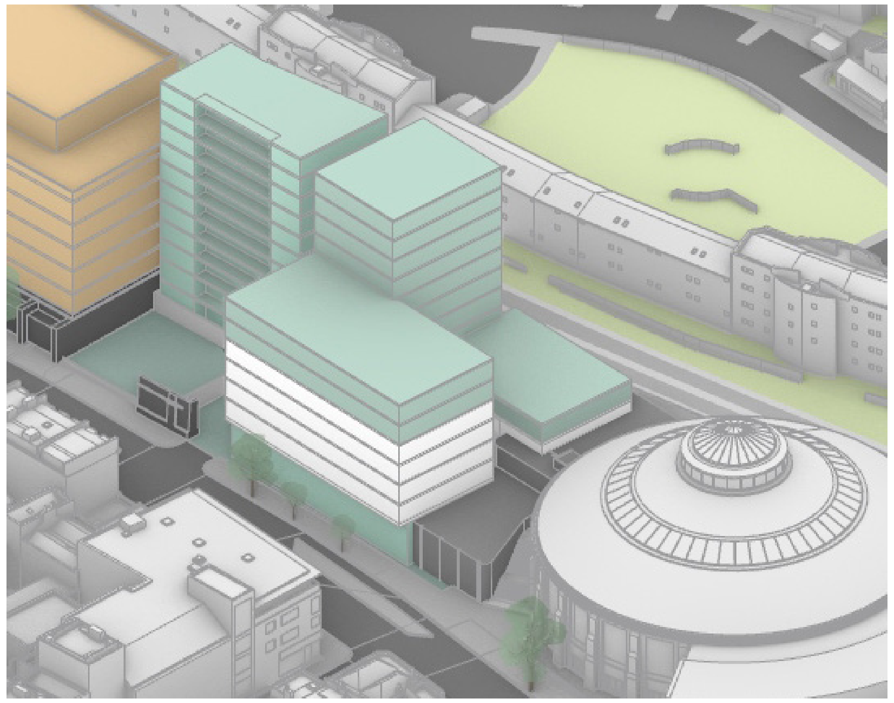
5.0 Development Options Sustainability Assessment

5.6 Heritage Impact

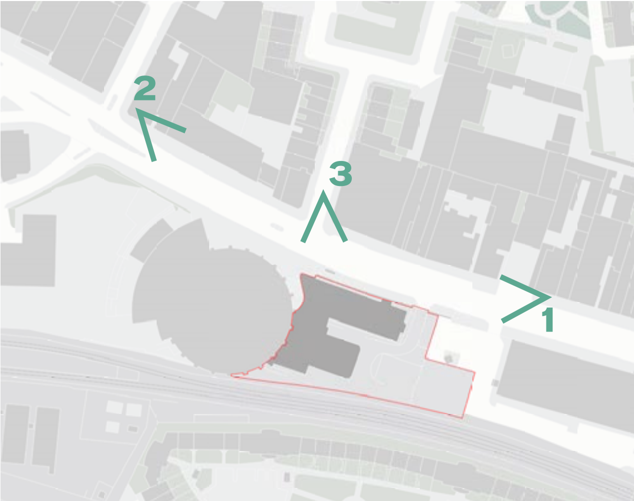
Option 2

Retention & Retrofit with Extension & New Build

- Retention and significant extension of existing building that does not contribute to the character and appearance of the conservation area or setting of the Roundhouse.
- Retention of existing boundary condition and its poor relation and public realm adjacent to the Roundhouse.
- The opportunity for activation enhancement of public realm and setting is not realised and significant linear massing is added to Chalk Farm Road.



1 View from Chalk Farm Road walking north.



2 View from Chalk Farm Road walking south.

3 View from Belmont Street walking west.

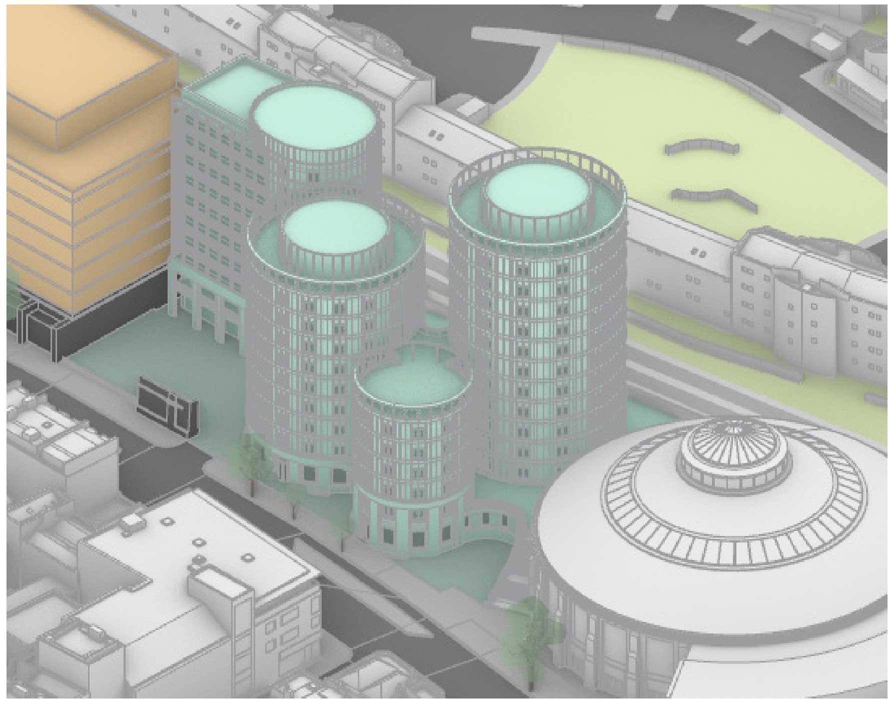
5.0 Development Options Sustainability Assessment

5.6 Heritage Impact

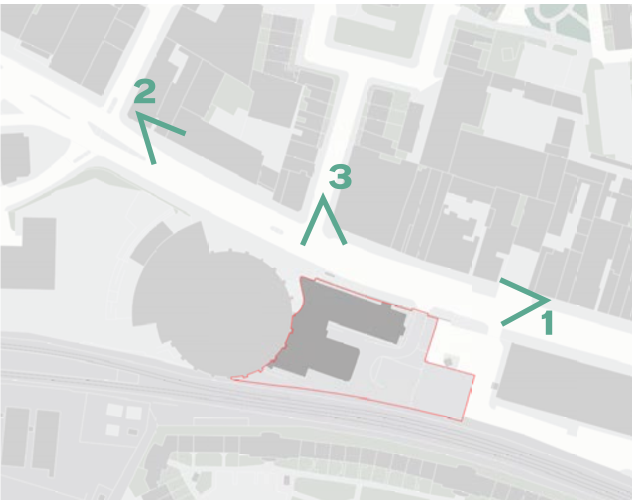
Option 3

New Build (proposed planning submission)

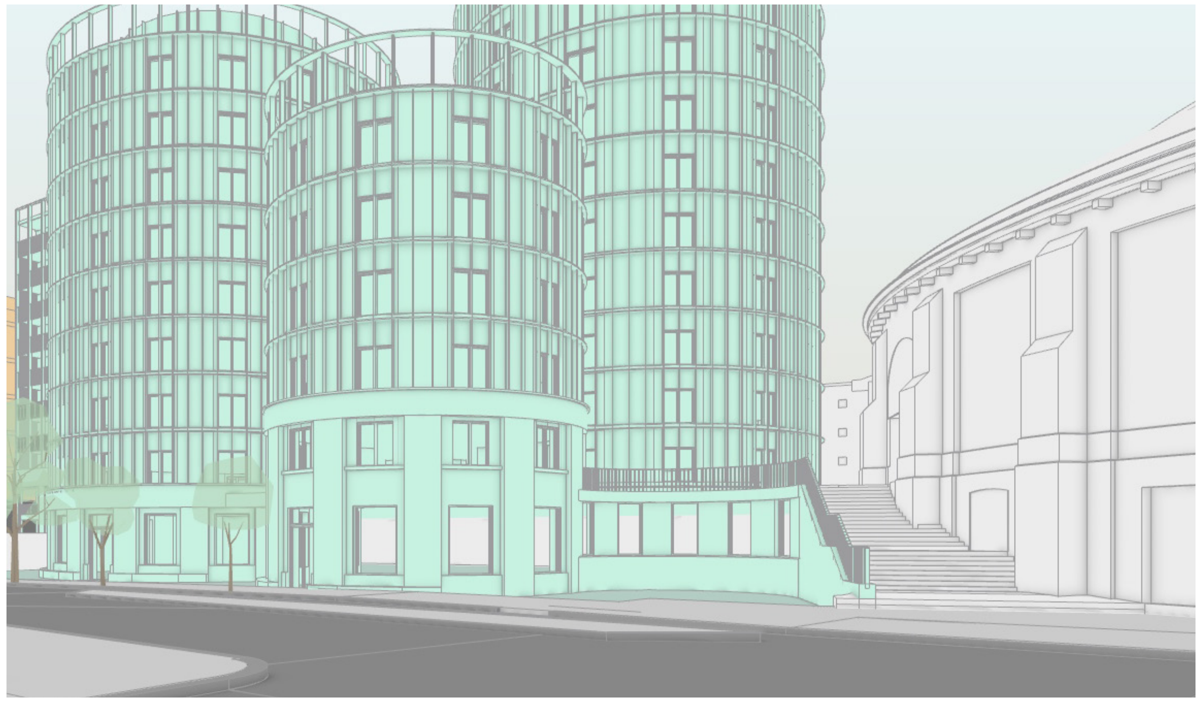
- New buildings that resonate with the form of the Roundhouse and take the opportunity to increase and activate the public realm and improve the setting of the Roundhouse and street scene of the conservation area.



1 View from Chalk Farm Road walking north.



2 View from Chalk Farm Road walking south.



3 View from Belmont Street walking west.

5.0 Development Options Sustainability Assessment

5.7 Circular Economy, Future Flexibility, Adaptability & Resiliance to Climate Change

To evaluate future proofing the full life cycle of a building should be considered alongside the six circular economy principles. To consider this factor we have assessed:

- How the options would offer future flexibility in terms of adaptability and reuse.
- How the options would improve health & wellbeing
- The ability of the development to deliver on the six circular design principles

Future Flexibility and Adaptability

To enable longevity of the built environment there is a need to allow for change, to meet the needs of the present, but with consideration of how those needs might change in the future, and to enable periodic remodelling. A 'loose fit' approach will more easily enable modifications and replacement of parts, with space for alternative technologies. Flexibility is required in order to balance the needs of the present with how those needs will develop over time and to enable change through easy reconfiguring, with minimum carbon emissions.

Given that the fundamental problems of 100 Chalk Farm Road remain after a retrofit and that the existing structure has a shorter lifespan due to its age, there is a concern that comprehensive refurbishments would be required every c.15 years.

For Options 1 and 2 where the existing building structure is retained, there is less scope for flexibility and adaptability. The existing structure has its own constraints as identified on section 4.0 of this report including limited access and varying levels, potentially reducing the options for future repurposing compared to Option 3.

For Option 3, the new PBSA building above ground level has been designed with reusability, recoverability, longevity, adaptability and flexibility in mind.

The new build structure would have a higher loading capacity than Options 1 and 2, increasing the optionality to repurpose to different uses without the need to strengthen the structure or foundations.

A new building approach for 100 Chalk Farm Road will deliver a commercial development asset fit for the next 60 years (minimum life span of the structure) with a predicted comprehensive refurbishment required in 30 years' time, double that for Option 1.

In addition, Options 2 and 3 are targetting a BREEAM rating of Outstanding (Excellent as a minimum) and a Nabers score of 5* (operational energy). Carrying out a BREEAM and Nabers assessment on Option 1 is outside of the scope of this report. However it can be reasonably expected that the constraints of the existing building, alongside viability considerations, would make these standards extremely challenging to meet.

Incorporating Wellbeing

Wellbeing in the built environment refers to the development of environments that positively support and or encourage improvements in building users' physical and mental health. For example, a building might:

- Support active modes of transport / active travel facilities (e.g. with cycle storage, showers).
- Optimise access to daylight and fresh air.
- Provide access to outdoor green space & support biophilia.
- Provide multi-purpose rooms supporting the wellbeing of users.

Many of these approaches connect to broader net zero strategies, and other significant human systems like transport and food production.

With the removal of the existing car park, all the considered options would be car free. In addition to the removal of on-site parking, this will have a positive impact on local air quality by reducing vehicles movements to and from the site. Additionally for all options cycle facilities would be provided to support active travel and align with current policies. Access to outdoor amenity space could potentially be provided on Options 1 and 2, however existing loading capacity may constrain the ability to do so. This amenity will be provided on the new podium and specified roofs of option 3.

Access to outdoor amenity spaces, namely terraces at different levels and landscaped public realm, can be provided throughout on Option 3. The planning application incorporates a biodiverse planting palette to encourage local wildlife.

The ecological emergency:

The planning scheme (Option 3) addresses the ecological emergency by creating a valuable local addition of biodiversity in an Area of Deficiency in public access to nature by providing significant biophilic benefits for occupiers, their guests and the public. The Urban Greening Factor (UGF) for Option 3 addresses the policy target of 0.3. It is beyond the scope of this exercise to calculated the comparable UGF for a retention scheme due to the level of design work required to calculate. However the retention schemes offer fewer opportunities for public realm creation and incorporating green and blue roofs due to design constraints and structural limitations. As such it would be fair to assume they would achieve a lower score.

Circular Economy

In line with the principles of a circular economy, first the condition of the existing site must be considered for any opportunities for a refurbishment in order to prevent waste prior to a new building being developed. This approach has been fully considered through a holistic evaluation of potential retention options when compared to the new build option as set out in this report. A circular economy statement has been developed for Option 3 (submitted scheme) to inform and establish relevant targets, and inform the approach to reusing existing materials, and minimise waste in construction, operation and end of life.

The Circular Economy principles are:

- Building in layers - Ensuring different parts of the Development are accessible and can be maintained and replaced where necessary. Maximise material recovery from the existing site in line with the waste hierarchy. Goal to recycle 95% of the material.
- Designing out waste: 95% reuse/recycling/recovery of construction and demolition waste.
- Designing for longevity - Designing to avoid a premature end of life for all components through considering maintenance and durability - Durability of materials used to be considered at outline specification stage and built into the design.
- Designing for adaptability or flexibility - Consider how the Development might be easily altered structurally to prolong its life. Consider how the Development might allow easy rearrangements of its internal fit-out and to suit the changing needs of occupants. Utilise soft spots to allow different floors to be connected to suit future needs.
- Designing for disassembly - Consider how the Development can be deconstructed and reconstructed to allow components and materials to be salvaged for reuse or recycling, whilst maintaining their economic and environmental value. Utilise modular and pre-fabricated components where possible.
- Using systems, elements or materials that can be reused and recycled - Aim for 20% recycled of recycled content by value, for the whole building and 50% of new construction materials to consist of recyclable materials.

Options 1 and 2 would be expected to produce less waste compared to Option 3. To address the circular economy priorites for Option 3 the below strategies have been proioritised:

- Backfilling on site with demolition material.
- Working with contractors to recycle 95%+ of waste.
- Prefabrication off site of component design.
- Exploring reuse of existing building materials within design.

Please refer to the Circular Economy Statement (CES) submitted with this application for further information.

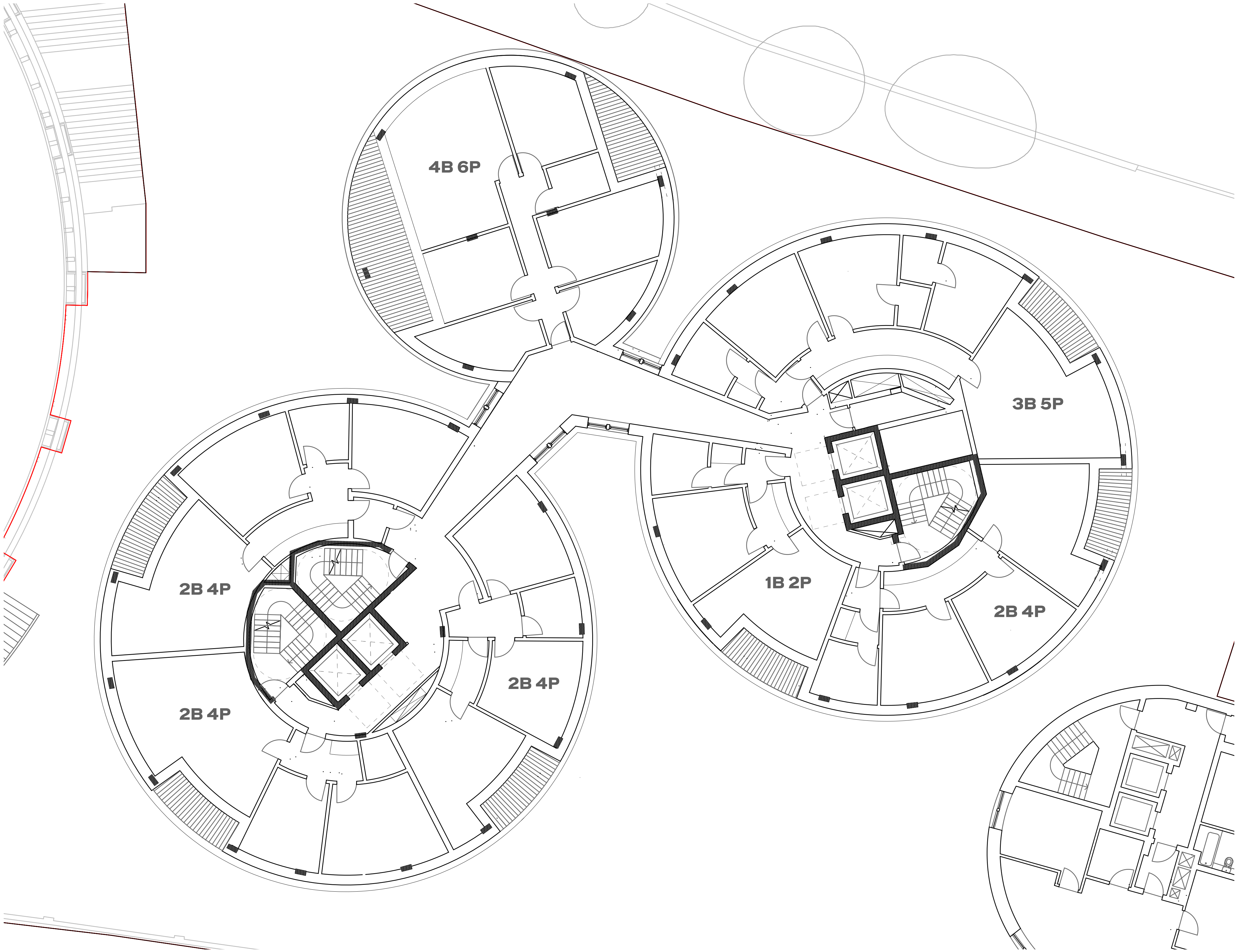
5.0 Development Options Sustainability Assessment

5.7 Circular Economy, Future Flexibility, Adaptability & Resiliance to Climate Change

Overview:
The plan on this page demonstrates the potential for the proposed PBSA building, Option 3, to be converted to private residential use in future.

The floor to floor heights for the PBSA building proposal are designed to work in future with minimum heights required for residential use. The design of the cores would allow for future conversion to residential use as it has similar requirements in terms of the number of stairs and lifts. The proposed insitu concrete floor slabs would also allow for new openings to be made in the slab for staircases within residential units and/or additional servicing if required.

External private amenity spaces:
This plan for the potential future conversion of the PBSA building to residential use includes inset balconies, to provide the required private amenity space for each residential unit. Inset balconies are proposed as opposed to clip-on balconies so as not to create problems around privacy and with proximity to neighbouring buildings. Inset balconies also would not disrupt the overall form and autonomy of the three cylinders.

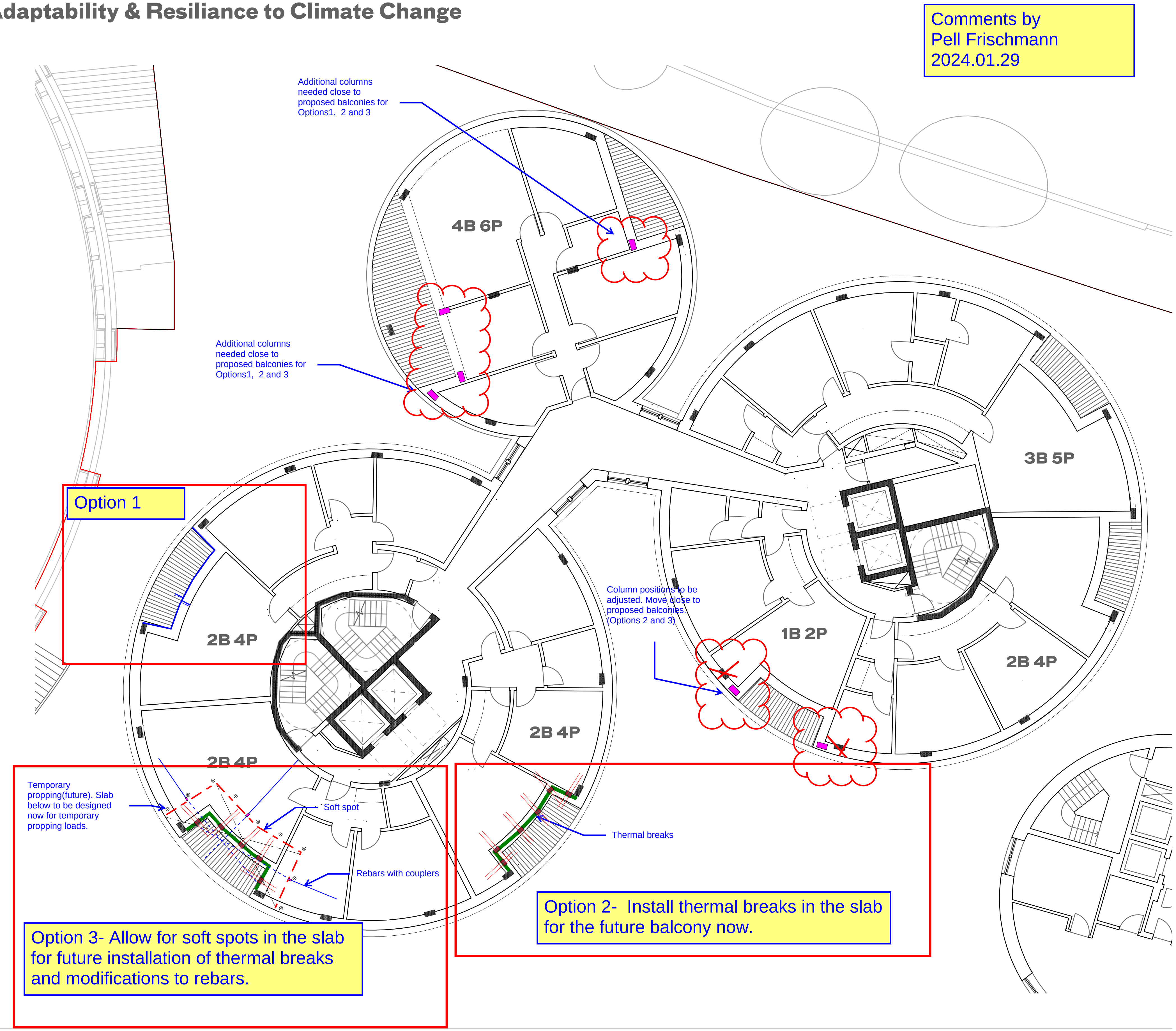


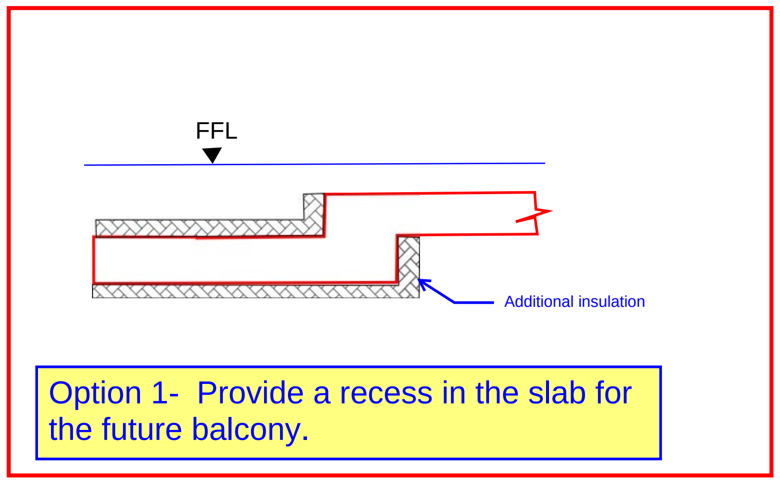
Typical Floor Residentail Conversion Plan

5.0 Development Options Sustainability Assessment

5.7 Circular Economy, Future Flexibility, Adaptability & Resiliance to Climate Change

Structural Engineering Considerations:
As outlined, serveral option have been considered for ways to provide private external amenity should a conversion to private residential use be sought.
Of the options considered, Option 3 represents the most suitable solution by providing soft spots in the slab locally to a balcony.





5.0 Development Options Sustainability Assessment

5.7 Circular Economy, Future Flexibility, Adaptability & Resiliance to Climate Change

Designing for disassembly, reusability, rocoverability, longevity, adaptability and flexibility

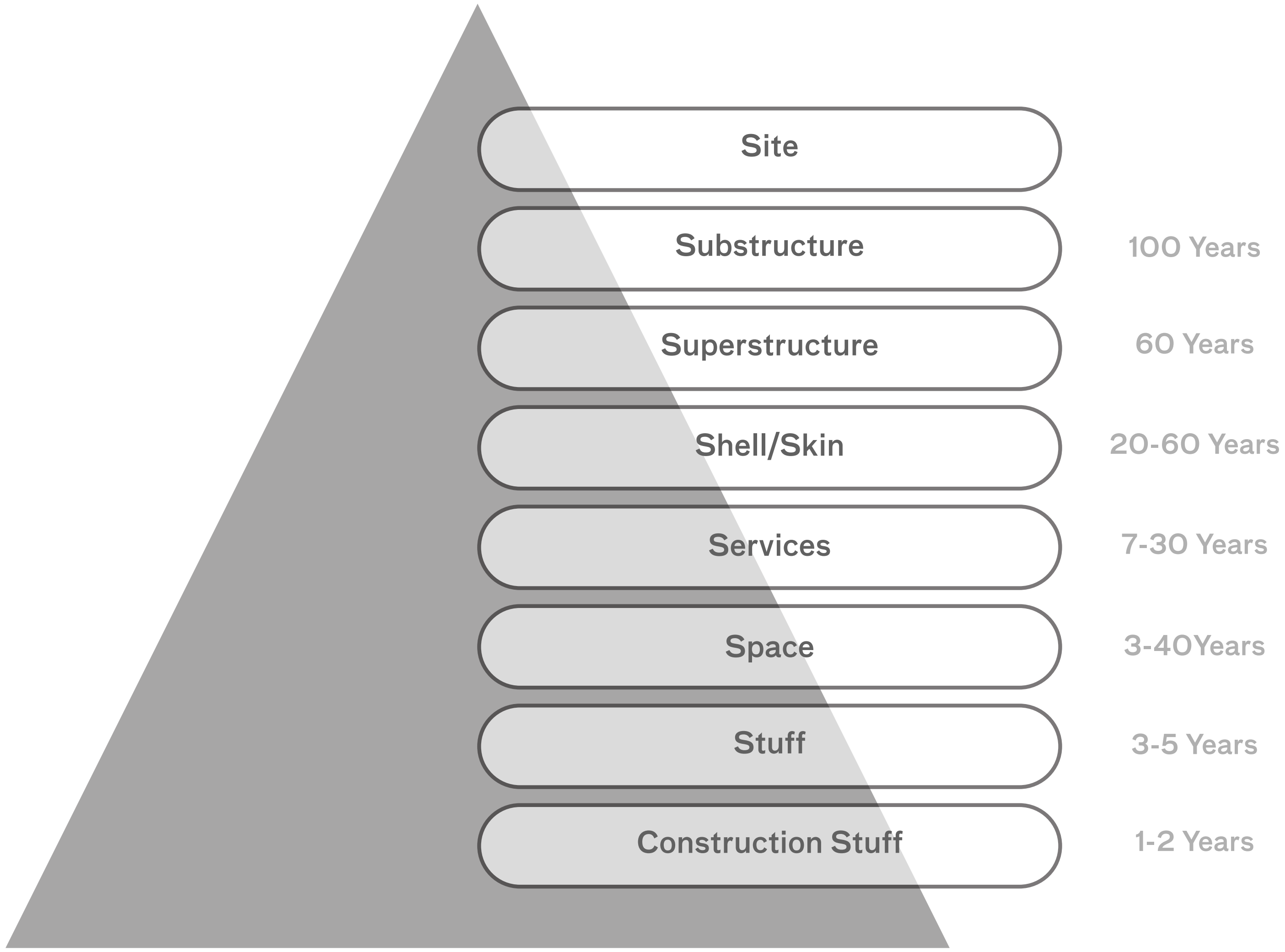
During the Circular Economy and Whole Life Carbon workshop the design team discussed the potential for the site at 100 Chalk Farm to be demountable at the end of its useful life. As well as the reusability, recoverability, longevity, adaptability and flexibility of the proposals.

To ensure the possible re-use and adaptation of the building over its life, steps have been taken to design in layers using components and servicing technologies which can be swapped and upgraded when the need arises. The circular economy guidance describes the process of 'building in layers' where each building layer has its own life cycle. This allows different approaches and solutions to be applied to each layer which increases their longevity and adaptability.
To support reuse and recycling, the different layers should be independent, accessible and removable whilst maintaining their value, where possible. This is especially important for layers that may need more frequent replacement, such as building services and internal fit-outs.

Non-structural internal walls within the residential apartments allow for future flexibility of layouts meaning it would be possible to adapt the residential units into student accommodation or hotel if required. Similarly with the student accommodation to be adapted to private residential as demonstrated in this section of the document.

The site also has been designed to enable future connection to a potential district heat network, this allows flexibility in the heating system. Central plant is mechanically fixed to allow easy disassembly.

The concrete frame of the buildings are designed for longevity rather than disassembly and with that in mind, the building will have generous proportions and a readiness for alternative technologies.



Building in Layers

5.0 Development Options Sustainability Assessment

5.8 Long-term Economic Sustainability & Planning Benefits

The amount of space and quality of the space a development can provide is a key factor contributing to long-term economic sustainability. It also has a bearing on the ability of a scheme to deliver key planning benefits such as public realm enhancements and affordable housing offer, typically captured in a Section 106 agreement.

Higher quality, flexible space with a wide appeal to occupiers is considered more likely to achieve target rent levels, be let on longer leases and to occupiers with strong covenant strength. These factors in turn contribute to the long-term economic sustainability of the development which supports the continued investment in the building's fabric and performance, important factors to reduce the likelihood of major refurbishment and keep up with technological advances that can further improve operational energy performance.

Near-term economic performance is captured in the development viability which informs the type and scale of planning benefits including affordable housing, that the scheme can be expected to deliver. .
The criteria analysed previously in this chapter informs development value and viability to varying extents by contributing to the expected quality and sustainability and therefore value of the space created by the development, particularly the student accommodation and ground floor workspace.

A further factor considered is the public benefit of development and therefore the Business Rates generated by the uses. The rent levels a site can achieve is also directly linked to the value of Business Rates associated with the scheme. The level of Business Rates are based on the 'rateable value' of that space. Therefore lower value can be reasonably expected to generate a lower level of Business Rates.
Business Rates are paid directly to the Council for the council to use to fund local services.

To assess this criteria our analysis focuses on:

- The expected development viability and ability to deliver additional planning benefit
- Additional direct and indirect public benefits associated with the options

Options 1 and 2

It can be reasonably assumed that the expected rental values and tenant strength associated with poorer quality office or PBSA space would create significant challenges for the viability of Options 1 and 2 as development project, as well as the ability of these options to deliver the additional planning benefits expected. This would be the case where the cost of the development didn't generate enough of a return to either represent a viable investment decision to implement the project, or a level of surplus profit to fund the expected planning benefits.

We have not undertaken an assessment of potential business rates as this is outside of the scope of this assessment, however, both Option 1 and 2 deliver less floorspace than Option 3 and lower quality and therefore lower value space.

Option 3

This option is able to deliver a range of planning benefits across the site, including 24 new affordable homes and S106 contributions for council priorities including Employment and Training.

New cafe space provided under Option 3.

New PBSA lobby under Option 3.

5.0 Development Options Sustainability Assessment

5.9 Construction Impacts

Another criteria to compare the different options is related with the project complexity and specifically the construction impacts.

Programme
Retention options will have a reduced programme on site when compared with a new build that includes demolition works and rebuilding.

Temporary Works
All of the options will require temporary works to different extents. These add to the overall demolition and construction programme (as well as being associated with additional carbon emissions). We estimate that Option 2 would require the most amount of temporary works to support the existing structure while the ground floor is lowered to match street level. There would also be considerable works to support and underpin the retained structures while the additional tower and basement are constructed.

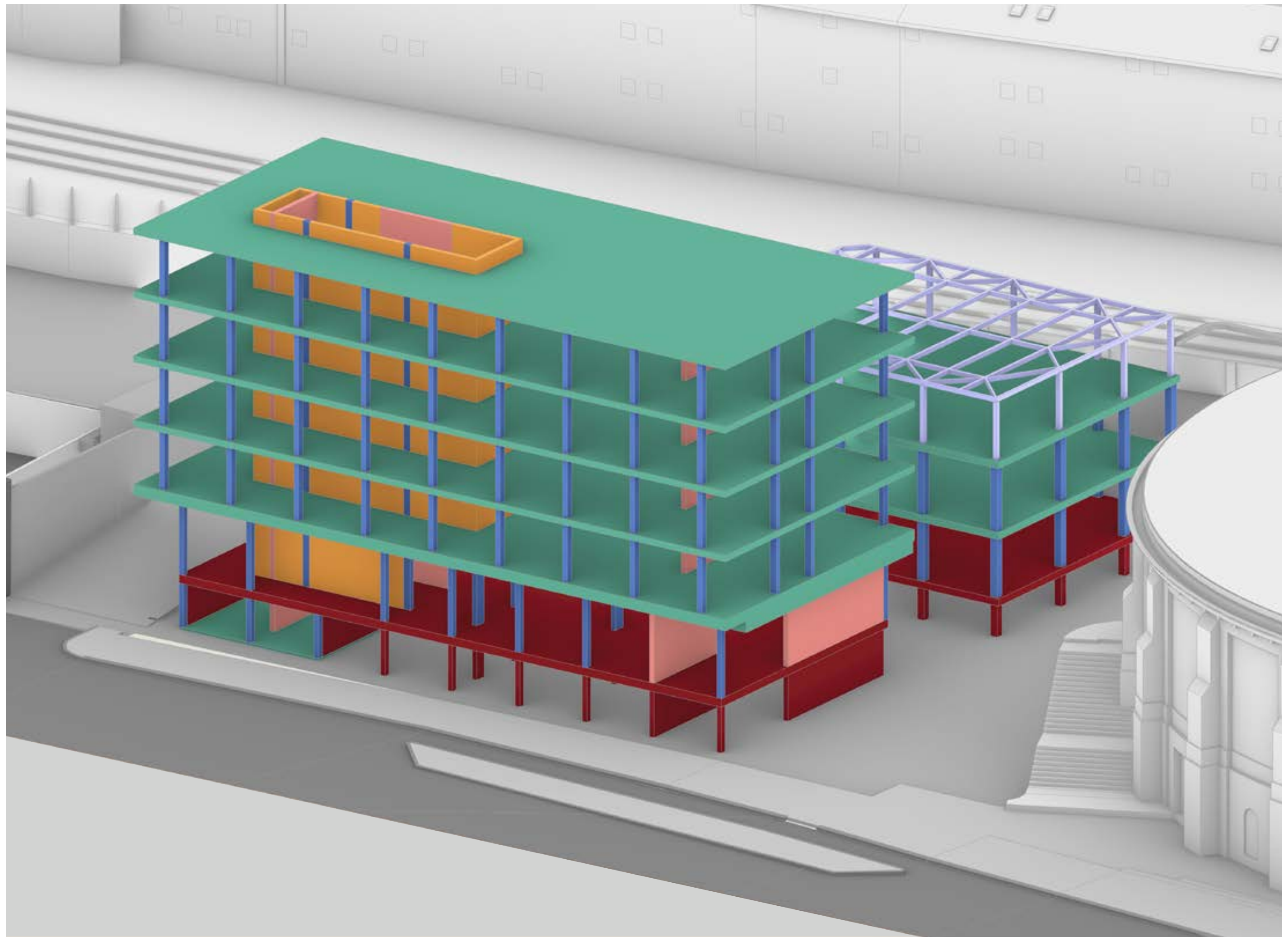
For Option 3 it has been estimated that the demolition and construction programme will have a duration of approximately 2-2.5 years including mobilisation and site set-up. We have not undertaken a detailed construction programme analysis for Options 1-2 but would expect these to have a shorter programme.

Site Disruption
The site at Chalk Farm Road is highly constrained and is only accessable via the CFR carriageway. In terms of disruption for residents and workers in the area similarly there will be a longer period of the works associated with Options 2 and 3. Therefore disruption and inconvenience associated with construction such as hoardings would be present for less time with Option 1 than 2 and 3.

Both Options 2 and 3 would require demolition works (i.e. existing car park) with associated impacts such as site traffic, noise, vibration, dust, pedestrian and vehicular access.

It is anticipated that there would be greater noise and associated construction impacts associated with Options 3 as that includes additional demolition works and the anticipated additional piling required to support the new structures. Potentially disruptive work would also be expected to be carried out over a longer period than for Options 1 and 2 given their level of retention. The additional construction of the new build basements for Option 2 and 3 will again add to their level of disruption.

Nevertheless any development is required to produce and adhere to a Construction Management Plan (CMP) that sets out how disturbance and impacts will be limited and mitigated as part of development activity. The applicant is also committed to working with neighbours to minimise and mitigate disruption where possible throughout the build programme.



Existing 100CFR structure highlighting the complexities of removing the existing ground structure (shown in red) required under Option 2.

5.0 Development Options Sustainability Assessment

5.10 Carbon Assessment

The aim of the Carbon Comparison Assessment included in this chapter is to compare the carbon emissions of 3 potential development options 100 Chalk Farm Road.

This assessment covers the operational carbon emissions for the proposed development options from both regulated and unregulated energy and water use, as well as its embodied carbon emissions, i.e. those associated with raw material extraction, manufacture and transport of building materials, construction and the emissions associated with maintenance, repair and replacement as well as dismantling, demolition and eventual material disposal.

This assessment also explores carbon associated with additional factors under consideration when comparing the development options. The objective is to understand the performance of the different options relative to each other and to the established benchmarks for carbon associated with development. This assessment forms part of a wider assessment of the carbon and sustainability impacts of the development proposals. The scope and methodology for the assessment is outlined below.

In addition to the RICS Methodology, further work has been carried out to understand the carbon impacts over the life of the different options. This acknowledges the extent to which each option could be successful in creating flexible space with broad and enduring appeal to occupiers. These qualities will have a direct impact on the occupational leases and need to re-let and repurpose the space through its life.

Summary of Results

	Option 1 Maximum Retention 3,433m2 GIA	Option 2 Retention & Extension 8,497m2 GIA	Option 3 New Build 13,063m2 GIA
Upfront Embodied Carbon A1-A5 (kgCO2/m2 GIA)	525	534	759
In Use Carbon B1-B5 (kgCO2/m2 GIA)	514	309	337
Operational Carbon B6-B7 (kgCO2/m2 GIA)	Not Measured	Not Measured	324
End of Life Carbon C1-C4 (kgCO2/m2 GIA)	62	53	30
Whole Life Carbon (WLC) A - C (kgCO2/m2 GIA)	1102	897	1088

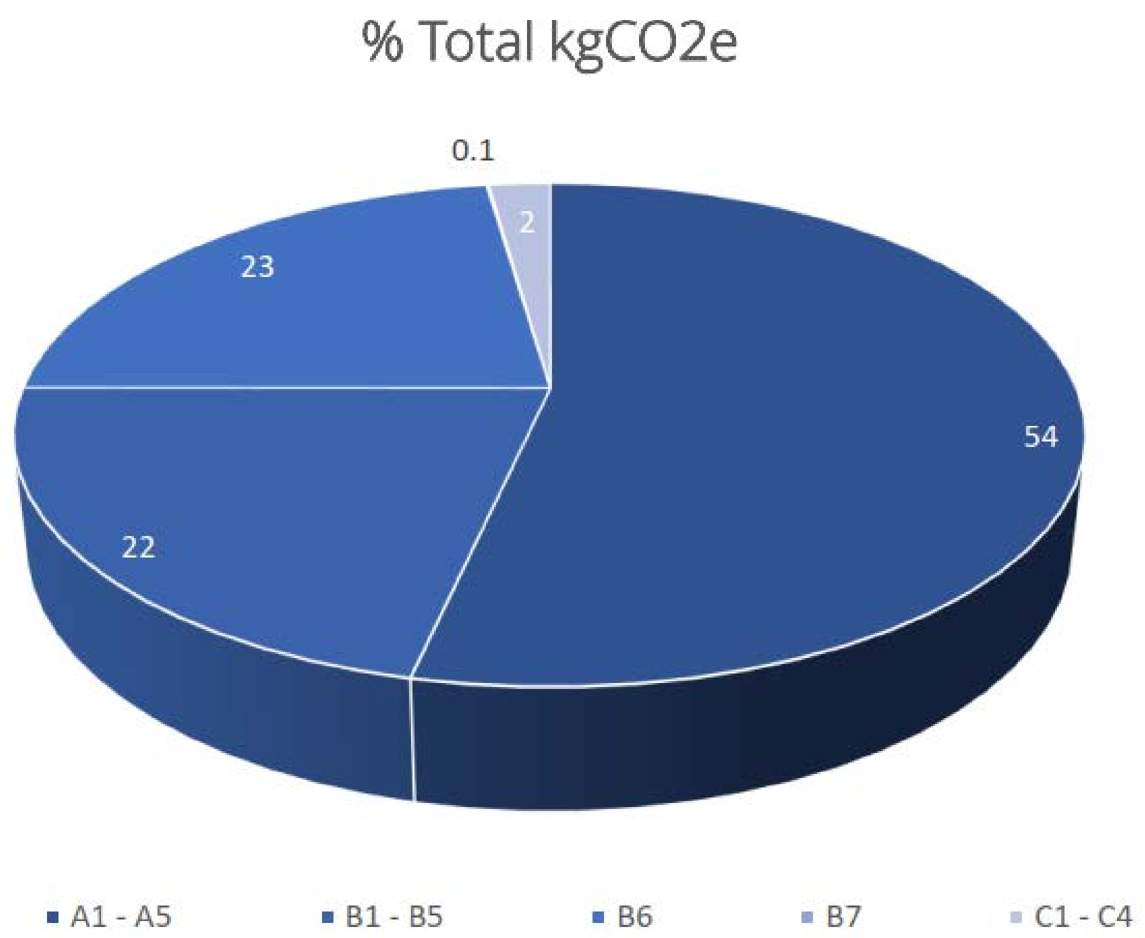
5.0 Development Options Sustainability Assessment

5.10 Carbon Assessment

The pie chart to the right presents the embodied carbon emissions breakdown attributed to stages A-C. The total carbon emissions are dominated by A1 - A5 which are associated with material production, transportation and site operations. This is the biggest contributer accounting for 54% of the total WLC emissions.

The table to the right shows that the development sits within the GLA baseline benchmark for Stages A1 - A5 and Stages B - C. Overall the development exceeds the WLC aspirational benchmark for stages A - C.

Full details of the Carbon Assessment are available within the Whole Life Carbon Assessment submitted by Whitecode Consulting as part of the planning application.



Percentage make-up of WLC emissions.

Stages	WLC Benchmark	Aspirational Benchmark	Chalk Farm WLC
	kgCO$_2$e/m^2 GIA		
Stages A1-A5	<850	<500	759
Stages B-C (excl. B6 & B7)	<350	<300	337
Stages A-C (excl. B6 & B7)	<1200	<800	1088

GLA WLC Benchmark

5.0 Development Options Sustainability Assessment

5.11 Sustainability Consultant's Analysis

Initial report by Whitecode Consulting Ltd. is included on the following pages.

CHALK FARM ROAD

The purpose of this document is to provide evidence as to why it is not feasible to retain and retrofit the existing buildings and to support the case for demolition report being proposed by DSDHA, for 100 and 100a Chalk Farm Road.

Camden Planning Guidance on Energy Efficiency and Adaptation requires creative and innovative solutions to be considered for re-purposing existing buildings and avoiding demolition where feasible.

Local Plan CC1 states we will:

e) require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building.
f) expect all developments to optimise resource efficiency.

The London Plan highlights the importance of retaining the value of existing buildings with the least preferable development option of recycling through demolition, although Policy D3 of the London Plan states the "best use of the land needs to be taken into consideration when deciding whether to retain existing buildings in a development." The information in this document supports the case for demolition having addressed all elements of Table 9.4 of the CPG on Energy Efficiency and Adaptation.

Two retrofit options have been investigated:
Retrofit Option 1 is the light-touch approach to upgrading the existing office building and extending the life of the building, with one additional floor, and a façade replacement. Retrofit Option 2 is deep retrofit to provide student accommodation, with extra floors and a new build residential building.

Summary of MEP (Mechanical, Electrical, Plumbing) servicing including lifespan

The services serving the building are not appropriate for reuse due to their age, reliability and condition. Below provides a summary of condition of each main system with benefits and negatives of each.

Heating

The main primary heating plant within the building is redundant and the building is currently served by temporary plant. Therefore, the existing plant would need to be completely replaced and there is no benefit in retention of the main plant which has been unused for a long period of time. Due to this, the plant would have fallen further into disrepair preventing any reuse.

In consideration of replacement plant, due to the existing nature of the building, plant would need to be oversized to account for poor thermal performance of the building. This would also have implications for the system design, which due to high heat losses would reduce the overall efficiency of any plant selected relative to a new build. Emitters would need to be larger, with higher heat outputs to overcome the greater heat demand required. This would mean embedded carbon associated with the heating plant, pipework and emitters would be higher than for a new build property.

The distribution pipework is also beyond serviceable life and not suitable to be reused as it has not been subject to regular maintenance and is therefore not suitable. In addition, it has not been designed to cater for an increased building footprint or different use class so would not be suitable.

Cooling

Existing cooling plant has failed, and therefore would need to be replaced with new replacement systems.

Due to the proportions of glazing, overheating will be a significant issue which would only be resolved by providing cooling throughout. Providing cooling goes against the hierarchy of The London Plan which requires passive measures including good building design to be considered. As the new scheme can be designed with passive measures to mitigate overheating, a new building design could avoid the use of comfort cooling. The ongoing carbon consumption associated with the cooling required would ultimately be passed onto the student accommodation management company and housing associations which may cause the scheme to be unviable. Therefore, there is a significant difference between the retrofit option and new build option in relation to life-cycle carbon.

Additional plant to provide cooling would also reduce amenity space which would enhance the facilities of the scheme.

Electrical Infrastructure

As the retrofit options include increasing of floor area, the existing electrical infrastructure would need to be redesigned to cater for the increase in load. Additional resilience would be required to comply with current regulations in relation to alternative supplies, which would be difficult to accommodate within the existing building footprint when considering safe access for maintenance and operation.

Ventilation

For the student accommodation option, ventilation provision to the student accommodation would be necessary through the façade in regular locations to account for a residential ventilation system. This would require additional penetrations through the existing façade which may be difficult to accommodate.

Water

The existing water infrastructure, including incoming main, pumps and storage tank, would be insufficient for the retrofit scheme. The additional demand from increased occupancy and increased size would require redesign of these systems. There would be no benefit in retention of the existing plant which would need to be increased in size. The increase in size would need additional plant rooms at ground floor level, along with additional plant rooms for sprinkler provision which would be difficult to accommodate within an existing footprint due to the size.

MEP Summary

The historic maintenance of building services has resulted in failures of the existing systems meaning any future use on the site would require new systems to be installed. The ventilation strategy of the building would need to be updated to meet current regulations and therefore is not suitable for reuse either. The other main systems including water and electrical infrastructure would need to be replaced to be brought

5.0 Development Options Sustainability Assessment

5.11 Sustainability Consultant's Analysis

up to current standards and to meet the increased demand of the retrofit scheme. There is therefore no benefit from a service perspective in retaining any of the existing plant. On the other hand, the disadvantage of retrofit scheme in comparison to a new build scheme, would be:

- An increased heating demand, resulting in larger emitters and main plant.
- Cooling plant and associated distribution pipework and fan coil units.
- Health and safety could be compromised due to accommodating increased and additional plant which would be constrained by existing building arrangements and may result in insufficient access. This is particularly relevant as the existing ground floor access arrangements are already inadequate.

Energy Performance and Thermal Performance

100 Chalk Farm Road was built in the 1970s as a purpose built 5 storey office. The construction is believed to be concrete superstructure and polyester powder coated aluminium cladding with double glazed casement windows and fair face brick walls to the ground floor. There are flat roofs with bituminous felt covering.

100a Chalk Farm Road is a purpose built 3 storey office with basement also built in the 1970s, with the same construction as no.100. with single glazed windows in the basement.

The U-values for the thermal elements have been estimated as indicated on the table to the right.

The below table to the right shows which elements would likely require improving inline with Part L2B and thevalue these elements would need to be bought up to. As seen in the table, it is likely that roofs and glazing would have to be replaced or upgraded.

It is worth noting that although the Building Regulations are unlikely to require an uplift for the floor and walls, in order to improve the energy efficiency of the building this would be recommended and the retrofit option would include a façade replacement. The condition of the fenestration is also noted to be in poor condition, with internal seals which have been dislodged affecting performance. There are a number of concerns with upgrading existing elements including the increased risk of interstitial condensation through introduction of new insulating materials and thermal bridging junctions around lintels, sills and jambs for new glazing.

Element:	As per 1970s construction	Comments/specification
Floors	0.59 W/m^{2}K	Uninsulated
External Walls	0.54 W/m^{2}K	Minimal insulation
Roofs	0.27 W/m^{2}K	Bitumen covered
Front Doors	3 W/m^{2}K	Front doors
Windows	2.8 W/m^{2}K	Double glazing – no low E coatings
Air Permeability Rate	15 + m^3/hm^2 (@50Pa)	Would not have been air tested and therefore air permeability likely to be higher than default
Thermal bridging	N/A	Thermal bridging details likely to be very poor, no evidence of continuity of insulation

Element	U-value		
	1970 regulations	2021 Threshold	2021 Improved
Floor	0.59	0.70	-
Walls	0.54	0.70	-
Roof	0.45	0.35	0.18
Windows/curtain wall	N/A	N/A	1.60

5.0 Development Options Sustainability Assessment

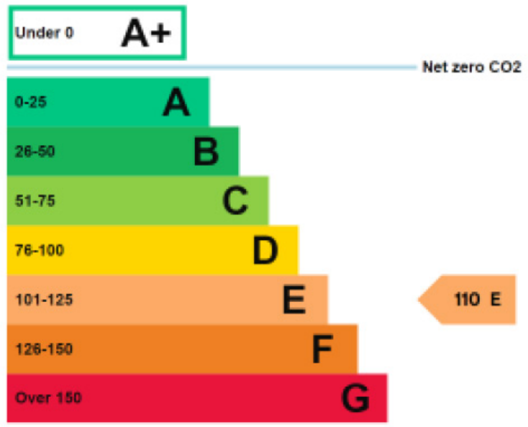
5.11 Sustainability Consultant's Analysis

Based on the current valid Energy Performance Certificate (EPC), the current building emission rate is 73.6 kg of CO2/m2/year with a primary energy use of 435 kWh/m2/year. Given the total floor area of 2,351m2 this equates to 173.03 TonnesCO2/year and 1,022,685 kWh/year respectively. Primary energy use includes energy required for lighting, heating, and hot water, and as a guide, the London Energy Transformation Initiative (LETI) gives a target Energy Use Intensity (EUI) of 55 kWh/m2/year for office spaces. EUI is the total energy used by the building divided by its floor area. While these figures aren't directly comparable, they give an indication of how the building performs compared to one newly constructed.

Furthermore, the EPC shows an asset rating of E (110) and compares poorly even to typical existing buildings of the same type.

Energy rating and score

This property's current energy rating is E.



Properties get a rating from A+ (best) to G (worst) and a score.

The better the rating and score, the lower your property's carbon emissions are likely to be.

How this property compares to others

Properties similar to this one could have ratings:

If newly built	24 A
If typical of the existing stock	70 C

Part L of the building regulations requires that consequential improvements are made for existing buildings with a total useful floor area of over 1000 m2. This additional work may be required to improve the overall efficiency of the building if the proposed work consists of or includes any of the following:

- An extension
- Providing any fixed building services in the building for the first time
- Increasing the capacity of any fixed building services (which does not include doing so on account of renewable technology)

Consequential improvements should be carried out to ensure that the entire building complies with part L of the building regulations to the extent that they are technically, functionally, and economically feasible.

As it is likely that any work to the building would require provision of new building services, this would trigger the requirement for consequential improvements. Table D1 of Approved Document L provides a list of improvements that are usually considered technically functionally and economically feasible under normal circumstance.

It is likely that all of the requirements in table D1 would have to be implemented if the building is retained.

Table D1 Energy efficiency measures which should usually be installed whenever consequential improvements are required

These measures are considered technically, functionally and economically feasible in normal circumstances.

These measures should be installed at least to the extent outlined to meet the reasonable provision criterion, based on the value of the principal works, as outlined in Section 12.

Item	Improvement measure
1	Upgrading heating systems that are more than 15 years old by providing new plant or improved controls.
2	Upgrading cooling systems that are more than 15 years old by providing new plant or improved controls.
3	Upgrading air-handling systems that are more than 15 years old by providing new plant or improved controls.
4	Upgrading general lighting systems that have an average lamp efficacy of less than 60 light source lumens per circuit-watt and that serve areas greater than 100m^2 by providing new luminaires and/or controls following the guidance in Section 6.
5	Installing energy metering following the guidance given in CIBSE's TM39.
6	Upgrading thermal elements that have U-values higher than those in Table 4.2, column (a), following the guidance in paragraphs 4.7 and 4.8.
7	Replacing existing windows, roof windows or rooflights (but excluding display windows) or doors (but excluding high-usage entrance doors) that have a U-value higher than the following. a. For windows, roof windows and doors – 3.30W/(m^2·K) b. For rooflights – 3.80W/(m^2·K), calculated by following paragraph 4.4.
8	If existing on-site low and zero carbon energy-generating systems provide less than 10% of on-site energy demand: increasing the capacity of on-site systems, provided the increase will achieve a simple payback of 7 years or less.
9	Measures specified in the recommendations report that accompanies a valid energy performance certificate which will achieve a simple payback of 15 years or less.

NOTE:

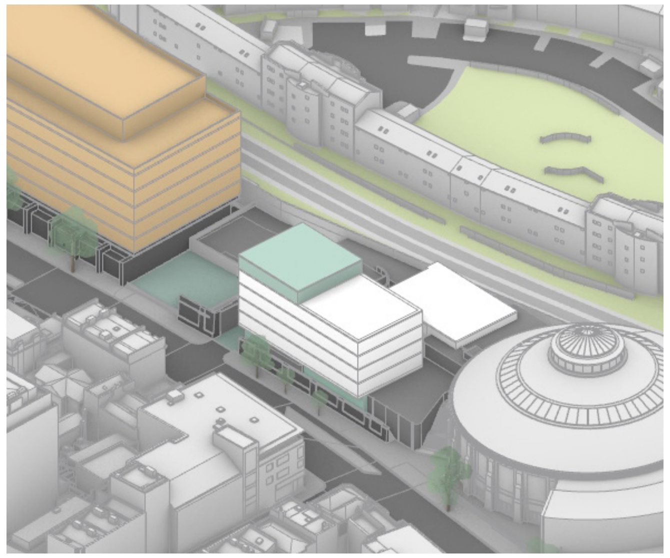
Items 1 to 7 usually meet the economic feasibility criterion of a simple payback of 15 years. A shorter simple payback period of 7 years is given for item 8 because such measures are likely to be more capital intensive or more risky than the others.

6.0 Key Findings & Conclusions

6.0 Key Findings & Conclusions

6.1 Overview

Overview of the three redevelopment options analysed.



Option 1

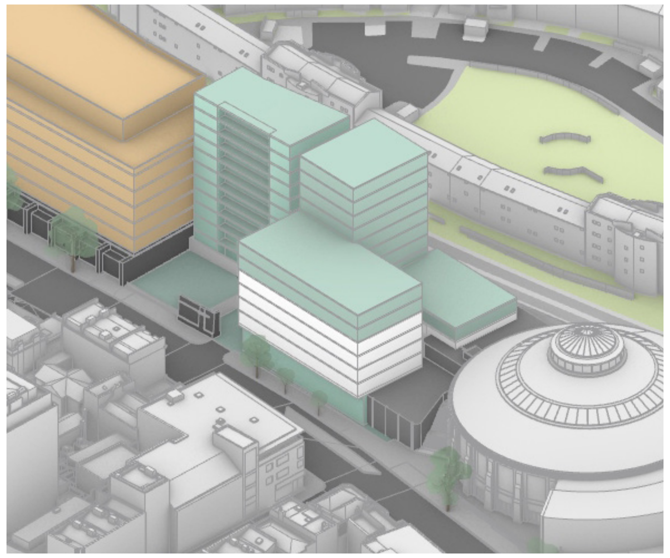
Retention & Retrofit with Extension

Description

Retrofit & extend as commercial office space with necessary upgrades to meet current regulations.

Summary

- Existing front building extended with half an additional floor to provide an additional 200m2 of accommodation.
- Retain existing raised ground floor and brick facade to street level.
- Recladding the existing facade
- Renew all MEP services
- Exisitng disused car park structures retained.



Option 2

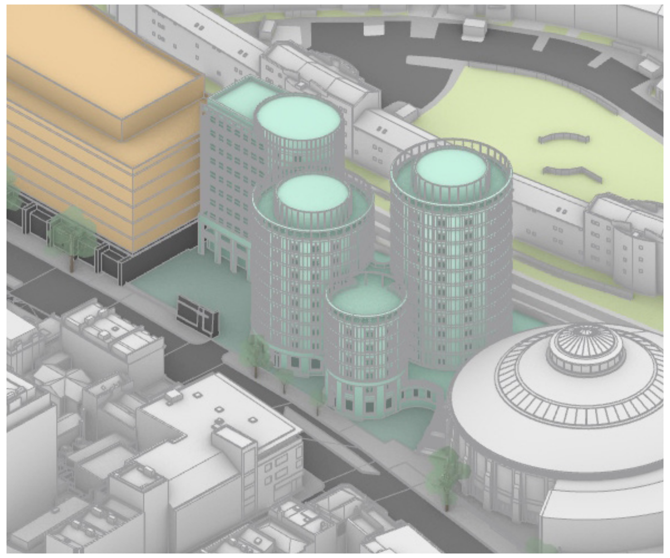
Retention & Retrofit with Extension & New Build

Description

Deep retrofit & extend for reuse as student accommodation plus new build affordable housing.

Summary

- Existing building extended with two additional storeys to the front building and one additional storey to the rear building.
- Demolish car park area and build new 11-storey student housing block, providing total GIA of 8497m2 to PBSA building across existing 100 CFR building, additional floors and new build.
- New 11-storey storey residential building providing 20 no. affordable housing units, equivalent to 35% of GIA of PBSA building adjacent.
- Lower existing ground floor to street level, a reduction in level of approximately 2m.
- Recladding the existing facade
- Renew all MEP services



Option 3

New Build (proposed planning submission)

Description

New build PBSA, commercial and affordable housing buildings raning in height from six to twelve storeys.

Summary

- Existing building on site to be removed.
- New 10 storey residential building providing 24 no. affordable housing units.
- New 6-12 storey PBSA building with commercial space at ground floor level.
- New public space on Chalk Farm Road.
- New amenity space for affordable housing and PBSA residents at first floor level.

6.0 Key Findings & Conclusions

6.2 Key Findings

Key Findings

When seeking to assess the sustainability of development options for a site such as 100-100a Chalk Farm Road, **a host of factors** including carbon emissions, economic and social contributions such as affordable housing delivery and contribution to the urban environment and experience **should be taken into account.**

On top of this, local and regional Planning policy establishes a framework for a holistic approach to sustainability. Moreover, recent London Plan Planning guidance seeks that developers to fully consider retaining buildings before demolition is proposed.

The 100-100a Chalk Farm Road site sits in an area with high public transport connectivity (PTAL rating 6B) and in an area identified for growth in local planning policy.

A drive to optimise use of land in sustainable locations is reflected in both local, regional and national planning policy. This is in part due to the high carbon impact of travel to less well served locations.

New build development options offer more efficient land use through an uplift in both floorspace quantum and quality.

These options are also able to more fully deliver public and operational benefits such as public realm design improvements, affordable homes (both through improved viability and optimising the site plan) and direct and indirect economic uplift by accommodating a higher number of workers. The scale and design of the new-build options also enables them to be operationally energy efficient.

The existing building has significant design and structural limitations.

These include low floor to ceiling heights across the buildings located on site which would result in 2.30m or lower head height, well below the minimum BCO guidance for office refurbishments.

The existing structure's limited loading capacity means that additional strengthening - with associated carbon from construction and materials - would be required to enable the building to meet modern standards and tennant expectations.

The inflexible structure and layout at floors 0-1 presents a key challenge.

The elevated entrance level, sitting roughly 2m above Chalk Farm Road, ensures accessability will remain a major problem with Option 1. Option 2 looks to bring the entrance down to match street level but will require substantial underpinning and temporary works to support the existing building while its lower structure is removed and reconstructed. Despite greater carbon associated with the works, Option 3 is the only option which provides a fully accessible ground floor and streamlined entance sequence.

Option 1 has been assessed for completeness, however it leaves the site under-developed at less than half the density of a comparative site.

This constraint severely limits the potential commercial success of the project as well as limiting prospective tennents willing to rent the refurbished building - making it economically unsustainable. It also increases the likelihood that the site will require additional investment at a sooner date than Option 2 or 3.

Option 2 has been included as a retention baseline which achieves a comparative uplift in GIA to Option 3.

These proposal however faces a number of drawbacks such as the large temporary works to acheive the design, a negative impact on the heritage setting of the adjacent Listed Roundhouse and failing to address the developng pressure on public realm along Chalk Farm Raod.

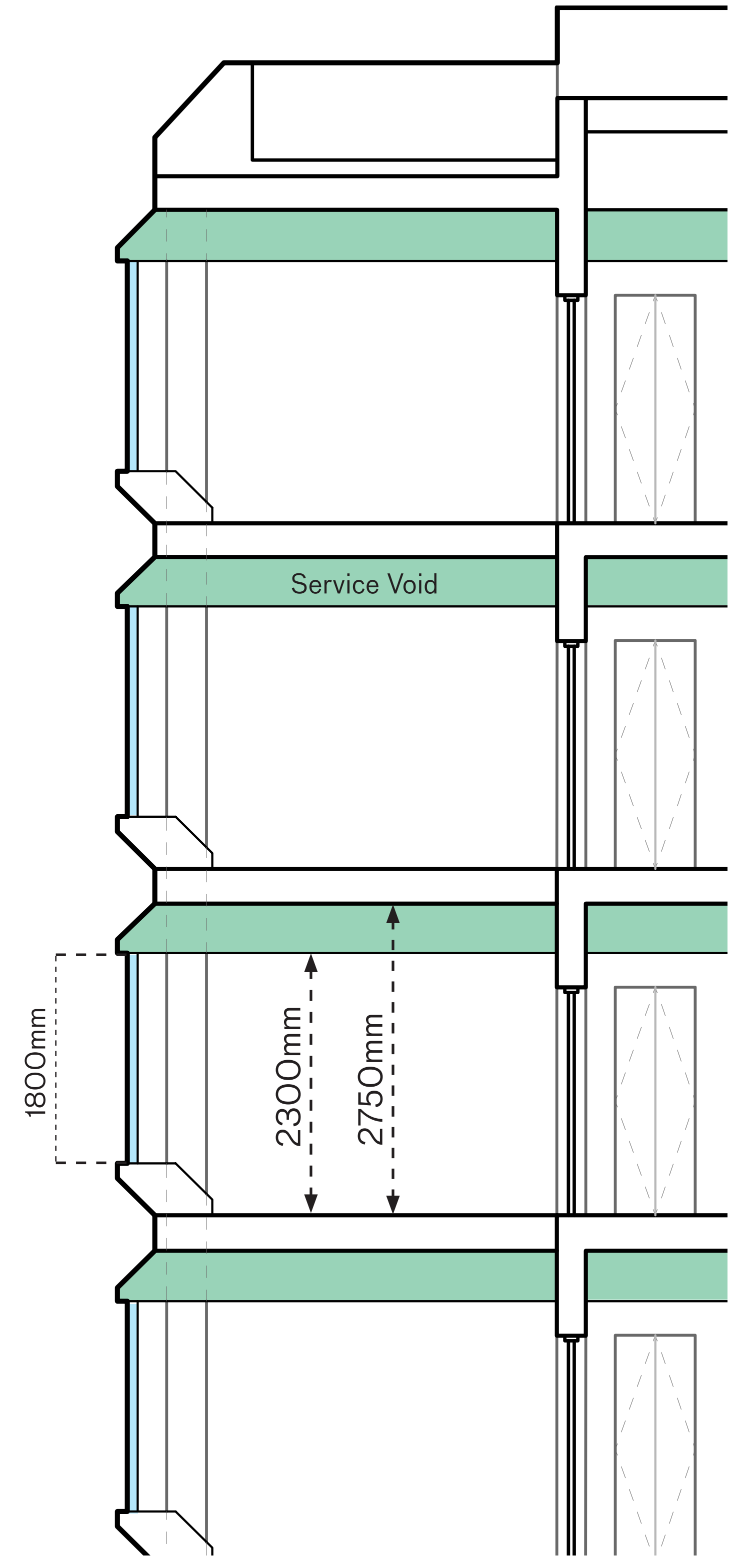
Option 3 represents the planning application scheme which delivers 24 affordable housing units, 265 student rooms, two high quality commercial units and new accessible public realm.

This option delivers good floor to ceiling heights when considered for PBSA use, has flexible and adaptable floorplates for conversion to a fully residential offering and compliments the heritage setting of the Regents Canal Conservation Area and Listed Roundhouse music venue and theatre.

Active ground floors are supported in planning policy and key to creating enjoyable, safe spaces.

Options 1 offers no improvement to the current, poor street level, experience. Option 2 provides limited ability to improve the inactive frontage but does provide some public realm benefits. Option 3 offers substantial benefits to the public realm.

Active frontage is greatly increased in Option 3 which offers the most holistic ground floor improvement through enabling the creation of high quality additional public realm, commercial spaces and entrances along the length of the site and passive surveillance down the street.



Compromised internal ceiling heights in current building.

6.0 Key Findings & Conclusions

6.2 Key Findings

Key Findings

Demolition of existing buildings and replacement with new buildings incurs a meaningful upfront embodied carbon impact when compared to options that retain existing structures.

This is to be expected given that the building structures typically represent a substantial proportion of the upfront embodied carbon associated with construction. This is reflected in the carbon assessment which finds that Option 1 and 2 represents less upfront embodied carbon than Option 3.

When taking in account the overall embodied carbon associated with a building across a standard 60 year lifespan, the gap between the level of emissions of retained and new build options per m2 of space narrows substantially.

When compared to industry benchmarks the overall embodied carbon emissions per m2 associated with **Option 3 is 1,088 kgCO2e/m2, below the GLA benchmark of 1,400.**

Retaining the existing structure significantly impacts the capacity, quality & flexibility of the final building.

These factors contribute to additional embodied carbon that is not captured by RICS methodology. Poorer quality workspace is let on shorter leases to less stable tenants.

The resulting anticipated turnover frequency increases likelihood of regular major refurbishment to keep up with market demand and a greater frequency of tenant fit-out activity.

This incurs additional embodied carbon across the buildings' lifetime. The impact on a substantially shorter average tenancy) Options 1 compared with Option 2 and 3 results in higher level of associated carbon per m2 over a 60 year period from the increased quantum of Cat-B fit-outs. Taking into account the more frequent refurbishment cycles anticipated with Options 1, the difference in WLC emissions between retention and redevelopment narrow further.

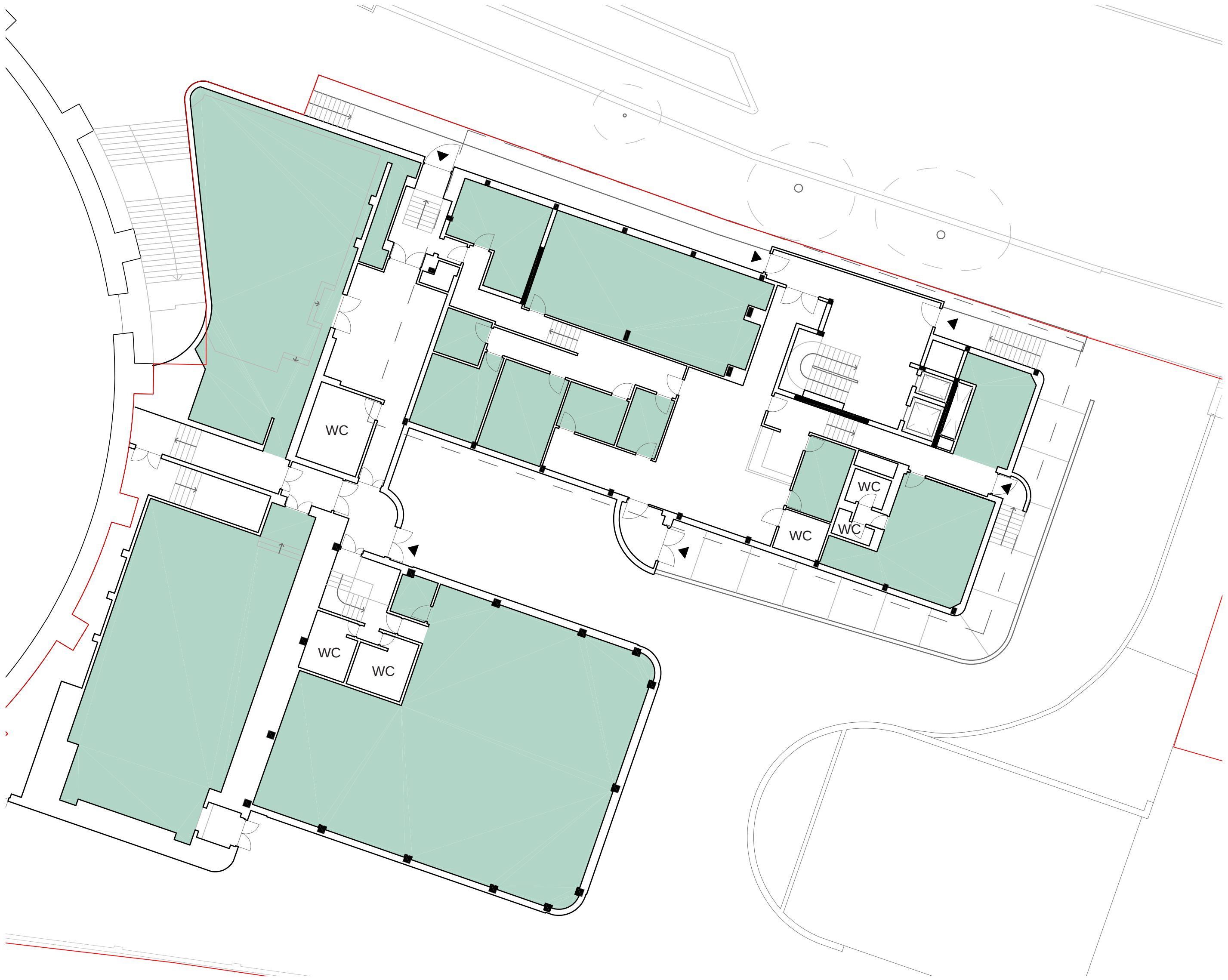
When comparing operational energy, the options present broadly similar results with the new build options performing marginally better.

The opportunity to further improve this performance through detailed design and while in use is significantly great for Option 3 due to the design flexibility offered by a new build and the economic viability of incorporating higher performing systems.

Option 2 performs reasonably well against some of the sustainability factors and provides a significant uplift in area. **However, this option fails to address some of the existing limitations of the building.**

Both Options 1 and 2 result in a compromised outcome that would generate additional embodied carbon through their life-span and are not able to secure the majority of the wider benefits of Options 3.

When taking holistic sustainability factors into account Option 3 – the planning submission – represents the best outcome against the criteria for redevelopment of the 100-100a Chalk Farm Road site.



Convoluted ground floor and entrance sequence in current building.

6.3 Conclusions

This report sets out to assess whether it is appropriate to retain the existing 100 Chalk Farm Road building in full or in part, or whether a new build scheme represents a better use of the site. It distils a huge amount of work by the design team over an extended period of time to review a far wider range of options and individual decisions and it represents these in the form of three options. The criteria against which theses should be judged are set out, and a rigorous and transparent methodology adopted for their assessment.

Whilst carbon emitted in creating the development and in use is given appropriate focus, wider considerations must be taken into account to assess holistically the environmental price and the resulting benefits of the scheme. The carbon accounting for the production of the building does not consider how and by how many people the development will be used, nor how they will get there and use it. It does not consider the quality and enduring appeal of the resulting product and therefore its utility and inevitable adaptation over time.

Whilst the planning application scheme (Option 3) is not optimal in every category, on holistic review of all the measures it provides the majority of benefits whilst minimising impacts, including carbon as measured by RICS. Importantly though, in delivering a higher quality, more flexible building with the urban benefits of public realm and active ground floor, it best meets the tests of utility and enduring appeal. This therefore represents the best investment of carbon. Arguably over time, taking into account additional factors such as travel connectivity, and the way it is likely to be adapted and refitted in use, this will result in the lowest carbon option of all over its life.

A review of the site shows that the existing building has a number of significant limitations, even before considering the age of the structure and the modifications that have taken place over time.

The compromised ground floor level elevated approximately 2m above street level means that it is not possible to bring the building back into use without major modifications and temporary support.

Option 1 is therefore not a workable option.

The analysis finds then that inevitably new build results in greater carbon invested up front, but that the difference between the options on a square metre basis, even on the relatively narrow RICS criteria is modest on a Whole Life Carbon basis.

In absolute terms the carbon emitted is materially greater for the larger options, but this is principally the result of creating more built area. This is supported by planning policy, and it is this additional density on the site that allows a number of the benefits to be delivered. Those most closely linked being housing (including affordable) and employment. If we consider there is a growing demand for space, the strong conclusion of planning policy and of the application team is that doing this on previously developed sites well served by public transport is far preferable to more remote or greenfield sites. Whilst it is outside the scope if this report, the carbon emitted for occupier journeys to and from any development through its life are material to the wider sustainability of our built environment.

Whilst the carbon emitted in development is significant, the report shows that all the options perform well against benchmarks and the ability to reduce carbon in use for the new build schemes is greater. The project team have a commitment to minimise carbon through the development.

Another point central to the discussion is the quality of the space created. The impacts on its utility over time and the likely cycle of adaptation and re-invention of poor quality space all has a carbon price. The report shows that when these scenarios are taken into account the new build options perform better over time.

There are a number of other benefits identified in the report that can only be delivered through the new build, reconfiguring of site, public realm, and street activation. These are more difficult to quantify, but are certainly material to the consideration of the options.

The planning application scheme is targeting BREEAM excellent (based on actual energy inuse) and the applicant is committed to seeking improvements in both embodied and operational carbon performance from the baseline established in the WLC report submitted.

Amongst the local benefits delivered by the scheme are the 24 new affordable homes, and a substantial improvement in public realm including a new public space on Chalk Farm Road.

The proposed building would accommodate 265 students and provide up to 80 jobs, as well as significant expenditure and thus provide a substantial economic uplift from a currently vacant site. The scheme addresses the ecological emergency by creating a valuable local addition of biodiversity in an Area of Deficiency in public access to nature and an Urban Greening Factor of 0.3. The scheme will also lower CO_2 emissions by replacing existing onsite cap parking spaces with cycle facilities.

Subject to planning, the next stage of detailed design and advances in technology offer the opportunity to improve the scheme further in regard to operational and embodied carbon, while retaining the wider benefits that the proposals are able to deliver.

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