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Great Northern Redevelopment

Environmental Statement:

Non-Technical Summary

November 2022

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1. Introduction

1.1. This Environmental Statement ('ES') has been prepared by Deloitte in support of an application for Full Planning Permission and Listed Building Consent for the proposed redevelopment of the Great Northern Complex in Manchester City Centre (the 'Site'). The application is submitted to Manchester City Council ('MCC') on behalf of GNW Developments Limited ('the Applicant').

1.2. This ES sets out the findings of an Environmental Impact Assessment ('EIA') carried out in respect of the development of the Site.

1.3. The Proposed Development has been identified as the following discrete phases of development:

- Phase A: the refurbishment and conversion of the Great Northern Warehouse including the removal of modern features facilitated from the 1997 comprehensive scheme, and the refurbishment of the northern end of Deansgate Terrace for commercial use, alongside the enhancement of Great Northern Square and retention of existing ground floor occupiers;
- Phase B and C: partial demolition of the Leisure Box and retention of car parking below followed by the erection of residential elements (B) and refurbishment and conversion of the southern end of Deansgate Terrace (C).

1.4. The Proposed Description of Development is as follows:

"Phased redevelopment of the Great Northern Warehouse (GNW), Deansgate Terrace and Leisure Box, including areas of public realm, comprising:

- *demolition of the central atrium, GNW car park ramp, and other modern elements, alongside removal of 519 car parking spaces from the GNW, retention of casino (Sui Generis), bowling alley and existing food and drink unit (Use Class E) alongside the refurbishment, restoration, and re-use of the Grade II* Listed Great Northern Warehouse to provide office, retail and / or food and drink use (Use Class E) and ancillary areas;*

- *the refurbishment, restoration, partial demolition and 3-storey extension of the Grade II Listed Deansgate Terrace (northern section) and Goods Yard Entrance to form office, retail and / or food and drink use (Use Class E) and drinking establishments / hot food takeaway (Sui Generis), with associated public realm works comprising the reconfiguration of Great Northern Square and the introduction of additional public realm with associated hard and soft landscaping, together with highways works, access and servicing facilities, rooftop plant and other associated works;*

- *partial demolition of the existing leisure box prior to conversion; reconfiguration and extension of existing car parking to provide 929 parking spaces and associated plant, followed by construction of three residential buildings to provide 746 no. apartments (Use Class C3) above the retained car park comprising ground floor plus 16, 27 and 34 storeys respectively including 753 cycle parking spaces, with office, retail and / or food and drink use (Use Class E), or Sui Generis (drinking establishments / hot food takeaway) at ground floor and level 3, hard and soft landscaping, together with highways works, access and servicing facilities, rooftop plant and other associated works; and,*

- *external alterations and restoration of Deansgate Terrace (southern section) to provide office, retail or food and drink use (Use Class E) or Sui Generis (drinking establishments / hot food takeaway / live music venue), along with delivery of associated public realm, highways works, plant, and associated works."*

1.5. The application for Planning Permission is accompanied by three separate applications for Listed Building Consent, as outlined below:

1.6. The description of development as applied for by the Listed Building Consent for the Great Northern Warehouse is as follows:

"Great Northern Warehouse: "Internal and external alterations to the Great Northern Warehouse as part of its restoration, refurbishment and re-use to include office, retail, restaurants / food and drink, alongside retention of the existing bowling alley, ground floor restaurant and casino following removal of non-original building elements."

1.7. The description of development as applied for by the Listed Building Consent for 223-233 Deansgate is as follows:

"223-233 Deansgate: "Removal of non-original buildings and structures attached to the former Goods Yard Entrance (223-233 Deansgate Terrace) to facilitate the construction of a new 3 storey extension for office, food and drink, retail and / or Sui Generis (drinking establishments / hot food takeaway) uses."

1.8. The description of development as applied for by the Listing Building Consent for 235-291 Deansgate is as follows:

"235-293 Deansgate: "Internal alterations, restoration and construction of a new integrated part 2, part 3 storey extension to the rear 235-291 Deansgate Terrace to facilitate office, retail or food and drink use (Use Class E) or Sui Generis (drinking establishments / hot food takeaway / live music venue) uses, and associated works."

1.9. The EIA has been carried out in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) ('the EIA Regulations') and best practice guidance.

1.10. The non-technical summary ('NTS') is a standalone document and is required under the EIA Regulations.

Purpose of the Environmental Impact Assessment and Non-Technical Summary

1.11. The purpose of an EIA is explained by the Government in the National Planning Practice Guidance at paragraph 002 (Reference ID: 4-002-20140306), which sets out:

> "The aim of Environmental Impact Assessment is to protect the environment by ensuring that a local planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process."

1.12. On this basis, an EIA only applies to those projects which are likely to have a significant effect on the environment and these are typically projects of a larger scale.

1.13. In simple terms, an EIA is an information gathering exercise in relation to the effect that the Proposed Development may have on the local environment when compared to the existing conditions.

1.14. Conducting an EIA is a systematic process, which leads to a final report, the ES.

1.15. This NTS is designed to be read on its own but forms part of the ES. It explains the environmental implications of the Proposed Development to the public, informing them in non-technical language, and allowing them to decide whether they would like more detail on the proposals.

Environmental Impact Assessment Process

1.16. The first step is understanding if the Proposed Development meets the criteria set out within legislation, which means that further consideration should be given to if it comprises an EIA development. The legislation sets out different 'schedules' of projects and how the EIA should be carried out.

1.17. A Proposed Development may then go through a 'Screening' and/or a 'Scoping' process. This is the process whereby an Applicant may submit a request to the Local Planning Authority for a formal opinion as to whether they consider the Proposed Development to be meet the criteria for an EIA and, if so, what technical topics it considers to be relevant to the EIA.

1.18. If an EIA is determined to be required, the Applicant will prepare an ES, which sets out the findings from the technical assessments undertaken. The ES is then submitted to the Local Planning Authority as part of an application for Planning Permission.

Assessment Methodology

Scoping

1.19. A formal EIA scoping request was submitted to Manchester City Council on 4 August 2022 requesting formal confirmation as the proposed scope of the Environmental Impact Assessment required in respect of the Proposed Development. A formal scoping opinion was received on 28 October 2022.

1.20. The advice contained within the EIA Scoping Opinion including its provisions on the identification of environmental impacts and mitigation measures has been addressed in each of the relevant technical assessments contained within this document. In addition, each of the technical consultants for those Chapters that were both scoped in and scoped out of the EIA, via the October 2022 Scoping Opinion, have further considered whether the development parameters submitted with this application would give rise to any potential additional or modified environmental effects, such that the scope and coverage of the EIA should consider any additional matters.

1.21. The need for this additional consideration is due to the fact that the commercial floorspace identified within the Environmental Impact Assessment Scoping Request in August 2022 was somewhat lower than that which is identified as a basis for assessment within this Environmental Statement. In undertaking this initial exercise, the scope of the EIA has been fully assessed on the basis of the submitted scheme. It should also be noted that the commercial components of the scheme have remained largely unaltered save for the modest extension to the northern end of the Deansgate Terrace and some new areas surrounding the reconfigured Leisure Box phase of the development, and that all other proposed commercial floorspace is contained within existing buildings, primarily comprising the Grade Northern Warehouse and Deansgate Terraces. The individual chapters have assessed the development with the current commercial floorspace and have not identified any demonstrable effect of this from an environmental perspective.

1.22. For completeness, the number of car parking spaces and the quantum and height of the residential development remain consistent, within identified tolerance levels, to that set out in the EIA Scoping Report and Scoping Opinion. Reference is made to this in the individual chapters to confirm that consultants have reviewed the previously assessed commercial floorspace figures and those applied for by the Proposed Development to confirm that the scope of their EIA disciplines remains unchanged."

Technical Topics not included in the Environmental Impact Assessment

1.23. The Scoping process identified a number of technical topics where significant environmental effects as a result of the Proposed Development would be unlikely and would not be assessed further within the EIA process.

1.24. Theses topics are:

- Agricultural Circumstances
- Arboriculture
- Archaeology
- Aviation
- Broadband Connectivity
- Ecology
- Ground Conditions
- Telecommunications
- Transport
- Water Resources

Approach to Technical Studies

1.25. Various technical studies were commenced at an early stage in the development process. The findings of the baseline (existing) 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.

1.26. Project team reviews, attended by different members of the team, were held throughout the pre-application process. These reviews provided a valuable forum for the exchange of information and ensured that the project team and design team were fully aware of the environmental constraints and opportunities, and of the interactions between disciplines. Meetings were also held with Manchester City Council as the Local Planning Authority, as well as pre-application discussions with technical consultees.

1.27. The technical studies have been undertaken in accordance with current best practice. Specific guidance used is referenced within each of the respective technical chapters, with a reference list at the end of each chapter.

1.28. Each chapter takes a standard approach, which ensures consistency. This structure is broadly as follows.

Technical Chapter Structure	
Introduction	Each technical chapter begins with an introduction providing context to the assessment work.
Policy Context	This section includes a summary of legislation (laws) and of national and local policies relevant to the environmental discipline in the context of the Proposed Development and the ES.
Assessment Methodology & Significance Criteria	This section describes the method or approach employed in the assessment of impacts, the criteria against which the significance of effects has been evaluated, the sources of information used and any technical difficulties encountered. Relevant legislation is also identified.
Baseline Conditions	This section describes and evaluates the existing environmental conditions i.e. the current situation and anticipated changes over time assuming the Site is not developed. This is a critical part of the EIA process as it provides a measure against which potential environmental effects can be assessed.
Identification and Evaluation of Key Impacts	This section identifies the likely significant effects on the environment resulting from the Proposed Development. A description of the likely effects of the Proposed Development and an assessment of their predicted significance is provided in relation to the discipline being considered. The assessment of effect significance has been undertaken using appropriate quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.
Mitigation Measures	One of the main aims of the EIA process is to develop suitable mitigation measures to avoid, reduce or compensate for any significant adverse (negative) effects of a project. This section of each technical chapter describes the measures which would be implemented to mitigate potential adverse effects.

Technical Chapter Structure	
	Where possible, enhancement measures have also been proposed.
Cumulative Effects	This section considers the cumulative (combined) effects of the Proposed Development with any other 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. There are two distinct types of cumulative effects: Type 1 - Cumulative effects are the effects on identified receptors arising from a combination of impacts related to the Proposed Development. Type 2 - Cumulative effects are those that arise from incremental changes caused by other consented or reasonably foreseeable activities ('committed developments') together with the Proposed Development.
Residual Effects	The residual effects, i.e. the remaining effects of the Proposed Development assuming implementation of the proposed mitigation measures, have been estimated and presented. The methods used to make these estimates are described and proposed methods of treatment for any residual effects have been identified and quantified where possible.
Summary	Each technical chapter concludes with a brief summary outlining the potential residual effects of the Proposed Development.

Objectivity

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

Structure of the NTS

1.30. The remainder of this NTS outlines the Proposed Development in non-technical terms and then provides a summary of each technical chapter using non-technical language.

Further Information

1.31. More detailed analysis of the findings described within the NTS can be found within the compiled ES and other documents submitted in support of the Planning Application.

1.32. The ES and other application documents are available for public viewing on Manchester City Council's Public Access website at the following address: http://pa.manchester.gov.uk/online-applications

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

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

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

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2. Description of the Proposed Development

Where?

2.1. The Site is situated within Deansgate in Manchester City Centre. It extends for 2.97 hectares, and comprises the Great Northern Warehouse, Great Northern Square, Deansgate Terrace and the Leisure Box.

2.2. To the south of the Site is the Beetham Tower – a landmark residential and hotel development in the heart of the City Centre. Beyond this is Whitworth Street West and Deansgate Locks, a prominent feature of Manchester's nightlife, which in turn connects into Great Jackson Street and First Street beyond.

2.3. To the west of the Site is the lower rise St. John's Gardens, which is a mix of two to four storey residential and commercial properties. Beyond this is the St. John's Regeneration Framework Area.

2.4. To the east of the Site lies Manchester Central, which is one of the City's largest event spaces and convention centre. It comprises the refurbished Manchester Central Station.

2.5. To the north of the Site is Peter Street, which features a range of bars, restaurants and events venues such as the Albert Hall. Beyond this is St. Michael's and Lincoln Square, which is a growing commercial area of the city that is closely linked to Albert Square and the Manchester Town Hall, which is in the process of being refurbished and transformed.

2.6. Overall, the area surrounding the Site comprises a wide range of commercial and residential areas of varying density and historical development. The Great Northern represents a key juncture between these areas.

What?

2.7. The Site comprises the Great Northern Warehouse, a Grade II* former railway goods exchange, a significant example of Victorian engineering due to its use as a railway, road and canal interchange. Following the industrial decline in Manchester, the warehouse the warehouse was eventually converted into a multi-storey car park and leisure facility. This element is extremely valuable piece of Manchester's heritage, as the building can clearly be understood as a former railway goods warehouse and is also nationally significant as a designated Grade II* asset.

2.8. The Site also covers Deansgate Terrace, which comprises 34 original shop units (some of which have been merged). This terrace compises two listings (both Grade II) and is of special interest for its architectural, historic and communal value to the city. It is considered one of the longest Listed Assets in the country, forming a unique and continual range of shops, of which the regular rhythm of its fenestration and shopfronts contributes to its significance.

2.9. The final element to the Site is the Leisure Box, a late 20th Century development which includes a gym and cinema alongside car parking as anchor uses. As part of the proposals, this element is to be demolished, whilst its foundations will be retained for future use.

2.10. A previous application for Full Planning Permission was secured in 2018 for the Site (excluding the Leisure Box and Deansgate Terrace South). It remains live and implementable; however, the applicant has revisited their vision for that part of the site through this application proposal. The description of development associated with the 2018 permission is as follows:

> "Removal of the central atrium, car park ramp and other modern elements as shown on Drawing References: 10161- Z2-A-B5D9-JC20-XP-00-001 and 10161-Z3-A-B5D9-JC20- XP00-001 retention of reconfigured casino (Sui Generis) and existing restaurant units (Use Class A3) followed by the refurbishment, restoration, and re-use of the Grade II* Listed Great Northern Warehouse to provide additional retail units (Use Class A1 or A3 or A4), gym (Use Class D2), 118 residential units (Use Class C3) and associated storage in addition to the refurbishment, restoration and extension of the Grade II Listed Deansgate Terrace and Goods Yard Entrance to form ground floor retail (Use Class A1 or A3 or A4), and 24 residential units above (Use Class C3) in addition to the reconfiguration of Great Northern Square and the introduction of additional public realm with associated hard and soft landscaping, including the formation of Dean Street (as shown on Plan Reference: 10161- Z0-A-B5D9-G100-P-00-001) together with highways works, access, servicing, rooftop plant and other associated works."

Proposed Developoment

2.11. The Proposed Development is anticipated to be brought forward in different phases; at this stage it is expected that the Great Northern Warehouse element and Deansgate Terrace will be brought forward first, followed by the demolition of the Leisure Box and the construction of the residential buildings.

2.12. In summary, the completed Proposed Development will comprise:

- 746 residential units (Use Class C3) and 2,057 sq. m of private external amenity space plus 4726 sq. m of shared amenity space (972 sq. m interna and 3,744 sq. m. external);
- 19,926 sq. m (GIA) of office floorspace (Class E) following extension and conversion of Deansgate Terrace North and conversion of the Great Northern Warehouse;
- 8,256 sq. m (GIA) of retained commercial floorspace (Use Class E or Sui Generis) associated with the existing tenancies within the ground and first floors Great Northern Warehouse;
- 5,739 sq. m (GIA) of ground floor commercial (Use Classes E, Sui Generis (Drinking Establishments, Hot Food Takeaway or entertainment venues) across the Site.
- 4,462 sq. m (GIA) of upper level commercial floorspace (Class E)
- 155 sq. m (GIA) of community floorspace (Use Class E or F2(b));
- 25,777 sq. m (GIA) of retained, reconfigured and extended car parking area (Sui Generis), comprising 929 spaces in total; and

2.13. For further details, please refer to Chapter 4 of the Planning and Tall Building Statement prepared by Deloitte and the Design and Access Statement prepared by SimpsonHaugh and Planit-ie.

3. Outline of the Main Alternatives Considered

Introduction

3.1. Regulation 18(3) and Paragraph 2 of Schedule 4 of the EIA Regulations requires the Applicant to provide an outline of the reasonable alternatives studied and an indication of the main reasons for the choice made, including a comparison of the environmental effects.

3.2. The form of the Proposed Development has been influenced by a range of factors, including location, surrounding land use and input from Manchester City Council, Statutory and Non-Statutory Consultees and other stakeholders.

3.3. The principal land use and siting options explored and the reasoning for the selection of the current design for the Proposed Development are considered here.

3.4. Four options have been considered:

- The 'do nothing' alternative where the Proposed Development is not progressed;
- Alternative uses for the Site;
- Alternative locations for the Proposed Development; and,
- Alternative design/layout for the Proposed Development in the context of the design evolution.

The "do nothing" Alternative

3.5. The Site has been identified as a priority for regeneration and a major opportunity to create a sustainable city centre neighbourhood for a number of years. In 2017, the council endorsed a Strategic Regeneration Framework, which noted that the "*Great Northern does not currently perform to its full potential and is underutilised in relation to much of its commercial floorspace as well as public realm.*" Reasons for this, set out in that document, included:

- An inability historically, to reach the necessary quality thresholds in terms of use has resulted in negative perceptions of the Great Northern. The complex has been partially full, lacks a sense of place and has not fulfilled its potential as a city centre destination in its own right.
- The Cinema has underperformed as an anchor to other uses.
- The impenetrability of the Deansgate façade, together with changes in levels and location and configuration of entrance points and routes prevent the complex from being legible and well-integrated into the city centre.
- The site's key asset: the Great Northern Warehouse, is not best utilised and the existing car parking has a detrimental effect on its setting and character.
- The Great Northern Square has not performed as other truly successful public spaces have. The amphitheatre space has rarely functioned as it was intended.

3.6. The "do nothing" scenario has therefore been discounted due to the long-established need for regeneration, both within Manchester city centre, and the Site specifically.

Consideration of Alternative Locations

3.7. The Site comprises the Grade II* Listed Great Northern Warehouse, and the Grade II Deansgate Terrace and the proposals in this location therefore represent a unique opportunity to make substantial and positive restorations to Listed Assets and drive positive regeneration outcomes for Manchester and its residents.

3.8. The Proposed Development will be located at the heart of a mixed-use regeneration area, covered by the Great Northern Manchester Central & Castlefield Quay SRF (2017) and the Great Northern Warehouse SRF Update (2019).

3.9. The Site sits within a pivotal location at the southern edge of the city centre between several Manchester's key established and emerging economic growth and regeneration areas, including: the Central Business District, St Peter's Square, the Conference Quarter and Spinningfields; established regeneration initiatives around Corridor Manchester and First Street; and more recent regeneration areas, including Great Jackson Street and St John's.

3.10. Each of these areas has been the subject of clearly articulated area-based regeneration strategies which have subsequently been implemented, or are in the process of being implemented, to deliver added value and complementary economic growth in the city centre.

3.11. Without significant intervention, the long-term use of the Great Northern Warehouse as a multi-storey car park will continue to have detrimental impacts on the historic fabric of the building. The land occupied by the Leisure Box will also continue to be underutilised, given its prime location within the city centre.

3.12. It can be inferred that there were very few – if any – readily available alternative sites which could support the Proposed Development. On balance, it is considered that, due to the use, land ownership, tenancy contracts and policy support for development in this area and the availability of the site to deliver this unique project in Manchester city centre, alternative locations are not possible for this particular development.

Consideration of Alternative Uses

3.13. The proposed uses have been identified in order to bring together a scheme that is viable and also responds to council objectives for this Site, the city centre and Regional Centre more generally. In this regard, the proposed uses are consistent with those identified in the council's regeneration plans for the Site and in turn consistent with the Local Development Plan policies for the city and regional centre, as identified in Manchester's Core Strategy.

3.14. For the listed buildings, options have been assessed over a number of years and iterations, in order to establish the optimum viable reuse of those listed buildings. As such, the heritage assessments provided with this application identify that the proposals will result in a level of harm that is 'less than substantial.' In addition, it is concluded that this harm outweighed by the public benefits that the proposed development will provide, and that is the key test to consider, as set out in national planning policy.

Design Evolution

3.15. The Design and Access Statement, prepared by SimpsonHaugh and Planit-IE, which accompanies these applications, addresses the design evolution of the Proposed Development in detail and is summarised below.

3.16. In developing the proposals, the Applicant has sought advice from a wide range of specialist consultants experienced in developing and delivering schemes of a similar nature to the proposals. The proposals have been developed with input from a highly experienced and comprehensive team of specialist consultants with the intention of delivering a unique project that embraces the site's valuable heritage assets and delivers key policy objectives and statutory requirements.

3.17. The proposals have been subject to extensive pre-application consultation with the Local Planning Authority, statutory consultees, and local stakeholders. The involvement of statutory consultees at the pre-application stage has informed the initial brief, and subsequent design of the Development, and changes to the scheme informed by this process have been included where appropriate.

3.18. It is considered that the Proposed Development has appropriately considered and aligns wholly with the principles set out in the 2017 SRF and its 2019 update, which has been refined as part of the master planning and design development process. For further details please refer to the Design and Access Statement prepared by SimpsonHaugh and submitted as part of the application.

4. Construction Methodology and Programme

4.1. Real PM Limited have prepared the Construction Methodology and Programme to assess the likely demolition and construction impacts of the proposals upon the site and surrounding area.

4.2. Throughout the demolition and construction periods, appropriate measures will be implemented to minimise and mitigate impact upon the on the surrounding properties and roadways. Close collaboration with all project teams of any impacting construction projects will be maintained at all times to achieve this aim.

4.3. The total construction programme will span a period of approximately five years and will be undertaken in two main construction Phases. In advance of the main construction works commencing on site there will be a pre-construction period of approximately one year which will allow for the delivery of several key Utility diversion and reinforcement works including provision of a temporary HV substation. Third party notifications and approvals will be discharged during this enabling works stage.

4.4. A key programme constraint is the retention of existing tenants on the site including the Casino, Bowling alley and Food & Beverage outlet located within the Great Northern Warehouse Building and the requirement to maintain 100 car parking spaces within the Ground and Basement levels of the existing Leisure Box Structure. The retention of these existing tenants / live operations has dictated the detailed construction sequence, servicing and logistics that are reflected in the construction programme and is detailed in the technical Appendices.

4.5. The current construction phases are provided below and will be brought forward sequentially unless there is an alternative delivery strategy:

- Phase A – Great Northern Warehouse & The Northern Terraces
- Phae B and C – Leisure Box and Southern Terraces

4.6. 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.

4.7. 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.

4.8. A fundamental aspect of the Principal Contractor's role is 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.

4.9. 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.

4.10. The successful Principal Contractor will have an on-going process of monitoring health and safety standards throughout its organisation. This is normally carried directly 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.

4.11. Health and safety is also incorporated as a fundamental aspect of the overall project review, the Applicant (Trilogy Real Estate) will appoint a Principal Contractor who will be required to demonstrate competency in the management and execution of Health and Safety. 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.

4.12. 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. Townscape and Visual Impact (ES Chapter 6)

What is Townscape and Visual Impact?

5.1. This Townscape and Visual Impact Assessment examines the impact that the Proposed Development will have on the townscape character of both Manchester and Salford city centre zones focussing on those immediately surrounding the Proposed Development in particular. It does so in a systematic, rational and objective way using established methodologies and practices contained in GLVIA 3. The impact of the Proposed Development on its own is explored and then in conjunction with consented and committed development in a Cumulative Assessment.

What has been assessed?

5.2. A computer modelling process was employed to provide an accurate series of Type 4 verified (AVR) rendered images which illustrate and inform the nature of the impact the Proposed Development on a series of selected Representative Viewpoints, and on the surrounding townscape character, on a 360 degree basis. The scale and location of the development results in a widespread Zone of Visual Influence to the west and south but limited visibility to the north and east.

5.3. Although it is not possible to provide one single summary value for the impact the Proposed Development will have on Manchester City Centre it is possible to summarise the effects in general terms.

5.4. In this regard Table 6.10 records that in a substantial proportion of cases the Proposed Development has major or moderate townscape and visual effects which are significant in EA regulation terms. The majority of these are recorded in close proximity to the Proposed Development. However, in the majority of cases the recorded effects are minor, negligible or no change as the distance from the Proposed Development increases or the tight urban grain and recent development restrict visibility.

What is the impact of the Proposed Development in terms of Townscape and Visual Impact?

5.5. In all cases where there is an effect the effects are judged to be beneficial in nature. The reason for this is derived from the design process which has sought to relate the Proposed Development to its historical origins and to unify the site as whole through the use of traditional colours and materials. This effect is accentuated by using a modular grid approach to the design of the taller elements in a holistic way and lifting some of the traditional features of the warehouse and incorporating them into the design. At the same time visual interest is improved by varying the height and form of the taller elements of the scheme and ensuring that a better relationship endures with taller neighbours such as Beetham and Viadux.

5.6. In terms of cumulative effects the cumulative schemes that have been assessed have little impact on the operational effects of the Proposed Development. Where there is judged to be a cumulative effect then the effects are diminished in most cases.

6. Historic Environment (ES Chapter 7)

What is Historic Environment?

6.1. For the purposes of this Chapter, Built Heritage is defined as components of the built historic environment which have some form of identified status, comprising Listed Buildings and Conservation Areas and inclusive of their settings. The purpose of the present Environmental Chapter in relation to Built Heritage, is to review available data and identify likely significant and not significant effects that may arise from the Proposed Development.

What has been assessed?

6.2. The Site is located within Manchester City Centre and is bounded by Peter Street to the north, Watson Street to the east, Great Bridgewater Street to the south, and Deansgate to the West.

6.3. The Site comprises of the former late 19th century Great Northern Railway Goods Company Warehouse (Grade II*) and associated former railway yard (now Great Northern Square), and long terraced range of shops/offices along Deansgate (Deansgate Terrace), which are Grade II Listed in two separate parts. The Site also takes in the c2000 'Leisure Box' complex into the southern part of the plot and an area of public realm to the north of the listed buildings (Great Northern Square). The Site is partially located within the Deansgate/Peter Street Conservation Area. There are a number of heritage assets in the local and wider townscape setting of the Site.

6.4. For the purposes of this assessment, consideration has been given to the relevant part of Manchester City Centre that surrounds the Site within a 500m radius. 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. The Heritage Statement (Appendix 7.1) has been informed by both desk-based research and on-site surveys.

6.5. Within the 500m study area, 189 listed buildings (Figure 7.1) and a number of Conservation Areas were identified. A scoping exercise informed by a ZVI determined that a number of these heritage assets have the potential to be impacted by the Proposed Development, including 52 listed buildings and seven Conservation Areas. These designated heritage assets were subsequently taken forward for assessment. Other heritage assets scoped out at pre-baseline stage were considered unlikely to be affected by the Proposed Development, primarily due to the screening effect of interposing development and separating distance from the Site.

Description of Methodology

6.6. The assessment methodology for the Historic Built Environment is a synthesis of established guidance, best practice and professional judgement. In accordance with an adapted form of the methodology set out in the ICOMOS Guidance on 'Heritage Impact Assessments' (Jan.2011), in which the value of heritage attributes is assessed in relation to statutory designations, and priorities or recommendations set out in national research agendas, and ascribed values.

6.7. Professional judgement is then used to determine the importance of the resource. The baseline situation of each asset which might be affected by the Proposed Development is valued and the impact on them is assessed in order to give a significance of effect. Historic England Guidance has also informed this assessment.

Description of baseline conditions

6.8. As noted above, the Site contains three individually listed buildings (the Grade II* Great Northern Warehouse and the Former Entrance to Deansgate Goods Station Including Numbers 223 to 233 and 235-291, Deansgate, both Grade II) and is partially located within the Deansgate / Peter Street Conservation Area.

6.9. The subject site was substantially redeveloped in the late 1990s / early 2000s, during which time, the Grade II* listed warehouse was redeveloped to serve the new Leisure Box complex, constructed to the in the southern part of the Site. The former shops to Deansgate Terrace were also altered around this time, with the Former Goods Entrance retained as a façade to a new extension.

6.10. Non-intrusive site surveys (undertaken in January 2021) have demonstrated those parts of the Site which convey special architectural and historic interest are principally the listed buildings within the boundary. This group of significant buildings make a positive contribution to the character and appearance of the Deansgate / Peter Street Conservation Area and to the settings of neighbouring listed buildings. Those parts of the Site constructed in the late-20th century / early 21st century yield no heritage interest and generally detract from / make a negative contribution to the character and appearance of the Deansgate / Peter Street Conservation Area and to the settings of listed buildings in the immediate area.

What is the impact of the Proposed Development in terms of Built Heritage?

6.11. Overall, the direct impact on the heritage assets within the Site is identified as incurring both beneficial and adverse impacts (refer to Heritage Statement report, Appendix 7.1 for detailed analysis). The proposals have sought to minimise the direct (physical) impact upon the Grade II* listed warehouse by changing the use from residential (as approved in 2017) to office use; this change presents a number of benefits, such as allowing for open spaces within the floorplate and reversable, lightweight alterations (e.g.: M&E and partitions) and a significant reduction to the size of the roof atrium, thereby presenting a much less intrusive scheme overall.

6.12. Great Northern Warehouse: the approach for the warehouse centres around the atrium space, which formed part of the original strategy for the 2017 residential application. In accordance with Historic England's pre-application advice, the design team tested a number of options and devised an innovative strategy to minimise internal fabric loss: the external circulation core and link bridge. This approach has reduced the loss of original fabric within the building from approximately 9% to 3%.

6.13. While this will necessitate the removal of some historic, steel window frames and cills, these are proposed to be reinstated elsewhere along the western elevation; resulting in no fabric loss overall (refer to SHP drawings and DAS for further detail. The direct impact assessment above has identified that the proposals would result in:

- 5 instances of Moderate beneficial direct impact;
- 36 instances of Minor beneficial direct impact;
- 6 instances of Negligible beneficial direct impact;
- 13 instances of Neutral direct impact;
- 7 instances of Negligible adverse direct impact;
- 21 instances of Minor adverse direct impact; and,
- 4 instances of Moderate adverse direct impact.

6.14. All windows to the warehouse are to be restored and reglazed in slimline DCU, re-establishing the character of the external appearance of the warehouse in a sensitive manner, which enables the building to be used as an active and vibrant office space.

6.15. Deansgate Terrace (north and south): The terrace will be sensitively restored, with alterations primarily focussed on non-original shopfronts and contemporary extensions. Internal alterations will principally relate to light refurbishment of spaces, with some new M&E to accord with modern office standards. Whilst the proposals will see the removal of some historic fabric, the areas proposed for alteration largely accord with those approved in the c.2017 LBC application. There is some additional loss of historic fabric (original rear elevation to the terrace) at first and second floor levels which will incur some further adverse impact (refer to alteration plans for detail).

6.16. A new roof terrace is proposed above the northern end of Deansgate Terrace (Former Goods Shed Entrance), this will replace the existing, modern extension with a more contemporary and appropriate response. The above direct impact assessment should be read in conjunction with the construction management plan (Real PM). The direct impact assessment above has identified that the proposals would result in:

- 1 instance of Moderate beneficial direct impact;
- 19 instances of Minor beneficial direct impact;
- 5 instances of Negligible beneficial direct impact;
- 5 instances of Neutral adverse direct impact;
- 6 instances of Negligible adverse direct impact;
- 5 instances of Minor adverse direct impact; and,
- 1 instance of Moderate adverse direct impact.

6.17. The Visual Impact Assessment (VIA) undertaken in the accompanying Heritage Statement (Appendix 7.1) has demonstrated that the proposals would incur an overall Moderate (neutral) impact on the setting of the Grade II* listed warehouse and a Moderate (neutral) impact on 223 to 233 and 235-291, Deansgate (both Grade II). A Minor beneficial impact is identified on the Deansgate/Peter Street Conservation Area.

6.18. Despite the height and scale of the Proposed Development, the design is of considerably high-quality and responds to the proportions and tonality of the Victorian buildings in the northern part of the Site. In particular, the design team have sought to utilise a palette of materials that takes architectural cues from the listed buildings within the Site. They have also sought to break up the massing through the chamfering and stepping down of corners of the building, and through use of projecting and recessed balconies. In summary, it will be clear that the proposals will consolidate a highly significant grouping of Listed Buildings focussed to the south end of Deansgate, whilst also ensuring a long-term viable use which celebrates the significant architectural attributes of each asset.

6.19. The VIA further demonstrated the proposals would incur some Minor / Minor-Moderate adverse and Minor impacts upon the settings of nearby listed buildings, such as the Former Central Station, the Central Library and the Midland Hotel (all Grade II*). The VIA has also demonstrated that there would be Negligible beneficial and adverse impacts as well as Neutral impacts on other listed buildings and Conservation Areas in the setting of the Site. The impact assessment has subsequently identified that the proposals will result in varying degrees of adverse and beneficial direct impacts upon the built historic environment.

6.20. The operational effects of the Proposed Development upon the settings of heritage assets can be summarised as

- 3 instances of Minor beneficial indirect impact;
- 11 instances of Negligible beneficial indirect impact;
- 21 instances of Neutral indirect impact (including 3 instances of moderate – neutral)
- 6 instances of Negligible adverse indirect impact;
- 13 instances of Minor adverse indirect impact; and,
- 5 instances of Minor-to-moderate adverse indirect impact.

6.21. Mitigation for any perceived instances of adverse impact (Minor-Moderate at most) are to be accrued by the public benefits of the Proposed Development alongside the heritage benefits of the scheme. The high-quality design of the Proposed Development represents embodied mitigation designed to limit as far as possible adverse impacts on the built historic environment within the study area, incurring a moderate (neutral) impact on the Grade II* listed Great Northern Warehouse and the Deansgate Terrace (Grade II, listed in two parts). The residual effects of the Proposed Development when the mitigation is taken into consideration are therefore not considered to change the nature of the identified impacts.

7. Air Quality (ES Chapter 8)

What is Air Quality?

7.1. The air quality assessment examines the likely air quality impacts of the proposals upon the site and surrounding area. The assessment also describes the methods used to assess these impacts, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce or offset any significant negative impacts and the likely residual impacts after these methods have been adopted.

What has been assessed?

7.2. 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,
- Increase in odorous emissions as a result of operation of the proposed restaurants.

7.3. Air quality impacts resulting from traffic associated with the construction and operational phases of the proposed development have the potential to effect existing and proposed sensitive receptors. Construction traffic emissions have the potential to impact air quality concentrations at sensitive receptors, in particular existing residents in the vicinity of the Site.

7.4. Once the proposed development is complete and operational, changes in traffic have the potential to impact local air quality at existing and proposed sensitive receptors. Without consideration of current and future air quality conditions (without and without the proposed development operational), there is the potential that existing and future users of the proposed development would be exposed to harmful air pollution levels.

7.5. A baseline desktop air quality study was conducted in 2022, to supplement the detailed air quality modelling that has been undertaken to firstly establish the existing air quality concentrations and secondly, predict potential changes to air quality concentrations as a result of the proposed development being operational.

What is the impact of the Proposed Development in terms of Air Quality?

Construction Phase

7.6. A Construction Environmental Management Plan (CEMP) would be implemented during construction works, which would provide general best practice mitigation in line with appropriate legislation, guidance, and measures to minimise emissions from construction traffic and dust generated by onsite construction activities. The impact of construction traffic on local air quality has been predicted using ADMS-Urban at existing sensitive receptor locations. By adopting appropriate mitigation measures as part of a CEMP, it is anticipated that all demolition and construction activities can be undertaken whilst minimising the emissions to air.

Operational Stage

7.7. There is potential that future users of the proposed development may be exposed to elevated air pollution where facades overlook the main roads running through and around the Site.

7.8. Detailed dispersion modelling of the road traffic generated by the Proposed Development was undertaken. The findings of the assessment included:

- The impact on annual mean NO2 concentrations at existing receptor locations ranged from negligible-substantial adverse (adverse impacts were only identified at medium sensitive receptors, where the annual mean is not typically applicable, the 1-hour mean AQS objective consider most relevant;
- Annual mean NO2 concentrations at all proposed receptors are below the relevant AQS objective;
- All modelled receptors (existing and proposed) are predicted to have 1-hour mean NO2 concentrations well below the AQS objective;
- The annual mean particulate (PM10 and PM2.5) concentrations are below the relevant AQS objectives for all receptors (existing and proposed); and,
- All modelled receptors (existing and proposed) are within the objective for daily mean PM10 (negligible).

7.9. With the incorporation of the design interventions and the provision of best practice measures, conditions suitable for residential amenity can be achieved.

7.10. A framework travel plan would be implemented once the proposed development is operational, to encourage sustainable travel options and reduce the need for personal car travel. By adopting the different mitigation measures within the travel plan it is anticipated that road traffic emissions generated from the proposed development will be minimised and subsequently improve local air quality in the vicinity of the Site.

7.11. Additionally, the anticipated advances in vehicle technology and changes in fleet composition, are expected to reduce vehicle emissions over time. There is good evidence from real-world testing of EURO 6 (VI) compliant vehicles of substantial improvements in vehicle emissions compared to earlier EURO categories, in particular with respect to NOX emissions.

7.12. Furthermore, MCC are actively striving to reduce road traffic in the city centre and encourage greater uptake of sustainable travel methods such as public transport, walking and cycling. In addition to this, there are plans regarding the closure and potential pedestrianisation of some major roads within Manchester which is likely to lead to a reduction of road traffic in the city centre, and thus improving local air quality.

7.13. Once the proposed development is fully operational the findings of the assessment conclude that the changes in local air quality are not significant.

8. Noise and Vibration (ES Chapter 9)

What is Noise and Vibration?

8.1. The noise and vibration Chapter of the ES assesses the likely noise and vibration impacts of the Proposed Development upon the surrounding area, and the suitability of the Site for the Proposed Development.

What has been assessed?

8.2. The scope and methodology of the assessment was agreed with representatives of Manchester City Council's (MCC) Environmental Health department and was heavily informed by MCC's Planning and Noise Technical Guidance document.

8.3. Noise levels from the various sources around the site were measured during a number of surveys and used to determine potential effects on the future occupants of the Proposed Development.

8.4. Noise levels during construction have been assessed and are mostly not significant. However, some significant negative effects could occasionally be caused to nearby residents in specific areas; however, these would be temporary. Vibration effects are likely to be negligible.

What is the impact of the Proposed Development in terms of Noise and Vibration?

8.5. To reduce the negative effects the future contractor will be required to use the Best Practicable Means (BMP) available for controlling noise and vibration. Suitable control measures could include restricted working hours (e.g. no working on Sundays or at night), using noise barriers and quiet pieces of equipment, and the contractor communicating directly with local residents.

8.6. MCC require the proposed construction noise and vibration control measures to be agreed with them before work starts, and the measures will be detailed in a Construction Management Plan. With adequate control of construction noise and vibration it is expected that effects on local residents can be minimised to a non-significant level for most of the time. Any effects will vary over time and will be temporary.

8.7. Measures have been proposed which aim to reduce the amount of vibration affecting existing buildings and the potential for damage to occur. Such measures include adopting low-vibration piling methods such as CFA piling (rather than impact piling) and monitoring vibration at the nearby buildings whilst piling is taking place so that any problems can be caught quickly. Employing adequate control measures is expected to reduce effects to a negligible level, which is not significant in ES terms. It is expected that the mitigation measures would be captured in the Construction Management Plan agreed with MCC.

8.8. To reduce the potential negative effects from surrounding road traffic and entertainment venues, the future residential buildings will be provided with glazing and ventilation systems which reduce the level of noise breaking into an acceptable level. Suitable glazing systems and approaches to ventilation design have been implemented by the Proposed Development and are expected to reduce effects to a negligible level. These effects are not significant with adequate mitigation in place.

8.9. Residents will have access to quiet external spaces at the centre of the site which are effectively screened from noise from surrounding roads. This will offset the impact of higher noise levels on individual balconies elsewhere. Overall effects are expected to be negligible and are not significant.

8.10. Noise from new items of building services equipment and activities within new commercial units in the Proposed Development will be restricted by noise limits – these limits also apply to the proposed rooftop terrace at the Deansgate Terraces and the proposed Leisure Box gym. The noise limits are based on measurements of existing noise levels around the Site and will inform the detailed design of the Proposed Development at a later stage. Examples of suitable acoustic treatments for the gym have been provided. Adherence to the noise limits would reduce negative effects to a negligible level and they are expected to be enforced by MCC through planning conditions. These effects are not significant with adequate mitigation in place.

9. Wind microclimate (ES Chapter 10)

What is Wind Microclimate?

9.1. Computational Fluid Dynamics (CFD) simulations were used to quantify the local wind speeds within and in the vicinity of the Site of the Proposed Development at various street locations (e.g., pedestrian access routes, building entrances, outdoor seating areas) for a comprehensive range of wind directions. Local wind speeds were then combined with winds statistics obtained from the meteorological station at Manchester Airport, corrected for the Site (accounting for upwind terrain and reference height at the Site), to determine the probability of local wind speeds exceeding comfort and safety thresholds for a range of common pedestrian activities.

What has been assessed?

9.2. In the Baseline scenario, wind conditions are mostly rated as safe for all users, except at receptors 56 (corner of Beetham Tower on Great Bridgewater Street) and 22 (Watson St./Windmill St.). Wind comfort ratings across the majority of the receptors are suitable for the intended pedestrian uses. The only exceedance of the pedestrian comfort criteria occurs at receptors 54 (entrance – Albert School).

9.3. With the introduction of the Proposed Development, inherent exceedances of the pedestrian safety criteria from the Baseline configuration persist. The nature and scale of the effects are Negligible and are therefore considered Not Significant. With the introduction of the Proposed Development, wind comfort ratings across the majority of the receptors are suitable for the intended pedestrian uses.

9.4. The inherent exceedance of the pedestrian comfort criteria from the Baseline configuration persist. The nature and scale of the effects are Negligible and are therefore considered Not Significant. At the elevated levels of the Proposed Development, all areas are generally suitable for intended uses. All balconies across the Proposed Development are suitable for short periods of sitting in summer. Wind conditions across the podium terraces are predominantly rated as suitable for standing/sitting – where outdoor seating areas are intended, additional localised shelter could be implemented to maximise the usage of these spaces.

9.5. The following wind mitigation measures were included in the assessment:

- On the south-east corner of the development:
    - 1x 2m deep, 11m tall, 50% porous façade fin (~3m clearance from the ground);
    - 2x 1m wide, 1.5m tall, 50% porous screens above/within the planters.
    - 2x freestanding 1.5m wide, 2m tall, 50% porous screens along the pavement on Watson Street.
    - Trees as per the proposed landscaping scheme. No trees in other areas have been included in the computational model.

9.6. On the private balconies within the Proposed Development, the following mitigation measures were included (Figure 1.8).

- 1.1m tall solid balustrades with an additional 0.4m 50% porous balustrade on the western-facing balconies on the tower.
- 1.5m tall, 50% porous balustrades on north- and south-facing balconies on the towers.
- 1.1m tall, 50% porous balustrades on all other private balconies.

9.7. The wind mitigation measures listed above were developed in conjunction with the wider design team. It is understood that the these will be integrated as part of the design of the proposed development.

What is the impact of the Proposed Development in terms of Wind Microclimate?

9.8. With the introduction of the cumulative surroundings, the inherent exceedance at receptor 56 persist. The nature and scale of the effects are **Negligible** and are therefore considered **Not Significant**. Wind conditions at receptor 22 improve, such that the inherent safety exceedance is alleviated. At this location, the nature and scale of the effects are **Major Beneficial** and therefore considered **Not Significant**.

9.9. Wind comfort ratings across the vast majority of the receptors are suitable for the intended pedestrian uses. The Inherent exceedance of the pedestrian comfort criteria from the Baseline configuration persists. The nature and scale of the effects are **Negligible** and are therefore considered **Not Significant**.

9.10. At the elevated levels of the Proposed Development, all areas are generally suitable for intended uses. All balconies across the Proposed Development are suitable for short periods of sitting in summer. Wind conditions across the podium terraces are predominantly rated as suitable for standing/sitting – where outdoor seating areas are intended, additional localised shelter could be implemented to maximise the usage of these spaces.

9.11. The completed Proposed Development in the context of both existing and cumulative surrounds – with the inclusion of wind mitigation measures – results in residual effects that are **Negligible** and **Not Significant.**

10. Sunlight, Daylight and Solar Glare (ES Chapter 11)

What is Sunlight, Daylight and Solar Glare?

10.1. The Daylight Sunlight study examined the effect of the Development on the daylight and sunlight enjoyed by the principal neighbouring residential properties.

10.2. The daylight sunlight review has been based on the methodologies set out in the Building Research Establishment (BRE) report 'Site layout planning for daylight and sunlight - A guide to good practice 2022' by P. J. Littlefair. The primary sources for the BRE document is the more detailed guidance contained within BS EN 17037 Daylight in buildings and in the CIBSE publication LG 10 Daylighting – a guide for designers.

What has been assessed?

10.3. This report focuses on the nearest sensitive receptors, which are the residential properties in the immediate vicinity of the site, as these have the highest reasonable expectation of daylight and sunlight when compared to other uses such as commercial.

What is the impact of the Proposed Development in terms of Sunlight, Daylight and Solar Glare?

10.4. The properties assessed are therefore as follows:

- B1 303 Deansgate and Land at Great Bridgewater Street and Trafford Street (Beetham Tower)
- B2 Deansgate, Manchester
- B6 332&334 Deansgate and 1A, 3, 7, 9 and 11 Liverpool Road
- B11 Porchfield Square and Rozel Square, Byrom Street, Manchester
- B38 Free Trade Hall, Peter Street, Manchester
- B44 Land on the East side of Watson Street, Manchester

Figure 11.13 Building Identification Plan

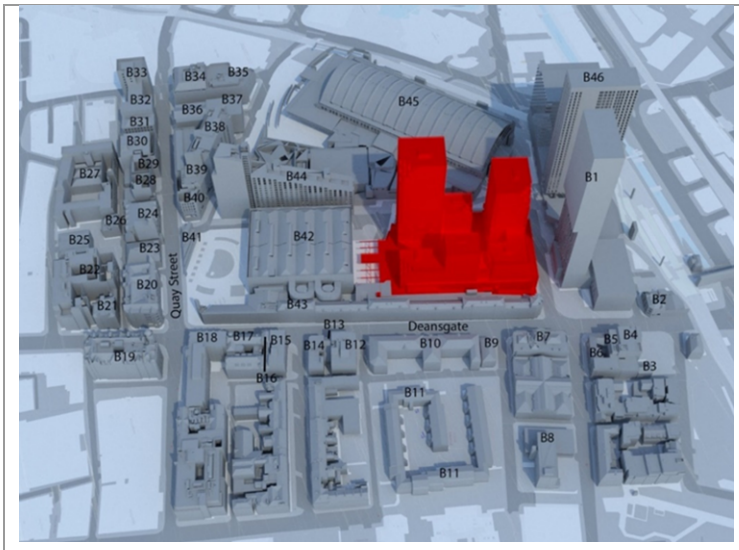


Figure:	11.13
Title:	Building Identification Plan
Project:	Great Northern, Manchester
Date:	November 2022
Scale:	Scale / NTS

10.5. In addition, there is proposed development adjacent to the Beetham Tower (known as Viadux). which has also been included as a cumulative massing and assessed:

- B46 Viadux scheme, Land and Buildings on the North Side.

10.6. All other surrounding properties are considered either too distant or are of commercial use and as such have not been considered by this report.

10.7. The Planning Portal was checked for other consented / committed developments, and these were built into the 3D computer model so that the potential overall effect combined with the Development could be understood.

10.8. A 3D computer model of the existing properties/surrounding areas and the proposed development was created and then run through proprietary software to calculate the proposed light levels at each window and within each room being assessed. These light levels were then compared with the corresponding levels in the BRE guidelines.

10.9. The criteria contained in the BRE document are provided for guidance and should be interpreted flexibly. In its introduction the BRE guide states *"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."*

10.10. The principles of how the BRE guide should be interpreted flexibly and in context are exemplified in various decisions on major urban developments. Notably in the appeal case for a dense scheme at the Whitechapel Estate (appeal decision ref APP/E5900/W/17/3171437). The following findings are informative:

- Paragraph 107 - It was agreed that the starting point in the assessment of the effect on residents' living conditions arising from daylight and sunlight should be the Building Research Establishment 2011 publication Site layout planning for daylight and sunlight: A guide to good practice, ('the BRE guide'). Note, this guide was updated in 2022 but remains in essence the same as the 2011 version for assessing adjacent properties.
- Paragraph 108 - It was confirmed that the BRE document offers guidance on generally acceptable standards of daylight and sunlight, but advises that numerical values are not to be rigidly applied and recognises the importance of the specific circumstances of each case.
- Paragraph 109 - It was agreed that daylight impact on adjacent properties should be assessed drawing on broadly comparable residential typologies within the area.

10.11. Notably, the Inspector concluded, against the above backdrop, that:

- Paragraph 112 - Residual vertical sky component (VSC) values in the mid-teens (as opposed to the BRE target value of 27%) are appropriate and have been accepted on many schemes.
- Paragraph 116 - It was acknowledged that light to bedrooms is less important.
- Paragraph 128 - That using a target value ADF of 1.5% for mixed use living / dining/ kitchens within a proposed development is reasonable (where the BRE targets are 2% for kitchens and 1.5% for living rooms).
- Paragraph 125 - Comparing the daylight sunlight results for impact on adjacent properties or within the proposed development by reference to other approved similar schemes either by looking at an approved schemes daylight sunlight report or undertaking calculations where that report is missing (or was not requested) was reasonable.

10.12. The above decision recognised that while the BRE guide requirements are based on a two-storey suburban model, more appropriate values and measures should be used when evaluating tall multi block developments in a city centre area, which by definition will naturally have different conditions to properties in a suburban area.

10.13. Prior to assessing the impact of the Development, we examined the baseline levels of daylight sunlight enjoyed by the adjacent residential properties and amenity spaces. This showed that only 78% of existing windows currently meet the BRE guide recommended level of daylight. In respect of direct sunlight, 97% of windows meet the BRE criteria in summer and 95% in winter.

10.14. The results from our assessment of the Development are summarised in tables 11.12, 11.13, 11.14 and 11.15.

Table 11.12 – VSC 16% Target Summary Spreadsheet

VSC														
		VSC - Existing Site as Baseline												
		Meet or Exceed BRE Guidelines (greater than 27% VSC or less than 20% reduction)			Below BRE Guidelines									
Building No.	Address	Total no. of Windows	No. Windows that Meet or Exceed BRE Guidelines		21-30% Reduction - Minor			31-40% Reduction - Moderate			>40% Reduction - Major			Significance
							Which are Bedrooms			Which are Bedrooms			Which are Bedrooms	
B1	303 Deansgate and Land at Great Bridgewater Street and Trafford Street (Beetham Tower)	270	270	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B2	321 Deansgate, Manchester	17	17	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B6	332 & 334 Deansgate and 1A, 3, 7, 9 and 11 Liverpool Road	14	14	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B11	Porchfield Square and Rozel Square, Byrom Street, Manchester	56	52	93%	4	7%	4	0	0%	0	0	0%	0	Minor Adverse
B38	Free Trade Hall, Peter Street, Manchester	80	80	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B44	Land on the east side of Watson Street, Manchester.	288	279	97%	9	3%	2	0	0%	0	0	0%	0	Minor Adverse
B46	Viadux (Salboy Development)	760	760	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
	Total	1485	1472	99%	13	1%	6	0	0%	0	0	0%	0	0

10.15. The results for daylight levels received by an adjacent property's windows were fully BRE guide compliant to all properties except B11 Porchfield Square and B44 Great Northern Tower. The daylight results to these two properties were also compliant to a high degree (93% and 97% respectively) and any divergence from the BRE guide levels was minor adverse.

Table 11.13 – NSL Summary Spreadsheet

NSL - Existing Site as Baseline														
		Meet or Exceed BRE Guidelines (less than 20% reduction)			Below BRE Guidelines									
Building No.	Address	Total no. of Rooms	No. Rooms that Meet or Exceed BRE Guidelines		21%-30% Reduction - Minor			31%-40% Reduction - Moderate			>40% Reduction - Major			Significance
							Which are Bedrooms			Which are Bedrooms			Which are Bedrooms	
B1	303 Deansgate and Land at Great Bridgewater Street and Trafford Street (Beetham Tower)	126	126	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B2	321 Deansgate, Manchester	5	5	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B6	332 & 334 Deansgate and 1A, 3, 7, 9 and 11 Liverpool Road	7	7	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B11	Porchfield Square and Rozel Square, Byrom Street, Manchester	56	42	75%	11	20%	11	3	5%	3	0	0%	0	Minor Adverse
B38	Free Trade Hall, Peter Street, Manchester	70	70	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B44	Land on the east side of Watson Street, Manchester	159	152	96%	1	0.5%	0	5	3%	0	1	0.5%	0	Minor Adverse
B46	Viadux	570	556	98%	2	0.5%	2	3	0.5%	3	9	1%	9	Minor Adverse
	Total	**993**	**958**	**96%**	**14**	**1%**	**13**	**11**	**1%**	**6**	**10**	**1%**	**9**	**0**

10.16. The results for daylight levels received by an adjacent property's rooms were fully BRE guide compliant to all properties except B11 Porchfield Square, B44 Great Northern Tower and B46 Viadux (not yet constructed).

10.17. To B11, 75% of rooms assessed fully pass the BRE criteria, 20% experience a minor and 5% a moderate adverse reduction in light distribution. All of the minor / moderate impacts are to bedrooms to be treated with less importance and thus considered minor adverse.

10.18. To B44, 96% of rooms assessed fully pass the BRE criteria and a further 0.5% experience a minor, 3% a moderate and 1 room (0.5%) a major adverse reduction in light distribution. Whilst there are five rooms to B44 that are technically noted as experiencing a moderate / major impact from the development, on closer examination of the results, these rooms face the existing Great Northern building (at low level) and currently receive very poor levels of sky visibility and would not in reality be impacted by the proposed development. These are therefore also considered minor adverse.

10.19. To B46, 98% of windows assessed fully pass the BRE criteria and a further 0.5% experience a minor adverse reduction, leaving just over 1% of windows that would have any moderate / major adverse impact, which are all bedrooms to be treated with less importance and thus overall considered minor adverse.

Table 11.14 – APSH Summary Spreadsheet (Summer)

Summer APSH - Existing Site as Baseline																
		Meet or Exceed Summer BRE Guidelines				Below Threshold for Summer APSH										
Building No.	Address	Total no. of Windows	No. Windows that Pass BRE Criteria			21%-30% Reduction - Minor			31%-40% Reduction - Moderate			>40% Reduction - Major			Significance
			Not Within 90 Degrees of South	Pass	%										
								Which are Bedrooms			Which are Bedrooms			Which are Bedrooms	
B1	303 Deansgate and Land at Great Bridgewater Street and Trafford Street	270	270	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B2	321 Deansgate, Manchester	17	17	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B6	332 & 334 Deansgate and 1A, 3, 7, 9 and 11 Liverpool Road	14	14	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B11	Porchfield Square and Rozel Square, Byrom Street, Manchester	56	0	36	64%	17	30%	17	3	6%	3	0	0%	0	Minor Adverse
B38	Free Trade Hall, Peter Street, Manchester	80	0	80	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B44	Land on the east side of Watson Street, Manchester.	288	243	45	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
B46	Viadux	760	646	114	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
	Total	**1485**	**1190**	**275**	**99%**	**17**	**4%**	**17**	**3**	**0%**	**3**	**0**	**0%**	**0**	**0**

Table 11.15 – APSH Summary Spreadsheet (Winter)

Winter APSH - Existing Site as Baseline													
Meet or Exceed Winter BRE Guidelines				Below Threshold for Winter APSH									
Total no. of Windows	No. Windows that Pass BRE Criteria			21%-30% Reduction - Minor			31%-40% Reduction - Moderate			>40% Reduction - Major			Significance
	Not Within 90 Degrees of South	Pass	%										
						Which are Bedrooms			Which are Bedrooms			Which are Bedrooms	
270	270	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible

Winter APSH - Existing Site as Baseline													
Meet or Exceed Winter BRE Guidelines						Below Threshold for Winter APSH							
17	17	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
14	14	0	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
56	0	32	57%	0	0%	0	2	4%	2	22	39%	22	Minor Adverse
80	0	80	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
288	243	45	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
760	646	114	100%	0	0%	0	0	0%	0	0	0%	0	Negligible
1485	1190	271	98%	0	0%	0	2	0%	2	22	1%	22	0

10.20. The results for sunlight levels received by an adjacent property's windows were fully BRE guide compliant to all properties except B11 Porchfield Square. The summer sunlight results for B11 Porchfield Square showed 64% compliance with the BRE guide with a further 30% a minor adverse amount below the BRE suggested level.

10.21. In summary, the daylight sunlight assessment ultimately demonstrates that the Development will not cause any materially unacceptable effects in terms of neighbouring properties' ambient daylight conditions. The results are also comparable to those for other similar schemes that have recently been granted planning approval in the Manchester city centre.

10.22. On this basis and having regard to the urban high-rise character of the site and the flexible suburban basis of the BRE guidance, the development's effects on neighbouring properties are considered acceptable.

10.23. Where there are deviations from the BRE guidelines, their significance is also offset by the following:

- It is inevitable when constructing buildings in an urban environment that alterations in daylight and sunlight to adjoining properties can occur.
- Deviations from the BRE baseline are generally extremely marginal.
- The BRE guidelines indicate that in interpreting the results of an assessment, a degree of flexibility is required, especially in a dense urban environment where neighbouring properties are located within narrow streetscapes and with design obstructions restricting the availability of daylight or sunlight.
- The new NPPF states that ''a flexible approach should be taken in applying policies relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site.
- The BRE tests are based on a typical (two storey) suburban model of development and it is reasonable to assume that expectations of levels of daylight sunlight will be different in developing larger properties such as this. This is noted in the guide itself.

Overshadowing

10.24. The Overshadowing Report and assessment was carried out to identify any areas where the Development could potentially cause issues of overshadowing to the nearby amenity spaces.

10.25. In the absence of official National Planning Guidance and legislation on overshadowing, it is usual to assess overshadowing in relation to the guidelines set out in the Building Research Establishment (BRE) report 'Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice' by P. J. Littlefair (2022). We shall refer to this report throughout as the 'BRE'. One of the primary sources for the BRE document is the more detailed guidance contained within BS EN 17037 Daylight in buildings and in the CIBSE publication LG 10 Daylighting – a guide for designers.

10.26. The criteria contained in the BRE document are provided for guidance and should be interpreted flexibly. In its introduction the BRE report states *"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."*

10.27. Various amenity spaces near the development site were identified for review as follows:

- Grass / tree areas within and around Porchfield Square (B11 - to the Northwest of the development site) – labelled A121 – A123
- Amenity space to North of the Great Northern building (B44 - near Peter Street) – A113
- Balcony / rooftop amenity spaces to the Great Northern Tower on Watson Street – A1 – A112

Figure 11.14 – Amenity Space Identification Plan

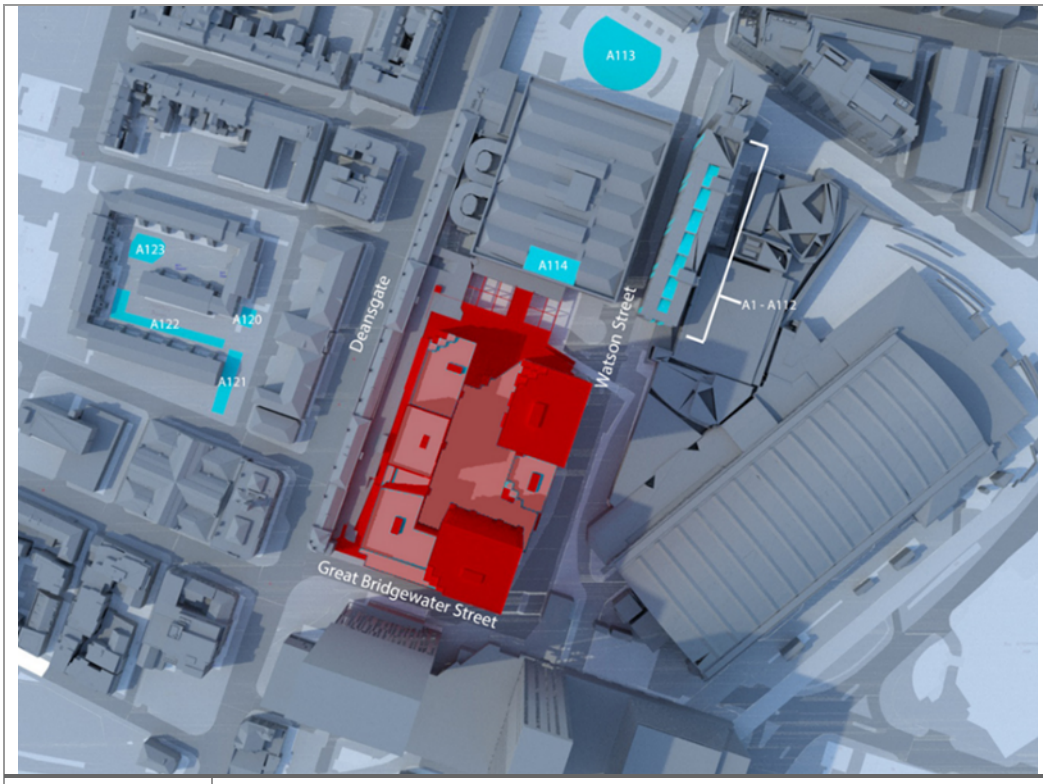


Figure:	11.14
Title	Amenity Space Identification Plan
Project	Great Northern, Manchester
Date	November 2022
Scale	Scale / NTS

10.28. The method for assessing permanent shadow on the ground is the sun path indicator (or sunlight availability protractor). This maps the obstructions to the path of the sun and compares them to the known sun paths to determine where the sun would reach the ground and where it would not. A 3D computer model and light analysis software can also be used.

10.29. The method used for calculating the impacts of any shadowing was as set out in the BRE Guidance as follows: *''It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area that can receive two hours of sun on 21 March is less than 0.80 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March''.*

10.30. The BRE guidelines also suggest that where large buildings are proposed which may affect a number of gardens or open spaces, it is useful and illustrative to plot a shadow plan to show the location of shadows at different times of the day and year. This can be plotted using 3D computer imagery and specialist shadowing software. For the purpose of this assessment the overshadowing was mapped at two hour intervals between 10.00am and 4.00pm in March, June and December (September is assumed to be the same as March as per the BRE guide).

10.31. Prior to assessing the impact of the Development, we examined the baseline levels of direct sunlight enjoyed by the adjacent amenity spaces. This showed that only 82 out of 124 (66%) of amenity spaces assessed pass the current BRE guide target level of 2 hours of direct sunlight on 21st March across 50% of the area assessed and thus receive good levels of direct sunlight across the year.

10.32. The results from our assessment of the Development showed that only two sets of amenity areas experienced any additional overshadowing and these are summarised below.

10.33. At B11 Porchfield Square, the majority of areas were unaffected by overshadowing and the areas that did experience some overshadowing (referenced was A120 to A123) was only before 10am in March. There was no additional overshadowing in June / summer as the shadows are shorter.

10.34. At B44 Great Northern Tower, the June 21st images show overshadowing for the summer equinox when the sun is of course at its highest and shadows are short. In June, the images show some additional overshadowing at the Southern end of the GNT from 1.30pm to 2.30pm (1 hour). Either side of June, shadows do of course become longer as the sun is lower in the sky and are at their longest in December:

- In May / July – there is again overshadowing for a short period between 1.30pm and 2.30pm but the shadows are longer.
- In April / August - there is overshadowing between 1.30pm and 3.30pm and the shadows are much longer and cover most of the GNT amenity areas.
- In March / Sept - there is overshadowing between 1.30pm and 4.00pm and the shadows are cover most of the GNT amenity areas. However, there is no real expectation of sunlight at this time of year or during the winter.

10.35. Overall, the images show that the amenity areas to the adjacent properties are not substantially affected by transient or permanent overshadowing.

Glare

10.36. The Glare assessment was carried out to examine the impact of the proposed development on any solar glare that may be experienced by drivers of cars or trains adjacent to the Development.

10.37. The glare review in this report has been based on the methodologies set out in the Building Research Establishment (BRE) report 'Site layout planning for daylight and sunlight - A guide to good practice 2022' by P. J. Littlefair and the BRE Information Paper IP 3/87, a methodology for the measurement of the occurrence and duration of Reflected Disability Glare, which might be caused by proposed buildings.

10.38. The BRE guide states: *"Glare or dazzle can occur when sunlight is reflected from a glazed façade or area of metal cladding. There are two types of reflected glare problem that can occur. Discomfort glare causes visual discomfort without necessarily affecting the ability to see. Disability glare happens when a bright source of light (such as the reflected sun) impairs the vision of other objects. The bright light is scattered in the eye, making it harder to see everything else. Outdoors, disability glare is easily the more serious problem, as it can affect motorists' and train drivers' ability to drive safely."*

10.39. If it is likely that a building may cause solar dazzle the exact scale of the problem should be evaluated. This is done by identifying key locations such as road junctions and windows of nearby buildings and working out the number of hours of the year that sunlight can be reflected to these points. BRE information Paper 3/87 gives details.

10.40. Where solar reflection can happen, the next step is to calculate the angle between the driver's line of view and the reflected sun. For vertically mounted clear double glazing facing a driver on a level road, solar dazzle could be a significant issue if this angle is less than 10°.

10.41. The report focused on the nearest sensitive view point areas, which are road junctions / traffic lights and train signals which a train driver will need to see clearly whilst operating the train. To assist, we obtained from Metrolink a guide to the positions of all train line signals.

10.42. The viewpoints chosen represent locations where reflected solar glare may cause adverse impacts to those travelling towards the development, such as road users or train drivers. The viewpoints on roads are generally located 23m back from signals (typical stopping distance of a car at 30mph).

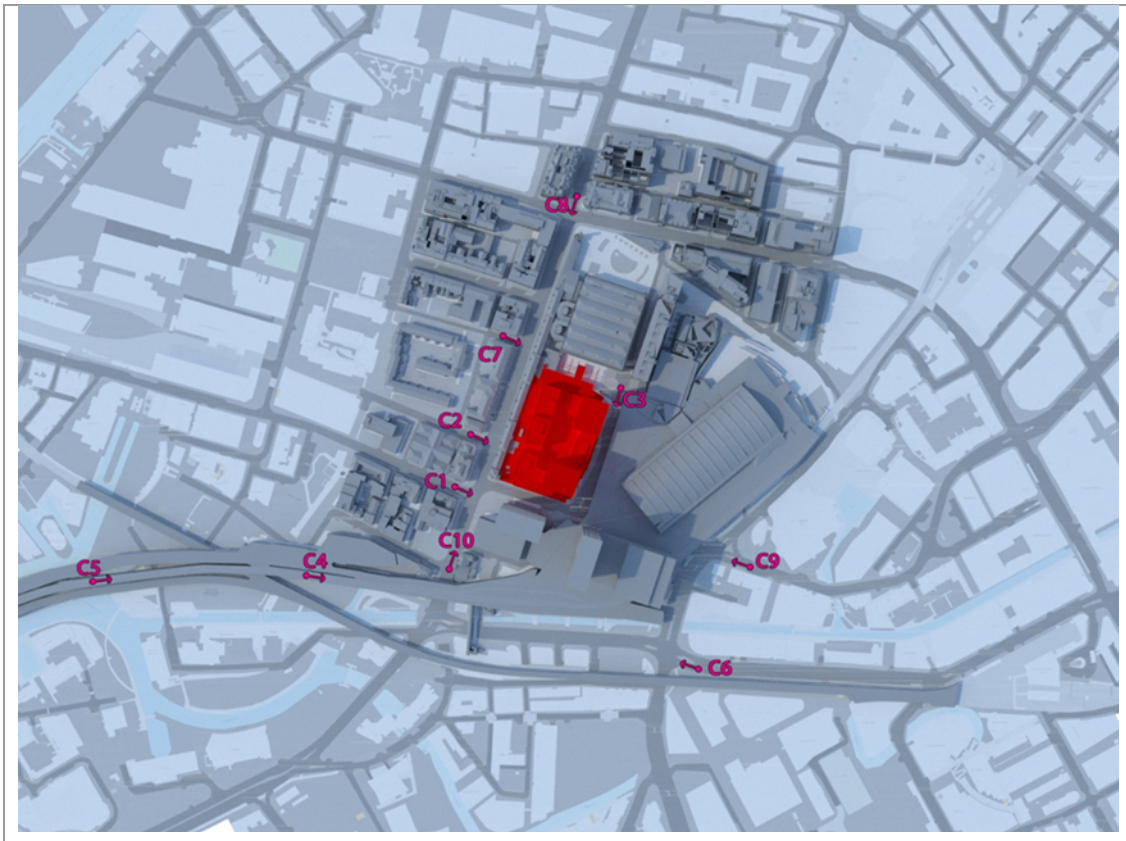


Figure:	11.15
Title:	Glare View Points
Project:	Great Northern, Manchester
Date:	November 2022

Scale:	Scale / NTS

10.43. The detailed assessment of the 10 viewpoints C1 – C10 shows that in 7 of the chosen locations there is no additional glare in the field of view.

10.44. At viewpoints C2, C5 and C9 there is potential additional glare, which was considered further.

10.45. At viewpoints C2 & C5 any glare is on the very edge of the main field of view and is not directly behind the points of interest (junction / train signals) and in respect of the road junction can be shielded by a sun visor.

10.46. At viewpoint C9, there are also no significant glare issues due to the number of traffic lights available without any significant glare impact and where there is minor glare, it is to the top of the field of vision, largely behind the Manchester Central building and can be shielded by a sun visor.

Residual Effects

10.47. The daylight sunlight and overshadowing study concludes that the development would have negligible or minor adverse impact on the surrounding residential properties and amenity spaces.

10.48. The glare study demonstrates that there would be negligible or minor adverse glare issues caused by the Development.

11. Socio Economics (ES Chapter 12)

What is Socio Economics?

11.1. The socio-economic impact assessment explores how the Proposed Development will impact local receptors including the local residents, workers, businesses and visitors and the local economy.

What has been assessed?

11.2. The socio-economic assessment assessed the likely effects of the Proposed Development against the following themes:

- Population;
- Visitors;
- Employment;
- Local expenditure;
- Local service provision;
- Crime; and,
- Open space, recreation, and amenity.

What is the impact of the Proposed Development in terms of Socio Economics?

11.3. A range of socio-economic impacts have been defined, quantified and monetised against the context of local baseline conditions. Significance has been assessed using professional judgement. Significant effects are identified as being minor/ moderate beneficial. A summary is provided below:

Table 11.1 Summary of receptors, residual and cumulative effects

Receptor(s)	Likely Significant Effects	Residual Effects	Cumulative effects
Construction			
Employment & GVA	Jobs and GVA created from construction (temporary during construction)	Minor beneficial	Moderate beneficial
Skills/ employment	Construction apprenticeships (temporary during construction)	Minor beneficial	Minor beneficial
Operational			
Local services	Increased residents placing additional burden on local social infrastructure (i.e. GPs, dentists, etc)	Negligible	Negligible
Employment and GVA	Increased household expenditure of new residents supporting local jobs (operational phase)	Minor beneficial	Moderate beneficial

Employment and GVA	Increased FTE employees and GVA onsite (operational phase)	Minor beneficial	Moderate beneficial
Open space	Increased quantity and value of public open space/ public realm (operational phase)	Moderate/ minor beneficial	Moderate/ minor beneficial
Local Authority Income	Increased rates generated from business onsite (operational phase)	Minor beneficial	Moderate beneficial
Local Authority Income	Increased income from council tax from new residents (operational phase)	Minor beneficial	Moderate beneficial
Local Authority Income	Income to the public purse from new homes bonus (operational phase)	Minor beneficial	Moderate beneficial
Local Authority Income	Income to the public purse from S106	[TBC]	[TBC]

12. Human Health (ES Chapter 13)

What is Human Health?

12.1. Human health and well-being are affected by a complex interaction of multiple factors, such as access to health and social care, healthy food, freedom from pollution to air/land/water, access to open and green space, reducing crime and fear of crime, and availability of housing, employment, and other services. Health is not just absence of disease but rather a combination of a person's physical, mental, and social well-being. This interaction of different factors can be organised into four themes for healthy urban living – Healthy Housing; Active Travel; Healthy Environment; and Vibrant Neighbourhoods.

What has been assessed?

12.2. A checklist of topics that are relevant to development proposals and health and wellbeing issues was used to help identify the topics that may be significant. The topics that were scoped into the EIA through the scoping process were considered for those aspects of the studies that are relevant to human health.

12.3. Summary relevant findings were taken from the impact assessment of each factor scoped as significant for this proposed development and that contributes to human health and well-being – visual impact, noise and vibration, traffic and transport, air quality, sunlight, daylight and overshadowing, wind microclimate, solar glare, socioeconomic, and climate change – and assessed using professional judgment according to the four themes for healthy urban living.

12.4. The site is located adjacent to Deansgate to the west, Peter Street to the north, Watson Street to the east, and Great Bridgewater Street, within the Deansgate Ward, and where residents generally have very good health. Deansgate is one of the least deprived Wards in the City according to the Index of Multiple deprivation (IMD) that is an overall relative measure of deprivation, although there are areas of deprivation for housing quality and affordability within the Study Area around the Site. The local community is relatively young and mostly working age. Most of the Study Area's population are aged between 20-49. Currently, the site supports economic activities associated with retail, commercial and leisure; there are no people resident, and the public realm area is popular but less well used outside daylight hours. The local noise and air quality environment is dominated by road traffic. Overall, the area is characterised as a built-up inner-city area with tall buildings nearby and including residential, commercial, retail, and leisure uses, together with a strong built heritage.

What is the impact of the Proposed Development in terms of Human Health

12.5. During the construction phase, there is the potential for negative health/wellbeing effects on townscape/visual impact, air quality and dust, and noise from the demolition and construction activities. Such effects will be mitigated through measures detailed in the Construction Environmental Management Plan (CEMP) and including methods and timing of working, management of traffic and waste, storage, and high-quality hoardings around the Site.

12.6. Many of the factors that could contribute to negative effects for health and wellbeing have been investigated and mitigated through the design process for the Proposed Development. For example, the size, location, and design of the buildings including the residential units have considered the implications for daylight, overshadowing and solar glare, and overheating/extreme weather events arising from climate change; have devised strategies for waste, energy, transport, crime impact and fire risk; and have incorporated high environmental standards.

12.7. The Proposed Development has been designed to limit vulnerability to climate change effects including through provisions for addressing higher temperatures, drought, flooding, wind, and humidity. Carbon emissions are predicted to be not significant with regard to the UK targets. Mitigation measures, particularly the transition to sustainable transport, should limit such effects in the longer term and contribute to a healthier environment. The current size, position and staggered height tower proposal maintains good levels of daylight and sunlight, minimises overshadowing of amenity spaces and minimises risk of glare for road and rail drivers, and is consistent with a built-up high-rise inner-city area.

12.8. The townscape and visual effects are mostly negligible or no change with some viewpoints having significant beneficial effects through the overall refurbishment and restoration of the site. Heritage is important for human wellbeing and the design proposals seek to minimise impacts on heritage assets and their settings. Potential noise effects for the new residents and those in nearby buildings have been reduced through the embedded design of glazing and facades and noise limit controls.

12.9. Currently, there are no people living on the Site and the Proposed Development is expected to accommodate 1,222 new residents. The delivery of high-quality residential units will have moderate beneficial effects for the site and contribute to improvements for housing within the city centre. The Proposed Development will not have adverse effects on social/community infrastructure and impacts on healthcare and educational facilities are negligible.

12.10. The location of the Site in an area with excellent accessibility to public transport, and with varied access to pedestrian and cycle networks for employment, services, and facilities in the city centre, will encourage active travel with likely major positive effects in the local area. The Proposed Development encourages sustainable travel through a net reduction in car parking spaces, improved pedestrian, cycle and public transport accessibility, and provision of a Framework Travel Plan.

12.11. The redevelopment of Great Northern Square seeks to provide new public realm and ancillary facilities, along with the creation of new pedestrianised areas. There will be new residential apartments on the retained and refurbished carparking, and the whole site will be complemented by new high quality public realm, including new biodiversity and increasing tree planting – all contributes positively to human health and wellbeing. Overall, the provision of residential units, the increased use and enhanced permeability through the site will contribute to less crime and enhanced community safety for residents, workers and visitors.

12.12. The delivery of the good-quality office, retail and leisure development on the site will contribute to the enhancement of the vibrancy of the local neighbourhood within the wider city centre. Provision of and access to employment is known to have a positive effect on health and wellbeing, and the provision of apprenticeships during the construction phase will have particular positive effects for young people and contribute to improving skills. Overall, the Proposed Development will deliver healthy housing and contribute towards healthy environments. It will encourage active travel and contribute towards a vibrant neighbourhood. Potential risks to human health have been identified and mitigated; possibilities for enhancing health and wellbeing have been integrated into the design proposals.

13. Climate Change (ES Chapter 14)

What is Climate Change?

13.1. The requirement to consider a project's impact on and vulnerability to climate change results from the 2014 amendment to the EIA Directive (2014/52). The Directive has been fully transposed into UK law in the EIA Regulations. The Directive requires: "A description of the likely significant effects of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change." As such, the climate change chapter has been split into two and assesses:

- The likely significant effects of the project on climate (for example the nature and magnitude of greenhouse gas emissions) (Climate change mitigation assessment);
- The vulnerability of the project to climate change (Climate change adaptation assessment).

Greenhouse Gases

13.2. Greenhouse gases are the gases that trap heat in the atmosphere, hence the name 'greenhouse'. The main greenhouse gases are carbon dioxide, methane, nitrous oxide and the fluorinated gases. While many greenhouse gases are naturally occurring, it is the increased emissions from human activities that causes climate change.

Climate Resilience

13.3. Climate resilience is the ability to anticipate, prepare for, and respond to hazardous events related to climate.

What has been assessed?

Greenhouse Gases

13.4. This Chapter of the ES assesses the likely impacts from greenhouse gas (GHG) emissions of the Proposed Development upon the site and surrounding area. The assessment follows the Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA) 2022. The guidance advocates a 'good practice' approach where GHG emissions are always considered and reported but at varying degrees of detail depending on the project. The approach to assess GHG emissions associated with the Proposed Development includes calculating the baseline emissions, determining the significance of each GHG emission source scoped into the assessment and setting out strategies for mitigation.

13.5. For the Proposed Development, the following emissions have been considered:

- Whole life embodied carbon emissions: These are embodied carbon emissions from the construction process and materials used, throughout the lifespan of the Proposed Development. This includes emissions during construction, construction transport emissions, emissions from replacement/repair work during the operational phase and end-of-life emissions;

- **Operational carbon emissions:** These include carbon emissions from energy consumption during the operational phase of the Proposed Development; and,
- **Operational transport emissions**: These include emissions from transport during the operational phase of the Proposed Development.

Climate Resilience

13.6. The climate resilience assessment identifies the likely vulnerability of the project and surrounding area to changes in climate over the Scheme life. The construction stage was scoped out of further assessment (at the Scoping stage) on the basis that measures included within a CEMP/ESMP would ensure that the construction site, compound and any associated storage areas are prepared for extreme weather events and more resilient to climate hazards. The significance of effects of changes in the (scoped in) climate variables on receptors were identified for the operation phase. The receptors scoped into this assessment include:

- Operation period (design life of approx. 60 years), consisting of:
  - Buildings with the inclusion of office space with retail and leisure and residential apartments;
  - Public Realm which includes pedestrianised areas and car parking and vegetation; and,
  - End users of the scheme.

13.7. The consequence and likelihood of potential impacts (that would result from the occurrence of changes in climate variables), determine the significance of effects on the Scheme's receptors. The determination of consequence is based on the Scheme design, including any embedded mitigation. The determination of likelihood is based on the future climate projections, as identified in the baseline. Embedded mitigation is identified through consultation with the project design team.

13.8. As mentioned, the future climate projections are used to determine likelihood. In the future, the Scheme is projected to be vulnerable to:

- Drier Summers (-29.4% average Summer precipitation by the 2080s);
- Wetter winters (+12.7% average Winter precipitation by the 2080s);
- Hotter Summers (from an average of 15oC to 19.4oC in the 2080s, with maximum Summer temperatures over 40oC);
- Warmer Winters (from an average of 3.9 oC to 6.9 oC in the 2080s); and,
- Reduced humidity.

What is the impact of the Proposed Development in terms of Climate Change?

Greenhouse Gas Emissions

13.9. The whole life embodied carbon emissions estimated for the domestic part of the Proposed Development exceeds the RIBA 2025 target (<800 $kgCO_2e/m^2$) therefore is likely to be moderate adverse (significant). The whole life embodied carbon emissions estimated for the non-domestic part of the Proposed Development meets the RIBA 2030 target (<750 $kgCO_2e/m^2$) therefore is likely to be minor adverse (not significant).

13.10. The operational energy estimated for the domestic part of the Proposed Development meets the RIBA 2025 target (<60 kWh/m^2/y) therefore is likely to be moderate adverse (significant). The operational energy estimated for the non-domestic part of the Proposed Development exceeds the RIBA 'business-as-usual scenario (<130 kWh/m^2/y), therefore is likely to be major adverse (significant).

13.11. There is no method to assess the significance of transport carbon emissions of the Proposed Development. However, based on the magnitude of carbon emissions from transport and it being the highest contributor (66%) to the overall carbon emissions from the Proposed Development, the operational transport carbon emissions are likely to have a moderate adverse (significant) effect on climate.

13.12. The mitigation measures have been suggested for the construction, operation and end-of-life phase of the Proposed Development have been stated below. Thereafter, no further residual effects were identified.

Construction phase

- Whole life embodied carbon reduction measures including optimising material usage, use of low carbon materials, reducing construction waste and using fewer finish materials (for wall, floor, ceiling, façade).
- Consideration should be given to the robustness and durability of materials and assets.
- Traffic management measures should be implemented to restrict construction vehicles in certain locations and routes at certain times of the day.
- Considerate construction best practices (such as wheel washing) should be adopted.

Operational phase

- Robust monitoring of energy consumption (i.e., smart metering) must be ensured.
- Energy efficient equipment should be used in both domestic and non-domestic buildings.
- At this stage, photovoltaic (PV) panels are considered the most likely renewable power technology for the Proposed Development.
- Measures proposed in the Interim Travel Plan of the Transport Assessment must be adopted which aim to increase the level of walking, cycling and public transport use to and from the site, and reduce reliance on private cars.

End of life phase

- Consideration should be given to the proportion of landfilling and reuse and/or recycling materials at the end of life of the Proposed Development. These measures should be developed in accordance with the existing standards and best practices.

Climate Resilience

13.13. The assessment of significance identified several potential significant effects including:

- Damage and destabilisation of vegetation posing a risk to buildings and end users;
- Increased risk of fire to buildings and the public realm;

- Destabilisation and degradation of above-ground infrastructure due to high winds and storms;
- The shrinking and cracking of soils in the public realm reducing soil stability;
- Potential melting and deformation of footways and cycleways; and,
- Lightning strikes causing fires and damage to assets and posing health and safety risks to end users.

13.14. To mitigate these significant effects, certain measures have been recommended, such as:

- Confirmation of vegetation maintenance plans to ensure that vegetation is controlled and stable, and removal plans are in place should vegetation pose a risk to buildings;
- Confirmation of the provisions in buildings to prevent damp conditions and mould growth;
- Confirmation of fire management and evacuation plans;
- For earthworks, embankments and cuttings, the consideration of the quality of topsoil used and the availability of planting;
- The durability requirements of construction materials to accommodate temperature risks;
- The consideration of wind forces in the durability of design and material choices; and,
- Maintenance plans following storm events to remove debris.

13.15. Following the implementation of the additional mitigation measures, no further residual effects were identified.

14. Type 1 Cumulative Effects (ES Chapter 16)

14.1. The concluding chapter of the Environmental Statement sets out what is considered to be the overall effect of the Proposed Development in EIA terms.

14.2. It is undertaken using what each technical chapter has considered to be the final impact of the Proposed Development once any mitigation measures have been included. It then considers how these effects might interact with each other and what the outcomes are predicted to be for the construction and the operational phases of the Proposed Development. These combined effects are considered 'intra project' or Type 1 cumulative effects.

14.3. 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 considered as part of the Type 1 assessment. Type 2 cumulative effects have been addressed within each Chapter.

Identification of Likely Significant Type 1 Cumulative Effects

Construction Phase

14.4. Table 16.1 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 16.1: Construction Phase Type 1 Cumulative Effects

Sensitive Receptor Group	Construction Phase Residual Effects (after mitigation)	Likely Significant Cumulative Effects
Views, visual setting, Site and townscape character	Townscape and Visual Impact: Temporary Minor to Moderate adverse Heritage: Listed Building and Conservation Area - Temporary Minor Adverse	No likely significant Type 1 cumulative effects
Existing residents, visitors and nearby population receptors	Noise: Temporary Minor Adverse Climate Change: Minor Adverse	No likely significant Type 1 cumulative effects
Construction workers	Socio Economic: Minor Beneficial Climate Change: Minor Adverse	No likely significant Type 1 cumulative effects.
Employment and GVA	Socio-Economic: Minor Beneficial Human Health: Temporary Minor Beneficial	No likely significant Type 1 cumulative effects.

14.5. The table above illustrates there are no Type 1 potential cumulative effects.

Operational phase

14.6. Table 16.2 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 16.2: Operational Phase Type 1 Cumulative Effects

Sensitive Receptor Group	Operational Phase Residual Effects (after mitigation)	Likely Significant Cumulative Effects
Views, visual setting, Site and townscape character	Townscape and Visual Impact: Minor Beneficial Heritage: Listed Building – Minor Adverse. Conservation Area – Minor Adverse	No likely significant Type 1 cumulative effects.
Existing and future local residents, visitors and nearby population receptors	Noise: Minor Adverse Overshadowing: Minor Adverse Human Health: Moderate Beneficial Climate Change: Minor Adverse	No likely significant Type 1 cumulative effects.
Existing residents	Sunlight/Daylight: Minor Adverse	No likely significant Type 1 cumulative effects.
Local Amenity/Public Ream	Overshadowing: Minor Adverse Socio- Economic: Minor-Moderate Beneficial	No likely significant Type 1 cumulative effects.
Transport (road and rail)	Glare: Minor Adverse	No likely significant Type 1 cumulative effects.
Employment and GVA	Socio-Economic: Minor Beneficial Human Health: Minor Beneficial	No likely significant Type 1 cumulative effects.

14.7. The table above illustrates there are no Type 1 potential cumulative effects.

Mitigation Measures

14.8. Where relevant, the individual residual effects which contribute to the identified intra-project effects have been considered and mitigated where necessary and feasible. It is not considered that the intra-project effects would be significant in EIA terms and therefore no further mitigation measures have been proposed.

Deloitte.

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