

An architectural rendering of modern buildings, featuring a mix of low-rise and high-rise structures with large windows and balconies. The entire image is overlaid with a semi-transparent blue filter. The sky is bright blue with scattered white clouds. In the foreground, there are some trees and a paved area with a few small figures of people.

June 2023  
Air Quality Assessment

# Upper Brook Street Masterplan (McLaren / Kadans)

## **ENVIRONMENT**

McLaren Property (UBS 1) Limited and Kadans  
Science Partner  
Upper Brook Street Masterplan –  
McLaren/Kadans  
Upper Brook Street, Manchester  
Air Quality Assessment

## ENVIRONMENT

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## EXECUTIVE SUMMARY

BWB Consulting Limited was appointed by McLaren Property (UBS 1) Limited and Kadans Science Partner to undertake an air quality assessment for a proposed purpose-built student accommodation and Sci-Tech building at land off Upper Brook Street, Manchester.

The Site is located within the administrative area of Manchester City Council. The Site is located within the Greater Manchester Combined Authority Air Quality Management Area which was declared for potential exceedances of the annual mean air quality objective for nitrogen dioxide.

A qualitative construction phase dust assessment was undertaken in accordance with Institute of Air Quality Management guidance and measures were recommended to minimise emissions during construction activities. With the implementation of these mitigation measures the impact of construction phase dust emissions was considered to be 'not significant' in accordance with Institute of Air Quality Management guidance.

The Proposed Development trip generation was screened using the Institute of Air Quality Management and Environmental Protection UK two stage screening process to determine whether a detailed road traffic emissions impact assessment was required. Consideration was also given to the Manchester City Council Air Quality and Planning Technical Guidance. The Proposed Development trip generation did not exceed the relevant screening criteria and therefore detailed dispersion modelling of development-generated road traffic was not undertaken.

Concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> were also predicted across the Site and the suitability of the Site for the proposed purpose-built student accommodation was considered with regard to air quality. Pollutant concentrations were predicted to be below the relevant air quality objectives and the Site was therefore considered suitable for the proposed residential use. No sensitive uses with regard to air quality are proposed at the Sci-Tech building and therefore an assessment of site suitability was not required.

Based on the assessment results, the impact of the Proposed Development on local air quality was considered to be not significant and mitigation measures are not required. However, the scheme includes measures which may be beneficial to air quality including an all-electric energy strategy and cycle storage at both buildings as well as changing facilities at the proposed Sci-Tech building, to promote active travel. In addition, a Travel Plan will be submitted as part of the scheme.

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## 1. INTRODUCTION

- 1.1 This report has been prepared by BWB Consulting Ltd on behalf of McLaren Property Ltd. and Kadans Science Partner, to support a full planning application for a Sci-Tech and purpose-built student accommodation scheme (PBSA) scheme (hereafter referred to as the 'Proposed Development') on the Upper Brook Street Masterplan – McLaren/Kadans (hereafter referred to as the 'Site'). This scheme would bring forward development on a Previously Developed site which is earmarked for commercial and PBSA uses in the Oxford Road Corridor SRF 2019. This application has been accompanied by a suite of technical documents, reports and plans.
- 1.2 The assessment considers construction phase dust impacts and operational phase road traffic emissions. A qualitative construction phase dust assessment was undertaken in accordance with relevant guidance. An operational phase road traffic emissions screening assessment was undertaken to consider the requirement for a detailed assessment of additional vehicles generated by the Proposed Development. In addition, pollutant concentrations were predicted across the Site for the purpose-built student accommodation (PBSA) to determine the suitability of the Site for the proposed end use. There are no proposed sensitive uses at the Sci-Tech building and therefore an assessment of site suitability was not required.
- 1.3 This report is necessarily technical in nature so to assist the reader a glossary of air quality terminology can be found in **Appendix A**.

### Site Setting

- 1.4 The Site is located off Upper Brook Street in Manchester and lies within the administrative area of Manchester City Council (MCC). The Site extends to 1.084 hectares (ha) and is partially in use as a temporary paid car park. The paid car park is located on a section of the Site which was formerly in use as a Citroën car dealership and is accessed from both Upper Brook Street (UBS) to the west and Kincardine Road to the east. The remainder of the Site comprises the former Elizabeth Yarwood Court residential complex, which is accessed from Kincardine Road to the east of the Site.
- 1.5 The Site is identified for redevelopment within the Oxford Road Corridor SRF with mixed commercial uses in-line with the SRF being a priority for the UBS site.
- 1.6 To the north of the Site is a vacant single-storey commercial building (also identified for redevelopment within the Oxford Road Corridor SRF) and the Grade II\* listed 'Former Unitarian Chapel' which now functions as student accommodation. To the east of the Site is Kincardine Road; beyond which is a 4 to 6-storey student accommodation building and 2-storey residential dwellings that form a part of the wider Brunswick Estate. The Brunswick Estate is an area currently undergoing extensive urban regeneration (see Cumulative Scheme 1 (Brunswick Neighbourhood)). To the south of the Site is Cottenham Street; beyond which is the Tai Wu restaurant and W.H. Lung Supermarket. To the west of the Site is UBS, on the opposite side of which is the University of Manchester's Main Campus, which includes the National Graphene Institute, the Manchester Engineering Campus and the Sir Henry Royce Institute, with buildings ranging from 4-storeys to 10-storeys in height.

1.7 **Figure 1.1** details the location of the Proposed Development.

1.8 Principal air pollution sources in the vicinity of the Site are likely to compromise road traffic emissions. The Site is located within the Greater Manchester Combined Authority (GMCA) Air Quality Management Area (AQMA) which was declared for potential exceedances of the annual mean air quality objective for nitrogen dioxide (NO<sub>2</sub>).

### **Proposed Upper Brook Street Masterplan**

1.9 The masterplan proposals are being brought forward by Kadans Science Partner, McLaren Property, Property Alliance Group and Moda Living. The masterplan intends to transform the currently vacant sites, re-establishing their important role in the area by reintroducing permeability, public realm, and active community-facing uses at ground floor. The emerging masterplan includes over 2 acres of new public realm and green spaces, a new public square, as well as a series of high-quality new buildings of varying heights to provide for approximately 700,000ft<sup>2</sup> of sci-tech accommodation, 1,800 purpose-built student accommodation beds, and 25,000ft<sup>2</sup> of active ground floor uses.

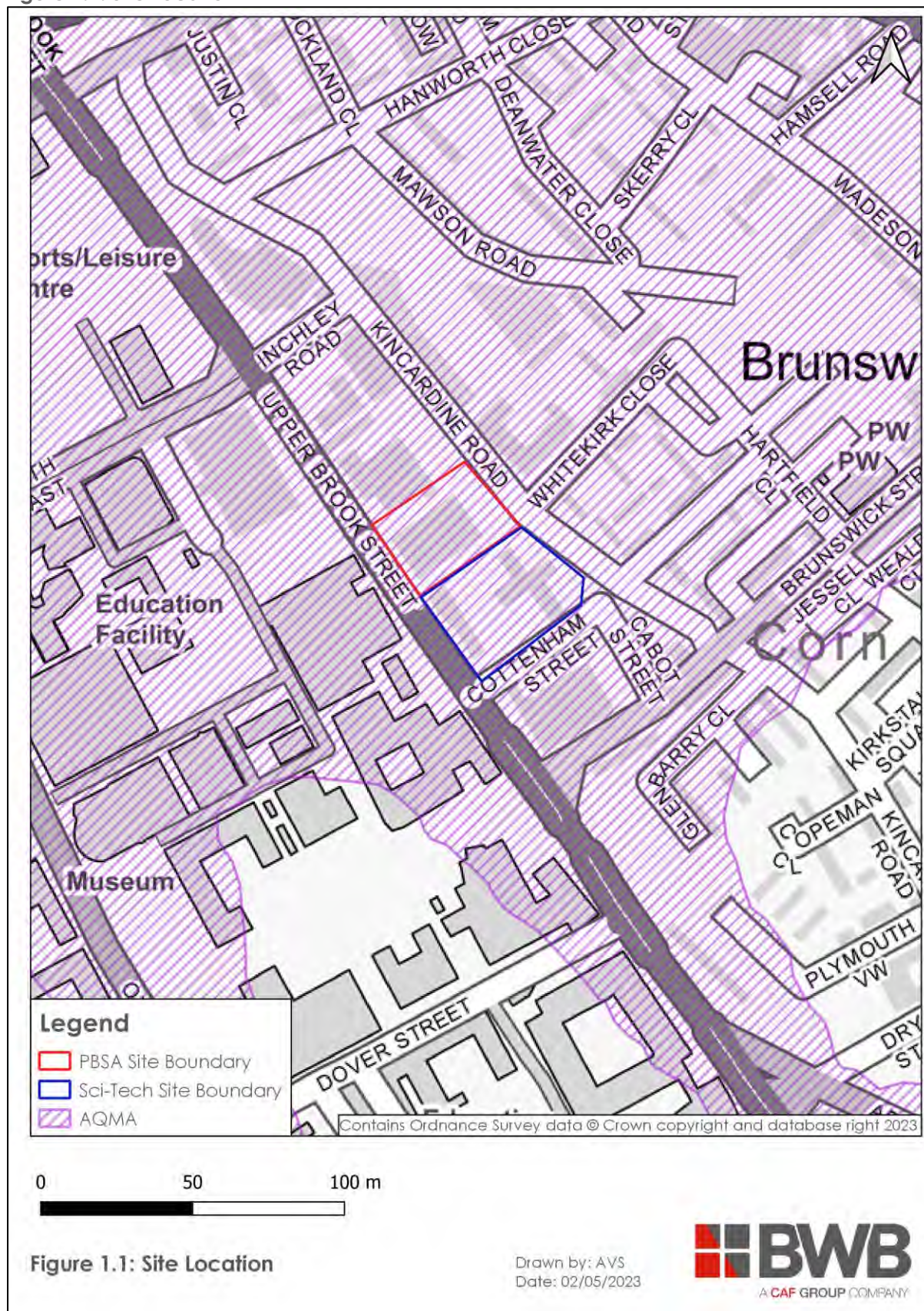
### **Upper Brook Street Masterplan – McLaren/Kadans**

1.10 This assessment relates to the Upper Brook Street Masterplan – McLaren/Kadans only which comprises the following proposed developments:

- Sci-Tech Building – The proposed building provides approximately 13,723m<sup>2</sup> of combined laboratory and office space along with a ground floor publicly accessible café, meeting room suites throughout the building, and a secure cycle store and cycle changing. The building massing is split into a low level 6 storey block (inc. plant) to Kincardine Road, jumping up to 9 storeys (inc. plant) at Upper Brook Street, with an atrium to the centre of the floorplates that houses informal breakout spaces and forum seating at ground floor.
- PBSA - The proposed building provides 737 student bedrooms (288 studios and 449 cluster bedrooms arranged in a variety of cluster sizes), student amenities, management suite, commercial/ community spaces and supporting ancillary areas. The proposed PBSA scheme is arranged in two parallel building blocks with central cores, which are linked on the ground floor to form spaces for indoor and outdoor student amenities. The block facing Upper Brook Street has 23 storeys and the block facing Kincardine Road has 9 storeys.

1.11 The Proposed Development plans are detailed in **Appendix B**.

Figure 1.1: Site Location



## 2. LEGISLATION, PLANNING POLICY & GUIDANCE

### National Legislation and Planning Policy

2.1 The following national legislation and planning policy is relevant to air quality and was considered in the undertaking of the assessment. A summary of the relevant national legislation and planning policy is provided in **Appendix C**:

- European Parliament, EU 2008 ambient Air Quality Directive (2008)<sup>1</sup>;
- HMSO, Air Quality (England) Regulations (2000)<sup>2</sup>;
- HMSO, Environment Act (1995)<sup>3</sup>;
- HMSO, Environment Act (2021)<sup>4</sup>;
- HMSO, Air Quality (England) Regulations (2002)<sup>5</sup>;
- HMSO, Air Quality Standards Regulations (2010)<sup>6</sup>;
- Department for Environment, Air Quality Strategy (1997)<sup>7</sup>;
- Department for the Environment, Food and Rural Affairs, Air Quality Strategy (2007)<sup>8</sup>;
- Department for the Environment, Food and Rural Affairs, The Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020)<sup>9</sup>;
- HMSO, The Environmental Targets (Fine Particulate Matter) (England) Regulations (2023)<sup>10</sup>;
- Ministry of Housing, Communities and Local Government, National Planning Policy Framework (NPPF) (2021)<sup>11</sup>; and
- Ministry for Housing, Communities and Local Government, Planning Practice Guidance (PPG) for air quality (2019)<sup>12</sup>.

### Local Planning Policy

2.2 The following local and regional planning policy was considered in the undertaking of the assessment and a summary is provided in **Appendix C**:

- Manchester City Council, Manchester's Local Development Framework Core Strategy Development Plan Document (2012)<sup>13</sup>.

### Air Quality Assessment Guidance

2.3 The following guidance was utilised in the air quality assessment:

<sup>1</sup> European Parliament (2008) Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe

<sup>2</sup> HMSO (2000) Statutory Instrument 2000 No. 928, The Air Quality (England) Regulations 2000 (as amended), London: HMSO

<sup>3</sup> HMSO (1995) The Environment Act 1995, London: TSO

<sup>4</sup> HMSO (2021) The Environment Act 2021, London: TSO

<sup>5</sup> HMSO (2002) Statutory Instruments 2002 No. 3043, The Air Quality (England) (Amendment) Regulations 2002, London: HMSO

<sup>6</sup> HMSO (2010) Statutory Instruments 2010 No. 1001 Air Quality Standards Regulations 2010, London: HMSO

<sup>7</sup> Department of the Environment (DoE) (1997) The UK National Air Quality Strategy, London: HMSO

<sup>8</sup> Department of the Environment, Food and Rural Affairs (Defra) (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, London: HMSO

<sup>9</sup> Department of the Environment, Food and Rural Affairs (Defra) (2020) The Environment (Miscellaneous Amendments) (EU Exit) Regulations, London: HMSO

<sup>10</sup> HMSO (2023) Statutory Instruments 2023 No. 96 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023

<sup>11</sup> Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework, HMSO London

<sup>12</sup> Ministry for Housing, Communities and Local Government (2019) Planning Practice Guidance Air Quality

<sup>13</sup> Manchester City Council (2012) Manchester's Local Development Framework Core Strategy Development Plan Document

- Defra, Local Air Quality Management Technical Guidance (LAQM.TG(22)) (2022)<sup>14</sup>;
- Institute of Air Quality Management, Guidance on the assessment of dust from demolition and construction (2014)<sup>15</sup>;
- Institute of Air Quality Management and Environmental Protection UK, Land-Use Planning and Development Control: Planning for Air Quality (2017)<sup>16</sup>; and
- Manchester City Council, Air Quality & Planning Technical Guidance (2022)<sup>17</sup>.

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<sup>14</sup> Defra (2022) Local Air Quality Management Technical Guidance LAQM.TG(22)

<sup>15</sup> Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London

<sup>16</sup> Institute of Air Quality Management and Environmental Protection UK (2017) Land-Use Planning and Development Control: Planning for Air Quality

<sup>17</sup> Manchester City Council (2022) Air Quality & Planning Technical Guidance

### **3. METHODOLOGY**

#### **Consultation with Manchester City Council**

- 3.1 Consultation was undertaken with the Environmental Health and Protection Department at MCC in which the proposed methodology was provided via email on the 9<sup>th</sup> March 2023. A response was received on the 16<sup>th</sup> of March 2023 from the Environmental Protection Officer and direction was given toward the MCC Air Quality & Planning Technical Guidance (2022)<sup>17</sup> to assist in undertaking the air quality assessment.
- 3.2 The assessment methodology, as provided to MCC, is summarised below:
- Construction Phase - A construction phase dust assessment was undertaken and relevant measures to mitigate construction phase dust emissions were recommended. The assessment was undertaken in accordance with guidance provided by the Institute of Air Quality Management (IAQM)<sup>15</sup>.
  - Operational Phase – An operational phase road traffic emissions screening assessment was undertaken in accordance with IAQM and Environmental Protection UK (EPUK) guidance<sup>16</sup>.
  - Operational Phase Road Traffic Emissions Exposure Assessment – Detailed dispersion modelling was undertaken to predict pollutant concentrations across the PBSA Site to consider the Site suitability for the proposed residential end use. The dispersion model ADMS-Roads was used to model concentrations of oxides of nitrogen (NO<sub>x</sub>) and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) across the PBSA Site. The assessment was undertaken in accordance with Defra Local Air Quality Management Technical Guidance (LAQM.TG22)<sup>14</sup>. The Sci-Tech building does not include any sensitive uses with regards to air quality and therefore a site suitability assessment is not required and was not undertaken.
  - Consideration was also given to the MCC Air Quality & Planning Technical Guidance<sup>17</sup>. The Proposed Development was classified as 'major' in accordance with the Town & Country Planning Act<sup>18</sup> as the proposals comprise 10 or more residential units and more than 1,000m<sup>2</sup> of commercial floorspace. However, the predicted trip generation does not exceed the screening criteria detailed within the IAQM and EPUK guidance<sup>16</sup>. As such, there was no requirement to offset any emissions and a damage cost calculation was not undertaken for the Proposed Development.
- 3.3 Full details of the methodology used in the assessment, as provided to MCC, are given below.

#### **Construction Phase Dust Assessment**

- 3.4 An assessment of the potential impacts arising from the construction of the Proposed Development was undertaken in accordance with IAQM Guidance<sup>15</sup>. The full assessment methodology is not reproduced within this report but a summary of the assessment steps are provided below:

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<sup>18</sup> HMSO (2015) Town and Country Planning (Development Management Procedure) (England), London: TSO

- Step 1 – screen the requirement for a more detailed assessment. No assessment is required if there are no receptors within a certain distance of the works.
- Step 2 – assess the risk of dust impacts separately for each of the four activities considered (demolition, earthworks, construction and trackout).
  - Step 2A – determine the potential dust emission magnitude for each of the four activities;
  - Step 2B – determine the sensitivity of the area;
  - Step 2C – determine the risk of dust impacts by combining the findings of steps 2A and 2B.
- Step 3 – determine the site-specific mitigation for each of the four activities; and
- Step 4 – examine the residual effects and determine significance.

## **Operational Phase Road Traffic Emissions – Screening Assessment**

### Operational Phase Energy Emissions

- 3.5 Space heating and hot water at both the PBSA and the Sci-Tech building will be provided via an all-electric system and therefore there are no on site associated emissions. The Sci-Tech building however includes an emergency generator. The emergency use diesel generator will operate for less than 18 hours per year. The short term air quality objective for NO<sub>2</sub> states that the 200µg.m<sup>-3</sup> hourly mean must not be exceeded more than 18 times per calendar year. As the generator will only be used for emergency use and will operate for less than 18 hours per year, it is unlikely that the short term NO<sub>2</sub> air quality objectives will be exceeded. A detailed assessment of generator emissions was therefore not undertaken.
- 3.6 The tenants of the Sci-Tech building are unknown at this stage and as such, information regarding emissions from fume cupboards is also unknown. An assessment of building emissions was therefore not undertaken.

### Operational Phase Road Traffic Emissions

- 3.7 Guidance published by the IAQM and EPUK in 2017<sup>16</sup> provides a two-stage approach to determine the level of assessment required in the consideration of the impact of development-generated road traffic emissions on local air quality.

### Stage 1

- 3.8 The Stage 1 criteria requires that the assessment progress to Stage 2 if any of the following apply:
- The development comprises:
    - 10 or more residential units or a site area of more than 0.5ha; or
    - More than 1,000m<sup>2</sup> of floor space for all other uses or a site area greater than 1ha.
  - Coupled with any of the following:

- The development has more than 10 parking spaces; or
- The development will have a centralised energy facility or other centralised combustion process.

*Note: Consideration should be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.*

## Stage 2

- 3.9 The IAQM and EPUK guidance<sup>16</sup> provides the following indicative criteria to determine whether a detailed road traffic emissions assessment is required for a Proposed Development.
- 3.10 The Stage 2 criteria relevant to the Proposed Development are:
- A change in Light Duty Vehicles (LDV) flow of more than 100 vehicles as a 24 hour Annual Average Daily Traffic (AADT) flow within an AQMA; and
  - A change in Heavy Duty Vehicle (HDV) flow of more than 25 vehicles as a 24 hour AADT flow within an AQMA.

## **Operational Phase Road Traffic Emissions – Site Suitability Assessment**

### Air Dispersion Modelling

- 3.11 The air dispersion model ADMS-Roads, version 5.0.1.3 was utilised in the assessment to predict concentrations of NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> across the PBSA Site to consider the Site suitability for the proposed residential end use.
- 3.12 The assessment was undertaken in accordance with Defra Local Air Quality Management Technical Guidance<sup>14</sup>.

### Assessment Scenarios and Traffic Data

- 3.13 The following scenarios were considered in the air dispersion modelling:
- Scenario 1: 2019 Verification Year; and
  - Scenario 2: 2026 Opening Year with development.
- 3.14 Traffic data were provided by Civic Engineers, the Transport Consultants for the project. 24-hour AADT and HDV proportions were provided for the following roads for use in the assessment:
- A34 Upper Brook Street;
  - A6 Ardwick Green South;
  - A57 Hyde Road; and
  - A6 Stockport Road.

3.15 Traffic data was also obtained from the Department for Transport website<sup>19</sup> for use in the assessment. 24-hour AADT and HDV proportions were obtained for the following roads:

- A57 (M) Mancunian Way; and
- A635 Mancunian Way.

3.16 Consideration was given to the speeds at which vehicles are likely to travel within the study area. Free flowing traffic conditions were modelled at speed limits. Queuing sections were modelled in accordance with Defra guidance<sup>14</sup>.

3.17 Traffic data used in the air dispersion modelling are provided in **Appendix D**.

#### ADMS-Roads Model Inputs

3.18 The following model inputs were utilised in the assessment:

- Emission Factors – emission factors were utilised from the Defra Emission Factor Toolkit<sup>20</sup> (EFT), version 11, for the years of assessment (2019 and 2026).
- Conversion of oxides of nitrogen – concentrations of NO<sub>x</sub> were predicted using the ADMS-Roads dispersion model. These concentrations were converted to NO<sub>2</sub> using the Defra NO<sub>x</sub> to NO<sub>2</sub> calculator<sup>21</sup>, version 8.1.
- Meteorological Data – hourly sequential meteorological data for the verification year of assessment (2019) were obtained for the Manchester Airport recording station. This is the closest meteorological station to the Site. The wind rose for 2019 is provided in **Appendix E**.
- Surface roughness and Monin-Obukhov length (MO) – Site – a surface roughness of 1.0m and a MO length of 100m were utilised in the air dispersion model to represent conditions at the Site and within the study area. These conditions are representative of the location of the Site within an urban area of Manchester.
- Surface roughness and Monin-Obukhov length (MO) – Meteorological Station – a surface roughness of 0.5m and a MO length of 30m were utilised in the air dispersion model to represent conditions at the meteorological station. These conditions were used to represent an average of the mixed urban/industrial conditions north of the Manchester Airport meteorological recording station and the rural conditions located to the south.
- Background pollutant concentrations – background concentrations of NO<sub>2</sub> for the study area were obtained from the urban background diffusion tube MA72NO for the year 2019. This was then adjusted using pollutant concentrations maps provided by Defra as a 1km x 1km grid of the UK to obtain the year 2026 background concentrations. Background pollution concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> for the study area were obtained from the pollutant concentrations maps provided by Defra<sup>22</sup> as a 1km x 1km grid of the UK, for the years of assessment (2019 and 2026).
- Model verification – model verification was undertaken using passive diffusion tube monitoring data available for the study area. Full details of the verification procedure are provided in **Appendix F**.

<sup>19</sup> Department for Transport (no date) Road Traffic Statistics (<https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints>)

<sup>20</sup> Defra (2019) Emission Factor Toolkit (<https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>)

<sup>21</sup> Defra (2019) NO<sub>x</sub> to NO<sub>2</sub> Calculator (<https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc>)

<sup>22</sup> Defra (2023) background pollutant concentration maps (<https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>)

- Calculation of short term PM<sub>10</sub> concentrations – the following calculation, as detailed in Defra guidance<sup>14</sup>, was utilised to calculate the number of exceedances of the 24-hour mean PM<sub>10</sub> air quality objective:

$$\text{Number of 24-Hour Mean Exceedance} = -18.5 + 0.00145 * \text{Annual Mean}^3 + (206 / \text{Annual Mean})$$

### Proposed Receptor Locations

- 3.19 Pollutant concentrations were predicted across the PBSA Site to consider exposure of future occupants of the Proposed Development to air quality. A Cartesian grid from minimum X 384637, Y 396557 to maximum X 384993, Y 397065 was modelled at a height of 1.5m to represent the average breathing height at ground floor level. However, there are no sensitive uses proposed at ground floor and as such modelling was also undertaken at a height of 4.2m, to represent first floor breathing height based on drawings provided by Sheppard Robson (drawing ref: 6601 SRA XX 01 DR A 20101).

### Limitations and Assumptions

- 3.20 There are uncertainties associated with both measured and predicted pollutant concentrations. The model (ADMS-Roads) used in this assessment relies on input data, which are also subject to uncertainty. The model itself simplifies complex physical systems into a range of algorithms. In addition, local micro-climatic conditions may affect the concentrations of pollutants that the ADMS-Roads model will not take into account.
- 3.21 The assessment is based on traffic data provided by Civic Engineers, the Transport Consultants for the project. As such any assumptions made by the Transport Consultants will also influence the air quality assessment.
- 3.22 In future years scenarios, uncertainty relates to the projection of vehicle emissions and, in particular the rate at which emissions per vehicle will improve over time. This assessment utilised the most recent version of the Defra EFT<sup>20</sup> to provide the most up to date estimate of current and future emission projections.
- 3.23 To reduce the uncertainty associated with predicted concentrations, model verification was carried out following guidance set out in Defra guidance<sup>14</sup>. As the models were verified using local monitoring data and adjusted accordingly, there can be reasonable confidence in the predicted concentrations.

### Assessment Criteria

- 3.24 Predicted pollutant concentrations were compared to the relevant current air quality objectives<sup>7</sup> for England. The current relevant air quality standards and objectives are detailed in **Table 3.1**.

**Table 3.1: Air Quality Standards and Objectives (England)**

| Pollutant         | Averaging Period                                                                                     | Air Quality Objective ( $\mu\text{g.m}^{-3}$ ) | Date to Achieve by     |
|-------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------|
| NO <sub>2</sub>   | Annual mean                                                                                          | 40                                             | 31 December 2005       |
|                   | 1-hour mean not to be exceeded more than 18 times per year                                           | 200                                            | 31 December 2005       |
| PM <sub>10</sub>  | Annual mean                                                                                          | 40                                             | 31 December 2004       |
|                   | 24-hour mean not to be exceeded more than 35 times per year                                          | 50                                             | 31 December 2004       |
| PM <sub>2.5</sub> | Annual mean                                                                                          | 20                                             | 1 January 2020         |
|                   | <i>Annual mean interim target as detailed within the Environmental Improvement Plan<sup>23</sup></i> | 12                                             | <i>31 January 2028</i> |
|                   | Annual mean                                                                                          | 10                                             | 31 December 2040       |

*Italics denotes future air quality objectives published by the UK Government that will come into force in the future*

<sup>23</sup> Defra (2023) Environmental Improvement Plan 2023, First revision of the 25 Year Environment Plan

## 4. BASELINE CONDITIONS

### Local Air Quality Management

- 4.1 The Site is located within the GMCA AQMA which was declared for the potential exceedance of the current annual mean NO<sub>2</sub> air quality objective for England.

### Local Air Quality Monitoring

#### Nitrogen Dioxide

- 4.2 MCC undertakes NO<sub>2</sub> monitoring within its administrative boundary using a network of both passive and continuous analysers. The closest monitoring locations to the Site are monitoring location MAN-J7 (420m north east), MAN-J8 (440m north east), MA96NO (430m north east) and MA72NO (450m north).
- 4.3 Bias adjusted NO<sub>2</sub> monitoring results, for the locations in the vicinity of the Site, are detailed in **Table 4.1**. At the time of assessment 2020 and 2021 monitoring data was available and therefore was included in the review. However, due to the influence of the COVID-19 pandemic lockdown restrictions, 2020 and 2021 monitoring data are not considered representative of normal conditions. The IAQM released a position statement<sup>24</sup> in August 2021 with regard to 2020 and 2021 monitoring datasets, which recommends that until the influence of the COVID-19 pandemic is fully understood, 2019 monitoring data should be treated as the last year of typical monitoring data. Exceedances of the current annual mean air quality objective are highlighted in **bold**.

**Table 4.1: MCC NO<sub>2</sub> Monitoring Data in 2015 – 2021**

| Site ID  | X, Y             | Site Monitoring Type | Distance from and direction to Site boundary | Monitored Annual Average Concentration (µg.m <sup>-3</sup> ) |      |      |      |             |             |             |
|----------|------------------|----------------------|----------------------------------------------|--------------------------------------------------------------|------|------|------|-------------|-------------|-------------|
|          |                  |                      |                                              | 2015                                                         | 2016 | 2017 | 2018 | 2019        | 2020        | 2021        |
| MA113BNO | 385087<br>396891 | Roadside             | 230m east                                    | -                                                            | -    | -    | -    | -           | -           | 28.1        |
| MA96BNO  | 385189<br>397167 | Roadside             | 430m north east                              | -                                                            | -    | -    | -    | <b>46.0</b> | 36.4        | <b>41.0</b> |
| MAN-J7*  | 385124<br>397234 | Roadside             | 420m north east                              | -                                                            | -    | -    | -    | <b>51.6</b> | 29.8        | 33.7        |
| MAN-J8*  | 385227<br>397142 | Roadside             | 440m north east                              | -                                                            | -    | -    | -    | <b>59.7</b> | <b>40.6</b> | <b>52.0</b> |
| MAN-J3*  | 384734<br>397268 | Roadside             | 340m north                                   | -                                                            | -    | -    | -    | -           | 21.7        | 24.8        |

<sup>24</sup> Institute of Air Quality Management (IAQM) (2020) Implications of the COVID-19 Pandemic on Air Quality Monitoring and Assessments

| Site ID | X, Y             | Site Monitoring Type | Distance from and direction to Site boundary | Monitored Annual Average Concentration ( $\mu\text{g.m}^{-3}$ ) |             |             |             |             |      |             |
|---------|------------------|----------------------|----------------------------------------------|-----------------------------------------------------------------|-------------|-------------|-------------|-------------|------|-------------|
|         |                  |                      |                                              | 2015                                                            | 2016        | 2017        | 2018        | 2019        | 2020 | 2021        |
| MAN-J4* | 384789<br>397314 | Roadside             | 380m north                                   | -                                                               | -           | -           | -           | -           | 22.1 | 25.6        |
| MA72NO  | 384761<br>397384 | Urban Background     | 450m north                                   | 34.8                                                            | <b>40.0</b> | 34.6        | 33.4        | 32.8        | 24.5 | 27.5        |
| MAN-J5* | 384846<br>397417 | Roadside             | 480m north east                              | -                                                               | -           | -           | -           | <b>46.9</b> | 28.4 | 31.2        |
| MAN-J6* | 384886<br>397415 | Roadside             | 480m north east                              | -                                                               | -           | -           | -           | -           | 32.2 | 33.8        |
| MAN-J2* | 384815<br>397450 | Roadside             | 510m north east                              | -                                                               | -           | -           | -           | <b>49.5</b> | 32.9 | 32.7        |
| MAN-J1* | 384774<br>397492 | Roadside             | 560m north                                   | -                                                               | -           | -           | -           | <b>42.7</b> | 26.9 | 29.9        |
| MA84NO  | 384239<br>397276 | Roadside             | 640m north west                              | <b>60.5</b>                                                     | <b>60.2</b> | <b>56.2</b> | <b>54.0</b> | <b>52.0</b> | 34.1 | <b>40.7</b> |
| MAN1    | 384233<br>397287 | Kerbside             | 650m north west                              | <b>66.0</b>                                                     | <b>66.0</b> | <b>65.0</b> | <b>62.0</b> | <b>59.0</b> | 36.0 | <b>44.0</b> |

- data not available \* additional monitoring locations taken from the Greater Manchester Clean Air Plan, which also offers bias adjusted NO<sub>2</sub> monitoring results for Manchester<sup>25</sup>

- 4.4 Exceedances of the current NO<sub>2</sub> annual mean air quality objective for England were recorded at all monitoring locations within the vicinity of the Site in 2019, with the exception of diffusion tube MA72NO. MA72NO is located in an urban background setting and away from any major roads or junctions, therefore lower concentrations are expected and an overall downward trend in NO<sub>2</sub> concentrations is evident from 2015-2019.
- 4.5 All of the monitoring locations considered are within the GMCA AQMA and therefore elevated NO<sub>2</sub> concentrations are anticipated. Elevated NO<sub>2</sub> concentrations are expected particularly at the roadside of a main arterial road in the city centre, where queuing traffic occurs and high volumes of traffic are present.
- 4.6 Diffusion tubes MA96NO, MAN-J7 and MAN-J8 are the closest monitoring locations to the Site and are all located adjacent to a main arterial road in the city centre, similar to the Site. As such, these locations are considered to be the most representative of pollutant concentrations at the Site.

<sup>25</sup> Clean Air Greater Manchester (no date) Greater Manchester Air Quality Data

- 4.7 With regard to the short-term air quality objective for NO<sub>2</sub>, annual mean NO<sub>2</sub> concentrations at all monitoring locations within the vicinity of the Site were less than 60µg.m<sup>-3</sup> in 2019, the most recent year of available representative monitoring data.

#### Particulate Matter (PM<sub>10</sub>)

- 4.8 MCC also monitor PM<sub>10</sub> at the MAN1 automatic monitoring station located approximately 650m north west of the Site, as detailed in **Table 4.2**.

**Table 4.2: MCC PM<sub>10</sub> Monitoring Data in 2015 – 2021**

| Site ID | X, Y             | Site Monitoring Type | Distance from and direction to Site boundary | Monitored Annual Average Concentration (µg.m <sup>-3</sup> ) |      |      |      |      |      |      |
|---------|------------------|----------------------|----------------------------------------------|--------------------------------------------------------------|------|------|------|------|------|------|
|         |                  |                      |                                              | 2015                                                         | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| MAN1    | 384233<br>397287 | Kerbside             | 650m north west                              | 28.0                                                         | 27.0 | 27.0 | 30.0 | 26.0 | 18.0 | 18.0 |

- 4.9 Annual mean concentrations were below the relevant current air quality objectives for PM<sub>10</sub> between the period of 2015 and 2021 and a downward trend was evident.

#### Particulate Matter (PM<sub>2.5</sub>)

- 4.10 There is no representative monitoring of PM<sub>2.5</sub> concentrations currently being undertaken by MCC within the vicinity of the Site.

### **Background Pollutant Concentrations**

- 4.11 MCC undertakes background monitoring of NO<sub>2</sub> using the diffusion tube MA72NO located approximately 451m north of the Site on Lockton Close. Monitored concentrations from 2019 for this location were adjusted in accordance with Defra guidance<sup>14</sup> to provide background NO<sub>2</sub> concentrations for the Site in the current year 2023 and the future assessment year of 2026. The adjusted concentration for 2026 is detailed in in **Table 4.3**. No background monitoring of particulate matter is undertaken by MCC within the vicinity of the Site.
- 4.12 Background PM<sub>10</sub> and PM<sub>2.5</sub> concentrations were therefore obtained from the latest Defra background concentration maps<sup>26</sup>, which are provided for the UK as a 1km x 1km grid network. The latest maps are based on 2018 monitoring and meteorological data. Background concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> were obtained for the grid squares covering the Site. The background concentrations for the assessment years of 2019, 2023 and 2026 are detailed in **Table 4.3**.

<sup>26</sup> Defra (2019) background pollutant concentration maps [<https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2022>]

**Table 4.3: Background Pollutant Concentrations used in the Assessment**

| Pollutant         | Grid Square   | Concentration ( $\mu\text{g.m}^{-3}$ ) |       |       |
|-------------------|---------------|----------------------------------------|-------|-------|
|                   |               | 2019                                   | 2023  | 2026  |
| NO <sub>2</sub>   | 384500,397500 | 32.8*                                  | 27.8† | 21.8† |
| PM <sub>10</sub>  |               | 14.3                                   | 13.6  | 13.4  |
| PM <sub>2.5</sub> |               | 9.1                                    | 8.6   | 8.4   |

\* 2019 monitored background NO<sub>2</sub> concentration at MA72NO, † NO<sub>2</sub> background concentration adjusted using Defra methodology<sup>14</sup>

- 4.13 As shown in **Table 4.3**, background concentrations are below the current relevant annual mean air quality objectives for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> the years of 2019, 2023 and 2026. Furthermore, background PM<sub>2.5</sub> concentrations in the assessment years are below both the interim and future air quality objective.

## 5. CONSTRUCTION PHASE DUST ASSESSMENT

- 5.1 The construction phase of the Proposed Development will involve a number of activities which have the potential to impact on local air quality. These include emissions of dust generated through demolition, excavation, construction, earthworks and trackout activities, exhaust pollutant emissions from construction traffic on the local highways network, and exhaust emissions from non-road mobile machinery (NRMM) within the construction site itself.
- 5.2 The location of sensitive receptors in relation to construction activities will affect the potential for such construction activities to cause dust soiling, nuisance and local air quality impacts. Meteorological conditions and the use of control measures will also contribute to the effects experienced.

### Step 1: Screen the Need for a Detailed Assessment

- 5.3 Step 1 of the IAQM guidance<sup>15</sup> involves a screening assessment to consider whether a more detailed construction phase dust assessment is required.
- 5.4 In accordance with the guidance, a detailed assessment is required if:
- Human receptors are located within 350m of the boundary of the site or 50m of routes used by construction vehicles on the public highways, up to 500m from the site entrances; or
  - Ecological receptors are located within 50m of the boundary of the site or 50m of routes used by construction vehicles on the public highways, up to 500m from the site entrances.
- 5.5 From a review of the Multi Agency Geographic Information for the Countryside (MAGIC) website<sup>27</sup>, no ecological designations were identified within the above screening distance and therefore the impact on ecological designations was not considered further. However human receptors are located within the above screening distances, with the closest of these receptors located off Kincardine Road.

### Step 2: Assess the Risk of Dust Impacts

#### Step 2A: Define the Potential Dust Emission Magnitude

- 5.6 The dust emission magnitudes for the construction activities were defined using the criteria detailed in the IAQM guidance<sup>15</sup> as detailed in **Table 5.1**.

---

<sup>27</sup> Defra, Multi Agency Geographic Information for the Countryside (MAGIC) [<http://magic.defra.gov.uk/>]

**Table 5.1: Dust Emission Magnitude Criteria and Definition**

| Activity     | IAQM Dust Emission Magnitude | IAQM Dust Emission Magnitude Criteria                                                                                                                                                                                                                                                    |
|--------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Demolition   | Large                        | Total building volume >50,000m <sup>3</sup> , potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level.                                                                                                    |
|              | Medium                       | Total building volume 20,000m <sup>3</sup> – 50,000m <sup>3</sup> , potentially dusty construction material, demolition activities 10 - 20m above ground level.                                                                                                                          |
|              | Small                        | Total building volume <20,000m <sup>3</sup> , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.                                                                       |
| Earthworks   | Large                        | Total site area >10,000m <sup>2</sup> , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes. |
|              | Medium                       | Total site area 2,500m <sup>2</sup> – 10,000m <sup>2</sup> , moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4m - 8m in height, total material moved 20,000 tonnes – 100,000 tonnes.                               |
|              | Small                        | Total site area <2,500m <sup>2</sup> , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <20,000 tonnes, earthworks during wetter months.                                       |
| Construction | Large                        | Total building volume >100,000m <sup>3</sup> , on site concrete batching, sandblasting.                                                                                                                                                                                                  |
|              | Medium                       | Total building volume 25,000m <sup>3</sup> – 100,000m <sup>3</sup> , potentially dusty construction material (e.g. concrete), on site concrete batching.                                                                                                                                 |
|              | Small                        | Total building volume <25,000m <sup>3</sup> , construction material with low potential for dust release (e.g. metal cladding or timber).                                                                                                                                                 |
| Trackout     | Large                        | >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m.                                                                                                                                                |
|              | Medium                       | 10 - 50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m.                                                                                                                                        |
|              | Small                        | <10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.                                                                                                                                                        |

5.7 The following dust emissions magnitudes were defined for the Proposed Development:

- Demolition – the Proposed Development includes the demolition of existing building at the Site. The total building volume to be demolished is anticipated to be less than 20,000m<sup>3</sup> and the maximum height of the buildings to be demolished is less than 10m above ground level. The dust emissions magnitude for demolition was therefore defined as '**Small**'.
- Earthworks - the total Site area is more than 10,000m<sup>2</sup>, therefore the dust emission magnitude was defined as '**Large**'.
- Construction – the Proposed Development comprises the construction of two tower blocks for use as student accommodation above a ground floor combined floorplate for community/commercial and amenity use, and a Sci-Tech building. Based on the size of the Proposed Development, total building volume is anticipated to be above 100,000m<sup>3</sup>. Therefore, the dust emission magnitude for construction was defined as '**Large**'.
- Trackout – due to the size of the Site, there are anticipated to be less than 10 HDV movements in any one day during the construction phase. It is assumed that construction traffic will access the Site via Kincardine Road, where there is existing Site access. Therefore, the dust emission magnitude for trackout was defined as '**Small**'. A

trackout distance of up to 50m from the Site access was therefore used in accordance with the IAQM guidance<sup>15</sup>.

- 5.8 A summary of the defined dust emissions magnitudes for the development are provided in **Table 5.2**.

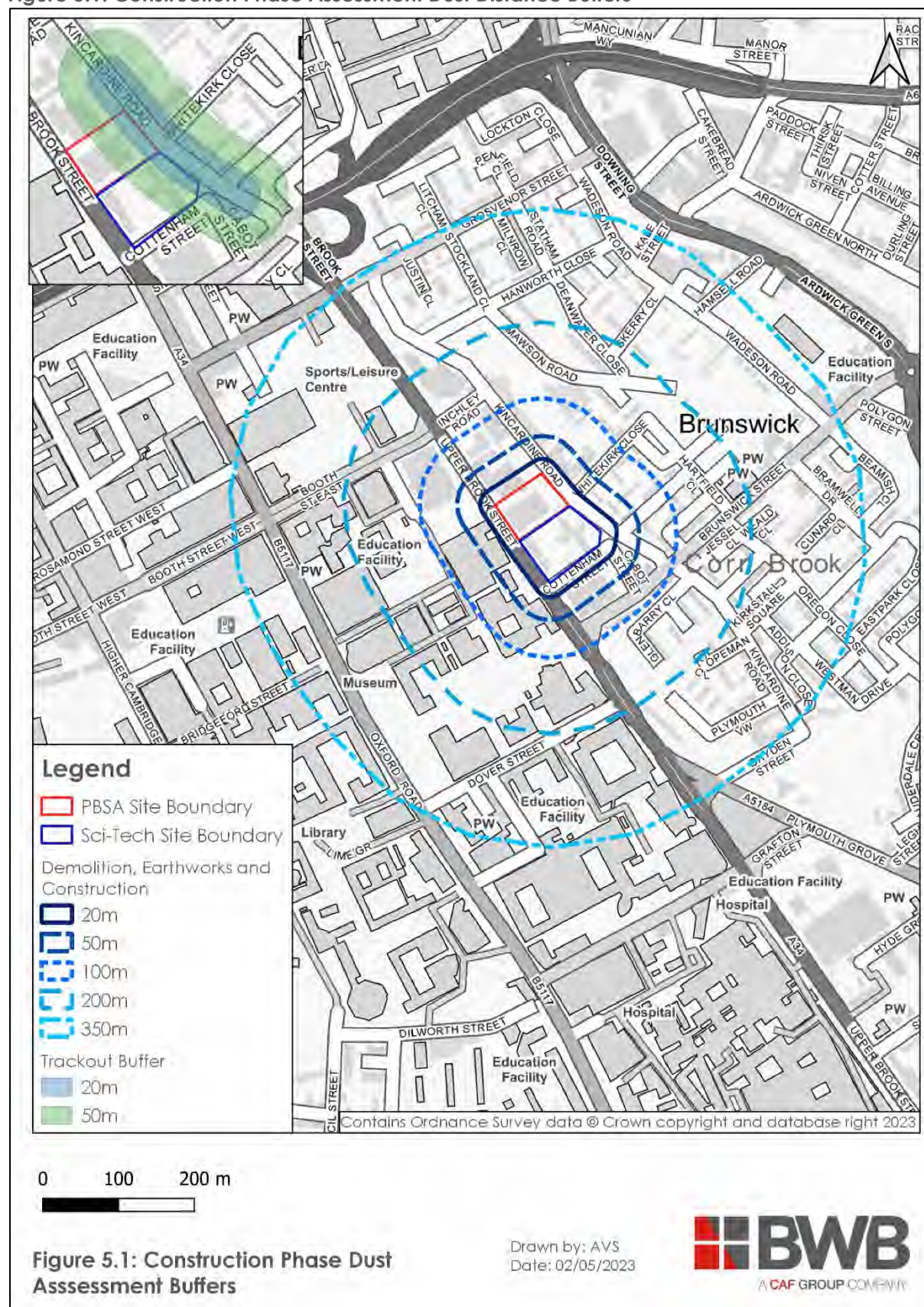
**Table 5.2: Summary of Project Defined Dust Emissions Magnitudes**

| Activity     | Dust Emissions Magnitude |
|--------------|--------------------------|
| Demolition   | Small                    |
| Earthworks   | Large                    |
| Construction | Large                    |
| Trackout     | Small                    |

#### Step 2B: Define the Sensitivity of the Area

- 5.9 The assessment requires the determination of the sensitivity of the area for the purposes of dust soiling and human health. The sensitivity of the study area takes into account the specific receptors in the vicinity of the Site, the proximity and number of those receptors, the local background concentration of PM<sub>10</sub> and site-specific factors. **Figure 5.1** was utilised to determine the number of receptors located within the distance bands provided in the IAQM guidance<sup>15</sup> for determining receptor sensitivity.

Figure 5.1: Construction Phase Assessment Dust Distance Buffers



5.10 The sensitivity of the area is defined below, in accordance with IAQM criteria<sup>15</sup> and summarised in **Table 5.3**.

- Dust Soiling – there are between 10 and 100 existing highly sensitive residential receptors located within 50m of the proposed Site boundary and potentially more than 100 existing receptors with medium sensitivity associated with The University of Manchester campus, which are located within 50m of the proposed Site boundary. There are also several short-medium stay car parks located within 50m of the proposed Site boundary which are considered highly sensitive. Therefore, the sensitivity of the area to dust soiling associated with earthworks, demolition and construction activities was defined as '**High**'. In addition, there are between 10 and 100 existing highly sensitive residential receptors located within 20m of the assumed roads to be used by construction traffic. Therefore, the sensitivity of the area to dust soiling associated with trackout activities was defined as '**High**'.
- Human Health – there are between 10 and 100 existing highly sensitive residential receptors located within 50m of the proposed Site boundary and potentially more than 100 receptors with medium sensitivity associated with The University of Manchester campus, which are located within 50m of the proposed Site boundary. In addition, there are between 10 and 100 highly sensitive existing residential receptors located within 20m of the assumed roads to be used by construction traffic. As detailed in **Table 4.2**, the current background PM<sub>10</sub> concentration at the Site is below 24µg.m<sup>-3</sup> and therefore the sensitivity of the area to human health impacts was defined as '**Low**'.

**Table 5.3: Determination of the Sensitivity of the Area**

| Potential Impact | Sensitivity |            |              |          |
|------------------|-------------|------------|--------------|----------|
|                  | Demolition  | Earthworks | Construction | Trackout |
| Dust Soiling     | High        | High       | High         | High     |
| Human Health     | Low         | Low        | Low          | Low      |

#### Step 2C: Define the Risk of Impacts

5.11 The dust emission magnitude determined in Step 2A is then combined with the sensitivity of the area determined in Step 2B to define the risk of dust impacts with no mitigation applied. The results of this assessment are detailed in **Table 5.4**.

**Table 5.4: Summary Dust Risk Table to Define Site Specific Risk**

| Activity                                           | Step 2A: Dust Emission Magnitude | Step 2B: Sensitivity of the Area | Step 2C: Risk of Dust Impacts |
|----------------------------------------------------|----------------------------------|----------------------------------|-------------------------------|
| <b>Dust Soiling Effects on People and Property</b> |                                  |                                  |                               |
| Demolition                                         | Small                            | High                             | Medium Risk                   |
| Earthworks                                         | Large                            | High                             | High Risk                     |
| Construction                                       | Large                            | High                             | High Risk                     |
| Trackout                                           | Small                            | High                             | Low Risk                      |
| <b>Human Health Impacts</b>                        |                                  |                                  |                               |
| Demolition                                         | Small                            | Low                              | Negligible                    |
| Earthworks                                         | Large                            | Low                              | Low Risk                      |
| Construction                                       | Large                            | Low                              | Low Risk                      |
| Trackout                                           | Small                            | Low                              | Negligible                    |

### Step 3: Site-Specific Mitigation

- 5.13 The risk of dust impacts, defined in Step 2C of the assessment, is used to determine the mitigation measures required to minimise the emission of dust during construction phase activities. The IAQM guidance<sup>15</sup> provides details of highly recommended and desirable mitigation measures which are commensurate with the risk of dust impacts defined in Step 2C for demolition, construction, earthworks and trackout activities. Where the mitigation measures are general in nature, the highest risk category was applied in accordance with the guidance<sup>15</sup>. The highest risk category identified was 'High Risk' and the recommended mitigation taken from the IAQM guidance<sup>15</sup> is detailed in **Table 5.5** and **Table 5.6**.

**Table 5.5: Mitigation Measures for a High Risk Site**

| Category      | Mitigation Measures for a High Risk Site                                                                                                                                                |           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|               | Highly Recommended                                                                                                                                                                      | Desirable |
| Communication | Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.                                                               | None      |
|               | Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager. |           |

| Category        | Mitigation Measures for a High Risk Site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                 | Highly Recommended                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Desirable |
|                 | Display the head or regional office contact information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
|                 | Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM <sub>10</sub> continuous monitoring and/or visual inspections. |           |
| Site Management | Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.                                                                                                                                                                                                                                                                                                                                                                                                                                      | None      |
|                 | Make the complaints log available to the local authority when asked.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |
|                 | Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |
|                 | Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.                                                                                                                                                                                                                                                  |           |
| Monitoring      | Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the site boundary, with cleaning to be provided as necessary.                                                                                                                                                                                                   | None      |
|                 | Carry out regular site inspections to monitor compliance with the DMP, record inspections results, and make an inspection log available to the local authority when asked.                                                                                                                                                                                                                                                                                                                                                                                                                          |           |
|                 | Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are                                                                                                                                                                                                                                                                                                                                                                                                                              |           |

| Category                                            | Mitigation Measures for a High Risk Site                                                                                                                                                                                                                                                                                                        |           |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                                     | Highly Recommended                                                                                                                                                                                                                                                                                                                              | Desirable |
|                                                     | being carried out and during prolonged dry or windy conditions.                                                                                                                                                                                                                                                                                 |           |
| Preparing and maintaining the site                  | Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.                                                                                                                                                                                                                      | None      |
|                                                     | Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.                                                                                                                                                                                                               |           |
|                                                     | Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extended period.                                                                                                                                                                                                    |           |
|                                                     | Avoid site runoff of water or mud.                                                                                                                                                                                                                                                                                                              |           |
|                                                     | Keep site fencing, barriers and scaffolding clean using wet methods.                                                                                                                                                                                                                                                                            |           |
|                                                     | Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.                                                                                                                                                                 |           |
|                                                     | Cover, seed or fence stockpiles to prevent wind whipping.                                                                                                                                                                                                                                                                                       |           |
| Operating vehicle/ machinery and sustainable travel | Ensure all vehicles switch off engines when stationary – no idling vehicles.                                                                                                                                                                                                                                                                    | None      |
|                                                     | Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.                                                                                                                                                                                                                  |           |
|                                                     | Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable control measures provided, subject to the approval of the nominated undertaker with the agreement of the local authority, where appropriate). |           |
|                                                     | Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.                                                                                                                                                                                                                                                |           |
|                                                     | Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).                                                                                                                                                                                                                  |           |
| Operations                                          | Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.                                                                                                                                    | None      |

| Category         | Mitigation Measures for a High Risk Site                                                                                                                                       |           |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                  | Highly Recommended                                                                                                                                                             | Desirable |
|                  | Ensure an adequate water supply on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.                  |           |
|                  | Used enclose chutes and conveyors and covered skips.                                                                                                                           |           |
|                  | Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.       |           |
|                  | Ensure equipment is readily available on site to clean and dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. |           |
| Waste Management | Avoid bonfires and burning of waste materials.                                                                                                                                 | None      |

**Table 5.6: Mitigation Measures Specific to Demolition, Earthworks, Construction and Trackout**

| Category                         | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                           |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | Highly Recommended                                                                                                                                                                                                                                                                                                                                                 | Desirable                                                                                                                                                 |
| Demolition<br>(Medium Risk Site) | Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. | Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). |
|                                  | Avoid explosive blasting, using appropriate manual or mechanical alternatives.                                                                                                                                                                                                                                                                                     |                                                                                                                                                           |
|                                  | Bag and remove any biological debris or damp down such material before demolition.                                                                                                                                                                                                                                                                                 |                                                                                                                                                           |
| Earthworks<br>(High Risk Site)   | Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.                                                                                                                                                                                                                                                             | None                                                                                                                                                      |
|                                  | Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.                                                                                                                                                                                                                                          |                                                                                                                                                           |
|                                  | Only remove the cover in small areas during work and not all at once.                                                                                                                                                                                                                                                                                              |                                                                                                                                                           |
| Construction<br>(High Risk Site) | Avoid scabbling (roughening of concrete surfaces) if possible.                                                                                                                                                                                                                                                                                                     | For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.                                  |
|                                  | Ensure sand and other aggregates are stored in bunded areas and are not                                                                                                                                                                                                                                                                                            |                                                                                                                                                           |

| Category                    | Mitigation Measures                                                                                                                                   |                                                                                                                                                                                                                               |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | Highly Recommended                                                                                                                                    | Desirable                                                                                                                                                                                                                     |
|                             | allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. |                                                                                                                                                                                                                               |
|                             |                                                                                                                                                       | Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. |
| Trackout<br>(Low Risk Site) | None                                                                                                                                                  | Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any materials tracked out of the site. This may require the sweeper being continuously in use.                                     |
|                             |                                                                                                                                                       | Avoid dry sweeping of large areas.                                                                                                                                                                                            |
|                             |                                                                                                                                                       | Ensure vehicles entering and leaving the sites are covered to prevent escape of materials during transport.                                                                                                                   |
|                             |                                                                                                                                                       | Record all inspections of haul routes and any subsequent action in a site log book.                                                                                                                                           |
|                             |                                                                                                                                                       | Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).                                                                             |

#### Step 4: Determine Significant Effects

- 5.14 In accordance with IAQM guidance<sup>15</sup>, with the implementation of the mitigation measures detailed in Step 3, the residual impacts from the construction phase are considered to be 'not significant'.

## **6. OPERATIONAL PHASE ROAD TRAFFIC EMISSIONS SCREENING ASSESSMENT**

### **IAQM and EPUK Guidance**

- 6.1 The trip generation for the Proposed Development was screened using IAQM and EPUK Stage 1 and Stage 2 criteria<sup>16</sup> to determine whether a detailed air quality assessment was required.

#### *Stage 1*

- 6.2 The Proposed Development comprises 10 or more residential units and more than 1,000m<sup>2</sup> of floor space, but proposes 8 disabled car parking spaces in total, 5 allocated to the PBSA and 3 allocated to the Sci-Tech building. In accordance with the IAQM and EPUK guidance<sup>16</sup>, as the proposed number of car parking space is below the threshold of ten spaces, there is no requirement to proceed to Stage 2. However, due to the nature of the Proposed Development there will be trips associated with drop offs, taxis and delivery vehicles travelling to and from the Site and therefore to provide a robust assessment, the Stage 2 indicative criteria for requiring an air quality assessment was also considered.

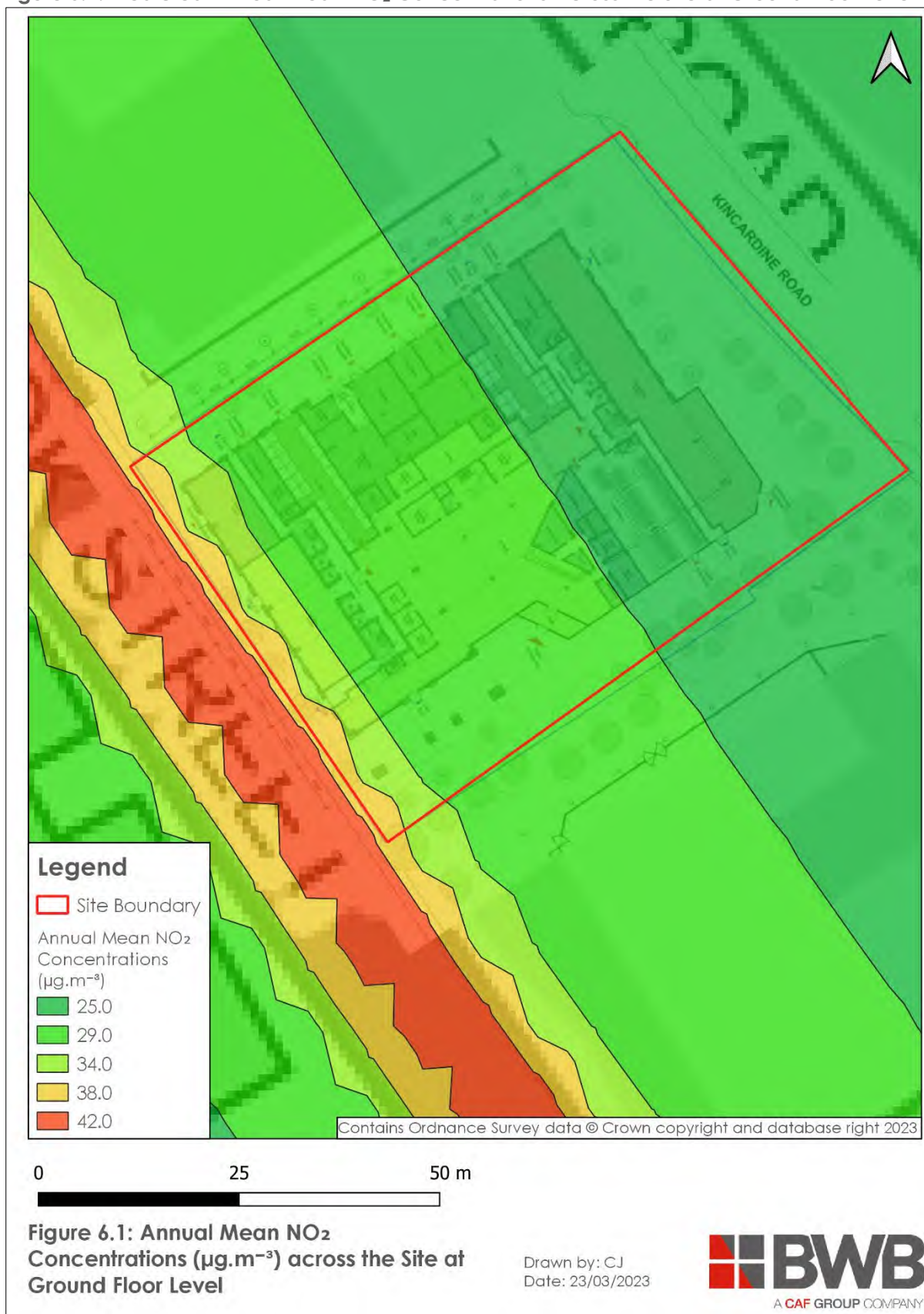
#### *Stage 2*

- 6.3 The trip generation for the Proposed Development was provided by Civic Engineers, the appointed Transport Consultants for the project. It was confirmed by Civic Engineers that the combined predicted trip generation for the PBSA and Sci-Tech building is 72 LDVs and one HDV as a 24 hour AADT flow.
- 6.4 Furthermore, the existing PBSA Site is currently in use as a car park with 90 spaces and it was confirmed by Civic Engineers that the Proposed Development would lead to a decrease of 239 LDVs and no change in HDVs as a 24 hour AADT flow.
- 6.5 The predicted trip generation is below the screening criteria detailed in the EPUK and IAQM guidance<sup>16</sup> of 100 LDV AADT and 25 HDV AADT for development within an AQMA. As such, it was considered that a detailed road traffic emissions assessment is not required.
- 6.6 In accordance with the IAQM and EPUK guidance<sup>14</sup>, where none of the screening criteria are met, impacts from the Proposed Development “*can be considered as having an insignificant effect*” on local air quality and a detailed air quality assessment is not required.

## Site Suitability Assessment of the PBSA Site

- 6.7 Concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> were predicted across the Site to determine the suitability of the PBSA Site for the proposed residential use with regard to air quality. There are no proposed sensitive uses in the Sci-Tech building, therefore pollutant concentrations were not predicted across this Sci-Tech Site.
- 6.8 A Cartesian grid from minimum X 384637, Y 396557 to maximum X 384993, Y 397065 was modelled at a height of 1.5m to represent average breathing height at ground floor across the PBSA Site. However, there are no sensitive uses proposed at ground floor and as such, modelling was also undertaken at a height of 4.2m, to represent first floor breathing height based on drawings provided by Sheppard Robson (drawing ref: 6601 SRA XX 01 DR A 20101).
- 6.9 Pollutant concentrations were predicted across the PBSA Site for Scenario 2: 2026 Opening Year. **Figures 6.1 – 6.6** illustrate annual mean pollutant concentration contours for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at ground floor and first floor, respectively, across the Site. Ground and first floor plans are included to illustrate the sensitive uses across the Site.

**Figure 6.1: Predicted Annual Mean NO<sub>2</sub> Concentrations Across the Site at Ground Floor Level**



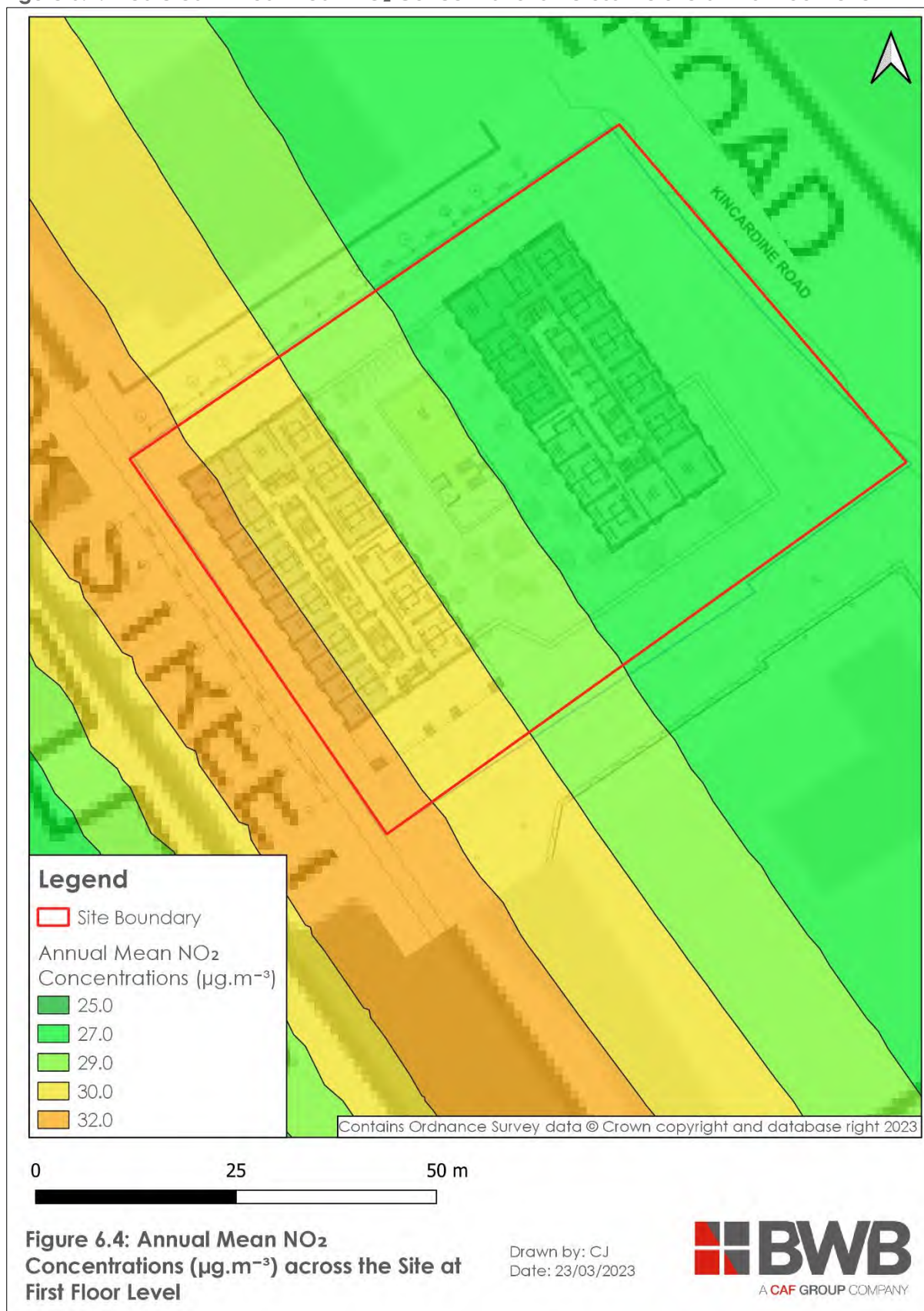
**Figure 6.2: Predicted Annual Mean PM<sub>10</sub> Concentrations Across the Site at Ground Floor Level**



**Figure 6.3: Predicted Annual Mean PM<sub>2.5</sub> Concentrations Across the Site at Ground Floor Level**



**Figure 6.4: Predicted Annual Mean NO<sub>2</sub> Concentrations Across the Site at First Floor Level**



**Figure 6.5: Predicted Annual Mean PM<sub>10</sub> Concentrations Across the Site at First Floor Level**



**Figure 6.6: Predicted Annual Mean PM<sub>2.5</sub> Concentrations Across the Site at First Floor Level**



- 6.11 The predicted annual mean NO<sub>2</sub> concentrations for Scenario 2: 2026 Opening Year with development, indicate that pollutant concentrations exceed the annual mean air quality objective for England at ground floor level locations along Upper Brook Street. Higher concentrations such as this are expected along a main arterial road in the city centre.
- 6.12 It should be noted that the Proposed Development is set further back from Upper Brook Street and is therefore located outside the exceedance area at ground floor level, as is shown in **Figure 6.1**. At first floor level, where sensitive residential uses are proposed, NO<sub>2</sub> concentrations for Scenario 2 are below the annual mean air quality objective for England, as is shown in **Figure 6.4**. As such, no exceedances are predicted at ground or first floor level of the Proposed Development.
- 6.13 PM<sub>10</sub> and PM<sub>2.5</sub> concentrations for Scenario 2 are below the annual objectives for England at both ground and first floor level. Furthermore, predicted annual mean PM<sub>2.5</sub> concentrations are below the interim and future PM<sub>2.5</sub> air quality objectives at first floor level, but are not below the future air quality objective at ground floor level.
- 6.14 There are potential sensitive community uses proposed for the ground floor level of the Proposed Development and therefore the short term air quality objectives for NO<sub>2</sub> and PM<sub>10</sub> apply. The predicted annual mean NO<sub>2</sub> concentrations are less than 60µg.m<sup>-3</sup> and therefore in accordance with Defra guidance<sup>12</sup> it may be assumed that exceedance of the 1-hour mean NO<sub>2</sub> objective are unlikely. The calculation detailed in paragraph 3.18 was used to determine potential exceedance of the 24-hour PM<sub>10</sub> short term objective; no exceedances were predicted.
- 6.15 Based on the assessment results, the Site can be considered suitable for the proposed residential use.

### **Development Measures**

- 6.16 The Proposed Development is not predicted to have a significant impact on air quality and therefore mitigation measures are not required to minimise air quality impacts. However, the proposed energy strategy comprises an all-electric system utilising ASHPs for heating and hot water which will further reduce emissions associated with the Proposed Development and therefore may benefit air quality. It is also understood that the Proposed Development includes cycle storage and changing facilities. In addition to this, a Travel Plan was submitted as part of the scheme and includes methods for active travel, further reducing emissions associated with travel to and from the Proposed Development.

## 7. CONCLUSION

- 7.1 An air quality impact assessment was undertaken for the proposed purpose-built student accommodation and Sci-Tech building at land off Upper Brook Street, Manchester.
- 7.2 A qualitative construction phase assessment was undertaken and measures were recommended to minimise emissions during construction activities. With the implementation of these mitigation measures the impact of construction phase dust emissions is considered to be 'not significant' in accordance with IAQM guidance<sup>15</sup>.
- 7.3 The predicted trip generation for the Proposed Development was screened using the IAQM and EPUK<sup>16</sup> two stage screening process. The predicted trip generation did not exceed the relevant screening criteria for development within an AQMA and therefore detailed air dispersion modelling was not undertaken. Air quality impacts as a result of additional road traffic emissions associated with the Site were therefore considered to be not significant.
- 7.4 Pollutant concentrations were also predicted across the Site to consider the Site suitability for the proposed residential end use for the PBSA, with regard to the current relevant current air quality objectives for England. Concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> were all predicted to be below the current relevant air quality objectives for England where sensitive use is currently proposed.
- 7.5 Based on the assessment results, the impact of the Proposed Development on air quality was determined to be 'not significant' and mitigation measures are not required. However, space heating and hot water will be provided via an all-electric system which may benefit air quality. It is also understood that the Proposed Development includes cycle storage and changing facilities to encourage active travel. In addition to this, a Travel Plan was submitted as part of the scheme, further reducing emissions associated with travel to and from the Proposed Development.

## ***APPENDICES***

## **APPENDIX A: GLOSSARY OF TERMS**

|                                                  | Definition                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AADT                                             | Annual Average Daily Traffic flow.                                                                                                                                                                                                                                                                                                                                     |
| Air quality objective                            | Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).                                                                                                                                                   |
| Air quality standard                             | The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).                                                          |
| Annual mean                                      | The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between two years, which is useful for pollutants that have higher concentrations during the winter months. |
| AQAP                                             | Air Quality Action Plan.                                                                                                                                                                                                                                                                                                                                               |
| AQMA                                             | Air Quality Management Area.                                                                                                                                                                                                                                                                                                                                           |
| AQS                                              | Air Quality Strategy.                                                                                                                                                                                                                                                                                                                                                  |
| Defra                                            | Department for Environment, Food and Rural Affairs.                                                                                                                                                                                                                                                                                                                    |
| EPUK                                             | Environmental Protection UK.                                                                                                                                                                                                                                                                                                                                           |
| Exceedance                                       | A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.                                                                                                                                                                                                                                           |
| HDV                                              | Heavy Duty Vehicles (HGVs + buses and coaches)                                                                                                                                                                                                                                                                                                                         |
| HGV                                              | Heavy Goods Vehicles.                                                                                                                                                                                                                                                                                                                                                  |
| IAQM                                             | Institute of Air Quality Management.                                                                                                                                                                                                                                                                                                                                   |
| LAQM                                             | Local Air Quality Management.                                                                                                                                                                                                                                                                                                                                          |
| LDV                                              | Light Duty Vehicles (motorbikes, cars, vans and small trucks)                                                                                                                                                                                                                                                                                                          |
| NO                                               | Nitrogen monoxide, a.k.a. nitric oxide.                                                                                                                                                                                                                                                                                                                                |
| NO <sub>2</sub>                                  | Nitrogen dioxide.                                                                                                                                                                                                                                                                                                                                                      |
| NO <sub>x</sub>                                  | Nitrogen oxides.                                                                                                                                                                                                                                                                                                                                                       |
| Percentile                                       | The percentage of results below a given value.                                                                                                                                                                                                                                                                                                                         |
| PM <sub>10</sub>                                 | Particulate matter with an aerodynamic diameter of less than 10 micrometres.                                                                                                                                                                                                                                                                                           |
| PM <sub>2.5</sub>                                | Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.                                                                                                                                                                                                                                                                                          |
| micrograms per cubic metre (µg.m <sup>-3</sup> ) | A measure of concentration in terms of mass per unit volume. A concentration of 1µg.m <sup>-3</sup> means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.                                                                                                                                                                       |

## **APPENDIX B: PROPOSED DEVELOPMENT MASTERPLANS**



GA Ground Floor Plan  
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Department Legend

- Amenity
- Bin Store
- Community / Commercial
- Cycle Store
- Management
- Lobby / Circulation
- MEP
- Vertical circulation

**Legend**  
Planning Application Boundary  
Site Ownership Boundary

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General Arrangement  
Ground Floor Plan

Stage 2

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### Department Legend

- 4-Bed Cluster Bedroom
- 5-Bed Cluster Bedroom
- 6-Bed Cluster Bedroom
- 7-Bed Cluster Bedroom
- 8-Bed Cluster Bedroom
- Amenity
- Standard Studio
- Accessible Studio
- Lobby / Circulation
- MEP
- Vertical circulation

### Legend

- Planning Application Boundary
- Site Ownership Boundary

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First Floor Plan**

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-  6-Bed Cluster Bedroom
-  7-Bed Cluster Bedroom
-  Standard Studio
-  Enlarged Studio
-  Lobby / Circulation
-  MEP
-  Vertical circulation

— Planning Application Boundary  
— Site Ownership Boundary

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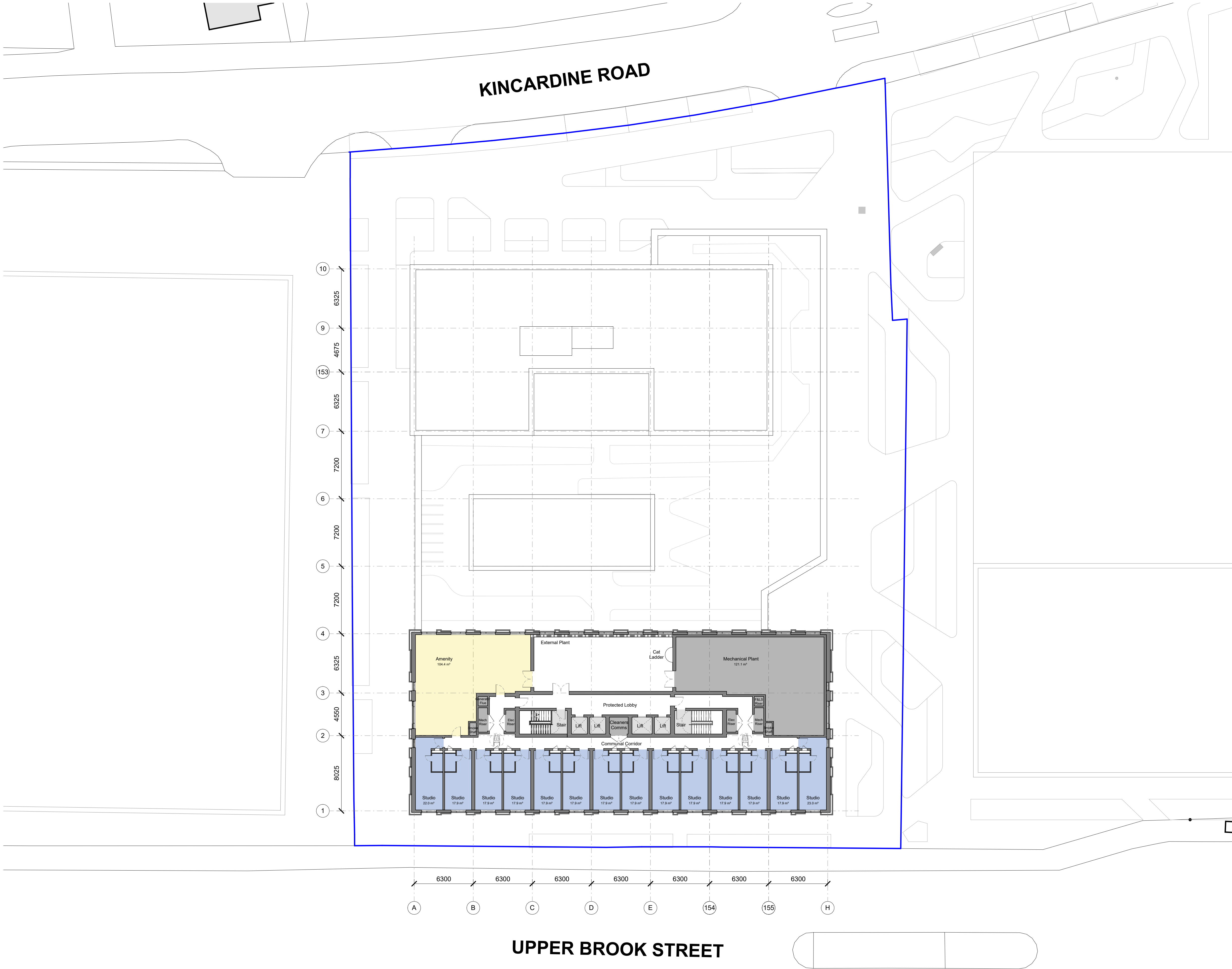
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## General Arrangement Eight Floor Plan

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Department Legend

- Amenity
- Standard Studio
- Lobby / Circulation
- MEP
- Vertical circulation

- Legend
- Planning Application Boundary
  - Site Ownership Boundary

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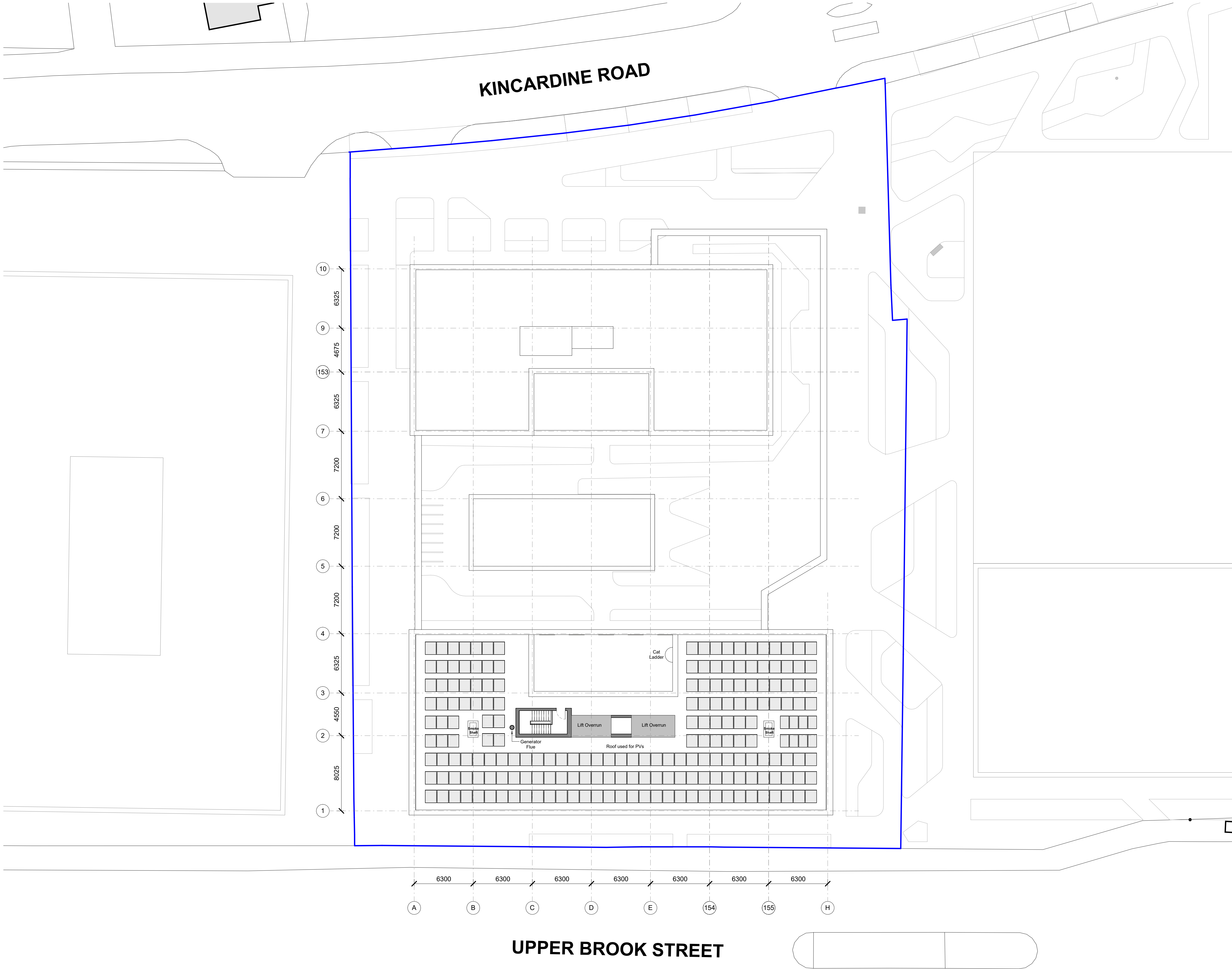
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General Arrangement  
Twenty-Second Floor Plan

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Legend

Planning Application Boundary

Site Ownership Boundary

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General Arrangement  
Roof Plan

Stage 2

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### Department Legend

- 6-Bed Cluster Bedroom
- 7-Bed Cluster Bedroom
- 8-Bed Cluster Bedroom
- Standard Studio
- Enlarged Studio
- Lobby / Circulation
- MEP
- Vertical circulation

### Legend

- Planning Application Boundary
- Site Ownership Boundary

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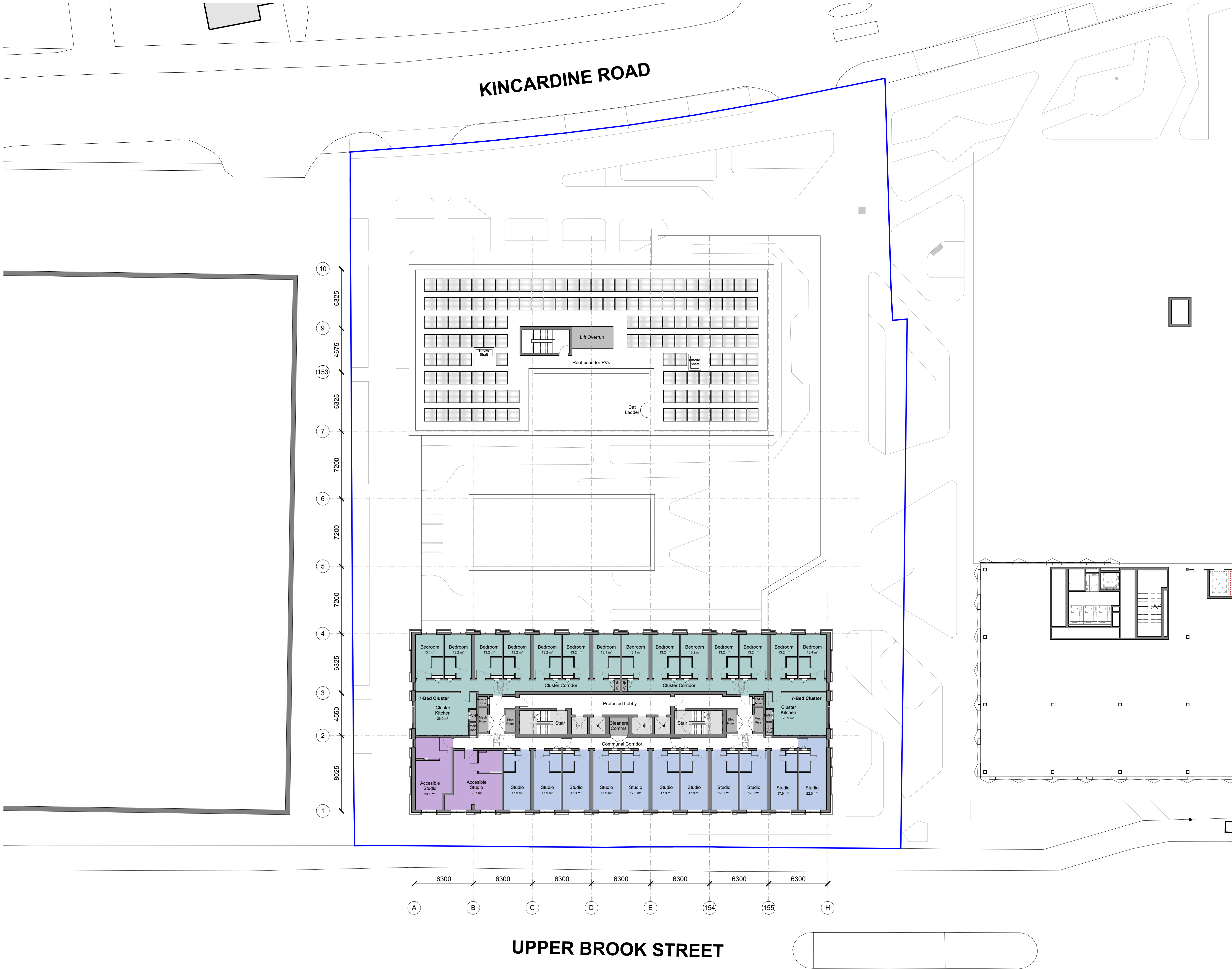
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**General Arrangement**  
**Second to Seventh Floor Plan**

### Stage 2

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Department Legend

- 7-Bed Cluster Bedroom
- Standard Studio
- Accessible Studio
- Lobby / Circulation
- MEP
- Vertical circulation

- Legend
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General Arrangement  
Tenth to Sixteenth Floor Plan

Stage 2

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|---------------------------------------|-------------------|--------|
| S2                                    | For Information   | 6601   |
| DRAWING NO.                           | REV.              |        |
| 6601 · SRA · XX · ZZ · DR · A · 20109 | P03               |        |



GA Seventeenth to Eighteenth Floor Plan  
1 : 200

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### Department Legend

- 7-Bed Cluster Bedroom
- Standard Studio
- Accessible Studio
- Lobby / Circulation
- MEP
- Vertical circulation

### Legend

- Planning Application Boundary
- Site Ownership Boundary

| REV. | DATE       | AMENDMENT                       |
|------|------------|---------------------------------|
| P01  | 10/02/2023 | First Issue                     |
| P02  | 28/02/2023 | DRAFT - Issued for Coordination |
| P03  | 20/03/2023 | DRAFT - Issued for Coordination |

KEYPLAN

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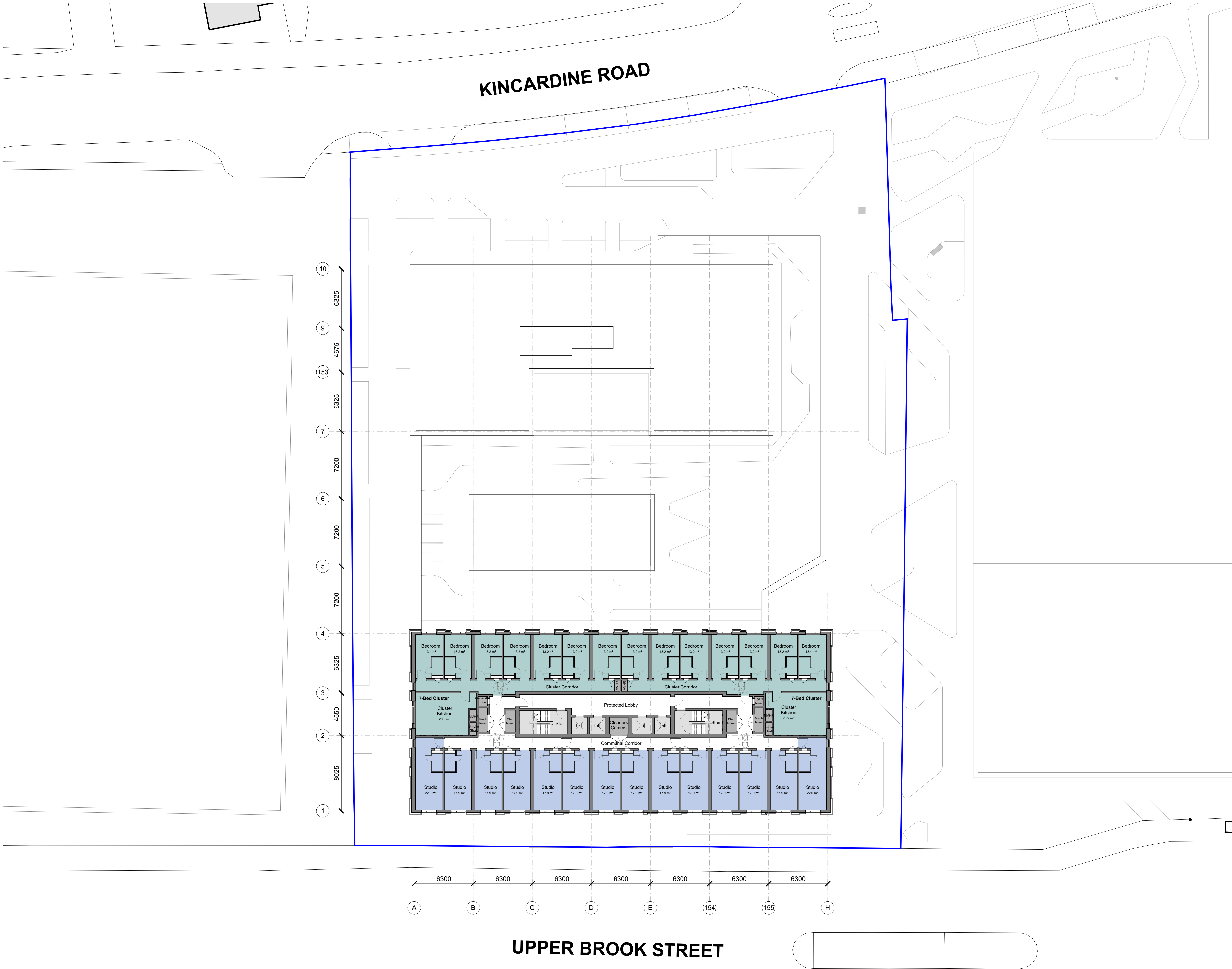
PROJECT  
**Upper Brook Street Student Accommodation**

| SCALE@A1     | DATE       | ORIGINATOR | CHECKED | AUTHORISED |
|--------------|------------|------------|---------|------------|
| As indicated | 20/03/2023 | SR         | ET      | RG         |

**General Arrangement**  
**Seventeenth to Eighteenth Floor Plan**

### Stage 2

| STATUS      | PURPOSE FOR ISSUE                     | SR NO.      |
|-------------|---------------------------------------|-------------|
| <b>S2</b>   | <b>For Information</b>                | <b>6601</b> |
| DRAWING NO. | REV.                                  |             |
| <b>6601</b> | <b>SRA · XX · ZZ · DR · A · 20117</b> | <b>P03</b>  |



GA Nineteenth to Twenty-First Floor Plan  
1 : 200

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### Department Legend

- 7-Bed Cluster Bedroom
- Standard Studio
- Lobby / Circulation
- MEP
- Vertical circulation

- Legend
- Planning Application Boundary
  - Site Ownership Boundary

| REV. | DATE       | AMENDMENT                       |
|------|------------|---------------------------------|
| P01  | 10/02/2023 | First Issue                     |
| P02  | 28/02/2023 | DRAFT - Issued for Coordination |
| P03  | 20/03/2023 | DRAFT - Issued for Coordination |

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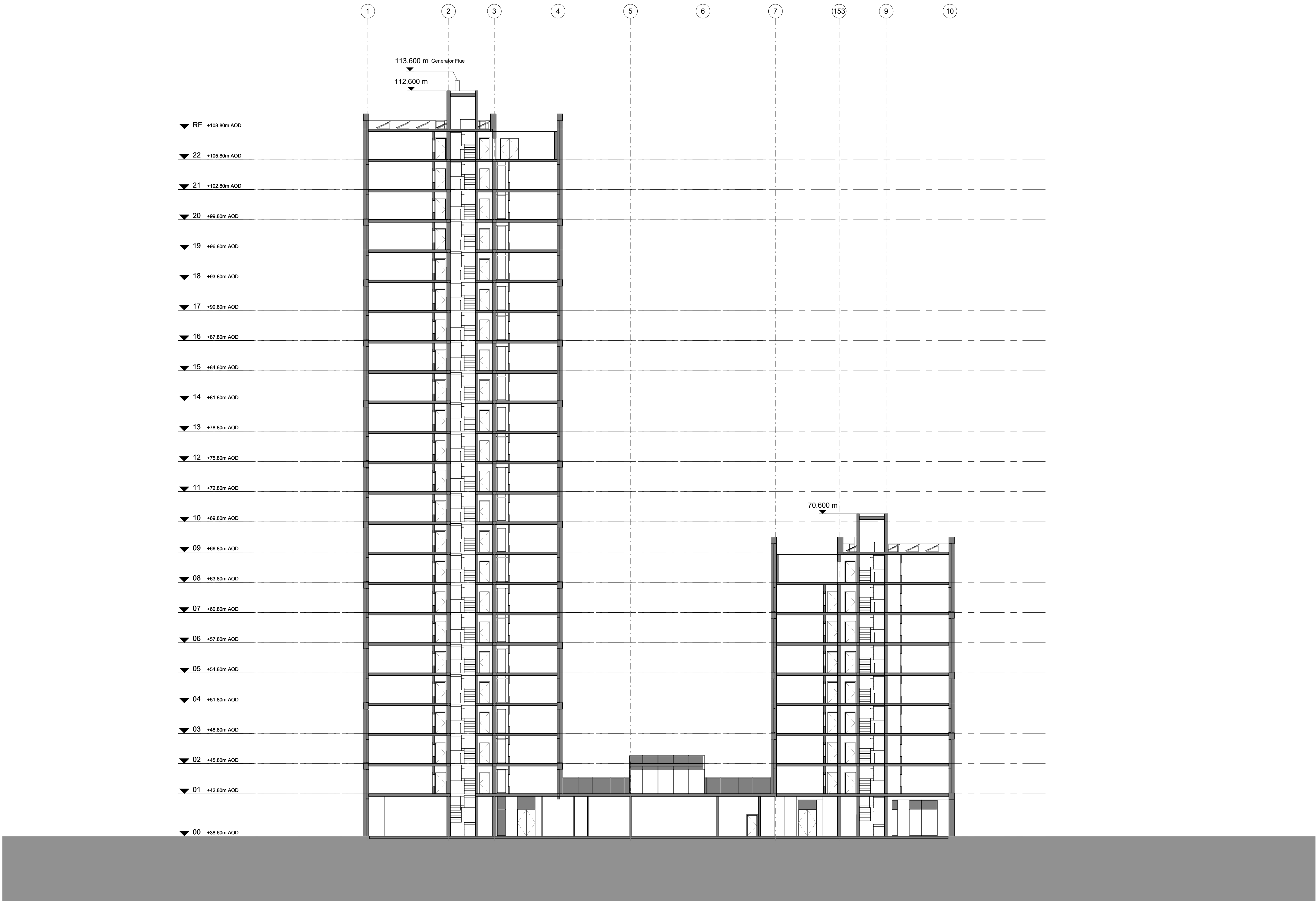
PROJECT  
Upper Brook Street Student Accommodation

| SCALE@A1     | DATE       | ORIGINATOR | CHECKED | AUTHORISED |
|--------------|------------|------------|---------|------------|
| As indicated | 20/03/2023 | JK         | ET      | RG         |

General Arrangement  
Nineteenth to Twenty-First Floor Plan

### Stage 2

| STATUS                                | PURPOSE FOR ISSUE | SR NO. |
|---------------------------------------|-------------------|--------|
| S2                                    | For Information   | 6601   |
| DRAWING NO.                           | REV.              |        |
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Section 01  
1 : 200

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KEYPLAN

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PROJECT  
Upper Brook Street Student Accommodation

| SCALE@A1 | DATE       | ORIGINATOR | CHECKED | AUTHORISED |
|----------|------------|------------|---------|------------|
| 1 : 200  | 20/03/2023 | JK         | ET      | RG         |

Section 01

### Stage 2

| STATUS                                | PURPOSE FOR ISSUE | SR NO. |
|---------------------------------------|-------------------|--------|
| S2                                    | For Information   | 6601   |
| DRAWING NO.                           | REV.              |        |
| 6601 · SRA · ZZ · ZZ · DR · A · 20401 | P01               |        |



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| P02  | 09.12.22 | For information |
| P03  | 13.01.23 | For information |
| P04  | 21.02.23 | For information |
| P05  | 01.03.23 | For information |
| P06  | 02.03.23 | For information |
| P07  | 06.03.23 | For information |



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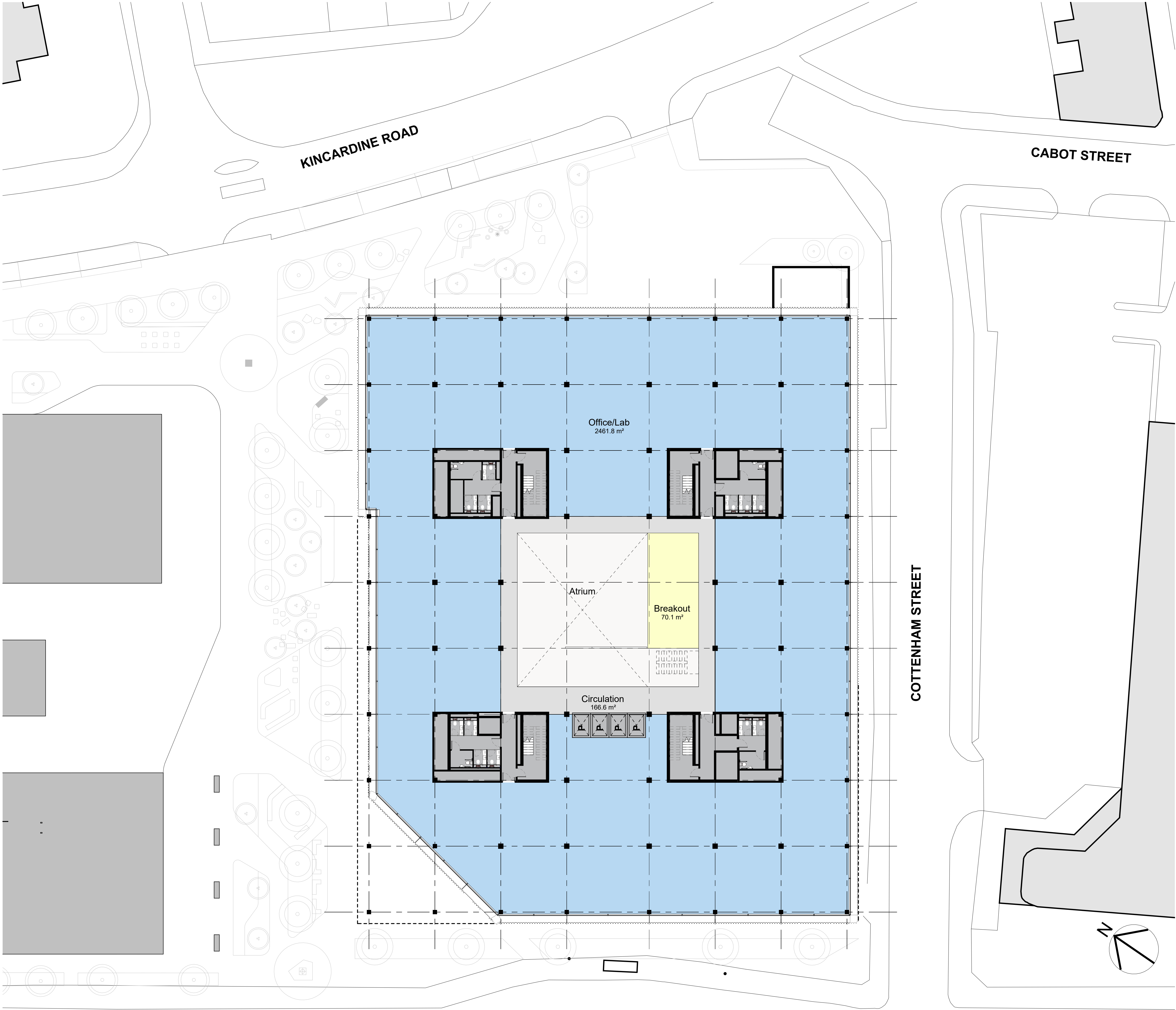
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PROJECT  
Upper Brook Street - Block B

| SCALE@A1 | DATE     | ORIGINATOR | CHECKED | AUTHORISED |
|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

Ground Floor Plan

| Stage 2                               |                   |  |      | SR NO. |
|---------------------------------------|-------------------|--|------|--------|
| STATUS                                | PURPOSE FOR ISSUE |  |      |        |
| S2                                    | INFORMATION       |  |      | 7025   |
| DRAWING NO.                           |                   |  | REV. |        |
| 7025 - SRA - ZZ - 00 - SK - A - SK002 | P07               |  |      |        |



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|------|----------|-----------------|
| P01  | 05.12.22 | For information |
| P02  | 09.12.22 | For information |
| P03  | 21.02.23 | For information |
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| P05  | 06.03.23 | For information |



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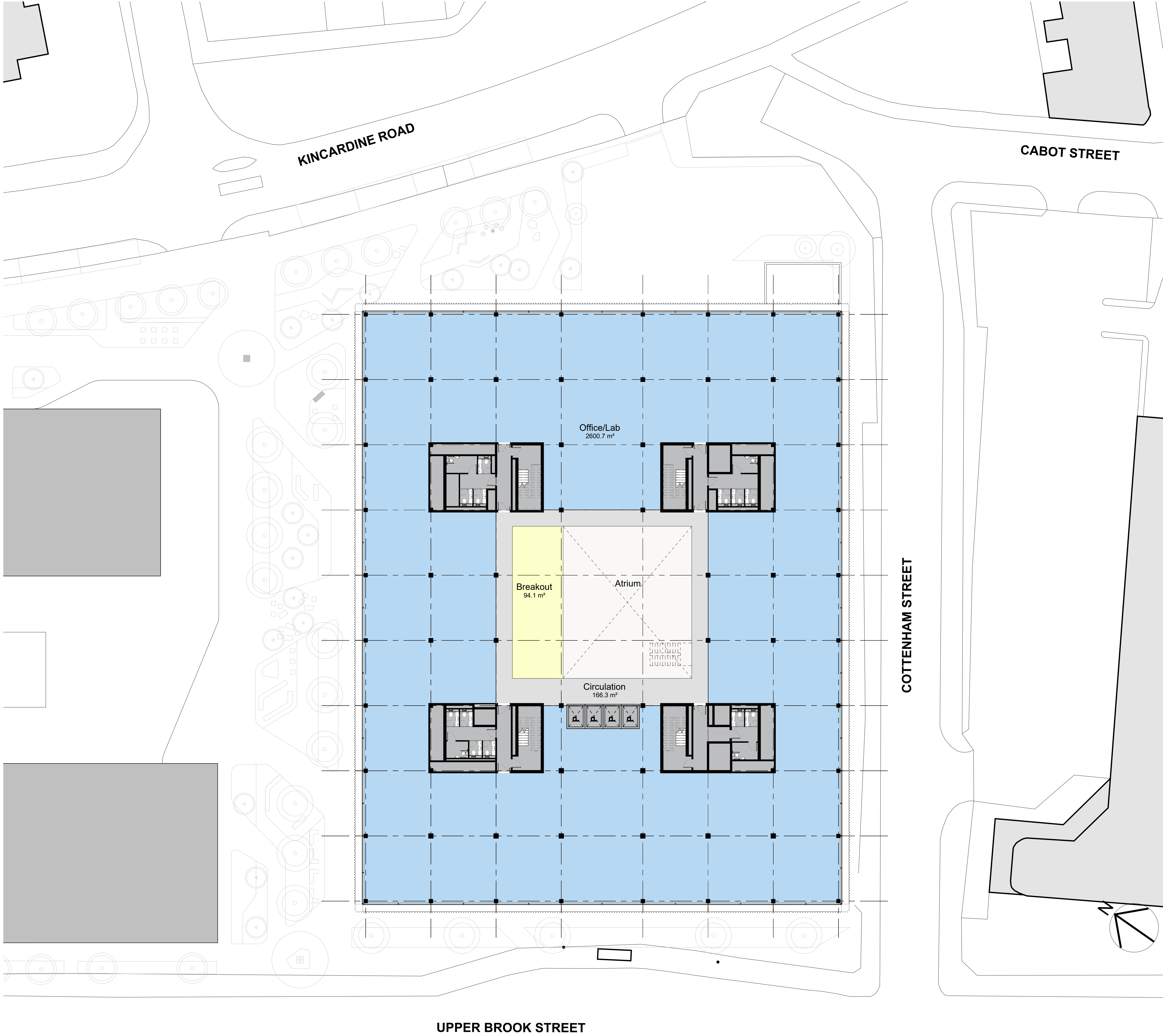
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| SCALE@A1 | DATE     | ORIGINATOR | CHECKED | AUTHORISED |
|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

First Floor Plan

| Stage 2                               |                   | SR NO. |
|---------------------------------------|-------------------|--------|
| STATUS                                | PURPOSE FOR ISSUE |        |
| S2                                    | INFORMATION       | 7025   |
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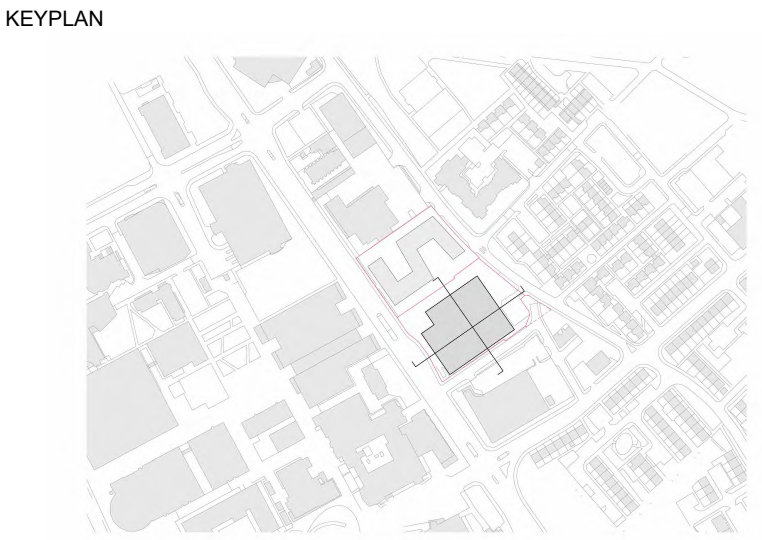


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|------|----------|-----------------|
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| P03  | 21.02.23 | For information |
| P04  | 02.03.23 | For information |
| P05  | 06.03.23 | For information |



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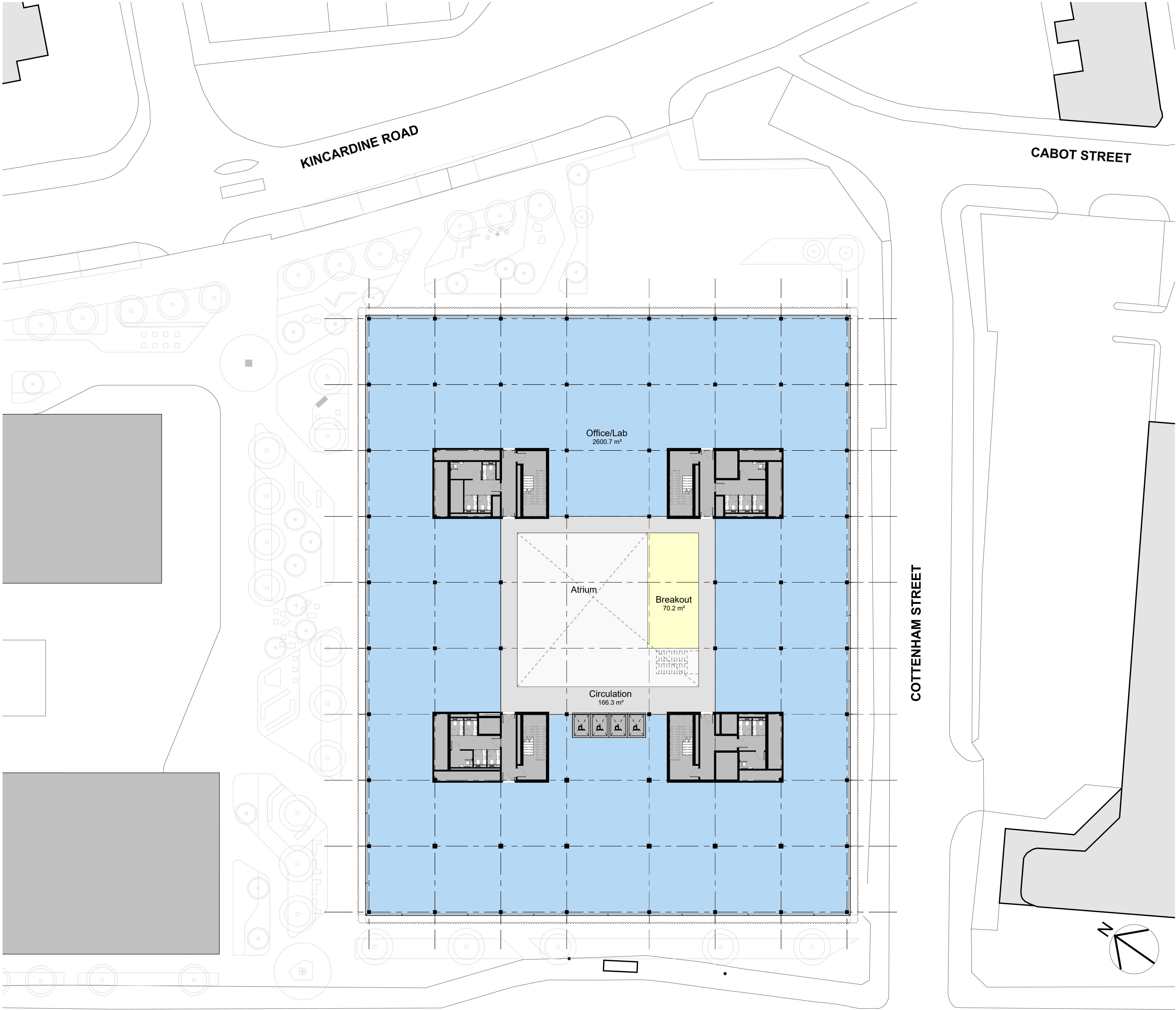
PROJECT  
Upper Brook Street - Block B

| SCALE@A1 | DATE     | ORIGINATOR | CHECKED | AUTHORISED |
|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

### Second Floor Plan

#### Stage 2

| STATUS                                | PURPOSE FOR ISSUE | SR NO. |
|---------------------------------------|-------------------|--------|
| S2                                    | INFORMATION       | 7025   |
| DRAWING NO.                           | REV.              |        |
| 7025 - SRA - ZZ - 02 - SK - A - SK004 | P05               |        |



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|------|----------|-----------------|
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| P02  | 09.12.22 | For information |
| P03  | 21.02.23 | For information |
| P04  | 02.03.23 | For information |
| P05  | 06.03.23 | For information |



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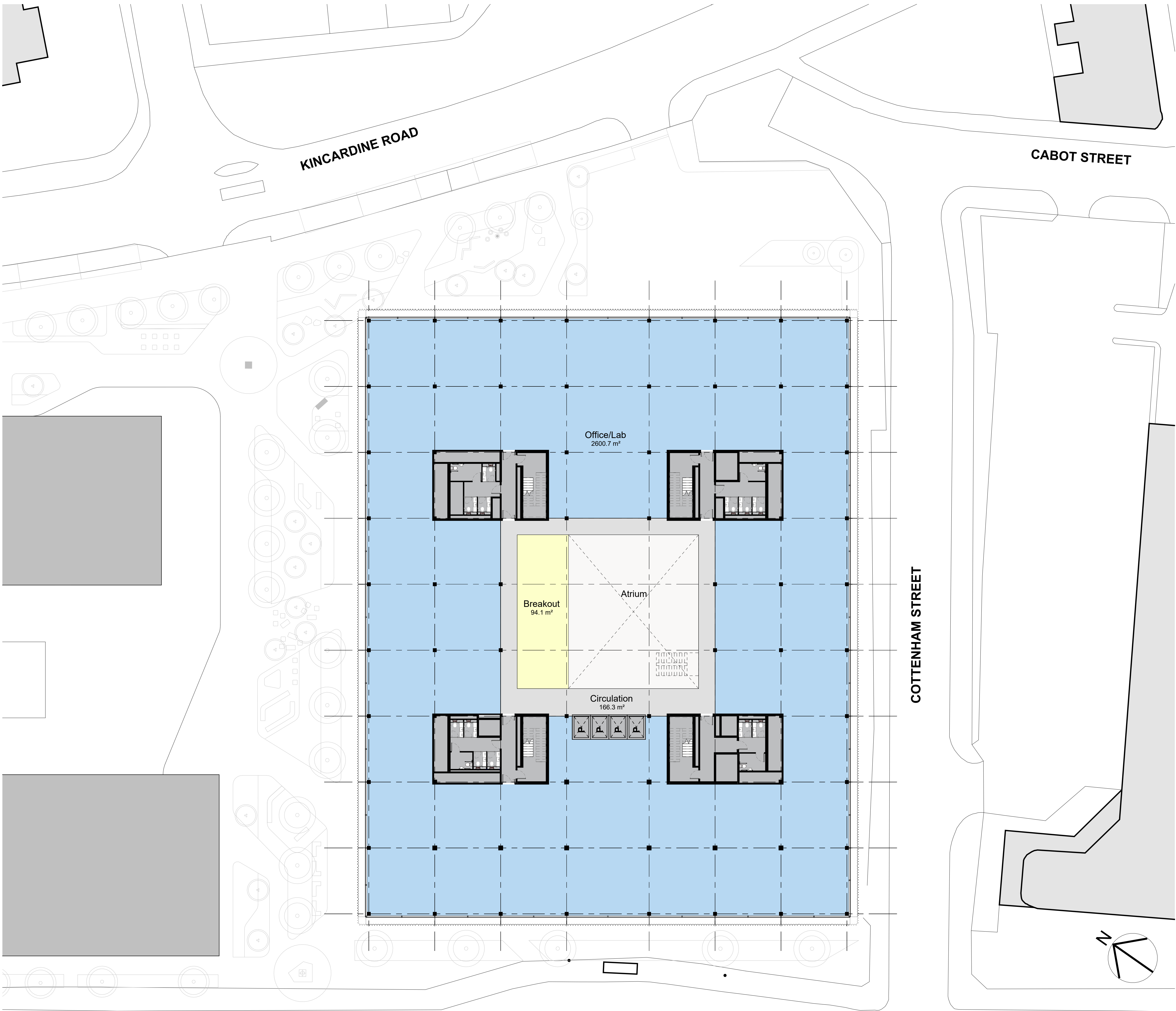
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PROJECT  
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| SCALE@A1 | DATE     | ORIGINATOR | CHECKED | AUTHORISED |
|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

Third Floor Plan

| Stage 2                             |                   | SR NO. |
|-------------------------------------|-------------------|--------|
| STATUS                              | PURPOSE FOR ISSUE |        |
| S2                                  | INFORMATION       | 7025   |
| DRAWING NO.                         | REV.              |        |
| 7025 - SRA - ZZ - 03- SK - A- SK005 | P05               |        |



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| P04  | 02.03.23 | For information |
| P05  | 06.03.23 | For information |



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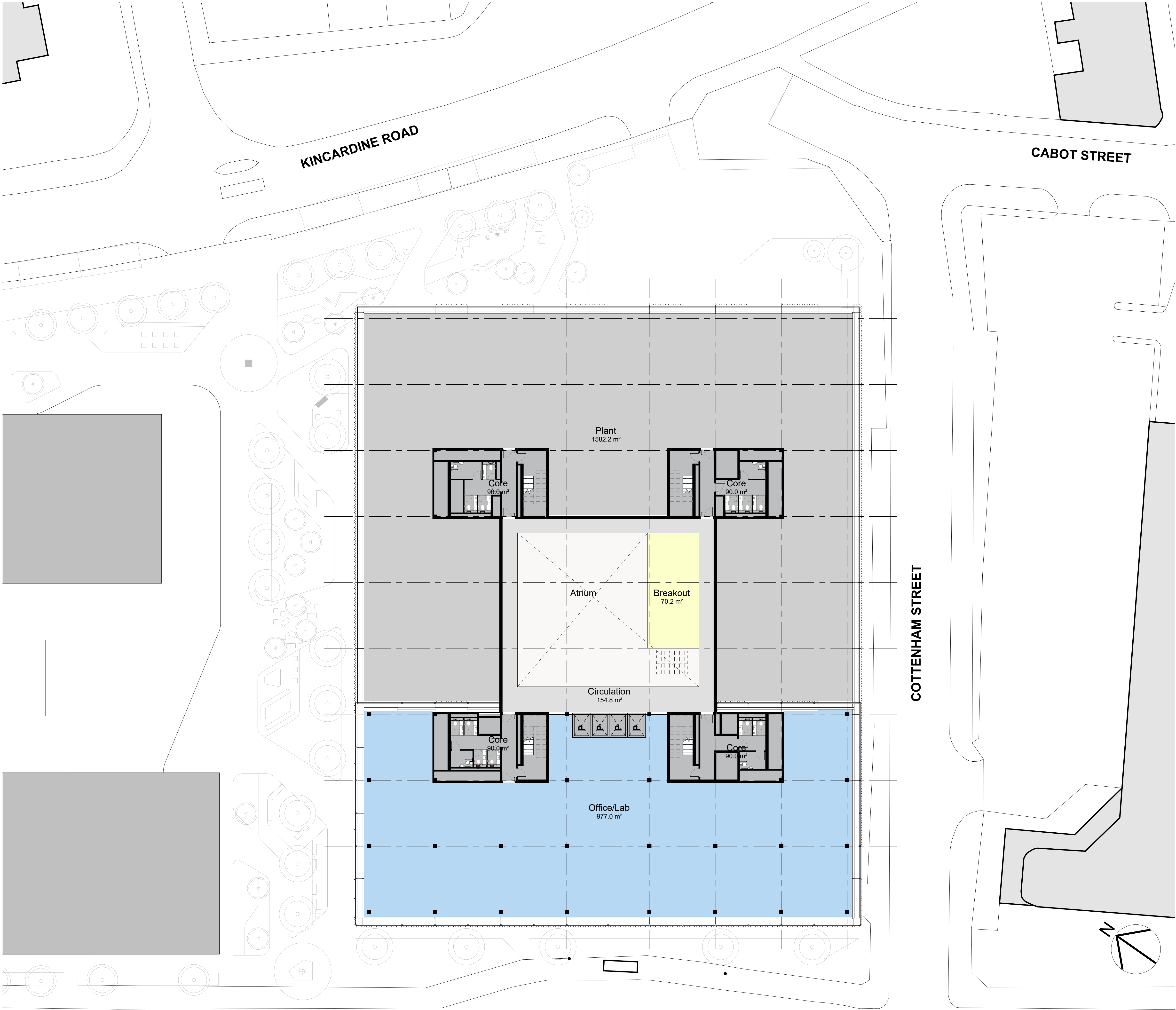
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|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

### Fourth Floor Plan

| Stage 2                             |                   | SR NO. |
|-------------------------------------|-------------------|--------|
| STATUS                              | PURPOSE FOR ISSUE |        |
| S2                                  | INFORMATION       | 7025   |
| DRAWING NO.                         | REV.              |        |
| 7025 - SRA - ZZ - 04- SK - A- SK006 | P05               |        |



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| P03  | 21.02.23 | For information |
| P04  | 02.03.23 | For information |
| P05  | 06.03.23 | For information |



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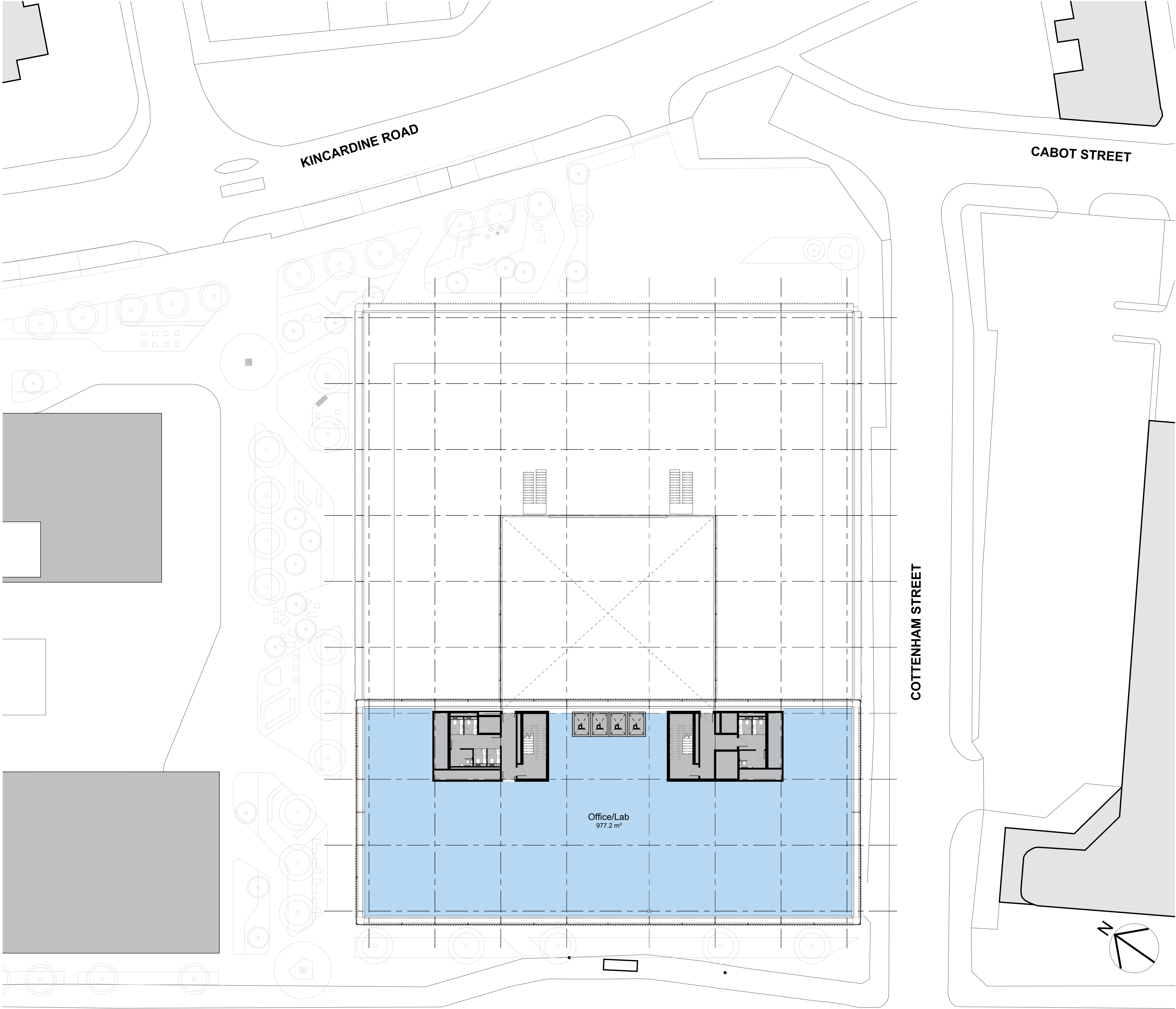
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PROJECT  
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|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

Fifth Floor Plan

| Stage 2                             |                   | SR NO. |
|-------------------------------------|-------------------|--------|
| STATUS                              | PURPOSE FOR ISSUE |        |
| S2                                  | INFORMATION       | 7025   |
| DRAWING NO.                         | REV.              |        |
| 7025 - SRA - ZZ - 05- SK - A- SK007 | P05               |        |



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| P04  | 02.03.23 | For information |
| P05  | 06.03.23 | For information |



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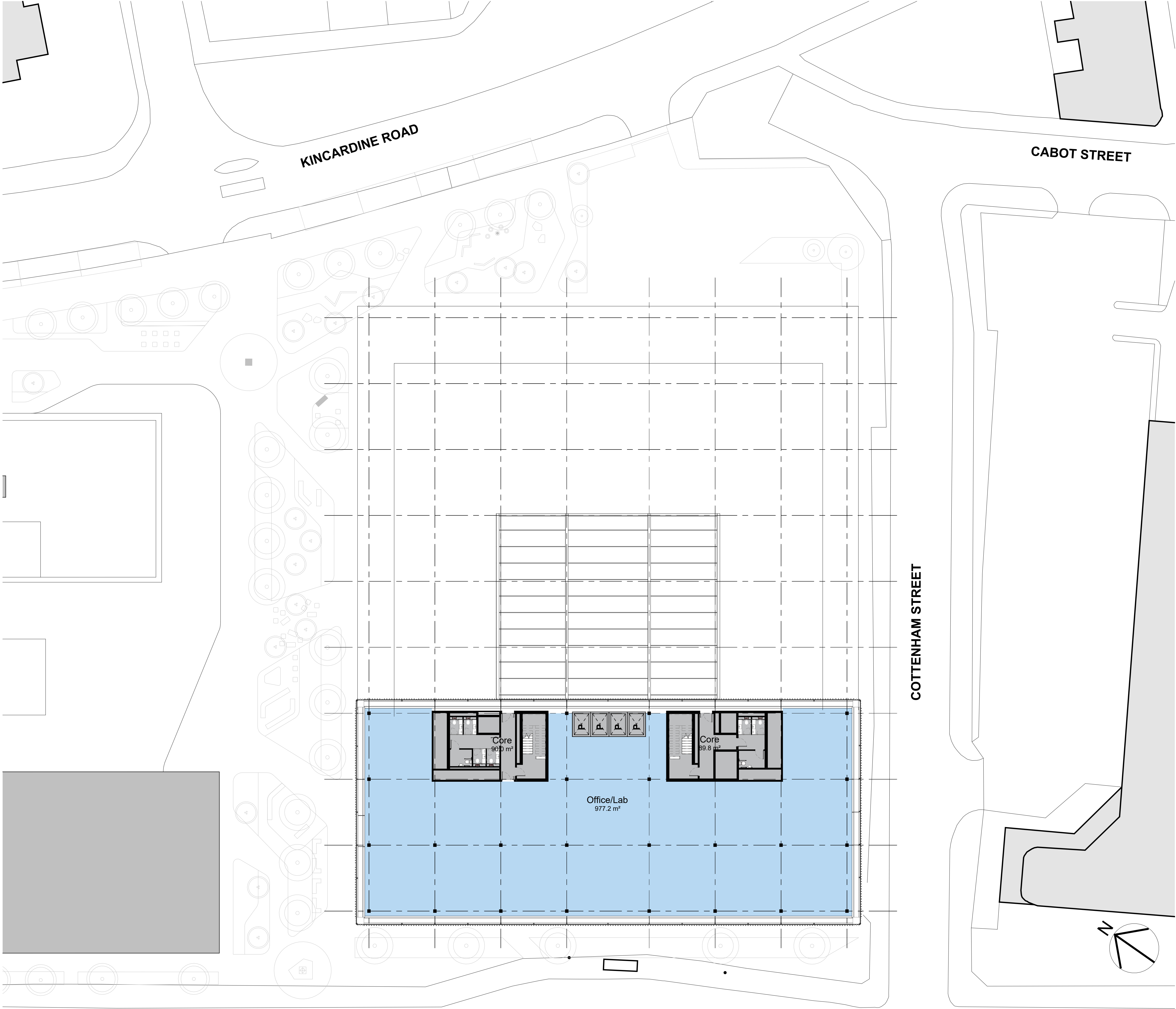
PROJECT  
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| SCALE@A1 | DATE     | ORIGINATOR | CHECKED | AUTHORISED |
|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

### Sixth Floor Plan

#### Stage 2

| STATUS                              | PURPOSE FOR ISSUE | SR NO. |
|-------------------------------------|-------------------|--------|
| S2                                  | INFORMATION       | 7025   |
| DRAWING NO.                         | REV.              |        |
| 7025 - SRA - ZZ - 06- SK - A- SK008 | P05               |        |



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| P05  | 06.03.23 | For information |



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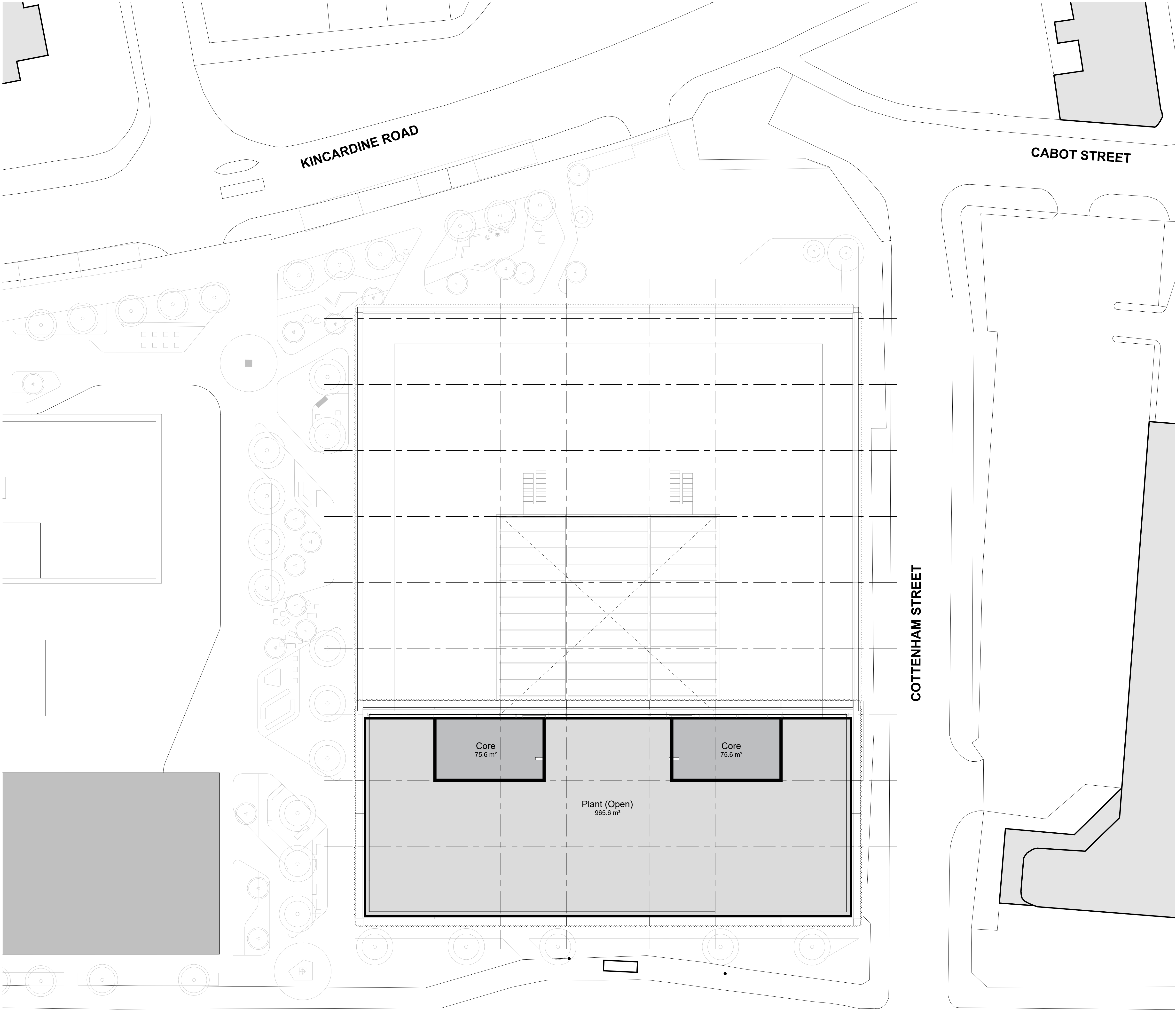
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| SCALE@A1 | DATE     | ORIGINATOR | CHECKED | AUTHORISED |
|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

### Seventh Floor Plan

| Stage 2                               |                   | SR NO. |
|---------------------------------------|-------------------|--------|
| STATUS                                | PURPOSE FOR ISSUE |        |
| S2                                    | INFORMATION       | 7025   |
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|------|----------|-----------------|
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| P03  | 21.02.23 | For information |
| P04  | 02.03.23 | For information |
| P05  | 06.03.23 | For information |



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PROJECT  
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| SCALE@A1 | DATE     | ORIGINATOR | CHECKED | AUTHORISED |
|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

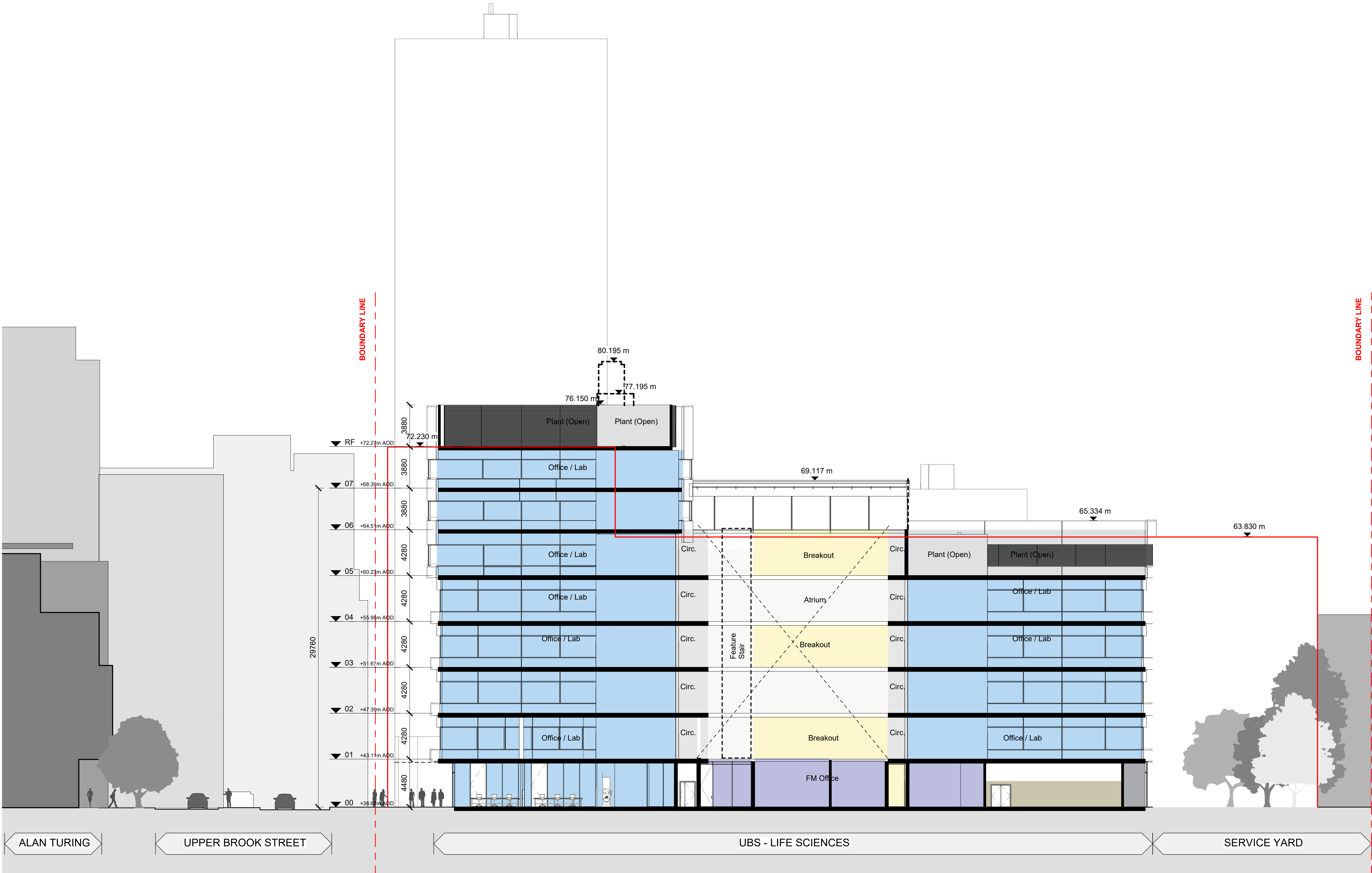
### Roof Plan

| Stage 2                             |                   | SR NO. |
|-------------------------------------|-------------------|--------|
| STATUS                              | PURPOSE FOR ISSUE |        |
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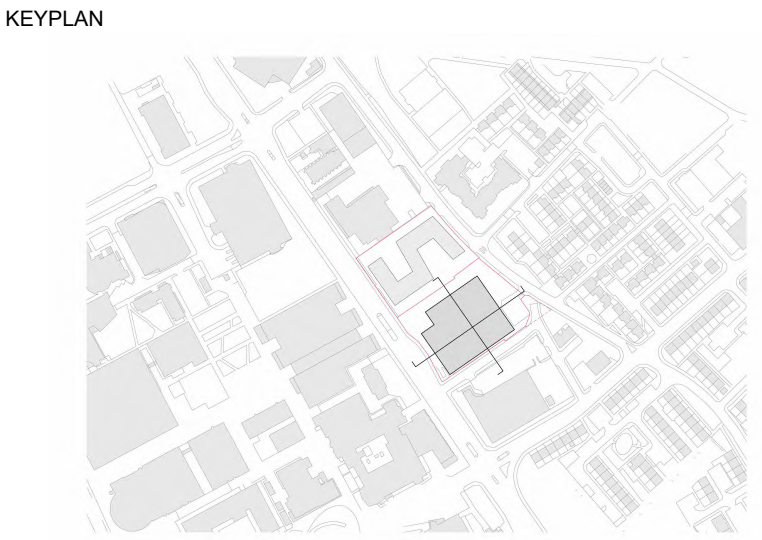
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| P02  | 09.12.22 | For information |
| P03  | 21.02.23 | For information |
| P04  | 06.03.23 | For information |



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|----------|----------|------------|---------|------------|
| 1 : 200  | 06.03.23 | PC         | JW      | ES         |

### East Section

| STATUS                              | PURPOSE FOR ISSUE | SR NO. |
|-------------------------------------|-------------------|--------|
| S2                                  | INFORMATION       | 7025   |
| DRAWING NO.                         | REV.              |        |
| 7025 - SRA - ZZ - SE- SK - A- SK011 | P04               |        |

## **APPENDIX C: PLANNING POLICY AND LEGISLATION**

## National Legislation and Planning Policy

### The UK Air Quality Strategy

- C.1 European Union (EU) legislation forms the basis of air quality policy and legislation in the UK. The EU 2008 ambient Air Quality Directive<sup>1</sup> sets limits for ambient concentrations of air pollutants including nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). The air quality standards and objectives are prescribed through the Air Quality (England) Regulations 2000<sup>2</sup>, as amended, for the purpose of the Local Air Quality Management Framework. The Air Quality (England) Regulations were amended in 2002<sup>5</sup> and again in 2010<sup>6</sup>, with miscellaneous amendments added in 2020<sup>9</sup> following the UK exit from the EU. Additionally, an updated PM<sub>2.5</sub> objective was published in 2023<sup>10</sup> with an interim target to be achieved by 2028<sup>23</sup>.
- C.2 The UK Government are required under the Environment Act 1995<sup>3</sup> to produce a national Air Quality Strategy (AQS). The AQS was first published in 1997<sup>7</sup> and was most recently reviewed and updated in 2007<sup>8</sup>. The AQS provides an overview of the Government's ambient air quality policy and sets out the air quality standards and objectives to be achieved and measures to improve air quality.
- C.3 The Environment Act 2021<sup>4</sup> was granted Royal Assent in November 2021 and contains amendments to Part IV of the Environment Act 1995<sup>3</sup> with regard to the Local Air Quality Management regime. Under the Environment Act 2021<sup>4</sup>, the Secretary of State must lay a statement before Parliament setting out progress made in meeting air quality objectives and standard in England and steps taken towards achieving the standards. The Environment Act 2021<sup>4</sup> also places responsibility on local authorities to co-operate with air quality partners in the preparation of Air Quality Action Plans and identification of measures which should be monitored within the Plan and dates by which they should be implemented.
- C.4 Part IV of the Environment Act<sup>3</sup> requires local authorities in the UK to review local air quality within their administrative area and, if relevant air quality standards and objectives are likely to be exceeded, designate Air Quality Management Areas (AQMA). Following the designation of an AQMA, local authorities are required to publish an Air Quality Action Plan (AQAP) detailing measures to be taken to improve local air quality and work towards meeting the relevant air quality standards and objectives.

### National Planning Policy Framework

- C.5 The National Planning Policy Framework (NPPF)<sup>11</sup> was amended in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.
- C.6 The NPPF<sup>11</sup> recognises air quality within Section 15: Conserving and enhancing the natural environment, and states that:

*"Planning policies and decisions should contribute to and enhance the natural and local environment by:*

*[...]*

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

*[...]*

*Ground conditions and pollution*

*[...]*

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

*[...]*

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

C.7 With regard to assessing cumulative effects the NPPF<sup>11</sup> states:

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

*[...]"*

## Planning Practice Guidance

- C.8 The Planning Practice Guidance (PPG) for air quality<sup>12</sup> was updated in November 2019 and provides guiding principles on how the planning process can take account of the impacts of new development on air quality.
- C.9 The PPG<sup>12</sup> sets out the following with regard to air quality and planning:
- *“What air quality considerations does planning need to address;*
  - *What is the role of plan-making with regard to air quality;*
  - *Air quality concerns relevant to neighbourhood planning;*
  - *What information is available about air quality;*
  - *When could air quality considerations be relevant to the development management process;*
  - *What specific issues may need to be considered when assessing air quality impacts;*
  - *How detailed does an air quality assessment need to be; and*
  - *How can an impact on air quality be mitigated”.*
- C.10 The PPG<sup>12</sup> sets out the pollutants for which there are legally binding limits for concentrations and those which the UK also has national emissions reduction commitments.
- C.11 The PPG<sup>12</sup> states that development plans may need to consider:
- *“what are the observed trends shown by recent air quality monitoring data and what would happen to these trends in light of proposed development and / or allocations;*
  - *the impact of point sources of air pollution (pollution that originates from one place);*
  - *the potential cumulative impact of a number of smaller developments on air quality as well as the effect of more substantial developments, including their implications for vehicle emissions;*
  - *ways in which new development could be made appropriate in locations where air quality is or is likely to be a concern, and not give rise to unacceptable risks from pollution. This could, for example, entail identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or low emissions strategy where applicable; and*
  - *opportunities to improve air quality or mitigate impacts, such as through traffic and travel management and green infrastructure provision and enhancement”.*
- C.12 The PPG<sup>12</sup> also states what may be considered relevant to determining a planning application and these include whether a development would:
- *“Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of*

*electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*

- Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;*
- Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*
- Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;*
- Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value".*

C.13 The PPG<sup>12</sup> provides guidance regarding what should be included within an air quality assessment. Examples of potential air quality mitigation measures are also provided.

## **Local Planning Policy**

### Manchester's Local Development Framework: Core Strategy Development Plan Document

C.14 MCC adopted the Local Development Framework: Core Strategy Development Plan Document<sup>13</sup> in 2012. The Document covers a fifteen year period between 2012 and 2027 and outlines MCC's vision for Manchester as well as planning policies to deliver that vision. A review of the Document indicated the following policies are relevant to air quality:

*"Policy CC 5*

*Transport*

*[...]*

*Proposals will be supported that improve pedestrian safety, improve air quality and increase the scope for accessible public realm improvements.*

*[...]"*

*"Policy T 1*

*Sustainable Transport*

*To deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to*

*support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that:-*

*[...]*

*Would reduce the negative impacts of road traffic for example, congestion, air pollution and road traffic accident casualties.*

*[...]"*

*"Policy EN 16*

*Air Quality*

*The Council will seek to improve the air quality within Manchester and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.*

*When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas"*

*[...]*

*"Policy DM 1*

*Development Management*

*All development should have regard to the following specific issues for which more detailed guidance may be given within the supplementary planning document:-*

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

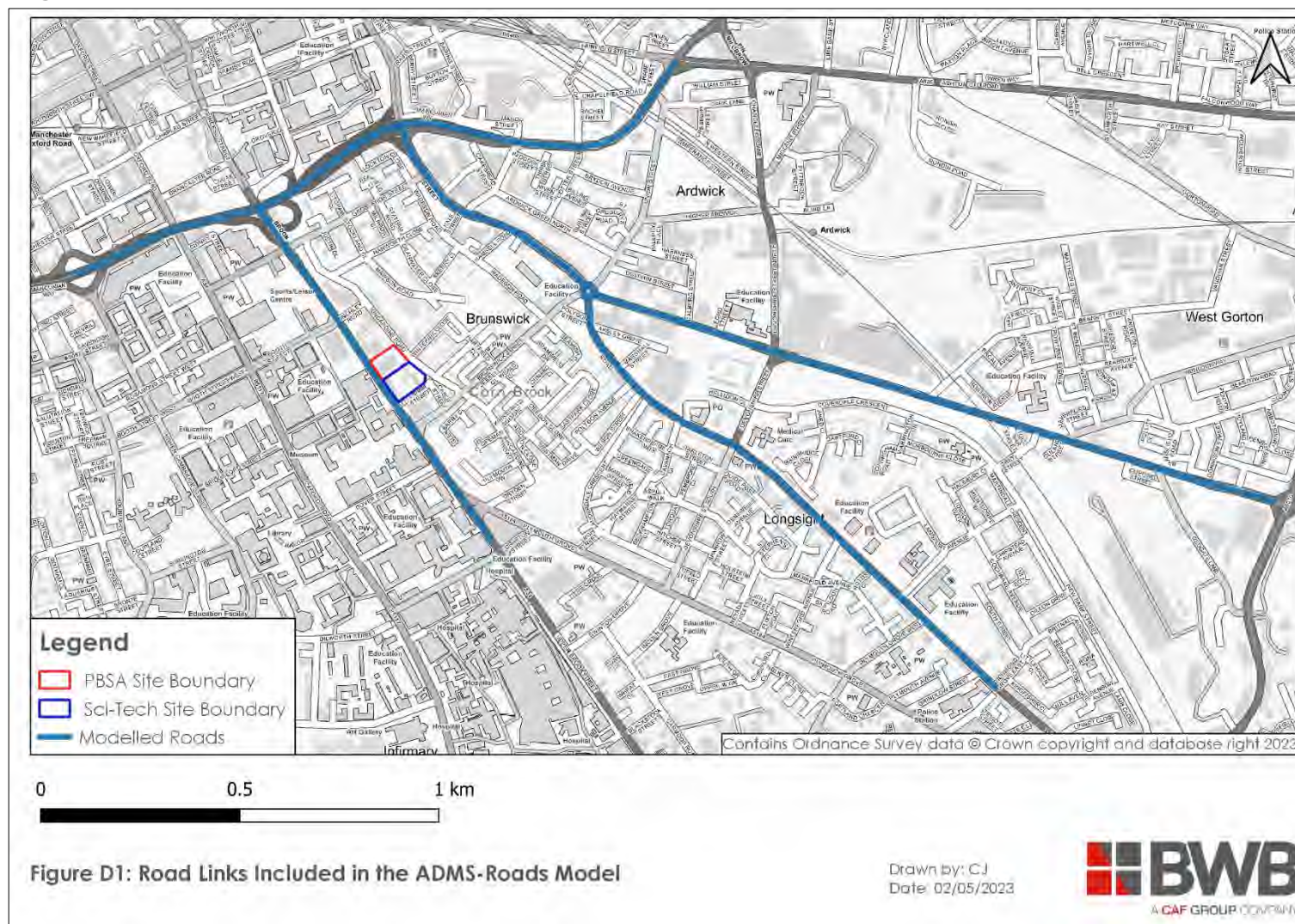
- C.15 The above policies were taken into consideration throughout the undertaking of the assessment.

## **APPENDIX D: TRAFFIC DATA UTILISED IN THE AIR QUALITY ASSESSMENT**

| Road Link              | Speed               | Scenario 1: 2019 Verification Year |          | Scenario 2: 2026 Opening Year With Development |          |
|------------------------|---------------------|------------------------------------|----------|------------------------------------------------|----------|
|                        | Km.hr <sup>-1</sup> | 24 hour AADT Total Flow            | HDV Flow | 24 hour AADT Total Flow                        | HDV Flow |
| A34 Upper Brook Street | 48                  | 18,883                             | 132      | 18,891                                         | 132      |
| A6 Ardwick Green South | 48                  | 19,425                             | 505      | 19,431                                         | 505      |
| A57 Hyde Road          | 48                  | 16,736                             | 574      | 16,762                                         | 574      |
| A6 Stockport Road      | 48                  | 10,520                             | 143      | 10,526                                         | 143      |
| A57 (M) Mancunian Way  | 48                  | 90,785                             | 3,532    | 90,785                                         | 3,532    |
| A57 (M) Mancunian Way  | 48                  | 47,198                             | 1,894    | 47,198                                         | 1,894    |
| A636 Mancunian Way     | 48                  | 32,510                             | 1,092    | 32,510                                         | 1,092    |

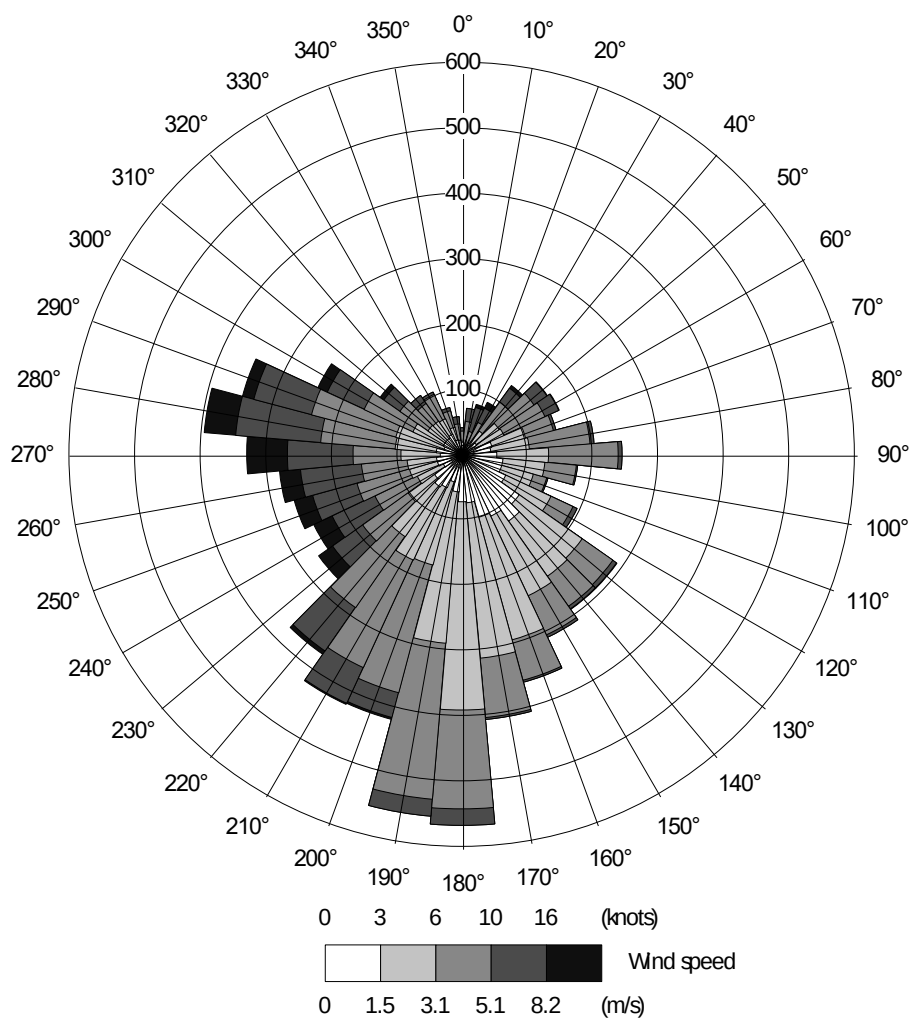
D.1 An illustration of the road links included in the ADMS-Roads model Site suitability assessment for the PBSA is provided in **Figure D1**.

Figure D1: Road Links Included in the ADMS-Roads Model



## **APPENDIX E: WIND ROSE FOR 2019 FOR MANCHESTER AIRPORT METEOROLOGICAL RECORDING STATION**

- E.1 Meteorological data for 2019 Verification Year scenario for the Manchester Airport recording station was obtained for use in the air dispersion modelling assessment. The wind rose for 2019 is detailed below and illustrates a predominant wind direction from the south and west.



## **APPENDIX F: MODEL VERIFICATION**

- F.1 Whilst ADMS-Roads is widely validated for use in this type of assessment, model verification for the area around the Site will not have been included. To determine model performance at a local level, a comparison of modelled results with monitored results in the study area was done in accordance with the methodology provided by Defra. This process of verification aims to minimise modelling uncertainty by correcting modelled results by an adjustment factor to give greater confidence to the results.
- F.2 The model was run for Scenario 1: 2019 Verification Year to predict the 2019 annual mean road contributions of NO<sub>2</sub> at the monitoring locations in the study area. The model outputs at these locations were compared to the 2019 monitored concentrations to provide adjustment factors. **Figure F1** details the monitoring locations utilised in the model verification.
- F.3 No monitoring of PM<sub>10</sub> or PM<sub>2.5</sub> suitable for use in the verification process is undertaken within the study area. Therefore, the adjustment factor calculated during the NOx verification process was utilised to adjust predicted concentrations of PM<sub>10</sub> and PM<sub>2.5</sub>.

**Table F1: NOx Verification Process**

| Model Verification Steps                                                        | MAN-J7 | MAN-J8 | MA96BNO |
|---------------------------------------------------------------------------------|--------|--------|---------|
| 2019 monitored total NO <sub>2</sub> (µg.m <sup>-3</sup> )                      | 51.6   | 59.7   | 46.0    |
| 2019 background NO <sub>2</sub> concentration (µg.m <sup>-3</sup> )             | 32.8   | 32.8   | 32.8    |
| Monitored road contribution NOx (µg.m <sup>-3</sup> )                           | 40.7   | 60.6   | 27.8    |
| Modelled road contribution NOx (µg.m <sup>-3</sup> )                            | 6.5    | 13.1   | 9.0     |
| Ratio of monitored road NOx to modelled road NOx                                | 6.3    | 4.6    | 3.1     |
| Adjustment factor for modelled road contribution NOx                            | 4.4432 |        |         |
| Adjusted modelled road contribution NOx (µg.m <sup>-3</sup> )                   | 28.7   | 58.0   | 40.1    |
| Modelled total NO <sub>2</sub> concentration (µg.m <sup>-3</sup> )              | 46.4   | 58.7   | 51.4    |
| Monitored total NO <sub>2</sub> concentration (µg.m <sup>-3</sup> )             | 51.6   | 59.7   | 46.0    |
| % difference between modelled and monitored total NO <sub>2</sub> concentration | -10.01 | -1.7   | 11.6    |
| RMSE % (should be less than 25% and ideally less than 10%)                      | 10.9%  |        |         |

*Road-NOx component, determined from NOx to NO<sub>2</sub> calculator*

- 7.6 A road-NOx factor of 4.4432 was determined as the slope of the best fit line between the 'measured' road contribution and the model derived road contribution, forced through zero. This factor was then applied to the modelled road-NOx concentration, before conversion to NO<sub>2</sub> concentrations using the NOx to NO<sub>2</sub> calculator provided by Defra.

**Figure F1: Monitoring Locations Utilised in the ADMS-Roads Model Verification Process**

