

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 filled with soft, white clouds. In the foreground, there are some trees and a few small figures of people, suggesting a public space or park area.

June 2023
Circular Economy Statement

Upper Brook Street Masterplan **(McLaren / Kadans)**

ENVIRONMENTAL PLANNING

McLaren Property Limited and Kadans
Scienc Partner
Upper Brook Street Masterplan -
McLaren/ Kadans,
Manchester
Circular Economy Statement

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EXECUTIVE SUMMARY

BWB Consulting (BWB) was instructed by McLaren Property Limited and Kadans Science Partner (the Client) to provide a Circular Economy Statement (CES) for two proposed developments, including a science and technology hub ('Sci-Tech') and Purpose Built Student Accommodation ('the Proposed Development') located off Upper Brook Street, Manchester ('the Site').

The Site is currently split into two distinct areas with different uses on each. The northern half of the Site is occupied by a vacant car showroom and garage with the hard standing around the garage currently being used for surface car parking. The southern part of the Site is occupied by a vacant building for sheltered housing.

The aim of this CES is to provide a high-level strategy for the construction, operation and decommissioning of buildings associated with the Proposed Development with respect to non-renewable material resources and minimising lifecycle impacts.

The objectives of this CES are to:

- Determine whether the Proposed Development adheres to the Waste Hierarchy;
- Determine whether the Proposed Development adheres to the Circular Economy Hierarchy; and
- Determine whether targets and commitments for materials and elements will be realised.

This CES has considered the circular economy hierarchy approach as developed by the Greater London Authority, who have set the requirements for what should be included within a CES.

Details within energy, drainage and waste documents to be submitted to support the application, as well as the most up to date information provided by the architects and engineers for both buildings, have been reviewed to determine whether the Proposed Development would adhere to waste and circular economy hierarchies and whether key targets and commitments will be met.

Following this review, it is considered that the Proposed Development would broadly adhere to the waste and circular economy hierarchies, and that targets and commitments for materials and elements are in line with circular economy principles.

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1. INTRODUCTION

Introduction

- 1.1 BWB Consulting (BWB) was instructed by McLaren Property Limited and Kadans Sciene Partner (the Client) to provide a Circular Economy Statement (CES) for two proposed developments, including a science and technology hub ('Sci-Tech') and Purpose Built Student Accommodation ('the Proposed Development') located off Upper Brook Street, Manchester ('the Site').
- 1.2 This CES has been developed to accompany the planning applications for both the Sci-Tech building and PBSA.

Principles of Circular Economy

- 1.3 Current and future trends point toward the need for a fundamental shift in the way resources are consumed. A shift to a circular economy will provide considerable economic opportunities as a result.
- 1.4 A circular economy can be defined as '...one where materials are retained in use at their highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste.' It is a move away from the current linear economic model, where materials are mined, manufactured, used and thrown away,' as shown in **Figure 1**.

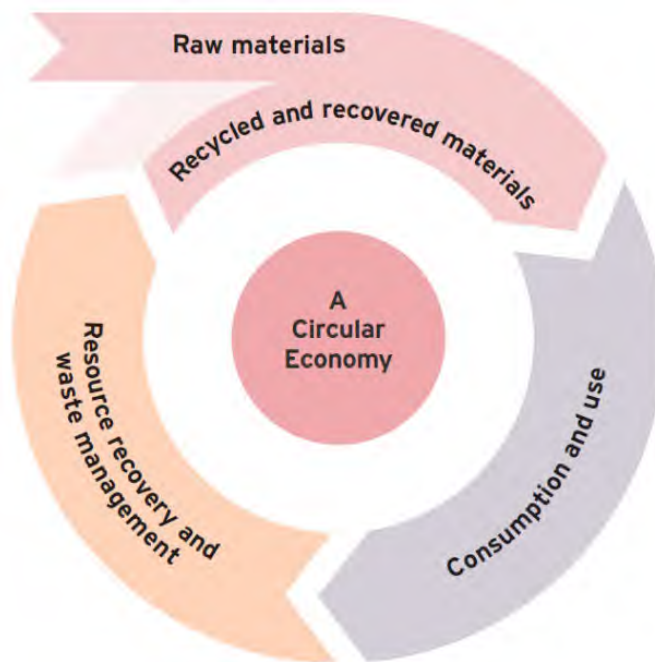


Figure 1: Circular Economies (Waste Strategy for England, 2020)

- 1.5 In contrast to a linear economy (take, make, dispose), a circular economy keeps products and materials circulating through the system at their highest value for as long as possible, through reuse, recycling, refurbishment and remanufacturing. As 60% of total UK waste is generated from construction, demolition and excavation (Defra and Government Statistical Service, 2019) this transition from linear to circular is essential:
- 1.6 A holistic approach has been adopted to establish the approach and targets for the project. The focus has been to create an architecture where the circular economy principles could be embedded in the design rather than an afterthought. Having a clear understanding of the objective of the local and national policies, the concepts of whole life carbon and circular economy were considered comprehensively. The design approach respects the following framework:
- **Retain** – Retaining and repurposing existing building on site.
 - **Reuse** – Reusing existing structure as much as practically feasible, reusing existing material, such as sending demolished concrete for crushing to produce aggregate. Thus, reducing embodied carbon.
 - **Recycle** – Use recycled and recyclable material for construction as much as possible.
- 1.7 The successful implementation of circular economy principles will help to reduce the volume of waste that London produces and has to manage. A key way of achieving this will be through incorporating the 'six circular economy principles', which have been developed by the Greater London Authority (GLA, 2020) and followed within best practice guidance throughout England, into the design of developments. These principals are as follows:
- i. **Building in layers** - ensuring that different parts of the building are accessible and can be maintained and replaced where necessary;
 - ii. **Designing out waste** - ensuring that waste reduction is planned in from project inception to completion, including consideration of standardised components, modular build and re-use of secondary products and materials;
 - iii. **Designing for longevity** – creating a built asset with well-defined long-term needs, while being durable, resilient or able to cope with societal and environmental change. It would require little modification / no replacement of parts, due to its 'loose fit', generous proportions and readiness for alternative technologies;
 - iv. **Designing for adaptability or flexibility** – to meet the needs of the present but with consideration of how those needs might change in the future, and to enable change in the form of periodic remodelling and reconfiguration, including alterations or replacement of non-structural parts;
 - v. **Design for assembly, disassembly and recoverability** – future proofing the asset by designing products and services to be assembled, deconstructed and reused or recycled on a part-by-part basis; and
 - vi. **Selecting materials** - any new material specified in the development should aim to be low impact materials with little or no adverse effect on either the environment or on human health throughout its lifecycle. Recognise and encourage the use of

recycled content and secondary aggregates, thereby reducing the demand for virgin material and optimising material efficiency in construction.

1.8 The aim of this CES is to provide a high-level strategy for the construction, operation and decommissioning of buildings associated with the Proposed Development with respect to non-renewable material resources and minimising lifecycle impacts.

1.9 The objectives of this CES are to:

- Determine whether the Proposed Development adheres to the Waste Hierarchy;
- Determine whether the Proposed Development adheres to the Circular Economy Hierarchy; and
- Determine whether targets and commitments for materials and elements will be realised.

2. THE SITE AND THE PROPOSED DEVELOPEMENT

Site Location and Description

- 2.1 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 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.
- 2.2 The Site is bound by:
- Upper Brooks Street to the south-west with university buildings beyond; commercial development to the north-west;
 - Kincardine Road to the north-east with student accommodation and residential development beyond; and
 - Cottenham Street to the south-east with commercial and residential development beyond.
- 2.3 The Site is currently split into two distinct areas with different uses on each. The northern half of the Site is occupied by an old car showroom and garage which have been vacant for a number of years and is visually detrimental to the overall appearance of the surrounding area. The hard standing around the garage is currently being used for surface car parking.
- 2.4 The southern part of the Site is occupied by Elizabeth Yarwood Court. Previously used as sheltered housing, the building ceased to be operational in June 2021 with the services being transfered to the recently opened Brunswick Village Extra Care.
- 2.5 Figure 2 shows the location of the Site.

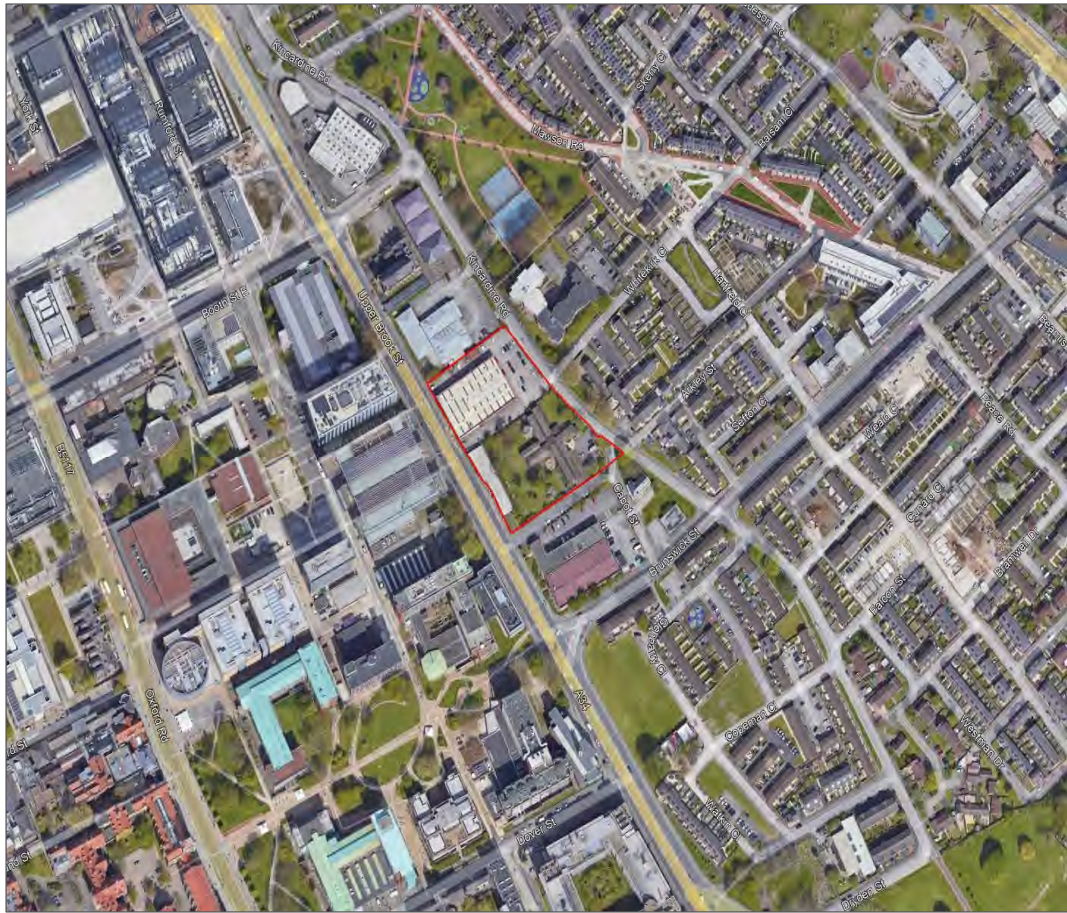


Figure 2: Site Location Plan

The Proposed Development

- 2.6 The Proposed Development forms one element of the wider Upper Brook Street Illustrative Masterplan, which can be seen within the Planning Statement submitted as part of the application.
- 2.7 The Proposed Development involves “demolition of existing buildings and erection of a single 6 to 9 storey block for Sci-Tech use (Use Class E (g)(ii) and 265 m² of a café/bar (Use Class E (b), and a single nine to 23 storey block to be used for Purpose Built Student Accommodation (Use Sui Generis), comprising 737 bedrooms in total and 293m² of community use (Use Class F2 (b) and 80m² of commercial floorspace (Use Class E) on Phase one of the Upper Brook Street Masterplan. The Masterplan for the Proposed Development is provided in **Appendix 1**. The provisions within each building are set out below.

Sci-Tech Building

Building Layout

- 2.8 The proposed Sci-Tech building will provide approximately 13,723 m² 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, extending up to 9 storeys (including 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.
- 2.9 The applicants have pledged to achieve a BREEAM minimum rating of ‘Excellent’ though a rating of ‘Outstanding’ is an aspirational target at this stage. If achieved, it would result in a development rated in the top 1% of UK new buildings with respect to sustainability.
- 2.10 Designs intend to incorporate a sustainable drainage system (SuDS) anticipated to include rain gardens and permeable paving, with water attenuated in a below ground tank prior to being discharged to the main network.

Purpose-built Student Accommodation

Building Layout

- 2.11 The proposed Student Accommodation will provide up to 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 scheme is to be 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 will be built up to 23 storeys in height with the second tower, facing Kincardine Road, rising up to 9 storeys.

- 2.12 A BREEAM rating of 'Excellent' is being targeted for the Student Accommodation, resulting in a design within the top 10% of UK new buildings in terms of sustainability.
- 2.13 Drainage options are being considered in line with the hierarchy of drainage preferences set out in the National Planning Policy Framework (NPPF) 2021.
- 2.14 Both foul and surface water will discharge into the United Utilities combined network within Upper Brook Street. This approach will be confirmed following consultation with the Lead Local Flood Authority.
- 2.15 Additional SuDS will likely comprise raingardens, permeable paving and tanked/geocellular attenuation systems. The exact SuDS proposals will be confirmed at design Stage 3.

Building in Layers

- 2.16 The proposed scheme design has been broken down into building layers to design out waste, optimise material use and keeping building elements/materials in use after the end of their life cycle. This approach follows the standard guidance as set out by the Royal Institute of Chartered Surveyors ('RICS') New Rules of Measurement ('NRM') (2021)¹ building elements where relevant (**Figure 3** and **Table 1**).

¹ RICS (2021) 'New Rules of Measurement'. Available from: <https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/nrm>

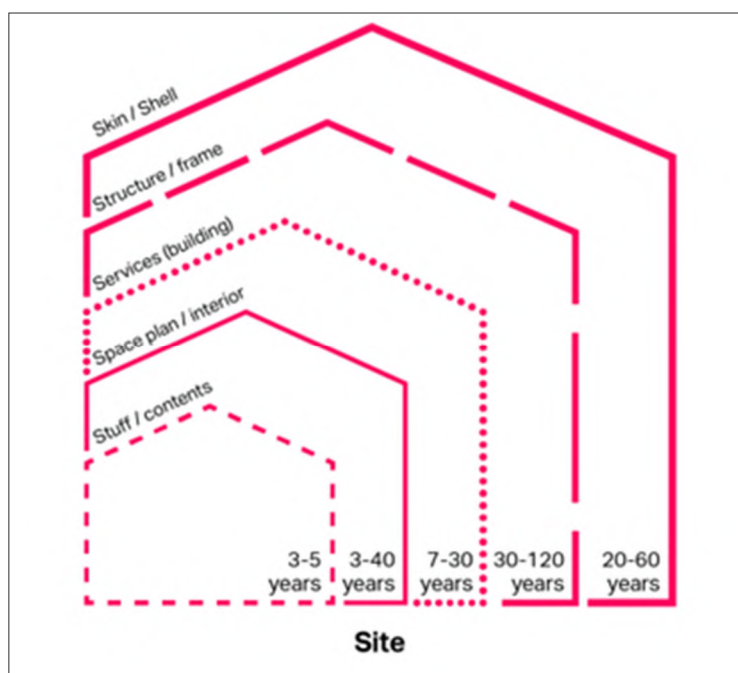


Figure 3: Building Layers and their Indicative Lifespans

2.17 Materials associated with each building layer for the Proposed Development are set out in **Table 1**. The information in the table is reflective of the most up to date information at the time of writing.

Table 1: Materials which Comprise the Proposed Building Layers

Building Layer	Summary	Proposals		
		Material Aspect	Sci-Tech building	Student Accomodation
Site	The geographical location, context, external works, earth works and landscaping.	-	Proposed landscaping and public realm. A Pre-demolition Audit (PDA) is to be undertaken on the existing on-site building and will include a list of products and construction materials that could be reused on/off-site, reclaimed or recycled prior to demolition. However, a PDA was not available at the time of writing.	Proposed landscaping and public realm. A Pre-demolition Audit (PDA) is to be undertaken on the existing on-site building and will include a list of products and construction materials that could be reused on/off-site, reclaimed or recycled prior to demolition. However, a PDA was not available at the time of writing.
Skin/shell e.g. façade	The layer keeping out water, wind, heat, cold, direct sunlight and noise. Includes exterior surfaces such as the roof, siding, sheathing and windows. This layer includes the façade (front or face of a building). This layer often has biggest impact on longterm durability, occupant comfort and building-energy performance.	External Windows	Façade on ground floor: Double-glazed structural glass assembly facade system Façade onn typical floors: 1800mm wide bronze anodized aluminium panels (colour TBC) with high recycled content, angled profile, mineral wool insulation and plasterboard dry lining. Horizontal spandrel panels. Curtain walling (typical width 1800mm) nominally to achieve U-values, G-values and light transmittance as per Mechanical, electrical and plumbing (MEP) requirements. Glass thickness to match acoustic requirements. - see acoustic report Solar/ Low-e coating – check on sustainability.	<u>Windows in Studios and Cluster Kitchens:</u> Aluminium framed window with full height fixed double glazed panel and integrated openable insulated purge vent panel. Perforated aluminium panel in front of purge vent and opaque areas. Horizontal aluminium shading section. <u>Windows in Cluster Bedrooms:</u> Aluminium framed window with fixed double glazed upper pane and back-painted insulated lower pane, and integrated openable insulated purge vent panel. Perforated aluminium panel in front of purge vent and opaque areas. " Horizontal aluminium shading section to all grouped windows.
			External Soffit	Precast concrete soffit cladding with integrated lighting.
		Columns	Back insulated Pre-cast Column Casing.	In-situ reinforced (steel reinforcement – 500N/mm ² Grade) concrete columns – C50/60

Building Layer	Summary	Proposals		
		Material Aspect	Sci-Tech building	Student Accomodation
Structure/ structural frame/ superstructure	supporting structure. Generally, it is the longest-lasting building element. Insulation and services may be embedded here.			Concrete. At this stage, this is assumed to be CEM 1, the top grade of cement.
		Walls	The materials to be used within the external walls of the ground floor, upper floors and atrium overrun include: • Anodised Aluminium Panels with high recycled content; • Corrugated anodised spandrel with high recycled content; • Aluminium framed glazing; • Insulation (mineral wool) where solid; • Internal finish: aluminium and plasterboard lining; • Back Painted Glass; • Extruded Aluminium Louvres; • Fence railing around service yard; • Folded perforated anodised metal - Plant screen (roof);	In-situ reinforced (steel reinforcement – 500N/mm ² Grade) concrete walls – C40/50 concrete. At this stage, this is assumed to be CEM 1, the top grade of cement.
		Frame	Concrete	Concrete
		Upper Floors	Wood	Concrete flat slab with levelling screed
		Roofs	• Structural concrete deck; • Concrete pavers on pedestal system / Ballast.	• Inverted roof with pavers on adjustable feet to walkable areas; • Inverted roof with stone ballast to parapet edges and non-walkable areas; and • Green roof on inverted roof system to external roof gardens.
		Stairs and ramps	Concrete pre-cast stairs	Concrete stairs
		External walls	Façade on ground floor: Double-glazed structural glass assembly facade system	<u>Residential Building Blocks:</u> Brick fixed to sheathing board on SFS filled with mineral/rockwool insulation (cavity and within

Building Layer	Summary	Proposals		
		Material Aspect	Sci-Tech building	Student Accomodation
			Façade in typical floors: 1800mm wide bronze anodized aluminium panels (colour TBC) with high recycled content, angled profile, mineral wool insulation and plasterboard dry lining. Horizontal spandrel panels. Curtain walling (typical width 1800mm) nominally to achieve U-values, G-values and light transmittance as per MEP requirements. Glass thickness to match acoustic requirements.	SFS), waterproof membrane, and internal wall lining. <u>Ground Floor (space between student resi blocks):</u> Curtain wall comprising double glazed panel, back-painted insulated glass panel and louvred units. <u>Roof Staircores Cladding:</u> Aluminium solid panel. <u>Roof Plant Screen:</u> Aluminium louvred screen.
		External doors	- Integrated all glass doors, centered on the bay; - Main Entrance Revolving Doors: (automatic type TBC for Part M) to main entrances to be frameless type, tested and certified to LPS 1175 SR2; - Main Entrance Pass doors (next to revolving doors): power assisted and access controlled for after hour use, clear opening width of at least 1000mm and weather protection to meet AD M Vol.2; and - Cycle access sliding door: automated.	- Double glazed entrance doors; and - Louvred doors to plant rooms and bin stores.
		External Balustrade	Metal rails balustrade	Metal rails balustrade
Substructure	Excavations, foundations, basements and ground floors.	Foundations	C32/40 reinforced concrete with a minimum 30% cement replacement with ground granulated blast-furnace slag.	In-situ reinforced (steel reinforcement – 500N/mm ² Grade) concrete slabs – C32/40 concrete. At this stage, this is assumed to be CEM 1, the top grade of cement.
		Floor Types	Screed to plant, bin and cycle stores.	Screed to plant, bin and cycle stores.

Building Layer	Summary	Proposals		
		Material Aspect	Sci-Tech building	Student Accomodation
Services (building)	Installations to ensure comfort, practicality, accessibility and safety, including plumbing, heating, cooling, ventilation and electrics.	To be confirmed by the appropriate design and build contractor.		
Space/space plan/interior/interior space	The layout, internal walls and partitions, ceilings, floors, surface finishes, fixtures, doors, fitted furniture. Changeable without changing structure, services or skin.	Internal walls and partitions	- Plasterboard partitions; - Blockwork walls to plant rooms, bin and cycle stores; - Internal Glazed Screen; and - IPS Panel.	- Plasterboard partitions; - Blockwork walls to plant rooms, bin and cycle stores; - Internal Glazed Screen; and - IPS Panel.
		Floor Finishes	- Carpet; - Vinyl flooring; - Porcelain floor tile; and - Concrete paint.	- Carpet; - Vinyl flooring; - Porcelain floor tile; and - Concrete paint.
		Wall Finishes	- Wall paint; - Ceramic wall tile; - PVC wall covering; - Acoustic wall panel; and - Vinyl wall covering.	- Wall paint; - Ceramic wall tile; - PVC wall covering; - Acoustic wall panel; and - Vinyl wall covering.
		Ceilings	- Suspended MF plasterboard; and - Suspended steel ceiling tile.	- Suspended MF plasterboard; and - Suspended steel ceiling tile.
		Internal Doors	Timber	Timber
Stuff/contents	Anything that could fall if the building was turned upside down. Not permanent, easily movable, most frequently changed by occupant, e.g., appliances, lamps, electronics, furniture, art.	This is not currently within the Applicant's control and will be determined at a later stage.		This is not currently within the Applicant's control and will be determined at a later stage.

Buliding Layer	Summary	Proposals		
		Material Aspect	Sci-Tech building	Student Accomodation
Construction materials	Any temporary installations/works/materials, packaging and equipment.		At this stage of design, there is no further information available on construction materials beyond what is set out above.	At this stage of design, there is no further information available on construction materials beyond what is set out above.

3. LEGISLATION AND POLICY CONTEXT

National Policy and Guidance

National Planning Policy Framework (NPPF)

- 3.1 The NPPF², which was most recently updated in July 2021, sets out the planning policies for England.
- 3.2 Paragraph 7 of the NPPF states that “*The purpose of the planning system is to contribute to the achievement of sustainable development*”. Among the environmental objectives set out within Paragraph 8 of the NPPF, the most relevant to this CES are “*using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy*”.

Waste Hierarchy

- 3.3 Article 4 of the revised EU Waste Framework Directive (2008) sets out 5 steps for dealing with waste, ranked according to environmental impact. The waste hierarchy shows that prevention offers the best environmental outcome and is the highest priority, followed by preparing for re-use, recycling, other recovery and finally disposal.
- 3.4 The waste hierarchy has been transposed into UK law through the Waste (England and Wales) Regulations 2011, meaning that all businesses or organisations that produce or handle waste must take all reasonable steps to prevent waste and apply the waste hierarchy to any waste that is produced.
- 3.5 The Waste Hierarchy is shown in Table 2.

Table 2: The Waste Hierarchy

Stages	Examples (as provided by DEFRA)
Prevention	○ Using less material in design and manufacture. ○ Keeping products for longer; re-use. Using less hazardous materials.
Re-using on-site / Preparing for re-use off-site	○ Checking, cleaning, repairing, refurbishing, whole items or spare parts.
Recycling	○ Turning waste into a new substance or product. ○ Includes composting if it meets quality protocols.
Other Recovery	○ Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis.
Disposal	○ Landfill and incineration without energy recovery.

² Ministry of Housing, Communities & Local Government (2021) 'National Planning Policy Framework'. Available from: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

Our Waste, Our Resources: A Strategy for England

- 3.6 The Our Waste, Our Resources: A Strategy for England³ document sets out how the Government will preserve the England's stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy.
- 3.7 According to this Strategy, by prolonging the lives of materials and goods, society can move away from the inefficient 'linear' economic model of 'take, make, use, throw' towards a more circular economy through which resources will be in use as long as possible so that maximum value can be extracted from them.
- 3.8 The two key objectives of this Strategy are:
- To maximise the value of resource use; and
 - To minimise waste and its impact on the environment.

Circular Economy Package Policy Statement

- 3.9 The Circular Economy Package Policy Statement⁴ introduced a revised legislative framework, identifying steps for the reduction of waste and establishing a long-term path for waste management and recycling.
- 3.10 This Policy Statement committed to recycle 65% of municipal waste and to have no more than 10% of municipal waste going to landfill by 2035.

National Guidance: UK Green Building Council (GBC) Circular Economy Guidance

- 3.11 The UK GBC Circular Economy Guidance⁵ was designed to enable construction companies to include more ambitious circular economy design and construction principles for the non-domestic built environment.
- 3.12 This is achieved by addressing the common commercial obstacles that developers may encounter, and providing practical support and evidence to assist them in setting clear circular economy objectives for their projects.
- 3.13 The UK GBC guidance follows the following circular economy principles:
- Reuse;
 - Design Buildings for Optimisation;

³ HM Government (2018) 'Our Waste, Our Resources: A Strategy for England'. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

⁴ Defra (2020) 'Circular Economy Package Policy Statement'. Available from: <https://www.gov.uk/government/publications/circular-economy-package-policy-statement/circular-economy-package-policy-statement>

⁵ UKGBC (2019) 'UKGBC Circular Economy Guidance'. Available from: <https://www.ukgbc.org/ukgbc-work/circular-economy-guidance-for-construction-clients-how-to-practically-apply-circular-economy-principles-at-the-project-brief-stage/>

- Standardisation or Modularisation;
- Servitisation and Leasing; and,
- Design and Construct Responsibly.

3.14 The guidance also aims to ensure that the construction supply chain can effectively deliver circular economy goals and that budget, project management, and timescale risks are minimised and mitigated.

Regional and Local Policy

Manchester Core Strategy 2012 – 2027

3.15 The Manchester Core Strategy 2012 – 2027⁶ sets the out the long term strategic policies for Manchester's future development and will form the framework that planning applications will be assessed against.

3.16 The following policies within the Strategy relate to waste:

- **Policy EN19 Waste:** This policy requires all developers to demonstrate the proposal's consistency with the principles of the waste hierarchy; and
- **Policy DM1 Development Management:** This policy states that all development should have regard for refuse storage and collection in the design.

Greater Manchester – Places for Everyone

3.17 The Greater Manchester – Places for Everyone⁷ Plan recognises the UK Government's focus on the creation of a circular economy.

3.18 Policy JP-S 7 – Resource Efficiency of this Plan states that “The achievement of a circular economy and a zero-waste economy will play a key role in meeting Greater Manchester's ambition of becoming a leading green city region by 2038. The following measures will help achieve this:

- “Development and implementation of the Resource Strategy for Greater Manchester which promotes overall reduction in the level of waste produced and supports resource efficiency within the Plan area in order to gain the maximum value from the things we produce;
- Ensuring the design of all new development incorporates storage space to facilitate efficient recycling and where appropriate, processing of waste on site;

⁶ Manchester City Council (2012) 'Manchester Core Strategy 2012 – 2027'. Available from: https://www.manchester.gov.uk/downloads/download/5672/core_strategy

⁷ Greater Manchester Combined Authority (2021) 'Greater Manchester – Places for Everyone'. Available from: <https://www.greatermanchester-ca.gov.uk/media/4838/places-for-everyone.pdf>

- Recognition of the role of existing infrastructure in managing our waste and protecting such facilities to ensure adequate waste management capacity is maintained; and
- Using sustainable design and construction techniques to reduce carbon emissions, adapt and future proof to the impact of climate change, reduce and recycle waste and minimise water use".

Greater Manchester - Sustainable Consumption & Production Plan 2022 – 2025

- 3.19 Greater Manchester - Sustainable Consumption & Production Plan 2022 – 2025⁸ sets out how Greater Manchester can contribute to becoming carbon neutral. Moving towards a circular economy is one of the four priorities of this Plan.
- 3.20 The Plan identified two main areas to focus on to ensure Greater Manchester can become a circular city: Industry; and Policy Development and Innovation.
- 3.21 The three points to address for Industry include:
- Sustainable Product Design - reducing the amount of raw materials within what is made, built and produced and reduce the amount of waste disposed;
 - Resource efficiency - moving away from the standard linear business models to promoting the benefits of different, more circular business models that maximise resource efficiency; and
 - Business to Business Approach - moving away from linear business models (make – use – dispose) and embrace circular business models.
- 3.22 The three points to address for Policy Development and Innovation include:
- Sustainable Procurement - moving to a full life cycle approach to ensure that negative impacts on the environment are reduced as much as possible;
 - Resource/Consumption mapping - understanding the raw materials being consumed within the city region; and
 - Innovation - tackling concern waste streams such as plastics, construction materials and textiles, to ensure those that those materials can either be reused or recycled, with sustainable end markets.

⁸ Greater Manchester Combined Authority (2022) 'Greater Manchester - Sustainable Consumption & Production Plan 2022 – 2025'. Available from: <https://democracy.greatermanchester-ca.gov.uk/documents/s21049/21%20SCP%20Plan%202022-25%20Final%20V2.pdf>

4. IMPLEMENTING A CIRCULAR ECONOMY

- 4.1 A circular economy is one where materials are retained in use at their highest value for as long as possible and are then re-used or recycled, leaving a minimum of residual waste (see **Figure 4**). Thus, turning waste into a resource is part of 'closing the loop' in circular economy systems. A circular economy saves resources, increases the resource efficiency of businesses and projects, and helps to reduce carbon emissions. It builds overall system health by decoupling economic activity from the consumption of finite resources. This should be underpinned by a transition towards renewable energy sources.

"All developments should be designed so that buildings can be adapted to extend their life. They should also be designed so they can be deconstructed and reconstructed to allow components and materials to be salvaged for reuse or recycling, whilst maintaining their economic and environmental value (GLA, 2020)".

- 4.2 The six CE principles, which should be a fundamental part of the building design process, are:

- i. **Building in layers** – ensuring that different parts of the building are accessible and can be maintained and replaced where necessary.
- ii. **Designing out waste** – ensuring that waste reduction is planned in from project inception to completion, including consideration of standardised components, modular build, and reuse of secondary products and materials.
- iii. **Designing for longevity.**
- iv. **Designing for adaptability or flexibility.**
- v. **Designing for disassembly.**
- vi. **Using systems, elements or materials that can be reused and recycled.**

- 4.3 **Figure 4** sets out a hierarchy for building approaches that maximises the use of existing materials. Diminishing returns are gained by moving through the hierarchy outwards, working through refurbishment and reuse through to the least preferable option of recycling materials produced by the building or demolition process. This provides an overall strategy for the redevelopment of buildings, with retention as the starting point.



Figure 4: CE hierarchy for building approaches (GLA, 2020)

Approach and Limitations

- 4.4 CE design approaches are not mutually exclusive. Multiple approaches are expected to be adopted for each project, development aspect, layers or uses, particularly for larger developments. As neither MCC nor Greater Manchester Combined Authority have produced guidance on how to undertake a CES, guidance produced by the Greater London Authority (GLA) in 2022⁹ has been considered in the preparation of this CES. The CES requirements for different application types is presented in **Appendix 2**.
- 4.5 It is expected that information on certain materials will be available at outline stage, for example, based on experience from previous schemes, and to estimate costs, however detailed information to inform a comprehensive bill of quantities, an end of life strategy and operational waste management plan is limited and therefore 'scoped out' of this issue.
- 4.6 The Applicant has therefore provided as much information as possible to ensure the CE principles and targets are embedded early in the design process.
- 4.7 Particularly important to include at outline stage are 'building layers' (see **Table 1**) or elements that are likely to be decided early on (for example site, structure and skin/shell) and which have the longest lifespans or will be changed less frequently. The principles support the application of the waste hierarchy in that avoiding or reducing waste is prioritised.
- 4.8 For the six CE principles to be successful, a whole building lifecycle approach is required. Therefore, the goals of this CES are closely linked with the approach of all architecture,

⁹ GLA (2022) 'Circular Economy Statement Guidance'. Available from: <https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance/circular-economy-statement-guidance>

engineering, energy, drainage and waste documents which have been submitted to support the application.

- 4.9 The commitments to manage quantities of materials, resources and waste as set out in the above documents will underpin the structure and content requirements of this CES.
- 4.10 BWB attended a circular economy workshop with the Project Team to confirm the principles, commitments and targets of the Proposed Development and to ensure that the principles of the circular economy are incorporated into the Proposed Development, where possible.
- 4.11 This collaboration with the Project Team has resulted in the targets and commitments set out below.

Targets and Commitments

- 4.12 The design objective for the elements with longer life cycle (more than 25 years) is to design for longevity, adaptability and flexibility. Concrete provides longevity and high thermal mass whilst steel is highly recyclable. -
- 4.13 Building layers with shorter life expectancy (less than 25 years) will be designed for ease of maintenance, reuse and recoverability. The plant will be made accessible for replaceability and maintenance. In terms of building services, a water based wet system is proposed for the communal network thus reducing the use of refrigerant in the building. The proposed mixed mechanical ventilation system with heat recovery reduces the heating demand, thus reducing the plant requirement. Cooling has been designed-out of the residential asset.
- 4.14 Opportunities will be explored for reusing hoardings and scaffoldings. Discussions with suppliers with regards to the possibility of sending back the packaging for reuse will be explored. Offsite and modern methods of construction may be considered to further optimise material use and waste minimisation.
- 4.15 **Table 3** below provides an overview of the circular economy design principles, the targets and commitments of the Proposed Development and the reports / documents within which these targets and commitments are stated, where relevant.

Table 3: Circular Economy Targets and Commitment for the Sci-Tech Building and PBSA

	Strategy	Site	Skin/shell e.g. façade	Structure/ structural frame/ superstructure	Substructure	Services (building)	Space/space plan/interior/ interior space	Stuff/contents	Construction materials
Minimise the quantities of materials used	The Proposed Development has been designed to utilise materials in as efficient a manner as practicably possible.	Material efficiency will be achieved through: • Designing to standard material dimensions; • Use materials with a high recycled content; • Avoid over specification; • Optimise the design of foundations; and • Use pre-assembled / prefabricated components, where possible. During construction, the project team will also aim to ensure where possible, efficient materials procurement and reduced construction waste by designing for less material use and less construction waste produced by: • Off-site prefabrication has been promoted and maximised where possible to minimise the potential for both on-site and off-site construction waste. • Reinforced steel is pre-cut off-site to minimise off-cuts and therefore waste. • Pre-cast concrete is used throughout the development, including pre cast columns will be used where practicable. This is a more efficient use of concrete as components are made in factory where exact quantities can be used to reduce waste. Offsite prefabrication of building elements will be utilised where possible. Transportation and construction details of materials should be reviewed by the contractor and supply chain as early as possible to determine if low carbon solutions are available. In accordance with the BREEAM Pre-Assessment for the PBSA ('W9069 UBS BREEAM Pre-assessment Report_Iss01'), a total of three (out of the four) credits will be targeted tfor 'Construction resource efficiency' and 'Diversion of resources from landfill' for 'Wst 01 - Construction waste management' to support an overall BREEAM rating of 'Excellent'. Targeting an additional credit for 'Wst 02 Recycled aggregates', which encourages the use of recycled and secondary aggregates, will alsoreduce the demand for virgin material and optimise material efficiency in construction.							
Minimise the quantities of other resources used	During the construction phase, the Principal Contractor will be responsible for setting targets for energy and water consumption through the following, where possible: • Avoid using fossil fuels; • Use renewable energy sources; • Use energy efficient plant and equipment; and • Ensure plant and equipment are turned off when not being used. During the operational phase, measures will be implemented to reduce: water consumption; energy generation and consumption; and greenhouse gas (GHG) emissions. Measures will also be implemented to increase energy efficiency.	The applicants aim to mitigate the potential impact of the development by addressing key sustainability issues and incorporate a range of procedures to maximise resource efficiency and minimise waste during all stages of the development. All buildings proposea a fabric first approach in reduction of operational energy (heating/cooling/ventilation) by aiming to achieve a low U-Value façade, low Y-value thermal bridging, improved air tightness, use of mechanical vent heat recovery (MVHR), and a very efficient form factor and optimised glazing ratio. A fabric-first and all-electric energy strategy will be adopted, resulting in a reduction of energy demand. The development will benefit from the ongoing decarbonisation of the UK electricity grid. The design incorporates designated roofs for PV. For the Sci-Tech building, approximately 400 m² of solar PV arrays will be installed on the roof, which will provide an estimated 51,950 kilowatt hour (kWh) of electricity generated annually. The applicants will review effects associated with all the phases of the life cycle of the new building, from the manufacture of the building materials through to the operation of the building and how it will be demolished and replaced, focusing on a range of sustainability metrics. Each design and specification decision is to be measured against the impact it will have on the net of the whole life carbon of the project. For the PBSA, approximately 200 m² of solar PV arrays will be installed on the roof. The modular efficiency and orientation could acheive up to 41.2 kilowatt peak (kWp) supply. Buildings will be designed to reduce water consumption and will include water efficient devices and equipment, including 'A' rated appliances. In accordance with the BREEAM Pre-Assessment for the PBSA ('W9069 UBS BREEAM Pre-assessment Report_Iss01'), a minimum of three (from a maxoium of five) BREEAM credits are targeted in relation to 'Wat 01 Water consumption' which will contriubute to an overall target rating of BREEAM 'Excellent'. Should a BREEAM rating of 'Outstanding' be achieved, all five credits for 'Wat 01 Water consumption' would need to be achieved. During the construction, the team will also investigate further measures to reduce use of other resources, such as packaging. The use of water, electricity and fuel should be monitored to track performance throughout construction, with decisions being taken considering these KPIs. This commitment to monitoring will be confirmed upon appointment contractors. The following will be implemented during the operational phase of the Sci-Tech building to contribute to a circular economy: • Approximately 400 m² of solar PV arrays will be installed on the roof; • The main source of heating/cooling will be through reversible heat pump chillers; • Water consumption will be reduced by a minimum of 40% against the BREEAM baseline through the use of water efficient components; • Energy generation will follow the energy hierarchy (i.e. Be Lean, Be Clean and Be Green); • Primary energy consumption will be reduced by 12.7% against the Part L baseline through energy saving measures such as: designing with low U-values, g-values and low air leakage rates; optimising the facades so that heat losses are minimised; positioning of openings so as to maximise the use of natural light within each space; mechanical ventilation throughout the year; use of high efficiency LED lighting coupled with occupancy and daylight controls; and tight metering of electrical and mechanical systems and controlled with a full Building Management System; and • The use of on-site renewables and low carbon technologies is anticipated to result in a 14.7% reduction in carbon emissions.							

	Strategy	Site	Skin/shell e.g. façade	Structure/ structural frame/ superstructure	Substructure	Services (building)	Space/space plan/interior/ interior space	Stuff/contents	Construction materials
		The following will be implemented during the operational phase of the PBSA to contribute to a circular economy: - Anticipated water demand is 100 litres per person per day, whilst a number of water saving measures will be implemented to further reduce water consumption; - Energy generation will follow the energy hierarchy (i.e. Be Lean, Be Clean and Be Green); - Energy consumption will be reduced by 28% against the Part L baseline through energy saving measures such as: glazing areas optimised for daylight and thermal performance; openable windows to allow mixed-mode ventilation; enhanced U-values for both opaque and transparent elements; very good air tightness where feasible; high light transmittance glazing in façade: solar shading devices and solar control glazing within the office façade; use of thermal mass; and relaxing heating and cooling setpoints; and - The use of on-site renewables and low carbon technologies is anticipated to result in a 12.6% reduction in carbon emissions.							
Responsible Sourcing	As part of the BREEAM Assessment the Principal Contractor will be required to source materials in accordance with a Sustainable Procurement Plan. Materials will need to be prepared in accordance with the BRE - Green Guide Specification to an A+ or A Rating.	N/A	The procurement team will ensure use of products from certified sustainable sources, and ensure the availability of supply for the needs of the development e.g. FSC/PEFC certified timber. The Contractor will endeavour to implement targets of increasing the recycled content of materials such as concrete, blockworks, insulation, carpet tiles etc. They will be cross checked by the team in line with commercial viability. Recycled materials with low embodied carbon will be preferred. Materials suppliers that have an established Environmental Management System (EMS) will be preferred. 100% of timber will be FSC or PEFC certified; 100% of concrete will be BES 6001 certified; - Steel will be sourced from suppliers rated under the CARES Sustainable Constructional Steel Scheme, where possible; and - Other major construction materials will be certified under an Environmental Management System (EMS) such as ISO 14001. Designing the PBSA to achieve a a BREEAM rating of 'Excellent' would include commitments to the rrResponsible sourcing of construction products'.						
Design for reusability / longevity / adaptability / flexibility	It is vital that the building is constructed to maximise the life of the component parts. It is inevitable that component parts will need to be repaired over the lifetime of the Proposed Development; therefore it is important that parts which are easily repaired are chosen to reduce the need for replacement. As part of the BREEAM Assessment the Principal Contractor will be required to select materials that are compliant with the Durability and Resilience Report.	N/A	In order to ensure that circular economy principles are embedded within the construction process, the development aims to meet long term needs while being durable and resilient. It should be able to cope with change from, for example, climate change or different ways of living. Material specifications and procurement will aim to achieve durability standards. Materials are to be demountable and recyclable where practicable. Off-site prefabrication and design for modularisation / standardisation will be promoted and maximised where possible to ensure ease of maintenance and repair/replacement during operation. The following will be implemented to ensure that circular economy principles are embedded within the construction process: - Durability standards, syuch as those in BS 7543:2015 'Guide to durability of buildings and building elements, products and components' will be achieved; - All timber will be sustainably sourced; - Materials will be sourced from suppliers with an established EMS; - There will be a preference for materials with low embodied carbon; and - Modular design will be used where possible. Designing the PBSA to achieve a a BREEAM rating of 'Excellent' would include commitments tto-'dDesigning for durability and resilience' and assess –'material efficiencies'.						
Designing out construction, demolition, excavation waste arisings	For demolition works, a PDA will be undertaken and materials will be segregated by type to ensure that material from the demolition works is recovered and used on site as either fill material or a piling mat. Any residual material will be sent to a material recycling facility that specialises in construction and demolition waste. The following measures will be implemented to minimise waste generation during the construction phase: Design for Manufacture and Assembly;	The construction of the development will aim to re-use as many suitable materials on site as possible. Where materials cannot be re-used, they will be sent off-site for re-use and refurbishment elsewhere if possible, instead of being taken by waste carriers. The appointed demolition contractor should endeavour to salvage natural stone, bricks, and good quality items of timber and top soil. Salvaged materials can be donated to local businesses, construction colleges and community groups where appropriate. Recovery of materials and products onsite could include: - Concrete: crushed and recycled to be used as sub-base below hard landscaping; - Tarmac: Tarmac is melted and re-used as asphalt on-site; - Electrical infrastructure such as reducant wiring; and - Topsoils / excavated materials: to be used in landscaping. During construction, the team will work together to maximise the value and quantity of materials recovered for potential reuse and recycling. This will include encourage efficient use of materials by applying lean design principles, using reclaimed materials, and components, and substituting high replacement cycle materials with more robust materials, including the use of pre-fabrication and modularisation, as described above. The appointed contractor (s) will continue review the reuse and recovery of materials and components such as identifying local uses and/or disposal of waste and material arisings where feasible.							

	Strategy	Site	Skin/shell e.g. façade	Structure/ structural frame/ superstructure	Substructure	Services (building)	Space/space plan/interior/ interior space	Stuff/contents	Construction materials
	- Use modular construction; - Use standard construction components; and - Consistent design to minimise need for supply of materials. No lower ground floors are proposed for the PBSA, therefore, excavation will be for foundations only. The volume of excavated waste expected to be generated for the Sci-Tech building is approximately 2,500 m³. This includes approximately 2,000 m³ for foundations (volume of pile caps, ground beams, piles, blinding, ground slab, lift pit) and 500 m³ for the drainage attenuation tank.	- An overall target of at least 95% diversion from landfill of waste during demolition, excavation and construction has been set; and - An overall target of less than 7.5 m³ or 6.5 tonnes of construction waste per 100m² of gross internal area has been set within the BREEAM Pre-Assessment for the Sci-Tech building.							
Manage demolition waste	A PDA is to be undertaken on the sites for both the PBSA and Sci-Tech building. The PDAs will include a list of products and construction materials that could be reused on/off-site, reclaimed or recycled prior to demolition. This will inform the aspiration to will ensure that the maximum amount of demolition waste is reused or recycled.	The scheme proposes to maximise the value and quantity of materials recovered for potential reuse and recycling during demolition. During the M&E strip, plant will then be cut out in large sections and will then be reprocessed. All waste should be further segregated and sorted off site prior to recycling in order to achieve the minimum amount of material sent to landfill. Mixed waste collected from site will be segregated off site at a local transfer station, where all materials will processed through a material recycling facility. The project team will agree a benchmark for waste reclamation which will include reuse on site, reuse on other sites, salvaged for reuse & collected from site by an approved waste management contractor. During the demolition there are waste streams that are considered non-recyclable and they include asbestos waste and bitumen roofing. - A target of at least 95% diversion from landfill; - A minimum target (in m³ or tonnes) will be set following the undertaking of a PDA; and - Any demolition waste that is unsuitable for reuse on-site will be managed by a private contractor, who will transport the waste to a nearby construction waste Materials Recycling Facility (MRF).	N/A						
Manage excavation waste	Any excavated waste will be managed in accordance with the waste hierarchy and will be reused on-site where possible, including the reuse of topsoil and subsoil. Any excavated waste that cannot be reused on-site, will be reused or recycled off-site where possible. Any unsuitable or	The proposed development will encourage on-site reuse and recycling of excavation waste where possible. Excavated materials will also follow the waste hierarchy. Only if excavated material is not required or is unsuitable / considered hazardous for the	N/A						

	Strategy	Site	Skin/shell e.g. façade	Structure/ structural frame/ superstructure	Substructure	Services (building)	Space/space plan/interior/ interior space	Stuff/contents	Construction materials
	hazardous excavated waste will be managed appropriatly by a private waste contractor.	construction of the Proposed Scheme would it be considered waste. The appointed Contractor should ensure that contaminated material (if present and requiring removal from the site) would be collected by suitable waste carriers and sent for disposal at appropriately licensed hazardous waste facilities. • A target of at least 95% beneficial use of excavation waste; and • Any excavation waste that is unsuitable for reuse on-site will be managed by a private contractor, who will transport the waste to a nearby construction waste MRF.							
Manage construction waste	The following measures will be employed where practicable during the construction phase to minimise the amount of construction waste created and comply with the waste hierarchy: • Use suppliers who limit the amount of packaging of their products and who, ideally, participate in a packaging take-back scheme; • Use prefabricated or off-site manufactured components; • Avoid potential damage to construction materials by implementing a 'just-in-time' material delivery system; • Avoid the over-ordering of materials by maintaining an inventory of stored materials; • Provide separate waste storage skips for different waste streams to allow easy segregation of waste on-site; and • Reuse or recycle any residual materials off-site where possible	A Waste Management Strategy will be developed, ensuring that adequately sized bin storage areas are provided, access for collection personnel and vehicles has been established and other aspects of waste management is designed into the development at an early stage of the design. The estimated volumes can be found within the Site Waste Management Strategy. The dwellings will be provided with four bins. One for general waste, one for pulpable waste, one for mixed recyclables and one for food waste, stored internally in each apartment before decanted into the communal bins in the ground floor bin store. This allows for appropriate waste management facilities in accordance with the Waste Hierarchy to enable segregation and recycling. It is anticipated that 50% of the bins in the residential waste store would be dedicated for recycling, including organic waste. This meets the Greater Manchester Municipal Waste Management Strategy, which aims to achieve 50% recycling and composting of households rates by 2020. This recycling rate will be reviewed upon occupation. The commercial units will have colour coded bins to facilitate identification of waste streams to encourage recycling. Waste collection frequency will be dependent upon the volume of waste generated, the storage method (i.e. whether balers and waste compactors are used) and the schedule of the appointed waste contractor. It is anticipated that commercial waste will be collected twice a week. The management company would be responsible for the monitoring of recycling rates and promote actively high recycling rates in the building, e.g. by providing information on segregation. Commercial tenants will be served by private waste contractors. • An overall target of at least 95% diversion from landfill of construction waste from landfill has been set; • An overall target of less than 7.5 m3 or 6.5 tonnes of construction waste per 100m2 of gross internal area has been set within the BREEAM Pre-Assessment for the Sci-Tech building; and • Any construction waste that is unsuitable for reuse on-site will be managed by a private contractor, who will transport the waste to a nearby construction waste MRF.							
Manage municipal waste	British Standards (BS5906-2005) have been followed to ensure that an appropriate amount of waste storage bins will be provided during the operational phase. This waste will be collected by MCC. Waste will be stored within two storage areas on the ground floor of the building, with direct access to a dedicated waste collection point to the north-west of the Site. The waste from the bin stores will be taken out for collection from Kincardine Road via the north-west road.	The proposed approach to management of construction waste is to follow the waste hierarchy and circular economy hierarchy. The proposed development will aim to minimise the total amount of construction waste produced on-site through best practice material handling procedures. Appropriate materials storage and handling onsite will help to reduce the amount of waste produced at source. Careful segregation of waste will occur where space allows on site, which enables higher quality recycled materials and encourages local reprocessing. This will help to improve the transparency of waste processing and confidence in the end use of waste materials. The contractor will be tasked with maximising site segregation of construction waste to enable local reuse of waste materials and increase the quality of recyclable materials. This procedure will be set out in a Site Waste Management Plan with the aim of meeting the 95% diversion from landfill target. During construction, the team will work with suppliers to further investigate packaging reduction measures. During construction, the team will work with suppliers to further investigate the recovery or reuse of remaining timber. Periodical environmental inspections should take place with KPIs to be monitored. The KPIs should include waste generation, segregation and diversion from landfill. These commitments will be confirmed once a contractors have been appointed for both the PBSA and Sci-Tech building. • Following calculations done in accordance with BS5906-2005, a total number of 53 waste storage bins will be provided within the two waste storage areas; • Separate bins stores will be provided for the community and commercial units to ensure these waste types are not mixed; and							

	Strategy	Site	Skin/shell e.g. façade	Structure/ structural frame/ superstructure	Substructure	Services (building)	Space/space plan/interior/ interior space	Stuff/contents	Construction materials
		An appropriate amount of recyclable waste storage bins will be provided so that recyclable waste will be collected separately from other waste types.							

End of Life Phase

- 4.16 The end of life phase should be considered during the design of the Proposed Development to adhere to circular economy principles. Therefore, to 'close off the loop' the materials and components used during construction should be selected with their reuse and / or recyclability at the end of life phase in mind.
- 4.17 The following will be considered during the design stage to maximise the reuse and / or recyclability of construction materials:
- Choose materials and components that can be remanufactured, reused or recycled at the end of life phase;
 - Choose components that can be easily disassembled;
 - Consider leasing short-lived components where possible;
 - Avoid permanent fixing of components to enable end of life deconstruction and salvage of building elements; and
 - Ensure fixtures are easy accessible to enable disassembly.
- 4.18 When the Proposed Development is nearing its end of life phase, the potential for extending its lifetime should be evaluated. Where this is possible, an inspection will be undertaken to determine which components of the Proposed Development will need to be refurbished or replaced to facilitate this extension.
- 4.19 Where a lifecycle extension of the Proposed Development is not deemed possible, a Pre-Demolition Audit inspection should be undertaken to determine which components could feasibly be reused or recycled.

5. CONCLUSIONS

- 5.1 This CES has been prepared to demonstrate how the Proposed Development will deliver the principles of the circular economy.
- 5.2 This CES has included the following key targets and commitments for the Proposed Development to deliver the principles of the circular economy:
- Strategies have been developed to: conserve resources, eliminate waste through design and manage waste during the demolition, excavation, construction and operational phases in accordance with the waste hierarchy;
 - Any demolition, excavation or construction waste which is unsuitable for reuse or recycling will be managed by a private contractor and transported to a nearby construction waste MRF;
 - Construction materials and components will be sustainably sourced and will be chosen with their reusability, longevity, adaptability and flexibility in mind;
 - Measures will be implemented to reduce: water consumption; energy generation and consumption; and greenhouse gas (GHG) emissions during the operational phase. Measures will also be implemented to increase energy efficiency;
 - British Standards guidance will be followed in the waste storage provision to ensure waste is managed appropriately during the operational phase;
 - Targets have been set to maximise the amount of waste that is diverted from landfill during the demolition, excavation and construction phases;
 - Targets have been set to minimise the amount of demolition, excavation and construction waste;
 - A target to minimise water consumption during the operational phase has been set;
 - A BREEAM Pre-Assessment has been undertaken for the Sci-Tech building and a BREEAM rating of 'Excellent' has been set.
- 5.3 This circular approach to development includes assessment of design and materials at key stages of the development in order to promote a flexible and adaptable design that also promotes longevity. Certain design decision of materials was made with the whole life carbon in mind in order to reduce emissions associated with construction.
- 5.4 In this context some of the key circular economy commitments incorporated into the Design and Build (D&B) contract of the development include the following:
- Ongoing encouragement of specifications that maximises energy and resource efficiency (e.g. water efficiency) within the design;
 - Ongoing investigation into the materials proposed for the Sci-Tech design;
 - Seek to specify the use of recycled materials wherever viable including steel content, aggregates, and building finishes such as carpets;
 - Utilise off-site prefabrication and precast concrete where possible;
 - Procurement of sustainable and robust/durable materials;

- Continue to work with suppliers to reduce packaging waste or investigate take-back schemes; and
- Internal project targets and commitments will be reviewed by the D&B contractor, with the circular economy targets added as agenda item within regular team meetings

5.5 At this later stage in design, the design team will continue to investigate opportunities to increase circularity of the design of the development. While some of the principles have been or are in the process of being implemented, as part of the design and build contract, the primary contractor will aim to ensure that where appropriate and viable, the principles will be carried through the remaining design and eventual construction

APPENDICES

APPENDIX 1: Site Masterplans



GA Ground Floor Plan
1 : 200

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Department Legend

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

Legend
Site Ownership Boundary

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

KEYPLAN

CLIENT

McLAREN
PROPERTY

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PROJECT
Upper Brook Street Student Accommodation

SCALE@A1	DATE	ORIGINATOR	CHECKED	AUTHORISED
As indicated	28/02/2023	SR	ET	RG

General Arrangement
Ground Floor Plan

Stage 2

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	For Information	6601
DRAWING NO.	REV.	
6601 · SRA · XX · 00 · DR · A · 20100	P02	



GA First Floor Plan
1 : 200

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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

Site Ownership Boundary

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

KEYPLAN

CLIENT

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PROJECT
Upper Brook Street Student Accommodation

SCALE@A1	DATE	ORIGINATOR	CHECKED	AUTHORISED
As indicated	28/02/2023	SR	ET	RG

General Arrangement First Floor Plan

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	For Information	6601
DRAWING NO.	REV.	
6601 · SRA · XX · 01 · DR · A · 20101	P02	



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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
Site Ownership Boundary

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

KEYPLAN

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PROJECT
Upper Brook Street Student Accommodation

SCALE@A1 DATE ORIGINATOR CHECKED AUTHORISED
As indicated 28/02/2023 SR ET RG

General Arrangement
Second to Seventh Floor Plan

Stage 2

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	For Information	6601
DRAWING NO.	REV.	
6601	SRA · XX · ZZ · DR · A · 20102	P02



GA Eight Floor Plan
1 : 200

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Department Legend

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

Legend
Site Ownership Boundary

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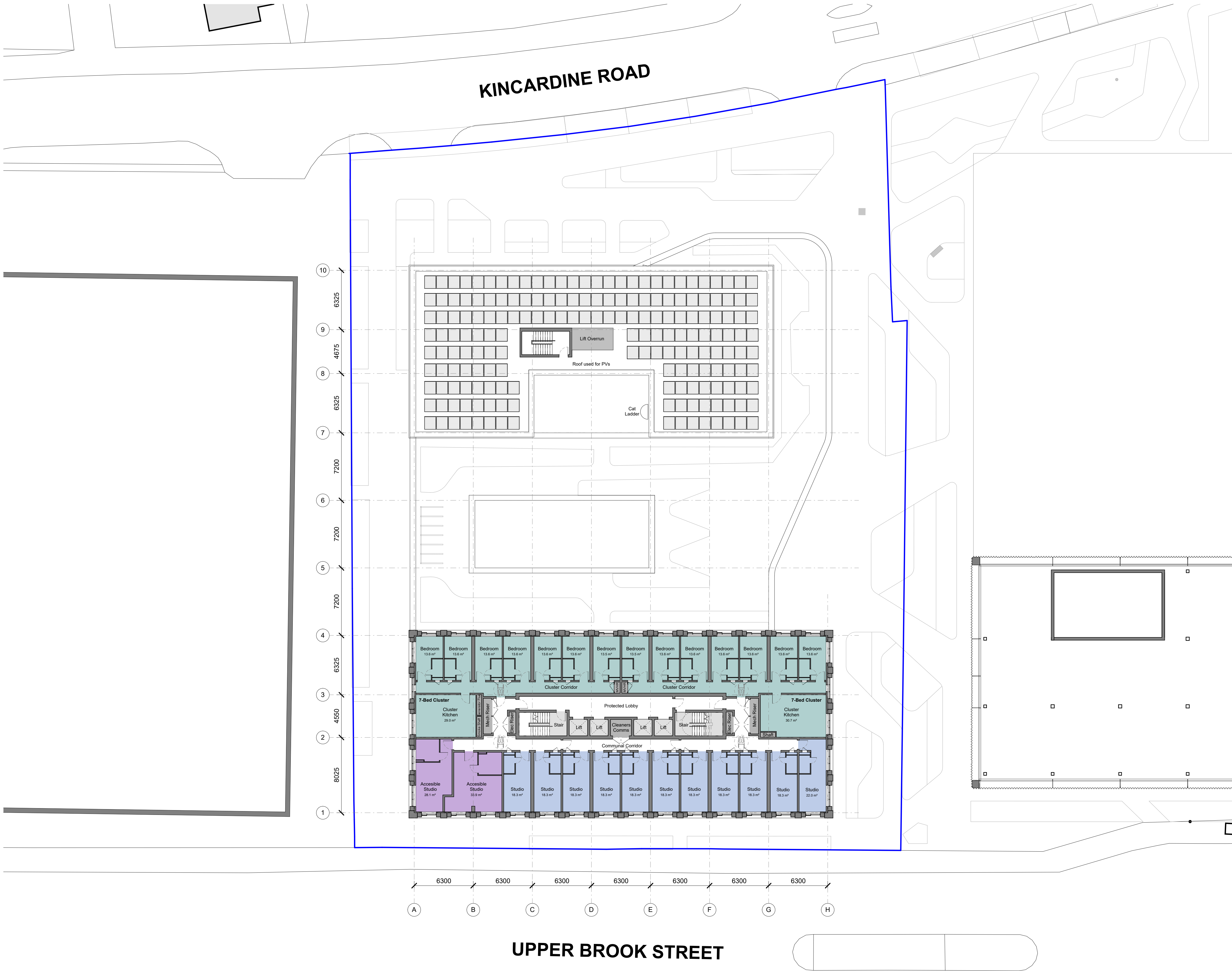
PROJECT
Upper Brook Street Student Accommodation

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General Arrangement
Eight Floor Plan

Stage 2

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Department Legend

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

Legend
Site Ownership Boundary

REV.	DATE	AMENDMENT
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P02	28/02/2023	DRAFT - Issued for Coordination

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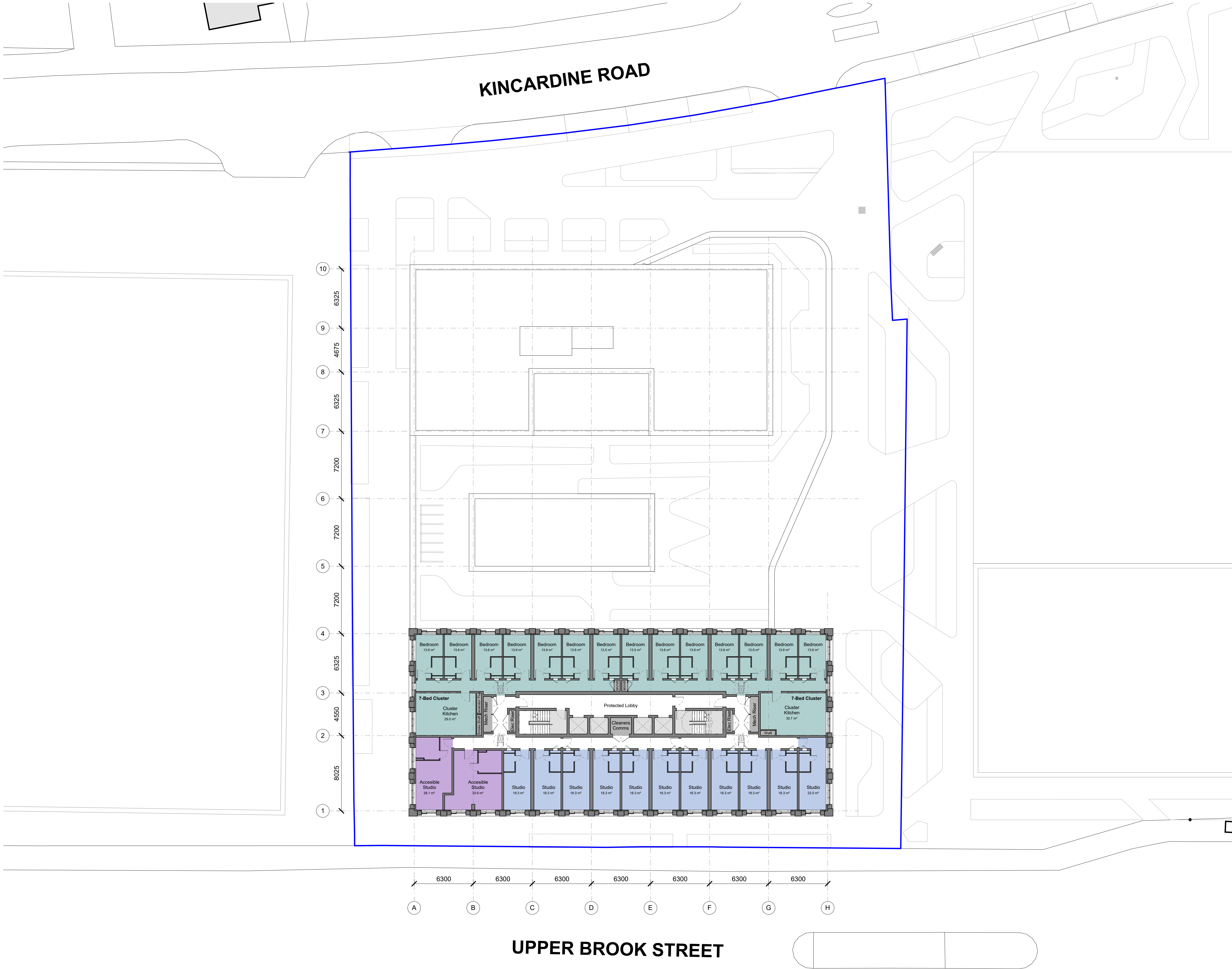
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General Arrangement
Tenth to Sixteenth Floor Plan

Stage 2
STATUS PURPOSE FOR ISSUE SR NO.
S2 For Information 6601
DRAWING NO. REV.
6601 · SRA · XX · ZZ · DR · A · 20109 P02



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
Site Ownership Boundary

REV.	DATE	AMENDMENT
P01	10/02/2023	First Issue
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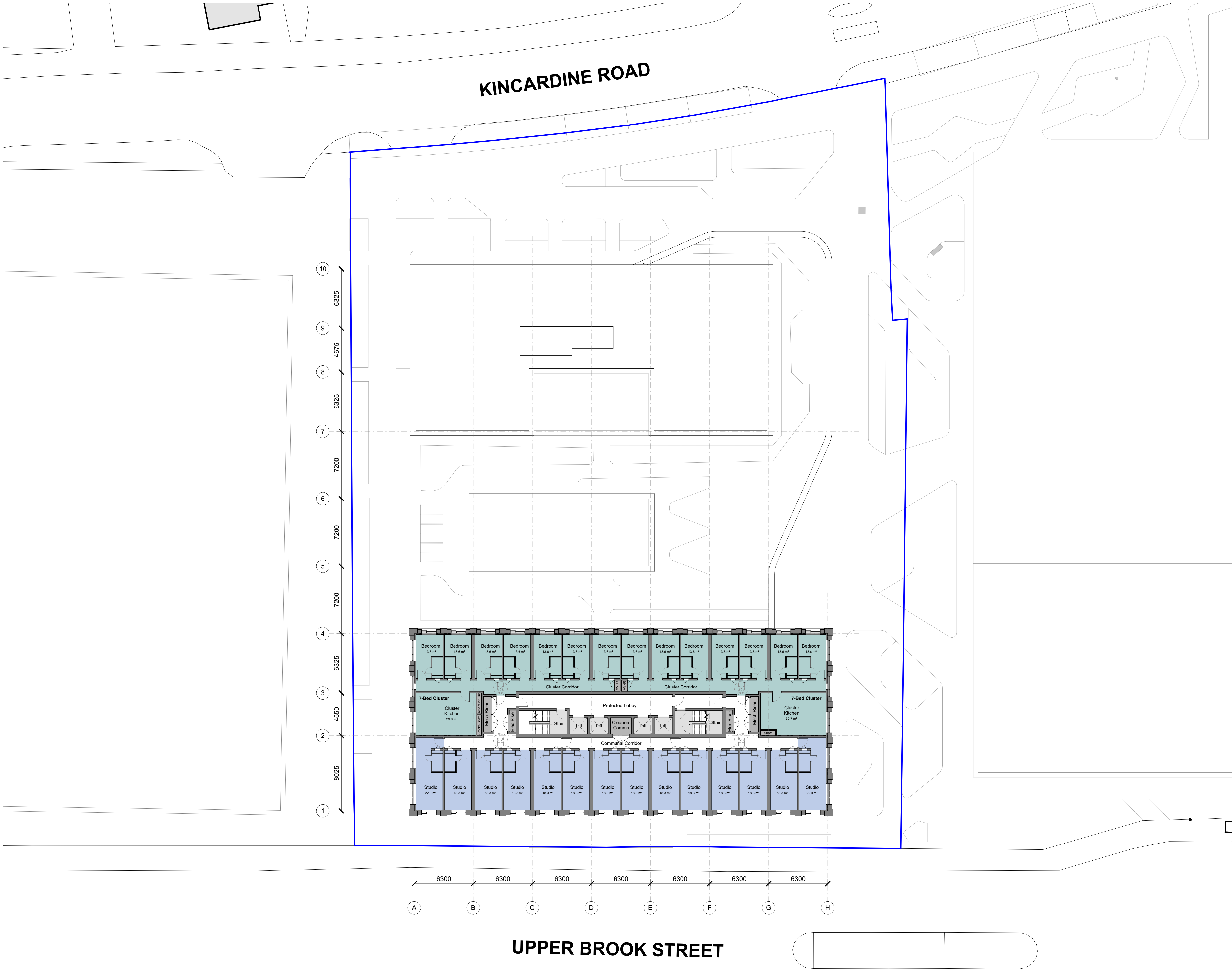
PROJECT
Upper Brook Street Student Accommodation

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General Arrangement
Seventeenth to Eighteenth Floor Plan

Stage 2

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	For Information	6601
DRAWING NO.	REV.	
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Department Legend

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

Legend
Site Ownership Boundary

REV.	DATE	AMENDMENT
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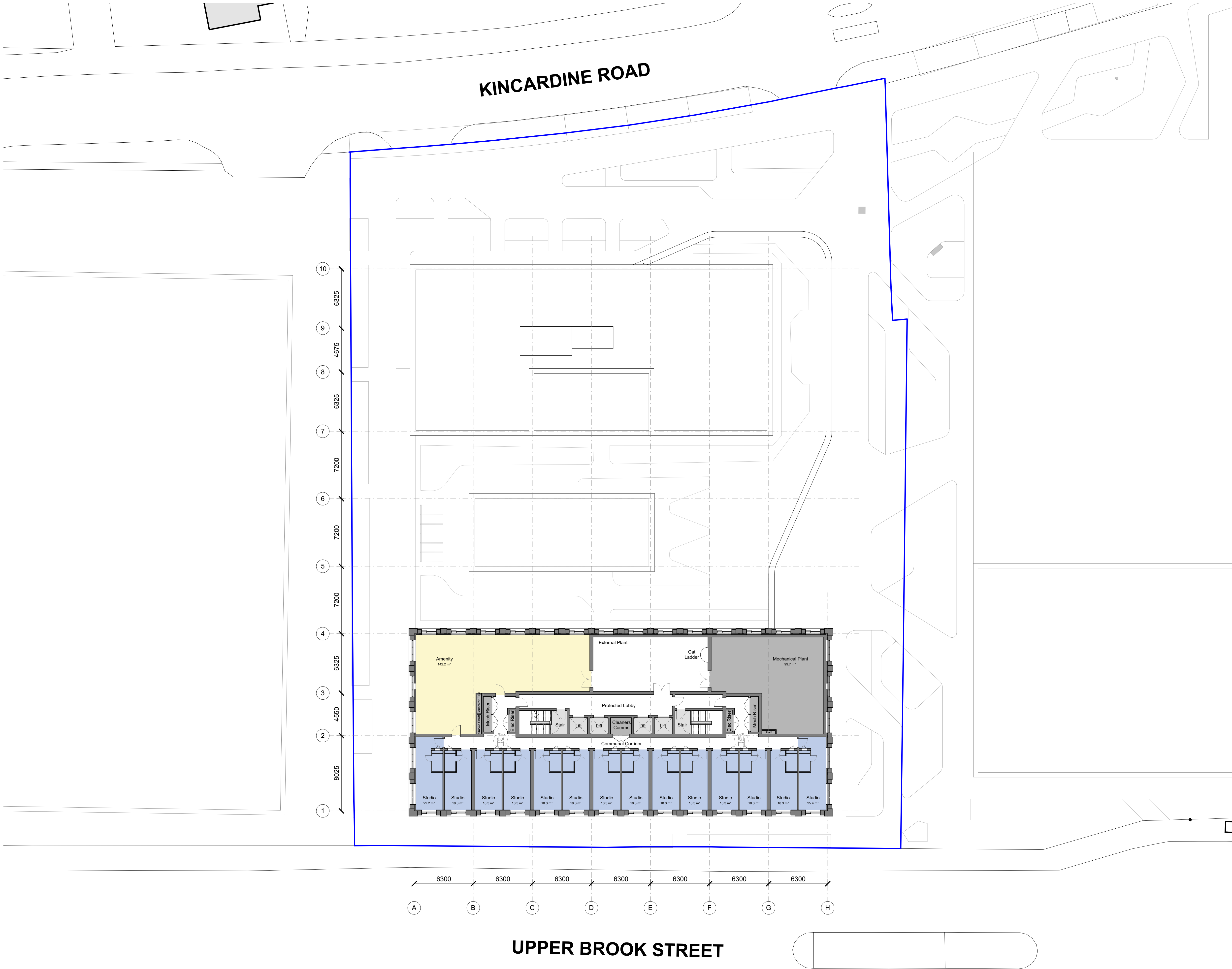
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General Arrangement
Nineteenth to Twenty-First Floor Plan

Stage 2

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	For Information	6601
DRAWING NO.	REV.	
6601 · SRA · XX · ZZ · DR · A · 20119	P02	



GA Twenty-Second Floor Plan
1 : 200

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Department Legend

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

Legend
Site Ownership Boundary

REV.	DATE	AMENDMENT
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P02	28/02/2023	DRAFT - Issued for Coordination

KEYPLAN

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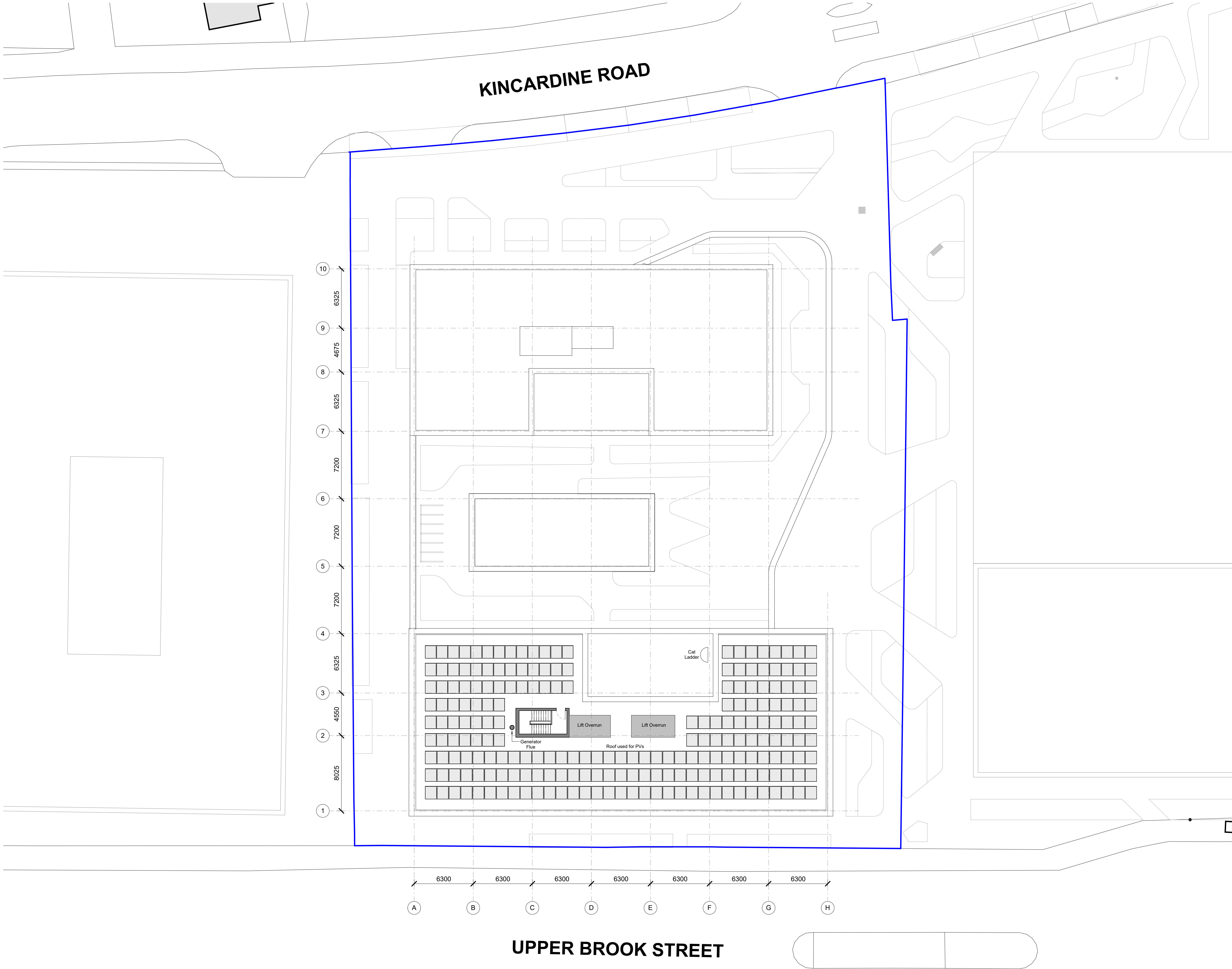
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PROJECT
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SCALE@A1	DATE	ORIGINATOR	CHECKED	AUTHORISED
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General Arrangement
Twenty-Second Floor Plan

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	For Information	6601
DRAWING NO.	REV.	
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GA Roof Plan
1 : 200

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Legend
Site Ownership Boundary

REV.	DATE	AMENDMENT
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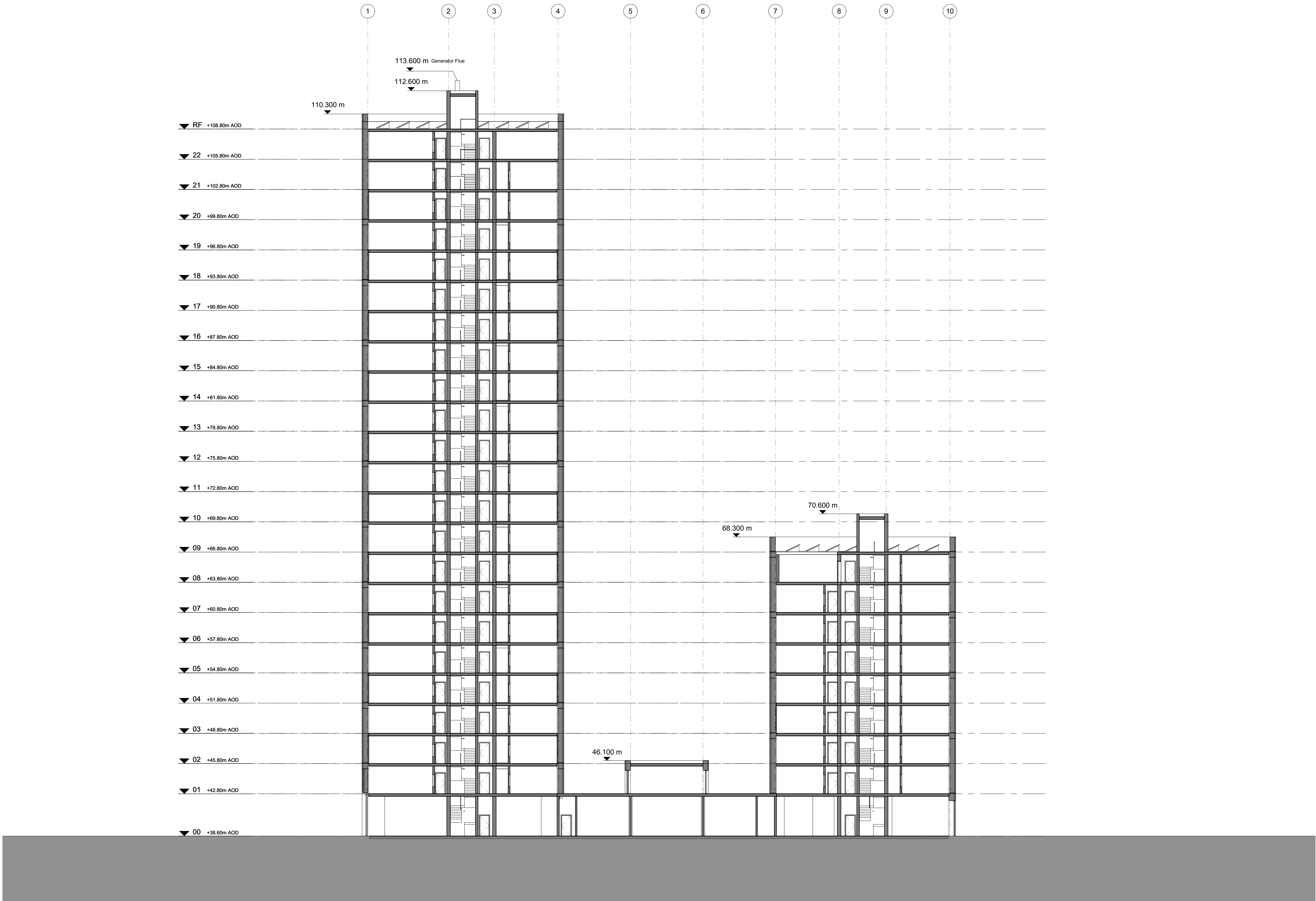
PROJECT
Upper Brook Street Student Accommodation

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General Arrangement
Roof Plan

Stage 2

STATUS	PURPOSE FOR ISSUE	SR NO.
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Section 01
1 : 200

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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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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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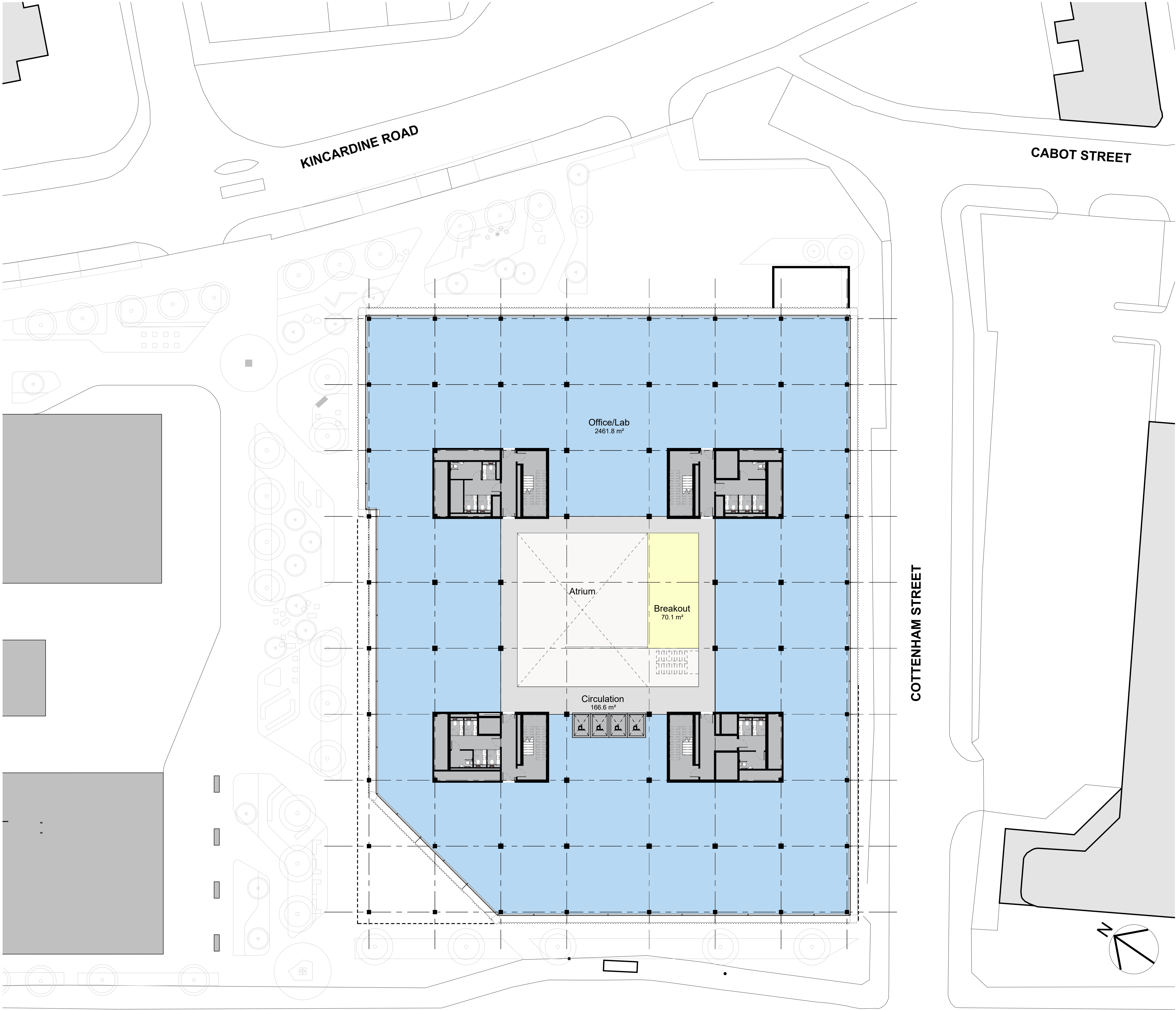
PROJECT
Upper Brook Street - Block B

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1 : 200	06.03.23	PC	JW	ES

Ground Floor Plan

Stage 2

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



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P04	02.03.23	For information
P05	06.03.23	For information



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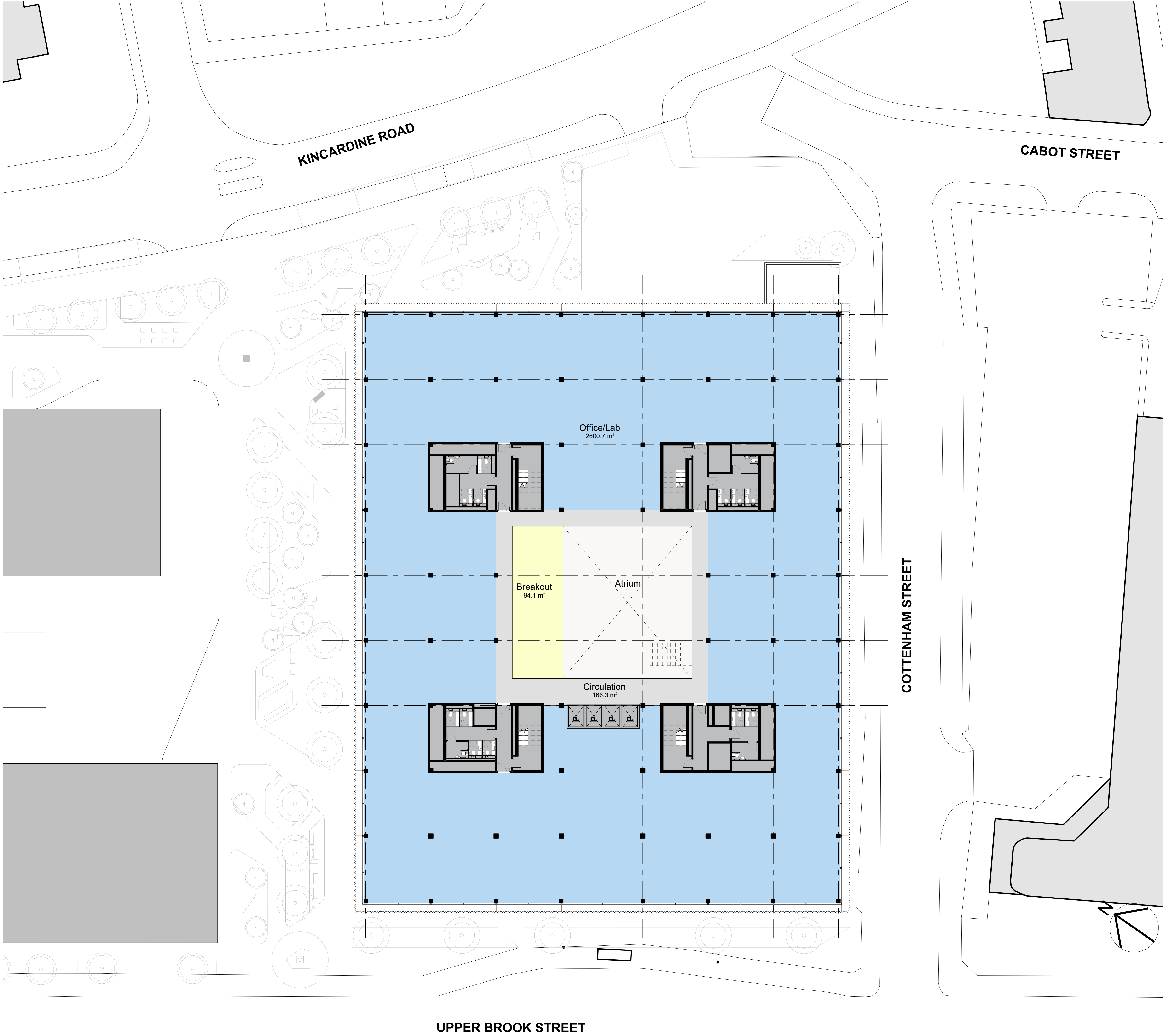
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PROJECT
Upper Brook Street - Block B

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First Floor Plan

Stage 2		SR NO.
STATUS	PURPOSE FOR ISSUE	
S2	INFORMATION	7025
DRAWING NO.	REV.	
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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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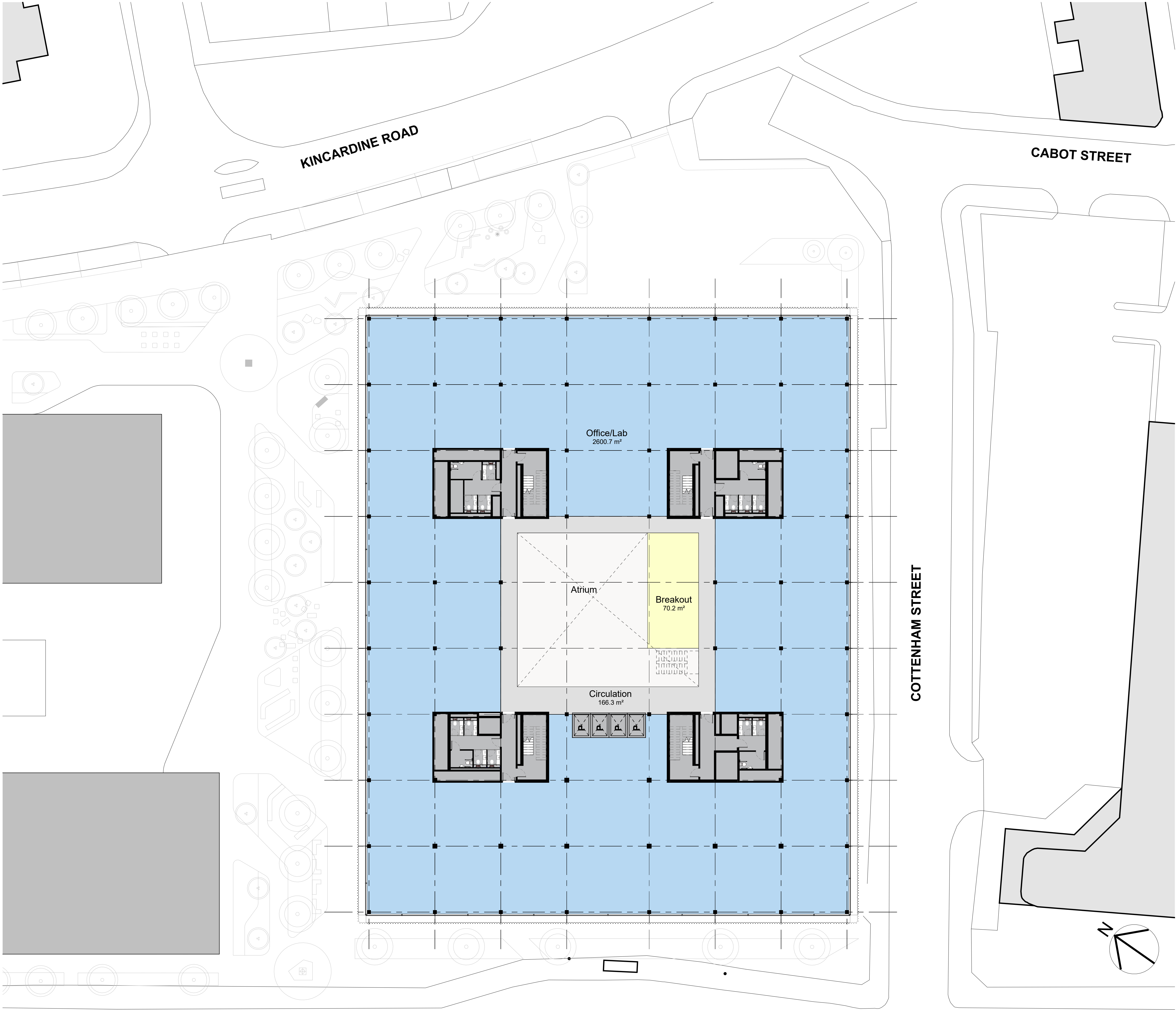
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Upper Brook Street - Block B

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Second Floor Plan

Stage 2				SR NO.
STATUS	PURPOSE FOR ISSUE			
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DRAWING NO.				REV.
7025 - SRA - ZZ - 02 - SK - A - SK004				P05



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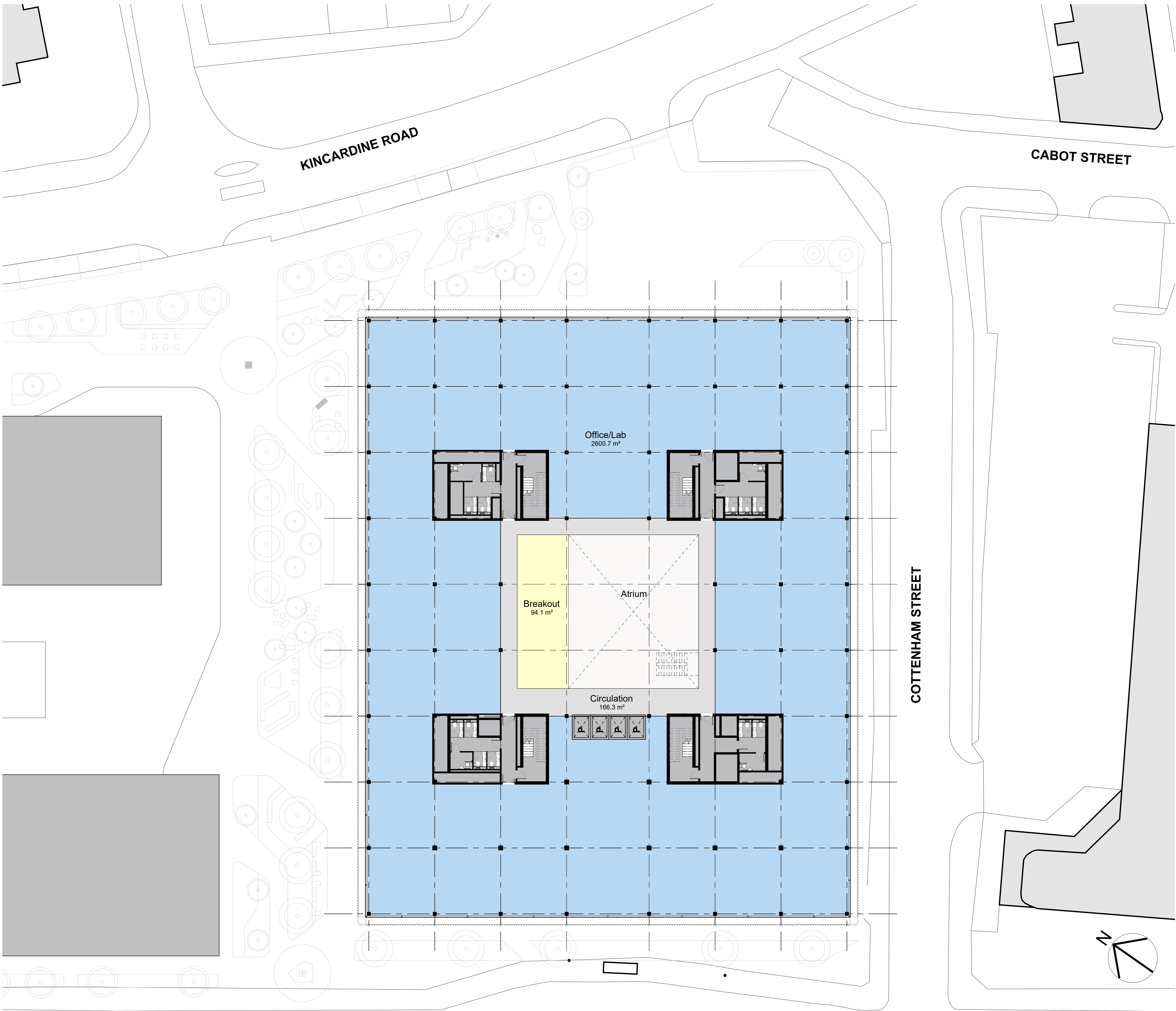
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Third Floor Plan

Stage 2		SR NO.
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P04	02.03.23	For information
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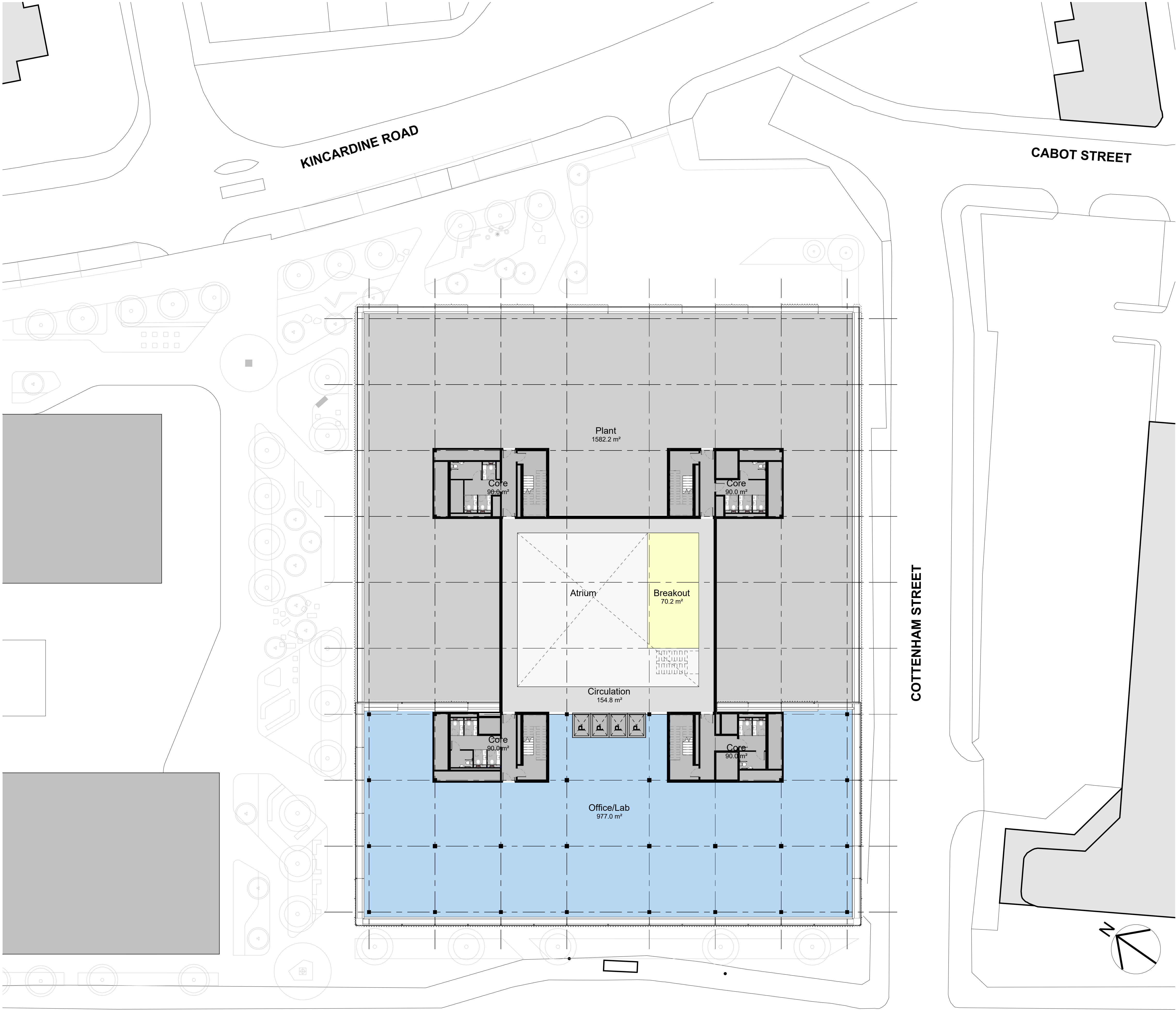
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Fourth Floor Plan

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	INFORMATION	7025
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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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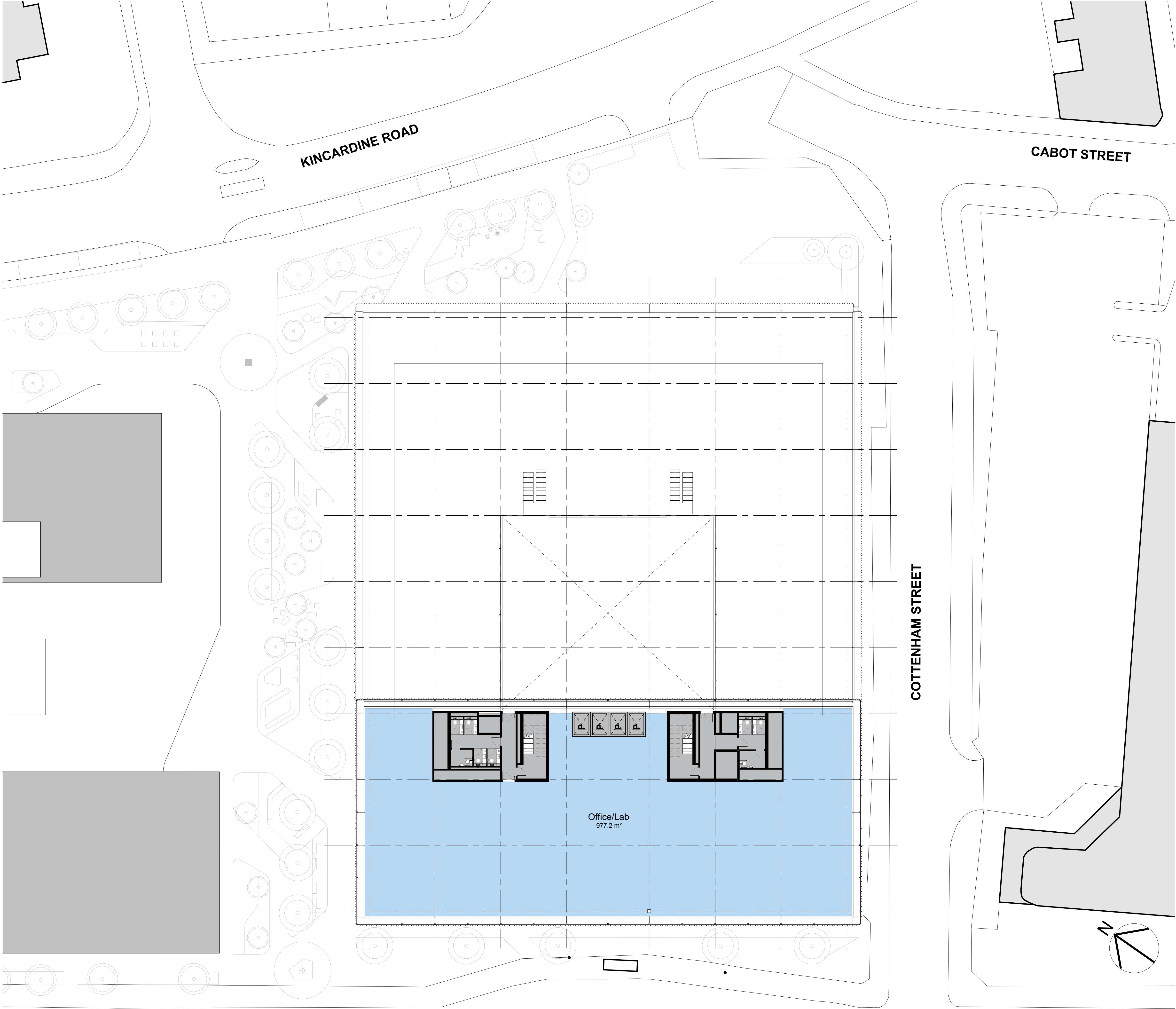
PROJECT
Upper Brook Street - Block B

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Fifth Floor Plan

Stage 2

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	INFORMATION	7025
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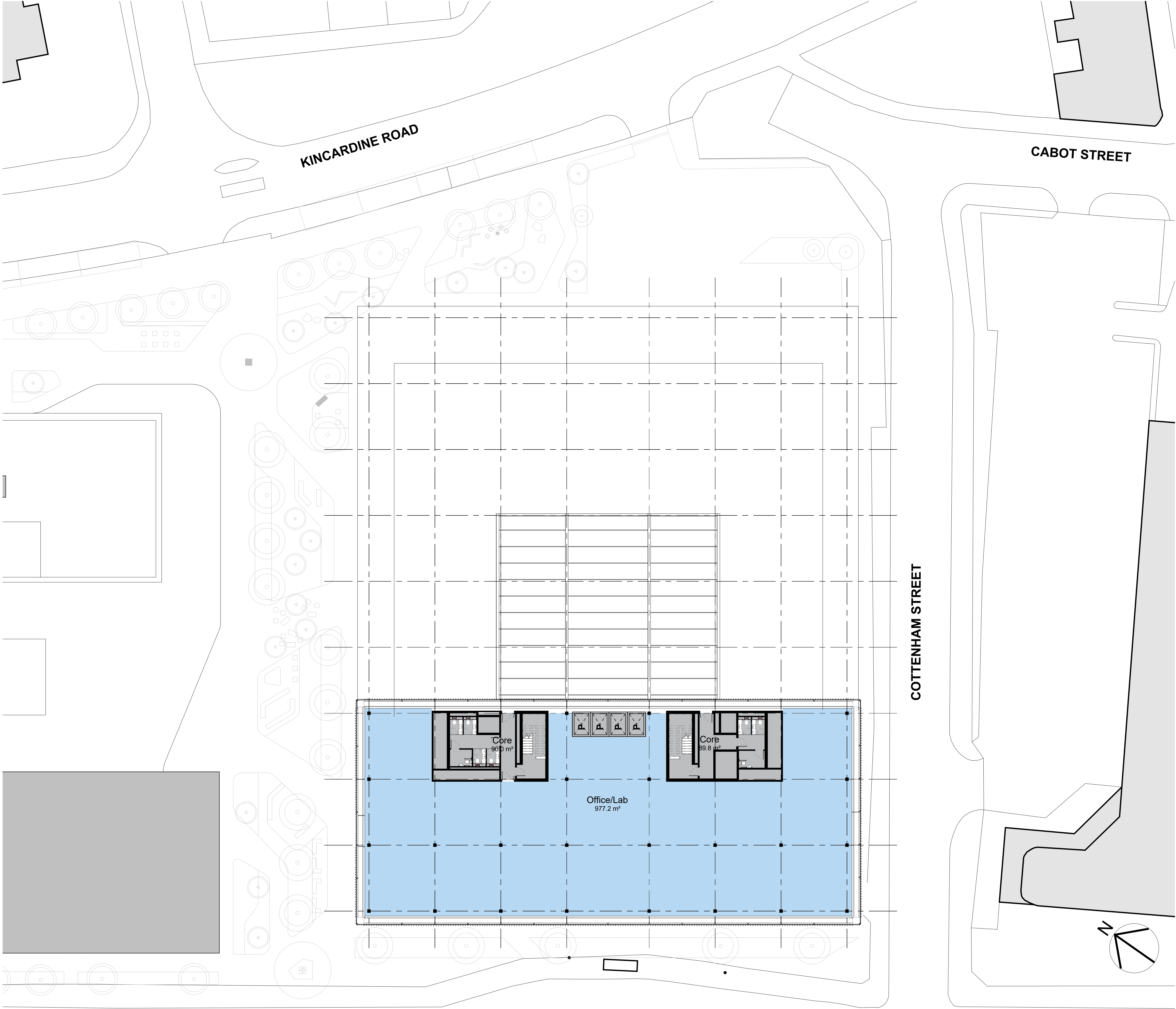
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Sixth Floor Plan

Stage 2		SR NO.
STATUS	PURPOSE FOR ISSUE	
S2	INFORMATION	7025
DRAWING NO.	REV.	
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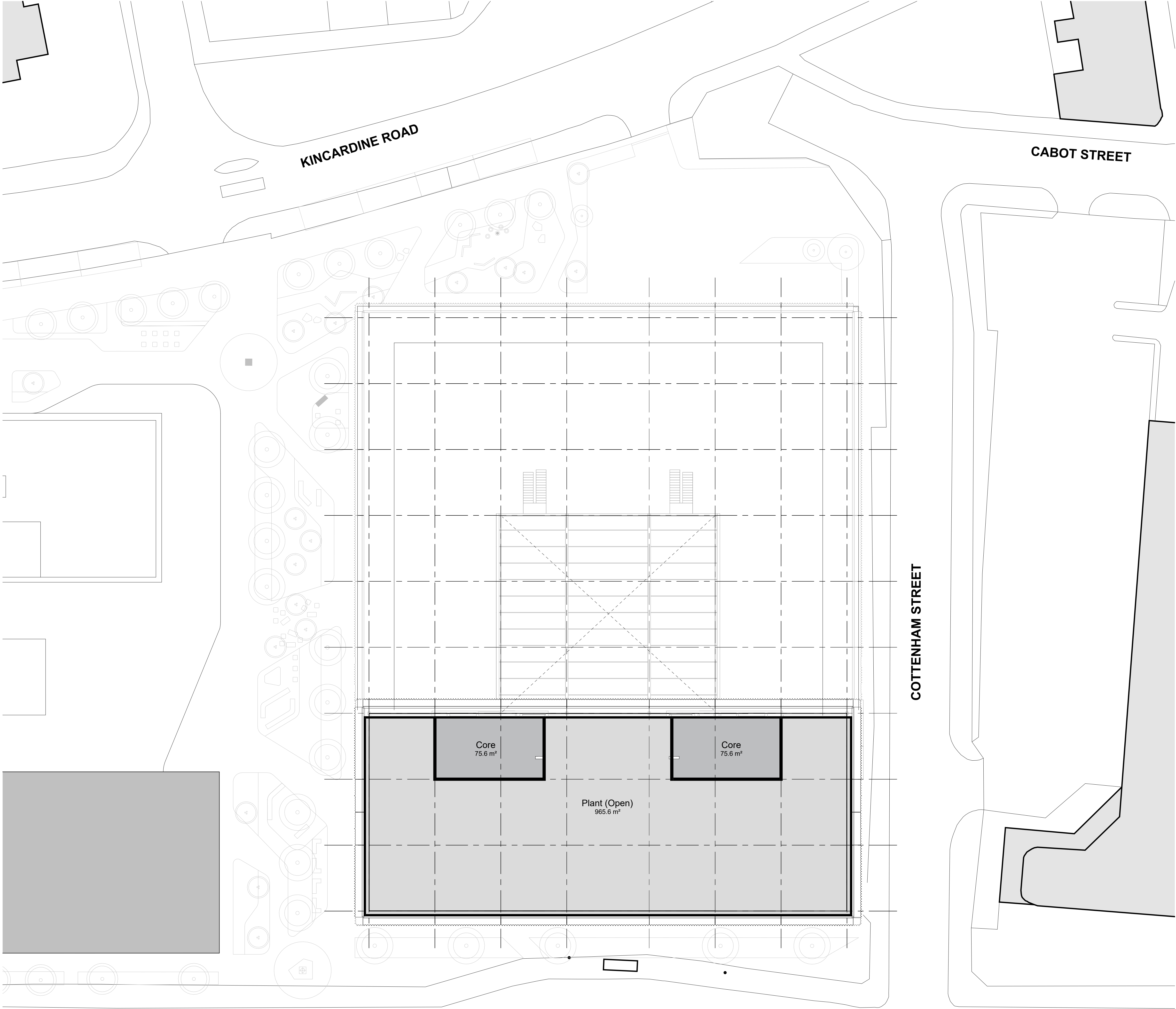
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SCALE@A1	DATE	ORIGINATOR	CHECKED	AUTHORISED
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Seventh Floor Plan

Stage 2		SR NO.
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P04	02.03.23	For information
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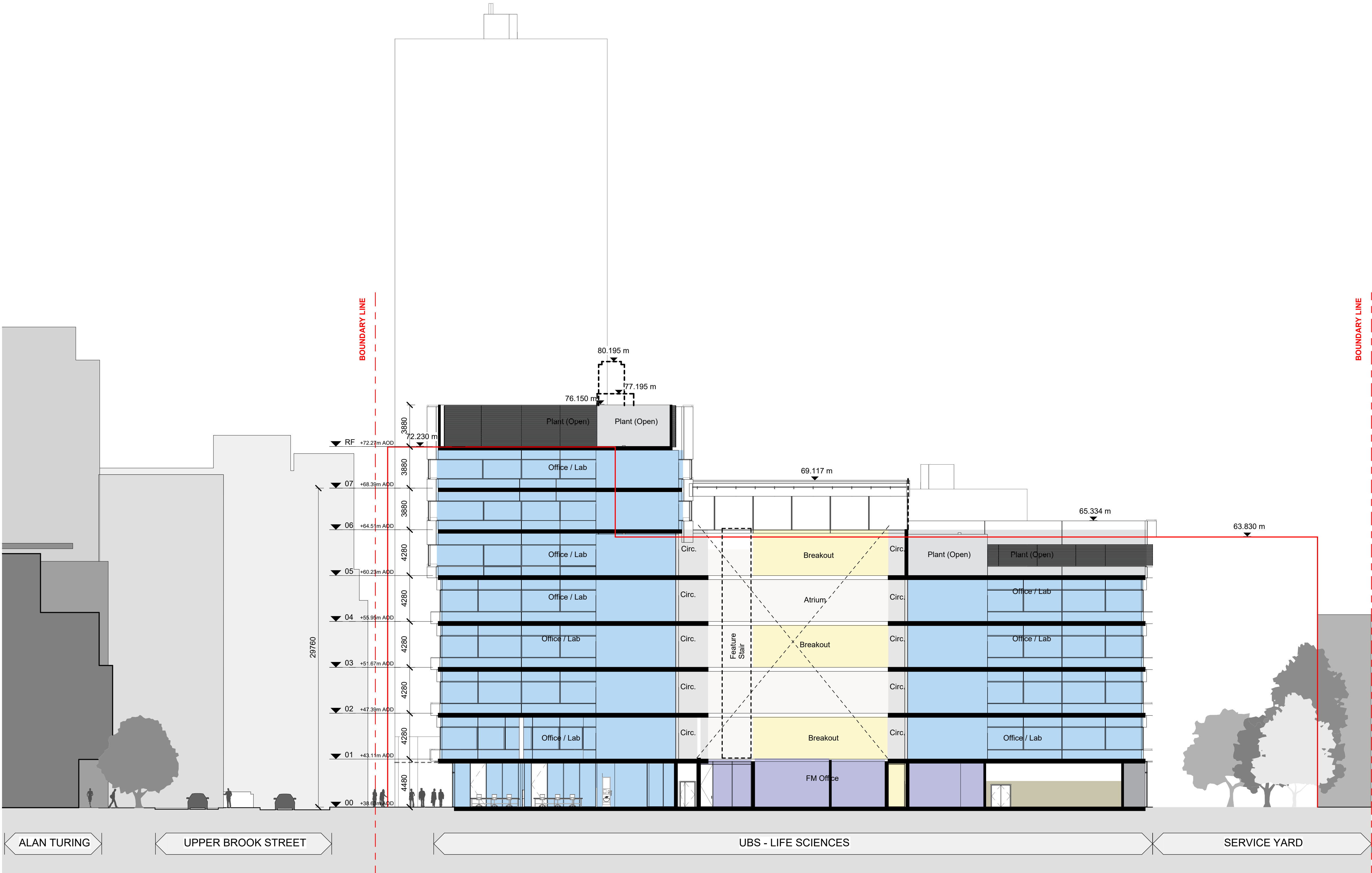
Roof Plan

Stage 2		SR NO.
STATUS	PURPOSE FOR ISSUE	
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DRAWING NO.	REV.	
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East Section

Stage 2

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

APPENDIX 2: Circular Economy Statement Requirements by Application Type

Requirement by application stage (see relevant section of guidance for more information)	Pre-application stage (suggested)	Outline application ^[1]	Full application / reserved matters ^[2]	Post-construction	Checklist	Information Reference (Please indicate whether this has been included in the report to accompany this template or as a separate submission)
CE targets (see section 4.2)	Encouraged	Yes	Yes	Yes (Performance reported)		Evidence in CES template spreadsheet
CE design approaches (see sections 2.3 - 2.5 and 4.3)	Yes	Yes	Yes	N/A		Evidence in CES template spreadsheet
CE design principles (see sections 2.1, 4.4 - 4.5)	Yes	No	No	No		Evidence in CES template spreadsheet
CE design principles by building layer (see sections 4.5)	No	Yes	Yes	No		Evidence in CES template spreadsheet
Pre-redevelopment audit (see section 4.6)	Encouraged	Yes	Yes	N/A		
Pre-demolition audit (see section 4.6)	Encouraged	Yes	Yes	N/A		
Bill of materials (including calculations – see section 4.7)	No	Yes (Estimated)	Yes (Estimated)	Yes (Actual)		Evidence in CES template spreadsheet
End of life strategy (see section 4.7)	No	No	Yes	Encouraged		
Operational waste management plan (see section 4.8)	No	No	Yes	Encouraged		
Recycling and waste reporting (see Section 4.9)	No	Yes (Estimated)	Yes (Estimated)	Yes (Actual)		Evidence in CES template spreadsheet
Lessons learnt and key achievements (see section 4.10)	N/A	N/A	N/A	Yes		Evidence in CES template spreadsheet

[\[1\] Also applicable to the outline and detailed part of hybrid applications.](#)

[\[2\] Also applicable to the outline and detailed part of hybrid applications.](#)

