and sunlight within the development itself will provide satisfactory living conditions for future occupants."

5.112 Paragraph 007 Reference ID: 66-007-20190722 also states:

"All developments should maintain acceptable living standards. What this means in practice, in relation to assessing appropriate levels of sunlight and daylight, will depend to some extent on the context for the development as well as its detailed design. For example in areas of high-density historic buildings, or city centre locations where tall modern".

Local Planning Policy

Manchester Core Strategy (2012 – 2027)

5.113 Policy DM1 – Development Management – States that all developments should have regard to the effects on amenity including privacy, light, noise, vibration, air quality and odours.

5.114 Policy EN2 – Tall Buildings – States that, by their very size, tall buildings can have a significant impact on the local environment and its micro-climate. It is therefore expected that this impact be modelled and that submissions for tall buildings also include appropriate measures to create an attractive, pedestrian friendly local environment.

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

5.115 The SPD sets out a series of design principles which should be considered and implemented where necessary, those measures relevant to this assessment are:

- Minimise reliance on energy-using equipment for heating, cooling, lighting and natural ventilation.
- Site layout and building design principles should maximise the capture and use of daylight and passive solar energy, whilst avoiding excessive solar gain in the summer.
- Consider the impacts of overshadowing.

Guidance Documents and Standards

Building Research Establishment (BRE) 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice', Second Edition, 2011

5.116 The Building Research Establishment (BRE) Guidelines 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2011, 2nd edition' (released October 2011) provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. It is intended for use by building designers, developers, consultants and Local Planning Authorities (LPAs). The advice it gives is not mandatory and should not be used as an instrument of planning policy, it states:

"This guide is a comprehensive revision of the 1991 edition of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice. It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location."

5.117 It also states:

"The advice is given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. In special circumstances the developer or planning authority may wish to use different target values… in an area with modern high rise buildings, a higher degree of obstruction maybe unavoidable if new developments are to match the height and proportions of existing building" (para.1.6).

5.118 In addition, the BRE Guidelines state (para. 1.3) that, "it is intended to be read in conjunction with the interior daylighting recommendations in the British Standard 8206-2 Code of practice for daylighting, and in the CIBSE publication Lighting guide: daylighting and window design".

British Standard (BS) 8206-2:2008: 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'

5.119 The British Standard 8206 part 2 provides recommendations regarding the design for daylight in buildings and sets out various methods for assessing daylight. The document states:

"Daylighting gives to a building a unique variety and interest. An interior which looks gloomy, or which does not have a view to the outside when this could reasonably be expected, will be considered unsatisfactory by its users."

EN17037:2019 Daylight in Buildings (December 2018)

5.120 The new European Standard for Daylighting, or EN17037 was published in December 2018. Most local authorities continue to refer to the BRE guidelines. The BRE hope to secure funding and re-write the BRE guidelines in the financial year beginning April 2019, with the view of a revised publication in 2020. These timescales leave a fair degree of ambiguity as to when the new European Standard will become part of planning policy and what the transition between standards will be. In the meantime, The BRE guidelines and BS8206 remain the relevant tests.

Daylighting and window design: Lighting Guide LG10 (CIBSE) (1999)

5.121 This guide replaces the CIBSE Applications Manual Window Design (1987) and provides a daylight design guide. It states:

"when daylighting decisions are made, however, they will have implications for other, interrelated aspects of window performance such as solar heat gain, winter heat loss, provision of view, acoustic performance, privacy, security and protection from fire."

Baseline Conditions

5.122 Baseline studies are currently being undertaken by GIA. The baseline assessment will review the daylight and sunlight conditions within each of the surrounding residential properties in the Proposed Development area's present form.

Potential Significant Effects

5.123 In order to predict the significance of any potential impacts, it will be necessary to understand the context of the area, and sensitivity of the existing surrounding buildings, and how this should affect the application of the guidance set out in the BRE Guide.

5.124 The BRE Guide does not provide explicit targets on what constitutes minor, moderate of major adverse impacts. For daylight and sunlight, the BRE Guidelines outline the approach within the accompanying Appendix I, in terms of assigning criteria to assess the effects (para I3-I8):

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

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

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

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

5.125 The classification of major adverse is documented within Paragraph 7 of the BRE Guidelines:

"Factors tending towards a major adverse impact include:

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

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

5.126 There is no guidance on what constitutes a moderate adverse impact.

5.127 Therefore, best practice guidance and professional judgment will be used to determine any impacts based on the guidance set out in Appendix I of the BRE Guidelines, the NPPF and the NPPG. Potential effects will be identified as beneficial, adverse or negligible, and their magnitude of effects will be set out as Minor, Moderate and Major.

Assessment Methodology

Technical Scope

5.128 The BRE Guidelines suggest that residential properties have the highest requirement for daylight and sunlight and states that: *"the guidelines are intended for use for rooms in adjoining dwellings where light is required, including living rooms, kitchens and bedrooms."*

5.129 The technical analyses carried out to inform the daylight, sunlight, and overshadowing, assessment will be undertaken by creating a digital three-dimensional (3D) model of the existing Site and Proposed Development.

5.130 The 3D model uses Waldram Diagrams to establish the VSC and 3D geometric calculations for daylight distribution. This model (which is orientated to north by the use of Ordnance Survey (OS) information) enables the path of the sun to be tracked throughout the year to establish the shadow cast by the existing and proposed buildings and thus calculate the sun hours on ground in each scenario.

5.131 Only those surrounding residential properties which have windows facing towards the Site were included in the assessment. If a nearby residential property has no windows facing the Site, these properties would not be affected by the Proposed Development in terms of light.

Baseline Assessment

5.132 The baseline assessment will review the daylight and sunlight conditions within each of the surrounding residential properties in the Proposed Development area's present form.

Construction Assessment

5.133 Owing to the evolving and changing nature of demolition and construction activities, the assessment of potential effects during demolition and construction of the Proposed Development on daylight and sunlight to surrounding properties will not be modelled. Instead, a qualitative assessment will be undertaken using professional judgement and experience.

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

Operational Assessment

5.135 The following approaches are undertaken to assess the effect on the sensitive receptors of surrounding properties when the Proposed Development is completed and operational:

- Daylight:
  - Vertical Sky Component (VSC); and
  - No Sky Line (NSL) Method.

- Sunlight:
  - Annual Probable Sunlight Hours (APSH).

Scenarios to be assessed

5.136 The properties set out Table 5.11 will be considered due to their proximity to the Site, and their use.

5.137 The assessment has considered other adjacent residential properties and due to the distance and orientation from the proposed development, they are unlikely to be affected, so they will not be assessed in detail.

5.138 The following scenarios will be assessed and considered, and are reported within this Chapter of the ES:

- Scenario 1: Baseline configuration (pre-development); and
- Scenario 2: Proposed Development

5.139 Schemes under construction and with planning consent but not under construction have been included in the baseline scenario, in line with the BRE Guide, and so no separate technical assessment of the cumulative impact is required.

5.140 There are no amenity areas located in close proximity to the Site. As such, no overshadowing assessment is required.

Table 5.11 Summary of Assessment of Scope

Receptor	Impact	Potential Effect	Scoped In / Out
Old Brewery Gardens	Daylight/sunlight	Negligible to Moderate Adverse	In
Travelodge	Daylight/sunlight	Negligible to Moderate Adverse	In

Population and Human Health

Introduction

5.141 This Chapter of the ES will be prepared by Atkins Ltd and assesses the likely Population and Human Health impacts of the Proposed Development upon the Site and surrounding area.

Legislative and Policy Context

5.142 It is essential that the Proposed Development conforms to the planning hierarchy and planning policy context where it is relevant to population and human health, at the local, regional and national levels. An overview of the plans, policies and strategies that are relevant to the Proposed Development is set out below.

National Planning Policy

5.143 The new EIA Directive transposed into UK legislation in May 2017 includes a requirement to consider 'population and human health' amongst the other environmental topics for assessment. Other national and regional policy and guidance establish the link between planning and health, and the role and responsibility of the planning system and planning decisions to promote public health. The key policies are set out below.

Table 5.13 Policy overview

Scale	Policy Document	Key Considerations for the Scheme
National	National Planning Policy Framework[41]	The NPPF outlines the important role that the planning policies and decisions should play in creating 'healthy, inclusive and safe places' by promoting social interaction, safety, accessibility and healthy lifestyles (see NPPF section 8). The influence of planning is not limited to the proactive promotion of health; the likely effects of pollution caused by new development on health and living conditions should be considered and mitigated (Paragraph 185).
	Planning Practice Guidance[42]	Planning Practice Guidance (PPG) on Health and wellbeing states that, as the built and natural environments are major determinants of health and wellbeing, local planning authorities should consider these issues in planning decision making. Healthy communities are defined as those which support healthy behaviours, reduce health inequalities, and enhance physical and mental health. Where appropriate, healthy communities should also encourage active lifestyles – which can be facilitated through development (including transport and services) – and support social interaction through the creation of healthy living environments for people of all ages.
	Fair Society, Healthy Lives (the Marmot Review) 2010[43]	The Marmot Review found that individual health is influenced by wider 'social' determinants such as income, education, local environmental quality and employment. The review established six policy objectives for reducing health inequalities including 'to create and develop healthy and sustainable places and communities'.
	Health and Social Care Act 2012[44]	This is a wide-ranging piece of legislation that places a duty of care to protect and improve public health on the Secretary of State for Health as well as other bodies directed by the Secretary of State for Health such as local authorities. The Act requires every local authority to improve health and wellbeing, including via spatial planning and development management.
	Public Health Outcomes Framework 2016-19[45]	The Public Health Outcomes Framework seeks to improve and protect the nation's health and wellbeing and improve the health of the poorest fastest, measured through healthy life expectancy and its discrepancy with life expectancy. The Framework summarises the public health responsibilities of boroughs and establishes indicators to measure progress towards the objectives of improving the wider determinants of health and of helping people to live healthy lifestyles. These include several which may be affected by planning decisions, as follows: • Killed and seriously injured casualties on England's roads; • The percentage of the population affected by noise; • Utilisation of outdoor space for exercise/health reasons; • Social isolation; • Excess weight in adults and children; • Proportion of physically active and inactive adults; and • Self-reported well-being.

[41] Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework available at: National Planning Policy Framework (publishing.service.gov.uk)
[42] Department for Communities and Local Government (2016) Planning Practice Guidance available at: https://www.gov.uk/government/collections/planning-practice-guidance
[43] Marmot, M. (2010) Fair society, healthy lives: the Marmot Review: strategic review of health inequalities in England post-2010. ISBN 9780956487001
[44] Department of Health (2012) Health and Social Care Act
[45] Public Health England (2016) Public Health Outcomes Framework 2016-19 available at: https://www.gov.uk/government/collections/public-health-outcomes-framework

Scale	Policy Document	Key Considerations for the Scheme
Regional	Greater Manchester Combined Authority Health Strategic Five Year Plan	In February 2015 the 37 NHS organisations and local authorities in Greater Manchester signed a landmark devolution agreement with the Government to take charge of health and social care spending and decisions in the city region. This Plan recognises that Manchester generally has worse health outcomes than England, though it is noted that impact of housing, employment, air quality, early years services, education and skills on health and wellbeing is well understood and the Plan sets out how these issues can be addressed.
	Greater Manchester 'Places for Everyone' (Draft August 2021)	Places for Everyone is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. It has been published by the GMCA on behalf of the nine districts. A key element to this Plan is to make Manchester a place where people live healthy lives and older people are valued and this is reflected in the Plan Objective to promote health and wellbeing of communities. It is to be noted that this draft Plan supersedes that outlined previously as the 'Greater Manchester Spatial Framework'.
Local	Manchester City Council Health Plan 2018-2027	The council is responsible for promoting and protecting the health and wellbeing of people in the city. They have a range of public health functions, and there are five priority areas of the Health Plan: - Improving outcomes in the first 1,000 days of a child's life - Strengthening the positive impact of work on health - Supporting people, households, and communities to be socially connected and make changes that matter to them - Creating an age-friendly city that promotes good health and wellbeing for people in mid and later life - Taking action on preventable early deaths Recognition is made in this Plan that better housing can help to prevent physical illness and reduce stress, and good heating and insulation helps to keep people well in winter.
	Manchester City Council Core Strategy 2012 (Note the Manchester City Council Local Plan is currently under review)	Manchester's Local Development Framework (Core Strategy), sets out a range of policies to implement the vision for Manchester in 2027 set by the City Council. This Strategy recognises that there are health challenges in Manchester, including health inequalities – part of the vision for Manchester by 2027 is to have a healthy population. To help address such issues, the Core Strategy sets out the need to provide for a significant increase in high quality housing provision at sustainable locations throughout the City, to both address demographic needs and to support economic growth. The emphasis will be on providing a good range of high quality housing, (in terms of size, type, tenure, accessibility and price) including affordable housing across the City; to create sustainable lifetime neighbourhoods with high quality environments, good local facilities and with easy access to employment opportunities. The Core Strategy also sets out the need to promote health lifestyles and contribute to a sense of wellbeing.

Baseline Conditions – the Proposed Development

5.144 This section provides a high-level overview of the baseline population and human health conditions for the Site and the surrounding area, as well as a general overview of the Proposed Development, with a focus on elements that could have implications for health and wellbeing.

5.145 The Site sits in an emerging location in Manchester City Centre, within 500m of Victoria Station and 650m of the top of Deansgate. Covering 1.24 acres of brownfield land, the Site is currently used as a surface car park and was formerly part of the former Boddingtons Brewery, with previous multi-storey buildings and industrial chimney having been demolished approximately 10 years ago.

5.146 It is understood that the number of homes targeted for the Site is 450, including affordable housing. It is proposed that the rented homes will be accommodated in the block facing Great Ducie Street, with the private sale and shared ownership ones to the rear. The external envelope for the social / affordable elements will be designed to the same standard as the other tenures to achieve a tenure blind development. A clear focus will be made on inclusive design that aims to achieve a design that enables residents to live longer, healthier and happier lives. The Proposed Development also aims to ensure residents have the right home for the right stage of their lives and empower residents to shape their lives and communities, no matter what age. Other key design elements include (but is not limited to) fire safety, acoustic design, health and safety in design, interior design and landscape design.

5.147 It is anticipated that the ground floor layout will accommodate commercial units with a minimum floorspace of 7,690 sqft. The use class and layout of these units is to be confirmed, consideration will be given to the possibility of organising them in 3 – 4 units. Hot food uses such as E(b) and Sui Generis (previously A3 or A5) will be avoided which would be positive from a human health and socio-economic perspective. Alcohol selling is restricted for part of the Site.

Population and human health profile

5.148 The Site is located in the Manchester City Council local authority area. The key population and human health baseline findings of interest to the assessment shows that the population of the Local Authority area is 541,000[46], of which 22.2% were aged under 18, while 9.3% were over 65. There is also a significant percentage (28.5%) of the local population from an ethnic minority group.

5.149 The health of people in Manchester is generally worse than the England average. Manchester is one of the 20% most deprived districts/unitary authorities in England and approximately 28% (29,600) of children live in low income families. Life expectancy for both men and women is lower than the England average – 8.1 years lower for men and 7.0 years lower for women in the most deprived parts of the Local Authority area.

5.150 The life expectancy gap between Manchester and England can be largely attributed to three broad causes of death: circulatory diseases, cancers and respiratory diseases. These conditions in turn are closely associated with poor lifestyle. All of the modifiable lifestyle factors that lead to poor health outcomes are highly prevalent in Manchester: high numbers of overweight or obese children, high recorded levels of drug misuse; high levels of alcohol use and poor diets[47].

5.151 Across a range of health indicators such as those relating to behavioural risk factors (alcohol, smoking levels etc.) as well as child health, the Local Authority area performs significantly worse than the average for England as a whole. This is also the case for wider determinants of health such as the number of children in low income families, educational attainment, violent crime levels, as well as other indices of health protection such as new sexually transmitted disease.

5.152 However, the Local Authority area performs in line (not significantly different) with the England average in terms of injuries and ill health. This includes indicators such as hospital stays for self-harm, cancer diagnosed at an early stage, diabetes diagnoses and dementia diagnosis. An aspect where the Local Authority area performs significantly better than the England average is in relation to the number of people killed and seriously injured on roads.

5.153 The Proposed Development falls within the Cheetham ward of Manchester. This ward has a total population of 20,558 (2019 mid-years estimate)[48], of which 1,281 are aged over 65 and 5,050 are aged under 16. Life expectancy is significantly worse for both males and females in Cheetham than for England as a whole. The Cheetham ward has significant numbers of Black and Minority Ethnic population (65.3%), with a population whose ethnicity is not 'White UK' of 74.2%. This is significantly greater than for Manchester (40.7%) as a whole.

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[46] Local Authority Health Profile (2018) – Public Health England
[47] Manchester City Joint Health and Wellbeing Strategy 2016
[48] Public Health England – Local Health Local Health - Public Health England - Reports: get a dashboard on a custom area. See also Manchester Health & Care Commissioning Neighbourhood Profile

5.154 Cheetham is considered to be significantly more deprived in terms of income (26.3%), child poverty (30%) and older people (57.7%) compared to England as a whole. Overcrowding of houses is also considered to be a significant issue in Cheetham, though there is no significant difference with England as a whole in terms of older people living alone – perhaps a reflection of the ethnic make up of the ward, with multiple generations of families living together. Cheetham also performs significantly worse in terms of unemployment (including long term unemployment).

5.155 Cheetham performs significantly worse than England as a whole in terms of emergency hospital admissions (for a range of causes including accidents and heart disease), although it performs better in areas such as self-harm. It also performs worse in terms of death from all causes, death from circulatory disease, coronary disease, stroke and respiratory disease. However, there is no significant difference between Cheetham and the rest of England in terms of cancer (other than lung cancer which is significantly worse). Cheetham also performs significantly better than England as a whole in terms of limiting long term illness and in behavioural risk factors such as smoking.

5.156 There are a wide range of receptors in the study area as would be expected from an inner core area (within 500m of the proposed development site), however there are very few areas of residential housing, with the nearest being located within approximately 475m at Sandywell Lane and separated from the Site by built development, a number of roads and the River Irwell. In addition to the range of commercial premises found in the locality such as general warehousing and similar, light industrial units, various takeaway businesses, derelict sites and a number of public car parks, identified receptors in the wider area include (but are not limited to):

- HMP Manchester (approximately 200m to the north)
- The River Irwell (approximately 200m to the west)
- Faith Life centre (approximately 300m to the west)
- Manchester Cathedral (approximately 530m south)
- Manchester Victoria Rail Station (approximately 380m south)
- Cheetham's Library and National Football Museum (approximately 450m south)
- The Friars Primary School (approximately 800m west)
- AO Arena (approximately 150m south)
- Indoor climbing centre / children's play area (approximately 150m west)
- Travelodge Manchester is immediately adjacent to the north of the Site

5.157 Given the location of the Site on the edge of the busy Manchester City Centre, as would be expected, there are a large number of roads and footpaths in proximity of the development site, as well as further afield, which provide good connectivity to the wider area.

5.158 No schools or other educational establishments have been identified in the immediate study area, however a new college is being constructed adjacent to the Site. Similarly, no health facilities such as hospitals have been identified.

5.159 By reviewing the baseline conditions, in addition to the wider population (all groups including workers living/working in proximity to the Proposed Development) the following sensitive population sub-groups have been identified as being present in the study area:

- Families with children and adolescents (e.g. pregnant women, babies, children and adolescents)
- People who are physically or mentally disadvantaged (e.g. elderly people, people with physical and/or disabilities, people with other health problems or impairments)
- People of certain ethnicity;
- People who are materially disadvantaged (e.g. people on low income, people unable to access housing or services)

Potential Significant Effects

5.160 This chapter of the report addresses the likely significant effects of the Proposed Development on human health and the local population.

Construction effects

5.161 During construction, human health could potentially be affected by the following:

- Housing: population required to relocate
- Community sustainability, viability, cohesion, and integration: relocation affecting the remaining communities, loss of social networks
- Risk of injury and death: risk to workers and contractors working on the Proposed Development, risk of road traffic incidents
- Access to services and healthcare: changes in access to public services
- Healthy lifestyles: open space and greenspace
- Healthy lifestyles: active travel
- Healthy lifestyles: work and training
- Healthy lifestyles: increase in the presence of pests
- Environment: health impacts from dust and/or emissions from vehicles on the highway network
- Environment: health impacts from noise and vibration sources
- Environment: health impacts from ground conditions, water environment, odour, lighting, changes to views
- Transport options: changes in accessibility, road conditions and vehicle numbers

Operational effects

5.162 Once the Proposed Development is operational, human health could be affected by:

- Housing: population required to relocate, new population
- Community sustainability, viability, cohesion, and integration: community identity
- Risk of injury and death
- Access to services and healthcare: changes in demand for local services and healthcare
- Healthy lifestyles: open space and greenspace
- Healthy lifestyles: active travel
- Healthy lifestyles: work and training
- Environment: health impacts from emissions from vehicles on the highway network
- Environment: health impacts from noise sources
- Environment: health impacts from ground conditions, water environment, odour, lighting, changes to views
- Transport options: changes in accessibility, road conditions and vehicle numbers

Assessment Methodology

5.163 Whilst the 2017 revisions to the EIA Directive make it clear that population and human health is a topic to be included and addressed in the EIA process, it does not seek to define the way in which this will be undertaken. From a public health perspective, likely changes in, for example, air quality or noise levels are changes in determinants of health, not changes in health outcomes. Therefore, the consideration of potential significant effects on population and human health also requires a separate consideration of the way in which any change

identified in the various technical chapters of the EIA, can be expected to manifest itself in health and well-being outcomes. For example, a change in air pollutants can cause a change in respiratory health or noise or vibration can cause a change in social or mental wellbeing and this could have particular impacts for the more vulnerable groups present in the area. The assessment therefore considers the issue of attribution i.e. how the health outcomes in the current and future population could be impacted (positively or negatively) as a result of the Proposed Development.

5.164 Impacts on population and human heath can be influenced (both negatively and positively) by a number of wider health determinants and are further modified by local community circumstance and existing health profiles. Therefore, the human health assessment will also consider the distribution of any potential impacts of the Proposed Development within the affected population, including potential impacts on more vulnerable, sensitive, or disadvantaged population groups. The location and presence of these groups within the study area and their profiles are described in greater detail in Table 5.14.

5.165 The assessment methodology uses the following assessment steps:

- Study area – the study area(s) relevant to population and human health are identified and summarised;
- Sensitive receptors – the physical and human receptors that have potential to be impacted or affected by the Proposed Development (both positively or negatively) are identified, including the presence of sensitive/vulnerable groups that would be more susceptible to impacts or effects arising from the Proposed Development;
- Wider determinants of health – the wider health determinants (i.e. a diverse range of social, economic and environmental factors which influence people's mental and physical health) considered relevant to the Proposed Development are identified and described;
- Sensitivity of receptors – the sensitivity of the physical and human receptors to changes to the wider health determinants is described; and
- Assessment criteria – the criteria for assessing the magnitude of impact and significance of effects (both positive and negative) of changes to the wider health determinants for the physical and human receptors is described.

Establishing the baseline

5.166 By using professional judgement, industry best practice and knowledge gained in the assessment of other development types, the likely effects of the Proposed Development on population and human health will predominantly be assessed for the development site and its immediate environs, alongside a study area which comprises a 500 metre buffer from the Proposed Development/ construction boundary, however other study areas will also be used when developing the baseline profile and assessing the potential impacts likely to arise from the Proposed Development. The following study areas will be used:

- A study area consisting of 500 metre buffer extending outwards from the Proposed Development boundary/ construction footprint, to identify receptors and potential impacts that may arise as a result of the Proposed Development. This study area has been chosen as from a population and human health perspective it is likely to capture the key sensitive physical and human health receptors which have the potential to be affected by the Proposed Development.
    - Within this study area, the level of impact on population and human health will generally, but not exclusively, be considered on the basis that the closer the proposed works occur to sensitive receptors (e.g. industrial premises would be the physical receptor; the people that work at or use these premises would be the human receptors), the more mitigation may be required (e.g. close to the proposed works or more directly affected, as opposed to 500m away) – bearing in mind that each receptor and individual has different susceptibilities and some individuals or groups may be particularly vulnerable or susceptible to certain changes to the baseline conditions.
- A wider study area used to define the characteristics and sensitivity of local communities and the context within which the local economy operates. This wider study is generally defined to include:
    - The Manchester City local authority area (with a particular focus on the Cheetham ward);

- The regional area where appropriate;
- A wider study area used to define the characteristics of population and human health, and health inequalities. This includes the area within which the local and regional National Health Service (NHS) organisations operate.
- The study areas defined in the assessment methodology sections for each of the other technical chapters will also apply.

5.167 It is considered that these study areas will capture the most relevant population and human health effects likely to arise from the Proposed Development, including likely effects on physical and mental health, and social wellbeing. As such, the assessment will provide an opportunity to identify ways in which health risks can be minimised and opportunities to improve health can be maximised.

Assessment criteria

Identifying the sensitive receptors

5.168 Using professional judgement and best practice guidance, the assessment is based upon Institute of Environmental Management and Assessment (IEMA) guidance contained in 'Health in Environmental Impact Assessment: A Primer for a Proportionate Approach' and the World Health Organisation (WHO) definition of health used by the public health profession in the UK. Here, health is defined as a 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'.

5.169 In general terms, the assessment considers the potential effects of the Proposed Development on two types of population. The first is the general or wider population (e.g. workers and contractors constructing and operating the Proposed Development, workers at nearby local businesses, residents living in houses, operators and users of community land and facilities, owners and users of commercial premises, users of footpaths and cycle routes, users of open space, recreation and leisure facilities, vehicle travellers, public transport users). The second is vulnerable groups identified within the general population who may be more susceptible to changes to the baseline conditions as a result of the Proposed Development.

5.170 The baseline study will be used to confirm the key physical and human receptors in the main study areas which have potential to be affected by the Proposed Development, including the presence of any vulnerable or sensitive groups. As such, the assessment considers the potential effects of the Proposed Development on two types of receptors. The first is the physical receptors (e.g. residential properties, schools, community facilities, local businesses, commercial interests, recreation routes or spaces, roads, footpaths etc.) and the second is the human receptors that are present or use these physical receptors.

Table 5.14 Overview of the Wider groups and Vulnerable or Sensitive sub-groups identified for assessment (adapted from IEMA 2017)

Sub-group	General description of sub-group and their locality within the study areas	Sensitivity or susceptibility of the sub-group to impacts or effects (both beneficial and adverse) arising from the Proposed Development
Wider groups - adults/usual residents/working people **People working at the Proposed Development and nearby local businesses**	Residents living in houses, operators and users of community land and facilities, owners and users of commercial and industrial premises, users of footpaths and cycle routes, leisure	The baseline study identifies a large number of workers and visitors in the study area, with a small resident population (though residential numbers are set to increase alongside other developments). In addition, a number of on-Site construction staff will work on the Proposed Development which will result in additional daily traffic flows of light duty vehicles (LDVs; cars or small vans) etc. A key current challenge to the physical health, mental and social wellbeing of the resident population in the wider area arises from housing quality and physical barriers to housing, lower economic

Sub-group	General description of sub-group and their locality within the study areas	Sensitivity or susceptibility of the sub-group to impacts or effects (both beneficial and adverse) arising from the Proposed Development
	facilities, public transport users.	activity rates, lack of amenity and greenspaces, access to services, and those linked to environmental conditions. A key challenge to the physical health, mental and social wellbeing of workers and contractors working on the Proposed Development will arise from risks and health and safety. Workers and contractors at the Proposed Development and nearby local businesses, and other residential properties in the study area, operators and users of community facilities, walkers and cyclists, users of open space and greenspace, and public transport users are likely to be most exposed to risks, amenity, and health impacts from the Proposed Development.
Sensitive group – families with children and adolescents (pregnant women, babies, children and adolescents)	Residential houses, community services and facilities, open space, greenspace and recreational facilities, local footpaths and cycleways, public transport, bus stops.	Children and adolescents generally constitute a sensitive population group due partly to their need to be able to move around freely to and from the city centre, home, school, open space, and recreational activities, whilst they lack the experience and judgement displayed by adults when moving around in traffic and public spaces and when using public transport. Hence, children and adolescents as pedestrians and cyclists are at elevated risk from danger on the roads. This is particularly relevant to the core study area where there are several busy roads and heavy traffic. Children and adolescents are also more prone to trespass on land and premises. Children are also more sensitive than adults to air pollution, noise, odour and other environmental factors and their bodies and minds are less able to deal with them. Particularly susceptible children are identified as those from low-income and/or black and minority ethnic (BME) backgrounds and/or living in the more deprived areas, which are all identified in the baseline.
Sensitive group – People who are physically or mentally disadvantaged (elderly people, people with existing poor health [physical and mental health], including where this is due to disabilities)	Residential houses, community services and facilities – particularly care homes and healthcare, open spaces, local footpaths, public transport, bus stops.	Elderly people constitute a sensitive group as they are more sensitive than young and middle-aged adults. Generally, the older people are, the poorer their health, the slower their movement and reactions, and the poorer their hearing. Elderly people are susceptible to environmental impacts, particularly from construction works and exposures to pollutants. Chronically ill persons, for example, people with impaired lung function, can be more adversely affected by air pollution. The same is true of hypersensitive individuals such as asthmatics. Elderly people can be more at risk from changes to the built environment and an unawareness of construction activities and increased traffic or altered traffic movements. They are more prone to injury and may fear falls, lack of safe crossing points and short crossing times at roads.

Sub-group	General description of sub-group and their locality within the study areas	Sensitivity or susceptibility of the sub-group to impacts or effects (both beneficial and adverse) arising from the Proposed Development
		Noise can cause hypertension and cardio-vascular problems. Those who already have these conditions can be more troubled by noise than others. People with existing physical and mental illnesses, including sleep disturbance, anxiety, and depression, are likely to be more sensitive to changes to the local environment.
Sensitive group – People of certain ethnicity	Residential houses, community services and facilities, local businesses, open space, local footpaths, public transport, bus stops The baseline study estimates there is a very high proportion of the local population from ethnic minority groups.	Research identifies that ethnic minority groups generally experience higher exposures to detrimental health effects in home and neighbourhood. This group statistically generally live in the worst housing conditions, can experience social and economic stresses and have less access to information and health care.
Sensitive group – People who are unemployed, on low incomes, have regular shift work, have low job stability, or have few progression prospects, those with no car)	Residential houses, community services and facilities, local businesses, open space, greenspace and recreational facilities, local footpaths and cycleways, public transport, bus stops The baseline study identifies that the study area include some of the more deprived areas. There are also issues with lower economic activity rates, lower educational attainment, barriers to housing and access to services, and low car ownership.	People on low incomes (living in deprived areas is a proxy measure for low income) constitute a sensitive group as they tend to suffer the most from road traffic incidents (deaths and injuries), noise and air pollution, as well as other environmental impacts. This group is generally more likely to already have reduced access to health and social care as well as reduced access to other services and amenities. This group may also have increased stress levels due to the factors above. In addition, this group is more sensitive to food insecurity, which has an access dimension. Barriers to housing and access to services is a key issue in the local area for all income groups but those on lower incomes will be more disproportionately affected.

Wider Health Determinants

5.171 The quality of the built and natural environment such as housing quality and air quality effect health.

5.172 In considering how the Proposed Development activities are likely to affect the health of the local population, wider health determinants are used. Wider health determinants are a diverse range of social, economic, and environmental factors which influence people's mental and physical health, and social wellbeing.

5.173 The following wider health determinants have been included for assessment:

- Housing;
- Community sustainability, viability, cohesion, and integration;
- Risk of injury and death;
- Access to services and healthcare;
- Open space and greenspace;
- Active travel;
- Work and training;
- Increase in presence of pests;
- Air pollution;
- Noise pollution and vibration;
- Soil and water pollution and amenity Transport options

Sensitivity of the physical and human receptors to changes to the wider health determinants

5.174 The potential impacts and effects (both positive and negative) of the Proposed Development on the physical and mental health, and social wellbeing of the local population depends on the sensitivity of the physical and human receptors to changes to the wider health determinants. The sensitivity of the physical and human receptors depends on whether the receptor is likely to be directly or indirectly impacted or affected by changes to the wider health determinants caused by the Proposed Development and whether the receptors are well placed to deal with any of these changes. This is set out in further detail in Table 5.15.

Table 5.15 Criteria for determining the value or sensitivity of the physical and human receptors to changes to the wider health determinants

Receptor value / sensitivity	Physical receptor – high-level definition of receptor value/ sensitivity	Human receptor – high-level definition of receptor value/ sensitivity
Very High	Physical receptor is of very high importance and rarity, international scale and very limited (i.e. no potential for substitution/replacement). Very high vulnerability to change, very well placed to take advantage of beneficial impacts, and/or very poorly placed to deal with any adverse impacts	Health receptor susceptible to direct permanent, sustained, or irreversible exposure or impacts. Receptor is very well placed to take advantage of beneficial impacts, and/or is very poorly

Receptor value / sensitivity	Physical receptor – high-level definition of receptor value/ sensitivity	Human receptor – high-level definition of receptor value/ sensitivity
		placed to deal with any adverse impacts.
High	Physical receptor is of high importance and rarity, national scale, and limited potential substitution/replacement. High vulnerability to change, little ability to absorb change for the following (or similar) reasons: Resource is frequently used No reasonable alternative facilities, access routes or opportunities available	Health receptor susceptible to permanent or reversible exposures resulting in longer-term impacts. Receptor is well placed to take advantage of beneficial impacts, and/or is not well placed to deal with any adverse impacts.
Medium	Physical receptor is of medium or high importance and rarity, regional scale, and limited potential for substitution/ replacement. Medium vulnerability to change, limited ability to absorb change for the following (or similar) reasons: Resource is semi-frequently used Limited range of reasonable alternative facilities, access routes, or opportunities available	Health receptor susceptible to frequent to infrequent or reversible, short to medium term exposures or impacts. Average ability to maximise beneficial impacts or cope with adverse impacts.
Low	Physical receptor is of low or medium importance and rarity, local scale, and considerable potential for substitution/ replacement. Low vulnerability to change, can easily absorb changes due to the following (or similar) reasons: Resource is infrequently used Reasonable alternative facilities, access routes or opportunities available	Health receptor susceptible to infrequent or reversible short-term exposures or impacts. Receptor is not well placed to take advantage of beneficial impacts, and/or is well placed to deal with any adverse impacts.
Negligible	Physical receptor is very low in importance and rarity, local scale, and ample potential for substitution/replacement	An impact that is likely to be temporary in nature, or which is anticipated to have a discernible impact on health receptors

Magnitude of Impact

5.175 Identifying and assessing the likely impacts of the Proposed Development (both positive and negative) depends on the sensitivity of the physical and human receptors to changes to the wider health determinants (for example, from changes to air quality, noise pollution and vibration etc.).

5.176 Where appropriate, the assessment will also use the findings as outlined in the other technical chapters of the EIA and consider how these findings can be expected to impact health and well-being outcomes, including the distribution of any impacts within the local population (e.g. on sensitive/vulnerable groups who would potentially be more susceptible to certain impacts arising from the Proposed Development).

5.177 However, the wider health determinants of housing, access to services and healthcare, risk of injuries and death, community sustainability, viability, cohesion, and integration, open space and greenspace, work and training are not covered by the other technical assessments. Therefore, professional judgement, industry best practice and experience from the assessment of other development types will be used to assess the impacts and affects to these wider health determinants.

5.178 The magnitude of impact for any changes to the wider health determinants on physical and human receptors will be assessed according to the criteria set out in Table 5.16. The magnitude of impact is primarily derived from the following impact parameters:

- Geographical scale of impact;
- Secondary or cumulative;
- Short, medium or long-term;
- Permanent or temporary;
- Reversible or irreversible; and
- Beneficial or adverse.

Table 5.16 : Magnitude of impact criteria for the physical and human receptors

Magnitude of Impact	High-level description of the magnitude of impact for the physical receptors	High-level description of the magnitude of impact for the human receptors
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.	Permanent, sustained or irreversible impact to the wider health determinant; impact represents a substantial change (positive or negative) from the baseline position; affecting a large number of people/ most people in the community; affecting sensitive population groups; a large widening or narrowing of inequalities; a direct and large contribution (positive or negative) to a recognised health priority.
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.	Permanent or reversible exposure resulting in longer-term impact to the wider health determinant; impact represents a notable change (positive or negative) from the baseline position; affecting a moderate to large number of people; affecting some sensitive population groups; a widening or narrowing of inequalities; a direct and large contribution (positive or negative) to a recognised health priority.
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to one	Infrequent or reversible short-term impact to the wider health determinant; impact represents a slight change (positive or negative) from the baseline

Magnitude of Impact	High-level description of the magnitude of impact for the physical receptors	High-level description of the magnitude of impact for the human receptors
	(maybe more) key characteristics, features or elements.	position; affecting a low to moderate number of people; affecting few sensitive population groups; a slight widening or narrowing of inequalities; an indirect or minor contribution (positive or negative) to a recognised health priority.
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements.	No discernible change in health or wellbeing within normal variations; no discernible change in exposure levels or reversible changes; no discernible change (positive or negative) from the baseline position; no discernible widening or narrowing of inequalities; no links to a recognised health priority.
No Change	No loss or detrimental alteration to one or more characteristics, features or elements; no observable effects in either direction.	No impact to the wider health determinant or to sensitive groups.

Significance of Effects

5.179 The significance of effects is the product of the sensitivity of the physical and human receptors and magnitude of impact. The significance of effects within the assessment will be measured according to the Significance of Effect Matrix, set out in Table 5.16 . The significance of effects will be determined by using professional judgement, best practice, and knowledge from the assessment of other development types.

5.180 Significance of effects can be neutral, beneficial, or adverse and will be further informed by considering the permanence of effect (temporary or permanent), type of effect (direct or indirect) and duration of effect (short-term or long-term). In general, temporary effects are for a limited period of time i.e. not permanent (this limited period can vary depending on the activity); short-term effects to the physical and human receptors are predicted to last for several months up to a few years and would generally apply for the duration of the construction period. Long-term effects are predicted to last beyond this, for several years.

5.181 Where Table 5.16identifies two potential outcomes e.g. Moderate (significant) or Large (significant), or Slight (not significant) or Moderate (significant), professional judgement will be applied in each instance to determine the appropriate level of significance.

Table 5.16 Significance of effect matrix

		Impact magnitude				
		No change	Negligible	Minor	Moderate	Major
Receptor Sensitivity	Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or large

	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

5.182 Using the described significance of effect matrix classification (Table 5.16), professional judgement, industry best practice and scrutiny of the assessment of other development types, any significance of effects of the Proposed Development considered to be Very Large, Large or Moderate are deemed to be significant and those Slight or Neutral, to be not significant.

Cumulative Effects

5.183 This part of the chapter will consider the potential cumulative effects of the Proposed Development on population and human health. Human health assessment is by nature an in-combination assessment of the potential impacts or effects on population and human health (both positive and negative) arising from the environmental effects of the Proposed Development.

Summary of Assessment Scope

5.184 The following wider health determinants have been Scoped In/ Scoped Out of the assessment stage. Any assessment made will consider the scenarios of Baseline to include the under construction college), Baseline + Proposed Development, Baseline + Future Committed Developments such as Old Brewery Gardens etc).

Table 5.17: Scoping Table – Population and Human Health

Wider Health Determinant/Aspect	Scoped in / out	Justification
Construction		
Housing	✗	There are no current residents on the Site and the nearest residential properties are nearly 500m away. It is anticipated that potential effects on housing availability due to an influx of construction workers will be minimal given the relatively low numbers expected to work on the proposed development and the location of the Site in central Manchester.
Community sustainability, viability, cohesion, and integration	x	No communities would be displaced to construct or accommodate the Proposed Development and impacts/ effects on local communities, including from the influx of a construction workforce is not expected to be significant
Risk of injury and death	✓	Due to the location and scale of the Proposed Development and construction activities, further assessment is required of the potential effects on risk of injury and death from construction activities and construction vehicles and increased traffic on the local road network.
Access to services and healthcare	x	There would be no significant impacts/ effects on access to services and healthcare, including from the influx of a non-home-based workforce

Wider Health Determinant/Aspect	Scoped in / out	Justification
Open space and greenspace	x	The current use of the Site is a car park and there are few areas of open space and greenspace in proximity to the Site. Therefore, there would be no significant construction impacts.
Active travel	✓	There could be some changes/ temporary disruptions to active travel during construction of the Proposed Development
Work and training	✓	There would be opportunities for the procurement of goods and services during the construction phase and construction activities will require a construction workforce. This would have benefits for human health.
Increase in the presence of pests	✓	Demolition and construction activities could give rise to disturbance and an increase in the population of pests or migration of pests off-site
Air pollution	✓	Further assessment is required of potential effects of the Proposed Development on air quality from dust emissions and emissions from construction traffic, and dust from construction activities. These effects will be assessed as part of the air quality assessment.
Noise pollution and vibration	✓	Further assessment is required of the potential effects of noise and vibration from construction activities and construction traffic associated with the proposed development. These effects will be assessed as part of the noise and vibration assessment.
Soil and water pollution and amenity	✓	Further assessment is required of the potential effects from disturbance of contaminated land and exposure of contaminants. Consideration will also be required of amenity impacts, such as those relating to odour, lighting and changes to views
Transport options	✓	The Proposed Development will result in the introduction of construction traffic and traffic management measures which has the potential to cause disruptions
Operation		
Housing	✓	Consideration of the provision of new housing (including affordable and social homes) in the study area will need to be considered, in addition to the impacts/effects of the proposed development of existing and future residents.
Community sustainability, viability, cohesion, and integration	✓	The impacts/effects of the influx of new residents to the area will increase the numbers and mix of the local population. This could have impacts/ effects on community cohesion and social networks and will need to be considered further in the assessment
Risk of injury and death	x	Whilst a new residential population, including some vulnerable groups, would move to the area, the Proposed Development replaces a car park and is not anticipated to significantly increase the risk of injury and death
Access to services and healthcare	x	The Proposed Development will contribute directly to population and household growth, which may affect the demand for local services, however each of these services will have its own sensitivity to change and there are wider plans for the master planning of the area which are expected to also alleviate any increased demand

Wider Health Determinant/Aspect	Scoped in / out	Justification
Open space and green space	x	This is an inner urban location, and the availability of open space and greenspace is low, including on the current site which is used as a car park. Whilst the Proposed Development will seek to provide as much amenity and open space as possible (in accordance with design and LPA requirements) and improve the baseline conditions, no significant effects are predicted
Active travel	x	The Proposed Development will contribute to a better built environment and is expected to improve connectivity/ legibility in the local area; however, no significant effects are predicted
Work and training,	×	The Proposed Development will result in a new resident population which could provide benefits and a workforce for local businesses in the area. There are also opportunities from the commercial units that will be provided as part of the Proposed Development. However, no significant effects are predicted.
Increase in the presence of pests	x	Residential uses, including use of community bins and littering etc., could result in the increased presence of pests, however this will be managed by standard housing management practices and would not be significant.
Air pollution	✓	The air quality impacts/ effects of the Proposed Development will need to be informed by the findings from the air quality assessment.
Noise pollution	✓	The air quality impacts/ effects of the Proposed Development will need to be informed by the findings from the noise and vibration assessment.
Soil and water pollution and amenity	✓	It is anticipated that there would be minimal potential for exposure to contaminants or the mobilisation/ accumulation of ground gas or vapours for residents at the new development, however there could be issues such as lighting and other amenity impacts, such as overlooking, that will need to be considered in the assessment.
Transport options	✓	Further assessment of the impacts of the Proposed Development on the highway network and traffic will be required.

Townscape and Visual

Introduction

5.185 This Chapter of the ES will be prepared by Barton Willmore and assesses the likely Townscape and Visual impacts of the proposals upon the Site and surrounding area.

Legislative and Policy Context

Legislation

5.186 There is no international or European legislation that is relevant to the Site or the consideration of the landscape and visual effects arising from the Development. However, the United Kingdom is a signatory to the European Landscape Convention (ELC), an international treaty dedicated to the protection, management and planning of all landscapes in Europe. Specifically, the ELC advocates an approach that recognises the intrinsic value of all landscapes, not just 'special' landscapes, as contributing factors in people's quality of life.

National Planning Policy

5.187 The National Planning Policy Framework (NPPF) aims to provide one concise document which sets out the Government's planning policies for England by replacing previous Planning Policy Guidance (PPGs) and Planning Policy Statements (PPSs). Paragraph 9 of the NPPF sets out that planning decisions should "take local circumstances into account, to reflect the character, needs and opportunities of each area", while Paragraph 130 sets out criteria related to townscape and visual matters that development proposals should deliver on to achieve well-designed places.

5.188 Guidance for local authorities' decision making identifies the need to approach proposed development in a positive and creative way, working proactively with applicants to make effective use of land, while securing the protection enhancement and creation of multifunctional Green Infrastructure assets. The NPPF also highlights that development should take consideration of opportunities to improve the quality and character of an area.

5.189 To support the policies of the NPPF, the Government has produced Planning Practice Guidance (PPG) covering a number of topics. The PPG supports the use of landscape character assessment to understand local distinctiveness and sets out that local plans should promote local character as well as an understanding of the context within which development sites lie.

5.190 The National Design Guide identifies the key influencing factors for good design and aims to influence the production of local plans, guidance and the determination of planning applications through the consideration of ten characteristics:

- Context,
- Identity,
- Built Form,
- Movement,
- Nature,
- Public Space,
- Uses,
- Homes and Buildings,
- Resources, and
- Lifespan.

Local Planning Policy

5.191 The Core Strategy outlines the Council's vision for Manchester in 2027 along with the planning policies which will be used to deliver that vision. The Core Strategy policies that are considered relevant to the Site and the Proposed Development include Policy SP1 Spatial Principles, Policy CC 6 City Centre High Density Development, Policy CC 9 Design and Heritage, Policy EN 1 Design Principles and Strategic Character Areas, Policy EN 2 Tall Buildings, Policy EN 3 Heritage, Policy EN 8 Adaptation to Climate Change, and Policy EN 9 Green Infrastructure.

5.192 The Site is located within the Boddingtons Strategic Regeneration Framework (SRF)(2015), which sits between a number of key regeneration areas, including NOMA, Strangeways and Victoria Station, on the northern edge of Manchester City Centre. The SRF aims to guide the re-development on the Site, which is considered to be acceptable in planning terms.

5.193 The SRF indicates that the Site is appropriate to form a Gateway Location and states:

"The Study Area is located in a prominent location at the cross roads between two major arterial routes into the City Centre (Great Ducie Street and Trinity Way / New Bridge Street). This provides an opportunity for the inclusion of a landmark building to signal the arrival at Manchester City Centre."

5.194 The SRF sets out that the key views which it determines to reinforce the suitability of the Site for taller buildings:

- *"Approaching from the City Centre along Victoria Street*
- *Approaching along Trinity Way from the west*
- *Approaching along Great Ducie Street from the north, marking a new gateway to the City Centre."*

5.195 The SRF also considers tall buildings could be accommodated on the northern edge of the Site at the junction of Dutton Street with Robert Street and Park Street as this would:

> *"provide a focus for future regeneration of the underdeveloped areas of 'City Fringe' immediately to the east. An axial vista from the Park Inn Hotel on Cheetham Hill Road along Park Street forms a strong and direct visual connection from the Green Quarter to the Site through the underdeveloped areas between the two."*

5.196 However, the SRF sets out that tall building proposals should be assessed in line with national and local guidance and policy, with particular emphasis placed on:

- "*Landmark buildings will need to be of the highest architectural quality and have a positive relationship to the City's skyline.*
- *Understanding any effects on the historic environment through a visual impact analysis and assessment of verified key views.*
- *They should contribute to the legibility of the area, and the provision of public space and high quality public realm"*

5.197 The SRF also considers the importance of landscaping schemes and public interface for the Site, in particular along the New Bridge Street and Great Ducie Street frontages, which are considered to contribute to the Sites Gateway Location due to their relationship with Manchester City Centre. As such, the SRF recommends that development of the Site aims to create a gateway to the City Centre.

5.198 The 2019 addendum to the Boddingtons SRF sets out that development within the SRF area should take reference from existing and emerging development in the vicinity and states:

> *"The scale and massing of building form within the Boddingtons SRF area should respond to existing buildings in surrounding areas, to the indicative proposals contained within the Great Ducie Street SRF and to the approved Old Brewery Gardens scheme."*

5.199 The addendum recognises that the five tall residential buildings of the Old Brewery Gardens approval establishes a form of development along the north-eastern edge of the study area of up to 28 stories from ground level.

5.200 The College development will be located to the south-western edges of the Boddingtons SRF study area, addressing the Great Ducie Street and New Bridge Street frontages which are positioned on a major approach to the city centre and directly on Manchester's Inner Relief Road. These development frontages are considered to provide key opportunities:

> *"In the event that the College does not progress with later phases of development and/or does not require all of the land available for educational use, there may be scope to deliver other development on the Site between the College and the existing Travelodge and (proposed) Multi Storey Car Park on Francis Street. In that instance, there may be opportunities for delivery of a taller building on this site, addressing new connections north east across the Site from the River Irwell, subject to a robust justification as referred to above."*

5.201 The SRF addendum recognises the importance of opportunities to re-establish connections through the SRF area to the wider area created by the approved landscape scheme for the Old Brewery Gardens and states:

"Developments should assist in mitigating the poor quality pedestrian environment currently created by the proximity of the Study Area to both Great Ducie Street and New Bridge Street through planting and other environmental improvements commensurate with their role as a gateway into the Study Area and on a key route into the City Centre, with a focus on introducing high quality frontages with attractive uses to encourage full integration of the Study Area with the City Centre and to draw people in."

Baseline Conditions

5.202 The Site is comprised of an area of land currently utilised as an at grade car park east of Great Ducie Street since the demolition of the former Boddingtons Brewery. The southern edge of the Site lies adjacent to the new Manchester College site which is under construction. An existing hotel is located on the north-western corner of the Site and combines with the under construction college to partially enclose the at grade car park. The wider context of the townscape in the vicinity of the Site is influenced by predominantly commercial and light industrial development south of the historic Strangeways Prison and north of the River Irwell.

5.203 The Site is set within the Boddingtons SRF which accepts the principle of development and that the scale and massing of buildings on the Site should respond to the scale and massing of existing buildings and proposals for buildings in the surrounding area.

5.204 Views available in the vicinity of the Site are characterised by the existing townscape. Views towards Manchester city centre from north of the Site are orientated and articulated by the taller buildings such as the collection of blocks at Deansgate Square of up to 65 storeys in height, creating a gateway to Manchester on the southern bank of the River Irwell.

5.205 Views north towards the Site from Manchester City Centre, including those from the Cathedral Quarter Conservation Area, represent a decreasing scale and mass of built form moving away from the city centre.

Potential Significant Effects

5.206 The study area for the assessment of significant townscape and visual effects has been restricted to a 3km radius area from the centre of the Site. On the basis of professional judgement it is considered that significant effects are unlikely to occur beyond this area for a scheme of this nature and surrounding built-up context.

5.207 The sensitivity of the townscape receptors and the likely magnitude of change that the Proposed Development will bring about will be determined in line with the methodology, utilising professional judgement to attribute a significance of effect value for the townscape receptor (either beneficial or adverse).

5.208 The sensitivity of the visual receptors and the likely magnitude of change that the Proposed Development will bring about will be determined in line with the methodology, utilising professional judgement to attribute a significance of effect value for the visual receptor (either beneficial or adverse).

Assessment Methodology

Technical Scope

5.209 The townscape and visual impact assessment will be undertaken in accordance with the Landscape Institute and Institute of Environmental Management and Assessment, 'Guidelines for Landscape and Visual Impact Assessment' (Third Edition, 2013) – the industry accepted best practice guidance - and will provide a review of the existing landscape planning policy context, townscape character and visual appraisal of the study area (including the provision of a Zone of Theoretical Visibility (ZTV)) and an assessment of the potential townscape and visual effects of the proposed development, in accordance with the ES assessment methodology, both at the construction and operational phases.

5.210 Baseline information for the study area will be collated, which will include existing townscape features, topography/landform, townscape planning policy designations, published sources of townscape character, typical photographic viewpoints to illustrate existing character of the Site and views of the Site (with baseline

photographs captured in line with the LI TGN 06/19 'Visual Representation of Development Proposals' which sets out in Appendix 5, that lens type should be selected to capture the highest point of development – given the urban context and nature of the scheme it is likely that a wider angle lens may be required, and where this is the case a detailed explanation will be included for any deviations from the standard Full Frame Sensor camera and 50mm focal length lens), and any other relevant information, including ZTV analysis.

5.211 Assessments will be made at the baseline year 2021, during construction; on completion in a year 1 scenario without the benefit of effective new planting; and 15 years thereafter with the benefit of effective planting mitigation delivered by the landscape strategy.

5.212 In accordance with current good practice, this assessment will address townscape and visual effects as separate aspects:

- Townscape effects relate to the direct effect on the physical features that make up the townscape character of the Site, and on the character of wider townscape.
- Visual effects relate to typical views of the proposed development that visual receptors gain from the surrounding area.

5.213 A selection of representative viewpoints for assessment will be agreed with the MCC Planning Case Officer, the location of which are represented by the VuCity viewpoints that have been selected to accompany the Scoping Report and are contained within Appendix 5.

5.214 The assessment of likely significant effects to sensitive receptors will consider the sensitivity of the receptor (on a scale of high, medium, low and very low) against the magnitude of effect/change (on a scale of large, medium, small, very small and none) to determine the level of effect on a scale of major, moderate, minor, negligible and neutral, in line with the 'Guidelines for Landscape and Visual Impact Assessment'. What constitutes a significant effect will be determined as part of this process and dictated by professional judgement.

Baseline Assessment

5.215 The Baseline Assessment will set out the existing townscape and visual scenarios .

5.216 The purpose of baseline studies is to record the existing townscape features, characteristics, the way the townscape is experienced and potential visual receptors. The following are typically undertaken as part of the baseline studies:

- Identification of the extents of the study area. This is based on professional judgement and may vary depending on the type of development proposed and the townscape context.
- A desktop study of patterns and scale of landform, land use and built development, relevant current planning policy (including townscape designations) and townscape character publications. Further localised character assessments may also be undertaken to supplement published assessments.
- Where such additional assessments are undertaken, these are based on principles set out in published guidance, including the Landscape Institute Technical Information Note 05/2017: Townscape Character Assessment. Factors typically considered may include the following, as relevant:
- Landform;
- Historical development;
- Pattern;
- Movement and connectivity:
- Land Use;
- Activity/Cultural Association;
- Tranquillity;

- Spatial structure and built form;
- Urban Infrastructure;
- Enclosure/Views; and
- Green Infrastructure.

5.217 The Baseline Assessment will enable the value, susceptibility and subsequent sensitivity of townscape and visual receptors to be established.

Construction Assessment

5.218 The Construction Assessment will consider the likely effects of the temporary construction phase for the Proposed Development, setting out the townscape effects of the temporary construction phase by establishing a likely magnitude of effect and the significance of anticipated effects in line with the assessment methodology. The Construction Assessment will also consider the visual effects of the temporary construction phase for the Proposed Development by establishing a likely magnitude of effect and the significance of anticipated effects in line with the assessment methodology.

Operational Assessment

5.219 The Operational Assessment will consider the likely effects of the permanent operational phase for the Proposed Development and set out the townscape effects of the operational phase by establishing a likely magnitude of effect and subsequently, the significance of anticipated effects in line with the assessment methodology. The Operational Assessment will also consider the visual effects of the permanent operational phase by establishing a likely magnitude of effect and the significance of anticipated effects in line with the assessment methodology.

Scenarios to be Assessed

5.220 The TVIA ES Chapter will consider the following scenarios: Baseline, Baseline + Proposed Development, and the Proposed Development + Future Committed Developments.

Summary of Assessment Scope

5.221 The assessment of effects on the following receptors will be the focus of the townscape and visual ES chapter. This is shown in table 5.18.

Table 5.18

Potential Significant Effect	Receptor	Applicable Development Phase (Construction / Operational)
Changes to townscape features on the Site	Site	[C /O]
Change to the character of the Site	Site	[C / O]
Change to the character of TCA 1 Strangeways	TCA 1 Strangeways	[C / O]
Change to the character of TCA 2 Cheetham Hill	TCA 2 Cheetham Hill	[C / O]
Change to the character of TCA 3 Green Quarter	TCA 3 Green Quarter	[C / O]

Potential Significant Effect	Receptor	Applicable Development Phase (Construction / Operational)
Change to the character of TCA 4 New Co-Op Site	TCA 4 New Co-Op Site	[C / O]
Change to the character of TCA 5 Noma	TCA 5 Noma	[C / O]
Change to the character of TCA 6 Medieval Quarter	TCA 6 Medieval Quarter	[C / O]
Change to the character of TCA 7 Greengate	TCA 7 Greengate	[C / O]
Change to the character of TCA 8 Manchester Arena & Victoria Station	TCA 8 Manchester Arena & Victoria Station	[C / O]
Change to the character of TCA 9 Irwell Riverside	TCA 9 Irwell Riverside	[C / O]
Change to visual amenity of visual receptors within the public realm of the wider townscape area	Visual receptors within the public realm	[C / O]
Change to the visual amenity of visual receptors in residential properties with views towards the city centre	Visual receptors in residential properties with views towards the city centre	[C / O]
Change to the visual amenity of visual receptors in residential properties with views out from the city centre	Visual receptors in residential properties with views out from the city centre	[C / O]
Change to visual amenity of visual receptors within educational premises	Visual receptors within educational premises	[C / O]
Change to visual amenity of visual receptors within commercial premises	Visual receptors within commercial premises	[C / O]
Change to visual amenity of visual receptors on the local road network	Visual receptors on the local road network	[C / O]

Wind Microclimate

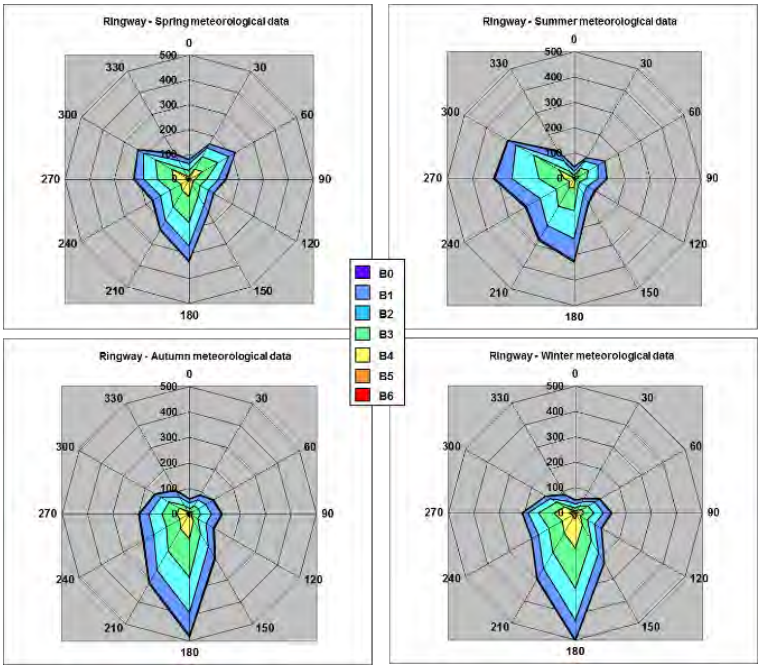
Introduction

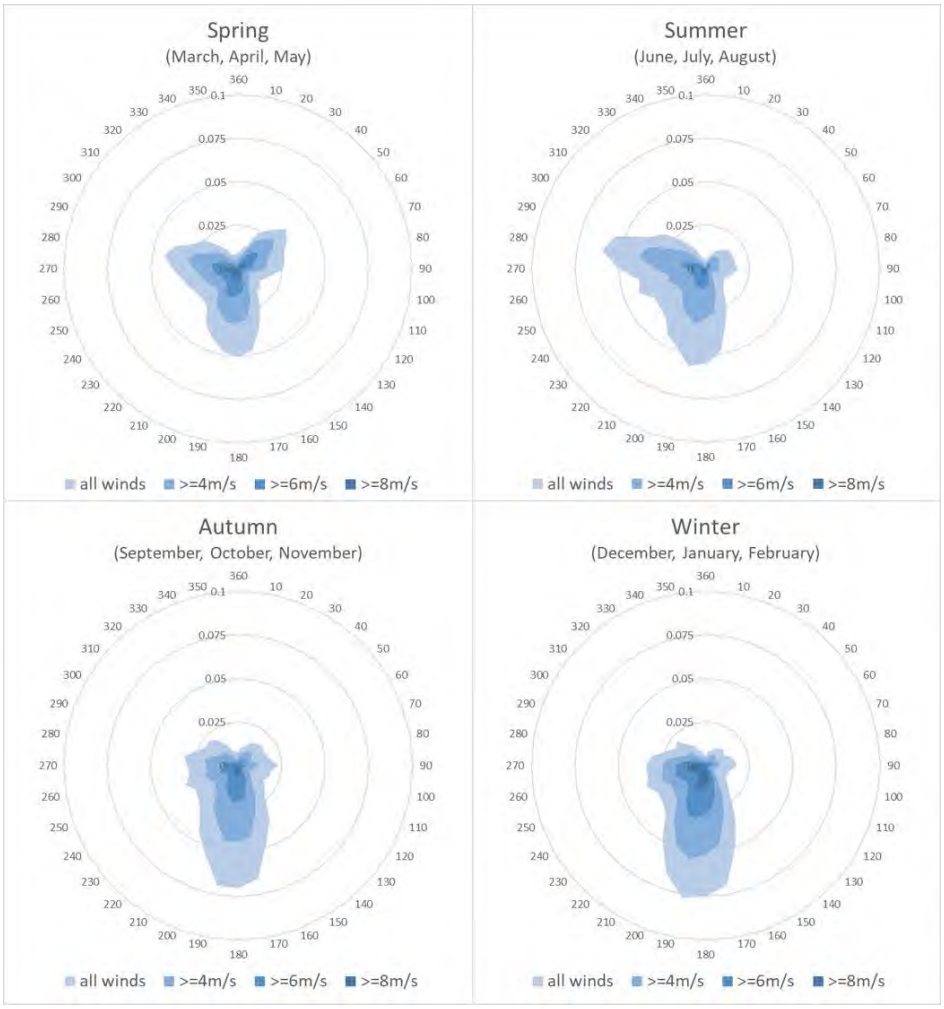
5.222 All buildings interact with the wind, and have the potential to generate locally windy areas that would be uncomfortable or unsafe for pedestrians and cyclists. Detailed assessment is necessary to identify and classify the wind microclimate within and around the Site, and to mitigate any conditions that are found to be unsuitable. The suitability of the conditions is dependent on the intended usage of the area (for example, proposed outdoor seating areas require relatively "calmer" wind conditions compared to a thoroughfare).

Baseline Conditions

5.223 Winds for the Manchester area are predominantly from the south, with a secondary peak from the west to north-west during spring and summer. Winds are typically stronger in the winter season, and lighter throughout the summer. Wind roses for the Manchester area are shown in Figure 5.2 below per season, from data obtained from Manchester airport over a period of approximately 30 years.

Figure 5.2: Seasonal wind roses for Manchester - (Radial axis indicates the proportion of the season for which the stated wind speed is exceeded).





5.224 To understand and quantify the baseline conditions at the site, a digital computer model will be constructed reflecting the existing built form of the site and the surrounding area within a 400m radius. This digital model will be analysed using Computational Fluid Dynamics (CFD) software which creates a 'digital wind tunnel' to allow the baseline wind microclimate conditions to be quantified.

5.225 The digital model will not include any hard or soft landscaping, in order to provide a conservative result.

Method of Assessment

5.226 The assessment will be performed using full-scale CFD modelling to predict the air flow patterns and wind velocities around the Proposed Development. The assessment will be conducted using the digital model of the site and its surroundings with a resolution of 0.05-0.25m around the proposed development.

5.227 The results of the CFD will then be combined with long-term wind climate statistics, corrected to apply at the Site, and benchmarked against the Lawson Comfort Criteria.

5.228 The Lawson Criteria is recognised guidance used universally across the UK to assess the impact of the proposed development on wind flows in public spaces. Lawson devised a scale for assessing the suitability of wind conditions in the urban environment based upon threshold values of wind speed and frequency of occurrence. This guidance will be used to inform the assessment. The commonly used London Docklands Development Corporation (LDDC) method of the Lawson Criteria is set out in Table 5.19 below.

Table 5.19: Lawsons Comfort Criteria

Key	Comfort Category	Threshold	Description
	Sitting	0-4 m/s	Light breezes desired for outdoor restaurants and seating areas where one can read a paper or comfortably sit for long periods.
	Standing	4-6 m/s	Gentle breezes suitable for main building entrances, pick-up/drop-off points and bus stops.
	Strolling	6-8 m/s	Moderate breezes that would be appropriate for strolling along a city/town centre street, plaza or park.
	Walking	8-10 m/s	Relatively high speeds that can be tolerated if the objective is to walk, run or cycle without lingering.
	Uncomfortable	>10 m/s	Winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended.

5.229 Such criteria identify the wind conditions and thresholds for a range of pedestrian activities such as sitting, standing, strolling, walking uncomfortable. In this way, the results of the wind tunnel testing can be used to determine the comfort and safety of the wind microclimate in relation to the expected pedestrian activities at and surrounding the Site for all test scenarios. This will be particularly important for test scenario 2 and 3.

5.230 The LDDC also specifies a strong wind threshold when winds exceed 15m/s for more than 0.025% of the time (approximately 2.2 hours of the year) and would have the potential to cause distress to pedestrians and cyclists. These instances are referred to as 'S15 Exceeded' in the figures. Exceedances of this threshold may indicate a need for remedial measures or a careful assessment of the expected use of that location; e.g. is it reasonable to expect older adults or young children to be present at the location on the windiest day of the year?

5.231 Wind speeds that exceed 20m/s for more than 0.025% of the time (approximately 2.2 hours per year) represent safety issues for all members of the population and would require mitigation measures to provide an appropriate wind microclimate environment. These instances are referred to as 'S20 Exceeded' in figures. The following scenarios for the proposed EIA development will be tested with the CFD software:

- Scenario 1: Baseline
- Scenario 2: Proposed Development and Baseline.
- Scenario 3: Proposed Development, Baseline and Cumulative.

5.232 Comfort and safety conditions will be obtained for the entire assessment area and presented as a 'heat map'. This will allow for a direct comparison to be made between the baseline conditions (with the existing site uses) and to the layout and end uses of the Proposed Development. One of the advantages of CFD modelling is that much more detail is captured about the conditions across the entire site and its surroundings ensuring that no issues are missed or misinterpreted. This will also allow for a comparison of off-site locations, to determine the effect of the Proposed Development on the surrounding area.

5.233 The results from the wind modelling will be benchmarked against the Lawson Comfort Criteria to determine the suitability of the different areas, both within and surrounding the site, for sitting, standing, strolling, walking, or crossing the road. Based on the results of the modelling and assessed against the Lawson Comfort Criteria, the suitability of the conditions and the likely effect both within and off-site, will be determined.

Table 5.20: Significance Criteria

Recorded Conditions	Significance Effect
Wind Conditions are 3 categories calmer than desired	Substantial beneficial
Wind Conditions are 2 categories calmer than desired	Moderate beneficial
Wind Conditions are 1 category calmer than desired	Minor beneficial
Wind Conditions are similar to those desired	Neutral/negligible
Wind Conditions are 1 category windier than desired	Minor Adverse
Wind Conditions are 2 categories windier than desired	Moderate Adverse
Wind Conditions are 3 categories windier than desired	Substantial Adverse
Wind Conditions exceed the safety criteria (S15 or S20)	Substantial Adverse

5.234 The adopted scale for the significance criteria is a logical comparison of the measured wind environment with the desired wind environment. An adverse effect implies that a location has a wind environment that is unsuitable for its intended use and mitigation should therefore be considered.

5.235 The minor, moderate and substantial categories indicate the severity of the difference between the desired microclimate and the actual microclimate. As an example, if the desired wind conditions at a particular location are required to be suitable for standing, but the predicted wind conditions are suitable for strolling, the difference between the desired and predicted wind condition is one category windier than desired. In this case, the significance of the effect would be identified as minor adverse. Any adverse effect would be material to the planning decision process because it implies that a location, or area, has a wind microclimate that is unsuitable for the desired use of that area. For the avoidance of doubt, in all cases an exceedance of the safety criteria would require mitigation.

5.236 Wind effects due to development are usually 'felt' within the Site boundary or the immediate surrounding streets and are due to the building massing and orientation. Consequently, all reported effects are considered to be direct, local and long-term/irreversible unless there is a change in the massing or climate.

5.237 The potential for strong winds to occur will also be quantified through the process for all the scenarios tested.

5.238 Should mitigation measures be required to provide wind conditions within a particular area / space to be suitable for their intended use, or are required to mitigate against predicted strong winds, the areas identified requiring suitable mitigation measures will be developed in consultation with the Applicant and the Design Team. Mitigation measures will be tested through additional rounds of CFD modelling. Following mitigation, the significance of any residual effects will be classified using the same criteria discussed above.

5.239 With regard to the assessment of demolition and construction effects, as demolition and construction works progress, the conditions on and around the Site would be expected to gradually transition between those of the baseline and the various phases of the Proposed Development assessed in the CFD model. Generally, for wind microclimate assessments, the potential impacts during demolition and construction are assessed using the professional judgement of an experienced wind engineer, based on an assessment of the background wind climate at the site and an understanding of the effects of wind in the built environment. A qualitative approach will be taken to the assessment of the demolition and construction works.

5.240 The results of all of the above assessments will be presented within an ES chapter, which will be supported by a full technical report provided as an appendix to the ES. Table 5.20 details what will be scoped into the ES chapter.

Table 5.20 Scoping Table - Wind

Receptor	Impact	Potential Effect	Scoped in / out
On-site Thoroughfares	High	Moderate Beneficial to Moderate Adverse	Scoped in
On-site Entrances	High	Minor Beneficial to Major Adverse	Scoped in
On-site Amenity spaces – ground and elevated	High	Negligible to Major Adverse	Scoped in
Off-site Thoroughfares	High	Negligible to Moderate Adverse	Scoped in
Off-site Entrances	High	Negligible to Major Adverse	Scoped in
Off-site bus-stop/drop-off areas etc	High	Negligible to Major Adverse	Scoped in
Off-site Amenity Spaces	High	Negligible to Major Adverse	Scoped in

Appendix 1 – Site Location Plan

Appendix 2 – List of Committed Developments

Application Reference	Description of Development Proposals	Date Approved	Map No	Distance from Site	Status
Baseline					
Embankment West **SCC PP. Ref.: 17/70626/FUL**	Erection of one 18 storey residential building (Block A, Use Class C3); one 16 storey residential building (Block B, Use Class C3); one 18 storey building providing a mix of residential and serviced apartment accommodation and amenity facilities including lounge, swimming pool and gym (Block C, Use Class Sui Generis); 536sqm of commercial floorspace (Use Classes A1, A2, A3, A4); new access from Greengate; car and cycle parking; public realm and landscaping; and other associated works	November 2017	1	462m	Construction nearly complete.
Port Loop **SCC PP. Ref.: 19/74205/FULEIA**	Erection of a mixed use development comprising a single building with two blocks (14 and 55 storeys) to include: 542 residential apartments, associated residents' facilities and basement parking; and 3 no. commercial units (use classes A1,	January 2020	2	280m	Contractor onboard

	A2, A3, B1 & D1) with associated landscaping and public realm works				
Greengate (Renaker) SCC PP. Ref.: 19/74465/HYBEIA	Hybrid planning application for demolition of existing buildings on the Site and comprehensive redevelopment to create between 1,407 and 1,521 dwellings, comprising of: (a) Phase 1 (submitted in full with no matters reserved) for development of a 50-storey residential building; commercial floor-space (Use Classes A1, A2, A3, A4, A5, B1, D1 and D2); new public park; highways and public realm improvements and other associated works; and, (b) Phases 2 and 3 (submitted in outline with all matters reserved) for the development of two residential buildings up to 42 storeys in height; commercial floor-space (Use Classes A1, A2, A3, A4, A5, B1, D1 and D2); new highways; a public square; public realm improvements and other associated works. (EIA development, accompanied by Environmental Statement)-	March 2020	3	401m	Construction underway, and resevered matters submitted for next phase.
New Victoria Road MCC PP. Ref.: 111777/FO/2016/C1	Erection of two residential buildings of a maximum 21 and 26 storeys to accommodate 520 apartments (178 x 1 bed, 286 x 2 bed and 56 x 3 bed	September 2016	4	439m	Construction underway.

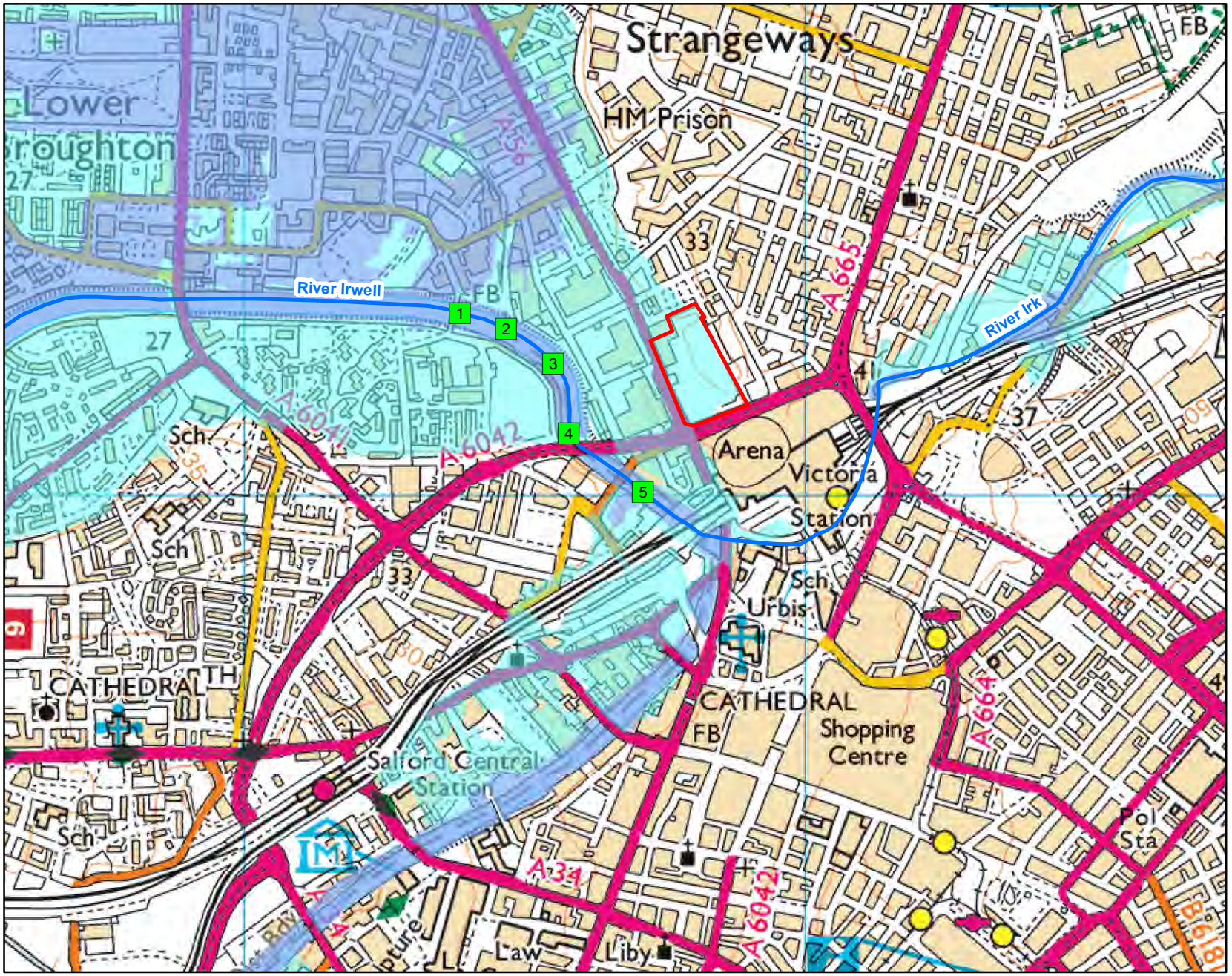
	apartments) (Use Class C3). Erection of one office building of maximum eight storeys comprising up to 11,647 sq. m (GIA) of office accommodation. Ground floor commercial space (Use Class A1, A2, A3 and B1), lower ground level car parking, access and servicing arrangements, alterations to Corporation Street, new public realm and other associated works				
4 Angel Square MCC PP. Ref.: 123427/FO/2019	Demolition of existing buildings to facilitate construction of an 11 storey building with external terrace to form a mixed use development comprising office use (Use Class B1) and ground floor commercial units (Use Classes A1, A2, A3, A4, B1 and D2); creation of a new public square and associated landscaping, undercroft car and cycle parking, provision of plant and servicing and related access and highways' works and associated works	July 2019	7	490m	Construction underway.
Angel Meadows MCC PP. Ref.: 124120/JO/2019	Variation of planning condition 3 (specified plans) of planning permission 116366/FO/2017 to increase the height of buildings at plots 2 and 3 by 1.1 m, amendments to the facade treatment of plots 2 and 3, increase in the height	December 2019	8	570m	Construction underway.

	of plot 4 by 0.278m, amendments to the facade treatment of building at plot 4, increase in height of plot 5 by 1m together with elevational alterations, alteration to podium to plot 4.				
Cumulative					
Mixed Use Scheme, Mirabel Street MCC PP. Ref.:	Erection of new mixed-use development to comprise of one 10 storey building fronting Mirabel Street to accommodate 45 no. Use Class C3 residential apartments (9 no. 1-bed studios, 27 no. 2-bed 3 person apartments and 9 no. 2-bed 4 person apartments) and 8 no. residential car parking spaces at ground level and one part 10, part 14 storey building fronting Great Ducie Street to accommodate 84 no. Use Class C3 residential apartments (31 no. 1-bed 2 person apartments, 26 no. 2-bed 3 person apartments, 18 no. 2-bed 4 person apartments and 9 no. 3-bed 5 person apartments) and 345 sq. m of commercial floor space at ground level (flexible use Use Class A1 shop, Use Class A2 financial and professional services and Use Class A3 cafe/restaurant) together with creation of roof terrace amenity space, cycle parking,	Awaiting Decision	5	170m	Resolution to grant planning permission.

	access, servicing and associated works following demolition of existing building.				
Old Brewery Gardens MCC PP. Ref.: 118831/FO/2018	Erection of two buildings (a part 17, part 12 storey building and a part 26, part 23 storey building) to form 556 residential units (Use Class C3a) together with the creation of 3490 sqm of commercial floor space (Use Classes A1, A2, A3, B1 and D1) with associated landscaping, access and other associated works	February 2019	6	75m	Construction is yet to begin on site.
Chapel Street Hotel SCC PP. Ref.: 20/76134/FUL	Erection of 16-storey building plus plant comprising a hotel (Use Class C1) with ancillary bar and restaurant uses, access, servicing, landscaping and other associated works	July 2021	9	505m	Construction is yet to begin on site.

Appendix 3 – Flooding within the vicinity of the Site

Detailed Flood Map centred on Great Ducie St, Cheetham Hill, Manchester M3 1PT.
Created on 13/07/2021 [GMMC224504AB]



Environment Agency

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Legend

- Site Location
- Model Measurements
- Main River
- Flood Zone 3
- Flood Zone 2

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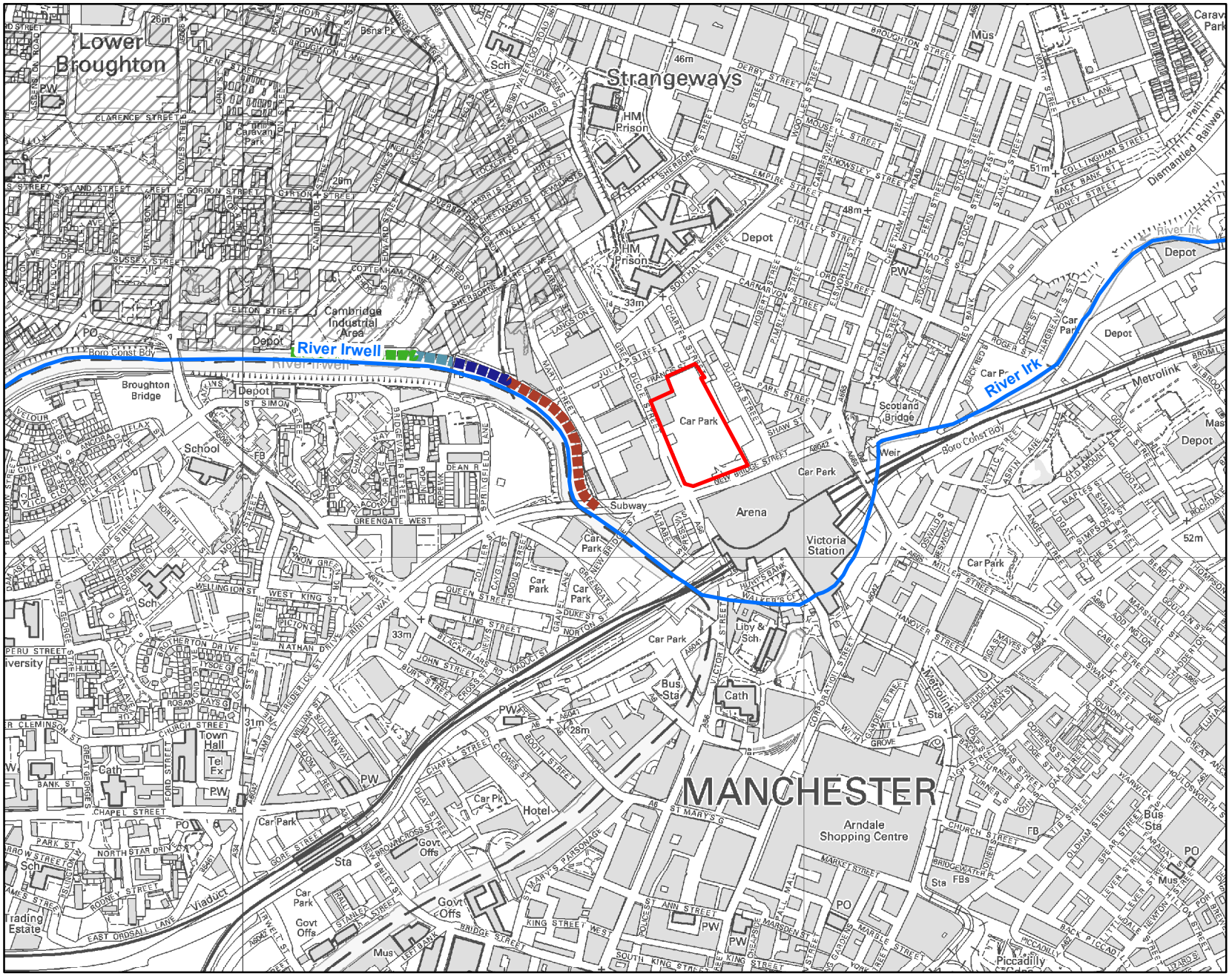
Flood Defence Map centred on Great Ducie St, Cheetham Hill, Manchester M3 1PT.
Created on 13/07/2021 [GMMC224504AB]



Environment Agency

1:10,001

N

Legend

Site Location

Main River

Defences

ASSET_ID

88831

88893

181081

452758

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					Defended											Undefended										
Map Reference	Model Node Reference	Easting	Northing	Data	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flows	1 % AEP (1 in 100 year) + 35% increase in flows	1 % AEP (1 in 100 year) + 70% increase in flows	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flows	1 % AEP (1 in 100 year) + 35% increase in flows	1 % AEP (1 in 100 year) + 70% increase in flows	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)
1	ea013_0208_IRW13692	383422	399255	Modelled Water Level (m aodN)	25.54	25.92	26.26	26.48	26.61	26.68	27.52	27.69	29.53	26.98	30.24	25.32	25.64	26.18	26.48	26.61	26.83	28.18	28.44	29.95	27.35	30.60
				Modelled Flow (cumecs)	318.42	356.75	387.29	406.85	417.61	425.33	516.71	518.61	509.23	472.52	474.40	294.54	333.01	388.01	416.70	433.33	457.32	508.89	506.19	480.96	498.71	466.21
2	ea013_0208_IRW13665	383485	399266	Modelled Water Level (m aodN)	25.52	25.90	26.24	26.47	26.59	26.66	27.50	27.66	29.52	26.96	30.24	25.30	25.62	26.15	26.46	26.59	26.80	28.16	28.42	29.95	27.32	30.59
				Modelled Flow (cumecs)	318.43	356.77	387.32	406.88	417.65	425.36	526.40	532.84	523.37	472.53	494.47	294.55	333.02	388.03	416.72	434.26	460.26	525.61	522.09	502.07	507.94	489.16
3	ea013_0208_IRW13571	383575	399205	Modelled Water Level (m aodN)	25.39	25.77	26.11	26.34	26.47	26.55	27.36	27.53	29.45	26.83	30.19	25.17	25.48	26.02	26.33	26.46	26.67	28.02	28.30	29.89	27.18	30.55
				Modelled Flow (cumecs)	318.47	356.83	387.40	406.98	417.76	425.47	528.87	539.41	541.44	472.59	519.73	294.60	333.04	388.06	416.74	434.28	460.28	548.53	545.82	530.36	509.27	517.98
4	ea013_0208_IRW13363	383608	399068	Modelled Water Level (m aodN)	25.27	25.66	26.02	26.25	26.38	26.46	27.26	27.42	29.27	26.74	30.07	25.05	25.37	25.91	26.23	26.37	26.57	27.90	28.16	29.76	27.09	30.46
				Modelled Flow (cumecs)	318.61	357.00	387.63	407.25	418.05	425.74	533.13	547.56	634.40	472.74	622.17	294.75	333.13	388.16	416.86	434.36	460.29	583.44	592.73	606.14	511.82	595.14
5	ea013_0208_IRW1_3304	383749	398955	Modelled Water Level (m aodN)	25.21	25.59	25.94	26.17	26.30	26.37	27.13	27.28	28.75	26.63	29.45	25.00	25.30	25.83	26.14	26.28	26.46	27.71	27.92	29.14	26.96	29.84
				Modelled Flow (cumecs)	318.65	357.04	387.68	407.31	418.12	425.81	533.15	547.37	678.74	472.77	674.11	294.78	333.15	388.19	416.90	434.38	460.37	587.64	606.72	685.05	511.67	672.60

Model data taken from Lower Irwell 2017 Study

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes:

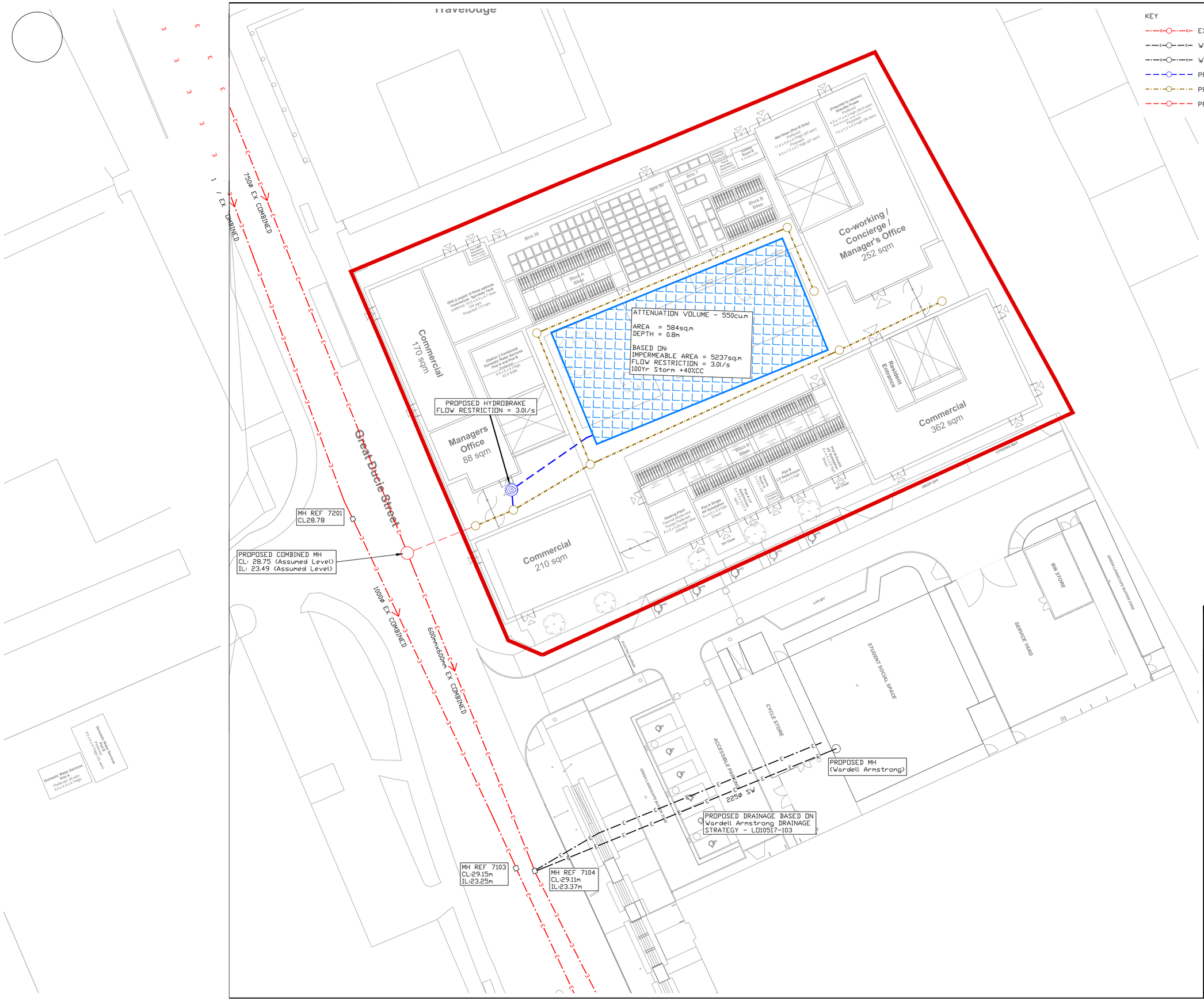
*Climate Change Scenario - 30%, 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

Flood Defences

Start Date	Asset Type	Asset ID	Standard of Protection	†Overall Condition Grade	Upstream Actual Crest Level (m aod)	Downstream Actual Crest Level (m aod)
14/12/2018	high Ground	88831	75	3	27.66	27.44
14/12/2018	high Ground	88893	75	2	27.44	27.20
14/12/2018	Wall	181081	75	3	27.10	27.07
14/12/2018	Embankment	452758	75	3	27.10	27.10

† Overall condition of the asset based on the (weighted) condition of each element of the latest inspection of the asset. See the attached document 'Visual Condition Grading of FCRM Assets' for interpretation of score given.

Appendix 4 – Drawing C1467-SK102



P2	PLAN TO LATEST LAYOUT	WC	09.09.21

Revisions

Project
Boddingtons Brewery

Client
Clarion Housing

Scale	Date	Drawn by:
1:250 A(1)	05.07.2021	WC

Drawing
Preliminary Drainage Review

Shepherd Gilmour Consulting Engineers
Colchester House, 40 Peter Street, Manchester M2 5GP.
Phone: 0161 837 1500. E-mail: sgi@sgiconsulting.co.uk
Web: www.sgiconsulting.co.uk

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Drawing No	Rev:
C1467-SK102	P2

Status
INFORMATION

Appendix 5 – VuCity Viewpoints

The scaling of this drawing cannot be assured

Revision	Date	Drn	Ckd
-	-	-	-

LEGEND

N

- Site Boundary
- Existing Woodlands, Copses and Tree Belts ^
- Existing Scrub ^
- Existing Water Courses and Features ^
- Contours/Spot Heights (Metres AOD) ^
- Public Rights of Way
- Cycle Route ++
- Sustrans Cycle Route
- Green Spaces ^
- Viewpoint Locations

Sources:

^	OS Mapping
#	Natural England GIS Data Set
~	Historic England National Monument Record GIS Data Set
*	<County Council> Definitive Map
+	Sustrans National Cycle Network GIS Data
++	Department of Transport Cycle Network Model
^^	Department for Communities and Local Government GIS Data
##	<District Council> Local Plan Proposals Map Adopted
~~	<County Council> Landscape Character Assessment
**	<District Council> Landscape Character Assessment

Data collated for constraints and analysis mapping is based on publicly available sources at the time of preparation inserted using the British National Grid and may itself not be accurate. Barton Willmore shall not be liable for the accuracy of data derived from external sources.

Project

Former Boddingtons Brewery

Drawing Title

Viewpoint Location Plan

Date	Scale	Drawn by	Check by
12.08.2021	1:10,000 @A3	ML	RG

Project No	Drawing No	Revision
33144	LN-LP-07	-

0 100 200 300 400 500m

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Town Planning • Master Planning & Urban Design • Architecture • Landscape Planning & Design • Infrastructure & Environmental Planning • Heritage • Graphic Communication • Communications & Engagement • Development Economics

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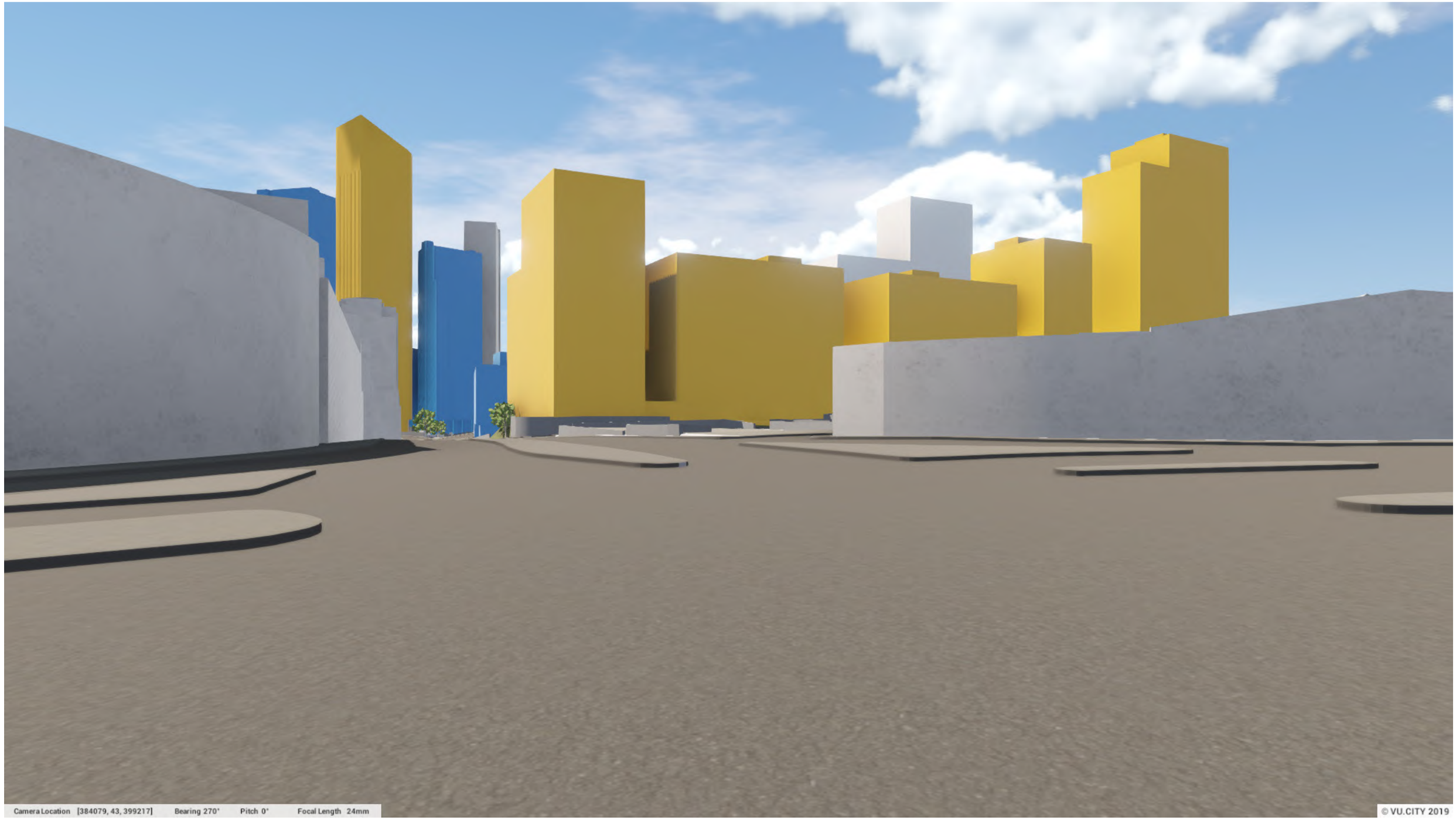
J:\33000\33144 - Former Boddingtons Brewery\A4 - Drawings & Registers\Landscape\33144 LN-LP-07 Viewpoint Location Plan.dwg - A3



FORMER BODDINGTONS BREWERY

PROPOSED VIEWPOINT: 1

BARTON WILLMORE

FORMER BODDINGTONS BREWERY

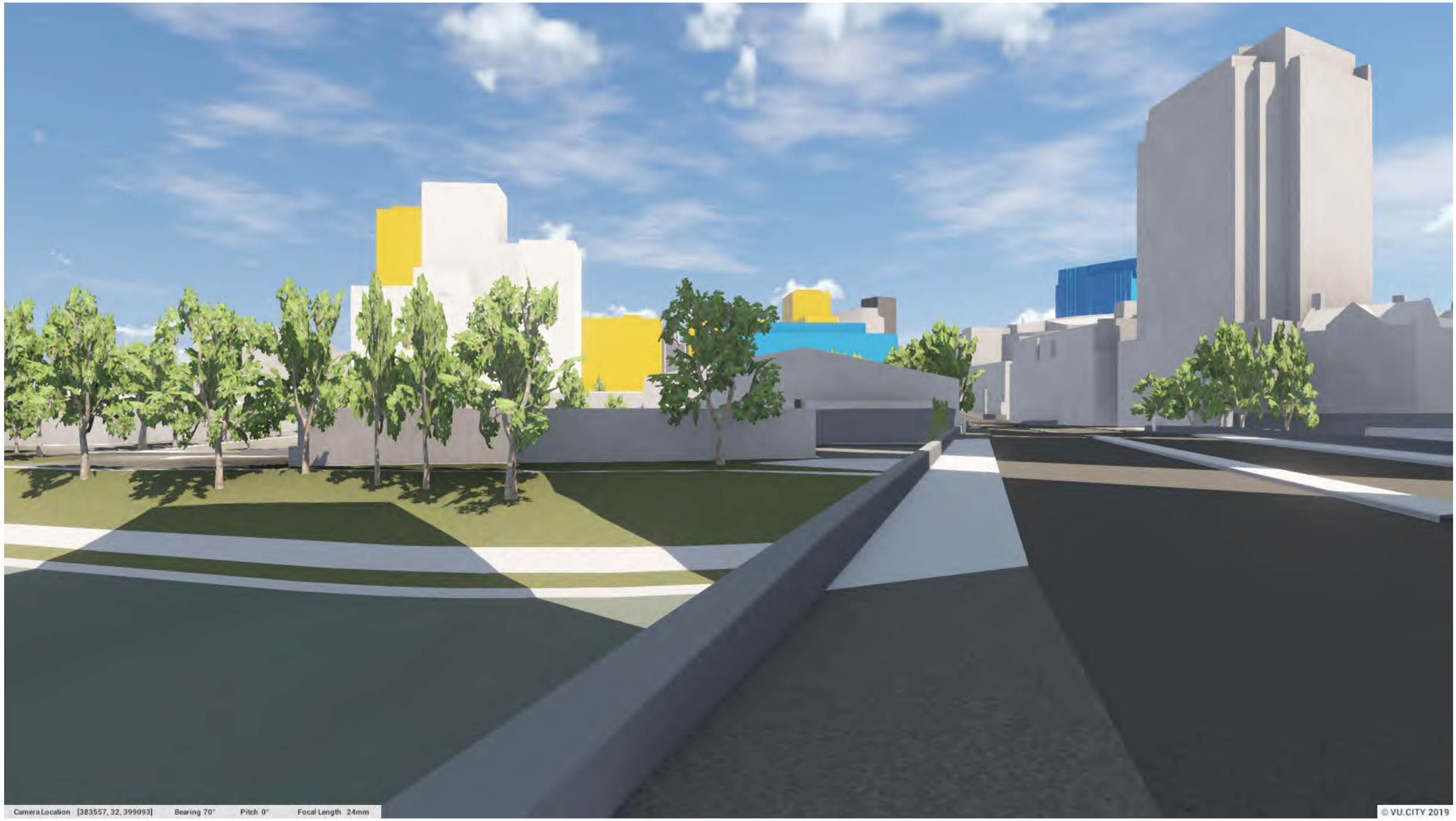
PROPOSED VIEWPOINT: 2

BARTON WILLMORE

FORMER BODDINGTONS BREWERY

PROPOSED VIEWPOINT: 3

BARTON WILLMORE



FORMER BODDINGTONS BREWERY

PROPOSED VIEWPOINT: 4

BARTON WILLMORE

FORMER BODDINGTONS BREWERY

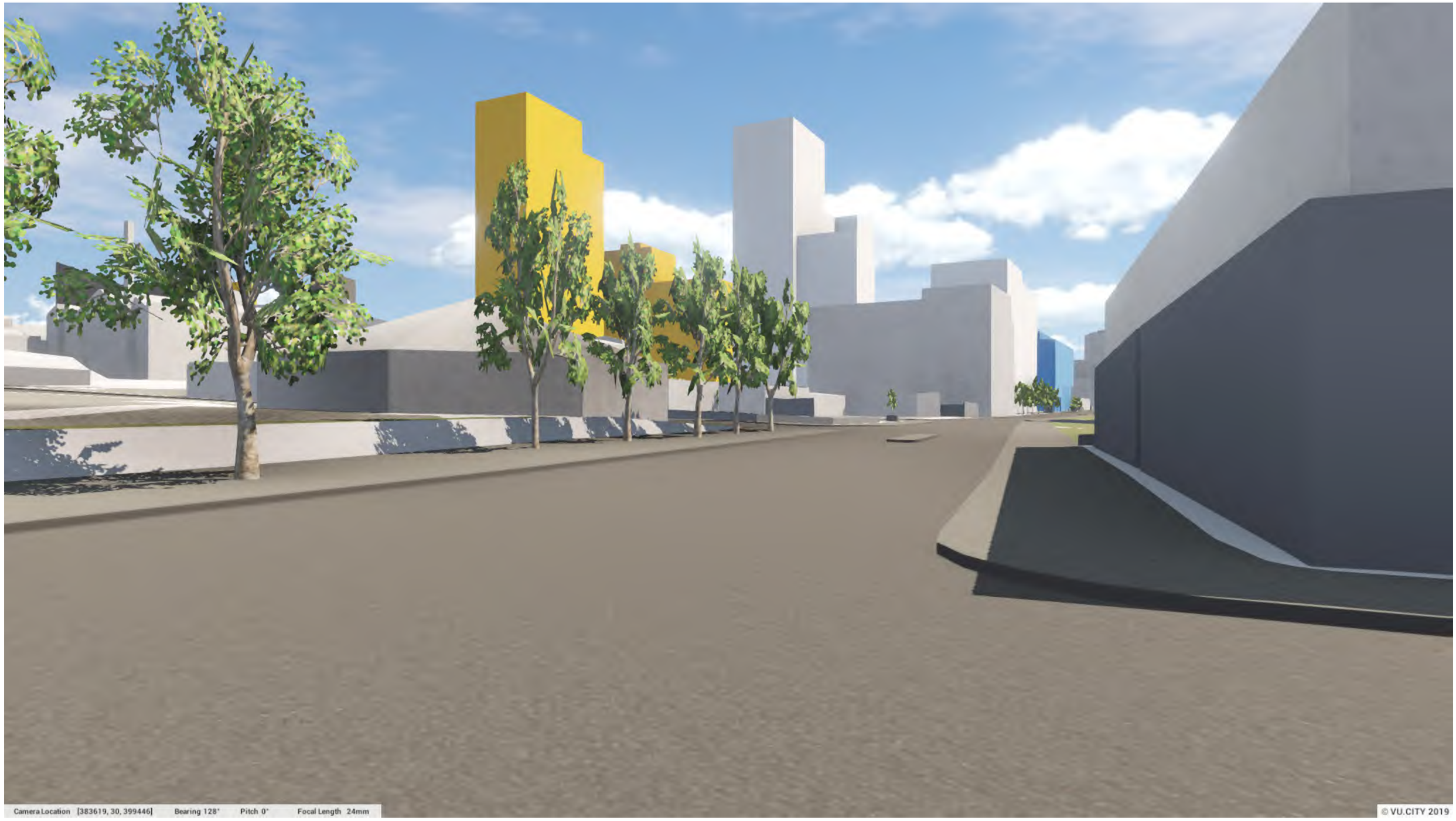
PROPOSED VIEWPOINT: 5

BARTON WILLMORE

FORMER BODDINGTONS BREWERY

PROPOSED VIEWPOINT: 6

BARTON WILLMORE



FORMER BODDINGTONS BREWERY

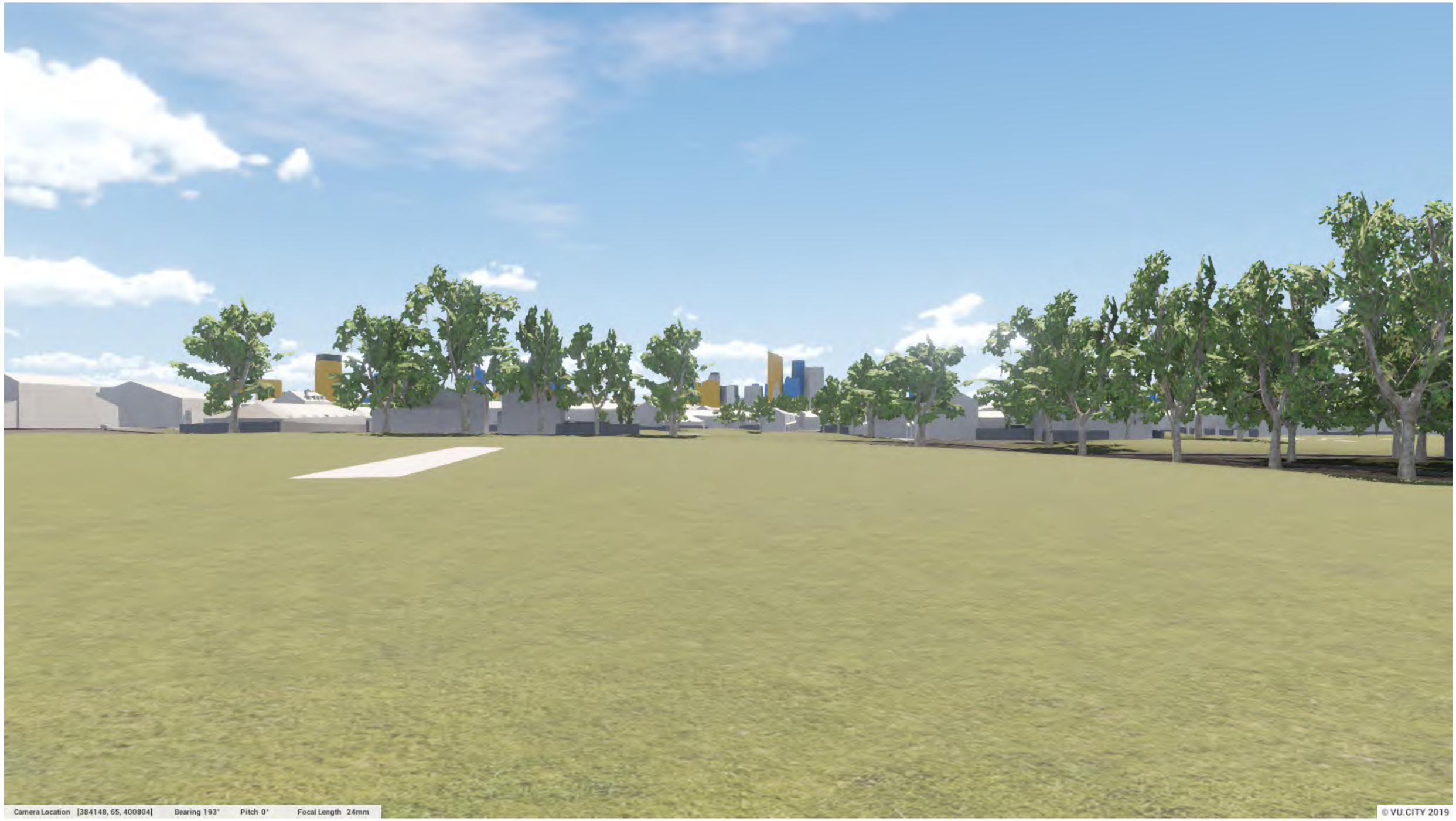
PROPOSED VIEWPOINT: 7

BARTON WILLMORE

FORMER BODDINGTONS BREWERY

PROPOSED VIEWPOINT: 8

BARTON WILLMORE



FORMER BODDINGTONS BREWERY

PROPOSED VIEWPOINT: 9

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FORMER BODDINGTONS BREWERY **PROPOSED VIEWPOINT: 10**

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