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property solutions

Land at 33-41 Cheetham Hill Road, Manchester

Environmental Impact Assessment

Request for Scoping Opinion

October 2023

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Version	FINAL
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1. Introduction

1.1 This Environmental Impact Assessment ('EIA') Scoping Report has been prepared by Euan Kellie Property Solutions ('Euan Kellie') on behalf of our client, Zephyr X ('the Applicant'), in respect of proposals to develop land at 33-41 Cheetham Hill Road in Manchester ('the Site'). A Location Plan is included in **Appendix 1**.

1.2 The forthcoming planning application to which the Scoping Report relates will seek full permission for the development of up to 240 dwellings (Class C3), ancillary residents' amenity facilities and a c. 100sqm ground floor commercial unit (Use Class E) within a part 18 / part 23-storey building. Further details in respect of the Site and the proposals are set out in within **Chapters 2** & **3** respectively.

1.3 When describing or referring to the proposals within this report, the term 'Proposed Development' will be used, and is deemed to include all stages of construction and the operation of the development.

1.4 The purpose of this Scoping Report is to assist the Local Planning Authority ('LPA') with the adoption of a Scoping Opinion under Regulation 15 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').

1.5 The EIA process seeks to protect the environment by ensuring that an LPA, when deciding whether to grant planning permission for a development 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.

1.6 The Regulations set out a procedure for identifying those projects which should be subject to an EIA, and for assessing, consulting and coming to a decision on those projects which are likely to have significant environmental effects.

1.7 The purpose of EIA is to identify both the nature of a proposed development and the environment within which it will take place in order to identify the likely significant environmental effects. This is undertaken by comparing the existing situation at the start of the work (baseline) with the situation once the development is in place, including any associated construction period and effects.

1.8 The EIA Regulations 2017 require that any proposed development falling within the description of a 'Schedule 2 development' (as defined by the EIA Regulations), will be subject to an EIA where such development is likely to have 'significant' effects on the environment by virtue of such factors as its nature, size or location (Regulation 2(b)).

1.9 Regulation 6 of the 2017 EIA Regulations makes provision for a developer to request a 'Screening Opinion' from the LPA to ascertain whether an EIA is required if a development is classed as a Schedule 2 development. This decision is based on the likelihood of significant environmental effects arising in relation to the development proposals.

1.10 The Proposed Development on the land at 33-41 Cheetham Hill Road falls under the category of 'Infrastructure Projects – Urban Development Projects' (Schedule 2, 10. (b)) as described in the Regulations. The Proposed Development exceeds the threshold of 150 dwellings for this type of development as set out in Schedule 2 10 (b) of the EIA Regulations as it comprises a residential-led development comprising up to 240 no. new dwellings.

1.11 In this instance, it is therefore considered that the Proposed Development constitutes 'EIA Development' as defined in Regulation 2(1) of the Regulations because it exceeds the threshold identified in Schedule 2 10 (b) and is likely to have significant effects on the environment. Accordingly, a request for a formal EIA Screening Opinion has not been submitted and an EIA will be undertaken voluntarily.

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Purpose of the Scoping Report

1.12 The process of identifying likely significant effects on the environment which should be addressed by the EIA is termed 'scoping' and the results are presented as a Scoping Report.

1.13 The requirements for obtaining a scoping opinion from the LPA are set out within Regulation 15 of the EIA Regulations. This states that a person who is minded to make an EIA application may ask the relevant LPA to state in writing their opinion as to the information to be provided and subsequently reported in an Environmental Statement ('ES') (through the submission of a 'Scoping Report').

1.14 The scoping process is an integral part of undertaking an EIA and its purpose is to provide relevant background information about the Site, the Proposed Development, key environmental issues and the approach for the assessment of potential effects.

1.15 This Scoping Report describes the Proposed Development and identifies issues that will be assessed by the EIA and reported within the ES that will accompany the planning application. The objectives of the scoping process are to:

- Provide details of the Proposed Development, including its physical characteristics and land use requirements;
- Identify the environmental topics that the EIA will consider;
- Define the extent to which environmental topics will be investigated and identify those which do not require detailed consideration within an Environmental Statement;
- Allow consultation with the LPA, and statutory and non-statutory consultees; and
- Provide a mechanism for agreeing the content and methodology of the EIA with stakeholders at an early stage in the process.

1.16 This Scoping Report sets out the framework within which the ES will be produced and the topic areas and information that will be contained within the document. It is issued to Manchester City Council ('MCC') as the LPA, to request their formal Scoping Opinion following consultation with statutory consultees and other organisations. Relevant bodies are asked to comment on the proposed scope of the EIA or provide details of other issues which may be considered to be of significance.

1.17 In line with the EIA Regulations, the LPA is required to respond to a formal request for a Scoping Opinion within five weeks of registering receipt (unless otherwise agreed in writing).

1.18 As required by Regulation 15, paragraph 2, the remainder of this report provides a brief description of the nature and purpose of the development and of its possible effects on the environment.

The EIA Team

1.19 The technical assessors that have contributed to the Scoping Report and (depending on the outcome of the Council's Scoping Opinion) who may or may not contribute to the Environmental Statement are listed in **Table 1.1** on the following page. Their inputs will be co-ordinated and led by Euan Kellie on behalf of the Applicant.

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Topic	Assessor
Air Quality	IDOM
Archaeology	Salford University
Climate Change	Lifeproven
Ecology & Biodiversity	E3P
Flood Risk and Drainage	Renaissance
Ground Conditions	Renaissance (with input from WML Consulting)
Heritage	Stephen Levant Heritage Architecture
Human Health	King Street Planning
Noise	Jameson Acoustics
Sunlight, Daylight and Overshadowing	Proximity
Wind	Architectural Aerodynamics
Transport	SK Transport Planning
Townscape and Visual Impact	Chris Burnett Associates

^ Table 1.1

1.20 Sustainability is an integral part of the design process and will also be considered throughout the EIA. Further standalone reports explaining the approach to sustainability policy objectives will accompany the application for Planning Permission. A schedule of the application documents which will be submitted in support of the application is provided at **Appendix 2**.

Contact Details

1.21 For further information in respect of this Scoping Report please contact:

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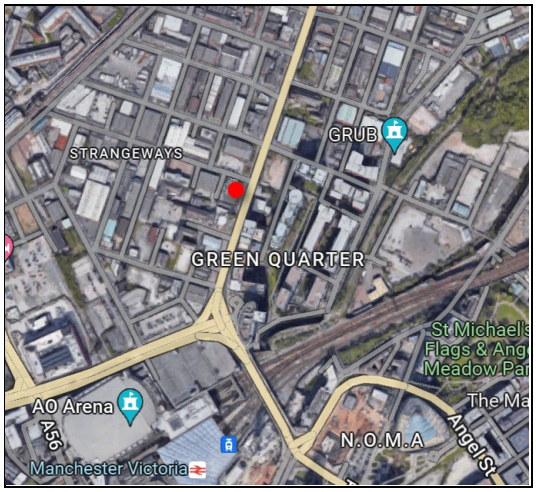
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2. The Application Site and Surroundings

2.1 The Site falls within the administrative boundary of MCC and is located within the Cheetham Ward. It is bound by Cheetham Hill Road (A665) to the east, Carnarvon Street to the north and Gibson Place to the west. South of the site are two low-level commercial units.

2.2 The Site is approximately 0.1 hectares (0.25 acres) in size and comprises a vacant parcel of brownfield land, which was most recently in use as a car wash and dealership. It is surrounded by a mix of residential and commercial developments, reflecting its location on the fringe of the City Centre.

2.3 **Figure 2.1** shows the Site context and **Figure 2.2** shows the Site boundary.

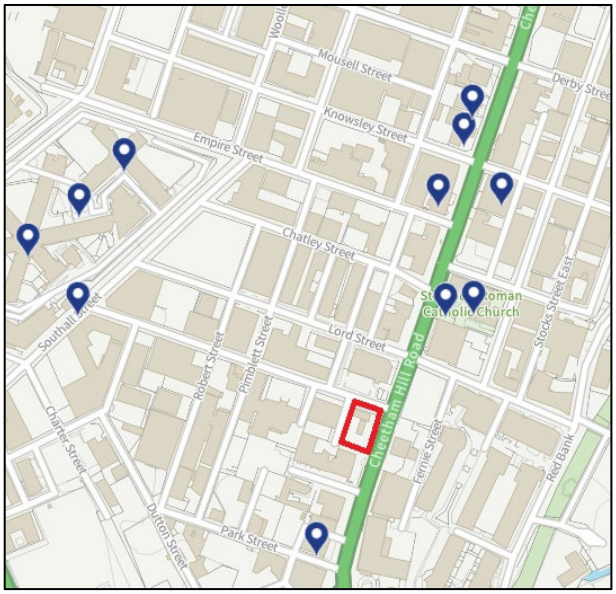


^ Figure 2.1: Site Context



^ Figure 2.2: Site Boundary

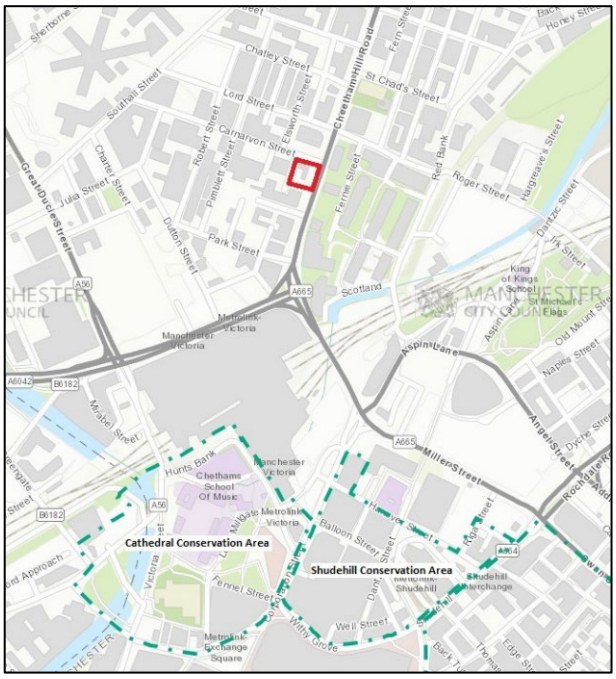
2.4 The nearest listed buildings to the Site are the Roman Catholic Church of St Chad and Presbytery (and churchyard walls) on Cheetham Hill Road (Grade II), the former synagogue at 19 Cheetham Hill Road (Grade II) and various structures associated with HMP Manchester (Strangeways) (Grade II).



^ Figure 2.3: Location of Nearby Listed Buildings

2.5 The nearest Conservation Areas are the Cathedral and Shudehill Conservation Areas to the south of the Site.

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^ Figure 2.4: Location of Nearby Conservation Areas

2.6 Existing views of the Site are provided in **Figures 2.3** and **2.4** below.



^ Figure 2.3: View from corner of Lord Street and Cheetham Hill Road looking south towards the Site

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^ Figure 2.4: View from Carnarvon Street looking east towards Cheetham Hill Road

Planning Policy Designations

2.7 The purpose of this section is to introduce the key planning policy designations for the Site.

2.8 The relevant Development Plan is Manchester City Council's Adopted Core Strategy ("CS") (July 2012) coupled with the saved policies of the Manchester Unitary Development Plan ('UDP') (1995).

2.9 The Site forms part of an Economic Improvement Area, as designated by UDP Policy CC10 (Economic Improvement Area), which covers the wider Strangeways and lower Cheetham Hill Road areas. Policy CC10 encourages a continued high level of economic activity, recognising particularly the needs of the existing wholesale trades operating within these areas. The Policy states that permission will be granted for the redevelopment of sites only where the proposals incorporate sufficient parking and servicing for their own needs, subject to a proper balance of other planning requirements.

2.10 Core Strategy Policy H3 (North Manchester) states that over the lifetime of the Plan, the North Manchester area (within which the Site is located) will accommodate around 20% of the City's new residential development. The Policy gives priority to family housing and other high value, high quality development where this can be sustained. The Policy also notes that high density housing will be permitted within the parts of North Manchester that fall within the Regional Centre (Strangeways and Collyhurst) as well as along high frequency public transport routes. The Site is located inside the boundary of the Regional Centre (within the Strangeways area).

2.11 Core Strategy Policy EC4 (North Manchester) states that North Manchester is expected to provide approximately 14 hectares of employment land, but nevertheless acknowledges that its predominant role is as a residential area.

2.12 Policy EC3 (The Regional Centre) states that within the Regional Centre, development for employment generating uses including offices and other commercial development will be encouraged. It goes on to state that housing will also be an appropriate use here and, subject to site and location details, this will generally be a location where higher density residential development is appropriate.

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2.13 Other relevant planning and regeneration policy documents include the Great Ducie Street Strategic Regeneration Framework, which was adopted by MCC in November 2018. This identifies the land at 33-41 Cheetham Hill Road as an appropriate location for a landmark/gateway building with active frontages on the eastern and southern elevations.

Air Quality

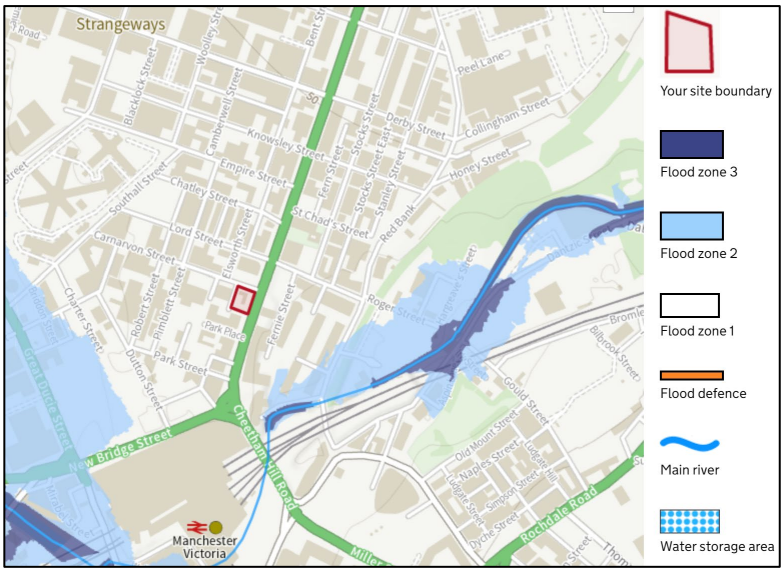
2.14 The Site falls within an Air Quality Management Area (see **Figure 2.5**, below), which has been designated as such due to historic exceedances of the national air quality objectives for Nitrogen Dioxide (NO2) (annual mean).



^ Figure 2.5: Air Quality Management Area Map

Flood Risk

2.15 Having consulted the GOV.UK website, the Site is located within Flood Zone 1, which means that there is a low probability of flooding (see **Figure 2.6**).



^ Figure 2.6: Flood Zone Map

Planning History

The Site

2.16 Planning permission was granted in May 2018 (following an appeal) for the construction of an eight-storey building on the Site comprising a 147-bedroom hotel with two basement levels of

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car parking providing 86 spaces and a restaurant, back of house area and WCs to the ground floor (ref. 114607/FO/2016). It is understood that this permission was never implemented and as a result the consent expired in May 2021.

2.17 Prior to this, permission was granted in November 2013 for a two-storey mixed-use development comprising 417 sqm of retail floorspace (Use Class A1) at ground floor level and a gym (Use Class D2) at first floor level, along with associated car parking, landscaping and boundary treatments, following demolition of existing building (ref. 103354/FO/2013/N1). Seemingly, this consent was also not implemented. As set out at the beginning of this Chapter, the Site was most recently in use as a car wash and dealership facility. The Site is currently vacant.

Surroundings

2.18 A search of all planning applications submitted over the past five years within a 500m radius of the Site has been undertaken using MCC's Public Access website. **Appendix 3** contains a schedule of extant planning permissions and 'live' planning applications for development schemes of significance, which were identified by this search.

2.19 **Chapter 3** of this Scoping Report will now set out details of the Proposed Development.

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3. Proposed Development

3.1 The Proposed Development comprises a residential-led scheme that would create up to 240 dwellings (Class C3), ancillary residents' amenity facilities and a c. 100sqm commercial unit (Use Class E) within a part 18 / part 23 storey building. Internal and external amenity space would be provided, together with appropriate cycle storage for users of the Proposed Development.

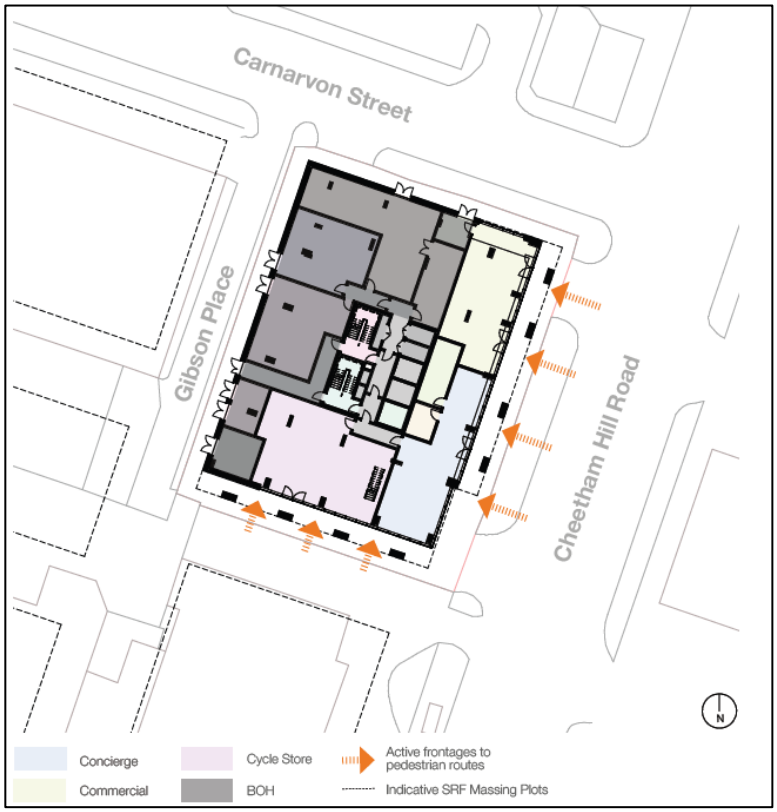
3.2 The anticipated mix of unit types is 33% one-bedroom apartments and 67%of two-bedroom apartments.

3.3 The key principles that are informing the design process are as follows:

- Create a landmark building that meets the place making, design and sustainability aspirations of MCC and the Great Ducie Street Strategic Regeneration Framework, setting the tone and character for the development of future plots.
- Enhance street edges along East and South facades with visible building entrances and active frontages that contribute to the character of the public realm and improve pedestrian experience.
- Deliver a product of the highest quality that aligns with the requirements of Manchester's Residential Design Quality Guidance and maximise the number of dual aspect apartments.

3.4 Although the elements set out above are currently anticipated to form part of the planning application to be submitted, the details will be informed and refined through the EIA process and the ongoing consultations with the LPA, key stakeholders and the local community.

3.5 A draft Site and Accommodation Arrangement Plan is set out at **Figure 3.1** below.



^ Figure 3.1: Draft Site and Accommodation Arrangement Plan

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3.6 An indicative massing model of the draft scheme is presented in **Figure 3.2** below.



^ Figure 3.2: Indicative massing model of draft scheme

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4. Proposed Scope of Assessment

4.1 The purpose of this Scoping Report is to assist the Council to determine which EIA topics are relevant to the Proposed Development and the scope of assessment required in order for the likely significant effects on the environment to be considered as part of the EIA process.

4.2 The information within the Environmental Statement ("ES") will be provided in accordance with Schedule 4 of the EIA Regulations, and will include:

- A description of the Proposed Development.
- A description of the reasonable alternatives.
- A description of the relevant aspects of the existing environment (the 'baseline' position) likely to be significantly affected by the Proposed Development.
- A description of the factors specified in regulation 4(2) likely to be significantly affected by the development.
- A description of the likely significant effects of the development on the environment.
- A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment.
- A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment.
- A non-technical summary.
- A reference list detailing the sources used for the descriptions and assessments included in the Environmental Statement.

4.3 The introductory chapters of the ES will comprise the following:

- An introduction to the ES, setting out details of the EIA Regulations under which it has been prepared.
- A description of the Site and surroundings.
- A description of the Proposed Development.
- Details of the alternatives which have been considered, and the design process which has been undertaken in order to confirm the Proposed Development.
- Details of the proposed EIA Methodology to be adopted.
- Details of the proposed construction methodology and anticipated programme.
- Details of the EIA Project Team.

4.4 The geographical extent of the EIA will be determined on a topic-by-topic basis and will be determined by the baseline conditions including the location of sensitive receptors; the distance over which significant effects are likely to be experienced; and, whether any "pathways" exist by which impacts could be spread.

4.5 The EIA will assess the construction phase and the operational phase of the Proposed Development.

4.6 **Chapter 5** will now present the proposed structure of the ES.

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5. Proposed Structure

5.1 The ES is anticipated to comprise two volumes: the first will set out the findings of the assessments for the EIA topic which will be considered, the second will include all of the supporting documents and appendices to the ES Chapters. A Non-Technical Summary ("NTS") will be produced which will form a standalone report.

5.2 The ES Chapter setting out the findings of the EIA will follow the headings set out below to ensure that it is easy to navigate and understand:

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

5.3 Each of these sub-headings is explained in more detail below.

Introduction

5.4 This section will introduce the EIA topic which is the subject of the chapter, and the reason it is being considered.

Policy Context

5.5 This section will include a summary of relevant national and local policies, as well as any relevant legislation, that is relevant to the EIA topic which is the subject of the chapter.

Assessment Methodology and Significance Criteria

5.6 This section will explain the methods used to undertake the assessment with reference to published standards, guidelines and best practice. The significance criteria used in the assessment will also be set out, along with details of any difficulties encountered in undertaking the assessment, or obtaining required data or information.

Baseline Conditions

5.7 This should include a description of the environment as it is currently (i.e. in 2023) and as it is expected to change should the Proposed Development not proceed (i.e. a 'do nothing' scenario). Some baseline data can be obtained from existing data sources, but additional data may be needed.

5.8 The method used to obtain this information should be clearly identified. Baseline data should be collected in such a way that the importance of the particular subject area to be affected can be placed in its context and surroundings so that the effects of the proposed changes can be predicted.

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Identification and Evaluation of Likely Significant Effects

5.9 The section should identify the likely significant environmental effects (positive, negative and neutral) resulting from the Proposed Development during the construction and operational phases.

5.10 Generic criteria for determining magnitude, sensitivity and significance are set out in **Tables 5.1**-**5.3**. However, for some subject areas, other references will need to be incorporated to reflect established thresholds of impact upon sensitive receptors.

5.11 Any significance criteria used should be explained under the Assessment Methodology and Significance Criteria section of the chapter, and should take account of the following factors:

- The value of the resource (international, national, regional and local level importance);
- The magnitude of the impact;
- The duration involved;
- The reversibility of the effect; and,
- The number and sensitivity of receptors.

Generic Significance Criteria

5.12 The generic Significance Criteria to be used is set out in **Table 5.1** below.

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

^ Table 5.1

5.13 The sensitively of a receptor is based on the relative importance of the receptor using the scale in **Table 5.2**.

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

^ Table 5.2

5.14 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. The Impact Significance Matrix is set out in **Table 5.3**.

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

^ Table 5.3

Mitigation Measures

5.15 Any adverse impact should be considered for mitigation and specific mitigation measures put forward, where practicable. Mitigation measures considered may include recommendations for modifications to the Proposed Development (if feasible), compensation and the provision of alternative solutions, as well as pollution control where appropriate. The assessment should identify where mitigation measures are required relative to the different phase of the Proposed Development (as necessary).

5.16 It should be clear as to the extent of the mitigation measures and how these will be effective. Where the effectiveness is uncertain or depends upon assumptions about operating procedures, data should be introduced to justify the acceptance of these assumptions.

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

5.18 The opportunity for enhancement measures should also be considered, where appropriate.

Cumulative Effects

5.19 The EIA should assess the effects of the Proposed Development cumulatively with other committed developments (i.e. those that are currently under construction or those that have not commenced but have a valid planning permission), where there are likely to be significant effects.

5.20 Two types of cumulative effects will be assessed:

- Type 1 Effects: The combination of individual effects (for example noise, dust and visual effects) from a development on a particular receptor; and,
- Type 2 Effects: Effects from several developments, which individually might be insignificant, but when considered together could create a significant cumulative effect.

5.21 Details of the consented developments of significance that would require consideration of cumulative effects within each of the technical EIA chapters are presented in **Chapter 6**.

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

5.23 We would welcome confirmation of details of any further committed or proposed developments which the LPA is aware of, which will need to be taken into consideration as part of this EIA.

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Residual Effects

5.24 The residual effect, i.e. the remaining impacts from the Proposed Development assuming implementation of proposed mitigation, should be estimated. Residual effects should also be detailed in tabular format (see example **Table 5.4**).

5.25 The methods used to make these estimates should be clearly described, and proposed methods of treatment for any residual effects should be identified. Any effects should be quantified wherever possible.

	Description	Pre-Mitigation Significance	Post-Mitigation Significance
Proposed Development			

^ Table 5.4

Summary

5.26 Finally, there should be a summary of the assessment undertaken. It should contain at least a brief description of the assessment scope, findings and an account of the main mitigation measures that shall be undertaken as part of the Proposed Development to offset any adverse effects.

5.27 The summary should be written in non-technical language so as to be suitable for inclusion in the separate Non-Technical Summary document.

5.28 The proposed EIA Topics will now be presented in **Chapter 6**.

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6. Proposed EIA Topics

6.1 This Chapter sets out the detail of the topics which are proposed to be covered by the EIA.

6.2 The scope of the ES is considered in this instance to be limited to Climate Change; Human Health; Sunlight, Daylight & Overshadowing and Townscape & Visual Impact.

Climate Change

Introduction

6.3 A Climate Change Assessment of the Proposed Development will be undertaken by LifeProven as part of the ES.

6.4 This will focus on assessing and addressing the potential impacts of the Proposed Development on climate change, in particular greenhouse gas (GHG) emissions.

6.5 In this way, it will provide a detailed analysis of how the Proposed Development will contribute to climate change and mitigate its impact in alignment with legislation and targets.

Reference Materials and Standards

6.6 The following legislation and policy will inform the assessment of effects within the ES Chapter:

National Policies

- The Climate Change Act 2008 (2050 Target Amendment) Order 2019
- Climate Change Risk Assessment (2022)
- Carbon Budgets (Order 2011, Order 2016, and Order 2021)
- The Carbon Plan: Delivering our Low Carbon Future (2011)
- Energy Act 2008
- Net Zero Strategy: Build Back Greener (2021)
- Building Regulations 2010, Approved Document L1A: Conservation of fuel and power in new dwellings, 2021 edition incorporating 2023 amendments
- Building Regulations 2010, Approved Document L2A: Conservation of fuel and power in buildings other than dwellings, 2021 edition incorporating 2023 amendments

Local Policies

- Manchester Climate Change Framework (2020-2025)
- Climate Change Action Plan (2020-2025)
- Manchester Low Carbon Build Standard
- Manchester's Local Development Framework Core Strategy (2012)

Context

Baseline Conditions

6.7 The impact of the Proposed Development will be assessed against the existing baseline conditions.

6.8 The current Site comprises a building that has been disused for some time, and therefore for the purpose of the assessment, the baseline emissions are considered to be 0. The baseline emissions for Manchester, North-West England and the UK have been taken from the UK Local Authority and Regional Greenhouse Gas Emissions National Statistics (2005-2021), 2023 update.

6.9 The effects of the Proposed Development on baseline conditions will be assessed against the baselines identified in **Table 6.1** below.

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Location	Baseline Emissions (2021), tCO_2e
Site	0
Manchester	2,095,600
North-West England	44,047,000
England	309,040,000

^ Table 6.1

Potential Effects

Impacts of the Proposed Development

6.10 The Proposed Development will have an effect on climate through the release of GHG emissions during construction and operation. The anticipated timescales for the construction and operation stages of the Proposed Development are set out in **Table 6.2** below.

Development Stage	Start Date	End Date	Description
Construction	Nov 2024	Dec 2026	The development programme indicates that construction of the Proposed Development will commence in November 2024 and be completed over a two-year period.
Operation	Jan 2027	Jan 2087	The Proposed Development is projected to be fully operational from 2027. A building's lifetime is typically assessed over 60 years; however, this is also assessed from the date of operation until 2038 to compare the magnitude of change against the UK's carbon budgets.

^ Table 6.2

Cumulative Impacts

6.11 The atmospheric concentration of GHGs and the resulting effect on climate change is affected by all sources and sinks globally, anthropogenic, or otherwise. Due to them being felt globally, rather than affecting a local area, the approach of cumulative effects differs from other EIA topics, where typically projects within a certain boundary is assessed. Hence, there is no increase in local climate effect due to one proposed development, and all combined developments globally contribute to the receptor (the atmospheric concentration of GHG emissions and therefore climate change). As suggested by IEMA, "there is no basis for selecting any particular cumulative project for assessment", and therefore cumulative effects will not be calculated in the assessment.

Mitigation

6.12 Any proposed development has an undoubtable effect on climate change through its contribution of emissions. The impact of mitigation measures will be assessed, with a proposed list for consideration at this early design stage provided below:

During Construction

6.13 During design and/or construction, these mitigation measures would reduce environmental impact of the Proposed Development:

- Reuse and retrofit existing buildings above demolition.
- Design for less material use.
- Select materials with low carbon content.
- Use materials that are recovered or have recycled content.
- Source materials locally.

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- Use responsibly and sustainably sourced materials.
- Design for adaptability and disassembly.
- Design for durability and flexibility.
- Use materials that can be reused or recycled.
- Manage waste during construction.
- Use modern methods of construction such as modular systems.
- Minimise fabrication and construction waste.
- Implement a construction stage traffic management plan to reduce construction traffic arising from the Proposed Development.

During Operation

6.14 During operation, the following environmental impact reduction measures could be used:

- Enhance the performance of building fabric such as low u-values and enhanced air tightness.
- Eliminate the use of fossil fuels, building a fully electric scheme.
- Use air source heat pumps for the entire Proposed Development, or if not possible, in communal areas.
- Use efficient building services to condition and light the Proposed Development.
- Reduce water consumption using low flow fixtures and leak detection systems.

Methods of Assessment

Assessment Methodology and Significance Criteria

6.15 There is no single accepted methodology for calculating greenhouse gas emissions within an EIA. Therefore, the assessment will be based on recommended practice guidance - IEMA's *'Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance'*. The below outlines the methodology used:

- The emission sources used in the assessment will be those from prior to construction, during construction, during operation and through to decommissioning. These sources will be assessed and calculated in One Click LCA, using the Royal Institution of Chartered Surveyors (RICS) professional standards and guidance for whole life carbon assessments for the built environment.
- The data quality will be assessed in line with PAS 2080.
- The results will be assessed against baseline GHG emissions from the site, Manchester, and North-West of England, and compared against national and local carbon budgets to assess the magnitude of change due to the Proposed Development.
- To assess the Proposed Development's climate change impact against Net Zero targets, the emissions will also be compared against RIBA's 2030 Climate Challenge targets for embodied carbon and operational energy.
- Following the interpretation of these results, the significance of effects will be determined.
- Mitigation measures to reduce climate change impacts will be identified along with any residual effects.

6.16 Currently, there is no agreed threshold for what level of emissions are considered significant. However, the IEMA identify that all new GHG emissions contribute to a significant negative environmental effect. Therefore, significance will be based on the net impact of the Proposed Development and should be mitigated as far as possible.

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6.17 Any contribution towards climate change has a global impact. Therefore, based on the significance criteria, the receptor (in this case the global climate system) is always considered to be high, as it is of international, national, and local importance.

Identification and Evaluation of Likely Significant Effects

6.18 The magnitude of change will be calculated using three indictors. This includes baseline emissions, carbon budgets as well as a comparison against industry Net Zero targets. There is no standard definition to determine the actual magnitude of change as major, moderate, or minor. Therefore, IEMA guidance and professional judgement has been used, as set out in **Table 6.3** below.

Magnitude of Change	Baseline emissions and/or carbon budget impact		Net Zero Impact
Major	>5% increase/decrease in GHG emissions relative to baseline emissions and/or future carbon budgets	and /or	Proposed Development exceeds "Business as Usual"
Moderate	2-5% increase/decrease in GHG emissions relative to baseline emissions and/or future carbon budgets		Proposed Development meets "Business as Usual
Minor	1-2% increase/decrease in GHG emissions relative to baseline emissions and/or future carbon budgets		Proposed Development meets "2025 Targets"
Negligible	<1% increase/decrease in GHG emissions relative to baseline emissions and/or future carbon budgets		Proposed Development meets "2030 Targets"

^ Table 6.3

6.19 By assessing the environmental impact against local and national carbon budgets, the likely effects can be assessed, which helps to determine the magnitude of change. The Climate Change Committee have defined the UK's climate budgets, meanwhile the Tyndall Centre for Climate Change Research have helped Manchester set their carbon budgets in line with a 1.5-degree warming, as presented in **Table 6.4** below.

Period	GHG Emissions (tCO2e)	
	UK	Manchester
2023-2027	1,950,000,000	4,600,000
2028-2032	1,725,000,000	2,400,000
2033-2037	965,000,000	1,200,000
2038-2042	Undefined	600,000
2043-2047	Undefined	300,000
2048-2100	Undefined	300,000

^ Table 6.4

6.21 The emission intensity of the Proposed Development will also be assessed against the RIBA 2030 Climate Challenge targets for whole life embodied emissions as well as operational building emissions from energy consumption. This will help to determine the magnitude of change compared to industry benchmarks for achieving Net Zero, as set out in **Table 6.5** below.

RIBA Sustainable Outcomes Metrics	Business as Usual	2025 Target	2030 Target
Whole Life Embodied Carbon (kgCO2e/m2)	1,200	< 800	< 625
Operational Energy (kWh/m2/y)	120	60	135

^ Table 6.5

6.22 The matrix set out in **Table 6.6** below will be used to assess the significance of effects (in this case the whole life embodied carbon, and operational emissions resulting from the Proposed

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Development), against the sensitivity of the receptor (the climate system). The receptor sensitivity is high, and therefore only the high sensitivity column applies to the assessment.

Magnitude of Change/Impact	Sensitivity (Value/Importance)		
	High	Moderate	Low
Major	Major	Major-Moderate	Moderate-Minor
Moderate	Major-Moderate	Moderate-Minor	Minor
Minor	Moderate-Minor	Minor	Minor-Negligible
Negligible	Negligible	Negligible	Negligible

^ Table 6.6

Residual Effects

6.24 With the implementation of mitigation measures, the Proposed Development is still likely to have residual effects and therefore a residual significance on the climate system. These estimates will be clearly identified, quantified, and described within the final Climate Change Impact Assessment.

6.25 The Proposed Development can compensate resulting residual emissions by carbon credits to achieve net zero emissions. This is proposed in the form of offsets that sequester atmospheric GHG emissions and shall be explored within the Assessment.

Summary of Scope

6.26 The Proposed Development will result in carbon emissions over its lifetime. Emissions sources have been identified using IEMA and RICS Whole Life Carbon Guidance. Professional judgement has been used to determine which emission sources will be scoped in or out of the Climate Change Impact Assessment that will be undertaken as part of the EIA, as set out in **Table 6.7** below.

Source of Impact	Description	Relevance to Proposed Development	Scoped In/Out
Product Stage (A1 – A3)	Emissions associated with materials or products used in construction, including raw material extraction, transport, and manufacturing emissions.	Raw materials and products have embodied emissions which may have large contributions to the project's release of GHG emissions.	Scoped In
Construction Stage (A4)	Emissions associated with the transport of materials to the construction site.	Fuels and energy associated with the transport of materials and products to site can be large if not sourced locally and sustainably.	Scoped In.
Construction Stage (A5)	Emissions from the construction and installation process.	Plant and equipment used during construction result in emissions being directly released into the atmosphere.	Scoped In.
	Emissions result from the disposal of waste and materials during construction.	Materials disposed of or lost during construction is expected to be low, however will be assessed.	Scoped In.
	Emission changes result from land use, land use change, and forestry during construction.	Emissions from land use change and biomass disposal is expected to be minimal and therefore excluded.	Scoped Out.

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Source of Impact	Description	Relevance to Proposed Development	Scoped In/Out
In-Use Stage (B1)	Emissions arising from the building's operation, such as those due to the release of refrigerants.	Whilst the contribution towards emissions is estimated to be small, this is easily calculated and has therefore been included.	Scoped In.
In-Use Stage (B2, B3, B4 and B5)	Emissions resulting from the Development's maintenance.	Whilst the contribution towards emissions is estimated to be small, this is easily calculated and has therefore been included.	Scoped In.
	Emissions resulting from any repairs conducted in the Development during operation.	Whilst the contribution towards emissions is estimated to be small, this is easily calculated and has therefore been included.	Scoped In.
	Emissions resulting from any refurbishments conducted during the buildings lifetime.	Emissions from refurbishments could be large, therefore this is included.	Scoped In.
	Emissions resulting from replacements of equipment and products over the Development's lifetime.	Emissions from replacement of equipment and products could be large.	Scoped In.
Operational Carbon (B6)	Emissions from the building's operation, specific to energy consumption during operation.	The building will use energy to run during its lifetime, leading to annual emission contributions which will be included in the assessment.	Scoped In.
Operational Carbon (B7)	Emissions from the building's operation, specific to water consumption during operation.	Due to it being a residential Development, water use is expected to be large and therefore this is scoped not the assessment.	Scoped In.
Other User Activities (B8)	These are emissions resulting from user activities including land change and forestry.	Emissions from land use change are expected to be small and therefore not included.	Scoped Out.
End of Life Stage (C1-C4)	Emissions associated with the end of life of the Development, including deconstruction and demolition, transport, waste processing and disposal.	Emissions associated with the building's decommissioning process could be large and has been included.	Scoped In.

^ Table 6.7

6.27 Lifeproven have prepared a more detailed report outlining the proposed scope of the Climate Change Impact Assessment that they are intending to undertake, which is provided at **Appendix 4**.

Human Health

Introduction

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6.28 This Chapter of the ES will comprise an assessment of the Human Health related effects associated with the Proposed Development. It will focus on the likely impacts during the construction and operational phases on human health receptors both on and off-site. The assessment will be undertaken by Jamie Lynch of King Street Planning (MRTPI, MIEMA, MRICS, CEnv).

Reference Materials and Standards

6.29 The assessment will utilise a suite of policy and guidance documents to inform the ES Chapter:

- National Planning Policy Framework.
- Planning Practice Guidance.
- Manchester's Core Strategy Development Plan Document (Adopted 11 July 2012).
- Spatial Planning for Health: An Evidence Resource for Planning and Designing Healthier Places (2017).
- HUDU Planning for Health: Healthy Urban Planning Checklist (April 2017).
- HUDU Rapid Health Impact Assessment Tool (October 2019).
- IEMA: Effective Scoping of Human Health in Environmental Impact Assessment (November 2022).
- IEMA: Determining Significance for Human Health In Environmental Impact Assessment (November 2022).

Context

6.30 The Site is located on the edge of Manchester City Centre in an urban context. It comprises previously developed land, part occupied by a vacant, single-storey building. Land to the east of the Site has been subject to extensive regeneration as part of the Green Quarter Masterplan, whilst land adjacent to the site, west of the A665, is principally commercial and non-residential land.

6.31 The Site is identified in area of change, allocated for mixed-use development in the Great Ducie Street Strategic Regeneration Framework (November 2018).

6.32 The Site is in a highly sustainable location, in close proximity to rail, bus and Metrolink services, and the edge of Manchester City Centre is located a c. 5-minute walk from the site.

6.33 The nearest existing off-site residential receptors are located c. 20m east of the site. There is also a committed residential development on the corner of Lord Street and Cheetham Hill Road (permission ref. 113914/FO/2016), which it is understood has been implemented and remains extant.

6.34 From an environmental perspective, the following constraints have been identified:

- Cheetham Hill Road is heavily trafficked and there could be elevated noise levels associated with vehicles on the highway network.
- The site is located within the Manchester Air Quality Management Area.
- The site comprises previously developed land and localised contamination may be present on site.
- The site is not subject to fluvial flood risk but areas of surface water flooding may be present on land within and adjacent to the site.

6.35 The site is located within an area which generally suffers from high levels of deprivation. The site is identified as Lower Super Output Area ("LSOA") '056B' and ranked 10,953 of 32,844 LSOAs in the country (where no.1 is the most deprived). LSOA 058C is adjacent to the west of LSOA 056B and ranked in the top 10% most deprived areas of the country.

Potential Effects

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Impacts of the Proposed Development

6.36 The potential impacts to human health will principally comprise of the following:

- Impacts during the construction phase to existing off-site human health receptors.
- Impacts during the construction phase to on-site workers.
- Impacts during the operational phase to existing off-site human health receptors.
- Impacts during the operational phase to future on-site human health receptors.

Cumulative Impacts

6.37 With regards to cumulative impacts, these could occur during both the construction and operational phases of development. The assessment will review each cumulative scheme once identified and confirm the likelihood for cumulative effects.

6.38 The construction phase effects are likely to be limited to cumulative schemes within the immediate vicinity of the site and only when construction phases of the proposed development and any cumulative schemes overlap. Reasonable assumptions will be made in relation to the construction phase assessment, for example it will be assumed that each construction site will implement a Construction Environmental Management Plan.

6.39 The Proposed Development has been designed to be car-free and therefore there is unlikely to be significant cumulative effects with respect to noise and air quality effects associated with increased vehicle movements during operation. The assessment will consider the likely cumulative effects associated with daylight and sunlight, and wind on any committed developments which do not form part of the baseline assessment.

Mitigation

6.40 Mitigation will be required during the construction and operational phases, this will likely comprise a series of best practice management plans and site controls during construction. During operation, a series of measures will be designed into the development to mitigate long term environmental effects. These will be confirmed during the assessment process and presented within the assessment.

Summary

6.41 MCC have requested the preparation of a Human Health ES Chapter to determine the significance of effects on human health receptors. As such, a Human Health ES Chapter will be prepared to evaluate the likely environmental impacts on human health receptors both on and off site, and identify mitigation measures if significant effects are identified.

Methods of Assessment

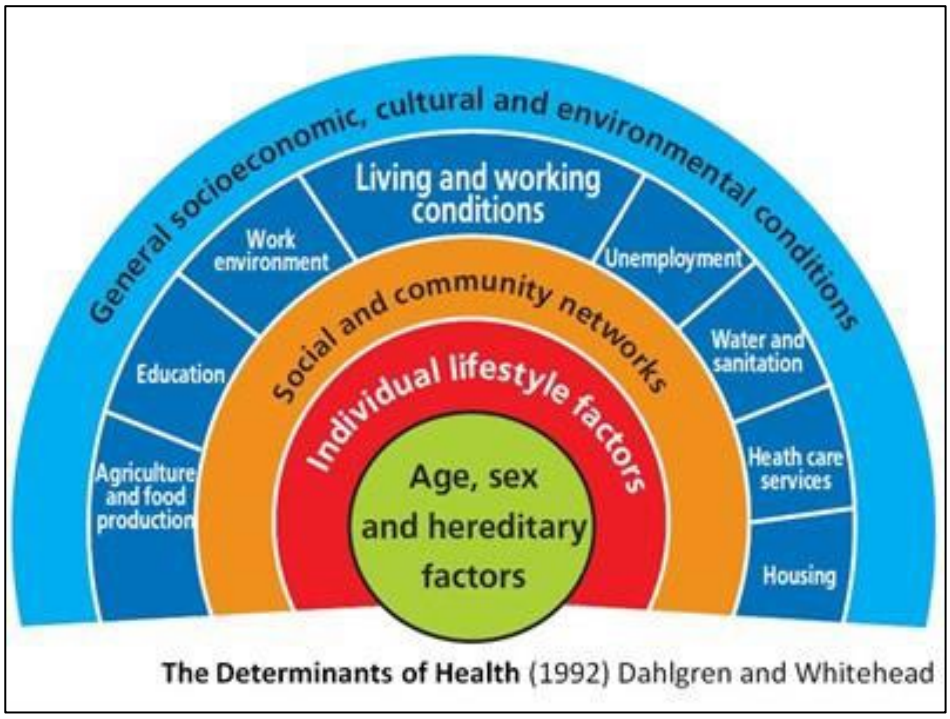
6.42 Human Health in an ES Chapter will broadly follow the expected methodology for a Health Impact Assessment ("HIA"). HIA is a systematic approach to identify the differential health and wellbeing impacts, both positive and negative, of projects and plans. The assessment of health is particularly concerned with the distribution of certain effects within a population, as different groups are likely to be affected in different ways. It therefore looks at how health and social determinants might be affected by a proposed development.

6.43 The aim of HIAs is to support and add value to the decision-making process by providing a systematic analysis of the potential impacts, as well as recommending opportunities, where appropriate, to mitigate negative impacts and reduce health inequalities.

Determinants for Health

6.44 Dahlgren and Whitehead developed the determinants for health model which identified a range of influences on health, providing a broad overview of the links with the planning system. These are illustrated in **Figure 6.1**.

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^ Figure 6.1 – Determinants for Health

Methodology

6.45 MCC does not have a Supplementary Planning Document which provides guidance when undertaking HIAs, nor is there a standard methodology when undertaking human health ES Chapters. The NHS Healthy Urban Development Unit ("HUDU") have, however, prepared a series of guidance notes to guide the process of undertaking HIAs. These include the Rapid Health Impact Assessment Tool (Fourth Edition, October 2019); and Healthy Urban Planning Checklist (April 2017).

6.46 The HUDU checklist interprets the health determinants into a set of themes which can be used to assess development proposals:

- Healthy housing.
- Active travel.
- Healthy environment.
- Vibrant neighbourhoods.

6.47 The HUDU guidance recognises that there are generally three types of HIAs: desktop; rapid; and full. Based on the type of development proposed, its scale, the existing site conditions and the likely effects, it is considered the most appropriate approach is a rapid appraisal as part of the ES.

Scope of the Assessment

6.48 The criteria used in the HUDU planning checklist will be utilised to determine the likely baseline considerations for the development:

- Housing quality and design.
- Access to healthcare services and other social infrastructure.
- Open space, nature and biodiversity.
- Pollutants and neighbourhood amenity.
- Accessibility and active transport.

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- Crime reduction and community safety.
- Access to healthy food.
- Access to education, training and employment opportunities.
- Social cohesion and lifetime neighbourhoods.
- Minimising the use of resources.
- Climate change.
- Health inequalities.

6.49 The principal health related impacts will however relate to the following considerations (set out in detail within **Table 6.12**):

- **Air Quality:**
  - Construction phase dust impacts to construction workers and off-site receptors.
  - Operational phase emissions generated by vehicles travelling to and from the site.
  - The suitability of the site for future residents from an air quality perspective.
- **Noise:**
  - Construction noise impacts on existing residential receptors.
  - The existing noise climate effects on future residents.
- **Wind:**
  - Operational impacts on the local wind environment, which impact the target wind conditions.
- **Daylight, Sunlight and Overshadowing:**
  - Operational impacts on existing and committed residential properties.
- **Ground Conditions:**
  - Construction phase impacts associated with contaminated material affecting construction site workers and off-site sensitive receptors.

Baseline

6.50 The HUDU themes include a series of assessment criteria which form the basis of the assessment. As such, the ES Chapter will include a baseline assessment of the Site and surrounding area. Due to the nature of the datasets available, the geographical scope of the assessment will comprise a mix of the Site, the Lower Super Output Area ("LSOA") (Manchester 056B), ward data, MCC's administrative area, the North West Region and England. Once the baseline has been established, the impacts of the Proposed Development against the themes set out above will be undertaken.

6.51 The receptor groups identified include:

- Construction workers.
- Existing off-site residents.
- Future on site residents and site users.

6.52 The accessibility of social and community infrastructure including schools, GPs and dentists will also be considered as part of the baseline assessment.

Impact Assessment

6.53 Based on the assessment criteria, its relevance to the Proposed Development is established, after which the potential health impact is determined. The health impact will take into account

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any mitigation which is secured by design (embedded mitigation) or through further mitigation which is secured by planning condition on the decision notice in the event that planning permission is secured.

Significance of Effects

6.54 IEMA have prepared a guidance document to assist in determining the significance of health related effects in the EIA. As the assessment focuses on the environmental impacts on human health receptors, the significance of effects will align with the findings of the technical assessments undertaken to support the planning application, and will therefore generally follow the methodology for each technical assessment to determine the sensitivity of a receptor, magnitude of effect and likely significance.

6.55 IEMA have, however, prepared a generic health significance framework that will be also be utilised to inform the findings of the assessment and identify mitigation measures where significant impacts are anticipated. Details are presented in Tables **6.8**-**6.11** below.

Category/Level	Indicative criteria
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Very Low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

^ Table 6.8 – Health Sensitivity Methodology Criteria

Category/Level	Indicative criteria
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.

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Category/Level	Indicative criteria
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Very Low	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

^ Table 6.9 – Health Magnitude Methodology Criteria

Category/Level	Indicative criteria
Major	• Changes, due to the project, have a substantial effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity levels), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect. • Change, due to the project, could result in a regulatory threshold or statutory standard being crossed (if applicable). • There is likely to be a substantial change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a causal relationship between changes that would result from the project and changes to health outcomes. • In addition, health priorities for the relevant study area are of specific relevance to the determinant of health or population group affected by the project.
Moderate	• Changes, due to the project, have an influential effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size, and as informed by consultation themes among stakeholders, which may show mixed views. • Change, due to the project, could result in a regulatory threshold or statutory standard being approached (if applicable). • There is likely to be a small change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a clear relationship between changes that would result from the project and changes to health outcomes. • In addition, health priorities for the relevant study area are of general relevance to the determinant of health or population group affected by the project.
Minor	• Changes, due to the project, have a marginal effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size of limited policy influence and/or that no relevant consultation themes emerge among stakeholders. • Change, due to the project, would be well within a regulatory threshold or statutory standard (if applicable); but could result in a guideline being crossed (if applicable).

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Category/Level	Indicative criteria
	• There is likely to be a slight change in the health baseline of the population, including as evidenced by the effect size and/or scientific literature showing there is only a suggestive relationship between changes that would result from the project and changes to health outcomes. • In addition, health priorities for the relevant study area are of low relevance to the determinant of health or population group affected by the project.
Negligible	• Changes, due to the project, are not related to the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size or lack of relevant policy, and as informed by the project having no responses on this issue among stakeholders. • Change, due to the project, would not affect a regulatory threshold, statutory standard or guideline (if applicable). • There is likely to be a very limited change in the health baseline of the population, including as evidenced by the effect size and/or scientific literature showing there is an unsupported relationship between changes that would result from the project and changes to health outcomes. • In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the project.

^ Table 6.10 – Significance of Effect Criteria

		Sensitivity			
		High	**Medium**	**Low**	**Negligible**
Magnitude	High	Major	Major / moderate	Moderate / minor	Minor / negligible
	Medium	Major / moderate	Moderate	Minor	Minor / negligible
	Low	Moderate / minor	Minor	Minor	Negligible
	Negligible	Minor / negligible	Minor / negligible	Negligible	Negligible

^ Table 6.11 – EIA Significance Matrix

6.56 Those effects identified as major will be significant. Moderate effects could be both significant and not significant. The determination of significant or not significant will be case specific based on the conclusions of the technical assessments.

Information Sources

6.57 The assessment will utilise the findings of technical assessments undertaken to support the planning application, and a suite of online government datasets, including (but not limited to):

- Air Quality Assessment.
- Daylight, Sunlight & Overshadowing Assessment.
- Energy & Environmental Standards Statement.
- Flood Risk Assessment & Drainage Strategy.
- Noise Impact Assessment.
- Phase 1 Site Investigation Report.
- Transport Statement and Interim Travel Plan.

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- Wind Assessment.

6.58 No primary research or surveys have been undertaken, and the assessment is based on published information which is considered an appropriate level of assessment based on the proposals.

Limitations

6.59 The latest published data available will be used throughout the assessment. However, the baseline demographics are constantly evolving and therefore the impacts identified relate to the proposed development sought for approval and the current demographics established at the point this assessment has been completed.

6.60 The 2021 Census has been undertaken; however, not all of the datasets are available for interrogation yet. Therefore, the latest data available for the relevant baseline criterion has been used. The assessment will not consider the capacity of surrounding health and social infrastructure as part of the impact assessment.

Summary of Assessment Scope

6.61 **Table 6.12** sets out a summary of the likely health related impacts that will be assessed within the ES Chapter.

6.62 The assessment will also consider the regenerative benefits of the Proposed Development through the creation of new jobs and housing to benefit the health characteristics of the local population.

Receptor	Impact	Potential Effect	Scoped in / Out
Construction			
Construction workers	Contaminated land associated with ground preparation works	Potentially significant prior to the implementation of mitigation. Level of effect will be confirmed through the assessment process.	Scoped-in
Off-site residential receptors	Construction dust impacts		Scoped-in
	Increased traffic associated with construction vehicles		Scoped-in
	Construction noise and vibration impacts		Scoped-in
	Contaminated land impacts associated with ground preparation works		Scoped-in
Operation			
Off-site residential receptors	Impacts on local air quality conditions.	Potentially significant prior to the implementation of mitigation. Level of effect will be confirmed through the assessment process.	Scoped-in
	Impacts on the local noise environment.		Scoped-in
	Impacts on the daylight and sunlight conditions for existing buildings.		Scoped-in
	Impacts on the off-site wind microclimate.		Scoped-in
On-site residential receptors	Suitability assessment due to air quality conditions		Scoped-in
	Suitability assessment due to noise conditions		Scoped-in
	Wind conditions within the site boundary.		Scoped-in

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^ Table 6.12 – Summary of the Impact Assessment Scope

Sunlight, Daylight & Overshadowing

Introduction

6.63 A Daylight and Sunlight Amenity Impact Assessment of the Proposed Development will be undertaken by Proximity as part of the ES. The author is an MRICS qualified chartered surveyor, with 6 years' experience of advising on daylight and sunlight amenity impacts.

Reference Materials and Standards

6.64 The following legislation and policy will inform the assessment of effects within the ES Chapter:

- Building Research Establishment ("the BRE") – Guidance document Site Layout Planning for Daylight and Sunlight – A Guide to Good Practise.
- MCC Policy - Core Strategy
- MCC Policy - Great Ducie Street Strategic Regeneration Framework
- NCC Policy - Guide to Development in Manchester Supplementary Planning Document

Context

6.65 At the present time, the Site is part occupied by a single-storey building. The remainder of the Site is open and free of any other buildings or structures.

6.66 To the north, west and south of the Site, the surrounding area is characterised by low rise buildings, which are predominately two or three storeys in height. To the east of the Site on the other side of Cheetham Hill Road, the height and massing of the buildings is significantly greater, including residential buildings of up to circa 20-storeys in height.

6.67 No measurement of the daylight and sunlight amenity of the neighbouring receptors has yet been undertaken.

Receptors

6.68 Daylight and Sunlight receptors have been identified using the BRE Guidance.

6.69 The emphasis of the Guidance is on the assessment of residential accommodation, specifically habitable rooms within residential buildings. A non-residential building may be assessed if there is a reasonable expectation of daylight and sunlight, such as hospitals or schools.

6.70 Preliminarily, the habitable rooms of the following neighbouring buildings rely on the Site for the receipt of daylight and sunlight. These receptors have been identified as worthy of impact appraisal:

- Hallmark Tower apartment building, 6 Cheetham Hill Road
- Jefferson Place, 1 Fernie Street
- Britton House, 21 Lord Street

6.71 Rooms known to be of non-habitable use are excluded from the assessment.

6.72 There are no other receptors in the vicinity of the Site that merit assessment, based on their use, distance from the Site, orientation or relationship with the Site.

Baseline Conditions

6.73 In the baseline condition the majority of the windows and rooms of the Hallmark Building and Jefferson Place are anticipated to achieve the aspirational targets for daylight set out in the BRE Guidance. This is a factor of their windows generally overlooking the low rise massing of the area surrounding the Site.

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6.74 It is anticipated that certain windows and rooms of Britton House will not achieve the BRE's aspirational daylight and sunlight targets on the basis that a significant portion of this building's window provision directly overlooks the 18 storey massing of Jefferson Place. This neighbouring building acts as a significant limitation on the daylight and sunlight amenity of rooms within Britton House in the baseline condition.

Potential Effects

Impacts of the Proposed Development

Construction Phase

6.75 The impact that the Construction Phase of the Proposed Development will have on the daylight and sunlight amenity of the surrounding built environment will not be considered.

6.76 The effects of the construction phase are temporary because they are a function of the proposed massing, which will vary during the construction phase operations.

6.77 The Proposed Development will have its greatest and long term daylight and sunlight impact upon completion of the construction phase once its massing has been fully established.

Operational Phase

6.78 In the operational phase, it is anticipated that overall, the impact of the Proposed Development on the daylight and sunlight amenity of the Hallmark Building would not be significant.

6.79 Impacts on the daylight amenity of Jefferson Place are anticipated to be significant. The windows of this neighbouring building directly overlook the Site. The presence of balconies in the design of Jefferson House (projecting above the window of the room below) and the massing of the adjacent Hallmark Tower are limitations on daylight to the windows and rooms of Jefferson Place in the baseline condition.

6.80 Impacts on the sunlight amenity of Jefferson Place would not be significant.

6.81 The BRE Guidance states that living rooms served by windows within 90 degrees of due south should be assessed. On the basis that the Site facing windows of Jefferson Place are northwest facing, they are therefore limited in the extent to which direct sunlight is received, and in accordance with the BRE Guidance do not require further detailed impact assessment.

6.82 It is anticipated that the Proposed Development would also have a significant impact on the daylight and sunlight amenity of Britton House. Windows of this neighbouring building do not overlook the Site directly, however daylight and sunlight amenity is likely to be limited in the baseline condition due to the adjacent mass of Jefferson Place. Impacts on daylight and sunlight amenity resulting from construction of the Proposed Development are potentially significant.

Cumulative Impacts

6.83 In the cumulative condition there is likely to be a significant impact on the daylight and sunlight amenity of Britton House and the daylight amenity of localised parts of Jefferson Place owing to the circa 16 storey massing of the development proposed on land bounded by Cheetham Hill Road, Lord Street and Fernie Street (planning permission ref. 113914/FO/2016). The massing of the proposed 1 Park Place development (planning application ref. 138302/FO/2023) may, in the cumulative consideration, also be a factor in daylight and sunlight amenity impacts to the Hallmark Tower.

6.84 It is not anticipated that any other proposed or committed developments in the vicinity will result in a cumulative impact on the receptors considered as part of this Chapter.

Proposed Methods of Mitigation

6.85 No methods of mitigation are proposed or anticipated.

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Conclusions

6.86 It is anticipated that there will be significant impacts on the daylight and sunlight amenity of the neighbouring receptors.

Methods of Assessment

6.87 The assessment of daylight and sunlight amenity impacts will be undertaking in accordance with the BRE Guidance.

6.88 The BRE Guidance was produced following extensive consultation with architects, planning officers, consultants, professional institutions and Government officials.

6.89 The Guidance was first published in 1991 and superseded the Department of the Environment Guidance "Sunlight and Daylight Planning Criteria and Design of Buildings".

6.90 The current edition (3rd) of the BRE Guidance was published in June 2022.

6.91 Its overall purpose is to assist in evaluating the relationship between new and existing buildings to ensure that each retains the potential to achieve a "fair share" of available daylight and sunlight given their relative siting, height and mass.

6.92 The BRE Guidance is technically robust and has become the industry standard methodology for assessing daylight and sunlight amenity in the built environment.

6.93 The BRE Guidance notes that the provisions and guidance therein are not mandatory, and that they the numerical guidelines should be applied flexibly, appropriate to the Site context. For example, guidelines should be applied flexibly within areas of high density development such as city centres.

6.94 Appendix H of the BRE Guidance outlines how the guidelines within can be applied in the context of Environmental Impact Assessment.

6.95 Assessment will also be made with reference to relevant local and national planning policy.

Receptors

6.96 A noted earlier in this Chapter, the following have been identified as neighbouring receptors worthy of daylight and sunlight impact assessment:

- Hallmark Tower apartment building, 6 Cheetham Hill Road
- Jefferson Place, 1 Fernie Street
- Britton House, 21 Lord Street

6.97 Rooms known to be of non-habitable use are excluded from the assessment.

6.98 There are no other receptors in the vicinity of the Site that merit assessment, based on their use, distance from the Site, orientation or relationship with the Site.

Methodology

6.99 The methodology of the impact assessment will be in accordance with the BRE Guidance.

6.100 A digital 3D massing model of the Site and surrounding will be constructed, using:

- Site survey information
- A point cloud survey laser scan of the neighbouring buildings and facades
- A photogrammetric massing model
- Design information from the architects of the Proposed Development.

6.101 Using specialist software, assessment of the identified receptors will be undertaken in the 'baseline' condition, representing the Site and surroundings as they exist currently.

6.102 Daylight and sunlight amenity in the baseline condition will be measured with reference to the following:

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- Vertical Sky Component ("VSC"); a measure of visible sky taken from the centre of a window;
- Daylight distribution within a room, through measurement of the 'No Sky Line' ("NSL") – a contour line separating those parts of the room in receive of direct skylight from those parts which do not; and
- Probable Sunlight Hours received by neighbouring habitable rooms, measured both annually ("APSH") and during the Winter months ("WPSH").

6.103 Assessment of the same criteria will be undertaken with the Proposed Development in situ.

6.104 The requirement for a cumulative assessment will also be established. If necessary, this will assess the impact of the Proposed Development in tandem with other committed or proposed developments in the vicinity on the neighbouring receptors.

Impact Significance

6.105 The significance of impact will be assessed with reference to both the sensitivity (in daylight and sunlight terms) of a neighbouring receptor, and the magnitude of change in daylight and sunlight amenity experienced by those receptors.

Summary of Assessment Scope

6.106 The residential buildings noted in the table below are identified as daylight and sunlight receptors that merit impact appraisal.

6.107 There are no other buildings in the vicinity, or external amenity spaces that merit impact assessment. Refer to **Table 6.13** below.

Receptor	Impact	Potential Effect	Scoped in / Out
Hallmark Tower	No Significant Impacts Anticipated	Reduction in daylight amenity	Scoped In
Jefferson Place	Significant Impacts Anticipated	Reduction in daylight amenity	Scoped In
Britton House	Significant Impacts Anticipated	Reduction in daylight and sunlight amenity	Scoped In

^ Table 6.13 – Daylight and sunlight receptors

Townscape & Visual Impact

Introduction

6.108 A Townscape and Visual Impact Assessment (TVIA) of the Proposed Development will be undertaken by Chris Burnett Associates as part of the EIA.

6.109 The author, Chris Burnett BSC BLD CMLI, is principal partner of Chris Burnett Associates, a registered practice of landscape architects, who has specialised in tall building Townscape and Visual Impact Assessments, as part of Environmental Statements, for many tall building developments throughout the UK since 2002. This includes 22 tall buildings all of which have received planning consent, in Manchester and Salford, with other schemes in Brighton, London, Leicester, Reading and Liverpool.

6.110 For this topic, the content of the chapter to be included within the ES will be based on the methodology, scope and findings of the TVIA which have been summarised below.

Context

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6.111 The Site is located on Cheetham Hill Road in Manchester. It is currently vacant and lies within an area that is largely characterised by low rise, one to three storey development.

Potential Effects

Impacts of the Proposed Development

6.112 Potential impacts of the Proposed Development can be separated into the following two categories:

- Townscape Impacts: the addition of new elements or features that will influence the character and distinctiveness of the townscape.
- Visual impacts: effects on visual receptors who are most sensitive and least sensitive to changes in the view dependent on the category of receptor.

Cumulative Impacts

6.113 Cumulative impacts of committed and proposed developments that are of sufficient scale to have a potential cumulative impact will be assessed.

6.114 The schedule of major development schemes presented within **Appendix 3** has been reviewed and it is proposed that the TVIA assesses the cumulative impacts of the following committed and proposed developments:

- The approved New Victoria Phase 2 proposals (application ref. 134092/FO/2022);
- The approved proposals for the land bound by Cheetham Hill Road, Lord Street and Fernie Street (application ref. 113914/FO/2016);
- The approved Old Brewery Gardens proposals (application ref. 118831/FO/2018);
- The approved Former Boddington Brewery Site proposals (application ref. 132416/FO/2021) and the current revised proposals (application ref. 137941/FO/2023); and
- The current 1 Park Place proposals (application ref. 138302/FO/2023).

6.115 We would welcome confirmation of details of any further committed or proposed developments which the LPA is aware of, which will need to be taken into consideration as part of the TVIA cumulative impact assessment.

Proposed Methods of Mitigation

6.116 Mitigation will be embedded in the design of the Proposed Development and will be derived as part of an iterative process as the design is developed through consultation with all interested parties.

Conclusions

6.117 It is likely that there will be some significant townscape and visual effects arising from the Proposed Development. The TVIA will assess these effects in accordance with the methodology outlined below and in conjunction with the Visualisation Methodology outlined in **Appendix 5** as part of the EIA.

Methods of Assessment

6.118 The TVIA will focus on assessing the potential effect of the Proposed Development in terms of Townscape Character and Visual Amenity (visual receptors). The assessment will be carried out to a study area of 2.0km radius centre of the site. The main objectives of the TVIA will be to:

- Identify and describe the current townscape character of the study area;

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- Determine the sensitivity of the townscape to the type of development proposed and identify potential effects;
- Identify potential visual receptors to the Proposed Development;
- Evaluate the degree of change and the sensitivity to the type of changes proposed;
- Identify likely adverse or beneficial townscape and visual effects;
- Identify likely significant townscape and visual effects distinguishing between those that are temporary or permanent; short, medium or long term; and
- Consider any remaining residual effects.

6.119 The inclusion of mitigation measures are to avoid and reduce where possible any adverse townscape and visual effects resulting from the Proposed Development and are embedded within the design of the building

6.120 The assessment will be undertaken in four key stages consisting of:

- A thorough desktop study covering an overview of the relevant planning policy context from national to local level, with particular reference to Manchester City Council's Core Strategy 2012 to 2027 plus a more detailed review of the topography and surrounding features, to determine the potential visibility of the development. The establishment of baseline townscape and visual conditions including any changes likely to occur independently of the development, as well as determining the value attached to the different resources follows on from this.
- A Zone of Theoretical Visibility (ZTV) map will be produced using Lidar data superimposed onto a 10K map to provide an indication of the Proposed Development's visibility and guide the selection of viewpoints.
- A number of 'Representative Viewpoints' will then be selected and agreed with the LPA, MCC in this case, all within the identified ZTV. They will be confirmed following extensive fieldwork. This will inform the assessment of the effect of the Proposed Development on townscape character, views and visual receptors in more detail and on a comprehensive basis, taking in short, medium and long range views, all from publicly accessible viewpoints agreed with the Local Planning Authority. A Plan of the Proposed Representative Viewpoints is provided at **Appendix 6** for review and comment by the LPA.
- The assessment will be undertaken to determine the potential townscape and visual effects of the proposed development and will be supported by Accurate Visual Representation (AVRs) consisting of rendered and wireline images of the Proposed Development superimposed onto baseline photographs which are accurately surveyed from selected viewpoints. Landscape Institute Technical Note 06/19 (Visual Representation of Development Proposals) will be used to inform the methods for production of visualisations but a Type 4 Photomontage / Photowire (Survey/ Scale Verifiable) is deemed an appropriate level of visualisation in these circumstances. The methodology for this approach is identified in **Appendix 5**.
- The development will then be assessed in relation to cumulative townscape and visual effects occurring when additional effects are caused by the proposed development in conjunction with other developments associated with or separate to it. Cumulative townscape effects can impact either the physical fabric or character of the townscape or any special value attached to it. Cumulative visual effects can be caused by combined visibility, which occurs where the observer is able to see two or more developments from one viewpoint and / or sequential effects when the observer moves to another viewpoint to see another development.

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7. Topics to be 'Scoped Out' of the EIA

7.1 In line with the relevant legislation and policy, consideration has been given to the potential for significant environmental effects to arise as a result of the Proposed Development. The following technical discipline areas and associated potential significant effects have been considered:

i. Air Quality

ii. Archaeology

iii. Ecology/Biodiversity

iv. Ground Conditions

v. Heritage

vi. Noise

vii. Transport

viii. Flood risk and drainage

ix. Wind

7.2 The relevant technical consultants for the above disciplines have concluded that the Proposed Development will not give rise to any likely significant environmental effects with regard to each of these disciplines and therefore would not warrant inclusion within the ES:

7.3 A summary of these matters and the conclusions drawn are considered below and overleaf:

i. Air Quality

Introduction

7.4 A standalone Air Quality Assessment is being prepared for the Proposed Development by IDOM Merebrook Limited (IDOM) to assess the potential air quality impacts during its construction and operation. The IDOM air quality team members involved at various stages of the assessment have professional affiliations that include membership of the Institute of Air Quality Management (IAQM). The assessment will be overseen by Kat Johnson, a Chartered Scientist with over 12 years' experience in air quality assessment.

Context

7.5 The Site is located within an Air Quality Management Area (AQMA) which has been declared by the Greater Manchester Combined Authority (GMCA) in respect of annual mean nitrogen dioxide (NO_2) and 24-hour mean PM10 concentrations.

Potential Effects

Construction Phase

7.6 During the construction phase, the Proposed Development has the potential to result in dust soiling and an increase in suspended particulate matter at sensitive receptors in the vicinity.

Operational Phase

7.7 The main existing source of air pollution in the vicinity of the Site is expected to be traffic on the local road network. The Proposed Development has been designed to be car-free and is not, therefore, anticipated to generate a significant increase in traffic.

7.8 However, it is noted that tall buildings are present on the eastern side of Cheetham Hill Road. The introduction of the Proposed Development could, therefore, potentially create a 'street

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canyon' effect resulting in reduced dispersion of air pollutants which could increase concentrations experienced by existing receptors on the opposite side of Cheetham Hill Road

7.9 No representative monitoring data monitoring is currently undertaken by MCC along Cheetham Hill Road. Due to the potential for elevated levels of air pollution associated with existing traffic emissions along Cheetham Hill Road, the suitability of the Site for the proposed residential use will also be considered in the assessment.

Methods of Assessment

Construction Phase

7.10 There is potential for dust and fine particulates to be generated during demolition of the existing structures and construction of the Proposed Development. The level of risk will be assessed using the methodology recommended in 'Guidance on the assessment of dust from demolition and construction' document produced by the IAQM in 2014.

Operational Phase

7.11 Due to the potential for elevated levels of air pollution associated with existing traffic emissions along Cheetham Hill Road, and the potential for the proposed development to have an adverse impact on dispersion of emissions, detailed modelling has been undertaken to inform the assessment. The significance of impacts has been assessed in accordance with the '*Land-Use Planning & Development Control: Planning For Air Quality*' guidance document produced jointly by Environmental Protection UK (EPUK) and the IAQM in 2017.

7.12 The land bound by Cheetham Hill Road, Lord Street and Fernie Street (on the opposite side of Cheetham Hill Road to the Site) benefits from an extant planning consent for a 16-storey residential-led development (reference 113914/FFO/2016). Due to the potential for this development to introduce additional receptors in future and also exacerbate the potential street canyon effect in combination with the Proposed Development, this building has been included in the dispersion modelling exercise and impacts have been assessed as though it is currently occupied.

7.13 The modelling predicts 'moderate adverse' impacts at the roadside façade of the 1 Lord Street development. However, this is an overestimation of impacts as it reflects the combined impact of introducing both the Proposed Development and the 1 Lord Street development simultaneously. Moreover, overall air pollutant concentrations at all receptors are predicted to remain well below the relevant air quality objectives. On this basis, no significant environmental effects are anticipated in relation to air quality.

Proposed Methods of Mitigation

7.14 Mitigation measures commensurate with the assessed level of risk will be recommended within the Air Quality Assessment to minimise dust generation and off-site migration during construction of the Proposed Development.

7.15 It is anticipated that the implementation of any recommended mitigation measures throughout the demolition and construction phases could be secured via planning condition, such that the overall residual effect of the Proposed Development on local air quality would not be significant.

7.16 A Travel Plan will be submitted with the planning application to encourage sustainable modes of transport and minimise vehicular trips associated with the Site.

Conclusions

7.17 It is considered that any potential impacts on Air Quality can be fully addressed within the planning process through the submission of the standalone Air Quality Assessment. **As no significant environmental effects are anticipated in relation to air quality, it is considered that this topic can be scoped out of the EIA.**

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ii. Archaeology

Introduction

7.18 An Archaeological Desk-based Assessment of the Proposed Development has been prepared by Salford Archaeology and is included within **Appendix 7**. This takes into account the archaeological potential and significance of the Site and has been carried out by Katie Fletcher - Project Officer (Heritage Consultancy) at Salford Archaeology. Katie has a BA (Hons) degree in Archaeology. Katie has experience in the production of desk-based assessments, scoping reports, ES Chapters, historic environment assessments, heritage statements, post-excavation assessments and supervising archaeological fieldwork.

Reference Materials and Standards

7.19 The significance of the archaeological resource identified on the Site has been assessed as recommended in the revised National Planning Policy Framework (Ministry of Housing, Communities & Local Government, 2021), Paragraph 194, 203 and 205.

7.20 The Assessment has been undertaken in line with the following policy and guidance:

- Manchester Core Strategy 2012 – 2027 (adopted 2012) – Policy EN3.
- Manchester's Historic Environment mapping page (pending a HER search request).
- Chartered Archaeologists' (CIfA's) Standards and Guidelines for Historic Environment Desk Based Assessments (CIFA, 2017).
- Annex 1 of 'Scheduled Monuments: identifying, protecting, conserving and investigating nationally important archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979' (DCMS, 2013).
- English Heritage 2006, Management of Research Projects in the Historic Environment (MoRPHE).
- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties' issued by the International Council on Monuments and Sites (ICOMOS) in January 2011 (ICOMOS, 2011).

Context

7.21 During the medieval and post-medieval period, the Site likely lay within the Strangeways estate. By at least the late 18th century, the Site consisted of an open field within Strangeways Park.

7.22 By the early 19th century, four double-depth houses and a slightly larger dwelling had been constructed within the Site. The properties had front and back gardens and may have included cellars.

7.23 The arrangement of buildings within the Site remained unchanged until the mid-20th century, when the houses were progressively cleared. The Site was redeveloped into a garage by 1990 but this is no longer in use.

Potential Effects

Impacts from the Proposed Development

7.24 Initial research has shown that the Site is of limited archaeological interest, with potential to contain buried remains dating from the industrial period. Therefore, the Site most likely contains non-statutory archaeological remains of negligible significance.

7.25 The delivery of the Proposed Development will involve site clearance, including hard-standing surfaces, and the erection of a c. 18-23 storey residential development. The delivery of the scheme will involve ground-breaking works that have the potential to affect any surviving archaeological remains within the Site. Due to the limited research potential of the archaeological remains (considered to be of negligible significance), no mitigation is required.

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Cumulative Impacts

7.26 No anticipated effects will arise from cumulative development.

Proposed Methods of Mitigation

7.27 Following consultation with the Greater Manchester Archaeological Advisory Service (GMAAS), in their capacity as archaeological advisor to MCC, it is anticipated that no further archaeological investigation will be required.

Conclusions

7.28 The Proposed Development will involve ground-breaking works that have the potential to affect any surviving archaeological remains within the Site. The potential for archaeological remains within the Site includes limited potential of garden soils and high potential for cellars associated with 19th-century housing. However, remains of garden soils and 19th-century houses have limited research potential and are therefore considered to be of negligible significance.

7.29 It would thus be appropriate for archaeological issues to be 'scoped out' of the EIA, given that a comprehensive archaeological desk-based assessment to assess the potential impact of the Proposed Development on the sub-surface archaeological resource has been prepared and will be submitted with the planning application.

7.30 **Consequently, it is considered that there will be no archaeological impacts which will give rise to the need for an EIA.**

iii. Ecology / Biodiversity

7.31 With regards to the consideration of ecological effects of the Proposed Development, an Ecological Walkover Survey and Preliminary Roost Assessment has been prepared by E3P and is included within **Appendix 8**.

7.32 The site visit and subsequent production of the report were undertaken by Graduate Ecologist Conor Evans BSc (Hons) MRes, QCIEEM, overseen by Associate Director, Celia Barlow BSc (Hons), MSc, MIEnvSc, CEnv, MCIEEM.

7.33 The Preliminary Assessment provides an assessment of the baseline conditions on the Site. It concludes the Site has limited value to support notable species, and mitigation is suggested which will adequately negate any negative impacts.

7.34 Further nocturnal bat surveys have been recommended which are yet to be undertaken, however no roosts of high conservation status are anticipated to be present on site.

7.35 The site will be exempt from biodiversity net gain due to the lack of baseline habitats present within the site.

7.36 **With consideration to the above matters, E3P has consequently confirmed that it is not anticipated that there will be any likely significant impacts on ecology and biodiversity as a result of the Proposed Development, and any potential impacts on Ecology can be fully considered though the planning process through the submission of the Ecological Assessment.**

iv. Ground Conditions

7.37 A Geo-environmental Investigation & Assessment of the Proposed Development has been undertaken by WML Consulting in October 2022 and can be found in **Appendix 9**.

7.38 Geotechnical and geo-environmental testing was undertaken as part of the site investigation and the results are presented within the Assessment.

7.39 Based on the information presented in the Geo-environmental Investigation & Assessment**, it is not considered that there would be any impacts from the Proposed Development that would trigger a need for an Environmental Impact Assessment with regards to Ground Conditions**. As such, it is recommended that this element is scoped out of the ES.

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v. Heritage

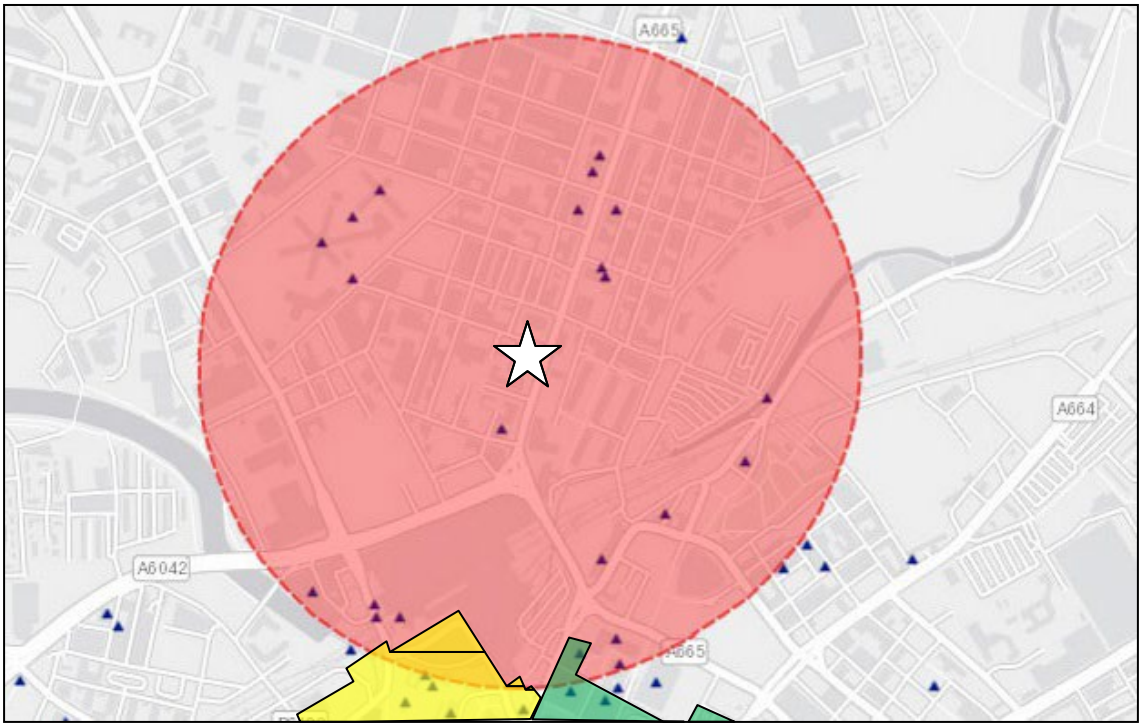
7.40 A Heritage Statement is being undertaken by Stephen Levrant Heritage Architecture Ltd and will be submitted with the planning application.

7.41 The report will be completed by Lee Hutchings who has over 17 years of experience in the private sector and is an affiliate member of the IHBC.

7.42 It has been confirmed that there are no designated or non-designated heritage assets within the Site and the Site is not located within or close to any designated conservation areas.

7.43 For the purposes of the Heritage Visual Impact Assessment (which will form part of the Heritage Statement), a 500m radius around the Site is considered appropriate in order to understand the sensitivities of the Site and its contribution to the wider built historic environment. It has been confirmed that within a 500m radius of the Site there are 22 listed buildings (listed in **Table 7.1** below).

7.44 There are no registered battlefields, registered parks and gardens, scheduled monuments or world heritage sites.



^ Figure 7.1 – Map showing the location of the 22 listed buildings (numbered) within a 500m radius of the Site (white star). The Cathedral Conservation Area is shown shaded yellow and the Shudehill Conservation Area is shown shaded green.

Asset Number	Name/descriptor	Grade	List Entry Number
01	Former Synagogue	II	1208420
02	Roman Catholic Church Of St Chad And Presbytery St Chads Presbytery	II	1208542
03	Churchyard Walls Of Roman Catholic Church Of St Chad	II	1197786
04	Former Free Library	II	1293124
05	Knowsley Hotel	II	1197784
06	Cheetham Town Hall (Former)	II	1208440

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Asset Number	Name/descriptor	Grade	List Entry Number
07	Cheetham Town Hall Annexe (Former)	II	1283065
08	Gatehouse Of HMP Manchester	II	1254670
09	Main Prison Block Of HMP Manchester	II	1254636
10	The Tower Of HMP Manchester	II	1254672
11	Former Boys Prison Block Of HMP Manchester	II	1254635
12	Union Bridge	II	1255163
13	Charter Street Mission (Formerly Charter Street Ragged School And Working Girls' Home)	II	1461979
14	Ashton House	II	1197764
15	Parkers Hotel	II	1208963
16	New Century House, Including Its Attached Conference Hall And Abstract Concrete Relief Wall In The Entrance Piazza	II	1255052
17	Cooperative Wholesale Society Building To North Of Junction With Hanover Street	II	1197765
18	Cooperative Society Building	II	1247472
19	Victoria Station Including Concourse To Rear With Restaurant And Booking Hall	II	1254725
20	Middle Bridge	II	1392488
21	North Bridge	II	1392698
22	Manchester Parcel Post Office	/	1389630
23	Cathedral Conservation Area	/	/
24	Shudehill Conservation Area	/	/

^ Table 7.1 – Listed Buildings and Conservation Areas within 500m radius of the Site

7.45 Due to the dense typology surrounding the Site and the visibility of the Proposed Development from surrounding streets/buildings, as highlighted on the Zone of Visual Influence plan (ZVI) provided by Chris Burnett Associates (see **Appendix 6**), it is considered that a considerable number of listed buildings will not be susceptible to potential indirect impacts from development of the Site, and are not considered to give rise a significant effect in EIA terms. Consequently, a total of 8 listed buildings (shaded orange in **Table 7.1** above) and one conservation area (The Cathedral Conservation Area – shaded yellow in **Table 7.1** above) form part of the Heritage Visual Impact Assessment.

7.46 Any potential impacts on Built Heritage will be adequately assessed within the supporting Heritage Statement (including Heritage Visual Impact Assessment), which will assess the significance and setting of the heritage assets and include an impact assessment in accordance with the Planning (Listed Buildings and Conservation Areas) Act 1990, the National Planning Policy Framework (NPPF) and local planning policy considerations.

7.47 **In summary, the Proposed Development is not considered to have any significant effects in respect of Heritage and consequently it is proposed that Heritage is scoped out of the ES.**

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vi. Noise

7.48 A Noise Impact Assessment Report has been prepared by Andrew Jameson, BSc(Hons) Acoustics, MIOA, MIET; Director at Jameson Acoustics Limited, which will be submitted as part of the planning application. This is contained within **Appendix 10**.

7.49 The Site's most recent previous use was as a car wash and dealership facility, located in close proximity to a number of existing residential properties. The proposed change of use to residential is considered likely to result in a beneficial change in noise environment in the vicinity of existing residents.

7.50 Noise levels on the Site have been surveyed and were noted to be dominated by road traffic on Cheetham Hill Road, which runs along the eastern boundary. There are a number of commercial offices and industrial warehouses to the west, but none of these were noted to produce any notable noise impacts onto the Site. All surrounding local roads to the west are minor access roads with low traffic flows relative to Cheetham Hill Road.

7.51 It is considered that adverse impacts associated with the existing noise environment at the Site can be completely removed within proposed dwellings with the inclusion of appropriately specified double glazed windows and suitable ventilation systems, in the context of the area.

7.52 It is considered that noise and vibration associated with the construction of the Proposed Development could be managed and mitigated effectively through a Construction Environmental Management Plan (CEMP) using relative standard prescriptive methods of noise/vibration control, in the context of the site location. The requirement for a CEMP could be secured via planning condition.

7.53 As a result, it is considered unlikely that potential significant adverse effects would occur and any potential noise impacts could be fully considered though the planning process through the submission of the Noise Impact Assessment Report.

7.54 **The Proposed Development is therefore not considered to have any significant effects in respect of Noise and consequently it Is proposed that this topic is scoped out of ES.**

vii. Transport

Introduction

7.55 SK Transport Planning Limited (SK) will prepare a Transport Statement in respect of the Proposed Development that will consider the environmental effects of transport and movement. The Transport Statement will be prepared by suitably qualified members of the SK Transport Planning team that have an engineering degree and / or an MSc degree in a relevant discipline and are members of the Chartered Institution of Highways and Transportation.

Reference Materials and Standards

7.56 The Transport Assessment will be undertaken in line with the following policy and guidance:

- Chartered Institution of Highways and Transportation (2019), Better planning, Better Transport, Better Places
- Department for Transport (2007), Guidance on Transport Assessment
- Institute of Environmental Management and Assessment (1993), Guidance Note Number 1: Guidelines of the Environmental Assessment of Road Traffic
- Manchester City Council (2007), The Guide to Development in Manchester SPD
- Manchester City Council (2012), Core Strategy
- Manchester City Council (2016), Residential Quality Guidance
- Manchester City Council (2018), Great Ducie Street Strategic Regeneration Framework

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- Ministry of Housing, Communities and Local Government (2016), Planning Practice Guidance
- Ministry of Housing, Communities and Local Government (2021), National Planning Policy Framework
- Transport for Greater Manchester (2013), Transport for Sustainable Developments
- TRICS (2022), TRICS Good Practice Guidance

Baseline Conditions

Site Location

7.57 The Site is bounded by Carnarvon Street to the north, Cheetham Hill Road to the east, Gibson Place to the west, and commercial properties to the south.

7.58 The Site sits on the northern edge of the city centre within the Great Ducie Street Strategic Regeneration Framework (SRF) area. It is less than a 15-minute walk to the core of the city and is within less than a 10-minute walk of Victoria Station.

Site Uses

7.59 Planning consent was granted at Appeal in 2018 for the development of a 147-bedroom hotel on the Site. It is understood that this consent has now lapsed.

7.60 The Site use, prior to this consent was for vehicle services, was a car wash and dealership facility. With the lapse of the consented use, the historic use could be brought back in to use at the Site. The historic permitted use of the Site is therefore the baseline against which the impact of the Proposed Development will be assessed.

7.61 Vehicle access to the Site is provided from two locations on Cheetham Hill Road and one location on Carnarvon Street.

Local Highway Network

7.62 Carnarvon Street routes east-west along the northern boundary of the site, providing access from Cheetham Hill Road to commercial uses to the west of the Site and also providing a route through to the A56 Great Ducie Street. Carnarvon Street is a single carriageway road with footways on both sides of the carriageway. The road is subject to a 30mph speed limit and street lighting is present.

7.63 At its eastern end Carnarvon Street meets Cheetham Hill Road at a priority junction arrangement. Dropped kerbs are present at the junction, but tactile paving is not.

7.64 Cheetham Hill Road forms part of the Key Route Network and routes north-south on the eastern boundary of the Site providing access between north Manchester and the city centre. Wide footways are provided on both sides of the carriageway and street lighting is present. The road is subject to a 30mph speed limit. Signalised crossings are provided 56m to the north of the Site at the junction with Lord Street and 190m to the south of the Site at the junction with New Bridge Street.

7.65 Gibson Place sits on the western boundary of the Site. Gibson Place provides a service function for the commercial uses to the south of the Site. On-line street information software indicates that the route does form part of the adopted highway network, and this is verified by the existing road markings and gulleys.

Traffic Regulation Orders – Parking Controls

7.66 Traffic Regulation Orders are present on Cheetham Hill Road and in the vicinity of the Site these are single line controls that prevent waiting and loading during peak periods (8am to 9.30am and 4pm to 6.30pm Monday to Friday and 8am to 9.30am Saturday).

7.67 In the vicinity of the Site Carnarvon Street is subject to Traffic Regulation Orders in the form of single line controls and white lined parking bays. Waiting on the single yellow lines is prohibited between 8am and 6pm (Monday to Friday) and 8am to 12.30pm (Saturday). The white lined

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bays permit parking for two hours (no return in one hour) between 8am and 6pm (Monday to Friday) and 8am to 12.30pm (Saturday). White lined parking bays are in place to the east of the Carnarvon Street Site access junction, to the west of the Gibson Place junction, and on the opposite side of the road to the Site.

7.68 Gibson Place is subject to single line controls which prohibits waiting between 8am and 6pm (Monday to Friday) and 8am to 12.30pm (Saturday).

7.69 There are no loading controls on Carnarvon Street and Gibson Place in the vicinity of the Site.

Collision Records

7.70 The TfGM (GMTU) database has been used to establish collision patterns over the most recent five-year period available. The database states that the current data is five years to 1st December 2022.

7.71 The database confirms that there have been no accidents on the Carnarvon Street frontage during the five-year period assessed.

7.72 A single accident occurred at the junction of Carnarvon Street / Cheetham Hill Road during the period assessed. The accident was classified as slight and occurred in 2020. The accident did not involve a pedestrian or cyclist.

7.73 Two accidents occurred on the Cheetham Hill Road Site frontage to the south of Carnarvon Street during the period assessed. The accidents were both classified as slight and occurred in 2016 and 2018. The accident in 2018 involved a pedestrian.

7.74 The accident data does not indicate a prevalent accident issue on the roads fronting the Site. The TfGM database shows that Cheetham Hill Road carries 22,126 vehicles per day and the level and severity of accidents is in keeping with what would be expected for this type of road.

Active & Sustainable Accessibility

7.75 There are 2m-2.3m wide footways on both sides of the Carnarvon Street carriageway. Dropped kerbs are present at the junctions with Gibson Place and Cheetham Hill Road, but tactile paving is not provided.

7.76 Cheetham Hill Road has a 3.5m wide footway adjacent to the Site and 2.3m wide footway on the opposite (eastern) side. Cheetham Hill Road is the principal pedestrian route from the Site to the city centre. The footways continue southbound providing a suitable width provision.

7.77 Signalised crossings are provided 56m to the north of the Site at the junction with Lord Street and 190m to the south of the Site at the junction with New Bridge Street. The New Bridge Street crossing is a toucan. These crossings provide a suitable means of accessing destinations on the opposite side of Cheetham Hill Road and southbound bus stops.

7.78 Carnarvon Street, and the other local roads surrounding the Site, provide a suitable means of accessing the more formal routes located on highway links with more traffic, such as to the south on Cheetham Hill Road and routes on Great Ducie Street. These routes then provide a connection to the network through the city centre and the strategic routes radiating out of the city centre. The routes on the south of Cheetham Hill Road and Great Ducie Street are on-carriageway, marked facilities. Advanced cycle stop lines are also provided at the junctions to the north and south of the Site at the Cheetham Hill Road junctions with Lord Street and New Bridge Street.

7.79 Mapping GM database shows the Bee Network in this area of the city. It shows that a new route will be provided from Lord Street to New Islington which will improve connectivity along the north-eastern edge of the city centre.

7.80 The nearest bus stops to the Site are located 79m to the south of the Site on Cheetham Hill Road. The northbound bus stop has a shelter, flag pole, timetable information and raised bus boarder. The southbound bus stop is of recent construction and has a flag pole, timetable information and raised bus boarder. Controlled crossings are in place to allow access to services on the opposite side of the road.

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7.81 The Site is served by 20 buses per hour on a weekday and at least 18 buses per hour at the weekend. Services are also available in the evening.

7.82 The nearest tram stops and train station to the Site are located at Manchester Victoria, 600m from the Site. Victoria Station is served by frequent trains and trams providing access to destinations across the Region and beyond.

7.83 A Greater Manchester Accessibility Level (GMAL) assessment has been undertaken of the Site. A GMAL is calculated using the interactive tool managed and maintained by TfGM. This tool measures accessibility by public transport of a point of interest and provides a score between 1 and 8, where 1 is a low level of accessibility and 8 is the highest level of accessibility. The Site has a GMAL of 8 (score: 37.75).

7.84 There may be occasions when residents at the Site require the use of a car. Car clubs provide an alternative to car ownership that complements the sustainable transport system Greater Manchester. Car clubs enable members to benefit from pay-as-you-go low cost, convenient and greener motoring, and a more sustainable pattern of living that provides access for ad-hoc vehicle use and negates the requirement to own and store a car.

7.85 Enterprise Car Club vehicles are located across the city with the nearest vehicle to the Site located on New Mount Street.

7.86 The active and sustainable infrastructure serving the site provides opportunities for active trips to / from the development to city centre destinations.

Baseline Site Traffic

7.87 The Site is brownfield site which is currently not in use. While not currently in use, the permitted use of the Site is for vehicle service facility, and this could be reinstated at the Site and is therefore the baseline against which the development impact should be assessed. The most recent use of the Site was as a car wash and dealership facility.

7.88 The TRICS database has been used to establish the baseline traffic flows associated with the Site. The car sales trip rates are based on both external and internal site areas. The total Site area is 0.1268ha.

7.89 The baseline Site use trip rates used in the assessment are presented in **Table 1.1**.

Period	In	Out	Total
AM Peak Hour (trip rate per ha)	62.581	22.581	85.162
PM Peak Hour (trip rate per ha)	21.935	58.71	80.645
Daily	413.013	403.2	816.213

^ Table 7.2 – TRICS Trip Rates (Baseline Site Use)

7.90 The total existing Site traffic flows based on the trip rates are presented in **Table 1.2**.

Period	In	Out	Total
AM Peak Hour	8	3	11
PM Peak Hour	3	7	10
Daily	52	51	103

^ Table 7.3 – Baseline Site Traffic Flows

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Potential Effects

Proposed Development Assumptions

7.91 The preliminary impact assessment is based on the following Proposed Development assumptions as per the current draft layout for the scheme:

- Apartments – 263 units
- Commercial – 85sqm

7.92 The main entrance to the building will be on Cheetham Hill Road with secondary entrances to the bin store provided on Carnarvon Street and to the cycle stores on the southern boundary.

7.93 The footway bounding the Site will be resurfaced and redundant accesses closed and reinstated. Dropped kerbs are provided at the junctions of Carnarvon Street / Cheetham Hill Road and Carnarvon Street / Gibson Place, but tactile paving is missing. The applicant will fund the introduction of tactile paving at these locations.

7.94 Cycle parking will be provided within the building at a rate of 1 space per unit, with 50% of the cycles provided in a ground floor store and 50% provided within the apartments.

7.95 The cycle store would provide most of the parking in a racking system and separate provision for adaptable bikes would also be provided (sheffield stand). A cycle cleaning area would be provided in the cycle store.

7.96 The Site is car free. The Council's parking policy allows Blue Badge holders to park for free and unlimited duration in street parking bays across the city. The Site relates well to existing parking bays where disabled residents could park. The proposal will provide two disabled white lined spaces on Carnarvon Street. The applicant will fund the modifications required to the existing TRO to accommodate these spaces. There is an opportunity to also provide a white lined bay for use by a car club vehicle on Carnarvon Street as part of the TRO proposal.

7.97 A white lined loading bay will be provided on Carnarvon Street for use by delivery and refuse vehicles. The applicant will fund the modifications required to the TRO to facilitate the loading bay.

7.98 The development will be supported by a Travel Plan.

Construction Phase Impacts

7.99 Construction movements are usually limited to regular but low level traffic volumes over a course of a working day and are comprised of contractor cars, light goods vans and larger vehicle movements. Construction activity typically occurs prior to the morning peak period and is complete prior to the evening peak period.

7.100 In SK Transport Planning's experience of constructing developments of this type and scale, daily construction traffic flows are typically less than 100 vehicles per day, which is similar to the traffic flows associated with the baseline use of the site.

Proposed Development Impacts

7.101 The TRICS database has been used to generate the trips associated with the Proposed Development.

7.102 In line with "TRICS Good Practice Guidance" comparable sites have been derived for the forecast based on adjustments to locational and accessibility qualities, rather than regions. Section 4 of the guidance states that:

> *"Bearing in mind the results of our research, with hard data now being available, it is not considered good practice to exclude survey sites within the TRICS database on the sole basis of such sites being located in a specific region."*

7.103 The TRICS software now also includes a warning on the region selection page that states that:

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"The TRICS Good Practice Guide provides guidance on the selection/deselection of sites by area and region. It is preferred that selection/deselection of sites is undertaken by considering various local factors, including location type, population levels, car ownership, etc, with the deselection of regions not taking place without these factors being considered. Research undertaken by TRICS investigated potential variations in trip generation by region, with the results suggesting that there were not any conclusive differences when picking out various regions and areas. Cross-region data inclusion should therefore be the norm rather than the exception, with the correct filtering of various data field criteria being of most importance."

7.104 In line with this, no adjustment has been made to the regions in the sample. Instead, the locational parameters have been set to reflect the site's characteristics and the accessibility parameters have been set to ensure that the sample includes sites with the same or worse level of accessibility as the site.

7.105 The site provides no car parking and in terms of vehicle trips will generate traffic associated with delivery / refuse collection and taxi movements. TRICS now enables users to select sites that have specific service movement surveys, and these have been selected for the trip generation.

7.106 The trip rates used in the assessment are shown in **Table 7.4**.

Period	In	Out	Total
AM Peak Hour (person trip rate per unit)	0.094	0.544	0.638
AM Peak Hour (LGV trip rate per unit)	0.008	0.004	0.015
AM Peak Hour (OGV trip rate per unit)	0	0	0
AM Peak Hour (taxi trip rate per unit)	0.007	0.006	0.013
PM Peak Hour (person trip rate per unit)	0.408	0.198	0.606
PM Peak Hour (LGV trip rate per unit)	0.011	0.004	0.015
PM Peak Hour (OGV trip rate per unit)	0	0	0
PM Peak Hour (taxi trip rate per unit)	0.005	0.005	0.01
Daily (person trip rate per unit)	2.976	2.913	5.889
Daily (LGV trip rate per unit)	0.124	0.125	0.249
Daily (OGV trip rate per unit)	0.012	0.012	0.024
Daily (taxi trip rate per unit)	0.071	0.071	0.142

^ Table 7.4 – Apartment Trip Rates (Private Dwellings)

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7.107 **Table 7.5** shows the AM and PM peak hour and daily trips associated with the Proposed Development.

Period	In	Out	Total
AM Peak Hour Person Trips	22	128	151
AM Peak Hour LGV Trips	2	2	4
AM Peak Hour OGV Trips	0	0	0
AM Peak Hour Taxi Trips	2	1	3
PM Peak Hour Person Trips	96	47	143
PM Peak Hour LGV Trips	3	1	4
PM Peak Hour OGV Trips	0	0	0
PM Peak Hour Taxi Trips	1	1	2
Daily Person Trips	702	687	1390
Daily LGV Trips	29	30	59
Daily OGV Trips	3	3	6
Daily Taxi Trips	17	17	34

^ Table 7.5 – Total Development Traffic Flows

7.108 **Table 7.6** shows the residual traffic flows generated by the Proposed Development.

Period	In	Out	Total
AM Peak Hour Residual Traffic Flows	4	4	8
PM Peak Hour Residual Traffic Flows	4	2	6
Daily Residual Traffic Flows	49	49	98

^ Table 7.6 – Residual Traffic Flows

7.109 The IEMA's guidance sets out general principles of when to assess the significance of environmental transport effects. The decision on whether to assess environmental effects is based initially on the IEMA screening thresholds where a 30% increase in traffic flows (Rule 1) or 10% increase in traffic flows (Rule 2) in sensitive areas.

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7.110 The daily impact of the Proposed Development has been examined against the existing daily traffic flows on Cheetham Hill Road. This shows that, as a worst case with no inclusion of the baseline site use traffic in the base, the development will result in a 0.59% increase in traffic on the local highway network. Again, this is well below both the IEMA Rule 1 (30%) and Rule 2 (10%) screening thresholds.

7.111 **Tables 7.3** and **7.6** show that the total traffic flows associated with Proposed Development will not be significantly different to that associated with the baseline site activity.

7.112 The Proposed Development is also shown to occupy a sustainable location whereby future site users will be able to access by sustainable modes and can readily connect to local services and amenities.

Cumulative Impacts

7.113 As the Proposed Development will not significantly change the traffic flows associated with the site then there will be no cumulative effects.

Proposed Methods of Mitigation

7.114 A Construction Management Plan will be prepared at an appropriate time in the development process to set out consideration of the measures that will be used to ensure safe, efficient and environmentally considerate construction practices. The Construction Management Plan will outline measures such as the following:

- Appropriate vehicle access locations and temporary pedestrian movement arrangements.
- Delivery management measures to reduce conflict with vulnerable road users and the impact during peak periods.
- Measures to reduce effects on dirt and dust
- Promotion of sustainable access and appropriate parking locations

7.115 Complementary measures will be provided with the Proposed Development to support active and sustainable trip making and to reduce the reliance on the private car. These will include:

- Appropriate levels of cycle parking
- Disabled street parking spaces
- Car club street parking space
- Improvements to bounding footways
- Resident Travel Plan

Conclusions

7.116 **The preliminary assessment confirms that the Proposed Development will not result in a change in site traffic that exceeds IEMA significance / screening thresholds and therefore there are unlikely to be any significant environmental impacts arising.**

7.117 Therefore, a separate ES Transport Chapter is not required for the planning application and a Transport Statement will be submitted with an Interim Travel Plan. The Transport Statement will include consideration of the environmental effects of the Proposed Development from a transport and movement perspective in line with best practice guidance.

7.118 Specifically, the following elements will be presented in the Transport Statement:

- Introduction – Background to the Proposed Development, Scope of the Assessment, and Relevant Policy Guidance.
- Baseline Situation – Characteristics / Location of the Site, Local Highway Network Qualitative Review, Traffic Regulation Order Review, Baseline Site Uses, Baseline Site Traffic Flows, and Road Safety Records.

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- Proposed Development – Description, Servicing / Refuse Collection Arrangements, Disabled and Cycle Parking Provision, Bounding Footway Proposals, Traffic Regulation Order Modifications, and Interim Travel Plan Measures.
- Accessibility Assessment – Audit of Walking / Cycling Networks, Details of Access to Amenities and Services, Public Transport Accessibility / GMAL, Travel Plan / Strategy Measures, and Policy Compliance
- Traffic, Parking and Road Safety Assessment – Proposed Development Trip Generation, Net Site Traffic Impact, Car-Free Parking Assessment / Compliance, and Road Safety Statement, and Policy Compliance.

7.119 A Transport Statement Scoping Report has been prepared and is attached as **Appendix 11**.

viii. Flood risk and drainage

Introduction

7.120 A Flood Risk Assessment and Drainage Strategy has been undertaken by Renaissance for submission as part of the planning application and this is included within **Appendix 12**.

Reference Materials & Standards

7.121 The Flood Risk Assessment and Drainage Strategy have been completed in accordance with guidance set out in the following documents:

- National Planning Policy Framework (NPPF), Ministry of Housing Communities & Local Government – July 2021
- Planning practice guidance (PPG) – Ministry of Housing Communities & Local Government – July 2021
- Flood risk assessments: climate change allowances – Environment Agency – October 2021
- Greater Manchester Combine Authority Strategic Flood Risk Assessment (GMCA SFRA) – March 2019

Context

7.122 The Site is located to the north of Manchester City Centre, bounded by Gibson Place, Carnarvon Street and Cheetham Hill Road. The total site is located over an area of 0.575 hectares on a previously developed brownfield site, most recently used as a car wash and dealership facility.

7.123 The Site is located within Flood Zone 1, as per the Environment Agency (EA) Flood map for planning. The Site is located within a Critical Drainage Area, as per the Greater Manchester Combined Authority Strategic Flood Risk Assessment.

7.124 The topography of the Site varies from the highest point of approximately 45.0m AOD in the south west corner of the Site to the lowest point of approximately 44.0m AOD in the south east corner.

Potential Effects

7.125 The existing Site is 95% covered by impermeable area due to the Site being historically developed with minimal soft landscaping. Therefore, any increase in impermeable area is likely to be negligible to none.

7.126 Levels for the Proposed Development will be designed to tie in with existing topographical levels of the Site, meaning surface water run-off is unlikely to be adversely affected.

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7.127 There will be an increase in foul water flow from the Site as a result of the Proposed Development, which is proposed to discharge to the local public sewer network, subject to confirmation with the local wastewater service provider (United Utilities).

Proposed Methods of Mitigation

7.128 Consultation will be undertaken with Manchester City Council as Lead Local Flood Authority (LLFA) regarding the recommendations presented within the Flood Risk Assessment and Drainage Strategy. United Utilities (UU) will be approached to confirm acceptable points of connection for surface water runoff and foul water discharge into the public sewer network.

7.129 The significance of flood risk has been assessed using criteria outlined in the NPPF. The Flood Risk Assessment includes a desk-based review of historical reports, local planning policy, the Strategic Flood Risk Assessment, topographical surveys and baseline information available from the EA.

7.130 The level of discharge from the Proposed Development will then be quantitatively assessed and an outline drainage strategy formulated for the disposal of the development-generated run-off, incorporating sustainable drainage techniques where feasible, to limit run-off to agreed post-development run-off rates. The recommendations of the strategy will be used to refine the proposed site layout.

7.131 All surface water falling within the site boundary will be collected and stored within the site boundary by use of attenuation measures, incorporating sustainable urban drainage techniques where feasible.

Conclusion

7.132 EA indicative flood mapping shows that the development site is located entirely within Flood Zone 1; at little or no risk from tidal or fluvial flooding and is therefore suitable for all types of development under Planning Practice Guidance.

7.133 The site is located within Flood Zone 1 and is considered to be at low or very low risk of flooding from fluvial, pluvial, surface water, ground water, sewers and reservoirs.

7.134 The surface water discharge from the Site is to be designed in line with the Outline Drainage Strategy to incorporate sustainable drainage techniques where feasible and limit run-off to rates to be agreed with LLFA (MCC) and UU. Storage will be provided on site to prevent surface water flooding during a 1 in 100 year storm event with an additional climate change allowance.

7.135 Based on the information above, **it is not considered that there would be any impacts from the Proposed Development that would trigger a need for an Environmental Impact Assessment with regards to flood risk and drainage.** As such, it is recommended that these elements are scoped out of the ES with any potential impacts being covered by the Flood Risk Assessment and Outline Drainage Strategy which are to be submitted as part of the planning application.

ix. Wind

7.136 An assessment of the potential effects of the Proposed Development in relation to wind has been prepared by Architectural Aerodynamics Limited (ArcAero).

7.137 The approach has been informed by long established guidance in the form of the 'LDDC' Lawson criteria and the assessment is included within **Appendix 13**.

7.138 The assessment has carried out computational (computational fluid dynamics, or CFD) modelling to predict the strength of wind speeds that would occur following the introduction of the Proposed Development. In doing so, a digital model of the study area was prepared, with the surrounding area modelled up to a distance of 450 metres from the Proposed Development and all features that are likely to impact the wind flow at the site replicated.

7.139 The local wind regime has been accounted for through combination of the wind speeds predicted with a wind climate model based on measured statistics from Manchester

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International Airport. Wind roses for the site (presented in **Appendix 13**) demonstrate that two principal prevailing sectors exist for the region, and these blow from generally southerly and westerly directions.

7.140 While it features a generally rectilinear form, the Proposed Development is oriented well for these southerly and westerly wind directions. Rather than the building elevations, the apexes of the building at the junction between the elevations substantially face these directions. Overall, this gives rise to relatively favourable wind patterns with limited downdraft effects for the more critical wind directions.

7.141 As a result, the study findings indicate that upon its introduction, conditions around the base of the Proposed Development would meet the criteria for pedestrian safety, and would be suitable for existing and planned pedestrian uses.

7.142 **The Proposed Development is therefore not considered to have any significant effects in respect of wind and it is therefore considered that this topic can be scoped out of the EIA.**

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8. Summary

8.1 The Proposed Development involves the redevelopment of a previously-developed site in an urban location for a development of up to 240 dwellings (Class C3), ancillary residents' amenity facilities and a c. 100sqm ground floor commercial unit (Use Class E) within a part 18 / part 23-storey building.

8.2 The Proposed Development is not of a type listed in Schedule 1 of the EIA Regulations, but is however categorised as Schedule 2 development under Section 10 'Infrastructure Projects' within sub-category (b) 'Urban Development Projects' as it exceeds the threshold of 150 dwellings for this type of development.

8.3 The Proposed Development is not considered to be of more than local significance, is not located in an environmentally sensitive area and is considered to be comparable to other development within the Regional Centre.

8.4 A team of technical consultants have assessed the Proposed Development with regards to its characteristics; location; and the types and characteristics of the potential impacts.

8.5 The scope of the ES is considered in this instance to be limited to Climate Change; Human Health; Sunlight, Daylight & Overshadowing; and Townscape & Visual Impact.

8.6 The appointed technical consultants have concluded that there are no likely significant environmental effects arising from the Proposed Development that would warrant inclusion within an Environmental Statement in respect of the following disciplines:

- Air Quality
- Archaeology
- Ecology & Biodiversity
- Flood Risk and Drainage
- Ground Conditions
- Heritage
- Noise
- Wind
- Transport

8.7 Notwithstanding the scope of the ES, it should be noted that the planning application will be supported by a range of technical assessments in order to understand fully understand the potential environmental effects which the Proposed Development may have in respect of the technical disciplines scoped out of the ES. A full list of the documents to be submitted with the application is included within **Appendix 2**.

8.8 With consideration to the above conclusions of this report, an EIA Scoping Opinion is requested from the Local Planning Authority in respect of the Proposed Development as soon as possible.

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Appendices

Appendix 1: Red Line Plan – Site Location Plan

Appendix 2: Schedule of Planning Application Submission Documents

Appendix 3: Schedule of Recent Major Planning Approvals and Live Planning Applications in the Surrounding Area

Appendix 4: Climate Change Impact Assessment Scoping Document

Appendix 5: Chris Burnett Associates Visualisation Methodology

Appendix 6: Representative Viewpoints Plan for the Townscape and Visual Impact Assessment

Appendix 7: Archaeological Desk-based Assessment

Appendix 8: Ecological Walkover Survey and Preliminary Roost Assessment

Appendix 9: Geo-environmental Investigation & Assessment

Appendix 10: Noise Impact Assessment

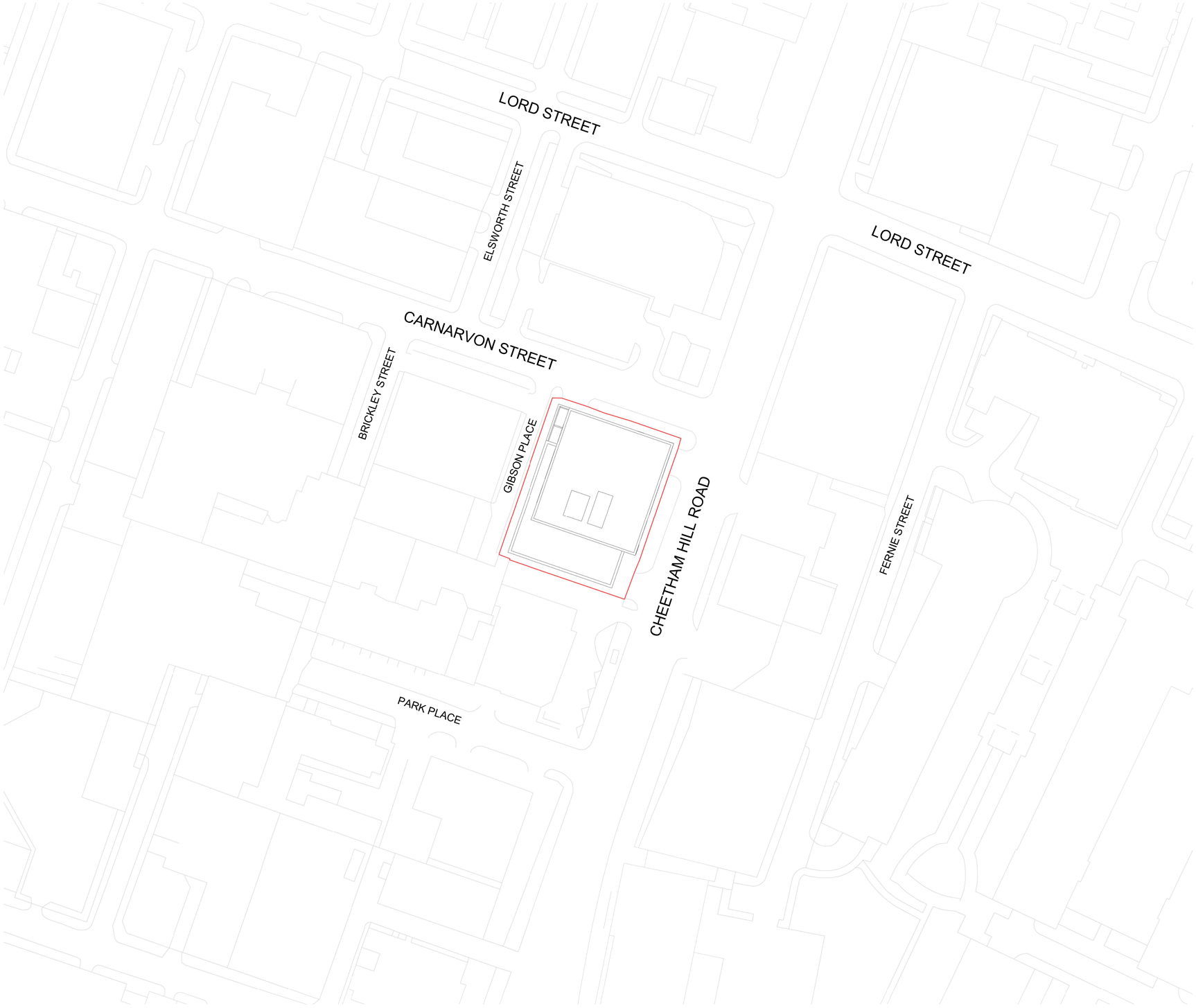
Appendix 11: Transport Statement Scoping Report

Appendix 12: Flood Risk Assessment (including Drainage Strategy)

Appendix 13: Wind Microclimate Report

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APPENDIX 1



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Scale 1:500

N

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No implied licence exists. This drawing should not be used to calculate areas for the purposes of valuation. Do not scale this drawing. All dimensions to be checked on the site by the contractor and such dimensions to be their responsibility. All work must comply with relevant British Standards and Building Regulations requirements. Drawing errors and omissions to be reported to the architect. To be read in conjunction with Architect's specification and other consultant information.

Rev	Description	Date
P01	Preliminary Issue	07.07.2023

26-28 Hilton Street
Manchester M1 2EH
mail@hawkinsbrown.com
hawkinsbrown.com

Hawkins\
Brown

Project
33-41 Cheetham Hill Road
33-41 Cheetham Hill Road,
Manchester,
M4 4FT

Drawing
Location Plan

Scale @	Date
1 : 500	06/07/23
Drawn By	**Checked By**
HG	NT

Job Number	Status	Purpose of Issue
230069	S1	For Information

Drawing No.	Rev
CHR-HBA-ZZ-SW-DR-A-00-0001	P01

APPENDIX 2

33 – 41 Cheetham Hill Road, Manchester – Proposed Residential Tall Building (Urban Villages Group)

Planning Application Document Schedule

Administrative Requirements

Document	Comments	Responsibility
Application Form and Certificates	To be completed accurately.	*EKPS*
Application Fee	The application fee will be dependent on the total number of residential units and amount of any ground floor commercial floorspace.	*Urban Villages Group*
Location Plan	The Site to be identified in red and other land in the applicant's ownership to be edged in blue.	*Hawkins Brown*
Covering Letter	To provide an overview of the planning submission.	*EKPS*

Plans, Drawings and Design and Access Statement

Document	Comments	Responsibility
Existing and Proposed Site Plan	1:500 or 1:200 scale to show the site boundary. Proposed Site Plan to include details of how the refuse is to be stored and collected.	*Hawkins Brown*
Proposed Floor Plans	Standard scale to be used, as appropriate.	*Hawkins Brown*
Proposed Elevations and Cross Sections	Plans to be fully annotated to indicate the materials that are to be used. Contextual elevations to show the proposed development in the context of the surrounding buildings to also be provided. Section drawings should show the window depths.	*Hawkins Brown*
Parking and Access Arrangements	Details of car and/or cycle parking provision to be provided.	*Hawkins Brown*
Landscape Proposals	Indicate proposed boundary treatment on plans.	*Exterior Architecture*
Lighting Details	Details of the nature and location of any external lighting proposed, showing how any impacts, including glare, are to be mitigated.	*Exterior Architecture*
Design and Access Statement	Should provide suitable justification for the proposed development and the relationship with surrounding buildings. The following information must be provided: • Use - what buildings and spaces will be used for. • Amount - how much would be built on the site.	*Hawkins Brown*

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	• Layout - how the buildings and public and private spaces will be arranged on the site, and the relationship between them and the buildings and spaces around the site. • Scale - how big the building and the spaces would be (in terms of height, width and length). • Landscaping - how open spaces will be treated to enhance and protect the character of a place. • Appearance - what the building and spaces will look like, for example, building materials and architectural details. The statement should also provide details of how the building will be accessed by a range of users and should include details of what provision has been made to accommodate disabled users. The statement should include consideration of the Manchester Blue and Green Infrastructure Strategy.	
Computer Generated Images ('CGIs') / Verified Views	CGIs should be prepared to show the proposed development in the context of its surroundings and from agreed identified viewpoints.	*Ambiente*

Additional Strategies and Statements

Document	Comments	Responsibility
Planning Policy and Compliance Statement	Demonstrate compliance with local and national planning policy.	*EKPS*
Environmental Impact Assessment	To be submitted on a voluntary basis. The extent of issues to be considered in the Environmental Impact Assessment (EIA) will be determined through a formal request to the Local Planning Authority for an EIA Scoping Opinion, but at this stage (and based on some informal advice received from the Planners at MCC), it is anticipated that it will include the following technical assessments: • Climate change: an assessment of the greenhouse gas emissions expected to generated by the proposed development during both construction and operation and the effect on the global climate, and climate change adaptation. • Daylight/ Sunlight/ Overshadowing Assessment: to consider the impact on existing properties. • Human health: considering the direct implications for health such as the provision of housing and employment, together with implications such as those arising through pollution, air quality, accessibility to healthcare facilities and sustainable transport for healthy living • Townscape and Visual Impact Assessment: assessment of the proposed development on existing and emerging townscape from consideration of agreed viewpoints.	*Coordinated by EKPS* *Lifeproven* *Proximity* *King Street Planning* *Chris Burnett Associates (with input from Ambiente)*
Noise Impact Assessment	To consider the impact on noise for existing surrounding occupiers and future occupiers of the proposed development.	*Jameson Acoustics*

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Document	Comments	Responsibility
Air Quality Assessment	To evaluate the impacts of the development and proposed mitigation within the context of compliance with Greater Manchester Air Quality Action Plan 2016.	*IDOM*
Archaeological Assessment	A Desk-based Study to evaluate the archaeological value of the Site, and in order to determine the need for and nature of any archaeological work that may be required in response to development proposals.	*Salford University*
Crime Impact Statement	To assess how crime and safety issues will be addressed through the design of the development. A Crime Impact Statement must be submitted in support of all major planning applications.	*Greater Manchester Police*
Statement of Consultation	To detail the consultation undertaken with MCC and Statutory and Non-Statutory Consultees in the preparation of the application.	*Counter Context*
Construction Management Plan (including Construction Waste Management Plan)	A statement setting out how construction and demolition waste would be minimised and recycled on site where possible and how sustainable waste management needs of the end user would be met.	*Client / Contractor*
Ecology Assessment	To identify any ecological features or wildlife habitats on the site and how the proposals intend to deal with them, including a bat survey of the existing buildings on the site. Will also need to include a strategy for delivering Biodiversity Net Gain (BNG).	*E3P*
Energy and Environmental Standards Statement	Required in line with the City Council's Guide to Development in Manchester SPD/SPG. An Environmental Standards Statement should be prepared which addresses how the proposed development will respond to sustainability targets and provide details of provision for renewable energy within the development. It should also include an Energy Statement, as required under the provisions of Core Strategy EN6. Needs to include some narrative on embodied carbon and how long this will take to balance out over the lifetime of the development (offset against the operational benefits).	*Futureserv*
Fire Statement	Demonstrating that fire safety matters have been taken into account in formulating the design proposals.	*Maze Fire Consulting*
Flood Risk/ Drainage Assessment/ SUDS Strategy	Requirement to be confirmed as the Site is not larger than 1ha and it is within Flood Zone 1. It is anticipated that details will be required in respect of how the Proposed Development could incorporate SUDs for the management of run-off.	*Renaissance*
Heritage Assessment	To assess the impact of the proposals upon the designated heritage assets and their settings.	*Heritage Architecture*
Local Labour Agreement	Details of a Local Employment Agreement which should contain a commitment to work with the Work and Skills Team to ensure that employment opportunities resulting from the proposed development are made available to Manchester residents. Further information can be obtained by liaising with - workandskillsadmin@manchester.gov.uk	*Client / Contractor*
Tall Buildings Statement	Justification for the Proposed Development, taking into consideration Historic England and Design Council guidance on 'Tall Buildings'. Can potentially be provided as a section within the Design & Access Statement.	*Hawkins Brown / EKPS*
Television Reception	A Report in respect of the possible interference created by the Proposed Development on TV and radio reception within the area.	*Taylor Bros*

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Document	Comments	Responsibility
Broadband Connectivity Statement	All new build residential developments must incorporate measures to facilitate digital connectivity for all new build residential properties having regard to the Data Ducting Infrastructure Guidance produced by the Department for Communities and Local Government. (Section 10 NPPF)	*Futureserv*
Transport Statement / Travel Plan	The Statement should assess trip generation and associated car parking provision. The Statement should also include details of measures to encourage sustainable modes of access to the site are promoted and encouraged. Will need to address MCC policy regarding parking provision. Should provide full details and a plan of the proposed servicing (deliveries, collection and maintenance etc.) to the Proposed Development.	*SKTP*
Phase 1 / Phase 2 Site Investigation	Usually a Stage 1 Preliminary Risk Assessment should be carried out if: • The land is known to be contaminated or suspected of being contaminated; and • The proposed end use of the development is considered sensitive to contamination (e.g. allotments, residential use, schools)	*Renaissance*
Waste Management Strategy	To show that the scheme meets the City Council's waste guidelines and to provide details of waste collection arrangements. The proposed site layout plans (floorplans) should also indicate the location and size of refuse and recycling storage within the development. This can be incorporated into the Design & Access Statement or submitted as a standalone assessment. Must include completed MCC waste proforma.	*Hawkins Brown*
Wind Assessment	Assessment of potential wind impacts as a result of proposed development and identification of any necessary mitigation	*Arcareo*
Ventilation Strategy	To provide details of how the proposed development will be ventilated. Will also be required for input to noise assessment.	*Futureserv*
Viability Assessment	For all applications where the proposal does not include the necessary policy provision or financial contributions, and this is being justified on viability grounds, a viability assessment, to include an executive summary, will be required.	*DS2*
Affordable Housing Statement	On schemes for 15 or more dwellings (Core Strategy Policy H8) a statement will be required which sets out how the proposals contributes to the housing mix in the city including proposed affordable units and mix/tenure.	*TBC – will be informed by the outcome of the viability assessment*
Operational Management Strategy	Providing details of how the Build to Rent development will be managed during the operational phase.	*Verv Life*

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APPENDIX 3

33-41 Cheetham Hill Road, Manchester: Schedule of Extant Planning Permissions and 'Live' Planning Applications for Development Schemes of Significance in the Surrounding Area (16/10/23)

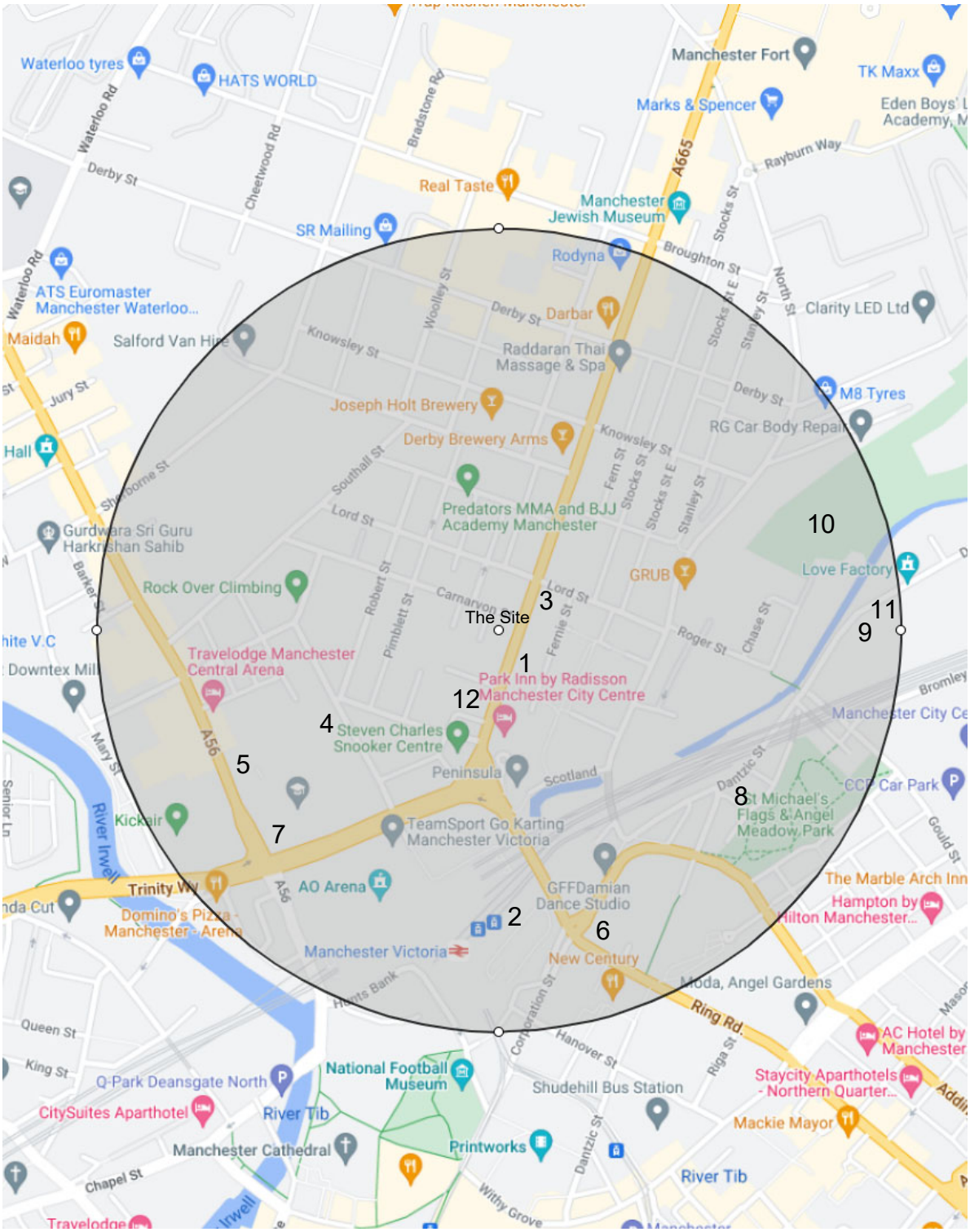
Application Reference	Address	Description	Decision	Distance from Site	Status
109031/FO/2015/N1 (subsequently varied by s73 applications 113953/JO/2016 and 118862/JO/2018) (*Green Quarter Block 7 / The Hallmark*) PLAN REF: 1	Land at 6 Cheetham Hill Road	Erection of a 15-storey building to form 146 residential apartments (Use Class C3a), along with ground-floor commercial floorspace (Use Classes A1, A2, A3 or B1) with associated car parking and vehicular access from Fernie Street and other associated works following demolition of existing buildings.	Approved on 27 August 2015 (the subsequent s73 applications were approved on 14 November 2016 and 18 April 2018 respectively)	0.07km	Completed
111777/FO/2016/C1 (subsequently varied by s73 application 128667/JO/2020) (*New Victoria*) PLAN REF: 2	New Victoria Land at Corporation Street Manchester M3 1NX	Erection of two residential buildings of a maximum 21 and 26 storeys to accommodate 520 apartments (178 x 1 bed, 286 x 2 bed and 56 x 3 bed apartments) (Use Class C3). Erection of one office building of maximum eight storeys comprising up to 11,647 sq. m (GIA) of office accommodation. Ground floor commercial space (Use Class A1, A2, A3 and B1), lower ground level car parking, access and servicing arrangements, alterations to Corporation Street, new public realm and other associated works.	Approved on 29 September 2016 (the subsequent s73 application was approved on 19 March 2021)	0.43km	Completed
134092/FO/2022 (*New Victoria Phase 2*) PLAN REF: 2	New Victoria Phase 2 Land at Corporation Street Manchester M3 1NX	Erection of a 10-storey office building (Use Class E) plus basement, a ground floor commercial unit (Use Class E), with associated external amenity in the form of roof terraces, plant, substation, cycle parking, hard and soft landscaping, access and servicing and other associated works	Approved on 20 October 2022	0.43km	Construction yet to commence
113914/FO/2016 PLAN REF: 3	Land bound by Cheetham Hill Road, Lord Street and Fernie Street	Erection of a 16-storey building to form 192 residential apartments (Use Class C3a), together with a ground-floor commercial unit (Use Class A1, A2, A3 or B1) with associated vehicular access from Fernie Street, car parking and hard and soft landscaping following demolition of existing buildings.	Approved on 21 November 2016	0.06km	Construction yet to commence (however the planning permission is understood to have been implemented)
118831/FO/2018 (*Old Brewery Gardens*) PLAN REF: 4	Former Boddingtons Brewery, Dutton Street, M3 1LE	Erection of two buildings (a part 17, part 12 storey building and a part 26, part 23 storey building) to form 556 residential units (Use Class C3a) together with the creation of 3,940sqm of commercial	Approved on 28 February 2019	0.26km	Construction yet to commence (however the planning permission is

Application Reference	Address	Description	Decision	Distance from Site	Status
		floorspace (Use Classes A1, A2, A3, B1 and D1) with associated landscaping, access and other associated works.			understood to have been implemented)
132416/FO/2021 (*Former Boddington Brewery Site*) PLAN REF: 5	Land bounded by the Travelodge and surface level car parking to the north, further surface level carparking to the east, Manchester College to the south and Bury New Road to the west	Erection of two buildings, part 27, 20, 17 storeys and part 11 and 10 storeys to form a mixed use development comprising of 461 residential apartments (Use Class C3a) and ground floor commercial uses (Use Class E) (718sqm) together with public realm including courtyard pocket park, landscaping, car parking and other associated works.	Approved on 30 June 2022	0.35km	Construction yet to commence
123437/FO/2019 (*4 Angel Square*) PLAN REF: 6	4 Angel Square Corporation Street Manchester M4 4DU	Demolition of existing buildings to facilitate construction of an 11 storey building with external terrace to form a mixed use development comprising office use (Use Class B1) and ground floor commercial units (Use Classes A1, A2, A3, A4, B1 and D2); creation of a new public square and associated landscaping, undercroft car and cycle parking, provision of plant and servicing and related access and highways' works and associated works.	Approved on 26 July 2019	0.39km	Completed
124995/FO/2019 (*Manchester City College – City Campus Phase 1*) PLAN REF: 7	Land on the corner of Great Ducie Street And New Bridge Street Manchester M3 1WB	Erection of a five storey educational building (18,495 sqm) (Use Class D1) with associated access, servicing, landscaping, public realm and other associated works following removal of existing car park	Approved on 19 December 2019	0.35km	Completed
136492/FO/2023 (*Manchester City College – City Campus Phase 2*) PLAN REF: 7	Land Off Great Ducie Street	Erection of new educational facility (Use Class F1(a)) with associated amenity space, servicing, accessible parking bays, cycle storage and other works.	Approved on 18 August 2023	0.33m	Construction yet to commence
116366/FO/2017 (subsequently varied by s73 application 124120/JO/2019) (*Victoria North – MeadowSide*) PLAN REF: 8	Land bounded by Dantzic Street & Aspin Lane, land bounded by Gould Street & Angel Meadows and land bounded by Old Mount Street, School Street,	Erection of four residential buildings (22 storey building, 17 storey building, 40 storey building and part 12, part 9 storey building) to form 756 residential apartments (Use Class C3a) together with ground floor commercial uses (616 sqm) (Use Classes A1, A2, A3, A4, A5, D1 and B1) with associated car parking, landscaping, amenity areas, creation of new public realm following the closure	Approved on 25 August 2017 (the subsequent s73 application was approved on 13 December 2019)	0.49km	Completed

Application Reference	Address	Description	Decision	Distance from Site	Status
	Naples Street & Ludgate Street Manchester	of Aspin Lane, Mincing Street and Irk Street and other associated works following demolition of existing structures			
126944/FO/2020 (*Victoria North – Victoria Riverside*) PLAN REF: 9	Land Bound By Dantzic Street, Gould Street, Williamson Street And Bromley Street (Known As Victoria Riverside) Manchester	Erection of a residential-led mixed use development comprising 3 no. towers (37, 26 and 18 storeys) and podium levels (6 storey) to form 634 residential apartments and townhouse accommodation (Use Class C3) together with commercial accommodation (1222 sqm) (Use Classes A1,A2,A3,A4,A5,B1, D1 and D2)); with associated residential amenity areas, refuse storage, plant (including substation), car parking, cycle storage, landscaping and new public realm including the re-instatement of Bromley Street and other associated works	Approved on 15 January 2021	0.53km	Under construction
133143/VO/2022 (subsequently varied by s73 application 137079/JO/2023) (*Victoria North – Red Bank Enabling Works*) PLAN REF: 10	Red Bank Neighbourhood, Victoria North, Manchester	City Council Development for the creation of development platforms, including remediation and earthworks, and change in site levels, to allow delivery of future residential-led development at the Red Bank Neighbourhood, together with the construction of a new road and priority junction from Red Bank, new drainage infrastructure, utility and services connections and diversions, preparatory tree and shrub clearance, and demolition of certain existing structures, along with the creation of new and improved green infrastructure and landscaping including the improvements of St Catherine's Wood to form part of a City River Park, and other associated works.	Approved on 14 July 2022 (the subsequent s73 application was approved on 4 August 2023)	0.20km	Construction yet to commence
136812/OO/2023 (*Victoria North – Red Bank outline application*) PLAN REF: 10	Land At Red Bank Victoria North Manchester	Outline application for development comprising: Erection of a residential led mixed use development across severable plots comprising residential (Use Class C3a); non-residential floorspace comprising commercial, business, service and community uses (Use Classes E, F and Sui Generis); residents amenity space including within clubhouse buildings; health centre (Use Class E); a primary school (Use Class F); the final surface finish of the highway and footpath consented under HIF permission ref: 133143/VO/2022; creation of new public realm and associated landscaping, car parking provision, cycle storage, and other associated works (with all matters reserved). Outline application	Manchester's Planning Committee resolved to approve the application on 31 August 2023 subject to the signing a s106 legal agreement	0.20km	Application pending determination

Application Reference	Address	Description	Decision	Distance from Site	Status
		for development with all matters considered: Demolition of existing buildings and structures.			
136814/FO/2023 (*Victoria North – New Town*) PLAN REF: 11	Land Bounded by Dantzic Street, Dalton Street And The Railway Line Known As Plots NT02, NT03 And NT04 Manchester	Erection of a phased residential led mixed use development comprising three residential towers (Use Class C3a) (NT02 34 storeys, NT03 part 8, part 20 and part 31 storeys and NT04 part 8, part 27 storeys) with associated flexible non-residential floorspace comprising commercial, business, service and community uses (Use Classes E, F and Sui Generis); erection of a 6 storey residential amenity space within a clubhouse building (part of NT02), with associated car and cycle parking, hard and soft landscaping, improvement works to Dantzic Street, drainage infrastructure and associated engineering works following demolition of existing buildings and structures.	Manchester's Planning Committee resolved to approve the application on 31 August 2023 subject to the signing a s106 legal agreement	0.43km	Application pending determination
137941/FO/2023 *(Former Boddington Brewery Site)* PLAN REF: 5	Former Boddington Brewery Site Land Off Great Ducie Street Manchester M2 5PE	Erection of two buildings part 29, 25 and 20 storeys and 12 storeys to create a mixed-use development comprising 505 residential apartments (Use Class C3a) with commercial uses (Use Class E) provided at the ground floor level, together with public realm including courtyard pocket, cycle parking, accessible parking spaces, access arrangements, and other associated works.	-	0.35km	Application pending determination
138302/FO/2023 *(1 Park Place)* PLAN REF: 12	1 Park Place Manchester M4 4EZ	Erection of a part 25 and part 15 storey residential building comprising 154 apartments (Use Class C3a) with ground floor commercial uses (Use Class E), together with associated residents amenity space, cycle parking, substation, servicing, and associated landscaping works following demolition of existing buildings	-	0.05km	Application pending determination

Plan of Extant Planning Permissions and 'Live' Planning Applications for Development Schemes of Significance in the Surrounding Area



APPENDIX 4

ESG PROPRTY COMPANY

LifeProven

33-41 Cheetham Hill Road, Manchester

Environmental Impact Assessment (Climate Change)

Scoping Document

23-079 / REVISION 1 / OCTOBER 23

We enhance the environmental, social, governance & financial performance of the leading UK based real estate companies & their assets.

Version Control

Revision	Date	RIBA Stage	Prepared by	Initial	Checked by	Initial
1	17.10.2023	2	Sofi Zickerman White	SZW	Jordan Relfe	JR

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1 Introduction

1.1 Background & Purpose

LifeProven has been appointed by the client, UV Cheetham Hill Developments Limited to develop a Climate Change Report for 33-41 Cheetham Hill Road, Manchester that will form part of the Environmental Impact Assessment (EIA). The Climate Change Report focuses on assessing and addressing the potential impacts of the project on climate change, in particular greenhouse gas (GHG) emissions. In this way, it will provide a detailed analysis of how the Proposed Development will contribute to climate change and mitigate its impact in alignment with legislation and targets.

1.2 Assessment Team

This assessment is being conducted by the following LifeProven experts, who will be responsible for undertaking the assessment.

Name	Competency
Edward Smith	• BSc Real Estate • 2 years of industry experience in Quantity Surveying and ESG services • Extensive use of OneClick LCA, completing multiple Whole Life Carbon Assessments across the UK
Sofi Zickerman White, WELL AP, NDEA	• BSc Geophysics • MPA in Energy Technology & Climate Policy • OneClick LCA Certified Construction Life Cycle Assessment Specialist • WELL AP • Level 4 Non-Domestic Energy Assessor
Jordan Relfe, MRICS	• Chartered Quantity Surveyor • Member of the Royal Institution of Chartered Surveyors (RICS)

1.3 Project Description

The Proposed Development at 33-41 Cheetham Hill Road, Manchester is a part 18 / part 23-storey building consisting of 240 dwellings - anticipated to be composed of 33% one-bedroom apartments and 67% two-bedroom apartments - as well as 100 sqm of ground floor commercial space. The Development has been categorised under 'Infrastructure Projects – Urban Development Projects' and is considered an Environmental Impact Assessment (EIA) Development, therefore requiring an assessment into its environmental impact.

2 Legislation, Policy, and Guidance

The below section outlines both UK-wide and local Manchester City Council (MCC) legislative frameworks and action plans that are applicable for developments to address and mitigate climate change impacts. These have been taken into consideration to ensure compliance in the case of the Cheetham Hill Development and is used to form the scope of this assessment.

2.1 National

Primary UK-wide legislation relevant to this study include:

- The Climate Change Act 2008 (2050 Target Amendment) Order 2019
- Climate Change Risk Assessment (2022)
- Carbon Budgets (Order 2011, Order 2016, and Order 2021)
- The Carbon Plan: Delivering our Low Carbon Future (2011)
- Energy Act 2008
- Net Zero Strategy: Build Back Greener (2021)
- Building Regulations 2010, Approved Document L1A: Conservation of fuel and power in new dwellings, 2021 edition incorporating 2023 amendments
- Building Regulations 2010, Approved Document L2A: Conservation of fuel and power in buildings other than dwellings, 2021 edition incorporating 2023 amendments

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

The Climate Change Act 2008 set out legally binding climate mitigation targets for the UK. This includes a legal target to achieve at least an 80% reduction in greenhouse gas emissions by 2050 based on 1990 levels, which in 2019 was increased to a 100% reduction in emissions by 2050.

2.1.2 Climate Change Risk Assessment (2022)

Part of the ambitious Climate Change Act 2008 is also to conduct a Climate Change Risk Assessment (CCRA) every 5 years, that evaluates the potential risks and opportunities associated with Climate Change in the UK across different sectors including energy, infrastructure, and health to inform the development of policies and measures to mitigate and adapt to the effects of Climate Change. The CCRA in conjunction with advice from the Climate Change Committee ensure that the UK's climate action is updated and remains evidence-based and responsive to the evolving challenges posed by global warming. The latest Climate Change Risk assessment was published in 2022.

2.1.3 Carbon Budgets (Order 2011, Order 2016 and Order 2021)

The ambitious Climate Change Act 2008 established a system of 5-year carbon budgets that set limits on the total greenhouse gases that the UK can emit over defined periods to better control emissions and support the transition to a low-carbon economy. Climate change budgets are set in tonnes of carbon dioxide equivalent (tCO_2e), which refer to greenhouse gas emissions beyond only CO_2, such as the addition of nitrous oxide (N_2O) and methane (CH_4). The Climate Change Committee are responsible for advising governments on emission reduction targets and monitoring the UK's progress towards them. The upcoming carbon budgets are as follows:

- Carbon Budget Order 2011 (2023-2027): 1.95 $GtCO_2e$
- Carbon Budget Order 2016 (2028-2032): 1,725 $MtCO_2e$
- Carbon Budget Order 2021 (2033-2037): 965 $MtCO_2e$

The UK government encourage cities to develop their own carbon budgets, which has been done by Manchester as described in the local policy section below.

2.1.4 The Carbon Plan: Delivering our Low Carbon Future (2011)

The Carbon Plan 2011 is a policy document that outlines a series of measures and strategies to reduce greenhouse gas emissions and transition to a low-carbon, more sustainable

economy. It looks to maintain energy security, and minimise cost to customers, particularly in poorer households.

In the context of developments, this plan reaffirmed the UK's commitments to the legally binding carbon budgets under the Climate Change Act 2008, emphasising the importance of renewable energy, detailing measures to improve energy efficiency - including initiatives to reduce energy consumption and enhance building insulation - and acknowledges the need for adaptation to climate change impacts and building resilience.

2.1.5 Energy Act 2008

The Energy Act 2008 is a piece of legislation that focuses on various aspects of energy policy and regulation. Key elements that influence building developments includes specific energy performance requirements to ensure developments make efforts to improve energy efficiency and contribute to the UK's carbon reduction targets. For example, it encourages developers to design and construct buildings with lower carbon emissions (affecting building materials, insulation, and energy systems) and incorporate renewable energy sources such as solar panels or heat pumps into building design.

2.1.6 Net Zero Strategy: Build Back Greener (2021)

The UK's Net Zero Strategy is a comprehensive and ambitious policy document outlining the country's plan to achieve net zero greenhouse gas emissions by 2050. Some of the key elements applicable to this development include green buildings (promoting improved energy efficiency through enhanced insulation and setting green building standards); nature-based solutions (encouraging biodiversity enhancement and natural sustainable building materials); decarbonising energy (using low-carbon energy sources, transitioning away from reliance on fossil fuels); in addition to adaptation and resilience (mitigating and preparing for potential climate change impacts).

2.1.7 Building Regulations 2010, Approved Document L1A: Conservation of fuel and power in new dwellings, 2021 edition incorporating 2023 amendments

Part L1A provides guidance and regulations related to the conservation of fuel and power in new dwellings. The purpose of the document is to set out the legal requirements for achieving energy efficiency in new residential buildings, promoting sustainable construction practices, and helping to reduce emissions. It sets mandatory standards for in-design and as-built stages to ensure that mandatory standards are met, outlining specific criteria related to insulation, building fabric, windows, heating systems, as well as air quality. It also requires the calculation of the energy performance using approved methodologies such as the Standard Assessment Procedure (SAP) to assess the building's energy consumption and carbon emissions.

The 2021 edition encourages the use of renewable energy sources and low carbon technologies in new dwellings to reduce carbon emissions and provides guidance on integrating these technologies effectively.

2.1.8 Building Regulations 2010, Approved Document L2A: Conservation of fuel and power in buildings other than dwellings, 2021 edition incorporating 2023 amendments

Approved Document L, Volume 2, of the UK Building Regulations provides specific guidance and requirements related to the conservation of fuel and power in new and existing non-domestic buildings (commercial, industrial, and public sector structures as well as residential

extensions to existing non-domestic buildings). The document sets out mandatory energy efficiency standards that these buildings must meet in relation to insulation, heating, cooling, lighting, and other building systems. It also requires conservation of fuel and power, emphasising the importance of reducing energy consumption and carbon emissions associated with building operations. It also encourages the use of renewable and low-carbon technologies. Building owners, developers and designers must demonstrate compliance to these standards through calculating the energy performance using nationally approved methodologies.

2.2 Local

The following local documents have been considered in the assessment:

- Manchester Climate Change Framework (2020-2025)
- Climate Change Action Plan (2020-2025)
- Manchester Low Carbon Build Standard
- Manchester's Local Development Framework Core Strategy (2012)

2.2.1 Manchester Climate Change Framework & Climate Change Action Plan (2020-2025)

Manchester's Climate Change Framework is a strategy that works towards making Manchester a thriving, zero carbon and climate resilient city. In relation to developments, this includes:

- Significantly reducing the CO_2 emitted from buildings, to ensure that Manchester stays within their 15 million tonne carbon budgets for 2018-2100.
- Adapting to the changing climate, promising resilience.
- Improving health and wellbeing by contributing towards CO_2 reduction and adaptation, particularly for those in need.
- Supporting Manchester's mission is to become a zero-carbon city by 2038 (12 years ahead of the Government's target for the UK of 2050).

The Climate Change Action Plan is a more detailed and practical document that outlines specific actions, targets, and initiatives aimed at reducing greenhouse gas emissions and promoting sustainability across the city.

2.2.2 Manchester Low Carbon Build Standard

All projects delivered by/ for MCC should be designed in line with the RIBA Sustainable Outcomes Guide 2019 to ensure a set of common, clear, and professionally determined standards. These must be used for project delivery, covering all aspects of the built environment. This includes achievement of RIBA's operational energy targets, designing now for achievement of the 2025 targets, and from 2025, designing for 2030:

Table 1: Operational Energy Targets for MCC Projects, RIBA 2030 Climate Challenge

Year	Non-Domestic	Domestic
2025	110 kWh/m^2/year	70 kWh/m^2/year
2030	55 kWh/m^2/year	35 kWh/m^2/year

As part of the Low Carbon Build Standards, Manchester has set out the 'Top 10 Carbon Priorities', which relate to (1) the building fabric, (2) efficient boilers, (3) improved lighting, (4) energy controls and metering, (5) improved ventilation, (6) renewable energy sources, (7)

reduced water consumption, (8) low energy equipment, (9) performance measurement, and finally (10) re-used and recycled materials.

2.2.3 Manchester's Local Development Framework Core Strategy (2012)

Manchester's Core Strategy contains guidance related to Environmental Quality and sustainability, which relate to climate change. These include policies related to the requirement for having energy statements, for reducing emissions through low and zero carbon developments, as well as the expectation for developments to be adaptable to climate change in terms of design, layout, siting, and function.

2.3 Guidance Documents

The following guidance documents have been used to define the scope of this assessment and supports the wider environmental impact assessment of the Proposed Development:

- RICS Guidance on Whole Life Carbon Assessment for the Built Environment 1st Edition (2017), with consideration of the 2nd edition that comes into effect from the 1st of July 2024
- Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition (2022)
- LETI Climate Emergency Design Guide (2020)
- LETI Embodied Carbon Primer (2020)
- RIBA 2030 Climate Challenge Version 2 (2021)

3 Consultation

No consultation is required to conduct the GHG assessment.

4 Scope of Assessment

The 33-41 Cheetham Hill Road Development will result in carbon emissions over its lifetime. Emissions sources have been identified using IEMA and RICS Whole Life Carbon Guidance. Professional judgement has been used to determine which emission sources will be scoped in or out of this climate change impact assessment.

The scope adheres to the British Standard (BS) EN 15978:2011 'Sustainability of construction works, Assessment of environmental performance of buildings calculation' method, which was developed by the European Committee for Standardisation (CEN) to enable a consistent approach to the environmental assessment and GHG emissions.

4.1 Scope Summary

Table 2: Summary of Assessment Scope

Source of Impact	Description	Relevance to Project	Scoped In / Out
Product Stage (A1 – A3)	Emissions associated with materials or products used in construction, including **raw material extraction**, **transport**, and **manufacturing emissions**.	Raw materials and products have embodied emissions which may have large contributions to the project's release of GHG emissions.	Scoped In

Construction Stage (A4)	Emissions associated with the **transport of materials** to the construction site.	Fuels and energy associated with the transport of materials and products to site can be large if not sourced locally and sustainably.	Scoped In.
Construction Stage (A5)	Emissions from the **construction and installation** process.	Plant and equipment used during construction result in emissions being directly released into the atmosphere.	Scoped In.
	Emissions result from the **disposal of waste and materials** during construction.	Materials disposed of or lost during construction is expected to be low, however will be assessed.	Scoped In.
	Emission changes result from **land use, land use change, and forestry** during construction.	Emissions from land use change and biomass disposal is expected to be minimal and therefore excluded.	Scoped Out.
In-Use Stage (B1)	Emissions arising from the building's **operation**, such as those due to the release of refrigerants.	Whilst the contribution towards emissions is estimated to be small, this is easily calculated and has therefore been included. and is therefore not included.	Scoped In.
In-Use Stage (B2, B3, B4 and B5)	Emissions resulting from the Development's **maintenance**.	Whilst the contribution towards emissions is estimated to be small, this is easily calculated and has therefore been included.	Scoped In.
In-Use Stage (B2, B3, B4 and B5)	Emissions resulting from any **repairs** conducted in the Development during operation.	Whilst the contribution towards emissions is estimated to be small, this is easily calculated and has therefore been included.	Scoped In.
In-Use Stage (B2, B3, B4 and B5)	Emissions resulting from any **refurbishments** conducted during the buildings lifetime.	Emissions from refurbishments could be large, therefore this is included.	Scoped In.
In-Use Stage (B2, B3, B4 and B5)	Emissions resulting from **replacements** of equipment and products over the Development's lifetime.	Emissions from replacement of equipment and products could be large.	Scoped In.
Operational Carbon (B6)	Emissions from the building's operation, specific to **energy consumption** during operation.	The building will use energy to run during its lifetime, leading to annual emission contributions which will be included in the assessment.	Scoped In.
Operational Carbon (B7)	Emissions from the building's operation, specific to **water consumption** during operation.	Due to it being a residential Development, water use is expected to be large and therefore this is scoped not the assessment.	Scoped In.
Other User Activities (B8)	These are emissions resulting from user activities including land change and forestry.	Emissions from land use change are expected to be small and therefore not included.	Scoped Out.
End of Life Stage (C1-C4)	Emissions associated with the end of life of the Development, including **deconstruction and demolition, transport, waste processing** and **disposal**.	Emissions associated with the building's decommissioning process could be large and has been included.	Scoped In.

5 Assessment Methodology

5.1 Study Area

The site of 33-41 Cheetham Hill Road will form the core study area for this assessment, however off-site emissions within the scope include those from the product stage (A1-A3) that includes those associated with raw material extraction, transport of materials and manufacturing, as well as transport to the site.

5.2 Information Used

The project is currently in its early stages of design (RIBA Stage 2) and therefore only data that has been made available can be used for the calculation of emissions. Information used for the baseline calculations as well as the climate change impact include:

- RIBA Stage 2 Architectural Drawings and Design Pack prepared and issued by Hawkins\Brown Architects including:
    - Proposed GA Floor Plans, Sections and Elevations
    - Area Schedule and Accommodation
- RIBA Stage 2 Civil and Structural Engineering Information prepared and issued by Renaissance Structural and Civil Engineering
- MEP RIBA Stage 2 Report prepared and issued by Futureserv Consulting Engineers
- RIBA Stage 2 Cost Plan prepared and issued by KS4 Project & Cost Consulting.
- RIBA 2030 Climate Challenge Version 2 (2021)

Any additional information used beyond those outlined above will be included in the final climate change impact report.

5.3 Site Visit

No site visit will be required to develop a climate change impact assessment at this stage.

5.4 Proposed Assessment Process

There is no single accepted methodology for calculating greenhouse gas emissions within an EIA. Therefore, this assessment will be based on recommended practice guidance - IEMA's 'Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance'. The below outlines the methodology used:

- The emission sources used in this assessment are those from prior to construction, construction, during operation and through to decommissioning. These sources are assessed and calculated in One Click LCA, using the Royal Institution of Chartered Surveyors (RICS) professional standards and guidance for whole life carbon assessments for the built environment.
- The data quality will be assessed in line with PAS 2080.
- The results are assessed against baseline GHG emissions from the site, Manchester, and North-West of England, and compared against national and local carbon budgets to assess the magnitude of change due to the Proposed Development.
- To assess the Proposed Development's climate change impact against Net Zero targets, the emissions are also compared against RIBA's 2030 Climate Challenge targets for embodied carbon and operational energy.

- Following the interpretation of these results, the significance of effects is determined.
- Mitigation measures to reduce climate change impacts are identified along with any residual effects.

5.5 Timeline of Impact

The Proposed Development will have an impact during construction and operation. The timescales for the construction and operation stages of the Project are set out in the table below:

Table 3: Timeline of Impact

Development Stage	Start Date	End Date	Description
Construction	Nov 2024	Dec 2026	The development programme indicates that the Proposed Scheme will commence in November 2024 and be completed over a two-year period.
Operation	Jan 2027	Jan 2087	The Proposed Scheme is projected to be fully operational from 2027. A building's lifetime is typically assessed over 60 years; however, this is also assessed from the date of operation until 2038 to compare the magnitude of change against the UK's carbon budgets.

6 Determining Significance Criteria

6.1 Receptor Sensitivity

Currently, there is no agreed threshold for what level of emissions are considered significant. However, the IEMA identify that all new GHG emissions contribute to a significant negative environmental effect. Therefore, significance is based on the net impact of the Development and should be mitigated as far as possible.

Any contribution towards climate change has a global impact. Therefore, based on the significance criteria, the receptor (in this case the global climate system) is always considered to be high, as it is of international, national, and local importance.

6.2 The Magnitude of Change

The magnitude of change has been calculated using three indictors. This includes baseline emissions, carbon budgets as well as a comparison against industry Net Zero targets. There is no standard definition to determine the actual magnitude of change as major, moderate, or minor. Therefore, IEMA guidance and professional judgement has been used.

Table 4: Determining the Magnitude of Change

Magnitude of Change	Baseline emissions and/or carbon budget impact		Net Zero Impact
Major	>5% increase/decrease in GHG emissions relative to baseline emissions and/or future carbon budgets	and/or	Proposed Development exceeds "Business as Usual"
Moderate	2-5% increase/decrease in GHG emissions relative to baseline emissions and/or future carbon budgets		Proposed Development meets "Business as Usual
Minor	1-2% increase/decrease in GHG emissions relative to baseline emissions and/or future carbon budgets		Proposed Development meets "2025 Targets"
Negligible	<1% increase/decrease in GHG emissions relative to baseline emissions and/or future carbon budgets		Proposed Development meets "2030 Targets"

6.2.1 Current Baseline

The impact of the Development has been assessed against the existing baseline conditions. The current site comprises a building that has been disused for some time, and therefore for the purpose of this assessment, the baseline emissions are considered to be 0. The baseline emissions for Manchester, North-West England and the UK has been taken from the UK Local Authority and Regional Greenhouse Gas Emissions National Statistics (2005-2021), 2023 update.

Table 5: Comparison of Emissions Against the Baseline

Location	Baseline Emissions (2021), tCO_2e
Site	0
Manchester	2,095,600
North-West England	44,047,000
England	309,040,000

6.2.2 Budget Contributions

By assessing the environmental impact against local and national carbon budgets, the percentage contribution can be assessed, which helps to determine the magnitude of change. The Climate Change Committee have defined the UK's climate budgets, meanwhile the Tyndall Centre for Climate Change Research have helped Manchester set their carbon budgets in line with a 1.5-degree warming.

Table 6: Budget Contributions of the Proposed Development

Period	GHG Emissions (tCO_2e)	
	UK	Manchester
2023-2027	1,950,000,000	4,600,000
2028-2032	1,725,000,000	2,400,000
2033-2037	965,000,000	1,200,000
2038-2042	Undefined	600,000
2043-2047	Undefined	300,000
2048-2100	Undefined	300,000

6.2.3 Net Zero Targets

The emission intensity of the Development is also assessed against the RIBA 2030 Climate Challenge targets for whole life embodied emissions as well as operational building emissions from energy consumption. This helps to determine the magnitude of change compared to industry benchmarks for achieving Net Zero.

Table 7: RIBA Climate Targets

RIBA Sustainable Outcome Metrics	Business as Usual	2025 Target	2030 Target
Whole Life Embodied Carbon (kgCO2e/m2)	1,200	< 800	< 625
Operational Energy (kWh/m2/y)	120	60	135

7 Assessing the Significance of Effects

The following matrix is used to assess the significance of effects (in this case the whole life embodied carbon, and operational emissions resulting from the Proposed Development), against the sensitivity of the receptor (the climate system). The receptor sensitivity is high, and therefore only the high sensitivity column applies to this assessment.

Table 8: Significance of Effects

Magnitude of Impact	Sensitivity (Importance)		
	High	Moderate	Low
Major	Major	Major-Moderate	Moderate-Minor
Moderate	Major-Moderate	Moderate-Minor	Minor
Minor	Moderate-Minor	Minor	Minor-Negligible
Negligible	Negligible	Negligible	Negligible

8 Impact Mitigation

Any Proposed Development has an undoubtable effect on climate change through its contribution of emissions. The impact of mitigation measures will be assessed, with a proposed list for consideration at this early design stage provided below:

8.1.1 During Construction

During design and/or construction, these mitigation measures will reduce environmental impact of the Cheetham Hill Development:

- Reuse and retrofit existing buildings above demolition.
- Design for less material use.
- Select materials with low carbon content.
- Use materials that are recovered or have recycled content.
- Source materials locally.
- Use responsibly and sustainably sourced materials.
- Design for adaptability and disassembly.
- Design for durability and flexibility.
- Use materials that can be reused or recycled.
- Manage waste during construction.
- Use modern methods of construction such as modular systems.
- Minimise fabrication and construction waste.
- Implement a construction stage traffic management plan to reduce construction traffic due to the Development.

8.1.2 During Operation

During operation, the following environmental impact reduction measures should be used:

- Enhance the performance of building fabric such as low u-values and enhanced air tightness.
- Eliminate the use of fossil fuels, building a fully electric Development.
- Use air source heat pumps for the entire Development, or if not possible, in communal areas.
- Use efficient building services to condition and light the Development.
- Reduce water consumption using low flow fixtures and leak detection systems.

9 Cumulative Effects

The atmospheric concentration of GHGs and the resulting effect on climate change is affected by all sources and sinks globally, anthropogenic, or otherwise. Due to them being felt globally, rather than affecting a local area, the approach of cumulative effects differs from other EIA topics, where typically projects within a certain boundary is assessed. Hence, there is no increase in local climate effect due to one Proposed Development, and all combined Developments globally contribute to the receptor (the atmospheric concentration of GHG emissions and therefore climate change). As suggested by IEMA, "*there is no basis for selecting any particular cumulative project for assessment*", and therefore cumulative effects are not calculated in this assessment.

10 Residual Effects

With the implementation of mitigation measures, the Proposed Development is still likely to have residual effects and therefore a residual significance on the climate system. These estimates will be clearly identified, quantified, and described. The Proposed Development can compensate resulting residual emissions by carbon credits to achieve net zero emissions. This is proposed in the form of offsets that sequester atmospheric GHG emissions and shall be explored within this chapter.

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APPENDIX 5

APPENDIX S1 TOWNSCAPE AND VISUAL IMPACT ASSESSMENT: VISUAL REPRESENTATION OF DEVELOPMENT PROPOSALS

Introduction

New guidance published by the Landscape Guidance in October 2019, LI Technical Guidance Note 06/19 Visual Representation of Development Proposals, recommends that not only TVIA Representative Viewpoints are agreed with the competent authority, Manchester City Council, (MCC) in this case, but also the methodology used in the Visual Representation of Development Proposals itself is agreed.

This advice note seeks to explain why, and seek agreement for, the need for specialist lens equipment in the preparation of Verified Views for tall buildings.

AVR TYPE

TYPE 4 PHOTOMONTAGE / PHOTOWIRE (SURVEY/ SCALE VERIFIABLE)

This is the most sophisticated form of visualization and judged to be the most appropriate level in these circumstances where the planning application is supported by a full EIA and the subject is a tall building.

As LI Technical Guidance note 06 / 19 states:

'*Type 4 photomontages and / or photowires require the use of equipment and processes which provide quantifiable verification data, such that they may be checked for accuracy (as per industry-standard 'AVRs' or 'Verified Views'). Precise survey of features and viewpoint / camera locations may be included where warranted. Type 4 visualisations represent the highest level of accuracy and verifiability for use in the most demanding of situations'*

and

'Type 4 visualisations are photomontages or photowires, produced using quantifiable data, with procedural transparency and appropriate levels of accuracy. This involves using a defined camera / lens combination and establishing the camera location with sufficient locational accuracy to enable accurate scaling and location of the 3D model within the view. In addition, the print presentation size can be determined to provide binocular image scaling when appropriate.'

The guidance states that a 50mm lens should be used 'unless there are exceptional circumstances' we believe that the assessment of a tall building in a townscape setting is an exceptional circumstance where a wide angle tilt shift lens is justified. This is because:

- The height of the building will inevitably mean that the top of the building is often cut off if a standard 50mm lens is used as the ridgeline is often more than 18˚from the horizontal
- Often close up views are necessary to assess the effect of the Proposed Development on the immediate streetscape, often in areas of tight urban grain

- Skylines and clusters of tall buildings are an important part of a TVIA where the insertion of a new tall building into an existing cluster or, as a new feature on the skyline or horizon, is an essential part of understanding its contextual fit.

For these reasons we are proposing to use a Canon EOS 5D Mark IV with sensor size 36 x 24mm lens

This is not without precedent as most TVIAs produced as part of EIAs for Tall Buildings in Manchester to date have used this equipment effectively to demonstrate accurately and verifiably the visual and townscape effects of a tall building on the townscape and views. As Technical Guidance note 06 / 19 notes:

'If the site / setting cannot be captured with the 50mm lens (e.g. close, tall buildings), consider alternative lenses. If a 50mm FL lens cannot capture the view in landscape or portrait orientation (for example, if the highest point of the development is approaching 18° above horizontal) the use of wider-angled prime lenses should be considered, working through the following sequence of fixed lenses in this order: 35mm FL > 28mm FL > 24mm FL > 24mm FL Tilt-Shift'

PRESENTATION AND VIEWING DISTANCE

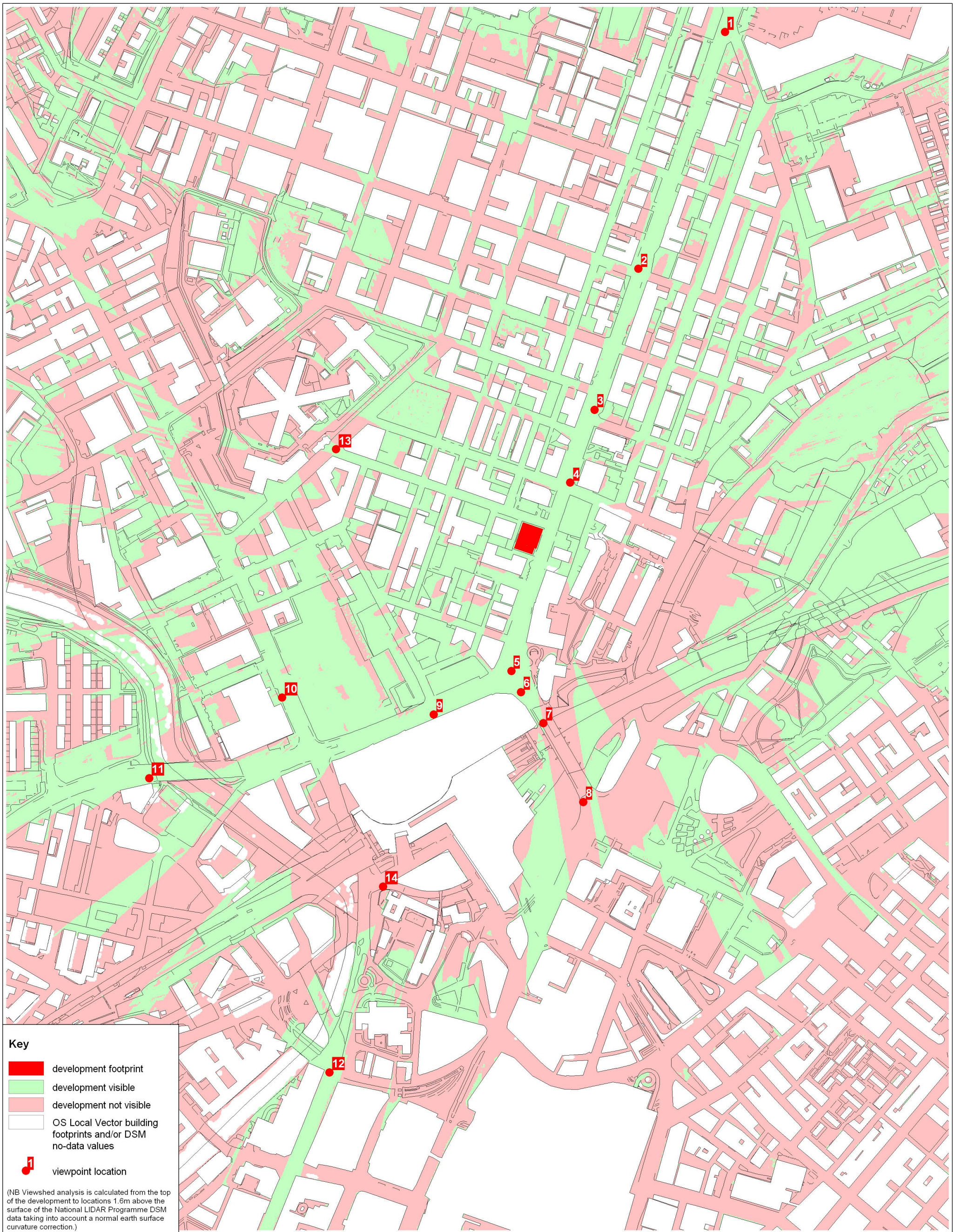
An equally important feature of the new guidance is how the images are presented and how they are viewed. Again, the guidance offers some useful advice which we propose to follow in this instance.

Research by the LI Working Group in the preparation of this guidance, carried out across several cities, suggests that, in mid- to smaller-scale landscapes / townscapes, an enlargement around halfway between 100% and 150% results in a binocular relationship between the presented image and reality…… notwithstanding the above, SNH considers that consistent use of 150% enlargement is beneficial

So, in these circumstances we propose to present each image, consisting of baseline, proposed and cumulative for each viewpoint is presented as an A3 PDF which then be viewed digitally or printed, if necessary, at A2 to obtain a 141% enlargement to achieve the recommended enlargement ratio. Each image when printed should be viewed, again as stated in the guidance, at a comfortable arm's length.

Chris Burnett Associates July 2023
Landscape Architects

APPENDIX 6



Key

- development footprint
- development visible
- development not visible
- OS Local Vector building footprints and/or DSM no-data values
- 1 viewpoint location

(NB Viewshed analysis is calculated from the top of the development to locations 1.6m above the surface of the National LIDAR Programme DSM data taking into account a normal earth surface curvature correction.)

0.0 47.5 95.0
metres

Date	Details	Revision
18/01/23	Additional viewpoint location.	-01
07/08/23	Revised building details and updated spatial data.	-02

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Viewshed and Viewpoint Locations

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Client	RPS
Project	33-41 Cheetham Hill Road, Manchester
Scale	1:4,750 @ A3
Date	07/08/23
Drawn	JHD
Checked	CB
Dwg No.	CHRMVIA22.01
Revision	-02

N

APPENDIX 7



SALFORD ARCHAEOLOGY
University of Salford

Hawkins Brown

Issue: v1

SA/2023/52

Cheetham Hill Road, Manchester

Archaeological Desk-based Assessment

Salford Environmental Consultancy

Built / Historic / Natural

REGISTERED ORGANISATION CIfA

QMS ISO 14001: 2015 45001: 2018

QMS ISO 9001: 2015

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1. Summary

Hawkins Brown is devising proposals for a 20-storey building used for both residential and commercial purposes on Cheetham Hill Road, Manchester (centred on NGR 384076, 399401). In order to support the planning applications for the scheme Hawkins Brown have commissioned Salford Archaeology to carry out an archaeological desk-based assessment for the proposed development site. This was intended to establish, as far as possible, the nature and significance of the sub-surface archaeological resource in order to enable informed recommendations to be made for the designs of the proposed schemes and the future treatment of any surviving remains.

During the medieval and post-medieval period, the proposed development area likely lay within the Strangeways estate. By at least the late 18th century, the site consisted of an open field within Strangeways Park.

By the early 19th century, four double-depth houses and a slightly larger dwelling had been constructed within the site. The properties had front and back gardens and may have included cellars. The arrangement of buildings within the site remained unchanged until the mid-20th century, when the houses were progressively cleared. The site was redeveloped into a garage by 1990 which is currently extant.

The potential for the site to contain buried archaeological remains is considered to be high. The most likely remains to be encountered within the site includes various types of 19th-century houses, however these may be considered as negligible. There is limited potential for garden soils to survive in discrete parts of the site, which would also be considered as negligible.

Following consultation with the Greater Manchester Archaeological Advisory Service (GMAAS), in their capacity as archaeological advisor to Manchester City Council, it is anticipated that no further archaeological investigation will be required.

2. Introduction

Hawkins Brown have prepared a planning application that comprises of a 20-storey building used for both residential and commercial purposes. The desk-based study aimed to identify as far as possible the nature, extent and significance of the sub-surface archaeological resource within the site so as to enable informed recommendations to be made for the future treatment of any surviving remains.

2.1 Site location

The proposed development area (centred on NGR 384076, 399401) comprises a plot of land in the Strangeways area of Manchester, Cheetham Hill, (herein referred to as the 'Site'). The Site lies to the north of Manchester City Centre and is bounded by Carnarvon Street in the north, Cheetham Hill Road to the east, a bank along Park Place to the south and Gibson Place to the west (Fig 1; Plate 1). The Site currently consists of a disused garage and associated hard standing car park.



Plate 1 Extract from Google Satellite, showing the Site boundary

2.2 Topography and geology

Topographically, the Manchester conurbation as a region lies within an undulating lowland basin, which is bounded by the Pennine uplands to the east and to the north. The region as a whole comprises of the Mersey River valley, whilst the rivers Irwell, Medlock and Irk represent the principal watercourses in Manchester. The River Irk runs *c.*175m south of the Site and the River Irwell runs *c.*500m south-west of the Site. The Site lies at a height of 44.5m above Ordnance Datum (aOD) and is relatively flat.

The Site is located on a band of solid geology comprising the sandstone of the Chester Formation, formed between 250 and 247.1 million years ago during the Triassic Period. It is

overlain by superficial Devensian Till deposits, which formed between 116 and 11.8 thousand years ago during the Quaternary Period (British Geological Society, 2021).

2.3 Designations

The Site does not contain any additional heritage assets that are afforded statutory protection, such as Listed Buildings, Scheduled Monuments, or any Registered Parks and Gardens. It does not lie within any Conservation Areas.

The Site is located within 300m of six designated heritage assets (Table 1). The proposed development will not have a physical impact on these designated heritage assets, and so they are not considered further in this report.

Site	Designation	List Entry	Location (NGR)
Former Synagogue	Grade II Listed Building	1208420	SJ 84034 99291
Roman Catholic Church of St Chads Presbytery	Grade II Listed Building	1208542	SJ 84195 99528
Churchyard Walls of Roman Catholic Church of St Chads Presbytery	Grade II Listed Building	1197786	SJ 84190 99544
Former Free Library	Grade II Listed Building	1293124	SJ 84215 99634
Cheetham Town Hall (former)	Grade II Listed Building	1208440	SJ 84178 99693
Gatehouse of HMP Manchester	Grade II Listed Building	1254670	SJ 83800 99527

Table 1 Designated sites within 300m radius of the Site

3. Method statement

3.1 Introduction

The assessment considers the potential impact of the proposed development upon any buried archaeological remains within the Site and comprises a desk-based study. The production of the assessment followed the Chartered Institute for Archaeologists (CIfA) standard and guidance for undertaking archaeological desk-based assessments (*Standard and Guidance for Historic Environment Desk-based Assessment*, 2017).

3.2 Research sources

The desk-based assessment made use of the following sources:

- Published and unpublished cartographic, documentary and photographic sources;
- The Greater Manchester Historic Environment Record, maintained by the Greater Manchester Archaeological Advisory Service (Fig 13);
- Manchester Local Archives and the Greater Manchester Record Office in Manchester Central Library;
- The National Heritage List for England;
- Salford Archaeology's extensive library of archaeological work carried out in the vicinity of the Site.

The aim of the research was to provide the relevant historical and archaeological background relating to the development of the Site. The available sequence of historical mapping was the principal source of information, as this provides evidence for the development of the Site since the late eighteenth century.

3.3 Site Inspection

The aim of the site inspection was to relate the findings of the desk-based study to the existing land use of the application area, in order to identify any evidence for surviving below-ground remains.

3.4 The document

The following presents the historical and archaeological evidence for the Site. Chapter 5 discusses the previous archaeological investigations that have taken place within the Site. A gazetteer (Chapter 6) is presented of heritage assets and sites of potential archaeological interest identified within the Site and this information, along with a map regression (Figs 3-10), is used to assess the significance of the remains (Chapter 7) and impact of the proposed development (Chapter 8). A mitigation strategy is outlined in Chapter 9, based on the assessment presented in the previous chapters.

3.5 Significance assessment methodology

An accepted methodology for assessing archaeological significance is the Secretary of State's criteria for the scheduling of ancient monuments, outlined in Annex 1 of 'Scheduled Monuments: identifying, protecting, conserving and investigating nationally important

archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979' (DCMS, 2013). These criteria have all been utilised in this assessment and are listed below:

- Archaeological interest
- Historical interest
- Period
- Rarity
- Documentation
- Group value
- Survival/condition
- Fragility/vulnerability
- Diversity
- Potential

The significance assessment also uses the approach to assessing heritage value contained within '*Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*' issued by the International Council on Monuments and Sites (ICOMOS) in January 2011 (ICOMOS, 2011). This document states that an archaeological asset's significance can be assessed as very high, high, medium, low, negligible or unknown.

3.6 Impact assessment methodology

The impact assessment assesses the potential impact of the proposed development upon the significance of the archaeological resource within the Site. Mitigation is then recommended to reduce the level of impact on the significance of the identified assets.

4. Planning and legislative background

This assessment accords with National, Regional and Local Planning Policies which relate to the historic environment. National planning policies relevant to heritage asset management are contained within the National Planning Policy Framework (NPPF 2021).

4.1 National Planning Policy Framework (NPPF)

The significance of the archaeological resource identified within this report has been assessed as recommended in the revised *National Planning Policy Framework* (Ministry of Housing, Communities & Local Government, 2021). The NPPF sets out the Government's planning policies and outlines the presumption in favour of sustainable development, which is defined by three principles: economic, social and environmental. Of the core planning principles underpinning decision making, conserving heritage assets 'in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations' is one. Section 16 deals specifically with this historic environment (paragraphs 189-208), and states that local planning authorities should consider:

- the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;
- the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring;
- the desirability of new development making a positive contribution to local character and distinctiveness; and
- opportunities to draw on the contribution made by the historic environment to the character of a place.

Paragraph 194 states that "local planning authorities, when determining applications, should require the applicant to describe the significance of any affected heritage assets, including any contribution made by their setting. 'The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation".

Paragraph 203 states that the effect of a proposal on non-designated heritage assets (designated assets are covered in paragraphs 199-202) should be taken into account in determining a planning application.

Paragraph 205 states that local planning authorities should require developers to record and advance understanding of any heritage assets to be lost, in a manner appropriate to their importance and impact, and to make this evidence publicly accessible.

4.2 Local Development Framework

The NPPF outlines the need for local planning policies to create local plans and frameworks to implement the NPPF at a local level. Manchester City Council adopted a Core Strategy in 2012, which is scheduled until 2027 (Manchester City Council, 2012) . The heritage strategy is outlined in *Objective 6: Environment* and summarises the approach the local authority will take in determining planning applications which may affect the historic environment (Manchester City Council, 2012, p. 164).

Policy EN3 states:

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

New developments must be designed so as to support the Council in preserving or, where possible, enhancing the historic environment, the character, setting and accessibility of areas and buildings of acknowledged importance, including scheduled ancient monuments, listed buildings, registered parks and gardens, conservation areas and archaeological remains. Proposals which enable the re-use of heritage assets will be encouraged where they are considered consistent with the significance of the heritage asset.'

Manchester City Council is advised on archaeological matters by the Greater Manchester Archaeological Advisory Service (GMAAS).

5. Historical background

The following section provides a framework to the present study, working chronologically through the periods listed below (Table 2).

British archaeological periods		
Period	**Sub-period**	**Date range**
Prehistoric	Palaeolithic	Pre-10,000 BC
	Mesolithic	10,000 – 3500 BC
	Neolithic	3500 – 2300 BC
	Bronze Age	2300 BC – 700 BC
	Iron Age	700 BC – AD 43
Historic	Romano-British	AD 43 – AD 410
	Early Medieval	AD 410 – AD 1066
	Late Medieval	AD 1066 – AD 1540
	Post-medieval	AD 1540 – *c* 1750
	Industrial Period	*c* AD1750 – 1914
Modern	Modern	Post-1914

Table 2 Summary of British archaeological periods and date ranges

5.1 Prehistoric period

The current understanding of human activity in the Manchester region during the prehistoric period is poor, although it is reasonable to suggest that several areas in the city centre, such as Castlefield, the area that now contains Manchester Cathedral and Chetham's School and Ardwick, may have been conducive for late prehistoric settlement on account of the natural topography and the abundance of natural water sources (i.e. rivers) (Gregory, 2007).

The nearest known prehistoric finds were discovered during the 19th century at Cathedral Yard. These comprise of a flint flake discovered in the Cathedral Churchyard in 1899, *c.*400m south of the Site. Any prehistoric remains within the study area are, at best, likely to comprise stray artefacts deposited within later, disturbed contexts. The survival of any *in-situ* prehistoric archaeological deposits is very unlikely.

5.1.1 Archaeological potential

There is no known evidence for prehistoric activity within the Site boundary, and the potential for any such remains to survive from this period is considered to be low.

5.2 Romano-British period

Archaeological evidence for Romano-British activity in Manchester is focused on the Roman fort of Mamucium, which was established on a sandstone bluff within Castlefield (Gregory, 2007). Archaeological excavation has shown that in the late 1st century, the fort comprised a turf rampart and timber gates, covering an area of c. 1.2ha, and was of a size compatible with

holding a 480-man infantry unit. The fort was rebuilt to similar dimensions in stone c AD 200 (ibid).

During the 2nd century, the fort was developed in association with a substantial extramural settlement, or vicus (Grealey, 1974, p. 11). Civilians occupied the extramural settlement, attracted by the security and commercial benefits of the nearby fort. Based on archaeological excavations and the distribution of Roman finds, the limits of this civilian settlement appear to have extended south-eastwards along Chester Road, terminating somewhere in the vicinity of Great Jackson Street, northwards from the fort to approximately Quay Street, westwards along Liverpool Road for c 100m from the north-west corner of the fort, eastwards across Deansgate to the area now occupied by the Beetham Tower. Castlefield Roman Vicus and Area of Roman Manchester lies *c.*1.5km south-west of the Site.

The study area lies beyond the extramural settlement, however, the Roman road (HER 14.1.0) from Manchester to Ribchester (HER 14.1.0) is situated *c.*200m to the west of the study area, continuing to the west of Strangeways, following the course of Bury New Road.

The River Irk, which runs *c.*280m south of the Site, is considered a receptacle of all relicts including ceramics, coins, weapons and domestic utensils that has either fell or been thrown in over the centuries. An immense amount of Roman and other coins were found in the old river bed during its diversion for the construction of the Lancashire & Yorkshire Railway Company in 1899 (HER 1393.1.0). Some notable coins included Emperors such as Trajan, Hadrian and Domitian. However, it also produced a coin of the Pyrrhus King of Epirus (295-272AD) and a copper coin from Carthage.

5.2.1 Archaeological potential

There is no known evidence for Roman activity within the Site boundary, and the potential for any such remains to survive from this period is considered to be low.

5.3 Medieval period

There is very little archaeological evidence in the region as a whole that represents the period between the end of the Roman occupation and the Norman Conquest of 1066. The area around Manchester came under the control of several kingdoms during this period. In AD 620, Edwin occupied Manchester, and it may have been at this time that settlement in the town was established around the cathedral (Farrer & Brownbill, 1911).

In AD 919, the Anglo-Saxon king Edward the Elder established a fortified base, or burh, at Manchester, which was then part of Viking Northumbria. It has been suggested that the burh lay within the area around the cathedral, which had become a focus for settlement by the late 11th century. The site occupied presently by Chetham's School is thought to have been the site of a castle founded by Manchester's Norman barons. This early settlement at the confluence of the Rivers Irwell and Irk seems to have been bounded on the landward side by Hanging Ditch, whose curving line ran between the two rivers, taking a line that was followed subsequently by Toad Lane, the forerunner of Todd Street and Corporation Street.

Evidence of early Saxon occupation within the area includes a Saxon findspot, recovered from Red Bank in 1850, *c.*195m east of the Site. The find was a funerary urn, that was stamped with decoration typical of the Saxon Period. The find likely dates to the 6th century and has parallels with vessels found in Yorkshire and Lincolnshire (HER 1254.1.0).

Following the Norman Conquest, William I assigned most of the land between the Ribble and Mersey rivers to Roger of Poitou, who retained the manor of Salford demesne (Tupling, 1962), but divided his other newly acquired land into several fiefdoms (Kidd, 1996). The largest of these was the landholding centred on Manchester, created by the grant of extensive lands in the hundreds of Salford, Leyland and West Derby to Albert Grelley (Tupling, 1962, p. 116).

By the 13th century, the Grelley family had established a manor house at the confluence of the rivers Irwell and Irk and the medieval town grew up around it (Hartwell, et al., 2004, p. 256). It was from this hall that they governed both the manor and the extensive barony. In 1222 Manchester was granted an annual fair, and in 1301 Thomas Grelley was granted the Great Charter of Manchester by Edward I, and thus it became a free borough (*ibid*).

The manorial watermill, originally known as Upper Mill, occupied a site on the River Irk to the north of the medieval settlement at Manchester (HER 9863.1.0), 200m south of the Site. The Manorial Survey of 1340 also recorded a fulling mill (HER 9864.1.0) at the site. By 1434, an oven had been built to the east of the mills. A new mill was erected in 1510 (HER 9862.1.0) and the mill buildings were granted to Chetham's in 1515. These buildings were presumably, demolished ahead of the construction of Victoria Station in 1844. The mill buildings were located approximately 380m to the south-east of the Site.A survey of the medieval layout of the city was undertaken in the 1980s by GMAU, which led to the designation of a zone defined as the Area of Medieval Manchester (Morris, 1983). The survey demonstrated that in addition to the manorial and ecclesiastical heart of the town, streets radiated out from the centre.

Hanging Ditch, formed the original boundary of the medieval settlement comprising the outermost of a series of defensive earthworks, which was excavated by the Greater Manchester Archaeological Unit (GMAU) at the Wellington Inn/Sinclair's Oyster Bar site in 1997 (HER 16050.1.0). This demonstrated that the feature had originated as a natural post-glacial channel, but had been modified in the 13th century, most likely as part of the defence of the Norman settlement, containing the castle, church, and a small number of dwellings. The later fills from episodes of in-filling contained artefacts dated to the mid-14th to 15th centuries. Two inner ditches may also have been associated with the castle. The middle ditch was observed in the 1760s during excavations for a new burial ground. This was undated but appeared to have defined the existing boundary of Chetham's School. The innermost was observed during excavations in *c* 1900 and by GMAU in 1983, creating a small enclosure at the tip of the spur at the confluence of the two rivers.

The Site lies *c.*400m north of Manchester's medieval core, in the Strangeways area of Manchester. Strangeways was first recorded in 1322 as *Strangwas*, deriving from the Anglo-Saxon *Strang* and *gewæsc* meaning 'a place by a stream with a strong current' (Farrer & Brownbill, 1911). Strangeways lies within the southern part of Cheetham, within Cheetwood.

The earliest reference to Cheetham appears in 1212, when Roger de Middleton held a ploughland in Cheetham of the king in chief in thegnage by the annual service of a mark. Henry de Chetham held the estate under Roger. The mesne lordship of the Middleton family did not last long, and it is believed that Cheetham was held directly by the king as Duke of Lancaster by the Chethams and their successors. Sir Geoffrey de Chetham was recorded throughout the mid-13th century. After his time, the manor was held by the Pilkingtons, the tenure being altered to knight's service, and on their forfeiture in 1485 it was granted to the Earl of Derby, and descended like Knowsley down to the mid-17th century. There does not

appear to be any later record of a manor of Cheetham, the estate probably having been dismembered by various sales (Farrer & Brownbill, 1911, pp. 259-62). Strangeways lay within the southern part of the Cheetham.

The principal estate in Cheetham, apart from the Manor, was Strangeways. Strangeways is mentioned in a description of The Bounds of Manchester in 1322 (HER 275.1.0). It was long held by the de Strangeways family from at least 1304 but was sold in the mid-17 century to the Hartleys, who retained possession for several generations. In 1711, the estate was bequeathed by Catherine Richards, widow to Thomas Reynolds, to the Earl of Ducie, who was the owner in 1850 (Farrer & Brownbill, 1911, pp. 259-62). The hall (formerly sited *c* 350m north-west of the Site) itself was built before 1590, thought its precise date is unknown. The hall was demolished around 1860 and replaced by the Assize Court (HER 11769.1.0). The site of Strangeways Hall lies *c.*410m north-west of the Site. The Site was most likely agricultural fields during this period.

The Manor Survey of 1320 records two mills within the area. Manor (Upper) Watermill (HER 9863.1.0) was revealed to be a watermill for the parish, situated *c.*200m south of the Site. A later medieval mill was built was erected in the same site in 1510. A fulling mill was also recorded south-west of the watermill (HER 9864.1.0). In 1515 the fulling mill was granted to Cheetham's.

5.3.1 Archaeological potential

The Site most likely lay just beyond medieval settlement activity and the potential for buried archaeological remains is considered to be low due to the extensive development that took place in the 19th century.

5.4 Post-medieval period

By 1539, John Leland was able to describe Manchester as the 'finest and busiest town in the whole of Lancashire, with the best buildings and the greatest population' (Chandler, 1993, p. 263), at a time when the textile industries in South Lancashire were beginning to flourish. Manchester emerged as a centre for the textile finishing processes, as woollen cloth was brought in from outlying areas for bleaching and dyeing. Most importantly, however, Manchester expanded its role as a market centre for textiles produced in the towns and hamlets of the surrounding district (Frangopulo, 1964, p. 26).

From the early 17th century, fustians produced in a network of towns with Manchester at their hub were being exported regularly to western and southern Europe, and the town became the principal commercial centre for the region (Hartwell, 2001, pp. 8-9). A flourishing business community developed, which was dominated by a few wealthy merchant manufacturers and fustian-dealing families, notably the Chethams, the Booths, the Wrigleys, and the Byroms. During this period, the Site presumably lay in a predominantly rural area that may have been used for agriculture.

In his tour of the country in the 1720s, Daniel Defoe (Defoe, 1727) noted that Manchester had 'extended in a surprising manner, being almost double to what it was a few years ago', reflecting the further expansion of the textile trade (Hadfield & Biddle, 1970). By the 1790s, Manchester's thriving export market was beginning to displace London as a centre of overseas

trade in cotton cloth, reflecting great improvements to the transport network across the North West.

Manchester underwent a rapid expansion during the post-medieval period. The population of Manchester increased from approximately 1800 people in 1563 to just over 3000 people in the year 1642 (Willian, 1980, pp. 38-9). The Hearth Tax Returns of 1664 listed 820 households, which suggests a population of approximately 3690. The population of Manchester roughly doubled between 1563 and 1664, despite an outbreak of plague in 1645 (Phillips & Smith, 1994, p. 7). By the census of 1773, the town's population had dramatically increased even further, with approximately 24,937 people living in the township of Manchester, 23,032 of which were living in the town itself. During the post-medieval period, Manchester changed from what had been a small market centre into the largest town in Lancashire (Nevell, 2003).

A settlement had been established within the Strangeways estate by 1544, which comprised 24 messuages, 20 burgages, 20 cottages and a watermill, with land, meadow, pasture, wood, moor and heath, and turbary, £5 13*s*. 4*d*. rent, and the moiety of a water-mill, in Cheetham, Strangeways, Rochdale, Spotland, Oldham, Cheesden, Manchester, Salford, Oldfield, Withington, and Ardwick (Farrer & Brownbill, 1911, pp. 259-62). Land within the estate was progressively sold off during the late 16th century and early 17th century, including a burbage in Manchester, near the Irk and land in Salford (*ibid*). The selling off of their property likely reflected the dwindling fortunes of the estate, though the family continued to had hold Strangeways Hall, watermill and 40 acres of land in Cheetham, the Knolls and other lands in Manchester, Ardwick, Salford, and Withington.

Cheetham was a township within the parish of Manchester by at least the post-medieval period. The hearth tax returns of 1666 show that there were 70 hearths liable in the township of Cheetham. The largest houses were those of John Hartley, John Symon, and Edward Chetham, with 13, seven, and six hearths respectively. A Cheetham halfpenny token was issued in 1668 (Farrer & Brownbill, 1911, pp. 259-62).

5.4.1 Archaeological potential

The Site most likely remained agricultural fields during the post-medieval period. The potential for buried archaeological remains is considered to be low.

5.5 Onset of the industrial revolution

Significant quantities of cotton began to be imported into south Lancashire from the early 17th century, firstly in linen/cotton fustians. By around 1750, pure cotton fabrics were being produced, and cotton had overtaken wool in importance. Textiles were generally manufactured in domestic-based workshops or weavers' cottages as part of the putting-out system, whereby merchants employed textile workers and supplied them with raw materials.

The second half of the 18th century was characterised by an accelerated pace of development, which was captured on the first detailed plans of the area, produced on four successive maps by Casson and Berry between 1741 and 1751 (Plate 2) The plans produced by Casson and Berry capture the expansion of Manchester and its suburbs. The growth of Manchester was enhanced by the development of waterborne transport. The first key development was the founding of the Mersey & Irwell Navigation Company in 1721, which aimed to provide a

navigable route from the Mersey estuary to the Salford and Manchester by improving the course of the River Irwell and the River Mersey. The navigation opened in 1734, opening up trade from the growing port of Liverpool to Manchester and Salford (George & Brummond, 2002, p. 22).

The next major development was the construction of the Bridgewater Canal, the first true canal in the world, completed between the Duke of Bridgewater's coal mines at Worsley and Castlefield by 1765. The Manchester end of the Bridgewater Canal was fed by the River Medlock, which was navigable as far as India House (HER 8654.1.0) on Whitworth Street. The combination of competition and improved efficiency halved the cost of coal and transport cost of raw cotton, vital to the sudden growth of textile industry.

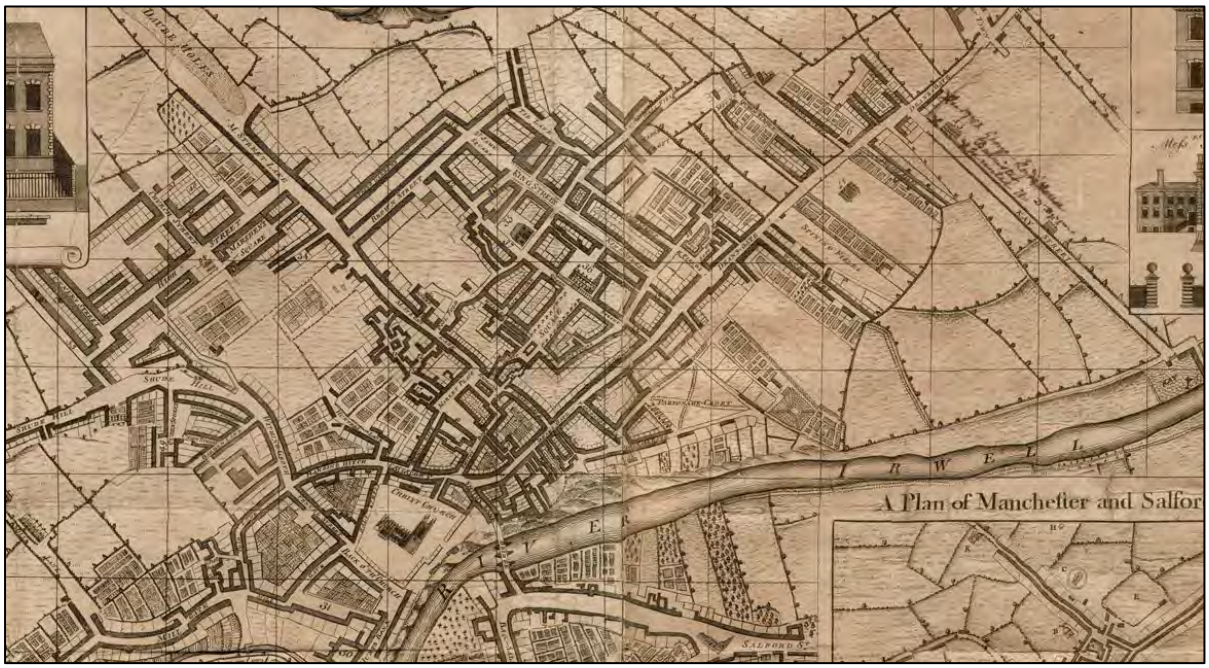


Plate 2 Extract from Casson and Berry's map of 1741, showing approximate Site location

The success of the Bridgewater canal acted as a catalyst for the construction of numerous canals, including the Rochdale Canal (HER 1386.2.0). The Rochdale Canal (HER 12089.9.0; 1386.2.0) had been planned in 1765 by James Brindley but was not completed until 1804 when it joined the Ashton Canal to the north of the city centre. Initially, the canal opened in stages as sections were completed beginning with the Manchester to Rochdale branch in 1798. The completion of the Rochdale canal in 1804 meant that a water transportation route now existed between the North Sea at Hull and the Irish Sea at Liverpool. In 1805, John Rennie engineered its connection to the Bridgewater Canal, to the south of the city centre, (DGM1553).

By the 1780s, the national demand for textiles, particularly cotton, began to rise, resulting in a dramatic increase in mill building that transformed Manchester into a centre of factory-based cotton manufacturing industry of international repute (Baines, 1835). The River Medlock was utilised for early industry, and several industrial premises associated with the textile finishing industries had been established along its banks. These included dye works and printworks, which are shown along its course on late 18th-century mapping. A large complex of buildings

identified as a Print Works (HER 9736.1.0) was situated *c.*240m south-west of the Site. The premises was most likely water powered and a large irregular reservoir lay to the north-east of it. Tithe maps reveal it was occupied by John Redfern, but the land was owned by the Earl of Ducie. Green's Map of 1794 reveals another complex of buildings situated *c.*140m south of the Site and named a dyeworks. However, it was demolished and turned into houses by the early 19th century.

A slightly example includes Red Bank Mill (HER 15733.1.0), which lay between Back Foundry Street and Back Red Bank in the 19th century, *c.*200m east of the Site. The building originally functioned as a cotton mill and consisted of a single rectangular building. It was later converted into an oil and tallow refinery and eventually adapted into a sawmill in the 20th century.

On the incorporation of Manchester in 1838, Cheetham became part of the new borough. Cheetham ceased to be a township in 1896, being absorbed into the new township of North Manchester. Land in the southern part of Cheetham, in the Strangeways area was sold off to the Manchester and Leeds Railway in 1838 (Farrer & Brownbill, 1911, pp. 259-62).

During the late 19th century, the southern end of the township became home to a large Jewish community, who had fled persecution from the former Russian Empire during the pogroms. In total, nine synagogues had been established by the early 20th century, some of the buildings having formerly been used as Nonconformist chapels. A hospital and dispensary were also founded, together with a Home for Aged Jews and a Talmud Torah (Farrer & Brownbill, 1911, pp. 259-62).

5.6 Victoria Station

The main notable railway in proximity to the Site (*c* 210m south of the Site) is Manchester Victoria Station. It was the original block to Hunt's Bank Approach for the Manchester and Leeds Railway Company in 1844 (List Entry: 1254725). The station was designed by George Stephenson and completed by John Brogden. By the mid-1840s, several different railway companies were operating from the station that connected Manchester to London, Glasgow, Liverpool, Leeds and Sheffield. At the time, it was one of the biggest passenger stations in Britain. Victoria Station has undergone several extensions as Manchester grew in the Industrial Period. In 1842, the Manchester and Leeds Railway broke ground in York Street, Cheetham Hill, in preparation for an additional line which would pass under Cheetham Hill Road (Wray, 2019).

In January 1846, during the Manchester Town Council meeting, the Town Clerk read from the report of the Improvement Committee, which consisted of the following:

"that an intimation was made to them in December from the Manchester and Leeds engineer to the effect that their station at Hunts Bank was becoming too small for their rapidly increasing traffic, and that other branch railways were likely, in a short time, to become connected with their main line, which would still further increase the amount of traffic; and that, in his opinion, it would be a convenience to the company, and enable them to provide much better accommodation for the public, if the street proposed to be carried along Mill Brow, through the land of the company to the present station, and thence to the Cheetham Hill Road, could be diverted so as to leave the entire area bounded by the river Irk at the disposal of the company, as, by this arrangement, the company would be enabled to bring the station for a portion of

their traffic up to Long Millgate, at the point opposite the bottom of Todd Street." (Wray, 2019, p. 162)

Several more extensions and reconstructions took place for Manchester Victoria including the extensions of the station which included the diversion of the old Cheetham Hill Road, and the covering of the River Irk between Hunts Bank and Red Bank (Wray, 2019, p. 844).

5.7 Development of the Site

The development of the Site can be traced reasonably well from the sequence of available historic mapping. Several cartographers began to map Manchester and its suburbs during the second half of the 18th century. One of the first maps to capture the Site is Green's Plan of Manchester and Salford 1787-1794 (Plate 3). The Site lay within the Strangeways estate, 350m east of the Hall, within an open field annotated on Green's map as being within '*Strangeways Park'*. Strangeways Park was a large pleasure garden that included fishing ponds, several other large bodies of water, a bowling ground, a maze, shooting butts and tree lined avenues. The field within the Site lay to the south of a decorative maze and east of a large body of water labelled '*Canal*' on Green's plan. The field was owned by Lord Ducie, who held the Strangeways estate in the late 18th century.

Lord Ducie, also known as Captain Francis Reynolds-Moreton, was the 3rd Baron of Ducie was a famous British naval officer who commanded several ships during and after the time of the American Revolutionary War. He was born in Strangeways, Manchester and was part of a notable family who were said to be descended from the Normans. The Ducie family had many estates and land, including the manors of Charfield, Cromhall Abbots and Cromhall Lygon, Tortworth, Wickwar and Woodchester (discovery.nationalarchives.gov.uk/).



Plate 3 Extract from Green's map of Manchester & Salford, 1787-94, showing the approximate Site boundary

Bancks and Co's map of Manchester (Fig 3; Plate 4) is the first map that captures development within the Site. The proposed grid of streets had been laid across the fields surrounding the

Site, in anticipation of development. Many of these streets intersected the large 'canal' or reservoir that lay to the west of the Site (see Plate 3, p15). York Street ran broadly south-west to north-east along the eastern boundary of the Site. An isolated row of five buildings had been erected within the Site. In total, four of the buildings were identical, comprising double-depth terraced houses with rear yards, outbuildings and small front gardens facing onto York Street. The northernmost building had a slightly larger footprint.



Plate 4 Extract from Bancks and Co's map of Manchester, 1831, showing the Site boundary

The next available map that captures the Site is the Ordnance Survey map of 1850 (Fig 4; Plate 5), which is the first accurate plan that details the Site. The same arrangement of buildings occupied the Site, though the 1851 map shows the buildings in greater detail than the previous map. Pavement lights seem to have been depicted along the York Street frontage, suggesting that the buildings may have been cellared. External staircases were also shown to the rear of each property, potentially suggesting that they were slightly raised above ground level. The only notable difference captured on the 1851 map was the erection of a small, square outbuilding to the rear of the northmost building. The wider area had undergone intense development, mostly consisting of residential houses.

Slater's trade directory of 1850 provides an insight into the social history of the Site. It records the houses within the Site as No. 25 to No. 33 York Street. The occupations of the residents within the Site included a salesman, a calenderer, a manager, and a surgeon (Slater, 1850, p. 646).

By 1879, Slater's trade directory records that the double-depth houses were occupied by an ironmonger, a manufacturer and a decorator. The directory shows that the northernmost house within the Site was split into two properties during this period. No. 41 was occupied by Cheetham Liberal Club Co. Limited and No.41a was occupied by Gaskin Thomas & Son Plumbers (Slater, 1879, p. 576).

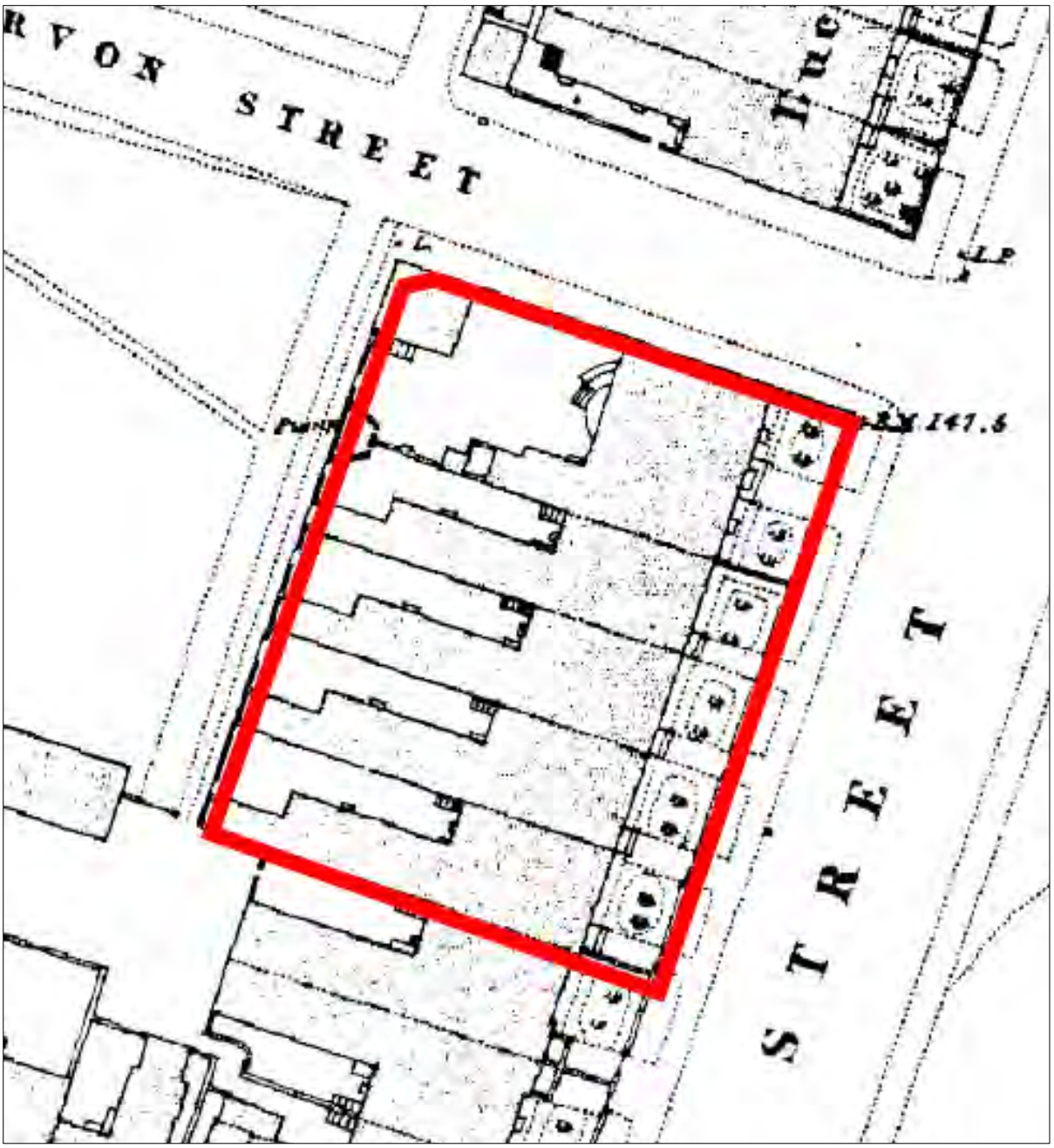


Plate 5 Extract from the Ordnance Survey Town Plan map of 1850, showing the Site boundary

The double-depth houses within the Site remained mostly unchanged on the Ordnance Survey map of 1891 (Fig 5; Plate 6) and throughout the first half of the 20th century (Figs 5 and 6). The only minor alteration included an extension to the rear of the larger building in the north of the Site, with access to the courtyard from Carnarvon Street. The extension could have been associated with it functioning as a liberal club and plumbers in the latter 19th century.



Plate 6 Extract from the Ordnance Survey Town Plan map of 1891, showing the Site boundary

The census returns of 1891 provides an insight into the social history of the area in the late 19th century. The census returns reflect the influx of Jewish settlers in the area, after they had fled the former Russian Empire from persecution (Table 3). In total, two Jewish families resided at the houses within the Site.

Address	Household Name(s)	No. of residents	Occupations of residents	Birthplace of residents
33 York Street	Saul	4	Retired Jewish clergyman, retired general practitioner	Russia

35 York Street	Holbrook, Williams, Barnes, Shatwell	9	Fruit salesman, domestic servants	Radford, Blackburn, Manchester, York
37 York Street	Landale, Holme, Walbank, Hughes	9	Fruit merchant, housekeeper, domestic servant, nurse	Manchester, London, Staffordshire, Chesterfield
39 York Street	Sewelson, Schlomonitz, Masley	5	Chemist, domestic servant	Russia, Manchester, Prussia
41 York Street	Hope	4	Insurance agent	Manchester

Table 3 Census Returns for York Street, 1891

By 1898, the original route of Cheetham Hill Road was diverted to arch over the Irk, in which it replaced York Street and continued north (Wray, 2019, p. 832). The census returns of 1901 recorded the houses within the Site as being No. 33 to No. 41 Cheetham Hill Road (Table 4). All of the properties within the Site were inhabited by Jewish families. This highlights the mass immigration of the Jewish population into Cheetham Hill during this period. The residents had specialised occupations, indicating that they were middle-class. Occupations listed include a surgeon, a boot and shoe manufacturer, a tailor, a chemist and a photographer. The majority of the residents within the Site employed domestic servants which is a further indication of wealth.

Address	Household Name(s)	No. of residents	Occupations of residents	Birthplace of residents
33 Cheetham Hill Road	Saul, Gorman	5	Physician & surgeon, domestic servant	Russia, Manchester, Wigan
35 Cheetham Hill Road	Freeman, Milan	10	Boot & shoe manufacturer, domestic servant	Russia, Manchester, Ireland
37 Cheetham Hill Road	Tragen, Milan, Findlen	12	Ladies tailor, ladies tailor's apprentice, domestic servant	Germany, Russia, Manchester

39 Cheetham Hill Road	Sewelson, Gray	4	Chemist, domestic servant	Russia, Manchester,
41 Cheetham Hill Road	Levy, Linsey	6	Grocer, grocer's assistant, domestic servant	Russia, Manchester, Ireland
41 Cheetham Hill Road	Lepshitz	1	Photographer	Russian

Table 4 Census Returns for Cheetham Hill Road, 1901

By the mid-20th century, two of the double-depth houses in the south of the Site had been demolished. The building at the north end of the Site had been converted into three properties which are labelled on the Ordnance Survey map of 1949 (Fig 8; Plate 7) as No. 1a and 1c of Carnarvon Street and No. 41 Cheetham Hill Road.



Plate 7 Extract from the Ordnance Survey National Grid map of 1949, showing the Site boundary

An aerial photograph of the Site taken in 1953 (Plate 8) shows the two remaining double-depth houses along Cheetham Hill Road and the separation of the larger building that occupied the junction of Cheetham Hill Road and Carnarvon Street. A small square structure can be seen on the photograph, in the south-west corner of the Site, although the purpose of this building is unknown.



Plate 8 Aerial photograph of the Site in 1953, courtesy of Historic England

The Site remained unchanged until the later 20th century (Fig 9 & Fig 10). The remaining buildings were demolished by 1990 and replaced with a garage. The garage remains extant, together with an associated shelter. The remainder of the Site consists of a hard-standing surface.

5.8 Previous archaeological works

In total, 23 archaeological events have been recorded within 300m of the Site. Non-intrusive events include 12 desk-based assessments, three heritage impact assessments and an environmental assessment. Intrusive archaeological investigations include two watching briefs, two evaluations and an excavation.

The closest archaeological event to the Site includes a desk-based assessment undertaken by Oxford Archaeology North in 2015 (EGM4197). The report was written for a plot land that lies *c.*18m south-east of the Site. concluded that the site contained a block of workers' houses that had some potential for survival along with the cellars of larger domestic buildings (Oxford Archaeology North, 2015).

An excavation at 4 & 5 Angel Square, situated *c.*290m south-east of the Site was undertaken by Salford Archaeology in 2020 (EGM5116). The excavation revealed former buildings on the

fringe of the medieval core of Manchester. It was believed that the earliest foundations encountered were associated with an 18th- century building. Other remains found were associated with dwellings and a workshop (Salford Archaeology, 2020).

5.9 Summary of archaeological potential

No prehistoric or Roman activity is known to have taken place within the Site and the likelihood of finding remains associated with these periods is considered to be low.

The Site lay within the Strangeways estate during the medieval and post-medieval periods. Late 18th-century maps show that the Site consisted of an open field that lay within Strangeways Park.

By the early 19th century, four double depth houses and a slightly larger dwelling had been constructed within the Site. The properties had front and back gardens and may have included cellars. The arrangement of buildings within the Site remained unchanged until the mid-20th century, when the houses were progressively cleared.

The Site was redeveloped into a garage by 1990 which is currently extant.

6. Site inspection

A Site visit was carried out as part of the archaeological assessment on 26th June 2023. The aim of the Site inspection was to relate the findings of the desk-based study to the existing land use of the application area, in order to identify any evidence for surviving below-ground remains.

The Site currently contains a disused red-brick motor garage (Plate 9) formerly known as 'Arena Motor Company' (Plate 10). Attached to the southern elevation of the garage is a rectangular steel-reinforced shelter with plastic cladding on the roof (Plate 11 & Plate 12). The remainder of the Site consists of hard-standing concrete and tarmacadam surfaces, with potential evidence of service trenches (Plate 13). There were no visible archaeological remains within the Site, though there is high potential for below-ground remains of the houses to survive beneath the present superficial structures.



Plate 9 Photograph of the disused garage within the Site, facing north



Plate 10 Photograph of disused garage within the Site, facing north-west



Plate 11 Photograph of shelter within the Site, facing east



Plate 12 Photograph of the shelter within the Site, facing north



Plate 13 Photograph of the concrete surface within the Site, facing south-east

7. Gazetteer

The following gazetteer entries (GE) summarise the sites of potential archaeological interest within the Study Area and elements of the historic landscape. The identification of these heritage assets is drawn primarily from the historic map regression analysis, Historic England, and the HER data. The locations of the gazetteer entries are shown on Figures 11-12 within Appendix 1: Figures.

Gazetteer Entry 01

Site Name	Strangeways Parkland
Designation	Non-designated heritage asset
HER Number	
Site Type	Garden soils (site of)
Period	Unknown
NGR	384076, 399400
Source	Green's map
Description	Green's map of 1794 shows that the Site lay within an open field within Strangeways Park. The estate was held byLord Ducie. The land remained undeveloped until the early 19th century.
Assessment	Most of the medieval to post-medieval landscape is likely to have been removed by the later 19th century development of the Site but cannot be completely discounted and may survive in discrete areas of the Site.

Gazetteer Entry 02

Site Name	19th century double-depth houses
Designation	Non-designated heritage asset
HER Number	
Site Type	domestic housing (site of)
Period	19th century
NGR	384076, 399393
Source	Bancks and Co's Map; OS Mapping; trade directories; census returns
Description	In the early 19th century, four double-depth houses, with rear gardens and outbuildings were constructed within the Site. The houses remained unchanged until they were progressively demolished between the mid-and late 20th century. The houses seem to have had pavement lights and external staircases to the rear, indicating that they may have been cellared.
Assessment	Remains associated with the double-depth houses may survive within the Site, especially if they were cellared and could be affected by the proposed scheme.

Gazetteer Entry 03

Site Name	19th century larger dwelling
Designation	No designation
HER Number	-
Site Type	Domestic building (site of)

Period	19th century
NGR	384083, 399413
Source	Bancks and Co's map, OS Mapping, trade directories, census returns
Description	A slightly larger dwelling was constructed adjacent to the double-depth houses in the north of the Site. It was extended and altered in the later 19th century, and eventually divided into three properties. The dwelling was later demolished sometime in the later 20th century. The Ordnance Survey map (Fig 5) shows that the house had paving lights, which is an indication that it was cellared.
Assessment	Remains of the larger dwelling could survive within the Site, especially if it was cellared and therefore may be affected by the proposed development scheme.

8. Significance

8.1 Policy context for heritage assets

The archaeological resource of an area can encompass a range of assets, including below-ground remains, earthworks, and standing buildings and other structures. Some of these remains may have statutory protection, such as Scheduled Monuments or listed buildings. Others do not but may nevertheless be of archaeological significance. Under both national and local planning policy, as outlined below, both statutory and non-statutory remains are to be considered within the planning process.

The NPPF sets out the Government's planning policy and framework for England, and how these are expected to be implemented. The NPPF places particular emphasis on assessing the development proposals in line with an up-to-date local plan. Consequently, Manchester's Core Strategy (adopted July 2012) was consulted as the key Development Plan Document in the Local Development Framework (LDF), with particular reference to Policy EN3: Heritage. In determining applications, local planning authorities must be able to understand the significance of any heritage assets affected by a proposed development in order to assess its impact. This enables the conservation of heritage assets in a manner suitable to their significance so that they can be enjoyed for their contribution to the quality of life of this and future generations, or else they can be recorded and advance understanding of the significance of any heritage assets to be lost in a manner proportionate to their importance and the impact, and to make this evidence publicly accessible.

8.2 Designated heritage assets

The Site is situated within 300m of six designated heritage assets, however, the proposed development will not have a physical impact on these designated heritage assets, and so they are not considered further in this report (see Section 2.3).

8.3 Significance of the archaeological resource

8.3.1 Historical and archaeological interest

Historical interest

Late 18th-century maps show that the Site consisted of an open field that lay within Strangeways Park (within the Strangeways estate) held by Lord Ducie (GE01). From the early 19th century onwards, domestic dwellings occupied the Site (GE02-03). Manchester was at the forefront of the industrial revolution and therefore the Site may be considered to be of historical interest.

Archaeological interest

Archaeological remains within the Site are most likely associated with the residential use of the area, comprising of 19th century houses (GE02-03) and associated outbuildings. The houses contained back yards and any surviving garden soils would be of archaeological interest as few remains of the former landscape survive within Manchester today. Any remains associated with the houses would be of little archaeological interest as many examples have been excavated.

8.3.2 Baseline significance conditions

Period

No prehistoric or Roman activity is known to have taken place within the Site, and the potential for such remains is considered to be low due to the intensive development of the Site in the early 19th century.

The Site likely lay within the Strangeways estate during the medieval and post-medieval periods. Late 18th-century maps show that the Site consisted of an open field that lay within Strangeways Park (GE01).

The most likely remains to be encountered within the Site could date to the industrial period, which could include domestic dwellings (GE02-03). Site's reflecting Manchester's industrial heritage may be considered significant due to period.

Rarity

Archaeological remains pre-dating the 19th century would be considered significant due to rarity, as few remains survive within the area due to extensive development during the Industrial Period. Remains associated with the pre-19th century landscape would include agricultural soils (GE01).

Archaeological remains associated with 19th-century domestic houses (GE02-3) may not be considered rare as several examples have been excavated in the past 30 years. In addition, several rows of double-depth terrace houses remain standing throughout Manchester.

Documentation

The historical development of the Site can be traced reasonably well from cartographic and other primary sources. Further documentary research would undoubtedly furnish additional evidence, although this is unlikely to alter the outline and conclusions presented in this assessment.

Group value

The Site lies within an area of Manchester that was developed from the early Industrial Period onwards. The buildings erected within the Site consisted of contemporary residential buildings (GE02-3) and have some group value.

Survival / condition

The survival, extent and condition of any below-ground archaeological remains within the Site is presently unknown. Some of the buildings within Site may have contained cellars, which have high potential to survive as below-ground remains.

Fragility / vulnerability

Any buried archaeological remains, should they be present and survive *in situ*, are vulnerable to damage or destruction during any earth-moving works associated with the restoration scheme.

Diversity

The remains within the Site are mostly associated with the development of Manchester during the Industrial Period, and therefore may not be considered significant due to diversity.

Potential

There are no prehistoric or Roman remains within the Site and the potential for these remains is considered to be low.

The Site lay within the Strangeways estate during the medieval and post-medieval period. By at least the late 18th century, the Site consisted of an open field within Strangeways Park. The remains of garden soils may have the potential to address the research agendas outlined in the current Archaeological Research Framework for North West England (https://researchframeworks.org/nwrf/sample-page/industrial: Table 5):

Industrial Period	
LM06	How can the impact of landholding and lordship be identified by wider landscape studies?
PM19	How can the study of leisure landscaping inform our understanding of the changing landscape in this period?
IND08	To what extent were post-medieval geometric garden landscapes swept away by post-1750 landscaping?
IND21	How did industrial period towns affect the pre-existing historic landscape?

Table 5 Industrial Period Research Agendas

Garden soils have the potential to survive within discrete parts of the Site, potentially in areas that did not contain 19th-century cellars and may have some potential to address the research agendas above (Table 5).

Double-depth terraced houses had been erected across the Site by the early 19th century. The survival of these houses may have the potential to address the research agendas outlined in the current Archaeological Research Framework for North West England (https://researchframeworks.org/nwrf/sample-page/industrial): Table 6):

Post-medieval	
Ind26	How can we take forward our understanding of the impact of industrialisation on the middle class, particularly their housing and its location?
Ind30	How have buildings changed in response to planning regulations?

Table 6 Industrial Period Research Agendas

Buried remains of houses may survive within the Site, especially if they were cellared and therefore have some potential to address the research agendas listed above (Table 6).

8.4 Summary of significance

It can be concluded from the information gained from the desk-based research that the Site has potential to contain buried remains dating to the Industrial period.

Using the above criteria and the ICOMOS guide for assessing value of heritage assets the Site most likely contains non-statutory archaeological remains of negligible significance.

The Site has limited potential to contain agricultural soils (GE01) that would be considered as negligible.

The Site has high potential to contain below-ground structural remains of early 19th-century housing (GE02-03) that would be of little archaeological interest and may be considered as negligible.

9. Impact assessment

9.1 Development Proposals

Hawkins Brown have prepared development proposals that comprise of a 20-storey building that will be used for residential and commercial purposes.

9.2 Impact upon archaeological resource within the Site

Delivery of the development proposals will necessitate ground-breaking and landscaping works across the Site, with potential to impact on buried archaeological remains.

This assessment has demonstrated that the Site has high potential to retain buried remains of 19th-century houses (GE02-03) and limited potential to contain agricultural soils (GE01). Any such remains that do exist within the Site are likely to be of limited archaeological value and may be considered as negligible.

10. Recommendations

10.1 Heritage Assets

The NPPF makes clear that where the loss of the whole or a material part of a non-designated heritage asset's significance is justified by a development, the developer should be required to record that asset and advance understanding of its significance, and to make this evidence publicly accessible.

10.2 Further Investigation

Following consultation with the Greater Manchester Advisory Service (GMAAS), in their capacity as archaeological advisor to Manchester City Council, it is anticipated that no further archaeological investigation will be required.

Sources

Cartographic sources

Casson and Berry's map of Manchester, 1741

A Plan of Manchester and Salford, W. Green 1787-1794

A Map of Manchester and Salford, Bancks & Co, 1831

Ordnance Survey 1:1056 Town Plan, published 1850

Ordnance Survey 1:500 Town Plan, published 1891

Ordnance Survey 1:1250 National Grid Map, published 1949

Census Returns

Census Returns for York Street, Cheetham, Manchester, Lancashire, 1891. Record Set: England, Wales & Scotland Census. Archive reference: RG12. Piece Number: 3261. Folio: 62. Page 13

Census Returns for Cheetham Hill Road, Cheetham, Manchester, Lancashire, 1901. Record Set: England, Wales & Scotland Census. Archive reference: RG13. Piece Number: 3770. Folio: 39. Page 68

Census Returns for Cheetham Hill Road, Cheetham, Manchester, Lancashire, 1901. Record Set: England, Wales & Scotland Census. Archive reference: RG13. Piece Number: 3770. Folio: 340 Page 69

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The desk-based research and report were compiled by Jade Foxall, and illustrations were provided by Sarah Mottershead. The report was edited by Katie Fletcher.

Appendix 1: Figures

Figure 1: Site location map

Figure 2: Site boundary superimposed on modern mapping

Figure 3: Site boundary superimposed onto Bancks & Co Map of Manchester and Salford, 1831.

Figure 4: Site boundary superimposed on the Ordnance Survey 1:1506 Town Plan Map of 1850

Figure 5: Site boundary superimposed on the Ordnance Survey 1:500 Town Plan Map of 1891

Figure 6: Site boundary superimposed on the Ordnance Survey 1:2500 County Series Map of 1908

Figure 7: Site boundary superimposed on the Ordnance Survey 1:2500 County Series Map of 1933

Figure 8: Site boundary superimposed on the Ordnance Survey 1:1250 National Grid Map of 1949

Figure 9: Site boundary superimposed on the Ordnance Survey 1:2500 National Grid Series 1959

Figure 10: Site boundary superimposed on the Ordnance Survey 1:2500 National Grid Series 1966

Figure 11: Gazetteer sites superimposed onto modern mapping

Figure 12: Gazetteer sites superimposed onto modern mapping

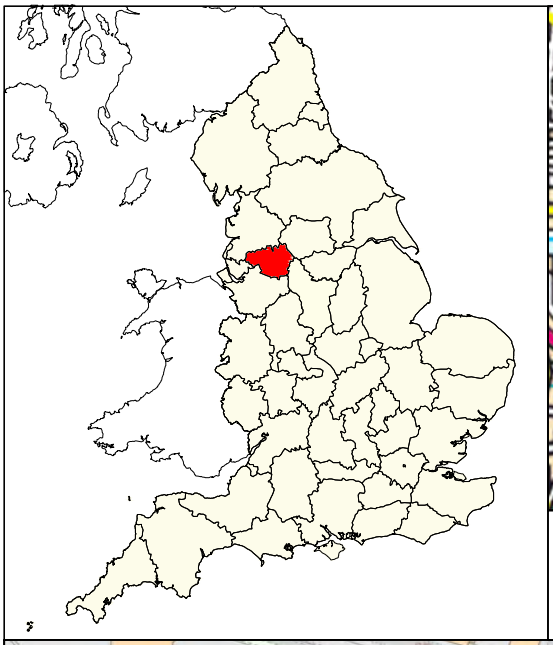


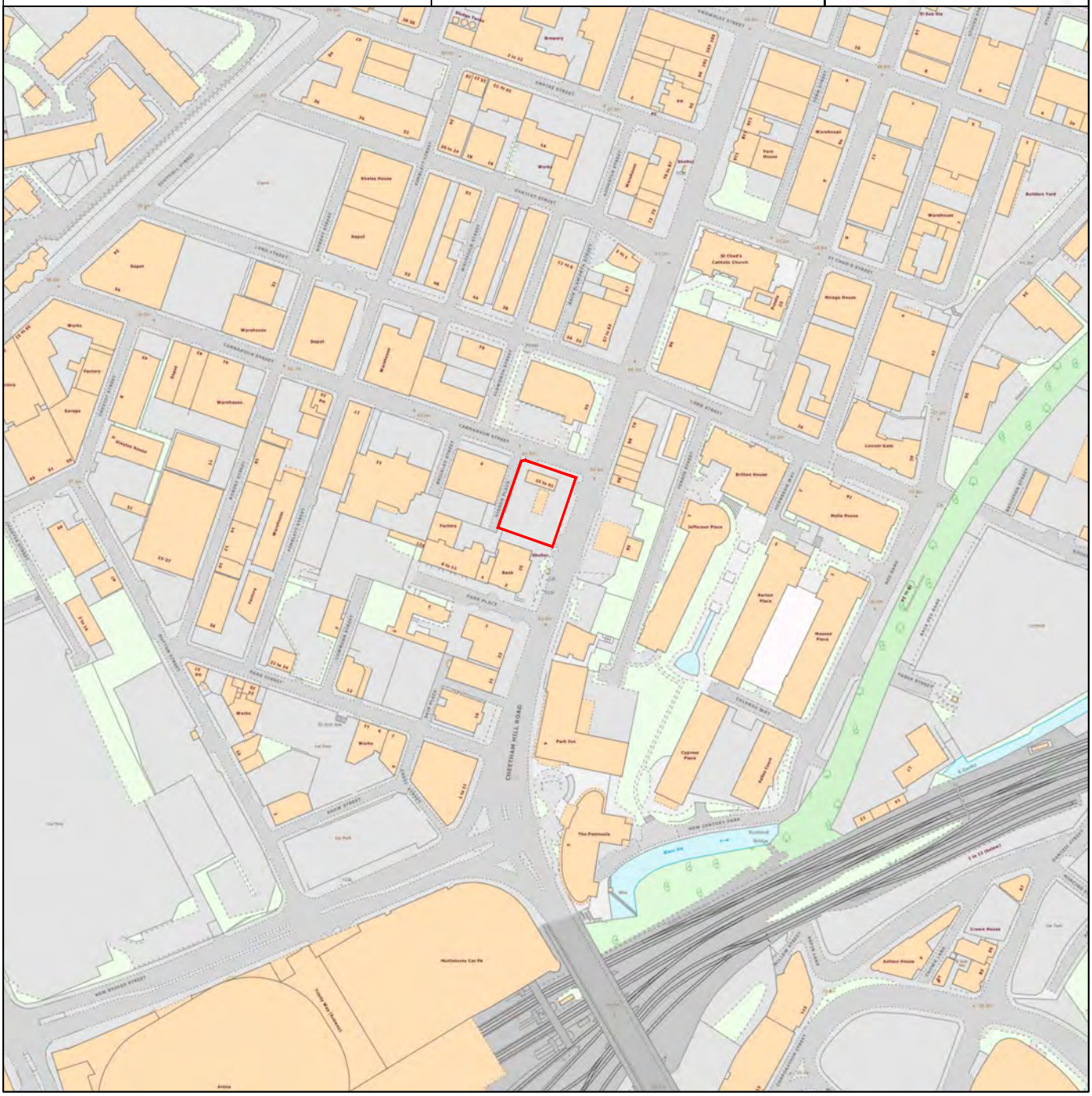


Figure 1:

Site Location

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Salford Archaeology, Peel Building, The Crescent, Salford, M5 4WT



Figure 2:

Site Boundary Superimposed onto Modern Mapping

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Key:

Site Boundary

SALFORD ARCHAEOLOGY

0 20 m

Scale at A4 1:400

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Figure 3:

Site Boundary Superimposed onto Bancks & C0's Map of Manchester & Salford 1831

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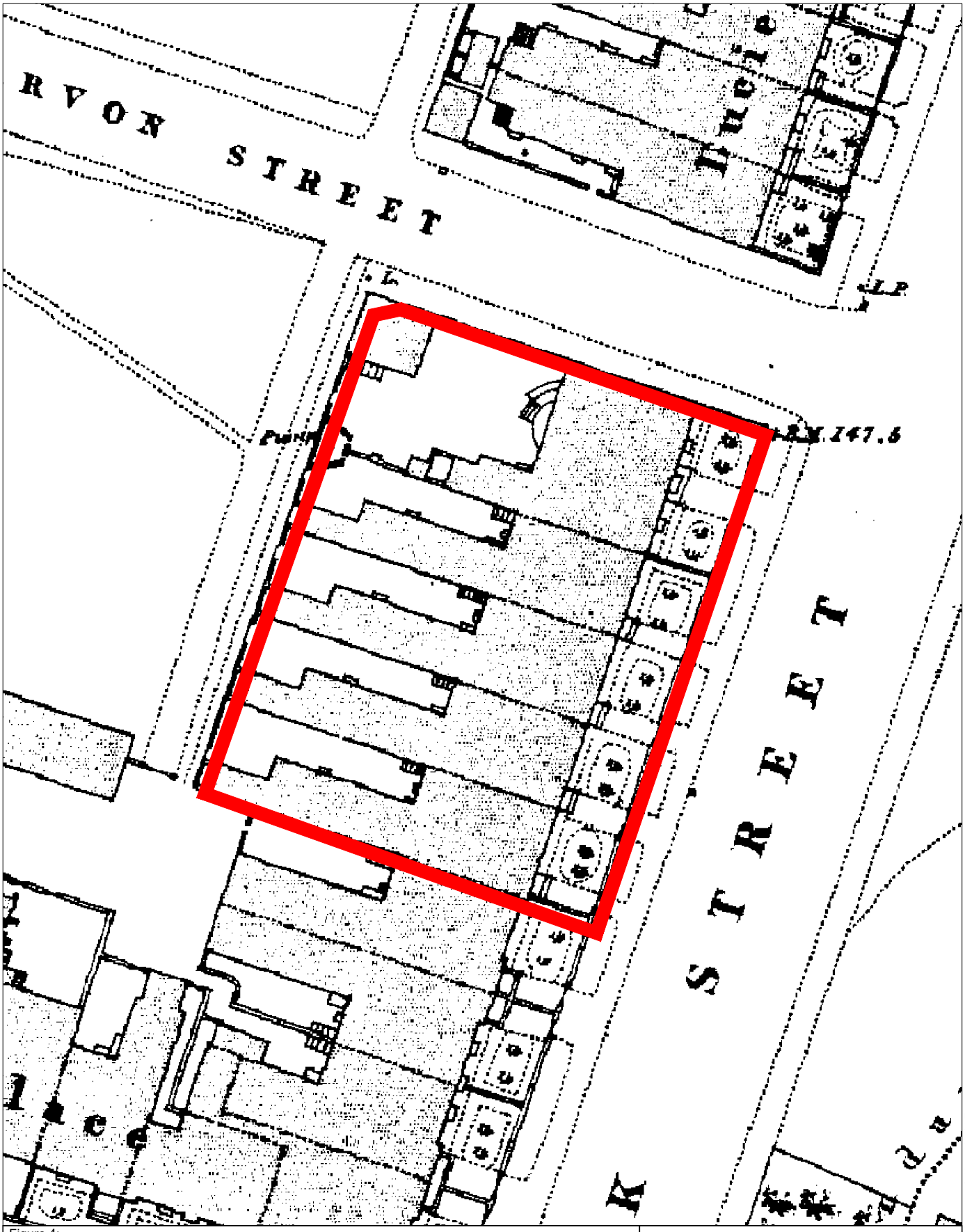


Figure 4:

Site Boundary Superimposed onto the 1:1056 Town Plan of 1850

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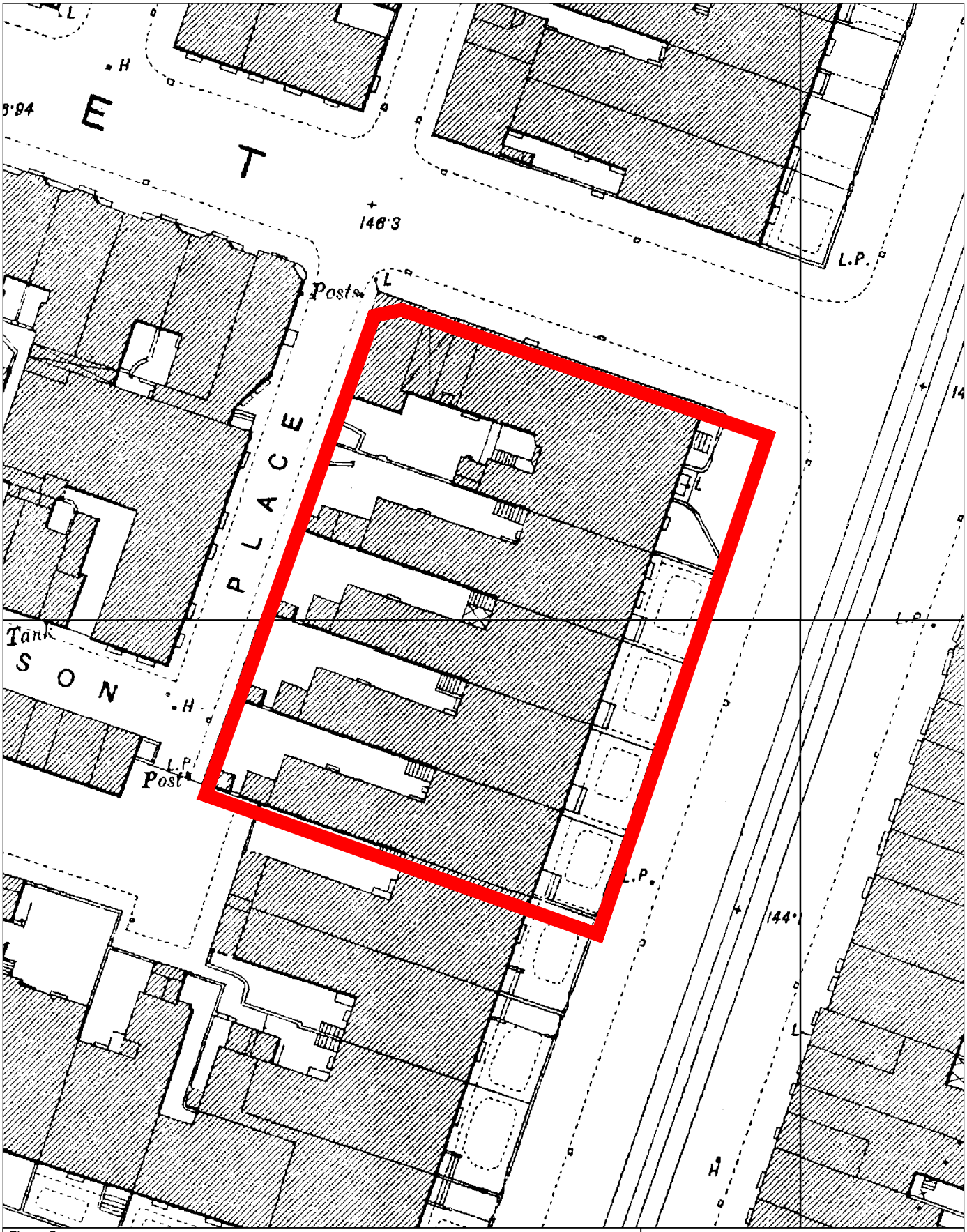


Figure 5:

Site Boundary Superimposed onto the 1:500 Town Plan of 1891

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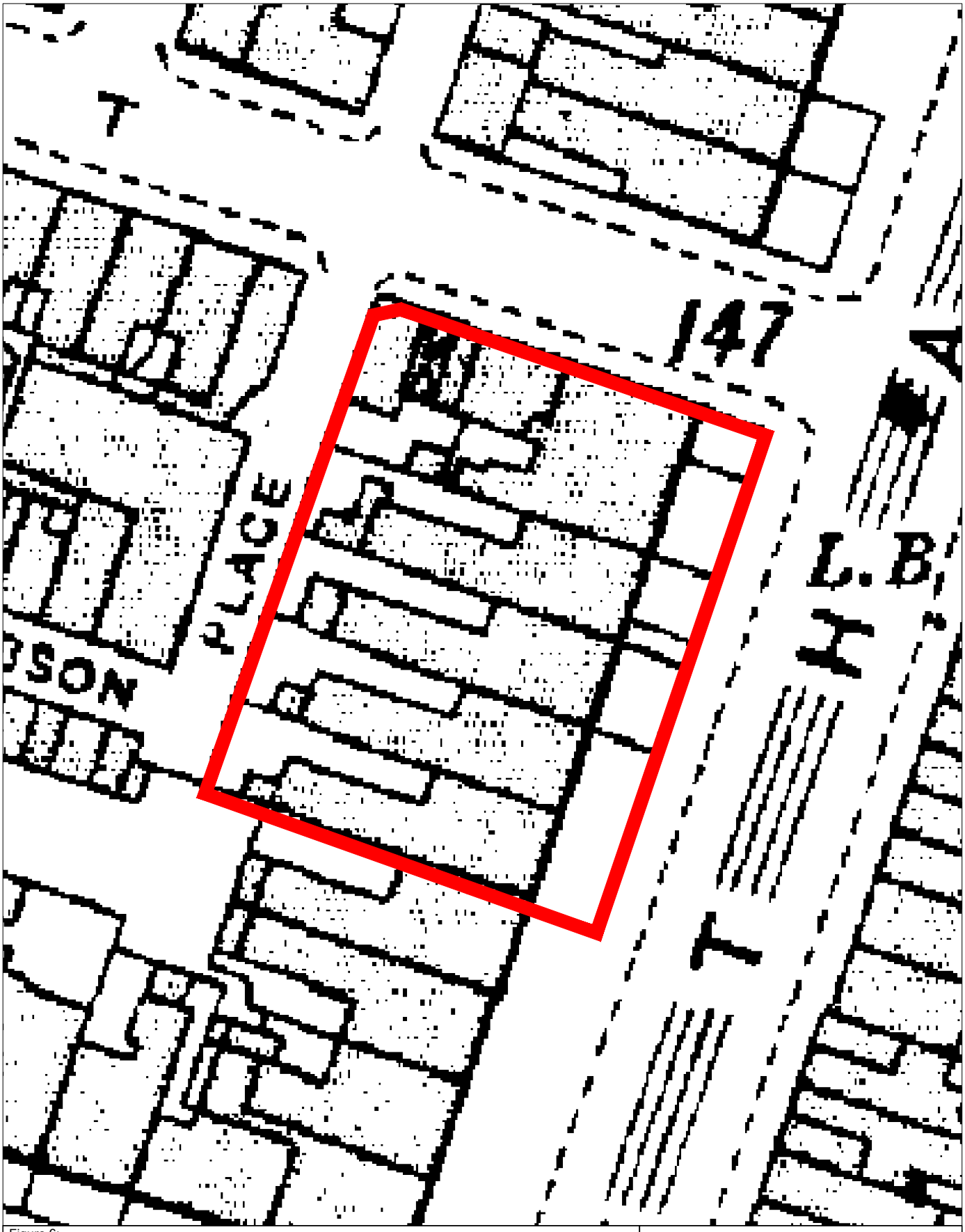


Figure 6:

Site Boundary Superimposed onto the 1:2500 County Series Map of 1908

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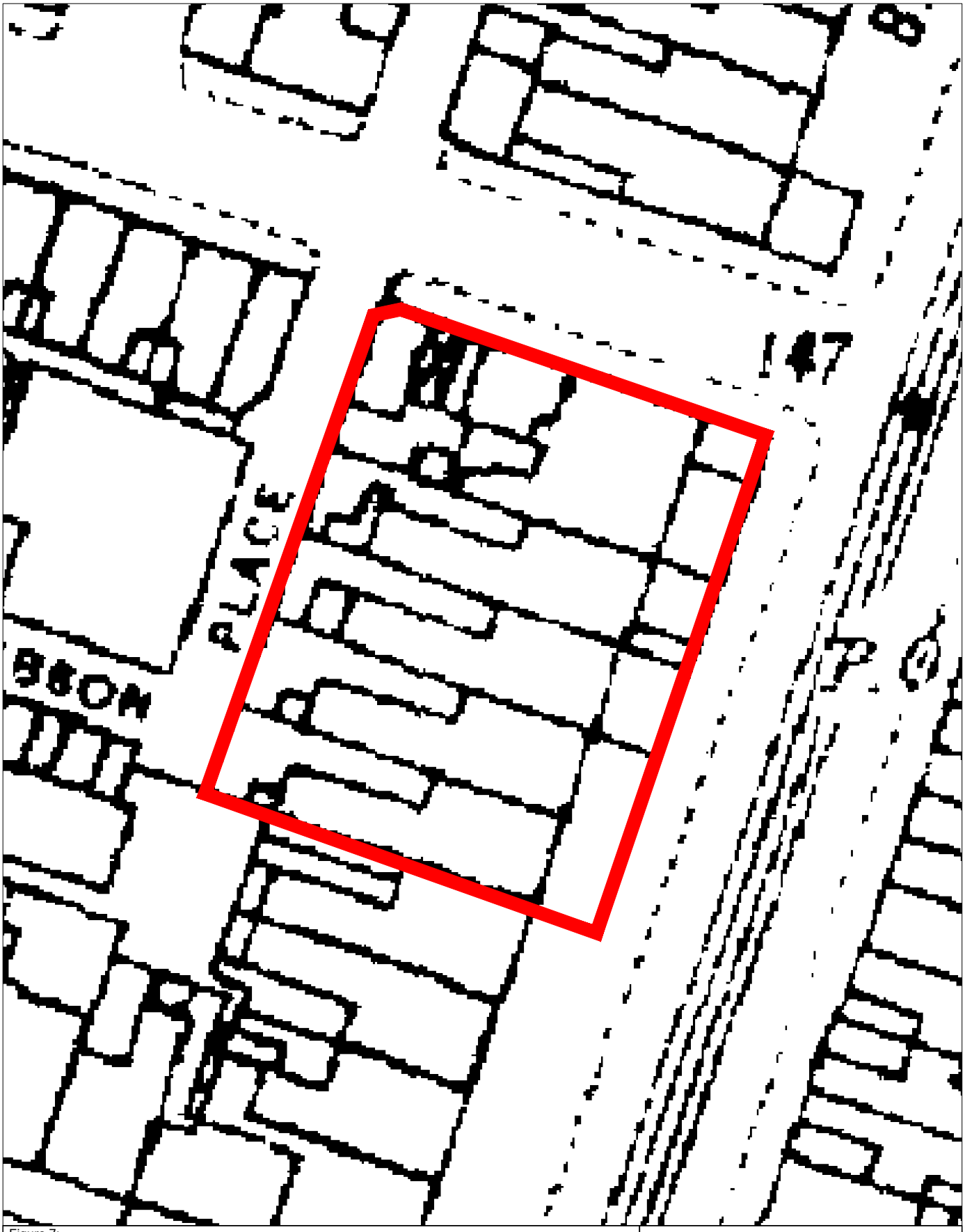


Figure 7:

Site Boundary Superimposed onto the 1:2500 County Series Map of 1933

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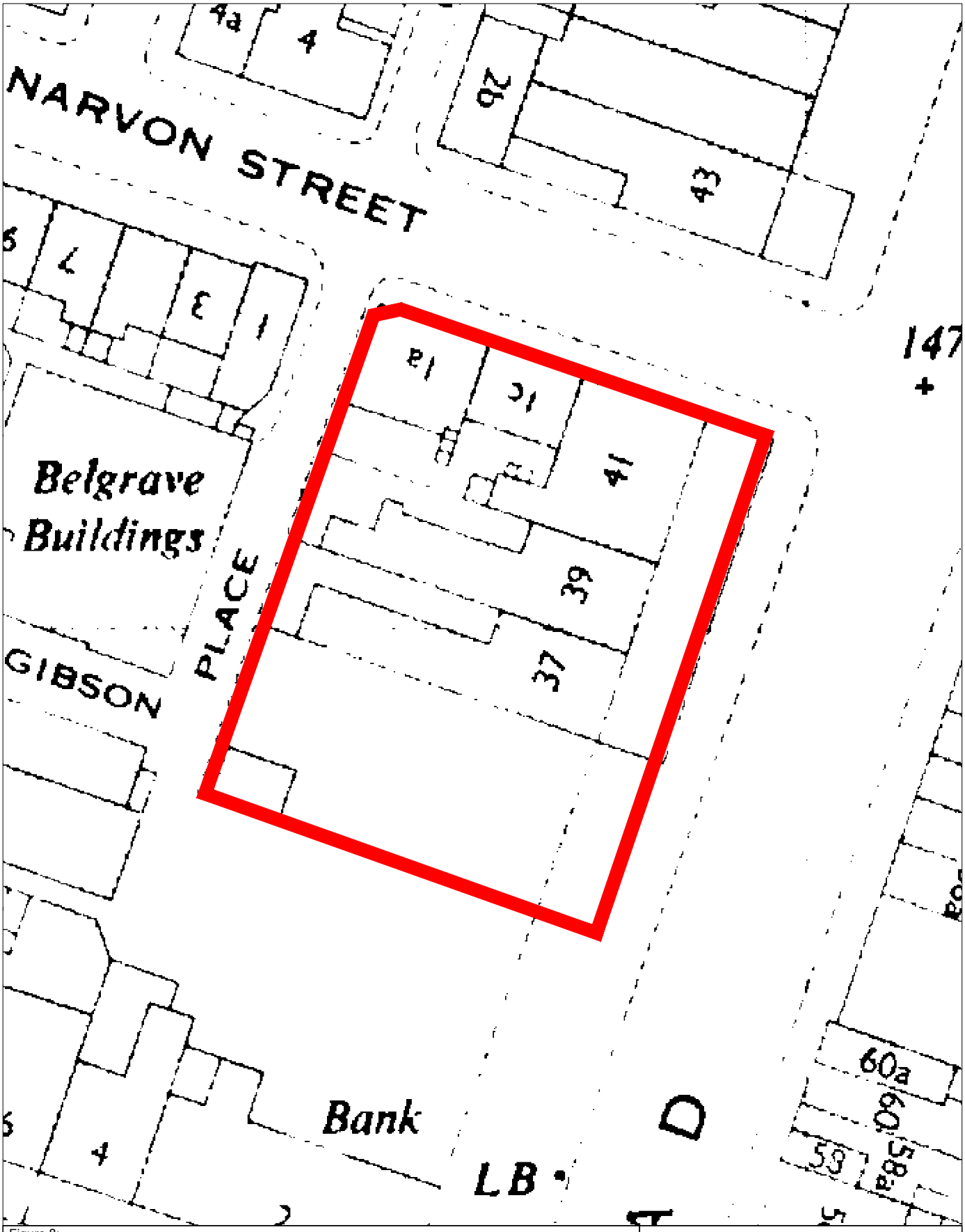


Figure 8:

Site Boundary Superimposed onto the 1:1250 National Grid Map of 1949

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Site Boundary

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Figure 9:

Site Boundary Superimposed onto the 1:2500 National Grid Map of 1959

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Site Boundary

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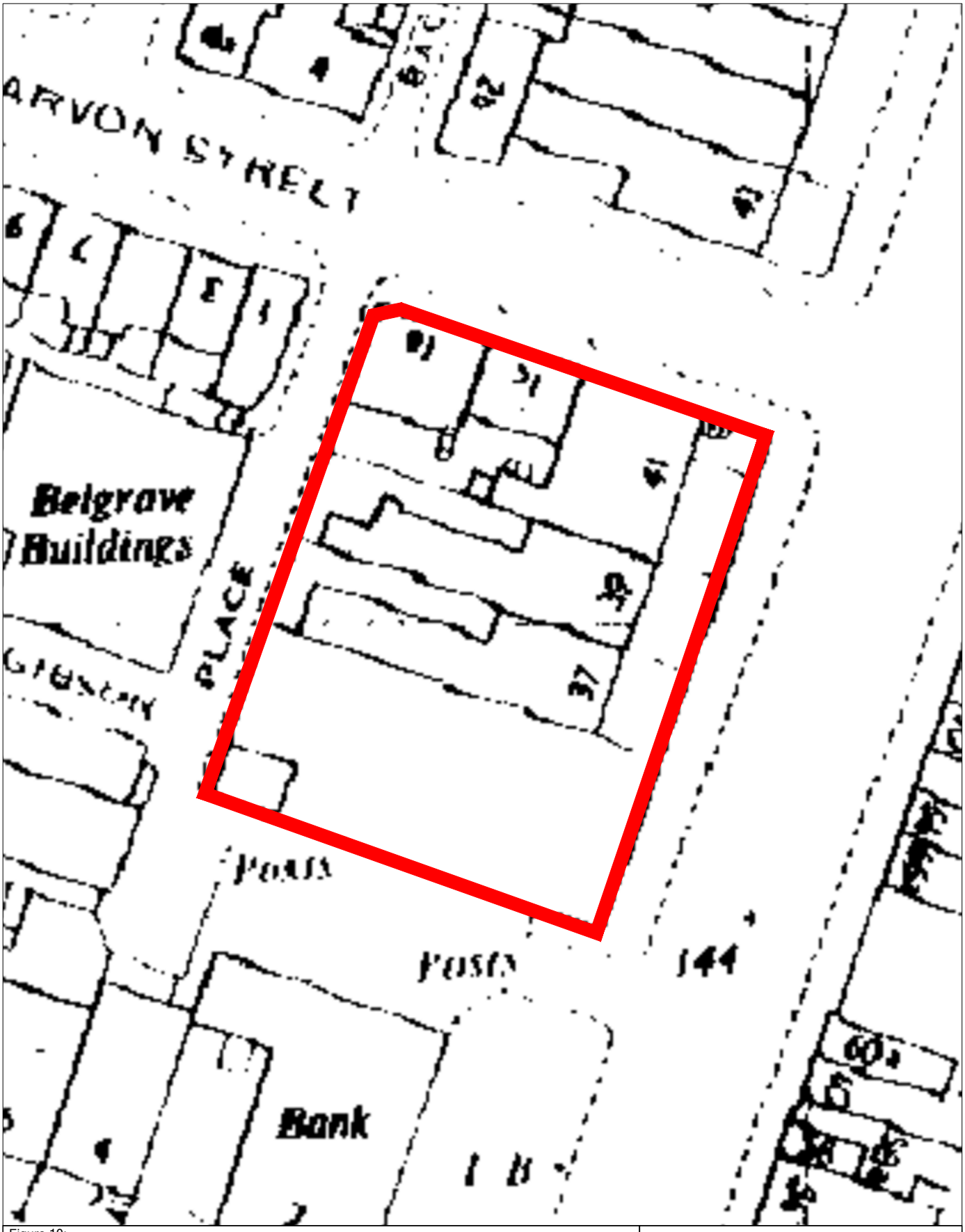


Figure 10:

Site Boundary Superimposed onto the 1:2500 National Grid Map of 1966

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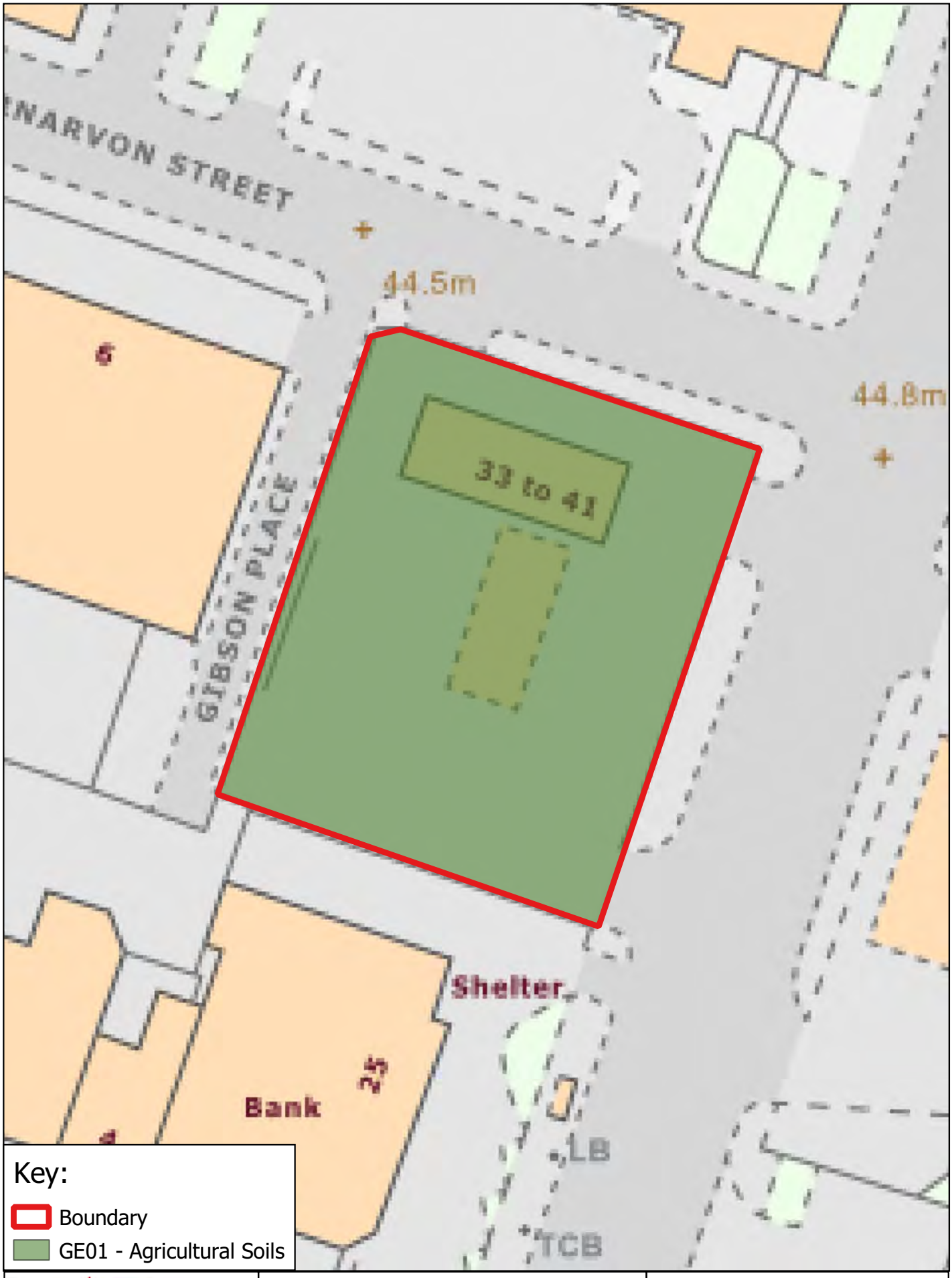
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Figure 11: Locations of Gazetteer Entries

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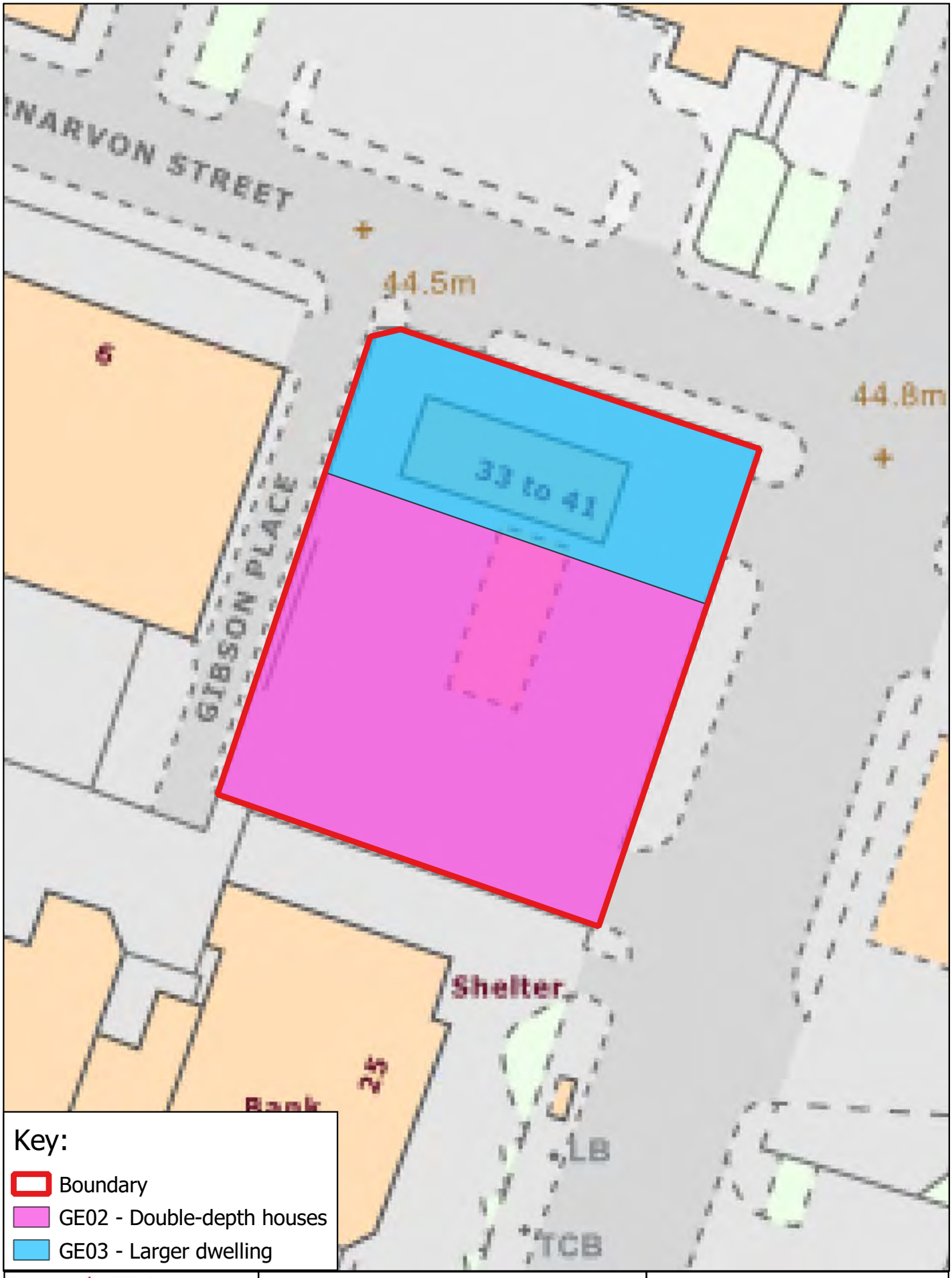


Figure 12: Locations of Gazetteer Entries

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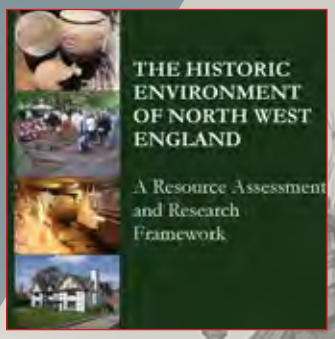
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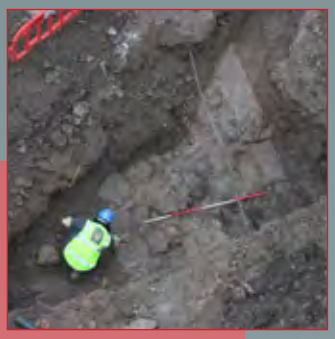
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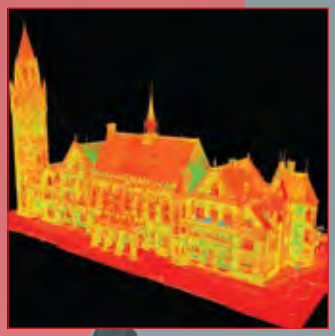
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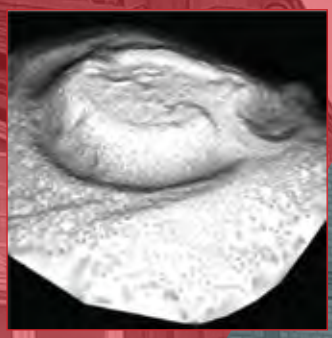
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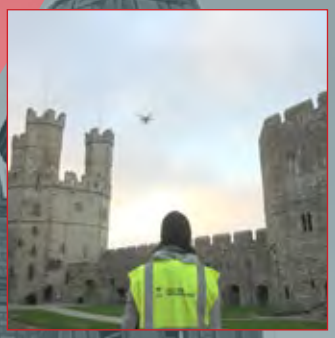
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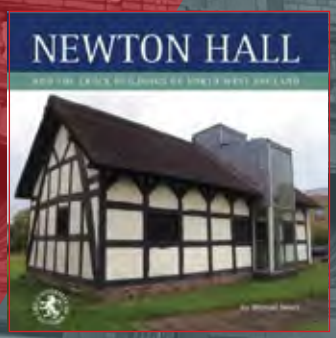
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APPENDIX 8

Preliminary Roost Assessment and Ecological Walkover

Cheetham Hill Road, Manchester

Reference: 81-135-R1-1

Date: July 2023

PRELIMINARY ROOST ASSESSMENT AND ECOLOGICAL WALKOVER

Cheetham Hill Road
Manchester

Prepared for:
UV Cheetham Hill Development Ltd

Report Ref: 81-135-R1-1
Date Issued: 27/07/2023

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QUALITY ASSURANCE

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VERSION	Version 1		
REMARKS	Final		
DATE	July 2023		
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EXECUTIVE SUMMARY

Site Address	33 - 41 Cheetham Hill Road, Cheetham, Manchester M4 4FT
Coordinates	E 384076, N 399407
Site Area	Approximately 0.1 ha
Current Site Use	The site comprised a disused building and associated flat roof extension, surrounded by an area of hardstanding.
Proposed Development	The proposed scheme includes the development of an apartment complex with associated car parking. The building on-site will require demolition in order for the development to proceed.
Results	The on-site building was assessed as having Moderate bat roost potential due to multiple entry-points on the south facing aspect that have suitability to support roosting bats on a regular basis. The brash piles on-site were assessed as having nesting bird potential.
Conclusions and Recommendations	Two Nocturnal Bat Surveys are required on the on-site building between May and September, with at least one of the surveys taking place between May and August. It is recommended that works or the removal of vegetation take place outside of the breeding bird season (March to September inclusive). If this is not possible, a nesting bird check should be undertaken by a suitably qualified ecologist up to 24 hrs before works commence. If a nest, or nest in construction, is located, then a stand-off distance should be maintained until the young have fledged.

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1. INTRODUCTION

1.1. BACKGROUND

E3P has been instructed by UV Cheetham Hill Development Ltd to undertake a Preliminary Roost Assessment at Cheetham Hill Road, hereafter referred to as "the site". An Ecological Walkover was also undertaken to assess the site for any additional protected species constraints.

The report was produced by Conor Evans BSc (Hons) MRes QCIEEM Graduate Ecologist, who has experience in completing PRAs and nocturnal bat surveys at many sites across the UK.

1.2. PROPOSED DEVELOPMENT

Detailed proposals include the development of an apartment complex with associated car parking. The building on-site will be demolished in order for the development to proceed.

1.3. SITE LOCATION

The site is located within north Manchester, in the urban area of Cheetham Hill. A series of commercial units are situated to the south and the west of the site. Carnarvon Street defines the site boundary to the north. Cheetham Hill Road defines the east boundary of the site. St Michael's Flags and Angel Meadow Park is located approximately 380 m south east of the site, with the River Irwell located approximately 520 m south west Please refer to Figure 1.1. for the approximate site location.

FIGURE 1.1 APPROXIMATE SITE LOCATION



1.4. OBJECTIVES

The objectives of the Preliminary Roost Assessment are as follows:

- Determine if bats currently, or could potentially, utilise the building for roosting.
- Determine whether further surveys (e.g. nocturnal bat surveys) and/or further mitigation is necessary for development to proceed.

The objectives of the Ecological Walkover are as follows:

- Identify the major habitats present.
- Ascertain the presence or potential presence of any legally protected species and habitats.
- Recommend any further surveys or mitigation that may be required.

The survey findings are detailed in this report, as well as any recommendations.

2. METHODOLOGY

2.1. DESK STUDY

The following sources of information and ecological records were consulted:

- MAGIC – A government web-based interactive mapping system, demonstrating European Protected Species Licences (EPSL) and Natural England Licences which have been previously granted within England.
- Information and species records from South Lancashire Bat Group.

A search via MAGIC was undertaken in July 2023 to identify EPSL within 1 km of the site boundary. This search area is considered suitable for the size of the development and the surrounding habitat.

2.2. PRELIMINARY ROOST ASSESSMENT

The Preliminary Roost Assessment (PRA) was undertaken on the 26th June 2023 by Conor Evans who has undertaken multiple PRA's on buildings and trees across the UK. The weather was dry and overcast.

The survey involved undertaking a systematic search of the trees and buildings, searching for signs of bats, or spaces where bats would be able to access. The methodology followed that described in *Bat Surveys for Professional Ecologists, 3rd Edition* (Collins, 2016).

The trees and buildings were categorised for their bat roosting potential as described in Table 2.1 in accordance with Collins (2016).

TABLE 2.1 BAT ROOSTING POTENTIAL CLASSIFICATION OF BUILDINGS

CATEGORY	DESCRIPTION
NEGLIGIBLE	A building with no roosting features present or of an age/species that would not support roosting bats.
LOW	A building with one or more potential roost site. However, the potential roost sites do not provide suitability for large numbers of bats (i.e. for maternity or hibernation) and would only be used on an occasional basis.
MODERATE	A building with one or more potential roosting feature which could support bats but is of a suitability meaning that it would be unlikely to support a roost of high conservation status.
HIGH	A building with several potential roosting features which would be able to support large number of bats on a regular basis and for longer periods of time. The building would have suitability to support maternity or hibernation roosts.

The survey was undertaken utilising suitable binoculars and ladders to access all areas where safe to do so.

2.3. ECOLOGICAL WALKOVER

A site walkover was undertaken by Conor Evans on 26th June 2023 to assess the site for any protected or notable species.

The walkover survey was undertaken to the standard methodology as detailed by the JNCC Handbook for Phase 1 Habitat Survey (2010). The assessment follows the methodology as per "Guidelines for Preliminary Ecological Appraisal" (CIEEM, 2017).

Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the Wildlife and Countryside Act 1981 (as amended) and species which are indicators of important and uncommon plant communities. All plant nomenclature follows Stace (2019).

Searches were carried out for the presence of invasive species, including those listed on the revised (April 2010) Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) including but not limited to Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*).

2.4. LIMITATIONS

Access to all areas within 30 m of the site was not possible due to commercial units bordering the site, however, due to the urban nature of the site, this is not considered to be a major constraint.

Internal access into the building was not possible. This is not considered to be a major constraint as if any further bat surveys are required, they will identify whether bats are roosting within the building.

3. RESULTS

3.1. LOCAL BAT GROUP RECORDS

Based on information from South Lancashire Bat Group, species present within the local area include; Brandt's bat (*Myotis brandtii*) brown long-eared (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's bat (*Myotis daubentonii*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), Natterer's bat (*Myotis nattereri*), noctule (*Nyctalus noctula*), and whiskered bat (*Myotis mystacinus*).

3.2. MAGIC REVIEW

A MAGIC review identified three European Protected Species Licences were located within the 1 km search area. The closest licence was located approximately 610 m south-east of the site boundary. The licence was active from 2015 to 2020 for the destruction of a common pipistrelle non-breeding roost.

3.3. SITE CONTEXT

The site comprised a disused building and associated flat roof extension, surrounded by an area of hardstanding. The site is situated within a predominately commercial area, with a series of residential apartments located to the east of the site. These areas are anticipated to offer little value to local wildlife. A large area of woodland is located approximately 310 m north-east of the site boundary. A railway line is located approximately 210 m south-east of the site boundary. The River Irwell is located approximately 515 m south-west of the site. These areas are anticipated to provide foraging opportunities for local bat species.

3.4. PRELIMINARY ROOST ASSESSMENT

A PRA was undertaken on the building on-site. No other buildings or trees were present within the site boundary.

The building comprised brick walls with a flat roof. The brickwork of the building was mostly in good condition and well-sealed, with no gaps observed that could be used by crevice dwelling bat species. However, there was access into the building where the fascia had been damaged on the south-west facing aspect, which provided suitability for roosting bats. Due to the flat roof, the building has the potential to support nesting birds.

PLATE 1	SHOWING MAIN ENTRANCE ON SOUTH-WEST FACING ASPECT



PLATE 2	SHOWING CLOSE UP OF ENTRY-WAYS INTO MAIN BUILDING



A flat roofed extension constructed from metal was present on the south-west facing aspect. The extension is unlikely to possess any potential to support roosting bats due to a lack of suitable features. Due to the flat roof, the extension has the potential to support nesting birds.

PLATE 3	SHOWING FLAT ROOFED EXTENSION



A weep hole and numerous holes were present on the north-east facing aspect of the building. These feature may support crevice-dwelling bat species on an occasional basis.

PLATE 4	SHOWING WEEP HOLE ON NORTH-EAST FACING ASPECT



PLATE 5	SHOWING DAMAGED BRICKWORK



An entry way into the building was present underneath the fascia on the north-west facing aspect of the building. This feature may support roosting bats on a regular basis, and provide bats with access to the building.

PLATE 6	SHOWING GAP UNDER FASCIA



Internal access could not be gained into the building during the survey. The building was assessed as having **MODERATE** bat roosting potential due to the missing fascia on the south-west facing aspect and the damaged brickwork on the north-east facing aspect. Both of these features lead into the building, and thus have the potential to support roosting bats on a regular basis.

3.5. ECOLOGICAL WALKOVER

The habitats on-site comprised hardstanding and brash piles. The habitats are described below.

The hardstanding had been left unmanaged and colonised by flora comprising butterfly-bush (*Buddleja davidii*), smooth hawk's beard (*Crepis capillaris*), Canadian fleabane (*Erigeron canadensis*), narrow-leaved ragwort (*Senecio inaequidens*), and wall barley (*Hordeum murinum*).

PLATE 7	SHOWING HARDSTANDING



Brash piles were present throughout the site. The species could not be identified. The brash piles have potential to support nesting birds. Due to the urban nature of the site, the brash piles are unlikely to support a population of amphibians.

PLATE 8	SHOWING BRASH PILE



4. CONCLUSIONS AND RECOMMENDATIONS

4.1. BATS

The main building was assessed as having **MODERATE** bat roosting potential. As such, two Nocturnal Bat Surveys are required on the building between May and September, with at least one of the surveys between May and August. If bats are identified roosting within the building, a third survey to characterise the roost, and a European Protected Species Licence will be required and would require up to date surveys from the survey season prior to the application submission.

4.2. NESTING BIRDS

It is recommended that any demolition works or the removal of vegetation/brash piles take place outside of the breeding bird season (March–September inclusive). However, if this is not possible, then a suitably qualified ecologist should inspect the area no more than 24 hours prior to the removal. Should any nests, or nests in construction be located, a suitable stand-off distance should be maintained until the young have fledged. The ecologist will advise on suitable stand off and provide a toolbox talk to all site contractors regarding their working limits and legal implications.

4.3. BIODIVERSITY NET GAIN

The proposed development will be exempt from a Biodiversity Metic calculation in line with the Environment Act (2021) due to the habitats on site being below the threshold of 25 m² of habitat, or 5 linear meters of water courses or hedgerows.

To further increase the site's value for wildlife, bat and bird boxes could be integrated into the proposed development.

5. REFERENCES

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END OF REPORT

APPENDIX 9

WML CONSULTING

Civil, Structural and Geotechnical Engineers

Geo-Environmental Investigation & Assessment

For a site at

Cheetham Hill Road, Manchester

Undertaken on behalf of

UV Cheetham Hill Developments Ltd

Report No. 10638G-WML-XX-ZZ RP-G-0002-A

October 2022

Report Title:	**Cheetham Hill Road, Manchester** **Geo-environmental Investigation and Assessment**
Report Reference:	**10638G-WML-XX-ZZ RP-G-0002-A**
Client:	**UV Cheetham Hill Developments Ltd**
Issue Date:	**3rd October 2022**
Drafted By:	**T P Booth**
Reviewed By:	**S Seddon**
Authorised By:	**S Seddon**

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Revision Status / History

Rev	Date	Issue / Purpose/ Comment	Prepared	Checked	Authorised
-	03/10/2022	Draft Issue	TPB	SCS	SCS
A	28/10/2022	Updated Geotechnical Results	TPB	SCS	SCS

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Executive Summary

Site Location	The site comprises land off Cheetham Hill Road in Manchester. It is centred on approximate Ordnance Survey National Grid Reference 384078E, 399401N with an indicative postcode of M4 4FT.
Development Proposals	The project involves construction of a new multi-storey 19-22 storey mixed retail and residential structure, with limited soft landscaping and hardstanding for access.
Ground Conditions	Ground conditions encountered during the intrusive investigation generally comprised made ground to depths of between 0.85m and 4.80mbgl, underlain by interbedded cohesive and granular glacial deposits to a maximum proven depth of 18.45mbgl.
Site Preparation	Site development will include the demolition of existing structures which should not proceed until an appropriate Asbestos survey of the existing building has been undertaken and any Asbestos Containing Materials (ACM) removed by an appropriately licensed contractor. Similarly, any demolition materials present on site and considered for re-use should be inspected with any ACM removed accordingly prior to crushing. Historical/existing foundations, ground floor slabs and other buried concrete/brick obstructions associated with existing structures will need to be broken out to suitable depths below formation levels where they are to impinge on the proposed buildings. Such materials removed as part of the clearance work, subject to appropriate screening and crushing, will be suitable for re-use as bulk fill beneath hard cover areas.
Underground Storage Tanks (UST's)	Anecdotal information has indicated that the historical underground hydrocarbon storage tanks (UST's) have been removed. However, this has not been confirmed at this stage. Therefore, care should be taken during the surface strip and a careful examination undertaken to ensure that these have been suitably remediated.
Foundations	The new structure will be supported on piles. Pile design should assume no side support (skin friction) for the pile sections surrounded by made ground and may need to be designed to withstand potentially negative skin friction effects within cohesive strata. Pile type, selection and design should to be undertaken in conjunction with a reputable, specialist piling contractor, ideally with experience of the local ground conditions.
Concrete Classification	The typical design sulphate (DS) class and "Aggressive Chemical Environment for Concrete" (ACEC) class for the site are DS-1 and AC-1 respectively.
Road Pavements	New road pavement design should be based on a California Bearing Ratio (CBR) value of no more than 2.5% in untreated made ground and natural cohesive strata.
Ground Contamination	The chemical analyses indicates that the site does not appear to have been impacted by significant and / or widespread contamination sources when compared to the relevant reference values associated with site end use. No evidence of remaining underground storage tanks (USTs) were encountered. However, if any suspected UST's and associated pipework are encountered they should be decommissioned and removed to facilitate redevelopment of the site and reduce the risk to human health and the environment. Following site development, there will be no mechanism for a direct contact pollution linkage with contaminated soil where surfaced with buildings and hardstanding. However, a direct contact pollution linkage is plausible in proposed soft landscaped areas and it is recommended that these should be capped with a geotextile membrane overlain by 450mm of clean sub-soil and 150mm of topsoil to provide a 600mm clean cover and thus remove any localised pollution linkages. Chemical analysis of samples of made ground have indicated slight exceedances of leachable copper and lead with slightly elevated concentrations of sulphate, copper, chromium and selenium within the groundwater, which are above the stringent assessment criteria. A sample of groundwater also indicated a slightly elevated concentration of C21-C35. Taking into consideration the low sensitivity of the underlying superficial aquifer and that the source of any historic hydrocarbon contamination (UST's, fuel pumps and associated

	pipework) appear to have been removed from the site, the concentrations recorded are not considered to represent a significant ongoing source of contamination. However, it cannot be discounted that further hydrocarbon contamination could be encountered during the groundworks phase of construction and such should be referred to an environmental consultant who will assess the requirement for further ground investigation and risk assessment at that stage. In consideration of the underlying principal Aquifer and requirement for a piled foundation, it is also considered that a piling risk assessment will be required as part of planning.
Ground Gas	The results give a maximum composite Qhg value of 0.0016l/hr and indicate the site to classify as Characteristic Situation (CS) 1 – Very Low Gas Risk'.
Waste Soils	It will be the responsibility of the waste producer to undertake additional testing and classification of any waste soils for disposal to an appropriately licenced landfill in accordance with current guidelines. For preliminary guidance based on the current information, it is likely that made ground, would be classified as 'Non-hazardous' with natural soils classified as 'Inert' for landfill disposal.

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1.0 INTRODUCTION

Appointment

1.1 WML Consulting has been commissioned by RPS, acting on behalf of UV Cheetham Hill Developments Ltd, to undertake a Geo-environmental Investigation and Assessment of a site located at 33-41 Cheetham Hill Road, Manchester.

Proposed Development

1.2 The project involves construction of a new multi-storey 19-22 storey mixed retail and residential structure, with limited soft landscaping and hardstanding for access.

1.3 A location plan (subject site is shown with a dashed red line) is included within Appendix 01.

Objective

1.4 The objective of the ground investigation and assessment was to provide geotechnical recommendations for construction design purposes together with a geo-environmental risk assessment in terms of possible ground contamination.

1.5 To achieve the objective, the following tasks were undertaken:

- Review the existing desk study report for the site and design a Phase 2 Ground Investigation.
- Characterise the ground conditions in terms of geology, soil geotechnical parameters and ground contamination from information provided by the ground investigation.
- Provide recommendations regarding suitable foundations together with any other geotechnical considerations that could affect possible future development.
- Determine a ground conceptual model for the site so as to undertake a ground contamination Generic Quantitative Risk Assessment (GQRA).

Scope

1.6 A Phase 1 Desk Study for the site area has been undertaken by ESI Environment Specialists and is presented in the following report:

- ESI Phase 1 Geoenvironmental Assessment Report, Reference 61519R1, dated May 2013.

1.7 This report includes the findings of a Phase 2 Ground Investigation designed on conclusions and recommendations within the Phase 1 Desk Study. For ease of reference, the findings of the Desk Study are summarised in the following sections. However, the two reports are not exclusive and should be read in conjunction.

1.8 The ground investigation comprised the formation of window sample probeholes and cable percussive boreholes undertaken with reference to BS5930:2015 + A1:2020 Code of Practice for Ground Investigation and BS10175:2011 together with A1:2013, "Investigation of Potentially Contaminated Sites - Code of Practice" except where superseded by EN ISO 22475-1 "Geotechnical Investigation and Assessment – Sampling by Drilling and Excavation and Groundwater Measurements".

1.9 Geotechnical soil testing was undertaken in general accordance with guidelines provided in BS1377:1990 – Parts 1-9, "Method of Test for Soils for Civil Engineering Purposes". Samples for chemical analysis were obtained and handled generally in accordance with the current guidelines (BS10175: 2011 and A1:2013).

2.0 SITE LOCATION AND DESCRIPTION

Site Location

2.1 The site comprises land off Cheetham Hill Road in Manchester. It is centred on approximate Ordnance Survey National Grid Reference 384078E, 399401N with an indicative postcode of M4 4FT.

2.2 The site is bounded to the north by Carnarvon Street with commercial properties beyond, to the west by Gibson Place with commercial properties beyond, to the east by Cheetham Hill Road with a Petrol Filling Station beyond and to the south by further commercial properties.

Site Description

2.3 At the time of the site investigation in August 2022 the site comprised a former petrol filling station that had more recently been used as a car wash.

2.4 The site was secured by fenced from public access and was no longer in use. A dilapidated structure, considered to be the former car-wash, was located in the north-eastern part and a canopy extending over the central part. An area of dense vegetation was located to the north and north-east of the structure.

2.5 The site was surfaced by a mixture of concrete and asphalt hardstanding.

2.6 No evidence of remaining underground storage tanks or associated pipework, such as a breather pipe, were visible at the time of the site investigation. Anecdotal information has indicated that these have previously been removed prior to use as a car wash, but this could not be confirmed.

Topography

2.7 A topographical survey of the site by Survey Operations, referenced 22F169/001, is presented in Appendix 01 and indicates the site to be roughly level between 44.47m and 4.79m Above Ordnance Datum (AOD).

3.0 SUMMARY OF ENVIRONMENTAL AND HISTORICAL SETTING

3.1 The following paragraphs summarise the most relevant findings of the Phase 1 desk study report.

Geology

3.2 The BGS plans indicate that the site is underlain by cohesive Glacial Till. The drift deposits are underlain by the Triassic Chester Formation, indicated to comprise sandstone.

Radon

3.3 The site is not in Radon Affected Area as defined by the UK Health Security Agency as less than 1% of properties are above the Action Level of exposure. Therefore, no radon protection measures are necessary for new structures as described in publication BR211 by the Building Research Establishment.

Mining and Subsidence

3.4 In consideration of the indicated geology, risks to the development from subsidence relating to shallow, unrecorded abandoned mine workings are considered low and can be discounted.

3.5 The risk from non-coal mining activity at the site is also considered low.

Environmental Setting

3.6 The bedrock underlying the site is classified as a 'Principal Aquifer'. The superficial strata is classified as a Secondary (Undifferentiated) Aquifer'.

3.7 The site is not within an Environment Agency Source Protection Zone. The nearest surface water feature is the River Irk, located around 180m south of the site.

3.8 There are no active landfills located within 500m of the site or historic landfills located within 250m of the site.

Site History

3.9 The earliest map dated 1850 indicated the site to have already been developed with residential dwellings. In the 1970's the site was redeveloped as a petrol filling station and more recently modified for use as a hand car wash before falling into disuse. The ESI Phase 1 Report indicates that the underground storage tanks have been removed from the ground, although no further information is provided.

3.10 The area surrounding the site has historically comprised mixed residential and commercial developments, including a number of historic works in the immediate vicinity.

Preliminary Contamination Risk Assessment

3.11 The approach at the Phase 1 Desk Study stage was precautionary until such time as uncertainties in the conceptual model can be verified by appropriate site investigation.

3.12 However, based on the site history and the proposed development scenario, potential pollution linkages were considered likely with associated preliminary risks being generally assessed as medium to high.

3.13 Such uncertainties relate in the main to the level of contamination associated with the sites historic use as a petrol filling station, including the potential for leakage from any remaining underground storage tanks.

3.14 In addition the potential for ACM and asbestos fibres to be present within existing structures and shallow soils cannot be discounted.

4.0 SITE INVESTIGATION

Rationale

4.1 Intrusive investigations were undertaken primarily to provide geotechnical parameters for structural design purposes but also to verify the preliminary site conceptual model and clarify the environmental risk.

4.2 Window sample probeholes were undertaken to provide information on near surface deposits and to obtain samples for chemical analysis and geotechnical testing. Due to the small diameter of the probing equipment, the depth of penetration achieved is dependent on favourable ground conditions. As such, ground penetration may be restricted in circumstances where the ground is particularly strong or contains relatively large obstructions such as cobbles and/or boulders.

4.3 Cable percussive boreholes were undertaken to provide information on deeper deposits and to obtain samples for geotechnical testing and future pile design.

4.4 The investigation locations were chosen so as not to impact on the presence of known/suspected services beneath the site.

4.5 Monitoring standpipes have been installed in selected boreholes for the measurement of groundwater levels.

4.6 Chemical analysis of a general suite of contaminants was undertaken on selected samples of soil. This was to clarify the expected contamination risk.

Intrusive Works

4.7 The initial phase of ground investigations were undertaken by LOT Geotechnics Ltd on 16th August 2022. This comprised the formation of 4no window sample probeholes to a maximum depth of 5.00 metres below ground level (mbgl).

4.8 Two cable percussive boreholes were then formed between 20th and 23rd September 2022 by Paul Blackledge Drilling to a maximum depth of 18.45mbgl.

4.9 The exploratory hole records are presented in Appendix 02 of this report whilst the exploratory hole locations are shown on drawing 10638G-SK02 in Appendix 01.

Monitoring Standpipes

4.10 Monitoring wells for groundwater measurements were installed in 3 No. probeholes, namely WS01, WS02 and WS04 as indicated on the logs presented in Appendix 02.

Geotechnical and Chemical Testing

4.11 In-situ geotechnical testing was undertaken at regular intervals during the formation of the window samples and boreholes in the form of Standard Penetration Tests (SPT's). The results for this testing are presented on the descriptive logs in Appendix 02.

4.12 Geotechnical soils testing was undertaken on selected samples for the following:

- Natural moisture content
- Liquid and Plastic limits.
- Laboratory California Bearing Ratio tests.
- Undrained Shear Strength in triaxial compression.
- pH and sulphate (2:1 water soluble).

4.13 The results of the geotechnical testing are included within Appendix 03.

4.14 Chemical analysis was undertaken on selected soil samples for the following contaminants of concern:

- Total arsenic, boron, cadmium, chromium VI, copper, lead, mercury, nickel, selenium, vanadium, zinc.
- Total cyanide, phenols, sulphur, sulphate.
- Speciated USEPA polyaromatic hydrocarbons (PAH).
- Total petroleum hydrocarbons (TPHCWG).
- BTEX & MTBE.
- Asbestos screen and identification.
- 2:1 water/soil sulphate extract, pH.

4.15 In order to assess the potential risk to controlled waters, selected samples of shallow soils from the site underwent leachate preparation for the following suite of contaminants:

- Total arsenic, boron, cadmium, chromium VI, copper, lead, mercury, nickel, selenium, vanadium, zinc.
- Speciated (16) hydrocarbons (PAH).
- Total phenols.
- Sulphate extract.

4.16 Where encountered groundwater samples from the standpipes were submitted for testing for the following contaminants of concern (CoC):

- Total arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc.
- Total petroleum hydrocarbons (TPH).
- BTEX & MTBE.

4.17 Due to the limited volumes of groundwater within the exploratory holes, the testing was limited by sample volume. The results of the chemical analysis are presented in Appendix 04.

Groundwater and Ground Gas Monitoring

4.18 Monitoring of standpipes for groundwater levels and ground gas has been undertaken on 4no occasions to date between 7th September and 19th October 2022. The results are presented in Appendix 05.

5.0 GROUND CONDITIONS

General

5.1 Ground conditions encountered during the intrusive investigation generally comprised made ground to depths of between 0.85m and 4.80mbgl, underlain by interbedded cohesive and granular glacial deposits to a maximum proven depth of 18.45mbgl.

Made Ground

5.2 Made ground was encountered within all exploratory holes from ground level to a depths of between 0.85m and in 4.80mbgl. The deepest area of made ground were recorded within WS01 and BH02 in the south-western part of the site and may reflect areas where underground storage tanks were historically located.

5.3 The made ground generally comprised a surface horizon of asphalt extending to around 0.10mbgl, underlain by grey to brown, sandy gravel with a medium cobble content. Gravel sized fragments included brick, concrete, sandstone and locally ash, slate, ceramic and plastic. Cobble sized fragments generally comprised brick.

5.4 Window sample WS01 was terminated at a depth of 4.00mbgl, due to water ingress causing the hole to collapse.

5.5 SPT 'N' values within the made ground ranged between 6 and 46 indicating the variable nature of the strata due to loose compaction and the presence of brick and concrete cobbles respectively.

Glacial Deposits

5.6 Within all of the exploratory holes penetrating the made ground, soil considered to represent glacial deposits were encountered beneath the made ground at depths of between 1.00m and 4.80mbgl, extending to a maximum proven depth of 18.45mbgl.

5.7 These deposits generally comprised brown and locally grey mottled, slightly silty, slightly sandy, slightly gravelly clay.

5.8 However, within BH01 and BH02, at greater depths the clay was interbedded with granular glacial deposits below depths of between 5.90m and 9.40mbgl and comprised variably silty sand and gravel.

5.9 SPT 'N' values within the upper part of cohesive glacial deposits, extending from beneath the made ground to 8.00mbgl, ranged between 10 and 31 indicating a locally very generally firm to stiff consistency.

5.10 SPT 'N' values within the lower part of the cohesive glacial deposits, from 9.00mbgl, were generally in excess of 50 indicating a very stiff consistency.

5.11 SPT 'N' values within the granular glacial deposits were generally recorded in excess of 50 indicating a dense state of compaction. A single N value of 8 was recorded in BH01 at 6.00mbgl, indicating a locally loose state of compaction.

Geotechnical Testing

5.12 Geotechnical testing undertaken on selected samples are summarised in the following table :

Test	Made Ground	Cohesive Glacial Deposits
Natural Moisture Content	17 - 24%	15 – 22%
Liquid Limit	-	30 – 44%
Plasticity Index	-	14 – 23% (Modified to 13.6 - 22.5%)
Atterberg Classification	-	Low – Intermediate Plasticity
C.B.R Value	0.7 – 9.8 %	-
Undrained Triaxial Strength Testing	-	103 - 146kN/m^2
Bulk Density	2.02 - 2.06Mg/m^3	2.11 – 21.3Mg/m^3
Dry Density	1.63 - 1.78Mg/m^3	1.79 – 1.83 Mg/m^3

Visual/Olfactory Evidence of Contamination

5.13 A hydrocarbon stain and odour was noted towards the base of the made ground in WS03 (between 2.25m and 2.35mbgl) and in WS04 (between 1.80 and 2.25mbgl). A hydrocarbon odour was also noted towards the base of the made ground in BH02 between 3.40 and 4.80mbgl. Subsequently samples were submitted for hydrocarbon analyses.

5.14 No further visual and/or olfactory evidence of significant ground contamination was identified within the exploratory holes during the investigation.

Groundwater

5.15 Perched groundwater was encountered during the formation of WS01 at a depth of 3.00mbgl.

5.16 Groundwater monitoring has recorded water levels in standpipes ranging between 1.57m and 3.77mbgl. However, WS01 was noted to be dry.

5.17 It should be appreciated that the groundwater observations described above have been undertaken during a very short period of time. Significant variations in the long-term groundwater regime may occur at other times, particularly with prolonged, extreme weather conditions, and that no account can be taken of such in this report.

General

5.18 It should also be appreciated that ground conditions may vary between and away from the exploratory hole positions, and that no account can be taken in this report of such variations.

6.0 GEOTECHNICAL APPRAISAL

Site Preparation

6.1 Site development will include the demolition of existing structures which should not proceed until an appropriate Asbestos survey of the existing building has been undertaken and any Asbestos Containing Materials (ACM) removed by an appropriately licensed contractor. Similarly, any demolition materials present on site and considered for re-use should be inspected with any ACM removed accordingly prior to crushing.

6.2 Historical/existing foundations, ground floor slabs and other buried concrete/brick obstructions associated with existing structures will need to be broken out to suitable depths below formation levels where they are to impinge on the proposed buildings. Such materials removed as part of the clearance work, subject to appropriate screening and crushing, will be suitable for re-use as bulk fill beneath hard cover areas.

6.3 Due to the possibility of unforeseen ground contamination beneath the existing structure, it is recommended that excavations should be overseen by an environmental specialist who will provide appropriate advice where any suspected contamination such as hydrocarbons or ACM is encountered during site preparation and/or subsequent groundworks.

6.4 No significant quantities of topsoil have been encountered at the site, so it is anticipated that any topsoil required for capping to landscaped areas will need to be imported to site, subject to suitability testing.

6.5 Site enabling works will need to take account of the integrity of any existing/ adjacent services at the site.

6.6 No significant earthworks are anticipated to facilitate redevelopment of the site with the exception of localised re-grading.

Underground Storage Tanks - USTs

6.7 Anecdotal information has indicated that the historical underground hydrocarbon storage tanks (UST's) have been removed. However, this has not been confirmed at this stage. Therefore, care should be taken during the surface strip and a careful examination undertaken to ensure that these have been suitably remediated.

6.8 If / where such are encountered during redevelopment their location and any associated pipe work should be established. In the event that the tanks have not previously been removed, they would form an underground void which could prove a source of ground instability if they were to deteriorate and collapse over a long period of time.

6.9 Therefore, it cannot be wholly discounted that the tanks would need to be removed by a specialist and the resulting hollow infilled with well compacted granular fill.

6.10 It is also recommended that a watching brief be undertaken during the site enabling works with any significant contamination so identified, including any previously unidentified UST's or other structures, being subject to further assessment and, where subsequently deemed an unacceptable risk, being subject to additional ground investigation, with any identified contamination sources being subject to an agreed remediation strategy.

Foundations

6.11 Made ground and any soft / loose natural deposits should be considered unsuitable for the direct support of structural loads as they will be weak and compressible, leading to possibly unacceptable total and differential settlements.

6.12 In consideration of the depths to competent bearing strata and the anticipated structural loads from the proposed multi-storey building, conventional shallow spread foundations are not considered a suitable option.

6.13 Therefore, it is recommended that the new structure be supported on piles. Pile design should assume no side support (skin friction) for the pile sections surrounded by made ground and may need to be designed to withstand potentially negative skin friction effects within cohesive strata.

6.14 Pile type, selection and design should to be undertaken in conjunction with a reputable, specialist piling contractor, ideally with experience of the local ground conditions.

6.15 However, for preliminary considerations, a pre-cast driven concrete pile would minimise waste soil arisings but potential noise and vibration effects may render this option unsuitable. Therefore, a bored pile solution could be the most appropriate solution for the site.

6.16 Foundation construction will also need to take account of any remaining and/or new services and the adjacent road infrastructure, where they are in close proximity, may need to be taken down to beneath the lowest level of the service trench so that their structural integrity is maintained.

Floor Slabs

6.17 Ground bearing floor slabs for the new structures should be suspended unless underlain by fill which has been compacted to an appropriate specification.

Excavations and Groundwater

6.18 Excavations at the site will be feasible using conventional hydraulic plant. All excavations at the site and specifically requiring man-entry, will need adequate lateral support, or will need to be battering back to a safe angle to ensure their stability.

6.19 Conventional 'sump and pump' dewatering measures are likely to be adequate to keep excavations dry, although it cannot be discounted that groundwater exclusion measures such as interlocking sheet piles would be required to prevent excessive ingress of water during periods of prolonged rainfall.

6.20 Such support measures will also reduce the risk of conditions that could lead to loss of ground beneath any nearby adjacent structures or infrastructure.

External Pavements

6.21 In consideration of the near surface ground conditions, it is recommended that new road pavement design should be based on a California Bearing Ratio (CBR) value of no more than 2.5% in untreated made ground and natural cohesive strata.

6.22 The CBR will need to be reviewed and confirmed by site inspection and possibly suitable in-situ testing at formation levels following any earthwork operations and prior to pavement construction.

6.23 In any event, all formations should be proof-rolled with any soft, loose or otherwise unsuitable material being removed and replaced with compacted granular fill.

Concrete Design

6.24 Design/mix of buried concrete should be undertaken in accordance with the "Aggressive Chemical Environment for Concrete" (ACEC) classification, of BRE Special Digest 1:2005 (Concrete in Aggressive Ground). With reference to the site history, it is deemed appropriate to classify the site as "Brownfield", with respect to BRE Special Digest, assuming mobile groundwater conditions.

6.25 Values of 2:1 water/soil extract for sulphate range between 27mg/l and 180mg/l. Values of pH at range from 8.1 to 9.7 indicating alkali conditions.

6.26 On the basis of these results, the typical design sulphate (DS) class and "Aggressive Chemical Environment for Concrete" (ACEC) class for the site are DS-1 and AC-1 respectively.

Drainage and Soakaways

6.27 In consideration of the predominantly cohesive nature of the natural soils and the limited external site area, soakaways are not considered a feasible drainage option for the site.

7.0 GENERIC QUANTITATIVE RISK ASSESSMENT (GQRA)

General

7.1 A review of the readily available information has concluded that the potential for exposure to ground contamination is likely leading to a medium to high preliminary risk.

7.2 Therefore, it has been considered prudent to undertake chemical analysis of the sub-surface soils to confirm the low human health risk status of the site.

Human Health

7.3 Selected samples have been analysed for a general suite of contaminants of concern and compared against Screening Levels (SL's) for human health to determine the significance of the measured concentrations in relation to the site conceptual model. Thus, a Generic Quantitative Risk Assessment has been undertaken in line with guidelines provided in Land Contamination Risk Management, October 2020.

7.4 The criteria for a limited number of contaminants have been derived by DEFRA in their document entitled SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, April 2014.

7.5 Within the document, Category 4 Screening Levels (C4SL's) are described as being more pragmatic than previous screening criteria and represent concentrations in soil that present an 'acceptable' level of risk within the context of Part 2A.

7.6 The National Planning Policy Framework states that 'after development, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990'. Therefore, by inference, the C4SL's are appropriate for use in the planning context.

7.7 Although the SP1010 document states that C4SL only apply for a 'sandy loam soil with 6% soil organic matter', it is generally accepted that assessment criteria for metals are not sensitive to changes in soil organic content (SOM). The C4SL's have therefore been adopted as assessment criteria in this report for the listed metals within the SP1010.

7.8 Subsequent to SP1010, LQM/CIEH have published a document entitled 'The LQM/CIEH S4ULs for Human Health Risk Assessment' 2015. In brief, the document provides updated assessment criteria which have been derived in accordance with UK legislation, national as well as EA policy and using a modified version of the CLEA software and available guidance. The new screening criteria, or Suitable 4 Use Levels (S4ULs), are intended to provide a complete and updated replacement to the previous LQM/CIEH GAC of 2009. As such they are considered appropriate for use in this assessment for other contaminants not covered by C4SL's and/or for organic contaminants assuming a worst-case Soil Organic Matter (SOM) of 1% as an initial conservative assessment.

7.9 For each contaminant, S4UL's and C4SL's have been calculated for six land use scenarios, namely:

- Residential with homegrown produce.
- Residential without homegrown produce.
- Allotments.
- Commercial.
- Public Open Space, near residential housing.
- Public Parks, remote from residential housing.

7.10 In light of the proposed development, and in the first instance the SL's for a "Residential without homegrown produce" end-use. However it may be more appropriate to assess these against 'Public Open Space near Residential Housing' due to the nature of the development. Therefore, the appropriate tables of relevant SL's are provided in Appendix 05.

Controlled Waters

7.11 Generic criteria for the assessment of potential groundwater contamination have been derived from very conservative guidelines protective of drinking water and environmental quality, namely:

- UK Drinking Water Standards (DWS) as defined by The Water Supply (Water Quality) Regulations, 2016;
- UK Environmental Quality Standards (EQS) for Freshwater, based on the United Utilities Hardness based on the postcode (M4 4FT) of soft; 0 – 50mg/l $CaCO_3$.
- Petroleum Products in Drinking-water, Background document for development of WHO Guidelines for Drinking-water Quality, 2011.

7.12 A table of relevant SL's are provided in Appendix 05.

Soil Test Results

7.13 8no soil samples were analysed for a suite of Contaminants of Concern (CoC). In the first instance the majority of the concentrations were measured below the SL's for a "Residential without homegrown produce" end-use with the following exceptions.

Contaminant	Number of Exceedances	SL (mg/kg)	Recorded Concentrations (mg/kg)	Samples
Lead	1	310	670	WS04 – 0.20m
Benzo[a]pyrene	1	3.2	4.2	WS01 – 0.40m
Dibenz[a,h]Anthracene	1	0.31	0.38	WS01 – 0.40m

7.14 However, in consideration of the proposed nature of the development it may be more appropriate to assess the values against the reference values for 'Public Open Space near Residential Housing'. In this case only a single value of lead (670mg/kg - WS04 – 0.20m) is noted to very slight elevated above the reference values of 630mg/kg.

7.15 8no samples submitted for TPH compound analysis recorded the majority of concentrations below the relevant reference values for the required end-use with the following exception.

Contaminant	Number of Exceedances	SL (mg/kg)	Recorded Concentrations (mg/kg)	Samples
TPH Aromatic C10-C12	1	250	340	WS04 – 1.85m

7.16 When compared against the reference values for 'Public Open Space near Residential Housing' all of the concentrations of TPH were below the relevant reference values.

7.17 A sample of asphalt from WS01 was analysed to determine the concentration of BaP, which, if the concentration exceeds 50mg/kg, may indicate that the asphalt is likely to contain coal tar at sufficient concentrations as to deem it hazardous waste. The analysis recorded a concentration of BaP of 2.3mg/kg, therefore suggesting that the asphalt does not contain coal tar at hazardous concentrations for disposal purposes.

7.18 Asbestos was also detected in 2no of the samples analysed (WS02 – 0.30m & WS02 – 0.60m) in the form of Amosite / Chrysotile fibres or clumps. Subsequent quantification indicated these comprised between 0.031% (WS02 – 0.60m) and 0.17% (WS02 – 0.30m) of the samples analysed.

Leachate Testing

7.19 4no samples of made ground were submitted for leachate preparation and testing for a range of contaminants of concern.

7.20 The majority of results were below the assessment criteria when compared to stringent drinking water and environmental standards (EQS with a water hardness of 0-50mg/l) with the following exceptions.

Contaminant	Ref Value ug/l		Concentration Exceedances ug/l		Sample
	EQS	UKDWS	EQS	UKDWS	
Copper	0.5	2000	2.6 – 4.5	-	WS01 - 1.20m WS02 – 0.35m WS04 – 1.50m
Lead	4	10	7.1 - 84	84	WS02 – 0.35m WS04 – 1.50m
pH	9	-	9.2 – 11.1	-	WS01 - 1.20m WS02 – 0.35m WS02 – 1.30m

Groundwater Analysis

7.21 1no sample of groundwater from WS02 was submitted for analysis for a range of metals, semi-metals and hydrocarbons. The majority of the concentrations measured were below the generic assessment criteria when compared to environmental standards (EQS with a water hardness of 0-50mg/l) and the more stringent drinking water standards with the following exceptions.

Contaminant	Ref Value ug/l			Exceedances in Groundwater ug/l			Sample
	EQS	UKDWS	WHO	EQS	UKDWS	WHO	
Sulphate	400	250	-	-	340	-	WS02
Copper	0.5	2000	-	5	-	-	WS02
Chromium	2	50	-	12	-	-	WS02
Selenium	-	10	-	-	11	-	WS02
TPH Aliphatic C21 - C35	-	-	300	-	-	365	WS02

7.22 The WHO Guideline Values for petroleum products in drinking water have been applied in the absence of current TPH water quality standards. However, for the aromatic TPH bandings of C6-C7, C7-C8 and C8-C10, the more conservative UK specific WQS for benzene, toluene and ethylbenzene have been used. For the aliphatic ranges C16-C21 and C21-C35, the guideline values for the aliphatic C8-C10 through to C12-C16 ranges of 300µg/l have been used. These are however considered conservative due to the increased stability and lower volatility of the longer chain aliphatics.

Discussion and Conclusions

Human Health

7.23 The test indicate that localised shallow made ground beneath the site contains levels of certain contaminants that are slightly elevated above their respective SL's. This relates to elevated concentrations of Lead and PAH Compounds recorded within a 2no samples of made ground at depths

of less than 0.40mbgl. Also when compared to a more appropriate reference values for 'Public Open Space near Residential Housing' only a single elevated concentration of lead was recorded.

7.24 A hydrocarbon stain and odour was encountered within WS03 between depths of 2.25m and 2.35mbgl, WS04 between depths of 1.80m and 2.25mbgl and BH02 between 3.40m and 4.80mbgl. A sample from WS04 at 1.85mbgl recorded slightly elevated concentrations of TPH within the lighter aromatic C10-C12 range. Samples of hydrocarbon impacted soils from BH02 were also submitted for TPH analyses, the results of which indicated no concentrations above their respective SL's.

7.25 No evidence of remaining underground storage tanks (USTs) were encountered. Made ground was recorded to a depth of 4.80mbgl in BH02 and in excess of 4.00mbgl in WS01 located in the south-western part of the site which may suggest their most likely historic location. However, it cannot be wholly discounted that further USTs or unidentified contamination sources could be encountered during site enabling works.

7.26 If any suspected UST's and associated pipework are encountered they should be delineated, decommissioned and removed to facilitate redevelopment of the site and reduce the risk to human health and the environment. On removal of the tanks, the ground should be inspected by an environmental specialist with any associated ground and/groundwater contamination being removed under the approved Remediation Strategy, which will include subsequent sampling and testing of the ground and groundwater beneath such areas to confirm that contamination risks have been reduced to acceptable levels.

7.27 Following site development, there will be no mechanism for a direct contact pollution linkage with contaminated soil where surfaced with buildings and hardstanding. However, a direct contact pollution linkage is plausible in proposed soft landscaped areas and it is recommended that these should be capped with a geotextile membrane overlain by 450mm of clean sub-soil and 150mm of topsoil to provide a 600mm clean cover and thus remove any localised pollution linkages.

Controlled Waters

7.28 Chemical analysis of samples of made ground have indicated slight exceedances of leachable copper and lead with slightly elevated concentrations of sulphate, copper, chromium and selenium within the groundwater, which are above the stringent assessment criteria.

7.29 Analysis of a sample of soil from WS04, noted to have hydrocarbon staining and odour, confirmed the presence of slight a slight exceedance within the aromatic TPH C10-C12 carbon bands. Although a suitable volume of groundwater could not be obtained from WS04 for analyses, an adjacent water sample from WS03 indicated a slightly elevated concentration of C21-C35 in the aliphatic range.

7.30 Although the bedrock underlying the site is classified as a 'Principal Aquifer' the overlying superficial deposits are predominantly cohesive and therefore relatively impermeable in nature, limiting the potential for downward migration of any localised mobile contamination sources.

7.31 Taking into consideration the low sensitivity of the underlying superficial aquifer and that the source of any historic hydrocarbon contamination (UST's, fuel pumps and associated pipework) appear to have been removed from the site, the concentrations recorded are not considered to represent a significant ongoing source of contamination.

7.32 Notwithstanding this, all UST's and associated pipework are to be removed and any further visual or olfactory signs of significant ground contamination encountered during the site clearance and groundworks phase of construction should be referred to an environmental consultant who will assess the requirement for further ground investigation and risk assessment at that stage.

In consideration of the underlying principal Aquifer and requirement for a piled foundation, it is also considered that a piling risk assessment will be required as part of planning.

8.0 GROUND GAS RISK ASSESSMENT

Methodology

8.1 Current guidance for the assessment of risk associated with the presence of hazardous ground gases (principally methane and carbon dioxide) is provided in two key documents, namely:

- Code of practice for the Characterisation and remediation from Ground Gas in Affected Developments. British Standard Institution (BS 8485: 2015 & A1:2019); and
- Assessing Risks posed by Hazardous Ground Gases to Buildings CIRIA (C665, 2007).

8.2 The assessment presented herein is primarily based on the BS8485 document.

8.3 Hazardous ground gas qualitative risk assessment is based on a conceptual model similar to that used for soil and groundwater contamination sources (i.e., source-pathway-receptor pollutant linkages). A semi-quantitative estimate of risk can be assessed based on knowledge of the conceptual model and a measure of hazardous gas concentration and gas flow at the site within monitoring standpipes.

8.4 Based on the measured flow rates and hazardous gas concentrations, individual "hazardous gas flow rates" (Qhg) can be derived for each monitoring point, from which the "site characteristic hazardous gas flow rate" (Qhgs), and then the "Characteristic Situation" (CS) can be determined.

8.5 BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation and the proposed development based on building type as outlined in Table 3.

Table 3 - Building Types

	Type A	Type B	Type C	Type D
Ownership	Private	Private or commercial/ Public, possible multiple	Commercial / Public	Commercial / Industrial
Control (Change of use)	None	Some but not all	Full	Full
Room Sizes	Small	Small/ medium	Small to Large	Large Industrial/ Retail Park

8.6 The proposed development therefore is indicated to comprise the construction of Type B buildings which include private or commercial structures with small to medium room sizes.

Ground Gas Conceptual Model

8.7 The site is not in Radon Affected Area, defined by the UK Health Security Agency as less than 1% of properties are above the Action Level of exposure. Therefore, no radon protection measures are necessary for new structures as described in publication BR211 by the Building Research Establishment.

8.8 There are no active landfills located within 500m of the site or historic landfills located within 250m of the site.

8.9 The presence of ground gas resulting from shallow unrecorded mine workings is considered unlikely.

8.10 No appreciable thickness of made ground or other soil with significant organic content have been encountered beneath the site.

8.11 However, hazardous ground gases originating from degraded hydrocarbons cannot be wholly discounted.

8.12 Therefore, it has been considered prudent to undertake ground gas monitoring, primarily for methane and carbon dioxide, with associated flow rates, on 4no occasions to date, between 7th September and 19th October 2022.

Results and Recommendations

8.13 The results to date indicate concentrations of peak and steady state methane not exceeding 0.1% by volume in air (v/v) and peak and steady state carbon dioxide concentrations ranging between less than 0.1 and 1.6% v/v. No detectable steady state ground gas flows were recorded.

8.14 The results give a maximum composite Qhg value of 0.0016l/hr and indicate the site to classify as Characteristic Situation (CS) 1 – Very Low Gas Risk'.

8.15 However, the Characteristic Situation will need to be confirmed on completion of the ground gas monitoring and risk assessment in due course and should also be confirmed with the local authority Environmental Health / Building Control Officer prior to any building design being finalised.

9.0 OTHER POTENTIAL DEVELOPMENT CONSIDERATIONS

Excavated Soils

9.1 Excavation works undertaken during the development are likely to produce waste soils for which appropriate waste management will be required. In line with current sustainability principals, any waste soils should firstly be considered for re-use where possible by incorporation into the development.

9.2 However, due to the extent of the proposed redevelopment, it is envisaged that such excavated soil will, in the main, need to be removed from site under appropriate duty of care.

9.3 It should be noted that the chemical analysis results for disposal classification are assessed against different assessment criteria to those relating to contamination risk assessment. Soils that are deemed suitable for use in terms of risk to human health and the environment may not necessary be un-contaminated and could be classified as Non-Hazardous or even Hazardous for disposal purposes.

9.4 It will be the responsibility of the waste producer to undertake additional testing and classification of any waste soils for disposal to an appropriately licenced landfill in accordance with current guidelines.

9.5 For preliminary guidance based on the current information, it is likely that made ground, would be classified as 'Non-hazardous' with natural soils classified as 'Inert' for landfill disposal.

9.6 However, excavated soils which are contaminated with TPH compounds may classify as 'Hazardous' if disposed to landfill. Any soils containing ACM or significant asbestos fibres may also classify as 'Hazardous' following further quantification analysis.

9.7 A sample of asphalt recorded a concentration of BaP of 2.3mg/kg, suggesting that the asphalt does not contain coal tar in hazardous concentrations. However, where asphalt materials are to be removed from site as waste, further analysis should be undertaken to fully categorise the material for disposal at landfill.

9.8 In addition, for Inert and Hazardous waste disposal, allowance will need to be made for adequate Waste Acceptance Criteria (WAC) testing with appropriate consideration of the additional time and cost associated with this.

9.9 It will be the responsibility of the waste producer to undertake further testing and classification of any waste soils for disposal to an appropriately licenced landfill in accordance with current guidelines and Duty of Care requirements.

Imported Fill

9.10 Imported fill will be subject to specific quality requirements and should be accompanied by appropriate certification to confirm its suitability. Allowance should also be made for testing imported fill materials prior to placement to ensure suitability.

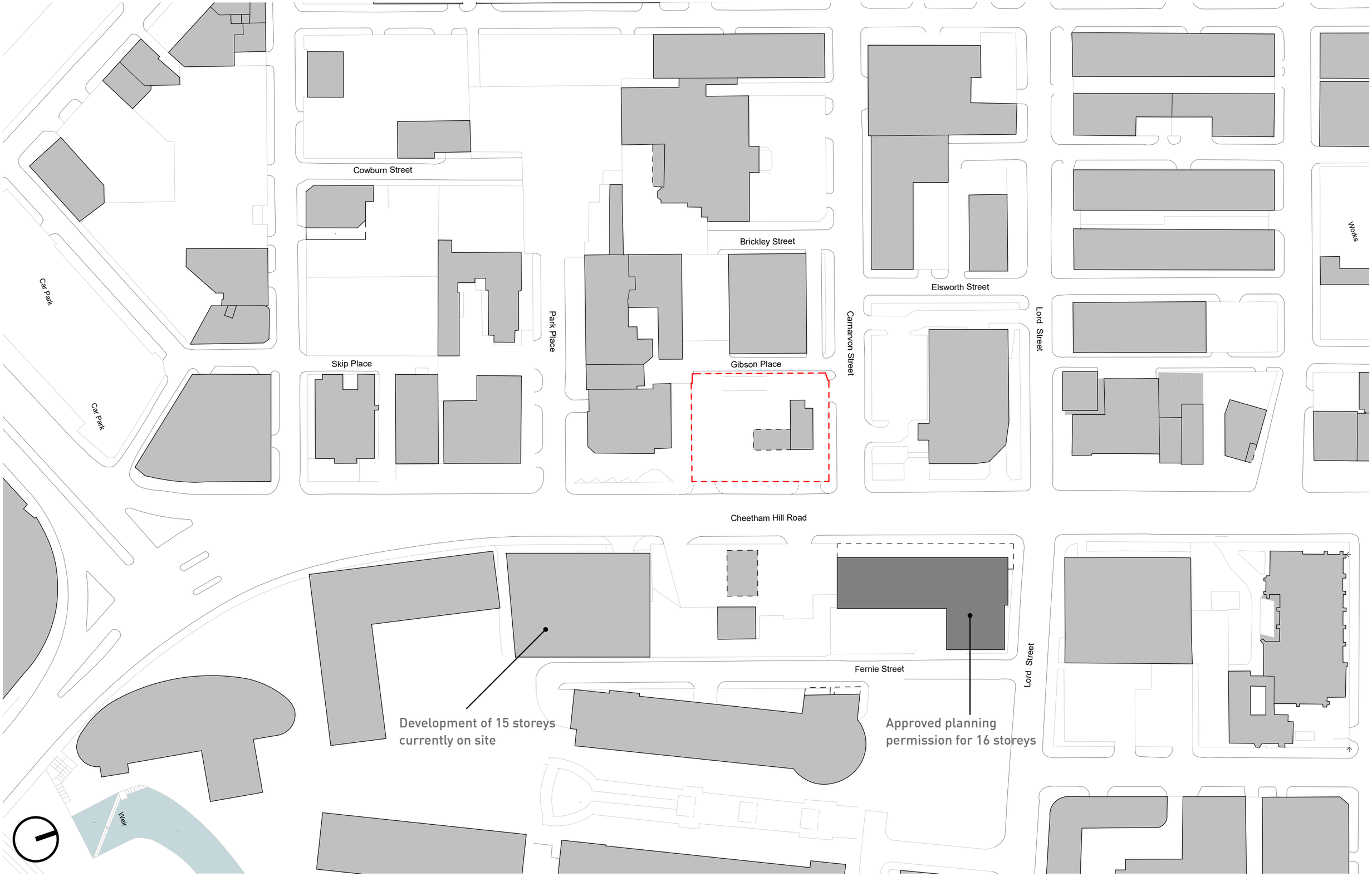
Water Supply Pipes

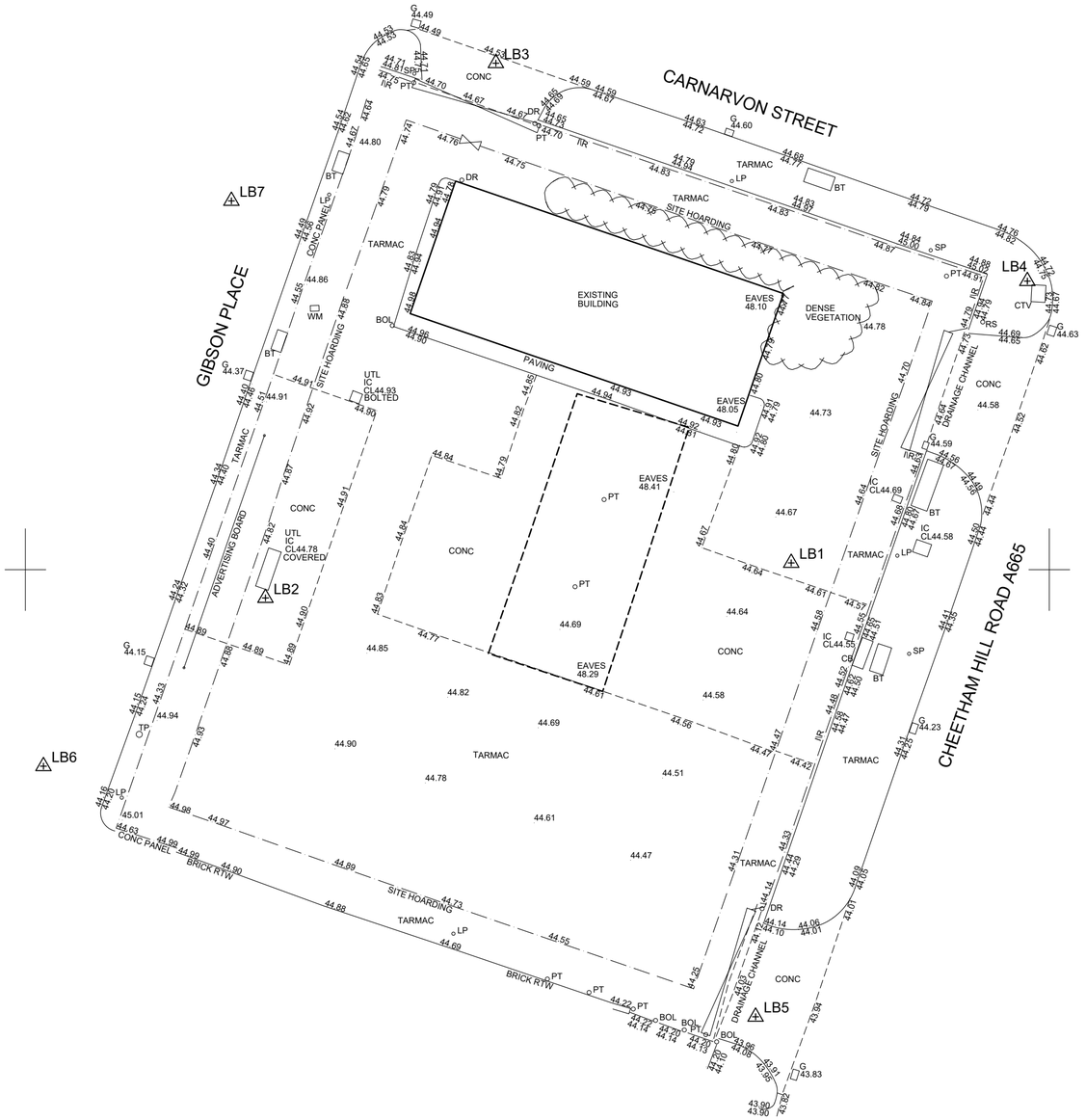
9.11 The relevant water supply provider will need to be consulted with regards the selection of suitable water supply pipe materials for the development. In consideration of the localised hydrocarbon contamination, it cannot be discounted at this stage that specific materials and measures to protect the water supply from ground contamination would be required. This will need to be confirmed once the development proposals have been finalised.

APPENDIX 01

Drawings

Existing Plan 1:1000





SURVEY STATIONS			
Name	Easting	Northing	Height
LB1	384087.40	399400.33	44.64
LB2	384061.72	399398.62	44.81
LB3	384072.97	399424.72	44.58
LB4	384098.93	399414.09	44.80
LB5	384085.66	399378.18	43.96
LB6	384050.88	399390.41	44.14
LB7	384060.06	399418.00	44.57

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N

Note:

The survey is plotted on a plane local Grid. Orientation to National Grid.
All levels relate to Ordnance Datum, achieved using the OS National GPS Network.
Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SurveY OPERATIONS

Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk – www.survops.co.uk

Client
RPS Group

Drawing Title
Topographical Survey of Land at:
31-44 Cheetham Hill
Manchester

Scale(s)	1:200	Surveyor	LB
Date	AUG 22	Drawn	CD
Job Number	22F169	Checked	TP

Sheet Size & Drg Number & Revision
A2 22F169/001

384050E

384100E

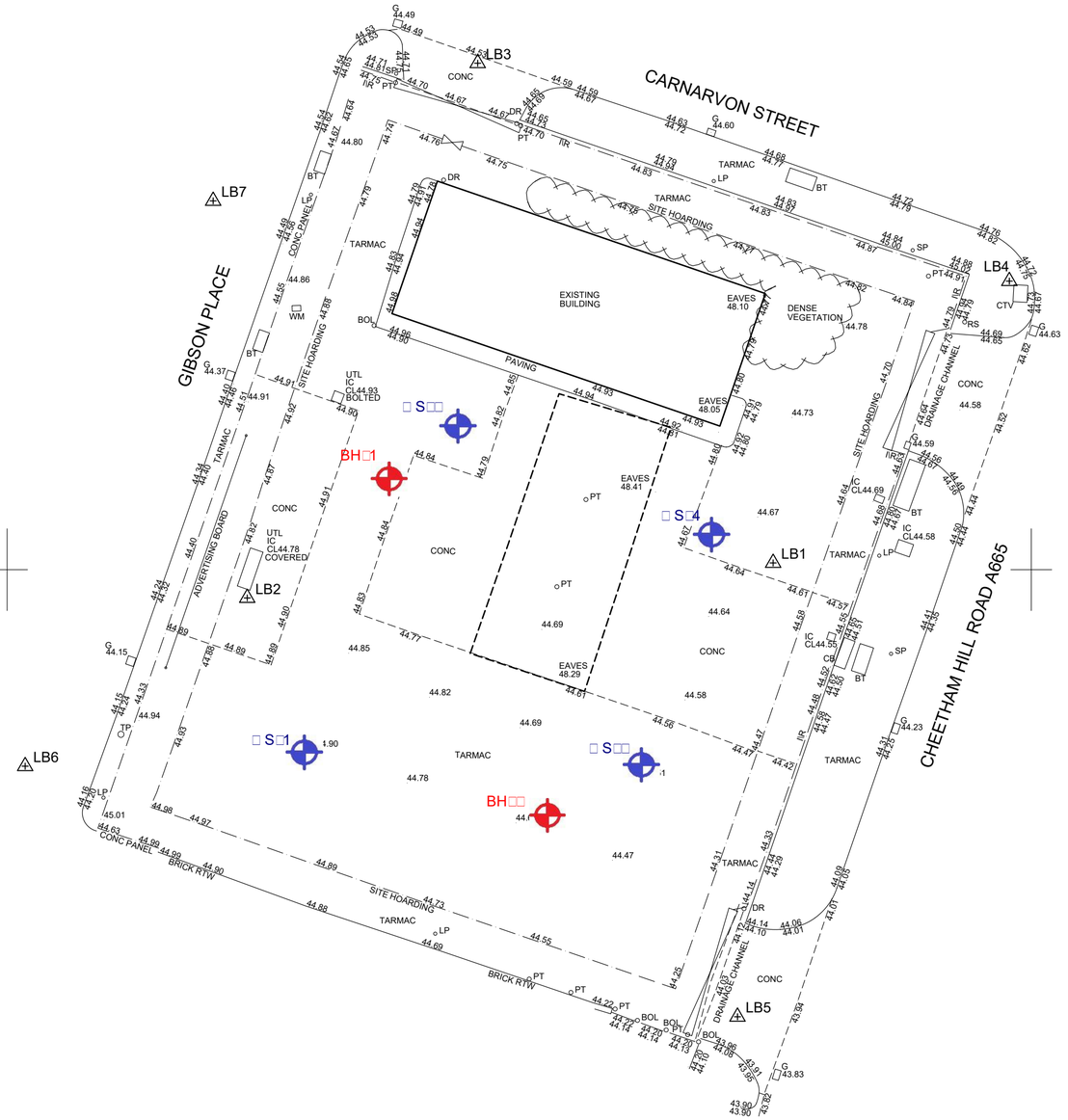
399400N

399400N

384050E

384100E

SURVEY STATIONS			
Name	Easting	Northing	Height
LB1	384087.40	399400.33	44.64
LB2	384061.72	399398.62	44.81
LB3	384072.97	399424.72	44.58
LB4	384098.93	399414.09	44.80
LB5	384085.66	399378.18	43.96
LB6	384050.88	399390.41	44.14
LB7	384060.06	399418.00	44.57



WML CONSULTING

Project: Cheetham Hill Rd
Drg Title: WS Location Plan
Job No: 10638G By: TPB
Drg No: SK-02 Rev: -
Date: 18/08/22 Scale: N.T.S.

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Note:

The survey is plotted on a plane local Grid. Orientation to National Grid.
All levels relate to Ordnance Datum, achieved using the OS National GPS Network.
Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SurveY OPERATIONS

Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk – www.survops.co.uk

Client: RPS Group

Drawing Title: Topographical Survey of Land at:
31-44 Cheetham Hill
Manchester

Scale(s)	1:200	Surveyor	LB
Date	AUG 22	Drawn	CD
Job Number	22F169	Checked	TP

Sheet Size & Drg Number & Revision: A2 22F169/001

APPENDIX 02

Exploratory Hole Records

WML CONSULTING	Project Title: Cheetham Hill Rd		BH01
	Project Number: 10638G	Client: Urban Village	Sheet 1 Of 3
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 22/09/2022-23/09/2022	Method: Cable Percussion	Driller: PB Drilling	Logged By: RH (PBD)

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
0.30 - 0.80	B				0.15 0.30	Asphalt. (MADE GROUND) Roadstone. (MADE GROUND)		
0.80 - 1.20	B				0.85	Brick, concrete & stone. (MADE GROUND)		
1.20 - 1.65	D	N=15			1.00	Silty, sandy boulder CLAY. (GLACIAL TILL)		
2.00 - 2.45	U				2.00			
2.50	D							
3.00 - 3.45	SPT	N=14			3.00			
4.00 - 4.45	U				4.00			
4.50	D				4.30	Very silty, sandy CLAY. (GLACIAL TILL)		
5.00 - 5.45	SPT	N=10			5.00			
6.00 - 6.45	SPT	N=8			5.90 6.00	Silty SAND. (GLACIAL DEPOSITS) Borehole Continues		

KEY

D - Disturbed Sample
B - Bulk Sample
U - Undisturbed
W - Water Sample
S - Standard Penetration Test
C - Cone Penetration Test
N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

REMARKS

No Groundwater Encountered

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING	Project Title: Cheetham Hill Rd		BH01
	Project Number: 10638G	Client: Urban Village	Sheet 2 Of 3
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 22/09/2022-23/09/2022	Method: Cable Percussion	Driller: PB Drilling	Logged By: RH (PBD)

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
6.50	D				6.50	Silty SAND. (GLACIAL DEPOSITS)		
						Brown, sandy, boulder CLAY. (GLACIAL TILL)		
7.50 - 7.95	SPT	N=31			7.60			
						Red brown, sandy, boulder CLAY. (GLACIAL TILL)		
					8.30			
8.50	D					Brown, sandy, boulder CLAY. (GLACIAL TILL)		
9.00 - 9.45	SPT	pp 50/125mm			9.30			
						Medium dense, silty SAND. (GLACIAL DEPOSITS)		
10.00	D							
10.50 - 10.95	SPT	pp 50/95mm						
11.50	D							
11.80	D				11.80			
12.00 - 12.45	SPT	pp 50/100mm				Brown, silty CLAY. (GLACIAL TILL)		
						Brown, silty SAND. (GLACIAL DEPOSITS)		
						Borehole Continues		

KEY

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N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

REMARKS

No Groundwater Encountered

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING	Project Title: Cheetham Hill Rd		BH01
	Project Number: 10638G	Client: Urban Village	Sheet 3 Of 3
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 22/09/2022-23/09/2022	Method: Cable Percussion	Driller: PB Drilling	Logged By: RH (PBD)

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
13.00	D					Brown, silty SAND. (GLACIAL DEPOSITS)		
13.50 - 13.95	SPT	pp 50/115mm						
14.50	D							
14.80	D				14.80			
15.00 - 15.45	SPT	pp 50/240mm				Slightly claybound SAND. (GLACIAL DEPOSITS)		
					15.40	Brown, very sandy, boulder CLAY. (GLACIAL TILL)		
						Coarse orange SAND. (GLACIAL DEPOSITS)		
16.50 - 16.95	SPT	pp 50/90mm						
					16.60	Coarse orange SAND with silty clay lenses. (GLACIAL DEPOSITS)		
17.00	D					Gravel with siltstone boulders. (GLACIAL DEPOSITS)		
18.00 - 18.45	SPT	pp 50/145mm						
						Brown, sandy, boudler CLAY with sand lenses. (GLACIAL TILL)		
					18.45	End Of Borehole At 18.45 m		

KEY

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N - Penetration Test 'N' Value
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▽ - Groundwater Strike
▼ - Groundwater Level

AGS

REMARKS

No Groundwater Encountered
Hole refused at 18.45mbgl.

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING

	Project Title: Cheetham Hill Rd		BH02
	Project Number: 10638G	Client: Urban Village	Sheet 1 Of 3
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 20/09/2022-21/09/2022	Method: Cable Percussion	Driller: PB Drilling	Logged By: RH (PBD)

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
					0.10	Asphalt. (MADE GROUND)		
0.40 - 1.20	B				0.40	Coarse red sand with stone. (MADE GROUND)		
					1.00	Sand, concrete and brick. Hydrocarbon aroma between 3.40 and 4.80mbgl. (MADE GROUND)		
1.20 - 1.65	D	N=6						
2.00 - 2.45	D	N=8			2.00			
3.00 - 3.45	J	N=17			3.00			
4.00 - 4.45	E	N=15			4.00			
4.80	E				4.80			
5.00 - 5.45	SPT	N=20			5.00	Brown, silty boulder CLAY. (GLACIAL TILL)		
6.00 - 6.45	SPT	N=16			6.00			
						Borehole Continues		

KEY

D - Disturbed Sample
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S - Standard Penetration Test
C - Cone Penetration Test
N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

AGS

REMARKS

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed
29/09/2022	2.5				

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING	Project Title: Cheetham Hill Rd		BH02
	Project Number: 10638G	Client: Urban Village	Sheet 2 Of 3
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 20/09/2022-21/09/2022	Method: Cable Percussion	Driller: PB Drilling	Logged By: RH (PBD)

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
						Brown, silty boulder CLAY. (GLACIAL TILL)		
7.00	D							
7.50 - 7.95	SPT	N=22						
8.00	D							
						Red brown boulder CLAY. (GLACIAL TILL)		
8.40	D				8.40			
						Brown, sandy boulder CLAY. (GLACIAL TILL)		
9.00 - 9.45	SPT	pp 50/125mm						
					9.40			
						SAND. (GLACIAL DEPOSITS)		
10.00	D							
10.50 - 10.95	SPT	pp 50/65mm						
11.50	D							
12.00 - 12.45	SPT	pp 50/60mm						
12.50	D				12.50			
						Silty SAND. (GLACIAL DEPOSITS)		
						Borehole Continues		

KEY

D - Disturbed Sample
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W - Water Sample
S - Standard Penetration Test
C - Cone Penetration Test
N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

REMARKS

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed
29/09/2022	2.5				

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING	Project Title: Cheetham Hill Rd		BH02
	Project Number: 10638G	Client: Urban Village	Sheet 3 Of 3
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 20/09/2022-21/09/2022	Method: Cable Percussion	Driller: PB Drilling	Logged By: RH (PBD)

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
13.50 - 13.95	SPT	pp 50/190mm				Silty SAND. (GLACIAL DEPOSITS)		
14.20	D				14.20	Reddish brown, sandy boulder CLAY. (GLACIAL TILL)		
15.00 - 15.45	SPT	pp 50/145mm			14.90	Coarse, orange SAND. (GLACIAL DEPOSITS)		
15.60	D				15.60			
					15.90	SAND & GRAVEL. (GLACIAL DEPOSITS)		
16.20 - 16.65	SPT	pp 50/65mm			16.20	Gravel and boulders of SANDSTONE. (CHESTER FORMATION)		
						End Of Borehole At 16.20 m		

KEY

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W - Water Sample
S - Standard Penetration Test
C - Cone Penetration Test
N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

AGS

REMARKS

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed
29/09/2022	2.5				

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING	Project Title: Cheetham Hill Rd		WS01
	Project Number: 10638G	Client: Urban Village	Sheet 1 Of 1
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 16/08/2022	Method: Window Sample	Driller: LOT Geotechnics Ltd	Logged By: TPB

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
0.05	J				0.10	Asphalt (MADE GROUND)		
0.30	E				0.30	Red brown, gravelly SAND. Gravel is subangular, fine to coarse, including sandstone. (MADE GROUND)		
0.40	E	N=46			1.00	Brownish grey, sandy, subangular, fine to coarse GRAVEL including sandstone, brick and concrete. Medium cobble content. Cobbles subangular, including brick. Occasional clayey pockets. (MADE GROUND)		
1.20	E	N=17			2.00			
2.90	J	N=46			3.00		▼	
		N=21			4.00	End Of Borehole At 4.00 m		
					5.00			
					6.00			

KEY

D - Disturbed Sample
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S - Standard Penetration Test
C - Cone Penetration Test
N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

AGS

REMARKS

Hole collapsing to 2mbgl.

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed
18/08/2022	3				

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING	Project Title: Cheetham Hill Rd		WS02
	Project Number: 10638G	Client: Urban Village	Sheet 1 Of 1
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 16/08/2022	Method: Window Sample	Driller: LOT Geotechnics Ltd	Logged By: TPB

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
0.05	J				0.10	Asphalt		
0.30	E				0.20	(MADE GROUND)		
0.40	E				0.40	Grey, sandy, subangular, fine to coarse GRAVEL including sandstone. (MADE GROUND)		
		N=14			1.00	Dark brownish grey, sandy, angular to subangular, fine to coarse GRAVEL including brick, sandstone, slate and ash. (MADE GROUND)		
1.20	E							
		N=25			2.00	Brown, clayey, sandy, subangular, fine to coarse GRAVEL including brick and sandstone. Medium cobble content. Cobbles are subangular, of brick. (MADE GROUND)		
2.90	J					Firm to stiff, brown and locally grey mottled, slightly silty, slightly sandy, slightly gravelly CLAY. Gravel is subangular, fine to coarse, of mixed lithologies. (GLACIAL TILL)		
		N=21			3.00			
		N=19			4.00			
		N=19			5.00	End Of Borehole At 5.00 m		
					6.00			

KEY

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C - Cone Penetration Test
N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

AGS

REMARKS

No Groundwater Encountered

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING	Project Title: Cheetham Hill Rd		WS03
	Project Number: 10638G	Client: Urban Village	Sheet 1 Of 1
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 16/08/2022	Method: Window Sample	Driller: LOT Geotechnics Ltd	Logged By: TPB

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
0.30	E				0.20	Asphalt (MADE GROUND)		
0.60	E	N=2			1.00	Brownish grey, sandy, angular to subangular, fine to coarse GRAVEL including brick, sandstone and asphalt. (MADE GROUND)		
2.20 2.30	E J	N=10			2.00 2.35	2.25 - 2.35 Hydrocarbon stain & aroma.		
		N=25			3.00	Firm to stiff, brown and locally grey mottled, slightly silty, slightly sandy, slightly gravelly CLAY. Gravel is subangular, fine to coarse, of mixed lithologies. (GLACIAL TILL) End Of Borehole At 3.00 m		
					4.00			
					5.00			
					6.00			

KEY

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S - Standard Penetration Test
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N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

REMARKS

No Groundwater Encountered
Hole collapsing to 1mbgl. Strata damp between 2.10 and 2.35mbgl.

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

WML CONSULTING	Project Title: Cheetham Hill Rd		WS04
	Project Number: 10638G	Client: Urban Village	Sheet 1 Of 1
	GL (mAOD):	N Coord: 0	E Coord: 0
Date: 16/08/2022	Method: Window Sample	Driller: LOT Geotechnics Ltd	Logged By: TPB

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
0.20	E				0.30	Asphalt (MADE GROUND)		
0.50	E					Brownish grey, sandy, angular to subangular, fine to coarse GRAVEL, including sandstone, brick, slate, ceramic and plastic. (MADE GROUND)		
		N=2			1.00	Greyish brown, sandy, subangular, fine to coarse GRAVEL including brick and sandstone. Medium cobble content. Cobbles are subangular, of brick. (MADE GROUND)		
1.50	E					0.30 - 1.20 Brick wall in east side of pit.		
1.85	J	N=21			2.00	1.80 - 2.25 Hydrocarbon stain & aroma.		
2.10	J				2.25	Firm to stiff, brown and locally grey mottled, slightly silty, slightly sandy, slightly gravelly CLAY. Gravel is subangular, fine to coarse, of mixed lithologies. (GLACIAL TILL)		
					3.00	End Of Borehole At 3.00 m		
					4.00			
					5.00			
					6.00			

KEY

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C - Cone Penetration Test
N - Penetration Test 'N' Value
V - Hand Shear Vane kPa
▽ - Groundwater Strike
▼ - Groundwater Level

AGS

REMARKS

No Groundwater Encountered
Strata damp between 2.00 and 2.25mbgl.

Scale: 1:40

Water Strikes

Date	Strike	Level	Minutes	Casing	Sealed

Daily Log Of Depths

Date	Casing	Water

Chiselling

From	To	Hours

Printed By GeoLogs (www.GeoLogs.com)

APPENDIX 03

Geotechnical Testing Results

LABORATORY REPORT

4043

Contract Number: PSL22/6418

Report Date: 18 October 2022

Client's Reference: 10638G

Client Name: WML Consultants
No 8 Oak Green Earl Road
Stanley Green Business Park
Cheadle Hulme
Cheshire
SK8 6QL

For the attention of: Tom Booth

Contract Title: Cheetham Hill

Date Received: 4/10/2022
Date Commenced: 4/10/2022
Date Completed: 18/10/2022

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins (Director)
R Berriman (Quality Manager)
S Royle (Laboratory Manager)

L Knight (Assistant Laboratory Manager)
S Eyre (Senior Technician)
T Watkins (Senior Technician)

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fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH01		B	0.30	0.80	MADE GROUND brown very gravelly very sandy clay.
BH01		B	0.80	1.20	MADE GROUND brown slightly gravelly very sandy CLAY.
BH01		D	1.20	1.65	Brown mottled grey slightly gravelly very sandy CLAY.
BH01		U	2.00	2.45	Very stiff brown slightly gravelly sandy CLAY.
BH01		D	2.50		Brown slightly gravelly sandy CLAY.
BH01		U	4.00	4.45	Stiff brown slightly gravelly very sandy CLAY.
BH01		D	4.50		Brown slightly gravelly very sandy CLAY.
BH01		D	8.50		Brown very sandy CLAY.
BH02		B	0.40	1.20	MADE GROUND brown very sandy clayey GRAVEL.
BH02		S	6.00	6.45	Brown very sandy CLAY.
BH02		D	8.00		Brown mottled grey slightly gravelly sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH01		D	1.20	1.65	22			37	18	19	98	Intermediate Plasticity CI
BH01		D	2.50		18			38	20	18	95	Intermediate Plasticity CI
BH01		D	4.50		18			31	17	14	97	Low Plasticity CL
BH01		D	8.50		18			33	17	16	100	Low Plasticity CL
BH02		S	6.00	6.45	15			30	16	14	100	Low Plasticity CL
BH02		D	8.00		18			44	21	23	98	Intermediate Plasticity CI

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Cheetham Hill

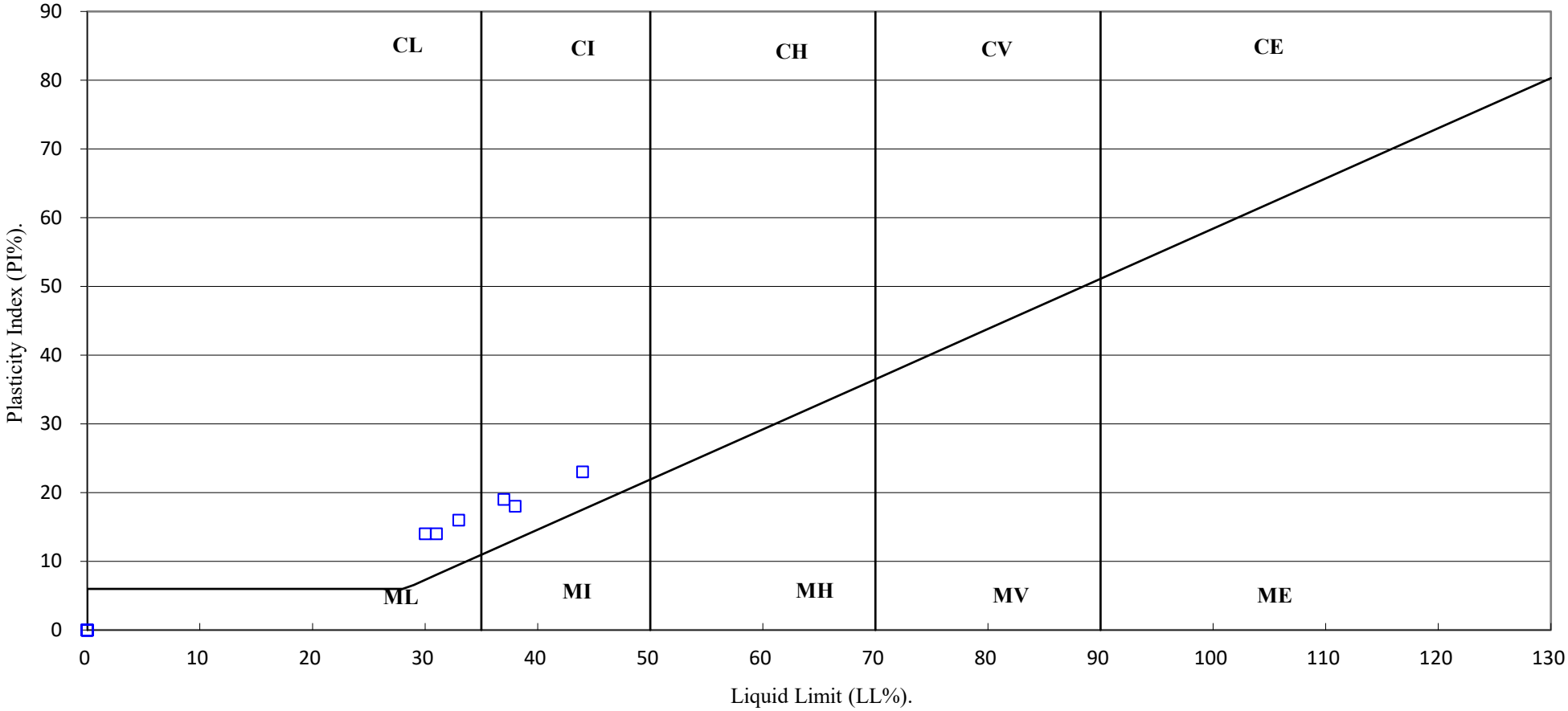
Contract No:

PSL22/6418

Client Ref:

10638G

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Cheetham Hill	Contract No: PSL22/6418 Client Ref: 10638G

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

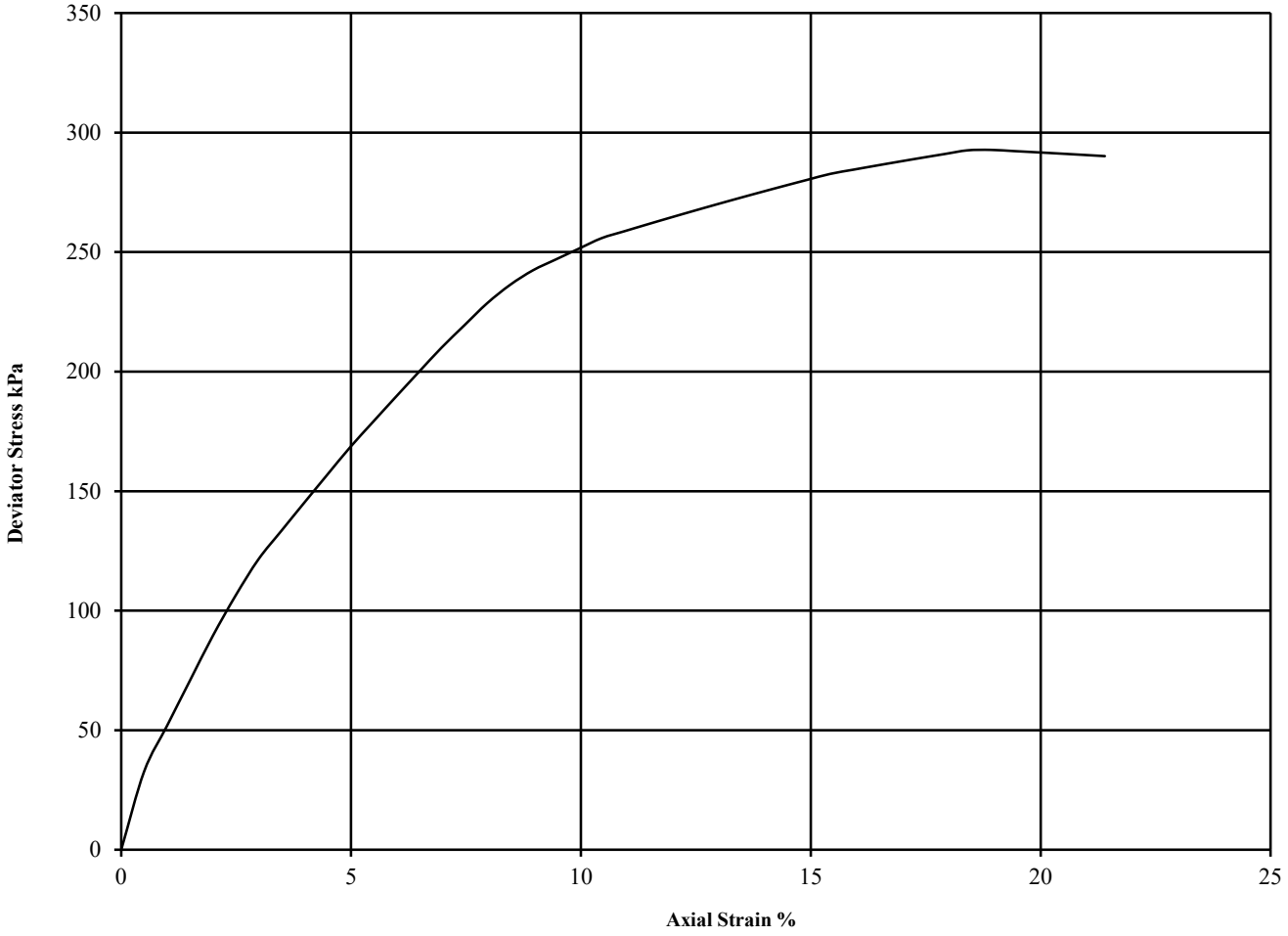
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: BH01 **Top Depth (m):** 2.00

Sample Number: **Base Depth (m):** 2.45

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.33
1	18	2.11	1.79	40	293	146	18.9	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Cheetham Hill

Contract No: PSL22/6418

Client Ref: 10638G

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

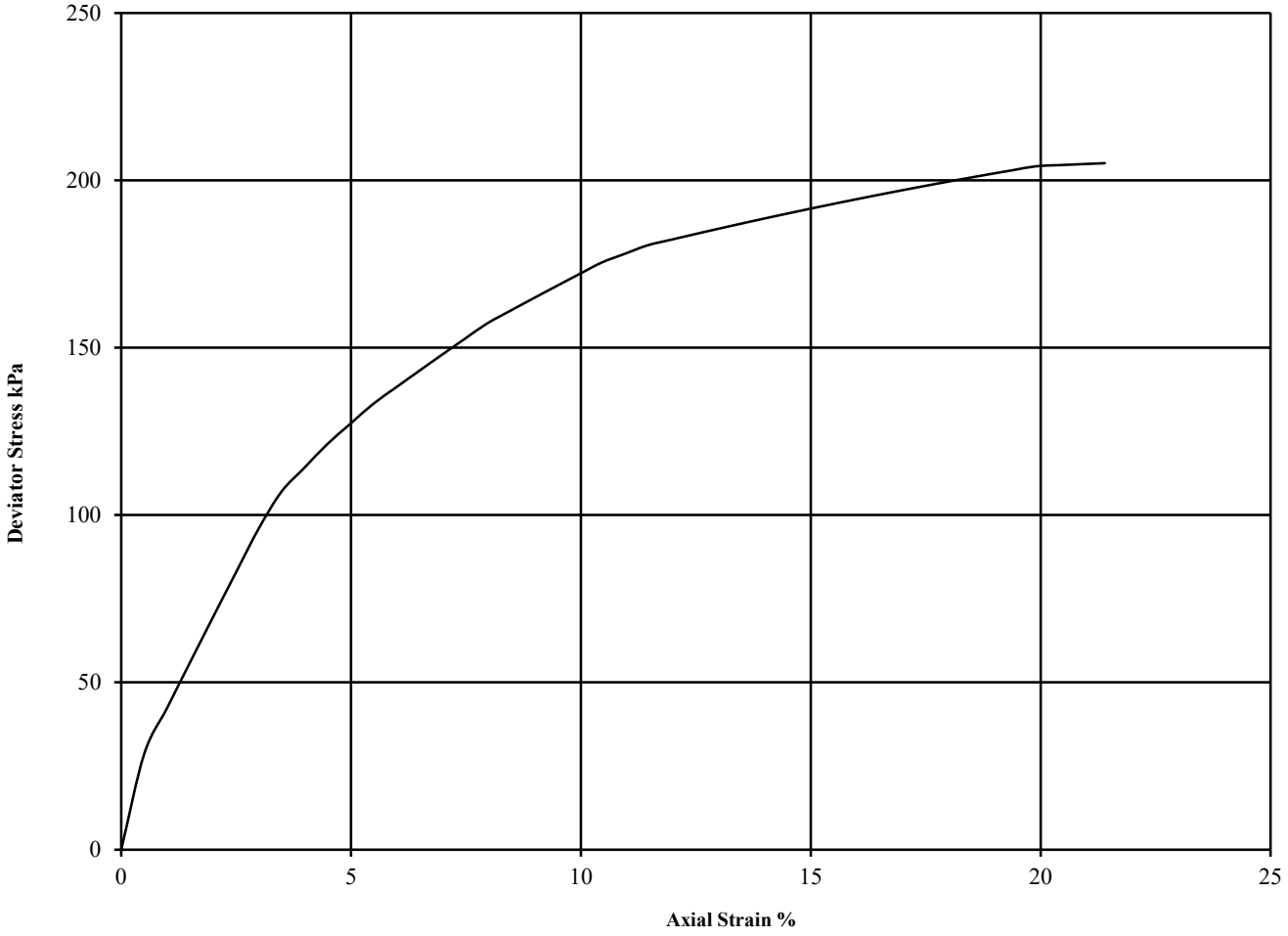
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: BH01 **Top Depth (m):** 4.00

Sample Number: **Base Depth (m):** 4.45

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.33
1	16	2.13	1.83	80	205	103	21.4	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Cheetham Hill

Contract No: PSL22/6418

Client Ref: 10638G

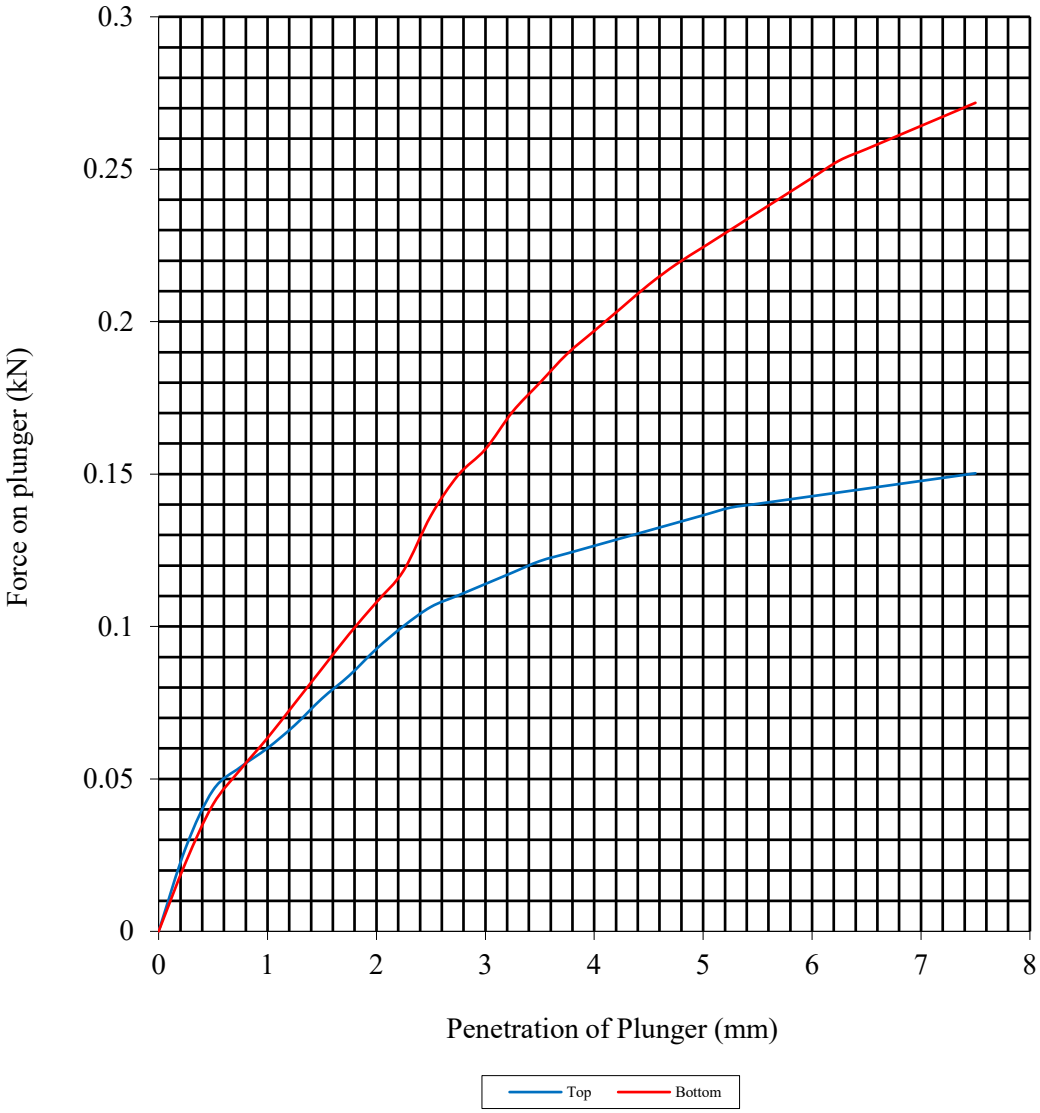
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: BH01 **Top Depth (m):** 0.30

Sample Number: **Base Depth (m):** 0.80

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	19	Surcharge Kg:	4.00	Sample Top	20	Sample Top	0.8
Bulk Density Mg/m3:	2.06	Soaking Time hrs	94	Sample Bottom	20	Sample Bottom	1.1
Dry Density Mg/m3:	1.73	Swelling mm:	0.68	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			23				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Cheetham Hill

Contract No: PSL22/6418

Client Ref: 10638G

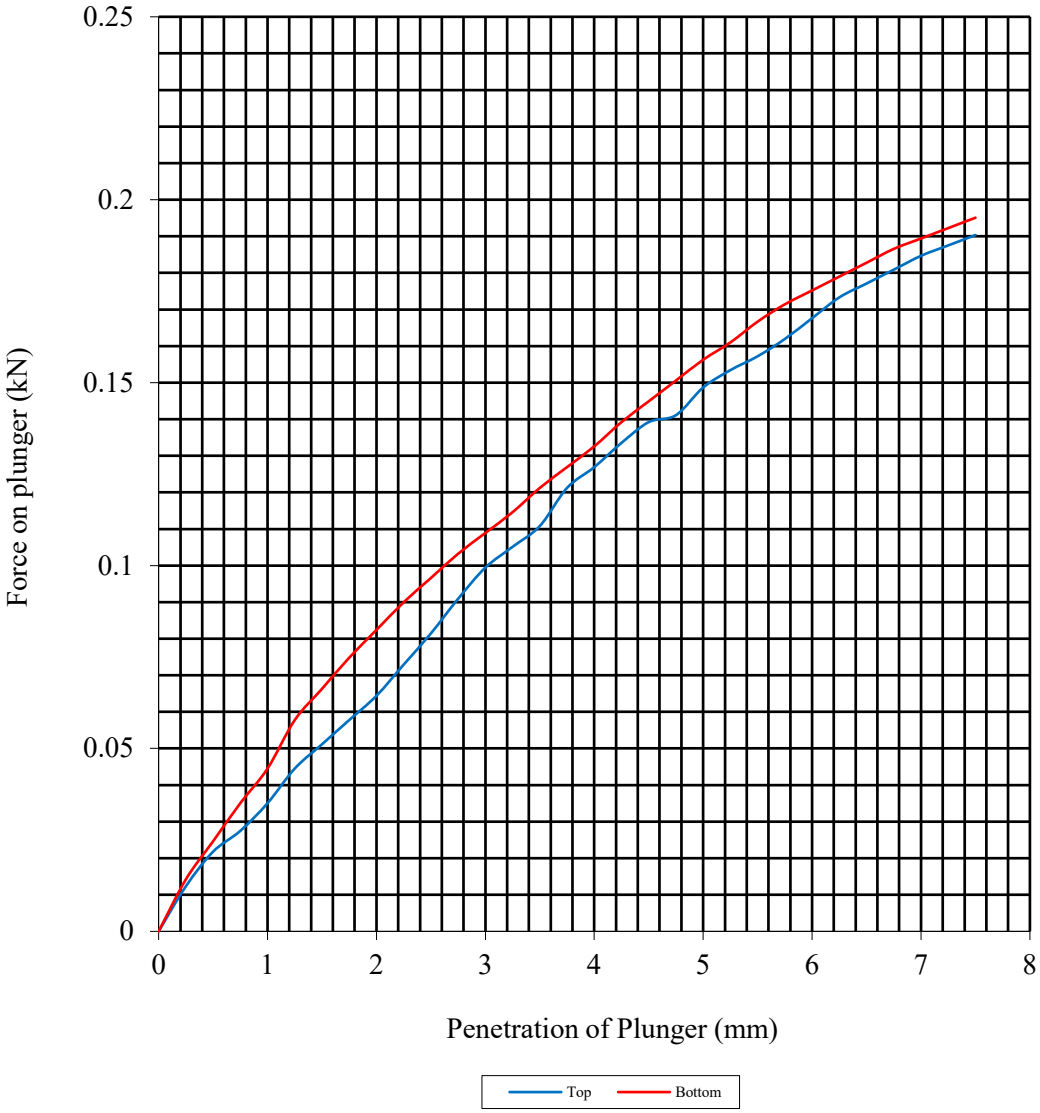
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: BH01 **Top Depth (m):** 0.80

Sample Number: **Base Depth (m):** 1.20

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	24	Surcharge Kg:	4.00	Sample Top	25	Sample Top	0.7
Bulk Density Mg/m3:	2.02	Soaking Time hrs	96	Sample Bottom	25	Sample Bottom	0.8
Dry Density Mg/m3:	1.63	Swelling mm:	0.08	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Cheetham Hill

Contract No: PSL22/6418

Client Ref: 10638G

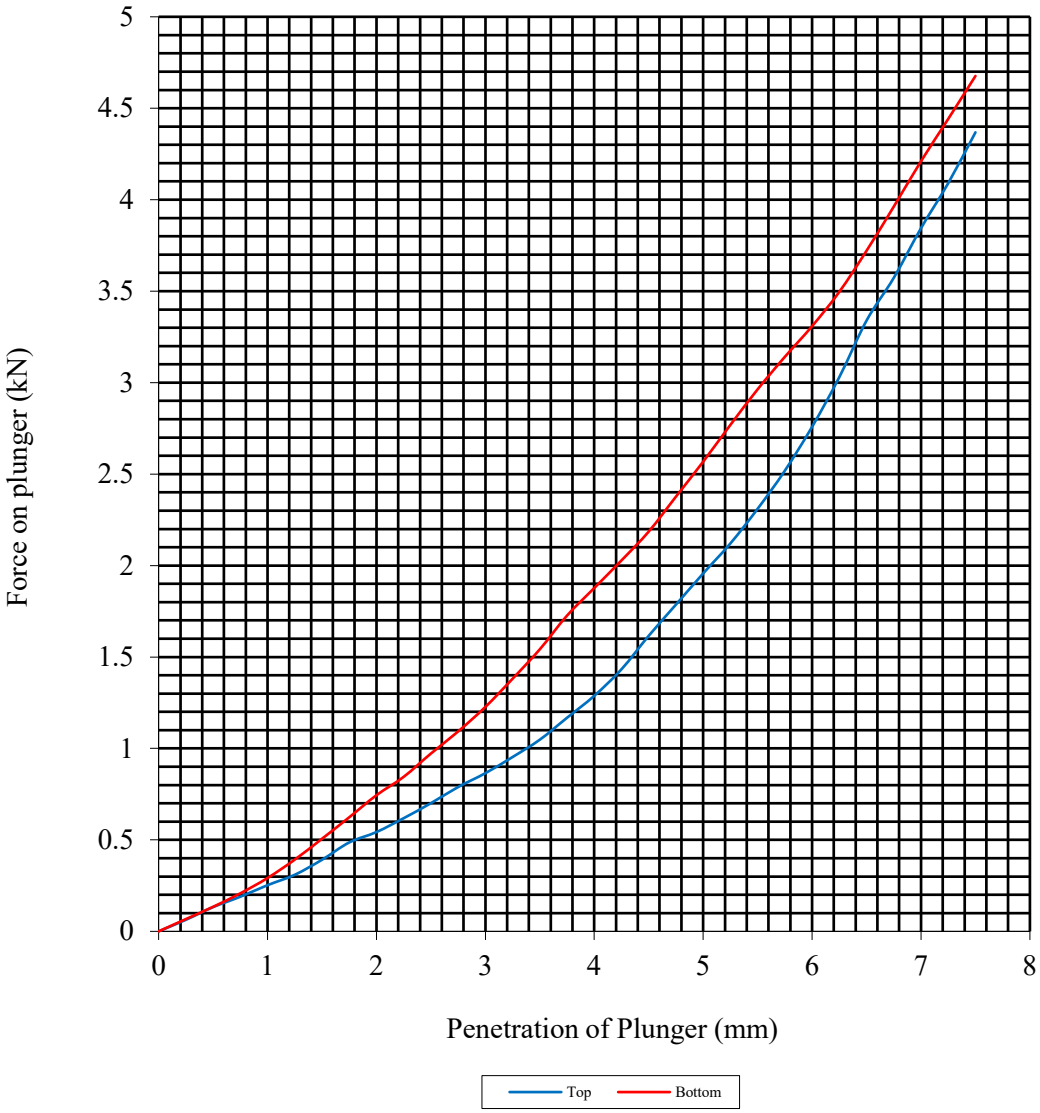
CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

Hole Number: BH02 **Top Depth (m):** 0.40

Sample Number: **Base Depth (m):** 1.20

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	17	Surcharge Kg:	4.00	Sample Top	20	Sample Top	9.8
Bulk Density Mg/m3:	2.09	Soaking Time hrs	96	Sample Bottom	19	Sample Bottom	12.8
Dry Density Mg/m3:	1.78	Swelling mm:	2.18	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			45				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Cheetham Hill

Contract No: PSL22/6418

Client Ref: 10638G

Certificate of Analysis

Certificate Number	22-20811	*Issued:*	28-Oct-22

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	22-20811
Client Reference	PSL22/6418
Order No	(not supplied)
Contract Title	Cheetham Hill
Description	6 Soil samples.
Date Received	17-Oct-22
Date Started	17-Oct-22
Date Completed	28-Oct-22
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 22-20811
Client Ref PSL22/6418
Contract Title Cheetham Hill

	Lab No	2072407	2072408	2072409	2072410	2072411	2072412
	.Sample ID	BH01	BH01	BH01	BH02	BH02	BH02
	Depth	3.00-3.45	10.00	14.50	2.00-2.45	11.50	15.60
	Other ID						
	Sample Type	S	D	D	D	D	D
	Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s
	Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	13	< 10	< 10	< 10	< 10
Inorganics							
pH	DETSC 2008#		pH	8.3	8.1	8.3	9.7	8.5	9.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	8.8	9.1	12	5.7	8.5	11
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.3	< 1.0	< 1.0	1.7	< 1.0	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	27	99	25	180	25	47
Sulphur as S, Total	DETSC 2320	0.01	%	0.02	0.10	0.04	0.09	0.02	0.03
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03	0.07	0.04	0.26	0.03	0.03

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 22-20811
Client Ref PSL22/6418
Contract Cheetham Hill

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2072407	BH01 3.00-3.45 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2072408	BH01 10.00 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2072409	BH01 14.50 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2072410	BH02 2.00-2.45 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2072411	BH02 11.50 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2072412	BH02 15.60 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX 04

Chemical Analytical Results

envirolab
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Mottram Road□H□de□□hesh□re□S□14 □□R

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: □□□□□1□□
Issue Number: 1 **Date:** □□ Se□tember□□□□□

Client:
□ ML □o□stru□t□o□
□o 8 Oa□ Gree□
□arl Road
Sta□le□ Gree□ Bus□ess □ar□
□headle Hulme
□hesh□re
S□8 □□L

Project Manager: Thomas Shee□
Project Name: □heetham H□ll Road□Ma□□hester
Project Ref: 1□□□8G
Order No: 1□□□8G
Date Samples Received: □□□□□□□□
Date Instructions Received: □1 □□□□□□
Date Analysis Completed: □□□□□□□□

Approved by:



R□□hard □ o□g
□l□e□t Ma□ager

UKAS TESTING
1247

Envirolab Job Number: 22/09192

Client Project Name: Cheetham Hill Road, Manchester

Client Project Ref: 10638G

Lab Sample ID	22/09192/1							Units	Limit of Detection	Method ref
Client Sample No	1									
Client Sample ID	WS02									
Depth to Top										
Depth To Bottom										
Date Sampled	14-Sep-22									
Sample Type	Water - EW									
Sample Matrix Code	N/A									
pH (w)$_A^{\#}$	7.68							pH	0.01	A-T-031w
Ammonia / Ammoniacal Nitrogen as NH3 (w)$_A^{\#}$	0.057							mg/l	0.061	A-T-033w
Sulphate (w)$_A^{\#}$	340							mg/l	1	A-T-026w
Cyanide (free) (w)$_A^{\#}$	<0.005							mg/l	0.005	A-T-042wFCN
Cyanide (total) (w)$_A^{\#}$	<0.005							mg/l	0.005	A-T-042wTCN
Phenols - Total by HPLC (w)$_A$	<0.01							mg/l	0.01	A-T-050w
Arsenic (dissolved)$_A^{\#}$	<1							µg/l	1	A-T-025w
Boron (dissolved)$_A^{\#}$	96							µg/l	10	A-T-025w
Cadmium (dissolved)$_A^{\#}$	<0.2							µg/l	0.2	A-T-025w
Copper (dissolved)$_A$	5							µg/l	4	A-T-025w
Chromium (dissolved)$_A^{\#}$	12							µg/l	1	A-T-025w
Chromium (hexavalent) (w)$_A$	<0.01							mg/l	0.01	A-T-040w
Iron (dissolved)$_A^{\#}$	<10							µg/l	10	A-T-025w
Lead (dissolved)$_A^{\#}$	<1							µg/l	1	A-T-025w
Mercury (dissolved)$_A^{\#}$	<0.1							µg/l	0.1	A-T-025w
Nickel (dissolved)$_A^{\#}$	4							µg/l	2	A-T-025w
Selenium (dissolved)$_A^{\#}$	11							µg/l	1	A-T-025w
Zinc (dissolved)$_A^{\#}$	3							µg/l	2	A-T-025w

Envirolab Job Number: 22/09192

Client Project Name: Cheetham Hill Road, Manchester

Client Project Ref: 10638G

Lab Sample ID	22/09192/1							Units	Limit of Detection	Method ref
Client Sample No	1									
Client Sample ID	WS02									
Depth to Top										
Depth To Bottom										
Date Sampled	14-Sep-22									
Sample Type	Water - EW									
Sample Matrix Code	N/A									
TPH CWG (w) with Clean Up										
Ali >C5-C6 (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
Ali >C6-C8 (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
Ali >C8-C10 (w)$_A^{\#}$	<5							µg/l	5	A-T-055w
Ali >C10-C12 (w)$_A^{\#}$	<5							µg/l	5	A-T-055w
Ali >C12-C16 (w)$_A^{\#}$	<5							µg/l	5	A-T-055w
Ali >C16-C21 (w)$_A^{\#}$	<5							µg/l	5	A-T-055w
Ali >C21-C35 (w)$_A^{\#}$	365							µg/l	5	A-T-055w
Total Aliphatics (w)$_A^{\#}$	365							µg/l	5	Calc-As Recd
Aro >C5-C7 (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
Aro >C7-C8 (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
Aro >C8-C10 (w)$_A$	<5							µg/l	5	A-T-055w
Aro >C10-C12 (w)$_A^{\#}$	<5							µg/l	5	A-T-055w
Aro >C12-C16 (w)$_A^{\#}$	48							µg/l	5	A-T-055w
Aro >C16-C21 (w)$_A^{\#}$	24							µg/l	5	A-T-055w
Aro >C21-C35 (w)$_A$	<10							µg/l	10	A-T-055w
Total Aromatics (w)$_A$	72							µg/l	10	Calc-As Recd
TPH (Ali & Aro >C5-C35) (w)$_A$	437							µg/l	10	Calc-As Recd
BTEX - Benzene (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
BTEX - Toluene (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
BTEX - Ethyl Benzene (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
BTEX - m & p Xylene (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
BTEX - o Xylene (w)$_A^{\#}$	<1							µg/l	1	A-T-022w
MTBE (w)$_A^{\#}$	<1							µg/l	1	A-T-022w

REPORT NOTES

General

This report shall not be reproduced except in full without written approval from Envirolab.
The results reported here relate only to the material supplied to the laboratory.
The residue of all samples obtained with this report and requested with the same delivery will be disposed of six weeks after initial scheduling. For samples tested for asbestos one will retain a portion of the dried sample for a minimum of six months after the initial asbestos testing is completed.
Qualitative results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are initialled it is because they are associated with a QC failure these are not accredited and are unreliable.
Non-detecting samples reported as <LOR and will indicate if samples or tests have been found to be detecting. QC test results affected may not be an accurate record of the concentration at the time of sampling and as a result may be invalid.
The Client Sample ID, Client Sample ID Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:
All results are reported as dry weight at 40°C.
For samples with Matrix Codes 1 or 2 natural stones, bricks and concrete fragments >1mm and extraneous material visible glass, metal or twigs are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as 1 stones >1mm.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are tested for asbestos or the client has confirmed asbestos may be present and/or if these are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 1,000,000µS/cm at 25°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to detect asbestos if present in small numbers as discrete fibres, fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a staged process including visual identification and weighing and fibre counting based methodology. Chrysotile, amosite and crocidolite are routinely identified. If asbestos is identified as being present but is not in a form that is suitable for analysis by counting and weighing normally if the asbestos is present as free fibres quantification by gravimetric is performed. Where PCMs are found a percentage asbestos is assigned to each with reference to HSG248 Asbestos: The surveyors guide and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 SOIL 2 LOAM 3 CLAY 4 LOAM SAND 5 SAND GRAVEL 6 LIGHT LOAM 7 OTHER 8 Asbestos bulk sample 9 PCM/RIMAP SHEET.
Samples with Matrix Code 8 are not predominantly a SOIL LOAM or PCM are not covered by BS EN ISO 17025 or MCERTS accreditation with the exception of bulk asbestos which are BS EN ISO 17025 accredited.
Secondary Matrix Codes:
A Contains stones B Contains concrete rubble C Contains visible hydrocarbons D Contains glass metal
E Contains roots twigs.

Key:
NDP indicates insufficient Sample for analysis.
NSP indicates unsuitable Sample for analysis.
NDP indicates No Determination possible.
NAD indicates no asbestos detected.
NOA indicates not applicable.
Surrogate % indicates method accredited to ISO 17025.
Surrogate "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample crushed to pass a 2mm sieve
Subscript "L" indicates analysis has deviated outside acceptable limits against results. Testing deviated results appear in the comments area of your sample report.
LOR GC results have humps mathematically subtracted through instrument calculation
TPH results "with lead us" indicates results leaded using the Shell during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in addition to TPH GC with lead GC please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

Envirolab Deviating Samples Report

□□ts □□8 Sa□d□ts Bus□ess □ar□□Mottram Road□H□de□S□14 □□R
Tel. □1□1 □□8 4□□1 ema□ as□□ e□□lab.□o.u□

Client: WML Construction , No 8 Oak Green, Earl Road, Stanley Green Business Park, Cheadle Hulme, Cheshire, SK8 6QL

Project No: 22/09192

Date Received: 21/09/2022 (am)

Project: Cheetham Hill Road, Manchester

Cool Box Temperatures (°C): 11.4

Clients Project No: 10638G

Lab Sample ID	□□□□1□□1
Client Sample No	1
Client Sample ID/Depth	□ S□□
Date Sampled	14□□□□□
Deviation Code	
□□ □□o H□O□□	✓
□8 □□o □aOH□	✓
□□ □□o H□SO4□	✓

Key

A7 (no HNO3)	*No HNO3 preserved bottle provided (dissolved metals will be deviating)*
A8 (no NaOH)	*No NaOH preserved bottle provided (cyanides, sulphide will be deviating)*
A9 (no H2SO4)	*No H2SO4 preserved bottle provided (phenols, ammonia, DOC, COD will be deviating)*

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	□□□□□1□□□1
Client Sample No	1
Client Sample ID/Depth	□ S□□
Date Sampled	14□□□□□□
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End of Report

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UKAS TESTING
2183

Amended Report

Report No.:	□□□□15□5□□		
Initial Date of Issue:	□5□□ug□□□□□	**Date of Re-Issue:**	□5□Se□□□□□□
Client	□ ML □o□sult□□g Ltd		
Client Address:	□o. 8 Oa□ Gree□□ Sta□le□Gree□ Bus□□ess □ar□□ □arl Rd□ □headle□ S□8 □□L		
Contact(s):	Tom Booth		
Project	1□□□8G □heetham H□l		
Quotation No.:		**Date Received:**	18□□ug□□□□□
Order No.:	1□□□8G	**Date Instructed:**	18□□ug□□□□□
No. of Samples:	18		
Turnaround (Wkdays):	1□	**Results Due:**	□5□Se□□□□□□
Date Approved:	□5□Se□□□□□□		

Approved By:



Details: Stuart He□derso□□Te□h□□al Ma□ager□

Results - Leachate

Project: 10638G Cheetham Hill

Client: WML Consulting Ltd				Chemtest Job No.:					
Quotation No.				Chemtest Sample ID.:	14 181	14 184	14 18	14 1
Order No. 1 8G				Client Sample Ref.				
				Sample Location	S1	S	S	S4
				Sample Type	SOIL	SOIL	SOIL	SOIL
				Top Depth (m)	1.	.5	1.	1.5
				Date Sampled	1 ug	1 ug	1 ug	1 ug
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**				
pH		1 1				11.1	.	.	8.8
Sulphur		1		mg	1.	1	.	.	5.
Sulphate		1		mg	1.	58	11	.	1
Hardness		1415		mg	15	5	8		5
Arsenic (Dissolved)		1455		g	.	.48	8.8	.8	.
Boron (Dissolved)		1455		g	1.	5		4	
Cadmium (Dissolved)		1455		g	.11	.11	.11	.11	.11
Copper (Dissolved)		1455		g	.5	4.5	.1	.5	.
Mercury (Dissolved)		1455		g	.5	.5	.5	.5	.5
Nickel (Dissolved)		1455		g	.5	.5	.5	.5	.5
Lead (Dissolved)		1455		g	.5	.5	.1	.5	84
Selenium (Dissolved)		1455		g	.5	.1	1.1	.1	.
Cadmium (Dissolved)		1455		g	.5	1	.5	.	
Zinc (Dissolved)		1455		g	.5	.5	5.	.	4.
Chromium (Hexavalent)		14		g					
Naphthalene		18		g	.1	.1	.1	.1	.1
Acenaphthylene		18		g	.1	.1	.1	.1	.1
Acenaphthene		18		g	.1	.1	.1	.1	.1
Fluorene		18		g	.1	.1	.1	.1	.1
Phenanthrene		18		g	.1	.1	.1	.1	.1
Anthracene		18		g	.1	.1	.1	.1	.1
Fluoranthene		18		g	.1	1.	.1	.1	.1
Pyrene		18		g	.1	1.	.1	.1	.1
Benzo(a)anthracene		18		g	.1	.1	.1	.1	.1
Chrysene		18		g	.1	.1	.1	.1	.1
Benzo(b)fluoranthene		18		g	.1	.1	.1	.1	.1
Benzo(k)fluoranthene		18		g	.1	.1	.1	.1	.1
Benzo(a)pyrene		18		g	.1	.1	.1	.1	.1
Indeno(1)pyrene		18		g	.1	.1	.1	.1	.1
Dibenz(a,h)anthracene		18		g	.1	.1	.1	.1	.1
Benzo(ghi)perylene		18		g	.1	.1	.1	.1	.1
Total Of 1 EPAHs		18		g	.	.	.	.	.
Total Phenols		1		mg	.	.	.	.	.

Results - Soil

Project: 10638G Cheetham Hill

Client: WML Consulting Ltd	Chemtest Job No.:	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5
□uotatio□ □o.□	Chemtest Sample ID.:	14□□1□8	14□□1□□	14□□18□	14□□18□	14□□18□	14□□185	14□□18□	14□□188
Order □o.□1□□□8G	□lie□t Sam□le Ref.□	□	□	□	□	□	□	□	□
	Sam□le Lo□atio□□	□ S□1	□ S□1	□ S□1	□ S□1	□ S□□	□ S□□	□ S□□	□ S□□
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Determinand	Accred.	SOP	Units	LOD							
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Results - Soil

Project: 10638G Cheetham Hill

Client: WML Consulting Ltd			Chemtest Job No.:	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5
□uotatō□ □o.□			Chemtest Sample ID.:	14□□1□8	14□□1□□	14□□18□	14□□18□	14□□18□	14□□185	14□□18□	14□□188
Order □o.□1□□□8G			□le□t Sam□le Ref.□	□	□	□	□	□	□	□	□
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Be□□o□g□h□□er□e□e	□	□8□□	mg□□g	□.1□	□ □.1□	1.□		□ □.1□	□ □.1□	□ □.1□	1.1
Total Of 1□ □□His	□	□8□□	mg□□g	□.□	1□	□□		4.□	□ □.□	5.4	□□
Total □he□ols	□	□□□□	mg□□g	□.1□	□ □.1□	□ □.1□		□ □.1□	□ □.1□	□ □.1□	□ □.1□

Results - Soil

Project: 10638G Cheetham Hill

Client: WML Consulting Ltd			Chemtest Job No.:						
Quotation No.			Chemtest Sample ID.:						
Order No.			Client Sample Ref.						
			Sample Location						
			Sample Type						
			Top Depth (m)						
			Date Sampled						
			Asbestos Lab						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
pH Type									
Asbestos Identification									
Asbestos by Gravimetric									
Total Asbestos									
Moisture									
pH									
Boron (Hot Water Soluble)			mg/kg						
Sulphate (2:1 Water Soluble as SO4)			g/l						
Total Sulphur									
Cyanide (Total)			mg/kg						
Sulphate (Total)			mg/kg						
Arsenic			mg/kg						
Cadmium			mg/kg						
Chromium			mg/kg						
Copper			mg/kg						
Mercury			mg/kg						
Nickel			mg/kg						
Lead			mg/kg						
Selenium			mg/kg						
Zinc			mg/kg						
Phenols			mg/kg						
Chromium (Hexavalent)			mg/kg						
Organic Matter									
Aliphatic TPH			mg/kg						
Aliphatic TPH			mg/kg						
Aliphatic TPH			mg/kg						
Aliphatic TPH			mg/kg						
Aliphatic TPH			mg/kg						
Aliphatic TPH			mg/kg						
Aliphatic TPH			mg/kg						
Aliphatic TPH			mg/kg						
Total Aliphatic Hydrocarbons			mg/kg						
Aromatic TPH			mg/kg						
Aromatic TPH			mg/kg						
Aromatic TPH			mg/kg						
Aromatic TPH			mg/kg						
Aromatic TPH			mg/kg						
Aromatic TPH			mg/kg						

Results - Soil

Project: 10638G Cheetham Hill

Client: WML Consulting Ltd			Chemtest Job No.:		□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5	□□□□15□5
□uotatō□ □o.□			Chemtest Sample ID.:		14□□18□	14□□1□□	14□□1□1	14□□1□□	14□□1□4	14□□1□5
Order □o.□1□□□8G			□le□t Sam□le Ref.□		□	□	□	□	□	□
			Sam□le Lo□atō□□		□ S□□	□ S□□	□ S□4	□ S□4	□ S□4	□ S□4
			Sam□le T□□e□		SOI□	SOI□	SOI□	SOI□	SOI□	SOI□
			To□ De□th □m□		□.□□	□.□□	□.□□	□.5□	1.85	□.1□
			Date Sam□led□		1□□□ug□□□□□	1□□□ug□□□□□	1□□□ug□□□□□	1□□□ug□□□□□	1□□□ug□□□□□	1□□□ug□□□□□
			□sbestos Lab□				□O□□□TR□	□O□□□TR□		
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
□romat□□ T□H □□□1□□□5	□	□□8□	mg□□g	1.□	□ 1.□	□ 1.□			□ 1.□	□ 1.□
□romat□□ T□H □□□5□□44	□	□□8□	mg□□g	1.□	□ 1.□	□ 1.□			□ 1.□	□ 1.□
Total □romat□□ H□dro□arbo□s	□	□□8□	mg□□g	5.□	□ 5.□	□ 5.□			□□□□	□□□
Total □etroleum H□dro□arbo□s	□	□□8□	mg□□g	1□.□	□ 1□	□ 1□			5□□□	14□□
Be□□o□a□□re□e	□	□□□□	mg□□g	□.1□						
Be□□e□e	□	□□□□	□g□□g	1.□	□ 1.□	□ 1.□			□ 1.□	□ 1.□
Tolue□e	□	□□□□	□g□□g	1.□	□ 1.□	□ 1.□			□ 1.□	□ 1.□
□th□be□□e□e	□	□□□□	□g□□g	1.□	□ 1.□	□ 1.□			□ 1.□	□ 1.□
m □ □□□□le□e	□	□□□□	□g□□g	1.□	□ 1.□	□ 1.□			□ 1.□	□ 1.□
o□□□le□e	□	□□□□	□g□□g	1.□	□ 1.□	□ 1.□			□ 1.□	□ 1.□
□a□hthale□e	□	□8□□	mg□□g	□.1□			□ □.1□	□ □.1□		
□□e□a□hth□le□e	□	□8□□	mg□□g	□.1□			□ □.1□	□ □.1□		
□□e□a□hthe□e	□	□8□□	mg□□g	□.1□			□ □.1□	□ □.1□		
Fluore□e	□	□8□□	mg□□g	□.1□			□ □.1□	□ □.1□		
□he□a□thre□e	□	□8□□	mg□□g	□.1□			□ □.1□	□.55		
□□thra□e□e	□	□8□□	mg□□g	□.1□			□ □.1□	□.1□		
Fluora□the□e	□	□8□□	mg□□g	□.1□			□.4□	□.□1		
□□re□e	□	□8□□	mg□□g	□.1□			□.5□	□.8□		
Be□□o□a□a□thra□e□e	□	□8□□	mg□□g	□.1□			□ □.1□	□.□□		
□hr□se□e	□	□8□□	mg□□g	□.1□			□ □.1□	□.□8		
Be□□o□b□fluora□the□e	□	□8□□	mg□□g	□.1□			□ □.1□	□.48		
Be□□o□□fluora□the□e	□	□8□□	mg□□g	□.1□			□ □.1□	□.1□		
Be□□o□a□□re□e	□	□8□□	mg□□g	□.1□			□ □.1□	□.□□		
□de□o□1□□□□□□d□□re□e	□	□8□□	mg□□g	□.1□			□ □.1□	□ □.1□		
D□be□□a□h□□thra□e□e	□	□8□□	mg□□g	□.1□			□ □.1□	□ □.1□		
Be□□o□g□h□□□er□e□e	□	□8□□	mg□□g	□.1□			□ □.1□	□ □.1□		
Total Of 1□ □□His	□	□8□□	mg□□g	□.□			□ □.□	4.4		
Total □he□ols	□	□□□□	mg□□g	□.1□			□ □.1□	□ □.1□		

Test Methods

SOP	Title	Parameters included	Method summary
1□1□	□H □alue of □ aters	□H	□H Meter
1□□□	□□o□s□□I□al□□t□ □ □mmo□□um □□ □ aters	Fluor□de□□hlor□de□□□tr□te□□trate□Total□ O□d□sable □troge□ □TO□□□Sulfate□□hos□hate□ □I□al□□t□□□mmo□□um	□utomated □olor□metr□ a□al□s□s us□g ‘Aquakem 600’ Discrete Analyser.
1415	□at□o□s □□ □ aters b□ □□□□MS	Sod□um□□otass□um□□al□□um□Mag□es□um	D□re□t determ□at□o□ b□ □□du□t□□el□□ou□led □lasma □mass s□e□trometr□ □□□□MS□
1455	Metals □□ □ aters b□ □□□□MS	Metals□□□□lud□g□□□t□mo□□□□rse□□□□Bar□um□ Ber□ll□um□Boro□□□adm□um□□hrom□um□□obalt□ □o□□er□Lead□Ma□ga□ese□Mer□ur□□ Mol□bde□um□□□□el□Sele□um□T□□□□a□ad□um□ □□□□	F□ltrat□o□ of sam□les follo□ed b□ d□re□t determ□at□o□ b□ □□du□t□el□ □ou□led □lasma mass s□e□trometr□ □□□□MS□
14□□	He□a□ale□t □hrom□um □□ □ aters	□hrom□um □□□□	Automated colorimetric analysis by ‘Aquakem 600’ Discrete Analyser using 1,5-d□□he□□l□arba□□de.
18□□	S□e□□ated □ol□□u□lear □romat□□ H□dro□arbo□s □□□H□ □□ □ aters b□G□□MS	□□e□a□hthe□e□□□e□a□hth□le□e□□□thra□e□e□ Be□□o□a□□thra□e□e□Be□□o□a□□□re□e□ Be□□o□b□Fluora□the□e□Be□□o□gh□□er□le□e□ Be□□o□□Fluora□the□e□□hr□se□e□ D□be□□□ah□□□thra□e□e□Fluora□the□e□Fluore□e□ □□de□o□1□□□d□□□re□e□□a□hthale□e□ □he□a□thre□e□□□re□e	□e□ta□e e□tra□t□o□ □G□MS dete□t□o□
1□□□	□he□ols □□ □ aters b□H□L□	□he□ol□□ □om□ou□ds □□□lud□g□□he□ol□ □resols□□□le□ols□Tr□meth□□he□ols □ote□ □hloro□he□ols are e□□luded.	Determ□at□o□ b□H□gh □erforma□□e L□u□d □hromatogra□h□□H□L□□us□g ele□tro□hem□al dete□t□o□.
□□1□	□H □alue of So□ls	□H	□H Meter
□□□□	Mo□sture a□d Sto□e □o□te□t of So□ls□Re□u□reme□t of M□□RTS□	Mo□sture □o□te□t	Determ□at□o□ of mo□sture □o□te□t of so□ as a □er□e□tage of □s as re□e□□ed mass obta□□ed at □□□□□.
□□4□	So□□Des□r□□t□o□□Re□u□reme□t of M□□RTS□	So□□des□r□□t□o□	□s re□e□□ed so□□s des□ribed based u□o□ BS5□□□
□1□□	□ ater Soluble Boro□□Sul□hate□ Mag□es□um □ □hrom□um	Boro□□Sul□hate□Mag□es□um□□hrom□um	□□ueous e□tra□t□o□ □□□□□O□S
□1□5	Total Sul□hur □□ So□ls	Total Sul□hur	Determ□□ed b□h□gh tem□erature □ombust□o□ u□der o□□ge□□us□g a□ □ltra eleme□tal a□al□ser.
□1□□	□sbestos	□sbestos	□olar□sed l□ght m□ros□o□□□Gra□metr□
□□□□	□□a□des □ Thi□□a□ate □□ So□ls	Free □or eas□ l□beratable□□□a□□de□total □□a□de□□om□le□□□a□□de□Thi□□a□ate	□ll□al□e e□tra□t□o□ follo□ed b□ □olor□metr□ determ□at□o□ us□g □utomated Flo□ □□e□t□o□ □□al□ser.
□4□□	Total Sul□hate □□ so□ls	Total Sul□hate	□□d d□gest□o□ follo□ed b□ determ□at□o□ of sul□hate □□ e□tra□t b□ □□□□O□S.
□4□□	He□a□ale□t □hrom□um □□ So□ls	□hrom□um □□□□	So□□e□tra□ts are □re□ared b□ e□tra□t□g dr□ed a□d grou□d so□□sam□les □□to bo□□□g □ater. Chromium [VI] is determined by ‘Aquakem 600’ D□s□rete □□al□ser us□g 1□5□d□□he□□l□arba□□de.
□□□5	Total Orga□□□ □arbo□ □□ So□ls	Total orga□□□ □arbo□ □TO□□	Determ□□ed b□h□gh tem□erature □ombust□o□ u□der o□□ge□□us□g a□ □ltra eleme□tal a□al□ser.
□□8□	T□H □□□ S□□t	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	D□□hlorometha□e e□tra□t□o□ □G□□G□ F□D dete□t□o□

Test Methods

SOP	Title	Parameters included	Method summary
□□□□□	S□e□ated □ol□□u□lear □romat□□ H□dro□arbo□s □□□H□ □□ So□□b□G□□F□D	□□e□a□hthe□e□□□e□a□hth□le□e□□□thra□e□e□ Be□□o□a□□□thra□e□e□Be□□o□a□□□re□e□ Be□□o□b□Fluora□the□e□Be□□o□gh□□□er□le□e□ Be□□o□□□Fluora□the□e□□hr□se□e□ D□be□□□ah□□□thra□e□e□Fluora□the□e□Fluore□e□ □□de□o□1□□□d□□□re□e□□a□hthale□e□ □he□a□thre□e□□□re□e	D□□hlorometha□e e□tra□t□o□□G□□F□D □G□□F□D dete□t□o□□s □o□sele□t□□e a□d □a□be sub□□□t to □□terfere□□e from □o□elut□□g □om□ou□ds□
□□□□□	□olat□le Orga□□□ □om□ou□ds □□O□s□□□ So□ls b□Heads□a□e G□□MS	□olat□le orga□□□ □om□ou□ds□□□□lud□□g BT□□ a□d haloge□ated □l□□hat□□□□romat□□s.□□f. □S□□□ Method 8□□□□□□□lease refer to □□□S s□hedule	□utomated heads□a□e gas □hromatogra□h□□ □G□□a□al□s□s of a so□□sam□le□as re□e□□ed□ □□th mass s□e□trometr□□ □MS□dete□t□o□ of □olat□le orga□□□ □om□ou□ds.
□8□□	S□e□ated □ol□□u□lear □romat□□ H□dro□arbo□s □□□H□ □□ So□□b□G□□MS	□□e□a□hthe□e□□□e□a□hth□le□e□□□thra□e□e□□ Be□□o□a□□□thra□e□e□□Be□□o□a□□□re□e□□ Be□□o□b□Fluora□the□e□□Be□□o□gh□□□er□le□e□□ Be□□o□□□Fluora□the□e□□hr□se□e□□ D□be□□□ah□□□thra□e□e□Fluora□the□e□□ Fluore□e□□□□de□o□1□□□d□□□re□e□□ □a□hthale□e□□□he□a□thre□e□□□re□e□	D□□hlorometha□e e□tra□t□o□□G□□MS
□□□□□	□he□ols □□ So□ls b□H□L□	□he□ol□□ □om□ou□ds □□□lud□□g Resor□□□ol□ □he□ol□Meth□□he□ols□D□meth□□he□ols□1□ □a□hthol a□d Tr□meth□□he□ols□ote□ □hloro□he□ols are e□□luded.	□□□4□ metha□ol□□ater m□□ture e□tra□t□o□□ follo□ed b□H□L□ determ□□at□o□ us□□g ele□tro□hem□□al dete□t□o□.

Report Information

Key

□	□□□S a□□redi□ted
M	M□□RTS a□d □□□S a□□redi□ted
□	□□a□□redi□ted
S	Thi□ a□al□□i□ has bee□ sub□o□tra□ted to a □□□S a□□redi□ted laborator□ that □ a□□redi□ted for thi□ a□al□□i□
S□	Thi□ a□al□□i□ has bee□ sub□o□tra□ted to a □□□S a□□redi□ted laborator□ that □ □ot a□□redi□ted for thi□ a□al□□i□
T	Thi□ a□al□□i□ has bee□ sub□o□tra□ted to a□ u□a□□redi□ted laborator□
□S	□□suff□□e□t Sam□le
□□S	□□su□table Sam□le
□□□	□ot e□aluated
□	"less tha□"
□	"greater tha□"
SO□	Sta□dard o□erat□□g □ro□edure
LOD	L□m□t of dete□t□o□

□omme□ts or □□ter□retat□o□s are be□o□d the s□o□e of □□□S a□□redi□tat□o□

The results relate o□l□ to the □tems tested

□□□erta□□t□ of measureme□t for the determ□□a□ds tested are a□a□□able u□o□ re□uest

□o□e of the results □□ th□s re□ort ha□e bee□ re□o□er□ □orre□ted

□ll results are e□□ressed o□ a dr□□e□ght bas□s

The follo□□□g tests □ere a□al□sed o□ sam□les as re□e□□ed a□d the results subse□ue□t□l□ □orre□ted to a dr□□e□ght bas□s T□H□BT□□□□O□s□S□O□s□□□Bs□□he□ols

For all other tests the sam□les □ere dr□ed at □ □□□□ □r□or to a□al□s□s

□ll □sbestos test□g □s □erformed at the □□d□□ated laborator□

□ssue □umbers are se□ue□t□al start□g □□th 1 all subse□ue□t re□orts are □□□reme□ted b□ 1

Sample Deviation Codes

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Sample Retention and Disposal

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□ll □ater sam□les □□ll be reta□□ed for 14 da□s from the date of re□e□□t

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UKAS TESTING
2183

Final Report

Report No.:	□□□□□□□8□1
Initial Date of Issue:	□□□O□t□□□□□
Client	□ ML □o□sult□□g Ltd
Client Address:	□o. 8 Oa□ Gree□□ Sta□le□Gree□ Bus□□ess □ar□□ □arl Rd□ □headle□ S□8 □□L
Contact(s):	Tom Booth
Project	1□□□8G □heetham H□l
Quotation No.:	**Date Received:** □□□O□t□□□□□
Order No.:	1□□□8G **Date Instructed:** □□□O□t□□□□□
No. of Samples:	□
Turnaround (Wkdays):	5 **Results Due:** □□□O□t□□□□□
Date Approved:	□□□O□t□□□□□
Approved By:	



Details: Stuart He□derso□□Te□h□□al Ma□ager□

Results - Soil

Project: 10638G Cheetham Hill

Client: WML Consulting Ltd	Chemtest Job No.:	□□□□□□□8	□□□□□□□8	□□□□□□□8
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	Sam□le Lo□at□o□□	BH□	BH□	BH□
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Test Methods

SOP	Title	Parameters included	Method summary
□□□□	Mo□sture a□d Sto□e □o□te□t of So□ls□Re□u□reme□t of M□□RTS□	Mo□sture □o□te□t	Determ□□at□□ of mo□sture □o□te□t of so□□as a □er□e□tage of □ts as re□e□□ed mass obta□□ed at □□□□□.
□□4□	So□□Des□r□□t□o□□Re□u□reme□t of M□□RTS□	So□□des□r□□t□o□	□s re□e□□ed so□□s des□r□bed based u□o□ BS5□□□
□□8□	T□H □□□ S□I□	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	D□□hlorometha□e e□tra□t□o□ □G□□G□ F□D dete□t□o□

Report Information

Key

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For all other tests the sam□les □ere dr□ed at □ □□□□ □r□or to a□al□s□s

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Sample Deviation Codes

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Sample Retention and Disposal

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APPENDIX 04

Gas Monitoring Results

Gas & Groundwater Monitoring Record Sheet

Project Name:- Cheetham Hill
Project No:- 10638G
Client:- Urban Village Ltd

Date:- 07/09/2022
Start Time:- 13:30
End Time:- 15:00
Ground Conditions:- Dry
Weather Conditions:- Dry, sunny, still

Atmospheric Pressure
Start:- 997
End:- 996
Trend:- Falling

Instrument:- Gas Data GFM436

Operator:- T Sheen

Hole ID	Peak Flow l/hr	Steady Flow l/hr	DP	CH4			CO2			Min O2 %	Peak H2S ppm	Peak CO ppm	Hexane %	Water Level mbgl	Base of Hole mbgl
				Peak %	Steady %	Qhg l/hr	Peak %	Steady %	Qhg l/hr						
WS01	<0.1	<0.1	0	0.0	0.0	0.0000	0.8	0.8	0.0008	17.6	0	0	0.018	Dry	1.77
WS02	<0.1	<0.1	0	0.0	0.0	0.0000	0.7	0.7	0.0007	19.0	0	0	0.018	2.05	3.95
WS04	<0.1	<0.1	0	0.0	0.0	0.0000	1.6	1.6	0.0016	19.5	0	0	0.020	1.59	1.68

Additional Comments

Gas & Groundwater Monitoring Record Sheet

Project Name:- Cheetham Hill
Project No:- 10638G
Client:- Urban Village Ltd

Date:- 21/09/2022
Start Time:- 13:30
End Time:- 15:00
Ground Conditions:- Dry
Weather Conditions:- Cool, light breeze, sunny

Atmospheric Pressure
Start:- 1016
End:- 1013
Trend:- Falling

Instrument:- Gas Data GFM436

Operator:- T Sheen

Hole ID	Peak Flow l/hr	Steady Flow l/hr	DP	CH4			CO2			Min O2 %	Peak H2S ppm	Peak CO ppm	Hexane %	Water Level mbgl	Base of Hole mbgl
				Peak %	Steady %	Qhg l/hr	Peak %	Steady %	Qhg l/hr						
WS01	<0.1	<0.1	0	0.0	0.0	0.0000	0.0	0.0	0.0000	16.4	0	0	0.022	Dry	1.76
WS02	<0.1	<0.1	0	0.0	0.0	0.0000	0.9	0.8	0.0008	16.4	0	0	0.020	3.77	3.95
WS04	<0.1	<0.1	0	0.0	0.0	0.0000	1.5	1.5	0.0015	18.9	0	0	0.020	1.60	1.68

Additional Comments

Gas & Groundwater Monitoring Record Sheet

Project Name:- Cheetham Hill
Project No:- 10638G
Client:- Urban Village Ltd

Date:- 05/10/2022
Start Time:- 12:00
End Time:- 14:00
Ground Conditions:- Wet
Weather Conditions:- Drizzling, cool

Atmospheric Pressure
Start:- 996
End:- 995
Trend:- Falling

Instrument:- Gas Data GFM436

Operator:- T Sheen

Hole ID	Peak Flow l/hr	Steady Flow l/hr	DP	CH4			CO2			Min O2 %	Peak H2S ppm	Peak CO ppm	Hexane %	Water Level mbgl	Base of Hole mbgl
				Peak %	Steady %	Qhg l/hr	Peak %	Steady %	Qhg l/hr						
WS01	<0.1	<0.1	0	0.0	0.0	0.0000	0.0	0.0	0.0000	14.4	0	0	0.021	Dry	1.76
WS02	<0.1	<0.1	0	0.0	0.0	0.0000	0.9	0.9	0.0009	14.2	0	0	0.020	3.47	3.95
WS04	<0.1	<0.1	0	0.0	0.0	0.0000	0.9	0.9	0.0009	19.9	0	0	0.020	1.57	1.68

Additional Comments

Gas & Groundwater Monitoring Record Sheet

WML CONSULTING

Project Name:- Cheetham Hill
Project No:- 10638G
Client:- Urban Village Ltd

Date:- 19/10/2022
Start Time:- 14:00
End Time:- 15:00
Ground Conditions:- Dry
Weather Conditions:- Dry, cool, overcast

Atmospheric Pressure
Start:- 1014
End:- 1012
Trend:- Falling

Instrument:- Gas Data GFM436 (hire unit)

Operator:- T Sheen

Hole ID	Peak Flow l/hr	Steady Flow l/hr	DP	CH4			CO2			Min O2 %	Peak H2S ppm	Peak CO ppm	Hexane %	Water Level mbgl	Base of Hole mbgl
				Peak %	Steady %	Qhg l/hr	Peak %	Steady %	Qhg l/hr						
WS01	<0.1	<0.1	0	0.0	0.0	0.0000	0.0	0.0	0.0000	17.8	0	0	0.021	Dry	1.76
WS02	<0.1	<0.1	0	0.0	0.0	0.0000	0.8	0.7	0.0007	13.6	0	0	0.021	3.24	3.95
WS04	<0.1	<0.1	0	0.0	0.0	0.0000	0.7	0.7	0.0007	20.3	0	0	0.021	1.59	1.68

Additional Comments

APPENDIX 05

Site Specific Acceptance Criteria

The GAC's for the assessment of potential groundwater contamination have been derived from very conservative guidelines protective of drinking water and environmental quality, namely:

- UK Environmental Quality Standards (EQS) for Freshwater, 2000;
- Petroleum Products in Drinking-water, Background document for development of WHO Guidelines for Drinking-water Quality, 2011.

Table 1: Inorganic Tier 1 Water Environment Screening Criteria

Contaminant	Units	Hardness Banding ($CaCO_3$ mg/l)	EQS /WFD (Freshwater)	UK DWS
Arsenic	µg/l	-	50	10
Ammonia	mg/l	-	0.2	0.5
Boron	µg/l	-	2000	1000
Cadmium	µg/l	-	5	5
Chromium	µg/l	0-50	2	50
		50-100	10	
		100-150	10	
		150-200	20	
		200-250	20	
Copper	µg/l	0-10	0.5	2000
		10-50	0.5	
		50-200	3	
		200-250	8	
		>250	12	
Cyanide (Free)	µg/l	-	1	-
Cyanide		-	-	50
Iron	µg/l	-	1000	200
Lead	µg/l	0-50	4	10
		50-150	10	
		150-250	20	
		>250	20	
Mercury	µg/l	-	1	1
Nickel	µg/l	0-50	8	20
		50-100	20	
		100-150	20	
		150-250	40	
		>250	40	
Selenium	µg/l	-	-	10
Sulphate (SO_4)	mg/l	-	400	250
Zinc	µg/l	0-50	8	5000
		50-150	15	
		150-250	50	
		>250	50	
pH	-	-	6-9	-

Table 2: Organic Tier 1 Water Environment Screening Criteria

Contaminant	Units	UK DWS	WHO
PAHs - The sum of • **Benzo(b)fluoranthene,** • **Benzo(ghi)perylene,** • **Benzo(k)fluoranthene,** • **indeno(1,2,3-c,d)pyrene)**	µg/l	0.1	-
Phenol (total)	µg/l	0.5	-
MTBE	µg/l	-	15
Aliphatic C5-C6	µg/l	-	15,000
Aliphatic C6-C8	µg/l	-	15,000
Aliphatic C8-C10	µg/l	-	300
Aliphatic C10-C12	µg/l	-	300
Aliphatic C12-C16	µg/l	-	300
Aliphatic C16-21	µg/l	-	(300) *
Aliphatic C21-35	µg/l	-	(300)*
Aromatic C6-C7	µg/l	1 (benzene)	10 (benzene)
Aromatic C7-C8	µg/l	-	700 (toluene)
Aromatic C8-C10	µg/l	-	300 (ethylbenzene)
Aromatic C10-12	µg/l	-	100
Aromatic C12-C16	µg/l	-	100
Aromatic C16-C21	µg/l	-	90
Aromatic C21-C35	µg/l	-	90

Notes

The WHO Guideline Values for petroleum products in drinking water have been applied in the absence of current TPH water quality standards. However, for the aromatic TPH bandings of C6-C7, C7-C8 and C8-C10, the more conservative UK specific WQS for benzene, toluene and ethylbenzene have been used.

In the absence of specific WHO Guideline Values for the aliphatic ranges C16-C21 and C21-C35, the guideline values for the aliphatic C8-C10 through to C12-C16 ranges of 300µg/l have been used. This is however considered conservative due to the increased stability and lower volatility of the longer chain aliphatics.

Screening Levels for Public Open Space (Residential) assuming a 1% SOM for Hydrocarbons.

Contaminant	Screening Levels for POS (Resi) (mg/kg)
Metals	
Arsenic	79
Boron	21,000
Cadmium	120
Chromium III	1,500
Chromium VI	23
Copper	12,000
Lead*	630
Mercury	16
Nickel	230
Selenium SGV	1,100
Vanadium	2,000
Zinc	81,000
Non Metals	
Phenol	440
Polyaromatic Hydrocarbons PAHs)	
Benz[a]anthracene	29
Benzo[a]pyrene	5.7
Benzo[b]fluoranthene	7.1
Benzo[ghi]perylene	640
Benzo[k]fluoranthene	190
Chrysene	57
Dibenz[ah]anthracene	0.57
Fluoranthene	3,100
Indeno[123-cd]pyrene	82
Naphthalene	4,900
Pyrene	7,400

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* Where not included in the S4UL's criteria for a limited number of contaminants, namely lead, have been derived by DEFRA in their document entitled SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, April 2014.

Contaminant	Screening Levels for POS (Resi) End Use
Volatile Organic Compounds (VOCs)	
Benzene	72
Ethylbenzene	24,000
Toluene	56,000
Xylene	41,000
Total Petroleum Hydrocarbons (TPH)	
Aliphatic C5-6	570,000
Aliphatic C6-8	600,000
Aliphatic C8-10	13,000
Aliphatic C10-12	13,000
Aliphatic C12-16	13,000
Aliphatic C16-35	250,000
Aliphatic C35-44	250,000
Aromatic C5-7	56,000
Aromatic C7-8	56,000
Aromatic C8-10	5,000
Aromatic C10-12	5,000
Aromatic C12-16	5,100
Aromatic C16-21	3,800
Aromatic C21-35	3,800
Aromatic C35 - 44	3,800

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* Where not included in the S4UL's criteria for a limited number of contaminants, namely lead, have been derived by DEFRA in their document entitled SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, April 2014.

Site Specific Assessment Criteria for Residential (without homegrown produce) assuming a 1% SOM for hydrocarbons

Contaminant	Assessment Criteria for Residential (without homegrown produce) (mg/kg)
Metals	
Arsenic	40
Boron	11,000
Cadmium	85
Chromium III	910
Chromium VI	6
Copper	7,100
Lead*	310
Mercury	1.2
Nickel	180
Selenium	430
Vanadium	1,200
Zinc	40,000
Non – Metals	
Phenol	440^{dir} (460)
Polyaromatic Hydrocarbons (PAH)	
Benzo[a]anthracene	11
Benzo[a]pyrene	3.2
Benzo[b]fluoranthene	3.9
Benzo[ghi]perylene	360
Benzo[k]fluoranthene	110
Chrysene	30
Dibenz[ah]anthracene	0.31
Fluoranthene	1,500
Indeno[123-cd]pyrene	45
Naphthalene	2.3
Pyrene	3,700

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Contaminant	Criteria (mg/kg)
Volatile Organic Compounds – (VOCs) 1% SOM	
Benzene	0.38
Ethylbenzene	83
Toluene	880[vap](869)
Xylene	79
1,2-Dichloroethane	0.0092
1,1,1-Trichloroethane	9.0
Tetrachloroethane	3.9
Tetrachloroethene (PCE)	0.18
Tetrachloromethane	0.026
Trichloroethene (TCE)	0.017
Trichloromethane	1.2
Vinyl Chloride	0.00077
Semi-Volatile Organic Compounds (SVOCs) 1% SOM	
1,2-Dichlorobenzene	24
1,4-Dichlorobenzene	61
1,2,4-Trichlorobenzene	2.6
Hexachlorobenzene	4.1(0.2)[vap]
Total Petroleum Hydrocarbons – TPH	
Aliphatic C5-6	42
Aliphatic C6-8	100
Aliphatic C8-10	27
Aliphatic C10-12	130(48)[vap]
Aliphatic C12-16	1,100(24)[sol]
Aliphatic C16-35	65,000(8.48)[sol]
Aliphatic C35 - 44	65,000(8.84)[sol]
Aromatic C5 – 7 (benzene)	370
Aromatic C7 – 8 (toluene)	860
Aromatic C8-10	47
Aromatic C10-12	250
Aromatic C12-16	1,800
Aromatic C16-21	1,900
Aromatic C21-35	1,900
Aromatic C35 - 44	1,900

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* Where not included in the S4UL's criteria for a limited number of contaminants, namely lead, have been derived by DEFRA in their document entitled SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, April 2014.

APPENDIX 10

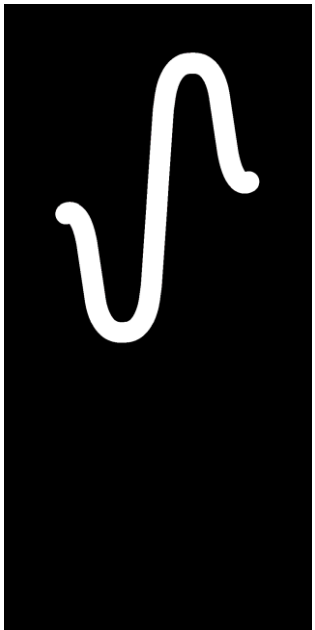
Cheetham Hill Road Manchester

Noise Impact Assessment Report

Client:
RPS Group
5 New York Street
Manchester, M1 4JB

Date:
28 July 2023

Our Ref:
22017-RP-1-R0



JAMESON ACOUSTICS

Consultants in acoustics,
noise and vibration

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ACOUSTICS

Document Control

Revision	Date	Author	Description
0	28-07-2023	AJ	First issue

This report has been prepared with all reasonable skill, care and diligence for the sole benefit, use and information of the aforementioned Client in accordance with the purposes and terms agreed between ourselves and the Client. The liability of Jameson Acoustics Limited in respect of the information contained within this report will not extend to any third party.

Author	Andrew Jameson (AJ)
Position	Director
Qualifications	BSc(Hons) Acoustics, MIOA, MIET
Experience	20+ years
Signature	
Date	28-07-2023

Executive Summary

Planning permission is sought for a new-build residential development on Cheetham Hill Road in Manchester. The development will create 23nr storey apartment block with 2nr ground floor commercial units.

The site is subject to noise from road traffic, primarily on Cheetham Hill RoadJameson Acoustics Limited has been commissioned to undertake a noise impact assessment to supplement the planning application. The assessment seeks to demonstrate that [A] noise impacts can be sufficiently mitigated to achieve acceptable acoustic conditions within new dwellings, and [B] noise generated from the operation of the development (plant and commercial unit operation) can be mitigated to prevent adverse noise impacts on the locality and structurally-connected dwellings.

The assessment finds that acceptable internal noise levels within new dwellings can be achieved through the appropriate specification of façade elements and appropriate ventilation and overheating mitigation solutions that removes or restricts reliance on openable windows, particularly for dwellings overlooking Cheetham Hill Road. Preliminary guidance on suitable specifications and solutions for framed external window/door systems has been provided. Acoustically-enhanced double glazed windows will be required for façades facing south, Cheetham Hill Road and Carnarvon Street, reducing to more conventional double glazing on the west elevation.

Plant noise emission limits have been proposed so that future plant installations do not adversely impact on the locality.

Noise impacts from ground floor commercial units have been considered and suitable noise criteria have been proposed to mitigate the risk of adverse noise impacts. The approach should be to provide shell only constructions achieving Building Regulations Part E sound insulation requirements. This will allow future tenants to introduce acoustic enhancements to suit their operation, and the Local Authority may wish to secure this through a suitably worded condition of planning.

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1.0 Introduction

Planning permission is sought for a new-build residential development on Cheetham Hill Road in Manchester. The development will create 23nr storey apartment block with 2nr ground floor commercial units.

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For a description of the acoustic terminology used herein, please see Appendix A.

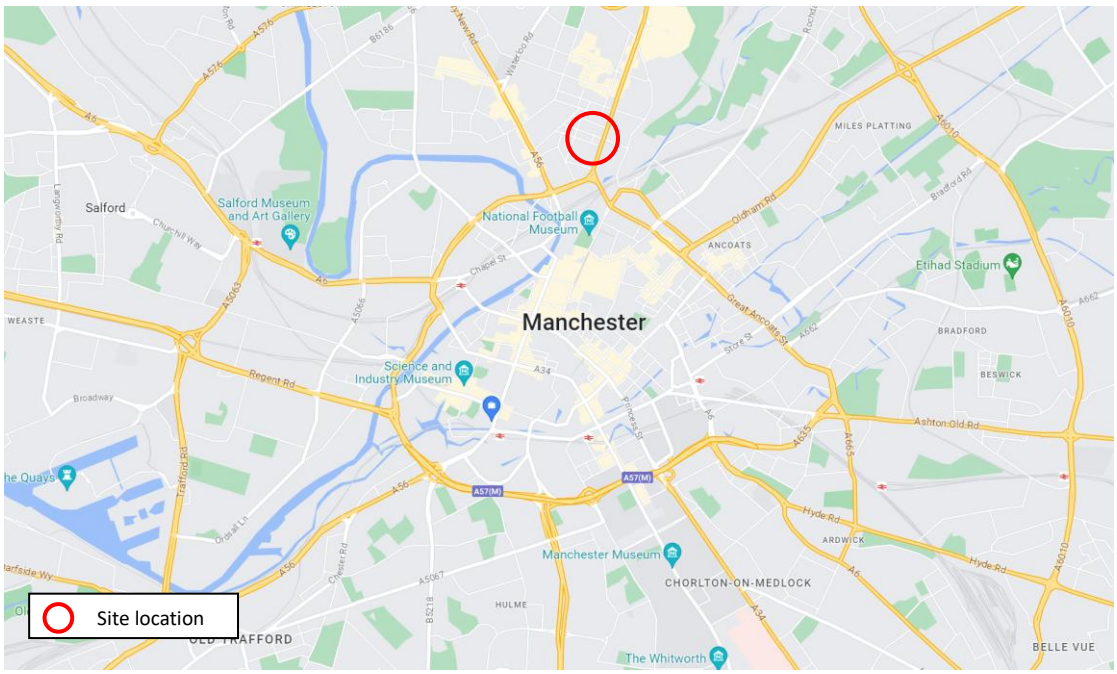
2.0 Objectives

- To review the latest national and local planning policies/requirements and relevant design standards and good practice guides that will inform the noise impact assessments.
- To carry out a 5-day noise survey at the site (over a weekend), capturing daytime and night-time noise levels at selected positions in accordance with BS 7445.
- Based on the survey data, to undertake a noise assessment for the suitability of the site for residential use in accordance with the Noise Policy Statement for England (NPSE), National Planning Policy Framework (NPPF), statutory legislation, Planning Practice Guidance (ProPG), British Standard BS8233:2014 and Local Authority guidance/requirements.
- To subsequently provide guidance on noise mitigation and façade sound insulation solutions to achieve acceptable acoustic conditions within the completed scheme.
- To set noise emission limits for the development in line with BS 4142 with the aim of minimising the risk of the operation of new plant causing a noise nuisance to neighbours.
- To advise on sound insulation provisions to adequately control commercial noise transfer externally and to adjoining residential spaces.

3.0 Site Description

3.1 Location

The site is located on Cheetham Hill Road in Manchester and falls under the jurisdiction of Manchester City Council. See Location Plan below.



Location Plan (© maps.google.co.uk)

3.2 Description

The site is bounded by Cheetham Hill Road to the east, Carnarvon Street to the north, Gibson Place to the west and existing commercial properties to the south. The surrounding local roads to the north and west are relatively minor access roads to the commercial estate, whereas Cheetham Hill Road is a busy 4-lane thoroughfare and bus route into the city centre.

The surrounding area is a mix of commercial/industrial (to the west) and residential (to the east).

The dominant noise source on site is road traffic from Cheetham Hill Road. The neighbouring commercial/industrial units appear to all be of a retail/office type operation with no notable industrial/delivery/service yard related noise activities.

See site plan below.



Site Plan (© maps.google.co.uk)

The proposed development is for a single 23nr storey residential building almost fully occupying the site. The development will contain 2nr commercial units at ground floor, together with residential entrance lobby and back of house spaces, with residential apartments above. See below the proposed ground floor plan and first (typical L1-16) floor plan.



Proposed Ground Floor Plan



Proposed First Floor Plan

4.0 Planning Policy, Legislation & Assessment Guides

4.1 National Planning Policy

National planning policies are set out in the following:

- Noise Policy Statement for England [NPSE], 2010;
- National Planning Policy Framework [NPPF], 2021;
- National Planning Practice Guidance – Noise [PPGN], 2019.

These documents provide a qualitative approach to noise assessments. See Appendix B for a detailed description of each.

4.2 Local Planning Requirements

4.2.1 Local Authority Development Plan

Manchester City Council's [MCC] Core Strategy was adopted on the 11 July 2012 and is the key document in the Manchester Local Plan. It sets the out the long-term strategic policies for Manchester's future development and will form the framework that planning applications will be assessed against.

The Core Strategy requests that all new developments follow the 'Development Principles' and accord with the design guidance set out in the Supplementary Planning Documents. In accordance with Policy DM1, this includes the effects on amenity due to noise generated by a new development and, conversely for noise sensitive uses (e.g. residential), the effects of environmental noise onto the new development.

MCC's Supplementary Planning Document relating to noise is their 'Planning & Noise, Technical Guidance' published in October 2022 by their Environmental Protection Team. This document provides guidance to applicants and consultants concerning the assessment and prediction of environmental noise associated with a particular development. The key elements relevant to this development are summarised below.

4.2.2 Specific Guidance on Noise

In relation to noise affecting newly proposed residential properties, the council has adopted the following noise limits for sites affected only by environmental noise (e.g. road traffic):

- **Bedrooms (night time – 23.00 – 07.00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 10 times)**
- **Living Rooms (daytime – 07.00 – 23.00) 35 dB L_{Aeq}**
- **Gardens and terraces (daytime) 55 dB L_{Aeq}**

In relation to commercial noise, MCC's guidance advises that "*BS 4142 should be used to assess the likely impact of noise from industrial and commercial sources at noise sensitive premises*".

The Council consider that new developments should contribute and enhance the area in which they are located and where possible, i.e. prevent 'noise creep', contribute to the improvement of people's health and quality of life as per the NPSE. With this in mind, the design objective should be:

'The development should be designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.'

For fixed plant, the Council advises a BS 4142 assessment that demonstrates that:

'Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location'.

4.3 Legislation (Building Regulations)

The development will need to be built in such a way that it conforms to the Building Regulations 2010. In relation to noise and acoustics, the key documents to consider are:

- Approved Document E: 2003 Edition (incorporating amendments to 2015) – Resistance to the Passage of Sound [ADE];
- Approved Document F: 2021 Edition – Ventilation [ADF];
- Approved Document O: 2021 Edition – Overheating [ADO].

ADE relates to the design of the building's internal building fabric and primarily considers the control sound transfer between adjacent spaces. In planning terms, this development will contain party floors separating new apartments from back of house plant spaces which will need to be designed in such a way that they achieve, as a minimum, the below ADE on-site sound insulation performance.

Description	Required Performance
Minimum airborne sound level difference *Party Walls/Floors separating dwellings from other parts of the building*	45 dB $D_{nT,w} + C_{tr}$

ADF includes a section on controlling noise from ventilation systems. It states that "*account should be taken of outside noise when considering whether openable windows are appropriate for purge ventilation*" and that noise from mechanical ventilation systems operating under normal conditions (not boost rates) should not exceed 30 dB $L_{Aeq,T}$ for noise sensitive rooms (e.g. bedrooms) and 45 dB $L_{Aeq,T}$ in less sensitive rooms.

ADO took effect on 15 June 2022 and does not apply to work subject to a building notice, full plans application or initial notice submitted before that date, provided the building work is started before 15 June 2023. It requires noise to be considered as part of the development's overheating strategy in locations where external noise may be an issue. It states that the overheating strategy should take account of the likelihood that windows will be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- 40 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
- 55 dB L_{AFmax}, more than 10 times a night (between 11pm and 7am).

4.4 Assessment Guides

For planning and noise, the following industry standards and assessment guides shall be considered.

- ProPG: Planning & Noise, 2017;
- BS 8233: 2014 '*Guidance on sound insulation and noise reduction for buildings'*;
- World Health Organisation [WHO] Environmental Noise Guidelines, 2018;
- Acoustics, Ventilation & Overheating [AVO] Residential Design Guide, 2020;
- BS 4142: 2014 '*Methods for Rating and Assessing Industrial and Commercial Sound*'.

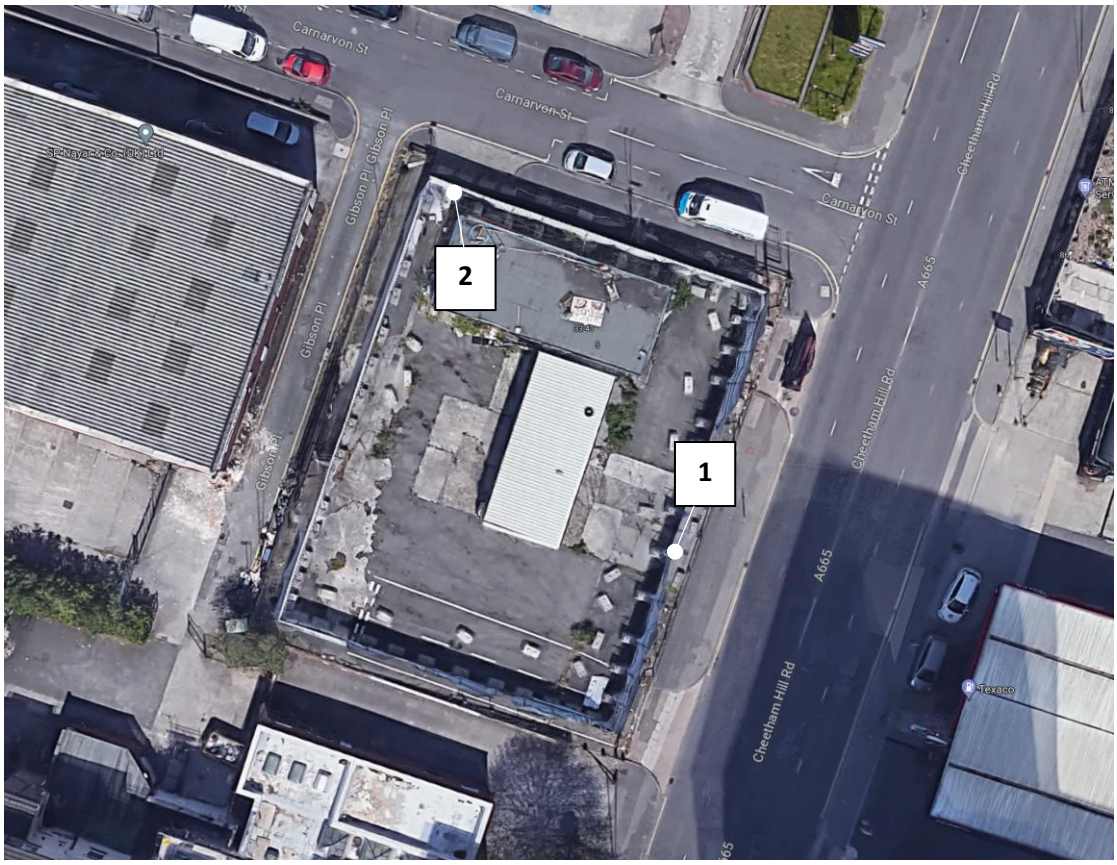
See Appendix B for a detailed description of each.

5.0 Baseline Noise Survey

5.1 Procedure

Automated noise level measurements were taken from 11:00 hours on Thursday 15 June 2023 to 13:00 hours on Monday 19 June 2023 at 2nr on-site positions as described below. Both positions were selected to establish the typical prevailing daytime and night-time ambient, maximum and background noise levels on the development site.

Position	Type	Description
1	Automated	To the east edge of the site, approximately 6 m from the roadside edge of Cheetham Hill Road. Microphone approximately 4 m from ground with full sight of Cheetham Hill Road in free-field conditions.
2	Automated	To the east edge of the site, approximately 5 m from the roadside edge of Carnarvon Road and 4 m from the roadside edge of Gibson Place. Microphone approximately 4 m from ground with full sight of both roads in free-field conditions.



Site Plan showing measurement positions (© maps.google.co.uk)

Each microphone was mounted on a pole and fitted to the site hoardings. The microphones were fitted with windshields and mounted in free-field conditions.

The equipment was programme to continuously log all relevant A-weighted broadband (dBA) and linear spectral noise level indices, including L_{eq}, L_{90}, L_{10} and L_{max}, over 15-minute and 1-hour intervals.

All measurements were taken in general accordance with BS 7445-1: 2003 '*Description and Measurement of Environmental Noise*'.

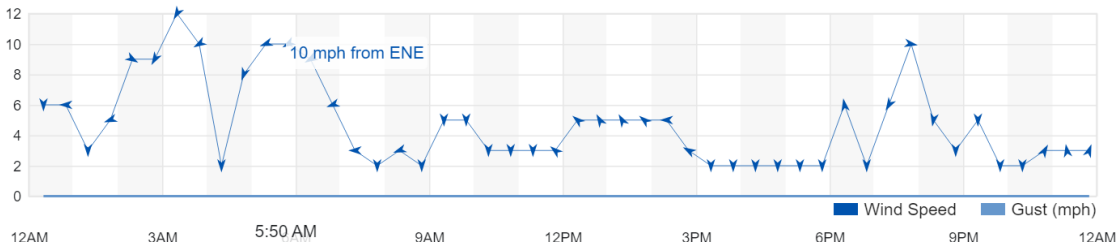
5.2 Instrumentation

The instrumentation used for the survey is summarised below. The sound level meters were hand-calibrated at the beginning and end of the survey periods. No significant deviations in calibration level were noted.

Description	Equipment	Serial Nr	Lab Calibration Expiry	Lab Calibration Certificate Nr
Class 1 sound level meter	Svantek 971A (with Type 7152 microphone)	124663 (82835)	11 Aug 2024	12 Aug 2022
Class 1 sound level meter	Svantek 971A (with Type 7152 microphone)	131635 (85533)	1 Nov 2024	2 Nov 2022
Class 1 sound calibrator	Cirrus CR:515	57570	8 Nov 2023	182770

5.3 Weather Conditions

Due to the nature of the survey, i.e. unmanned, it is not possible to describe the noise climate throughout the duration of the survey period. However, on install and collection, weather conditions were considered suitable for obtaining representative readings. The sky was clear with patchy cloud cover, road surfaces were dry and wind speeds were low (below 3 m/s). Based on internet weather reports for the full duration of the survey, conditions generally remain commensurate with those described, although there were brief periods of rainfall and two notable periods of high winds in the early hours of morning and early evening of Sunday 18 June 2023 (see below). Noise level measurements during these periods appear to have been influenced by the high winds and shall therefore be excluded from our results analysis.



High wind speeds on Sunday 18 June 2023 (© Wunderground.com)

5.4 Observed Noise Climate

Due to the nature of the survey, i.e. unmanned, it is not possible to describe the noise climate throughout the duration of the survey period. However, on install and collection (and during the manned survey) the noise climate was dominated by road traffic Cheetham Hill Road.

5.5 Results & Analysis

The results of the automated survey have been plotted on Time History Graphs 22017-G1 and 22017-G2 enclosed in Appendix C. The graph presents the 15 minute A-weighted (dBA) L_{90}, L_{eq} and L_{max} levels at each position throughout the duration of the survey.

A summary of the results (excluding periods affected by high winds), as used to inform subsequent assessments against current guidelines, is presented in the following tables.

L_{Aeq} Ambient Noise Levels

The logarithmically-averaged 16-hour daytime and 8-hour night-time L_{Aeq} ambient noise levels

Position 1 Period Commencement (Day/Night of…)	Free-Field Ambient Noise Level (dB)	
	Daytime $L_{Aeq,16hr}$ (07:00-23:00)	Night-time $L_{Aeq,8hr}$ (23:00-07:00)
Thursday 15 June 2023	67 [1]	63
Friday 16 June 2023	67	63
Saturday 17 June 2023	67	64 [3]
Sunday 18 June 2023	67 [3]	64
Monday 19 June 2023	67 [1]	- [2]
Week Average [4]	**67**	**63**

Position 2 Period Commencement (Day/Night of…)	Free-Field Ambient Noise Level (dB)	
	Daytime $L_{Aeq,16hr}$ (07:00-23:00)	Night-time $L_{Aeq,8hr}$ (23:00-07:00)
Thursday 15 June 2023	59 [1]	55
Friday 16 June 2023	59	55
Saturday 17 June 2023	59	56 [3]
Sunday 18 June 2023	59 [3]	57
Monday 19 June 2023	60 [1]	- [2]
Week Average [4]	**59**	**55**

[1] incomplete 16-hr period

[2] insufficient/no measurement data

[3] excludes measurement periods unduly influenced by high winds

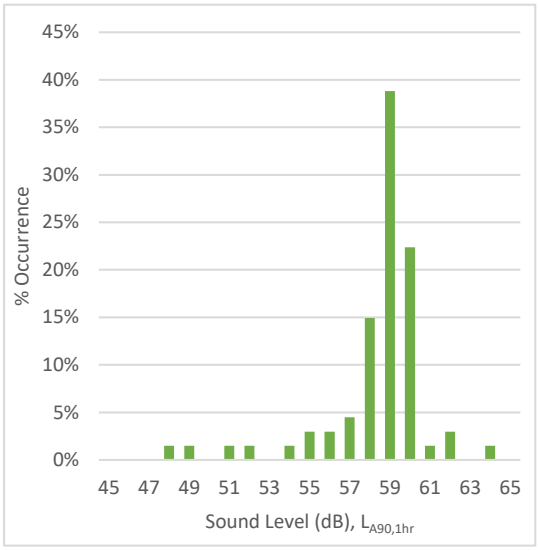
[4] full week average, considering 5 weekdays (average of Thu/Fri values)

L_{A90} Background Noise Levels

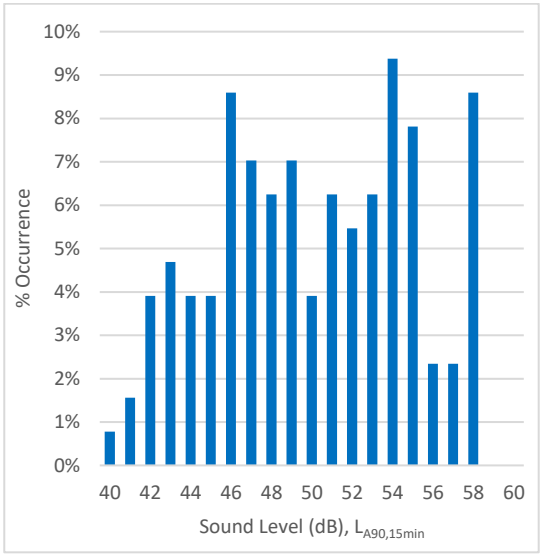
The representative background determined through statistical analysis to BS 4142

Position	Free-Field Background Noise Level (dB)	
	Daytime $L_{A90,1hr}$ (07:00-23:00)	Night-time $L_{A90,15min}$ (23:00-07:00)
1	58	46
2	51	40

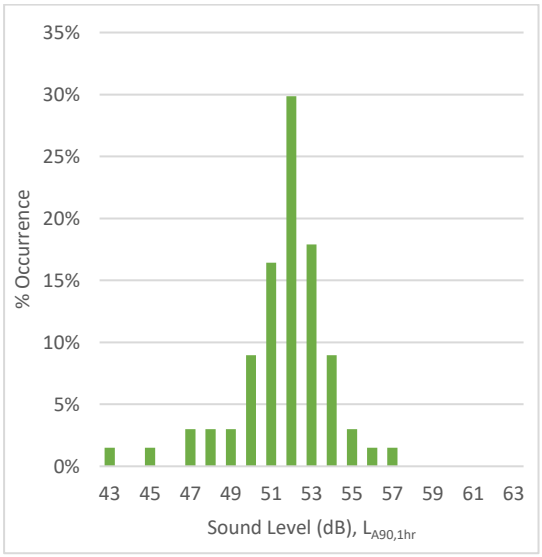
See below graphs showing the % distribution of background noise levels at each position throughout the duration of the survey.



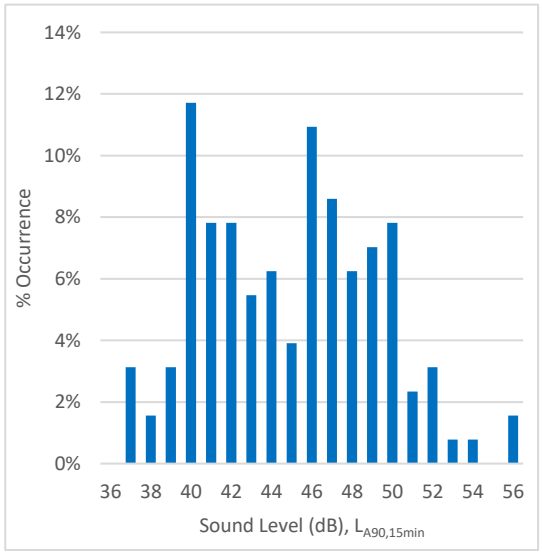
Position 1 – Daytime



Position 1 – Night-time



Position 2 – Daytime



Position 2 – Night-time

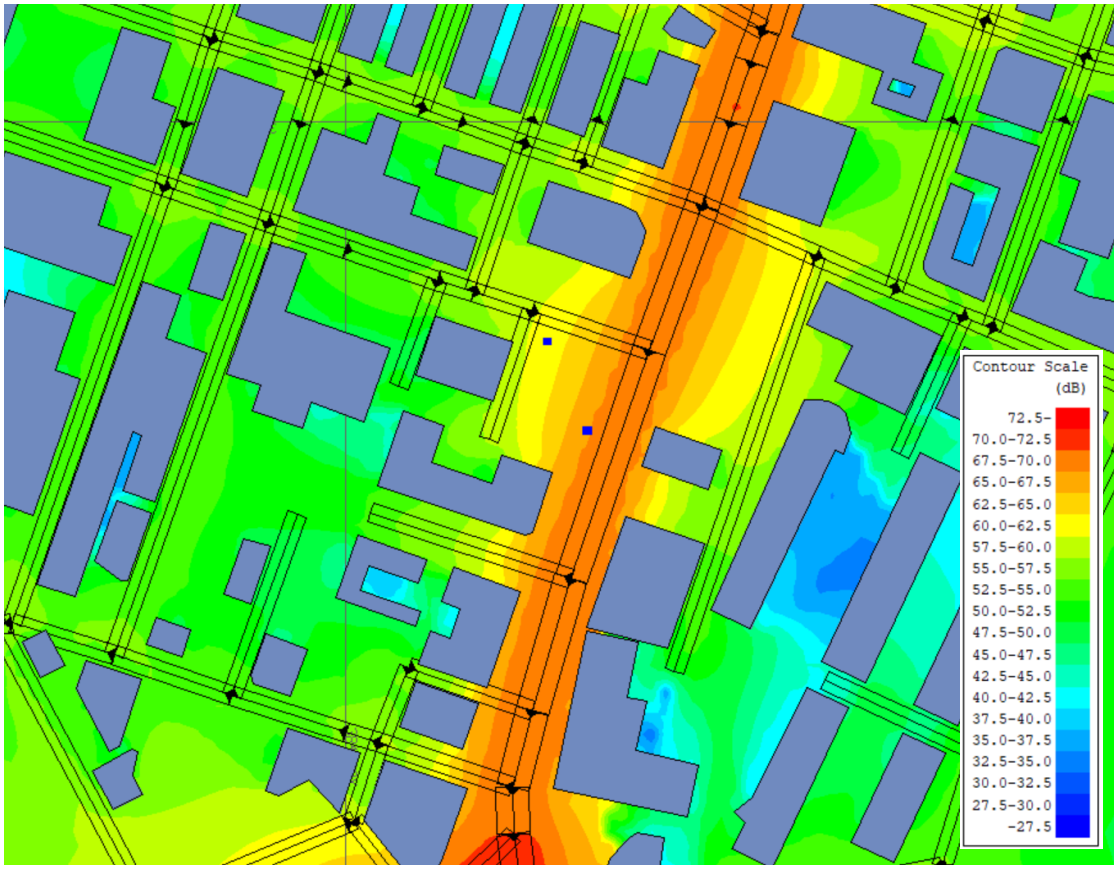
L_{Afmax} Maximum Noise Levels at Night

The 10-15th highest 5-minute L_{Afmax} maximum noise level 'event' at night

Position	Free-Field Maximum Noise Level (dB) At Night-time $L_{Amax,5min}$ (23:00-07:00)
1	78
2	73

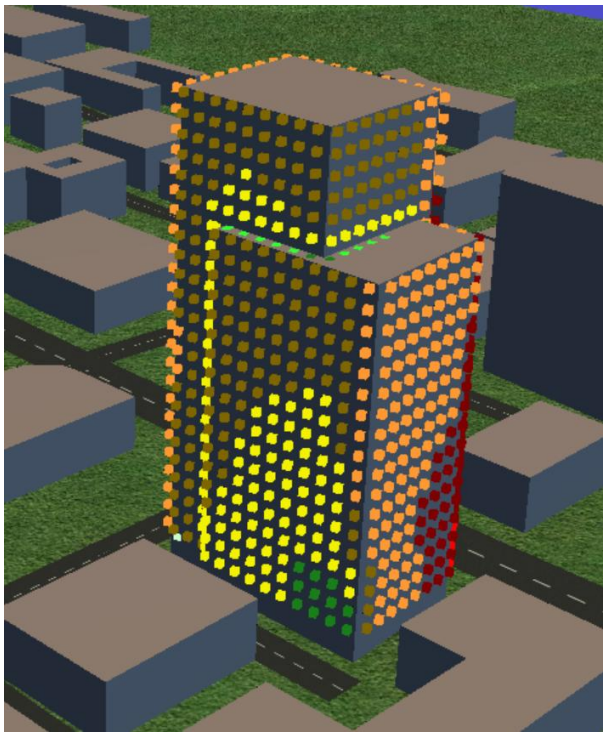
6.0 Incident Road Traffic Noise Levels

Incident road traffic noise levels onto each building façade have been analysed using 3D noise modelling software. The following plan illustrates the spread of daytime $L_{Aeq,16hr}$ traffic noise levels across the existing site.

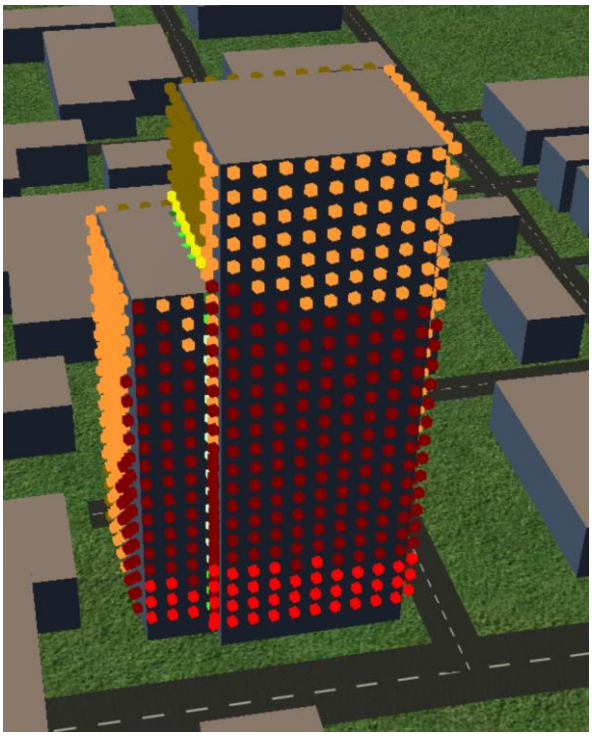


Noise Map of Existing Site – Daytime $L_{Aeq,16hr}$ traffic noise levels (4 m above ground level)

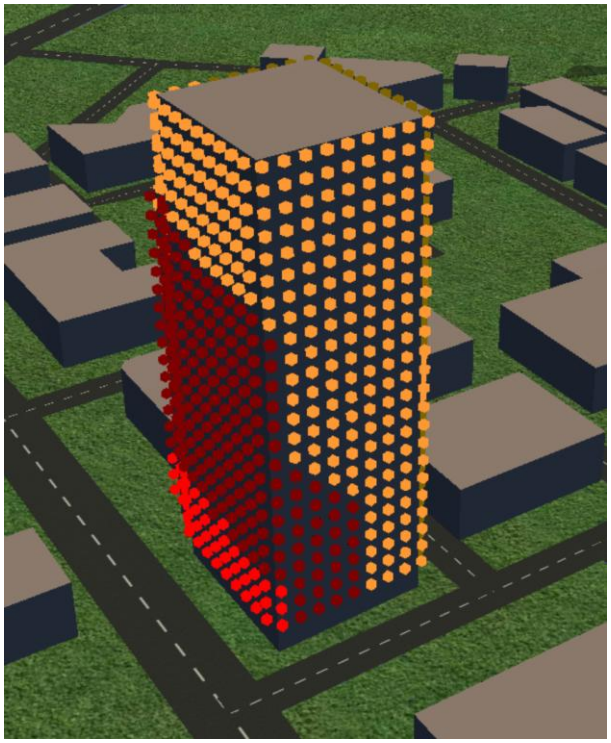
The following Figures illustrate the incident daytime $L_{Aeq,16hr}$ traffic noise levels across the proposed facades of the development. Note, night-time $L_{Aeq,8hr}$ noise levels will be consistently 4 dB lower than these values.



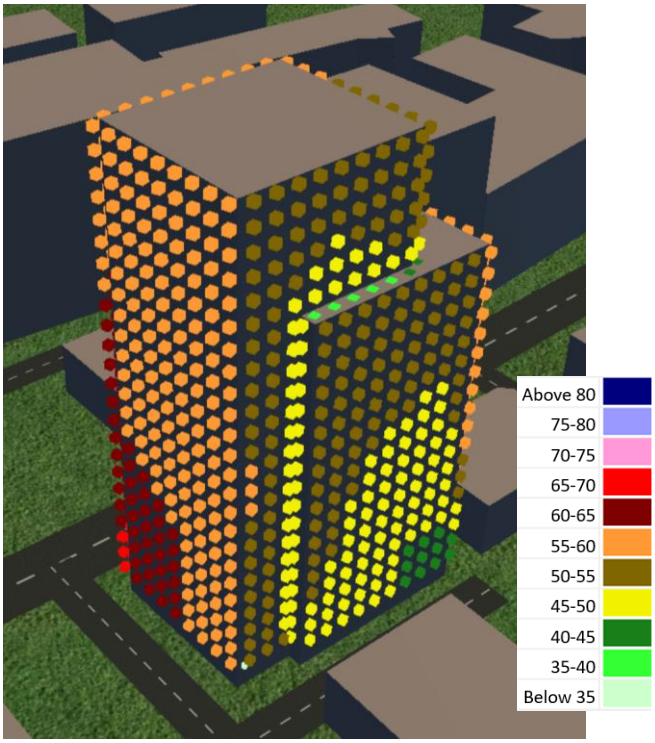
Looking North-East



Looking North-West (from Cheetham Hill Road)



Looking South-West (from Cheetham Hill Road)



Looking South-East

Incident night-time L_{Amax} noise levels are calculated to be 78 dB on the lower levels of facades facing Cheetham Hill Road, reducing to 68 dB on the rear elevation.

7.0 Achieving Internal Noise Levels

7.1 Criteria

We would propose the following internal noise levels to be achieve (where feasible) within new dwellings during normal ventilation conditions.

Room	Desirable Internal Noise Level	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Living Room	35 dB $L_{Aeq,16hr}$	-
Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB* L_{Afmax}

* Noise events (5-min) - not exceeded more than 10-15 times per night

7.2 Building Envelope Acoustic Design

7.2.1 External Walls & Roofs

The façade design proposes brick/clad external walls with insulated SFS and plasterboard linings with punched-in double glazed windows. Such a construction would be expected to provide a sound reduction performance far in excess of 45 dB $R'_w + C_{tr}$. This performance would far surpass what will be required on this site to control noise ingress.

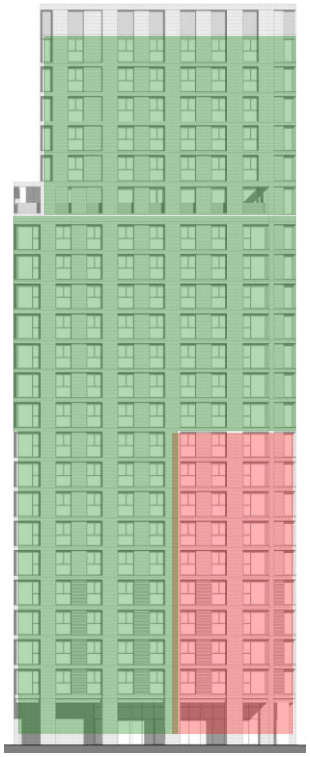
The roof elements will be a solid concrete slab of circa 200-225 mm depth which, again, will provide a sound reduction performance far in excess of what will be required on this scheme (again, greater than 45 dB $R'_w + C_{tr}$).

7.2.2 Framed External Windows/Door Systems

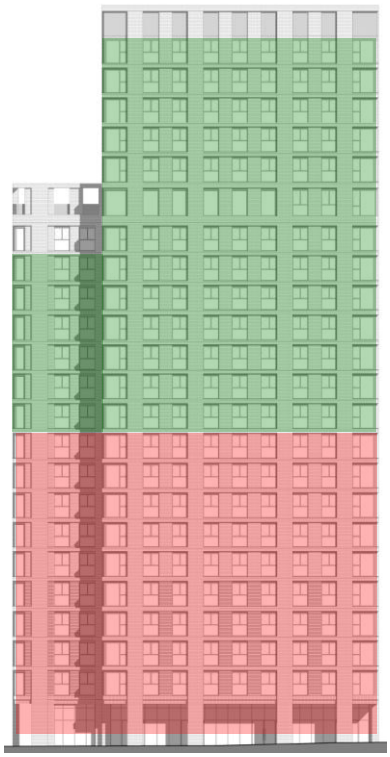
Preliminary sound insulation calculations have been carried out in order to specify the minimum sound insulation performance of the windows. Our calculations follow BS 8233 procedures and consider the apartment room dimensions and window sizes taken from the planning stage drawings.

Our calculations suggest provisions should be made for the following specifications for the complete framed window/door systems to habitable rooms (living rooms and bedrooms). Example configurations are provided for guidance only.

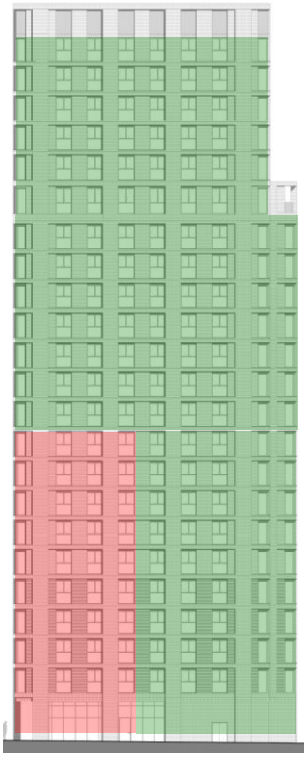
Façade Zone *(ref. Figures below table)*	Min. Required Sound Reduction $R_w + C_{tr}$ (dB)	Example Configuration
RED	**35**	10.4 / 16 / 6.4 mm (aco. lam.)
GREEN	**31**	8.4 / 16 / 6.4 mm (lam.)
BLUE	**27**	6 / 16 / 6 mm



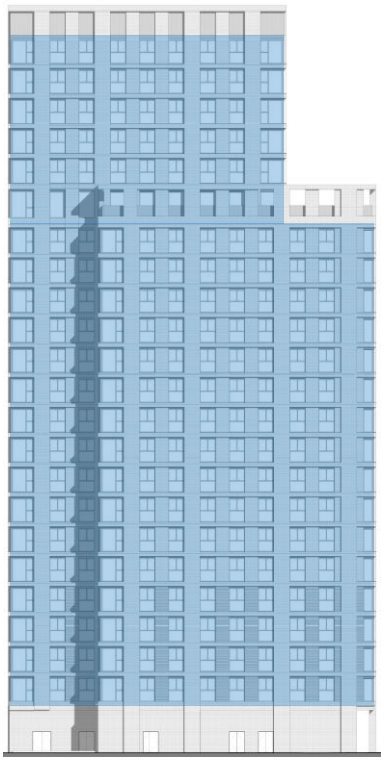
South



Cheetham Hill Road



Carnarvon Street



Gibson Place

7.2.3 Ventilation

For ventilation (and to assist with overheating), appropriately-sized MVHR heat recovery systems will be provided to each apartment. These will remove the need for trickle ventilators and/or reliance on openable windows to provide normal background ventilation (in line with Approved Document F).

Note: Noise from mechanical ventilation systems should be designed to NR 25 in bedrooms at night and NR 30 in both bedrooms and living rooms during the day.

7.3 Overheating & Noise

Often the overheating strategy for residential buildings places some reliance on openable windows in the summer months. For sites where incident noise levels are high, noise should be taken into account when considering whether openable windows are appropriate for providing this extra purge ventilation to control overheating.

In accordance with the Acoustics, Ventilation and Overheating Guide (AVO), the associated risk of noise levels been deemed unacceptably high with windows open would be when incident external noise levels exceed 65 dB $L_{Aeq,16hr}$ (day) and 55 dB $L_{Aeq,8hr}$ (night). In addition, Building Regulations' Part O advises that the overheating strategy should assume windows will be closed throughout the night where incident façade noise levels exceed circa 49 dB $L_{Aeq,8hr}$ and 64 dB L_{Amax}.

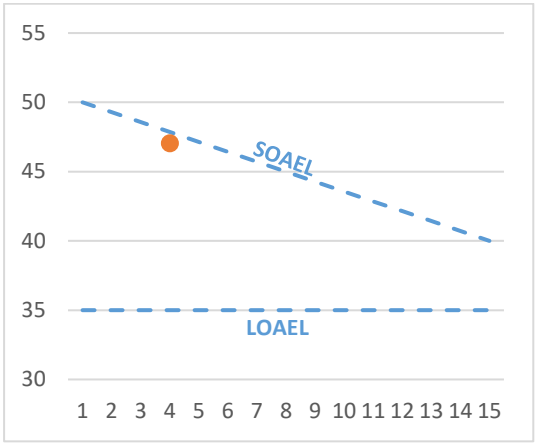
Based on the Part O requirements, the overheating strategy shall assume windows will be closed throughout the night for apartments on the south, east (Cheetham Hill Road) and north (Carnarvon Street) elevations. Open windows at night may, however, be a permissible means of overheating mitigation for some apartments on the west (Gibson Place) elevation, subject to detailed analysis during the design stage.

For AVO (daytime), the following table sets out the maximum number of hours windows can be opened during daytime hours before internal noise levels would exceed the Significant Observed Adverse Effect Level (SOAEL). Please refer to façade zones in Figures in Section 7.2.2.

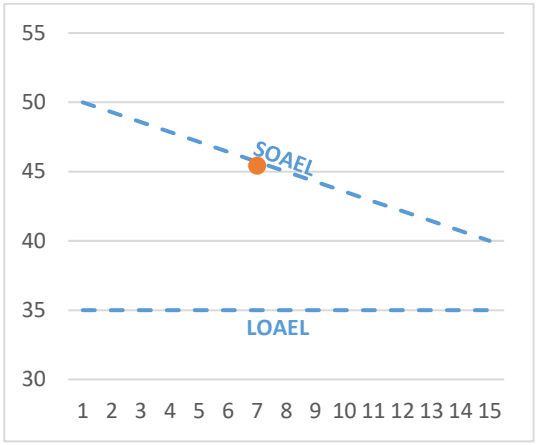
Façade Zone *(ref. Figure above)*	Maximum number of hours windows can be open during the day (07:00-23:00)
RED	4 hours
GREEN	7 hours
BLUE	12 hours

Provided the above limits are achieved, internal noise levels would fall below the AVO threshold in all zones, as illustrated on the below Figures.

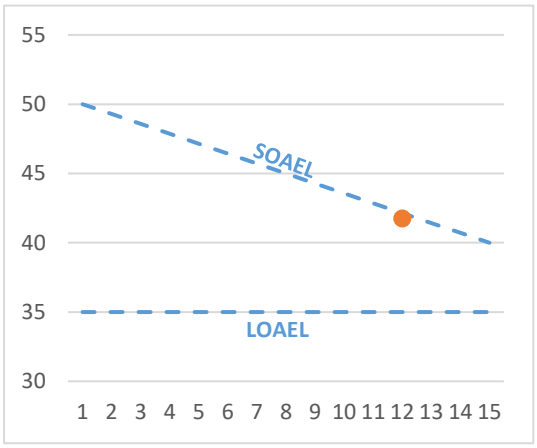
The x-axis scale is duration for which 'overheating condition' occurs (in hours), the y-axis is the internal ambient noise level (in dB, $L_{Aeq,16hr}$).



Red Zone – AVO Assessment



Green Zone – AVO Assessment



Blue Zone - AVO Assessment

Based on our experience working on similar schemes with restricted reliance on openable windows for acoustics, TM59 internal temperature targets can be maintained with a combination of suitably specified solar-rated glazing, appropriately sized windows, black-out blinds, and the specification of suitably sized mechanical ventilation systems.

Air conditioning can be considered for quality developments. However, the introduction of mechanical solutions should be considered carefully; not only with regard to cost and maintenance, but sustainability and the environment, which are factors that carry more importance for any new development under MCC's jurisdiction.

8.0 Development-Generating Noise Impacts

8.1 Plant Noise Emission Limits

Based on the results of the noise survey and the requirements of the Local Authority, we propose the following plant noise emission limits to be achieved incident at the nearest noise sensitive windows with all plant operating simultaneously. These limits are 5 dB below the prevailing 'representative' background noise levels.

Receptor Location	Plant Noise Rating Limit, $L_{Ar,Tr}$ ref. BS 4142 (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Any Noise Sensitive Receptor	46	35

Noise shall be assessed in accordance with BS 4142:2014 with corrections applied for any plant emitting noise of a tonal or irregular quality.

The above limits shall be subject to the final approval of the Local Authority.

8.2 Commercial Unit

We would suggest the commercial units are designed a shell that (a) satisfies minimum Building Regulations sound insulation standards to dwellings as per Section 4.3, and (b) provides a conventional double-glazed curtain walling frontage that will control operational noise egress for the vast majority of prospective restaurant/café tenants. Appropriate operational noise limits would then need to be assigned depending on the proposed building structure. Should prospective tenants wish to exceed these limits, they would be responsible for acoustic-enhancements to prevent adverse noise impacts. This would be secured through an appropriately worded clause in the AfL and the planning authority may also wish to secure this via an appropriate worded planning condition.

As an example, if a traditional restaurant was proposed (Class E), standard façade constructions and Building Regulations compliant floor constructions are likely to result in appropriate noise levels to accommodate anticipated operational noise. If, however, a modern bustling restaurant with music was proposed, additional acoustic treatment could be required but the AfL would ensure the tenant would provide this in their fit-out works (e.g. a plasterboard ceiling to control noise to above).

It may be prudent for the local authority to consider a suitably worded condition so further information can be provided as the building design progresses.

9.0 Conclusions

Planning permission is sought for a new-build residential development on Cheetham Hill Road in Manchester. The development will create 23nr storey apartment block with 2nr ground floor commercial units.

The site is subject to noise from road traffic, primarily on Cheetham Hill RoadJameson Acoustics Limited has been commissioned to undertake a noise impact assessment to supplement the planning application. The assessment seeks to demonstrate that [A] noise impacts can be sufficiently mitigated to achieve acceptable acoustic conditions within new dwellings, and [B] noise generated from the operation of the development (plant and commercial unit operation) can be mitigated to prevent adverse noise impacts on the locality and structurally-connected dwellings.

The assessment finds that acceptable internal noise levels within new dwellings can be achieved through the appropriate specification of façade elements and appropriate ventilation and overheating mitigation solutions that removes or restricts reliance on openable windows, particularly for dwellings overlooking Cheetham Hill Road. Preliminary guidance on suitable specifications and solutions for framed external window/door systems has been provided. Acoustically-enhanced double glazed windows will be required for façades facing south, Cheetham Hill Road and Carnarvon Street, reducing to more conventional double glazing on the west elevation.

Plant noise emission limits have been proposed so that future plant installations do not adversely impact on the locality.

Noise impacts from ground floor commercial units have been considered and suitable noise criteria have been proposed to mitigate the risk of adverse noise impacts. The approach should be to provide shell only constructions achieving Building Regulations Part E sound insulation requirements. This will allow future tenants to introduce acoustic enhancements to suit their operation, and the Local Authority may wish to secure this through a suitably worded condition of planning.

Appendix A – Acoustic Terminology

dB Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form.

dB(A) The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The $_A$ subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted (e.g. $L_{Aeq,T}$ in dB). Noise levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is only just perceptible.

$L_{Aeq,T}$ $L_{Aeq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time measurement period, *T*.

$L_{10,T}$ L_{10} is the noise level exceeded for 10% of the measurement period *T* (i.e. the quietest 10% of the measurement) and has, for many years, been used in the assessment of road traffic noise.

$L_{90,T}$ L_{90} is the noise level exceeded for 90% of the measurement period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the 'background' noise level.

L_{max} L_{max} is the maximum sound pressure level recorded over the measurement period, *T*. L_{max} is often used in assessing scheduled environmental noise 'events' (such as train passbys), particularly at night where such events may cause sleep disturbance.

R_w The weighted sound reduction index, R_w, is a single figure description of sound reduction as defined in BS EN ISO 717-1. It is single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The R_w is calculated from sound insulation measurements taken in an acoustic laboratory. Sound insulation ratings derived from site measurements are invariably lower than the laboratory figures and are referred to as the apparent weighted sound reduction index, R'_w.

$D_{n,e,w}$ The weighted element-normalised level difference, $D_{n,e,w}$, is a single figure description of the sound insulation performance of small building elements, such as a trickle ventilator.

C_{tr} C_{tr} is correction term applied against the sound insulation single-number values (e.g. R_w) to provide a weighting against low frequency performance. The reference values used within the C_{tr} calculation are based on urban traffic noise.

Appendix B – Planning Policy & Assessment Guides

Planning Policy

- **Noise Policy Statement for England (NPSE)**

  The Noise Policy Statement for England (NPSE) launched in March 2010 states the long-term vision of Government noise policy is to "*promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*".

  The long-term vision is supported by the following aims; through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

  - Avoid significant adverse impacts on health and quality of life;
  - Mitigate and minimise adverse impacts on health and quality of life;
  - Where possible, contribute to the improvement of health and quality of life.

  The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise).

  The NPSE introduces a three-tier concept for the assessment of noise impacts onto a receptor:

  - **NOEL – No Observed Effect Level:** The level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

  - **LOAEL – Lowest Observable Adverse Effect Level:** The level above which adverse effects on health and quality of life can be detected.

  - **SOAEL – Significant Observed Adverse Effect Level:** The level above which significant adverse effects on health and quality of life occur.

  There are no numeric thresholds relating to each of the above. The NPSE acknowledges that the severity of noise impacts vary depending upon the type of noise, the type of receptor, the duration (on-time) of the noise, the characteristics of the noise, the time of day, the day of the week, etc.. As a result, the definition of what constitutes an SOAEL is somewhat flexible.

- **National Planning Policy Framework (NPPF)**

  The National Planning Policy Framework (NPPF) was first published in 2012 and sets out the government's planning policies for England and how these are expected to be applied.

  The latest revision of the NPPF (July 2021) states that planning system should **contribute to, and enhance**, the natural and local environment by (amongst others) "*preventing both new and existing development*

from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or ***noise pollution*** *or land stability*."

The express inclusion of noise in the NPPF means that it is a material planning consideration for local planning decisions.

Paragraph 123 of the NPPF document states that planning policies and decisions should aim to:

"A*. Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*

B*. Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*

C*. Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*

D*. Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

NPPF advises that decisions relating to planning applications should ensure "…*new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."*

To achieve this, new developments should *"mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life"* and should also *"identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason*."

The NPPF recognises that "…*new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed*."

- **Planning Practice Guidance on Noise (PPG)**

The National Planning Practice Guidance (PPG) is a web-based resource, launched by the Department for Communities and Local Government (DCLG) in March 2014 to support the NPPF and make it more accessible. It advises on how planning can manage potential noise impacts in new development. The guidance is regularly reviewed and updated and noise is listed as a specific category. The guidance is for ad hoc developments, as major infrastructure is covered by overarching National Policy Statements.

PPG provides the following tabulated summary of the effects of noise exposure (in terms of health and quality of life) associated with noise generating and sensitive developments.

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Assessment Guides

- **ProPG: Planning & Noise**

ProPG: Planning & Noise 'Professional Practice Guidance on Planning & Noise' was issued in May 2017 with the primary goal of assisting the delivery of sustainable residential development by promoting good health and well-being through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise.

It is applicable to noise from existing transport sources (noting that good professional practice should have regard to any reasonably foreseeable changes in existing and/or new sources of noise). The recommended approach is also considered suitable where some industrial or commercial noise contributes to the acoustic environment provided that is "not dominant".

ProPG advocates a systematic, proportionate, risk based, 2-stage, approach. The approach encourages early consideration of noise issues, facilitates straightforward accelerated decision making for lower risk sites, and assists proper consideration of noise issues where the acoustic environment is challenging.

The two sequential stages of the overall approach are:

Stage 1 – an initial noise risk assessment of the proposed development site; and
Stage 2 – a systematic consideration of four key elements.

Element 1 – demonstrating a "Good Acoustic Design Process";
Element 2 – observing internal "Noise Level Guidelines";
Element 3 – undertaking an "External Amenity Area Noise Assessment"; and
Element 4 – consideration of "Other Relevant Issues".

The ProPG considers suitable guidance on internal noise levels found in BS 8233 (see below) with the addition of an $L_{Amax,f}$ requirement for bedrooms at night, as below.

"*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events*."

- **BS 8233: 2014**

British Standard 8233: 2014 '*Sound insulation and noise reduction for buildings*' presents the following desirable internal ambient noise levels for dwellings based on steady external noise sources (e.g. road traffic).

Activity	Location	Desirable Internal Ambient Noise Level	
		07:00 – 23:00	23:00 – 07:00
Resting	Living Rooms	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS 8233 states that where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

For outdoor living spaces, BS 8233 states:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable and a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB LAeq,T or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."

- **World Health Organisation (WHO)**

The current WHO Environmental Noise Guidelines 2018 for the European Region supersede the 1999 Guidelines for Community Noise, although it does suggest that the 1999 values for indoor noise levels remain valid, as presented below.

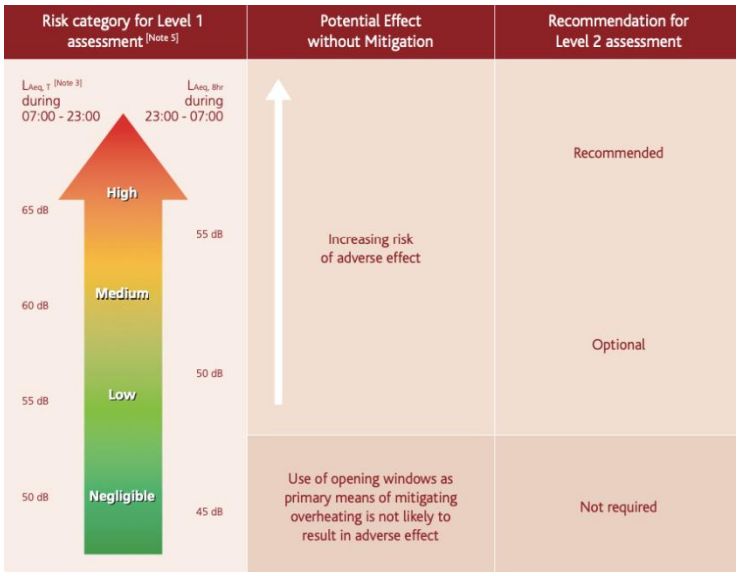
Noise Source	CNG guideline indoors all sources	ENG guideline outdoors noise from specific source only
Road traffic	35 dB $L_{Aeq,\ 16h}$	53 dB L_{den}
	30 dB $L_{Aeq,\ 8h}$	45 dB L_{night}
Railway	35 dB $L_{Aeq,\ 16h}$	54 dB L_{den}
	30 dB $L_{Aeq,\ 8h}$	44 dB L_{night}
Aircraft	35 dB $L_{Aeq,\ 16h}$	45 dB L_{den}
	30 dB $L_{Aeq,\ 8h}$	40 dB L_{night}

With regard to night-time noise "events", WHO states *"In many situations, average noise levels like the L_{den} or L_{night} indicators may not be the best to explain a particular noise effect. Single-event noise indicators – such as the maximum sound pressure level (L_{Amax}) and its frequency distribution – are warranted in specific situations, such as in the context of night-time railway or aircraft noise events that can clearly elicit awakenings and other physiological reactions that are mostly determined by $L_{A,max}$. Nevertheless, the assessment of the relationship between different types of single-event noise indicators and long-term health outcomes at the population level remains tentative. The guidelines therefore make no recommendations for single-event noise indicators."*

- **Acoustics, Ventilation & Overheating Residential Design Guide**

The Acoustics, Ventilation and Overheating Residential Design Guide (Version 1.1) was issued in January 2020 by the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA). This document provides guidance on the interdependence between acoustics, ventilation and overheating.

The AVO guide recommends a two-level approach to assess the potential impact of noise ingress through windows that have been opened to mitigate overheating and also noise from any mechanical services used to provide comfort cooling. The level 1 assessment relates to incident environmental noise levels across a proposed site, it is used to define "risk categories" for each building façade based on these levels. These categories are set out below:



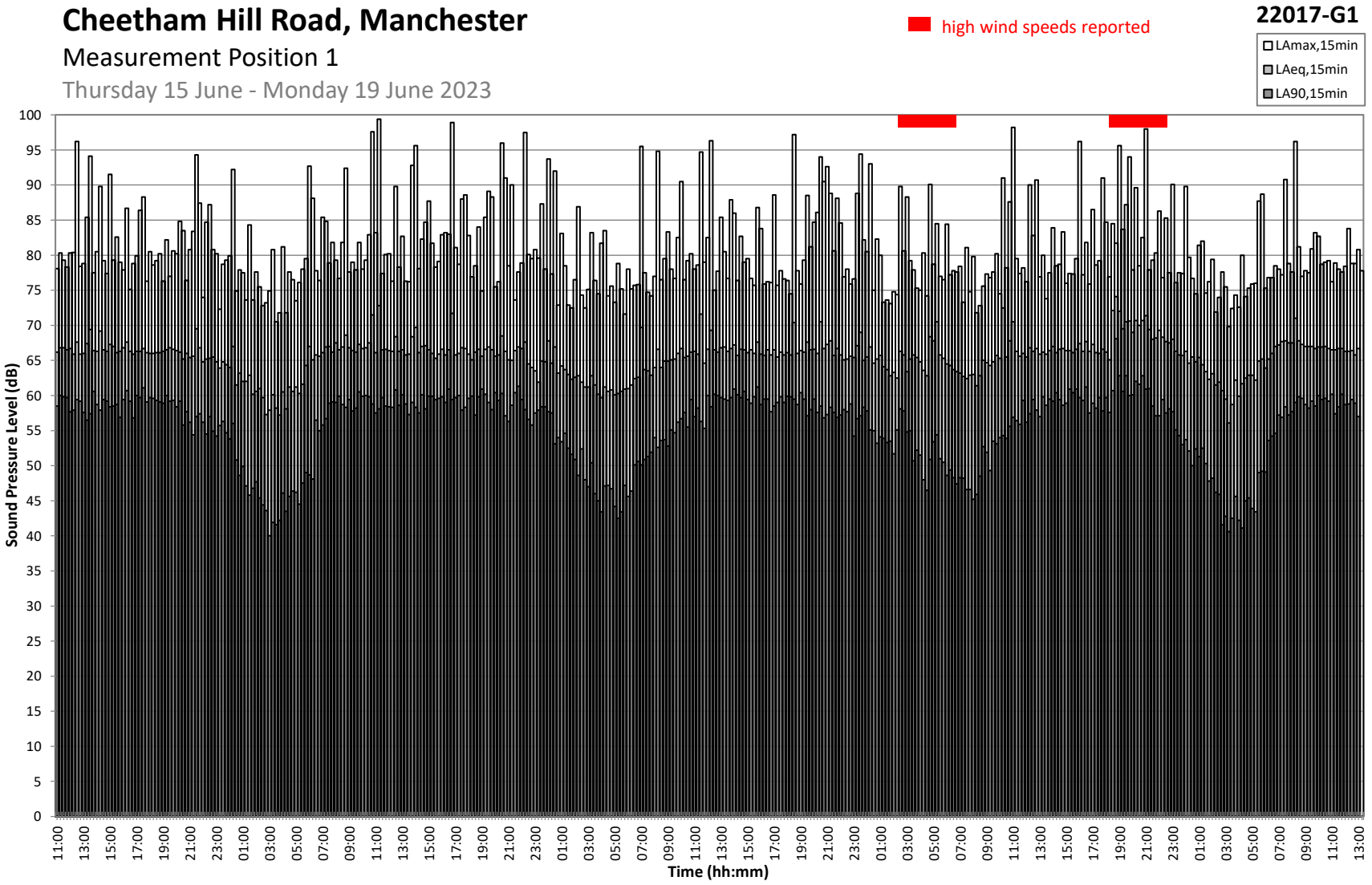
At planning stage the level of information required to undertake a level 2 assessment in-line with the AVO guide is often not available and a level 1 assessment, which establishes the risk categories of each proposed façade, would be most suitable.

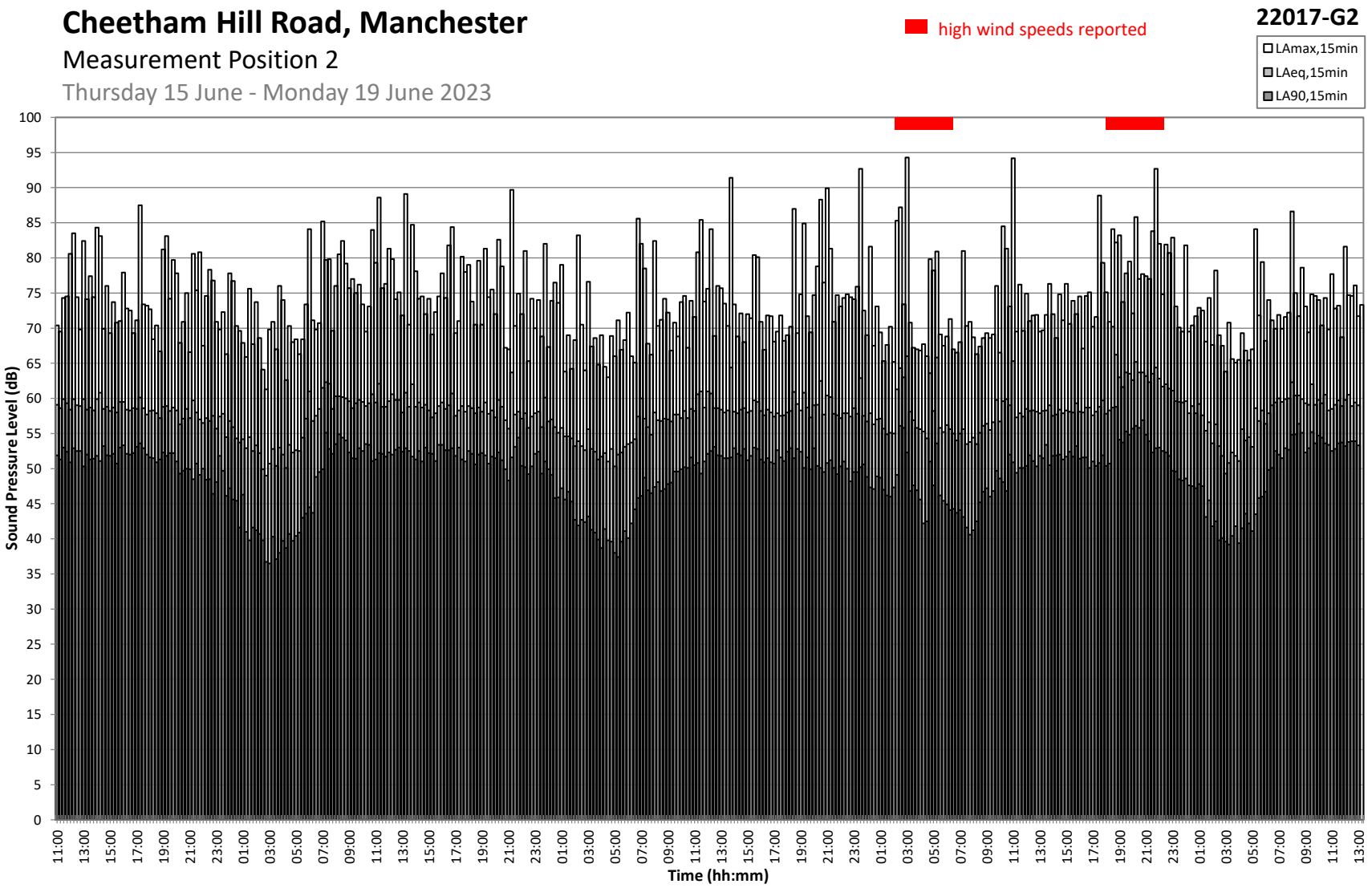
- **BS 4142:2014**

British Standard BS 4142 looks at the assessment of noise of a commercial / industrial nature. It describes methods for rating and assessing outdoor sound of an industrial and/or commercial nature "*on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident".* In relation to this development, this includes sound from fixed installations, comprising M&E plant and equipment.

The assessment method is based on the difference between the measured 'background sound level' without the influence of any industrial noise source, and the 'rating level' of the industrial source, at the receiver location. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact. A difference of around +5 dB is of marginal significance, and where the rating level does not exceed the background, this is an indication of the specific sound source having a low impact.

Appendix C – Noise Survey Time History Graphs


Cheetham Hill Road, Manchester
Measurement Position 1
Thursday 15 June - Monday 19 June 2023
high wind speeds reported
22017-G1
LAmax,15min
LAeq,15min
LA90,15min
Sound Pressure Level (dB)
Time (hh:mm)


Cheetham Hill Road, Manchester
Measurement Position 2
Thursday 15 June - Monday 19 June 2023
high wind speeds reported
22017-G2
LAmax,15min
LAeq,15min
LA90,15min
Sound Pressure Level (dB)
Time (hh:mm)

APPENDIX 11

Technical Note

Date: 25 August 2023

Project: Land off Cheetham Hill Road, Manchester

Title: Transport Statement Scoping Report

1. Introduction

Background

1.1 This Transport Statement Scoping Report has been prepared to set out the proposed method of assessing a residential development on a site off Cheetham Hill Road to the north of Manchester City Centre. The Transport Statement Scoping Report also sets out a preliminary impact assessment to aid discussions with the Local Highway Authority, Manchester City Council (MCC).

1.2 The Transport Statement Scoping Report has been prepared in line with the following policy guidance:

- Department for Transport (2007), Guidance on Transport Assessment
- Chartered Institution of Highways & Transportation (2019), Better planning, better transport, better places
- Ministry of Housing, Communities & Local Government (2016), Planning Practice Guidance
- Ministry of Housing, Communities & Local Government (2021), National Planning Policy Framework
- Manchester City Council (2007), The Guide to Development in Manchester SPD
- Manchester City Council (2012), Core Strategy
- Manchester City Council (2016), Residential Quality Guidance
- Manchester City Council (2018), Great Ducie Street SRF
- Transport for Greater Manchester (2013), Transport for Sustainable Communities
- TRICS (2022), TRICS Good Practice Guidance

Development Proposal

1.3 The current ground floor layout is attached as Appendix A.

1.4 The planning application seeks consent for the development of 263 apartments and 85sqm of ground floor commercial space.

1.5 The main entrance to the building will be on Cheetham Hill Road with secondary entrances to the bin store provided on Carnarvon Street and to the cycle stores on the southern boundary.

1.6 The footway bounding the site will be resurfaced and redundant accesses closed and reinstated. Dropped kerbs are provided at the junctions of Carnarvon Street / Cheetham Hill Road and Carnarvon Street / Gibson Place, but tactile paving is missing. The applicant will fund the introduction of tactile paving at these locations.

1.7 Cycle parking will be provided within the building at a rate of 1 space per unit. 50% of the cycle parking will be provided in the ground floor store and 50% will be accommodated in apartments.

1.8 Most of the cycle parking in the store will be in a racking system and separate parking is provided to accommodate adapted bikes (a sheffield stand). A cycle cleaning area is also provided in the cycle store.

1.9 The site is car free. The Council's parking policy allows Blue Badge holders to park for free and unlimited duration in street parking bays across the city. The site relates well to existing parking bays where disabled residents could park. The proposal will provide two disabled white lined spaces on Carnarvon Street. The applicant will fund the modifications required to the existing Traffic Regulation Orders (TRO) to accommodate these spaces.

1.10 There is an opportunity to also provide a white lined bay for use by a car club vehicle on Carnarvon Street as part of the TRO proposal.

1.11 A white lined loading bay will be provided on Carnarvon Street for use by delivery and refuse vehicles. The applicant will fund the modifications required to the TRO to facilitate the loading bay.

1.12 The proposed TRO modifications and footway works are shown in Appendix A.

1.13 The development will be supported by a Travel Plan.

2. Baseline Context

Site Location

2.1 Figure 2.1 shows that the location of the site. The site sits on the northern edge of the city centre within the Great Ducie Street Strategic Regeneration Framework (SRF) area. The SRF[1] states that:

> "Notwithstanding the above, the site's location immediately at the edge of Manchester city centre adjacent to Victoria Station and the Manchester Arena, positions the SRF area as an outstanding opportunity to further support the positive growth trajectory of Manchester that has been established in recent years…
> …As available land within the traditional city centre is filled, a significant amount of recent growth and neighbourhood regeneration has been taking place within adjoining areas. The SRF area is an important opportunity in this regard, underpinned by the fact that it shares many of the city centre's locational advantages in terms of employment opportunities, accessibility to the local, regional, and national network of public transport and the lifestyle attraction of the city centre's leisure and cultural uses."

2.2 The site is bounded by Carnarvon Street to the north, Cheetham Hill Road to the east, Gibson Place to the west, and commercial properties to the south.

Baseline Site Use

2.3 Planning consent was granted at Appeal in 2018 for the development of a 147-bedroom hotel on the site. It is understood that this consent has now lapsed.

2.4 The site use, prior to this consent was for vehicle services, was a car sales / servicing facility. With the lapse of the consented use, the historic use could be brought back in to use at the site. The historic permitted use of the site is therefore the baseline against which the impact of the development will be assessed.

2.5 Vehicle access to the site is provided from two locations on Cheetham Hill Road and one location on Carnarvon Street.

Highway Network Audit

2.6 Carnarvon Street routes east-west along the northern boundary of the site, providing access from Cheetham Hill Road to commercial uses to the west of the site and also providing a route through to the A56 Great Ducie Street. Carnarvon Street is a single carriageway road with footways on both sides of the carriageway. The road is subject to a 30mph speed limit and street lighting is present.

2.7 At its eastern end Carnarvon Street meets Cheetham Hill Road at a priority junction arrangement. Dropped kerbs are present at the junction, but tactile paving is not.

2.8 Cheetham Hill Road forms part of the Key Route Network and routes north-south on the eastern boundary of the site providing access between north Manchester and the city centre. Wide footways are provided on both sides of the carriageway and street lighting is present. The road is subject to a 30mph speed limit. Signalised crossings are provided 56m to the north of the site at the junction with Lord Street and 190m to the south of the site at the junction with New Bridge Street.

2.9 Gibson Place sites on the western boundary of the site. Gibson Place provides a service function for the commercial uses to the south of the site. On-line street information software indicates that the route does form part of the adopted highway network, and this is verified by the existing road markings and gulleys.

[1] Deloitte (2018), Great Ducie Street Strategic Regeneration Framework



Figure 2.1: Site Location
[source: Hawkins Brown]

Traffic Regulation Order Review

2.10 TRO are present on Cheetham Hill Road and in the vicinity of the site these are single line controls that prevent waiting and loading during peak periods (8am to 9.30am and 4pm to 6.30pm Monday to Friday and 8am to 9.30am Saturday).

2.11 In the vicinity of the site Carnarvon Street is subject to Traffic Regulation Orders in the form of single line controls and white lined parking bays. Waiting on the single yellow lines is prohibited between 8am and 6pm (Monday to Friday) and 8am to 12.30pm (Saturday). The white lined bays permit parking for two hours (no return in one hour) between 8am and 6pm (Monday to Friday) and 8am to 12.30pm (Saturday). White lined parking bays are in place to the east of the Carnarvon Street site access junction, to the west of the Gibson Place junction, and on the opposite side of the road to the site.

2.12 Gibson Place is subject to single line controls which prohibits waiting between 8am and 6pm (Monday to Friday) and 8am to 12.30pm (Saturday).

2.13 There are no loading controls on Carnarvon Street and Gibson Place in the vicinity of the site.

Road Safety Patterns

2.14 The TfGM (GMTU) database has been used to establish collision patterns over the most recent five-year period available. The database states that the current data is five years to 1st December 2022.

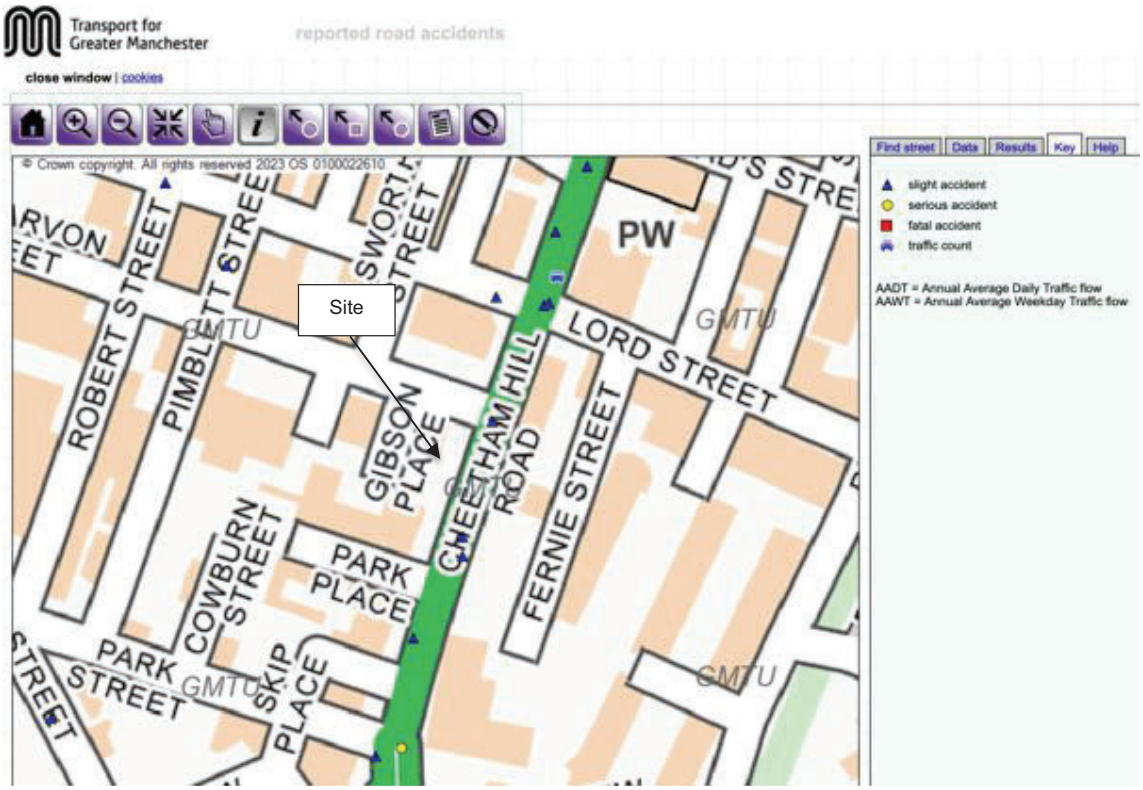


Figure 2.2: Road Safety
[source: GMTU]

2.15 Figure 2.2 shows that there have been no accidents on the Carnarvon Street frontage during the five-year period assessed.

2.16 A single accident occurred at the junction of Carnarvon Street / Cheetham Hill Road during the period assessed. The accident was classified as slight and occurred in 2020. The accident did not involve a pedestrian or cyclist.

2.17 Two accidents occurred on the Cheetham Hill Road site frontage to the south of Carnarvon Street during the period assessed. The accidents were both classified as slight and occurred in 2016 and 2018. The accident in 2018 involved a pedestrian.

2.18 The accident data does not indicate a prevalent accident issue on the roads fronting the site. The TfGM database shows that Cheetham Hill Road carries 22,126 vehicles per day and the level and severity of accidents is in keeping with what would be expected for this type of road.

3. Accessibility Assessment

Walking & Cycling Audit

3.1 There are 2m-2.3m wide footways on both sides of the Carnarvon Street carriageway. Dropped kerbs are present at the junctions with Gibson Place and Cheetham Hill Road, but tactile paving is not provided.

3.2 Cheetham Hill Road has a 3.5m wide footway adjacent to the site and 2.3m wide footway on the opposite (eastern) side. Cheetham Hill Road is the principal pedestrian route from the site to the city centre. The footways continue southbound providing a suitable width provision.

3.3 Signalised crossings are provided 56m to the north of the site at the junction with Lord Street and 190m to the south of the site at the junction with New Bridge Street. The New Bridge Street crossing is a toucan. These crossings provide a suitable means of accessing destinations on the opposite side of Cheetham Hill Road and southbound bus stops.

3.4 Carnarvon Street, and the other local roads surrounding the site, provide a suitable means of accessing the more formal routes located on highway links with more traffic, such as to the south on Cheetham Hill Road and routes on Great Ducie Street. These routes then provide a connection to the network through the city centre and the strategic routes radiating out of the city centre. The routes on the south of Cheetham Hill Road and Great Ducie Street are on-carriageway, marked facilities. Advanced cycle stop lines are also provided at the junctions to the north and south of the site at the Cheetham Hill Road junctions with Lord Street and New Bridge Street.

3.5 Figure 3.1 shows the Bee Network. This shows that a new route will be provided from Lord Street to New Islington which will improve connectivity along the north-eastern edge of the city centre.

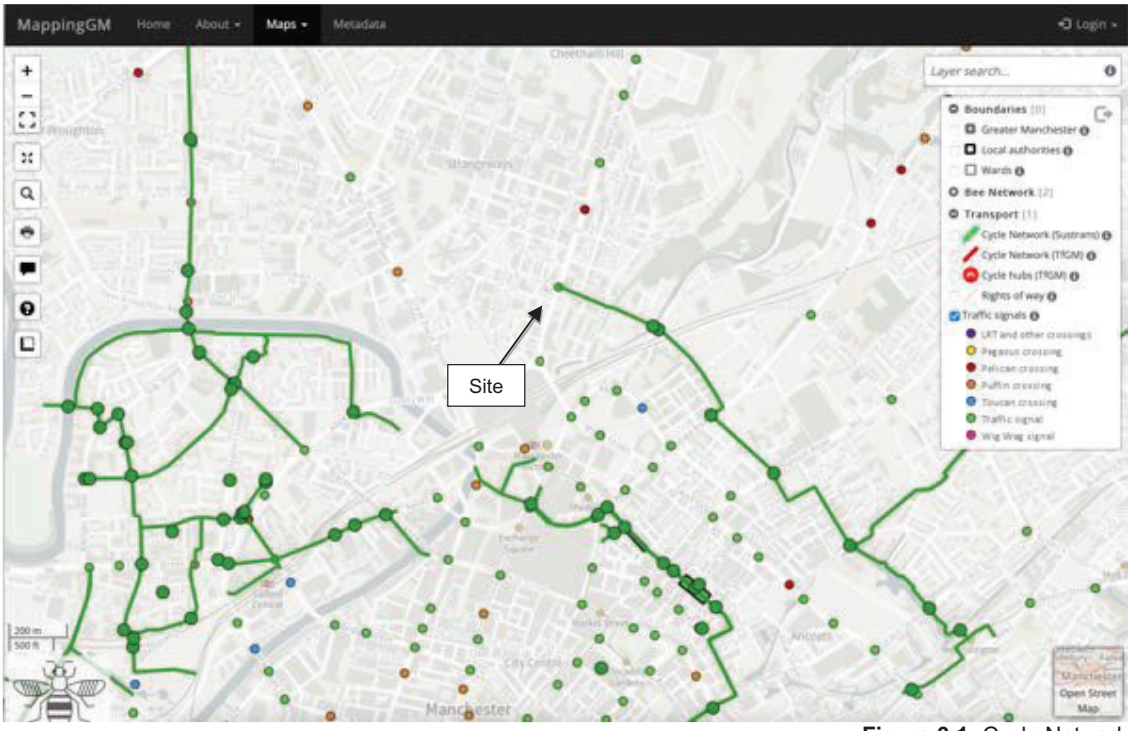


Figure 3.1: Cycle Network
[source: GM Mapping]

3.6 The existing walking and cycling infrastructure provides opportunities for active trips to / from the development to city centre destinations.

Access to Amenities Assessment

3.7 TfGM supports developments that meet 15-Minute City principles, whereby residents can access a range of services and amenities within a short walk or cycle of their home.

3.8 As would be expected, and in line with the SRF, Figure 3.2 shows that the site offers easy opportunities for access to amenities and services in the city centre.

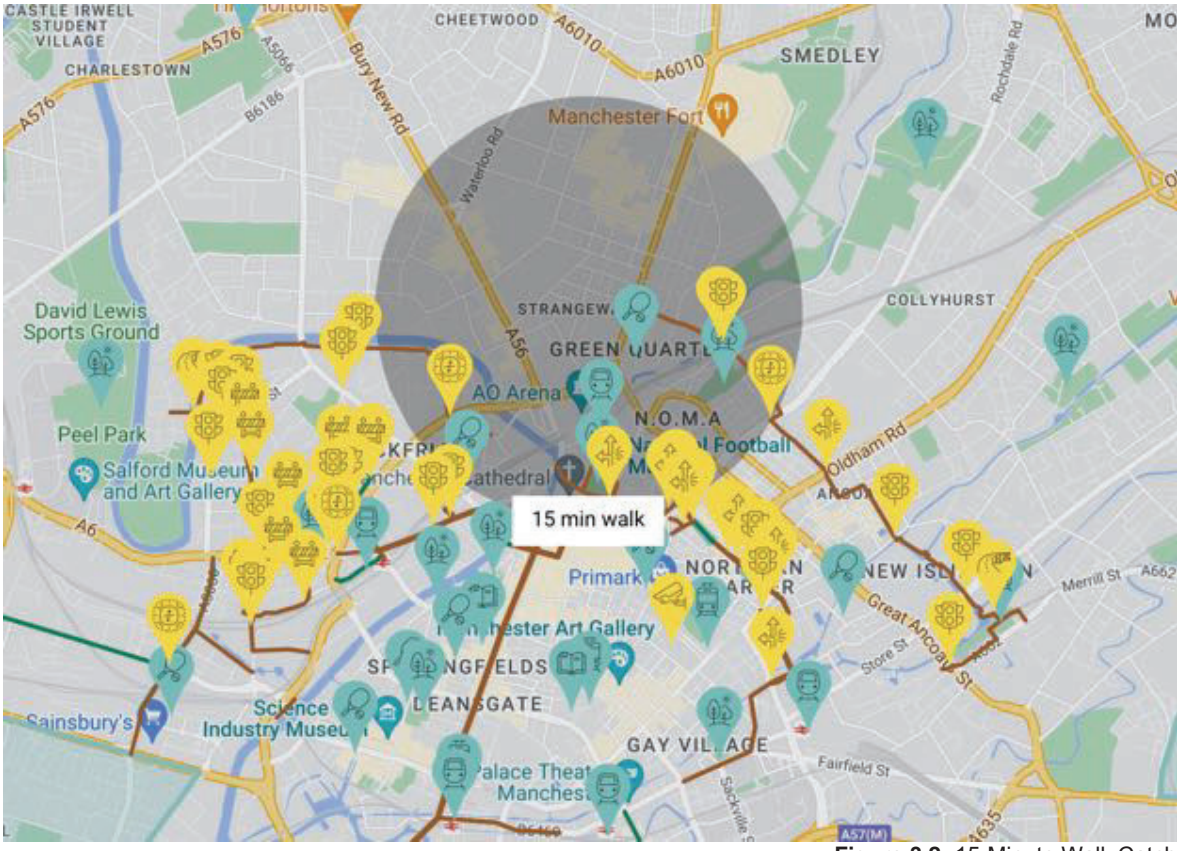


Figure 3.2: 15-Minute Walk Catch
[source: TfGM]

Public Transport Audit

3.9 The nearest bus stops to the site are located 79m to the south of the site on Cheetham Hill Road. The northbound bus stop has a shelter, flag pole, timetable information and raised bus boarder. The southbound bus stop is of recent construction and has a flag pole, timetable information and raised bus boarder. Controlled crossings are in place to allow access to services on the opposite side of the road.

3.10 Table 3.1 provides a summary of the buses serving the stops.

No.	Route	Weekday (Buses per hour / each way)			Weekend (Buses per hour / each way)	
		Peak	Day	Evening	Saturday	Sunday
41	Middleton – Bowker – City Centre – Sale	3	3	1	3	2
135	Manchester – Moston – Middleton	6	7	6	6	6

Table 3.1: Bus Services
[source: TfGM]

3.11 Table 3.1 shows that the site is served by typically 20 buses per hour on a weekday and at least 18 buses per hour at the weekend. Services are also available in the evening.

3.12 The nearest tram stops and train station to the site are located at Manchester Victoria, 600m from the site. Victoria Station is served by frequent trains and trams providing access to destinations across the Region and beyond.

3.13 The above confirms that the site is well served by existing public transport services.

Public Transport Accessibility Assessment

3.14 A Greater Manchester Accessibility Level (GMAL) assessment has been undertaken of the site. A GMAL is calculated using the interactive tool managed and maintained by TfGM. This tool measures accessibility by public transport of a point of interest and provides a score between 1 and 8, where 1 is a low level of accessibility and 8 is the highest level of accessibility.

3.15 Figure 3.3 shows that the site has a GMAL of 8, which is the highest level of accessibility in Greater Manchester.

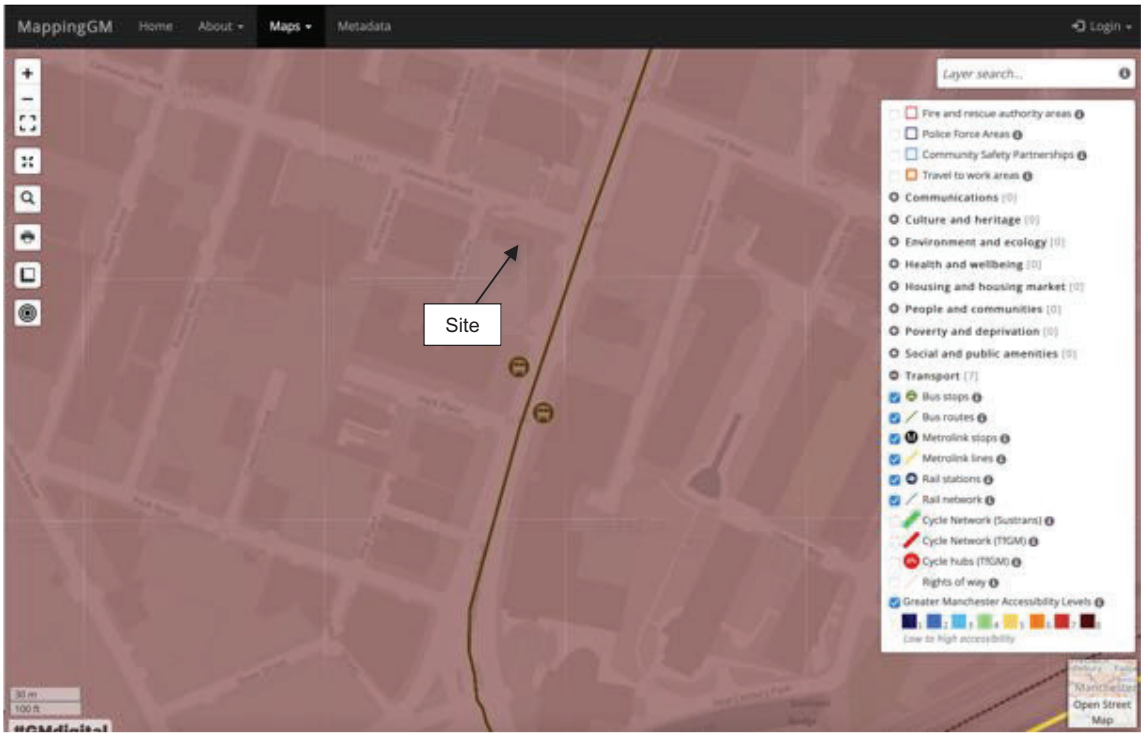


Figure 3.3: GMAL
[source: TfGM]

3.16 The assessment confirms that the proposal site has a very good level of access by public transport.

Casual Car Use

3.17 There may be occasions when residents at the site require the use of a car. Car clubs provide an alternative to car ownership that complements the sustainable transport system Greater Manchester. Car clubs enable members to benefit from pay-as-you-go low cost, convenient and greener motoring, and a more sustainable pattern of living that provides access for ad-hoc vehicle use and negates the requirement to own and store a car.

3.18 Enterprise Car Club vehicles are located across the city with the nearest vehicle to the site located on New Mount Street.

4. Impact Assessment

Trip Generation Method

4.1 The total trips generated by the proposal has been derived using the TRICS database. TRICS land use class 'Private Flats' has been used to provide a robust assessment.

4.2 In line with TRICS guidance[2] comparable sites have been derived for the forecast based on adjustments to locational and accessibility qualities, rather than regions. Section 4 of the guidance states that:

'Bearing in mind the results of our research, with hard data now being available, it is not considered good practice to exclude survey sites within the TRICS database on the sole basis of such sites being located in a specific region.'

4.3 The TRICS software now also includes a warning on the region selection page that states that:

'The TRICS Good Practice Guide provides guidance on the selection/deselection of sites by area and region. It is preferred that selection/deselection of sites is undertaken by considering various local factors, including location type, population levels, car ownership, etc, with the deselection of regions not taking place without these factors being considered. Research undertaken by TRICS investigated potential variations in trip generation by region, with the results suggesting that there were not any conclusive differences when picking out various regions and areas. Cross-region data inclusion should therefore be the norm rather than the exception, with the correct filtering of various data field criteria being of most importance.'

4.4 In line with this, no adjustment has been made to the regions in the sample. Instead, the locational parameters have been set to reflect the site's characteristics and the accessibility parameters have been set to ensure that the sample includes sites with the same or worse level of accessibility as the site.

4.5 A 2019 TRICS report[3] reviewed trends in travel behaviour over the past three decades or so and concluded that there was a consistent trend in vehicle trip reductions for residential uses that are reflected in site data held on the TRICS database. The 2021 TRICS report[4] states that changes in vehicle use is in part to do with changes in perceptions of car ownership by younger generations, reductions in driving license take-up by younger generations and are subsequently driving less than previous generations as they age, socio-economic conditions affecting travel choices with a decline in disposable income affecting travel choice, higher density living in urban centres influencing car ownership and changes in commuter patterns with more people working from home or not having a fixed work location.

4.6 In addition to the above, guidance from CIHT[5] published in 2019 states that local authorities can no longer build themselves out of congestion and that support should be given to new approaches to transport planning that do not rely heavily on historic car dominated travel patterns and 'predict and provide' methods that have ultimately led to a dominance of car infrastructure and perpetuating problems with congestion. CIHT know supports 'provide and decide' planning whereby a development is designed to deliver the types of travel choices wanted, rather than relying on historic data that will just replicate historic issues. This advice is echoed in the TRICS research report published in 2021.

4.7 The trip generation method has been developed in line with this guidance and research and seeks to reflect the transport characteristics of the development and fact that the site will appeal to residents who are less likely to own a private car.

4.8 The site provides no car parking and in terms of vehicle trips will generate traffic associated with delivery / refuse collection and taxi movements. TRICS now enables users to select sites that have specific service movement surveys, and these survey sites have been selected for the trip generation.

Trip Generation Method

4.9 The TRICS output is attached as Appendix B with a summary of the trip rates and trips provided in Tables 4.1 and 4.2

[2] TRICS (2022), TRICS Good Practice Guide 2023
[3] TRICS (2019), TRICS Guidance Note on Changes in Travel Behaviour
[4] TRICS (2021), Guidance Note
[5] Chartered Institution of Highways & Transportation (2019), Better planning, better transport, better places

	Person Trip Rates (per unit)			LGV Trip Rates (per unit)		
	In	Out	Total	In	Out	Total
AM Peak Hour	0.094	0.544	0.638	0.008	0.01	0.018
PM Peak Hour	0.408	0.198	0.606	0.011	0.004	0.015
	OGV Trip Rates (per unit)			Taxi Trip Rates (per unit)		
	In	Out	Total	In	Out	Total
AM Peak Hour	0	0	0	0.007	0.006	0.013
PM Peak Hour	0	0	0	0.005	0.005	0.01

Table 4.1: Development Trip Rates

	Person Trips			LGV Trips		
	In	Out	Total	In	Out	Total
AM Peak Hour	22	128	151	2	2	4
PM Peak Hour	96	47	143	3	1	4
	OGV Trips			Taxi Trips		
	In	Out	Total	In	Out	Total
AM Peak Hour	0	0	0	2	1	3
PM Peak Hour	0	0	0	1	1	2

Table 4.2: Development Trips

4.10 The assessment shows that the proposal will not generate a significant level of traffic in the AM and PM peak hours.

Baseline Site Traffic

4.11 The site is brownfield site which is currently not in use. While not currently in use, the permitted use of the site is for vehicle service facility, and this could be reinstated at the site and is therefore the baseline against which the development impact should be assessed. The most recent use of the site was car sales.

4.12 The TRICS output is attached as Appendix C. The car sales trip rates are based on both external and internal site areas. The total site area is 0.1268ha and this has been applied to the trip rates.

	Vehicle Trip Rates (per ha)			Base Site Use Traffic Flows		
	In	Out	Total	In	Out	Total
AM Peak Hour	62.581	22.581	85.162	8	3	11
PM Peak Hour	21.935	58.71	80.645	3	7	10

Table 4.3: Baseline Traffic Flows

4.13 When considered in the context of the baseline situation, the proposed development will not significantly change the traffic associated with the site.

Parking Assessment

4.14 The parking assessment reviews the suitability of the site to operate as car free development with no on-site car parking.

4.15 The Council does not maintain any parking standards for residential developments and each site is taken on its own merits. However, Policy T2 of the Core Strategy[6] states that developments in the city centre should:

"… provide a level of car parking which reflects the highly accessible nature of the location."

4.16 The SRF[7] states that the parking requirements for development in the area will be assessed on a plot-by-plot basis and should be assessed against the public transport accessibility of the site.

4.17 The accessibility assessment confirms that the site occupies a highly accessible location, with a GMAL of 8 (the highest level in Greater Manchester). To test whether the accessibility level is suitable for car free living a review has been made of the accessibility of other car free developments consented by the Council in similar locations in the outer areas of the city.

Site	Area	No. of Units	Site Parking Rate	GMAL
Proposal Site	**Great Ducie Street SRF**	**273**	**0%**	**8**
Boddingtons	Great Ducie Street SRF	461	0%	8
Talbot Mill	St Georges	208	0%	7
Port Street	Ancoats	135	0%	8
Crusader Works	Piccadilly	201	0%	8
Bendix Street	New Cross	161	0%	8
Oldham Street	New Cross	144	0%	8
Goulden Street	New Cross	73	0%	8

Table 4.4: Consented Car Free Schemes

4.18 Table 4.4 confirms that the site has the same level of accessibility as other consented car free developments in the outer areas of the city.

4.19 Parking is controlled by existing Traffic Regulation Orders on the streets adjacent to the site. These controls will assist in removing the practicability of a resident storing a car on-street.

5. Transport Statement Scope

5.1 The Transport Statement will include the elements set out below.

Baseline Situation

5.2 Details of the site location, review of the local highway network and TRO, baseline site uses, baseline site traffic flows, and accident data analysis.

Development Proposal

5.3 Development description.

[6] Manchester City Council (2012), Core Strategy
[7] Deloitte (2018), Great Ducie Street Regeneration Framework

5.4 Information on parking proposals, service / refuse access arrangements, pedestrian access arrangements and details of bounding footway treatment and modifications to TRO.

5.5 General arrangement layouts (suitable for planning stage) will be provided and swept paths, where required.

Accessibility Assessment

5.6 Walking and cycling audit to assess the existing conditions surrounding the site. Details of public transport services, car club infrastructure and GMAL assessment. Information on the measures that will be adopted at the development to support / promote active / sustainable trip making. Assessment of policy compliance.

Impact Assessment

5.7 Trip generation exercise and accordance with TRICS best practice. Residual traffic impact calculation. Suitability for car free living assessment. Details of existing parking controls and information on modifications proposed to support the development. Assessment of policy compliance.

Transport Statement Scope

5.8 In summary, the Transport Statement will include the following elements:

1) Baseline Situation
- Characteristics and location of the site
- Planning history
- Baseline site use
- Local transport network review
- Local streets parking control review
- Baseline site traffic flows
- Road safety analysis

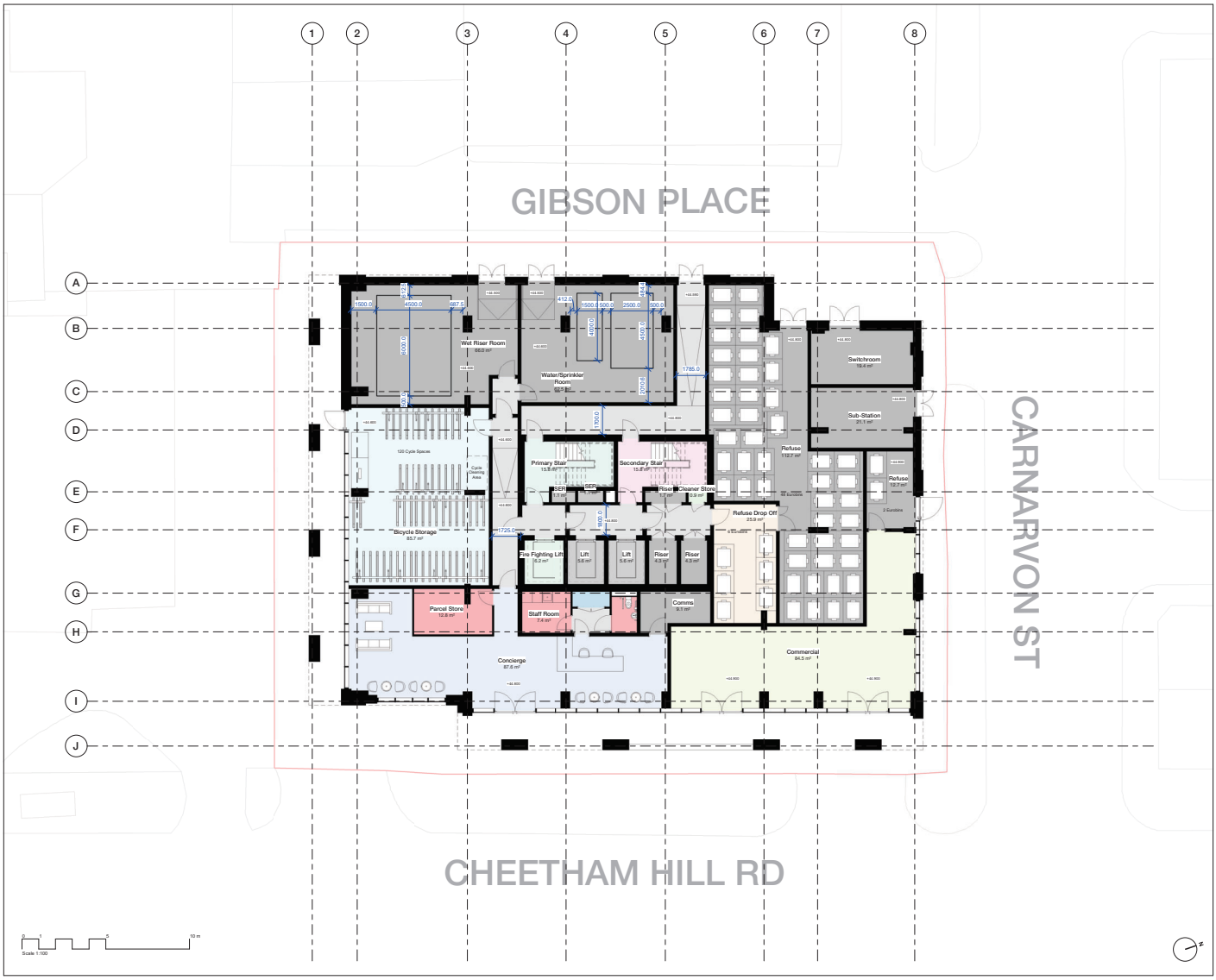
2) Proposed Development
- Pedestrian access arrangements
- Disabled parking strategy
- Cycle parking provision
- Servicing / refuse collection strategy
- Bounding footway works
- TRO modification details

3) Accessibility Assessment
- Pedestrian and cycle network audit
- Pedestrian and cyclist road safety audit
- Local amenities review
- Public transport accessibility
- Greater Manchester Accessibility Level
- Development strategy
- Policy compliance

4) Impact Assessment
- Baseline trip generation
- Development trip generation
- Net traffic impact
- Car free suitability assessment
- Policy compliance

5.9 An Interim Travel Plan will be prepared for the planning application, and this will be included as an appendix in the Transport Statement.

Appendix A



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No implied licence exists. This drawing should not be used to calculate areas for the purposes of valuation. Do not scale this drawing. All dimensions to be checked on the site by the contractor and such dimensions to be their responsibility. All work must comply with relevant British Standards and Building Regulations requirements. Drawing errors and omissions to be reported to the architect. To be read in conjunction with Architect's specification and other consultant information.

Rev	Description	Date
P01	Work in progress issue to design team	17.05.23
P02	Initial Stage 2 Costing Pack	21.06.23
P03	Work in progress issue to design team	05.07.23
P04	Work in progress issue to design team	21.07.23
P05	Issued for Design Team Coordination	18.08.23

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Hawkins\ Brown

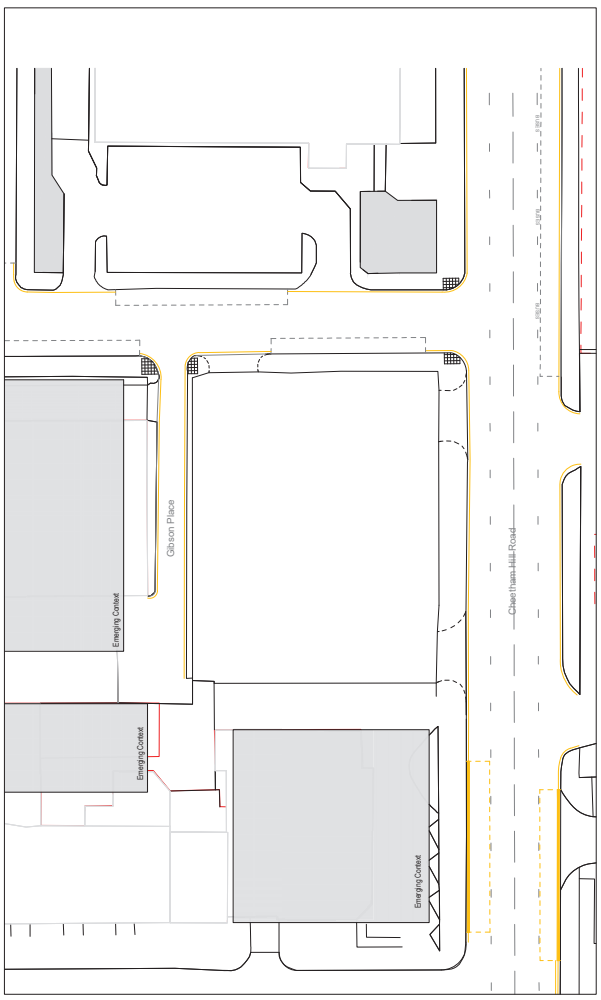
Project
33-41 Cheetham Hill Road
33-41 Cheetham Hill Road,
Manchester,
M4 4FT

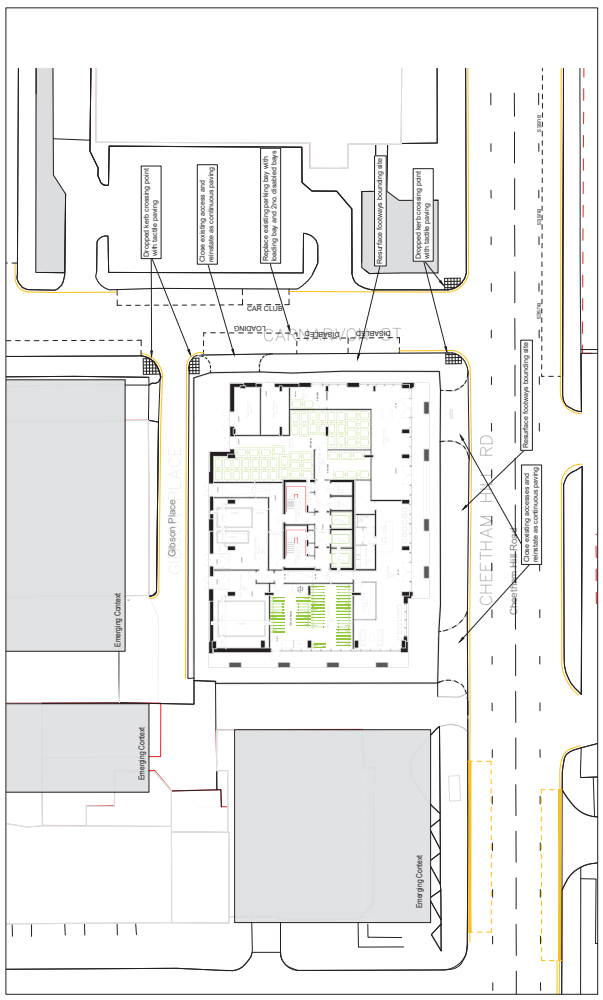
Drawing
Proposed Ground Floor Plan

Scale @ A1	Date
1 : 100	April 2023
Drawn By	Checked By
HG	NT
Job Number	Status / Purpose of Issue
230069	S1 / For Information

Drawing No.
CHR-HBA-ZZ-00-DR-A-00-0100

Rev
P05





THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

NOTES

Layout subject to detailed design and confirmation of statutory undertakers' equipment.

Revision Details	By	Check	Date	Suffix
Site layout updated	JAT	LGS	25.08.23	A

Drawing Number

SK222117-001

Cheetham Hill Rd, Manchester

Drawing Title

Existing and Proposed Waiting Restrictions & Proposed External Works

Scale at A3	
1:500	
Drawn: JAT	Approved: LGS
Check: LGS	Date: 19.07.23

SK Transport Planning Ltd
Albion Wharf | Manchester | M1 5LN
www.sktransport.co.uk
0161 234 6509

Appendix B

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : C - FLATS PRIVATELY OWNED
MULTI-MODAL TAXIS

Selected regions and areas:

01	**GREATER LONDON**		
	BE	BEXLEY	1 days
	BM	BROMLEY	1 days
	IS	ISLINGTON	1 days
	WF	WALTHAM FOREST	1 days
02	**SOUTH EAST**		
	CT	CENTRAL BEDFORDSHIRE	3 days
	HF	HERTFORDSHIRE	1 days
	PO	PORTSMOUTH	1 days

Primary Filtering selection:

Parameter: No of Dwellings
Actual Range: 62 to 190 (units:)
Range Selected by User: 50 to 493 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/00 to 20/10/22

Selected survey days:

Monday	1 days
Tuesday	5 days
Wednesday	1 days
Thursday	2 days

Selected survey types:

Manual count	9 days
Directional ATC Count	0 days

Selected Locations:

Town Centre	1
Edge of Town Centre	8

Selected Location Sub Categories:

Development Zone	1
Residential Zone	4
Built-Up Zone	3
No Sub Category	1

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	13 days - Selected
Servicing vehicles Excluded	21 days - Not Selected

Secondary Filtering selection:

Use Class:
C3 9 days

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

25,001 to 50,000	7 days
50,001 to 100,000	1 days
100,001 or More	1 days

Population within 5 miles:

50,001 to 75,000	2 days
125,001 to 250,000	1 days
250,001 to 500,000	2 days
500,001 or More	4 days

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	5 days
1.1 to 1.5	3 days

Travel Plan:

Yes	3 days
No	6 days

PTAL Rating:

No PTAL Present	5 days
3 Moderate	1 days
5 Very Good	2 days
6a Excellent	1 days

LIST OF SITES relevant to selection parameters

1 **BE-03-C-01** **BLOCKS OF FLATS** **BEXLEY**
CROOK LOG
BEXLEYHEATH

Edge of Town Centre
Residential Zone
Total No of Dwellings: 79
Survey date: WEDNESDAY *19/09/18* *Survey Type: MANUAL*

2 **BM-03-C-01** **BLOCKS OF FLATS** **BROMLEY**
RINGER'S ROAD
BROMLEY

Town Centre
Built-Up Zone
Total No of Dwellings: 160
Survey date: MONDAY *12/11/18* *Survey Type: MANUAL*

3 **CT-03-C-01** **BLOCKS OF FLATS** **CENTRAL BEDFORDSHIRE**
WING ROAD
LEIGHTON BUZZARD
LINSLADE
Edge of Town Centre
Residential Zone
Total No of Dwellings: 175
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

4 **CT-03-C-02** **BLOCKS OF FLATS** **CENTRAL BEDFORDSHIRE**
STANBRIDGE ROAD
LEIGHTON BUZZARD

Edge of Town Centre
Residential Zone
Total No of Dwellings: 62
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

5 **CT-03-C-03** **BLOCKS OF FLATS** **CENTRAL BEDFORDSHIRE**
COURT DRIVE
DUNSTABLE

Edge of Town Centre
No Sub Category
Total No of Dwellings: 146
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

6 **HF-03-C-03** **BLOCK OF FLATS** **HERTFORDSHIRE**
SHENLEY ROAD
BOREHAMWOOD

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 91
Survey date: THURSDAY *14/11/19* *Survey Type: MANUAL*

7 **IS-03-C-08** **BLOCK OF FLATS** **ISLINGTON**
CITY ROAD
ISLINGTON

Edge of Town Centre
Development Zone
Total No of Dwellings: 190
Survey date: THURSDAY *20/10/22* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

8 **PO-03-C-01** **BLOCKS OF FLATS** **PORTSMOUTH**
CROSS STREET
PORTSMOUTH

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 90
Survey date: TUESDAY *05/06/18* *Survey Type: MANUAL*

9 **WF-03-C-01** **BLOCKS OF FLATS** **WALTHAM FOREST**
ERSKINE ROAD
WALTHAMSTOW

Edge of Town Centre
Residential Zone
Total No of Dwellings: 97
Survey date: TUESDAY *05/11/19* *Survey Type: MANUAL*

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL TAXIS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	121	0.003	9	121	0.004	9	121	0.007
08:00 - 09:00	9	121	0.007	9	121	0.006	9	121	0.013
09:00 - 10:00	9	121	0.004	9	121	0.006	9	121	0.010
10:00 - 11:00	9	121	0.005	9	121	0.005	9	121	0.010
11:00 - 12:00	9	121	0.006	9	121	0.006	9	121	0.012
12:00 - 13:00	9	121	0.006	9	121	0.006	9	121	0.012
13:00 - 14:00	9	121	0.004	9	121	0.004	9	121	0.008
14:00 - 15:00	9	121	0.002	9	121	0.002	9	121	0.004
15:00 - 16:00	9	121	0.002	9	121	0.002	9	121	0.004
16:00 - 17:00	9	121	0.006	9	121	0.006	9	121	0.012
17:00 - 18:00	9	121	0.005	9	121	0.005	9	121	0.010
18:00 - 19:00	9	121	0.003	9	121	0.003	9	121	0.006
19:00 - 20:00	4	132	0.008	**4**	**132**	**0.008**	4	132	0.016
20:00 - 21:00	**4**	**132**	**0.010**	4	132	0.008	**4**	**132**	**0.018**
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.071			0.071			0.142

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL OGVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	**9**	**121**	**0.004**	**9**	**121**	**0.004**	**9**	**121**	**0.008**
08:00 - 09:00	9	121	0.000	9	121	0.000	9	121	0.000
09:00 - 10:00	9	121	0.002	9	121	0.002	9	121	0.004
10:00 - 11:00	9	121	0.001	9	121	0.000	9	121	0.001
11:00 - 12:00	9	121	0.003	9	121	0.003	9	121	0.006
12:00 - 13:00	9	121	0.000	9	121	0.001	9	121	0.001
13:00 - 14:00	9	121	0.000	9	121	0.000	9	121	0.000
14:00 - 15:00	9	121	0.002	9	121	0.002	9	121	0.004
15:00 - 16:00	9	121	0.000	9	121	0.000	9	121	0.000
16:00 - 17:00	9	121	0.000	9	121	0.000	9	121	0.000
17:00 - 18:00	9	121	0.000	9	121	0.000	9	121	0.000
18:00 - 19:00	9	121	0.000	9	121	0.000	9	121	0.000
19:00 - 20:00	4	132	0.000	4	132	0.000	4	132	0.000
20:00 - 21:00	4	132	0.000	4	132	0.000	4	132	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.012			0.012			0.024

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL TOTAL PEOPLE

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Total People to Total Vehicles ratio (all time periods and directions): 3.14

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	121	0.054	9	121	0.367	9	121	0.421
08:00 - 09:00	9	121	0.094	**9**	**121**	**0.544**	9	121	0.638
09:00 - 10:00	9	121	0.099	9	121	0.199	9	121	0.298
10:00 - 11:00	9	121	0.138	9	121	0.176	9	121	0.314
11:00 - 12:00	9	121	0.122	9	121	0.157	9	121	0.279
12:00 - 13:00	9	121	0.177	9	121	0.176	9	121	0.353
13:00 - 14:00	9	121	0.161	9	121	0.163	9	121	0.324
14:00 - 15:00	9	121	0.138	9	121	0.118	9	121	0.256
15:00 - 16:00	9	121	0.299	9	121	0.168	9	121	0.467
16:00 - 17:00	9	121	0.283	9	121	0.170	9	121	0.453
17:00 - 18:00	9	121	0.408	9	121	0.198	9	121	0.606
18:00 - 19:00	**9**	**121**	**0.466**	9	121	0.236	**9**	**121**	**0.702**
19:00 - 20:00	4	132	0.356	4	132	0.152	4	132	0.508
20:00 - 21:00	4	132	0.181	4	132	0.089	4	132	0.270
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.976			2.913			5.889

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL LGVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	121	0.003	9	121	0.009	9	121	0.012
08:00 - 09:00	9	121	0.008	9	121	0.010	9	121	0.018
09:00 - 10:00	9	121	0.010	9	121	0.005	9	121	0.015
10:00 - 11:00	9	121	0.014	9	121	0.014	9	121	0.028
11:00 - 12:00	9	121	0.014	9	121	0.016	9	121	0.030
12:00 - 13:00	**9**	**121**	**0.017**	**9**	**121**	**0.019**	**9**	**121**	**0.036**
13:00 - 14:00	9	121	0.008	9	121	0.012	9	121	0.020
14:00 - 15:00	9	121	0.005	9	121	0.005	9	121	0.010
15:00 - 16:00	9	121	0.010	9	121	0.007	9	121	0.017
16:00 - 17:00	9	121	0.014	9	121	0.015	9	121	0.029
17:00 - 18:00	9	121	0.011	9	121	0.004	9	121	0.015
18:00 - 19:00	9	121	0.004	9	121	0.003	9	121	0.007
19:00 - 20:00	4	132	0.004	4	132	0.004	4	132	0.008
20:00 - 21:00	4	132	0.002	4	132	0.002	4	132	0.004
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.124			0.125			0.249

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

MULTI-MODAL Servicing Vehicles

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	121	0.006	9	121	0.006	9	121	0.012
08:00 - 09:00	9	121	0.009	9	121	0.006	9	121	0.015
09:00 - 10:00	9	121	0.012	9	121	0.007	9	121	0.019
10:00 - 11:00	9	121	0.013	9	121	0.011	9	121	0.024
11:00 - 12:00	9	121	0.010	9	121	0.014	9	121	0.024
12:00 - 13:00	**9**	**121**	**0.016**	**9**	**121**	**0.017**	**9**	**121**	**0.033**
13:00 - 14:00	9	121	0.007	9	121	0.008	9	121	0.015
14:00 - 15:00	9	121	0.005	9	121	0.006	9	121	0.011
15:00 - 16:00	9	121	0.007	9	121	0.006	9	121	0.013
16:00 - 17:00	9	121	0.010	9	121	0.014	9	121	0.024
17:00 - 18:00	9	121	0.005	9	121	0.004	9	121	0.009
18:00 - 19:00	9	121	0.005	9	121	0.006	9	121	0.011
19:00 - 20:00	4	132	0.013	4	132	0.013	4	132	0.026
20:00 - 21:00	4	132	0.008	4	132	0.008	4	132	0.016
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.126			0.126			0.252

Appendix C

Calculation Reference: AUDIT-443201-230111-0100

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 14 - CAR SHOW ROOMS
Category : A - CAR SHOW ROOMS
TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	EX	ESSEX	1 days
04	**EAST ANGLIA**		
	CA	CAMBRIDGESHIRE	1 days
05	**EAST MIDLANDS**		
	LN	LINCOLNSHIRE	1 days
06	**WEST MIDLANDS**		
	WM	WEST MIDLANDS	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	WY	WEST YORKSHIRE	1 days

Primary Filtering selection:

Parameter: Site area
Actual Range: 0.07 to 0.50 (units: hect)
Range Selected by User: 0.06 to 2.00 (units: hect)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/00 to 25/11/19

Selected survey days:

Tuesday	1 days
Wednesday	2 days
Friday	2 days

Selected survey types:

Manual count	5 days
Directional ATC Count	0 days

Selected Locations:

Edge of Town Centre	5

Selected Location Sub Categories:

Industrial Zone	1
Residential Zone	1
Built-Up Zone	2
No Sub Category	1

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	X days - Selected
Servicing vehicles Excluded	5 days - Selected

Secondary Filtering selection:

Use Class:

Sui Generis	5 days

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

5,001 to 10,000	1 days
15,001 to 20,000	1 days
25,001 to 50,000	3 days

Population within 5 miles:

100,001 to 125,000	1 days
125,001 to 250,000	3 days
250,001 to 500,000	1 days

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	2 days
1.1 to 1.5	2 days

Travel Plan:

No	5 days

PTAL Rating:

No PTAL Present	5 days

LIST OF SITES relevant to selection parameters

1 **CA-14-A-01** **VAUXHALL** **CAMBRIDGESHIRE**
HISTON ROAD
CAMBRIDGE

Edge of Town Centre
No Sub Category
Total Site area: 0.50 hect
Survey date: FRIDAY *05/11/04* *Survey Type: MANUAL*

2 **EX-14-A-01** **FORD** **ESSEX**
109 RAINSFORD ROAD
CHELMSFORD

Edge of Town Centre
Residential Zone
Total Site area: 0.19 hect
Survey date: TUESDAY *15/10/13* *Survey Type: MANUAL*

3 **LN-14-A-02** **CAR SHOWROOM** **LINCOLNSHIRE**
GT NORTHERN TERRACE
LINCOLN

Edge of Town Centre
Industrial Zone
Total Site area: 0.07 hect
Survey date: WEDNESDAY *04/10/17* *Survey Type: MANUAL*

4 **WM-14-A-05** **EVANS HALSHAW** **WEST MIDLANDS**
HAGLEY ROAD
STOURBRIDGE

Edge of Town Centre
Built-Up Zone
Total Site area: 0.49 hect
Survey date: WEDNESDAY *29/11/17* *Survey Type: MANUAL*

5 **WY-14-A-01** **MAZDA** **WEST YORKSHIRE**
ST ANDREWS ROAD
HUDDERSFIELD

Edge of Town Centre
Built-Up Zone
Total Site area: 0.30 hect
Survey date: FRIDAY *14/03/03* *Survey Type: MANUAL*

TRIP RATE for Land Use 14 - CAR SHOW ROOMS/A - CAR SHOW ROOMS

TOTAL VEHICLES

Calculation factor: 1 hect

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	0.34	27.206	4	0.34	7.353	4	0.34	34.559
08:00 - 09:00	**5**	**0.31**	**62.581**	5	0.31	22.581	**5**	**0.31**	**85.162**
09:00 - 10:00	5	0.31	41.935	5	0.31	28.387	5	0.31	70.322
10:00 - 11:00	5	0.31	38.065	5	0.31	38.065	5	0.31	76.130
11:00 - 12:00	5	0.31	36.774	5	0.31	38.710	5	0.31	75.484
12:00 - 13:00	5	0.31	40.000	5	0.31	45.161	5	0.31	85.161
13:00 - 14:00	5	0.31	42.581	5	0.31	34.839	5	0.31	77.420
14:00 - 15:00	5	0.31	34.194	5	0.31	34.194	5	0.31	68.388
15:00 - 16:00	5	0.31	30.968	5	0.31	34.194	5	0.31	65.162
16:00 - 17:00	5	0.31	33.548	5	0.31	43.226	5	0.31	76.774
17:00 - 18:00	5	0.31	21.935	**5**	**0.31**	**58.710**	5	0.31	80.645
18:00 - 19:00	5	0.31	3.226	5	0.31	14.839	5	0.31	18.065
19:00 - 20:00	2	0.34	0.000	2	0.34	2.941	2	0.34	2.941
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			413.013			403.200			816.213

Parameter summary

Trip rate parameter range selected:	0.07 to 0.50 (units: hect)
Survey date date range:	01/01/00 - 25/11/19
Number of weekdays (Monday-Friday):	5
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

TRIP RATE for Land Use 14 - CAR SHOW ROOMS/A - CAR SHOW ROOMS

OGVS

Calculation factor: 1 hect

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	**4**	**0.34**	**3.676**	4	0.34	1.471	**4**	**0.34**	**5.147**
08:00 - 09:00	5	0.31	1.935	**5**	**0.31**	**1.935**	5	0.31	3.870
09:00 - 10:00	5	0.31	0.000	5	0.31	0.645	5	0.31	0.645
10:00 - 11:00	5	0.31	0.645	5	0.31	0.645	5	0.31	1.290
11:00 - 12:00	5	0.31	1.935	5	0.31	1.935	5	0.31	3.870
12:00 - 13:00	5	0.31	1.290	5	0.31	1.935	5	0.31	3.225
13:00 - 14:00	5	0.31	1.290	5	0.31	1.290	5	0.31	2.580
14:00 - 15:00	5	0.31	1.290	5	0.31	0.645	5	0.31	1.935
15:00 - 16:00	5	0.31	0.645	5	0.31	0.000	5	0.31	0.645
16:00 - 17:00	5	0.31	0.000	5	0.31	0.645	5	0.31	0.645
17:00 - 18:00	5	0.31	0.000	5	0.31	1.290	5	0.31	1.290
18:00 - 19:00	5	0.31	0.000	5	0.31	0.000	5	0.31	0.000
19:00 - 20:00	2	0.34	0.000	2	0.34	0.000	2	0.34	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			12.706			12.436			25.142

APPENDIX 12

renaissance
STRUCTURAL • CIVIL ENGINEERING

CHEETHAM HILL ROAD, MANCHESTER

FLOOD RISK ASSESSMENT

□ro□e□t □o□□□□□□11
□u□e □□□□
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Re□□□□□

Th□s re□ort has bee□ □re□ared for the sole be□ef t□use a□d □format□o□ of **UV Cheetham Hill Developments Ltd (UVDL)** for the □ur□oses set out □□the re□ort or □□stru□t□o□s □omm□ss□o□□g t□ The l□ab□l□t□ of **renaissance** □□res□e□t of the □□format□o□ □o□ta□□ed □□the re□ort □□ll □ot e□te□d to a□□ th□rd □art□ Th□s do□ume□t should □ot be used □□ □hole or □art b□ a□□ th□rd □art□es □t□out the e□□ress □r□tte□ □erm□ss□o□ of **renaissance**. □f a□□ u□author□sed th□rd □art□ □omes □□to □ossess□o□ of th□s re□ort□the□ rel□ o□ t□ at the□r o□□ r□s□ a□d **renaissance** do □ot o□e them a□□ Dut□ of □are.

author	**Andy Mclaughlin** **MEng (Hons)**
date	**16.06.2023**
a□□ro□ed	**Helen Gribbon** **BEng, MScArch, CEng, MIStructE**
date	**16.06.2023**

□o□ta□t Deta□ls□

Carvers Warehouse, 77 Dale Street

Manchester, M1 2HG

t: □1□1 □□□ □5□

Revision	Description	Issued by	Date	Checked
□□1	Stage □ □ssue	□ M□laughl□	1□.□□.□□□□	H Gr□bbo□
□□□	Street □umber Remo□ed	□ M□laughl□	□□.□□.□□□□	H Gr□bbo□

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1.0 INTRODUCTION

1.1 Purpose of this report

Th□s S□te□S□e□f□□ Flood R□s□ □ssessme□t □FR□□ has bee□ □re□ared for the □ro□osed de□elo□me□t at □heetham H□ll Road□Ma□□hester. The assessme□t □□□est□gates the □ote□t□al flood r□s□ □m□a□ts of the □ro□osed de□elo□me□t □□ a□□orda□□e □th the □at□o□al □la□□□□g □ol□□□ Frame□or□ □□ □□□F□ a□d su□□ort□□g □la□□□□g □ra□t□□e Gu□da□□e.

Th□s FR□ □s □o□s□dered □ro□ort□o□ate to the degree of flood r□s□ a□d to the s□ale□ □ature a□d lo□at□o□ of the de□elo□me□t. Th□s FR□ has bee□ □re□ared □□ a□□orda□□e □th □o□statutor□ te□h□□□al sta□dards for susta□□able dra□□age a□d □□□F □□mate □ha□ge allo□a□□es.

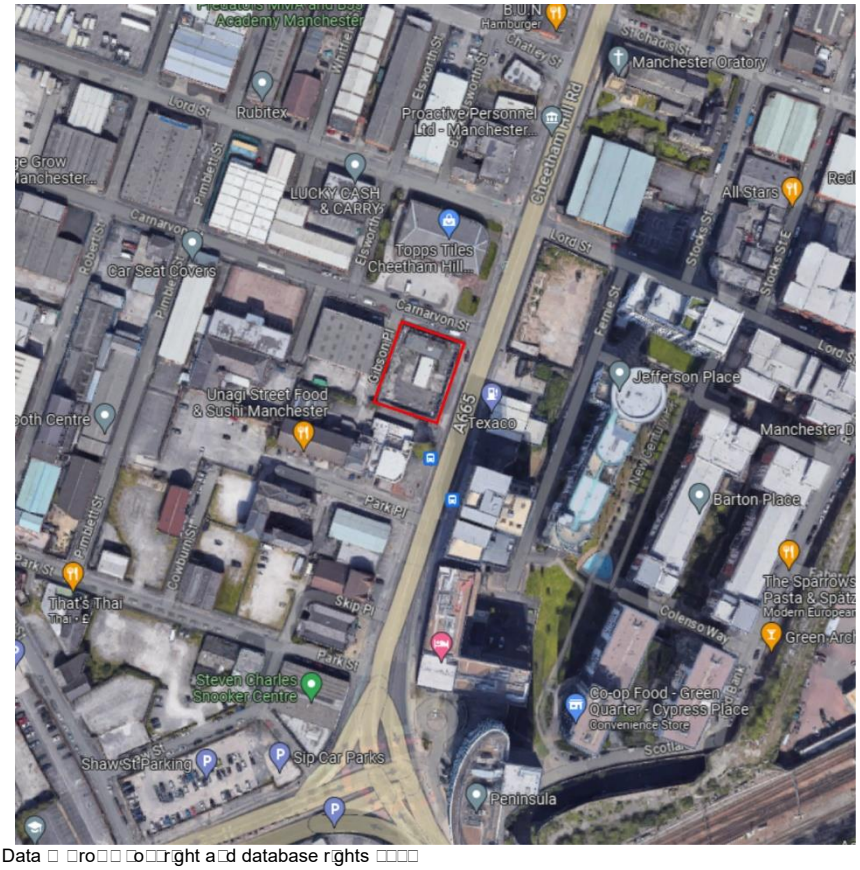
2.0 THE SITE

2.1 Site Location

The □ro□osed de□elo□me□t si□e □s bou□ded b□ G□bso□ □la□e □□ ar□ar□o□ Street a□d □heetham Hill Road. The total si□e □s lo□ated o□er a□ area of □.5□5 he□tares o□ a □re□ousl□ de□elo□ed bro□□fi□ld si□e□most re□e□tl□ used as a □ar □ash. The si□e lo□ato□ □s des□ribed belo□□

- □ □ost □ode M4 4FT
- □ OS Refere□□e □84□81□□□□41□
- □ □ato□al Gri□d Refere□□e S□84□□□4

The □ro□osed de□elo□me□t forms □art of a □□der Strateg□□ Rege□erato□ Frame□or□ □SRF□□ut for□ard b□ Ma□□hester □□t□ □ou□□□l□amed Great Du□□e Street SRF.



□o□ta□s OS Data □ □ro□□ □o□right a□d database ri□hts □□□□

Figure 2.1: Indicative Site Location

2.1 Site Description

The si□e □s □o□s□dered a bro□□fi□ld si□e as □t has bee□ h□stor□all□ de□elo□ed□□ th □re□□ous usage □o□s□st□□g of res□de□t□al hous□□g from 185□ to 1□□□ before t□as □o□□erted □□to a □etrol fi□□□g stat□□ □□FS□ The si□e has most re□e□tl□ bee□ used as a □ar □ash □th □o e□de□□e of alterat□□s to the □FS stru□tures. The o□erall area of the de□elo□me□t si□e □s a□□ro□□matel□ □.1□5 he□tares a□d □s □urre□tl□ □o□ered □th a□□ro□□matel□ □5□ hardsta□d□□g □th a small area of □egetat□□ gro□th to the □orth.

The to□ogra□h□al sur□e□ □□□□e□d□□ □□□d□□ates that the si□e □s relat□□el□ flat □th si□e□□de le□els a□□ro□□matel□ bet□ee□ 44.□□m □OD a□d 44.□□m □OD.

□□ted □t□□□es se□er re□ords □□□□e□d□□ B□□□d□□ate a □□□mm d□ameter □omb□□ed Se□er □rese□t to the □orth of the si□e □th□□ □ar□ar□o□ Street □h□□h flo□s east□ards □□to a □□□mm d□ameter □omb□□ed Se□er to the east of the si□e □th□□ □heetham Hill Road.

2.2 Existing Site Drainage

The e□st□g s□te □s □5□ □m□ermeable a□d □t □s assumed that the □re□ous de□elo□me□ts □os□t□el□ dra□ed to the lo□al □ubl□ se□er □et□or□.

□ □□T□ sur□e□ has bee□ □omm□ss□o□ed to tra□e the o□s□te dra□□age□ho□e□er□at th□s stage □t □s assumed that surfa□e □ater from the s□te □s □olle□ted b□ surfa□e □ater gull□es before d□s□harg□g □to the □□ted □t□□es Se□er □th□ □heetham H□ll Road as the s□te □as de□elo□ed □r□or to the □o□stru□t□o□ of □ar□ar□o□ Street.

2.3 Geology

□ □hase □□trus□e geote□h□□al grou□d □□est□gat□o□ has bee□ u□derta□e□ o□ the s□te b□ □ ML □Refere□□e 1□□□8G□□ ML□□□□□□□R□G□□□□□□□□dated O□tober □□□□□. The □□est□gat□o□ □□luded t□o boreholes □h□h e□te□ded u□ to 18.45m □ de□th a□d four □□do□ sam□les □th asso□ated □□ s□tu a□d laborator□ test□g.

The f□nd□gs □o□f□m the grou□d □o□d□t□□s to □om□r□se made grou□d of □ar□□g de□ths u□ to 4.8□m□ o□erl□□g gla□al t□ll de□osits of sa□d a□d s□lt□ boulder □la□s. Bedro□□ □as □ot e□□ou□tered □□ e□ther of the boreholes □h□h □o□f□ms bedro□□ □s lo□ated □18.45m belo□ e□ter□al grou□d le□el.

Br□t□sh Geolog□al Sur□e□ ma□□□g d□s□la□s that the s□te □s lo□ated o□er the □hester Format□o□ a□d bedro□□ □s h□gh□l□□el□ to be sa□dsto□e.

Refere□□e should be made to the follo□□g s□te □□est□gat□o□ do□ume□ts for further □format□o□ o□ the u□derl□□g s□te geolog□□

1□ Phase 1 Desk Study Site Investigation, ESI Environment Specialists
Ref: 61519R1. Date: March 2013.

□□ Phase 2 Intrusive Site Investigation, WML Consulting.
Ref: 10638G-WML-XX-ZZ-RP-G-0002-A. Date: October 2022

2.4 Hydrology and Hydrogeology

There are t□o □ater□ourses □earb□ the □ro□osed de□elo□me□t s□te□R□□er r□ell □s lo□ated □.55□m to the south□est of the s□te a□d R□□er r□ □s lo□ated □.□□□m to the southeast of the s□te.

Based o□ the □□ferred Geolog□□a summar□ of the □□□□ro□me□t □ge□□□ a□u□fer des□g□at□o□s are □rese□ted belo□

Stratum	Coverage	Aquifer Designation
T□ll□De□e□s□a□	Full S□te	Se□o□dar□ □□u□fer □□d□ffere□t□ated□ The □lass□f□at□o□ □s ass□g□ed □here □t □s □ot □oss□ble to attr□bute e□ther □ategor□ □ or B to the a□u□fer
Bedro□□	Full S□te	□r□□□□al □□u□fer. Th□s □s the Geolog□ of h□gh □□tergra□ular a□d/or fra□ture □ermeab□l□□ usuall□ □ro□d□□g a h□gh le□el of □ater storage a□d ma□su□□ort □ater su□□l□□□er base flo□ o□ a strateg□□ le□el

Table 2.1 –Environment agency aquifer designations of site geology

□ summar□ of the □ert□□e□t h□drogeolog□al features □□th□□ the □hase 1 Des□ Stud□ are □ro□ded belo□□

Description	Disctance (m) & Direction	Details
□earest □□t□□e Grou□d□ater □bstra□t□o□	□5□m□south□est	□
□earest □□t□□e □otable Grou□d□ater □bstra□t□o□	□5□m□south□est	□

Sour□e □rote□tio□ □o□es	□	Site l□es □th□□ o□e □ □Outer □at□hme□t□of a Sour□e □rote□tio□ □o□e a□d a □o□e 1 □□□er □at□hme□t□s lo□ated □5□m south□est of the site. Sour□e □rote□tio□ Zones are associated with the 'Nearest Active Ground Water Abstraction'

Table 2.2 –Summary of Hydrogeological features

2.5 Proposed Development

The de□elo□me□t □s referred to as □heetham H□ll Road□Ma□□hester a□d □o□s□sts of a s□□gle □□□ store□ res□de□t□al bu□ld□□g a□□ommodat□□g □r□a. □□□ □□d□□□dual a□artme□ts alo□g □th mult□□le areas of ame□□t□ s□a□e□lo□ated both at grou□d le□el □ Le□el 1□ □□th a roofto□ e□ter□al terra□e area. □ small area of □ubl□□ realm □s lo□ated arou□d the base of the □ro□osed to□er to allo□ □edestr□a□ a□□ess. Refer to □□□e□d□□ □ for □ro□osed de□elo□me□t □la□s.

3.0 SUITABILITY OF DEVELOPMENT PROPOSALS

3.1 National Planning Policy

The □ati□al □la□□□g □ol□□ Frame□or□ □□□F□ a□d the a□□om□a□□□g □la□□□g □ra□t□e Gu□da□□e □□G□a□m to e□sure that flood r□s□ is ta□e □to □o□sidera□o□ at all stages of the □la□□□g □ro□ess a□d ad□o□ates the use of a r□s□based 'Sequential Test' to preferentially lo□ate de□elo□me□t □ areas □th a lo□ r□s□ of flood□g. □here de□elo□me□t □s □e□essar□ □ h□gh r□s□ areas□the □□□F a□ms to e□sure that the de□elo□me□t □s safe □thout □□reas□g flood r□s□ through the a□□l□ca□o□ of the □□□e□to□ Test.

The □□G□def□es the le□els of flood r□s□ □□th□ □□gla□d as follo□s□

- Flood □o□e 1 □Lo□ □robab□l□t□ □La□d ha□□g less tha□ a 1 □ 1□□□ a□□ual □robab□l□t□ of r□□er or sea flood□g.
- Flood □o□e □ □Med□um □robab□l□t□ □La□d ha□□g bet□ee□ a 1 □ 1□□ a□d 1 □ 1□□□ a□□ual □robab□l□t□ of r□□er flood□g□or bet□ee□ a 1 □ □□□ a□d 1 □ 1□□□ a□□ual □robab□l□t□ of sea flood□g.
- Flood □o□e □a □H□gh □robab□l□t□ □La□d ha□□g a 1 □ 1□□ or greater a□□ual □robab□l□t□ of r□□er flood□g□or ha□□g a 1 □ □□□ or greater a□□ual □robab□l□t□ of sea flood□g.
- Flood □o□e □b □Fu□□t□□al Flood□a□ □La□d □here □ater has to flo□ or be stored □ t□mes of flood.

The □□G states that a s□te s□e f□ FR□ s re□u□red for all □e□ de□elo□me□t □ro□osals lo□ated □ Flood □o□es □ a□d □□a□d for a□□ □ro□osal of 1 he□tare or greater regardless of □ts flood □o□e classification. The flood zones as described above are shown on the Environment Agency's Flood Ma□ for □la□□□g□a□a□lable o□l□e.

Table □ of the □□G □lassf□es de□elo□me□t t□□es based o□ the□r □ul□erab□l□t□ to flood□g□ra□g□□g from 'Essential Infrastructure' which has to be operational in times of flood, through 'Highly Vulnerable' (e.g. emergency service stations), 'More Vulnerable' (e.g. residential dwellings and establishments), 'Less Vulnerable' (e.g. offices/retail), to 'Water Compatible' development (e.g. o□e□s□a□e□do□□s□mar□as a□d □har□es□.

Table □ of the PPG indicates which 'vulnerability classes' are acceptable in each of the Flood □o□es□a□d □he□ the □□□e□to□ Test should be a□□l□ed. Th□s □s re□rodu□ed as Table □.1 belo□.

3.2 Flood Risk Vulnerability

The Flood R□s□ □ul□erab□l□t□ □lassf□a□o□ has bee□ determ□ed □ a□□orda□□e □th □la□□□g □ra□t□e Gu□da□□e□Flood R□s□ a□d □oastal □ha□ge. For mult□□o□u□a□□ s□tes□the Flood R□s□ □ul□erab□l□t□ should be based u□o□ the most □ul□erable □art of the s□te. The Flood R□s□ □ul□erab□l□t□ Classification is 'More Vulnerable', which includes 'Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels'.

3.3 Flood Zone Compatibility

The Flood □o□e □om□at□b□l□t□ has bee□ re□e□ed □ a□□orda□□e □th □la□□□g □ra□t□e Gu□da□□e□ Flood R□s□ a□d □oastal □ha□ge□□aragra□h □□□.

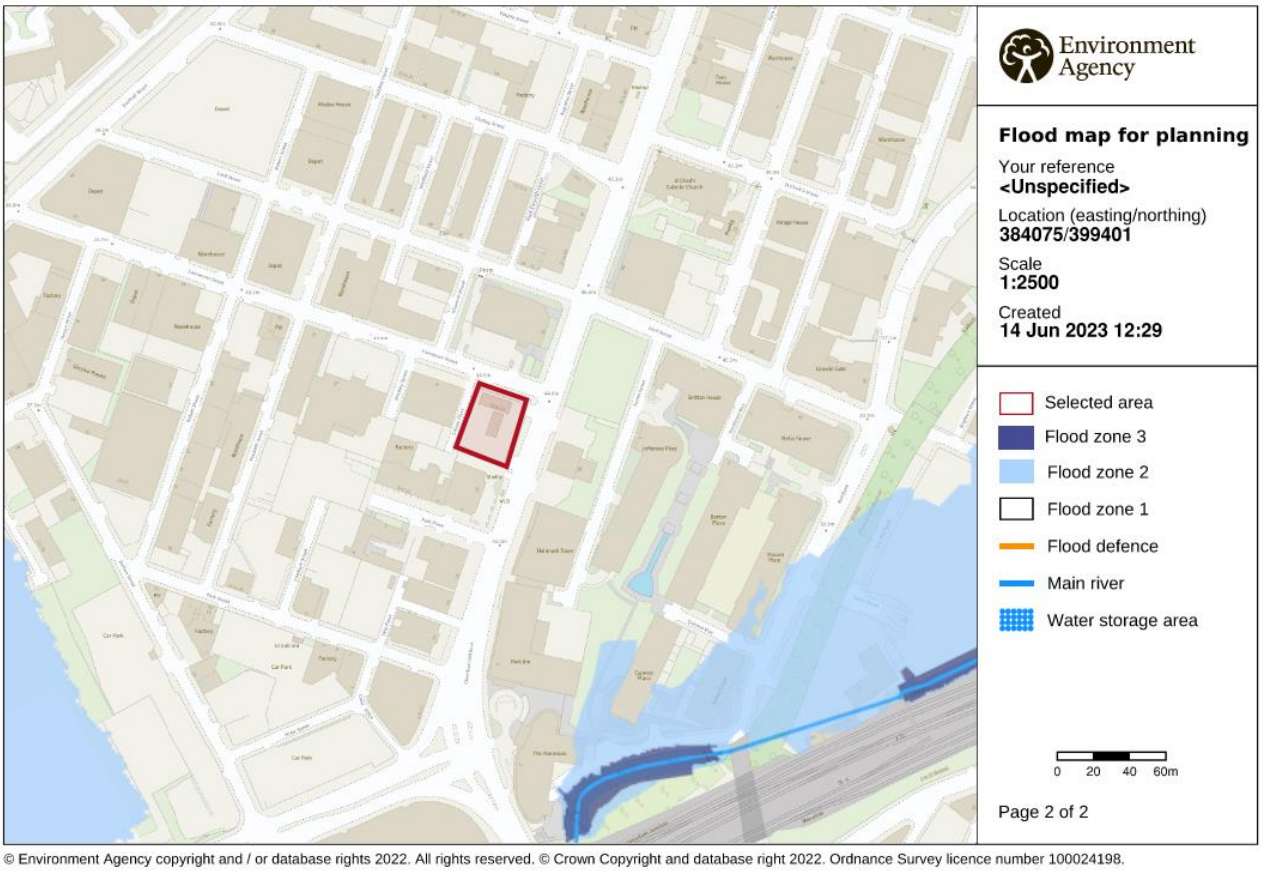
FLOOD ZONES	FLOOD RISK VULNERABILITY CLASSIFICATION				
	□sse□t□al □frastru□ture	H□ghl□ □ul□erable	More □ul□erable	Less □ul□erable	□ ater □om□at□ble
□o□e 1	✓	✓	✓	✓	✓
□o□e □	✓	□□□e□t□o□ Test Re□u□red	✓	✓	✓
□o□e □a	□□□e□t□o□ Test Re□u□red	×	□□□e□t□o□ Test Re□u□red	✓	✓
□o□e □b	□□□e□t□o□ Test Re□u□red	×	×	×	✓□

Table 3.1: Flood Risk Vulnerability and Flood Zone Compatibility Key

□e□□
✓ De□elo□me□t □s a□□ro□r□ate
✗ De□elo□me□t should □ot be □erm□tted

The above, Table 3.1, indicates which 'vulnerability classes' are acceptable in each of the Flood □o□es□a□d □he□ the □□□e□t□o□ Test should be a□□l□ed.

□□□ord□g to □□□ro□me□t □ge□□□ flood ma□s□the s□te □s lo□ated □th□ Flood □o□e 1 □Refer to Se□t□o□ □.1 for e□tra□t of ma□□. The vulnerability classification is 'More vulnerable'. Therefore, based o□ the gu□da□□e □rese□ted □ Table □.1 abo□e□the □ro□osal □s □o□s□dered to be a□□ro□r□ate □ a□□orda□□e □th □la□□□g □ra□t□e Gu□da□□e.



□o□ta□s OS Data □ □ro□□ □o□r□ght a□d database r□ghts □□□□

Figure 3.1: Environment Agency Flood Map for planning

3.4 Application of Sequential and Exception Test

The above Table 3.1 indicates which 'vulnerability classes' are acceptable in each of the Flood □o□es□a□d □he□ the □□□e□t□o□ Test should be a□□l□ed.

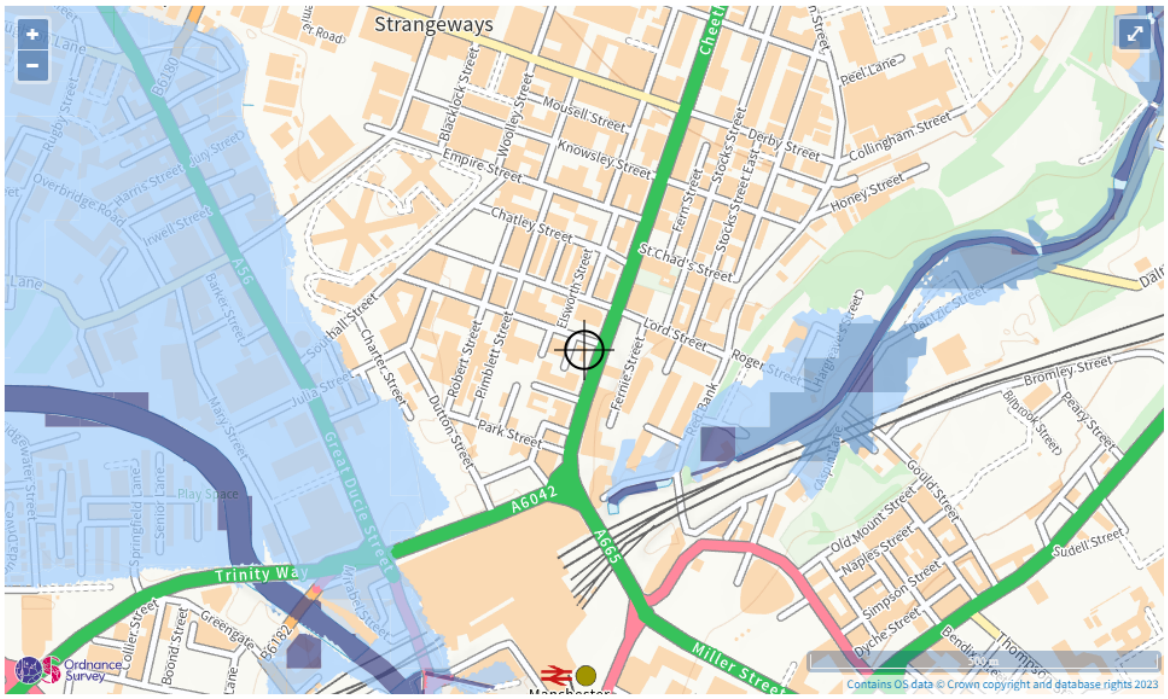
The Se□ue□t□al Test□as set out □n the □□□F□a□ms to steer de□elo□me□ts to areas □□th the lo□est r□s□ of flood□□g □□e. to steer de□elo□me□ts to Flood □o□e 1 areas □here □oss□ble□ S□□□e the □ro□osed de□elo□me□t area □s lo□ated □holl□ □□th□□ Flood □o□e 1□based o□ the gu□da□□e □rese□ted □n Table □.1 abo□e□the Se□ue□t□al Test □s deemed to ha□e bee□ □assed.

4.0 SOURCES OF FLOODING

4.1 Flood Map for Planning (Rivers and Seas)

Flu□al flood□g o□□urs □he□ h□gh flo□s e□□eed the □a□a□t□ of the r□□er □ha□□el a□d s□ll out o□to the flood□la□□usuall□ after a □er□d of □rolo□ged or hea□□ ra□fall.

The □□ Flood Ma□ for □la□□□g r□□ers a□d sea□has bee□ re□e□ed □Figure 4.1□. The s□te falls □holl□ □ th□ Flood □o□e 1. The r□s□ of flood□g from R□□ers a□d Sea a□ross the s□te □s □er□lo□. □t mea□s that ea□h □ear the la□d assessed as ha□□g a less tha□ 1 □□ 1□□□□ a□□ual □robab□l□t□ of r□□er or sea flood□g □□□.1□ □.



Extent of flooding from rivers or the sea

High Medium Low Very low Location you selected

□o□ta□s OS Data □ □ro□□ □o□□right a□d database r□ghts □□□□

Figure 4.1: Risk of flooding from Rivers and Seas

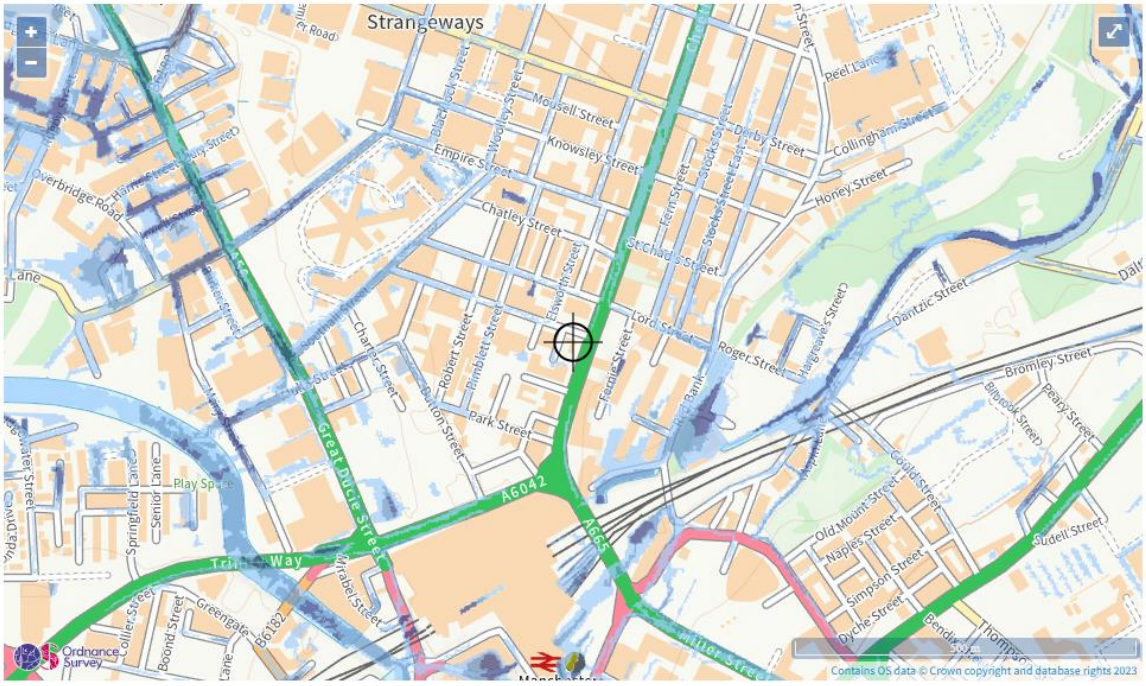
4.2 Flooding from Land (Pluvial Flooding)

The □□□ro□me□t □ge□□□ Ma□ sho□□g r□s□ of flood□g from surfa□e □ater □s □rese□ted □□ F□gure 4.□. Th□s t□□e of flood□g □a□ be d□ff□ult to □red□t□ mu□h more so tha□ r□□er or sea flood□g as t□ □s hard to fore□ast e□a□t□ □here or ho□ mu□h ra□□ □ll fall □□ a□□ storm.

□s □llustrated □□ f□gure 4.□□the s□te □s t□□□all□ at □er□lo□ □□□.1□ □r□s□ of surfa□e □ater flood□g□ ho□e□er□small areas of lo□ r□s□ e□□st o□ roads surrou□d□g the s□te.

Th□s ma□ □s □ot def□□t□□e a□d □s based o□ the best □format□o□ a□a□lable to the □□□ro□me□t □ge□□□□ su□h as grou□d le□els a□d dra□□age.

To m□t□gate a□□ r□s□ asso□□ated □ th surfa□e □ater flood□g□the bu□ld□g □s to be set ba□□ from the h□gh□a□ □ th a□□ro□r□ate falls to m□t□gate a□□ □ssues.



□o□ta□s OS Data □ □ro□□ □o□□right a□d database r□ghts □□□□

Figure 4.2: Risk of Flooding from Surface Water

4.3 Flooding from Groundwater

Grou□d□ater flood□g te□ds to o□□ur s□orad□all□ □ both lo□ato□ a□d t□me. □he□ grou□d□ater flood□g does o□□ur□t te□ds to mostl□ affe□t lo□□l□□g areas□belo□ surfa□e □frastru□ture a□d bu□d□gs □for e□am□le□ tu□□els□ baseme□ts□ a□d □ar □ar□s□ u□derla□ b□ □ermeable ro□□s □a□ufers□ Bedro□□ u□derl□□g the s□te □s a □r□□□al a□ufer ho□e□er t□ s lo□ated greater tha□ 18.45m belo□ grou□d le□el a□d o□erla□ b□ lo□ □ermeab□□t□ □la□s. The s□te □s lo□ated □ear t□o □ater□ourses□R□er r□ell □.55□m to the south□est of the s□te a□d R□er r□□ □.□□□m to the southeast of the s□te. Therefore□there □s l□m□ted □ote□t□al for a□□ de□th of grou□d□ater to a□□umulate as a□□ e□□ess grou□d□ater □s l□el□ to d□s□harge to the □earb□ □ater□ourses.

Therefore□the s□te □s □ot □o□s□dered to be at r□s□ from grou□d□ater flood□g.

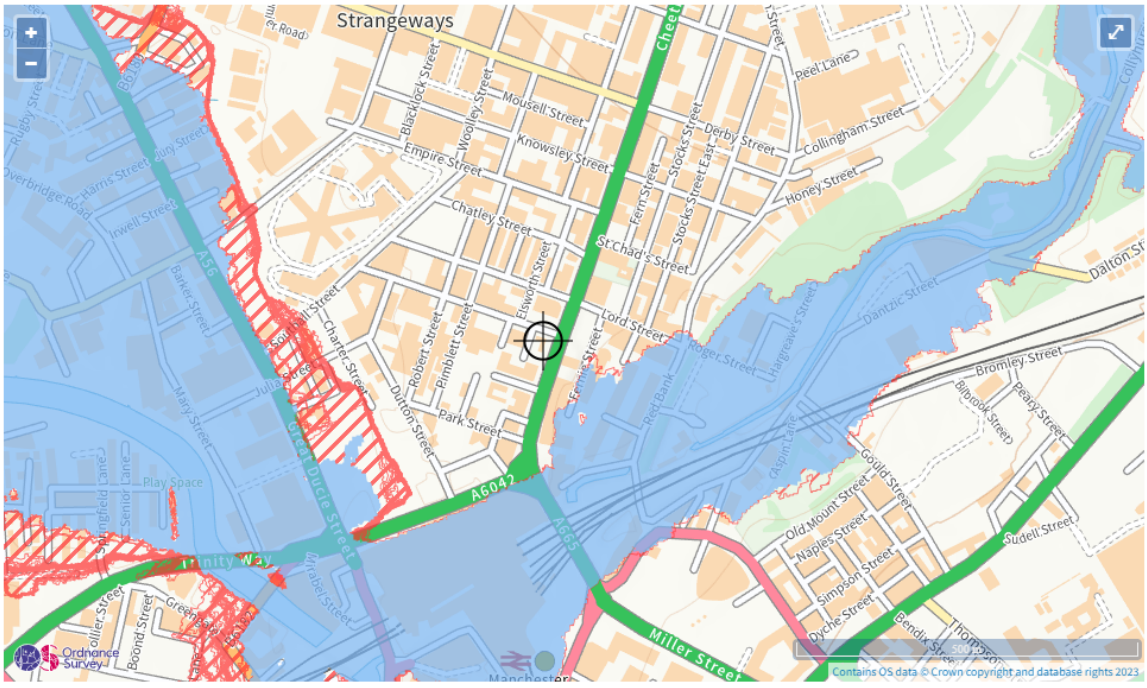
4.4 Flooding from Sewers

Se□er flood□g o□□urs □he□ urba□ dra□□age □et□or□s be□ome o□er□helmed a□d ma□□mum □a□a□t□ □s rea□hed. Th□s □a□ o□□ur □f there □s a blo□□age □□ the □et□or□ □aus□g □ater to ba□□u□ beh□nd t□or □f the sheer □olume of □ater dra□□□g □nto the s□stem □s too great to be ha□dled. Th□s t□□e of flood□g te□ds to o□□ur s□orad□all□ □ both lo□ato□ a□d t□me. The ma□or□t□ of se□ers are bu□t to the gu□del□□es □th□ Se□ers for □do□to□. These se□ers ha□e a des□g□ sta□dard to the 1 □□ □□□□ear flood e□e□t a□d therefore □t □s l□el□ that most se□er s□stems □□ll sur□harge dur□g ra□□storm e□e□ts □th a retur□ □er□od greater tha□ □□ □ears.

The de□elo□me□t □ro□osals also □□te□d to redu□e the rate of surfa□e □ater d□s□harge from the s□te a□d a□□ommodate the bala□□e of flo□s u□ to a□d □□lud□g the 1 □□ 1□□□□ear □r□□al e□e□t □lus □l□mate □ha□ge allo□a□□e. Th□s restr□□t□o□□atte□uat□o□ of flo□s a□d d□s□harge to □ater□ourse □□ll ha□e a □os□□e □m□a□t o□ the surrou□d□g e□st□g dra□□age a□d he□□e □or□ to m□t□gate the lo□g□ term r□s□ of flood□g from se□ers.

4.5 Flooding from Reservoirs

The □□□ro□me□t □ge□□□ Reser□or flood r□s□ ma□ □d□ates the s□te to be outs□de of the ma□□mum flood e□te□t of a brea□h to a□□lo□al reser□or.



Maximum extent of flooding from reservoirs:

when river levels are normal | when there is also flooding from rivers | Location you selected

□o□ta□s OS Data □ □ro□□ □o□□right a□d database r□ghts □□□□

Figure 4.3: Risk of Flooding from Reservoirs

4.6 Summary of Flooding Risks

Based o□ the abo□e re□e□ the s□te □s lo□ated □ Flood □o□e 1

The r□s□ of flood□g from flu□al□□lu□al□surfa□e □ater□grou□d□ater□se□ers a□d reser□o□s are all □o□s□dered to be lo□ or □er□lo□.

5.0 DRAINAGE STRATEGY

For deta□led Dra□age Strateg□ refer to re□assa□□e Outl□e Dra□age Strateg□ do□ume□t □□HR□ R□□□□□□□□R□□□□□□□8□ □ br□ef summar□ of the □r□□□les to be ado□ted □s □□luded belo□□

5.1 Drainage Hierarchy

□□ a□□orda□□e □th the □□□F□the follo□□g h□erar□h□ of surfa□e □ater dra□age o□t□o□s ha□e bee□ □o□s□dered□

- □ filtrat□o□ has bee□ □o□s□dered. Due to the l□m□ted s□a□e o□ ste a□a□ from ad□a□e□t bu□ld□gs or h□gh□a□s to a□□ommodate soa□a□a□s the □ote□t□al □o□tam□at□o□ r□s□ □osed b□ the □rese□□e of made grou□d o□ ste a□d the ste geolog□ □o□ss□st□g of lo□ □ermeab□l□t□ □la□s□□ filtrat□o□ has bee□ d□s□ou□ted as the □r□mar□ method of d□s□harg□g surfa□e □ater from the ste.

- O□□ortu□□t□es for d□s□harge to a □ater□ourse ha□e bee□ □o□s□dered. There are t□o □ater□ourses □th□□ 55□m of the de□elo□me□t ste. Ho□e□er □ro□d□g a □e□ dra□age □et□or□ □h□h e□te□ds to these □ater□ourses □s □ot feas□le due to the d□sta□□e a□d the de□se □o□ulat□o□ of surrou□d□g o□□u□ed s□tes. □s a result□ th□s method of d□s□harge has bee□ d□s□ou□ted.

- O□□ortu□□t□es to d□s□harge □□to a surfa□e □ater se□er ha□e bee□ □o□s□dered. The □earest surfa□e □ater se□er □s □r□□ate a□d □s o□ the o□□os□te s□de of □heetham H□ll Road□ a□□ro□matel□ 1□□m to the south of the ste. □t □s □ot feas□le for the □et□or□ to e□te□d o□er th□s d□sta□□e a□d as a result□ th□s method of d□s□harge has bee□ d□s□ou□ted.

- O□□ortu□□t□es to □o□□e□t □□to a □omb□□ed se□er ha□e bee□ □o□s□dered. T□o □omb□□ed□ □ubl□□ se□ers are □rese□t □mmed□atel□ ad□a□e□t to the ste□o□e to the □orth be□eath □ar□ar□o□ Street a□d o□e to the east be□eath □heetham H□ll Road. Both e□st□□g □ubl□□ se□ers are to be sur□e□ed as □art of the dra□age sur□e□ that has bee□ □omm□ss□o□ed to □o□f□rm the feas□l□t□ of □ro□d□g a□ outfall □o□□e□t□o□ for the □ro□osed belo□ grou□d dra□age □et□or□. Based o□ the □□ted □t□l□t□es Se□er Re□ords □□□e□d□ B□□t□s assumed that a □o□□e□t□o□ □□ll be feas□le.

Therefore□surfa□e □ater □□ll be □olle□t□d b□ a ded□□ated gra□t□ s□stem des□g□ed □□ a□□orda□□e □th BS □□ □5□ before d□s□harg□g to the □□□mm □omb□□ed □ubl□□ se□er to the □orth of the ste be□eath □ar□ar□o□ Street. The □o□□e□t□o□ □□ll be sub□e□t to a S1□□ a□□l□at□o□ □□th □□ted □t□l□t□es u□der the □ater □ndustr□ □□t.

□t□s □ro□osed that the d□s□harge rate from ste s□ l□m□ted to a ma□□mum of □.□ l/s for all storm e□e□ts u□ to the 1 □n 1□□ □ear storm □th a□ allo□a□□e for □l□mate □ha□ge. Restr□□t□g the ru□□off to th□s rate □ould result □n a □□□ betterme□t from the e□st□g ru□□off rates □h□h □om□□es □th the re□u□reme□ts outl□ned □n the □o□□Statutor□ Te□h□□al Sta□dards for Susta□nable Dra□age □oted abo□e.

The ste □□ll ha□e a ded□□ated foul □ater □et□or□ that □□ll □olle□t the foul □ater asso□□ated □th the de□elo□me□t before □omb□□□g □th the surfa□e □ater □et□or□ □n the f□□al ma□hole o□ ste a□d d□s□harg□g □□to the □□□ d□a □omb□□ed □ubl□□ se□er □th□□ □ar□ar□o□ Street to the □orth of the ste.

The □omb□□ed dra□age □o□□e□t□o□ □□ll be sub□e□t to a se□t□o□ 1□□ a□□l□at□o□ □th □□ted □t□l□t□es

The dra□age s□stem □s to be des□g□ed □□ a□□orda□□e □th Bu□ld□g Regulat□o□s □art H□BS □□ □5□ a□d □odes for □do□t□o□.

5.2 Climate change

The □ost de□elo□me□t d□s□harge rates □□ll □□lude for a□ □□□rease □n the ra□fall □□te□s□t□ of 4□□ a□d 45□ for the 1 □n □□□□ear a□d 1 □n 1□□□ear storm e□e□ts res□e□t□el□ to allo□ for □l□mate □ha□ge. Th□s □s □o□s□ste□t □th a des□g□ l□fe for the de□elo□me□t of 1□□ □ears□as outl□ned b□ the □at□o□al □la□□□g □ra□□e Frame□or□ □□□□F□

6.0 CONCLUSION

□□□ro□me□t □ge□□□ □□□□□d□at□e flood ma□□□g sho□s that the de□elo□me□t si□e □s lo□ated e□tirel□ □□th□ Flood □o□e 1□at l□ttle or □o ri□k from tidal or flu□ial flood□g a□d □s therefore su□table for all t□□es of de□elo□me□t u□der □la□□□g □ra□t□e Gu□da□□e. The si□e □s □o□sidered a□□ro□riate u□der □la□□□g □ra□t□e Gu□da□□e.

The stud□ has □□□est□gated alter□at□e me□ha□□sms for flood□g at the si□e a□d has □o□□luded that the si□e □s □ot at ri□k □ of flood□g a□d □□ll □ot □ause a□□ □□□rease □n flood ri□k else□here o□□e the □ro□osed susta□□able dra□□age s□stem □s o□erato□al.

The use of a□atte□uato□ s□stem □□ll redu□e the le□el of ru□off from the si□e □he□ □om□ared to the □re□de□elo□me□t s□e□ario.

Surfa□e □ater □□ll d□s□harge □nto the □□□ted □t□□□es □omb□□ed Se□er at a□ agreed d□s□harge rate□ sub□e□t to agreeme□t □□th the lead lo□al flood author□t□ □LLF□ □□Ma□□hester □ou□□l. □t □s □urre□t□ □ro□osed that surfa□e □ater d□s□harge rate from the si□e □□ll be restr□□ted to □.□l□s □h□□h □s a □□□ betterme□t from □re□de□elo□me□t d□s□harge rates.

Surfa□e □ater storage □□ll be □ro□ded o□ si□e□suff□□e□t to store a □olume u□ to□a□d □□□lud□□g□a 1 □□ 1□□ □ear storm □lus a□ add□to□al □□mate □ha□ge allo□a□□e □□ l□□e □□th the □□□F.

Foul a□d surfa□e □ater flo□s from the de□elo□me□t □□ll be □e□t se□arate □□th□□ the si□e bou□dar□ a□d o□l□ □omb□□ed o□e ma□hole □r□or to d□s□harg□□g □□to the e□st□g □□□ted □t□□□es □omb□□ed se□er.

□ro□ded the re□omme□dat□o□s outl□□ed □□ th□s re□ort are ado□ted □□ the de□elo□me□t □ro□osal the□ there □s the □a□a□t□ to ma□age the surfa□e □ater ru□off from the de□elo□me□t a□d □ro□de betterme□t. The □ro□osed dra□□age □nfrastru□ture has bee□ des□g□ed □□ a□□orda□□e □□th gu□da□□e outl□□ed □□ the □□□F□ □□G a□d GM□□ Strateg□□ Flood R□s□ □ssessme□t a□d therefore the de□elo□me□t □s e□tirel□ a□□ro□riate o□ th□s si□e from a flood ri□k □ers□e□t□e.

7.0 REFERENCES

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British Geological Survey – Geolog□ of Br□tish □□e□er□ htt□□□ma□a□□s.bgs.a□.u□geolog□ofbr□ta□□home.html

Long term flood risk information, htt□s□□flood□□ar□□g□□format□□.ser□□e.go□.u□lo□g□term□flood□ r□s□□ma□

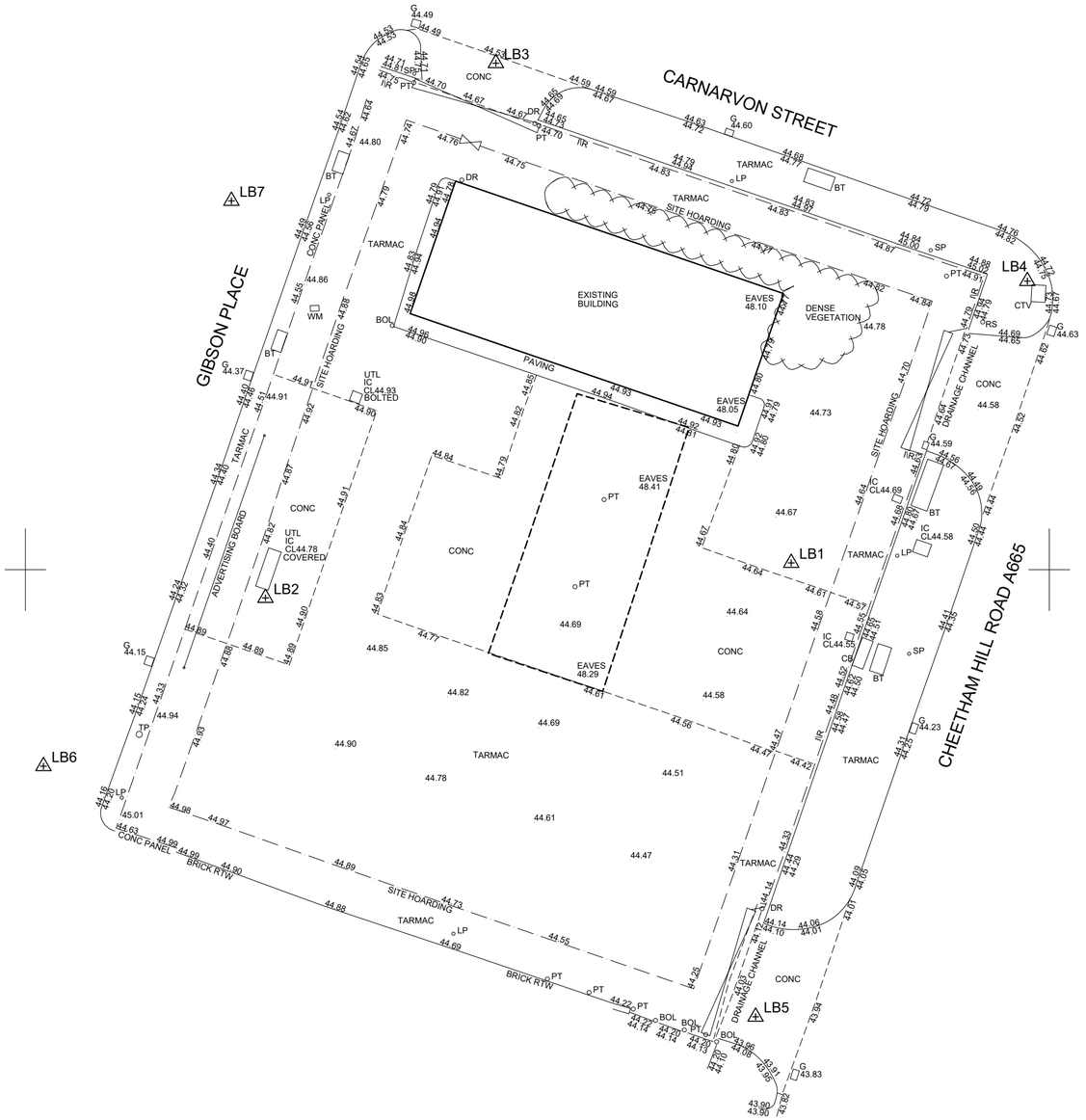
Improving the Flood Performance of New Buildings, Flood Resilient Construction, De□artme□t for □ommu□ti□s a□d Lo□al Go□er□me□t□htt□s□□□□.go□.u□flood□a□d□oastal□ero□□o□r□s□□ ma□ageme□t□resear□h□re□orts□m□ro□□g□the□flood□□erforma□□e□of□□e□□bu□ld□gs□□□flood□r□s□□ areas□□Ma□ □□□□□

Greater Manchester Combined Authority, Level 2 Hybrid Strategic Flood Risk Assessment□ htt□s□□□□.greaterma□□hester□□a.go□.u□□□hat□□e□do□la□□□g□a□d□hous□g□□la□es□for□ e□er□o□e□su□□ort□□g□ do□ume□ts□□folder□□ 5□□4□ □□Susta□able□ □□a□d□ □□Res□□e□t□ □□□la□es□fL□st□□O□tober □□□□□

Manchester, Salford, Trafford Strategic Flood Risk Assessment (2011)

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APPENDIX A
Existing Topographical Survey



SURVEY STATIONS			
Name	Easting	Northing	Height
LB1	384087.40	399400.33	44.64
LB2	384061.72	399398.62	44.81
LB3	384072.97	399424.72	44.58
LB4	384098.93	399414.09	44.80
LB5	384085.66	399378.18	43.96
LB6	384050.88	399390.41	44.14
LB7	384060.06	399418.00	44.57

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Note:

The survey is plotted on a plane local Grid. Orientation to National Grid.
All levels relate to Ordnance Datum, achieved using the OS National GPS Network.
Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SurveY OPERATIONS

Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk – www.survops.co.uk

Client
RPS Group

Drawing Title
Topographical Survey of Land at:
31-44 Cheetham Hill
Manchester

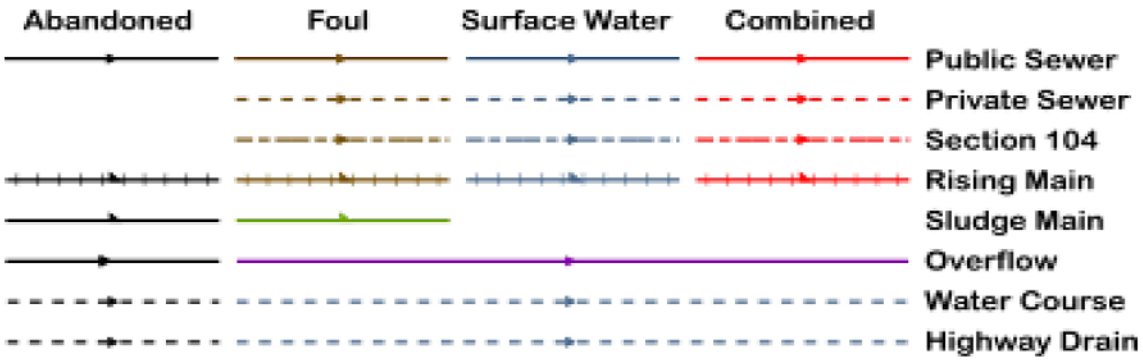
Scale(s)	1:200	Surveyor	LB
Date	AUG 22	Drawn	CD
Job Number	22F169	Checked	TP

Sheet Size & Drg Number & Revision
A2 22F169/001

APPENDIX B
United Utilities Sewer Records

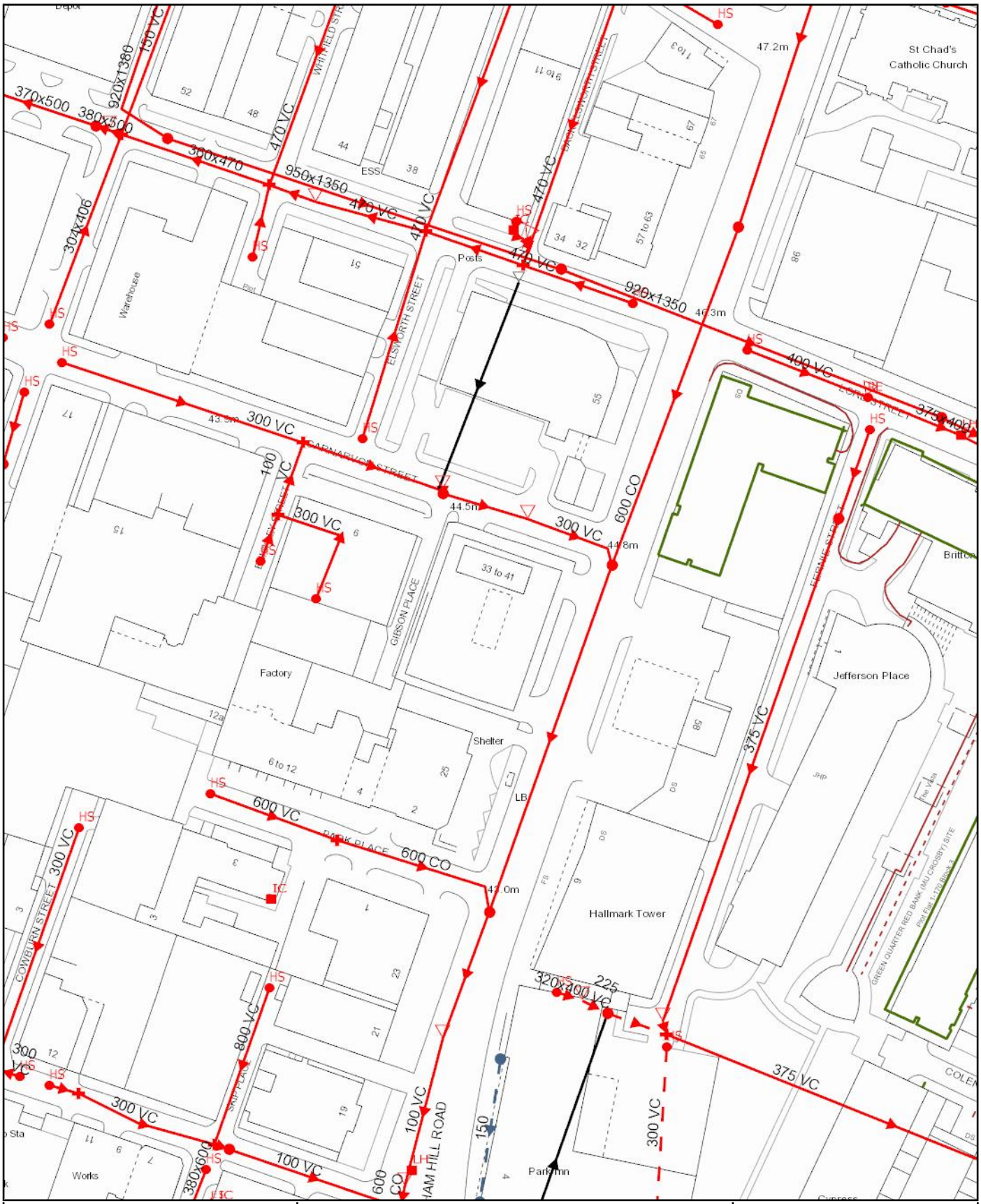
United Utilities
Water for the North West

Wastewater Symbology



All point assets follow the standard colour convention: red – combined, brown - foul, blue – surface water, purple - overflow

- Manhole
- HS Head of System
- ES Extent of Survey
- RE Rodding Eye
- IN Inlet
- DP Discharge Point
- HY Vortex
- PE Penstock
- WO Washout Chamber
- VA Valve
- AV Air Valve
- NRV Non Return Valve
- SO Soakaway
- GU Gully
- CA Cascade
- FM Flow Meter
- HA Hatch Box
- OI Oil Interceptor
- SM Summit
- DS Drop Shaft
- OP Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- IC Inspection Chamber
- Bifurcation Chamber
- LH Lamp Hole
- T Junction / Saddle
- CA Catchpit
- VC Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- ST Septic Tank
- CK Control Kiosk
- Change of Characteristic



Scale:	1:1250	**SEWER RECORDS**	United Utilities Water for the North West
Date:	28/07/2022		
Address or Site Reference:	33-41 Cheetham Hill Road Cheetham Hill Manchester M4 4FT		
Printed by:	Property Searches		

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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APPENDIX C
Proposed Development Plans

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Rev	Description	Date
P01	Work in progress issue to design team	17.05.2023
P02	Initial Stage 2 Costing Pack	09.06.2023



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Hawkins\
Brown

Project
33-41 Cheetham Hill Road
33-41 Cheetham Hill Road,
Manchester,
M4 4FT

Drawing
Proposed Ground Floor Plan

Scale @	Date
1 : 100	April 2023
Drawn By	**Checked By**
HG	NT

Job Number	Status	Purpose of Issue
230069	S1	For Information

Drawing No.
CHR-HBA-ZZ-00-DR-A-00-0100

Rev
P02

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Rev	Description	Date
P01	Work in progress issue to design team	17.05.2023
P02	Initial Stage 2 Costing Pack	09.06.2023

GIBSON PLACE

CARNARVON ST

CHEETHAM HILL RD



0 1 5 10 m
Scale 1:100

26-28 Hilton Street
Manchester M1 2EH
mail@hawkinsbrown.com
hawkinsbrown.com

Hawkins\
Brown

Project
33-41 Cheetham Hill Road
33-41 Cheetham Hill Road,
Manchester,
M4 4FT

Drawing
Proposed Level 1 (Typical to Level 16) Plan

Scale @	Date
1 : 100	April 2023
Drawn By	**Checked By**
HG	NT

Job Number	Status	Purpose of Issue
230069	S1	For Information

Drawing No.
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Rev	Description	Date
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Project
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33-41 Cheetham Hill Road,
Manchester,
M4 4FT

Drawing
Proposed Level 17 Plan

Scale @	Date
1 : 100	April 2023
Drawn By	**Checked By**
HG	NT

Job Number	Status	Purpose of Issue
230069	S1	For Information

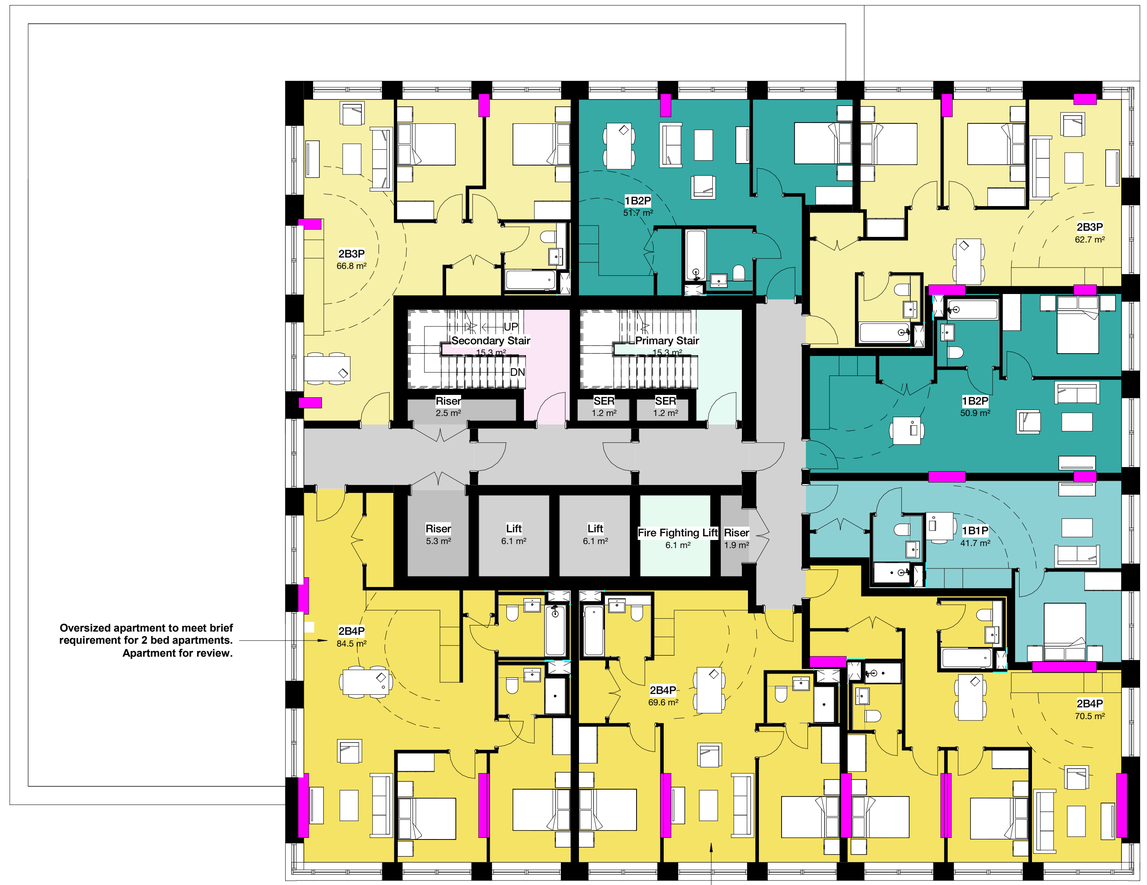
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CHR-HBA-ZZ-ZZ-DR-A-00-0117	P02

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Rev	Description	Date
P01	Work in progress issue to design team	17.05.2023
P02	Initial Stage 2 Costing Pack	09.06.2023

GIBSON PLACE

CARNARVON ST



CHEETHAM HILL RD

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Scale 1:100

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Brown

Project
33-41 Cheetham Hill Road
33-41 Cheetham Hill Road,
Manchester,
M4 4FT

Drawing
Proposed Level 18 (Typical to Level 22) Plan

Scale @	Date
1 : 100	April 2023
Drawn By	**Checked By**
HG	NT

Job Number	Status	Purpose of Issue
230069	S1	For Information

Drawing No.
CHR-HBA-ZZ-ZZ-DR-A-00-0118

Rev
P02

APPENDIX 13

33-41 Cheetham Hill Road

For

UV Cheetham Hill Developments Limited

Wind Microclimate Report

2910468rep1v1

05 July 2023

Architectural Aerodynamics Ltd.
Kemp House
160 City Road
London
United Kingdom
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Submitted by:
Joe Osman
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Issue History

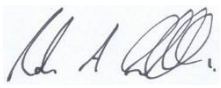
	Previous Issue			Current Issue
Comment				
Issue				1
Date				05 July 2023
Prepared by				L. Arif
Signature				
Checked by				R. Stanfield
Signature				
Report Number				2910468rep1v1

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3 Assessment Methodology 6
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5 Conclusions 10
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Executive Summary

Background

A study has been carried out by Architectural Aerodynamics Ltd. (ArcAero) to assess the wind microclimate for the proposed 33-41 Cheetham Hill Road development in Manchester, United Kingdom.

The study has employed computational modelling (CFD) to predict the strength of wind speeds that will occur following the introduction of the proposed development.

This suitability of wind conditions is determined using the widely accepted industry standard Lawson criteria to determine the suitability of wind conditions on site and the impact of the proposed development on the surrounding area.

Conclusions

The following conclusions have been drawn:

- Wind conditions within and around the existing site are predicted to meet the safety criteria for wind and comfortable for intended uses.
- Upon the introduction of proposed development
    - Conditions at ground level are suitable, in terms of pedestrian comfort and safety.
    - Within the Level 17 roof terrace, conditions generally meet the safety criteria and are substantially suitable general recreational uses from spring to autumn, and thus for a general amenity space.
    - Minor exceedances of the safety criteria occur near the southwest corner of the Level 17 terrace. Here the same localised region is also suitable for strolling at best. Further mitigation measures such as tall planting, hedges or screens can be implemented to improve the wind conditions within this region, and carefully placed, these would be expected to be effective in ensuring the suitability of the accessible parts of the terrace.
- Upon the introduction of cumulative surrounds, the overall suitability of conditions remains materially the same as that of the proposed development within existing surrounds.

1 Introduction

A microclimate is defined as the distinctive climate of a small-scale area. The weather variables in a microclimate, such as wind, may be different to the conditions prevailing over the area as a whole. Wind microclimate assessments consider the wind conditions that would result upon the introduction of a new development into an existing space.

Such assessments predict the proportion of time an area will experience wind speeds in excess of threshold values associated with safe and comfortable use by pedestrians and occupants once the development is introduced. It can therefore be shown within the various parts of a new proposal and neighbouring properties whether wind conditions are suitable or unsuitable, and whether design adjustment or mitigation measures are required. It is for this purpose that wind microclimate assessments are undertaken.

This report summarises the results of a CFD study, commissioned by UV Cheetham Hill Developments Limited, to assess the wind microclimate for the proposed Cheetham Hill Road development in Manchester, United Kingdom.

2 The Project

2.1 Site Location and Surrounding Area

The 33-41 Cheetham Hill Road development is bounded by Carnarvon Street to the north, Cheetham Hill Road to the east and Gibson Place to the west. To the south there is an existing commercial property.

Further afield, the development is largely characterised by medium to high rise developments to the east and northeast, with low-rise buildings more prevalent from southwest round to north.

2.2 The Proposed Development

The proposed development will comprise a ground plus 24 storey tower, rising to approximately 80m above the ground.

2.3 Drawing Information Describing the Proposed Development

Assessment models have been constructed on the basis of the following drawings received from Hawkins Brown Architects on 7th and 13th June 2023:

- CHR-HBA-01-ZZ-M3-A-0001.dwg
- 201610_33-41_Cheetham_Hill_Road_Manchester_Master_v2017.skp

The existing surrounding area was based upon information supplied Hawkins Browns Architects and supplemented by Ordnance Survey details for the area. Cumulative surrounds were based upon information contained within the Manchester City Council open access system.

2.4 Soft Landscaping

The wind microclimate has been assessed for the proposed development in the absence of soft landscaping proposals and surrounding landscaping.

2.5 Cumulative Schemes

A number of cumulative schemes have been considered in the assessment. These schemes are presented in tabular format in Table 2-1.

Table 2-1 – Cumulative Schemes

Development Name	Planning Reference
Former Boddingtons Brewery	132416/FO/2021
Old Brewery Gardens	118831/FO/2018
Land Bounded By Cheetham Hill Road, Lord Street & Fernie Street Manchester	113914/FO/2016

3 Assessment Methodology

3.1 Overview

CFD modelling has employed a steady-state RANS approach This method employs turbulence models to approximate the magnitude of velocity fluctuations about the average wind speeds predicted, in order to derive an estimation of the effect of gusts.

Full details on this approach are provided in Appendix A of this report - salient highlights of this approach are:

- The Shear Stress Transport k-ω turbulence model has been employed.
- Architectural features of 0.5 metres or more have been captured within the geometry modelled.
- Cell sizes of as small as 0.2 metres were utilised to capture flow behaviour in critical locations.
- The region of interest closest to the ground (1.5 metres) incorporated 5 layers of cells.

Modelling has derived mean and gust equivalent mean wind speeds, in accordance with best industry practice. In doing so 16 wind directions were assessed, in 22.5° increments.

The industry standard criteria for wind microclimate assessments, the LDDC variant of the Lawson criteria (1), has been employed for the study.

3.2 Computational Model

A digital model of the site and surrounds was used for the study. The surrounding area was modelled up to a distance of 450 m and all features which are likely to impact the wind flow to and through the site have been replicated. Details of the model, including the configurations tested, are presented within Appendix B of this report.

3.3 Wind Climate Analysis

Wind microclimate studies require that meteorological data is transposed from a nearby weather station with sufficient wind data to produce accurate wind frequency statistics. The current study uses data from Manchester International Airport.

Full details of the wind climate relevant to the site, the wind properties approaching the site and the modelling of those wind properties in the CFD models are provided in Appendix C of this report. All analysis of wind data and the atmospheric boundary layer has employed the methods of ESDU item 01008 (2), in accordance with best industry practice.

3.4 The LDDC Lawson Criteria

The industry standard criteria for such assessments are commonly referred to as the Lawson criteria. Architectural Aerodynamics use the London Docklands Development Corporation (LDDC) variant of the Lawson Criteria (1).

The LDDC variant of the Lawson criteria applies a single percentage probability of exceedance of a range of wind speeds related to different pedestrian uses.

3.4.1 Safety

A wind speed of 15 metres-per-second occurring once per year is rated as unsafe, with the potential to de-stabilise the less able members of the public including the elderly, cyclists and children.

3.4.2 Comfort

The LLDC variant of the Lawson criteria (1) dictates that wind conditions are suitable for a given activity when the threshold is exceeded no more than 5% of the time in seasons relevant to the activities that will take place in a given area. The value of 5% has been established as giving a reasonable allowance for extreme and relatively infrequent winds that are tolerable within each category. These threshold wind speed values are presented in Table 3-1.

Table 3-1 – LLDC Wind Comfort Thresholds

Threshold Wind Speed [m/s]	Comfort Rating / Activity	
4	C4	Long-term sitting
6	C3	Standing / short-term sitting
8	C2	Strolling
10	C1	Walking
> 10	C0	Uncomfortable

4 Results

4.1 Existing Site Conditions

The results for the existing site conditions are presented graphically within Figure 4.1 for safety, and Figure 4.2 and Figure 4.3 for worst-seasonal and summer comfort conditions respectively.

4.1.1 Safety

Wind conditions within and around the existing site satisfy the criteria for pedestrian safety.

4.1.2 Comfort

Wind conditions within the site and immediate surrounding areas are generally suitable for at least short-term standing or better with small pockets of strolling conditions further to the east & northeast of the site. Thus, wind conditions are comfortable for intended uses as pedestrian ingress / egress at all entrances, and comfortable throughfare use in and around the site.

4.2 Proposed Development within Existing Surrounds

The results for the proposed development within existing surrounds are presented graphically within Figure 4.4 and Figure 4.5 for safety, Figure 4.6 and Figure 4.7 for worst-seasonal comfort and Figure 4.8 and Figure 4.9 for summer comfort respectively.

4.2.1 Safety

Upon the introduction of proposed development, the wind safety criteria within the site and surrounding areas are met at ground level.

At elevated levels, a small localised exception occurs at the southwest corner of the Level 17 terrace of proposed development. This area would benefit from mitigation such as tall planting, hedges, or screens to break up the wind flow in this area.

4.2.2 Comfort

4.2.2.1 Thoroughfares

Wind conditions at thoroughfares within the site are substantially suitable for at least short-term standing or better, with some regions of strolling conditions northwest, southwest and east of proposed development. Therefore, all thoroughfares are comfortable for pedestrian access to and passage through the site.

4.2.2.2 Entrances

Wind conditions at all entrances of proposed development are suitable for short-term standing or better throughout the year, and thus comfortable for pedestrian ingress / egress.

4.2.2.3 Recreational Spaces

Wind conditions on amenity spaces of Level 17 are more exposed to southerly prevailing winds and tend to be slightly windier. This area is substantially suitable for short-term sitting from spring to autumn, with a localised region of windier conditions off towards the southwestern corner that is exposed to wind at this level. As noted in section 4.2.1, this area would benefit from mitigation such as tall planting, hedges, or screens to break up the wind flow in this area.

4.2.2.4 Surrounding Area

Within the nearby surrounding areas, wind conditions are generally suitable for short-term standing or better all year round with localised region of strolling conditions present along the Cheetham Hill Road and Carnarvon Street. The comfort criteria for a leisure throughfare use and ingress / egress at entrances continues to be met throughout the surrounding area.

4.3 Proposed Development within Cumulative Surrounds

The results for the proposed development within future surrounds are presented graphically within Figure 4.10 and Figure 4.11 for safety, Figure 4.12 and Figure 4.13 for worst-seasonal comfort and Figure 4.14 and Figure 4.15 for summer comfort respectively.

Following the introduction of cumulative surrounds, the suitability (in terms of safety and comfort) of wind conditions within the site and surrounding area remains materially the same as the proposed development in existing scenario. Correspondingly, acceptable wind conditions exist at ground level, and substantially so at the Level 17 roof terrace, though this area would benefit from further mitigation as previously described.

5 Conclusions

The following conclusions have been drawn:

- Wind conditions within and around the existing site are predicted to meet the safety criteria for wind and comfortable for intended uses.
- Upon the introduction of proposed development
    - conditions at ground level are suitable, in terms of pedestrian comfort and safety.
    - within the Level 17 roof terrace, conditions generally meet the safety criteria and are substantially suitable general recreational uses from spring to autumn, and thus for a general amenity space.
    - minor exceedances of the safety criteria occur near the southwest corner of the Level 17 terrace. Here the same localised region is also suitable for strolling at best. Further mitigation measures such as tall planting, hedges or screens can be implemented to improve the wind conditions within this region, and carefully placed, these would be expected to be effective in ensuring the suitability of the accessible parts of the terrace.
- Upon the introduction of cumulative surrounds, the overall suitability of conditions remains materially the same as that of the proposed development within existing surrounds.

6 References

1. **Lawson, T.V.** *The determination of the wind environment of a building complex before construction.* Bristol : University of Bristol, Department of Aeronautical Engineering, 1990.

2. **ESDU (Engineering Science Data Unit).** *Item 01008. Computer Program for wind speeds and turbulence properties: flat or hilly sites in terrain with roughness.* 2001.

3. **F, Menter.** *Zonal Two Equation k-ω Turbulence Models for Aerodynamic Flows.* 1993. AIAA Paper 93-2906.

4. **F, Menter.** *Turbulence Modelling for Engineering Flows.* s.l. : ANSYS Inc., 2011.

5. **Richards, P.J. and Hoxey, R.P.** *Appropriate boundary conditions for computational wind engineering models using the k-ε turbulence model.* s.l. : Journal of Wind Engineering and Industrial Aerodynamics, 1993. vol. 46 & 47, pg. 145 - 153.

6. **Blocken, B. and Carmeliiet, J.** *Pedestrian wind environment around buildings: Literature review and practical examples.* s.l. : Journal of Thermal Envelope and Building Science, 2004.

7 Figures

Figure 4.1 – Pedestrian wind conditions, existing site within existing surrounds, annual safety

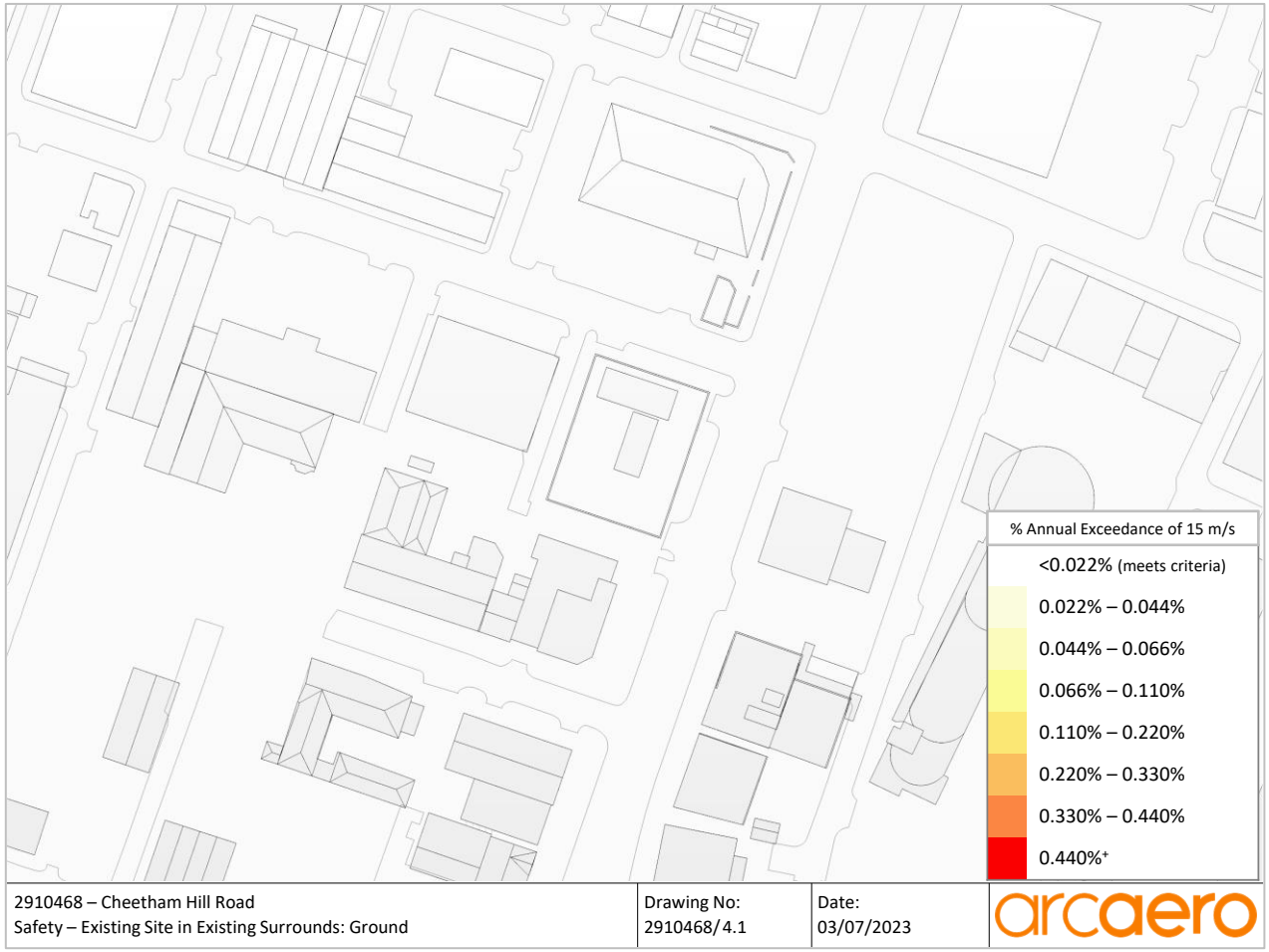


Figure 4.2 - Pedestrian wind conditions, existing site within existing surrounds, worst case season



Figure 4.3 – Pedestrian wind conditions, existing site within existing surrounds, summer season



Figure 4.4 – Pedestrian wind conditions, proposed development within existing surrounds, annual safety – ground level

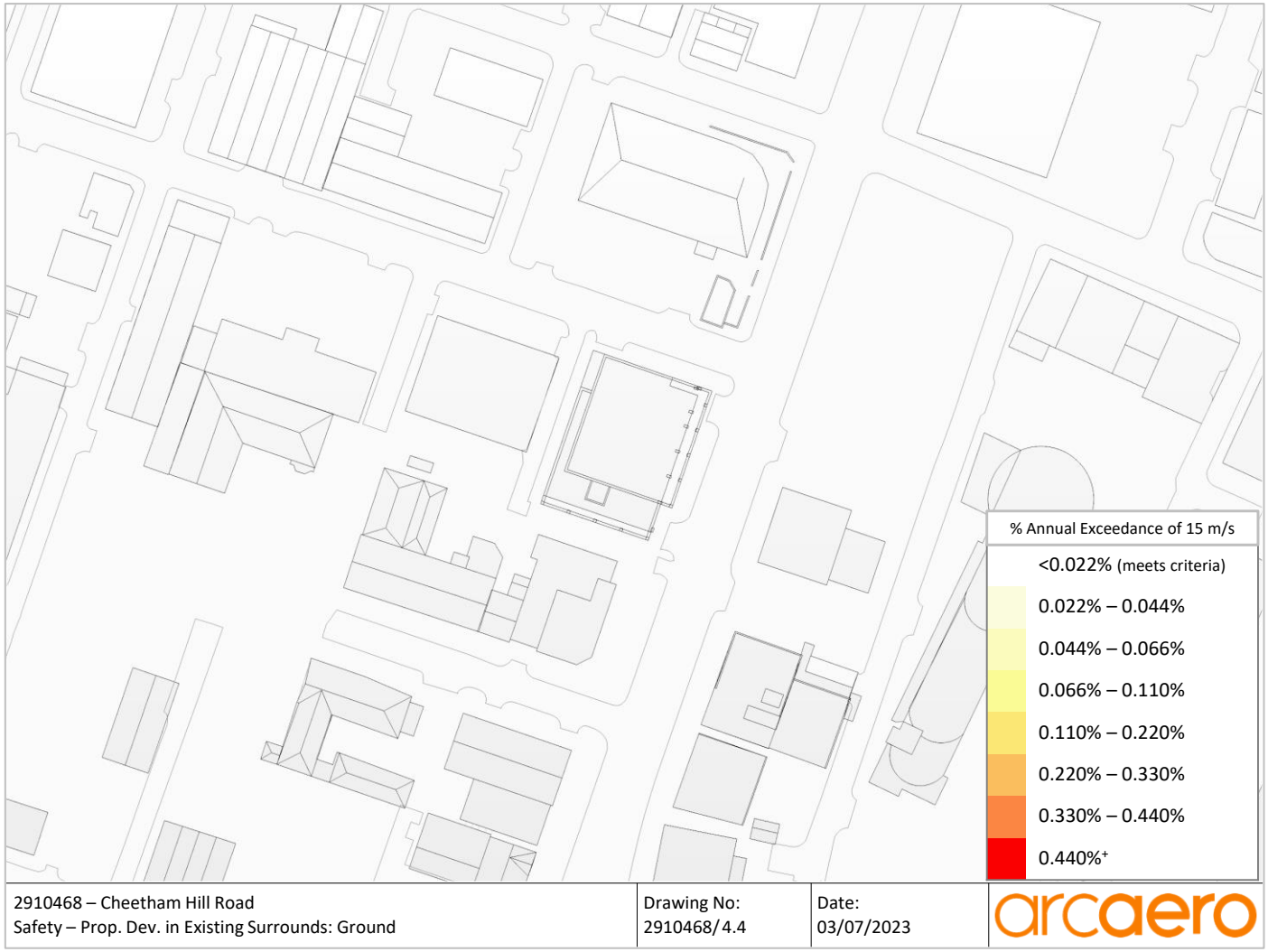


Figure 4.5 – Pedestrian wind conditions, proposed development within existing surrounds, annual safety – terrace level

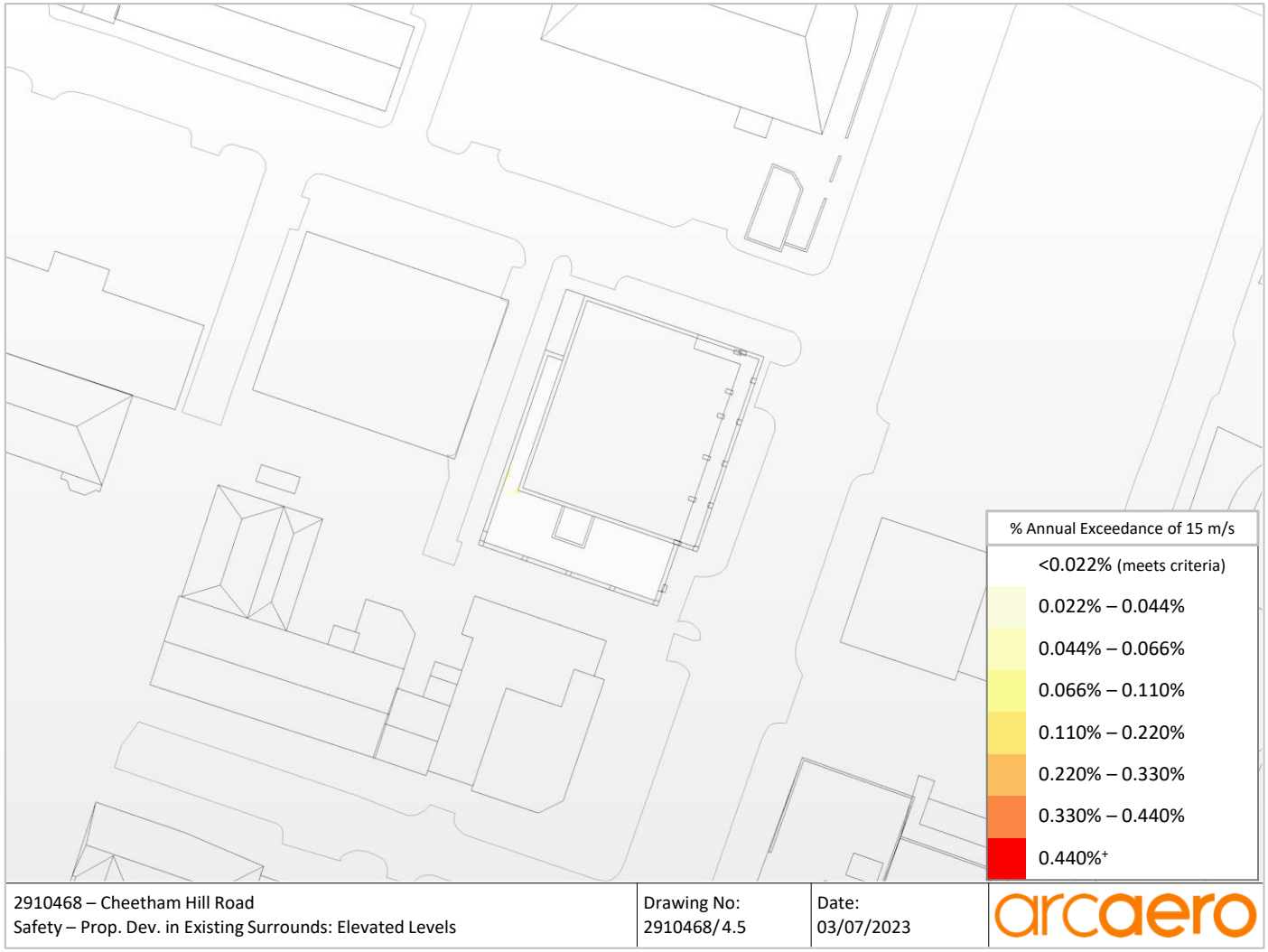


Figure 4.6 – Pedestrian wind conditions, proposed development within existing surrounds, worst case season – ground level



Figure 4.7 – Pedestrian wind conditions, proposed development within existing surrounds, worst case season – terrace level



Figure 4.8 – Pedestrian wind conditions, proposed development within existing surrounds, summer season – ground level

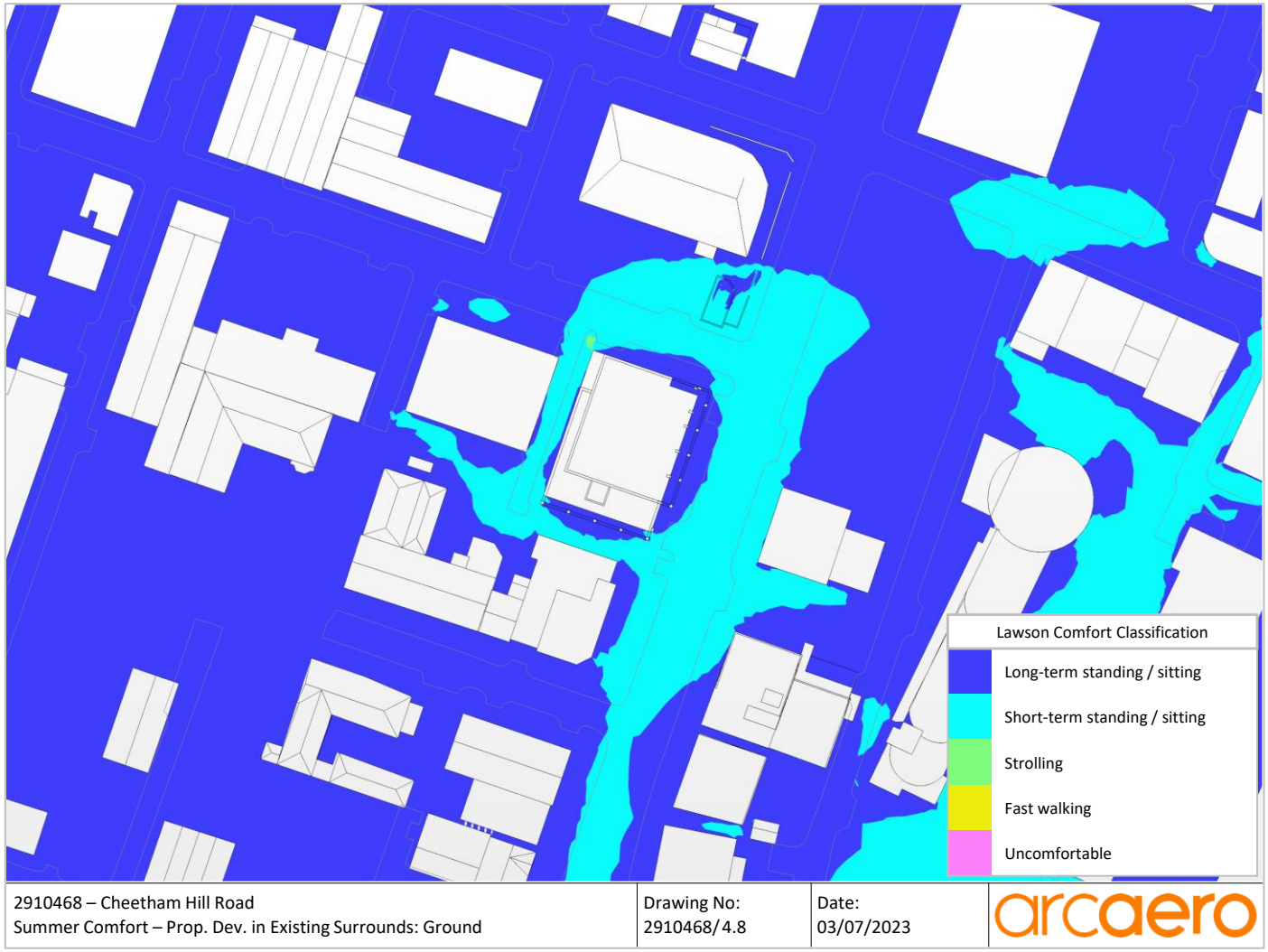


Figure 4.9 – Pedestrian wind conditions, proposed development within existing surrounds, summer season – terrace level



Figure 4.10 – Pedestrian wind conditions, proposed development within cumulative surrounds, annual safety – ground level

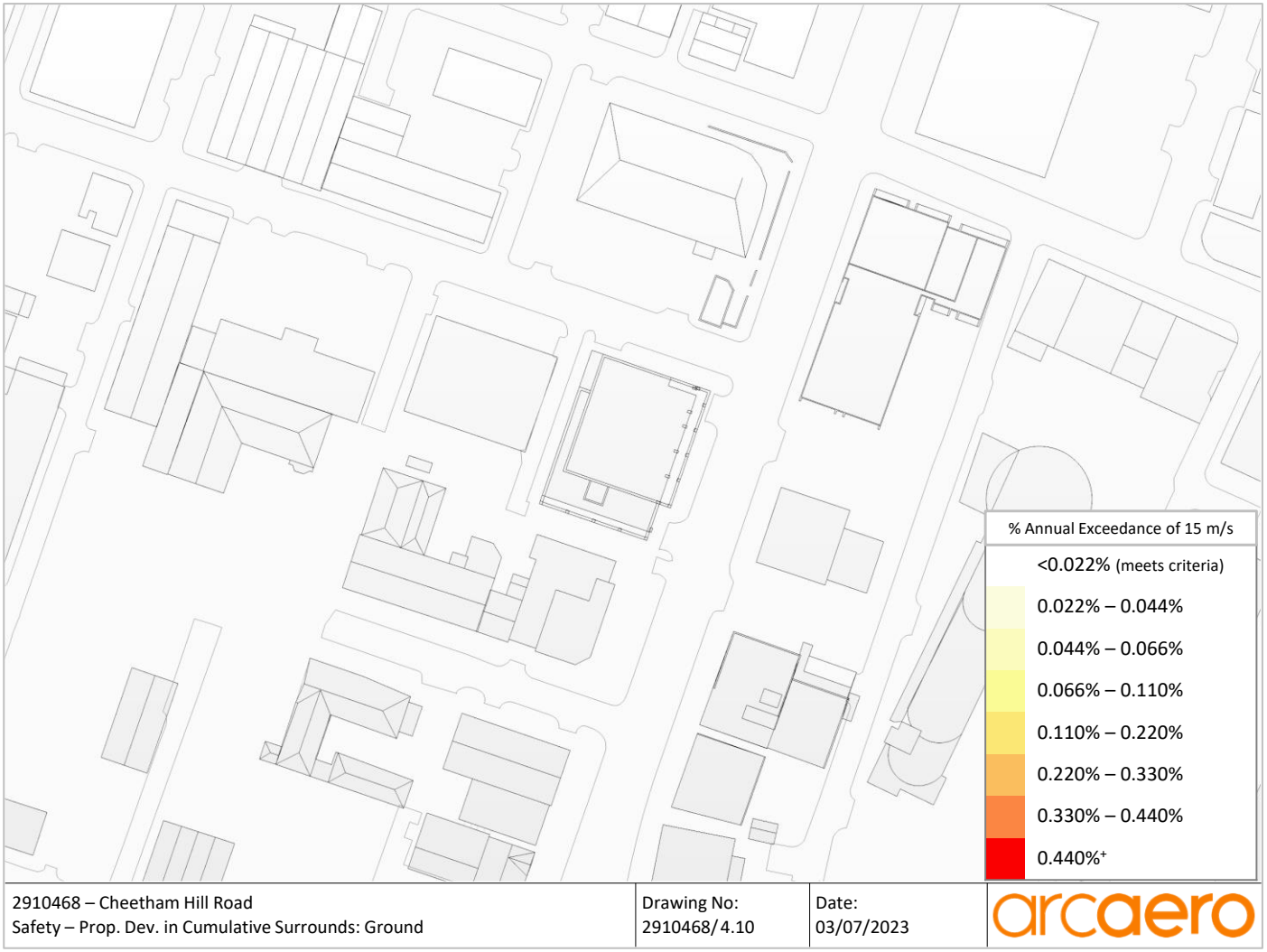


Figure 4.11 – Pedestrian wind conditions, proposed development within cumulative surrounds, annual safety – terrace level

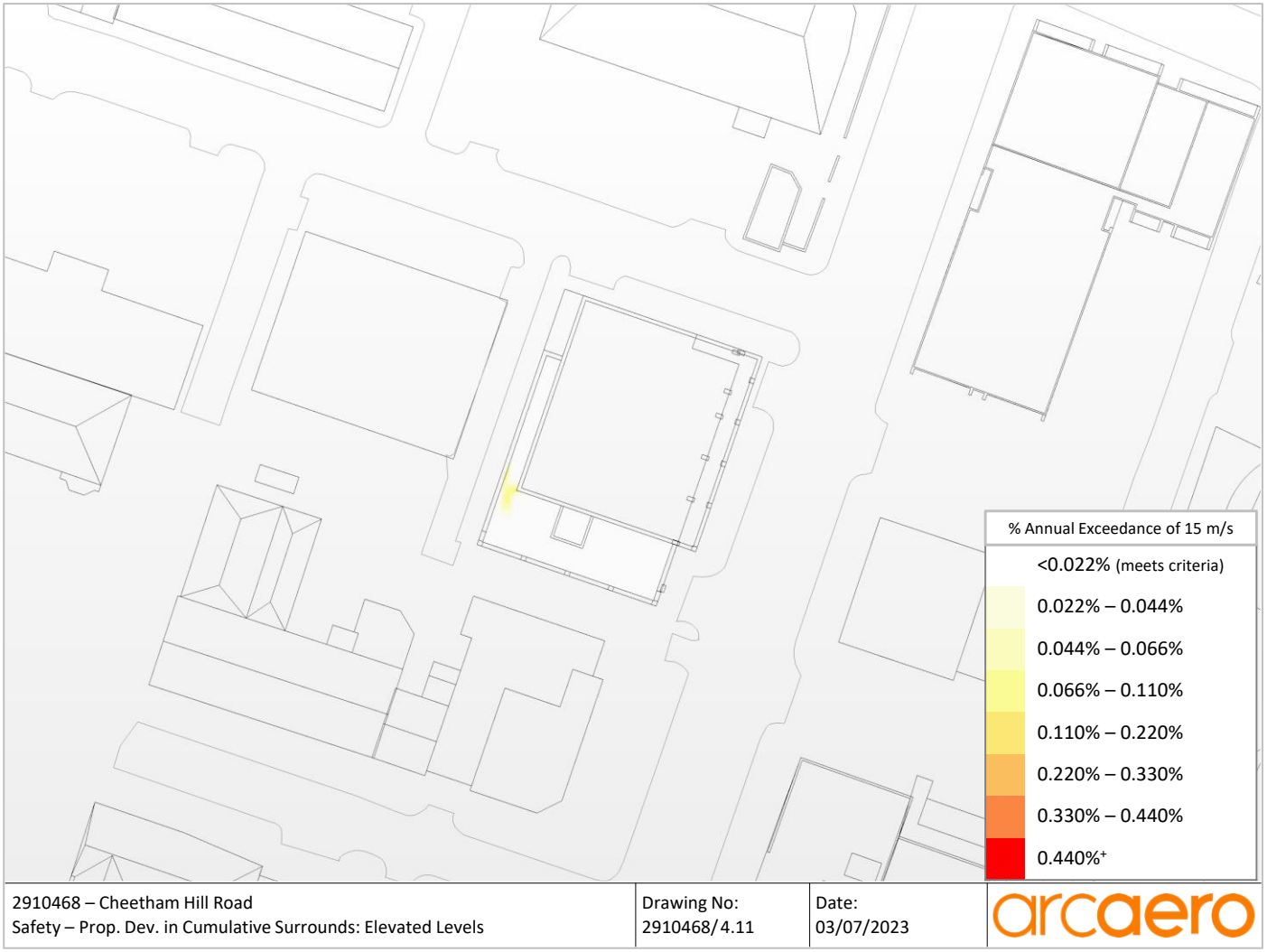


Figure 4.12 – Pedestrian wind conditions, proposed development within cumulative surrounds, worst case season – ground level

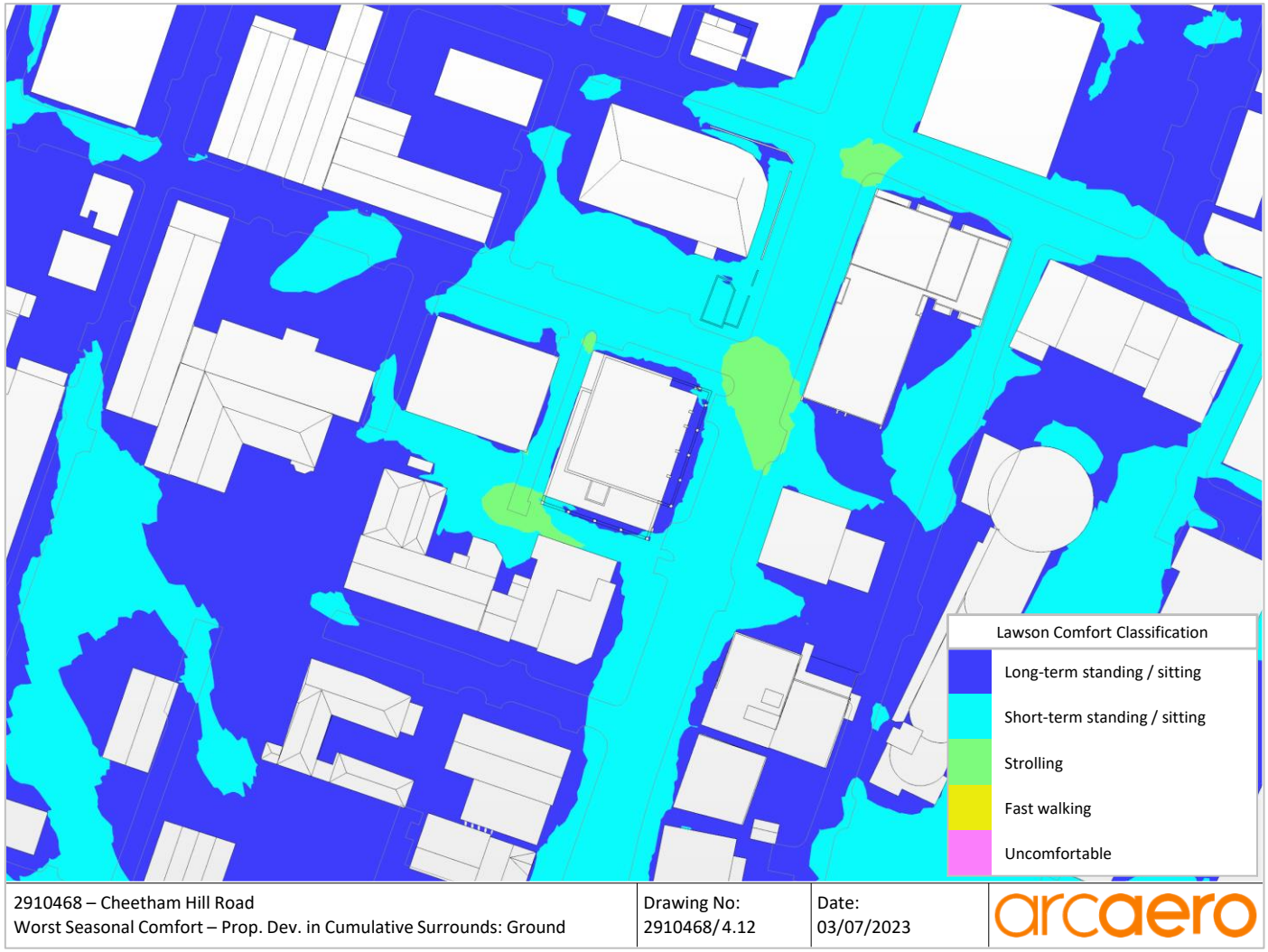


Figure 4.13 – Pedestrian wind conditions, proposed development within cumulative surrounds, worst case season – terrace level



Figure 4.14 – Pedestrian wind conditions, proposed development within cumulative surrounds, summer season – ground level



Figure 4.15 – Pedestrian wind conditions, proposed development within cumulative surrounds, summer season – terrace level



Appendix A CFD Modelling

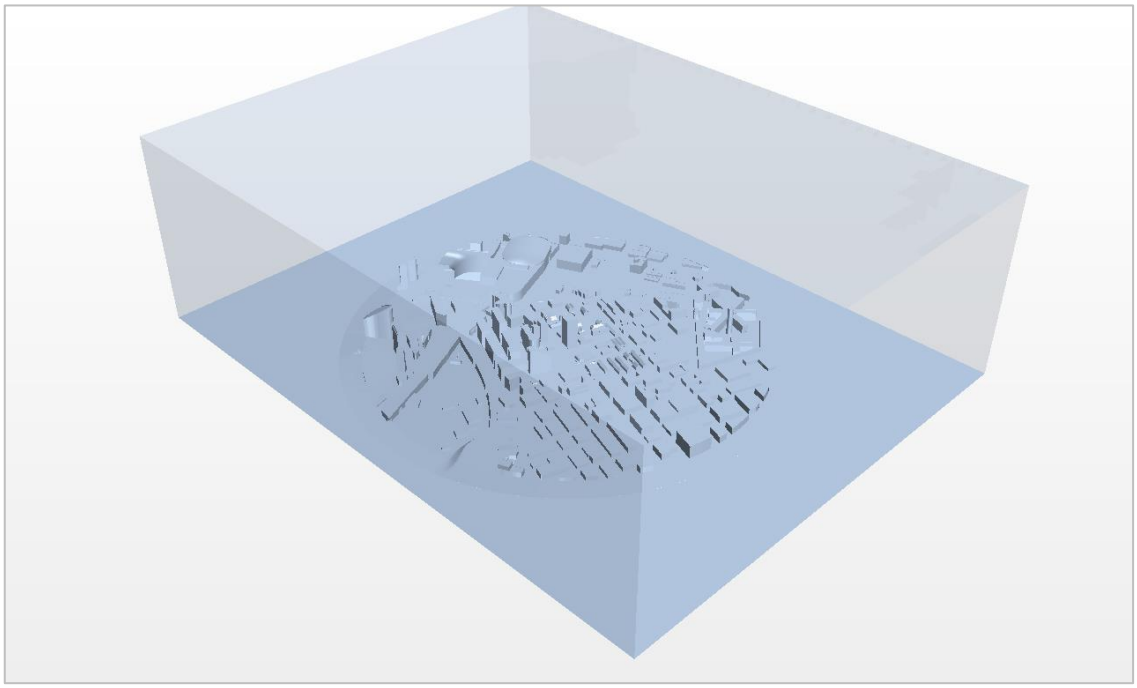
A.1 Spatial discretization

The computational domain was discretised using polyhedral cells for the core mesh, and low aspect-ratio prism cells adjacent to walls and the ground. Computational meshes were constructed for each of the three different study configurations.

The computational domain includes the proposed development site, with surrounding buildings and topographical features within a 450m radius represented explicitly. The full computational domain extends to 1500m in the along-wind direction, 1100m in the across-wind direction, and 450m vertically.

The proposed development and immediate vicinity were meshed down to a cell size of 0.2m in order to capture the detailed geometric features and resulting flow artefacts. The pedestrian ground level surfaces were meshed with a prism layer mesh of 5 layers, which, in the vicinity of the building rise up to a total height of 1.5m above the ground.

Figure A.1 – Computational Domain



A.2 Solution Method

The modelling of an incompressible fluid flow was completed with combinations of semi-implicit method for pressure-linked equations (SIMPLE) algorithms. The resulting flow turbulent features were modelled with introduction of the Shear Stress Transport (SST) k-ω turbulence model. This model was suggested by Menter (3) and is based on a two-equation eddy-viscosity approach, where the SST model formulation combines the use of a k-ω in the inner parts of the boundary layer, but also switches to a k-ε behaviour in the free-stream regions of the solutions. Further details for the selected turbulence model are provided in the work of Menter (4).

A.3 Initial and Boundary Conditions

The atmospheric boundary layer flow was simulated by implementing a logarithmic velocity profile model presented by Richards and Hoxey (5), with the following main assumptions:

- The vertical velocity component at the domain boundary is negligible
- The pressure gradient and shear stress are constant

The model implies the following equation for the mean inlet velocity at the CFD domain:

$$U(z) = \frac{U^*}{\kappa} \cdot ln\left(\frac{z + z_0}{z_0}\right)$$

where:

- κ - is the von Karman's constant
- z - is the distance from the ground surface in vertical direction
- z_o - is the ground surface roughness length in meters

The friction velocity U* is calculated by the following equations:

$$U^* = \kappa \cdot \frac{U_{ref}}{ln\left(\frac{z_{ref} + z_0}{z_0}\right)}$$

where:

- z_{ref} – is the reference height in metres
- U_{ref} - is the reference velocity in m/s measured at z_{ref}

The turbulent velocity fluctuations at the domain inlet are induced by the constant shear stress with height, maintained by the turbulent kinetic energy k equation below:

$$k(z) = \frac{(U^*)^2}{\sqrt{C_\mu}}$$

where:

- Cμ = 0.03 - is a k-ε turbulence model constant

All surface boundary conditions were modelled as smooth walls with a no-slip condition. A no-slip wall boundary condition with a varying roughness length height based on the terrain analysis for the site was applied on the ground surface outside the explicit surrounds area of the domain.

A.4 Gust Equivalent Mean Calculation

The gusts in the wind flow is a major component that may lead to additional danger and discomfort to that caused by the mean wind flow. Thus, the gust wind speed is accounted by a calculation of the equivalent mean wind speed, considering the standard deviation of the mean wind speed, in particular the turbulent kinetic energy, k:

$$\sigma = \sqrt{(k * 2/3)}$$

The GEM is them calculated as:

$$U_{GEM} = \frac{U_{Mean} + 3.5\sigma}{k_g}$$

Where gust factor, k_g= 1.85

The final speedup used in the Lawson criteria is the worst case from U_{GEM} and U_{Mean}.

Appendix B Computational Model

A digital model of the site and surrounds was used for the study. The surrounding area was modelled up to a distance of 450m and all features which are likely to impact the wind flow to and through the site have been replicated. The model was reviewed and approved by the design team prior to the study.

B.1 Model Images

Images of the computational model are presented as follows:

- Figure B.1 and Figure B.2: Existing site and surrounds
- Figure B.3 and Figure B.4: Proposed development within existing surrounds
- Figure B.5 and Figure B.6: Proposed development within cumulative surrounds
- Figure B.7 and Figure B.8: Close-ups of the proposed development

Figure B.1 - Existing site and surrounds, viewed from south

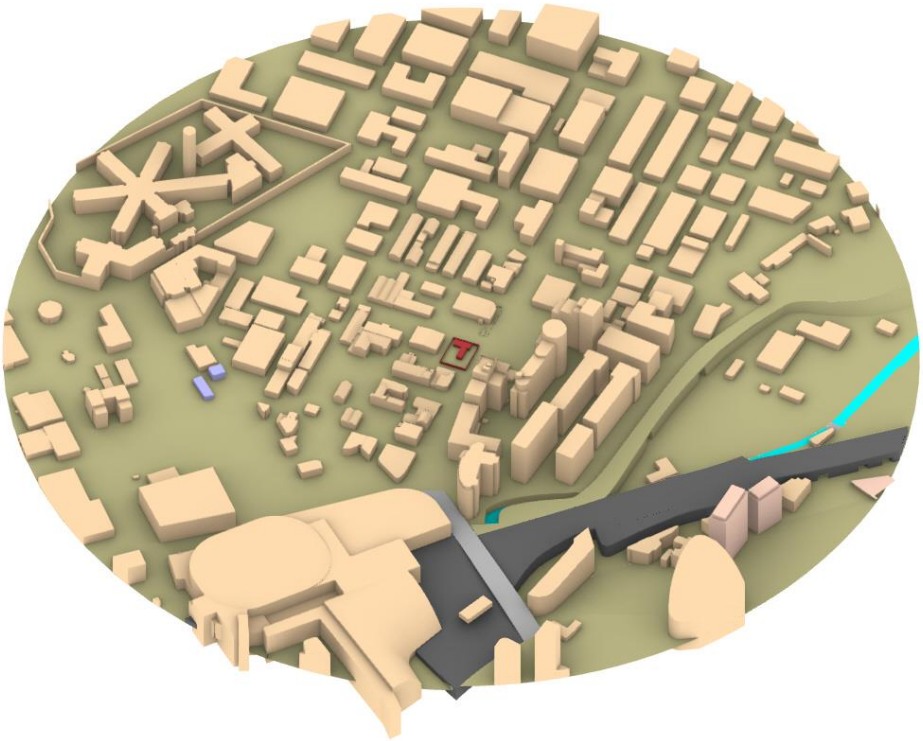


Figure B.2 - Existing site and surrounds, viewed from west

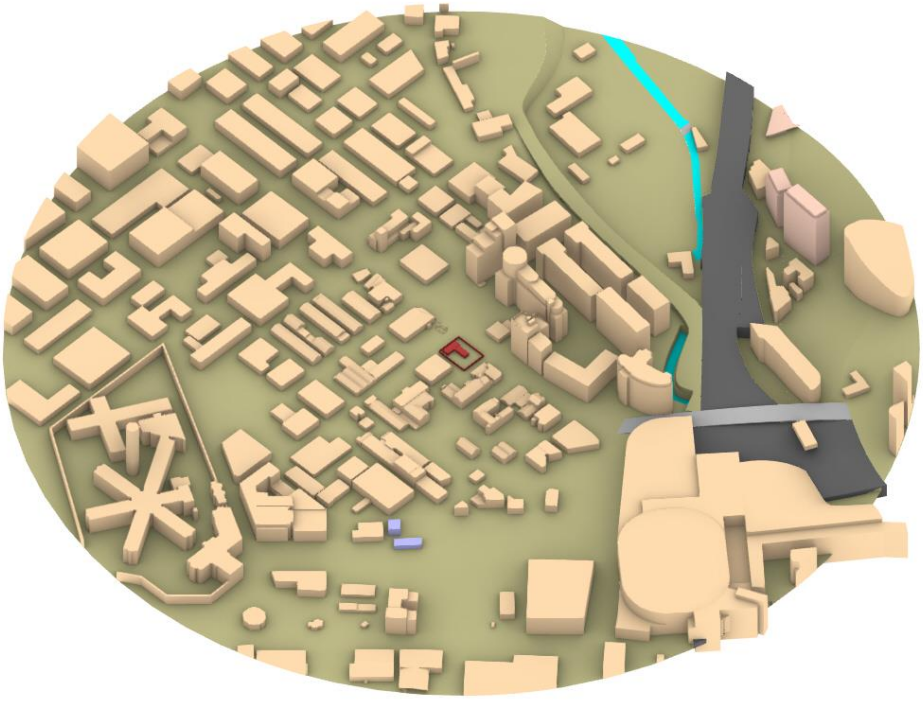


Figure B.3– Proposed development within existing surrounds, viewed from south

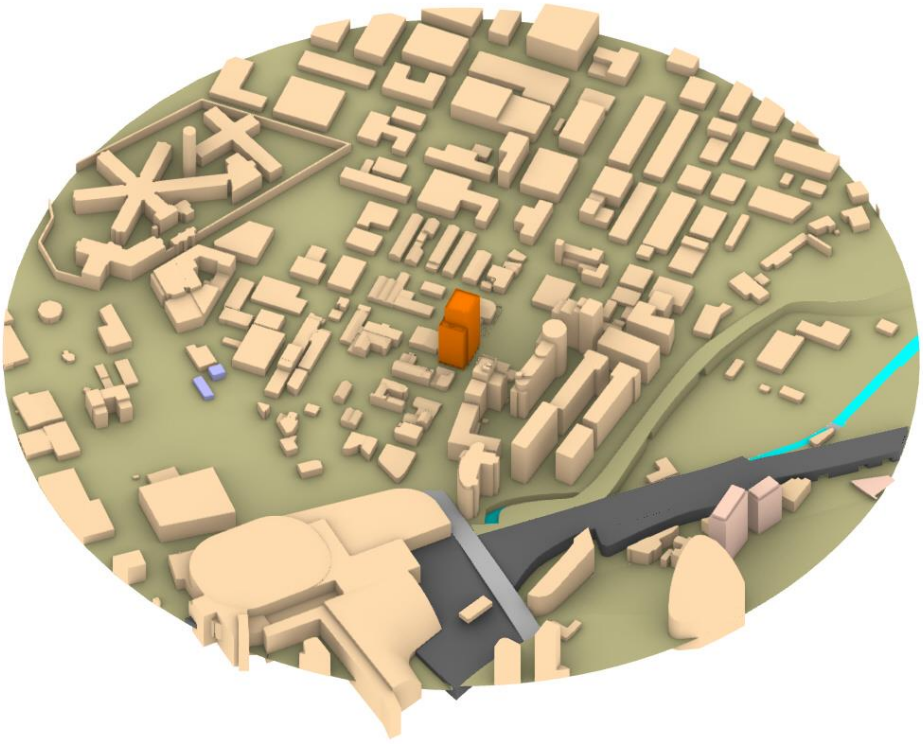


Figure B.4 – Proposed development within existing surrounds, viewed from west

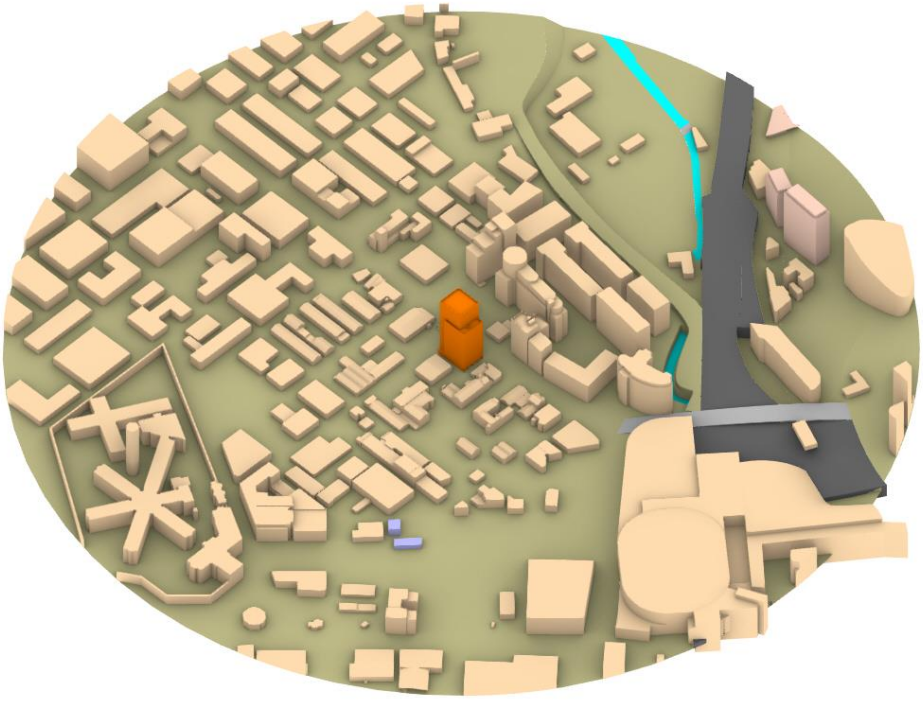


Figure B.5 – Proposed development within cumulative surrounds, viewed from south

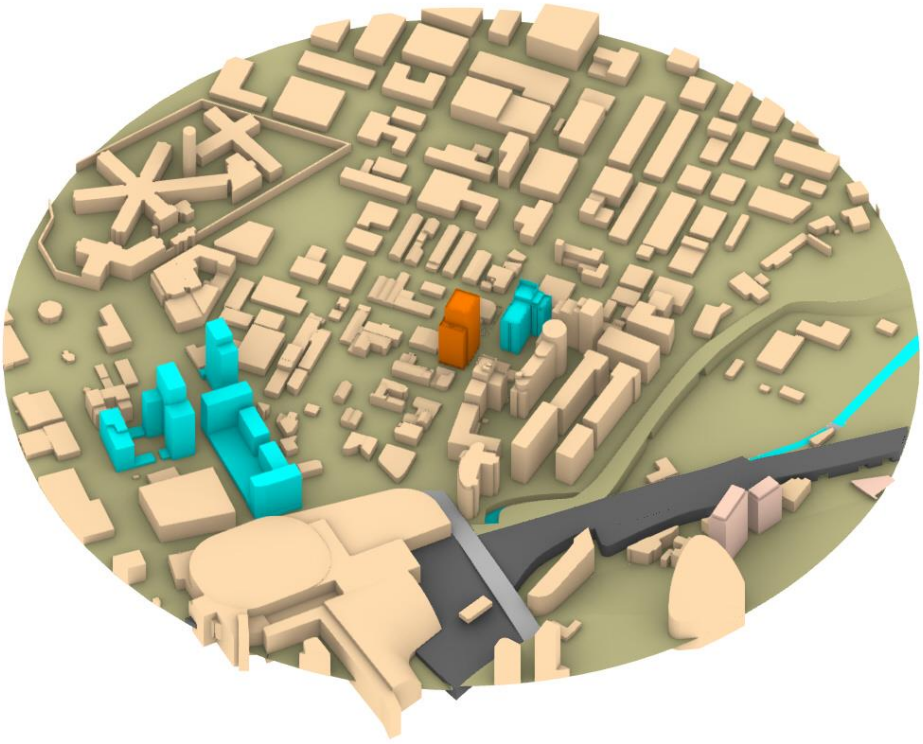


Figure B.6 – Proposed development within cumulative surrounds, viewed from west

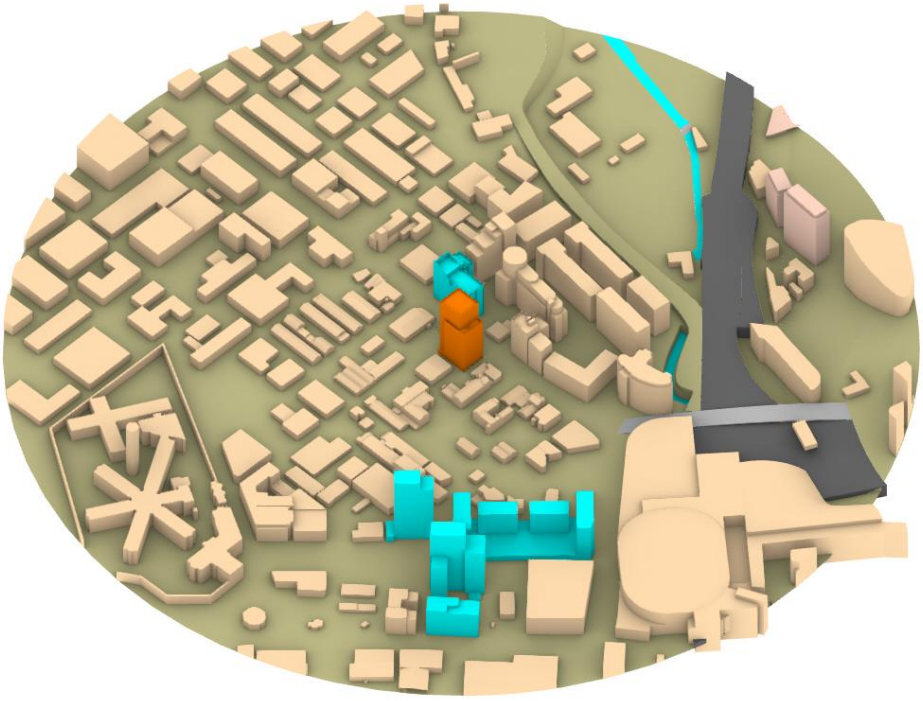


Figure B.7 – Proposed development, close-up from south

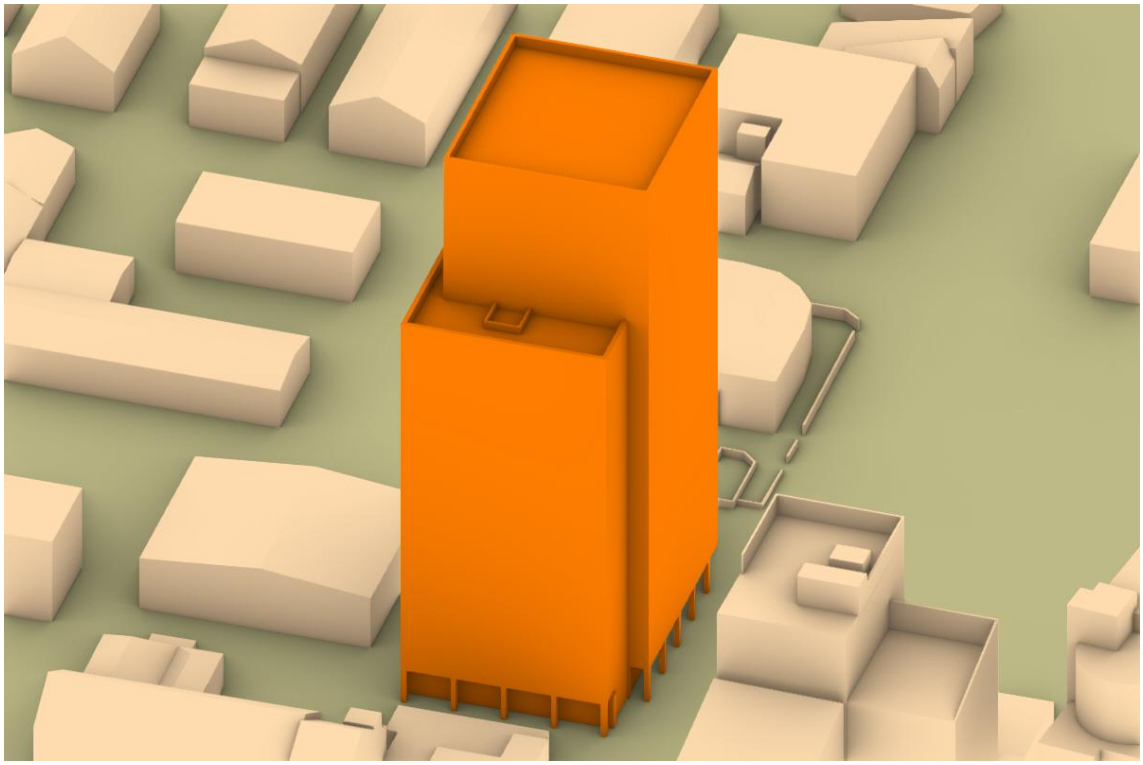
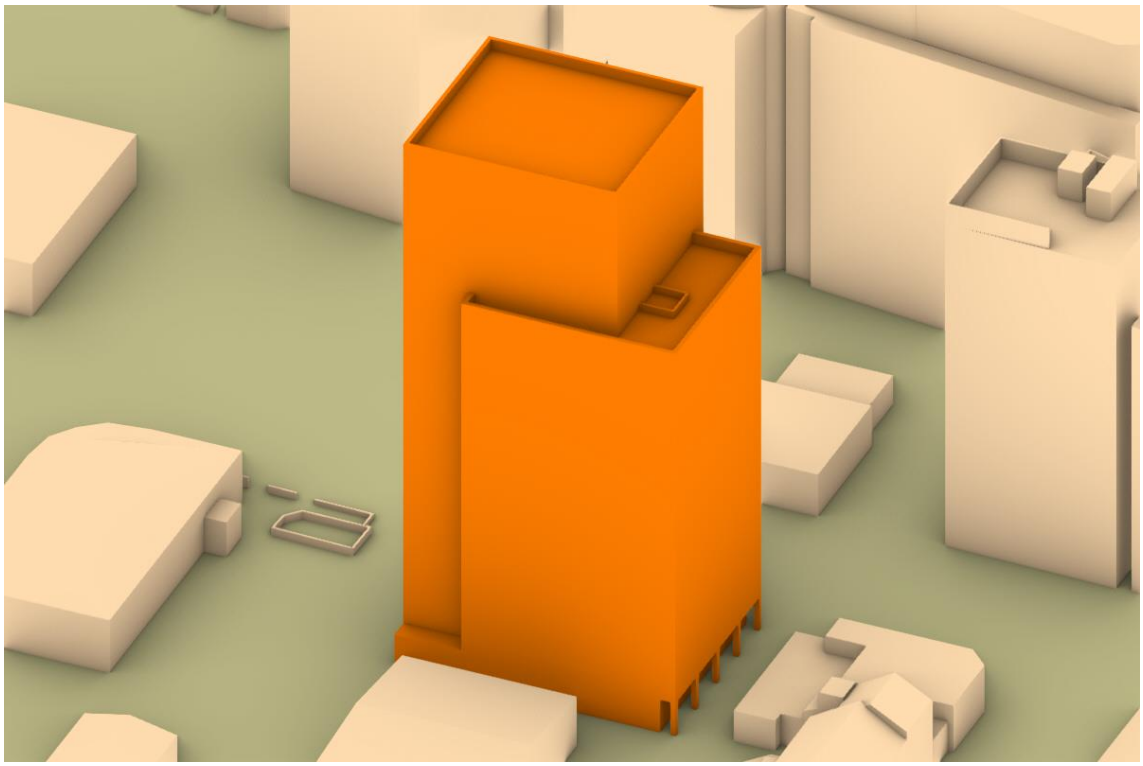


Figure B.8 – Proposed development, close-up from west



Appendix C Wind Climate Analysis

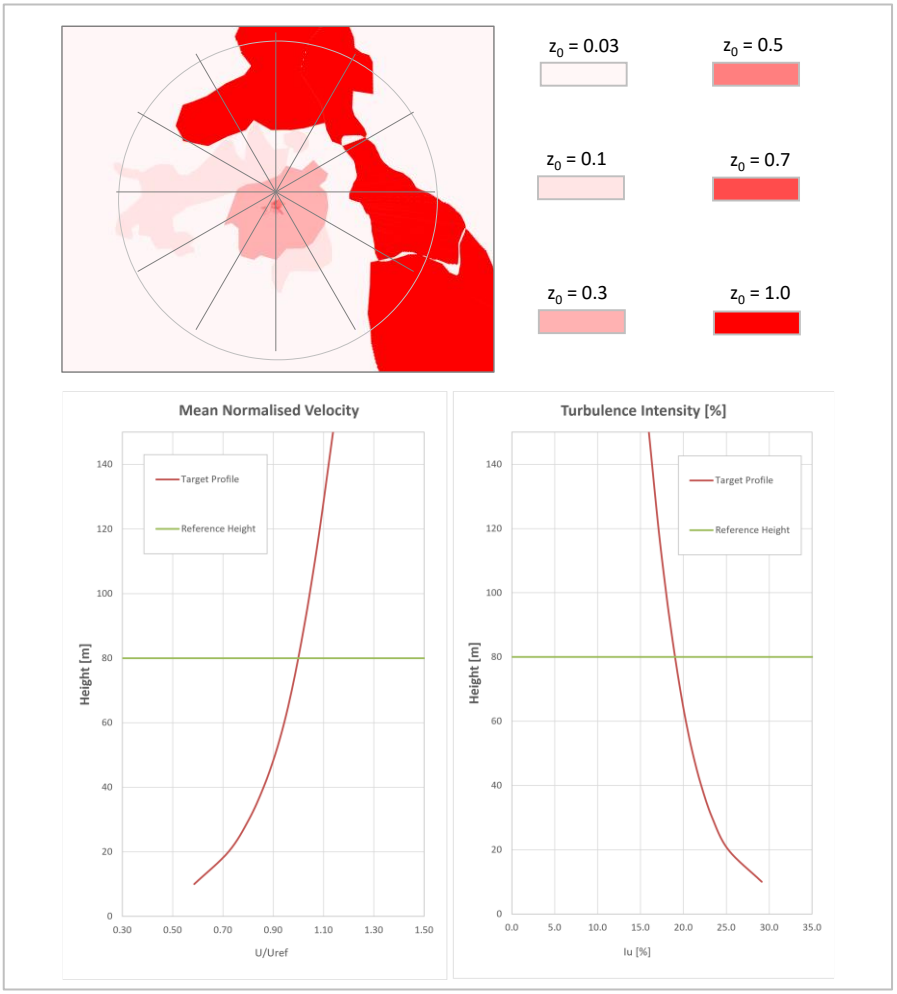
C.1 Surrounding Terrain Assessment

A detailed analysis, based on the widely accepted Deaves and Harris model of the atmospheric boundary layer, as defined in ESDU Item 01008 (2), has been carried out to determine the wind properties at the site. From this analysis, a representative profile was defined as a target profile for the CFD simulations.

C.2 Wind Properties at the Site

Upon conducting the ESDU analysis, each angle was replicated within the CFD model. As each angle exhibited very similar wind profiles, a generic wind profile used in the study is presented within Figure C.1.

Figure C.1 – Mean wind speed and turbulence intensity profiles



C.3 Wind Frequency Data

Wind microclimate studies require that meteorological data is transposed from a nearby weather station with sufficient wind data to produce accurate wind frequency statistics. The current study uses data from Manchester Airport. The cumulative wind speed probability distributions, transposed to building height at site are provided in Figure C.2 to Figure C.6.

Figure C.2 – Cumulative wind speed probability distribution at site, annual

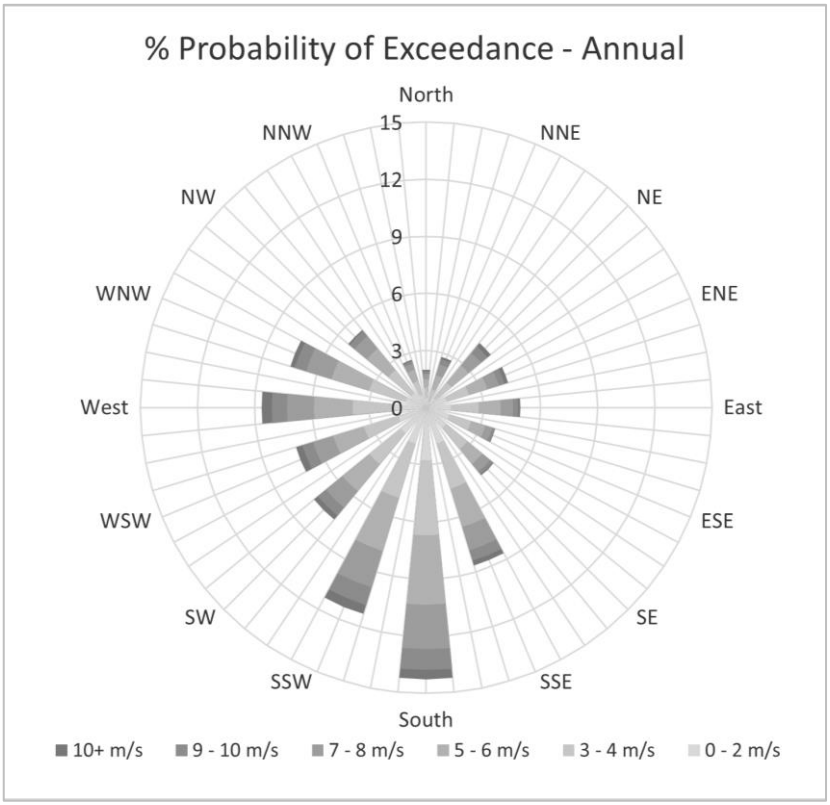


Figure C.3 – Cumulative wind speed probability distribution at site, spring

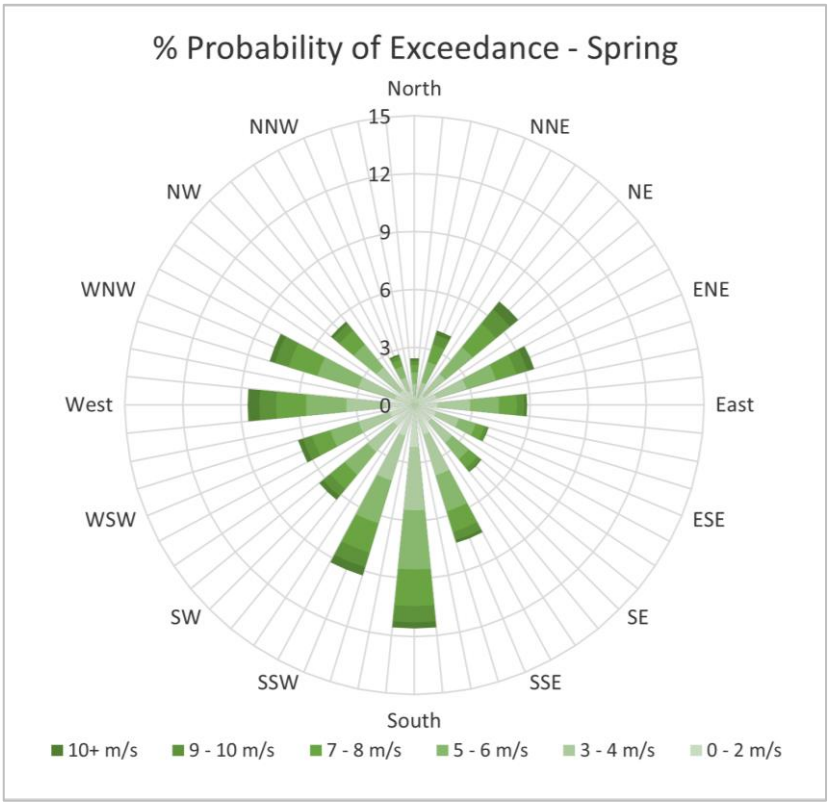


Figure C.4 – Cumulative wind speed probability distribution at site, summer

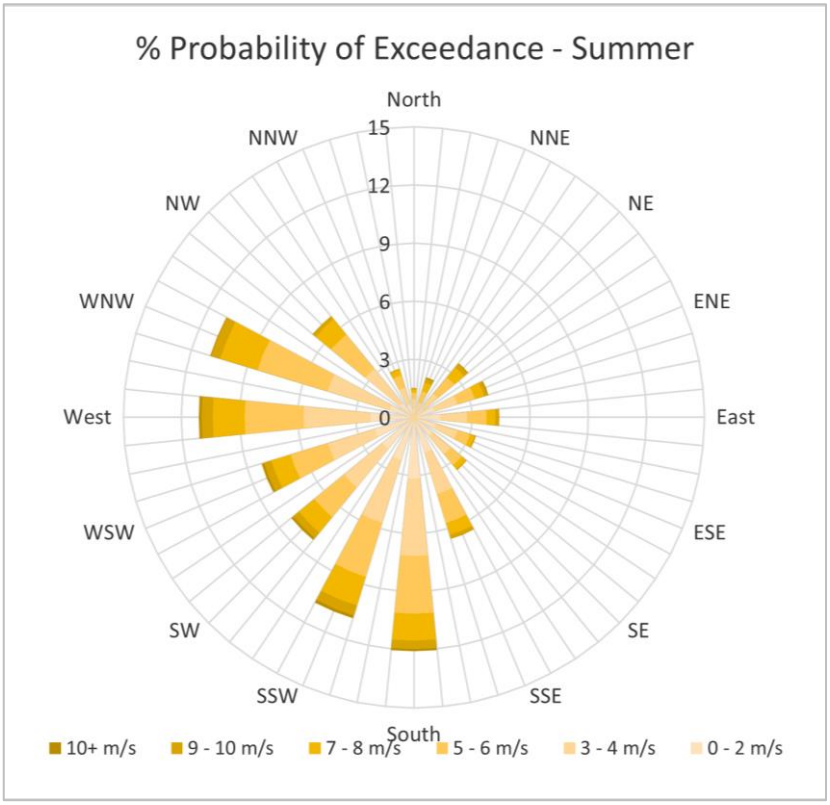


Figure C.5 – Cumulative wind speed probability distribution at site, autumn

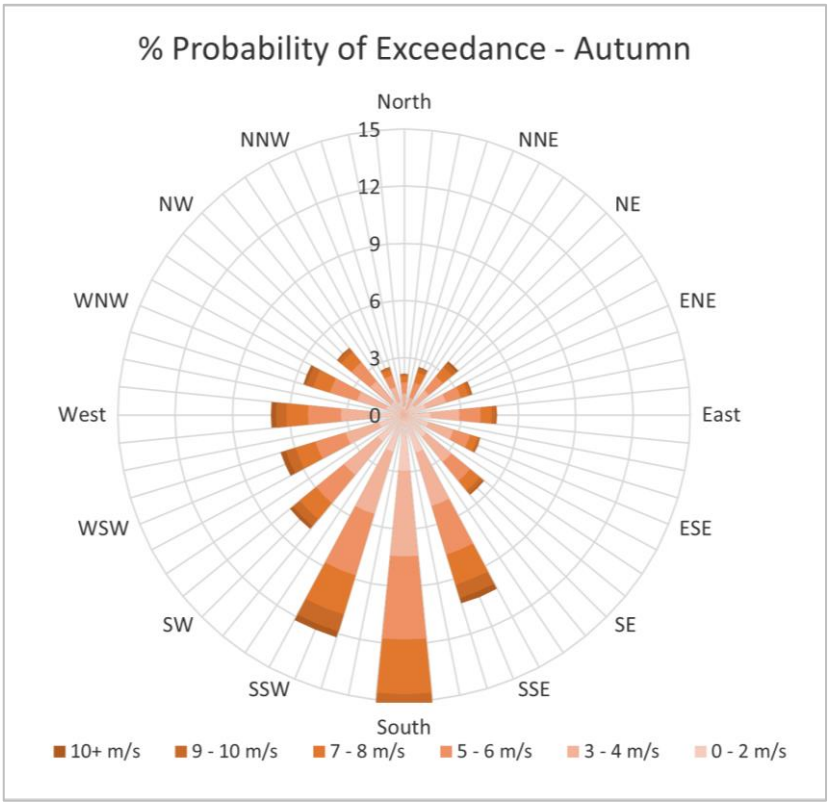


Figure C.6 – Cumulative wind speed probability distribution at site, winter

