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Euston Tower

Independent review of pre-planning Feasibility Study (Volumes 1-3)

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Full details of the Review Team can be found in Appendix C.

Contents

1. Introduction

1.1 Background and context

Elliott Wood (EW) and Hilson Moran (HM) were appointed in May 2023 by the London Borough of Camden to provide an independent audit of the following reports submitted in relation to the pre-application discussions for the proposed redevelopment of Euston Tower:

- Euston Tower Feasibility Study Volume One: Assessing the Existing Building
- Euston Tower Feasibility Study Volume Two: Pathways for Alternative uses
- Euston Tower Feasibility Study Volume Three: Options for Retention and Extension[1]

These reports were submitted as supporting documentation for the scheme's planning application and are available on the London Borough of Camden's planning portal. Note that this planning application is yet to be determined (Application Number: 2023/5240/P; status: registered).

The final version of our original report, summarising the findings of our review process, was submitted to LB Camden and the Applicant Team on 25th October 2024 (revision P6). This report was informed by a lengthy review and consultation process with both LB Camden and the Applicant Team.

In the period following submission of the planning application the proposed scheme has undergone several key changes. Consequently Volume Three of the Feasibility Study has been updated. A new version of this volume (revision B, dated December 2024) has been submitted for consideration, to support the revised planning application. All other volumes remain unchanged. A summary of the revisions made to the planning application can be found in Section 13.2 of the revised Volume Three.

Elliott and Hilson Moran have been re-engaged by LB Camden to review the latest revision of Volume Three of the Euston Tower Feasibility Study. This version of our independent review report (revision P7) is based the following, latest, versions of the Feasibility Study:

- Euston Tower Feasibility Study Volume Zero: Summary of the Feasibility Study (Revision B, December 2024)
- Euston Tower Feasibility Study Volume One: Assessing the Existing Building (Revision D, November 2023)
- Euston Tower Feasibility Study Volume Two: Pathways for Alternative uses (Revision B , November 2023)
- Euston Tower Feasibility Study Volume Three: Options for Retention and Extension **(Revision B, December 2024**)

The revised scheme is based on similar principles to the original full planning permission (ref. 23/5240/P), submitted in December 2023 for the proposed development. The feasibility studies have been updated to reflect the changes for the new application, and include updated information for WLCA, and energy performance as well as new GIAs for options. In addition, further information has been provided to provided clarity on the 'lab' area impacts. The information relating to the original existing building services remains the same.

1.2 Purpose

The purpose of the Feasibility Study is to respond:

'...to the requirements of the London Plan 2021, specifically policy SI7 and its associated guidance on the circular economy, but also takes cognisance of policy D3 with regards to optimisation of site capacity. It is also aligned with the policies of the Camden Local Plan 2017 and its supplementary document: Camden Panning Guidance – Energy efficiency and adaptation which in clause 9.4 requires a condition and feasibility study, and an options appraisal for all major developments proposing substantial demolition.' [2]

The overarching aim of the Feasibility Study is:

'to outline and explore the various factors — technical, economic, policy-driven, market demand, etc. — that inform a re-imagining of Euston Tower.'

Please note that Volume One includes a detailed description of the existing building and wider site, as well as an explanation of the current planning policy landscape. We have therefore avoided repeating these points and would direct readers to the relevant sections of the Feasibility Study. [3]

[1] Hereafter we use the term 'Feasibility Study' to refer to the combined report (volumes 1 -3). We will clearly indicate when our comments refer to a specific volume.
[2] Euston Tower - Feasibility Study Volume One: Assessing the Existing Building (revision D, November 2012), page 12.
[3] Feasibility Study Volume One: Section 2 'Policy Position', and Section 5 'Existing Building'.

1.3 Aims and objectives of the independent review

Our role as reviewers has not changed – we are appointed to assess the Feasibility Study against relevant Camden planning documents, in particular Local Plan Policy CC1 [4] and Camden Planning Guidance (CPG) Energy, efficiency and adaptation, January 2021, hereafter referred to as 'the CPG' [5]. A list of the full review team, along with a statement of independence, can be found in Appendix C.

As the Feasibility Study has been produced at an early stage in the design process, primarily to inform the pre-application discussions, we would not expect it to address all aspects of Policy CC1 and the CPG in detail. This is entirely appropriate for the stage at which this work was undertaken by the Applicant Team. It is expected that the remaining requirements of CC1 and the CPG will be responded to full as part of the detailed planning application (for example with the Sustainability Statement, Energy Assessment, Circular Economy Statement and Whole Life Carbon Assessment).

Our remit is solely to review the Feasibility Study. We have not been appointed to review any of the other reports submitted as part of the planning application.

As the main requirements for a feasibility study of this nature are defined in Chapter 9 of the CPG ('Reuse and optimising resource efficiency'), we would expect this chapter to be addressed in full. The policy text supporting this is Policy CC1 (point e) – we would expect this point (along with the relevant supporting text in the Local Plan) to be met in full. Both Chapter 9 of the CPG and Policy CC1 are reproduced in Appendix C for reference.

The Camden CPG and Policy CC1 refer to each other and reiterate the requirement that all proposals involving substantial demolition must demonstrate that it is not possible to retain and improve the existing building. Furthermore, all developments are expected to optimise resource efficiency.

Alongside a detailed review of compliance against the points within Chapter 9 of the CPG we have provided commentary on compliance with other chapters and the remaining points within Policy CC1. We have noted where the Feasibility Study provides the amount of information we would expect to see at this stage and where we feel additional information should have been provided by the Applicant Team.

We have also provided an early screening of the GLA requirements for pre-application stage, mainly for informative purposes and to identify potential issues with the options presented against GLA planning policies, this can be found in Appendix A.

1.4 Review process

The independent third-party review has been an ongoing, collaborative process. EW and HM met with the Applicant Team on three occasions to discuss the scheme [6]. ARUP and GXN briefed the review team relating to the changes for the revised application in January 2024.

As part of this process we reviewed and commented on previous (draft) versions of the Feasibility Study. However, for clarity, the comments outlined in this report pertain to the final version of the Feasibility Study (as listed above in Section 1.1).

1.5 Structure of this report

Section 1 (this section) introduces the review process, along with a summary of the review team's general comments.
Section 2 reviews the Feasibility Study against Chapter 9 of the CPG.
Section 3 reviews the Feasibility Study against the other chapters of the CPG.
Section 4 concludes the report and outlines our main points for further discussion.

The following additional information is provided in the appendices:

Appendix A provides an early screening against GLA criteria.
Appendix B includes details of LB Camden Policy CC1 and the Energy efficiency and adaptation CPG.
Appendix C provides details of the review team and a statement of independence.

[4] Camden Local Plan 2017.
[5] Note that our role does not include an analysis of financial viability.
[6] Formal meetings were held between the Applicant Team, the reviewers and LB Camden on 09.06.2023, 23.08.2023 and 10.01.2025.

2. Review against CPG chapter 9

2.1 Policy wording

The main purpose of the Feasibility Study is to respond to Camden Local Plan Policy CC1 (point e) which requires:

> *...all proposals that involve substation demolition to demonstrate that it is not possible to retain and improve the existing building...* [7]

To demonstrate this, applicants are required to follow the guidance provided in Chapter 9 of the Energy efficiency and adaptation CPG [8].

There are other requirements both within Policy CC1 and the CPG. Our review of the Feasibility Study focusses primarily on Chapter 9 of the CPG; however, other relevant chapters of the CPG are discussed in the next section of this report.

2.2 Supporting information provided

Chapter 9 of the CPG states that the following supporting information should be provided:

2.2.1 Condition and feasibility study, and options appraisal

This has been provided. In accordance with the requirements of the CPG the Feasibility Study covers the following points [9]:

- Existing building uses
- Servicing
- Technical review of the existing building based on intrusive survey (with evidence and photos)
- Site capacity

Further commentary on how each of these points have been addressed is outlined in Sections 2.3 to 2.6 of this report.

2.2.2 Whole life carbon assessment

The CPG requires whole life carbon assessments to be carried out for all applications involving substantial demolition. LB Camden have confirmed that in policy terms each of the 'partial retention and extension' options as well as the 'new build' option are classified as involving substantial demolition.

Carbon assessments are provided in Volume Three for each of the options considered at feasibility stage [10]. This is discussed in detail in Section 2.8 of this report. An updated assessment for the chosen option has been included in the planning application (in accordance with GLA and LB Camden requirements).

2.2.3 Pre-demolition audit

This has been provided within Volume One of the Feasibility Study [11].

2.2.4 Resource efficiency plan

Section 18 of Volume Three covers resource efficiency and future proofing [12]. This is discussed in detail in Section 2.9 of this report. The Feasibility Study acknowledges that 'a detailed response will from part of the Circular Economy Statement and Whole Life-cycle Carbon Assessment'. As noted above the Review Team have not been appointed to assess these reports and can only comment on the information provided within the Feasibility Study.

[7] Camden Local Plan 2017, Policy CC1, page 250.
[8] Camden Planning Guidance: Energy efficiency and adaptation, January 2021, Chapter 9, page 43.
[9] Camden Planning Guidance: Energy efficiency and adaptation, January 2021, Chapter 9, page 45.
[10] Feasibility Study, Volume Three, Section 17, page 99 onwards.
[11] Feasibility Study, Volume One, Appendix M
[12] Feasibility Study, Volume Three, Section 18, page 149 onwards.

2.3 Existing building uses

The existing building was constructed in the late 1960s and was completed in 1970. It has undergone a light refurbishment to add a secondary glazing system and perimeter fan coil system (circa 1990) but beyond this it's external form and façade remain largely as originally constructed.

2.3.1 How well does the building function?

The performance of the existing building (positives and negatives) is discussed in Volume One. As Volume One has not been updated since submission of the planning application, the following comments remain unchanged).

As the building is unoccupied (and has been for several years) it is not functional in its current state. This is explained in Section 5.1.1 (page 60) of Volume One of the Feasibility Study:

'Over the last 10 years through to 2021, tenants gradually moved out of Euston Tower leaving many floors unoccupied and disused. It is understood that during its lifetime, the building was never fully-occupied. The last tenants, being HMRC, in the last approximately four years occupied the lower 10 floors only, with two sub-tenants occupying only Levels 33 and 34 (partial floor plates). The last of these moved out in April 2021 and, save the retail tenants at ground level, the tower has been entirely vacated since.'

It should be noted that 'all workplace levels have been striped back to their base build condition' (Section 5.1.3, page 64, Volume One). There are no services on any of the floors and the central building plant has been removed. As such the building is not habitable in its current condition.

Section 5.3.3 (Volume One, page 82) discusses building operation. The review team agree that the existing layout poses several challenges to reuse, including:

- Satellite cores block connectivity
- Irregularity of the existing column grid

We agree that these limitations restrict the existing building to single-tenant floors. Volume One of the Feasibility Study states that 'in a single-tenant scenario, the existing floor place could work at reasonable efficiencies' [13].

We agree with the Applicant's conclusion that multiple tenants on a single floor would be unworkable due to extent of circulation space required around the central lift core, which would make these layouts highly inefficient. This would be exacerbated by the requirement to install additional passenger, goods and evacuation lifts (as required to meet modern Building Regulations). These restrictions on internal arrangement are explained diagrammatically on page 83 of Volume One.

Existing floor-to-ceiling heights are also mentioned in this section; however, we do not believe it is fair to compare the existing building to current BCO guidelines for new build. This is discussed in more detail below (Section 2.5 of this report).

2.3.2 Existing user surveys (if occupied) to understand what works or doesn't work

We agree with the Applicant Team that this is not relevant as the existing building is unoccupied (apart from the ground floor retail units). As noted in Section 5.3.3 (Volume One, page 82) details of previous leasing agreements are confidential due to the nature of the tenants involved (MI5 and HMRC).

2.3.3 If the building is not occupied have other options for reuse been explored?

Volume Two explores potential building uses and covers:

- Commercial-led developments (offices and labs)
- Residential / mixed-used development
- Hotel / student accommodation developments

As Volume Two has not been updated since planning submission the following comments remain unchanged.

From a policy perspective, all potential uses have been thoroughly explored by the applicant. As noted above all services have been removed from the building [14]. We agree with the applicant that all strategies for future reuse and redevelopment would therefore require new MEP services. The MEP servicing strategy of each use is explored and considered. We agree that substantial structural alterations are necessary to deliver the upgrades required to meet modern/current Building Regulations and standards, including new lift shafts, MEP equipment and new risers.

[13] Feasibility Study, Volume One, Section 5.3.3, page 83.
[14] Prior to removal the majority of services would have been at the end of their useable service life. The building was previously serviced by an oil-fired boiler, which was not compatible with modern low-carbon building servicing solutions.

The Feasibility Study looks at various servicing strategies and concludes that for commercial offices a decentralised AHU strategy to reduce riser space is preferred, however this approach reduces floorplate efficiencies. In each case the existing floor-to-ceiling heights are constrained by the existing structural slab to slab dimension of 3200mm and this has an impact on the clear floor-to-ceiling heights that can be achieved. To achieve lab-enabled spaces the Applicant Team suggest removing alternative floor slabs to create increased height (this is also technically challenging and will increase the amount of temporary works), but this has a negative effect on floor efficiencies as overall building NIA is greatly reduced making viability more challenging. The argument is more nuanced for commercial uses – BCO recommended floor-to-ceiling levels of 2.45m could still be achieved [15]. We have commented further on the various options to deliver a commercial-led scheme in the following sections of this report.

We agree that for residential schemes [16] it will be extremely difficult to achieve the London Plan requirements for clear hights for residential units (2.5m for at least 75% of the GIA). It is, however, important to note that Camden Planning Guidance and National Space Standards both refer to 2.3m.

The Applicant Team have looked at this option in a high level of detail and have determined that despite the challenges 'the building's configuration could theoretically lend itself to conversion to residential use'[17]. The main reason for ruling out a residential-led scheme is that the general low quality of the residential units would mean the 'cost of such a conversion relative to value achieved is highly prohibitive to financial viability.' As noted elsewhere in this report it is beyond the remit of this review team to comment on financial viability – or role is to assess technical feasibility and compliance with policy requirement.

We agree with the Applicant Team's assessment that from a technical perspective the building could be converted for use as hotel or student accommodation. The following justification has been provided for ruling out these potential uses:

- There is no operator who would be interested in such a large hotel in this location (over 900 keys).
- The cost of conversion to student accommodation relative to the value achieved is prohibitive to financial viability.

2.4 Servicing

As noted above (Section 2.3) the majority of the plant and services have already been stripped out; therefore, all options for redevelopment must include new building services.

2.4.1 Summary of MEP servicing, thermal performance and efficiency for each building component

The existing building achieved an EPC of E (prior to service strip out). The MEP plant was partly overhauled in 2000 with the introduction of some new central cooling and heating plant (oil and gas boilers), plate heat exchangers, motor control centres, cold water storage, and BMS upgrades. New fan coil units were installed, but some of the existing fan coils were retained resulting in a mix of terminal units.

A condition survey of the original existing services has been provided and concluded that all services would need replacement. When compared to today's criteria the original servicing strategy was inefficient and outdated. The plant was largely beyond its economic life and as a result it was stripped out in 2021.

The survey identified the services that had not been upgraded in line with changes to Building Regulations and planning requirements and as such the building had been left as an unoccupiable asset and would not be occupiable without significant intervention. The configuration of the existing floor plates makes service upgrades challenging with potential loss of NIA.

This is summarised in the Feasibility Study where it schedules the BCO 2019 criteria which is considered as a reasonable benchmark for commercial offices against comments on the existing design[18]. Whilst limited details of the original design are provided it is reasonable to agree with the comments in the Feasibility Study.

2.4.2 Identify remaining lifespan of plant and discuss pros/cons of plant upgrade

The remaining lifespan of the original existing building services is highlighted in the Feasibility Study and identifies that most of the plant had exceeded its end-of-life estimate or was near to its end of life potential.

Pros and cons of upgrading the existing plant are discussed and conclude that any future scheme would utilise an all-electric approach meaning changes to central plant and larger riser provisions would be required to meet current requirements. Enhancements to utility connections would need to be reviewed as the scheme develops.

[15] This is discussed in more detail in Section 2.5 of this report.
[16] Discussed in Volume Two, Section 10, page 60 onwards.
[17] Volume Two, Section 10.5, page 104.
[18] Volume Two, Section 4.2.2, page 57.

On this basis, the plant has already been removed so new plant will have to be provided in all scenarios. The old plant relied heavily on fossil fuels. The new development's services will have a positive improvement compared to what was previously there on a kWh/ m^2 basis.

2.4.3 Proposed new services

The Feasibility Study is written on the basis of new services in all options. The options present different approaches based on available floor-to-ceiling heights.

The following options are based on exposed services:

- Major Refurbishment
- Retention and Partial Extension – 'Max Retention'
- Retention and Extension – 'Full" Retention'

The following options are based on a mix of exposed services at lower stack and floor with ceilings at upper stack:

- Partial Retention and Extension - Retain Consecutive Slabs (Office)
- Partial Retention and Extension - Retain Consecutive Slabs (Office & Lab)

The following options assume suspended ceilings for both lab and office space:

- Partial Retention and Extension - retain intestinal slabs (office / Office & Lab)
- Partial Retention and Extension - retain the core
- New Build

The services approach is similar (all electric approach) in each option with slight changes in assumptions for distribution, depending on ease of route due to potential refurbishment challenges. These are reasonable assumptions to make at a feasibility stage. Considerations / assumptions are provided in tables 17.3 (embodied) and 17.4 (EUI) of Volume Three [19].

Energy figures are assumed to be based on a kWh/m^2/yr GIA metric in all options, so are consistent for comparison.

In terms of MEPs for potential lab spaces assumptions have been made for a more intensive services provisions and associated energy consumption. Considerations / assumptions are provided in tables 17.5 (embodied) and 17.6 EUI) of Volume Three [20] and are considered reasonable, albeit they are potentially ambitious, they are below NZCBS pilot EUI for science and technology buildings. The Feasibility study does note that good EUI data for the options with 'lab-enabled' spaces is scarce, and this is a valid point to make. They have estimated Lab area it will be 3x the office spaces, it could be argued the high end should be used for a feasibility study. The chosen option will need further detail on this, however at feasibility stage it is acceptable and reasonable. The method is consistent for optioneering purposes, although it may result in difference for the final application in terms of overall Carbon impact.

2.5 Technical review

Table 4 of the CPG requires the technical review to include evidence and photos of the existing building, based on intrusive surveys. We are satisfied that the Feasibility Study includes these requirements[21].

2.5.1 Upgrades required to comply with current legislation

Section 15.2 of Volume Three [22] summarises the minimum interventions required to comply with current Building Regulations (this is explained in more detail in Volumes One and Two). The Applicant Team have taken a clear and logical approach, and we are in agreement with their findings.

Fire protection does not currently comply with new standards. Additional protection and sprinklers could be added to meet current regulations. A condition survey of the existing MEP services has been provided by SVM Associates, along with a high-level budget cost of works required to upgrade the services based on a short term (three-year) life extension and a longer term (10-year) projection [23]. Costs have also been provided for a full upgrade of all services.

[19] Volume Three, Section 17.1.2, pages 106 and 107.
[20] Volume Three, Section 17.1.2, pages 110 and 111.
[21] Details of surveys undertaken by the applicant team can be found in Volume One, Section 5.1.2, page 62.
[22] Volume Three, Section 15.2, page 28.
[23] SVMA Condition Survey Euston Tower, London (MEP & VT) referenced in Volume 1.

2.5.2 A material inventory audit, including an estimate of embodied carbon

A detailed material inventory of the existing building in its current conditions has been produced by Reusefully Ltd. See 'Pre-Demolition Audit of Euston Tower' [24]. The pre-demolition audit report provides an estimate of the embodied carbon of existing materials based on the Inventory of Carbon & Energy (ICE) embodied carbon database. We believe this is a sensible approach for feasibility stage.

2.5.3 Scaled section drawings showing slab depths, floor-to-ceiling dimensions etc.

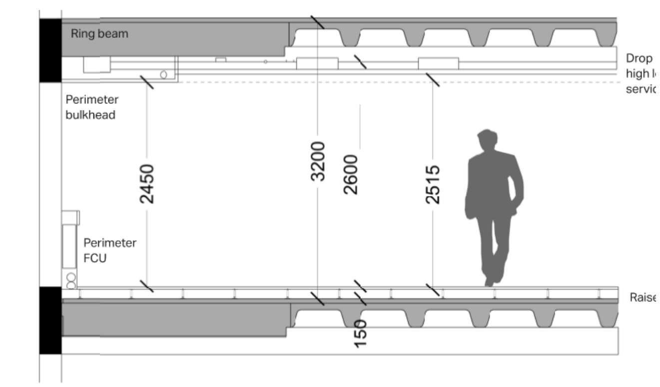
Volume One includes four options for upgrading the building to provide modern services (Figure 1, below). Scaled section drawings showing slab depths and floor-to-ceiling dimensions have been provided. BCO guidance sets a minimum floor-to-ceiling height for refurbishments of 2.45m.

- **Option 1:** perimeter servicing with drop ceiling and high-level air and a servicing bulkhead; raised access floor to accommodate electrical and data infrastructure.
  - This option achieves the required 2.45m beneath the perimeter bulkhead.
  - The remainder of the floorplate achieves an acceptable floor-to-ceiling height of >2.5m.
- **Option 2:** drop ceiling with high level air and servicing; raised access floor to accommodate electrical and data infrastructure
  - This option does not achieve the required 2.45m floor-to-ceiling height.
- **Option 3a:** minimal services within the suspended ceiling; taller raised access floor to accommodate underfloor air servicing, in additional to electrical and data infrastructure.
  - This option does not achieve the required 2.45m floor-to-ceiling height beneath the perimeter ring beam.
- **Option 3b:** exposed services (sprinklers, lighting, etc.); taller raised access floor to accommodate underfloor air servicing, in additional to electrical and data infrastructure.
  - This option achieves the required 2.45m beneath the zone of exposed services.

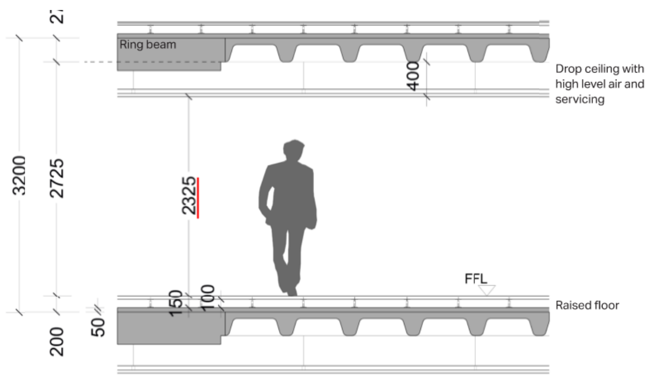
The Applicant Team has demonstrated that BCO floor-to-ceiling heights for refurbishments can be achieved (Options 1 and 3b). However, they have stated that these options 'would still not meet occupier requirements', though the reasoning behind this is unclear. While daylight is a key factor influencing floor-to-ceiling heights, the shallow floor plate and large windows on both sides of each pinwheel suggest that sufficient daylight levels can still be achieved. Even if the BCO guideline of 2.45m for existing office buildings cannot be exceeded in certain areas, daylight standards are likely to be met[25].

It is important to note that while the building cannot match the floor-to-ceiling heights of a modern new build, this should not be used as justification for demolition. As more reused and refurbished buildings enter the market, occupier expectations will need to adjust[26]. Whilst we acknowledge there are many factors at play, rejecting buildings for reuse solely based on floor-to-ceiling heights that fall short of current market expectations may lead to the unnecessary demolition of many structures across London.

Regarding Option 3b, the Feasibility Study highlights that 'areas between services would achieve taller floor-to-soffit heights', meaning that the perceived floor-to-ceiling height will feel greater, as occupiers will have a clear view of the underside of the slab between services.

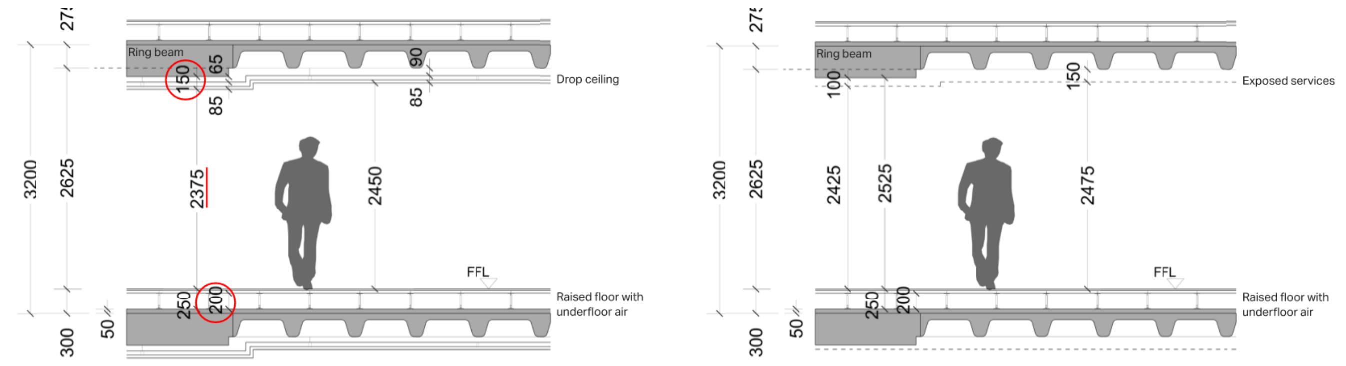


Modernising Option 1



Modernising Option 2

[24] Dated 24/08/2022, included in Appendix M of Volume One.
[25] Daylight analysis is included in Volume Three.
[26] This point is often overlooked in current market analysis.



Modernising Option 3a

Modernising Option 3b

Figure 1: Modernising options 1, 2, 3a and 3b (Volume One, page 146 to 149)

2.5.4 Loading capacity of structural frame, materials strength, pile testing

Initial testing on the sub & super structure show that the concrete frame is in reasonable condition and can continue to take the load for commercial use and comply to the current structural standards for loading and disproportionate collapse. Volume One states:

'*The findings suggest that the concrete and reinforcement is generally in reasonable condition, and has a high strength in walls, columns and beams. Accordingly, the existing structure satisfied the stability requirements with the arrangement as is.'*[27]

The only area that needs upgrading is the fire protection as Building Regulations have changed, so sprinklers would need to be installed and additional protection added to the underside of the slabs as part of any refurbishment.

2.5.5 Energy performance of the façade

The feasibility study estimates that the existing façade U-Value would be at least two to three times worse than modern standards, with a U-value of approximately 2.4 W/m^2K (with secondary glazing) and 4.2 W/m^2K (without secondary glazing). The review team have visited site and inspected the existing façade and this seems to be a reasonable estimate based on the build up and condition of the façade.

We accept that the existing façade does not comply with current standards and has passed its intended design life and would need to be fully replaced in the next few years. The complexity, timing and the health and safety risk in not doing this work in phase one of this project is noted and understood. As such, it is reasonable that no further intrusive surveys have been undertaken.

2.5.6 SBEM (simplified building energy model) and Energy Performance Certificate (EPC)

The existing building SBEM has not been provided, however the EPC, which is based on the SBEM performance rating has been provided. The EPC is E rated (121) and a primary energy estimation of 178kWh/m^2/annum which shows poor performance and would not be acceptable for a modern building, which would be expected to achieve a B or A rating. The existing EPC rating would also make the ability to let the space even more challenging.

2.5.7 Details of airtightness, thermal bridge modelling and condensation analysis in exploration of limits to fabric upgrade in existing building

The existing façade is in very poor condition and (as noted above in Section 2.5.5) is at the end of its useable service life. The review team agree that all reuse and refurbishment options would involve the removal and replacement of the entire façade.

The report estimates the air permeability of the existing façade is approximately seven times worse than a more modern equivalent and assumes it would be around 20m^3/(h.m^2) @50Pa. This is a reasonable assumption.

An intrusive survey has not been undertaken; however, as noted above (Section 2.5.5) given the existing condition of the façade we do not believe intrusive testing is required in this instance.

Thermal bridge and condensation analysis has not been provided; however, given the condition of the existing façade and the need for replacement, this analysis is not required.

[27] Volume One, Section 7.2.1, page 116.

2.5.8 Future projections for carbon content of electric load should incorporate latest BEIS carbon factors

Section 17 of Volume Three states that operational energy emissions were converted to carbon emissions over the building lifecycle using National Grid Future Energy Scenario 2021 'steady progression' scenario, with a change in carbon factor every five years until 2050. We deem this to be an optimistic decarbonisation scenario, possibly under-estimating the carbon impact of the operational energy emissions over the lifecycle of the building. However, as the same scenario has been used for each development option, and the EUI assumptions for each option (for offices) are relatively similar, due to the level of upgrades required, for the purposes of comparison across options, this is deemed to be acceptable.

The Energy Use intensities EUIs for lab-enabled spaces / lab areas has been provided, however, only the total carbon impact (A-C) has been stated. The Feasibility study acknowledges that the carbon impact will be greater for lab-enabled spaces, compared to offices, however it is difficult to assess the assumptions made by the Applicant Team specifically for module B6 operational carbon for comparison.

The carbon has been reported as a wholistic total with the embodied carbon, which is acceptable [28]. Having a breakdown does not change the total carbon impact estimations but would have been a useful breakdown for the review. It is likely the carbon impact will be greater in reality, but this should be reviewed and reported in the detailed application WLC. Assumptions are reasonable for a feasibility study. The larger building area would result in greater overall emissions; however, it is likely all options would be an improvement over the existing building when it was in use.

2.6 Site capacity

2.6.1 What is the best use of the site? And can optimal site capacity be achieved?

Existing site capacity is addressed in Volume One[29]. The review team agree that the tower and public realm, in their current state, are not maximising the capacity of the site. The assertion that redevelopment is required to unlock the capacity of the site is justified as the tower is vacant and cannot be let in its current state.

The best use of the site, and measures to achieve optional site capacity, are discussed in Volume Three. Clearly, as the site is located within the Knowledge Quarter Innovation District, it is a logical location for provision of lab-enabled space. However, it should be noted that LB Camden has confirmed that that:

'Not all Knowledge Quarter buildings need to be lab-enabled, the Knowledge Quarter goes wider than just lab based work, but in the Knowledge Quarter we are looking for buildings designed with flexibility and longevity in mind, so we want to see buildings which could over their life time accommodate a range of Knowledge Quarter uses and be adaptable for alternative uses in the future if the need for KQ buildings diminishes.'

Due to the height of the existing building the capacity on the plot is currently high; however, the current plan does not fill the air space above a large part of the site. It is reasonable to questions whether, if the building were fully demolished, current planning massing guidance would approve the height or equivalent volume today.

2.6.2 Lettability

The existing building was not at full capacity from 2010 onwards (never more than 70% capacity) and appeared to be let on a floor-by-floor basis (no split tenancy on floors).

When discussing the floor-to-ceiling heights of the existing building the Feasibility Study states that 'without a ceiling ... significant areas would be compromised and/or no compliant' [30]. As noted elsewhere in this report we do not agree with the use of the term 'compromised' as this is subjective. Quality depends on multiple factors not solely floor-to-ceiling heights. Furthermore, as shown in Figure 14.3 [31] of the study the 'compromised' area of floorplate is around the perimeter of the building, where floor-to-ceiling heights are impacted by the downstand beam. We do not feel that it is reasonable to claim that this is a 'significant' area.

Section 14.1.2 of Volume Three[32] summarises the implications of various floor-to-ceiling heights on potential future lettings. Central London leasing deals for smaller (10,000 to 15,000 sqft) and larger (over 20,000 sqft) floorplates are analysed over the ten-year period between 2012 and 2022 (CBRE research based on 725 deals in Central London).

The Feasibility Study states that 'across all deals there are only five deals in this analysis for the floor-to-ceiling height that could reasonably be achieved with or without a ceiling zone within the existing structure at Euston

[28] It is important to note that 'lab-enabled space' captures a very wide range of potential uses, from highly energy intense research facilities to buildings that more closely resemble offices.
[29] Section 5.4 page 86.
[30] Volume Three, Section 14.1.2, paragraph 4, page 16.
[31] Volume Three, Section 14.1.3 , page 19.
[32] Volume Three, page 16.

Tower.' The implication being that occupiers in Central London prefer to lease spaces with floor-to-ceiling heights of at least 2.6m.

These results do not, however, indicate occupier preference. What the data show is a clear trend in recent years for developments with floor-to-ceiling heights in excess of 2.6m. It is a snapshot of current 'business as usual'. A breakdown is not provided of which deals were for retrofitted buildings and which were for new build. Clearly, most new build developments would be constructed in accordance with BCO recommendations. If, therefore, over this period the majority of leasing deals were for newly constructed space, the results would be skewed in favour of spaces with a floor-to-ceiling in excess of 2.6m.

Furthermore, there is no explanation provided for how 'floor-to-ceiling' is measured within this analysis. The term 'floor-to-ceiling' is open to interpretation as it will vary depending on whether a building has a suspended ceiling or not. For buildings with a suspended ceiling 'floor-to-ceiling' would equate to the measurement of finished floor level to the ceiling finish (underside of suspended ceiling). However, for developments with exposed services 'floor-to-ceiling' is effectively finished floor level to the underside of the structural slab.

Section 14.1.4 lists a range of potential benefits associated with larger floorplate and increased floor-to-ceiling heights. There is, however, no opposing viewpoint presented. The growing demand for sustainable office space is well documented; an increasing number of companies are looking for low carbon space. The sustainability benefits associated with reusing the existing building could attract a 'green premium', despite the floor-to-ceiling heights.

We acknowledge that the current EPC rating of E would create an additional letting challenge so significant upgrades are needed to the building.

2.6.3 Daylighting

Section 14.1.3 of the Volume Three[33] sets out the provision for daylight analysis. The parameters by which the study has been undertaken have been provided and these are clearly transparent. Different example floorplates have been provided, with variables and parameters disclosed. As expected, deep floor plates would restrict daylight, the information provided in the study seems to be consistent and transparent for comparison purposes.

Floorplate depth has a larger effect on the daylight performance to the floors, due to the smaller floorplates in the retention options. It could also be argued that moving the AHU rooms to other areas could improve the daylight locally in the refurb and extension options (i.e. whilst the difference due to increase ceiling height is 9%, different internal layouts could potentially achieve better internal daylight improvement).

For clarity, the percentage increase of the total floor area that meets the BRE criteria is 9% in the higher ceiling scenario. There is an increase of 52% (from 286 m^2 to 438 m^2) when only accounting for the areas that meet the criteria in both scenarios; however, this is not related to the total floor area. The difference between the two scenarios is +152 m^2 (+9%) of well-lit area over the entire assessment plane as per BRE guidance.

There are multiple solutions or ways of evaluating the daylight calculations that could occur for all scenarios, however the conclusion made in the feasibility study is reasonable and acceptable at this stage. For the deeper floor plates the ceiling height changes does result in improved daylight in like for like comparisons, with a single variable change.

The assumptions made within the daylight analysis are reasonable (methodology, weather data, reflectance, etc.) [34]. However, it is not clear why the results (which were shown in Revision A of the report) are no longer included [35].

2.7 Development options hierarchy

2.7.1 Establishing a baseline

The distribution of embodied carbon within the existing tower is discussed in detail in Volume One of the feasibility study, which has not been updated. The breakdown of carbon summarised in this section is what we would expect to see in a building of this nature.

We agree with the Applicant Team's conclusion that the maximum structural carbon retention is likely to be in the region of 89% and the maximum structural retention by volume is likely to be around 90%. We agree with the final comment in this section that the only way to better these figures would be to expand the floor plate.

[33] Volume Three, page 18.
[34] Volume Three, Section 14.1.2, page 18.
[35] Volume Three, Section 14.1.3, paragraph 13, page 20.

2.7.2 Retention options appraisal

Considering the condition of the existing building and the feasibility of reuse, the CPG states that a structured hierarchy should be adopted to explore all potential options for the site. The primary aim of this section of the CPG is to optimise resource efficiency while ensuring the maximum achievable reduction in carbon dioxide emissions, along with the integration of necessary adaptation measures[36].

Table 1: Mapping Feasibility Study options against the CPG development options hierarchy

CPG terminology	Feasibility Study options	Description
Refit	None	• Not considered as a minor / light touch refurbishment is not possible (we are in agreement with this omission)
Refurbish	Major refurbishment	• New MEP • New finishes • New façade • No vertical or horizontal extension
Substantial refurbishment and extension	Retention and partial extension - max retention	• New MEP • New finishes • New façade • Extended floorplates • New core elements • Maximising existing structure retention: 93% by carbon (or 92% by volume)
	Retention and partial extension – full retention	• New MEP • New finishes • New façade • Floors extended to deliver an expanded floorplate, with new construction for the extension only • Some new columns • New core elements (maintains the existing core and two of the satellite cores). • Retains all existing floor slabs. • Structural retention: 89% by carbon (or 90% by volume).
Reclaim and recycle	Partial retention and extension – retain consecutive / interstitial slabs [38]	• New MEP • New finishes • New façade • New floorplates • Three options explored to partially retain existing floors[37] • New columns • New core elements • Structural retention varies depending on option: 38-41% by carbon (or 42-45% by volume).
	Partial retention and extension - retain the core [38]	• New MEP • New finishes • New façade • New floorplates • New columns • New core elements • Structural retention: 25% by carbon (or 31% by volume).
	Fully new build	• New build scheme, existing building demolished

[36] Camden Planning Guidance – Energy efficiency and adaption, Section 9.6, page 46.
[37] Three options are explored: retain consecutive slabs (office), retain consecutive slabs (office and labs), retain interstitial slabs.
[38] LB Camden have confirmed that in policy terms the 'partial retention and extension' options are classified as 'reclaim and recycle' not 'substantial refurbishment and extension'.

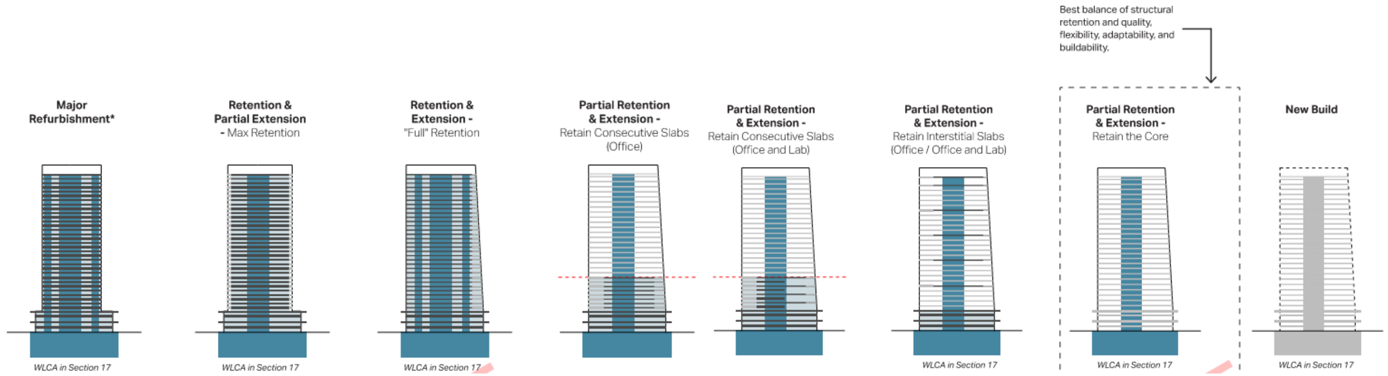


Figure 2: Extract from Volume Three pages 98-99

Table 1 compares the development options considered by the Applicant Team against the four options listed in the CPG. These are also shown in Figure 2. The level of intervention required for each option is summarised in figure 17.1 of Volume Three[39]. The Applicant Team has utilised five factors for assessing each development option [40] :

1. 'Retain structure'
2. 'Future-proofed'
3. 'Health & safety and buildability'
4. 'Efficiency and viability'
5. 'Lab-enabled'

There is, however, no clarification provided on how each of these points are weighted with regards to the assessment of each development option. In particular there is a question around replacing a large percentage of an existing building to provide a more 'future proofed' or adaptable space. This is discussed in more detail below when reviewing the 'max retention' and 'full retention' options below.

2.7.3 Refit

The CPG defines 'refit' as retaining the existing structure as is, with minor works, and the replacement of building services such as heating and insulation to continue occupation of the building[41]. This option is not applicable to the development. As noted above, all services have been stripped out and the building is not habitable[42]. The review team agree that the building cannot be brought back into use via a 'light touch refurbishment' or refit strategy. The façade is at the end of its useable service life (>30 years) and would need to be replaced prior to installing new services. Upgrades to services on this scale would likely result in consequential improvements being required under Part L of the Building Regulations and therefore needing greater levels of intervention.

2.7.4 Refurbish

The 'major refurbishment' scenario includes all the changes required to bring the building up to the requirements of current Building Regulations and standards, without extension to the floorplate. Volume One of the Feasibility Study deems this option to not be financially justifiable due to the cost of the work and the quality of office space created, noting that 'the consequential economic payback over time is very challenging'[43].

It is not within the remit of the review team to interrogate the arguments around financial viability. We accept that significant investment will be required to bring the building up to modern standards, and that without an increase in floor area this might pose challenges from a viability perspective. However, we reiterate here that market expectations (particularly around what is considered 'compromised' space) will need to change in order to bring about more widespread reuse of buildings. We note this is not in the Applicant Team's control and is complex considering the age of the building.

2.7.5 Substantial refurbishment and extension

Two options have been explored which seek to refurbish and extend the existing building:

- Retention and partial extension – 'max retention'
- Retention and extension – 'full retention'

[39] Section 17.1.1, page 103.
[40] Volume Three, Section 16.2,1, page 36.
[41] Camden Planning Guidance – Energy efficiency and adaptation, Section 9.6, page 46.
[42] The building originally contained a central oil-fired boiler, which was located in the basement. Even if this had not been removed it would need to be replaced as part of the redevelopment works so that that building could be converted to a modern, all-electric servicing solution.
[43] Volume One, Section 7.6, page 178.

We acknowledge the detailed nature of the options assessed and commend the Applicant Team for going far beyond current industry practice for feasibility studies of this nature. Whilst we acknowledge the range of options considered, we question some of the assertions and assumptions made within Volume Three of the Feasibility Study. Our concerns are summarised below.

When discussing the efficiency and viability of the 'max retention' option The Applicant Team state that existing floor-to-floor heights are 'challenging for delivering a modern office offering, making leasing difficult on these floors, if not impossible'[44].

The term 'impossible' is subjective and misleading to readers. The Applicant Team has shown in Volume One that it is possible to achieve the BCO required floor-to-ceiling heights for refurbishments. As discussed earlier in this report it is not justifiable to rule out retention and refurbishment based on floor-to-ceiling heights, particularly when these comply with BCO guidance. There are numerous factors at play with regards to future lettings, and the premium attached to a low carbon development may well offset any potential negative opinions of floor-to-ceiling heights that do not meet current market expectations. Furthermore, by encouraging reuse, standards and expectations within the London market will begin to shift.

The difficulties with extending the current floorplate[45] are acknowledged. Although limited information is provided on the proposed design of the new floor slabs (extended areas), it is likely that these will result in a floor-to-ceiling height below BCO guidance for refurbishments. The primary reasons presented by the Applicant Team for discounting these options are:

- Challenging floor to floor height creating a 'larger quantum of compromised floor space'.
  - As noted above, we dispute the use of the term 'compromised floor space' as this is subjective.
- Difficulty in using the additional floor space at the perimeter 'due to the existing column positions and proximities to the external cores.'
  - We agree that the existing column positions do pose a challenge to future uses.
  - However, it may be possible to overcome some of these issues through detailed design work.
- Retention of existing column grid 'hindering flexibility and adaptability in use, and potential for non-destructive disassembly at end of life.'
  - This is a circular argument. We do not agree that 'future adaptability' is a valid reason for demolishing an existing building. It would be better to utilise the existing building for as long as possible rather than construct a new building for a potential future use that may never come to pass.
  - We strongly refute the argument that the existing building should be demolished (or partially demolished) on the grounds of a lack of 'potential for non-destructive disassembly at end of life'.

The Applicant Team acknowledge it is not possible to incorporate lab-enabled spaces within any of the refurbishment options. For clarity, Section 16.4 of Volume Three explains [46]:

- Major refurbishment: no lab-enabled space
- Retention and partial extension: no lab-enabled space
- Retention and extension: no lab-enabled space
- Partial retention and extension – retain consecutive slabs: two options explored (100% office and mix of office and lab-enabled)
- Partial retention and extension – retain interstitial slabs: two options explored (100% office and mix of office and lab-enabled)
- Partial retention and extension – retain the core: either fully office or mix of office and lab-enabled space
- New build: either fully office or mix of office and lab-enabled space

Therefore, the requirement for lab-enabled space within the building plays a key role in the decision-making process. The review team's role does not include assessing whether lab-enabled space is (or is not) required. As noted previously, our understanding from discussions with LB Camden is that provision of lab-enabled space is not a requirement of the Knowledge Quarter (as discussed in Local Plan Policy E1). However, there is clearly a strong link between the aims and objectives of the Knowledge Quarter and the provision of high quality (and affordable) lab space. The point we would like to emphasise is that if the decision is made to include lab-enabled space within the building, this will rule out several of the reuse/refurbishment options.

[44] Volume Three, Section 16.3.1, page 48. This phrasing is also used when discussing the viability of 'partial retention and extension – retain consecutive slabs' (Volume Three, Section 16.3.3, page 56).
[45] As discussed in the 'retention and partial extension – full retention' option, Volume Three, Section 16.3.2, page 54.
[46] Volume Three, Section 16.4, page 96.

2.7.6 Reclaim and recycle

Three options are analysed within the ‘reclaim and recycle’ category:

- Partial retention and extension – retain consecutive/interstitial slabs, including:
  - Retain consecutive slabs (office)
  - Retain consecutive slabs (office and lab)
  - Retain interstitial slabs (office) / (office and lab use)
- Partial retention and extension – retain the core only
- Fully new build scheme

Whist there are always additional options that could have been reviewed, we feel that the Applicant Team have covered a realistic (and reasonable) number of alternatives and have met the objectives of the policy and CPG in this regard.

Each of the options that seeks to retain consecutive or interstitial slabs suffers from either:

- Poor floor-to-ceiling heights associated with extending the existing slabs.
- Provision of over-dimensioned space (in excess of 6m) – associated with removal of slabs.
- Unreasonable (or even impossible) amounts of temporary works – in particular associated with supporting of slab edges and retention of interstitial slabs.

Use of mezzanines could have been explored; however, this is unlikely to yield savings in carbon. The Applicant Team could also have explored removal/replacement of all slabs at lower level with retention of existing slabs above; however, this would pose a challenge in terms of buildability and would add a significant amount of temporary works to the project.

A pre-demolition audit is included which estimates the existing material volumes within the building and apportions embodied carbon to these based on ICE database values. This is agreed to be a sensible approach.

Volume Three, Section 18 considers ways in which materials from the proposed partial demolition might be reused and recycled in the scheme although this is set out at a strategic level rather than in detailed (which is to be expected within a Feasibility Study[47]). The feasibility study as a whole deals with the wider questions need to address these challenges. The strategic proposals are reasonable considering the stage of review, it is recommended that Camden are kept update on developments relating to circular economy for the building.

As the existing structure is a reinforced concrete frame, the report estimates some 36,981 tonnes of concrete are included in the existing structure. It is difficult to see how the Applicant’s proposal to ensure the materials are used at their highest value can be realised. Business as usual is to crush concrete, separate out the reinforcement for recycling and then use the crushed concrete as either hardcore or recycled aggregate in new concrete. Both uses are downcycling the concrete to lower value uses. The best way to maximise the value of in situ RC is for it to be reused in situ. It will not be commercially viable nor technically straightforward to cut out existing RC beams and reuse them.

2.8 Whole lifecycle carbon assessment

The Applicant Team provided a whole lifecycle carbon assessment including each of the potential development options [48]. The information provided is adequate for this stage of the design process. We would expect whole lifecycle carbon calculations to be updated prior to planning and included in the planning application submission (note that this review covers the Feasibility Study only; we have not reviewed any of the other planning reports such as the Whole Life Carbon Assessment).

Following discussions with the Applicant Team, and our review of draft versions of the Feasibility Study and accompanying information[49], it was agreed that an early-stage carbon study would be provided covering the options discussed above, in Section 2.7 of this report:

1. **Major refurbishment**: existing façade replaced & building upgraded to meet current standards.
2. **Retention & partial extension (‘max retention’)**: retention and partial extension involving the addition of new cores outside the existing floorplates and extension of the remaining floorplate with 900mm cantilever slabs.
3. **Retention & extension (‘full retention’):** central and two satellite cores retained, additional floorplate area added to achieve the same massing envelope as the ‘retain the core’ and ‘new build’ options.
4. **Partial retention & extension (retain consecutive / interstitial slabs)**: similar to the ‘full retention’ scheme but with either retention of consecutive slabs at lower levels, or removal of approximately every sixth-floor slab and four new slabs constructed between to achieve increased floor to floor heights.

[47] We would expect further information to be presented in the supporting documents submitted as part of the planning application.
[48] Volume Three, Section 17, page 101. In this respect the Applicant Team have gone beyond the requirements of the CPG – which only requires a WLC assessment for developments that are pursuing the ‘reclaim and recycle’ scenario.
[49] Including ‘Euston Tower – Whole Life Carbon Presentation’ Revision 2, October 2022.

5. **Partial retention & extension (retain the core)**: removal of all floor slabs down to ground, retention of core and construction of new floor slabs at increased floor to floor heights relative to existing.
6. **New build**: including new foundations, basement, and superstructure.

The carbon associated with each of these options is discussed in Section 17 of Volume Three[50] together with the following assumptions[51]:

- **Benchmarking values** for carbon intensities of similar developments from the design team's respective portfolios have been used to inform the assessment.
- **Structural element carbon factors** are based on ICE database values which we deem to be sensible[52]. The key material carbon factors used are stated and these reflect industry average values, which follows current best practice guidance for early-stage carbon calculations.
- **MEP embodied carbon** is based on benchmarked data from a WBSCD report by Arup. The high-level embodied carbon MEP data appears to be in the correct range. The application of the benchmark data is explained and justified in Figure 17.3 [53].
- **Façade embodied carbon** is calculated based on the CWCT[54] approach considering FSA. An FSA based impact of 352kgCO_2e/m^2FSA is used and then apportioned to each option based on the actual façade area and GIA. This is a sensible approach representing current industry best practice.
- **Internal walls, doors, finishes and fittings** carbon impact remains the same across all options.
- **Temporary works** are included in A1-A5 for each option.
- **A4 transportation values** have not been calculated at this stage but use benchmark data, which should be representative of the industry.
- **A5 construction impacts** were split between A5a and A5w. A5w was included in the benchmark data as per A4. A5a was based on a baseline figure of 30kgCO_2e/m^2 GIA taken from Sweco's portfolio for a construction programme for the new build of 55 months as advised by Lendlease. Based on input from Lendlease the construction programme was estimated for each option and the carbon impact applied proportionately to programme. This is a sensible and considered method.
- **Demolition impacts** for each option have been included in A1 to A5. These were calculated using the material quantities from the pre-demolition audit, run through OneClick LCA to extract the end-of-life emissions. This is deemed to be a logical, detailed and robust methodology.
- **Site impacts from demolition**, C1, has been estimated by considering the magnitude of existing materials to be demolished and proportioning the C1 base value of 3.4kgCO_2/m^2 GIA. Therefore the Major Refurbishment option has a significantly lower C1 impact than the New Build.
- **Operational energy** (B6) has been calculated for each option based on assumed Energy Use Intensity values for each option. Lab space estimated EUI has also been reported. As noted earlier, these appear to be ambitious and perhaps further detail on assumptions could be provided in the detailed selection option for the application. Carbon is not separately identified for module B6 and is reported in combination with other WLC modules (A-C), including where lab energy is accounted for. The energy use figures are then translated into carbon emissions using the National Grid Future Energy Scenario 'steady progression'. As noted earlier, this is likely to give an overly optimistic reduction in carbon from the National Grid, potentially underestimating the carbon emissions of each option over the lifecycle of the building. We would propose the National Grid Future Energy Scenario 'falling short' should be used. However as the same scenario has been used for each assessment, the 'steady progression' scenario can reasonably be applied for comparison purposes, but no reliance should be put on the absolute whole lifecycle carbon figures. This will need to be updated for the detailed application for the chosen option.

2.8.1 Commentary on whole life carbon assessments

As shown in Table 2, none of the options meet the GLA aspirational (office) benchmark for modules B-C; and only the first three (refurbishment) options meet the aspirational benchmark for modules A1-A5 [55]. However, the review team would like to highlight the difficulty in achieving these benchmarks at present (current construction practices, material availability, carbon factors, etc.) particularly for tall buildings.

The view of the review team is that figures presented in the Feasibility Study represent a challenging yet realistic level of ambition. Although not policy compliant, for a development of this size, scale and massing to achieve A1-A5 emissions below 700 kg CO2e/m^2 would be an achievement.

[50] Volume Three, page 102.
[51] These were requested following our initial review of earlier (draft) versions of the Feasibility Study.
[52] It is noted that the Feasibility Study refers to 'ICE' as 'Institution of Civil Engineers', this should be 'Inventory of Carbon and Energy'.
[53] Volume Three, Section 17.1.2, page 108.
[54] 'How to calculate the embodied carbon of facades: A methodology', Centre for Window and Cladding Technology, February 2023.
[55] GLA aspirational (office) benchmark A1-A5 <600 kg CO_2e/m^2; B-C <370 kg CO_2e/m^2

Table 2: Comparison against GLA aspirational benchmarks (kg CO_2e/m^2)

Option	A1-A5	B-C	Office / lab	Meets GLA aspirational benchmark for office?
Major refurbishment	406	504	Office only	Yes: A1-A5 No: B-C
Retention & partial extension	398	488	Office only	Yes: A1-A5 No: B-C
Retention & extension	512	474	Office only	Yes: A1-A5 No: B-C
Partial retention & extension – retain interstitial slabs (office only)	627	459	Office only	No
Partial retention & extension – retain interstitial slabs (office & lab)	654	523	Office and lab	No
Partial retention and extension – retain the core (office only)	627	458	Office only	No
Partial retention and extension – retain the core (office & lab)	666	550	Office and lab	No
New build (office only)	660	448	Office only	No
New build (office & lab)	698	536	Office and lab	No

The assumptions and methodology for the carbon study appear to be robust and detailed. However, there are several areas which require further explanation. The most critical of these relates to the proposed uses of the building for each option. The Feasibility Study states that where lab-enabled spaces are proposed, the lab area represents approximately a third of the total lettable area. Lab use is only proposed in the three options where new floorplates will be provided to allow for the increased floor-to-floor height required.

In the carbon study it is assumed that MEP is provided for office use only for three options and incorporate some floors to include label enabled spaces for three options; however there are some inconsistencies in the reporting as explained in Section 17.2.4 of Volume Three:

'This assumes that the fit out is for office only including in the spaces with larger floor to floor heights that are designed as lab-enabled. This is chosen to provide a like for like comparison with the other options since they cannot accommodate any laboratory spaces, and the laboratory MEP equipment is more carbon intensive than that for offices.' [56]

However, the summary tables do provide office and lab uses so both scenarios are accounted for, despite this slightly confusing text.

The three lab-enabled options have an additional EUI rate applied increasing the overall energy use intensity, which is to be expected. The comparison of options account for differing uses as these are key factor in the decision-making process. The main argument for significant demolition is the compromised existing floor-to-floor heights, existing floor layout and the inability to accommodate lab space, then the structure, façade, finishes and MEP should all reflect the proposed uses. The structure and façade are assumed to be lab-ready, and an and additional set of data is provided for MEP and finishes thus provided estimates for office only and Lab-enabled space for complete transparency.

The addition of these EUIs is welcome and was made following our previous comments, the Applicant Team has provided commentary on the three affected options to summarise the upfront and whole lifecycle carbon impact of the inclusion of lab-enabled spaces.

The allowances for temporary works seem on the low side given the extent propping required for several of the options. The basis of these assumptions is not explained within the Feasibility Study; however, we note that knowledge of the embodied carbon within temporary works is in its infancy across the whole industry.

We would also expect the figures for finishes and FF&E to be significantly higher than those presented. Similarly, although the Feasibility Study mentions the CWCT Guidance, the carbon reported for façades is low in our opinion for a development of this type (large tower).

As noted above (although not policy compliant) our professional opinion is that the upfront carbon figures (modules A1-A5) reported in the Feasibility Study [57] are low for this type of development[58]. We would expect (in the final WLCA presented for planning) the figures for the proposed option to increase from 627 kg CO_2e/m^2 (for office only) or 666 kg CO_2e/m^2 (for office and lab). This could potentially widen the gap in total whole life carbon between

[56] Volume Three, page 124.
[57] Volume Three, Section 17.3.2, pages 146 and 147.
[58] It is extremely challenging to achieve upfront carbon below 700 kg CO_2e/m^2 for towers, particularly given recent changes in calculation methodology (RICS v2 and CWCT).

the proposed option (retain the core) and the various retention options. For reference, the gap between 'max retention' and 'retain the core' (for the office only scenario) is already 22,866 tCO_2e [59].

We would also like to highlight that the vast majority of the carbon savings associated with the preferred option (retain the core) are associated with the reuse of foundations and substructure within this option. As shown in section 17.1 of Volume Three [60] the upfront carbon associated with superstructure elements for the 'retain the core' and 'new build' options is 262 kg CO_2e/m^2.

2.9 Resource efficiency and circular economy principles

Policy CC1 expects all development whether for refurbishment or redevelopment to optimise resource efficiency by:

- Reducing waste
- Reducing energy and water use during construction
- Minimising materials required
- Using materials with low embodied carbon content
- Enabling low energy and water demands once the building is in use

A strategy for resource efficiency and future proofing is presented in Section 18 of Volume Three [61]. It is apparent that a substantial amount of work has gone into this section – well above the minimum level of detail that would usually be expected at this project stage. All policy requirements (as noted above) have been addressed and it is evident that circular economy has been a key consideration in the design process. The strategy for incorporating circular design principles has been clearly thought through and is presented across each of the following stages of the building's lifecycle:

- Design stage
- Construction and operation stage
- End of life stage

We would encourage the Applicant Team to continue with their approach to circular economy. We expect this will be carried forward in the project's Circular Economy Statement (submitted for planning) and implemented at subsequent project stages.

2.9.1 Design stage

Volume one covers the pre-demolition audit of the existing building, quantifies the key materials and the embodied carbon associated with them. This volume also provides some initial thoughts on what could be done/achieved with the existing materials to be demolished.

Volume Three provides commentary on the most prevalent materials, concrete and steel, and provides some high-level suggestions that materials will be used in this highest value state. Focus is given to key material hotspots with the overall strategy to move as many of these materials as possible up the reuse and recycling hierarchy. The Applicant Team acknowledges that no genuine high value reuse route current exists for concrete. However, the Applicant Team has used this project as a vehicle for research and development of innovative ways of reusing disused concrete. We would expect this research to continue in subsequent stages of the project.

In addition to considering the treatment of materials arising from the deconstruction process the Applicant Team have provided commentary on the proposed new build elements of the scheme and the strategies to be implemented for 'using less stuff'. We would expect more detail to be provided on the strategies to reduce material use within the Circular Economy Statement.

2.9.2 Construction and operation

Sufficient detail has been provided for this stage within the Feasibility Study. The ambition to run a fossil fuel free site is commended. The GLA's targets for construction and demolition waste diversion (95%) have been set; however, it would good to see a stretch target implemented. We expect more detail on how these targets will be achieved to be provided in the Site and Operational Waste Management Plan – as such we are not concerned that this level of detail is not provided within the Feasibility Study.

We would, however, stress the importance of a rigorous waste management strategy for a site of this scale – with the amount of deconstruction waste that will potentially be generated (in particular concrete). High-grade recycling

[59] Total WLC tonnage: 'max retention' = 77,480 tCO_2e; 'retain the core' = 100,346 tCO_2e (Volume Three, Section 17.3.2, page 145).
[60] Summary table, page 143.
[61] Volume Three, page 148 onwards.

of many materials (including glass and concrete) depends on segregation of these materials and prevention of contamination.

Although not a policy requirement, the ambition to pursue materials passports and best-in-class metering for NABERS is welcomed.

2.9.3 End of life stage

In response to previous comments made by the Review Team, the Applicant Team have provided additonal information on the strategies to be implemented for end of life stage. We are in agreement with the proposals, which include:

- Design for long life and flexibility/adaptability
- Design for disassembly

The approach taken by the Applicant Team ('building in layers') is in accordance with industry best practice. The proposal to include a soft spots in the structural slabs within the core is sensible and will increase the adaptability of the proposed building. However, this principle should be used to facilitate future adaptability rather than last minute, post-completion changes during tenant fit-out.

The proposed steel structure (while potentially more carbon intensive than concrete) will facilitate future deconstruction and material recovery and reuse.

An alternative floor structure (precast planks) is presented as a 'pioneering' option. We agree that precast planks are potentially more easily recovered and reused at end of life than composite deck. However, we question whether this is truly a pioneering approach. Given the length of time before the scheme is on site it would be good to see some more innovative systems and approaches explored.

As noted above, we do not think that a lack of flexibility, adaptability and/or demountability should be a reason for discounting reuse of an existing building. Whilst these principles are of considerable importance for any newly designed building, they should not be used as a reason for deconstruction.

3. Review against other CPG chapters

It is assumed that for the options relevant policy would need to be complied with for the planning application as the development progresses. It is too early to address all planning requirements in the CPG; however, the general strategic approach and trends can be set out. This would be typical given the stage of the project. A high-level approach to policy has been referenced.

The Feasibility Study has addressed the relevant policies CC1 and Chapter 9 of the CPG as far as possible give the stage of the project and the review. It is expected that the application will address all remaining elements that cannot be addressed at feasibility stage. Commentary on other relevant chapters within the CPG is provided below.

3.1 CPG Chapter 2: the energy hierarchy

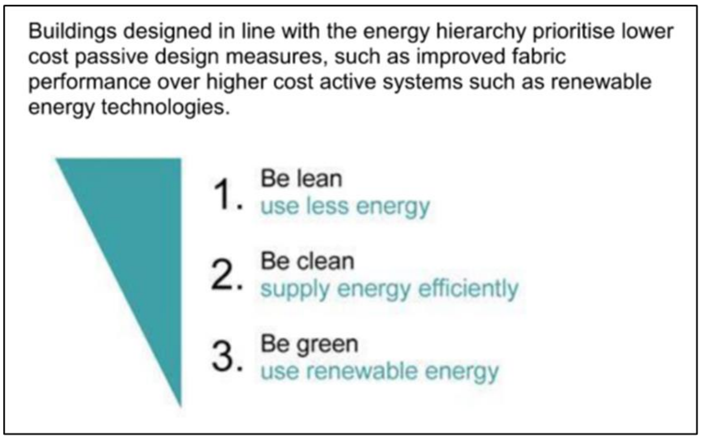


Figure 3: Extract from CPG Ch 2.2

Section 3.1 of Volume One references London Plan Policy SI 7 R*educing waste and supporting the circular economy and* Policy SI 2 *Minimising greenhouse gas emissions* and the associated GLA guidance documents. Camden Local Plan 2017 Policy CC1 *Climate change mitigation* is also referenced.

The energy hierarchy is referenced (be lean, be clean, be green). 'Be seen' is referenced but only in terms of BMS and that energy monitoring will be enabled. Further detail would be required relating to operational energy in the full application. Predicted EUIs are provided for all typologies. It is stated all policy will be addressed in the full application.

A high-level strategy related to the energy hierarchy has been undertaken. Detailed analysis has not been undertaken at this stage and detailed parameters have not been set out. This is to be expected for this stage of the design process and it is agreed that this is acceptable at the feasibility stage.

Existing building energy has been addressed in Volume One, estimated energy use intensity (EUI) of the existing building has been provided based on in use performance and it is estimated to be 300 kWh/m^2/annum.
The EPC of the existing building has been referenced as Band E with primary energy of 178 kWh/m^2/annum (note: this differs to EUI which is a more accurate reflection of the buildings energy consumption than primary energy)_.

Primary Energy is the consumption at the point of generation and cannot be compared to EUI directly, which includes items such as unregulated energy prediction. It should be noted the EPC is not an accurate reflection of predicated or actual energy use, the reality is the existing building EUI will be much higher, as highlighted by the in use 300 kWh/m^2/annum estimation in the feasibility report. When upgrades are undertaken a new EPC will be required. An equivalent modern building should be able to achieve at least an EPC rating of B as a minimum and could possibly achieve EPC A.

Volume Three provides a target whole building energy use for the options, covers offices for comparison and for the options with Labs an EUI with assumptions and a blended rate The EUIs listed in figure 17.4 (Volume Three) for offices and the impact of lab-enabled spaces is in figure 17.5. The 'blended' rates can be seen in the summary tables of the options with labs and the overarching summary table (Volume 3).

The proposed building options EUI predictions in the Feasibility Study set whole building targets of between 90-104 kWh/m^2/annum (GIA) (figure 17.4), for the various options for office areas, these would be very good performance level, if achieved in use. The preferred option is 95 kWh/m^2/yr. For comparison the UKGBC 2025-2030 target is 90kWh/m^2/yr (GIA).

The GLA target of 55 kWh/m^2/annum (GIA) for whole building energy for offices is widely accepted to be incredibly challenging and the applicant team has been optimistic but realistic in their early-stage assumptions.

The Feasibility Study does state that lab-enabled buildings will have a higher energy use when compared to a typical office space, in the full application this should be clearly explained. Lab-enabled spaces EUI estimations have been provided (figure 17.6), these are stated as being between 270-285 kWh/m^2/yr for the lab areas in the different options with assumptions provided. The figures are reasonable estimates for a feasibility stage.

Typically labs have higher ventilation requirements, specific condition needs, unique equipment with higher power draw (sometimes 24/7) and run times, so can be intensive spaces when compared to offices, hence the higher EUI. It should be noted there is little data for estimating lab EUIs (for which each lab will have specific and entirely unique usage profiles, unlike offices, where predictions are slightly easier). The net Zero Carbon Building Standard Pilot for Science and Technology buildings for 2025 - 305 kWh/m^2/yr GIA and for 2050 reduce to 180 kWh/m^2/yr GIA, this is for whole buildings or can be applied as a 'mix' where multiple use types are present in one building).

The blended estimates are between 141 – 162 kWh/m^2/annum (GIA) for the options with lab spaces. The blended rate for the preferred option (retain the core) is 162 kWh/m^2/annum (GIA).

The accuracy of the EUI prediction should be looked at in more detail for the final application, for the feasibility study the information provided seems reasonable and consistent across options and the outcome should be a building that performs well in operation.

The Feasibility Study mentions Renewable Energy Guarantee of Origin (REGO) certified energy could be used to supply energy to the building. This is welcome but there is no firm commitment at this stage. Furthermore, use of REGOs cannot be considered from a policy perspective and will therefore not inform the planning decision.

All services within the building have been stripped out and were mostly at end-of-life (see Section 2.4 of this report). Whilst Volume Three does mention the minimum upgrades required to meet Building Regulations, it does not specifically address Part L consequential improvements, this would likely require significant upgrades to the façade performance to meet regulation. Part L could require additional work to improve the overall energy efficiency of the building (when certain thresholds are met and subject to viability). This is an acceptable reason to discount a light refurbishment option as not being possible. As such a light refurbishment option has not be taken forward. The review team agrees with this approach.

The report provides details of the current façade, which is in a poor state. The report states the U-value would be two to three times worse than modern standards with secondary glazing U-value of approximately 2.4 W/m^{2}K and without the secondary glazing the U-value is approximately 4.2 W/m^{2}K. It also states the air permeability will be approximately seven times worse than a more modern equivalent and assumes it would be around 20m^3 (hr/m^2@50Pa), this seems a reasonable estimate considering the condition and age of the façade.

Given the nature of the existing façade it will perform poorly and would not meet current Building Regulations or the performance needed for a 'low carbon' building in operation. It is also noted that the façade cannot be realistically upgraded. This is a reasonable assumption given the poor condition of the façade. Consideration should be made of what can be achieved with the removed façade in material terms (see carbon and circular economy section of this report).

In addition, current policy and the potential Minimum Energy Efficiency Standard (MEES) updates the building would need substantial service (and fabric) upgrades to achieve better energy performance in terms of EPC. The existing building, if operational, would not meet current energy standards without major interventions.

Benchmarks have been used but these are based on office use only as acknowledged in the text. - Carbon impacts of lab use are noted for each relevant options, the EUI used to inform the operational carbon impact is not explained in detail, but assumption appear reasonable. As mentioned previously Laboratory uses tend to have significantly increased power loads and air side energy and changed operational hours (compared to offices). The comparison of differing options is reasonable but given the level of intervention required for the development. the comparison methods are consistent across options (for offices and labs) If the energy figures provided are achieved this will be a good in use performance (for all options).

It should be noted that a light touch refurbishment was considered as part of the initial study, however following the review of the information and discussions with Camden and the BL team, it was agreed that a light refurbishment option is not a viable nor sensible approach for Euston Tower and has been excluded from the feasibility report. This is due to multiple reasons, including regulations and it no longer meeting standards required. The façade needs to be replaced as part of any refurbishment works to the tower to improve operational energy performance, daylighting and because it has reached its usable life. As such the agreed baseline option is the 'Major Refurbishment' option.

3.2 CPG Chapter 3: making buildings more energy efficient

There is reference to the performance of the original building in occupation, although as mentioned above the EPC is out of date, however the current EPC has the same performance band. No historical in use energy performance (energy consumption) data from the existing building has been provided due to lack of available / accessible data, as a result an estimation of 300 kWh/m^2/annum has been provided. All options indicate a significant improvement on this estimation. See the Building MEP service section of this report (Section 2.4) for further discussion and details.

The options now clearly define both office and lab spaces and their associated energy use impacts (EUI) in section 17.3 and the summary table of Volume Three [62]. This change is in response to comments previously issued by the review team. Lab space will increase the energy consumption of the building compared to a typical office space but the options allow for comparison.

All options, regardless of use type show a lower consumption than the estimation of building perforce from the existing building. This is an acceptable conclusion on an EUI/m^2/yr basis. Operational energy emissions [B6] EUI has been converted to carbon using National Grid FES 2021 'steady progression' scenario, with a change in carbon factor applied every 5 years, until 2050.

3.3 CPG Chapter 4: decentralised energy

The Feasibility study has updated and clarified the decentralised energy information to align with policy. There are no existing local networks under the 'be Clean' category in Section 18.2.2 [63]. This in line with policy, however, no heat network map has been provided.

Detailed information on the locality or availability of local heating and cooling networks should be provided as part of the energy strategy for the application. A high-level statement that a future connection provision will be made as part of the application in line with policy. A review would be expected to be included as part of the energy strategy for the chosen option, for the feasibly study this approach is acceptable.

3.4 CPG Chapter 5: renewable energy technologies

An all-electric approach using Air source heat pumps (ASHP) is mentioned as the main plant for heating, cooling an d hot water and potentially PV under be green. No other low and zero carbon targets (LZCT) are mentioned at this stage, and we would expect a full energy strategy to be developed in future to include this information. At feasibility stage this is acceptable, with greater detail to follow at application stage. Although sperate to the chapter 5 requirements it should be noted the study does mention procuring Renewable Energy Guarantees of Origin (REGO) backed energy where possible.

3.5 CPG Chapter 6: energy statements

A detailed energy statement has not been provided for the feasibility study. The study is based on estimates and assumptions. These are reasonable for the time of the study. We would not expect a completed energy statement at feasibility stage. This will be provided further on in the design process at application stage. The feasibility study does outline an initial approach in line with the energy hierarchy and has ambitions energy performance targets. EUIs are provide for each options and these appear to be consistently applied.

3.6 CPG Chapter 7: energy reduction

See Section 3.1 above. All options will require new plant and controls. This should result in a significant improvement compared to the oil and gas boilers that were part of the existing building (note the boilers have already been removed). The strategy involves an all-electric solution. The EUIs for all options are listed as being lower than the existing building condition. Overall impacts in carbon terms have not been compared of the existing building verses the overall areas of different options.

3.7 CPG Chapter 8: energy efficiency in existing buildings

See above and Section 2.4 of this document.

3.8 CPG Chapter 10: sustainable design and construction measures

This chapter of the CPG focuses on ways in which the proposed development can be optimised for future climate change and make a positive contribution to green space provision or urban greening. We would not expect the topics in this chapter to be addressed in detail within a feasibility study.

[62] Volume Three, Section 17.3 Summary and Comparison, page 142.
[63] Volume Three, page 146.

3.8.1 Overheating

Overheating (thermal comfort) has not been addressed in the Feasibility Study. This is appropriate for the stage at which this work was carried out and we would expect this to be investigated for the chosen option and details provided in the final application.

It should be noted the existing façade performance it would not comply with CIBSE Guide A, thermal comfort requirements for present and future climate. Significant improvements would be required to the existing façade therefore it is another reason for a new façade.

3.8.2 Cooling Hierarchy

This has not been provided in the Feasibility Study. This is appropriate for the stage at which this work was carried out. We would expect this to be investigated for the chosen option. Given the nature and the size of the tower it is likely that active cooling will be required for labs and offices.

Note: A residential use may not require active cooling; however, it is unlikely residential use will be prioritised. Due to Camden policy E1 and E2 which prevents conversion of office space to non-office space (page 173 of Volume One).

3.8.3 Flooding & drought

Nothing mentioned within the Feasibility Study regarding flooding, drought, retaining water for use in the building or resilience to climate change. This is appropriate for the stage at which this work was carried out and we would expect this to be investigated for the chosen option.

3.8.4 Green spaces

Nothing mentioned within the Feasibility Study regarding improving green spaces, green roofs or walls, wildlife etc. This is appropriate for the stage at which this work was carried out and we would expect this to be investigated for the chosen option.

3.8.5 Greening roofs

Nothing mentioned within the Feasibility Study, this is appropriate for the stage at which this work was carried out.

3.8.6 Greening walls

Nothing mentioned within the Feasibility Study, this is appropriate for the stage at which this work was carried out.

3.8.7 Sustainable design & construction measures (sustainability statement)

Aspects of the table are covered by the Feasibility Study to some degree (e.g. materials and resource conservation) but many others are not yet covered. This is acceptable at feasibility stage and we assume more detail will be provided at detailed application stage. .

3.9 CPG Chapter 11: sustainable assessment tools

3.9.1 BREEAM

BREEAM Excellent is a requirement for planning; this is not considered by the Feasibility Study provided by British Land at this stage. It will form part of the final application. It is assumed a market-leading development of this nature would target BREEAM Outstanding.

3.9.2 Home Quality Mark

Home Quality Mark will not apply as residential use for the tower appears to have been ruled out by the Applicant.

3.9.3 PassivHaus & EnerPHit

PassivHaus could be considered for this development but is not currently mentioned. The EnerPHit Standard could be considered for a refurbishment scheme but given the façade needs to be replaced it is suggested PassivHaus would be a more appropriate certification scheme.

3.9.4 NABERS UK

Whilst not in Camden policy the aim for the project is to use industry leading modelling estimations using NABERS. Section 18.3.2 [64] explains the aim is to achieve a best-in-class NABERS rating for the development which shows a

[64] Volume Three, page 148.

commitment to try and design and operate the building as efficiently as possible. This will require a very detailed metering and monitoring strategy to be developed during the detailed design phases. The feasibility studies mentions it will be tuned post-completion to optimise its real-world energy performance.

NABERS is an energy rating system that evaluates the performance of a building and its energy consumption in use and provides a star rating (1-6 stars). During design a NABERs Design for Performance rating can be undertaken to help inform design decisions and try to accurately evaluate a building's performance (either as a whole building, for landlord-controlled areas and systems or for the tenant spaces).

3.9.5 WELL

Although not a planning requirement it is acknowledged that there is tenant demand for WELL certified buildings and as such this may form part of the client brief going forward.

3.9.6 Developer targets

British Land have a set of sustainability requirements in the 'British Land Sustainability Brief' that forms part of their project brief. This includes metrics for commercial building such as achieving BREEAM 2018 Outstanding, biodiversity improvement, energy performance targets, embodied carbon targets and several other requirements. Laboratory use is not currently covered in this document; however offices are.

4. Discussion and conclusions

4.1 General feedback and comments

We recognise the amount of work that has gone into the Feasibility Study. Given the high-profile nature of the application, this level of diligence is expected. However, the Applicant Team have provided substantial and detailed information within the Feasibility Study for the options presented. The reviewers agree that the Applicant Team have provided information to enable informed decision making relating to reuse / retrofit of the existing building.

We encourage broader adoption of this type of process across the industry, particularly for future applications involving prominent existing buildings. Whilst there is substantial detail within the Feasibility Study there are a few clarifications and points that the team would like to be addressed, or at least taken forward to detailed application stage:

- Consideration of targets for embodied and operational carbon. As an exemplary project we would expect to see detailed carbon targets implemented, with clear 'carbon budgets' for each works package.
- Temporary works are challenging to estimate during optioneering as detailed information or methods are not available at a feasibility stage. Further detail of the proposed temporary works, and the associated embodied carbon of these will need to be provided. As an exemplary project we would suggest that this includes early engagement with the supply chain to determine realistic assumptions for reuse of temporary structures. This scheme represents a good opportunity to develop the industry's knowledge in this area.
- Further detail of the proposed façade and associated embodied carbon – to be provided at detailed application stage.
- Details of any proposed carbon offsetting, including approach if undertaken.
- Inclusion of uncertainty / contingency factors for embodied carbon figures.

Whilst not a policy requirement, the Applicant Team may wish to consider aligning future calculations with RICS Whole Life Carbon Profession Standard 2nd edition and/or the UK Net Zero Carbon Building Standard.

4.2 Compliance with Policy CC1 and the CPG

From reviewing the three volumes we conclude that from a technical perspective the Applicant Team have done what is asked for by Policy CC1 for a pre-planning review. We have summarised this below in Table 3.

4.2.1 Reuse potential

With regards to the existing building we agree with the Applicant Team's conclusion that the building's structure is the only element potentially suitable for reuse. Under all circumstances the façade and services would need to be entirely replaced.

According to the surveys undertaken the existing structure (both above- and below-ground) is in good condition. For reference this is confirmed in Section 7.2 of Volume One of the Feasibility Study [65], which concludes that 'the structure appears to be in reasonable condition for its age and [is] suitable for its intended purpose as an office space.'

Should the structure be retained and reused upgrades would be required to meet current fire safety guidance for a building of this height. However, these upgrades do not necessitate wholesale demolition of the existing structure. Actions required include:

- Achieve 120-minute structural fire rating (via intumescent coatings or fire boarding)
- Load balancing to justify additonal load on foundations (resulting from installation of a new, modern façade)
- New penetrations through slabs to accommodate additonal lifts (fire fighting lifts cannot be shared with goods lifts – as is currently the case).

Provision of fire escape cores is critical. The existing building would support two escape cores (the existing east and west cores, following upgrades). This is suitable for continued office use. If multiple uses are to be accommodated within the building additional independent escape cores would be required, which would be difficult to accommodate within the existing building layout.

[65] Page 116 onwards.

The Applicant Team have taken a logical approach to assessing the impact on existing floorplates resulting from the required upgrades. These are summarised in Section 7.4.6 of Volume One [66] and include:

- Provision of additonal risers
- On floor air handling units
- Upgraded passenger lifts
- New goods lifts

The ribbed slab system necessitates removal of large portions of the floor slab to accommodate these required improvements. This has a negative impact on floorplate efficiencies (with net to gross efficiency estimated to be 67%).

4.2.2 Alternative uses

The Applicant Team have explored three potential uses for the existing building:

- Commercial-led developments
- Residential / mixed-use developments
- Hotel / student accommodation developments

From a technical perspective the Applicant Team confirm that the building could be converted to either residential use, hotel or student accommodation. In the case of residential uses the Applicant Team concludes that 'the cost of such a conversion relative to value achieve is highly prohibitive to financial viability' [67]. Conversion to 100% hotel has been ruled out due to lack of operator or investor interest [68]. Neither a fully residential nor a student accommodation only scheme have been considered due to 'poor air quality at the lower levels of the tower' [69]. A mix of either hotel and residential or hotel and student accommodation has been ruled out due to the ;cost of such a conversion relative to the value achieved being prohibitive to financial viability' [70].

With regards to a commercial-led development the Feasibility Study argues that a major refurbishment, with minimal demolition and no extension of the floorplate, is not financially viable[71]. Therefore, to make the development viable remodelling of the existing building (including demolition and extension) is required.

The question LB Camden should ask is whether the extent of proposed demolition is acceptable. The Applicant Team's main argument for demolition of the existing floor slabs is that the floor-to-ceiling heights and internal layouts are sub-optimal for the contemporary office rental market. The building has a complex history in terms of letting, since 2010 the building was never occupied at more than 70%, with tenants consistently moving out. In addition, if lab space is a driver for the future use of the building, additional floor-to-floor height will be required over and above the contemporary office requirement.

The basis of Policy CC1 (as with similar policies across London) is to encourage reuse of existing buildings. As an industry we have little chance of meeting our carbon targets without reusing a significant number of buildings, however the issue is a complex one. As such, we need to start questioning the assumptions we are making with regards to what is classed as 'optimal' and 'sub-optimal'.

The existing building can meet the BCO guidance for floor-to-ceiling heights in refurbished buildings. However, we understand and appreciate that it will be extremely difficult to extend the existing floorplates and achieve BCO guidance for clear floor-to-ceiling heights in these extended areas. We also acknowledge that there is little point in either leaving buildings unoccupied or delivering a large quantum of office floor space that does not meet BCO guidance.

From a policy and environmental perspective, a major refurbishment (or retention and partial extension) would be the preferred solution. However, if this is not financially viable, of all the options put forward in the Feasibility Study we agree that the most realistic is to retain the core. This option attempts to provide a compromise position and is less impactful than a completely new build option. All other options for partial retention and extension pose significant problems, from a viability and/or technical perspective. The substantial amount of temporary works involved in these options (particularly propping slab edges) is challenging both in terms of the embodied carbon associated with these works and the complexity of the potential build programme (and the health and safety risks).

Overall the Applicant Team have covered an acceptable range of development options and have come to a justifiable conclusion with regards to the extent of the demolition proposed. Given the high-profile nature of this application, and the extent of demolition proposed, we stress the importance of carrying out further, detailed research and analysis into options for reducing the selected scheme's embodied and operational carbon. We would expect this to be addressed at detailed application stage and continued post-planning.

[66] Page 156 onwards.
[67] Feasibility Study, Volume Two, Section 10.5.1, page 104.
[68] Feasibility Study, Volume Two, Section 11.5.1, page 136.
[69] Feasibility Study, Volume Two, Section 11.1.1, page 108.
[70] Feasibility Study, Volume Two, Section 11.5.1, page 136.
[71] It is not within the remit of the review team to analyse the financial viability arguments put forward by the applicant team.

Table 3: Summary of Applicant Team responses against Policy CC1 requirements

Policy CC1	Requirements	Addressed by Applicant Team within the feasibility study?
A	• Promote zero carbon development • Require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy.	Partial – this will be developed further at detailed application stage.
B	• All major development to demonstrate how London Plan targets for carbon dioxide emissions have been met.	Partial – this will be developed further at detailed application stage.
C	• Ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks.	Partial – this will be developed further at detailed application stage.
D	• Support and encourage sensitive energy efficiency improvements to existing buildings.	Partial – this will be developed further at detailed application stage.
E	• All proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building.	Yes – the feasibility study addresses the aims of this point by reviewing differing levels of reuse and comparing these to a new build scenario.
F	• All developments to optimise resource efficiency.	Partial – this will be developed further at detailed application stage.
G	• Working with local organisations and developers to implement decentralised energy networks in the parts of Camden most likely to support them.	Not relevant for feasibility study.
H	• Protecting existing decentralised energy networks. • Safeguarding potential network routes.	Not relevant for feasibility study.
I	• All major developments to assess the feasibility of connecting to an existing decentralised energy network. • Or where this is not possible establishing a new network.	Partial – this will be developed further at detailed application stage.

Appendices

Appendix A: Early screening against GLA criteria

The major refurbishment option has been identified as not feasible in Volume One. All other options presented in Volume Three involve, with different degree, structural demolitions, new primary structure and new floor area to be created. It's therefore reasonable to assume that the project will be GLA referable, regardless of which viable option is taken forward.

Whether the scheme is GLA referable or not, in common with other London Boroughs it is suggested LB Camden request the project is compliant with the current GLA requirements for a whole lifecycle carbon assessment (WLCA) and circular economy statement (CES). All relevant requirements in this regard will need to be addressed as part of the planning application.

Demonstrating compliance with GLA requirements goes beyond the remit of the feasibility study, this is largely understood and accepted. This section of the Feasibility Study includes an early screening of the GLA requirements for pre-application stage, mainly for informative purposes and to identify potential issues with the options presented against GLA planning policies.

Whole Life-Cycle Carbon Assessments

At pre-application stage, applicants are required to complete the pre-application tab of the WLC assessment template.[72]

- We acknowledge that this is not relevant at this stage and the necessary evidence will be produced by the project team later during the pre-application stage for the proposed option only.

The pre-application assessment should include confirmation that options for retaining existing buildings and structures have been fully explored before considering substantial demolition, including incorporating the fabric of existing buildings into the new development.[73]

- Different options with different levels of structure retention have been explored.
- A major refurbishment option has been fully explored in Volume One; the project team reached the conclusion that this option is not viable.
- Extended options with higher level of interventions are presented in Volume Three.
- Opportunities for reusing the existing top five materials (concrete, steel, glass, aluminium, and bricks) which make up over 99% of all existing materials by mass into the new development have been explored in Volume One.
- The project team, based on the investigations undertaken so far, reached the conclusion that only a very small part of these materials could be reused on the same site.
- There is no opportunity to reuse existing MEP systems as most equipment has already been stripped out.

The pre-application assessment should include the carbon emissions associated with pre-construction demolition.[74]

- Pre-construction demolition impacts have been estimated for each development options based on the methodology stated in Volume Three (page 110).
- Demolition emissions should technically be reported separately, but the Applicant Team opted to aggregate these impacts to the upfront carbon emissions (A1-A5) in line with the 2nd edition of the RICS PS for WLCAs.
- This is deemed to be a sensible approach for the purposes of the feasibility study.

The pre-application assessment should include an estimate of the percentage of the new build development which will be made up of existing façades, structures, buildings.[75]

- The feasibility study includes an estimate of the retention rate of the existing structure (% by volume) for each development option.
- Percentages spread from 0% for the 'new build' worst case scenario to 92% for the 'max retention' option.
- The 'retain the core' option, which has been identified by the project team as the best balance of structural retention, quality, flexibility, adaptability and buildability comes with a structural retention rate of approximately 31% by volume.

The pre-application assessment should include the WLC principles that inform the development of the sites.[76]

[72] London Plan guidance: Whole Life-Cycle Carbon Assessments, March 2022, paragraph 3.1.1 (page 24)
[73] London Plan guidance: Whole Life-Cycle Carbon Assessments, March 2022, paragraph 3.1.2.2 (page 24)
[74] London Plan guidance: Whole Life-Cycle Carbon Assessments, March 2022, paragraph 3.1.2.3 (page 24)
[75] London Plan guidance: Whole Life-Cycle Carbon Assessments, March 2022, paragraph 3.1.2.4 (page 24)
[76] London Plan guidance: Whole Life-Cycle Carbon Assessments, March 2022, paragraph 3.1.2.5 (page 24)

- The feasibility study includes early consideration of some of the 16 WLC principles outlined in the GLA guidance for Whole Life-Cycle Carbon Assessments.
- We understand a full review of the principles to reduce WLC impact will be undertaken during the pre-application stage for the proposed development option.
- These should be built into the project brief and should be aligned with the energy strategy for the site and with the Circular Economy Statement.

Circular Economy Statements

At pre-application stage, applicants should complete the CE design approaches table in the relevant tab of the CE statement template spreadsheet.[77]

- We acknowledge that this is not relevant at this stage and the necessary evidence will be produced later for the proposed option only.

At pre-application stage, applicants should demonstrate circular economy principles that will be adopted, with reasons explained.[78]

- The feasibility study includes early consideration of some of the six circular economy (CE) principles outlined in the GLA guidance for Circular Economy Statements, such as design for future flexibility, adaptability and disassembly.
- We understand a full review of the CE principles for each building layer will be undertaken during the pre-application stage for the proposed development option.
- The circular economy principles should be included in the project brief and should be aligned with the Whole Life Carbon strategy.

At pre-application stage, applicants are strongly encouraged to submit an independent pre-demolition audit with all applications where demolition is proposed, as supporting evidence to their CE statement.[79]

- A detailed pre-demolition audit has been undertaken by Reusefully Ltd (see Volume One, Appendix M).
- The audit has investigated the key materials which are likely to arise from the full demolition of the existing building down to floor slab.
- The results of the pre-demolition audit should be further reviewed in the next stage once the proposed approach and the actual extent of demolition are determined.

Energy Assessments

Major developments are required to achieve net zero-carbon by following the energy hierarchy (Policy SI 2). This means that regulated carbon emissions should be reduced so they are as close as possible to zero. Once on-site reductions have been maximised, the residual emissions should be offset via a payment into the relevant borough's carbon offset fund.[80]

- The energy hierarchy and the approach to mitigate the energy demand of the proposed scheme are provided in Volume One (Section 3). Additional details are not expected at this stage.
- We understand a detailed strategy to meet the London plan will be established during the application stage once the main option is chosen.
- It should be noted there would be an increase in energy consumption (and associated carbon impact) if lab spaces are taken forward.

At pre-application stage, non-residential development should outline in the preliminary strategy information submitted to the GLA how the overheating risk will be minimised [81]

- Volume One (Section 3) outlines the strategy to minimise overheating risks.
- This will be achieved with a high-performance fabric, limiting solar gains through passive shading (it should be noted that avoiding shading such as fins or brise soleil would reduce overall embodied carbon of the facade) and limited glazing areas with low g-values.
- Further details are not expected at this stage, but it should be reviewed in detail for the application.

[77] London Plan guidance: Circular Economy Statements, March 2022, paragraph 4.3.2 (page 23)
[78] London Plan guidance: Circular Economy Statements, March 2022, paragraph 4.4.1 (page 23)
[79] London Plan guidance: Circular Economy Statements, March 2022, paragraph 4.6.7 (page 24)
[80] Energy Assessment Guidance (GLA), June 2022, paragraph 2.1 (page 6)
[81] Energy Assessment Guidance (GLA), June 2022, paragraph 8.4, table 6 (page 23)

Heating and heat networks: where a heat network exists in the vicinity of the proposed development the applicant must prioritise connection to that network provided that the network does not exceed the CO2 emission and primary energy factor limits set out in Part L 2021; and the network operator has agreed a decarbonisation strategy with the GLA and the relevant borough or is in the process of doing so.[82]

- The feasibility study states there are no existing heat networks in the area. The proposal will allow for future connection to heat networks. A detailed review of local heat networks will be required for the energy strategy for the application.
- In should be noted that The London heat map shows that there proposed heat network to be established on Euston Road (potentially extending the existing Somers Town and King Cross Heat Networks), however this is not in place currently and no date is provided for when this would be available.

[82] Energy Assessment Guidance (GLA), June 2022, section 9 (page 29 onwards)

Appendix B: Policy wording

The Camden Local Plan 2017 is the central document within Camden's development plan – the grouping of documents that sets the planning direction for the borough (see Figure 4). A key aim of the Local Plan is to tackle climate change within the borough. Policy CC1 requires all proposals involving substantial demolition to demonstrate that it is not possible to retain and improve the existing building[83]. The supporting text notes:

- The possibility of sensitively altering or retrofitting buildings should always be strongly considered before demolition is proposed.
- All proposals for substantial demolition and reconstruction should be fully justified in terms of the optimisation of resources and energy use, in comparison with the existing building.[84]

This report reviews the submitted Feasibility Study against these requirements. Further guidance on how this should be implemented is provided in Camden Planning Guidance (CPG): Energy efficiency and adaptation (January 2021).

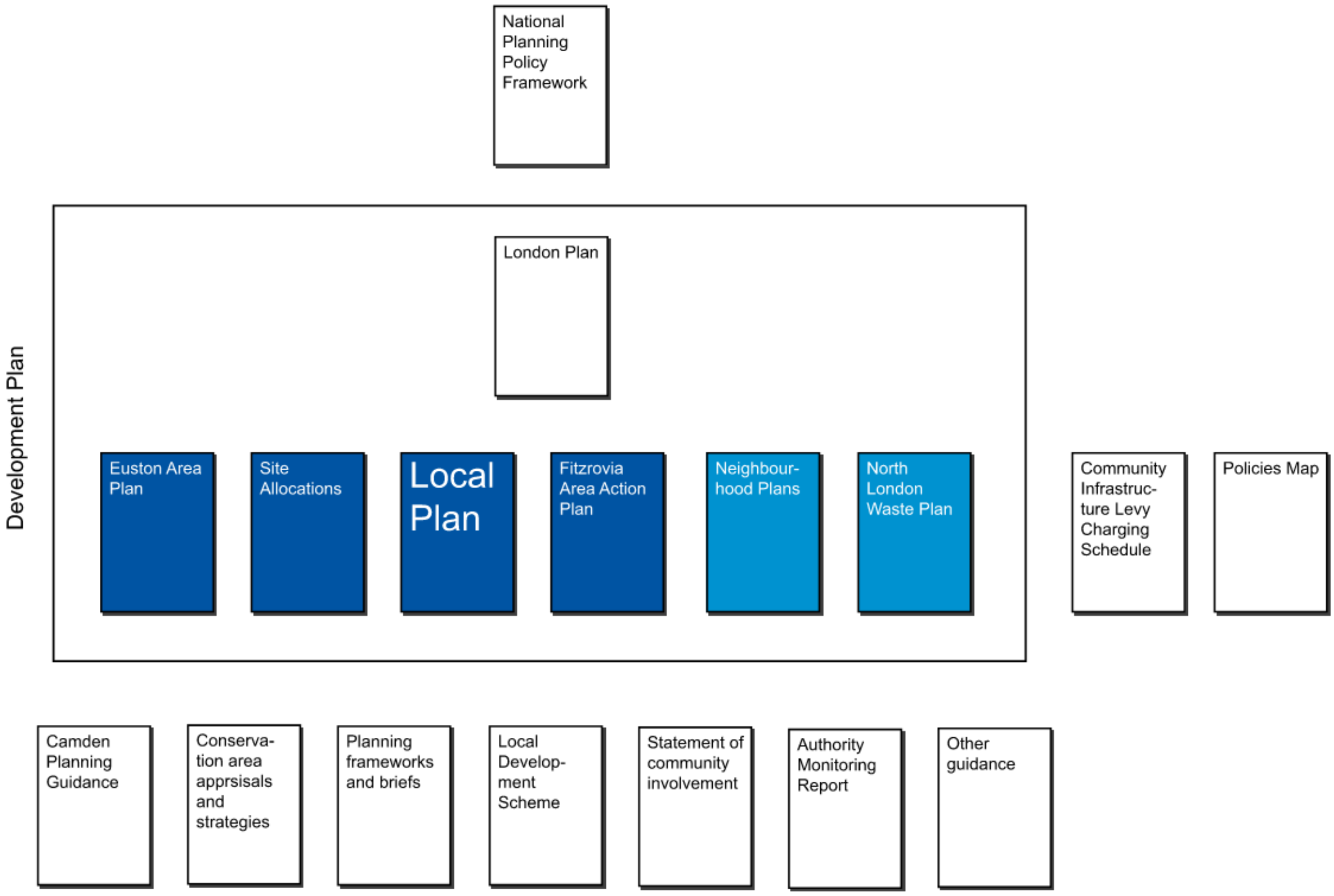


Figure 4: Planning document hierarchy (source: Camden Local Plan 2017)

[83] Policy CC1, point e (Camden Local Plan 2017 page 250). Policy wording reproduced in full in Appendix A for reference.
[84] Camden Local Plan 2017 paragraphs 8.16 and 8.17.

Adopted Camden Local Plan 2017

The Local Plan was adopted by Council on 3 July 2017. It replaced the Core Strategy and Camden Development Policies as the basis for planning decisions and future development in Camden.

Policy CC1: climate change mitigation

The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.

We will:

> a. promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;
>
> b. require all major development to demonstrate how London Plan targets for carbon dioxide emissions have been met;
>
> c. ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;
>
> d. support and encourage sensitive energy efficiency improvements to existing buildings;
>
> e. require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and
>
> f. expect all developments to optimise resource efficiency.

For decentralised energy networks, we will promote decentralised energy by:

> g. working with local organisations and developers to implement decentralised energy networks in the parts of Camden most likely to support them;
>
> h. protecting existing decentralised energy networks (e.g. at Gower Street, Bloomsbury, King's Cross, Gospel Oak and Somers Town) and safeguarding potential network routes; and
>
> i. requiring all major developments to assess the feasibility of connecting to an existing decentralised energy network, or where this is not possible establishing a new network.

To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, major developments will be required to install appropriate monitoring equipment.

Camden Planning Guidance (CPG)

Camden Planning Guidance (CPG) provides advice and information on how we will apply our planning policies.

The adopted CPG documents can be 'material considerations' in planning decisions. However, they have less weight than the Local Plan or other development plan documents.

Energy efficiency and adaption (January 2021): Chapter 9

Reuse and optimising resource efficiency

KEY MESSAGES

- We will expect creative and innovative solutions to repurposing existing buildings, and avoiding demolition where feasible;
- All development should seek to optimise resource efficiency and use circular economy principles.

Supporting information

- Condition and feasibility study, and options appraisal. See paragraphs 9.4 – 9.7. (applies to: major redevelopment applications, any development proposing substantial demolition)
- Whole Life Carbon assessment and pre-demolition audit. See paragraphs 9.6 – 9.7. (All applications where the option is substantial demolition)

- Resource efficiency plan. See paragraph 9.10. (All major applications, and new buildings)

Reusing existing buildings

9.1 Retaining the resource value embedded in structures is one of the most significant actions you can take to reduce waste and material consumption. Include a stage in your asset management process to review the need for a brand new building/asset." (Green Construction Board, Top Tips for Embedding Circular Economy Principles in the Construction Industry).

9.2 Local Plan policy 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; and f) expect all developments to optimise resource efficiency.

9.3 Reusing buildings helps developers and the wider community to understand the environmental, social, and heritage value of a site.

Benefits of retaining and refurbishing buildings:

- Reduces the requirement for virgin materials and therefore reduces its embodied carbon impact;
- Keeps products and materials at their highest value for as long as possible;
- Maintains heritage value;
- Minimises demolition waste;
- Reduces human disruption of extensive demolition and construction works, associated noise and transport impacts, and likely impact on air quality;
- Cost and programme savings, depending on the scope of refurbishment; and
- Achieve BREEAM credits.

Examples

- The examples below have been taken from UK Green Building Council, Circular economy guidance for construction clients, 'How to practically apply circular economy principles at the project brief stage' April 2019.
- The Bartlett School of Architecture was refurbished to provide 3000m2 of additional floor area.
- Derwent London's Angel Building in Islington London was overclad and fully let within 13 months.
- The Senator building in London is being refurbished by Legal & General to high sustainability standards.
- Argent's Kings Cross Development includes over 20 reused and refurbished buildings.
- LWARBs office was fitted out in just four weeks, using circular principles. The result is a smart, medium spec, modern working environment delivered for the same price as a traditional cat B, low spec fit out.
- UKGBC office refit reused or repurposed 98% of original fixtures and fittings.
- The University of Cambridge's David Attenborough building had poor energy and comfort performance, but also a significant volume of embodied carbon locked into the compact 16,000m2 of valuable real estate. The University challenged the design team to retain the building and it is estimated that over 82% of the building's embodied carbon has been saved through the refurbishment works.

9.4 In assessing the opportunities for retention and refurbishment developers should assess the condition of the existing building and explore future potential of the site. The New 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 New 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 following information in the table below should help to inform decision making prior to the pre-application of a scheme. This should provide a transparent and holistic approach to assessing options that delivers the best outcomes.

Condition and feasibility studies (to understand the reuse potential of the existing building/s)	
Existing building uses	• How well does the building function? Identify operational positives/negatives. • Existing user surveys (if occupied) to understand what works / or doesn't work • If the building is not occupied have other options for reuse been explored?
Servicing	• Summary of MEP (Mechanical, Electrical, Plumbing) servicing, thermal performance and efficiency for each building component. • Identify remaining lifespan of plant and discuss pros/cons of plant upgrade.
Technical: review, with evidence and photos, of existing building, based on intrusive survey.	• Upgrades required to comply with current legislation • A material inventory audit, including an estimate of embodied carbon • Scaled section drawings showing slab depths, floor-to-ceiling dimensions etc. • Loading capacity of structural frame, materials strength, pile testing • Energy performance of the façade • SBEM (Simplified Building Energy Model) energy modelling • Details of Air Tightness, thermal bridge modelling and condensation analysis in exploration of limits to fabric upgrade in existing building • Future projections for carbon content of electric load should incorporate latest BEIS carbon factors
Site Capacity	• What is the best use of the site? And can optimal site capacity be achieved?

Development options

9.5 Taking into account the condition of the existing building and feasibility of re-use above, the following hierarchy should be used to explore all potential options of an existing site, with the aim of optimising resource efficiency (paragraphs 9.9 – 9.12).

9.6 All options should achieve maximum possible reductions for carbon dioxide emissions and include adaptation measures, in accordance with the Council's Development Plan and this CPG.

7. Refit
8. Refurbish
9. Substantial refurbishment and extension
10. Reclaim and recycle

Refit

This option retains the existing structure as is, includes minor works, and the replacement of building services such as heating and insulation, to continue occupation of the building.

Refurbish

Refurbishment should seek to significantly improve the service life of the existing building. This option provides an opportunity to retrofit the building to reduce carbon emissions and include sustainable adaptation measures.

Substantial refurbishment and extension

This option is similar to the above, but takes into consideration the need to optimise site capacity and alter the existing structure to meet future needs. This may involve significant changes to the façade (façade replacement) but should seek to retain as much of the existing building as possible reducing the need to use new materials and reduce the loss of embodied carbon in the existing structure. If this option includes partial reclaim and recycle the development proposal should include a pre-demolition audit, as specified below.

Reclaim and recycle

Where it is demonstrated to the Councils satisfaction, that the above options are not feasible the development proposal should include a pre-demolition audit identifying all materials within the building and documenting how they will be managed. The preference should be for re-use on site, then re-use off site, remanufacture or recycling. (Providing time in the project plan for selective deconstruction techniques and materials storage to maximise reuse). . New London Plan policy SI7 expects 95% of construction and demolition waste to be diverted from landfill (reuse, recycle, recovery), and 95% of excavation waste to be put to beneficial use.

At this option a Whole Life Carbon assessment (including embodied carbon) should be submitted, following the GLA draft SPG and including long term carbon factors (as set out in the GLA Whole Life Carbon SPG).

Specifically, the most recently available long-term Green Book projections from the Government should be used in preference to the National Grid source suggested in the current draft, as we view this is as the more established source. The fuel-specific carbon factors are given, to year 2100, in worksheet 'Conversion factors from fuel to CO2e' within the spreadsheet 'IAG spreadsheet toolkit for valuing changes in greenhouse gas emissions'. WLC assessment to be undertaken prior to any public consultation and results explained and included in design options.

9.7 This approach is justified through Local Plan policy CC1 which requires all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building. Paragraph 8.17 of the Local Plan states this should be justified in terms of optimisation of resources and energy use. As such a Whole Life Carbon assessment will be expected for all applications proposing substantial demolition.

9.8 It is important to connect all development options to resource efficiency and circular economy principles, outlined in Local Plan policy CC1 and expanded in the section below.

Resource efficiency and circular economy principles

9.9 As noted above the construction process and new materials employed in developing buildings are major consumers of resources and can produce large quantities of waste and carbon emissions. Policy CC1 expects all development whether for refurbishment or redevelopment to optimise resource efficiency by:

- reducing waste;
- reducing energy and water use during construction;
- minimising materials required;
- using materials with low embodied carbon content; and
- enabling low energy and water demands once the building is in use.

9.10 Reducing embodied carbon impacts can result in other additional benefits including: less waste to landfill from efficient construction methods, or improved air quality benefits from reduced transportation and lower costs of development, operation, and maintenance.

9.11 Policy SI7 of the New London Plan and GLA draft guidance provides a clear framework for integrating circular economy principles within a development but this has the most value when considered at the earliest stages of project design.

9.12 There are various stages of the development process where resource efficiencies can be made and we will expect these to be demonstrated in your Sustainability or Energy statement where relevant.

Design stage

- Energy efficient building design
- Minimise the quantities of materials used
- Where demolition is involved, submission of a pre-demolition audit, implementing careful demolition strategies, segregating materials and conducting analysis to maximise reuse and reclamation
- Use of reclaimed / recycled content, and enabling reuse of building materials (local sourcing through material exchange portals)

- High durability materials and low maintenance requirements
- Design to allow for flexibility – reconfiguration/ remodelling
- Design to allow for easy repair/ replacement of components
- Design for deconstruction and reuse of materials

Construction stage

- Minimise the quantities of other resources used (energy, water, land)
- More efficient use of resources and materials including minimising waste generation
- Divert waste from landfill (via reuse, recycling or recovery)
- Demolition and construction waste - 95% to reuse, recycling, recovery (excavation 95% 'beneficial use')
- Use efficient demolition equipment
- More efficient modes of transporting materials
- Local sourcing of materials responsibly and sustainably
- Post completion bill of materials (including as a minimum the building layer, element, material and quantity)
- Efficient construction processes and machinery

Operation stage

- Use a soft landings approach to ensure the building is operating efficiently as designed
- Implement a good maintenance/ repair strategy to maximise life of materials
- Consider repair before replacement
- When replacements required select high durability materials with low maintenance requirements

Deconstruction/ end-of-life, and managing waste

- Design for deconstruction and reuse of materials
- Divert waste from landfill (via reuse, recycling or recovery)
- Demolition and construction waste - 95% to reuse, recycling, recovery
- Excavation 95% 'beneficial use'
- Use efficient demolition equipment

Appendix C: Independent review team

Current review team

This independent review has been carried out by:

Ben Holmes (Elliott Wood)

Ben is an Associate Director with over 10 years' industry experience. His expertise includes embodied carbon, circular economy and building certification. A passionate advocate for sustainable, low carbon development, Ben has a strong understanding of how global issues of climate change, habitat loss and resource depletion pertain to the built environment. Ben leads Elliott Wood's Sustainability Team.

Ben is interested in the interconnections between disciplines, and takes a holistic approach to sustainability consulting, working closely with colleagues to deliver tailored solutions to complex problems. Over the course of his career Ben has worked in almost every major sector, from education and residential, to industrial and leisure.

Sarah Pellereau MEng CEng MISructE (Elliott Wood)

Sarah is an Associate Director with over 20 years of experience and prides herself in designing efficient elegant structures She's highly technically and always looks for the best solution, as a result she has a lot of award-winning projects to her name.

With a Master's in engineering and RIBA Part 1 in Architecture she has a focus on detail. She has a broad spectrum of expertise across heritage and new build projects from commercial to education and cultural buildings. She is also a technical judge reviewing the structure for several construction industry awards.

James Souter MEng CEng MIStructE (Elliott Wood)

James Souter has over 20 years of experience in Structural Engineering and as a director, he is responsible for two teams working out of Elliott Wood's central London office. James has specific expertise in the Commercial sector and has delivered an array of award-winning projects both in the UK and overseas. He particularly enjoys the challenge of complex refurbishment projects as they align with his enthusiasm for low carbon and sustainable solutions.

James is Elliott Wood's engineered timber expert. He is also leading an initiative called the Commercial Timber Guidebook which is funded by Built by Nature and aims to enhance the collaboration between the UK Construction and Insurance industries, specifically in relation to exposed timber buildings.

Andew Moore (Hilson Moran)

Andrew is an Associate Director and experienced Sustainability Consultant and LCA reviewer. He has over 15 years' experience in the industry. Areas of expertise include embodied carbon and materials impacts, energy management in use, and climate change risk.

Andrew is a leading industry figure, most notably for developing and co-authoring the City of London policy advice note on WLC optioneering for early-stage carbon related decision making.

Andrew Ashfield (Hilson Moran)

Andrew is a director and leads the London Environmental Building team. He has over 40 years' experience in the industry and has delivered some of London's largest schemes across a number of sectors including commercial, residential, education and data centres and has extensive experience in electrical engineering.

Andrew has worked in both the public and private sector and has delivered notable projects such as 1 Bank Street, 100 Bishopsgate and 20 Fenchurch Street.

Samuele Rando (Hilson Moran)

Samuele is a Principal Sustainability Consultant who has extensive experience undertaking Whole Life Carbon assessments and supporting design teams in the implementation of Circular Economy principles over the last 7 years. His experience spans from high-rise office buildings to multi-storey residential developments, from large scale industrial projects to educational buildings.

Samuele recently supported Camden Council as an independent reviewer of WLCAs submission for other strategic applications in the London Borough of Camden, having gained in-depth knowledge of Camden's planning policies.

Previous reviewers

Penny Gowler MEng CEng MIStructE (formerly Elliott Wood)

Is an experienced Chartered Engineer (MIStructE) who's expertise lies in embodied carbon and circular economy, particularly reuse of materials. This is supported by over 17 years' structural engineering experience working on complex existing buildings and new build projects across a range of sectors including commercial, education, housing and hotels.

Statement of independence

Elliott Wood & Hilson Moran have been appointed by Camden as independent advisors to review the Feasibility Study (Volumes One, Two and Three) and comment on if they comply with specific policies.

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