



Union T2 (St Johns)
Environmental Statement Volume 1

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1 Introduction

- 1.1 This Environmental Statement (ES) has been prepared on behalf of Union Living Ltd ("the Applicant"), a wholly owned subsidiary of Vita Group. It accompanies an application for full planning permission for Union, Vita's latest concept for a co-living and co-working development.
- 1.2 The application site (referred to hereafter as 'the Site') is in Manchester City Centre located within the St. John's Masterplan, forming part of Enterprise City. It is bounded by the under construction Manchester Goods Yard and T1 (as approved under PP.: 121511/FO/2018) to the east, under construction Factory (as approved under PP.: 119890/VO/2018) to the south, the Victoria and Albert Hotel located to the north, and the River Irwell to the west.
- 1.3 The Site extends to 0.67ha and currently comprises a construction compound, associated with the delivery of adjacent St John's developments. Therefore, no buildings, structures or trees currently exist on this Site upon which the Proposed Development would take place.
- 1.4 The description of the Proposed Development is:
- "Full Planning Permission for the erection of 36 storey plus basement level mixed use building comprising co-living apartments, amenity space and flexible commercial space (Sui Generis), co-work (Use Class B1), landscaping, access and other associated works."***
- 1.5 The Proposed Development is described as Union T2 throughout the ES. The Proposed Development also includes public realm improvements, which have been designed with the wider St. John's Masterplan and Factory public realm in mind.
- 1.6 This ES sets out the findings of an Environmental Impact Assessment (EIA) carried out in respect of the Proposed Development on the Site.

Requirement for EIA

- 1.7 The EIA process is the mechanism by which the Proposed Development is appraised in terms of likely environmental and socio-economic effects, in addition to engineering and technical considerations.
- 1.8 The purpose of the EIA is to establish the nature of the Proposed Development and the environment in which it is likely to take place, during both construction and operational phases, so as to identify the likely significant effects on the environment. The assessment compares the existing situation at the start of the work (baseline) with the situation during demolition and construction, and when the Proposed Development is operational.
- 1.9 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the "EIA Regulations") require that any Proposed Development falling within the description of a 'Schedule 2 development' (as defined within the meaning of the EIA Regulations), will be subject to an EIA where such development is likely to have 'significant' effects on the environment by virtue of such factors as its nature, size or location (Regulation 2(b)).
- 1.10 The Proposed Development is an "Infrastructure Project" (Schedule 2, 10 (b)) as described in the EIA Regulations and, although this is below the indicative applicable threshold of 5 hectares, it could give rise to potentially significant effects either on its own or as part of the wider St. John's development activity planned and taking place currently. As such it has been identified through an EIA Scoping exercise with Manchester City Council that an EIA should be carried out in relation to specific topic areas where there is the potential for a significant effect on the environment.

- 1.11 The EIA Scoping Request was undertaken to determine the specific topic areas that should be included within the EIA and was submitted to Manchester City Council in March 2020. A copy of the Scoping Report is included at Appendix 2.1 to this ES. An opinion has not yet been received from the Local Authority.
- 1.12 In accordance with the EIA Regulations, this ES sets out the following information:
- A description of the development, including in particular:
 - (a) a description of the location of the development;
 - (b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
 - (c) a description of the main characteristics of the operational phase of the development; and,
 - (d) an estimate, by type and quantity, of expected residues and emissions during the construction and operation phases.
 - A description of the reasonable alternatives studied, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.
 - A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
 - A description of the factors specified in regulation 4(2) likely to be significantly affected by the development.
 - A description of the likely significant effects of the development on the environment resulting from, inter alia:
 - (a) the construction and existence of the development, including, where relevant, demolition works;
 - (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
 - (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
 - (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
 - (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
 - (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; and,
 - (g) the technologies and the substances used.
 - A description of the likely significant effects on the factors specified in regulation 4(2) that covers the direct effects and any indirect, secondary, cumulative, transboundary, short-term,

medium-term and long-term, permanent and temporary, positive and negative effects of the development.

- A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
- A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis).
- A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned.
- A non-technical summary of the information.
- A reference list detailing the sources used for the descriptions and assessments included.

Project Team

1.13 Details of the EIA Technical Team and their qualifications are set out in Table 1-1.

Table 1-1: EIA Consultant Team

Topic	Consultant	
EIA Lead	Deloitte Real Estate	Extensive experience in preparation, co-ordination and submission of Environmental Impact Assessments and accredited firm for organisations including RTPI, RICS and IEMA (including EIA Quality Mark).
Townscape and Visual Impact Assessment	Chris Burnett Associates	CBA was established in 1985 and was founded by Chris Burnett, a Chartered Member of the Landscape Institute with experience of townscape and visual impact assessment including preparation of Environmental Statement Chapters.
Historic Built Environment	Stephen Levrant Heritage Architecture	SL:HA is the continuation of a specialist practice originally founded in 1948, which provides planning and urban design services within the historic cultural environment. The assessment was carried out about by Sarah Stirling, a Historic Building Consultant and member of the IHBC who has experience of undertaking heritage impact assessment including preparation of Environmental Statement chapters.
Noise and Vibration	Fisher Acoustics	Fisher Acoustics has extensive experience in the acoustic design of large-scale residential and commercial developments. The Director of Fisher Acoustics is a Chartered Engineer, holds a First Class Bachelor of Engineering in applied acoustics and has 28 years' post-graduate experience in acoustic consultancy.
Air Quality	Hilson Moran	Hilson Moran was established in 1977 as an engineering consultancy, which provides services including sustainability and air quality advice. The assessment was carried out by a member of the

Topic	Consultant	
		IES and IAQM who has experience of undertaking air quality assessment including preparation of Environmental Statement chapters.
Daylight and Sunlight	Watts	Founded in 1967, Watts are a specialist property consultancy providing consultancy services and surveys, across a wide range of projects and industry sectors. Richard Howard is a chartered building surveyor and has led the preparation of the EIA in respect of Daylight and Sunlight.
Wind Microclimate	Urban Microclimate	Urban Microclimate was founded in 2014 by Dr Graeme Flynn, one of the UK's most experienced microclimate specialists with more than 20 years' experience in aerodynamics and wind engineering. Urban Microclimate regularly contribute to the preparation of Environmental Statements in respect of wind microclimate.

Although we have read Chris Burnett Associates, Stephen Levrant Heritage Architecture, Fisher Acoustics, Hilson Moran, Watts, Urban Microclimate reports ('the Consultant Reports') for consistency and provide our observations based on our knowledge and experience, we accept no liability or responsibility for the Consultant's Reports and will not be responsible for the technical content of Chapters 6 to 11.

Organisation of Environmental Structure

- 1.14 This ES comprises five introductory chapters, six technical chapters and is supported by technical appendices (within a separate Volume 2). A Non-Technical Summary (NTS) of the full ES is provided as a separate standalone document. This is summarised in Table 1-2.

Table 1-2: EIA Structure

Chapter No.	Chapter Title	Description
Volume 1		
1	Introduction	Introduction to the ES, EIA requirements, details of project team, ES organisation and availability.
2	Site Context and Proposals	Site description and details of the Proposed Development.
3	EIA Methodology	Methods used to prepare each chapter, description of ES structure and content, generic significance criteria, scoping and consultation. Includes EIA Scoping and Cumulative Developments (Appendix 3.1-3.2).
4	Construction Management	Description of the construction and operational phase of the project and an outline of the construction programme. Includes Framework Construction Management Plan and Local Labour Agreement (Appendix 4.1 – 4.2).
5	Consideration of Alternatives	Outline of the main alternatives considered by the

Chapter No.	Chapter Title	Description
		Applicant.
6	Townscape and Visual Impact Assessment	Assessment of potential townscape and visual impacts associated with construction and operation of the development. Includes Maps (Appendix 6.1) and photography including Accurate Visual Representations ('AVR') and computer generated images of the scheme in situ (Appendix 6.2).
7	Historic Built Environment	Assessment of potential built heritage impacts associated with the development, including Listed Buildings and Conservation Areas. Includes Heritage Statement (Appendix 7.1)
8	Noise and Vibration	Assessment of potential impacts on noise and vibration associated with the construction and operation of the development. Includes Noise Assessment (Appendix 8.1)
9	Air Quality	Assessment of potential impacts on air quality associated with the construction and operation of the development. Includes Air Quality Assessment (Appendix 9.1-9.7).
10	Daylight and Sunlight	Assessment of the potential impact on Daylight / Sunlight capabilities of surrounding buildings as a result of the Proposed Development. Includes Sunlight, Daylight and Overshadowing Assessment (Appendix 10.1).
11	Wind Microclimate	Assessment of effects on local air movement as a result of the Proposed Development. Includes Wind Assessment (Appendix 11.1).
12	Type 1 Cumulative Effects	Summary of Type 1 cumulative effects, the combined effects arising from the development on a set of defined sensitive receptors.
13	Summary of Residual Effects	Summary of the effects that remain after mitigation.
Vol 2	Technical Appendices	Technical data and reports to support the chapters in Volume 1 as listed above. (N.B. Electronic Versions of the Appendices are provided as individual files)
Vol 3	Non-Technical Summary	Summary of the ES in non-technical language.

Application Documents

1.15 In addition to this Environmental Statement and its supporting technical appendices, the following Non-EIA documents are submitted in support of the Planning Application as agreed through discussions with the Local Planning Authority:

- Application forms and notices, prepared by Deloitte Real Estate;
- Accommodation and Drawing Schedules, prepared by Denton Corker Marshall;
- Site and location plans, prepared by Denton Corker Marshall;
- Existing and Proposed plans, prepared by Denton Corker Marshall;
- Public Realm General Arrangement Plan, prepared by Exterior Architecture;
- Design and Access Statement, prepared by Denton Corker Marshall;
- Planning and Tall Building Statement, prepared by Deloitte Real Estate;
- Statement of Community Consultation, prepared by Deloitte Real Estate;
- Environmental Standards Statement, prepared by Futureserv;
- Ground Conditions and Remediation Strategy, prepared by Curtins;
- Transport Statement, prepared by Vectos;
- CGI's, prepared by Our Studio;
- Archaeological Desk Based Assessment, prepared by Salford Archaeology;
- Ecological Assessment and cover note, prepared by ERAP;
- Crime Impact Statement, prepared by Greater Manchester Police;
- Flood Risk and Drainage Assessment, prepared by Curtins;
- Travel Plan Framework, prepared by Vectos;
- Waste Management and Servicing Strategy, prepared by Vectos;
- TV Reception Survey, prepared by G-Tech Surveys;
- Viability Assessment, prepared by Deloitte Real Estate;
- Energy Statement, prepared by Futureserv;
- Ventilation Strategy, prepared by Futureserv;
- Management Strategy, prepared by VITA;
- Broadband Assessment, prepared by G-Tech Surveys; and
- Local Labour Agreement, prepared by BAM

Environmental Statement Availability

1.16 The ES is available for public viewing during normal office hours at the following address:

Manchester City Council
Town Hall
Albert Square
Manchester
M60 2LA

1.17 Please note that restrictions on public access to the Town Hall may be in place due to the current government guidance in respect of Covid-19.

1.18 A copy of the Planning submission including the ES is also available online through MCC's [public access system](#) by searching for the site address.

1.19 The ES may be purchased in volumes, the cost for which are set out below

- **Volume 1:** ES Main Text and Figures - £150
- **Volume 2:** ES Appendices - £150
- **Volume 3:** Non-Technical Summary (NTS) - £15
- **Full Copy:** Volumes 1, 2 and 3 of the ES on CD - £15

1.20 For copies of any of the above, please contact the Manchester Planning Team at Deloitte Real Estate.

Union (T2) Project Team – Planning
Deloitte Real Estate
2 Hardman Street
Spinningfields
Manchester
M3 3HF

or

consultation@deloitte.co.uk

2 Site Context and Proposed Development

Site Description

- 2.1 The Site is located within the St. John's Masterplan, identified as 'T2' within that Masterplan. It is bound by the Manchester Goods Yard and T1 construction site (as approved under PP.: 121511/FO/2018) to the east, Factory (as approved under PP.: 119890/VO/2018) to the south, the Victoria and Albert Hotel located to the north ('the Site'), and the River Irwell to the west. The Site covers approximately 0.67ha and currently accessed from Water Street. A Site Plan is included below.

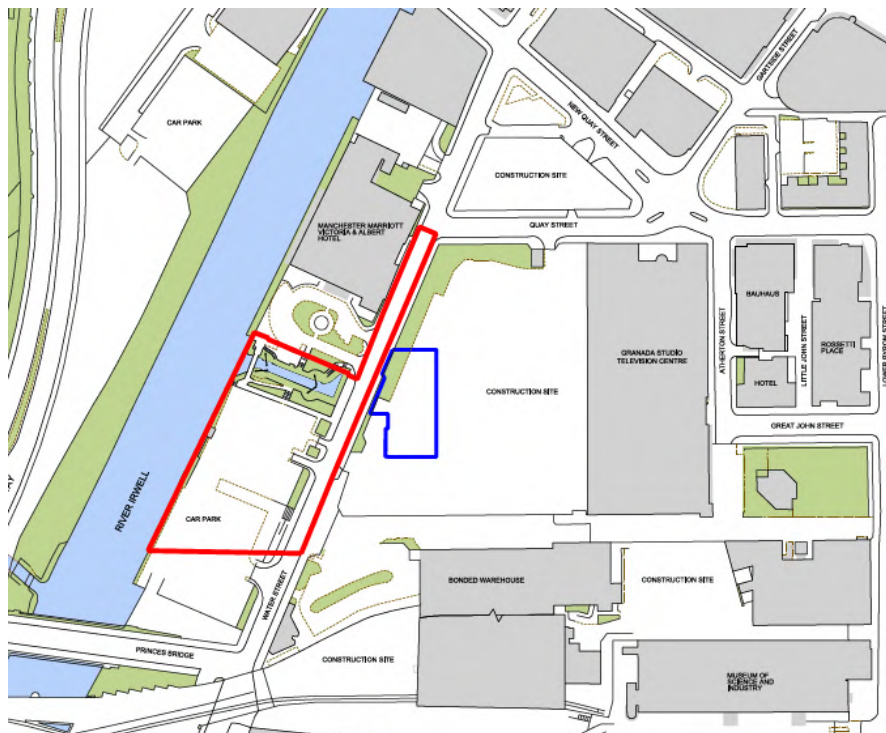


Figure 2-1: Site Plan

- 2.2 The Site currently comprises a construction compound, associated with the delivery of adjacent development plots within St John's. Therefore, no buildings, structures or trees currently exist and the Proposed Development will take place on a fully enabled Site.
- 2.3 The Site currently has an extant permission (PP Reference: 114723/FO/2016) for a 36 storey residential tower, which this application will seek to replace subject to approval. This is referred to as 'extant T2' throughout the ES. Comparison between the two proposals where appropriate, as well as the existing baseline, has been provided in each of the technical chapters and a summary of this approach is provided in Chapter 3 (EIA Methodology).

Surrounding Uses

- 2.4 To the north, the Victoria and Albert Hotel provides four star hotel accommodation under the Marriott brand, on the River Irwell.

- 2.5 To the east is the under construction Manchester Goods Yard scheme and extant T1 scheme outlined above. The Applicant has submitted a planning application for development of a 32-storey co-living development, which will replace the extant build-to-rent residential consent on the T1 element of that site. This is referred to as 'Union T1' throughout the ES. That application is currently pending validation with MCC.
- 2.6 The wider St John's masterplan is an area of regeneration that has been subject to great change over the past 5 years. There are several schemes already delivered, such as Bonded Warehouse, and ABC Buildings, office led schemes providing c.20,000 sq m of office space.
- 2.7 Further to the north, Spinningfields provides a high grade business and commercial district with high profile tenants consisting of several banks and other high profile national and international occupiers, as well as residential properties in Leftbank.
- 2.8 The area surrounding Salford Central to the west of the Site and River Irwell is supported by other commercial uses, including tenants such as HMRC and WHIreland. Some more recent residential development has been brought forward on the opposite side of the Irwell, including Slate Yard Wharf.
- 2.9 Residential properties are located in Bauhaus on Atherton Street adjacent to the Great John Street Hotel with St. John's Gardens and adjoining residential area beyond, located to the east of the site, outside of the St. John's masterplan.
- 2.10 To the south of the Site, a construction compound serves the development relating to the construction of Factory, a new world class cultural space that will become the home of Manchester's International Festival.
- 2.11 Beyond the Factory development, there are leisure uses associated with the Science and Industry Museum, warehousing and self-storage and other single storey warehousing units that have been converted into football pitches.

Transport and Linkages

- 2.12 The Site is considered to be highly accessible due to its location within Manchester City Centre, which is within a 30 minute walking distance of the wider Manchester City Centre and Salford City Centre.
- 2.13 The Site is also well located to other sustainable transport modes, such as cycling. There are local cycle routes in the vicinity and these are set to be improved by both the development of St. John's and city-wide cycle schemes that are being rolled out under the 'Made to Move' strategy and associated Bee Lines network.
- 2.14 Several bus routes, including the free city centre buses, run down Deansgate and across the city. These routes provide free and clean travel in the city centre and services to the wider region via the local bus service providers and rail network.
- 2.15 The Metrolink tram services run from Deansgate Castlefield Metrolink Station, from where it is possible to travel across Greater Manchester. The Site is within walking distance of Deansgate Castlefield Metrolink station; all Metrolink services run through this station and it provides connections to both Manchester Airport and the mainline railway stations.
- 2.16 Deansgate and Oxford Road rail stations are located within a 15 minute walk from the Site. Salford Central Station is a 12 minute walk to the east, whilst Victoria Station is an 18 minute walk from the Site to the north. All of these stations offer access to regional and national rail services, as well as connecting to Piccadilly following the completion of the Ordsall Chord, which provides services every 20 minutes to London Euston.
- 2.17 The area does not currently attract a lot of vehicular traffic due to the former ITV estate comprising a construction site; Water Street is retained as an access to both the construction sites and the Victoria and Albert hotel, but is closed to through traffic.

- 2.18 Full details of the Site and its transport connectivity can be found in the Transport Statement prepared by Vectos that is submitted in support of this Application, demonstrating that the development is in a highly accessible location.

Environmental Designations

- 2.19 With reference to flood mapping obtained from the Environmental Agency online, the Site is generally located in Flood Zone 2, the majority of the Site is located in Flood Zone 2. The canal basin to the north of the proposed building is located within Flood Zone 3.
- 2.20 A Flood Risk Assessment and Drainage Strategy has been prepared by Curtins for all of the St John's Masterplan area and is included in support of the planning application. This reflects the as built and proposed situation in St. John's including the application Site. The Flood Risk and Drainage Strategy has previously been approved under the extant T2 consent.
- 2.21 There are no parts of the Site that are subject to ecological Environmental Designations and there are no such identified sites within the vicinity of the Site.

Conservation and Heritage

- 2.22 The Site is located within the Castlefield Conservation Area.
- 2.23 There is a Grade II Listed Canal Junction, which runs underground to the north of the Site. There will be no underground works in this area, so it is not considered that there will be any disturbance to the junction.
- 2.24 There are a number of Grade I, II* and II Listed buildings in the vicinity of the Site, with the closest asset being c. 30 metres to the north east of the Site, the 'Albert Warehouse, Quay on West side fronting River Irwell, Victoria Warehouse' (Listing ID: 1254727).
- 2.25 Full details of the historical context of the Site and Proposed Development are explored within Chapter 7 of this ES and the supporting technical appendices (Appendix 7.1 - Historic Environment and Heritage Appraisal).

Planning History

- 2.26 The Site has a relevant recent planning history, summarised in the table below:

Table 2-1: Site Planning History

Name and PP Reference	Description	Status	Notes
T2 – PP. Ref.: 114723/FO/2016	Demolition of existing buildings and structures to enable construction of 36 storey residential tower (Class C3) with retail uses at lower floors (Classes A1, A2, A3 and A4), new public realm, landscaping including the first phase of Riverside Park and Walkway, provision of external seating areas, car and cycle parking, access arrangements and other associated works.	Implemented	The Proposed Development detailed in this Report will supersede the 36-storey tower ("T2") approved under this Planning Permission.

- 2.27 The Proposed Development will supersede Planning Permission 114723/FO/2016. Given the changes to the baseline context since the original permission was approved, a fresh standalone EIA has been undertaken in support of the planning application.
- 2.28 Together with planning approvals existing on the Site, there are a number of relevant planning permissions relating to adjacent Sites related to delivery of the wider St John's masterplan:
- St John's Place (Ref:109660/FO/2015/C1): Mixed use proposals comprising hotel and residential, with a variety of ground floor uses.
 - St John's Place (Ref:121721/FO/2018): Proposals for 9 storey office, superseding the above.
 - Central Village and 'T1' (Ref:114385/FO/2016): 36 storey residential tower with retail at ground floor.
 - Factory (Ref:119890/VO/2018): Flexible arts and events space.
 - Old Granada Studios (118040/FO/2017): 10 storey residential and commercial mixed use tower, provision of events and filming studios, and a hotel.
- 2.29 The Proposed Development takes into account the surrounding development context and this is set out further in Chapter 3 (EIA Methodology) in terms of a cumulative assessment.

Proposed Development

- 2.30 The Proposed Development is for a 36-storey, mixed use building, comprising one basement level, ground floor plus mezzanine, and first floor of associated amenity spaces, three floors of co-working space, with a mix of co-living apartments above in the form of studio, 'trio' and 'quad' apartments.
- 2.31 Union at Enterprise City is based around a unique destination for residents, workers and the wider community. The flexible commercial and amenity offer has been specifically curated for Enterprise City and is focused on:
- Casual work space for use by residents, which will act as an incubator hub for entrepreneurs and start-ups, as well as offering space for agile working from home in a more social and productive environment. This offering works well in combination with an events space, which will offer a carefully curated programme of events and can be hired by external companies wishing to reach out to those living in Union.
 - An independent curated retail offer, comprising local vendors delivering unique food, drink and retail experiences. Vita will be partnering with local manufacturers who are looking for a retail springboard and will also be creating pop-up space that can be utilised by emerging brands wanting to test concepts with the varied demographic in Union.
- 2.32 In addition the first floor will provide amenity space for the co-living residents and co-workers, this floor will not be accessible to the general public.
- 2.33 Union's standard of co-living accommodation, its operational platform, and its facilities will set a new quality benchmark for city centre living as a single occupancy product.
- 2.34 This will be delivered through:
- **Intelligent layouts and contemporary design quality:** Where space is maximised through attention to detail in terms of layouts, storage, interior design and careful selection of furniture.
 - **An ecosystem of residential accommodation:** Comprising predominantly of "Quad", and "Trio" apartments to deliver a shared living experience, available on 6-month+ leases.

- **Residential amenities:** An activated destination for both residents and the wider community, which promotes collaboration and networking, social inclusion, capacity building and social mobility, health and wellbeing and interaction with the local communities. Under the operational management regime, this will further be facilitated through dedicated community organisers who will provide a programme of events for residents and the community.
- **Technology influenced selection for flat mates:** House sharing relationships are frequently the result of online advertising without any consideration of compatibility. Union has pioneered technology to match residents within similar interests, applying an algorithm to the selection of sharers to ensure compatibility.
- **Vita's long-term operational platform:** An adaptable, professional and dynamic approach to management founded on a single, long-term ownership model (as in the case of all Vita Group's products) as a long-term investment. Vita is committed to the long-term ownership, operation and management of Union. Vita will remain directly responsible and accountable for the effective management and performance of Union in the long term.

- 2.35 In line with Union's ethos of being accessible and inclusive, the open to all co-work space seeks to provide affordable entry level space for start-ups, small enterprises and young professionals who want vibrant work space without hefty overheads or long-term commitments; adjacent to like-minded individuals. The co-working space will host a variety of individual, duo and multi-occupant offices and larger meeting spaces for people to think and to creatively team work. The space will allow people to grab a coffee in-between meetings, hot desk, host a meet-up / workshop, or provide a more permanent base for staff. This dynamic space will inspire innovation and the collaboration of modern creative industries within Enterprise City.
- 2.36 As well as supporting talent, social mobility, capacity building and therefore economic growth and enhanced productivity, Union would both support and add value to Manchester's strategic regeneration initiatives and make a significant contribution to the vitality, attractiveness and diversity characteristics of the emerging St John's neighbourhood.
- 2.37 The characteristics and combination of uses within Union can be a powerful driver of regeneration within emerging neighbourhoods and a catalyst for further regeneration and positive place-making in their own right.
- 2.38 The location characteristics of Union in Enterprise City ensure it is uniquely placed to capitalise on the varied and tech focused capacity of the immediate area, with relevance to the established market in Spinningfields. In summary, the Proposed Development comprises:

Table 2-2: Summary of Proposed Development

Measurement	Proposed Development
Proposed Site Area	0.67ha
Units / Bedspaces	372 Units / 806 Bedspaces
Co-working Space	1995 sqm
Development Footprint	877 sq. m (GEA)
Development Floorspace	32,698 sq. m (GEA)
Development Height	35 stories + 1 basement levels (114.125 AOD)

Car and Cycle Parking Spaces	Car Parking Spaces – 0 Cycle Parking Spaces – 412 Sheffield Stands - 12
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- 2.39 The Proposed Development is set out in more detail within the Planning and Tall Building Supporting Statement, which sets out all material considerations pertinent to this submission and a full description of the scheme overall within its strategic context. The Design and Access Statement prepared by Denton Corker Marshall sets out the Proposed Development in detail from a design perspective.

3 EIA Methodology

3.1 This chapter sets out the methodology used to prepare each chapter of the ES and describes its structure and content. In particular, it sets out the process of identifying and assessing the likely significant effects of the Proposed Development (as defined in Chapter 1 and described in further detail in Chapters 2, 4 and 5) on the environment. It is accompanied by the following appendices:

- Appendix 3.1 – EIA Scoping Report
- Appendix 3.2 – Cumulative and Baseline Developments

Legislation and Guidance

3.2 The ES has been prepared to comply with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, which implement European Council Directive No. 85/337/EEC as amended by Directives 2011/92/EU and 2014/52/EU, which entered into force on the 17 May 2017. Reference has also been made to currently available good practice guidance in EIA including:

- National Planning Practice Guidance – Department for Communities and Local Government;
- Impact Assessment Guidelines and ES Review Criteria, Institute of Environmental Management and Assessment (IEMA), 2004;
- Guidance on EIA, EIS Review, European Commission, June 2001;
- Guidance on EIA Scoping, European Commission, June 2001;
- Guidance on Transport Assessment, DCLG and DfT, March 2007;
- Shaping Quality Development, IEMA, November 2015; and
- Health in Environmental Impact Assessment, A Primer for a Proportionate Approach (IEMA), 2017.

Consultation

3.3 The Proposed Development is largely consistent with the extant T2 planning permission on the Site in relation to scale, layout and form of the development. It also comes forward in accordance with the endorsed St John's SRF which has been through many rounds of consultation since its original endorsement in 2014 and update in 2016. As such, further pre-application engagement has largely focused on the proposed use of the building and Union concept, together with the external appearance of the Proposed Development.

3.4 A range of stakeholders have been engaged throughout the pre-application process. Key engagements have included regular meetings with the Local Planning Authority between November 2019 and March 2020; engagement with statutory and non-statutory consultees, including e.g. Greater Manchester Police and Historic England; Local Ward Councillors; and an online consultation event in March 2020.

3.5 A public consultation exhibition was planned to take place on 19 March 2020 at the Victoria and Albert Hotel; however, as a consequence of the Covid-19 crisis and government advice on social distancing this had to be cancelled. In lieu of the exhibition an online consultation was held via the Applicant's website. To ensure people were aware that the consultation would take place online leaflets were issued electronically to local resident associations, a notice was left at the hotel advising providing details of the online consultation, and the Applicant's website was updated. 891 "hits" were recorded on the website. A total of six comments were received through the website and a further seven by email.

- 3.6 A Statement of Consultation is submitted in support of this application, which details the consultation that has taken place prior to submission.

Screening and Scoping

- 3.7 An EIA Screening and Scoping Report has been prepared to identify the likely significant effects on the environment that may arise from the construction and operational phases of the Proposed Development.
- 3.8 This was submitted in March 2020 and prepared with reference to best practice guidance, outlined in paragraph 3.2 above. In addition, the EIA methodology follows the previously approved EIA for extant T2 and discussions with Statutory consultees. An EIA Scoping Opinion has not yet been received from the Local Authority. The scoping exercise have determined the technical subject areas of the EIA. These are:
- Townscape and Visual Impact
 - Historic Built Environment
 - Noise and Vibration
 - Air Quality
 - Daylight and Sunlight
 - Wind Microclimate
- 3.9 The issues that have been scoped out are:
- Archaeology
 - Climate Change
 - Ecology
 - Electronic Interference
 - Ground Conditions
 - Human Health
 - Socio-Economic Issues
 - Transport
 - Water Resources and Flood Risk
- 3.10 A copy of the EIA Scoping Report is included at Appendix 3.1.

Non-Significant Effects

- 3.11 The following disciplines have been identified as non-significant with respect to the Proposed Development and are therefore not included in the ES. An explanation for each discipline being scoped out of the process is provided below.

Agricultural Circumstances

- 3.12 The Site is entirely on brownfield land so there would be no likely significant effects with respect to agriculture. This discipline has therefore been scoped out of this EIA.

Archaeology

- 3.13 The development will result in the introduction of a new tower element, which would have some impact on below ground archaeological resources primarily as a result of piling activities and basement levels, if not recorded.

- 3.14 However, an Archaeological Desk Based Assessment, Written Scheme of Investigation and Analysis of Findings have all been undertaken for the Site (in accordance with PP Ref.: 114723/FO/2016 for extant T2) in advance of permanent redevelopment and have been resubmitted with this application.
- 3.15 There is a Listed Canal structure under Water Street; however, no underground works are proposed in this location.
- 3.16 Given that a full archaeological assessment has been undertaken for the Site, it is considered that any impact on below-ground historical can be mitigated. On this basis, archaeology has been scoped out of this EIA.

Aviation

- 3.17 The height of the Proposed Development will be similar to the development previously approved on Site, albeit slightly shorter, and the previously approved proposal did not consider there to be any significant effects in relation to aviation.
- 3.18 On the basis that the Proposed Development has been reduced in height compared to the previously consented scheme, there would be no likely significant effects with respect to aviation. Manchester Airport Group have been made aware of the Proposed Development and have advised they will review the application once submitted through the formal consultation process. In addition, the relevant consultation will be undertaken with respect to the National Aviation Transport Society (NATS). This discipline has therefore been scoped out of this EIA.

Climate Change

- 3.19 The Proposed Development will have an impact on climate change during the operational phase of the development through the emission of greenhouse gasses. Sustainability measures have informed the design process from the outset, including climate change mitigation and energy usage.
- 3.20 An Energy Strategy and Environmental Standards Statement has been submitted alongside the planning application, outlining this process in greater detail including an assessment of the energy efficiency of the buildings and use of low carbon technologies.
- 3.21 Any impacts of climate change on the wind microclimate will be considered as part of the wind assessment. The Site is part located in Flood Zone 3, albeit no physical development is proposed in this area. The Flood Risk Assessment and drainage strategy for the Site has fully considered the impacts of climate change in respect of flooding.
- 3.22 It is not considered that the Proposed Development will result in any likely significant effects in relation to climate change. The Proposed Development's effects on climate change and climatic factors for individual topics has been considered within the relevant chapters of the ES and supporting technical information.

Ecology

- 3.23 The Site has very limited ecological potential. An Ecological Appraisal of the Site, prepared for the previous application for extant T2, is provided in support of this Application and a letter confirming the conclusions are still valid has been provided.
- 3.24 In the context of the constrained Site boundary, soft landscaping will be introduced to provide an additional ecological benefit to the Site. Compared to the baseline, this will result in a biodiversity net gain and on this basis no significant impacts in relation to ecology are likely. The Proposed Development will contribute to the wider St. John's regeneration, which will deliver significant amounts of tree planting across the whole estate.

Electronic Interference

- 3.25 Tall buildings and structures could disrupt wireless services by physically blocking the signal or reflecting signals from the sides of the structure. However, in the United Kingdom, TV signals switched over to digital during 2012 and are less susceptible to interference. The Proposed Development is not considered to significantly disrupt telecommunications infrastructure. Therefore, significant effects are not considered likely.
- 3.26 A TV Reception Survey has been conducted in order to assess baseline reception and identify and mitigate potential impacts on telecommunications infrastructure, which has been submitted in support of this application. The assessment of electronic interference has therefore been scoped out of this EIA, given it is covered by standalone technical report.

Ground Conditions

- 3.27 A Phase 1 Desk Study has been undertaken by Curtins, which determined a varied level of risk associated with the Proposed Development. This has previously been approved under the extant T2 consent. It recommends an intrusive ground investigation and Qualitative Risk Assessment be undertaken, and also a comprehensive UXO report, prior to development taking place.
- 3.28 On this basis and acknowledging the work undertaken to date, it is considered that the Proposed Development will result in positive effects on ground conditions associated with the construction phase of development given the removal of any identified contamination during the proposed basement excavation and will therefore not give rise to significant environmental effects.

Human Health

- 3.29 The Proposed Development is located in an urban environment and the immediate environs are characterised by both low rise and high rise residential and commercial development that is typical of the city centre, namely Spinningfields including Left Bank and the wider Castlefield area.
- 3.30 There will be some short term impacts to human health during the construction phase with the potential for accidental spillages, dust and noise and vibration. These will be considered and mitigation will be proposed as part of a Construction Management Plan (Chapter 4 of this ES and Appendix 4.2).
- 3.31 During the operational phase, the Proposed Development could potentially have impacts on health as a result of introducing a residential receptor to the wider development's traffic movements, associated air quality and noise impacts. These potential impacts will be fully considered and mitigation is proposed as part of the relevant ES chapters and supporting technical reports, such as the Ventilation Strategy, Acoustic Report and tree planting.

Major Accidents and Disasters

- 3.32 The potential for major accidents and disasters for the Site and the Proposed Development described herein mean that the development is at a very low risk of creating a major event that would ultimately lead to a significant environmental effect.
- 3.33 In order to ensure that the ES remains proportional to the development and site context, the environmental effects of any potential impacts will be considered inherently within the submission. For example, where there is a risk of major accidents or disasters in any form, these have been considered as part of other included chapters of the ES or in standalone technical reports, such as wind. The likely impacts associated with road traffic accidents are captured within the Transport Statement submitted in support of this Application.
- 3.34 On this basis, a separate chapter on Major Accidents and Disasters has been scoped out of the ES.

Socio-economics

- 3.35 The socio-economic effects are considered as relevant as part of the supporting Planning Statement submitted in support of this Application.
- 3.36 The Proposed Development may create some short-term employment during the construction phase, however the effect is not considered to be significant. The proposed uses would create long-term employment opportunities during the operational phase, the effect of which would be positive but not significant.
- 3.37 Similarly, while the Proposed Development would be economically and socially beneficial through the delivery of new accommodation, for example in terms of additional Council Tax receipts and local expenditure, these are not of a significant scale.
- 3.38 Therefore, likely significant effects on the environment with respect to socio-economic issues are not anticipated during either the construction or operational stages, an ES chapter is not required.

Transport and Traffic

- 3.39 The IEA Guidelines states that, in Scoping out the extent of the assessment, two broad principles could be used as a screening process to delimit the scale and extent of any Transport and Traffic EIA assessment. Those rules are:
- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)
 - Rule 2: Include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 3.40 The Site previously gained planning approval for a 36 storey tower and 305 residential units as part of the extant T2 planning permission (Ref.: 114723/FO/2016). This planning application was supported by a Transport Statement, Travel Plan and Waste and Servicing Strategy documents prepared by Vectos and formed part of the ES submitted with the 2016 planning application.
- 3.41 These assessments were based on traffic modelling that was undertaken by TfGM using agreed trip forecasts and traffic growth assumptions and tested the highway network at 2017 and 2032 levels.
- 3.42 The nature of construction is expected to be similar to that of the approved scheme and is not expected to result in a change in the number or type of construction vehicles as previously assessed and approved. As described in the previous assessment, construction vehicles are only present on the highway for a limited time period during the construction those HGVs or other construction vehicles tend to be spaced out over the course of a working day and would generally be timed to avoid the background peak traffic periods.
- 3.43 A Construction Management Plan is submitted as part of this ES (Chapter 4) and would be put in place and agreed with the local highway authority to route vehicles away from sensitive locations (such as residential properties) where possible and employs good practice measures (such as wheel washing, driver safety training) to limit any adverse impact on vulnerable road users and sensitive receptors.
- 3.44 The extant T2 includes 78 car parking spaces for use by future residents of the residential tower, accommodated within the two levels of Basement. Environmental impacts through traffic movements on the local highway were considered to be acceptable with regards to that approved scheme.
- 3.45 The Proposed Development includes no car parking for residents or visitors, reflecting the Site's highly accessible location and the target demographic of residents, and therefore is predicted to result in a net decrease in traffic movements from those modelled for the extant T2 development on-site.

- 3.46 Traffic movements related to servicing and waste are likewise not considered likely to give rise to significant increases over the approved development on-Site, and will form part of a co-ordinated strategy across St John's.
- 3.47 Any potentially significant impacts have been previously considered and are suitably mitigated by the package of sustainable transport measures coordinated by a Construction Management Plan, Travel Plan and Waste and Servicing Strategy.
- 3.48 On this basis and as the development is car free, Traffic and Transport has been scoped out of the EIA. The application is supported by standalone technical reports comprising Waste and Servicing Strategy, Transport Statement and Travel Plan.
- 3.49 As part of these assessments, the impact of the scheme in the context of cumulative developments have been considered.

Water Resources, Drainage and Flood Risk

- 3.50 The majority of the Site is located in Flood Zone 2. The canal basin to the north of the proposed building is located within Flood Zone 3.
- 3.51 A Flood Risk and Drainage Strategy has been prepared for the whole of the St John's Masterplan area and has been approved as part of the extant T2 application at the Site (114723/FO/2016). The same strategy is proposed for this Application and the Flood Risk and Drainage Strategy is therefore re-submitted as a standalone technical report.
- 3.52 The Proposed Development is unlikely to give rise to any significant environmental effects during the construction or operational phase of development, the assessment identifies the following key mitigation for the masterplan, which are relevant to the Site:
- The Flood Risk Assessment bases the benchmark for protection on the Environment Agency detailed hydraulic model 1 in 100yr plus climate change water level of 26.600m AoD. Typical freeboard of 600mm is normally applied to development; however, the FRA confirms that a freeboard of 300mm can be applied because of the confidence in the modelling predictions. As such, the preferred ground floor levels for any new buildings is 26.900m AoD.
 - The ground floor levels for Union T2 site are set at 26.900m AoD and the basement is accessible only by the ground floor with no access available via other plots and therefore the basement is protected up to a level of 26.900m AoD.
 - The levels strategy should also be developed so that all landscaped areas are profiled as such, that they convey water away from the building and into lower lying areas served by the site surface water drainage network.
 - Further flood risk considerations which will be necessary as development progresses includes preparation of a flood warning and emergency response plan for areas located within Flood Zone 2.
 - The part of the Site that lies within The Flood Zone 3 is the existing basin to the River Irwell. The area is to be water compatible and levels within Flood Zone 3 areas are to be maintained therefore no mitigation measures are required.
- 3.53 Any potential impacts during either the construction or operational phase of the Proposed Development have therefore been considered and relevant mitigation measures have or will be implemented on Site and it is considered that this discipline can therefore be scoped out of the EIA. The Flood Risk Assessment and Drainage Strategy for Proposed Development is enclosed with this Application.

Approach to Technical Studies

- 3.54 The findings of the baseline environmental studies have played an important role in the design of the Proposed Development by defining the environmental sensitivities, constraints and opportunities associated with the Site.
- 3.55 Design team reviews, attended by members of the project team, were held at regular intervals throughout the application process. These reviews provided a valuable forum for the exchange of information and ensured that the design team were fully aware of the environmental constraints and opportunities and of the interactions between disciplines. Regular correspondence has also been held with Manchester City Council.
- 3.56 The technical studies have been undertaken in accordance with current best practice. Specific guidance used is referenced within each of the respective assessment chapters.
- 3.57 The majority of assessments involve consultations with statutory and non-statutory bodies, desk-based research, site inspections and surveys, impact prediction and mitigation.
- 3.58 The assessment and conclusions of the ES are based on the description of the Proposed Development provided in Chapter 2.

Structure of Technical Chapters

- 3.59 Each technical chapter of the ES (Chapters 6-10) has been set out broadly in line with Table 3-1 below:

Table 3-1 - Structure of Technical Chapters

Technical Chapter Structure	
Introduction	Each of the technical chapters begins with an introduction providing context to the EIA completed.
Policy Context	This section includes a summary of national, regional and local policies of relevance to the environmental discipline and explains its purpose in the context of the Development and the ES.
Assessment Methodology & Significance Criteria	This section describes the method and approach employed in the assessment of likely significant effects, the criteria against which the significance has been evaluated, the sources of information used and any technical difficulties encountered. Relevant legislation is also identified.
Baseline Conditions	This section describes and evaluates the baseline environmental conditions i.e. the current situation and anticipated changes over time assuming the Site remains undeveloped. This is a critical part of the EIA process as it provides a measure against which the likely significant effects on the environment can be assessed.
Identification and Evaluation of Key Impacts	This section identifies the likely significant effects on the environment resulting from the Development during demolition, construction and operational phases. A description of the likely effects of the Development and an assessment of their predicted significance is provided.
Cumulative Effects	This section considers the cumulative effects of the Development with committed developments identified within the vicinity of the Site. Any likely significant effects on the environment arising in this respect are set out in this section.
Mitigation Measures	One of the main aims of the EIA process is to develop suitable mitigation measures to avoid, reduce or compensate for any significant adverse effects of a project. These measures relate to all phases. This section describes the measures which

Technical Chapter Structure	
	would be implemented to mitigate against potential adverse impacts. Where possible, enhancement measures have also been proposed.
Residual Effects	The residual effects, i.e. the remaining effects of the Development assuming implementation of the proposed mitigation measures, have been estimated and presented. The methods used to make these estimates are described and proposed methods of treatment for any residual effects have been identified and quantified where possible.
Summary	Each technical chapter concludes with a brief summary outlining the potential residual effects for the construction phase (short/medium) and operation (medium/long-term) phase of the Development.
Reference List	A reference list is provided within each chapter as relevant.

Identification and Evaluation of Key Impacts

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

Magnitude

3.61 The methodology for determining the scale, or magnitude, of effect is set out in Table 3-2 below.

Table 3-2: Magnitude of Change

Magnitude	Description
Major	Total loss or major/substantial alteration to key elements/features of the baseline conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernable/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.

Sensitivity

- 3.62 The sensitivity of a receptor is based on the relative importance of the receptor using the scale in Table 3-3 below.

Table 3-3: Sensitivity of Receptors

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

Significance

- 3.63 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative.

- 3.64 Table 3-4 below shows how magnitude and sensitivity interact to derive effect significance.

Table 3-4: Significance of Impact

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

- 3.65 The above magnitude and significance criteria have been provided as a guide for technical specialists to assess impact significance. Where discipline specific methodology has been applied that differs from the generic criteria above, this has been clearly explained within the given chapter under the heading of Assessment Methodology and Significance Criteria.

- 3.66 For the purposes of this ES, an effect will be considered to be 'significant' if it is classed as either 'moderate' or 'major', unless otherwise specified within the technical chapter.

Comparison of the Approved Scheme

- 3.67 Due to the presence of an extant and implemented scheme on the Site, impacts have been considered against this potential future baseline where relevant, with reference to the conclusions of the previously approved EIA and technical studies.

Baseline Conditions

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

Mitigation

- 3.71 Any adverse environmental effects have been considered for mitigation at the design stage and, where practicable, specific measures have been put forward. Measures have been considered based on the following hierarchy of mitigation:
- Avoidance.
 - Reduction.
 - Compensation.
 - Remediation.
 - Enhancement.
- 3.72 Where the effectiveness of the mitigation proposed has been considered uncertain, or where it depends upon assumptions of operating procedures, data and/or professional judgement has been introduced to support these assumptions.
- 3.73 Mitigation during the construction phase will be set out in the Construction Management Plan (CMP) to be agreed with prior to the commencement of work and implemented throughout the duration of the works. Outline mitigation measures to be included in a future CMP are set out in Chapter 4: Construction Methodology and Programme.
- 3.74 Mitigation to be implemented during the operational phase would be secured through planning conditions and obligations.

Cumulative Effects

- 3.75 The ES considers the potential for likely significant effects on the environment resulting from approved or reasonably foreseeable developments in the area coming forward at the same time as the Proposed Development. These include:
- Approved but not yet commenced projects;
 - Plans or projects for which an application has been made and which are under consideration by the consenting authorities, which have been specifically requested by the LPA;
 - Plans and projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative effects.

- Projects under construction but not year completed are included in the baseline.

- 3.76 There are no other extant Planning Permissions on the Site that could co-exist with the Proposed Development. Approved and incomplete projects in the surrounding area have been taken into account as part of the assessment of cumulative effects.
- 3.77 Whilst an extant and implemented planning permission for a residential tower exists on the Site (extant T2 under Planning Permission Ref. 114723/FO/2016), to ensure a robust and conservative assessment, this has not been factored into the baseline. The comparative results of that approval and the Proposed Development will be discussed in the ES as appropriate.
- 3.78 The extant T1 extant consent (Ref:114385/FO/2016) has been implemented and is on site, so will be presented as part of the baseline. The proposed Union T1 development currently submitted to the LPA will be presented in the cumulative assessment as it is due to be delivered by the same Applicant, therefore, subject to Planning Permission, there is certainty that the revised proposals will be implemented.
- 3.79 Planning Permissions that will be considered as part of the cumulative assessment are set out in Appendix 3.2 of this ES (Cumulative Schemes).
- 3.80 Each technical chapter (Chapters 6-11) has assessed the potential for likely significant effects on the environment as a result of the above reasonably foreseeable development.

Residual Effects

- 3.81 The likely significant effects on the environment, assuming the successful implementation of mitigation measures proposed, have been estimated within each chapter.

Assumptions and Limitations

- 3.82 The principal assumptions that have been made and any limitations that have been identified in preparing the ES are set out in each technical chapter. General assumptions include the following:
- Assessments assume the baseline conditions at the time of ES preparation (January to March 2020).
 - It is assumed that current surrounding land uses do not change, other than where specific projects have been identified for assessment of cumulative effects.
 - Assessments are based on published sources of information and primary data collection. Sources are provided as necessary.
 - Assessments are based upon, and conclude the “worst case” effects that would arise from the application as defined by the description of Proposed Development set out in Chapter 2.
 - Construction and phasing will be in accordance with the description of the Proposed Development set out in Chapter 2 and will follow the timetable and methods set out in the illustrative Phasing Strategy and Construction Methodology and Programme described in Chapter 4.
 - Conditions will be attached to the Planning Permission that will control disturbance during the Proposed Development.

Objectivity

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

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

4 Construction Methodology

4.1 This Chapter of the ES describes the proposed construction programme and key activities that will be undertaken. Detailed consideration of potential impacts during the construction process and any necessary mitigation measures are provided in each relevant chapter of the ES. This Chapter is supported by the following Appendices:

- Appendix 4.1 Local Labour Agreement
- Appendix 4.2: Draft Construction Management Plan

4.2 The main aim throughout the construction period is to minimise the impact on the surrounding properties and roadways for the duration of the work. Close collaboration with all project teams of all construction projects taking place in St John's will be maintained at all times to achieve this aim.

4.3 The following narrative explains this methodology and timescales envisaged at the time of the planning application submission. More detailed proposals will be developed once contractors are appointed and prior to commencement on site. This will include preparation of detailed plans to incorporate Construction Management, Construction Phase Health and Safety, Environmental Management as well as Site Waste Management, Logistics and Traffic Management.

Programme

4.4 Subject to Planning Permission, the construction programme has a start date of Q3 2020 with a 120 week duration completion date of Q3 2022. The expected phases of construction have been broken down and detailed as below:

- Phase 1: Substructure

Piling, capping beam and construction of the single level basement will commence in Q3 2020. This will take 15 weeks to complete ahead of the superstructure.

- Phase 2: Superstructure

The insitu-concrete core and floor construction will be carried out progressively. This will commence at ground floor level in Q1 2021 and will take 80 weeks to construct the 36 floors until Q3 2022. The core will be jump formed over 88 weeks with the floors following up 3 weeks behind and taking 82 weeks respectively to construct.

- Phase 3: Façade

The façade will be of a unitized construction and will be lifted in using spider cranes located four floors above the level being installed. The envelope will commence in Q3 2021 for 70 weeks and will be completed in Q1 2023

- Phase 4: Internal fit out

Internal fit out works will commence once the external walls and windows to level 4 have been installed and will progress on a floor by floor basis starting at 1st floor working upwards. This is a 101 week process that will commence in Q1 2022 inclusive of completion one floor every 28 weeks. The internal fit out will be completed in Q3 2023.

4.5 Working hours at the Site will be according to the standard hours of operation for Manchester, as stated in the "Environmental Protection Information for Developers by Manchester City Council (MCC). Therefore, hours of operation will be in accordance to MCC's guidelines which state: construction work should normally take place only between the following hours:

- Monday to Friday*: 7.30am - 6pm
- Saturday*: 8.30am - 2pm
- Sunday / Bank holidays: No work

*Workforce may arrive on site 30 minutes prior but no working outside these times, unless changed by prior agreement. Noise to be kept to a minimum in the first hour.

- 4.6 If it is required to work outside these hours, this will only be done following consultation with Manchester City Council's Environmental Officers.
- 4.7 The close proximity of the neighbouring residents is acknowledged and as such working hours will be adhered to in order to protect this residential amenity.

Construction Methodology

- 4.8 The following is a brief overview of the methodology to be adopted for the construction and fit out of the Proposed Development. The section also considers general logistics as well as traffic management for the movement of material to the disposal of waste.

Construction Activities

- 4.9 The works generally comprise the following:
- Site establishment – This will be located on a structure spanning the Canal Basin on Water St.
 - Construction of Union T2, the Site is bound by The Canal Basin / Welfare to the North, Water St to the East, "The Factory Site to the South and River Irwell to the West.

Transport

- 4.10 Road transport is a major source of local air and noise pollution and contributes to carbon dioxide emissions. Opportunities to minimise construction traffic are to be considered, measures may include for example, reducing the transport impacts of materials and construction staff.
- 4.11 The Contractor will define the method of delivery / removal of materials and plant from the Site, including the identification of access routes for deliveries and personnel.
- 4.12 The Contractor will ensure that pro-active measures are taken to prevent slurry/spoil from vehicles leaving Site during the works being deposited on the public highway. The cleanliness of site roads will be inspected regularly by the Principal Contractor(s) who will provide wheel- washing apparatus (a sponge and hose pipe) and will ensure that all exiting site traffic is thoroughly cleaned. Wagons carrying loose material will be covered before leaving site, additionally, damping down will be considered in windy weather conditions, depending on the materials being carried. Additional damping down and road sweeping will be introduced if required as the project progresses.
- 4.13 Contractors will use local car parks as necessary as there will be no parking on Site. The need for travel by car is reduced as there is a wide range of public transport in close proximity to the Site as detailed in the Transport Statement prepared by Vectos.

Health and Safety

- 4.14 Facilities will be established to minimise risk to the environment and promote efficient use of resources. This will include:
- Temporary protective fencing will be erected to delineate the working areas, site boundaries and protect sensitive features from disturbance.
 - Temporary offices, welfare facilities and secure storage of equipment.
 - Any necessary fuel and oil will be stored in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001. Refuelling will only be undertaken in a designated area, designed

to contain contaminated runoff, and by trained personnel. Emergency spill kits are to be readily available.

- Materials storage areas will be set up and managed.
- Waste segregation areas will be established utilising containers of an appropriate design to ensure that no waste can escape.
- Sewerage effluent from the site office and welfare facilities will be removed from site using a vacuum tanker, if no sewer connection is available.
- Temporary lighting will be designed to minimise spillage of light, and oriented away from residential properties.

Construction Materials

- 4.15 Materials required for the scheme are predominantly shuttering for the construction of the core and floor slabs. This material will be brought in from previous schemes and reused throughout the core of the project. It can be repaired for multiple reuse across a number of schemes.
- 4.16 Timber used in permanent and temporary works, such as for noise fencing, is to be from sustainably managed sources with recognised timber labelling or from re-use.
- 4.17 Local materials will be sourced to minimise associated transportation, where possible.
- 4.18 Material procurement procedures are to be employed that involve purchasing materials based on their environmental impact.

Site Security and Safety

- 4.19 The Site boundary will be fenced as necessary for security, to prevent windblown litter or waste from polluting the wider environment and to exclude species such as urban foxes that may be trapped or harmed in excavations or around plant or materials.

Environmental Legislation

- 4.20 A schedule of appropriate environmental legislation and good practice that will be adhered to is to be included within the CMP. A register of permissions and consents that may be required, with responsibilities allocated and a programme for obtaining them is to be developed by the Contractor. Environmental consents and licenses that may be required to enable the construction works are given in Table 4-1:

Table 4-1: Environmental Consents Required

Legislation	License / Permission Required
Control of Pollution Act 1974	Prior consent to carry out construction works from the Local Authority under Section 61
Conservation of Natural Habitats Regulations 1994	A license may be required if protected species are disturbed by a development, eg bats.
Environmental Permitting Regulations 2007	It is not anticipated that a waste management permit will be required as part of the works. However certain activities are exempt from Waste Management licensing and must be notified to the Environmental Agency in advance.

Pollution

- 4.21 The Contractor shall adopt good construction management practices that will reduce the risks of accidental discharge of pollutants into streams, rivers or ponds, or contamination of groundwater.
- 4.22 A pollution control and contingency plan will be developed by the Contractor and included within the CMP to provide details of the measures to be implemented to prevent pollution of the aquifer and the actions to be taken in the event of an environmental incident or emergency.

Noise and Vibration

- 4.23 The Contractor shall prepare a Management Plan for the control and monitoring of Noise and Vibration (see also Chapter 8 of this ES).
- 4.24 Noise and vibration will be controlled and limited so far as reasonably practicable so that sensitive receptors are protected from excessive noise and vibration arising from construction.
- 4.25 Certain activities may extend outside normal working hours to enable safe working or as a result of unforeseen events. The Environmental Health Team will be contacted to agree the activities required. The principles of Best Practicable Means will be employed to minimise noise levels during construction. Recommendations for the control of noise and vibration on construction sites are set out in BS 5228.

Dust

- 4.26 The Contractor shall prepare a Management Plan for the control and monitoring of dust, smoke and any other airborne pollutants (see also Chapter 9 of this ES).
- 4.27 All necessary and practicable measures to control dust emissions through good housekeeping and site operational practices shall be carried out including:
- Sheeting of vehicles: all HGVs carrying loose material capable of spillage or which has the potential to give rise to dusty emissions from the vehicles during transit shall be sheeted. This requirement shall be enforced by the Contractor and any transgressions shall be recorded in a log book by the Contractor with details of measures to be taken to prevent further occurrences. The log book shall be available for inspection by the Client Project Manager and local authority at any time during working hours.
 - Compound: an area of hard standing of reasonable size shall be provided by the Contractor around site offices and over vehicle management areas, so that dust will be kept to a minimum by appropriate control methods.
 - Drainage arrangements will be included where necessary. The area will be swept at least once every two days or more frequently as the Client Project Manager considers appropriate.
 - Water bowsers/sprays: Water sprays shall be applied to all demolition operations as the Client Project Manager considers appropriate.
 - Prevention of wind-blown dust arising from storage mounds: storage mounds shall be profiled to reduce erosion where the nature of the material could lead to it being rain washed or windblown. Mound surfaces shall be kept sufficiently damp to prevent windblow unless and until the surface is sprayed, sealed or stabilised by means of vegetation. Materials that have the potential to give rise to dust emissions shall be stored as far away from the site boundaries as is reasonably practicable.
 - Dust collection during cutting and grinding works: if this is not carried out in an enclosure, tools shall be used that are fitted with dust collection devices (excluding small tools which require a continuously wet working surface).

Public Relations

- 4.28 The Contractor will define procedures for internal and external communication. The client may require that any communication with external parties such as environmental regulators or the public is undertaken through a nominated client representative.
- 4.29 The agreed CMP will be published on the project website and the Contractor will display a contact number on hoardings which will be answered 24/7.
- 4.30 All complaints or information requests will be made aware to the Client Project Manager and will be logged promptly.
- 4.31 The Contractor will ensure that regular contact is made with local residents and community groups to ensure they are kept up to date with general progress on the site.

Operational Waste Removal

- 4.32 An outline Site Waste Management Plan will be drafted at the detailed design/construction stage to comply with the requirements of the Regulations.
- 4.33 The Contractor shall, in order to reduce the need for waste disposal, minimise the generation and environmental impacts of wastes arising during the works and shall maximise opportunities for the re-use and recovery of wastes. The Contractor shall include within the CEMP proposals for the identification, segregation, handling and storage, with necessary protection to prevent contamination of surrounding stockpiles and underlying ground, of the different types of wastes identified as arising from the works.
- 4.34 The Contractor shall make any necessary applications to the Local Authority and/or the Environment Agency, under the terms of the Environmental Permitting Regulations 2007, and the Town and Country Planning Act (1990) for the storage, treatment or disposal of wastes.

Summary

- 4.35 The Construction (Design and Management) Regulations 2015 will apply to this project and all appropriate controls and systems will be in place to comply with the standards of the Regulations and associated guidance.
- 4.36 Every stage of the project will be pre-risk assessed and appropriate controls applied, sub- contractors will be pre vetted and will be subject to extensive pre contract requirements of information transfer and risk assessment.
- 4.37 A fundamental aspect of the Principal Contractors role will be the development of a Construction Management Plan, which will take account of all known risks, which have been identified at pre-construction stage by the Principal Designer/CDM Consultant, the Design Team and also through site investigations.
- 4.38 The Construction Management Plan will describe arrangements and procedures for managing these key risk areas in more detail, as well as any future risk, and also the resources, including personnel, which will be applied to the scheme and which will ensure the Health and Safety of all those working on or affected by the project works.
- 4.39 The Principal Contractor will have an on-going process of monitoring health and safety standards throughout its organisation. This is normally done directly (on site) by the site management team through regular inspections, toolbox talks etc. and also via the risk assessment process both during the completion of risk assessments and then by monitoring the effectiveness of risk control measures, which have been implemented. Site managers will also undertake regular reviews of safety on site, including any accidents or incidents and any matters raised will be dealt with accordingly.

- 4.40 Health and safety is also incorporated as a fundamental aspect of the overall project review. The Principal Contractor will work closely with the Principal Designer at this early stage of the project and will influence the detailed design to remove construction and residual safety risks.
- 4.41 The Principal Contractor will at the earliest possible stage of the project enter into dialogue with all relevant parties, including neighbours to ensure there is effective coordination throughout all stages of construction.

5 Consideration of Alternatives

- 5.1 Regulation 18(3) and Paragraph 2 of Schedule 4 of the 2017 EIA Regulations requires the Applicant to provide an outline of the reasonable alternatives studied and an indication of the main reasons for the choice made, taking into account the environmental effects.
- 5.2 The form of the Proposed Development has been influenced by a range of factors, including location, surrounding land use and input from Manchester City Council, Statutory and Non-Statutory Consultees and other stakeholders.
- 5.3 This Chapter reviews the principal land use, design and siting options explored and the reasoning for the selection of the current design for the proposed Development, which forms the subject of assessment within the ES.
- 5.4 This Chapter considers the following four options in the context of the existing Development Brief:
- The 'do nothing' alternative where the Proposed Development is not progressed.
 - Alternative locations for the Proposed Development.
 - Alternative uses for the Site.
 - Alternative design/layout for the Proposed Development in the context of the design evolution.

The Development Brief

- 5.5 The Applicant provided a brief for development of the Site to accommodate the site constraints to ensure that this key site maximises the development opportunity. The following objectives were given as high level requirements:
- To provide a development that realises the full potential of the Site, working within the parameters of the approved Planning Permission and limited site area.
 - Delivery of a quantum and mix of accommodation to secure viable redevelopment of the Site, with a change from typical apartment types to a co-living product.
 - To provide high density, high quality residential accommodation that offers a range of unit types with complementary spaces to suit a wide demand.
 - To provide flexible co-work space to allow like-minded individuals and small businesses to collaborate feeding into the wider aspirations of Enterprise City.
 - Ensure the development makes a valuable addition to the quality of the surrounding area in design terms, fitting in with the wider designs of St. John's and nearby designated heritage assets.

The "do nothing" Alternative

- 5.6 The "do nothing" scenario usually refers to the option of leaving the Site in its current state.
- 5.7 The Site was previously used as car parking. It currently comprises a construction site, associated with the delivery of adjacent developments in the St John's area. The extant T2 application was implemented in early 2020; however, the Site is still currently in use as a construction compound on a temporary basis, therefore the do nothing scenario would be for the Site to return back to a car park once it is no longer required as a construction compound.
- 5.8 Lack of high density development on the Site would undermine the strategic vision for St. John's. The Site is considered to be suitable for high density development within the Manchester Core Strategy and the endorsed St. John's Strategic Regeneration Framework. This is confirmed via the extant T2

planning Permission at the Site. It's urban location, close proximity to a wide range of facilities and excellent transport links also support development on the Site.

- 5.9 The 'do nothing' scenario is therefore discounted as redevelopment of the Site is supported on both a strategic, local policy and national policy level and as per the previous permission for the Site.

Consideration of Alternative Locations

- 5.10 The Site is under-utilised in a location within the City Centre with high levels of accessibility. Being within the City Centre, the Site sits among a wide mix of uses that are typical of its location.
- 5.11 The Site has the potential to provide economic and regeneration benefits, which will contribute to the wider strategic aims of the City Region.
- 5.12 It is previously developed land, which had been underused as a surface level car park for a number of years. Its regeneration is supported by planning policy, as set out in detail within the Supporting Planning Statement, which accompanies the Application.
- 5.13 The Site's selection as a suitable site for co-living accommodation and co-work space is based on its:
- city centre location;
 - access to transport links;
 - access to a wide range of facilities;
 - status as brownfield land, suitable for redevelopment;
 - identification as suitable for high density development; and,
 - close proximity to several places of work.
- 5.14 Whilst there would inevitably be other locations in the City Centre where there is development ready land available, these would fall outside of the Applicant's land ownership and ultimately discounts the possibility of alternative locations for the Proposed Development.
- 5.15 The location of this Site within St. John's and proposed use as a co-living and co-working development is also an important consideration. The area is due to become a significant employment generator for the City, particularly in combination with the established employment area of Spinningfields, and requires both a permanent yet flexible residential product that can cater for the needs of existing and future businesses. There are very few other locations across the city that would be appropriate for this type of product, given the unique nature of the surrounding context.
- 5.16 Therefore this Chapter does not consider alternative sites within the context of the planning application, as there is an identified need to redevelop this specific site to contribute towards regenerating the local area.

Consideration of Alternative Uses

- 5.17 The wider area is characterised by a mix of uses, consistent with the city centre location. In this respect, the St John's Masterplan area will deliver a wide range of uses, with a large quantum of office space, leisure and event space. Within this context, a range of uses could potentially be acceptable on the Site, but have been discounted due to the overriding reasons for bringing forward co-living accommodation and co-work space in this location.
- 5.18 Considering the long period in which the Site has been in need of redevelopment, there is an overriding requirement to ensure there is certainty of delivery of the Proposed Development. The proposed use meets a demonstrable demand for co-living accommodation and therefore meets this requirement.
- 5.19 Furthermore, its location is well suited to provide easy pedestrian access to a range of existing and committed workplaces, as well as the range of amenities available in the city centre. As such, it is

ideally located for the proposed use.

- 5.20 For the reasons above, alternative uses were discounted as the proposed co-living accommodation and co-work space is most appropriate in the context of identified development activity, housing need to support sustainable population growth, viability and deliverability.

Consideration of Alternative Designs

- 5.21 The scheme design has evolved over time during the design process and a number of alternative design options and proposals have been considered by the design team prior to settling on the final layout and design presented within this Application.
- 5.22 In addition to the design work undertaken for the Proposed Development, a previous Planning Permission was approved for the Site that approved a 36 storey residential tower for 305 apartments. The design of the previously approved development comprised an almost identical footprint, but was slightly taller than the Proposed Development and offered a different façade approach through inclusion of a metallic aluminum wrap around the external envelope of the building.
- 5.23 The change to the internal layout of the development following the new co-living apartments proposed had a consequential impact on the external appearance of the building as the rhythm of the façade needed to align with the new internal layout in a considered and well-designed manner. On this basis, the 'façade wrap' previously proposed was omitted to achieve a more uniform grid to align best with the living and communal spaces proposed internally.
- 5.24 Once this new grid pattern had been established, options were tested to understand what materiality and colour would ensure the best fit for the development in the surrounding context. Initial options sought to use a similar materiality to the previously approved scheme and proposed a white metallic façade.
- 5.25 Consideration of the façade approach and palette included extensive options appraisal to identify the optimum solution that represented the use proposed and complemented the existing and emerging vernacular of St John's. The relationship of the Proposed Development with the proposed Union T1 building, and how these would sit as a pair of buildings in their historic context and beside the Factory, were particularly important considerations in this process.
- 5.26 Following this design analysis, with the buildings adjacent approved and in situ, it was considered that changing this materiality to a black inner core, with silver metallic façade grid better complemented the surrounding development context.
- 5.27 In addition to design options tested against the extant Planning Permission on Site, further consultation with key stakeholders allowed for a number of façade treatments to be considered. The aim of this exercise was to ensure a deliverable and sustainable use of the Site whilst minimising any negative impacts on adjacent land uses and aligning with the design strategy for the Site.
- 5.28 The Design and Access Statement submitted with this Application sets out the options appraisal for the development which details how design of the Proposed Development has been formulated.
- 5.29 The options considered for the development were considered within the context of the Site and the final design is considered to respond most appropriately to the planned, strategic and heritage context. The development of the design has been an iterative process with the architect and wider technical team to ensure all relevant material considerations have been dealt with satisfactorily.

Summary

- 5.30 The Proposed Development has been influenced by a variety of stakeholders, including planning officers at MCC, independent design review, statutory consultees and local communities, as part of an iterative design process, which has led to the final design.
- 5.31 The wider project team have also played an important part in influencing the design of the Proposed Development to ensure that likely significant environmental effects are avoided or mitigated.

- 5.32 The key alternatives which were considered during the design process have been described within this chapter, along with the main reasons for selecting the chosen option. The primary environmental drivers for design choices have been a combination of ensuring project feasibility, minimising visual impacts, and responding to reviews from members of the public, statutory consultees and key stakeholders generated by extensive pre-application consultation.

6 Townscape and Visual Impact Assessment

Introduction

- 6.1 This Chapter of the ES has been prepared by Chris Burnett Associates and assesses the likely significant effects of the Proposed Development with respect to Townscape and Visual amenity.
- 6.2 This Chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Proposed Development Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; cumulative effects and the likely residual effects.
- 6.3 This Chapter has been prepared by Chris Burnett; a Chartered Member of the Landscape Institute with experience of townscape and visual impact assessment including preparation of Environmental Statement Chapters.
- 6.4 Technical appendices also support this assessment and consist of the following:
 - Appendix 6.1: Maps
 - Appendix 6.2: Viewpoint and townscape photographs including AVR and block images.

Legislative and Policy Context

Legislation

- 6.5 The European Landscape Convention (ELC, 2000)¹ provides a foundation for closer co-operation on landscape issues across Europe and was ratified in the UK on the 21 November 2006 and became binding on 1 March 2007. The convention identifies the need to recognise landscape in law, to develop and promote landscape policies dedicated to the protection, management and creation of landscapes, and to establish procedures for the participation of the general public and other stakeholders in the evolution and implementation of landscape policies. It also encourages the integration of landscape into all relevant areas of policy, including cultural, economic and social policies.
- 6.6 The ELC defines landscape under Article 1 as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'. It recognises that landscape has important cultural, ecological, environmental and social dimensions and is a key element of achieving sustainable development. Article 3 states that the aims of the Convention are to promote landscape protection, management and planning and to organize European co-operation on landscape issues.

¹ Ref 6.3 The European Landscape Convention (ELC 2000)

National Planning Policy

- 6.7 The National Planning Policy Framework² sets out the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.
- 6.8 Key aspects of the NPPF, revised in 2019, which apply to the Townscape and Heritage Assessment are the paragraphs 124 and 127 below:

Para. 124 *"Para 56. The creation of high quality buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities. Being clear about design expectations, and how these will be tested, is essential for achieving this. So too is effective engagement between applicants, communities, local planning authorities and other interests throughout the process.*

Para. 127 *Planning policies and decisions should ensure that developments:*

a) will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development;

b) are visually attractive as a result of good architecture, layout and appropriate and effective landscaping;

c) are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities);

d) establish or maintain a strong sense of place, using the arrangement of streets, spaces, building types and materials to create attractive, welcoming and distinctive places to live, work and visit;

e) optimise the potential of the site to accommodate and sustain an appropriate amount and mix of development (including green and other public space) and support local facilities and transport networks; and

f) 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 users⁴⁶; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion and resilience.

Para. 189 *In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation." (Ref 6.4)*

² Ref 6.4 National Planning Policy Framework 2019 Dept Communities and Local Government

Local planning policy

- 6.9 The following relevant policies are set out below as extracts from Manchester City Council's Core Strategy³:

"The Core Strategy was adopted by Manchester City Council on 11th July 2012. It is the key document in Manchester's Local Development Framework and covers a period of 15 years from 2012 to 2027. It describes Manchester today and outlines the Council's vision for Manchester in 2027 along with the planning policies which will be used to deliver that vision. "

Relevant Policies include:

Policy EN 1 - Design Principles and Strategic Character Areas

"All development in Manchester will be expected to follow the seven principles of urban design, as identified in national planning guidance and listed above and have regard to the strategic character area in which the development is located. Opportunities for good design to enhance the overall image of the City should be fully realised, particularly on major radial and orbital road and rail routes. Design and Access Statements submitted with proposals for new development must clearly detail how the Proposed Development addresses the design principles, reinforces and enhances the local character of that part of the City and supports the achievement of the Core Strategy Strategic Objectives."

- 6.10 The City Centre Character Area is of relevance to the Proposed Development. This area has been broken down into distinct townscape character zones by Manchester City Council and the extent and nature of the impact of the Proposed Development on these zones is described in more detail later in this chapter. The Core Strategy also refers to tall buildings:

Policy EN2 - Tall Buildings

"Tall buildings are defined as buildings which are substantially taller than their neighbourhoods and/or which significantly change the skyline.

Proposals for tall buildings will be supported where it can be demonstrated that they

- Are of excellent design quality,*
- Are appropriately located,*
- Contribute positively to sustainability,*
- Contribute positively to place making, for example as a landmark, by terminating a view, or by signposting a facility of significance, and*
- Will bring significant regeneration benefits.*

A fundamental design objective will be to ensure that tall buildings complement the City's key existing building assets and make a positive contribution to the evolution of a unique, attractive and distinctive Manchester, including to its skyline and approach views.

Suitable locations will include sites within and immediately adjacent to the City Centre with particular encouragement given to non-conservation areas and sites which can easily be served by public transport nodes.

Elsewhere within Manchester tall building development will only be supported where, in addition to the requirements listed above, it can be shown to play a positive role in a coordinated place-making approach to a wider area. Suitable locations are likely to relate to existing district centres. The height

³ Ref 6.5 Manchester City Council Core Strategy 2012

of tall buildings in such locations should relate more to the local, rather than the City Centre, urban context.

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.

It will be necessary for the applicant/developer to demonstrate that proposals for tall buildings are viable and deliverable”.

- 6.11 Significantly, the Core Strategy offers further guidance in relation to the development of tall buildings as follows:-

"Tall Buildings can provide a sense of place and distinctiveness, however as high development can have a substantial impact on an area careful consideration should be given to each proposal.

The NPPF requires local authorities to have regard to best practice in design, such as "By Design - Urban Design in the Planning System: Towards better practice" and "By Design – Better places to live". Policies are not to be overly prescriptive but, amongst other things, should concentrate on guiding height in relation to neighbouring buildings and the local area in general. Innovation should not be stifled but local distinctiveness should be reinforced. PPS4 directs planning authorities to set flexible policies for their centres which can respond to changing economic circumstances and encourage where appropriate high density development accessible by public transport, walking and cycling.

In the context of ensuring sustainable development, the City Centre is clearly a location that requires the prudent use of scarce land resources. It is generally well served by public transport and one where a high density of development is consistent with its distinctive character. The City Centre is, in general, considered an appropriate area for tall buildings. The growth of the City Centre is still evolving, particularly in relation to the development of fringe sites, and proposals need to be considered having regard to the character of the places in which they are proposed. Therefore, whilst some parts of the City Centre are more or less likely to be suitable for tall buildings, the Council does not consider a site specific policy that identifies detailed locations for a tall building to be appropriate. The Council is aware that over the 15 year plan period there is a need to be flexible and to be able to respond to changing economic conditions. The above criteria based policy is therefore set out, which will together with other design policies, form the policy context against which all proposals for tall buildings will be considered.

Elsewhere across the City, District Centres may be appropriate locations for "tall" buildings. Being generally accessible to the local population and well served by public transport, they are natural foci for developments that attract a larger number of people. The definition of tall as being in relation to neighbouring buildings should be noted, however, as the scale of development acceptable within a District Centre is unlikely ever to match that within the City Centre.

Tall buildings by their very nature can dominate the street scene and be highly visible over long distances. They can also have an impact on the local micro-climatic conditions, for example, by creating wind tunnels. It is for these reasons that it is considered particularly important that they are designed to the highest quality, both in terms of appearance and their impact on the functioning of surrounding space.”

Policy EN3 - Heritage

"Throughout the City, the Council will encourage development that complements and takes advantage of the distinct historic and heritage features of its districts and neighbourhoods, including those of the City Centre.

New developments must be designed so as to support the Council in preserving or, where possible, enhancing the historic environment, the character, setting and accessibility of areas and buildings of acknowledged importance, including scheduled ancient monuments, listed buildings, registered parks and gardens, conservation areas and archaeological remains.

Proposals which enable the re-use of heritage assets will be encouraged where they are considered consistent with the significance of the heritage asset."

- 6.12 There are a number of extant Manchester City Council Unitary Development Plan (UDP) Policies, of which Policies 18 and 19 (relating to Conservation Areas and Listed Buildings) remain relevant. Heritage impacts are discussed and evaluated in more detail in this ES at Chapter 7.

Assessment Methodology and Significance Criteria

- 6.13 This section of the ES chapter describes the study area, how baseline information has been gathered, and the method of assessing the significance of effects.

Study Area

- 6.14 The study area for this assessment comprises an area of approximately 1km in radius focused on the Proposed Development Site which is an appropriate area in these circumstances. It covers Manchester City Centre, including Castlefield, Deansgate and part of Salford.

Baseline Surveys

Desk Based Research

- 6.15 Research included establishing a Zone of Theoretical Visibility (ZTV) and examining appropriate guidance and policies on tall buildings issued by Manchester City Council (MCC) and relevant authorities such as Historic England.

Field Surveys

- 6.16 Field surveys were undertaken to explore the current baseline of Manchester City Centre Townscape Character Zones, confirm the ZTV and establish a series of key Representative Viewpoints for assessment including those subject to Accurate Visual Representation (AVR).

Consultations

- 6.17 Representative Viewpoints were submitted to Manchester City Council as part of the EIA Scoping Report in March 2020

Method of Assessing Significance

- 6.18 The Townscape and Visual Impact Assessment (TVIA) was undertaken in accordance with the methodology and approach set out in the 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA) Third Edition' (2013) – produced by the Landscape Institute (LI) and IEMA.⁴

"The GLVIA requires that a clear distinction is drawn between landscape (which includes the urban townscape) and visual effects:

Townscape effects relate to the degree of change to characteristics or physical components of an urban area, which together form the character of that townscape, e.g. topography, buildings and vegetation.

⁴ Ref 6.6 Guidelines for Landscape and Visual Impact Assessment 3rd Edition 2013 landscape Institute and Institute of Environmental Management and Assessment

- *Visual effects relate to the degree of change to an individual receptor's or a receptor group's view of that townscape, e.g. local residents, users of public footpaths or motorists passing through the area."*

6.19 The relationship between the effects of the Proposed Development on Townscape and Visual Issues are interdependent but not exclusively so. The effects will therefore be examined in terms of:

Effects on Townscape character: For the purposes of this study the area immediately around the Proposed Development is examined on a character area basis based on the zonal template used by Manchester City Council. These character areas are shown on maps in Appendix 6.1

Effects on visual receptors: This is examined through the Representative Viewpoint Approach in which the effects of the Proposed Development are assessed in short, medium and long distance views from variety of key locations.

6.20 In addition the following guidance documents have been also been consulted:

- Guidance on tall buildings published by Historic England: Advice Note 4⁵
- History in the View prepared for English Heritage by LUC in 2011
- Manchester Residential Quality Guidance ⁶

6.21 The guidance contained in Historic England's advice note on Tall Buildings is particularly relevant:

"Tall buildings need to set exemplary standards in design because of their scale, mass, wide impact and likely longevity. Good design will take the opportunities available for improving the character and quality of an area and respond to local character and history (NPPF paragraphs 58 and 64). It is important that the required high standard of architectural quality is maintained throughout the process of procurement, detailed design, and construction, through the use of conditions and reserved matters.

Given their likely impact on a wide area, it is important that social and environmental effects are also assessed. Consideration needs to be given to a tall building's contribution to public space and facilities. This applies both internally and externally, including the provision of a mix of uses (especially on the ground floor of towers), as part of a well-designed public realm. Consideration of the impact on the local environment is also important, including microclimate, overshadowing, night-time appearance, light pollution, vehicle movements, the environment and amenity of those in the vicinity of the building, and the impact on the pedestrian experience. Well-designed tall buildings provide an inclusive environment, both internally and externally, taking opportunities to offer improved permeability, accessibility and, where appropriate, the opening up or effective closure of views to improve the legibility of the wider townscape."

Townscape Character effects

6.22 The assessment of the Proposed Development on Townscape Character has been based on Manchester City Centre Strategic Character Areas and City Centre Zones. (See Fig 2.1 in MCC Core Strategy). It includes an assessment of the elements which comprise it such as built form and styles, urban grain and street pattern, soft elements such as green spaces and trees and a sense of place and effect that the Proposed Development is judged to have on them. The principal zones which could be potentially affected by the Proposed Development include those that surround the Proposed Development:

Manchester City Centre Character Zones

- Castlefield

⁵ Ref 6.7 Historic England note on Tall Buildings 2015

⁶ Ref 6.8 Manchester Residential Quality Guidance MCC 2017

- St Johns
- Chapel Street

- 6.23 Their extent is defined in the Viewpoints and City Centre Zone map in Appendix 6.1. and they are described in more detail in the corresponding baseline condition section.
- 6.24 Townscape effects can be characterised as the changes in the urban grain, character and condition of the townscape as a result of the impact of a development. Specifically, the assessment will examine:
- Direct effects on specific townscape elements
 - Effects that are more subtle in nature which affect the character of the townscape
 - Effects on a designated asset such as a World Heritage Site, Listed Building or Conservation Area or tourist landmark.

Visual Effects

- 6.25 The Zone of Theoretical Visibility (ZTV), in the context of the surrounding topography and the height of the Proposed Development, has been established initially through 3D modelling using Lidar DSM data combined with 10K base mapping to produce a Zone of Theoretical Visibility (ZTV) or Viewshed map, **within Appendix 6.1**, and then confirmed as part of the field work exercise. It covers the area immediately surrounding the Proposed Development to a distance of approximately 0.5km with a focus on the city centre. The Proposed Development as a 36 storey tower of 142.205 AOD will be widely visible and the ZTV provides a summary guide as to the extent and scope of this.
- 6.26 A refreshed range of key "Representative Viewpoints" based on the previously prepared Townscape and Visual Impact Assessment for extant T2 have been identified for assessment as a series of key viewpoints. This is the most appropriate and practical method of assessing and understanding the visual impact of the Proposed Development on this occasion. These viewpoint locations are marked on maps in **Appendix 6.1** and illustrated by way of photographs taken from these viewpoints which are represented in **Appendix 6.2**.
- 6.27 Viewpoints were selected to cover a number of different locations to reflect the experience of different types of visual receptor, heritage assets and viewing distances. Accordingly, viewpoints ranged from immediate proximity to the Proposed Development to surrounding neighbourhoods. Viewpoints included: streets, public parks, footpaths and main approach roads.
- 6.28 During the main field assessment process, which occurred in March 2020, baseline viewpoint photographs were taken following guidance incorporated in the Landscape Institute Advice note 06/19⁷ which offers the following guidance on field of view:
- " The tilt shift lens is increasingly being used in architectural photography in urban locations. It can also be employed for taking photographs up or down slope. The lens comes in a range of focal lengths including 17mm, 24mm, 45mm and 90mm. The 24mm tilt shift is typically used for visualisation work where viewpoints are located close to a development and the normal range of prime lenses will not capture the proposed site."*
- 6.29 This guidance has been taken into account in and in order to illustrate as much of the surrounding context as possible in the context of visualising a tall building. Photographs were taken at 1.7m height. A technical appendix assembled by CGI specialists Our Studio accompanies the TVIA which sets out in detail the camera and lens used together with information on coordinates and field of view. The viewing distance for all photographs when printed at A3 should be a comfortable arms' length.

⁷ Landscape Institute Advice Note 06 /19 Visual Representation of Development Proposals Landscape Institute 09 19

- 6.30 The effect of the Proposed Development is then assessed from each of the viewpoints using the information on the height of the building provided by the architect Denton Corker Marshall and the accurate interpretation of this information by Our Studio in the form of Accurate Verified Rendered (AVR) images.

Defining Significance of Effect

- 6.31 The significance of townscape and visual effects can broadly be determined by the interaction of the sensitivity of the receptor and the magnitude of effect with professional judgement playing an important part in identifying the overall significance values for each receptor.

Townscape: Sensitivity of Receptor

- 6.32 The sensitivity of a townscape receptor is an expression of its ability to accommodate the Proposed Development. Sensitivity is a judgement based on a combination of the susceptibility of the type of change or development proposed and the value attached to the townscape, as set out below.

Susceptibility

- 6.33 Susceptibility indicates the ability of a defined townscape receptor to accommodate the Proposed Development "without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies." (GLVIA, 3rd version, para 5.40). A description of how susceptibility would be evaluated for each receptor type is included below:

Table 6.1 Susceptibility of Townscape Receptor

Susceptibility	Criteria
High	Little ability to accommodate the Proposed Development without undue harm.
Medium	Some ability to accommodate the Proposed Development without undue harm.
Low	Substantial ability to accommodate the Proposed Development without undue harm.

Value

- 6.34 Townscape Value is "the relative value that is attached to different landscapes by society". It is assessed on the following scale along with assessment of various undesignated townscape attributes:

Table 6.2 Townscape Value

Value	Description
High	Sites, features or areas of national or international importance with settings of high quality such as World Heritage Site, AONB, National Parks, Grade I and Grade II* Listed buildings or Registered Parks and Gardens.
Medium	Sites, features or areas of local or regional importance with intact character such as Grade II* and Grade II Listed Buildings or Registered Parks and Gardens, Conservation Areas, Scheduled Monuments, local nature site, long distance recreational routes. Tree Preservation Orders (TPO) and local designations that exhibit wider geographic, cultural or townscape significance.
Low	Areas or features of local importance such as Tree Preservation Orders (TPO), Public Right of Way (PROW) and locally listed buildings.

- 6.35 The overall sensitivity of each townscape receptor would be rated within the range of High-Medium-Low and would be informed by combining the susceptibility and value as described above.

Townscape: Magnitude of Effect

- 6.36 The magnitude of a townscape effect is assessed in terms of its size or scale, the geographical extent of the area influenced by that effect, and its duration and degree of reversibility and would be rated within the range of Major-Moderate-Minor-Negligible-No Change set out below:

Table 6.3 Magnitude of Townscape Effect

Category	Criteria
Major adverse townscape effect	The proposals will result in a total change in the key characteristics of townscape character; will introduce elements totally uncharacteristic to the attributes of the receiving townscape; and/or will result in a substantial or total loss, alteration or addition of key elements/features/characteristics.
Moderate adverse townscape effect	The proposals will result in a partial change in the key characteristics of townscape character; will introduce elements partially uncharacteristic to the attributes of the receiving townscape; and/or will result in partial loss, alteration or addition of key elements/features/characteristics.
Minor adverse townscape effect	The proposals will result in a small change in the key characteristics of townscape character; will introduce elements that are not uncharacteristic to the attributes of the receiving townscape; and/or will result in a minor loss, alteration or addition of elements/features/characteristics.
Negligible adverse townscape effect	The proposals will result in a just discernible change to townscape character/elements/features/characteristics.
Negligible townscape benefit	The proposals will result in a just discernible improvement to the townscape character/elements/features/characteristics.
Minor townscape benefit	The proposals will achieve a degree of fit with the townscape character/elements/features/characteristics and go some way towards improving the condition or character of the townscape.
Moderate townscape benefit	The proposals will achieve a good fit with the townscape character/elements/features/characteristics, or would noticeably improve the condition or character of the townscape.
Major townscape benefit	The proposals will totally accord with the townscape character/elements/features/characteristics, or would restore, recreate or permanently benefit the condition or character of the townscape.

No Change

The proposals will not cause any change to the townscape character/ elements/ features/ characteristics.

6.37 The size and/or scale of change in the townscape takes into consideration the following factors:

- the extent/proportion of townscape elements lost or added;
- the contribution of that element to townscape character and the degree to which aesthetic/perceptual aspects are altered; and
- whether the effect is likely to change the key characteristics of the townscape, which are critical to its distinctive character.

6.38 The geographical extent of effects relates to:

- the area over which townscape effects are likely to be experienced, i.e. this could be at the site level, the immediate setting of the site, or townscape character type or area;
- the area over which visual effects are likely to be visible; and duration.

Visual receptors: Sensitivity of Receptor

6.39 In terms of assessing the baseline visual sensitivity, key factors to consider are the type of view and the likely numbers and types of viewers (the visual receptors). The type of view and the number of viewers are described in the following terms:

- Glimpsed (i.e. in passing) / Filtered / Oblique / Framed / Open Views; and Few / Moderate / Many Viewers

6.40 The value attached to views has regard to a number of factors, including:

- recognition through planning designations or heritage assets; and
- the popularity of the viewpoint, its appearance in guidebooks, literature or art, on tourist maps and the facilities provided for its enjoyment.

6.41 The GLVIA identifies that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- The occupation or activity of people experiencing the view at a particular location; and
- The extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

6.42 The assessment of receptor sensitivity is rated on the scale High-Medium-Low, and combines judgements on the susceptibility of the receptor to the specific type of development proposed and the value attributed to that receptor, determined from the criteria below.

Table 6.4 Visual Receptor Susceptibility

Susceptibility	Type of Receptor
High	Users of public space, including users of public rights of way, whose attention is likely to be focused on the townscape and on particular views; Visitors to heritage assets or other attractions where views of the ssurroundings are an important part of the experience; Communities where views contribute to the townscape setting enjoyed by residents; and Travellers on scenic routes.
Medium	Travellers on road, rail or other transport routes, where the view is moderately important to the quality of the journey; and Users of public space, where the view is part of the wider experience of the place.
Low	People at their place of work, where the setting is not important to the quality of working life; Travellers on road, rail or other transport routes, where the view is fleeting and incidental to the journey; and People engaged in outdoor sport or recreation, or users of a public space, which does not involve appreciation of views.

Table 6.5 Visual Receptor value

Value	Criteria
High	Views from townscapes/viewpoints of national importance, or highly popular visitor attractions where the view forms an important part of the experience, or with important cultural associations. An example may be where the viewpoint features a nationally important designated asset as the main focus of the view.
Medium	Views from townscapes/viewpoints of regional/district importance or moderately popular visitor attractions where the view forms part of the experience, or with local cultural associations. The viewpoint may be a good location to view a designated asset of regional/local importance, or where a nationally important designated asset is not the main focus of the view.
Low	Views from townscapes/viewpoints with limited designations, not particularly popular as a viewpoint and with minimal or no cultural associations. The viewpoint may include designated assets of regional/local importance which do not form the main focus of the view.

Visual: Magnitude of Effect

- 6.43 The magnitude of a visual effect is assessed in terms of its size or scale, the geographical extent of the area influenced and its duration and degree of reversibility and will be rated within the range of Major-Moderate-Minor-Negligible-No Change set out below.

Table 6.6 Magnitude of visual effect

Category	Criteria
Major adverse or beneficial visual effect	The proposals will cause a dominant or complete change or contrast to the view, resulting from the loss or addition of substantial features in the view and will substantially alter the appreciation of the view.
Moderate adverse or beneficial visual effect	The proposals will cause a clearly noticeable change or contrast to the view, which would have some effect on the composition, resulting from the loss or addition of features in the view and will noticeably alter the appreciation of the view.
Minor adverse or beneficial visual effect	The proposals will cause a perceptible change or contrast to the view, but which would not materially affect the composition or the appreciation of the view.
Negligible adverse or beneficial visual effect	The proposals will cause a barely perceptible change or contrast to the view, which would not affect the composition or the appreciation of the view.
No change	The proposals will cause no change to the view.

- 6.44 The size or scale of change in the view relates to the degree of contrast or integration likely to result from the Proposed Development and is influenced by the relative time over which a view is experienced and whether it is a full, partial or glimpsed view.

Duration of Effect

- 6.45 Both Townscape and Visual effects may be experienced over a range of timescales. For this assessment, the following timescales are considered appropriate:
- Short-term: 1 year or below
 - Medium-term: Between 1 and 10 years in duration
 - Long-term: Greater than 10 years in duration

Significance of Effect

- 6.46 The objective of the assessment process is to identify and evaluate the likely significant effects arising from the Proposed Development for both Townscape and Visual Receptors. Significance indicates the importance or gravity of the effect. The table below, Table 6.7 is offered in support of professional judgement in determining the Significance of effect and is used as a guide to the narrative explanation of the nature and significance of both townscape and visual effects brought about by the Proposed Development.

Table 6.7: Significance of Effect

Sensitivity of Receptor	Magnitude of Effect				
	Major Effect	Moderate Effect	Minor Effect	Negligible Effect	No Change
	High	Major Significance	Moderate Significance	Moderate Significance	Minor Significance Negligible
	Medium	Moderate Significance	Moderate Significance	Minor Significance Negligible	Negligible
	Low	Moderate Significance	Minor Significance	Negligible	Negligible

- 6.47 The effects on both townscape and visual receptors is examined in each case. The selected viewpoints have been subjected to the insertion of an Accurate Verified Representation (AVR) into a baseline photograph so that the extent of both townscape and visual effects can be judged more accurately. The results of this exercise can be found in **Appendix 6.2**.
- 6.48 In each case the effect of the Proposed Development is compared with the baseline condition or view and an assessment made in terms of receptor susceptibility, value of townscape setting or view, receptor sensitivity and magnitude of effect. A judgement is then made as to whether the effect is of major to negligible significance of effect using the Effect Significance Matrix in **Table 6.7** and then a judgement made as to whether the effect is significant or not significant in EIA terms.
- 6.49 For the purposes of this Townscape and Visual Impact Assessment, effects of Moderate Significance and above are considered to be Significant. Those values of Minor and below are therefore deemed to be Not Significant. A professional judgement is then made as to whether the effect is of an adverse or beneficial nature. The effects below are primarily concerned with the effects on townscape character and visual receptors.
- 6.50 This process has been applied to provide a robust assessment in similar townscape settings, including Manchester City Centre, and is considered to be the most suitable approach in this context.
- 6.51 The visual impact of the Proposed Development will demonstrably change as it is constructed. As the construction phase is likely to be a very short period in relative terms in the context of its lifecycle, the impact of the building upon completion, or operational phase, is the principal focus of this study although the construction effects are also examined below. Similarly, the impact pathway is direct. The building is either visible or it is not.

Mitigation Methodology

- 6.52 In terms of mitigation for the Proposed Development this has been derived by the architects Denton Corker Marshall as the design of the building has developed in consultation with interested parties. Mitigation for the Construction Phase Effects is described in the relevant section below.

Residual Impact Methodology

- 6.53 Residual Impacts are described based on the assumption that all mitigation measures have been fully deployed.

Baseline Conditions

Townscape Baseline

- 6.54 A summary set out below describes the main attributes and characteristics of each of the Inner City Zones and Representative Viewpoints that may be potentially most affected by the Proposed Development as existing at the time of this assessment in 2019. Each character area is referenced on Fig 8.2: Inner City Zones and Viewpoints (**Appendix 6.1**).
- 6.55 Manchester, with the St Johns area in particular, is currently going through a major phase of new development with construction which affects most of the inner city character zones in some form or other and many buildings have been constructed since the original ES for extant T2 was submitted in 2016. Some development, but not all, will have the capacity to alter the visual and townscape baseline more significantly than others. In terms of the baseline assessment the GLVIA advises that 'existing schemes and those under construction should be included in the baseline for both landscape (townscape in this case) and visual effects baseline 'and that 'the baseline for assessing cumulative landscape (townscape) effects should include those schemes, and in addition potential schemes, that are not yet present in the landscape but are at various stages in the development and consenting process.'
- 6.56 For the purposes of this assessment therefore, the baseline conditions that prevail at the current time (2020) in terms of Townscape Character and Views are described below and include relevant schemes under construction which are predicted to be complete when the Proposed Development is due to have been completed. This includes the current consented extant T1 2016 scheme. It should be noted however, that the consented extant T2 is not included in the baseline as the empty site represents a worst case scenario.

Zone O - Castlefield

- 6.57 This zone forms Britain's first Urban Heritage Park and is one of Manchester's key tourist destinations. It is the terminus for the world's first industrial canal: the Bridgewater Canal and the world's first passenger railway terminated nearby in 1830. Its historic interest is therefore very much linked with the historic transport networks formed by the railways and canals. It also includes the remaining sections of a Roman fort. In addition, the area provides a highly attractive location for offices, apartments, cafes, bars and hotel developments and includes public spaces and an events area. Castlefield Conservation Area covers this area.
- 6.58 The visual character of the area is varied. The many viaducts that pass through the zone provide the opportunity for panoramic views of the city but also visually enclose the spaces below. These strongly horizontal features contrast with the chimneys and towers all associated with the industrial development of the area. The historic fabric is well represented in Castlefield and the older buildings tend to assert themselves in defiance of more recent development.
- 6.59 The enclosed canal basins dominated by its restored heritage with an influx of new residential and leisure development are a particular characteristic feature of the zone. Here the public spaces and towpaths provide a very human scale and intimacy to the area. Throughout the canal system the views are constantly changing, even slight distances creating very different juxtapositions and views. The Mancunian way passes through this area and links with the inner ring road affording occasional interrupted views of the City centre. New development is coming forward with 20 storey development overlooking the basin on Chester Road.

Zone M: St Johns

- 6.60 The area comprises a variety of buildings associated with the former ITV Quay Street estate but which is now the focus of a major scheme of redevelopment: The St Johns Masterplan which has many varied components including several tall buildings. The area contains one Listed structure (the Grade II Listed Manchester and Salford Junction Canal tunnel, which is underground); the Grade II Listed Colonnaded Railway Viaduct also falls partially within the area. The area contains a number of non-designated heritage assets, many of which are proposed to be retained and re-used as part of the St. John's Masterplan. It also lies adjacent to a number of listed structures, including the Grade I Liverpool Road Station and 1830s Warehouse. The area contains a number of natural assets, including riverside frontages and a mature garden that faces the existing St. John Street public gardens.
- 6.61 The central part of the area comprises the Granada Studios and associated car park as part of the former ITV Quay Street estate. This area is undergoing a major renaissance with several notable schemes under construction which include The Factory, Enterprise City, Globe and Simpson, the Bonded Warehouse, now complete and OGS.
- 6.62 To the south of the zone a range of high quality heritage buildings which line Liverpool Road, including the original Liverpool Road Station Buildings, the first passenger transport terminal that received Stephenson's Rocket (Grade I Listed), and various industrial buildings, which have now been utilised for the Museum of Science and Industry. These buildings have extremely fine architectural quality and Liverpool Road forms an important perspective vista. The area at the junction of Water Street and Liverpool Road is dominated by several viaducts and bridges over different periods (Grade I to Grade II Listed).
- 6.63 A major new scheme, the Ordsall Chord, an elegant bridge and viaduct, carries a railway line north towards Salford Central adjacent to the inner ring road.
- 6.64 Immediately to the north of Liverpool Road, and to the west of Deansgate, is an area of high townscape quality consisting of the low rise Georgian streets of the St Johns quarter, home to the chambers and practices of Manchester's legal and medical professions. The quiet oasis of St Johns gardens occupies a small tranquil green space in the centre of this district, a welcome contrast to the busy and noisy Deansgate which is a short distance away.
- 6.65 The Proposed Development site lies within this zone. It measures 0.67ha in area and currently comprises a construction compound associated with the delivery of current schemes in the St John's neighbourhood and therefore all buildings, structures, trees are absent at the present time. Uses immediately surrounding the Site include hotel uses, office uses, and retail and leisure spaces currently in operation within the St. John's Masterplan. The Site is currently accessed from Water Street.

Zone J Chapel Street

- 6.66 Chapel Wharf is part of the historic core of Salford and a key part of the city centre. Recently it has seen many new developments for residential, educational, civic and business uses. The area includes the city centre's first five star rated hotel, the Lowry Hotel, on the banks of the River Irwell, which forms the southern boundary of the zone. Development along the river has created a predominantly 'canyon' effect, although views open up at various crossing points. A small plaza combines with a pedestrian bridge next to the Lowry Hotel and forms one such nodal point. The raised section of the railway corridor linking Salford Central Station, in the centre of this zone, with Manchester Victoria also continues through this area. In general, the area has a dense urban fabric and tight urban grain with little in the way of open space and opportunities for panoramic views out. The Flat Iron conservation area also lies within this character area and contains both Trinity Church and the market itself.

Assessment of Effects

Limitations and Assumptions

- 6.67 The principal limitation as far as the field survey work was concerned has been that photography was undertaken in the months when the extent of foliage on trees is at its minimum. This represents therefore, a worst case scenario. However, as the population of street trees in Manchester is low this effect should only become apparent in a limited number of views.

Embedded Mitigation

- 6.68 Mitigation in terms of visual and townscape effects has been incorporated into the Proposed Development as part of the design process by the scheme architects Denton Corker Marshall has evolved through consultation with the Local Planning Authority and others.

Sources of Effect

Construction phases

- 6.69 The construction of this building on a site on the outskirts of Manchester City Centre will clearly involve procedures and processes that are unsightly and intrusive consistent with operations on most large scale construction sites. However, this process is comparatively short lived in nature when considered in the context of the lifespan of the Proposed Development concerned. The construction programme will commence as a single operation at the start of the project. The key physical activities will include:
- Site clearance.
 - Construction plant such as cranes etc.
 - Mobile construction plant.
 - Delivery and stockpiling of materials.
 - Protective fencing and hoardings.
 - Unfinished appearance of the Proposed Development and its core for the majority of the construction period.
 - Traffic movements associated with the above.

Assessment of Construction Phase Effects

- 6.70 The construction phase effects, as with the Operational Phase effects are assessed against the Baseline. The townscape character area most affected by the construction operations are the Townscape Character Zones in and around the Proposed Development Site namely: Zone J Chapel Street, Zone K Salford, Zone M St Johns and Zone O Castlefield. The effects of such construction activity on the character of this zone in the immediate vicinity is predicted to be **minor adverse** on a temporary basis during the construction period due to the stockpiling of construction materials, the use of construction equipment such as cranes and temporary fencing. This is judged **not significant** in EIA terms. The effects, however, should also be relatively localised and temporary and will not affect other Townscape character zones in any measurable way.

Effects of construction on Views

- 6.71 The effects of construction on the Representative Viewpoints will also be readily visible in the immediate area surrounding the Proposed Development, as the ZVT demonstrates, but less so within the core of the city centre. Nonetheless, there is little doubt that the construction phase of any building of any scale, until it is fully clad, will involve processes that are visually unsightly and are likely, in visual effect terms to be largely adverse in nature. This period, however, is only likely to be transitional and will be of short duration in relation to the lifespan of the Proposed Development itself. In view of the scale of the Proposed Development, the impact magnitude, and significance of effect is therefore judged to be **minor adverse** which is not significant in EIA terms,

in the following Zones: Zone J Chapel Street, Zone K Salford, Zone M St Johns and Zone O Castlefield but **negligible** in Zones H Central Business District, Zone L Spinningfields and Zone P Southern Gateway where views are limited. This is confirmed by examination of the ZTV map in Appendix 6.1

Operational Phases

- 6.72 The source of the effect during the operation phase is concerned with the physical impact that the Proposed Development will have on views, visual and townscape receptors.

Assessment of Operational Phase Effects

Effects of completed Development on Townscape Character and Views

- 6.73 The visual and townscape effects of the completed Proposed Development are now summarised with respect to the effects of the Proposed Development on the Townscape Character through a narrative description of the nature of the effect on each of the Representative Viewpoints which lie within each character area.
- 6.74 The ZTV confirms that the Proposed Development will be visible, as predicted, in the townscape character zones that surround it but less so towards the city centre. This is firstly, because the tight urban grain combined with orientation of the street pattern often preclude views of the Proposed Development but secondly because the consented extant T1 development, now modelled in the ZTV as part of the baseline, will effectively obscure many views from the east.
- 6.75 The zones that are primarily affected include:

- 1. Zone O Castlefield**
- 2. Zone M St Johns**
- 3. Zone J Chapel Street**
- 4. Zone K Salford**

The effects in zones further afield such as Zone H Central Business District, Zone L Spinningfields and Zone P Southern Gateway are judged to be largely insignificant due to the effects of extant T1, distance and tight urban grain and are not assessed.

- 6.76 The townscape and visual effects of the Proposed Development on each of these zones is now examined via a detailed description and judgement on a viewpoint by viewpoint basis. In all cases the effects are judged to be permanent in nature.

Castlefield

Viewpoint 6 A57 / Ring road junction

- 6.77 Located at the intersection of Regent Road (A57) with the Inner Ring road (A6042) this view represents a clear view of the western face of inner city Manchester from one of the main approach roads from the west. The susceptibility of the townscape to accommodate change from this location is judged to be low as the horizon is open and rapidly being populated by a series of tall buildings under construction. Townscape value is judged to be medium at this point however, as the viewpoint lies within the Castlefield Conservation Area although the historic fabric of Castlefield is not especially evident at this location. As a result, townscape sensitivity is judged to be medium low at this point. In terms of visual receptor sensitivity there are likely to be a large number of receptors but in the least sensitive category as most will be in transit where the view is fleeting and incidental to their journey. A low value is recorded for visual receptors. In terms of magnitude of townscape effect the effect is predicted to be minor beneficial as the Proposed Development will fit in well with the existing baseline character. In terms of visual effects, the Proposed Development fits in well with its profile in particular articulating well with extant T1 stepping down and away.

The contribution that the texture and pattern of the external cladding, which emphasises the building's verticality, can clearly be seen here and the development also responds well to extant T1. Most of the Proposed Development will also be clearly seen in this view. In terms of visual effects, therefore, a judgement of moderate beneficial is made. Significance of effect for both townscape and visual receptors is therefore judged to be of **minor beneficial** significance which is **not significant** in EIA terms.

Viewpoint 19 Castlefield bowl

- 6.78 Situated in one of Manchester's significant event spaces, Castlefield Bowl, any focus is directed from a small, sunken and enclosed space in an outward direction across the surrounding rooflines to the north and west. The adjacent canal basin also provides a foreground focal point of interest and glimpses of the Liverpool Road railway complex can be obtained through a gap in the built façade that lines Liverpool Road to the north. The number of cranes testify to the rapidly changing nature of the townscape baseline with work on the Factory proceeding apace. Townscape sensitivity is judged to be medium here, a function of its ability to accommodate development without undue harm and the fact that it lies within the Castlefield Conservation area. Visual receptor sensitivity is judged to be low as this location as it attracts a wide range of visitors to a series of events but remains an empty space for most of the time. The Proposed Development responds well to T1 and presents a strong elevation from this viewpoint and consolidates the emerging townscape character which includes the Factory. A minor beneficial effect is predicted for townscape effects. The Proposed Development also improves the composition with its neighbor extant T1 noticeably in this view and adds to the diversity of the skyline with its stepped roofline and vertical cladding. A value of moderate beneficial is registered for magnitude of visual effect in this case. In terms of significance of effect, the values of **minor beneficial** for both townscape and visual significance which is **not significant** in EIA terms.

Viewpoint 22 Castlefield basin

- 6.79 Located centrally within the Castlefield basin this view offers a niche view up the Rochdale canal to the railway Viaduct well within the Castlefield Conservation Area. The view is directed away the principal area of change, Great Jackson Street and towards the St Johns area masterplan some of which, as extant T1 is in this view, are now part of the baseline. Some ability to accommodate change without due harm combined with the Conservation Area status confers a value of medium townscape sensitivity. Visual receptor sensitivity is medium also reflecting the status of one of Manchester's principal historic attractions. In terms of magnitude of effect the Proposed Development augments the effect of extant T1 consistently in terms of townscape character. A value of minor beneficial is registered for the magnitude of townscape effect for this viewpoint. In terms of visual effect the Proposed Development relates well to extant T1 and improves the composition of the view by being marginally higher than its neighbour and stepping down and away from it. A value of minor beneficial is registered for the magnitude of visual effect for this viewpoint. This translates into a value **minor beneficial** significance for both categories which is **not significant** in EIA terms.

Zone: St Johns

Viewpoint 1 Lower Byrom Street

6.80 The current townscape character is formed from recent 5 storey and 8 storey office and apartment development with some buildings now being demolished as new development associated with the St Johns Masterplan takes shape. The street view is softened by trees which line the street and frame the view. In townscape receptor sensitivity terms this area is capable of accommodating change as the new development demonstrates although townscape value is high here as the viewpoint lies just on the perimeter of the St Johns Conservation Area boundary. Receptor sensitivity is judged to be medium overall. Visual receptors are judged to be low as this is a quiet backwater focused more on office and commercial activity rather than residential dwellings although some buildings in the foreground are part residential. In terms of townscape and visual effects the Proposed Development will be completely obscured by extant T1 so values of no change are registered for both categories. This translates to significance of effect values of **negligible** for both categories which is **not significant** in EIA terms.

Viewpoint 7 Liverpool Road

6.80 This viewpoint stands in the middle of Liverpool Road looking due west. In terms of townscape receptors, the central focus of the view is the Grade 1 former Liverpool Road Railway Station complex which lines Liverpool Road on the north side. This is a significant heritage asset and sensitive receptor. The viewpoint also lies inside Castlefield conservation area and in this location is judged to have a medium sensitivity with a limited ability to accommodate change as a result although it should be noted that the Factory is now emerging behind. In terms of visual receptors, there are some residential receptors at this location although Liverpool Road is a relatively quiet street remote from the busy thoroughfares of Deansgate and the Inner Ring Road. A value of medium sensitivity is therefore recorded for visual receptors. The Proposed Development sits well apart from the Grade 1 Liverpool Road building and joins the Factory, and T1, out of view here, as an accepted part of the emerging townscape character and there is no adverse effect on the heritage asset from a townscape perspective in this view. Values of minor beneficial are therefore registered for both the magnitude of visual and townscape effect. In terms of significance **minor beneficial** is recorded for both townscape and visual receptors both of which are **not significant** in EIA terms.

Viewpoint 8 Liverpool Road

6.81 This view seeks to explore the effect of the Proposed Development on the Museum of Science and Industry, a group of Grade 1 and 2 listed historic buildings, which dominates the view and is the principal focus of it bringing a strong sense of coherence and identity to the surrounding townscape, a factor recognized in its status as a Conservation Area. However, repair and restoration works are now proceeding with the result that the building is clad in protective sheeting at the present time. Modern intrusions into this view are absent, apart from the new Wilburn Street development at the end of Liverpool Road. New buildings, principally the OGS and Factory are, however, under construction in this view as the number of cranes testify but at present it is the single storey buildings that prevail and accentuate horizontal perspective, providing an uncluttered horizon in the process. Townscape receptor sensitivity is high as a consequence. Visual receptor sensitivity is high here also as the viewpoint is close to Deansgate and a high proportion of receptors are visitors to heritage assets with the asset in this case being of regional importance. The Proposed Development is however, barely visible even though when the protective cladding is removed slightly more of it will be seen and in the context of the dominance of the heritage asset an adverse effect is predicted. A value of negligible adverse is therefore registered for magnitude of both townscape and visual effect. This translates to values of **minor adverse** significance for both categories for this viewpoint which is **not significant** in EIA terms.

Viewpoint 33 St John's Gardens

- 6.82 This viewpoint located in the peaceful oasis of St John's Gardens in the heart of the St John's zone. The garden is heavily enclosed at a low level by vegetation and an upper level on the north side by a 6 storey office block of c.1970's origin. The susceptibility of the townscape to accommodate change from this location is judged to be medium as the horizon is open above the softly enclosing vegetation and presently unaffected by any major tall building development apart from T1 which is a new element in the baseline. It lies just outside the Conservation Area. Townscape sensitivity is medium therefore. Visual receptor sensitivity is judged to be medium as this will be filtered view to some degree and receptors will be users of a public space where the view is part of the wider experience of the place. However, in terms of magnitude of effect for townscape and visual categories, the Proposed Development will be completely obscured by extant T1. A value of no change is therefore recorded for both categories here which translates, in terms of significance into **no impact** which is **not significant** in EIA terms.

Viewpoint 34 St John Street

- 6.83 A street with a distinctive historic character arising from 2 to 3 storey Georgian terraced housing and provides a visual conduit right to the heart of the Proposed Development Site which lies within the St John's Masterplan. In terms of townscape susceptibility, in this high quality townscape setting, there is little ability to accommodate change in an area of high value. St John Street lies inside St John Street Conservation Area. Townscape sensitivity is therefore judged to be high. Visual receptor sensitivity is conversely low as most receptors in this street are at their place of work where the setting is not important to their quality of working life. The Proposed Development is almost completely obscured by extant T1 with only the top of the building perceptible. This translates to values of negligible for both magnitude of both townscape and visual effect. A value of minor **beneficial** is therefore recorded for townscape significance of effect and **negligible** for visual significance of effect both of which are **not significant** in EIA terms.

Viewpoint 35 Water Street

- 6.84 A street which provides views directly into the heart of the St John 's Masterplan area this viewpoint is witnessing dramatic changes in townscape character as a result of a number of St Johns masterplan schemes which are under construction. Susceptibility to change in townscape terms is low as a result and in the absence of any townscape designations townscape sensitivity is judged to be low. Visual receptors are mixed at this location ranging from residents of apartments, users of car parks, pedestrians and vehicle users translating to a medium sensitivity value for visual receptors overall. In terms of magnitude of townscape effect the Proposed Development fits well with the scale and character of the emerging townscape so a value of minor beneficial is registered for this viewpoint. In visual terms the Proposed Development complements extant T1, frames the view of the Factory beyond, and improves the composition of the view, although partially concealed behind the adjacent warehouse. A value of minor beneficial is registered for magnitude of visual effect. This translates to values of **negligible** significance for townscape receptors and **minor beneficial** for visual receptors both of which are not **significant** in EIA terms.

Viewpoint 55 Museum of Science and Industry

- 6.85 This viewpoint is deep within the Museum of Science and industry (MSI) and explores the impact of the Proposed Development on the relatively small space in the centre of the museum. Both townscape sensitivity and visual receptor sensitivity are judged to be high here in the context of a high quality historic townscape which attracts many visitors where views of the surroundings are likely to be an important part of the experience. The Proposed Development, however, will introduce a building that is clearly contemporary in origin, medium in scale and in close proximity to the consented extant T1, Manchester Goods Yard, No.1 Grape Street and the Factory schemes, most of which are now in construction just behind the MSI and which are beginning to make a considerable impact on the townscape character baseline. The Proposed Development fits into this mixed townscape character in a complimentary way but its presence will be softened, and to some extent obscured, by these

developments. For these reasons the magnitude of effect is judged to have a negligible effect for both townscape and visual receptors. Significance of effect for both categories is therefore **negligible** which is **not significant** in EIA terms

Zone J Chapel Street

Viewpoint 15 New Quay Street

- 6.86 This niche view down the River Irwell allows a full view of the Proposed Development to be obtained. Townscape sensitivity is judged to be medium as, from this perspective with much of the riverside, as yet, undeveloped, the area is judged to have some ability to accommodate change although the viewpoint lies just outside the Castlefield Conservation Area. Visual receptor sensitivity is judged to be medium also in the context of neighbouring hotels and apartments and the fact that this is a busy approach into the City Centre with good pedestrian access on the bridge and good views down the river Irwell. The Proposed Development occupies a prominent position in this view but complements the existing, and emerging, change in townscape character by augmenting T1, framing the distant Water Street Development and connecting with the Ordsall Chord bridge at ground level. A value of minor beneficial is recorded therefore, for magnitude of townscape effect. In visual effect terms the maximum elevation is in view here, the cladding and texture of the exterior fits in this context. A value of minor beneficial is also registered here for visual effects. In terms of significance of effect therefore, a value of **minor beneficial** is recorded for both townscape and visual receptor categories which is **not significant** in EIA terms.

Comparison with Previously Consented Scheme

- 6.87 The proposed development is of similar scale in comparison to its predecessor. This is confirmed by the illustrations in the Design and Access statement. Therefore the conclusion are similar to the extant T2 TVIA.

Assessment of Cumulative Effects

- 6.88 The cumulative effect of the Proposed Development is now examined in relation to intra- project and inter-project cumulative effects.

Inter-project cumulative effects

- 6.89 In terms of inter- project cumulative effects, or effects arising from similar developments that are either consented or are coming forward in the planning process in close proximity to the Proposed Development Site, there are developments that cumulatively, are considered to affect the significance values for townscape and views. It should be noted that these schemes include the revised Union T1 scheme submitted in December 2019. A list of relevant cumulative schemes can be found in the Appendices and are illustrated also in Appendix 6.2 TVIA Photos
- 6.90 The developments listed above will not have a universal effect on all of the selected viewpoints and the townscape character of the city centre zones assessed. In order, therefore, to assess the cumulative effect in a more systematic way, **Table 6.10**, has been compiled to summarise the effect of the Proposed Development on its own and then in respect of the relevant cumulative scheme on a viewpoint by viewpoint basis. Where a cumulative scheme is predicted to have an effect on a particular viewpoint or townscape character then the effect values are reassessed and adjusted accordingly to take the scheme or schemes into account, if it is judged that there is, in fact, a cumulative effect.
- 6.91 Of course as the cumulative schemes come forward then, in certain cases, visual receptor sensitivity is likely to increase as many of the developments contain apartments. However, by the same token, the magnitude of effect is likely to decline as the Proposed Development will now be seen in the context of a greater number of similar developments of equivalent scale. As a result, the net effect, where the effect is deemed to be significant, is generally a lowering of the significance of effect value in cumulative terms. This is exacerbated to a value of not significant if

the cumulative building obscures the view of the Proposed Development completely which occurs in a few cases.

Table 6.9 TVIA Cumulative & Residual Impact Assessment summary table

(Note. Where townscape (T) and visual receptor (VR) significance of effect values are the same, one, shared, value is provided. Where they are different, a value is provided for both categories)

Location	Development Only	Relevant Cumulative Scheme	Cumulative Effect
1 Lower Byrom St Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	Low Medium No change No change Negligible	OGS T1 Manchester gds yd	None
6 Ring Road Junction Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	Medium Medium – low Moderate beneficial Minor beneficial Minor beneficial	St Johns Tower Factory Trinity	Negligible beneficial
7 Liverpool Road Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	Medium Medium Minor beneficial Minor beneficial Minor beneficial	T1 Factory	None
8 Liverpool Road Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	High High Negligible Negligible Minor adverse	Factory OGS	Negligible adverse
15 New Quay Street Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	Medium Medium Minor beneficial Minor beneficial Minor beneficial	St Johns Trinity T1	Negligible beneficial
19 Castlefield bowl Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	Low Medium Moderate beneficial Minor beneficial Minor beneficial	St Johns Tower Factory Manchester gds yd	Negligible beneficial

22 Castlefield basin Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	Medium Medium Minor beneficial Minor beneficial Minor beneficial	St Johns Tower	Negligible beneficial
33 St John's gardens Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	Medium Medium No Change No Change No impact	St Johns Tower OGS T1	None
34 St John Street Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	Low High Negligible Negligible Negligible	St Johns Tower OGS T1	None
35 Water Street Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect(T) (VR)	Medium Low Minor beneficial Minor beneficial Negligible Minor beneficial	T1 St Johns Tower The Factory	Negligible beneficial
55 Museum of Science and Industry Sensitivity (VR) Sensitivity (T) Magnitude (VR) Magnitude (T) Significance of effect	High High Negligible Negligible beneficial Negligible beneficial	St Johns Tower Factory T1 Manchester Gds Yd	None

Mitigation Measures

Mitigation of effects during the construction phase.

- 6.92 Mitigating the effects of the construction phase will involve high quality hoardings that will be used to limit unsightly visual impacts during the construction phase at street level. These will secure and protect the Proposed Development Site and prevent views of an unsightly construction site.

Mitigation of effects during operational phase

- 6.93 Mitigation measures for the operational phase are focused on embedded mitigation measures which are an integral part of the design of the building and fully described in the Design and Access Statement which accompanies the planning application. These mitigation measures deal with the Proposed Development's relationship to neighbouring buildings and its location.

Residual Impacts

- 6.94 The visual impact assessment has been carried out based on the assumption that all the necessary mitigation measures have been accounted for in the design process. The images for selected viewpoints illustrated in **Appendix 6.2** represent the accurate definition of the location and mass of the component parts of the Proposed Development. The predicted significance of effect values are therefore the same for each representative viewpoint and Townscape Character Area as the residual effect values and are illustrated in Table 6.10.

Ref . No.	Reference
6.1	The European Landscape Convention (ELC, 2000)
6.2	National Planning Policy Framework 2019 Dept Communities and Local Government
6.3	Manchester City Council Core Strategy 2012
6.4	Guidelines for Landscape and Visual Impact Assessment 3 rd Edition 2013 landscape Institute and Institute of Environmental Management and Assessment
6.5	Historic England note on tall building 2014
6.6	Manchester Residential Quality Guidance MCC 2017
6.7	Landscape Institute Technical Guidance Note 06/19 September 2019 , Landscape Institute

7 Historic Built Environment

Introduction

- 7.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development with respect to the direct and indirect heritage impacts Historic Built Environment only. This Chapter describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 7.2 This chapter has been prepared by Stephen Levrant Heritage Architecture Ltd., an architectural practice specialising exclusively in the historic cultural environment. The assessment was carried out by Kirsten McKnight, a Historic Building Consultant and member of the IHBC who has experience of undertaking heritage impact assessment including preparation of Environmental Statement chapters. This Chapter is accompanied by one Technical Appendix: the accompanying Heritage Statement (SLHA : March 2021) (Appendix 7.1).
- 7.3 This Chapter should be read alongside Chapter 6 Townscape and Visual Impact Assessment by Chris Burnett, which assesses the impact of the Proposed Development over a wider area and assesses it against townscape character, visual amenity and effects on people.

Legislative and Policy Context

Planning (Listed Buildings and Conservation Areas) Act 1990

- 7.4 As the Site is within the Castlefield Conservation Area, **Section 72** of the Act is of relevance as it requires the Local Planning Authority to pay special attention to the “desirability of preserving or enhancing the character and appearance” of the designated area. Consequently, it is important to consider the Site as a contributor to the character of the designated Conservation Area and the impact of the Proposed Development on this aspect of the wider historic environment. This chapter is considered primarily in this legislative context.
- 7.5 The Site is also adjacent to and within the setting to a number of listed buildings. Section 66 of the Act requires the Local Planning Authority to “*have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses,*” when considering whether to grant planning permission.

National Planning Policy Framework (2019)

- 7.6 Section 16 of the National Planning Policy Framework (NPPF) sets out the Government’s planning policies on the conservation of the historic environment.
- 7.7 The policies in the NPPF constitute the Government’s view of what sustainable development in England means in practice. In these terms development proposals which fail to give due weight to the conservation of heritage assets are deemed not to be sustainable development and consequently should not be supported. This is because one of the key dimensions of sustainability is protecting and enhancing our historic environment (**NPPF paragraph 8**).
- 7.8 The focus of the Government’s planning policy guidance is to ensure that account is always taken of the desirability of sustaining and enhancing the significance of heritage assets and for new development to make a positive contribution to local character and distinctiveness (NPPF paragraph 185).
- 7.9 The NPPF stresses that “great weight” should be given to the conservation of designated heritage assets (**NPPF paragraph 193**), emphasising the need to avoid substantial harm, in terms of demolition, alteration or the compromise of its setting. In this instance, this relates to the designated

Castlefield Conservation Area and identified Listed Buildings. It will be clear that the redevelopment of a site adjacent to heritage assets could affect the setting of them, and that could be either beneficial or harmful. The fundamental objective is to ensure that the balance of the impact on the heritage assets is demonstrably beneficial, minimising any negative impact on their significance.

Local Planning Policy: Manchester City Council Unitary Development Plan (1995) and Core Strategy (2012)

- 7.10 Extant policies DC18.1 and DC19.1 of the UDP and Policies EN3 and CC9 of the Core Strategy are relevant to this assessment. These policies seek to preserve and enhance the setting of buildings and areas of architectural or historic interest.

Assessment Methodology and Significance Criteria

- 7.11 This assesses the effect of the Proposed Development on designated built heritage assets, both within the Application Site and within a 250m study area.

Baseline Assessment

- 7.12 The baseline assessment was undertaken using a combination of desk-based study, research and fieldwork to identify and assess the heritage significance of the designated and non-designated heritage asset receptors. It also establishes the way in which the settings and the Site contribute to the heritage significance of these assets.
- 7.13 The identified receptors (designated heritage assets) are individually valued and the impact on them assessed giving a significance of effect. Individual viewpoints from which to undertake the Visual Impact Assessment were determined following site inspection and discussion with Historic England.
- 7.14 In order to predict the magnitude and significance of visual impact upon the settings of the identified heritage assets, the following criteria was considered:
- The sensitivity and proximity of receptors;
 - The nature of the existing views;
 - The degree of change to existing views and visibility of the Proposed Development; and
 - The availability and amenity of alternative views.

Assessment Methodology

- 7.15 The assessment methodology for the Historic Environment and Visual Impact is a synthesis of established guidance, best practice and professional judgement. In accordance with an adapted form of the methodology set out in the Historic England Guidance on "*the setting of heritage assets (2017)*", all receptors identified in the baseline which might be affected by the Proposed Development are valued and the impact on them is assessed in order to give a significance of effect. The following Historic England (formerly English Heritage) guidance has also been utilised for the assessment:
- DCMS's Principles of Selection for Listing Buildings (2010);
 - Historic England's Conservation Principles, Policies and Guidance (2008);
 - Historic England's Seeing the History in the View (May 2011);
 - Historic England's Good Practice Advice Note 3: The Setting of Heritage Assets (2015);
 - Historic England's Good Practice Advice Note 4: Tall Buildings (2016); and
 - Historic England's Understanding Place: Conservation Area Designation, Appraisal and Management (2011).
 - Historic England (2019). Statements of Heritage Significance: Analysing Significance in Heritage Assets. Advice Note 12

- 7.16 The aim of this assessment has been:
- To establish the baseline environment regarding designated heritage assets related to the historic built environment, i.e. Listed Buildings and Conservation Areas.
 - Assessment of the significance of the known resource.
 - Evaluation of the magnitude of impacts on identified resources.
 - Identification of mitigation in the form of further surveys, investigation and recording to be undertaken in light of the identified impacts.
- 7.17 Identification and description of the baseline environment has involved a combination of desk-based review of plans, maps, records and other documents, consultation with Historic England (2016) and non-intrusive surveys (2016 – 2020).
- 7.18 A survey of the surrounding area was conducted in February 2020 by visual inspection, in order to map out and identify the settings of the designated heritage assets that could be affected by the Proposed Development. Consideration has also been given to the historical development, non-designated heritage assets, building types and materials, key views to the notable historic buildings which contribute to the identification of the built form, and understanding of the special interest of the area. The views selected are consistent with those previously agreed with Historic England (2016) for the original scheme. For the purpose of this assessment, 10 of the 17 views have been scoped in where a) there is a baseline value to the view, in heritage terms, and b) where the proposed development was visible, and c) sensitive / key viewpoints which test whether the Proposed Development would have any perceived impact on the experience or appreciation on designated heritage assets.
- 7.19 For the purposes of this assessment, consideration has been given to the relevant part of Manchester City centre that surrounds the site a 250m radius of the Site. The study area provides a focus for assessment but is not intended to be prescriptive; buildings outside the boundary of the study area are considered where relevant and vice versa.
- 7.20 The characterisation appraisal, of the study area, which informed the selection of key views for the visual impact assessment, took into account the following factors which define the historic character and distinctiveness of the area surrounding the Site: open spaces, public realm, materials, views into and from the Site, current and historic uses and the urban grain.
- 7.21 Information was collated from a number of sources including:
- Manchester Local Images Library.
 - Manchester Archives.
 - The National Heritage List (Historic England).
 - Manchester City Council Planning website.
 - John Rylands University Library website.

Significance Criteria

- 7.22 Criteria have been established to appraise a heritage asset's significance. Statutory criteria, as set out in the 'Principles of Selection for Listing Buildings', DCMS, 2010, provides a list of principles of assessing significance based on architectural and historic interest, age and rarity, aesthetic merits, selectivity and national interest. Historic England (formerly English Heritage)'s criteria outlined in 'Conservation Principles, Policies and Guidance,' are also considered in this assessment.
- 7.23 Evaluation of significance has been informed primarily by the designation of the assets at an international, national, regional or local level as well as their ability to contribute to an understanding of the past. This value rating had also been applied when considering sensitivity of views containing heritage assets. Indicative definitions for each of these ratings are outlined in Table 7.1 below:

Table 7.1 Significance Criteria for determining the value of heritage assets

Significance	Definition
High	Grade I and Grade II* listed buildings. Other buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade. Conservation Areas containing very important buildings.
Medium	Grade II listed buildings. Historic buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation areas containing buildings that contribute significantly to its historic character.
Low	Locally listed buildings. Historic buildings of modest quality in their fabric or historical association.

Assessment of Effects and Evaluation of the Magnitude of Impact

- 7.24 Impacts may be beneficial or adverse. If the Proposed Development will enhance heritage values or the ability to appreciate them, as expressed in the first stage of the assessment, then the impact on heritage significance will be deemed to be beneficial. However, if they fail to sustain heritage values or impair their appreciation then the impact will be deemed to be adverse.
- 7.25 Table 7.2 summarises the factors to be taken into account when assessing the magnitude of impact. This table is adapted from ICOMOS Guidance on Heritage Impact Assessments (2011) and Historic England Guidance on setting (2017). The criteria are not intended to be prescriptive and the weighting to be accorded to each requires professional judgement.

Table 7.2 Criteria for determining the magnitude of impact

Magnitude of impact	Criteria for assessing impact
Major beneficial	The development considerably enhances the heritage values of the heritage assets, or the ability to appreciate those values.
Moderate beneficial	The development enhances to a clearly discernible extent the heritage values of the heritage assets, or the ability to appreciate those values.
Minor beneficial	The development enhances to a minor extent the heritage values of the heritage assets, or the ability to appreciate those values.
Negligible	The development does not affect the heritage values of the heritage assets in the view, or the ability to appreciate those values.
Minor adverse	The development erodes to a minor extent the heritage values of the heritage assets, or the ability to appreciate those values.
Moderate adverse	The development erodes to a clearly discernible extent the heritage values of the heritage assets, or the ability to appreciate those values.
Major adverse	The development severely erodes the heritage values of the heritage assets, or the ability to appreciate those values.

Significance of effect

- 7.26 The assessment of the significance of effect is derived from ICOMOS guidance (2011) and Historic England Guidance on setting (2016) as outlined above. The effect on the experience and appreciation of heritage assets and heritage significance within views may depend on both the magnitude of impact and the value and importance of the resource; this is how the overall impact of the proposed development is determined.
- 7.27 Derived by combining the significance rating of the resource with the magnitude of impact for each asset, Table 7.3 illustrates how information on the significance of the asset and the magnitude of the impact has been combined to arrive at an assessment of the significance of effect. The matrix is not intended to 'mechanise' judgment of the significance of effect but act as a check to ensure that judgments regarding value, magnitude of impact and significance of effect are reasonable and balanced.

Table 7.3 – Significance of effect matrix

Magnitude	Sensitivity		
	High	Medium	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

Limitations and Assumptions

- 7.28 Survey of the identified heritage assets within the study area was from publicly accessible areas. As such the study is limited to assessment from ground level.
- 7.29 Assessment of below ground archaeology does not form part of this assessment.

Baseline Conditions

- 7.30 The assessment has identified 18 no. heritage assets within the study area (Table 7.4 and Figure 7.1).

Table 7.4 Identified Heritage Assets and contribution of setting to significance

Heritage Asset (No. on Figure 7.1)	Value
Former Liverpool Road Station (11), Grade I listed	Medium
Old Warehouse (2), Grade I listed	Medium
Railway Bridge (Manchester) (8), Grade I listed	Low-to-Medium
Railway Bridge (Salford) (8), Grade I listed	Low-to-Medium
Railway viaduct to Liverpool Road Station (13), Grade II listed	Low-to-Medium
Albert Warehouse (Victoria and Albert Hotel) (4), Grade II listed	Low-to-Medium
Railway viaduct to Lower Byrom Street Warehouse (15), Grade II listed	Low-to-Medium
123 Liverpool Road (5), Grade II listed	Medium

Heritage Asset (No. on Figure 7.1)	Value
Commercial Hotel, Liverpool Road (10), Grade II listed	Medium
Colonnaded railway viaduct (6), Grade II listed	Low-to-Medium
Irwell Street Bridge (9), Grade II listed	Low-to-Medium
Bollards to St John's Passage (12), Grade II listed	Low
Manchester and Salford Junction Canal Tunnel (16), Grade II listed	n/a
St John's College of Further Education (Great John Street Hotel) (3), Grade II listed	Low
Former Lower Byrom Street Warehouse (1), Grade II listed	Low-to-Medium
Power Hall of MOSI (14), Grade II listed	Low-to-Medium
Former Grape Street Railway Bonded Warehouse (7), Grade II listed	Low-to-Medium
Castlefield Conservation Area	High
St Johns Conservation Area	High

Historical Context

- 7.31 The following historical context should be read alongside the map regression in Section 4 of the Heritage Statement in Appendix 7.1 of this document.
- 7.32 The immediate environs surrounding the former ITV Granada Site as it is today, began developing following the establishment of the first of Manchester's Quay's in the late 18th century. This first quay was located at approximately the junction of Water Street and Quay Street, thus giving Quay Street its name.
- 7.33 By the beginning of the 19th century other warehouses and wharves had been constructed and a handful of small residential roads and courts, which were interspersed with warehousing and industrial buildings, leading off Quay Street southwards into what is today the car park of the ITV Granada Studio.
- 7.34 In regard to the Liverpool Road Station/ SIM complex, the cutting of the Bridgewater Canal in 1765, to the south of this area, reinforced this location as a hub of transportation and industry. By 1808, the line of Liverpool Road had been laid out, and in 1810 a red-brick double-fronted town house had been erected on the corner of Water Street. In 1830 the construction of the Liverpool Road Station (Grade I Listed) saw the construction of the group of station buildings to the western end of Liverpool Road and incorporating the existing town house of 1810 into the new station as the station masters residence. The station development included the stone bridge over the Irwell (Grade I listed), a brick viaduct and a cast iron bridge over Water Street (replaced 1905 & Grade II Listed).
- 7.35 Rapid development of the railways followed including the MSJ&AR Viaduct in 1850 and the partial redevelopment of the station following a warehouse fire in 1866, by which time the station was used exclusively for transporting goods. The fire resulted in two early warehouses being replaced by a Bonded Warehouse on Grape Street in c1867, which was originally named the Charles Street Warehouse before 1888. The eastern end of Liverpool Road was characterised by blocks of three-storeyed weaver's terraces and back courtyard dwellings behind. The northern side of the street was the St Matthews Church (designed by Sir Charles Barry, demolished 1951) with its Sunday school to the southern side of the street (Grade II Listed). Two iron and glass market buildings were constructed either side of the church in the 1870's.

- 7.36 During the 1880's, developments on the station site saw the Lower Byrom Street Warehouse, which is now occupied by the Museum of Science and Industry (MSI), being constructed along with an accumulator tower to generate the good's yard machinery with hydraulic power.
- 7.37 Except for the areas of late-20th century residential blocks to the western end of the street, today the area largely remains unchanged as it did in the mid-19th Century. The railway buildings have been redeveloped for use as SIM and the former railway and industrial buildings form a significant grouping which can be understood and appreciated as a multi-phased railway station development.
- 7.38 The area surrounding the Site witnessed constant and dramatic sequences of both development of new ventures and industries and their subsequent decline. The area was first developed in the middle of the 18th century, and initially formed around the first quay in Manchester located at the Water Street/ Quay Street junction, branching out soon after to meet with the burgeoning town of Manchester along its main thoroughfare of Deansgate by the late-18th Century. The decline of industry 150 years later saw the area become underused and derelict.
- 7.39 Following the demolition of the majority of early, and mid-Victorian industrial buildings along Water Street, and the construction of the Mancunian Way and the associated road network by the 1960s, the area immediately surrounding the subject site become shorn of any historic context and was largely unused and derelict.
- 7.40 The development of the Granada ITV site created a large inward facing site with little streetscape presence.

Conservation Area

- 7.41 The Site is within the Castlefield Conservation Area and adjacent to St John's Conservation Area and Peter Street/ Deansgate Conservation Area.
- 7.42 As has been demonstrated, the Castlefield Conservation Area is extensive and the part that covers the St Johns Masterplan site, and its environs, is formed of a variety of character areas. The analysis of the different character areas has highlighted the areas which have a positive contribution to the overall character of the Conservation Area.
- 7.43 Whilst the areas Castlefield Basin/ Potato Wharf, Liverpool Road and the ITV site illustrates the late 18th – mid 19th Century industrial development of the area, the Site illustrates the subsequent early-mid 20th century re-development and long decline of this part of the area. The Site contains two early 20th Century buildings which are not considered to be positive contributors to the overall character of the Conservation Area.
- 7.44 The adjacent St John Street Conservation Area was designated due to the high architectural interest of the buildings on St John Street, which is the only surviving Georgian terraced street in central Manchester.
- 7.45 The adjacent Deansgate/Peter Street Conservation Area is also focused on the high architectural interest of the development focused on particular streets, but this time it is the Victorian commercial development in this part of the city centre.

Statement of Significance

- 7.46 The Site is a negative element to the character and appearance of the Castlefield Conservation Area. This is due to the fact that any historic buildings upon the Site have been removed piecemeal since the 1950's.
- 7.47 The Site yields no heritage value and is generally a negative contributor to the setting of nearby heritage assets.

- 7.48 The primary focus of the Conservation Area is the Castlefield Basin/ Potato Wharf area and Liverpool Road, as these areas contain a large number of listed buildings which best characterise the development of the railways and canal network, and associated industry in this part of the city.
- 7.49 Surrounding character areas such as the Quay Street Area have been affected by redevelopment in the mid-late 20th Century but contain landmark buildings which allow for the understanding and appreciation of the commercial development of the area.

Identification and Evaluation of Significant Effects

- 7.50 Heritage assets are susceptible to numerous forms of development and non-development impacts both during the construction process and as a consequence of the operational life of the Development. The potential effects in relation to the current Proposed Development have been deemed to relate to impacts on the setting of the identified heritage assets only.
- 7.51 Detailed evaluation of the impacts of the identified heritage assets are provided within the Impact Assessment set out in Section 6 of the Heritage Statement within Appendix 7.1.

Construction Phase

- 7.52 Due to the proximity of the Grade II listed Bonded Warehouse and Victoria and Albert Warehouse (Marriot Hotel) to the Site, the potential effects of the demolition and construction phase will result in temporary, localised minor adverse impacts on the ability to understand and appreciate the setting of the building. The construction would be managed in the context of a construction management plan which will ensure there will be no detrimental impact upon nearby heritage assets. Therefore, there will be no unmitigated impact upon the heritage assets during the construction phase, resulting in an overall neutral impact.
- 7.53 It will be clear that the Proposed Development will result in no physical impact upon the Grade II Manchester and Salford Junction Canal Tunnel.

Operational Phase

- 7.54 The operational phase is defined as the completion of the development. The impact upon the surrounding heritage assets during this phase is therefore considered to be final.
- 7.55 The potential effects of the Proposed Development are considered in full within the Heritage Visual Impact Assessment (HVIA) in Section 6 of the Heritage Statement, Appendix 7.1.
- 7.56 The Proposed Development will result in 4 instances of minor adverse impact; 1 negligible adverse; 4 neutral and 1 negligible beneficial.
- 7.57 The Proposed Development Site forms part of a previously consented scheme (114723/FO/2016), as approved March 2017. Whilst the impact assessment conclusions remain largely similar for both schemes, changes to the surrounding townscape and the materiality of the Proposed Development have resulted in some minor changes to the overall conclusions.

Mitigation Measures

- 7.58 Heritage considerations have been integral to the design of the proposals. Enlisting appropriate specialists and consultation with the local authority has informed the design development and assessment process to ensure potential adverse visual impacts on the identified heritage assets are minimised.
- 7.59 The physical impact of the Proposed Development will be controlled by the measures as set out in the construction management plan. There will be no direct impact on any heritage assets, however the indirect (visual) impact on the character of the area will enhance the use and therefore sustainability of the identified heritage assets. While the impact of the regenerated townscape will change by means of the construction of the Proposed Development, the character and experience of the identified

heritage assets will not be compromised by the development and will be partially mitigated by the enhanced vitality of the area.

Cumulative Effects

7.60 The impact of each of the committed developments within has been tested separately and accepted. The overall cumulative effects of these committed developments, alongside the Proposed Development, is not considered to cause any additional significant impact on the baseline historic built environment beyond what has been established for the Proposed Development and Baseline scenario. Therefore impact from cumulative effects is as identified within Table 7.5. Therefore, direct and indirect cumulative impact in terms of heritage assets and/or the experience of those heritage assets is as identified in Table 7.5.

Residual Effect

7.61 Consideration to mitigating the impacts on the identified heritage assets has been made throughout the development of the Proposed Development. Consequently, the residual effects will be the same as the potential effects discussed.

7.62 A summary of the potential and residual effects is set out below in Table 7.5.

Table 7.5 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Receptor(s)	Likely Significant Effect	Mitigation Measure	Residual Effect
Construction Phase			
Bonded Warehouse	Minor adverse	Construction methodology and programme	Minor Adverse (temporary)
Victoria and Albert Warehouse (Marriot Hotel)	Minor adverse	Construction methodology and programme	Minor Adverse (temporary)
Operational Phase			
Former Liverpool Road Station, Grade I listed	Minor adverse	Public benefits	Minor adverse
Old Warehouse, Grade I listed	Minor adverse	Public benefits	Minor adverse
Railway Bridge (Manchester), Grade I listed	Negligible	Public benefits	Negligible
Railway Bridge (Salford), Grade I listed	Negligible	Public benefits	Negligible
Railway viaduct to Liverpool Road Station, Grade II listed	Negligible	Public benefits	Negligible
Albert Warehouse (Victoria and Albert Hotel) (4), Grade II listed	Minor adverse	Public benefits	Minor adverse
Railway viaduct to Lower Byrom Street Warehouse (15), Grade II listed	Negligible	Public benefits	Negligible
123 Liverpool Road (5), Grade II listed	Neutral	n/a	Neutral
Commercial Hotel, Liverpool Road (10), Grade II listed	Neutral	n/a	Neutral
Colonnaded railway viaduct (6), Grade II listed	Negligible	Public benefits	Neutral
Irwell Street Bridge (9), Grade II listed	Negligible	Public benefits	Neutral
Manchester and Salford Junction Canal Tunnel (16), Grade II listed	Neutral	n/a	Neutral
St John's College of Further Education (Great John Street Hotel) (3), Grade II listed	Neutral	n/a	Neutral

Former Lower Byrom Street Warehouse (1), Grade II listed	Negligible	Public benefits	Negligible
Power Hall of MOSI (14), Grade II listed	Minor adverse	Public benefits	Minor adverse
Former Grape Street Railway Bonded Warehouse (7), Grade II listed	Minor adverse	Public benefits	Minor adverse
Castlefield Conservation Area	Negligible	Public benefits	Negligible
St John's Conservation Area	Negligible	Public benefits	Negligible

Summary

- 7.63 The visual impact assessment has demonstrated that the Proposed Development will result in minor adverse impacts on the settings of five listed buildings. However, this will not significantly compromise the ability to understand or appreciate the significance of these heritage assets.
- 7.64 Mitigation for instances of any perceived adverse harm are accrued by the substantial public benefits of the Proposed Development, including significant regeneration benefits and provision of new homes. The benefits to the surrounding heritage assets will be indirect and relate to the enhancement of the surrounding townscape which will in turn ensure their sustainability.
- 7.65 The Proposed Development will introduce new features to the city skyline signifying presence and activity within a key gateway site. It will create a point of interest and encourage movement through the surrounding area which will help to revitalise the area and act as a catalyst for further development.
- 7.66 Overall, the effect of the Proposed Development on the identified Heritage resource as a whole would be minor adverse.

References:

- Highways Agency. 2007. Design Manual for Roads and Bridges, Volume 11, Section 3, Part 2 HA 208/07 – Cultural Heritage;
- DCMS's Principles of Selection for Listing Buildings (2018);
- Historic England's Conservation Principles, Policies and Guidance (2008);
- Historic England's Good Practice Advice Note 2: Managing Significance in Decision-Taking in the Historic Environment (March 2015);
- Historic England's Good Practice Advice Note 3: The Setting of Heritage Assets (2017);
- Historic England's Good Practice Advice Note 4: Tall Buildings (2016); and
- Historic England's Understanding Place: Conservation Area Designation, Appraisal and Management (2017).

8 Noise and Vibration

- 8.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development with respect to noise and vibration. This chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 8.2 This Chapter has been compiled by Fisher Acoustics Ltd. Fisher Acoustics has extensive experience in the acoustic design of large-scale residential and commercial developments. The Director of Fisher Acoustics is a Chartered Engineer, holds a First Class Bachelor of Engineering in applied acoustics and has 28 years' post-graduate experience in acoustic consultancy.

Legislative and Policy Context

Legislation

- 8.3 The Control of Pollution Act 1974 contains powers for local authorities to deal with noise and vibration from construction and demolition sites. Prior consent for demolition and construction activities can be granted under Section 61 of the Act.
- 8.4 The Planning and Compulsory Purchase Act 2004 requires local authorities to draw up local development plans, setting the broad framework for acceptable development in their area and reconciling any potential conflicts. Under the Town and Country Planning Act 1990, and in their development management role, local planning authorities may attach conditions to Planning Consents which may include controls on the emission of noise. Advice on the use of these powers is given to English authorities in the light of the Governments Noise Policy Statement for England in the National Planning Policy Framework (February 2019).
- 8.5 The Environmental Protection Act 1990 provides the principal controls over so-called 'statutory nuisances', including noise emitted from premises so as to be prejudicial to health or a nuisance. Under the Act, local authorities have a duty to inspect their areas from time-to-time to detect nuisances and, subject to a discretion to defer for seven days, when satisfied that a statutory nuisance exists or is likely to occur or recur, to serve an abatement notice on the person responsible. They also have a duty to investigate any complaint made by a person living within their area. Businesses are able to rely on the provision of 'best practicable means' to attenuate noise sources, but failure to comply with a notice is a criminal offence. Local authorities have a power of entry to private premises, power to seize noise-making equipment and powers to carry out works in default of Notices.
- 8.6 The Licensing Act 2003 establishes a scheme administered by local authorities for licensing premises which are used for the supply of alcohol, to provide 'regulated entertainment' or to provide 'late night refreshment'. Licensing authorities are obliged to prevent public nuisance, e.g. through noise, via the use of appropriate conditions.

National Planning Policy

- 8.7 The National Planning Policy Framework (NPPF), published in February 2019 by the Ministry of Housing, Communities and Local Government 'sets out the Government's planning policies for England and how these should be applied'.
- 8.8 Clause 170 of the National Planning Policy Framework states that 'Planning policies and decisions should contribute to enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability'

8.9 Clause 180 of the National Planning Policy Framework states that:

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

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

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

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.”

8.10 The National Planning Policy Framework document cross references the ‘Explanatory Note to the Noise Policy Statement for England’. The ‘Noise Policy Statement for England’ (NPSE) was published by the Department for Environment Food and Rural Affairs in March 2010. The NPSE does not give suggested external noise criteria for commercial Developments. In the absence of specific criteria, reference shall be made in this document to established guidance and principles, as established in British Standards and the local Planning policy.

National Planning Practice Guidance – Noise

8.11 ‘Planning Practice Guidance – Noise’ is a web-based resource provided by the Ministry of Housing, Communities and Local Government (last revision date 22 July 2019) which gives guidance on Planning considerations in relation to noise.

8.12 The document identifies the subjective grading of noise and the recommended actions and different effect levels, as reproduced in Table 8.1.

Table 8-1: Summary of noise exposure hierarchy based on average response

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television;	Observed Adverse Effect	Mitigate and reduce to a minimum

Perception	Examples of Outcomes	Increasing Effect Level	Action
	speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.		
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Local Planning Policy

Manchester's Local Development Framework – Core Strategy Development Plan 2012-2027

- 8.13 The local planning context is provided by Manchester's Local Development Framework, Core Strategy, Development Plan Document. The Document was adopted on 11th July 2012.
- 8.14 With regard to noise, Policy DM1, Development Management, states that:

'all development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document: 'effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.'

'Planning & Noise, Technical Guidance' issued by Manchester City Council, December 2015

- 8.15 'Planning & Noise, Technical Guidance', dated December 2015 has been issued by the Environmental Protection, Environmental Health and The Neighbourhoods Service sections of Manchester City Council. The document provides guidance to applicants and consultants concerning the assessment and prediction of environmental noise associated with a particular development. Reference is also made in the document to the relevant supporting information and guidance documents that Developers are expected to refer to when submitting a planning application.
- 8.16 'Planning & Noise, Technical Guidance' refers to the following guidance documents:
- BS 7385 (1990) Evaluation and measurement of vibration in buildings
 - BS4142 (2014) Methods for rating and assessing industrial and commercial sound
 - BS 8233 (2014) Guidance on sound insulation and noise reduction for buildings
 - BS 6472 (2008) Guide to the evaluation of human exposure to vibration in buildings
 - BS 5228 (2009+A1:2014) Code of practice for noise and vibration control on construction and open sites
 - BS 7445-1 (2003) The description and measurement of environmental noise: Guide to quantities and procedures
 - BS 717-1 (2013) Acoustics. Rating of sound insulation in buildings and of building elements. Airborne sound insulation
 - National Planning Policy Framework (2012) (now on 2019 update)
 - National Planning Policy Guidance (2014)
 - WHO (1999) Guidelines for Community Noise.

Manchester Residential Quality Guidance, (Issue 01, March 2017)

- 8.17 Section 4 of 'Key Actions - Ensure Visual and Acoustic Privacy' of The Manchester Residential Quality Guidance states that 'Homes are places of retreat. Residents should be able to 'shut out' the external world and enjoy sleep without suffering from either external noise generated by traffic or the public realm; or from neighbouring homes, common spaces or other functions in the building'.

Manchester City Council – Noise from construction and demolition sites

- 8.18 Manchester City Council provides outline information on the control of noise pollution from construction sites in an undated guidance document entitled 'Guidance on completing an application for prior consent; Noise from construction and demolition sites'.
- 8.19 The document sets out the steps that should be taken when completing a Section 61 application. Where a Section 61 application is not to be made, the document provides a useful reference document, as it highlights the construction noise assessment method that Manchester City Council are likely to employ when assessing planning applications.
- 8.20 The document states that:
- 'The assessment should be completed as per British Standard 5228 (Parts 1 & 2) and usually takes the form of the ABC Method. To assess the impact of noisy work, baseline levels of ambient noise and vibration on the site boundary should be established. These data / details may be available from work carried out for the planning application stage of the development. The measured noise and vibration data should include results for periods during which the works will be carried out. Predictions of construction noise should be calculated at one metre, free field, from the facades of the worst affected (generally the nearest) sensitive receptors, thus allowing for a 'worst case scenario' noise assessment to be made'.**

British Standards

BS 4142: 2014

- 8.21 BS4142 (2014) 'Methods for rating and assessing industrial and commercial sound noise' details assessment methods to determine the likely effects on people inside or outside residential buildings of noise of an industrial nature such as fixed building services plant.

BS 5228: 2009+A1: 2014

- 8.22 BS 5228: 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites' provides guidance on significance criteria for construction noise.

BS 6472: 2008

- 8.23 BS6472-1: 2008 'Guide to evaluation of human exposure to vibration in buildings - part 1: Vibration sources other than blasting' provides guidance on typically acceptable limits for vibration within residential and office buildings during the day and night.

BS 8233: 2014

- 8.24 BS 8233: 2014 'Guidance on sound insulation and noise reduction for buildings' provides appropriate criteria for acceptable levels of noise within dwellings.

Other Standards

Design Manual for Roads and Bridges

- 8.25 Volume 11, Part 7 of the Design Manual for Roads and Bridges (DMRB) highlights methods for the assessment of traffic noise levels and advises on the impact magnitude of changes in noise levels.
- 8.26 The DMRB advises that the threshold criteria used for traffic noise assessment during the day is a permanent change in magnitude of 1 dB LA10,18h in the short term (i.e. on opening) or a 3 dB LA10,18h change in the long term (typically 15 years after project opening).
- 8.27 Furthermore, the DMRB also states that a change in noise level of 1 dB LA10,18h is equivalent to a 25% increase or a 20% decrease in traffic flow, assuming other factors remain unchanged and a change in noise level of 3 dB LA10,18h is equivalent to a 100% increase or a 50% decrease in traffic flow.
- 8.28 Given that the expected increase in road traffic on local roads due to the operation of the Proposed Development is less than 25%, the threshold criteria are not expected to be reached. Therefore, a specific assessment of operational phase traffic noise is not proposed.

Assessment Methodology and Significance Criteria

- 8.29 In order to assess the potential environmental noise and vibration effects of the Proposed Development, the following methodology has been adopted:
- Liaison with Manchester City Council Environmental Health department to agree noise and vibration assessment methodologies;
 - Identification of significant existing noise and vibration sources and existing sensitive receptors and baseline monitoring locations;
 - Reference to results of previous noise surveys carried out around the Site that quantify the environmental noise levels at selected existing noise sensitive locations, such as residential properties, and at the location of the Proposed Development;
 - Measurement of environmental noise levels at the site due to road traffic and rail movements to the northwest of the Site.

- Calculation of noise and vibration levels likely to arise at the nearest sensitive receptors during construction phases using the procedures and guidance given in BS 5228-1: 2009+A1:2014 'Code of Practice for noise and vibration control on construction and open sites';
- Review of measured noise climate at the Site in order to derive appropriate environmental noise limits for commercial units within the Proposed Development;
- Review of measured noise climate at the Site in order to derive appropriate environmental noise limits for stationary building services plant serving the Proposed Development;
- Interpretation of results and comparison of the likely noise levels with relevant national criteria and guidance for construction noise;
- Where appropriate, formulation of proposals for controlling noise and vibration during the construction works, to be agreed with Manchester City Council Environmental Health department;

8.30 In addition, potential impacts on the Proposed Development from the following principal local noise and vibration sources have been assessed:

- Traffic on local roads;
- Train movements; and
- Noise from building services plant within the Proposed Development affecting the buildings within the development.

8.31 With regard to potential vibration impact on the Proposed Development, a train line is located approximately 80 metres from the Proposed Development. This distance is such that there will be considerable attenuation of ground borne vibration and thus it is not considered necessary to conduct measurements of train-generated vibration at and around the Site. Road traffic generates insignificant levels of groundborne vibration.

8.32 This Chapter includes the results of calculations of construction noise and vibration levels at the nearest residential properties to the Site and a comparison of these predicted noise levels with noise limits based on guidance given in BS 5228-1: 2009+A1:2014.

8.33 The results of environmental noise surveys around the Site and the determination of the likely environmental noise effect of the Proposed Development on the surrounding residential areas are presented.

8.34 Where applicable, noise mitigation options have also been recommended in order to limit construction noise effects. In addition, mitigation measures to achieve appropriate noise and vibration levels within the Proposed Development are discussed.

Construction Noise and Vibration

8.35 Annex E of BS 5228-1: 2009+A1:2014 'Code of Practice for noise and vibration control on construction and open sites' provides guidance on significance criteria for construction noise.

8.36 Example Method 1 within Annex E, termed the 'ABC Method' is for residential receptors only, and allows the setting of threshold noise levels above which a potential significant effect could be generated. For the appropriate period (night, evening/weekends or day), the ambient noise level is determined and rounded to the nearest 5 dB. This noise level is then compared with the noise level at the receptor in question due solely to site operations. If the noise level originating from the site exceeds the appropriate category value, then a potential significant effect is indicated. Other project-specific factors, such as the number of receptors affected and the duration and character of the impact then need to be taken into consideration to determine if there is a significant effect. Table 8.2 gives the threshold values and explains how the method is applied.

Table 8-2: Example threshold of potential significant effect at dwellings

Assessment category and threshold value period	Threshold value (dB LAeq, T)		
	Category A ^A	Category B ^B	Category C ^C
Night time (23.00 - 07.00)	45	50	55
Evening and weekends ^D	55	60	65
Daytime (07.00 – 19.00)	65	70	75

NOTE 1: A potential significant effect is indicated if the LAeq, T noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2; If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total LAeq, T noise level for the period increases by more than 3 dB due to site noise.

- 8.37 Example Method 2 within Annex E states that noise generated by construction activities of duration of one month or more is deemed to be potentially significant if the total noise (pre-construction ambient noise plus construction noise) exceeds the pre-construction ambient noise level by 5dB or more, subject to lower cut-off values during daytime, evening and night of 65dB, 55dB and 45dB LAeq respectively.
- 8.38 The criteria stated within example method 2 are generally applicable to the following building types:
- Residential
 - Hotels and hostels
 - Religious
 - Education
 - Health and/or community
- 8.39 For office and residential buildings, BS5228-1: 2009+A1:2014 refers to the 1976 revision of Advisory Leaflet 72 'Noise control on building sites, published by the Department of the Environment, which states 'Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut.....Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:
- 70 dB(A) in rural, suburban and urban areas away from main road traffic and industrial noise
 - 75 dB(A) in urban areas near main roads in heavy industrial areas'.
- 8.40 These limits are for daytime working outside living rooms and offices. In noise-sensitive situations, for example, near hospitals and educational establishments, and when working outside normal working hours, such as between 19.00 and 22.00 hours, the allowable noise levels from building sites will be less. A reduction of 10 dB(A) may often be appropriate'.
- 8.41 With reference to the above discussions, Table 8.3 summarises the suggested significance criteria for the rating of construction noise affecting the noise sensitive premises around the Site.

Table 8-3: Summary of construction noise impact magnitude

Negligible	Minor	Moderate	Major
Site noise is equal to the threshold value	Site noise is 3dB to 5dB greater than the threshold value	Site noise is 5dB to 10dB greater than the threshold value	Site noise is more than 10dB greater than the threshold value

Human Response to Vibration

- 8.42 Section B.2 and Table B.1 of Annex B of BS 5228-2: 2009+A1: 2014 'Code of practice for noise and vibration control on construction and open sites – Vibration' provides guidance on human response to vibration. The vibration levels at which different effects may be perceived and their impact magnitude are summarised in Table 8.4.

Table 8-4: Guidance on Effects of Vibration Levels

Vibration Level (PPV)	Effect	Impact Magnitude
0.14 mm·s ⁻¹	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Negligible
0.3 mm·s ⁻¹	Vibration might be just perceptible in residential environments.	Minor
1.0 mm·s ⁻¹	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.	Moderate
10 mm·s ⁻¹	Vibration is likely to be intolerable for any more than a very brief exposure to this level.	Major

- 8.43 BS6472-1: 2008 'Guide to evaluation of human exposure to vibration in buildings - part 1: Vibration sources other than blasting' provides guidance on typically acceptable limits for vibration within residential and office buildings during the day and night.
- 8.44 Table 8.5 gives the applicable criteria from BS6472-1: 2008. The applicable assessment criterion is the 'Vibration Dose Value' (VDV). Values of VDV within certain ranges indicate the likelihood or otherwise of adverse comment from occupants of the building.

Table 8-5: Vibration Dose Value ranges which might result in various probabilities of adverse comment within residential buildings

Place and Time	Low probability of adverse comment ms ^{-1.75}	Adverse comment possible ms ^{-1.75}	Adverse comment probable ms ^{-1.75}
Residential buildings 16hr day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6

Residential buildings 8hr night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
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8.45 For offices, BS6472-1: 2008 advises that a multiplying factor of 2 should be applied to the above vibration dose values ranges for a 16 h day.

Vibration Effects on Buildings

8.46 Section B.3 and Table B.2 of Annex B of BS 5228-2: 2009+A1: 2014 'Code of practice for noise and vibration control on construction and open sites – Vibration' identifies the transient vibration levels above which cosmetic damage could occur. The guideline levels are reproduced in Table 8.6:

Table 8-6 Transient vibration guide values for cosmetic damage

Line (see Figure 8.1 within Appendix 8.1)	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
2	Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

NOTE 1 Values referred to are at the base of the building.

NOTE 2 For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded

Operation Environmental Noise Impact

Building Services Noise

8.47 For noise of an industrial nature such as fixed building services plant, an assessment of the likely effects on people inside or outside residential buildings due to noise can be carried out using BS4142: 2014 'Methods for rating and assessing industrial and commercial sound'.

8.48 The following acoustic parameters are described within BS4142: 2014:

- Specific Noise Level – the equivalent continuous A-weighted sound pressure level measured over a specified time period, T_r , at the assessment position with the specific noise source contribution, LA_{eq, T_r} (i.e. the noise level due to the new noise source).
- Rating Level – the Specific Noise Level plus an adjustment for any characteristic noise features, L_{Ar, T_r} .
- Residual Noise Level – the equivalent continuous A-weighted sound pressure level measured when the specific noise does not contribute to the ambient noise.
- Background Noise level – measured for a specific duration, T , in the absence of the specific noise source, $LA_{90, T}$.

8.49 To complete a BS4142 assessment of potential noise effects upon residential properties, it is necessary to obtain the Rating Level due to the sound source in question. The Rating Level is derived by adding corrections to the measured Specific Noise Level, if the noise source:

- is tonal (correction of 0dB to +6dB, depending on severity)
- contains distinct impulses (correction of 0dB to +9dB, depending on severity)
- is intermittent (correction of +3dB if applicable)
- is otherwise distinctive against the residual acoustic environment (correction of +3dB)

For instance, where a sound source is strongly tonal and impulsive over the duration of the appropriate assessment period, a correction of +15 dB may apply.

8.50 The Rating Level can then be used in order to ascertain the likelihood of complaints due to industrial noise disturbance by subtracting the measured background noise level. The greater the positive difference, the greater the likelihood of complaints. Table 8.7 summarises the assessment method.

Table 8-7: BS4142: 2014 Assessment Method

Difference between Rating Level and Measured Background Level	Assessment
+10 dB or greater	Significant adverse impact
+5 dB	Indication of adverse impact, depending on context
0 dB or less	Indication of low impact, depending on context

8.51 Where a new noise source has not yet been introduced, a recommended specific noise level can be determined based on a knowledge of the existing background noise level.

8.52 BS 4142: 2014 recognises that where background and rating levels are low, the potential absolute noise levels at the sensitive receptor might be more relevant in assessing potential impact than a simple comparison of the rating level and background noise level.

8.53 In such instances, reference can be made to BS 8233: 2014 in order to determine appropriate external noise levels due to buildings services plant, such that acceptable noise levels are achieved inside buildings.

8.54 'Planning & Noise, Technical Guidance' issued by Manchester City Council in December 2015 gives guidance on the preferred approach to environmental noise assessments. With regard to external noise due to building services plant, Section 3.6.1.5.1 of the document states:

- 'Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location'.

Noise from Commercial Operations

8.55 Noise egress from the proposed commercial units at the Proposed Development must be controlled to appropriate levels so as to avoid noise nuisance to existing sensitive receptors. With regard to entertainment venues, 'Planning & Noise, Technical Guidance' states:

- **'When considering the potential impact of a proposal for an entertainment venue, consultants should consider the overall noise level (LAeq) and the 63 Hz and 125 Hz octave**

band noise levels (Leq). Music noise in the 63 Hz and 125 Hz octave bands, which is often described as “bass noise”, is particularly difficult to contain and the impulsive character of this low frequency music noise is particularly disturbing for local residents exposed to it.

- A planning application for a new entertainment venue that is structurally detached from other building uses should demonstrate that music noise from the proposal will not be ‘audible’ in nearby residential properties, assuming that the residential properties in question have their windows open. The criterion here is:
- Entertainment noise (LAeq) should be controlled to 10dB below the background noise level (LA90) without the entertainment noise present, in each octave band at the nearest noise sensitive location.
- A criterion that would achieve a condition of ‘inaudible’ / ‘virtually inaudible’ which is applicable for new residential developments that are structurally connected to entertainment venues (or vice versa) would be: ‘Music noise levels in the 63Hz and 125Hz octave centre frequency bands (Leq) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq), respectively.
- This criterion may also be applicable for new residential developments that are structurally separate from an existing entertainment venue’.

Intrusive Noise within Proposed Residential Dwellings

- 8.56 Internal noise levels within the proposed apartments must be appropriate for the intended use. BS8233: 2014 ‘Guidance on sound insulation and noise reduction for buildings’ provides appropriate criteria for acceptable levels of noise ingress within dwellings.
- 8.57 In particular, section 7.2.2 ‘Internal ambient noise levels in dwellings’ of BS8233: 2014 states that ‘In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in Table 4’. Table 8.8 identifies the guideline values.

Table 8-8: BS8233: 2014 intrusive noise criteria

BS8233: 2014 – Indoor ambient noise levels for dwellings			
Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq, 16 hours	-
Dining	Dining room / area	40 dB LAeq, 16 hours	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16 hours	30 dB LAeq, 16 hours

- 8.58 Note 7 of section 7.2.2 states that: ‘Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed up to 5 dB and reasonable internal conditions still achieved’.
- 8.59 The pre-existing external Noise levels at the Site are above the WHO (World Health Organisation) external noise guideline levels and therefore, with reference to BS8233: 2014, the maximum recommended daytime intrusive noise level within the habitable rooms of the Proposed Development is 35 dB LAeq,(16 hours) to 40 dB LAeq,(16 hours), and the corresponding night time intrusive noise limit within bedrooms is 30 dB LAeq,(16 hours) to 35 dB LAeq,(8 hours). Additionally, the recommended daytime intrusive noise level within bedrooms of the Proposed Development is 35 dB LAeq(16 hours) to 40 dB LAeq(16 hours).
- 8.60 With regard to maximum night time noise levels within bedrooms, BS8233: 2014 states ‘regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance.

A guideline value may be set in terms of SEL or L_{Amax,f} depending on the character and number of events per night. Sporadic noise events could require separate values’.

8.61 In the absence of a specific performance criterion within BS8233 for short-term noise maxima, reference can be made to guidance published by the WHO. In particular, the WHO publication ‘Guidelines for Community Noise’ (1999), from which the guidance given in BS8233: 2014 is itself derived, states that ‘for a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{Amax} more than ten to fifteen times per night’.

8.62 With regard to noise ingress to residential dwellings, section 3.5 ‘National & International Standards’ of ‘Planning & Noise, Technical Guidance’ issued by the Environmental Protection Section of Manchester City Council, references both BS8233: 2014 and WHO ‘Guidelines for Community Noise’, but advises that 5dB relaxations of the internal noise criteria in these documents should not be assumed. The document states that ‘Manchester City Council has adopted the following internal noise limits for residential properties’:

- Living Rooms: Daytime (0700-2300 hrs) 35dB LAeq
- Bedrooms: Daytime (0700-2300 hrs) 35dB LAeq
- Bedrooms: Night time (2300-0700 hrs) 30dB LAeq, 45dB L_{Amax}
(fifteen excesses over 45dB L_{Amax} allowed per night)

Sensitivity of receptors

8.63 Table 8.9 presents the sensitivity criteria for receptors during the construction phase and the operational phase of the Proposed Development.

Table 8-9: Criteria to Determine Receptor Sensitivity

Sensitivity of Receptor	Description	Examples
High	Receptors where people or operations are particularly susceptible to noise or vibration	Residential dwellings, schools (during the daytime), hospitals, places of worship
Medium	Receptors of moderate to low sensitivity to noise or vibration, where it may cause some distraction or disturbance.	Conference facilities, hotels, offices
Low	Receptors of low sensitivity to noise or vibration, where it may cause mild distraction or disturbance.	Bars, cafes, restaurants, sports grounds
Negligible	Receptors where distraction or disturbance from noise or vibration is minimal	Un-occupied buildings, factories and working environments with existing high levels of noise, night clubs

Significance Criteria

8.64 In line with the guidance presented in Guidelines for Environmental Noise Impact Assessment, published by the Institute of Environmental Managements and Assessment in November 2014, the significance of an impact can be determined with reference to the impact significance matrix detailed in Table 8.10.

Table 8-10: Impact Significance Matrix

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

8.65 A description of the magnitude terms given in Table 8.10 is given below:

- **Major:** Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area;
- **Major:** Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area;
- **Moderate:** Noise impact can be heard and causes small changes in behaviour and/ or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance. Affects the character of the area such that there is a perceived change in the quality of life;
- **Minor:** Noise impact can be heard, but does not cause any change in behaviour or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life
- **Negligible:** no discernible effect on noise or in the character of the area.

Limitations and Assumptions

- 8.66 As part of the overall study of noise and vibration, a quantitative assessment of the potential noise levels generated by construction activities has been carried out. The assessment has been based on the potential construction programme and information received relating to the number and type of plant items expected on site over the construction programme.
- 8.67 It is possible that there may be variation between the assumed construction programme and the actual construction programme and that plant items may vary from those considered as part of this assessment. However, the risk is expected to be small, in that there is certainty regarding the broad demolition and construction tasks that must be undertaken and the plant items that will be required to undertake these tasks.

Baseline Conditions

Noise

- 8.68 In normal circumstances, a baseline noise survey would be carried out over daytime and night time periods at the boundaries of the Site to determine the pre-existing noise levels at and around the Site. However, due to the ongoing extensive construction works across the St Johns Masterplan site, a noise survey around the site at the present time would yield unrepresentative results. However, a targeted

noise survey has been carried out to determine the prevailing noise levels due to road traffic on Trinity Way and rail movements to the northwest of the Site, in particular on the Ordsall Chord bridge.

- 8.69 For the extended purposes of this assessment, reference has also been made to the results of previous noise surveys carried out across the St Johns Masterplan site and an adjacent site prior to the current construction works. This approach has been discussed and agreed with Manchester City Council.
- 8.70 The noise surveys of the pre-existing noise environment at sensitive locations at and around the Site were carried out in support of the following planning applications:
- Slate Yard, New Bailey, Salford, planning reference 09/57950;
 - Globe & Simpson, Quay Street, Manchester, planning reference 121721/FO/2018;
 - Manchester Goods Yard, St Johns, Manchester, planning reference 121511/FO/2018;
 - The Factory arts venue, Water Street, Manchester, planning reference 119890/FO/2018;
 - Granada House, Atherton Street, Manchester, planning reference 118040/FO/2017; and
 - Extant planning application for the Site, planning reference 114385/FO/2016
- 8.71 The noise surveys provide appropriate baseline measurements in order to determine the pre-existing noise levels at the locations of the Proposed Development and at existing and planning-approved noise sensitive properties close to the Proposed Development.
- 8.72 Measurement locations for the noise surveys are shown in Figure 8.2A within Appendix 8.1 and described below.
- Location 1: At location of closest façade of the Slate Yard, New Bailey (Planning reference 09/57950) to Water Street
 - Location 2: Representative of Quay Street façade of the Left Bank Apartments, Quay Street
 - Location 3: Representative of Water Street façade of Manchester Marriott Victoria & Albert Hotel, Water Street and of Water Street façade of the Proposed Development
 - Location 4: Representative of proposed Factory arts venue, Water Street
 - Location 5: Representative of proposed Manchester Goods Yard (MGY), St Johns
 - Location 6: Atherton Street
 - Location 7: Representative of proposed northwest elevation of the Proposed Development
- 8.73 Prior to the commencement of major construction works around the Site, the general noise environment at and around the Site was principally determined by road traffic on Water Street and Quay Street. Quay Street is a major route into Manchester city centre and is relatively heavily trafficked. Water Street was formerly a reasonably busy minor road. Typical maximum noise levels along Water Street are generated by passenger vehicles and occasional commercial vehicles.
- 8.74 As described in the Transport Statement for the Proposed Development, various changes are being implemented to Water Street as part of the St John's masterplan works. Just to the north of Union T2, Water Street will be narrowed from 7.5m to 6m to provide additional trees and public realm space in front of Union T1. To the south of Union T2, the alignment of Water Street passes Festival Square rising up to a raised table and access controls to manage service vehicle movements through the Square. Water Street then narrows as it passes under Factory.

- 8.75 In addition, there is currently a plan being consulted upon to close Water Street to through traffic under Factory. These proposals would mean that all servicing vehicles to and from Union T2 would arrive from the north.
- 8.76 The implication of the above proposals is that the noise road traffic noise levels able to impact on the Proposed Development can be expected to reduce relative to the noise levels measured during the previous noise surveys.
- 8.77 Prior to the commencement of major construction works around the Site, the general noise environment at and around the Site was principally determined by road traffic on Water Street and Quay Street. Quay Street is a major route into Manchester city centre and is relatively heavily trafficked. Water Street was formerly a reasonably busy minor road. Typical maximum noise levels along Water Street are generated by passenger vehicles and occasional commercial vehicles.
- 8.78 The measured noise levels during the day and night at and around the Site are summarised in Table 8.11.

Table 8-11: Summary of measured environmental noise levels – existing and proposed receptors

Location	Measured Noise Level					
	Daytime (defined as 0700 to 2300)			Night time (defined as 2300 to 0700)		
	dB, LAeq	dB, LAmax	dB LA90	dB, LAeq	dB, LAmax	dB LA90
1 (Slate Yard)	59	64 to 71	55 to 56	52	63 to 68	48 to 51
2 (Left Bank)	74	84 to 99	55 to 62	68	81 to 84	47 to 50
3 (Marriott)	68	81 to 83	56 to 58	-	-	-
4 (The Factory)	58	-	50 to 57	54	-	44 to 57
5 (MGY)	55	-	48 to 52	52	-	48 to 49
6 (Atherton St)	58	-	47 to 50	53	-	44 to 45
7 (Union T2)	60	61 to 73	53 to 62	-	-	-

- 8.79 In addition to the pre-existing noise sources that contribute to the noise levels identified in Table 8.11, the St Johns Masterplan will introduce new potential long-term noise sources in relative proximity to the Proposed Development. These new noise sources include The Factory, commercial units, fixed building services plant and patrons in external areas.
- 8.80 Entertainment noise egress from The Factory and the proposed commercial units will be controlled in line with the applicable planning conditions, such that entertainment noise is not audible at the Proposed Development.
- 8.81 Similarly, noise from building services plant serving the various proposed buildings across the St Johns Masterplan site is to be controlled by the applicable planning conditions, such that plant noise is lower than the pre-existing background noise levels at the Proposed Development.
- 8.82 With regard to potential noise due to the servicing of The Factory, Condition 15 of the planning approval for the Factory (planning reference 119890/FO/2018) states

'Deliveries, servicing and collections including waste collections from the Water Street loading bays and Factory Servicing Yard servicing access shall not take place outside of 0700 and 1100 Monday to Saturday and 1000 to 1100 Sundays and Bank Holidays, with the exception of:

Limited additional deliveries and servicing to the Water Street loading bays and Factory Servicing Yard servicing access that may take place between 1500 and 1800 subject to confirmation of the type and frequency of activity to be agreed via the submission and approval in writing by Manchester City Council of a Servicing Management Plan in accordance with Condition 9; and,

Deliveries and takedowns associated with events and performances utilising the truck lifts, which shall be able to take place at extended times to be agreed via the submission and approval in writing by Manchester City Council of an updated Event Management Strategy in accordance with Condition 17 and Servicing Management Plan in accordance with Condition 9. Any extended servicing hours will be subject to the following operational strategy / limitations:

I. Personnel to utilise two-way radios or similar to prevent noise disturbance from raised voices.

II. No reversing beepers to be used for vehicles. All vehicles to be safely reversed into location using banksmen.

III. All engines to be switched off during loading/ unloading

IV. No cab radios to be operated during specified hours'.

- 8.83 Condition 15 of planning approval 119890/FO/2018 refers to conditions 9 and 17 of the same approval. These references appear to be an error, as the conditions in question do not relate to noise. It is assumed that condition 15 should refer to conditions 8 and 19. Which respectively state

8) Before first occupation of the development, a servicing and access management plan, including:

Details of management and enforcement of the coach parking strategy;

Details of how the access to the service road would be designed so that HGVs do not over run the pavement which should include use of a banksmen to aid in manoeuvres;

Details of refuse collection from Grape Street accessed from Water Street through the ANPR controlled bollards;

A schedule of loading and unloading locations and times which should include for servicing to take place outside of peak hours and during non-event hours to reduce congestion on the adopted highway; and

A plan to manage residents and visitors to South Village must be submitted to and agreed in writing by the City Council as local planning authority. Servicing shall thereafter take place in accordance with the approved plan.

19) The consent hereby granted shall be operated in accordance with the Event Noise Emission calculation prepared by Level Acoustics and Vibration dated October 2017 found within appendix 9.4 of the EIS

- 8.84 Whilst an event management strategy can go some way to mitigate patron noise on the surrounding roads, it can be expected that elevated external noise levels may be generated by patrons of The Factory walking either to or from the venue.
- 8.85 An estimation of the potential noise levels external to the windows of the Proposed Development due to a number of patrons talking in raised and loud voices on the external access routes to The Factory.
- 8.86 Table 8.12 identifies the estimated noise levels external to the Proposed Development on the assumption that directly below a residential window (at a distance of eleven metres) there are five people talking in a loud voice and five people talking in a raised voice and that at an average distance of thirty metres, there are a further forty five people talking in a loud voice and ninety five people talking in a raised voice.

Table 8-12: Estimated external patron noise at end of event at Factory

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
1m from residential windows of Proposed Development	46	47	56	63	63	55	48

Vibration

- 8.87 There are no major sources of vibration in reasonably close proximity to the Site. A train line is located approximately 170 metres from the Proposed Development. This distance is such that there will be considerable attenuation of ground borne vibration and thus it is not considered necessary to conduct measurements of train-generated vibration at and around the Site. No adverse comment would be expected in any area of the Proposed Development due to existing levels of vibration due to other sources such as road vehicles.

Identification and Evaluation of Likely Significant Effects

Construction

- 8.88 There are, or will be, a number of potentially sensitive receptors around the Site during the Construction phase. The closest sensitive receptors to the Site are (as identified on Figure 8.3A within Appendix 8.1):
- Residential Dwellings on Stanley Street ('The Slate Yard') and on Quay Street ('Left Bank').
 - Offices within the St John's Masterplan area ('Manchester Goods Yard', 'The Bonded Warehouse' and 'Globe & Simpson').
 - Hotels on Water Street (Marriott) and on Great John Street ('Great John Street Hotel')
- 8.89 The buildings within the St John's Masterplan area are under construction at the time of writing, but are expected to be complete prior to completion of the construction of the structural frame of the Proposed Development. Therefore, the St John buildings are expected to become sensitive receptors during the Union T2 build programme. The proposed residential building known as Union T1 may also be complete prior to the completion of the Proposed Development. Thus Union T1 may become during the latter stages of the construction of the Proposed Development.
- 8.90 There is the potential for environmental noise effects at the above receptors from the following during the construction phase of the project:
- Temporary addition to traffic flows on local roads due to construction traffic
 - Construction of Proposed Development
- 8.91 Construction noise impact at the following sensitive receptors has been assessed:
- Dwellings on Stanley Street ('The Slate Yard') (120 metres from Site)
 - Dwellings on Quay Street ('Left Bank') (180 metres from Site)
 - Hotel on Water Street ('Marriott') (22 metres from Site)
 - Offices within the St Johns Masterplan area ('Manchester Goods Yard') (10 metres from Site)

E. Dwellings on Water Street ('Union T1') (63 metres from Site)

- 8.92 The identified distances above are the distances from each receptor to the closest point of the Site to that receptor.
- 8.93 Whilst there are other receptors around the Site, these other receptors are at greater distances from the Site than the receptors identified above and with similar exposure to the existing noise sources in the areas. Therefore, the achievement of acceptable noise levels at the assessed receptors would lead to acceptable noise level at receptors at a further distance from the Site.
- 8.94 With reference to the guidance discussed above and the results of the noise surveys, the threshold values for potential significant effects are as given in Table 8.13.

Table 8-13: Threshold noise values for potential significant effect due to construction

Location	Threshold Values, daytime
	dB, L _{Aeq}
A: The Slate Yard (residential)	65
B: Left Bank (residential)	75
C: Marriott Hotel (commercial/residential)	75
D: Manchester Goods Yard (Office)	75
E: Union, T1	75

- 8.95 In order to estimate the likely levels of noise from construction activities at the Site, calculations have been carried out using the methodologies and data given in BS5228: 2009+A1:2014 'Code of Practice for noise and vibration control on construction and open sites; Part 1 - Noise' and by applying corrections for distance attenuation (i.e. by how much noise reduces with increasing distance from the plant).
- 8.96 This exercise has been carried out for each major construction phase of the project in order to calculate the worst case hourly noise level (L_{Aeq,1hour}) at each receptor.
- 8.97 For large construction vehicles that will travel to and from the Site, additional calculations have been carried out for the maximum number of expected movements per hour, speed and average travel distance from each receptor.
- 8.98 The construction works will involve the operation on the Site of the following principal major plant items at certain stages of the construction works:
- Excavators;
 - Dumper trucks;
 - Continuous flight auger piling rigs;
 - Concrete pump;
 - Poker vibrators;

- Tower crane;
- Telehandler.

- 8.99 With regard to construction traffic such as concrete deliveries, it has been estimated that in the worst case, there would be approximately twenty four vehicle movements to or from the Site per working day i.e. approximately two vehicles per hour to arrive and offload and/or loadup and then depart.
- 8.100 Table 8.14 identifies the calculated noise levels at the receptors identified above due to cumulative noise from construction noise sources at the Site during the main construction phases. The Table presents the worst case cumulative noise level on the assumption that all of the noisier mobile items of construction plant are situated at the section of the Site perimeter that is closest to the receptor in question. This situation will not prevail for an extended period of time, as the construction plant will move around the Site as each section of the works is completed. In addition, the typical expected noise level is presented given the location of plant items at more typical distances from the nearby receptors. It should be noted that the calculations at this stage do not include for any beneficial acoustic screening provided by any solid hoarding around the Site or by the local screening of individual plant items. An 'on' time of construction noise sources during each day of 50% has been assumed during the excavation and piling stage, and of 70% during the frame construction.

Table 8-14: Calculated noise levels at sensitive receptors during construction phases

Receptor	Calculated noise levels during construction phase (dB LAeq)	Calculated noise levels during construction phase (dB LAeq)
	Excavation/Piling worst case/typical	Frame Construction worst case/typical
A: The Slate Yard (residential)	69 / 66	67 / 64
B: Left Bank (residential)	57 / 56	56 / 55
C: Marriott Hotel (commercial/residential)	69 / 66	67 / 64
D: Manchester Goods Yard (Office)	64 / 61	64 / 63
E: Union T1	71 / 67	71 / 68

- 8.101 At other stages of the construction programme, the expected noise levels at the sensitive receptors will be lower than those given in Table 8.14, depending upon the ongoing processes and the stage of the build programme.
- 8.102 Table 8.15 shows the calculated excess over the threshold noise values for potential significant effect due to construction, if no mitigation measures are in place.

Table 8-15: Calculated excess over threshold noise values for potential significant effect, no mitigation

Receptor type and location	Calculated excess over construction noise target (dB LAeq)	Calculated excess over construction noise target (dB LAeq)	Effect
	Excavation/Piling worst case/typical	Frame Construction worst case/typical	
A: The Slate Yard	+4 / +1	+2 / -1	Minor Adverse
B: Left Bank	-18 / -19	-19 / -20	Negligible
C: Marriott Hotel	-6 / -9	-8 / -11	Negligible
D: Manchester Goods Yard	-11 / -14	-11 / -12	Negligible
E: Union, T1	-4 / -8	-4 / -7	Negligible

- 8.103 The expected maximum noise levels during the construction works at the closest receptor to the Site are up to 4 dB(A) greater than the threshold noise values for potential significant effect due to construction, if no mitigation measures are in place. This noise level is only expected to prevail for relatively short periods of time when construction works are taking place at the building perimeters closest to Manchester Goods Yard. When noisy construction activities are taking place at a more typical distance from this receptor, the expected maximum noise levels are up to 1 dB(A) greater than the threshold noise values for potential significant effect due to construction if no mitigation measures are in place.
- 8.104 There is therefore the potential for **Negligible to Minor Adverse** impact due to construction noise at the existing and planning-approved properties around the Site. As a consequence, measures to mitigate construction noise would be appropriate.
- 8.105 As discussed in BS5228-2: 2014 'Code of Practice for noise and vibration control on construction and open sites', it is fully expected that the construction vibration levels would not be sufficient to cause structural damage to buildings around the Site.
- 8.106 Natural mitigation of potential ground borne vibration due to the proposed construction activities will be afforded to the residential buildings around the Site by virtue of the distance of these receptors from the works. Potential significant effects are not expected to arise on the basis that good communication is established between the Contractor and residents, as detailed further in Chapter 4 – Construction Management, of this report.
- 8.107 The impact of construction vibration on existing sensitive receptors is therefore expected to be **Negligible**.

Building Services Plant

- 8.108 At this design stage, the specific total building services requirements for the various aspects of the Proposed Development are not known. However, noise limits for any and all building services plant can be established using published guidance.
- 8.109 In line with the assessment methodology detailed in BS4142:2014 'Methods for rating and assessing industrial and commercial sound', in order to avoid potential noise nuisance at existing and proposed sensitive receptors, the non-emergency building services plant at the Proposed Development should be selected and suitably attenuated so as to achieve noise levels in line with those stated in Table

8.16. It should be noted that the noise limits in Table 8.16 relate to the simultaneous operation of all plant serving the Proposed Development. The stated criteria are on the basis that the installed plant items are not tonal.

Table 8-16: Cumulative environmental noise limits for non-emergency building services plant

Location	Noise Level, dB LAeq	
	Daytime (07:00hrs to 19:00hrs)	Night time (23:00hrs to 07:00hrs)
A: The Slate Yard	50	42
B: Left Bank	50	42
C: Marriott Hotel	47	39
D: Manchester Goods Yard	50	45
E: Union, T1	45	39
F: Union, T2	45	39

- 8.110 Building services plant with tonal characteristics should be avoided if possible. If such plant is provided such that tonal noise is significant at the receptors in question, then the noise limits given in Table 8.16 must be reduced by 5dB in order to comply with the published requirements of Manchester City Council.
- 8.111 It is expected that any emergency plant items required at the Proposed Development, such as smoke extract fans and standby generators, would only operate during emergencies and during periodical test runs (perhaps test runs of thirty minutes every two weeks). On this basis, it is not considered appropriate to require emergency plant to comply with the noise limits that would apply to continuously-operating non-emergency plant. It is therefore suggested that the noise level from any emergency plant is no more than 10dB(A) greater than the ambient noise level (measured as an LAeq noise level) at any proposed or existing residential receptor.
- 8.112 It is therefore recommended that the noise level at any residential façade during operation of any emergency plant does not exceed the daytime noise levels given in Table 8.17.

Table 8-17: Cumulative environmental noise limits for emergency building services plant

Location	Noise Level, dB LAeq	
	Daytime (07:00hrs to 19:00hrs)	
A: The Slate Yard	69	
B: Left Bank	84	
C: Marriott Hotel	78	

E: Union, T1	68
F: Union, T2	68

Noise Egress from Commercial Units

- 8.113 In order to avoid potential noise nuisance to existing noise sensitive receptors, activity noise egress from the proposed commercial units within the Proposed Development must be controlled. As the proposed commercial units may potentially be home to restaurants and could employ music replay, suitable limits relating to music noise egress from the proposed units must be assessed.
- 8.114 As detailed above, Manchester City Council suggests that external music noise levels (measured as an Leq noise level) external to a residential property due to an entertainment venue should be 10dB lower than the prevailing background noise level in each octave band. In some circumstances this requirement is more stringent than would be necessary to maintain residential amenity, as strict compliance with this criterion lead could lead to external music noise levels that would be below the threshold of human hearing. It is therefore suggested that external noise limits include a lower bound.
- 8.115 Table 8.18 identifies the maximum allowable cumulative daytime and night time free-field noise levels at the closest residential façades due to music noise from the proposed commercial units to comply with the guidance of Manchester City Council, taking into account the threshold of human hearing at low frequency.

Table 8-18: Maximum allowable external music noise levels due to proposed commercial units

Location/period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Slate Yard (0700 to 2300)	43	36	35	30	34	28	15
Slate Yard (2300 to 0700)	43	33	31	26	23	21	15
Left Bank (0700 to 2300)	45	42	41	39	37	30	20
Left Bank (2300 to 0700)	43	37	36	34	32	25	15
Marriott Hotel (0700 to 2300)	43	40	38	35	32	35	26
Marriott Hotel (2300 to 0700)	43	40	38	35	31	34	27
Union, T1 (0700 to 2300)	43	36	35	30	34	28	15
Union, T1 (2300 to 0700)	43	33	31	26	23	21	15
Union, T2 (0700 to 2300)	43	36	35	30	34	28	15
Union, T2 (2300 to 0700)	43	33	31	26	23	21	15

Noise Affecting the Proposed Development

Proposed Residential Buildings

- 8.116 The sensitive areas of the Proposed Development that could be affected by the noise levels summarised in Tables 8.11 and 8.12 above are the living rooms and bedrooms of the proposed apartments.
- 8.117 The principal determinant of the internal noise level within the proposed apartments will be the sound reduction index of the external façade, which is to include vision panels and non-vision panels of a curtain wall system. By taking into account the levels of noise measured at the Site, the area of façade elements and the likely acoustic characteristics of the noise sensitive receiving space, the sound reduction required to be provided by the façade elements can be determined.
- 8.118 Two principal non-vision panel build-ups are proposed for the apartments, as described below:
- Glazed insulated spandrel unit – Opaque single glazing, approximately 160 mm mineral wool insulation, steel panel
 - Insulated metal panel – Aluminium outer panel fixed to curtain wall frame, approximately 200 mm mineral wool insulation, steel panel
- 8.119 Table 8.19 identifies the minimum recommended Sound Reduction Index of the non-vision panels in order to allow compliance with the internal noise criteria identified above.

Table 8-19: Minimum recommended sound reduction index of non-vision panels

Façade Element	Sound Reduction Index (dB)						
	@ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Non-vision panels – bedrooms at NE and SE corners of building	22	30	38	48	51	53	52
All other non-vision panels	18	25	33	44	47	47	45

- 8.120 It has been determined that a range of acoustic specifications for the vision panels to the proposed habitable rooms will be required to achieve the recommended internal noise levels, in relation to road traffic noise, rail noise and pedestrian noise. Figures 8.4 to 8.7 within Appendix 8.1 identify the recommended acoustic specification of windows to living rooms and bedrooms that are located in the identified zones.
- 8.121 Table 8.20 identifies the minimum recommended Sound Reduction Index of the vision panel specifications referred to in Figures 8.4 to 8.8 within Appendix 8.1. The recommended performance figures in Table 8.20 relate to the composite performance of the glazing and the associated framing.

Table 8-20: Minimum Sound Reduction Index of vision panels – Residential

Vision Panel Specification Reference	Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Type A	22	26	28	38	41	41	50
Type B	21	26	27	34	40	37	45
Type C	19	24	24	31	37	37	40

- 8.122 Compliance with the recommended acoustic performance of facades elements stated above is expected to lead to **negligible** impact from the existing and proposed external noise levels at the Site.

Mitigation Measures

Construction

- 8.123 The construction of a solid, close-boarded hoarding (2.4 metres high) around the majority of the Site is proposed, as detailed further in Chapter 4 – Construction Management, of this report. This can be expected to reduce noise levels at local receptors by 0dB(A) to 5dB(A), depending upon the location of the noise source on Site and the height of the receptor.
- 8.124 In addition, the following recommendations must be followed to achieve appropriate reductions of construction noise.
- Noisy plant should be located so as to maximise the distances between the plant and the sensitive receptors.
 - The works should be carried out in as timely a manner as possible in order to minimise the duration of any disturbance.
 - Via communication between the Contractor and the Council, local residents should be kept informed of general construction activities, including working hours.
 - Wherever possible, working hours should be restricted in line with Manchester City Council's typical requirements.
 - Excavations in hard materials should use silenced and sensitively located compressors in conjunction with shrouded breakers.
 - The drop height of materials into wagons shall be minimised.
 - Any materials hoists used on the Site should be enclosed by hoarding at ground level and operated by mains electricity or via a silenced generator.
 - Rubbish skips should be housed within enclosed areas that encompass the chute terminations. The materials unloading point should be enclosed.
 - All reasonable steps should be taken to limit the number of vehicles waiting to deliver to the Site.
 - All plant and equipment should be properly maintained.
 - All plant and equipment should be operated in their minimum-noise modes with any manufacturer's silencers and covers properly in place.

- With the exception of enhanced generators, pumps and electric plant, all plant and equipment should be shut down when not in use.
- Vehicle movements should be arranged so as to minimise noise from reversing warning indicators.
- The Contractor should generally comply with the guidance and procedures given in BS5228: 2014.

8.125 Given the implementation of the above best practice measures, the impact of construction noise is expected to be **negligible**.

Operation

Building Services noise

8.126 Overall building services noise limits have been established to achieve compliance with published guidelines. To ensure compliance with the criteria, individual items of building services plant and any associated noise control hardware will need to be selected such that the cumulative noise levels from all plant items do not exceed the overall building services noise limits.

8.127 Given compliance with the building services noise limits given in Tables 8.16 and 8.17, the noise impact of mechanical plant serving the Proposed Development is expected to be **negligible**.

Noise from Commercial Operations

8.128 Environmental noise limits relating to activity noise egress from the proposed amenity / commercial space have been established to ensure compliance with published guidelines. Tenants of the commercial must carry out an assessment to determine the allowable internal levels of noise. To achieve compliance with the criteria, the façade elements of the commercial units must achieve the performance criteria stated herein and activity noise levels within the commercial units must not exceed the advised limits.

8.129 Given compliance with the external music noise limits given in Table 8.18, the noise impact of the commercial units within the Proposed Development is expected to be **negligible**.

Cumulative Effects

Construction

8.130 There is expected to be an overlap of construction works at the Site and at other buildings on the St Johns Masterplan site. However, the other buildings will be at a much later stage in their build programmes such that the noisier construction activities including excavation and frame construction will have ceased at the time that these activities commence at the Site. It is therefore expected that the cumulative construction noise levels at the nearby noise-sensitive buildings will be determined by the construction activities at the proposed Site. With reference to paragraph 8.125 above, the cumulative effect of construction noise is expected to be **negligible**.

Operation

8.131 Operational noise due to the Proposed Development and the committed developments in the surrounding area would include mechanical services noise, noise egress due to leisure activities and changes in road traffic noise levels due to changes in traffic flows.

8.132 As identified herein, the cumulative impact of noise due to changes in road traffic flows is expected to be **negligible**. This result takes into account the predicted changes in traffic flow relating to the committed developments in the surrounding area. A full Transport Statement is submitted in support of this application.

8.133 Operational noise limits due to mechanical services at the Proposed Development have been derived using the methodology and assessment criteria given in BS4142: 2014. Operational noise limits for

any mechanical services systems at the buildings of the committed developments in the surrounding area would also be derived using the methodology and assessment criteria given in BS4142: 2014. The Planning Conditions for the committed developments in the surrounding area include a requirement for the building and any externally mounted ancillary equipment to be acoustically insulated in accordance with a scheme submitted to and approved in writing by the City Council in order to secure a reduction in the level of noise emanating from the equipment. The applicable noise limits will tend to be governed by the need to minimise noise levels at the buildings within the Proposed Development, as these are the closest sensitive receptors in the majority of cases. Therefore, given the relative distances of the sensitive receptors applicable to each development, cumulative impact of building services noise will be **negligible**.

Residual Effects

Demolition and Construction

- 8.134 Table 8.21 summarises the noise and vibration impact assessment. It is expected that noise levels at sensitive receptors during the construction works would be **negligible** following mitigation measures. It is expected that the impact of vibration levels at sensitive receptors due to the construction works would be **negligible**. A range of mitigation measures to minimise disturbance due to the construction works has been summarised, including the maintenance of communication between the Contractor, the City Council and local businesses and residents.

Operation

- 8.135 Noise limits for permanent stationary plant serving the Proposed Development have been established. Compliance with these noise limits should ensure that the environmental noise impact from the Proposed Development is negligible during the operational phase of the Proposed Development.
- 8.136 Noise limits for the proposed amenity/commercial spaces within the Proposed Development have been established. Compliance with these noise limits should ensure that the environmental noise impact from the commercial units of the Proposed Development is negligible during the operational phase of the Proposed Development.

Table 8.21: Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
<i>Construction Phase</i>			
Negligible to moderate adverse construction noise	Local residents & commercial buildings	Para. 8.120 & 8.121: Solid screening around Site. Communication with City Council and local residents. Application of 'Best Practicable Means' and noise control guidance from BS5228.	Negligible construction noise effects
<i>Operational Phase</i>			
Negligible building services plant noise effects	Residential and commercial properties	Para. 8.105: Adherence to environmental noise limits for plant	Negligible building services plant noise effects
Negligible activity noise effects from commercial units	Residential and commercial properties	Para. 8.111: Adherence to environmental noise limits for commercial units	Negligible activity noise effects from commercial units

9 Air Quality

Introduction

- 9.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development with respect to Union 2 at St John's, Manchester (illustrated in Figure 9.1). This chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and, the likely residual effects after these measures have been adopted.
- 9.2 This Chapter has been produced by Hilson Moran and led by Tom Reade, an experienced air quality consultant. Tom has over 8 years professional experience and has completed air quality chapters for a range of projects considering the protection of both human health and ecosystems. He is a Chartered Environmentalist, a Member of the Institute of Air Quality Management and the Institution of Environmental Sciences.
- 9.3 A summary of the **Appendix** to support this ES Chapter is set out below:
- Appendix 9.1 – Glossary of Terms;
 - Appendix 9.2 – Traffic Data;
 - Appendix 9.3 – Modelled Receptors & 2020 Defra Background Concentrations;
 - Appendix 9.4 – Model Verification;
 - Appendix 9.5 – Modelled Buildings;
 - Appendix 9.6 – 2018 Wind Rose (Manchester); and,
 - Appendix 9.7 – Operational Phase Results (2020 Background Concentrations & Emission Factors).
- 9.4 A summary of the **Figures** to support this ES Chapter is set out below:
- Figure 9.1 – Site Boundary;
 - Figure 9.2 – Modelled Roads;
 - Figure 9.3 – Modelled Buildings & Flue Termination;
 - Figure 9.4 – Air Quality Management Area;
 - Figure 9.5 – Existing Receptors;
 - Figure 9.6 – Proposed Receptors; and,
 - Figure 9.7 – Construction Zone of Influence.

Legislative and Policy Context

- 9.5 The following presents a summary of the legislation, planning policy and guidance relevant to the assessment of air quality.
- a. Legislation
- b. Air Quality Strategy for England, Scotland, Wales and Northern Ireland
- 9.6 The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland⁸, most recently updated in July 2007. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that the European Union and International agreements are met in the UK.

⁸ Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

- 9.7 The AQS covers the following air pollutants: ammonia (NH₃), benzene (C₆H₆), 1,3 butadiene (C₄H₆), carbon monoxide (CO), lead (Pb), oxides of nitrogen (NO_x) (including nitrogen dioxide (NO₂)), particulate matter (PM₁₀ and PM_{2.5}), sulphur dioxide (SO₂), ozone (O₃) and polycyclic aromatic hydrocarbons (PAHs).
- 9.8 The AQS sets standards and objectives for the listed pollutants for the protection of human health, vegetation and ecosystems. The standards are based on recommendations by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO), based on current understanding and scientific knowledge about the effects of air pollution on health and the environment. The air quality objectives are policy based targets set by the UK Government that are often expressed as maximum concentrations not to be exceeded either without exception or with a limited number of exceedances within a specified timescale.
- 9.9 For the pollutants considered in this assessment, there are both a long-term (e.g. annual mean) and short-term (e.g. one hour mean) standard. In the case of NO₂, the short-term standard is for a 1-hour averaging period (no more than 18 exceedances of 200 µg/m³ per year), whereas for PM₁₀ it is a 24-hour averaging period (no more than 35 exceedances of 50 µg/m³ per year). The variation in time period reflects the varying impacts on health of differing exposures to pollutants.

Air Quality Standards Regulations

- 9.10 The air quality objectives set out in the AQS are statutory in England with the Air Quality (England) Regulations 2000⁹ and the Air Quality (England) (Amendment) Regulations 2002¹⁰ for the purpose of Local Air Quality Management (LAQM).
- 9.11 The Regulations require likely exceedances of the AQS objectives to be assessed in relation to:
- "...the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present..."*
- 9.12 The Air Quality Standards (Amendment) Regulations 2016¹¹ transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as NO₂, PM₁₀ and PM_{2.5}. The limit values for NO₂ and PM₁₀ are the same concentrations levels as the relevant AQS objectives and the limit value for PM_{2.5} is currently a concentration of 25 µg/m³. The relevant air quality objectives are presented in Table 9.1.

Table 9.1 Air Quality Objectives for Relevant Pollutants

Pollutant	Concentration	Measured as
NO ₂	200 µg/m ³	1-hour mean, not to be exceeded more than 18 times a year (99.79 %ile)
	40 µg/m ³	Annual mean
PM ₁₀	50 µg/m ³	24-hour mean, not to be exceeded more than 35 times a year (90.41 %ile)
	40 µg/m ³	Annual mean
PM _{2.5}	25 µg/m ³	Annual mean

⁹ The Air Quality (England) Regulations 2000 – Statutory Instrument 2000, No. 928.

¹⁰ The Air Quality (England) (Amendment) Regulations 2002 – Statutory Instrument 2002, No. 3043.

¹¹ The Air Quality Standards (Amendment) Regulations 2016 – Statutory Instrument 2016, No. 1184.

Environment Act

- 9.13 Part IV of the Environment Act 1995¹² requires local authorities to periodically review and assess the quality of air within their administrative area. The reviews have to consider both the air quality at the time of review and likely future air quality during the 'relevant period' and whether any air quality objectives prescribed in regulations are being achieved or are likely to be achieved in the future. Where the objectives are not likely to be achieved, an authority is required to designate an AQMA. For each designated AQMA the local authority is required to produce an Air Quality Action Plan (AQAP) that works to ensure compliance with the objectives by implementing a number of air quality improvement measures.

Environmental Protection Act

- 9.14 Section 79 of the Environmental Protection Act 1990 (as amended)¹³ makes provision for the identification and control of statutory nuisances. The Act identifies statutory nuisance, in relation to air quality, as:

"Any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance; and, any accumulation or deposit which is prejudicial to health or a nuisance."

- 9.15 As a result, the level at which a nuisance occurs is highly variable and dependent on perception, with effects influenced by existing conditions and the degree of change that has occurred.
- 9.16 Where a statutory nuisance has been demonstrated the local authority must serve an abatement notice, non-compliance with which would constitute a legal offence. The abatement notice may prevent or restrict occurrence or re-occurrence of the nuisance or the local authority may, itself, undertake action to abate the nuisance and recover any associated expenses.

National Planning Policy

- 9.17 The National Planning Policy Framework (NPPF)¹⁴ sets out policies which apply to the preparation of local plans and to development management decisions. This framework sets out the Government's economic, environmental and social planning policies for England. Taken together, these policies articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations.
- 9.18 The NPPF sets out the Government's planning policies on the conservation and enhancement of the natural environment, with the following paragraphs relating to air quality:

Paragraph 8c, which states:

- c. *"to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."*

Paragraph 54, which states:

- d. *"Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition."*

¹² The Environment Act 1995.

¹³ The Environmental Protection Act 1995.

¹⁴ Ministry of Housing, Communities and Local Government (February 2019). National Planning Policy Framework.

Paragraph 103, which states:

- e. *"the planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making."*

Paragraph 170e, which states:

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

Paragraph 181, which states:

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

Paragraph 183, which states:

- h. *"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."*

Paragraph 205c, which states:

- i. *"ensure that any unavoidable noise, dust and particulate emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive receptors."*

Local Planning Policy

Manchester Local Plan

- 9.19 Local planning policy is provided in Manchester City Council's Local Plan, with the Core Strategy Development Plan Document¹⁵ comprising the key document in the Local Plan outlining the Council's vision for Manchester in 2027 and identifying the planning policies which will be used to deliver that vision.

¹⁵ Manchester City Council (2012) Manchester's Local Development Framework Core Strategy Development Plan Document.

- 9.20 The main planning policy relating to air quality is provided by Policy EN16 of the Core Strategy, which states that:

"...the Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant. When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas."

- 9.21 Further this, Policy EN7 on energy infrastructure opportunities identifies that

"...there will be a presumption in favour of low and zero carbon decentralised energy schemes, subject to the following considerations... the cumulative impact of energy schemes will be taken into account when consideration applications, to include modelled impacts on air quality and landscape character, with reference to Policy EN16."

Local Air Quality Management

- 9.22 Local authorities are required, under Part IV of the Environment Act 1995, to assess and review local air quality within their area periodically. The assessment and review processes should consider the air quality both at the time of review and likely future conditions within a relevant period and identify whether air quality standards and objectives are being achieved at the time of review and likely to be achieved for the appropriate period into the future.
- 9.23 The local authority has an obligation under the Act to identify any areas in which the objectives are not or are not likely to be achieved and must designate them as an Air Quality Management Area (AQMA). For each area, an Action Plan identifying how the authority will address the air quality issues with the aim of achieving the prescribed air quality standards and objectives.
- 9.24 The Greater Manchester Air Quality Action Plan¹⁶ has been prepared by the 10 Greater Manchester Authorities, including Manchester City Council, complying with the statutory requirement to produce such a plan once an AQMA has been declared. The Plan details the measures that will be taken across the area and process by which the Plan will be evaluated, and is accompanied by detailed annexes for each of the 10 district authorities providing a more detailed and local focus to the wider actions and strategies. The latest monitoring report¹⁷ identifies that long-term trends indicate a slight improvement in air quality, however areas remain above the air quality objective for annual mean NO₂ and one location (Manchester Oxford Road) exceeds the hourly NO₂ objective.

Guidance

National Planning Practice Guidance

- 9.25 The NPPF is supported by Planning Practice Guidance¹⁸, which outlines how the planning process can address potential air quality impacts associated with new development. It provides guidance on the level of detail required, how impacts can be mitigated and also provides information on how local authorities may take air quality as a specific consideration in a planning decision.

¹⁶ Greater Manchester Combined Authority (2018) Greater Manchester Air Quality Management Plan. 2016 – 2021.

¹⁷ Greater Manchester Combined Authority (2018) 2018 Air Quality Annual Status Report for Greater Manchester.

¹⁸ Ministry of Housing, Communities and Local Government (2019) National Planning Practice Guidance.

Local Air Quality Management Review and Assessment Technical Guidance

- 9.26 The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities. This technical guidance, identified as LAQM.TG(16)¹⁹, is for use by local authorities for their review and assessment work and has been applied where appropriate to this assessment.

Land-Use Planning and Development Control: Planning for Air Quality

- 9.27 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance²⁰ which offers advice as to when an air quality assessment may or may not be required. The guidance document details what should be included within an assessment, how to determine the significance of impacts and the likely mitigation measures required to minimise the impacts.

Guidance on the Assessment of Dust from Demolition and Construction

- 9.28 This document²¹, published by the IAQM, provides guidance on how to assess the impact of construction activities on air quality associated with new developments. The methodology prescribed within the document allows the impacts to be categorised based on risk (with particular reference to dust and PM10 on sensitive human and ecological receptors) and, where applicable, identify mitigation measures associated to the risk classification determined.

Assessment Methodology and Significance Criteria

- 9.29 The Air Quality Assessment considers the impact of the Proposed Development, both during construction and operation, on local air quality and its subsequent effect on sensitive receptors. The scope of the assessment includes consideration of the effects arising as a result of dust related impacts during construction and local air quality effects as a result of road traffic and onsite combustion plant associated with the Proposed Development.
- 9.30 The Air Quality Assessment has been completed following appropriate best practice guidelines by the IAQM for dust during construction and jointly produced by EPUK and IAQM for operational air quality effects. The area over which impacts are considered varies between the two assessments: construction related impacts are considered over a 350 m radius surrounding the Proposed Development plus 50 m from the highway boundary of main roads likely to be used by construction related vehicles surrounding the Site for up to 500 m from the Site.
- 9.31 Consultation to discuss the scope and methodology of the air quality assessment was undertaken with the Environmental Health Officer (EHO) at MCC on 13th March 2020 (although due to timescales no response has been received). In addition, a scoping report has been submitted to MCC, this is provided in Appendix 3.1.

Assessment Methodology

Scope of the Assessment

- 9.32 The scope of the assessment has been determined in the following way:
- Consultation with the EHO at MCC to agree the scope of the assessment and the methodology to be applied;

¹⁹ Defra (2018) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance (TG16). Defra, London.

²⁰ Environmental Protection UK and Institute of Air Quality Management (2017) Land Use Planning & Development Control: Planning for Air Quality. Version 1.2, Updated January 2017.

²¹ Institute of Air Quality Management (2016). Guidance on the Assessment of Dust from Demolition and Construction. Version 1.1, Updated June 2016.

- Review of MCC's latest review and assessment reports and the air quality data for the area surround the Application Site, including MCC and Defra;
- Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality, and a review of the masterplan for the Development to establish the location of new sensitive receptors;
- Review of the traffic data provided by Vectos; and,
- Review of the combustion plant associated with the Proposed Development (technical specification date provided by Futureserv).

9.33 The scope of the assessment includes consideration of the potential impacts on local air quality resulting from:

- Dust and particulate matter generated by on-site activities during the construction phase;
- Increases in pollutant concentrations as a result of exhaust emissions arising from construction traffic and plant;
- Increases in pollutant concentrations as a result of exhaust emissions arising from traffic generated by the Proposed Development once operational; and,
- Increases in pollutant concentrations as a result of the emissions arising from the proposed onsite combustion plant.

Construction

9.34 Assessment of the risk of impact associated with the generation of dust during the construction phase of the Proposed Development and determination of subsequent mitigation measures necessary has been undertaken following IAQM guidelines²².

9.35 The assessment is based on a series of steps: screening the requirement for a detailed assessment, classification of the likely magnitude of dust emissions; characterisation of the area of influence and establishment of its sensitivity to dust and establishment of the overall risk of impact. The risk of impact from dust emissions from the Proposed Development considers effects on human health, nuisance as a result of dust soiling and ecological receptors from four main activities: demolition; earthworks; construction; and trackout. The potential for dust emissions from each activity should be considered, unless any of them are not relevant to the Proposed Development.

9.36 The guidelines identify appropriate screening criteria for the identification of potential receptors, based on a conservative approach and in consideration of the exponential decline in both airborne concentrations and the rate of deposition with distance. A detailed assessment of the impact of dust from construction sites will be required where:

- A 'human receptor' is located within 350 m of the boundary of the site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance;
- An 'ecological receptor' is located within 50 m of the boundary of the site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance.

9.37 The magnitude of dust emissions for each activity is classified as small, medium or large depending upon the scale of the works proposed, materials involved and level of activity required. The IAQM guidelines provide examples of how the magnitude of emissions can be defined, which are identified in Table 9.2. The Proposed Development is unlikely to satisfy all criteria within the examples, therefore professional judgement and site specific information are used to identify appropriate emission magnitude.

²² Institute of Air Quality Management (2016). Guidance on the Assessment of Dust from Demolition and Construction. Version 1.1, Updated June 2016.

Table 9.2 Dust Emission Magnitude (Source: IAQM Guidance, v1.1 Updated June 2016)

Activity	Small	Medium	Large
Demolition	• Total building volume <20,000m³ • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities <10m above ground level)	• Total building volume 20,000 – 50,000m³ • Potentially dusty construction material • Demolition activities 10 to 20m above ground level	• Total building volume >50,000m³ • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities >20m above ground
Earthworks	• Total site area <2,500m² • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <4m in height • Total material moved <20,000 tonnes • Earthworks during wetter months	• Total site area 2,500 to 10,000m² • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 4m to 8m in height • Total material moved 20,000 to 100,000 tonnes	• Total site area >10,000m² • Potentially dusty soil type (e.g. clay) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >8m in height • Total material moved >100,000 tonnes
Construction	• Total building volume <25,000m³ • Construction material with low potential for dust (e.g. metal cladding or timber)	• Total building volume 25,000m³ to 100,000m³ • Potentially dusty construction material (e.g. concrete) • On-site concrete batching	• Total building volume >100,000m³ • On-site concrete batching, sandblasting
Trackout	• <10 HDV (>3.5t) outward movements* in any one day[#] • Surface material with low potential for dust release • Unpaved road length <50m	• 10 to 50 HDV (>3.5t) outward movements* in any one day[#] • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50m to 100m	• >50 HDV (>3.5t) outward movements* in any one day[#] • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100m
* A vehicle movement is a one way journey, i.e. from A to B, and excludes the return journey # HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum, not the average.			

9.38 Consideration is given to the likely sensitivity of the area to the impacts of dust, establishing a sensitivity of low, medium or high for dust soiling, human health and ecological receptors. The sensitivity of the area considers a number of factors, including the specific sensitivities of receptors in the area, the proximity and number of those receptors, local baseline conditions such as background concentrations and site specific factors.

9.39 The first step in identifying the sensitivity of the area is to establish the sensitivity of the receptor, based on the presence or level of activity associated with the area of influence of the Proposed Development. Professional judgement and site specific information are used to assign an appropriate level of receptor sensitivity using the principles outlined in Table 9.3. Following this, the sensitivity of the area can be established from Tables 9.4 to 9.6 based on the sensitivity of the receptors, number of receptors (in the case of human health and dust soiling) and the distance from source.

Table 9.3 Dust Emission Magnitude (Source: IAQM Guidance, v1.1 Updated June 2016)

Impact	Small (Minor)	Medium (Moderate)	Large (Substantial)
Dust Soiling	• Enjoyment of amenity would not reasonably be expected; • There is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; • Transient exposure, where people or property is only expected to be present for limited periods of time as part of the normal pattern of use; • Indicative examples include playing fields, farmland, footpaths, short-term car parks and roads.	• Users would expect to enjoy a reasonable level of amenity, but not reasonably at the same level as in their home; • The appearance, aesthetics or value of property could be diminished by soiling; • Indicative examples include parks and places of work.	• Users can reasonably expect enjoyment of a high level of amenity; • The appearance, aesthetics or value of property would be diminished by soiling, and continuous or regularly extended periods of presence expected during normal pattern of land use; • Indicative examples include dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.
Human Health	• Locations where human exposure is transient; • Indicative examples include public footpaths, playing fields, parks and shopping streets.	• Locations where people exposed are workers[#], and exposure is over a time period relevant to the air quality objective for PM₁₀*; • Indicative examples including office and shop workers, but not those occupationally exposed to dust.	• Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM₁₀*; • Indicative examples include residential properties, hospitals, schools and residential care homes.
Ecology	• Locations with a local designation where the features may be affected by dust deposition, <i>e.g.</i> Local Nature Reserve.	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; • Locations with a national designation where the features may be affected by dust deposition, <i>e.g.</i> Site of Special Scientific Interest.	• Locations with an international or national designation and the designated features may be affected by dust soiling, <i>e.g.</i> Special Area of Conservation with acid heathland. • Locations where there is a community of particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain.
* In the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day, following Defra guidance. [#] Workers are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children, are not normally workers.			

Table 9.4 Sensitivity of the Area to Dust Soiling Effects on People and Property (Source: IAQM Guidance, v1.1 Updated June 2016)

Receptor Sensitivity	Number of Receptors	Distance from Source			
		<20m	<50m	<100m	<350m
High	>100	High	High	Medium	Low
	10 – 100	High	Medium	Low	Low
	1 – 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 9.5 Sensitivity of the Area to Human Health Effects (Source: IAQM Guidance, v1.1 Updated June 2016)

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from Source				
			<20m	<50m	<100m	<200m	<350m
High	>32 µg/m ³	>100	High	High	High	Medium	Low
		10 – 100	High	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	28 – 32 µg/m ³	>100	High	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	24 – 28 µg/m ³	>100	High	Medium	Low	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10 – 100	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	28 – 32 µg/m ³	>10	Medium	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	24 – 28 µg/m ³	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	-	>1	Low	Low	Low	Low	Low
		>1	Low	Low	Low	Low	Low

Table 9.6 Sensitivity of the Area to Ecological Impacts (Source: IAQM Guidance, v1.1 Updated June 2016)

Receptor Sensitivity	Distance from Source	
	<20m	<50m
	High	Medium
	Medium	Low
	Low	Low

Significance Criteria

Construction

- 9.40 The risk of dust related impacts from the Proposed Development is established from the sensitivity of the area and the likely dust emission magnitude. The risk should be established, on the worst-case area sensitivity and in the absence of mitigation, for each of the construction related activities (demolition, earthworks, construction and trackout) following the matrix in Table 9.7.

Table 9.7 Risk of Dust Impacts from Each Activity (Source: IAQM Guidance, v1.1 Updated June 2016)

Sensitivity of Area	Activity	Dust Emission Magnitude		
		Large	Medium	Small
High	Demolition	High Risk	Medium Risk	Medium Risk
	Earthworks	High Risk	Medium Risk	Low Risk
	Construction	High Risk	Medium Risk	Low Risk
	Trackout	High Risk	Medium Risk	Low Risk
Medium	Demolition	High Risk	Medium Risk	Low Risk
	Earthworks	Medium Risk	Medium Risk	Low Risk
	Construction	Medium Risk	Medium Risk	Low Risk
	Trackout	Medium Risk	Low Risk	Negligible
Low	Demolition	Medium Risk	Low Risk	Negligible
	Earthworks	Low Risk	Low Risk	Negligible
	Construction	Low Risk	Low Risk	Negligible
	Trackout	Low Risk	Low Risk	Negligible

- 9.41 The IAQM guidelines identify a range of mitigation measures intended to reduce the emission and effects of dust from construction sites, and identify their likely applicability to a development based on the level of impact risk attributed. Consideration is given to these in the development of mitigation measures, with the significance of the residual effect based on professional judgement.

Operation

Road Traffic Emissions

- 9.42 Impacts on concentrations of NO₂, PM₁₀ and PM_{2.5} have been considered in this assessment as road traffic is the main source of these pollutants.
- 9.43 A detailed assessment of the potential impacts of development-generated road traffic on the local air quality has been undertaken using the dispersion model ADMS-Roads, Version 4.1.1.0 (release date 18th January 2018). This model uses detailed road traffic information, surface roughness, and

local meteorological information to predict the impact on pollutant concentrations at specific receptor points.

9.44 Information provided by Vectos, which has been derived from the Transport for Greater Manchester (TfGM) strategic transport model is for a current baseline year of 2020. TfGM have indicated that the flows derived in this scenario are the maximum to be expected in any future year i.e. TfGM expects no additional growth on the road network. The TfGM strategic transport model includes for trips associated with the wider St John's Masterplan, therefore detailed modelling of development generated traffic has been scoped out. However, detailed road traffic modelling has been undertaken to calculate the baseline concentrations.

9.45 Table 9.8 summarises the air quality modelling parameters for road traffic.

Table 9.8 ADMS Roads Modelling Parameters

Parameter	Local Area	Met. Measurement Site
Latitude	53.2	53.2
Surface Roughness	1	0.5
Monin-Obukhov Length (m)	30	30

9.46 The ADMS model uses meteorological data including wind speed and direction to determine the how pollution is transported and diluted with distance from the source. For this assessment meteorological data from 2018 for Manchester Airport (most recently available) has been utilised as this is considered representative of the Application Site.

9.47 A summary of the traffic data used in the air quality assessment is presented in Appendix 9.2 and illustrated in Figure 9.2. Appendix 9.2 includes details regarding Annual Average Daily Traffic (AADT) flows, percentage of Heavy Goods Vehicles (HGV) and vehicle speeds (km/hr). For the assessment, three scenarios have been modelled:

- 2018 Model Verification (based on available monitoring along road network provided);
- Without Development + Committed Developments (Traffic Data from 2020 TfGM Strategic Transport Model); and,
- With Development + Committed Developments (Traffic Data from 2020 TfGM Strategic Transport Model) + Proposed Development (Process Contributions associated with the onsite combustion plant).

j. Vehicle Emission Factors

9.48 Vehicle emission factors for the air assessment are usually obtained using the Emission Factor Toolkit (EFT) version 9.0.1 (published in May 2019) available on the Defra website²³. The EFT allows for the calculation of emission factors arising from road traffic for all years between 2017 and 2030. For the predictions of future year emissions, the toolkit takes into account factors such as anticipated advances in vehicle technology and changes in vehicle fleet composition, such that vehicle emissions are assumed to reduce over time.

9.49 Defra's EFT calculator has been used to calculate the emission factors for NO₂, PM₁₀ and PM_{2.5}.

9.50 Emission factors for 2018 have been used for the model verification scenario and 2020 emission factors have been used for the 'without' and 'with' development scenarios. Using the 2020 emission factors

²³ Defra Emission Factor Toolkit. Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>. Accessed 17/03/2020.

for the operational impacts represents a worst case i.e. no improvement on the current baseline - this is considered to be reasonable and robust.

Selection of Background Concentrations

- 9.51 The background concentrations of those pollutants included within the AQS have been mapped at a grid resolution of 1x1km for the whole of the UK and are available on Defra's website²⁴. Estimated background concentrations are available for all years between 2017 and 2030 and the maps assume that background concentrations will reduce (i.e. improve) over time. This assumption is based up on improvements in emissions from various sources. In line with the findings (usually based on monitoring data) of local authorities measured concentrations as expected have not reduced over time.
- 9.52 For the purposes of the assessment, background concentrations from 2018 have been used in the verification scenario and 2020 for the 'without' and 'with' development scenarios. Background concentrations for NO₂, PM₁₀ and PM_{2.5} and modelled receptors are presented in Appendix 9.3.

Model Verification

- 9.53 The ADMS-Roads dispersion model has been validated by the software developer and is considered to be fit for purpose, however local model validation, i.e. in the vicinity of the Proposed Development, has not been undertaken. Therefore, to validate the model and to determine how well the model is performing at a local level, comparing the modelling results with local monitoring data is undertaken. The verification process aims to minimise model uncertainty and error by adjusting the modelled results by a factor to offer great confidence in the final results. This is undertaken in accordance with the methodology specified in Chapter 7, Section 4, of LAQM.TG16.
- 9.54 Details of the verification factor calculations are presented in Appendix 9.4. An adjustment factor of 1.3 was obtained during the verification process, which indicated that the model was under-predicting. This factor was applied to the model road-NO_x outputs prior to conversion to annual mean NO₂ concentrations utilising the NO_x to NO₂ calculator provided by Defra²⁵.
- 9.55 No local monitoring data was available for PM₁₀ and PM_{2.5}, therefore, the adjustment factor calculated for NO_x has been applied to both the modelled PM₁₀ and PM_{2.5} concentrations, prior to adding to the appropriate background concentration. This approach is in accordance with LAQM.TG16.

Assessment of Impacts Due to Emissions Generated by the Onsite Combustion Plant

- 9.56 For the prediction of impacts due to emissions arising from the operation of onsite combustion plant, the air pollutant dispersion model ADMS 5.2 has been used. This model uses detailed information regarding the pollutant releases, local building effects and local meteorological conditions to predict pollution concentrations at specific locations selected by the user.
- 9.57 A summary of the model parameters used in the assessment are detailed in Table 9.9.

Table 9.9 ADMS 5.2 Modelling Parameters

Parameter	Each Boiler	CHP
Model*	Hoval Ultragas 300D	PowerBloc 260
Number of Units	4	1

²⁴ Defra Background Maps. Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>. Accessed 17/03/2020.

²⁵ Defra NO_x to NO₂ Calculator. Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>. Accessed 17/03/2020.

Parameter	Each Boiler	CHP
Stack Height (m)	115.125 (1m above parapet)	115.125 (1m above parapet)
Stack diameter (m)	0.4m (combined)	0.2
Release temperature (°C)	71	120
Release velocity (m/s)	1.04	8.9
Actual Volumetric Release (Nm ³ /s)	0.104	0.19
Average NO _x emission rate (g/s) – Annual Mean	0.039 (per boiler)	0.0291
Assumed Operating Schedule:	24 hours per day, 7 days per week	24 hours per day, 7 days per week
*Surrogate Boiler & CHP models have been selected as no specific units have been selected, however sizing is in accordance with those proposed by the M&E Engineer.		

- 9.58 The same meteorological data used in the assessment of traffic impacts, were used in the combustion plant modelling.
- 9.59 Both nearby buildings and complex topography can have a significant effect on the dispersion characteristics of the plumes from the stacks being assessed. ADMS 5.2 has algorithms which attempt to take account of these impacts. Buildings can cause the plume to come to ground much closer to the stack than otherwise expected, causing higher pollutant concentrations. Plumes can also impact on hillsides under certain weather conditions, or within a basin or hollow which may result in pollutants being trapped for low level discharges.
- 9.60 A detailed description of the modelled buildings can be found in Appendix 9.5 and illustrated on Figure 9.3.
- 9.61 The combustion plant contribution to annual mean NO_x concentrations was predicted, along with the 99.79th percentile of hourly mean concentrations. The predicted NO_x contributions were then converted to NO₂ assuming 70% for long-term emissions and 35% for short-term emissions, as set out in a guidance note published by the Environment Agency²⁶.

Significant Combustion Plant Contributions

- 9.62 The Environment Agency's Air Emissions risk assessment guidance sets out the levels at which process contributions (contributions to concentrations from combustion plant emissions) can be screened out as being insignificant; Process Contributions ("PC") can be considered insignificant if:
- The long term PC is <1% of the long term environmental standard (for NO₂ <0.4 µg/m³);
 - The short term PC is <10% of the short term environmental standard (for NO₂ <20 µg/m³).
- 9.63 Where the PC exceeds these thresholds and is potentially significant, it is necessary to compare the Predicted Environmental Concentration ("PEC") against the relevant statutory and guideline air quality standards, by combining the PC with appropriate background data.

In-combination Impacts of the Emissions from the Onsite Combustion Plant & Traffic Emissions

- 9.64 The total NO₂ concentrations (*i.e.* PEC) at each receptor were calculated as follows:
- Long term standards: PEC = PC + Background Concentration

²⁶ Environment Agency's advice note for conversion ratios for NO_x and NO₂. Available at http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/static/documents/Conversion_ratios_for_NOx_and_NO2_.pdf. Accessed 22/08/2019.

- Short term standards: $PEC_{\text{short term}} = PC_{\text{short term}} + (2 \times \text{Background}_{\text{long term}})$.

9.65 The air quality modelling generates pollutant estimates of road source contributed NO_x, PM₁₀ and PM_{2.5} and NO_x for combustion plant contributions at specified receptors. To permit comparison with the relevant air quality objectives for NO₂, PM₁₀ and PM_{2.5} it has been necessary to combine the adjusted model outputs data with the background concentrations.

9.66 To consider compliance with the 1-hour mean air quality objective for NO₂, detailed modelling has been undertaken and the results are summarised in Section 5.2.

9.67 To consider compliance with the 24-hour mean air quality objective for PM₁₀, Defra's guidance gives the following equation that relates the annual mean concentration to the number of exceedances of the 24-hour mean concentration of 50 µg/m³, where up to 35 exceedances are allowed:

- No. 24-hour mean exceedances = $-18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$.

This approach has been adopted for 24-hour mean PM₁₀ for this assessment.

Significance Criteria

9.68 The EPUK and IAQM guidelines²⁷ provide guidance for establishing the significance of air quality impacts arising as a result of development proposals. The magnitude of impact on individual receptors is dependent upon the long-term average pollutant concentration at the receptors in the assessment year and the percentage change relative to the AQAL, as identified in Table 9.10.

Table 9.10 Operational Impact Descriptors

Long-Term Average Concentration at Receptor in Assessment Year	Percentage Change in Concentration to AQAL*			
	1	2 – 5	6 – 10	>10
75% or less of AQAL	Negligible	Negligible	Minor (Slight)	Moderate
76 – 94% of AQAL	Negligible	Minor (Slight)	Moderate	Moderate
95 – 102% of AQAL	Minor (Slight)	Moderate	Moderate	Major (Substantial)
103 – 109% of AQAL	Moderate	Moderate	Major (Substantial)	Major (Substantial)
110% or more of AQAL	Moderate	Major (Substantial)	Major (Substantial)	Major (Substantial)

*Where the % change is <0.5% the change is described as 'Negligible' regardless of concentration.

9.69 The guidelines do not, however, provide a set method for establishing the significance of impact. Whilst the establishment of the impact magnitude on individual receptors can be identified as negligible, slight, moderate or substantial, the significance of the overall effect is dependent on a number of factors. Therefore, professional judgement will be applied to determine the likely significance of effects, with the following factors considered:

- The existing and future air quality in the absence of the development, notably whether the Air Quality Objectives are likely to be met or the scale of exceedances in the long-term and short-term concentrations;

²⁷ Environmental Protection UK and Institute of Air Quality Management (2017) Land Use Planning & Development Control: Planning for Air Quality. Version 1.2, Updated January 2017.

- The extent of current and future population exposure to the impacts, notably the number of properties and/or people present and the scale of impact (e.g. whether the majority of the local population is subject to substantial or slight magnitude impacts);
- The influence and validity of any assumption adopted when undertaking the prediction of impacts, such as establishing a worst-case scenario for sensitive receptors.

Limitations and Assumptions

- 9.70 Professional judgement has been used in the completion of the construction phase dust assessment for the Proposed Development.
- 9.71 The ADMS-Roads and ADMS 5.2 dispersion models used in this assessment relies up on input data (including predicted traffic flows and combustion plant specification data), which is supplied by third parties and may have uncertainties associated with them. The model simplifies complex environments and does not always accurately reflect local micro-climatic conditions which may ultimately affect the predicted pollutant concentrations.
- 9.72 It is assumed that the information provided by the transport consultant for use in the air quality assessment are accurate.
- 9.73 It is assumed that the information provided by the M&E engineers and the energy consultant for the onsite combustion plant for the provision of heating and hot water are accurate.
- 9.74 The assumptions made in the assessment are considered reasonable and robust.

Baseline Conditions

Local Air Quality Information

- 9.75 The Greater Manchester Combined Authority (GMCA) have declared an AQMA which covers Manchester City Centre and extends along the main arterial traffic routes in the city and around Manchester Airport. The pollutant declared for the AQMA is annual mean NO₂, with the source identified as a mixture of road types. The extent of the AQMA in relation to the Application Site is identified in Figure 9.4.
- 9.76 The most recent air quality progress report for Greater Manchester concluded that:
- Long-term trends have shown that there has been an improvement in air quality, but areas still remain above the air quality objective for the annual mean NO₂;
 - The assessment of monitoring data shows that real time monitoring data for the NO₂ annual mean objective broadly confirms the new AQMA boundaries declared in 2016;
 - Exceedances were noted at several roadside monitoring sites, most notably Manchester Oxford Road and Manchester Piccadilly, with measurements from Greater Manchester's diffusion tube network confirming locations that continue to be above the annual mean NO₂;
 - One site, Manchester Oxford Road, exceeded the hourly NO₂ objective with 90 exceedances (18 exceedances permitted by the objective), however the exceedances were noted to be associated with queuing buses close to the monitoring site as a result of diversions associated with the Metrolink works and other road closures;
 - Real time monitoring data for PM₁₀ shows that annual average objectives are not exceeded and mostly remain stable at low concentrations;
 - No sites had more than 35 exceedances of the daily mean particulate objective, and therefore this objective is met;
 - SO₂ monitoring was carried out at 2 locations, with no exceedances of the air quality objectives; and,
 - Monitoring and reporting of CO and C₆H₆ has been discontinued as previous assessments indicated no exceedances.

- 9.77 Importantly, the Greater Manchester Air Quality Action Plan identifies that the major source of both NO₂ and PM₁₀ is the road network, with a large percentage of that originating from roads with an AADT flow in excess of 10,000 vehicles.

Local Air Quality Monitoring Data

- 9.78 As part of the Greater Manchester Air Quality Action Plan, a number of automated and non-automated air quality monitoring stations have been set up. Two continuous automated monitoring stations are located in the vicinity of Manchester City Centre, as identified in Table 9.11, with three non-automated monitoring locations in the vicinity of the Proposed Development, including Trinity Way (SA37 and SA39) and Regent Road (SA60) – all represent roadside sites.

Table 9.11 Air Quality Monitoring Locations within Manchester City Centre

Monitoring Site	Location	Type	Pollutants Monitored
Oxford Road	384233 397287	Kerbside – sites with sample inlets within 1m of the edge of a busy road. Sampling height is 2m	NO ₂ , PM ₁₀
Piccadilly	384310 398337	Urban centre – non-kerbside sites located in an area representative of typical population exposure in town or city centre areas, e.g. pedestrian precincts and shopping areas. Sampling height is 4m	NO ₂ , O ₃ , PM ₁₀ , PM _{2.5} , SO ₂
Salford SA37 (Trinity Way)	383089, 398739	Roadside – sites with sample inlets within 2-5m of the edge of a busy road. Sampling height is 2m	NO ₂
Salford SA39 (Trinity Way)	383040, 398563	Roadside – sites with sample inlets within 2-5m of the edge of a busy road. Sampling height is 2m	NO ₂
Salford SA60 (Regent Road)	382445, 397724	Roadside – sites with sample inlets within 2-5m of the edge of a busy road. Sampling height is 2m	NO ₂

Nitrogen Dioxide

- 9.79 The annual mean NO₂ concentrations are identified in Table 9.12 for the air quality monitoring locations located in close proximity to the Site.
- 9.80 Automated survey results from the Oxford Road and Piccadilly demonstrate exceedances of the annual mean between 2013 and 2016, with the exception of Piccadilly in 2013, 2015 and 2017.
- 9.81 The results from the most representative non-automated monitoring sites (SA37, SA39 and SA60) indicated annual mean concentrations below the AQS objective between 2013 and 2017, with the exception of SA39 and SA60 in 2017 and SA60 in 2018.

Table 9.12 NO₂ Monitoring – Annual Mean Concentrations (µg/m³)

Year	Monitoring Objective	Automated Surveys		Non-Automated Surveys		
		Oxford Road	Piccadilly	Salford SA37 (Trinity Way)	Salford SA39 (Trinity Way)	Salford SA60 (Regent Rd)
2013	Annual Mean Concentration	55	39	36.5	37.5	-
	Number of 1-hour Mean Exceedances	0 (138)*	0 (97)*	-	-	-
2014	Annual Mean Concentration	68	40	36.5	39.7	-
	Number of 1-hour Mean Exceedances	14	2	-	-	-

Year	Monitoring Objective	Automated Surveys		Non-Automated Surveys		
		Oxford Road	Piccadilly	Salford SA37 (Trinity Way)	Salford SA39 (Trinity Way)	Salford SA60 (Regent Rd)
2015	Annual Mean Concentration	66	39	35.4	38.5	-
	Number of 1-hour Mean Exceedances	60	1	-	-	-
2016	Annual Mean Concentration	66	40	39	46.8	-
	Number of 1-hour Mean Exceedances	90	0	-	-	-
2017	Annual Mean Concentration	65	36	37.2	42.1	41.2
	Number of 1-hour Mean Exceedances	6	1	-	-	-
2018	Annual Mean Concentration	65	62	-	39.1	40.2
	Number of 1-hour Mean Exceedances	6	2	-	-	-
* If the data capture for the full year is less than 90%, the 99.8th percentile of hourly means (in brackets) is a useful predictor of possible exceedance of the Air Quality Objective. **Bold indicates an exceedance of the relevant AQS objective.						

Particulate Matter

9.82 The annual mean PM10 and PM2.5 concentrations are identified in Table 9.13 for the air quality monitoring located closest to the Proposed Development. The results from the automated stations demonstrate that the annual mean particulate concentrations, for both PM10 and PM2.5, fall within the relevant long-term AQS objectives between 2013 and 2018. The monitors also demonstrate compliance with the short-term objective for PM10.

Table 9.13 Particulate Monitoring – Annual Mean Concentrations

Year	Monitoring Objective	PM ₁₀		PM _{2.5}
		Oxford Road	Piccadilly	Piccadilly
2013	Annual Mean Concentration	31	22	12
	Number of 24-hour Mean Exceedances	21	7	-
2014	Annual Mean Concentration	28	20	12
	Number of 24-hour Mean Exceedances	18	5	-
2015	Annual Mean Concentration	28	20	10
	Number of 24-hour Mean Exceedances	25	3	-
2016	Annual Mean Concentration	27	20	10
	Number of 24-hour Mean Exceedances	16	3	-
2017	Annual Mean Concentration	27	20	8
	Number of 24-hour Mean Exceedances	15	3	-
2018	Annual Mean Concentration	30	21	11
	Number of 24-hour Mean Exceedances	15	2	-
* Bold indicates an exceedance of the relevant AQS objective.				

Sensitive Receptors

- 9.83 Defra provides guidance on locations where the air quality objectives should apply, Table 9.14 and professional judgement have been used to select receptors where likely significant exposure to pollutant concentrations may occur.

Table 9.14 Examples of where the Air Quality Objective may or may not apply

Averaging Period	Objectives Should Apply	Objectives Should Generally Not Apply
Annual Mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes, <i>etc.</i>	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade) or any other locations where public exposure is expected to be short-term.
24-Hour Mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside Sites (as opposed to locations at the building façade), or any other locations where public exposure is expected to be short-term.
1-Hour Mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations <i>etc.</i> which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend 1 hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-Minute Mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

- 9.84 The receptors were selected in locations that are likely to experience the greatest impact as a result of the Proposed Development. These locations are detailed in Appendix 9.3 and illustrated in Figure 9.5 and Figure 9.6. The receptors selected are based up on professional judgement but include a number of existing residential dwellings that are located on the road network in the vicinity of the Proposed Development.

Identification and Evaluation of Likely Significant Effects

Construction

Dust Emission Magnitude

- 9.85 The likely magnitude of dust emissions from the Proposed Development for the four main activities is outlined in Table 9.15.

Table 9.15 Predicted Magnitude of Dust Emissions from Proposed Development

Activity	Magnitude	Justification
Demolition	N/A	The site has been cleared in preparation for the various buildings in the masterplan to be brought forwards. As a result, there are no buildings, concrete slabs or hardstanding that required removal.
Earthworks	Medium (Moderate)	The total Site area is approximately 0.67ha, with compacted soils dominating the surface material and likely to be of potentially dusty material type (clay). The Proposed Development will require excavation of material to accommodate the construction of a basement. It is reasonable to assume that 5-10 heavy earth moving vehicles will be active at any one time, but given the location of the Site it is unlikely to be more than 10.
Construction	Large (Substantial)	The Proposed Development is likely to exceed the upper threshold building volume of 100,000 m ³ . Considering the building type, it is considered likely that construction materials will include potentially dusty types (e.g. concrete).
Trackout	Medium (Moderate)	Although the Site supports a potentially dusty surface material, the unpaved road length is estimated to be less than 50 m. Considering the size of the Site and nature of the Development, the daily HDV outward movements are considered likely to exceed 10 HDV movements but is not considered likely to exceed 50 HDV movements.

k. Sensitivity of the Area

- 9.86 A wind rose for Manchester 2018 is provided in Appendix 9.6 and this indicates that the prevailing wind direction is from the south, therefore existing receptors located to the north are most likely to fall within the area of influence from dust emissions generated during the construction phase. Under low wind speed conditions the majority of dust generated by the construction phase is likely to be deposited in close proximity to the source.
- 9.87 The surrounding area within the zone of influence from dust emissions include receptors of high (residential properties), medium (commercial and office properties) and low (footpaths, streets, shopping areas and roads) sensitivity. As a result, exposure to impacts will vary from transient exposure as a result of infrequent and short-duration presence to long-term and regular exposure. The majority of dust generated during the construction phase is likely to be deposited in close proximity to the source (within 350 m), Figure 9.7 illustrates the construction zone of influence.
- 9.88 There are no designated ecological receptors within 50 m of the Site or within 50 m of roads to be used by construction vehicles, up to 500 m from the Site access, therefore ecological receptors have not been considered further in this assessment.
- 9.89 The maximum Defra annual mean PM₁₀ concentration (for 2020) for the Site is 12.3 µg/m³, which is well below the AQS objective and falls under the lowest bracket for dust significance (i.e. <24 µg/m³) in the IAQM assessment methodology.

- 9.90 Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM₁₀ has been derived for each of the construction activities considered. The results are shown in Table 9.16.

Table 9.16 Sensitivity of the Area to Dust Emission Impacts

Impact Type	Receptor Sensitivity	No. Receptors	Background Concentration	Distance from Source	Sensitivity of Area
Dust Soiling	High	>100	-	<20	High
	Medium	>1	-	<20	Medium
	Low	>1	-	<20	Low
Human Health	High	>100	28 – 32 µg/m ³	<20	High
	Medium	>10	28 – 32 µg/m ³	<20	Medium
	Low	>1	28 – 32 µg/m ³	<20	Low
Ecological	N/A	N/A	N/A	N/A	N/A

- 9.91 Consequently, the sensitivity of the surrounding area is high for dust soiling (given the proximity of existing sensitive receptors) and medium human health.

Risk of Impact

- 9.92 The predicted dust emission magnitude has been combined with the defined sensitivity of the study area to determine the risk of impacts during the construction phase, prior to mitigation. Table 9.17 below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 9.17 Risk of Dust Related Impacts from the Proposed Development Prior to Mitigation

Impact Type	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
	N/A	Medium Risk	High Risk	Medium Risk
	N/A	Medium Risk	Medium Risk	Low Risk
	N/A	N/A	N/A	N/A

- 9.93 Considering the overall level of risk identified in Table 9.17, for the earthworks, construction and trackout elements of the construction phase, along with the likely duration of construction works, the impact identified is considered to hold a 'moderate adverse' impact with respect to dust soiling and 'minor to moderate adverse' impact to 'human health, without the implementation of mitigation measures.
- 9.94 The IAQM guidelines identify a range of mitigation measures intended to reduce the emission and effects of dust from construction sites and identify their likely applicability to a development based on the level of impact risk attributed. Consideration is given to these in the development of mitigation measures, with the significance of the residual effect based on professional judgement.

Construction Road Traffic & Non-Road Mobile Machinery (NRMM)

- 9.95 The greatest impact on air quality due to construction road traffic and NRMM is likely to be along roads in the vicinity of the Site. It is anticipated that the traffic will enter the Site via Water Street. The construction traffic volumes are likely to be relatively low compared to the existing traffic flows on the local road network.

- 9.96 Based on the current local air quality, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, the impacts are considered to be 'minor adverse' without the implementation of mitigation.

Operation

- 9.97 Full results of the dispersion modelling are presented in Appendix 9.7 and a summary is provided below.

Annual Mean NO₂ Concentrations

- 9.98 The objective for annual mean NO₂ concentrations is 40 µg/m³.

Existing Receptors

- 9.99 Without and with the Development operational, all existing receptors are predicted to be well below the annual mean AQS objective. The highest predicted concentration is 39.8 µg/m³, unchanged as a result of the development, at receptor E8_GF (ground floor receptor along New Quay Street). There is discernible change in annual mean NO₂ concentrations as result of the Development – likely due to the unchanged traffic contribution in the future compared to the current baseline (as per TfGM traffic modelling) and the emission point of the onsite combustion plant is a circa 115m above ground level.
- 9.100 The greatest long-term PC attributable to onsite combustion plant at existing receptors during the operational phase is 0.003 µg/m³, which is below the threshold of 1% of the long-term environmental standard for NO₂ (<0.4 µg/m³). Emissions from the onsite combustion plant PC is considered not significant.
- 9.101 Overall, the predicted impacts on annual mean NO₂ concentrations at existing receptors in accordance with the EPUK & IAQM guidance are negligible at all existing receptors. Mitigation is, therefore, not required.

Future Receptors

- 9.102 All 216 modelled new receptors within the Site are predicted to fall within the annual mean NO₂ objective. The highest predicted concentration being 32 µg/m³ at receptor N6_GF (new receptor on the ground floor along Water Street). It should be noted that there a proposals for Water Street to be closed off to public access.
- 9.103 The onsite combustion plant has a maximum PC of 0.3 µg/m³ at receptor N3_35 (new receptor on the 35th floor), which does not exceed the threshold of 1% of the long-term environmental standard for NO₂ (<0.4 µg/m³). The impact of the onsite combustion plant is considered not significant. Mitigation is, therefore, not required.

Hourly Mean NO₂ Concentrations

- 9.104 The AQS objective for 1-hour mean NO₂ concentrations is 200 µg/m³ to be exceeded no more than 18 times a year (the 99.79th percentile statistic).
- 9.105 With the Development operational, short-term NO₂ concentrations at all existing receptors are predicted to be below the AQS objective. The highest predicted concentration with the operation of the Development is 54.1 µg/m³. The impacts of the Development on hourly mean NO₂ concentrations are negligible, therefore mitigation is not required.
- 9.106 All the new receptors would experience concentrations below the short-term AQS objective, with the highest predicted concentration being 54.1 µg/m³.

- 9.107 The onsite combustion plant has a maximum PC of 5.5 µg/m³, which is significantly below the threshold of 10% of the short-term environmental standard for NO₂ (<20 µg/m³). The PC is considered not significant, therefore no mitigation is required.

Annual Mean PM₁₀ Concentrations

- 9.108 The objective for annual mean PM₁₀ concentrations is 40 µg/m³.
- 9.109 The highest predicted concentration at existing receptors is 13.7 µg/m³ at receptor E8_GF (ground floor receptor along New Quay Street). The development does not lead to an increase in PM₁₀ concentrations at any of the existing receptors. The predicted impacts on annual mean PM₁₀ concentrations at all existing receptors, in accordance with the EPUK & IAQM guidance, are negligible and therefore mitigation is not required.
- 9.110 All new receptors associated with the Site would experience PM₁₀ concentrations well below the AQS objective, and therefore mitigation is not required.

Daily Mean PM₁₀ Concentrations

- 9.111 The AQS objective for daily mean PM₁₀ concentrations is 50 µg/m³, to be exceeded no more than 35 times a year. The assessment demonstrates that all existing receptors fall within the daily mean PM₁₀ objective with a maximum of 1 exceedance predicted in both the 'without' and 'with' Development scenarios. Furthermore, there are no differences between the 'without' and 'with' development scenarios. As a result, the impact on daily mean PM₁₀ concentrations are negligible.
- 9.112 For daily mean PM₁₀, it is predicted that all new receptors would be well within the AQS objective, again with a maximum of one predicted exceedance of the limit at a number of receptors.

Annual Mean PM_{2.5} Concentrations

- 9.113 The objective for annual mean PM_{2.5} concentrations is 25 µg/m³.
- 9.114 The highest predicted concentration at existing receptors is 8.9 µg/m³ at receptor E8_GF & E9_GF (ground floor receptors located New Quay Street and Bridgewater Viaduct, respectively). The development does not lead to an increase in PM_{2.5} concentrations at any of the existing receptors. The predicted impacts on annual mean PM_{2.5} concentrations at all existing receptors, in accordance with the EPUK & IAQM guidance, are negligible and therefore mitigation is not required.
- 9.115 All new receptors associated with the Site would experience PM_{2.5} concentrations well below the AQS objective, and therefore mitigation is not required.

Mitigation Measures

Construction

- 9.116 The IAQM guidelines provide an indication of the mitigation measures that would be appropriate for inclusion within the Proposed Development, based on the level of risk of dust related impacts identified for each of the activities. Consequently, the following mitigation measures should be incorporated into the Proposed Development, and delivered through the implementation of a Construction Environmental Management Plan (CEMP).
- 9.117 Mitigation measures that are generic to each of the activities, and therefore should be implemented for the duration of the construction related works where applicable are identified in Table 9.18, whilst activity specific mitigation measures are identified in Table 9.19.

Table 9.18 Mitigation Measures to be implemented during the Construction Phase

Development Element	Mitigation Measure
Communication	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. Display the head or regional office contact information on the site boundary.
Planning	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The measures outlined here should be included as a minimum. The DMP may include monitoring of dust deposition, dust flux, real-time PM₁₀ continuous monitoring and/or visual inspections.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of the site boundary, with cleaning to be provided if necessary. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Agree dust deposition, dust flux or real-time PM₁₀ continuous monitoring locations with the Local Authority. Where possible, commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. Fully enclose site of specific operations where there is a high potential for dust production and the site is active for an extensive period. Avoid site runoff of water or mud. Keep site fencing, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site, cover as described below. Cover, seed or fence stockpiles to prevent wind whipping.
Operating Vehicle/ Vehicle Movements	Ensure all vehicles switch off engines when stationary – no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.

Development Element	Mitigation Measure
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	Avoid bonfires and burning of waste material.

Table 9.19 Activity Specific Mitigation Measures to be implemented during the Construction Phase

Development Element	Mitigation Measure
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. Record all inspections of haul routes and any subsequent action in a site log book. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. Access to gates to be located at least 10 m from receptors, where possible.

Operation

9.118 Based on the findings of the assessment (i.e. negligible impacts at existing receptors and no exceedances predicted of the long-term and short-term AQS objectives at new receptors), site specific mitigation in the form of NO_x filtration is not required. However, this should not deter from best practice design and we have therefore made the following recommendations:

- Where possible, locate any air intakes along façades that face away from roads;

- Locate air intakes at height (>4th floor, where possible) to avoid the highest contribution from road traffic;
- Where the termination of commercial kitchen exhausts an intake ventilations are located at ground level it is necessary to ensure the correct odour abatement is installed to avoid the ingress of cooking odours to the student accommodation above. Any future tenants installation commercial kitchens should undertake the and odour risk assessment prior occupation;
- Be mindful when locating of air intakes at roof level – where roof level intakes are necessary it is important to consider existing flues (combustion plant/kitchen extracts) associated with any neighbouring buildings and any exhausts (kitchen or ventilation) associated with the Proposed Development itself. This will reduce the likelihood of recirculating 'dirty' air. Where possible, air intakes should be located approximately 20 m from an exhaust (see Part F of the Building Regulations); and,
- To ensure compliance with the Medium Combustion Plant Directive (MCPD) any testing of life safety generators should not exceed 50 hours of testing per year and not utilised for balancing services or triad regimes etc.

Cumulative Effects

Construction

- 9.119 Although the development has already been identified as posing a high risk in relation to dust soiling and a medium risk human health, the significance of effects in the absence of mitigation is likely to be greater when considered in the context of other construction sites. As a result there is potential for greater exposure of the population to effects and/or prolonged exposure to impacts. As a result the significance is, conservatively, considered to be major adverse in the absence of mitigation.
- 9.120 However, as the risk of impact from the Proposed Development alone is high, the mitigation measures proposed in Tables 9.18 and 9.19 aim to mitigate these impacts. As a result, site specific mitigation is already in place to minimise the contribution from the Site to cumulative effects. It is expected that other construction sites would be employing the appropriate mitigation measures to minimise their construction contribution.
- 9.121 Nonetheless, the following measures are recommended to ensure co-ordination of efforts to reduce dust impacts on shared receptors:
- Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes;
 - Where there is potential for significant effects upon a receptor, consideration should be given to the timing of activities, and where possible activities with potential to generate significant dust emissions should not be undertaken at the same time;
 - Additional monitoring requirements as a result of concurrent activities should be identified in the liaison meetings, and reviewed in subsequent meetings to understand if further mitigation measures are necessary.
- 9.122 After mitigation, the Proposed Development is considered to have a minor adverse, but temporary impact on pollutant concentrations as a result of construction traffic. However, with the appropriate mitigation cumulative significant air quality impacts in-combination with the other identified developments running concurrently is unlikely.

Operation

- 9.123 The assessment of operational phase impacts has considered the cumulative impacts of the Proposed Development and localised committed schemes through the inclusion of traffic from such schemes in the air quality dispersion modelling.

- 9.124 The traffic data provided for the detailed modelling have been obtained from TfGM's Strategic Transport Model which accounts for all localised traffic growth in the future. It is understood that TfGM do not expect additional traffic growth beyond what is presented in the most recent strategic model outputs and therefore the quantum of vehicles modelled in the air quality assessment is considered to be the maximum i.e. worst case.
- 9.125 The conclusions of the assessment indicate that the impacts are negligible at all modelled receptors. The assessment has determined that mitigation for the scheme is not required.

Residual Effects

- 9.126 Table 9.20 below summarise the likely significant impacts, the mitigation measure required and the residual effects.

Table 9.20 Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Construction Phase			
Moderate adverse effect of dust soiling, rising to major adverse cumulative effect	Residential properties, education establishments and significant buildings (e.g. Listed buildings)	Generic and activity specific measures to control dust generation and emission from site, liaison with local stakeholders, liaison with other developments and, where possible, avoidance of significant dust-generating activities simultaneously (see Tables 9.18 and 9.19)	Not Significant
Minor to Moderate adverse effect on human health, rising to major adverse cumulative effect	Residential properties, education establishments and significant buildings (e.g. Listed buildings)	Generic and activity specific measures to control dust generation and emission from site, liaison with local stakeholders, liaison with other developments and, where possible, avoidance of significant dust-generating activities simultaneously (see Tables 9.18 and 9.19)	Not Significant
Operational Phase			
Without & With Development (2020 BG's & Emission Factors) – Negligible i.e. not significant.	Existing & New Receptors (see Appendix 9.3)	Not Required	Not Significant

[illegible]

The map displays the New Windsor area, with the site boundary highlighted in red and modelled roads in blue. The map includes a key, a scale bar, and various street names and landmarks.

Key:

- Site Boundary (Red line)
- Modelled Roads (Blue line)

Scale: 0 100 200 300 400 500 m

Map Labels:

- New Windsor
- University of Bedford
- Trains
- City Centre
- St. Paul's Church
- St. John's Church
- St. Peter's Church
- St. James' Church
- St. Andrew's Church
- St. George's Church
- St. Mary's Church
- St. Nicholas' Church
- St. Vincent's Church
- St. Elizabeth's Church
- St. Anne's Church
- St. Agatha's Church
- St. Ursula's Church
- St. Clare's Church
- St. Francis' Church
- St. John's Church
- St. Peter's Church
- St. James' Church
- St. Andrew's Church
- St. George's Church
- St. Mary's Church
- St. Nicholas' Church
- St. Vincent's Church
- St. Elizabeth's Church
- St. Anne's Church
- St. Agatha's Church
- St. Ursula's Church
- St. Clare's Church
- St. Francis' Church

Figure 3

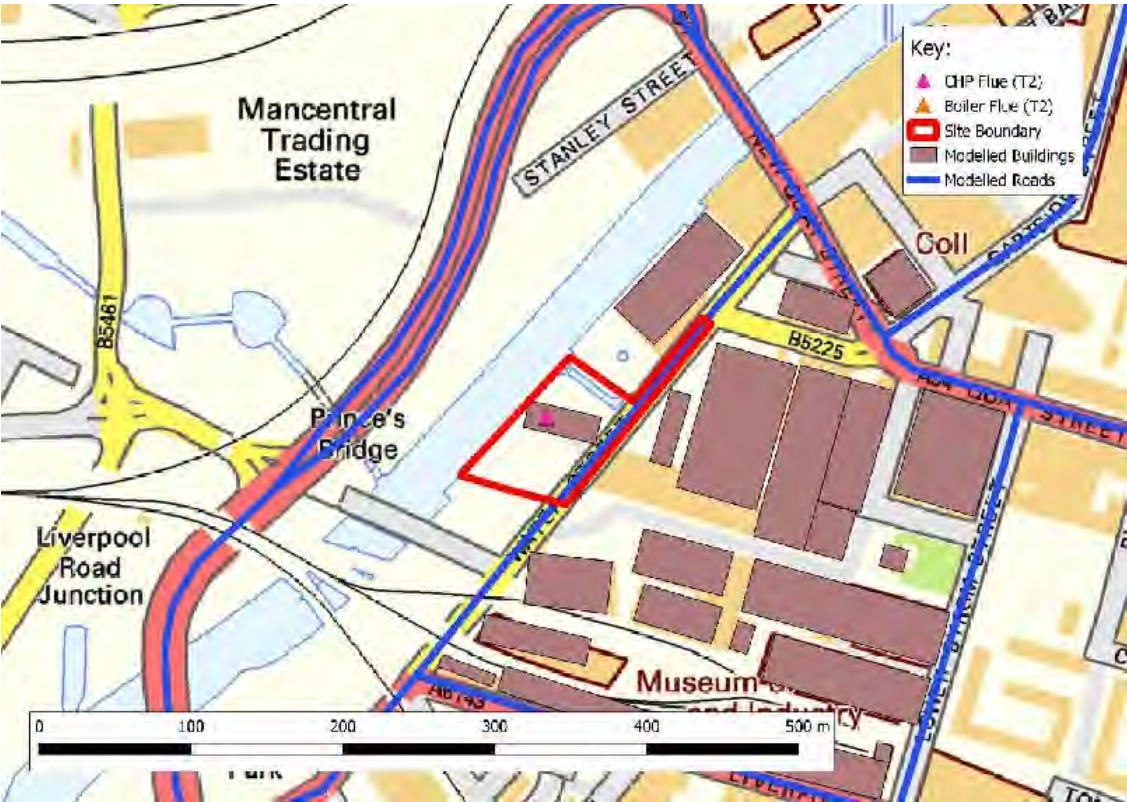


Figure 4

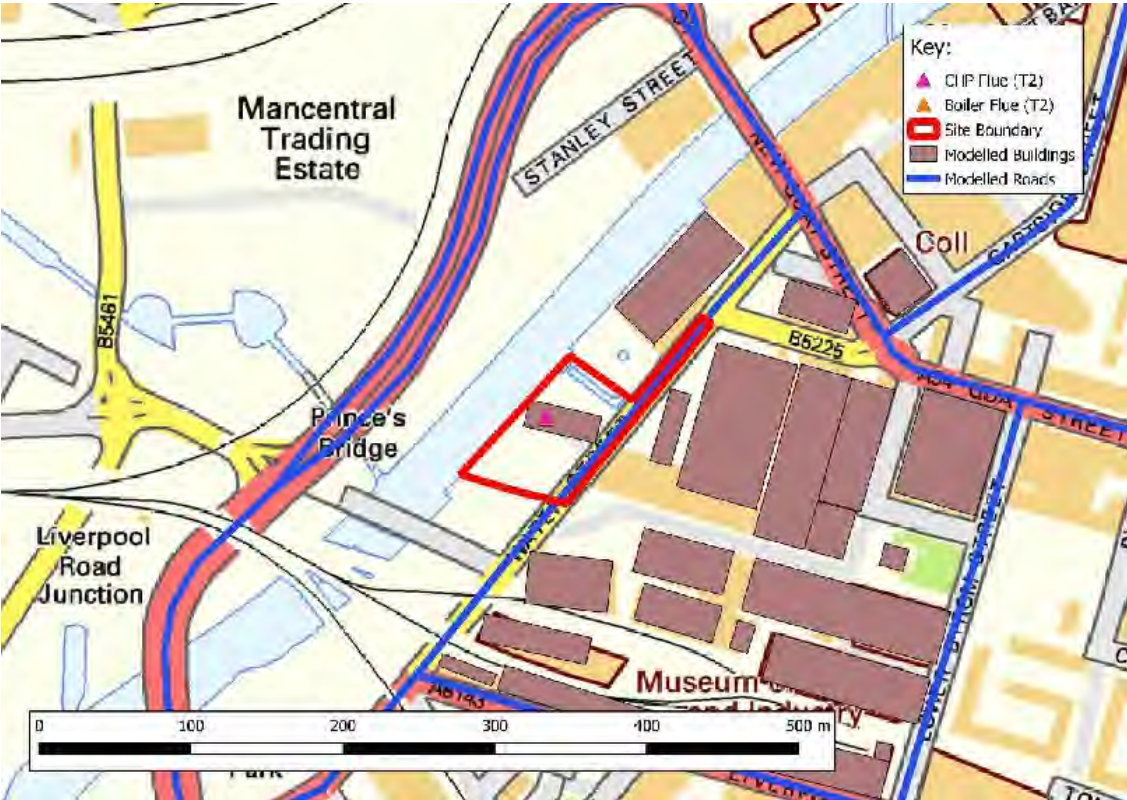


Figure 5



Figure 6

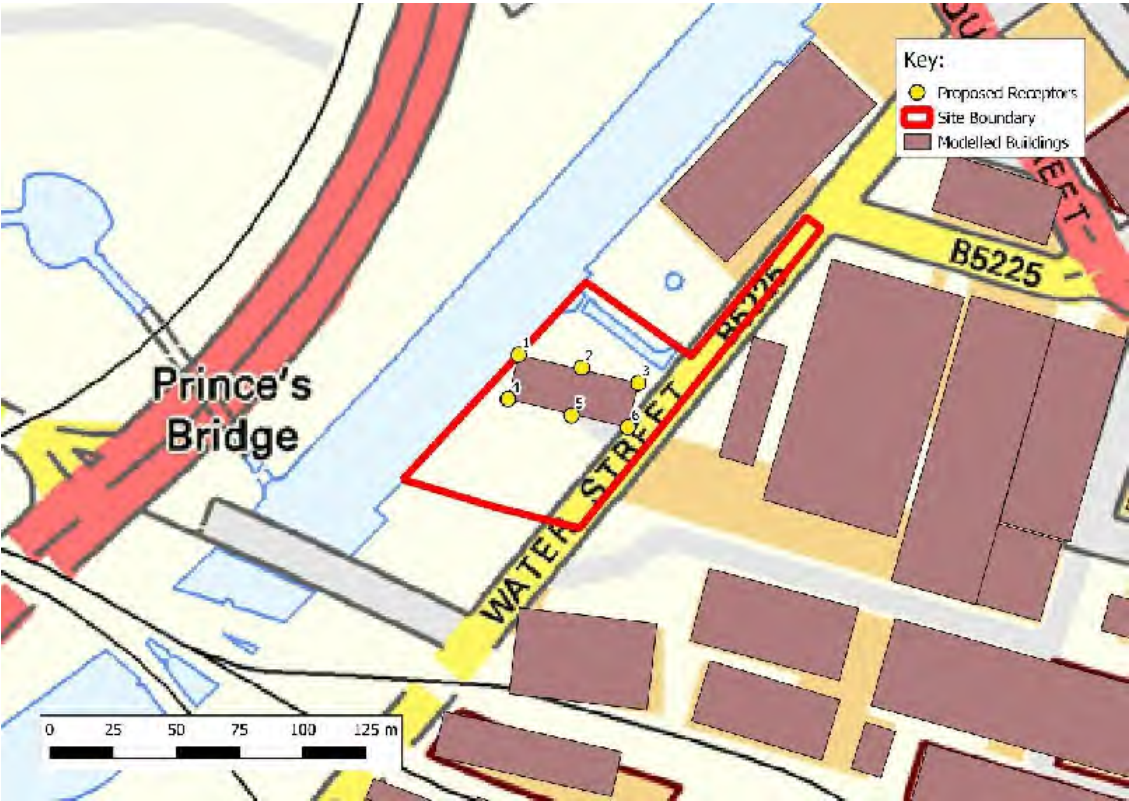
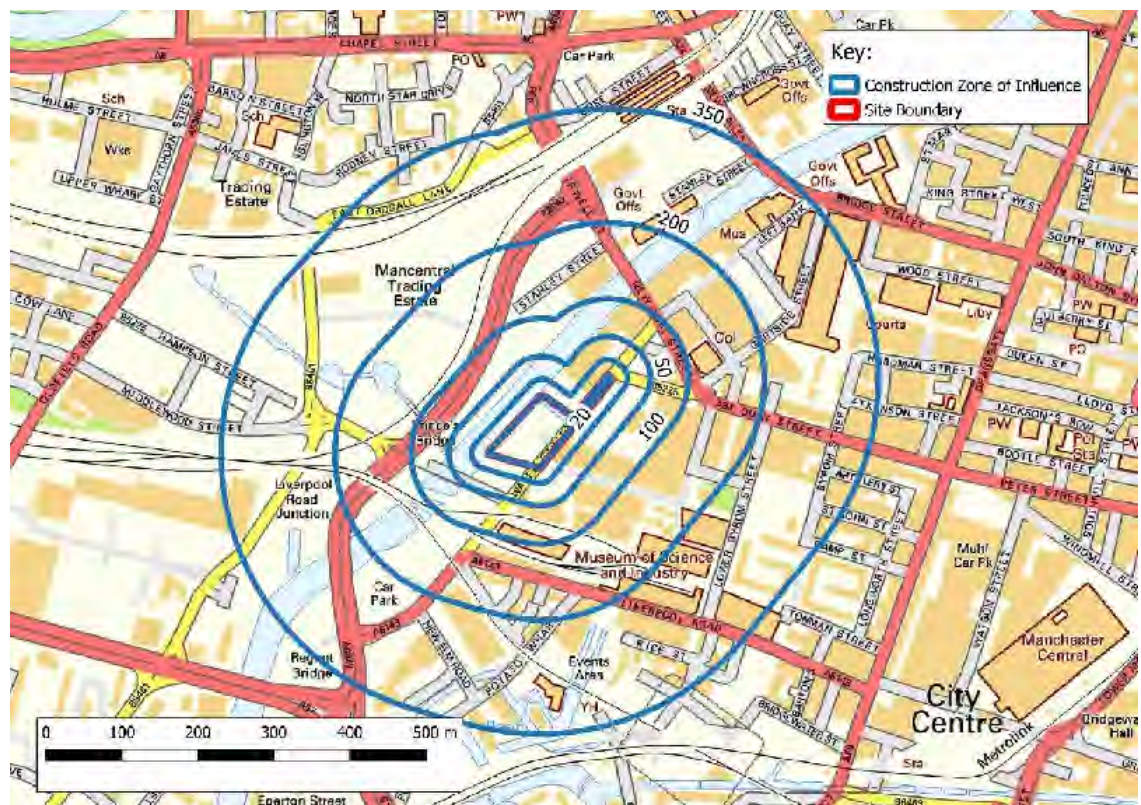


Figure 7



10 Daylight and Sunlight

Introduction

- 10.1 This Chapter of the ES assesses the likely significant effects of the completed Proposed Development with respect to sunlight, daylight and overshadowing. This Chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted. This Chapter is supported by the following Appendices:
- Appendix 10.1: DDAPSH VSC Results
- 10.2 The assessment of the impact of the Proposed Development on the relevant surrounding properties has been undertaken in accordance with BRE Report 209 "*Site Layout Planning for Daylight and Sunlight – a guide to good practice*".
- 10.3 The analysis establishes the baseline levels of Daylight and Sunlight currently enjoyed; the approved St John's masterplan scheme has been included within the baseline scenario.
- 10.4 The analysis then established the change in Daylight and Sunlight levels as a result of the Proposed Development; which is slightly lower in height than the extant T2 building.
- 10.5 The contents of this chapter are supported by the tables of results for the daylight and sunlight assessments undertaken (**Appendix 10.1**).
- 10.6 This Chapter has been prepared by Richard Howard MSc MRICS, of Watts Group Limited, who specialises in Daylight and Sunlight Amenity consultancy for both developers and adjacent property owners.

Policy Context

- 10.7 Whilst not an instrument of planning policy the BRE Report 209 "*Site Layout Planning for Daylight and Sunlight – a guide to good practice*" is generally accepted as the industry standard and is used by most local planning authorities in considering the impact on sunlight, daylight and overshadowing that a development may cause.
- 10.8 The guide is not prescriptive but provides methods of assessing the potential impact of a scheme on the daylight and sunlight to adjacent windows. The BRE report suggests values for parameters to be considered by designers in order to be able to retain good levels of sunlight and daylight to surrounding properties.
- 10.9 The values within BRE Report 209 are based on sub-urban scenarios (equivalent to the light available over two storey houses across a suburban street), and can be considered restrictive in an urban, city centre environment. The significance criteria used in this report have not been adjusted to take account of the city centre location of this Proposed Development. As a result the severity of the impact may be considered dis-proportionate to a city centre window where less daylight and sunlight would be expected by an occupant.

Local Planning Policy

10.10 The Local Planning Authority (LPA) for this development is Manchester City Council (MCC).

10.11 The current Core Strategy was adopted by the LPA on 11th July 2012, and contains the following policies in respect of daylight and sunlight enjoyed by properties surrounding a development site:

Planning Policy DM1 – Development Management

10.12 This states:

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

Planning Policy EN2 – Tall Buildings

10.13 This states:

...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.

The Guide to Development in Manchester, supplementary Planning Document and Planning Guidance

10.14 This states:

That designs “should consider issues such as overshadowing” (Section 2) and that consideration be given to “microclimate, including overshadowing and air turbulence effects, created by the relationship of the building to those adjacent; and the quality and usability of the spaces surrounding the building.” (Section 12).

Assessment Methodology and Significance Criteria

Scope

10.15 The scope of the assessment has included an assessment of the likely impact of the completed development on the daylight and sunlight to adjacent residential and hotel and Science and Industry Museum (SIM) properties' windows and report whether these are able to meet with the guidance set out in BRE report 209. The likely impact of overshadowing to external amenity spaces is also to be assessed and reported on in accordance with the BRE Report 209.

10.16 The Scenarios tested within this assessment are the Baseline + Consented and Proposed + Consented. The consented scheme included is the approved St John's Masterplan.

10.17 Planning permission for a building of similar size, scale and massing has been implemented (extant T2) and therefore the results of this analysis are similar to the previously approved scheme.

Baseline Assessment

10.18 The BRE Report 209 is primarily focused on residential properties; the baseline assessment has included all residential properties' windows which are unable to pass the initial 25 degree line test, as set out in the BRE Report 209, and are considered to need a more detailed check. These are the 'relevant' windows. Other hotels and SIM properties have also been included to analyse the effect on these windows.

Assessment Methodology

- 10.19 A 3D computer model was constructed of the Site and the surrounding buildings and structures. The constructed model was formed from data collected from a laser scan of the existing buildings and structures.
- 10.20 The existing buildings and structures form the baseline conditions to be analysed to assess the existing levels of sunlight, daylight and overshadowing to adjacent properties. The change in sunlight, daylight and overshadowing to the surrounding properties was then assessed. This process is as detailed in the submitted Scoping Report (Appendix 3.1).
- 10.21 Each of the relevant windows, either directly facing or within 90 degrees of the Proposed Development has been assessed, in accordance with the guidelines given in the BRE Report, in the baseline and proposed conditions. Specifically, the following have been assessed;

Daylight

- 10.22 Daylight amenity is measured using Vertical Sky Component (VSC). Where windows to existing surrounding properties fail to meet the minimum VSC criteria at the face of the window, an assessment of the before and after scenarios is undertaken and determine whether the impact exceeds 20% (by reference to BRE guidelines).

Vertical Sky Component (VSC)

- 10.23 A model of the buildings and structures presently on the Site and a model of the Proposed Development and relevant surrounding buildings are created in a CAD model. The Vertical Sky Component (VSC) is then calculated using a two-dimensional Skylight Indicator contained in Appendix A of the BRE Report, or by bespoke computer software as is the case in this instance.
- 10.24 The BRE Report defines the Vertical Sky Component as:

“the ratio of that part of illuminance, at a point on a given vertical plane, that is received directly from a CIE Standard Overcast Sky, to the illuminance on a horizontal plane due to an unobstructed hemisphere of this sky”

- 10.25 Consideration of the Vertical Sky Component (VSC) for each relevant window in each neighbouring property is required. If the VSC for a window is less than 27% and is less than 0.8 times (20%) its former value, then the BRE criteria cannot be satisfied.
- 10.26 Alternatively, if the Vertical Sky Component is less than 27%, but more than 0.8 times (20%) its former value then daylighting levels might still be adequate to the neighbouring property.

Daylight Distribution (DD) (Area of Working Plane receiving skylight directly)

- 10.27 This requires consideration of the daylight distribution within a room and involves the plotting within a room of an adjoining property, the “no-sky” contour line at the working plane. This is the contour within a room, behind which no sky is visible from the room’s window (or windows) at the working plane. After a development is complete, the area of a room with visible sky should, ideally, be 0.8 times (20%) or more of the former area on the working plane prior to the development. There is no absolute minimum area given in BRE Report 209.

Sunlight

10.28 With regard to assessing sunlight, BRE report 209 gives recommendations for the assessment of the effect on sunlight enjoyed by individual windows. When considering sunlight, in the northern hemisphere, it is only those windows that face within 90 degrees off due south that will enjoy significant amounts of sunlight and BRE Report 209 limits the extent of assessments required to only these windows. Sunlight amenity is measured in terms of Annual Probable Sunlight Hours (APSH).

10.29 The assessment analyses a point in each window which receives at least a quarter of annual probable sunlight hours (25%), including at least 5% of annual probable sunlight hours during the winter months, between 21 September and 21 March. The BRE Report suggests that the sunlight may be adversely affected if there is a reduction greater than 20% of the amount of sunlight hours available to that window post development.

Overshadowing

10.30 For ground shading analysis the BRE recommends that gardens and other amenity spaces be considered. In order for a garden or amenity area to appear adequately sunlit throughout the year, it should receive at least 2 hours of sunlight on the 21st March. If, as a result of the new development an existing garden or amenity area does not meet the 2 hours suggested, and the area that can receive 2 hours of sun on the 21st March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.

10.31 We have not carried out an overshadowing assessment as we not aware of any surrounding adjacent amenity spaces (gardens, parks and playing fields, children's playgrounds etc.) that need to be assessed under the BRE guidance.

Receptors and Sensitivity

10.32 The buildings in Table 10.1 have been analysed to assess the impact of the Proposed Development. The residential properties have been assessed as high sensitivity.

Table 10-1 Adjacent Buildings Analysed

Property	Number of windows analysed	Analysed For	Sensitivity
Marriot Hotel Water Street	177	VSC, DD, APSH	Low
SIM 1830s Warehouse	98	VSC, DD	Low
Salford New Bailey Block A7	200	VSC, DD, APSH	High
Salford New Bailey Block A6	158	VSC, DD, APSH	High
Salford New Bailey Block A5	100	VSC, DD, APSH	High
Premier Inn Irwell Street	93	VSC, DD, APSH	Low
10-18 Left Bank	403	VSC, DD, APSH	High
Total	1229		

Significance Criteria

10.33 The criteria adopted for assessing the magnitude of the impact (Table 10.2) and assessing the sensitivity of the windows (Table 10.3) are set out below. A matrix to determine the impact significance is included at Table 10.4.

Table 10-2 Methodology for Determining Impact Magnitude

Magnitude of Impact	Criteria for assessing impact
Major	Change in % of assessed windows unable to meet with BRE Guidance is >40% of windows analysed.
Moderate	Change in % of assessed windows unable to meet with BRE Guidance is ≤30% of windows analysed.
Minor	Change in % of assessed windows unable to meet with BRE Guidance is ≤20% of windows analysed.
Negligible	Change in % of assessed windows unable to meet with BRE Guidance is ≤ 10% of windows analysed.

Table 10-3 Methodology for Determining Sensitivity

Window Sensitivity	Criteria for assessing sensitivity
High	Property has a high expectation for daylight and sunlight amenity (e.g. Residential property etc.).
Moderate	Property has a moderate expectation for daylight and sunlight amenity (e.g. Offices, leisure etc.)
Low	Property has a low expectation for daylight and sunlight or is used infrequently (e.g. Hotels etc.)

Table 10-4 Impact Significance Matrix

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

10.34 Table 10.5 presents a definition of the percentage change thresholds where these are below the BRE Guidance.

Table 10-5 Definition of % Change from BRE Guidance

Change from BRE guidance	
Negligible	0.99 - 0.8 x BRE guidance
Minor	0.79 - 0.6 x BRE Guidance
Moderate	0.59 - 0.4 x BRE Guidance
Major	<0.4 x BRE Guidance

Assumptions and Limitations

10.35 Reflected light does not form part of BRE report 209's analysis. As previously stated the BRE report is based on examples in a sub-urban setting, where reflected light is unlikely to be of great significance.

Baseline Conditions

10.36 Prior to being cleared the Site was occupied by low lying structures and surface car parks. Please refer to Figure 10.1 at the end of this Chapter.

Baseline Daylight Condition (VSC)

10.37 In line with the methodology (para 10.18 to 10.21) A total of 1,229 windows have been analysed for VSC across 7 adjacent properties. The findings are summarised in Table 10.6. This analysis considers what percentage of the VSC is available, and specifically which windows are unable to meet the 27% VSC suggested in BRE Report 209.

10.38 The analysis shows that windows to properties around the Site already have varying levels of daylight. It is clear that there are windows that are already moderately (358 windows) or substantially (500 windows) below the values suggested in BRE report 209. This is unsurprising given the city centre location of these properties and the impact of the forthcoming adjacent St Johns masterplan massing.

Table 10-6 Baseline VSC Results

Property	Standard VSC target (absolute) (%)	Number of Windows			
		Negligible (0-0.8x)	Minor (0.79x-0.6x)	Moderate (0.59x-0.4x)	Major (<0.4x)
Marriott Hotel Water Street	27	0	39	86	52
SIM 1830 Warehouse	27	9	47	24	18
Salford Central New Bailey Block A7	27	74	32	77	17
Salford Central New Bailey Block A6	27	18	6	58	76
Salford Central New Bailey Block A5	27	10	5	12	73
Premier Inn Irwell Street	27	3	19	41	30
10-18 Leftbank	27	42	67	60	234
TOTAL		156	215	358	500

Baseline Daylight Condition (DD)

10.39 The results of the daylight distribution analysis contained in Appendix 10.1 are summarised in Table 10.8 below.

10.40 The criteria to fulfil under BRE report 209 are that the reduction of the area of the working plane to a room which can receive direct skylight should not be reduced by more than 20% of its former value. Therefore there is not a requirement at baseline condition to be fulfilled or assessed. A summary of the analysis of this daylight test is provided under the proposed condition section of this Chapter.

Baseline Annual Probable Sunlight Hours (APSH)

10.41 Of the 1,229 windows reviewed for the VSC, 214 are 'north facing' and so discounted from the BRE assessment of APSH.

10.42 Of the remaining 1,015 windows analysed, 39 windows fail to achieve the suggested 25% of the APSHs in the existing condition.

Overshadowing

10.43 The criteria to fulfil under BRE report 209 are that the reduction of the area of the amenity space which can receive direct sunlight for 2 hours should not be reduced by more than 20% of its former value. Therefore there is not a requirement at baseline condition to be fulfilled or assessed. A summary of the analysis of this daylight test is provided under within the following section of this Chapter.

Identification and Evaluation of Likely Significant Effects

10.44 The analysis undertaken as part of this assessment has compared the existing baseline scenario with the proposed scenario and detail below the likely key changes in daylight, sunlight and overshadowing. Please refer to Figure 10.1 to view the proposed scenario following the construction of the tower. The results are presented below.

Construction Phase

10.45 It is not necessary to undertake a qualitative assessment of the construction phase. During the construction phase there would be progressive encroachment on the daylight and sunlight amenity up to the worst case impact on the surrounding receptors upon completion of the Proposed Development.

10.46 The effect on the surrounding receptors will be that, either, the worst case scenario is in place, or the position is improved and some receptors have a greater amount of daylight and sunlight amenity available until completion of the Proposed Development.

Operational Phase

Daylight Condition (VSC) Post Proposed Development

10.47 Analysis of the change in VSC for each building following development is presented in Table 10.7 below. The windows tested directly face the Proposed Development; the windows that do not take light from over the Proposed Development site have not been included and have not been affected by the Proposed Development. Therefore, the results below should be considered in the context of each property as a whole.

10.48 In considering the results below it is important to bear in mind the unusual situation of a currently vacant site within an urban environment. The existing levels of daylight to the surrounding windows, particular to the lower floors, are unusually high even in the context of an urban environment.

10.49 No amendment of the values has been undertaken to take account for the urban setting. The results are based on the BRE's guidance for a sub-urban setting.

10.50 It is evident that there is a slight reduction in the levels of the existing VSC from that of the baseline position. Post development 93% (1,139) windows are able to meet the BRE Guidance for a sub-urban environment. The results are considered to be good compared to other high rise developments in an urban environment, where the percentages of windows able to meet with the BRE Guidance is often lower.

10.51 We have tested all the windows overlooking the Proposed Development. The BRE guidance is clear that whilst bedrooms are to be analysed they are 'less important' than a living room, dining room or kitchen. We anticipate that of the 177 windows tested on the Marriott Hotel 156 (88%) of these windows serve bedrooms. This should be accounted for when considering the impact on daylight to this property.

Table 10-7 VSC Results Post Development

Property	Total no. of windows tested	Windows satisfying BRE		No. of windows not satisfying BRE		
		No.	%	Minor	Moderate	Major
Marriott Hotel Water Street	177	137	77%	18	20	2
SIM 1830 Warehouse	98	97	99%	0	0	1
Salford Central New Bailey Block A7	200	157	79%	41	2	0
Salford Central New Bailey Block A6	158	157	99%	1	0	0
Salford Central New Bailey Block A5	100	100	100%	0	0	0
Premier Inn Irwell Street	93	93	100%	0	0	0
10-18 Leftbank	403	398	99%	0	3	2
TOTAL	1229	1139	93%	60	25	5

10.52 In summary 93% of the windows analysed have not had the daylight to their face reduced by more than the BRE recommendation of 20% of their former value; the BRE Guidance considers that a 20% reduction is the point at which people begin to notice the reduction in light. 60 (5%) of the windows have had their daylight reduced by slightly more than the 20% reduction recommend; 25 (2%) windows have had their day light reduced moderately below the BRE recommendation. 5 (0.6%) windows have been reduced substantially below the 20% reduction suggested by the BRE Guidance for sub-urban areas. In the city centre the BRE guidance for the sub-urban areas may be considered restrictive.

10.53 The Salford Central New Bailey Blocks A5, and the Premier Inn are able to meet the BRE recommendations for VSC in a sub-urban environment.

10.54 There are very small reductions to the daylight to the SIM 1830s Warehouse and the New Bailey Block A6 due to the impact on a single window at each building. 10-18 Left Bank also sees a small reduction to the daylight as a result of the development. This is not considered to be detrimental.

10.55 The New Bailey A7 Block shows the most rooms that will fall below target. 41 of the 200 rooms tests show reductions (approximately 21%), that are slightly below the BRE guidance, but above 0.6x their existing values and therefore a minor adverse impact. 2 windows (1%) will experience a moderate adverse impact.

Daylight Condition (DD) Post Proposed Development

10.56 In summary 572 (97%) of the 590 rooms tested meet with the BRE Guidance. 18 rooms within the Marriott Hotel have the daylight reduced slightly below the BRE guidance. We do not consider that the impact on the daylight distribution to the Marriott Hotel is significant, given the transient nature of hotel accommodation and the dense urban environment.

Table 10-8 Daylight Distribution Operational Impact

Property	Total no. of rooms tested	Rooms satisfying BRE		No. of rooms not satisfying BRE		
		No.	%	Minor	Moderate	Major
Marriott Hotel Water Street	108	90	83%	18	0	0
SIM 1830 Warehouse	54	54	100%	0	0	0
Salford Central New Bailey Block A7	102	102	100%	0	0	0
Salford Central New Bailey Block A6	60	60	100%	0	0	0
Salford Central New Bailey Block A5	40	40	100%	0	0	0
Premier Inn Irwell Street	56	56	100%	0	0	0
10-18 Leftbank	170	170	100%	0	0	0
TOTAL	590	572	97%	18	0	0

Annual Probable Sunlight Hours (APSH) Operational Impact

10.57 The likely impact on the sunlight to the windows, which are within 90 degrees of due south, is shown in table 10.9 below.

Table 10-9 APSH Operational Impact

Property	Total no. of windows tested	ANNUAL SUNLIGHT						WINTER SUNLIGHT			
		Windows satisfying BRE		No. of windows not satisfying BRE			Windows satisfying BRE		No. of windows not satisfying BRE		
		No.	%	Minor	Moderate	Major	No.	%	Minor	Moderate	Major
Marriott Hotel Water Street	130	118	91%	3	9	0	123	95%	1	6	0
Salford Central New Bailey Block A7	105	96	91%	4	5	0	105	100%	0	0	0
Salford Central New Bailey Block A6	126	120	95%	6	0	0	126	100%	0	0	0
Salford Central New Bailey Block A5	80	80	100%	0	0	0	80	100%	0	0	0
Premier Inn Irwell Street	80	80	100%	0	0	0	80	100%	0	0	0
10-18 Leftbank	336	336	100%	0	0	0	336	100%	0	0	0
TOTAL	857	830	97%	13	14	0	850	99%	1	6	0

10.58 In summary 97% of the relevant windows are able to meet the BRE recommendations in respect of both annual and winter sunlight hours not being reduced by more than 20%. Given the city centre environment this is considered to be excellent.

Overshadowing Operational Impact

10.59 Because of the southerly (as opposed to a northerly) transit of the sun path from east to west overshadowing will only occur, to a greater or lesser extent, to those open areas lying to the east, north and west of the Proposed Development. Open areas to the south will not be affected. The location of an open area, relative to the site of the Proposed Development, is, therefore, important. There are no

surrounding adjacent amenity spaces (gardens, parks and playing fields, children's playgrounds etc.) that need to be assessed under the BRE guidance.

Overall Operational Impact (Permanent)

10.60 The impact significance matrix has been used to assess the impact on each property for VSC, APSH and Overshadowing. This is presented in Table 10.10 below.

Table 10-10 Overall Operational Impact on Daylight and Sunlight

Property	Sensitivity	Magnitude of daylight impact VSC	Magnitude of sunlight impact APSH	Magnitude of amenity overshadowing	Overall impact
Marriott Hotel Water Street	Low	Moderate Adverse	Negligible	Negligible	Minor Adverse
Salford Central New Bailey Block A7	High	Moderate Adverse	Negligible	Negligible	Minor Adverse
Salford Central New Bailey Block A6	High	Negligible	Negligible	Negligible	Negligible
Salford Central New Bailey Block A5	High	Negligible	Negligible	Negligible	Negligible
Premier Inn Irwell Street	Low	Negligible	Negligible	Negligible	Negligible
SIM Great Western Warehouse	Low	Negligible	Negligible	Negligible	Negligible
10-18 Leftbank	High	Negligible	Negligible	Negligible	Negligible

Mitigation Measures

10.61 Within the confines of the Site, consideration has been given to the design of the Proposed Development in relation to the daylight to the surrounding properties. The layout of the Proposed Development is set away from the perimeters of the wider St John's Masterplan Site, where adjacent properties are in closer proximity.

10.62 It is not considered that there are additional realistic and economically viable methods to mitigate the impact on the surrounding properties; whilst ensuring that the Proposed Development remains commercially viable. The Proposed Development massing is lower than the approved scheme within the St John's Masterplan.

10.63 Whilst this Chapter of the ES does not consider reflected light, consideration should be given to the choice of elevation treatment. Care should be taken to avoid reflective materials that could cause solar glare into adjacent windows.

Cumulative Effects

10.64 Of the committed developments identified in Chapter 2 of this ES, only the proposed St John's Street Masterplan is of sufficient mass to be considered within this analysis as a cumulative effect. We have included the cumulative impact of this development within the analysis undertaken above.

Residual Effects

10.65 There is no additional mitigation proposed, please refer to Table 10.10 for a summary of the effects.

11 Wind Microclimate

Introduction

- 11.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development with respect to wind microclimate. This Chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 11.2 This wind microclimate Chapter has been prepared by Urban Microclimate Ltd. The Chapter is supported by the following:
- Figure 11.1 Annual Wind Climate at Site
 - Figure 11.2 Wind Microclimate Suitability Assessment
 - Appendix 11.1 Wind Microclimate

Policy Context

Legislation

- 11.3 There are no legislative policies relating to the assessment of environmental wind flows in the built environment.

National Planning Policy

- 11.4 Although there are no national planning policies directly relating to wind microclimate issues, the National Planning Policy Framework (updated in June 2019) emphasises the benefits of a high-quality built environment. An example of this is presented in Section 12, which states that developments should:

"establish or maintain a strong sense of place, using the arrangement of streets, spaces, building types and materials to create attractive, welcoming and distinctive places to live, work and visit"

- 11.5 The National Design Guide (October 2019) forms part of the associated planning practice guidance. Within this guide, the section Built Form B2 'Appropriate building types and forms' states that:

"Proposals for tall buildings (and other buildings with a significantly larger scale or bulk than their surroundings) require special consideration. This includes their location and siting; relationship to context; impact on local character, views and sight lines; composition - how they meet the ground and the sky; and environmental impacts, such as sunlight, daylight, overshadowing and wind. These need to be resolved satisfactorily in relation to the context and local character."

- 11.6 The section Context C1 'Understand and relate well to the site, its local and wider context' goes on to state:

"Well-designed new development responds positively to the features of the site itself and the surrounding context beyond the site boundary. It enhances positive qualities and improves negative ones. Some features are physical, including:

- **environment - including landscape and visual impact, microclimate..."**

Local Planning Policy

11.7 Manchester City Council's Local Development Framework Core Strategy Development Plan Document (adopted July 2012) includes Policy EN2 Tall Buildings, for which tall buildings are defined as buildings which are substantially taller than their neighbourhoods and / or which significantly change the skyline. Policy EN2 states:

"...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."

11.8 The Guide to Development in Manchester, Supplementary Planning Document and Planning Guidance (adopted April 2007), Section 2. Design, Paragraph 2.40 (Hard landscaped areas within the public realm should be attractive) states:

"Where the public realm includes hard landscaped areas, its design should reflect the level and nature of their use, and should consider issues such as overshadowing, prevailing winds..."

11.9 Within the same guide, Section 12. The City Centre, Paragraph 12.8 (Development Quality) states:

"...Key questions will be ... the microclimate, including overshadowing and air turbulence effects, created by the relationship of the building to those adjacent; and the quality and usability of the spaces surrounding the building."

Additional Standards and Guidance

11.10 The assessment of environmental wind flows lies outside the scope of BS EN 1991-1-4:2005²⁸, the current European and UK Standard for wind actions on structures, which focuses on wind loading issues.

11.11 The impact of environmental wind on pedestrian spaces and the consequent suitability of these spaces for planned usage are described by and compared against the industry standard Lawson criteria²⁹, which are recognised by Local Authorities as a suitable benchmark for wind assessments.

Assessment Methodology and Significance Criteria

Assessment Methodology

11.12 Due to the scale of the Proposed Development, a comprehensive assessment of existing and likely pedestrian level wind conditions upon completion of the Development has been undertaken based on wind tunnel testing of a physical scale model and the industry standard Lawson criteria. This allows a detailed comparison to be drawn between the existing Site and the post-development Site once the Development is constructed. Due to the changing conditions and pedestrian activities during the construction process, the potential for additional effects during the demolition and construction stages is considered qualitatively, based on an experience-based review. This is standard practice for construction periods of the extent proposed.

11.13 The detailed assessments of baseline and operational conditions combine the following elements to determine the probability of local wind speeds exceeding comfort and safety thresholds for a range of common activities based on the Lawson criteria for pedestrian comfort and safety:

- Measured pedestrian level wind speeds at key areas in and around the Site, from model-scale boundary layer wind tunnel testing; with

²⁸ BS EN 1991-1-4:2005 Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions

²⁹ Lawson, T.V. (1990), "The Determination of the Wind Environment of a Building Complex before Construction" Department of Aerospace Engineering, University of Bristol, Report Number TVL 9025

- Long-term wind frequency statistics transposed from the nearest suitable weather centre to apply directly at the Site.

11.14 Details of the wind tunnel testing are provided at Appendix 11.1 of this ES. The tests were conducted in RWDI Anemos Ltd.'s wind tunnel facility, where an atmospheric boundary layer representative of that at the Site was simulated. The wind tunnel model was constructed at a scale of 1:300 and covers a full-scale extent of 360 m from the approximate centre of the St John's masterplan (up to and beyond the extent of potential significant effects of the Proposed Development).

11.15 The Proposed Development was modelled based on 3D models, plans and elevations provided by the design team in March 2020. The surrounding existing and consented future buildings were represented to a sufficient level of detail to reproduce the wind flows at the Site and on surrounding land. To ensure the tests are conservative, proposed semi-mature trees, as upon planting, were modelled in winter, or bare, format. Existing surrounding trees were also modelled in winter format.

11.16 To inform the testing, an initial experience-based assessment was carried out to identify areas of potential accelerated winds in and around the Site resulting from the Proposed Development, and to identify the potential extent of likely significant wind effects within the surrounding area. Existing and proposed pedestrian activities were also reviewed to identify areas of increased sensitivity to wind effects, such as recreational areas and building entrances. Wind speed measurements at these key pedestrian level locations were then made using probes capable of measuring fluctuating pressure differences that are calibrated against wind speed. A system of probes running simultaneously were used to obtain results from up to 115 locations. In accordance with best practice, measurements were taken for a full range of wind directions in increments of 22.5°. To fully meet the requirements of the Lawson criteria, recordings were taken for a sufficient length of time to determine the mean and gust wind speeds.

11.17 Wind tunnel tests were carried out for the following configurations:

- Existing / Baseline Site conditions;
- Proposed Development with existing (baseline) surrounds; and
- Proposed Development with future surrounds.

11.18 The list of committed schemes, were reviewed using publicly available information and professional experience to determine their relevance to the wind assessment. Buildings under construction at the time of assessment were included within the baseline, in their completed form. This includes the following schemes:

- i. St John's T1 (ref 114385/FO/2016)
- ii. Manchester Goods Yard and No.1 Grape Street (ref 121511/FO/2018)
- iii. St. John's Place Zone 2, Globe and Simpson (ref 121721/FO/2018)
- iv. Old Granada Studios (ref 118040/FO/2017)
- v. The Factory (ref 119890/VO/2018)
- vi. Astley and Byrom House (ref 119610/FO/2018)
- vii. Salford Central (ref 17/70439/REM)
- viii. Salford Central (ref 17/70082/REM)
- ix. Salford Central (ref 16/68199/REM)

11.19 The future committed developments considered within the cumulative effects assessment comprises the following surrounding schemes:

- a. Proposed Union T1 (pending validation)
- b. St. John's Place Zones 1, 3 & 4 (ref 109660/FO/2015/C1)

- c. Middlewood Locks (ref 14/65457/OUTEIA)
- d. Middlewood Locks (ref 14/65793/OUT)
- e. Salford Central (ref 16/68325/OUT)
- f. Salford Central Zone C (ref 19/73721/REM)
- g. Trinity Islands (ref 115107/FO/2017)

11.20 The baseline context includes the approved St John's T1 (item i. above) as this consent has been implemented and works are underway to form the basement of that building; however, T1 is also in the ownership of the Applicant who will not progress this development and is committed to delivering the proposed Union T1 development (item a. above).

11.21 Further committed developments in the area lie beyond the extent of the wind tunnel model and are considered too distant from the Site to have any potential significant cumulative effects.

11.22 Long-term wind frequency statistics from Manchester Airport, for the period 2001 to 2015, were corrected to apply directly at the Site, taking account of differences in upwind terrain and altitude between the weather centre and the Site based on the widely accepted Deaves and Harris log law wind model of the atmospheric boundary layer and BS EN 1991-14:2005. This is considered suitable to provide a statistically robust climate model for the Site.

11.23 Details of the Lawson criteria for pedestrian safety, or distress, are presented in Table 11.1 and are based on the exceedance of the threshold wind speeds, considering mean-hourly and gust-equivalent-mean values, occurring once per annum. These thresholds represent wind speeds with the potential to destabilise the less able or more susceptible members of the public (including elderly, cyclists and children) and able-bodied users.

Table 11.1 Lawson Criteria for Pedestrian Safety or Distress

i. Threshold Mean-hourly Wind Speed Exceeded Once a Year	ii. Safety Rating	iii. Qualifying Comments
iv. 15 m/s	v. S2	vi. Unsuitable for general public
viii. 20 m/s	ix. S1	x. Unsuitable for able-bodied
		vii. Less able and cyclists find conditions physically difficult.
		xi. Able-bodied persons find conditions difficult. Physically impossible to remain standing during gusts.

11.24 Details of the Lawson criteria for pedestrian comfort are presented in Table 11.2 and are based on the exceedance of threshold wind speeds, considering mean-hourly and gust-equivalent-mean values, occurring less than 5% of the time. The thresholds represent upper bounds of acceptability for a range of common activities. The value of 5% is linked to the specified threshold speeds and gives a reasonable allowance for extreme and relatively infrequent winds that are acceptable within each category.

Table 11.2 Lawson Criteria for Pedestrian Comfort

xii. Threshold Mean-hourly Wind Speed Exceeded < 5% of the Time	xiii. Comfort Rating / Activity	xiv. Qualifying Comments
xv. 4 m/s	xvi. C4	xvii. Long term Sitting
xix. 6 m/s	xx. C3	xxi. Standing or short term Sitting
		xviii. Reading a newspaper and eating and drinking.
		xxii. Appropriate for bus stops, window shopping and building entrances.

xxiii.	8 m/s	xxiv.	C2	xxv.	Walking and Strolling	xxvi.	General areas of walking and sightseeing.
xxvii.	10 m/s	xxviii.	C1	xxix.	Business walking	xxx.	Local areas around tall buildings where people are not likely to linger.

11.25 The pedestrian level wind environment assessment is summarised in terms of suitability for various activities, based on the above criteria. The assessment takes full account of seasonal variations in wind conditions and pedestrian activities. Thus, conditions for recreational activities focus on summer but also consider spring and autumn. Recreational activities do not consider winter comfort ratings as it is anticipated that users would not demand suitable conditions 95% of the time in winter but would instead be satisfied to use the amenity spaces on occasions when conditions, including precipitation and temperature, permit. Conditions for pedestrian thoroughfare, access or waiting (for example at bus stops) consider all seasons, with winter being predominantly the critical season due to generally higher wind speeds in the winter months.

11.26 The activities considered, and their relation to the comfort criteria detailed above, are shown in Table 11.3. The table is ordered in terms of decreasing sensitivity to wind speeds. Conditions considered suitable for the more sensitive activities would also be suitable for the subsequent, less sensitive, uses.

Table 11.3 Suitability Assessment

xxxi.	Suitability	xxxii.	Target Lawson comfort and safety criteria for specified seasons
xxxiii. Outdoor seating	xxxiv. For long periods of sitting, such as for an outdoor café or picnic area.	xxxv.	'Long term sitting' (C4) in at least summer.
xxxvi. Entrances, waiting areas	xxxvii. For pedestrian ingress/egress at entrances, or short periods of sitting or standing such as at a bus stop, taxi rank, meeting point, window shopping, etc.	xxxviii.	'Standing or short term sitting' (C3) in all seasons.
xxxix. General leisure (excluding seating areas)	xl. For leisure uses excluding long periods of outdoor sitting, such as active leisure, general park spaces, children's play area, etc.	xli.	'Standing or short term sitting' (C3) from spring to autumn.
xlii. Thoroughfare	xliii. For pedestrian access to, and passage through, the Site and surrounding area.	xliv.	'Business walking' / 'Walking or strolling' (C1/C2) in all seasons.
xliv. Unsuitable	xlvi. Unsuitable for all activities.	xlvi.	Exceeds comfort criterion for 'Business walking' (C1) or safety criteria (S1/S2).

Significance Criteria

11.27 The significance of any effects is assessed based on the suitability of wind conditions in each area against the current or planned pedestrian activities. Although pedestrian perception, and thus sensitivity, differs with the activity being undertaken, this is directly considered within the assessment criteria.

11.28 The assessment criteria apply upper bounds of acceptability, and so exceedances have the potential to fundamentally alter the character of a space. It is therefore appropriate to consider the sensitivity of pedestrian level receptors as high. On this basis:

- Effects on pedestrian safety, where conditions change from suitable to unsuitable (for adverse impact) or from unsuitable to suitable (for beneficial impact), are generally considered **major**. Where the effect is marginal, relative to the safety criteria, the effect is considered **moderate**. If

a moderate significance is applied, details to explain and justify this are included in the discussion.

- Effects on pedestrian comfort where conditions change from suitable to unsuitable (for adverse impact) or from unsuitable to suitable (for beneficial impact) for current or planned activities are deemed **moderate**.
- Where conditions change from marginal (or tolerable) to suitable or unsuitable for current or planned activities the effect is deemed **minor**. Similarly, a change from suitable or unsuitable to marginal / tolerable is also deemed **minor**.
- Any effect that does not alter the suitability of wind conditions with respect to current or planned activities is considered **negligible**.

11.29 As an example of the above criteria of significance, where conditions at a building frontage with no current entrances are suitable only for strolling and a proposed development introduced an entrance in this area, wind conditions would need to improve to be suitable for pedestrian ingress / egress for the impact to be insignificant. If wind conditions became marginally windy for an entrance, the impact would be minor adverse even if wind speeds were lower, due to the introduction of a more sensitive activity.

11.30 Where existing conditions are calmer than required for existing activities, an increase in wind speeds could be accommodated without the effect being significant, provided conditions remain suitable for pedestrian activities.

Limitations and Assumptions

11.31 The assessment is based on boundary layer wind tunnel testing of a physical scale model. This represents best industry practice, and provides a detailed, robust, quantitative assessment.

11.32 Historical wind statistics are used as standard practice due, in part, to lack of certainty in potential future changes in wind patterns, though any changes are expected to be minor.

11.33 The final designed-in wind mitigation features were developed for the Proposed Development with future surrounds scenario. Although each feature was also tested for the Proposed Development with the baseline surrounds, the specific combination of features was not tested for this scenario. The results presented for the Proposed Development with baseline surrounds therefore represent a collation of results based on the closest test cases and professional judgement.

Baseline Conditions

11.34 The wind climate expected at the Site is summarised in Figure 11.1 in terms of the annual wind speed and direction probability distributions at a reference height of 114 m above local ground level. Seasonal wind speed and direction probability distributions are presented in Appendix 11.1.

11.35 Based on the wind climate statistics, winds from the southerly quadrant are prevalent. Light to moderate winds from the south and south-south-east are most common, whilst stronger winds more frequently blow from the south-south-west. Winds from the west-south-west and west also occur frequently, and extreme wind speeds (relevant to pedestrian safety) are most likely to blow from this direction. Northerly winds are generally light and rare, though cold north-easterly winds are common during spring. Wind speeds are generally higher during winter and lower during summer.

11.36 The existing open Site is partially sheltered from prevailing southerly winds by The Factory. The Site is exposed to the stronger, but less frequent, westerly winds but the back-pressure created by the consented St John's T1 and Manchester Goods Yard helps limit the resulting wind speeds across the Site. The exposure of St John's T1, Manchester Goods Yard and No.1 Grape Street to these westerly winds does however result in downdraughts and subsequent channelling of winds around and between the buildings to the east of the Site.

- 11.37 The resulting pedestrian level wind environment in and around the existing Site is presented in terms of the Lawson comfort and safety criteria in Appendix 11.1, and is summarised below.
- 11.38 As a result of the downdraughts from the west elevation of the consented St John's T1 reaching pedestrian level and subsequently channelling northwards along Water Street, pedestrian level wind conditions marginally rate as unsuitable, in terms of pedestrian safety, for the general public at the junction of Water Street and the access road to Manchester Goods Yard (location 28 in Figures A11.4 of Appendix 11.1). Here, the once per annum wind speed is approximately 15.6 m/s, against the criterion of 15.0 m/s. The 15 m/s threshold is exceeded approximately 1.5 times per annum, against a target of once per annum.
- 11.39 Otherwise, pedestrian level wind conditions in and around the Site rate as safe for all users.
- 11.40 In terms of pedestrian comfort, with respect to wind force, wind conditions across the Site are suitable for recreational activities including at least short periods of standing or sitting (such as for a meeting point, for example), with suitable conditions for long periods of outdoor sitting (such as for picnics, for example) enjoyed during at least summer. The more sheltered area around the Canal Basin enjoys amenable conditions for outdoor seating throughout the year.
- 11.41 The bus stop on Water Street, near the entrance to the Marriott Hotel, is also expected to enjoy suitable conditions for awaiting a bus, though this bus stop will be removed for proposed Site conditions.
- 11.42 Within the surrounding area, wind conditions at the junction of Water Street and the access road to Manchester Goods Yard are considered suitable, ideally, only for fast walking, normally associated with business activities, during winter. However, conditions only marginally exceed the Lawson criterion for leisurely strolling and would likely be considered tolerable for pedestrian passage. Otherwise, surrounding conditions are suitable for at least leisurely strolling and are thus considered suitable for pedestrian passage.
- 11.43 Main entrances to the existing surrounding buildings enjoy suitable conditions for pedestrian ingress / egress.
- 11.44 The Marriott Hotel's outdoor seating area, adjacent to the River Irwell, is exposed to westerly winds but enjoys suitable conditions for long periods of outdoor sitting, such as for an outdoor café.
- 11.45 Factory Square (to the west of The Factory) enjoys suitable conditions for general recreational uses including at least short periods of sitting (such as for a meeting point). Suitable conditions for long periods of outdoor sitting (such as for picnics) are enjoyed across most of the Square during at least summer, with only a small area close to The Factory's west elevation being marginally windy for such activities.
- 11.46 Most of Festival Square (on the north side of and beneath The Factory) enjoys suitable conditions for recreational uses including at least short periods of sitting, with much of the space further suitable for long periods of outdoor sitting during at least summer. Channelling of prevailing southerly winds beneath The Factory's eastern overhang and around the north-eastern core creates conditions suitable for leisurely strolling but too windy for sedentary activities during autumn and winter. However, given the extent of area affected, the overall conditions across the square are expected to be tolerable for associated recreational uses.
- 11.47 The open space around the southwest corner of St John's T1 generally has suitable conditions for recreational activities including short periods of sitting from spring to autumn. Suitable conditions for long periods of sitting in summer, such as for an outdoor café, are limited to small areas close to the west and

south frontages, away from the building corners. Purposely developed landscaping would therefore be required to create suitable conditions for planned uses.

- 11.48 The open space at St John's Place generally has suitable conditions for recreational activities including at least short periods of sitting in summer and autumn, though the southwest corner of the space is too windy for such activities during spring and winter. Overall, conditions are expected to be considered tolerable for associated temporary uses.

Identification and Evaluation of Likely Significant Effects

Demolition and Construction Phase

- 11.49 There are no existing structures to be demolished within the Site.
- 11.50 During construction, the massing of neighbouring buildings and the spacing and orientation to the Proposed Development, including consented future developments, is such that potential short-term effects where partially completed buildings may exacerbate downdraughts from downwind buildings are not expected to be significant. Potential wind effects from the partially completed Development are therefore expected to be less than from the completed Development considered below.
- 11.51 Furthermore, pedestrian activities within the Site and immediate surrounds will also be different during construction, with pedestrian movements restricted by temporary hoardings. Pedestrian perception of conditions in the surrounding area is also likely to be affected by expectations of conditions around a building site, with pedestrians more likely to tolerate adverse conditions as they can appreciate it as a temporary situation.
- 11.52 On the basis of the above, the Proposed Development is expected to have a lesser effect on the suitability of wind conditions in and around the Site during construction than for the completed scheme and any potential additional effects of the demolition and construction phase are expected to be **negligible**.

Operational Phase

- 11.53 Upon completion, the Proposed Development presents a relatively wide obstruction to prevailing southerly winds, particularly the stronger south-south-westerly winds. The Development is partially sheltered at lower levels from these winds but is relative exposed at mid-to-upper levels. Downdraughts from the southerly elevation have potential to reach pedestrian level before channelling along the façade and around the southwest and southeast corners of the building. The downdraughts may extend some distance upwind towards The Factory and to the east (towards the T1 site), before channelling along Water Street, to the northeast of the Proposed Development.
- 11.54 The Proposed Development is more exposed to, but presents a narrow obstruction to, the most frequent extreme winds from the west-south-west and west. The building orientation helps limit the potential for downdraughts and subsequent channelling of resulting pedestrian level winds for these wind directions. Similarly, the Proposed Development is orientated to present a corner to north-easterly winds, common in spring, again limiting the potential for significant effects for these winds.
- 11.55 The landscaping and localised building features were developed during an interactive workshop to allow the Proposed Development to respond to the potential wind effects discussed above, and the proposed pedestrian and occupant activities. Resulting key features embedded into the design include:
- 4 m deep, 50% porous canopy, extending from south elevation at Level 1;
 - 6 – 8 m high trees, of a deciduous species with substantial retained solidity in winter (i.e. significant canopies with numerous branches):

- along the north edge of the raised terrace;
- along the edge of Canal Basin;
- in a cluster to the west of Proposed Development's southwest corner; and
- in two columns across the open space between the Proposed Development and Factory Square.
- ~1.1 – 1.2 m high shrubs in planters:
 - on the north and south sides of main entrances; and
 - extending out from the southeast corner of Proposed Development.
- Two 2.4 m x 1.8 m wide, 50% porous, screens within the planter extending out from the Proposed Development's southeast corner;
- 1.8 m high, 50% porous gate, extending from the southwest corner of Proposed Development; and
- ~ 1.1 - 1.2 m high, 50% porous, barriers:
 - around the raised terrace edge;
 - along the level drop above the Canal Basin; and
 - along the waterfront.

11.56 The above features, as modelled, are illustrated in Appendix 11.1.

11.57 The pedestrian level wind environment in and around the Site resulting from the above effects and accounting for the designed-in features is presented in terms of the Lawson comfort and safety criteria in Appendix 11.1. Conditions are further summarised graphically in terms of likely suitability for pedestrian activities (based on the seasonal targets outlined in Table 11.3) in Figure 11.2. This presentation applies expert judgement to extrapolate from the key-point measurements in order to indicatively cover the Site and surrounding area.

Pedestrian Safety (Baseline Surrounds)

11.58 In the baseline surrounds scenario, without further mitigation, pedestrian level wind conditions generally rate as safe for all users. However, the following areas rate as unsuitable, in term of pedestrian safety, for the general public:

- at the northeast corner of the Site, extending across the Proposed Development's access road and onto Water Street (locations 50 and 112 in Figures A11.4 of Appendix 11.1); and
- at the southwest corner of the St John's T1 site, extending across the access road and potentially back onto Water Street (location 60 in Figures A11.4 of Appendix 11.1).

11.59 It is expected that conditions at Locations 50 and 60 will only marginally exceed the safety criteria: the assessed once per annum wind speed is approximately 15.6 m/s, against the criterion of 15.0 m/s; the 15 m/s threshold is exceeded approximately 1.5 times per annum, against a target of once per annum. Given the marginal exceedance of the criteria, in the absence of further mitigation, these effects are considered **moderate adverse**.

11.60 The exceedance of the safety criteria on the south side of the Proposed Development's access road (location 112) is slightly greater: the once per annum wind speed potentially exceeds 16 m/s and the 15 m/s threshold is potentially exceeded more than twice per annum. In the absence of further mitigation, this effect is considered **major adverse**, though very localised.

11.61 Mitigation of these exceedances is discussed at paragraphs 11.96 to 11.104 below.

11.62 Otherwise, conditions in and around the Site rate as safe for all users. The wider effect on pedestrian safety is therefore considered **negligible**, with a localised **moderate beneficial** effect at the junction of Water Street and the access road to Manchester Goods Yard.

Pedestrian Comfort (Baseline Surrounds)

Thoroughfares

11.63 In terms of pedestrian comfort, with respect to wind force, wind conditions at the northeast corner of the Site, extending across the Proposed Development's access road and along Water Street, are considered suitable only for fast walking, normally associated with business activities, during winter. The localised effect, around the access road (locations 50 and 112), is considered **moderate adverse**. Further along Water Street, above the Canal Basin (location 111), the conditions only marginally exceed the Lawson criterion for leisurely strolling and are expected to be considered tolerable for pedestrian passage. This localised effect is therefore considered **minor adverse**.

11.64 Otherwise, conditions within the Site are suitable for at least leisurely strolling and are thus considered suitable for pedestrian access to, and passage through or past, the Site. The wider effect on thoroughfares within the Site is therefore considered **negligible**.

Building Entrances

11.65 The main entrances to the Proposed Development are located away from areas of potential accelerated winds or a locally sheltered. As a result, conditions at the Proposed Development's main entrances are suitable for pedestrian ingress / egress. The effect on the Proposed Development's entrances is therefore considered **negligible**.

Amenity Spaces

11.66 Most of the raised terrace around the north, west and south sides of the Proposed Development enjoys suitable conditions for recreational activities including long periods of outdoor sitting, such as for café outdoor seating, during at least summer and autumn. The west and south sides of the tower also enjoy these amenable conditions in spring. The north side of the tower is marginally windy, but likely tolerable, for outdoor seating during spring. The areas around the tower's southwest and northwest corners are too windy for outdoor seating. However, overall, the conditions are considered suitable for proposed uses and the small limitation on potential seating areas is not considered significant. The overall effect on the proposed terrace is therefore deemed **negligible**.

11.67 The open space on the south side of the Proposed Development is susceptible to some downdraughts from the tower. Summer conditions are suitable for recreational activities including short periods of sitting or standing, such as for a meeting point or children's play. Conditions from autumn to spring, whilst suitable for leisurely strolling, are considered too windy for sedentary activities across much of the space. However, given the open nature of this space, conditions are expected to be considered tolerable and this effect is therefore considered **minor adverse**.

11.68 The area around the Canal Basin enjoys suitable conditions for recreational activities, including at least short periods of sitting or standing from spring through to autumn, with much of the space further suitable for long periods of outdoor sitting during at least summer. Overall, conditions are expected to be suitable for proposed uses and this effect is therefore considered **negligible**.

Surrounding Area

11.69 With the introduction of the Proposed Development, conditions on the thoroughfares around the southwest corner of the St John's T1 site are suitable only for fast or business walking during winter. The localised effect around the access road (location 60 in Figures A11.4 of Appendix 11.1) is **considered moderate adverse**. Further along Water Street (location 59) the conditions only marginally exceed the Lawson

criterion for leisurely strolling and are expected to be considered tolerable for pedestrian passage. This localised effect is therefore considered **minor adverse**.

11.70 Otherwise, conditions in the immediate surrounding area are suitable for at least leisurely strolling and would be considered suitable for pedestrian access to and passage past the Site. The Proposed Development therefore has a localised **minor beneficial** effect at the junction of Water Street and the access road to Manchester Goods Yard. The wider effect on surrounding thoroughfares is considered **negligible**.

11.71 The main entrance to the consented St John's T1 development is marginally windy, but likely tolerable, for pedestrian ingress / egress during winter. This localised effect is considered **minor adverse**. Otherwise, entrances to surrounding buildings are expected to retain suitable conditions for pedestrian ingress / egress and the wider effect on surrounding entrances is considered **negligible**.

11.72 The Marriott Hotel's outdoor seating area, adjacent to the River Irwell, retains suitable conditions for café outdoor seating. Factory Square retains suitable conditions for recreational uses, including outdoor seating during at least summer across the Square. The slight enhancement at the west elevation of The Factory is not considered significant and these effects are both considered **negligible**.

11.73 Most of Festival Square retains suitable conditions for recreational uses including at least short periods of sitting, particularly from spring through to autumn. The area along the north elevation of The Factory is further suitable for outdoor seating during at least summer. Relative to the Baseline conditions, the area with suitable summer conditions for outdoor seating is reduced in the north area of the Square but extended in the east. The area susceptible to channelling of prevailing southerly winds beneath The Factory, with resulting conditions suitable for leisurely strolling but too windy for sedentary activities in winter, is slightly increased around the north-eastern core but autumn conditions closer to the core are enhanced relative to Baseline conditions. Overall, this mix of effects is considered **negligible** to no worse than **minor adverse**.

11.74 The Proposed Development has a mixed effect on the area in the southwest of St John's T1. The extent of the open space with suitable conditions for general recreational activities, including short periods of sitting (such as for a meeting point), during summer is reduced and conditions in the open space are too windy for sedentary activities from autumn to spring. However, the area with suitable conditions for long periods of sitting (such as for an outdoor café) is extended, though remains limited to small areas close to the west and south frontages, away from the building corners. Purposely developed landscaping would still therefore be required to create suitable conditions for planned uses and the effects are considered to range from **minor adverse** (in the open space, set back from the roadway considered as thoroughfare, above) to **minor beneficial** (at the building frontage).

11.75 The open space at St John's Place is slightly enhanced relative to Baseline conditions, with resulting conditions suitable for recreational activities including at least short periods of sitting throughout the year. This effect is considered negligible to localised **minor beneficial** (towards the southwest corner).

Cumulative Effects

11.76 With the introduction of identified cumulative developments, including the Union T1 scheme that will replace the St John's T1 development, the Proposed Development enjoys greater shelter from prevailing southerly winds and is significantly sheltered from the most frequent strong winds from the west-south-west and west.

11.77 The St John's Place Zone 1 tower development represents a substantial structure with potential to create areas of accelerated pedestrian level winds within the area surrounding the tower. The current assessment has considered only the illustrative canopies and landscaping presented within the latest relevant planning application for this development and does not include further mitigation measures which are expected to be developed during the detailed design stages for this plot to address the planning condition requiring submission of a final wind mitigation scheme.

11.78 Although sheltered at lower levels, the St John's Place tower is exposed to both prevailing southerly winds and north-easterly winds, common in spring. Downdraughts from the mid-to-upper levels of the south and north elevations have potential to spill over the southern canopy and northern podium, respectively, reaching pedestrian level to the southwest of the tower, by Water Street.

11.79 The resulting pedestrian level wind conditions in and around the Site is presented in terms of the Lawson comfort and safety criteria in Appendix 11.1, and is summarised below.

Pedestrian Safety (Future Surrounds)

11.80 As a result of the wind effects discussed above, pedestrian level wind conditions rate as unsuitable, in terms of pedestrian safety, for the general public around the southwest of the St John's Place tower. However, the accelerated winds are dictated by downdraughts from St John's Place tower, particularly from the northern elevation for north-easterly winds. This is not therefore considered a combined effect of the Proposed Development with this future development.

11.81 The exceedances of the safety criteria identified at paragraphs 11.58 to 11.60 are removed in the cumulative scenario.

11.82 The cumulative effects of the Proposed Development with the future surrounding developments on pedestrian safety at ground level is therefore expected to be generally **negligible**, with a localised **moderate beneficial** effect at the junction of Water Street and the access road to Manchester Goods Yard.

Pedestrian Comfort (Future Surrounds)

Thoroughfares

11.83 Wind conditions within the Site are suitable for at least leisurely strolling and are thus considered suitable for pedestrian access to, and passage through or past, the Site. The cumulative effect on thoroughfares within the Site is therefore considered **negligible**.

Building Entrances and Waiting Areas

11.84 Conditions at the Proposed Development's main entrances are suitable for pedestrian ingress / egress. The cumulative effect on the Proposed Development's entrances is therefore considered **negligible**.

Amenity Spaces

11.85 Most of the raised terrace around the north, west and south sides of the Proposed Development enjoys suitable conditions for recreational activities including long periods of outdoor sitting, such as for café outdoor seating, from spring through to autumn. The areas around the tower's southwest and northwest corners are too windy for outdoor seating. However, overall, the conditions are considered suitable for proposed uses and the small limitation on potential seating areas is not considered significant. The overall cumulative effect on the proposed terrace is therefore deemed **negligible**.

11.86 The open space on the south side of the Proposed Development is suitable for general recreational activities including short periods of sitting or standing, such as for a meeting point, from spring through to autumn. These conditions would also be considered suitable for activities such as a children's play space for example. Summer conditions are considered too windy for long periods of outdoor sitting, such as for picnics. However, given the open nature of this space, conditions are overall expected to be considered tolerable and this cumulative effect is therefore considered no worse than **minor adverse**.

11.87 The area around the Canal Basin enjoys suitable conditions for recreational activities, including at least short periods of sitting or standing throughout the year, with amenable conditions for long periods of outdoor sitting during at least summer. Conditions are therefore expected to be suitable for proposed uses and this cumulative effect is therefore considered **negligible**.

Surrounding Area

11.88 Within the surrounding area, conditions to the southwest of the St John's Place tower are considered suitable, ideally, only for fast or business walking during winter but are only marginally windy for leisurely strolling and are expected to be considered tolerable. However, as discussed above, these accelerated winds are expected to be dictated by the St John's Place tower and are not considered to represent a combined effect of the Proposed Development with this future development. There is also a planning condition attached to the St. John's Place Planning Permission requiring submission of a final wind mitigation scheme to address this point.

11.89 Otherwise, thoroughfares in the immediate surrounding area are suitable for at least leisurely strolling and are considered suitable for pedestrian access to and passage past the Site. On this basis, the cumulative effects of the Proposed Development with future surrounding developments on pedestrian comfort on surrounding thoroughfares is expected to be localised **minor beneficial** at the junction of Water Street and the access road to Manchester Goods Yard and **negligible** elsewhere.

11.90 Entrances to surrounding buildings are expected to enjoy suitable conditions for pedestrian ingress / egress. The cumulative effect on surrounding entrances is therefore considered **negligible**.

11.91 The Marriott Hotel's outdoor seating area retains suitable conditions for café seating. Factory Square retains suitable conditions for recreational uses, including outdoor seating during at least summer across the Square. The slight enhancement at the west elevation of The Factory is not considered significant and these cumulative effects are both considered **negligible**.

11.92 Festival Square enjoys suitable conditions for recreational uses including at least short periods of sitting, such as for a meeting place, throughout the year, with much of the space further suitable for long periods of outdoor sitting during at least summer. Relative to the Baseline conditions, the area with suitable summer conditions for outdoor seating is slightly reduced in the north area of the Square but extended in the east. The channelling of prevailing southerly winds beneath The Factory's eastern overhang and around the north-eastern core is also alleviated. Overall, the cumulative effect is considered **negligible**.

11.93 The Union T1 development incorporates purposely developed wind mitigation measures and enjoys suitable conditions for long periods of outdoor sitting, such as for café outdoor seating, across the south side of the tower, during at least summer. The open space in the southwest of the T1 site is suitable for general recreational activities including short periods of sitting (such as for a meeting point), from spring through to autumn. Conditions are considered suitable for proposed use and this cumulative effect is therefore considered **negligible**.

- 11.94 The sheltered amenity space beneath the canopy on the south side of St John's Place tower has suitable conditions for general recreational activities, such as a play space. Further development of the landscaping proposal is therefore expected to be required to ensure suitable conditions for planned recreational activities, including outdoor seating. However, these conditions are expected to be dictated by St John's Place tower and the cumulative effect of the developments is expected to be **negligible**.
- 11.95 Salford Central Zone C, to the northwest of the Site (on the opposite side of the River Irwell), enjoys suitable conditions for general recreational activities along the waterfront, from spring through to autumn, with much of the space further suitable for outdoor seating in at least summer. In the absence of landscaping measures, the podium-top terrace is marginally windy for outdoor seating during summer. However, with inclusion of the landscaping proposals, conditions would be expected to be acceptable. The likely cumulative effect on Salford Central Zone C is therefore considered **negligible**.

Mitigation Measures

- 11.96 Development of the landscaping proposals to help alleviate anticipated wind effects has been carried out and measures implemented are accounted for in the assessment discussed above.
- 11.97 Further mitigation is not required in the cumulative scenario.
- 11.98 The existing surrounds scenario requires more detailed discussion.
- 11.99 Firstly, the existing surrounds scenario incorporates the consented St John's T1 development with its illustrative landscaping, which is relatively sparse along Water Street. The consented St John's T1 will not be delivered; the site is now under the ownership of the Applicant who is progressing alternative proposals on the site, referenced in this document as Union T1. The existing surrounds scenario will not therefore materialise.
- 11.100 The Union T1 proposals incorporate significantly denser tree planting, staggered porous screens and planters with tall shrub planting to help mitigate wind impacts along Water Street. These mitigation measures have been tested as part of the cumulative assessment. As detailed above, the cumulative scenario including these measures resolves the safety exceedances identified for the existing surrounds scenario.
- 11.101 On this basis, in the unlikely event that just the Proposed Development and Union T1 are developed (without the other identified cumulative developments), it is expected that the enhanced landscaping around T1 will help alleviate the accelerated winds where the identified exceedances of the safety criteria are located.
- 11.102 Furthermore, as both developments are in the same ownership, there will be opportunity to develop an integrated solution between both sites, if this were to be necessary. This may also include further development of the landscaping in the open space on the south side of the Proposed Development, which could also contribute to further enhancing conditions in this area.
- 11.103 A planning condition is anticipated on both consents that requires further wind tunnel testing and validation prior to occupation of either building. This would be in common with other consents in the St John's area, in recognition of the evolving physical context and the need for a holistic approach that delivers a suitable wind environment across the regeneration area.
- 11.104 Even in the very highly unlikely event that the implemented St John's T1 development is progressed rather than the revised Union T1 development, and if no other committed development has come forward

in the interim period, the same outstanding planning condition attached to that consent requires development of the illustrative landscaping proposals for wind mitigation prior to occupation of the building.

Residual Effects

11.105 As discussed above, development of the landscaping and localised building features, to help alleviate anticipated wind effects, has been carried out and measures implemented are accounted for in the assessments. In the absence of further pedestrian level wind mitigation measures, residual conditions with the existing surrounding context would therefore be as discussed in paragraphs 11.58 – 11.75.

11.106 However, at the very least, the consented St John's T1 will be replaced with revised Union T1 development on that site. The Union T1 development incorporates significantly more wind mitigation measures in the open space between the developments which would be expected to reduce the wind effects along Water Street.

11.107 In the unlikely event that no other committed development, other than the Proposed Development and Union T1 has come forward, the resulting effects on pedestrian safety therefore have potential to be **negligible**, or at least no worse than localised **moderate adverse**. Effects on pedestrian comfort may be no worse than **minor adverse**.

11.108 If further mitigation were required between the two buildings, which are both within the Applicant's control, then development of the landscaping as part of the site-wide strategy for the wider St John's regeneration area could also be implemented to further alleviate the accelerated winds.

11.109 All planning permissions granted within the St John's regeneration area are subject to the same planning condition requiring further wind tunnel testing prior to occupation of the building. This is in recognition of the rapidly evolving physical context of the area and the need for a holistic wind mitigation strategy across the regeneration area. It is anticipated that the same condition would be applied to any planning permission for the Proposed Development.

11.110 With the introduction of consented future surrounding developments, the Proposed Development is significantly sheltered from key wind directions, further reducing the significance of effects. Resulting effects are generally **negligible** with some localised effects ranging from **moderate beneficial** to **minor adverse**.

11.111 Consequently, it is expected that the landscaping features detailed in paragraph 11.55 could potentially be reduced should some or all of these wider developments have progressed prior to completion of the Proposed Development.

11.112 As with all developments across St John's, further wind microclimate assessment should be undertaken at that time as part of a site wide analysis to confirm the optimum wind mitigation strategy across the regeneration area.

Table 11.4 Residual Impact Summary

Impact	Description of Effect	Pre-mitigation Significance	Post-mitigation Significance
Pedestrian safety	Creation or alleviation of accelerated pedestrian level winds along Water Street	Localised moderate beneficial to localised major adverse.	Localised moderate beneficial to no worse than localised moderate adverse.

		Long-term moderate beneficial (with future surrounds).	Long-term moderate beneficial (with future surrounds).
Comfort for pedestrian access to and passage past the Site	Creation of accelerated pedestrian level winds along Water Street	Moderate to minor adverse Long-term negligible (with future surrounds)	No worse the minor adverse Long-term negligible (with future surrounds)
Comfort for pedestrian ingress / egress at entrances to Development	None	Negligible	Negligible
Comfort for recreational use of proposed amenity spaces	Some restrictions on potential use of open space on south side of the Proposed Development	Minor adverse	Minor adverse
Comfort for existing activities within surrounding area	Changes to wind conditions at surrounding thoroughfares, entrances and amenity spaces	Minor beneficial to moderate adverse Long-term localised minor beneficial to negligible (with future surrounds)	Minor beneficial to minor adverse Long-term localised minor beneficial to negligible (with future surrounds)

12 Summary of Residual Impacts

12.1 This section contains a summary of the residual effects of the Proposed Development.

Legislation, Policy and Guidance

Regulatory Requirement

12.2 The requirement for mitigation measures is specified in Schedule 4 (7) of the EIA Regulations, which states that Environmental Statements should include:

"A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases."

Approach to Mitigation

12.3 The legislation does not specifically outline how mitigation measures should be incorporated into an EIA. Nonetheless, mitigation measures form an integral part of the EIA process. This is illustrated by the International Association for Impact Assessment's definition of EIA as:

"the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made."

12.4 Mitigation itself is defined by the United Nations Environment Programme (UNEP) as:

"the measures that are necessary to avoid, minimise or offset predicted adverse impacts and, where appropriate, to incorporate these into an environmental management plan or system."

12.5 In approaching mitigation, best practice guidance suggests a hierarchical approach. The UNEP EIA Training Resource Manual (2002) advises that impacts should ideally be:

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

Planning Policy

12.6 This chapter considers policy relating to the mitigation of impacts from the Proposed Development. It should be read in conjunction with technical chapters 6 - 11 where planning policy at the national, regional, county and local level is discussed in greater detail for each topic.

12.7 Paragraph 32 of the National Planning Policy Framework (NPPF) also outlines a hierarchical approach to mitigating effects:

"Significant adverse impacts on any of... [the economic, social and environmental]... dimensions should be avoided and, wherever possible, alternative options which reduce or eliminate such impacts should be pursued. Where adverse impacts are unavoidable, measures to mitigate the impact should be considered. Where adequate mitigation measures are not possible, compensatory measures may be appropriate."

Planning Guidance

- 12.8 The National Planning Practice Guidance does not provide specific advice regarding approaches to mitigation, however Paragraph 4 (Reference ID: 6-004-20140612), 'How can adaptation and mitigation approaches be integrated?', suggests particular attention be paid:

"to integrating adaptation and mitigation approaches and looking for 'win-win' solutions that will support sustainable development... Environmental Impact Assessment can be a useful (sic) for testing the integration of mitigation and adaptation measures and the long term implications of decisions."

Mitigation and Enhancement by Design

- 12.9 The EIA process has played a key part in the evolution of the design for the Proposed Development, as discussed in Chapter 5, Consideration of Alternatives, of the ES. This has resulted in various features built into the design acting as inherent mitigation and enhancement measures. This includes:

- Provision for community and retail facilities;
- Improved pedestrian infrastructure, and cycle parking facilities on-site;
- Enhancement of biodiversity through sensitive landscaping, creation of new public space;
- Ecological enhancements, including bird boxes and habitat for invertebrates;
- Design of the building to minimise visual impact and appropriately relate to the historic and wider contexts;
- Concentrating heights in less sensitive areas of the Site; and,
- Inclusion of strategic landscaping in order to minimise wind microclimate effects.

Specific Mitigation Measures

- 12.10 Notwithstanding the above efforts to minimise the effects of the Proposed Development on environmental receptors, some adverse effects are anticipated during the construction and operational phases of the Proposed Development.
- 12.11 Detailed descriptions of the likely significant effects, both beneficial and adverse, of the Proposed Development are discussed in greater detail in the technical chapters of the ES (6 - 11). The methods and controls for mitigating adverse environmental effects are also described in detail within the ES technical chapters.
- 12.12 Table 12-1 summarises the likely significant effects of the Proposed Development prior to mitigation being implemented, mitigation measures that will be taken to minimise any significant adverse effects, and the residual effects following mitigation.
- 12.13 It is anticipated these controls could be secured through the submission of details to the local authority, or alternatively by appropriate planning conditions or obligations.

Table 12-1: Residual Impacts Table

Chapter	Phase	Likely Significant Effect	Mitigation Measure	Residual Impact
Chapter 6 – Townscape and Visual Impact	Construction	Minor adverse impact on character zones anticipated due to construction activity.	Screening of the development site and temporary fencing.	Temporary minor adverse / negligible - not significant.

Chapter	Phase	Likely Significant Effect	Mitigation Measure	Residual Impact
	Operation	Five instances of negligible benefit, five instances of no impact (none) and one instance of negligible adverse impact on the identified views.	Embedded high quality design seeks to reduce any potentially significant adverse impacts on neighbouring buildings, viewpoints and townscape receptors. Regeneration benefits of the development will also offset this impact.	Five instances of negligible benefit , five instances of no impact (none) and one instance of negligible adverse impact on the identified view – all not significant.
Chapter 7 – Historic Environment	Construction	Potential temporary minor adverse effects from construction on the ability to understand and appreciate the setting of Bonded Warehouse and Victoria and Albert Hotel.	Management of the construction period through construction management plan to reduce the timescales for the project and to ensure minimum disruption from dust or vibration.	Temporary minor adverse – not significant
	Operation	Minor adverse impact on Designated and Non-Designated Heritage Assets.	Any potentially perceived non-significant minor adverse impacts on nearby identified assets will be mitigated against weighing the scheme in balance with the public regeneration benefits, in addition to in built mitigation provided by the quality of the scheme.	Minor adverse – not significant
Chapter 8 – Noise and Vibration	Construction	Potential for Negligible to Moderate adverse impact due to construction noise at the existing and proposed properties around the Site.	A detailed CMP would be developed for the scheme in accordance with the Construction Methodology Chapter (Chapter 4) and Noise and Vibration Chapter (Chapter 8) of this ES and will form part of the mitigation of noise and vibration during the construction phase. The CMP will provide methodology and solutions for the contractor to use and inform their works.	Temporary Negligible effect – not significant
	Operation	Negligible building services plant noise effects Negligible activity noise effects from commercial units.	Overall building services noise limits have been established to achieve compliance with published guidelines. Individual items of building services plant and any associated noise control hardware will need to be selected such that the cumulative noise levels from all plant items do not exceed the overall building services noise limits set in the ES Chapter. Compliance with music noise limits as set out in the ES.	Negligible effect – not significant
Chapter 9 – Air Quality	Construction	Potential for moderate adverse effect on nearby identified sensitive receptors as a result of dust soiling and impact on human health. With regard to road construction traffic, there is a potential for minor adverse impact without	Mitigation measures are set out in Table 9.19 to control the impact on Air Quality as a result of construction activity, including dampening down of the construction site and vehicles, dust sheeting of vehicles and temporary construction fencing.	Temporary Minor Adverse – not significant.

Chapter	Phase	Likely Significant Effect	Mitigation Measure	Residual Impact
		the implementation of mitigation measures.		
	Operation	Negligible (not significant) impact on existing or proposed sensitive receptors as a result of air quality during operation, either through building services plant or the local highway network.	The assessment has determined that mitigation for the scheme is not required.	Negligible – not significant
Chapter 10 – Daylight and Sunlight	Construction	N/A	N/A	N/A
	Operation	Two instances of minor adverse impact and five instances of negligible impact on surrounding properties.	No mitigation is proposed.	Two instances of minor adverse impact and five instances of negligible impact – not significant.
Chapter 11 – Wind Microclimate	Construction	N/A	N/A	N/A
	Operation	Moderate beneficial – Localised moderate adverse	Mitigation measures incorporated into results. However, at the very least, the consented St John's T1 will be replaced with revised Union T1 development on that site. The Union T1 development incorporates significantly more wind mitigation measures in the open space between the developments which would be expected to reduce the wind effects along Water Street. In the unlikely event that no other committed development, other than the Proposed Development and Union T1 has come forward, the resulting effects on pedestrian safety therefore have potential to be negligible, or at least no worse than localised moderate adverse. Effects on pedestrian comfort may be no worse than minor adverse. If further mitigation were required between the two buildings, which are both within the Applicant's control, then development of the landscaping as part of the site-wide strategy for the wider St John's regeneration area could also be implemented to further alleviate the accelerated winds.	Moderate beneficial – Localised minor adverse on pedestrian comfort Negligible on pedestrian safety

13 Type 1 Cumulative Effects

- 13.1 This section gives consideration to 'Type 1' cumulative effects.
- 13.2 The assessment is informed by the results of the technical assessments as set out in Chapter 12 of the ES.
- 13.3 Type 1 cumulative effects are also known as 'intra-project' effects, which are the combined effects arising from the Proposed Development upon a set of defined sensitive receptors. They are also known as inter-relationship effects.
- 13.4 Type 2 cumulative effects are considered within the ES technical chapters. The technical chapters also had regard to the potential for Type 1 cumulative effects, however for robustness the results of a standalone assessment of these is provided below.

Legislation, Policy and Guidance

Legislation

- 13.5 There is no legislation outlining how cumulative effects should be assessed. EIA Regulations Schedule 4(5) states that the EIA should consider cumulative effects. Cumulative is not defined in the EIA Directive or Regulations however a dictionary definition is 'increasing by one addition after another'.
- 13.6 The EIA Regulations require 'a description of the likely significant effects', including cumulative effects.
- 13.7 In the context of this assessment, 'cumulative effects' refers to the interactions between different likely residual effects resulting from the Proposed Development (Type 1). Both positive and negative effects are considered across the construction and operational phases.

Policy

- 13.8 As this chapter considers the Type 1 cumulative effects of the technical areas within the ES, all relevant policy has already been reviewed within the individual technical chapters.

Guidance

- 13.9 A number of guidance documents which relate to assessing cumulative effects have been used to inform the assessment and include:
- European Commission (EC) Environment DG (May 1999), 'Study on the Assessment of Indirect and Cumulative Impacts as well as Impact Interaction', Hyder Consulting; and
 - Institute of Environmental Management and Assessment (1992), Guidelines for the Environmental Assessment of Road Traffic.
- 13.10 The EC guidelines *'are not intended to be formal or prescriptive, but are designed to assist EIA practitioners in developing an approach which is appropriate to a project'*.

Assessment Methodology and Significance Criteria

Methodology

- 13.11 This assessment is primarily concerned with where there is a likelihood of significant Type 1 cumulative effects occurring, in accordance with EIA practice and other planning guidance.

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

Significance Criteria

- 13.17 The following terms have been used to define the significance of the effects identified:
- Major effect: where the proposed development could be expected to have a very significant effect (either positive or negative) cumulatively on a defined receptor / receiving environment;
 - Moderate effect: where the proposed development could be expected to have a noticeable effect (either positive or negative) cumulatively on a defined receptor / receiving environment;
 - Minor effect: where the proposed development could be expected to result in a small, barely noticeable effect (either positive or negative) cumulatively on a defined receptor / receiving environment; and
 - Negligible: where no discernible effect is expected as a result of the proposed development cumulatively on a defined receptor / receiving environment.
- 13.18 The significance level attributed to each effect has been assessed based on the magnitude of change due to the combination of residual effects and the sensitivity of the affected receptor/receiving environment to change, as outlined in Chapter 3 of the ES. Magnitude of change is assessed on a scale of major, moderate, minor and negligible and the sensitivity of the affected receptor/receiving environment is assessed on a scale of high, moderate, low and negligible.

Limitations and Assumptions

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

Identification of Likely Significant Type 1 Cumulative Effects Construction Phase

- 13.20 Based on the methodology detailed above, Table 13-1 presents the results of the review of the potential for interactions of individual effects during the construction phase of development. The potential effect interactions are then discussed further.

Table 13-1 - Type 1 Cumulative Effects – Construction Phase

Sensitive Receptor Group	Construction Phase Residual Effects	Likely Significant Cumulative Effects
Designated and non-designated heritage assets and key views.	Negligible to Minor Adverse effect Heritage Assets (significance preserved).	No likely significant Type 1 cumulative effects.
Nearby residential receptors.	Minor adverse (temporary) impact as a result of air quality, noise and vibration.	No likely significant Type 1 cumulative effects.
Ecology and Biodiversity	Negligible to Minor Adverse as a result of Air Quality and noise	No likely significant Type 1 cumulative effects.

- 13.21 Individual residual effects with the potential to give rise to a Type 1 cumulative effect are predominantly expected to relate to the interaction between temporary adverse air quality and noise and vibration (nuisance) impacts.

- 13.22 The combined effects are not considered likely to pose a significant risk to health or wellbeing for existing residents in the wider area due to the use of best practice construction measures.

Operational Phase

- 13.23 Based on the methodology detailed above, Table 13-2 presents the results of the review of the potential for interactions of individual effects during the operational phase of development. The potential effect interactions are then discussed further.

Table 13-2 - Type 1 Cumulative Effects - Operational Phase

Sensitive Receptor Group	Relevant Operational Phase Residual Effects	Likely Significant Cumulative Effects
New residents	Negligible effects relating to noise and vibration due to construction activities expected nearby. Negligible effects relating to other uses nearby, such as offices. Negligible to potentially very localised moderate adverse impacts relating to wind microclimate without mitigation.	No likely significant Type 1 cumulative effects. No likely significant Type 1 cumulative effects. No likely significant Type 1 cumulative effects
Neighbouring residential and hotel properties	Negligible effects relating to noise and moderate adverse effects from Daylight and Sunlight and negligible to potentially very localised moderate adverse impacts related to wind without mitigation.	No likely significant Type 1 cumulative effects.
Townscape views and nearby heritage assets.	Minor adverse to minor beneficial effects on appearance and understanding of the site and its wider surroundings.	No likely significant Type 1 cumulative effects.

Factory arts and culture hub	Negligible effects as a result of noise.	No likely significant Type 1 cumulative effects.
Ecology	Negligible to minor beneficial effects relating to the opening of the river walkway, introduction of trees, and clearing of the canal inlet.	No likely significant Type 1 cumulative effects.

13.24 Individual residual effects with the potential to give rise to a Type 1 cumulative effect are predominantly expected to relate to the interaction between temporary adverse wind, daylight, and noise and vibration (nuisance) impacts.

13.25 The combined noise and vibration effects are not considered likely to pose a significant risk to health or wellbeing due to the use of best practice construction measures.

Mitigation Measures

13.26 Where relevant, the individual residual effects which contribute to the potential cumulation have been considered within the ES and mitigated where necessary and feasible.

13.27 No mitigation is proposed for the identified Type 1 cumulative effects.



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