STOP
RETHINK
RESET

WHY THE CITY OF LONDON'S CARBON ASSESSMENT FOR LONDON WALL WEST IS MISINFORMED AND MISLEADING

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INTRODUCTION

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HAVE MEMBERS OF THE COURT OF COMMON COUNCIL BEEN MISLED?

Barbican Quarter Action* believes that in the case of the City's London Wall West (LWW) proposals the Court has been misled.

We have commissioned two reports by leading UK experts, Bob Stagg of Conisbee Structural Engineering and Simon Sturgis of Targeting Zero, which are presented here.

These reports contest the reliability of the City's own Whole Life Carbon Assessment (WLCA 31/05/22) and call into question the legitimacy of the decisions that have been made on LWW to date.

Simon Sturgis is the UK's leading expert in delivering a low carbon, resource efficient, built environment. Most recently he has been responsible for the review of the plans to demolish the M&S flagship store in Oxford St, as a result of which the scheme has been called in by the Secretary of State.

Bob Stagg is a structural engineer specialising in the appraisal, repair and refurbishment of buildings. He was involved with the final dismantling of Ronan Point after its partial collapse in 1968.

Their reports show that the WLCA is flawed and misleading. It is built on the assumption that Bastion House is at risk of disproportionate collapse. The review by Conisbee Structural Engineers emphatically contradicts this.

The actual carbon assessment falls short as it does not consider the retention and retrofit of Bastion House and ignores the impact of its demolition on the scheme's carbon footprint.

Sturgess states "National Legislation sets out a net zero trajectory to 2050 with demanding interim targets for 2030 and 2035. The demolition and new build approach proposed for this site will not meet these targets. A more comprehensive retrofit approach than the one proposed, with Bastion House retained and retrofitted, would have far lower carbon emissions, and help meet these targets."

The City's justification for demolishing the existing buildings does not stand up to peer review.

We urge the Court and Officers now to STOP, RETHINK and RESET current plans for London Wall West in the light of these expert reports. Failure to do so will result in damage to the Corporation's reputation, not just on a local but on a national and international stage.

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Key Points

The Whole Life Carbon Assessment (WLCA) justifies the need for demolition, claiming *"that retaining the existing building fabric does not achieve the most sustainable outcome for this transformative and strategic site"*.

What underpins their argument is the assertion that Bastion House is at risk of disproportionate collapse and thus not safe for retrofit and reuse:

"reuse of Bastion House is not considered feasible from an engineering perspective on account of the risk of disproportionate collapse which arises from the unique transfer structure and column design at level 3 of Bastion House" (WLCA 4.2.3).

In fact, only buildings using the Large Panel System of construction are at such risk. Bastion House is not built using the LPS system. Bob Stagg reports that Bastion House and the MoL comply with all current Building Regulations and the buildings are in better condition than many other concrete buildings of that era. Strengthening of either building is not needed. Bastion House is not unsafe

Having assumed that Bastion House must be demolished on the grounds of safety, the LWW team chose to consider and compare only two options: complete demolition and a part retention option – both of which include the demolition of Bastion House.

"the Whole Life Carbon Assessment concludes that that the redevelopment option would perform 10% better than the partial retention option" (WLCA executive summary)

Simon Sturgis of Targeting Zero refutes this claim, pointing out that *"The demolition and new build approach proposed for this site will not meet these targets. A more comprehensive retrofit approach than the one proposed, with Bastion House retained and retrofitted, would have far lower carbon emissions, and help meet these targets."*

Simon goes on to state that *"The London Wall West Report appears to be designed to pay lip service to the requirement to examine retrofit, and to set out to prove that new build is the only realistic solution. If the City of London is serious about its ambitions with respect to climate change, then this project needs to be re-examined in the light of these stated ambitions."*

We repeat our call from the Open Letter sent to Members of the Corporation by the Barbican Association and Golden Lane Estate Residents Association in May 2021: *"given the international significance of the Barbican and Golden Lane, and its commercial and cultural contribution, the City needs to bring together all the different interest groups in in an inclusive, forward-looking process to create a proper Blueprint; not just a jigsaw of unconnected, and often competing and wasteful initiatives"*.

Adam Hogg and Averil Baldwin, joint chairs Barbican Quarter Action

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*Barbican Quarter Action (BQA) is a campaign group, working on behalf of residents from the Barbican Estate, Golden Lane, Monkwell Square, Little Britain, London House and the wider neighbourhood, to challenge any proposed development that could potentially damage areas of cultural, social, historical and geographical significance as well as injuring the reputation of the Corporation of London on an international stage. BQA is supported by the Barbican Association.

These reports were presented by their authors on a webinar organised by BQA on Monday 26th September. A recording of the webinar is available on our website: londonstartshere.co.uk

Appendices

i. Open letter to C.Hayward
ii. Bob Stagg full report
iii. Simon Sturgis full report

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APPENDIX I

BQA OPEN LETTER TO MR. C. HAYWARD
23rd JUNE 2022

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To Chris Hayward
Chairman of the Policy and Resources Committee
City of London Corporation
Guildhall
Aldermanbury
London EC2V 7HH

23 June 2022

LONDON WALL WEST – RESPONSE TO PROPOSALS PUBLISHED 18 JUNE 2022

OVERALL COMMENT

We are dismayed that the fundamentals of the proposed design remain the same as those we saw last December. The scheme proposes the demolition of Bastion House and the Museum of London. In their place is planned a huge office-led development of some 780,000 sq. ft, including two massive new towers, with limited cultural and green space. The scheme is wholly inappropriate for a site of such significance, both in its physical form and in terms of its proposed usage. Moreover, it undermines the City's desire, as expressed in Destination City, to be one of the world's premier destinations through its cultural offerings.

OUR OBJECTIONS

We have been told repeatedly that the principal objective of the proposed development is to raise funds – for the move of the Museum of London and other City projects. By focusing on this objective, the City will:

- Ignore the site's rich history, which features the Romans, Shakespeare, and John Wesley and many other historical features. The opening up of the Roman Fort Gate will be severely diminished by its commercial setting.

- Sacrifice the site's public cultural heritage: as the home of the Museum of London for 50 years and the previously intended location of the world-class Centre for Music. It remains the Southern gateway to Culture Mile linking the South Bank and Tate Modern to St. Paul's Cathedral and beyond.

- Confront visitors instead with a huge commercial development, with a cultural offering representing just over one per cent of its space.

- Compromise the nature and architectural integrity of the Barbican Quarter. The Barbican is world-renowned and one of the City's major post-war achievements. The Museum complements the public benefit of the Barbican while Bastion House reflects its admired Brutalist design. The new proposals include little in the way of public benefit while the height and mass of the buildings will dominate and diminish the surrounding neighbourhood.

- Undermine many of its own policies and statements: the draft City Plan; the Open Space, Responsible Business and Climate Change strategies; the aims expressed in Destination City and the desire for the City to be a cultural hub, as expressed in the Barbican/Golden Lane Strategy .

There are also questions concerning the scheme's compatibility with the National Plan and the National Planning Framework . How can the City ask others to respect its policies if it fails to do so itself?

THE CITY'S CLIMATE CHANGE STRATEGY

It is now widely agreed that, because of the devastating impact of carbon emissions on global warming, and the large proportion of carbon emissions resulting from major construction projects, serviceable buildings should not be demolished if re-fitting them is a feasible alternative. Our polling showed that 88% of Barbican residents opposed demolition of Bastion House and the Museum of London. However, the Whole Life Carbon Assessment report prepared by the City's project team dismisses the option of retaining Bastion House without providing the necessary factual evidence. The judgement is based on a hypothetical assessment of risk rather than a full structural survey.

Moreover, if the scheme were to go ahead in its current proposed form, it would add over 45,000 tonnes of CO2 to the atmosphere during the demolition and construction phases. This is more than the entire CO2 annual output of the City Corporation's operational activities. How would this be compatible with the City's stated aim of achieving Net Zero in its own operations by 2027?

THE CONSULTATION PROCESS

The City has stated its *commitment to transparency and delivering a robust consultation process*. We have commented elsewhere that this is far removed from our experience. Above all, the City has failed to engage with local stakeholders

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on the fundamental issues about the site as recommended by the National Planning Policy Framework.

While the Project Team has specified the nature of the consultation undertaken to date and highlighted the key concerns that arose (the height and mass of the proposed buildings, and issues of sustainability) they have provided *no information whatsoever* on the extent of those concerns, and why so little has been done to address them. We can only assume that the City's failure to provide us with detailed information is because there is widespread opposition to these proposals.

In addition, the Project Team's graphics are selective and misleading. There is little assessment of the scheme's impact on the Barbican Estate and neighbouring conservation area. No 3D models demonstrating the full scale of what is proposed have been made available although we know they exist and their availability for stakeholders is encouraged in the London Plan .

We urge the City to live up to its commitment to transparency and consult meaningfully with the local community. The current process falls far short.

CONCLUSION

This remains a short-sighted proposal, lacking vision and apparently driven solely by the desire to raise money. Furthermore, the intention to enter into a long lease with a developer carries the risk that even the limited public benefits of the proposal would later be jettisoned by the developer.

As our polling showed, there is no evidence the scheme has the support of the local community. It is contrary to many of the City's own policies. This is an outstanding site crying out for an imaginative scheme respecting its heritage and location. We once more invite the City to stop, think again, and work with us and the wider community to develop a scheme worthy of the site, the City and London itself.

Adam Hogg and Averil Baldwin Joint Chairs Barbican Quarter Action

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APPENDIX II

REPORT ON STRUCTURAL ASSESSMENT OF BASTION HOUSE AND MUSEUM OF LONDON

BY

CONISBEE CONSULTING STRUCTURAL ENGINEERS

2nd SEPTEMBER 2022

conisbee | Consulting Structural Engineers
Consulting Civil Engineers

REPORT ON STRUCTURAL ASSESSMENT

BASTION HOUSE AND MUSEUM OF LONDON

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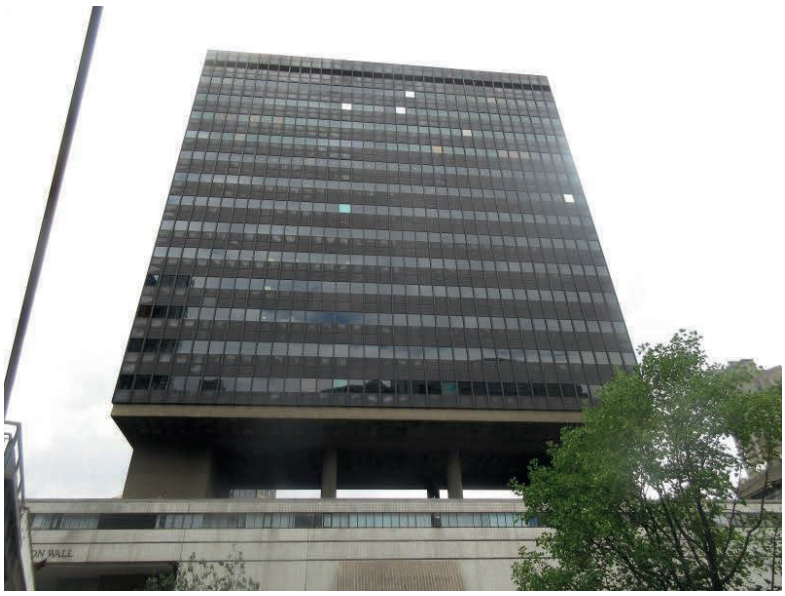

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2nd September 2022

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Executive Summary

1. Alan Conisbee and Associates were commissioned by the Barbican Quarter Action to carry out a structural engineering review of Bastion House and the Museum of London, considering specifically disproportionate collapse and durability. I, Bob Stagg (consultant to Conisbee, CV included as Appendix A) have prepared this report. I reviewed the structural engineering aspects of the report "London Wall West – Whole Life Carbon Assessment" dated May 2022 prepared for the City of London. I undertook a limited visual survey from around the exterior of the buildings and inside the Museum. I reviewed some original architect's drawings but the structural engineer's drawings were not available. The evidence I examined is sufficient to inform and confirm the clear and positive conclusions of this assessment.

2. The detailed summary of the structures of Bastion House and the Museum of London in section 4 below illustrates that the buildings are clearly of a monolithic, in-situ (poured in place), reinforced concrete form of structure. The detailed explanation of disproportionate collapse in sections 5 and 6 below considers the risk of it. It occurs when damage to a building is disproportionate (much larger) than would be expected from the cause of the damage. This concept followed a gas explosion causing partial collapse of Ronan Point, a residential tower block in east London in 1968, with large concrete panels (LPS) forming the walls and floors, acting as the primary structure. The explosion which would normally have damaged perhaps 2 or 3 dwellings, caused 21 to be affected. It resulted in major changes to the Building Regulations over the subsequent years.

3. The LPS form of construction is very different to the in-situ concrete frames forming the Museum of London and Bastion House. It is accepted wisdom in the structural engineering design industry that the very nature of a framed structure most probably prevents collapse of this type. In addition, noting the substantial size and arrangement of the structural elements in the buildings, I consider it most unusual to even question this aspect. I do not understand why it should even a factor to be considered in deciding the future of the buildings. I would be pleased to discuss this issue with CoL's structural engineering advisor, presumably Buro Happold, to better understand their position.

4. If disproportionate collapse is considered to be a risk by the CoL which therefore requires demolition or strengthening, I would expect detailed guidance on how big the risk was, and when action (evacuation and demolition/strengthening) should be taken. CoL's report reference to a "short-term" solution (their executive summary) is not clear and may not be helpful to the current users of the buildings.

5. In summary, and based on this assessment, I am of the opinion that both buildings comply with recognised disproportionate collapse requirements including Part A (Structure) of the current Building Regulations. The resistance to collapse would be achieved by "Method B, the key element method", i.e. a load bearing element, such as a column would not be displaced by load from an explosion. The floors above the location of an explosion would not fail, the columns and cores would remain in place, so disproportionate collapse would not occur. Strengthening of either building is not needed.

6. The long-term durability, based on the visual evidence of the exterior of the buildings is and will be good. The concrete and tiles are in satisfactory condition and will not require undue maintenance to remain so in the future. Occasional localised repair may be found necessary and perhaps the application of an anti-carbonation coating every 15 to 20 years or so. The quality of the build was clearly high and as a result, the buildings are in better condition than many other concrete buildings of that era.

7. In addition to re-use as office space, conversion of Bastion House to residential use or as a hotel would be feasible from a structural perspective. The installation of additional lift shafts through the existing reinforced concrete structure would be possible if carefully designed and executed. An external additional lift/stair core could be considered which would achieve stability from the existing structure of Bastion House.

8. The Museum of London could remain as museum space, or in view of the generous floor loading, even perhaps storage or workshop usage would be possible.

1. Brief

1.1. On 11th August 2022, Alan Conisbee and Associates, consulting structural engineers were commissioned by Mr Adam Hogg of the Barbican Association, on behalf of Barbican Quarter Action (BQA) to carry out a structural engineering review of Bastion House (BH) and the Museum of London (MoL). The brief is detailed in our email dated 9th August 2022 and BQA's email dated 11th August.

1.2. The brief was to consider the future of the buildings from a structural engineering standpoint, specifically disproportionate (or progressive) collapse and durability. I, Bob Stagg (consultant to Conisbee, CV included as Appendix A) have prepared this report. I have not considered such issues as whole life carbon issues, the internal spatial arrangements of the buildings, fire risk and compartmentation, presence of asbestos, the condition of the general fabric such as facades and roofs etc.

2. Assessment Procedures

2.1. A review has been carried out of the structural engineering aspects of the report "London Wall West – Whole Life Carbon Assessment" dated May 2022. It was prepared for the City of London (CoL) by a multi-disciplinary team comprising Buro Happold (sustainability consultants), DS+R (lead designers), Sheppard Robson (collaborating architect) and Gerald Eve (planning consultant).

2.2. A limited visual survey was carried out on 30th August 2022 from public areas around the exterior of the buildings and inside MoL. Access into BH was not attempted. The survey was to assess the form of structure of the buildings and gain an initial impression of their structural condition and hence durability.

2.3. A limited review of the original architect's drawings (Powell and Moya (PM)) was undertaken although they are poor condition microfiche prints, and much is illegible.

2.4. The original structural engineers were Charles Weiss and Partners (who also designed Trellick Tower) but were bought by White Young Green many years ago. In 2018 Tetra Tech (a large American engineering practice) bought WYG. It would be of interest if Weiss' original drawings were available, but the recent visual inspection and the architect's drawings provide sufficient evidence on the structural form of the buildings to inform and confirm the conclusions of this report.

2.5. I have considered changes regarding robustness requirements to the Building Regulations over the years and have referred to the NHBC Technical Guidance Note "The Buildings Regulations 2004 Edition Requirement A3 – Disproportionate Collapse" and the Institution of Structural Engineer's (IStructE) document "Appraisal of Existing Structures" 3rd Edition, dated October 2010.

2.6. I have also referred to the Building Research Establishment's (BRE) report BR511 "Handbook for the structural assessment of LPS dwelling blocks for accidental loading", dated 2012, which is extremely comprehensive (245 pages). Although it considers residential buildings comprising large concrete panels forming the structure, some aspects of it are relevant to all buildings, for example the risk of explosions occurring.

3. This Report

3.1. The findings and conclusions of this assessment, along with my knowledge and experience of disproportionate collapse issues and durability of concrete buildings, form the basis of this report which reaches clear, positive conclusions.

3.2. Whilst the study has been taken far enough to satisfy the brief, it has not of necessity, been exhaustive and cannot therefore constitute a warranty as to the soundness of BH and MoL. This report has been prepared for BQA and no responsibility to other parties is accepted.

3.3. Section 4 of this report describes the form of structure of the buildings. Section 5 gives some background to the issue of disproportionate collapse. Section 6 assesses the effects of explosions on the buildings and considers the concerns raised in the CoL report. Section 7 considers durability and comments on the CoL report's view of this issue. Section 8 is a summary of the conclusions of this report and includes initial thoughts on possible re-uses of the buildings.

4. Construction

4.1. The basic arrangement of the buildings is explained in the CoL report (Introduction, paragraph 2), which also confirms that construction took place c.1971 to 1976. There is no mention of the form of construction however. Based on the architect's drawings, our background knowledge and visual inspection, it is evident that the structure of both BH and MoL comprise frames of cast in-situ (poured in place) reinforced concrete, i.e. slabs supported by beams and columns forming substantial, monolithic structures.

4.2. The front cover photo shows BH, some 7m or so above the "roof" of MoL, supported by a lift core (11m x 6m in plan) at the south end, a stair/ducts core at the north end (same plan size) and 4No 1.2m diameter concrete columns. 2No beams, 2.1m deep (partially within the floor zone) and 1.4m wide span from core to column to column to core (see P+M drawing 172-T1-15). The bearing of the beams on the cores appear to include a sliding joint, possibly to minimise horizontal movement, (initial shrinkage and ongoing thermal) which would induce a moment in the columns (photo 1).

Photo 1 – Soffit of Level 03 – note waffle slab, downstanding part of the beam, column and the south core

4.3. The columns and cores continue down through the MoL to foundations below basement level (photo 2). The superstructure of BH comprises 200mm thick insitu concrete slabs supported via shear heads (1.2m x 1.2m x 200mm deep concrete downstands) on a grid of 600mm diameter columns. The column spacing is approximately 5m x 5m. The core walls comprise reinforced concrete approximately 400mm with openings to suit lift doors and riser access panels.

4.4. The transfer structure at the base of BH is referred to as level 03 and comprises a cast insitu reinforced concrete waffle slab. The waffles reduce the volume and weight of the concrete needed. It is referred to as a transfer structure since it transfers the point loads from the BH internal columns from above onto the cores, beams and external columns below (photo 1). The slab is clearly carefully and economically designed with an overall thickness of 700mm with varying depth of waffle across the width of the building to account for the varying bending moment and shear forces resulting from the load pattern (see P+M drawing 172-T1-15).

Photo 2 – South end of BH over MoI – note core continues down to basement level

4.5. The superstructure of MoL is complex both in plan and levels, and fundamentally the same as BH but with more extensive use of waffle slabs.

4.6. In both buildings, where exposed, the concrete is bush-hammered (photo 1). Much of the exterior of the MoL is covered in ceramic tiles (photo 3). The exterior of BH is typical 1970's façade comprising glazing and possibly metallic spandrel panels and jambs (front cover photo).

Photo 3 – East elevation of MoL – note extensive use of tiling and their good condition

5 Background to Disproportionate Collapse

5.1. As a response to the housing shortage following the Second World War, the government encouraged local authorities to build new housing quickly and efficiently. Residential blocks up to 22 storeys were given additional grants. The building industry developed a system of construction for dwellings formed of panels of precast concrete walls and floors, commonly known as LPS (large panel system).

5.2. It was unclear to the designers at the time (c.1945 to 1968) how well tied together the panels needed to be. The consequences of an explosion within buildings were not formally considered in codes of practice at the time.

5.3. In May 1968 a gas explosion occurred in a 22 storey LPS residential block called Ronan Point in Newham, east London. This caused the floors and walls above the explosion to fall, and their weight overloaded the floor below causing a domino effect down the full height of one corner of the block. Although gas explosions (and occasionally other sources of the explosion) had occurred in buildings previously, the LPS form of construction exacerbated the extent of damage, resulting in disproportionate collapse.

5.4. There seems to be a misunderstanding in 2nd para of section 4.2.3 of the CoL report. Disproportionate collapse cannot be a contributory factor in the failure of a building. It is the failure, and whether it is disproportionate or not is dependent on the extent of the collapse and the significance of the cause. The Ronan Point collapse was disproportionate since an explosion which would normally have only affected 2 or 3 dwellings, resulted in 21 being severely damaged.

5.5. The subsequent enquiry into Ronan Point reported in late 1968 produced recommendations (Ministry of Housing and Local Government (MHLG) Circular No.62/68) requiring all buildings to be tied to avoid disproportionate collapse. This requirement initially referred to buildings where piped gas was provided, and hence the risk of an explosion significantly higher, and required the structure to withstand a force, referred to as an equivalent static pressure (e.s.p.), of 34kN/sq.m. To put that in context, that is 23 times more than domestic floor loading.

5.6. Another MHLG circular soon followed however (No.71/68) which allowed that load to be reduced for buildings if gas was not supplied. The Institution of Structural Engineers advised that the load should be halved, i.e. an e.s.p. of 17kN/sq.m. For two years these requirements only applied to buildings over 6 storeys but in 1970, the revised Building Regulations clarified that the requirement applied to buildings above 4 storeys.

5.7. The ability of a building to resist an explosion became known as structural robustness and a more general term for an explosive load became known as accidental or abnormal loading, meaning any load not normally expected during the life of the structure. Avoiding disproportionate collapse, i.e. providing robustness, is a fundamental requirement concept for the design of new buildings and for checking existing ones. Explosions, usually gas, do occur and can cause collapse of buildings. Avoiding disproportionate collapse ensures that the structure of a building is designed to ensure that damage is relatively limited and within society's acceptance of risk.

5.8. Following Ronan Point, the emphasis was on LPS buildings with the assumption being that a framed building (steel or concrete, such as BH and MoL) would resist the force of an explosion without a column (or beam) being blown out. As a result, disproportionate collapse would not occur. Brick structures were considered acceptable without tying, since they were mostly not taller than 4 storey, similarly for timber structures.

5.9. The Building Regulations (Part A - Structure) were revised in 2004 requiring some aspects of robustness, specifically the horizontal tying requirement, to apply to all buildings regardless of height. They also require an abnormal load to be taken as 34kN/sq.m regardless of whether gas is supplied or not.

5.10. The robustness of a building can be provided by satisfying either a Method A or a Method B. In simple terms, Method A (known as the alternative load path method) is satisfied if an abnormal load causes the loss of a load bearing wall or column or beam but the damage is not disproportionate because the loads previously carried by the missing element finds an alternative route down to ground. Method B (key element method) requires the structural element to be strong enough to resist the abnormal load, stay in place and continue to provide support. In both cases, significant cracking and deflection should be expected but not disproportionate collapse.

5.11. It is impossible to accurately model the behaviour of a building under abnormal loading but recognized techniques, combined with engineering judgement and reference to the BRE's report 511, enable a reasonably realistic assessment to be made. The behaviour of a building depends on many factors, such the form of structure, the strength of materials used, loading, design, accuracy of construction, workmanship and so on.

5.12. Much study was carried out on Ronan Point in 1968 and the pressure of the gas explosion which occurred has been estimated to between 20 and 80kN/sq.m. This large spread illustrates that there is, inevitably, substantial uncertainty when dealing with explosion effects. The requirement of 34kN/sq.m is a reasonable estimate. In the event of an explosion within a building, venting is likely to occur whereby some of the pressure would be reduced by the blowing out of windows and spandrel panels, for example the façade of BH.

5.13. It is also of interest to note that a structure can withstand a much larger transient load such as an explosion than a permanent load such as dead or live load. This effect could as much as double the resistance of the structure and is caused by the rate of change of strain in the structural materials (BRE's report 511 Appendix E Section E.2).

5.14. The BRE Report 511 (2012) considers in detail the statistical chance of accidental loading occurring in a building and compares it to other types of hazards. Section 6.4 and Appendix B of the document include a very large amount of statistics but the summary is that the risk of a disproportionate collapse is very small indeed. The BRE's report states that "rationally the risks might be regarded as insignificant and adequately controlled".

6. Collapse

6.1. Both BH and MoL are framed buildings and will include reinforcement which effectively ties the structural elements (columns, beams and floors) together. The sizes of the buildings, the sizes of the elements and the excellent reputation of the design engineer indicate that the tying will have been extensive and comply with contemporary and current requirements. The suggestion (3rd para of section 4.2.3 of CoL report) that the design was carried out ignoring the implications of Ronan Point seems extremely unlikely. Charles Weiss and Partners will have been well aware of the issue of disproportionate collapse. The construction of a reinforced concrete framed structure could not be carried out without adequate tying by reinforcement between the elements.

6.2. By inspection, a 600m thick reinforced column would resist an abnormal load of 34kN/sq.m. It is likely that a 200mm thick reinforced slab would also, either above or below, albeit it would be significantly cracked. Even if the floor slab is blown out, the columns are sufficiently robustly designed to span vertically the 6.8m between two floors. The transfer slab is able to support 14 storeys so clearly the addition load from an abnormal loading incident from above i.e. within BH, would not cause failure.

6.3. It is difficult to envisage a circumstance of the standard abnormal loading of 34kN/sq.m being applied to the soffit of level 03 since it is external space. Abnormal loading, perhaps beyond that amount could occur for example if a bomb was detonated under BH. It is not possible to quantify that however and previous and current regulations recognise that. Society accepts that buildings cannot be sensibly designed to resist a force greater than 34kN/sq.m. If an explosion was powerful enough to cause significant damage to the concrete structure supporting BH, for example removal of one of the columns, the subsequent possible collapse could not be considered as disproportionate to the cause.

6.4. In practice, the removal of one of the columns below level 03 would possibly result in the structure above acting as a deep beam spanning between the cores, with the slabs and columns forming "Vierendeel girder" at each level, thus avoiding collapse. Very significant cracking and distortion would occur however.

6.5. The 3rd para of section 4.2.3 of the CoL report states that it is unlikely that BH design complied with the Building Regulations and goes on to "There is further evidence that this is the case from the design of the Level 3 transfer structure." The 4th para mentions strengthening works and then ends with the sentence "However, for Bastion House, the level 3 transfer structure would be of particular risk".

6.6. It is unclear on what the further evidence is if the structural drawings and calculations are not available. If in CoL's opinion the building needs strengthening and the transfer structure (the most significant structural element) is at "particular risk", it would be useful to review this further evidence and be clearer on when the risk becomes unacceptable. The 3rd para of the CoL's Executive Summary refers to "a short-term solution". Short-term is not defined but presumably at that juncture, BH would be evacuated and MoL would already have been vacated?

6.7. Based on the evidence available to ACA, I do not consider there is a concern regarding safety. If there were to be, I would consider it essential to be unambiguous on when the building should be vacated. Apart from all else, the wellbeing of the current users should be considered.

7. Durability

7.1. Based on the limited inspection, both buildings are considered to be in good condition with regard to the concrete structure, with no obvious visible examples of spalling concrete fragments, exposed rusting reinforcement and/or detached/missing tiles.

7.2. The first para of Section 4.2.1 of CoL report suggests that in the 1970s, buildings would have been designed for 50 years. The accepted figure at that time was 60 years but this is of academic interest. The ageing of a concrete structure depends very much on appropriate design, particularly the amount of cover to the steel reinforcement, the porosity of the concrete and good quality workmanship. The current visual evidence suggests these aspects were correctly addressed.

7.3. That same para seems confused regarding the process of carbonation. Carbonation occurs in the concrete, not in the steel reinforcement. The carbon dioxide in the atmosphere slowly penetrates the concrete. It is a significant process with carbonated concrete having a lower level of alkalinity. This allows the process of rusting of the steel to occur providing oxygen and water is also present. It is not possible to predict that rate of carbonation but certainly the amount of cover is a very significant factor. The amount of exposure to the environment of the concrete element is not relevant. Wet concrete reduces the rate of carbonation so for example in UK, the south and west elevations would in theory be less carbonated due to the increase in rain compared to the north and east elevations. In practice however a wet west elevation would dry sooner than a north facing one. In an internal environment, the concentration of carbon dioxide is greater than externally. Internally exposed concrete is generally more carbonated but generally the absence of water minimises the rusting.

7.4. The bush hammer effect on the concrete surfaces requires the cover to reinforcement to be increased during design and construction. This allows for the reduction in cover depth which results from the hammering. From the absence of significant spalling concrete on BH and MoL, it appears this requirement was properly followed.

7.5. Concrete behind ceramic tiles or mosaics are less affected by carbonation if there is good adhesion between the two materials. If however water/air seeps into the joint, the tiling ceases to act as protection and carbonation progresses as in exposed concrete. In time, rusting of the reinforcement occurs which expands, (rust is approximately 7 times more voluminous than the steel from which is came), with spalling concrete and tiles detaching. The condition of the tiles on MoL (photo 3) appears to be good.

7.6. In due course, the external envelope of the buildings will need to be checked and possibly remedial treatment, such as an anti-carbonation coating, as highlighted in the last para of section 4.2.1 of the CoL report.

8. Summary

8.1. The reasonably detailed summary of the structure of BH and MoL in section 4 above illustrates that the buildings are clearly of a monolithic, in-situ, reinforced concrete structure. The detailed explanation of disproportionate collapse in sections 5 and 6 considers the risk of disproportionate collapse.

8.2. Based on this assessment as detailed in this report and using reasonable skill, care and judgement, I am of the opinion that BH and MoL comply with recognised disproportionate collapse requirements including Part A (Structure) of the current Building Regulations. This is achieved by Method B, the key element method, i.e. a load bearing element, such as a column would not be displaced by the abnormal loading of 34kN/sq.m. The floors above would not fall, so disproportionate collapse would not occur. Strengthening is not needed.

8.3. The LPS form of construction is very different to the in-situ concrete frames forming the Museum of London and Bastion House. It is accepted wisdom in the structural engineering design industry that the very nature of a framed structure most probably prevents collapse of this type. In addition, noting the substantial size and arrangement of the structural elements in the buildings, I consider it most unusual to even question this aspect. I do not understand why it should even a factor to be considered in deciding the future of the buildings. I would be pleased to discuss this issue with CoL's structural engineering advisor, presumably Buro Happold, to better understand their position.

8.4. If disproportionate collapse is considered to be a risk by the CoL which therefore requires demolition or strengthening, I would expect detailed guidance on how big the risk was, and when action (evacuation and demolition/strengthening) should be taken. CoL's report reference to a "short-term" solution (their executive summary) is not clear and may not be helpful to the current users of the buildings.

8.5. The long-term durability, based on the visual evidence of the exterior of the buildings is and will be good. The concrete and tiles are in satisfactory condition and will not require an undue amount of maintenance to remain so in the future. Occasional localised repair may be found necessary and perhaps the application of an anti-carbonation coating every 15 to 20 years or so. The quality of the build was clearly high and as a result, BH and MoL are in better condition than many other contemporary concrete buildings.

8.6. The buildings will have been designed at least in accordance with the codes of practice current at the time. Floor loading for example in the MoL will be high, at least 5kN/sq.m. BH will be at least 2.5kN/sq.m or possibly the office agent's requirement of 4+1 – 4kN/sq.m for the floor loading plus 1kN/sq.m to allow for non-load bearing partitions between the individual offices.

8.7. In addition to re-use office space, conversion of BH to residential use or as a hotel would be feasible from a structural perspective. The installation of additional lift shafts through the existing reinforced concrete structure would be possible if carefully designed and executed. An external additional lift/stair core could be considered which would achieve stability from the existing structure of BH.

8.8. The MOL could remain as museum space, or in view of the generous floor loading, even storage or workshop usage would be possible.

Appendix A

Following retirement from Conisbee after 23 years, I am currently a consultant to them. I have nearly 50 years experience of appraisal, repair and refurbishment of buildings, working in the public and private sectors. My experience includes work on all types and ages of building ranging from historic structures such as Christ Church Spitalfields and the Royal Albert Hall, through to the high-rise residential estates of the 1960s and 70s, including Ronan Point, east London. I was involved with the final dismantling of that particular block in 1987 after its partial collapse in 1968.

I have a particular interest in how buildings perform throughout their life and an extensive experience assessing buildings with regard to disproportionate collapse. I am currently involved in considering this fundamental issue for several housing blocks in north and east London. I advise contractors on the temporary works needed to alter the structures of existing buildings and am also involved in checking show rigs such as for Cirque du Soleil, at the Royal Albert Hall.

I had a long association with the Institution of Structural Engineers at national and local level, becoming a fellow in 1998, serving on its council and committees, and lecturing on CPD courses on the assessment of existing buildings. I served on the task groups which authored the Institution's publication 'Appraisal of Existing Structures (2nd and 3rd Editions), the former under the chairmanship of Ted Happold, the founder of Buro Happold in the late 1980's.

Bob Stagg BSc CEng FIStructE

Consultant, Alan Conisbee and Associates

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APPENDIX III

REVIEW OF CARBON POLICIES AND LWW WHOLE LIFE CARBON ASSESSMENT

BY
SIMON STURGIS

30th AUGUST 2022

London Wall West

Review of Carbon Policies

and

The London Wall West Whole Life Carbon Assessment

Of May 2022

On behalf of

Barbican Quarter Action

30 August 2022

Contents

1. Introduction

This report is produced by Targeting Zero on behalf of Barbican Quarter Action.

The report examines the City of London's own assessment for the London Wall West proposal, which offers two options: Option 1 – Partial retrofit plus New Build, and Option 2 – Full demolition and larger New Build. A comparison using the City of London's own figures shows that the retrofit option produces **less** lifetime carbon emissions than new build.

This report also sets out the carbon policy context for this scheme. for the United Kingdom, the Greater London Authority (GLA), and the City of London (the City). It makes the case that at all policy levels, in order to meet Government Targets and transition to a net zero economy, retrofit should be prioritised over new construction.

Carbon Terminology:

Embodied carbon: All greenhouse gas emissions associated with materials, fabrication, transport, construction, maintenance, replacement, demolition, and disposal of a building.

Operational carbon: All greenhouse gas emissions associated with use of energy within a building, for example energy used for heating or cooling.

Whole-life carbon (WLC): The combined total of embodied and operational carbon emissions over the whole life cycle of a building.

Retrofit: A refurbishment and possible extension of a building that specifically involves improved environmental performance, usually to current standards.

2. Summary:

- National Legislation sets out a net zero trajectory to 2050 with demanding interim targets for 2030 and 2035 *(see Item 5.1 below).* The demolition and new build approach proposed for this site will not meet these targets. A more comprehensive retrofit approach than the one proposed, with Bastion House retained and retrofitted, would have far lower carbon emissions, and help meet these targets.

- The GLA has declared a 'Climate Emergency' with policies to match, the City of London has started this process with good intentions, but these are not yet being followed through. The choice to proceed with this scheme for London Wall West is a prime example of this conflict. Examples of City publications calling for action on the Climate issue include:
  - The Global City – Climate Action: Managing Climate Risk for Financial Investments 2021
  - City of London – Climate Action Strategy 2020-2027,
  - City of London – Draft Local Plan 2021
  - City of London – Whole Lifecycle Carbon Optioneering 2022
  - City of London – Climate Action Strategy 5th June 2022

  The intent expressed in these reports conflicts with the choice to proceed with full demolition and new build at London Wall West.

- This lack of follow through on climate action puts the City at a disadvantage in comparison with our European and north American competitors. It also puts the City in a 'catch up' position with respect to the GLA's more forward-looking policies. The City of London is therefore falling behind in both action and deed with respect to Global, UK, and GLA Climate Action. Proceeding with the London Wall West proposal is in direct conflict with Global, UK, and GLA policies and intentions.

- An issue of concern is that the 'London Wall West – Whole Life Carbon Assessment' of May 2022 shows that the full demolition and new build has a greater carbon cost that the suggested alternative partial demolition and retrofit, although the Executive Summary gives the opposite impression. There are other issues in the report that need further examination as outlined below.

- Globally tenants and occupiers are becoming more knowledgeable about climate change. It is worth noting that around the time this project is completed it will no longer be possible to buy a petrol or diesel car in the UK. This level of awareness will inevitably feed through into the attitudes of employees of major City Occupiers with a detrimental impact on buildings that are substandard from a Net Zero perspective.

- The London Wall West Report appears to be designed to pay lip service to the requirement to examine retrofit, and to set out to prove that new build is the only realistic solution. If the City of London is serious about its ambitions with respect to climate change then this proposal needs to be re-examined in the light of these stated ambitions.

- Both the UK's National Planning Policy Framework (NPPF) (Item 5.8 below), and GLA Policies SI2 – Whole Life Carbon and SI7 – Circular Economy (Item 6 below), clearly state that retention and retrofit should be prioritised over new build. The most Circular Economic option for this site is to retain as much as possible. Option 1 is paying lip service to this requirement with a structural assessment being used to demonstrate that Bastion House, for example, is not suitable for retention. This needs to be examined more thoroughly and more positively. The assessment for Option 1 produces surprising high kgCO2e/m2 rates, especially cladding. These should be examined more closely to see what is causing this high figure, and how it could be reduced. One carbon reduction option would be to retain and retrofit Bastion House.

- The City of London Planning Policies on net zero are in the process of being updated, and for referable schemes align with / are superseded by GLA policies. Nevertheless, the City is making a significant effort to transition to a zero carbon planning approach, and certainly sees this as part of an overall strategy for promoting the City for the future. This ambition and intent are in opposition to the promotion of schemes such as this which are high carbon in construction and use. It is not possible on the limited information provided to understand the actual performance of the materials proposed for the new build. If however the facades are to be substantially glazed, this will be fundamentally carbon inefficient and should be rethought. Fully glazed facades have a comparatively short life (30-40 years) requiring regular replacement and are therefore a high embodied carbon solution as well as often producing high operational carbon emissions.

- The City of London's London Wall West WLC assessment clearly shows that the retrofit option produces less whole life carbon emissions than the new build option. However, in the 'Executive Summary' the report suggests the reverse is true by only emphasising the /m2 rate of carbon emissions. To those unfamiliar with carbon assessment and jargon this would give entirely the wrong impression.

- The City of London Report suggests that Bastion House is at risk from disproportionate collapse and therefore this is significant reason for demolition. This assumption needs to be

further tested, and with a more positive attitude to see what the most carbon and cost-effective solution is for this building.

- As new construction produces an immediate and large carbon emissions 'hit' all efforts should be made to retain and reuse existing structure and material as far as possible to reduce the sites impact on climate change.

- The London Wall West Report appears to be designed to pay lip service to the requirement to examine retrofit, and to set out to prove that new build is the only realistic solution. If the City of London is serious about its ambitions with respect to climate change then this project needs to be re-examined in the light of these stated ambitions.

3. Recommendations:

- The disproportionate collapse issue needs to be further examined and more positively in terms of how it can be economically, in both carbon and money terms, resolved.
- The retrofit option and its carbon assessment needs to be re-examined in the light of the above and possibly from the perspective of alternative use types and specifically for ways to reduce the carbon cost in both /m2 rates and in overall terms.
- For any proposal, as required by the GLA Policies, the assessments should include:
  - Carbon Emissions from pre-construction demolition should be reported.
  - Reporting the key actions undertaken to reduce WLC emissions and the associated carbon savings, including those associated with the retention, reuse and recycling of existing structures and materials that are already on-site.
  - 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. In practice for London Wall West, this would include minimising demolition and maximising retention and reuse.
  - An estimate of the percentage of the new build development which will be made up of existing façades, structures, buildings
  - Policy SI7, Clause 2.3.4.: How the proposals comply with this clause, prioritizing retrofit and contributing to a circular economy.
  - Policy SI7, how any proposal responds to Clauses 2.4.2., 2.4.3., 2.4.5..
  - An explanation of how the proposal meets Core Strategic Policy CS15: Sustainable Development and Climate Change'; which states "To enable City businesses and residents to make sustainable choices in their daily activities creating a more sustainable City, adapted to the changing climate", by, in: Point 3: Avoiding demolition through the reuse of existing buildings or their main structures.

- How the proposal complies with the City's Draft Local Plan 2021: Policy CE1 states that: "development should be designed to promote circular economy principles throughout the life cycle of the building. This can be achieved by the 're-use and refurbishment of existing buildings, structures and materials to reduce reliance on virgin resources and retain embodied carbon."
- Illustrate the carbon performance of the proposed options on a graph as per the May 2022, Planning Advice Note; Whole Life Cycle Carbon Optioneering by Hilson Moran (see page 10 above).
- It should be noted that by 2030 it will not be possible to buy new petrol or diesel cars. In this rapidly evolving environmental context will prospective investors and tenants be happy to own or occupy buildings that are substandard from a net zero perspective?

4. **London Wall West – Whole Life Carbon Assessment, May 2022**

4.1. This report for the City of London sets out to make the case on carbon emissions grounds for new build instead of a major retrofit for this site. The 'Executive Summary' makes the following points:

- *"The analysis concludes that retaining existing building fabric does not achieve the most sustainable outcome for this transformative and strategic site"*. On the information provided in the Report this is clearly not the case.
- *"It also concludes that it is not possible to undertake a "light touch" refurbishment due to inherent safety concerns with the existing buildings, that make them unsuitable for retention and adaption"*. If the Bastion House is subject to such *'safety concerns'*, why is it still occupied? The analysis provided in the LWW report appears to have the intent of assisting the case for demolition. It is recommended that the existing structure be examined for the potential for local strengthening from a more positive viewpoint, and/or by investigating design and occupier solutions that make retention achievable.
- *"A Whole Life Carbon Assessment has been prepared to compare the two options, on a kgCO2e/m2 basis, the assessment concludes that the redevelopment option would perform 10% better than the retention option".* The Executive Summary does not however mention that the report also concludes that the retention/retrofit is better than the new build in terms of overall carbon emissions. This gives a misleading impression that is the opposite of the actual total emissions.

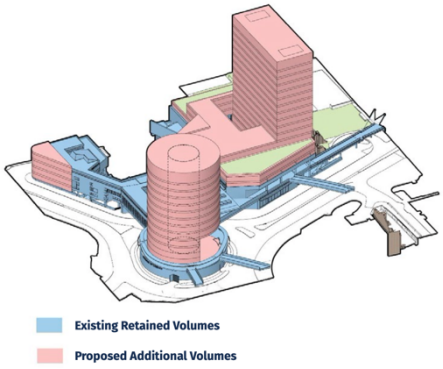
4.2. Bastion House: There are several points made within the report to try and justify its demolition:

- That the floor to ceiling height is too low: The report states that the Floor/ceiling dimension is 2.54m, and also states that the BCO recommends that for refurbishments a floor to

ceiling dimension of between 2.45m and 2.8m is acceptable. The existing building therefore complies with this recommendation.

- Unacceptable column grid: The report states that the existing building has column grids of 5.1m x 5m and 5.1m x 4.4m, it also notes that the BCO recommends structural grids of 9m, 10m, 12m, or 15m. What is not mentioned is that these dimensions are recommendations are for new build office. The existing grid dimensions have been successfully used for decades, and whilst not ideal are by no means unusable, and perfectly acceptable for a range of uses including office.
- Fire Safety and façade performance: Unsurprisingly the standards to not meet current requirements. This is capable of remedy and is a standard retrofit issue. If the facades were upgraded (secondary glazing, fire compliance) or replaced, the fire related concerns could also be addressed.
- Services and Amenities substandard: All capable of an upgrade with a retrofit.
- Material Design Life: various assumptions have been made as to the original construction and associated design life however these comments are not proven. Clearly investigations need to be undertaken to examine these assumptions. There are many examples of buildings of this period and construction type being retained and retrofitted.
- Disproportionate collapse: The explanation is that any remedial action would be complex, expensive, and not recommended. As the whole tone of this section of the report is clearly intended to support the case for demolition, a second opinion is therefore essential.
- Façade and Energy performance: The façade is single glazed and substandard in energy performance terms. This is a standard retrofit issue, solvable either through secondary glazing and other additional insulation, or a new façade designed for today's conditions.

4.3. Comparison of Retrofit and New Build. Consistent with the Hilson Moran Report requirements (see section 4 above), a comparison between 'Option 1- Part Demolition' and 'Option 2- Full Demolition' has been assessed.



Option 1 - Part Demolition and Retrofit

Option 2 - Full Demolition and Redevelopment

- It is worth noting that Option 1 has not retained Bastion House, and restricted retention to only the lower floors on all areas of the site. Option 2 involves complete demolition and a new significantly larger new build. Retention of Bastion House would make a positive difference to the assessment for Option 1.

- There is no actual breakdown of the embodied carbon assessment provided, but a question that needs to be answered is: Why is the embodied carbon for the façade for Option 1 larger than Option 2, given that Option 2 has a considerably more façade area? This would make a big difference to the overall whole life carbon figures as well.

- It would be useful to assess a major retrofit option that retained and strengthened the existing structure of Bastion House and upgraded or replaced the existing cladding. This would be expected to produce additional carbon savings as well as improve the performance of the existing building.

- The analysis undertaken on behalf of the City of London and included within the London Wall West Report shows the following comparisons over the whole life of the buildings.

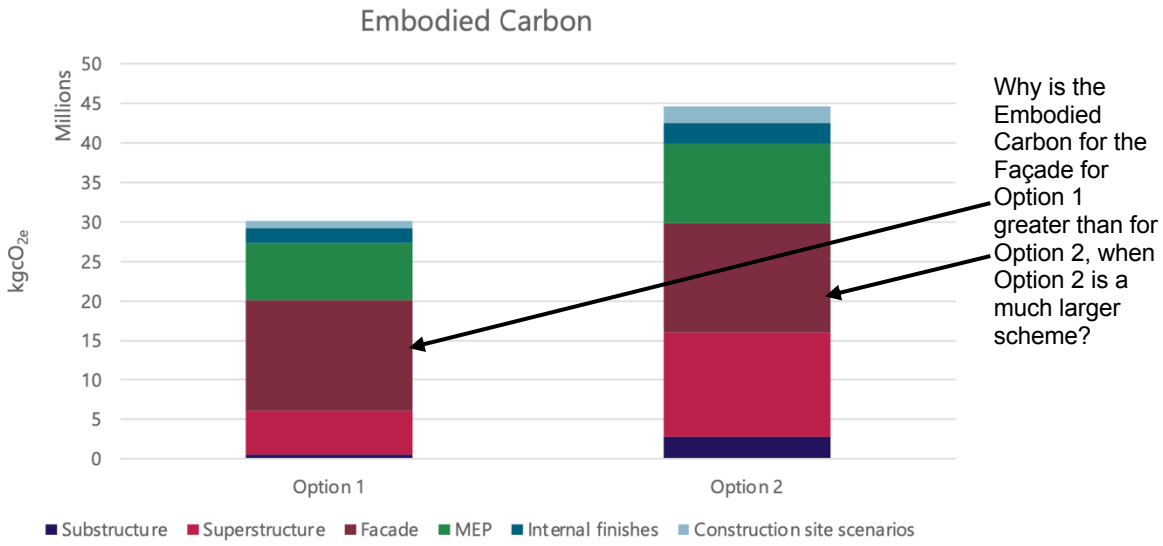


Figure 6—4 Comparison of Embodied Carbon

Fig 6-4 Comparison of Embodied Carbon – Option 1 vs Option 2

Option 1 Retrofit is clearly less than Option 2 New Build

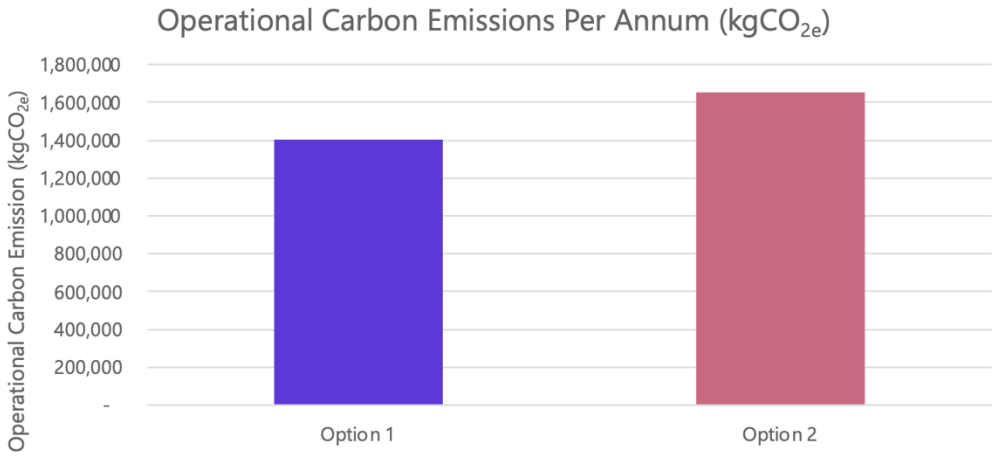


Figure 6—6 Operational Carbon Emission per Annum

Fig 6-6 Comparison of Operational Carbon Emissions – Option 1 vs Option 2

Option 1 Retrofit is less than Option 2 New Build

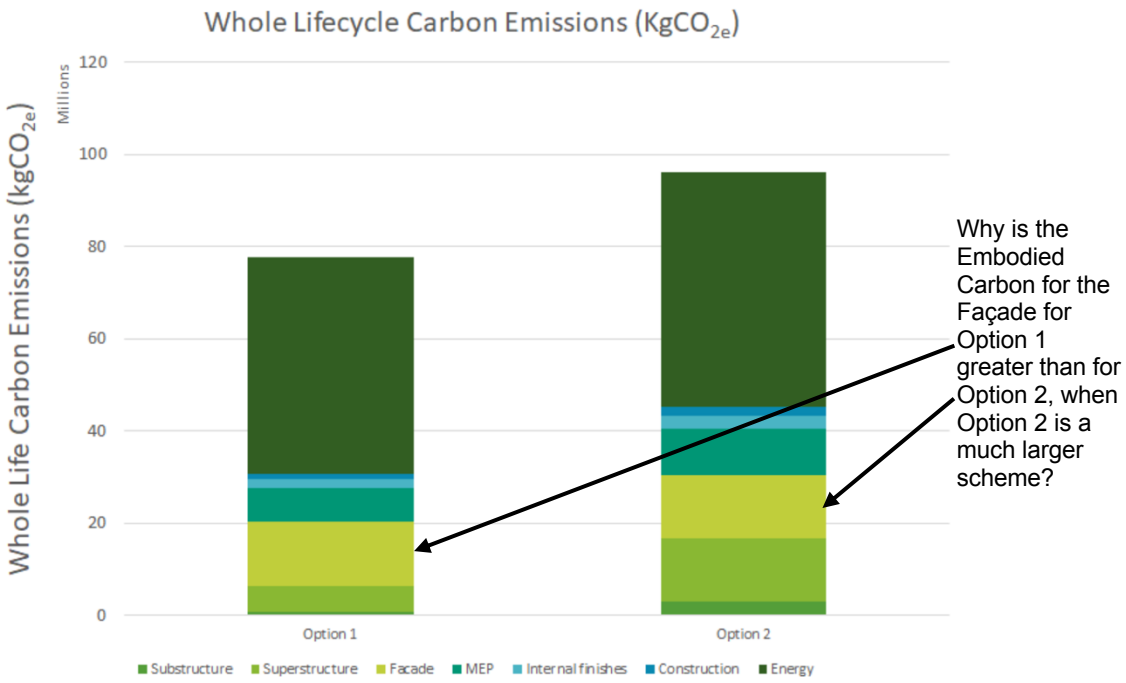


Figure 6—8 Whole Lifecycle Carbon Emissions in millions of kilograms of CO_2 equivalent

Fig 6-8 Comparison of whole Life Cycle emissions– Option 1 vs Option 2

Option 1 Retrofit is less than Option 2 New Build

- In all cases the total whole life carbon emissions, embodied and operational are less with Option 1 than with Option 2.

- Precise whole life carbon figures have not been provided for the options in the LWW Report, however from the graphs in Fig 6-8 above, it would appear that Option 1 – Partial Retrofit is some 75,000TCO2e, and Option 2 – All New Build is about 95,000TCO2e. This means that the new build is about 20,000TCO2e more than the partial retrofit. This extra carbon cost for the demolition and new build is equivalent to:
    - 101,520,000 miles travelled by an average family car or
    - 138,060,000 miles travelled by one economy class air passenger.
    - Or will take 340,000 trees 10 years to absorb.

- Based on the reports analysis the /m2 rate of carbon emissions is lower with Option 2 than with Option 1. However, this is not relevant, as the key environmental issue is the total carbon emissions / GHG emissions impact of the scheme on the environment. A larger scheme with larger amounts of air conditioning will also have a larger amount on refrigerant loss with its larger GHG impact. This is not included in these figures. The rate quoted for Option 1 is surprisingly high and should be re-examined.

- New construction will produce an immediate and large carbon emissions 'hit' to the environment. The greater the extent of retention and reuse, and the less the use of new materials, the greater the reduction to this initial carbon emissions 'hit'. This is very beneficial as carbon emissions released now have a greater long-term impact than those released over a building's life.

5. Planning Policy Context – UK Net Zero Carbon Policy

5.1 The UK national political context is to achieve a 'Net Zero' carbon economy by 2050. This was passed by parliament in 2019 as a legally binding amendment to the Climate Change Act of 2008. This commitment was further updated by Parliament in April 2021 by creating an interim commitment of achieving 78% carbon reductions by 2035. In addition, the UK made a commitment at COP26 in November 2021 to reduce emission by 68% by 2030, only 8 years away. These objectives cannot be achieved through 'business as usual'.

5.2 The global built environment sector is generally held to be responsible for some 40% (*World Green Building Council*) of global CO_2 and other Greenhouse Gas (GHG's) emissions (UK approx. 25%) and therefore there is particular pressure on the built environment to reduce carbon emissions significantly and rapidly. To achieve 78% of reductions by 2035 means that schemes under consideration today already need to be making significant reductions in their overall carbon footprint. The RIBA's 2030 Climate Challenge/LETI set out interim targets for this.

5.3 The carbon emissions covered by the Government's net zero commitment are both in use 'operational', i.e. day to day, energy use, as well as the 'embodied' carbon emissions from the sourcing of materials and products, fabrication, transport, construction and the in-use emissions due to maintenance, repair and replacement of components, as well as final demolition and disposal. What is known as 'Whole Life Carbon' (WLC) assessment brings together embodied (material related) and operational (day to day energy use) emissions over the entire life cycle of the building.

5.4 Under the UN's Greenhouse Gas Protocol operational emissions are covered under Scope 1 (*direct)* and Scope 2 (*energy indirect*) emissions with embodied emissions covered under Scope 3 (*purchased goods and services, which includes construction*) emissions. The UK Government's objectives are to reduce 'all greenhouse gas emissions to net zero by 2050'.

5.5 HM Government has backed up its intentions with the following guidance, 'The Construction Playbook', published in December 2020 which says that it's use will create the right environment to:

- *"Take strides towards our 2050 net zero commitment and focus on a whole life carbon approach to fight climate change and deliver greener facilities designed for the future".* (Introduction p3)
- And that: *"contracting authorities should adopt the use of whole life carbon assessments (eg PAS2080) to understand and minimise the GHG emissions footprint of projects and programmes throughout their lifecycle."* (Build Back Greener p5)

5.6 Many Local Authorities have declared a Climate Emergency with some now actively pursuing low 'whole life carbon' policies. For example, the Greater London Authority, in the new London Plan, requires all referable schemes to undertake a full 'whole life carbon' (i.e. operational and embodied emissions over the buildings entire life cycle) assessment at planning submission, and with an 'as built' update post completion.

5.7 In May 2022 the Environmental Audit Select Committee published a report into its inquiry on carbon and construction: "Building to Net Zero: Costing Carbon in Construction". The Committee report included the following (p60, para 213, p70, para 38.)

- "*Retrofit and reuse of existing buildings, where practicable, should be prioritised over new build to conserve resources, minimise embodied carbon emissions, reduce demolition waste and deliver cost-effective solutions to delivering on housing demand. Local authorities and housing developers are expected to balance multiple objectives when meeting housing needs, and therefore require a coherent policy framework to support the balancing of retrofit and new, low-carbon housing delivery. The Government states it is promoting the benefits of re-using and retrofitting ahead of demolition, but we have seen limited evidence to demonstrate that this is yet the case. In some cases, reforms to permitted development rights appear to have created a perverse incentive for demolition and new-build over retrofit. We are concerned that the amendment to permitted development rights which allowed demolition and replacement was introduced without full consideration of its potential impact on sustainability and on carbon emissions*".

5.8 In the National Planning Policy Framework (NPPF) of July 2021, in Section 14; Meeting the challenge of climate change, flooding and coastal change, Item 152 states:

- *The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that*

contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

6. Planning Policy Context – Greater London Authority (GLA) - Planning Policy

6.1. In December 2018, the **London Assembly** declared a climate emergency, and called on the mayor to do likewise and put in place specific emergency plans so that London is carbon neutral by 2030. The mayor, Sadiq Khan, declared a climate emergency shortly after the Assembly and in early 2020, set a target for London to be net zero-carbon by 2030.

6.2. **In March 2022 Policy Guidance SI2** was published requiring **Whole Life Carbon** (WLC) assessments for schemes referrable to the Mayor. This Guidance included the following:

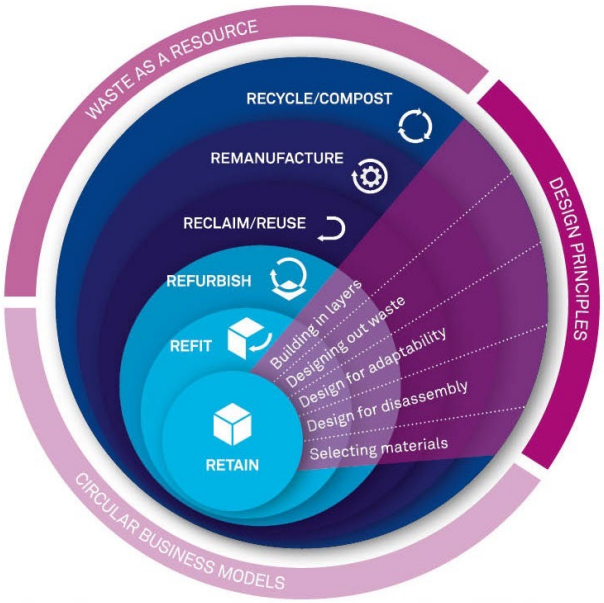
- **Item 1.2.3.:** Designing a development that follows a WLC approach will: *"achieve resource efficiency and cost savings, by encouraging refurbishment, and the retention and reuse of existing materials and structures, instead of new construction"*
- **Table 2.1**. WLC Principles: Principle 1: Reuse and retrofit of existing built structures: *"Retaining existing built structures for reuse and retrofit, in part or as a whole, should be prioritised before considering substantial demolition, as this is typically the lowest-carbon option".*
- **Item 2.4.1.:** *"WLC assessments should demonstrate the actions that have and will be taken to reduce WLC emissions. The assessment should cover the development's carbon emissions over its lifetime, accounting for:*
    - *any carbon emissions associated with pre-construction demolition*
    - *any carbon savings associated with the retention, reuse and recycling of existing structures and materials that are already on-site"*
- **Box 1.** *"Key requirements of this guidance that differ from the RICSPS methodology:*
    - *Carbon Emissions from pre-construction demolition should be reported.*
    - *Reporting the key actions undertaken to reduce WLC emissions and the associated carbon savings, including those associated with the retention, reuse and recycling of existing structures and materials that are already on-site – see section 3 for further details."*
- **Item 2.5.3.:** "*Each module should be presented separately, as identified in the WLC assessment template. The reference study period (that is, the assumed building life*

expectancy) for the purposes of the assessment is 60 years. Where the design life of the project exceeds or is less than 60 years, the assessment should still be done to 60 years but with an accompanying explanation of the life cycle and end-of-life scenarios for the actual design life".

- **Box 3:** *"The pre-application assessment should include the information listed in Box 3.*
  - *"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."*
  - *"The carbon emissions associated with pre-construction demolition.*
  - *An estimate of the percentage of the new build development which will be made up of existing façades, structures, buildings."*
  - *"The WLC principles that are informing the development of the site".*
- **Item 3.1.3.:** "*If substantial demolition is proposed, applicants will need to demonstrate that the benefits of demolition would clearly outweigh the benefits of retaining the existing building or parts of the structure. Retention should be seen as the starting point; this will usually be the most sustainable option as it can make an immediate contribution toward the Mayoral objective of London becoming a zero carbon city by 2030, as well as reflecting the need to both move towards a low-carbon circular economy (set out in Good Growth objective GG6 – Increasing efficiency and resilience) and to push development up the waste and energy hierarchies (see Policy SI 2 – minimising greenhouse gas emissions; and Policy SI 7 – reducing waste and supporting the circular economy)".*
- **Item 3.1.4.:** "*To calculate the carbon emissions associated with pre-construction demolition, actual figures should be used where possible. If actual figures are not available, applicants can apply a standard assumption of 50kgCO2e/m^2 to the GIA of the existing areas being demolished that fall within the boundary line".*
- **Item 3.2.2.: Box 4:** *"Planning application submission stage information requirements:"*
  - *"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. See paragraph 3.1.3 for further guidance."*
  - *"The percentage of the new build development that will be made up of existing façades, structures, buildings. "*
  - *"Summary of key actions to achieve the WLC emissions reported and the emission reductions they are expected to achieve, including from the retention, reuse and recycling of existing structures and materials that are already on-site."*

6.3. In March 2022 Policy Guidance SI7 was published requiring **Circular Economy** (CE) Statements for schemes referred to the Mayor to promote CE outcomes, and to aim to be net-zero-waste. This Guidance included the following:

- **Item: 1.1.3.:** *"This guidance explains how to prepare a CE statement to comply with Policy SI 7, including the information that must be submitted under Policy SI 7(B). It also includes guidance on how the design of new buildings, and prioritising the reuse and retrofit of existing structures, can promote CE outcomes.*
- **Item 2.3.4:** *"Figure 3 sets out a hierarchy for building approaches that maximises the use of existing materials. Diminishing returns are gained by moving through the hierarchy outwards, working through refurbishment and reuse through to the least preferable option of recycling materials produced by the building or demolition process. This provides an overall strategy for the redevelopment of buildings, with retention as the starting point. The decision trees in the following sections (Figures 4 and 5) expand on this, setting out a hierarchy of CE design approaches for development."*



Source: Building Revolutions (2016), David Cheshire, RIBA Publishing ©

Figure 3: CE hierarchy for building approaches

- **Item 2.4.2:** *"To follow the approach set out in Figure 3 (London Plan Policy D3 Figure 3.2), retaining existing built structures totally or partially should be prioritised before considering substantial demolition, as this is typically the lowest- carbon option."*
- **Item 2.4.3:** *"The CE statement should set out the justification for whichever of the four approaches set out in Table 4, above, is being proposed for the development.*

Proposals that are further down the hierarchy will require more detailed and compelling justification."

- **Item 2.4.5.:** *"When assessing whether existing buildings are suited to the requirements for the site, applicants should robustly explore the options for retaining existing buildings (either wholly or in part). Where disassembly or demolition is proposed, applicants should set out how the options for retaining and reconstructing existing buildings have been explored and discounted; and show that the proposed scheme would be a more environmentally sustainable development."*

7. Planning Policy Context – City of London - Planning Policy

7.1. In 2015, the City of London published the 'Local Plan', this set out Policy in the section 'Environmental Sustainability' Policy around Climate Change and Sustainable Development. This policy focussed on Energy Consumption, Air Quality and the Urban Heat Island and climate change.

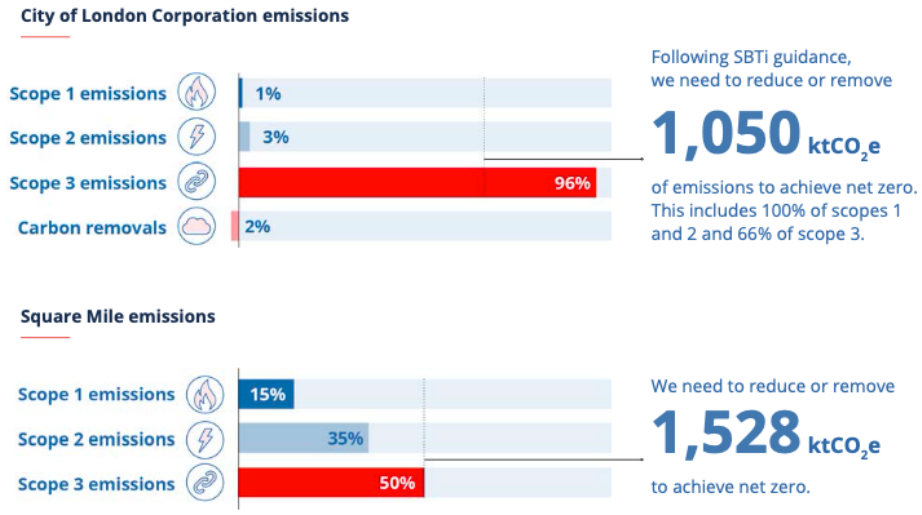
- The 2015 Policy document includes in *'Core Strategic Policy CS15: Sustainable Development and Climate Change'*; which states *"To enable City businesses and residents to make sustainable choices in their daily activities creating a more sustainable City, adapted to the changing climate",* by, in: Point 3: *"Avoiding demolition through the reuse of existing buildings or their main structures, and minimising the disruption to businesses and residents, using sustainably sourced materials and conserving water resources".*

7.2. To redress this omission, and to align with national and the GLA's Environmental Policies, The City of City has launched a number of initiatives these include:

- **Published November 2018: City Plan 2036:** This is a statement of intent and includes the commitment: *"The draft Plan promotes innovative, sustainable and high-quality buildings, streets and spaces. The design policies aim to move towards a Zero Emission City"*.
- **The City's Draft Local Plan 2021**: Policy CE1 states that: *"..development should be designed to promote circular economy principles throughout the life cycle of the building. This can be achieved by the 're-use and refurbishment of existing buildings, structures and materials to reduce reliance on virgin resources and retain embodied carbon."* The most circular economic approach by far is the retention and reuse of existing buildings.
- **Published 2020: Climate Action Strategy 2020-2027:**
- This included the headlines:

- Net Zero by 2027 in the City Corporations operations.
- Net Zero by 2040 across the City Corporations full value chain.
- Net Zero by 2040 in the Square Mile
- Climate resilience in our buildings, public spaces and infrastructure.
- Work with all stakeholder groups to accelerate the transition to net zero.

- *In the context of climate action, this means we can support the achievement of net zero, build climate resilience and champion sustainable growth to achieve a truly sustainable City. We will do this by means of the following actions, committed to in our Corporate Plan, 2018-23, against which we drive our performance.*
- **Under 'Our Approach':**
  - Many organisations and authorities focus on driving down the emissions they have most control over – scope 1 and 2. Addressing scope 3 can be daunting as it covers everything an organisation buys, sells, invests in, leases to others and disposes of as well as commuting and business travel.
  - But for organisations and financial centres like ours, scope 3 makes up a large portion of the total carbon footprint. Measuring it can lead to the design of innovative solutions to reduce carbon emissions significantly.
- **Under 'Our Baseline'** is a breakdown of City of London Corporation emissions and Square Mile emissions:



What this shows is that Scope 3 emissions, which would normally include development (purchased goods and services) are responsible for half or all emissions.

- The aims for 'The First Six Years' Include the following actions under 'Actions to support the achievement of net zero', and 'Actions to champion sustainable growth': *"Use our planning role to influence others to embed carbon analysis and circular economy principles in capital projects".*

- **Published May 2022, Planning Advice Note; Whole Life Cycle Carbon Optioneering** by Hilson Moran for the City of London:
  - This document sets outs how the City of London proposes to meet its commitments with respect to achieving; *"The City of London Corporation (CoL) has committed to Net Zero Carbon (NZC) for both embodied and operational carbon emissions by 2040"* through the planning system.
  - The Climate Action Strategy also commits to: *"The City of London Corporation has adopted a radical Climate Action Strategy which breaks new ground and sets out how the organisation will achieve net zero, build climate resilience and champion sustainable growth, both in the UK and globally, over the next two decades.*
    - *By adopting the strategy, the City Corporation has committed to:*
    - *Achieve net zero carbon emissions from our own operations by 2027*
    - *Achieve net zero carbon emissions across our investments and supply chain by 2040*
    - *Support the achievement of net zero for the Square Mile by 2040"*
  - The document also states that: *"The property and construction industry has a moral duty to act and reduce the environmental impacts of this sector as well as mitigate the effects of Climate Change".*
  - Under Section 1: 'Carbon in Planning Policy', The first section specifically outlines the GLA's WLC Policy and what these mean for development. It also points out that that currently the City of London's own policies do not yet require Whole Life Carbon assessments, but do require a minimum BREEAM 'Excellent' rating which does require a limited WLC assessment. However, it should be noted that the GLA Policies SI2 (requiring a full WLC assessment and prioritising retrofit) and SI7 (CE – prioritising resource efficiency) apply to all schemes referrable to the Mayor of London.
  - Also specifically referred to is the GLA's requirement for applications to demonstrate that:
    - Options for retaining existing buildings and structures have been fully explored before proposing substantial demolition, including incorporating the fabric of existing buildings into the new development (aligned with London Plan Guidance for Circular Economy Statements, March 2022);
    - Carbon emissions associated with pre-construction demolition are reported separately.
    - An estimate of the percentage of the new build development which will be made up of existing façades, structures and other key components is reported

- Specifically highlighted is the GLA WLC Reduction Principle 1 on the Reuse and Retrofit of existing Buildings: *"Retaining existing built structures for reuse and retrofit, in part or as a whole, should be prioritised before considering substantial demolition, as this is typically the lowest-carbon option".*
- This document also specifically refers to GLA Policy SI7 on the Circular Economy (see Section 2.2 above).
- Under Section 4 'Carbon Optioneering', the document notes that: *"It has become clear to the industry that the construction of new buildings using current construction techniques and materials result in high carbon emissions over the buildings lifecycle".* It goes on to show the following Graph which compares the overall carbon impacts of new build vs retrofit:

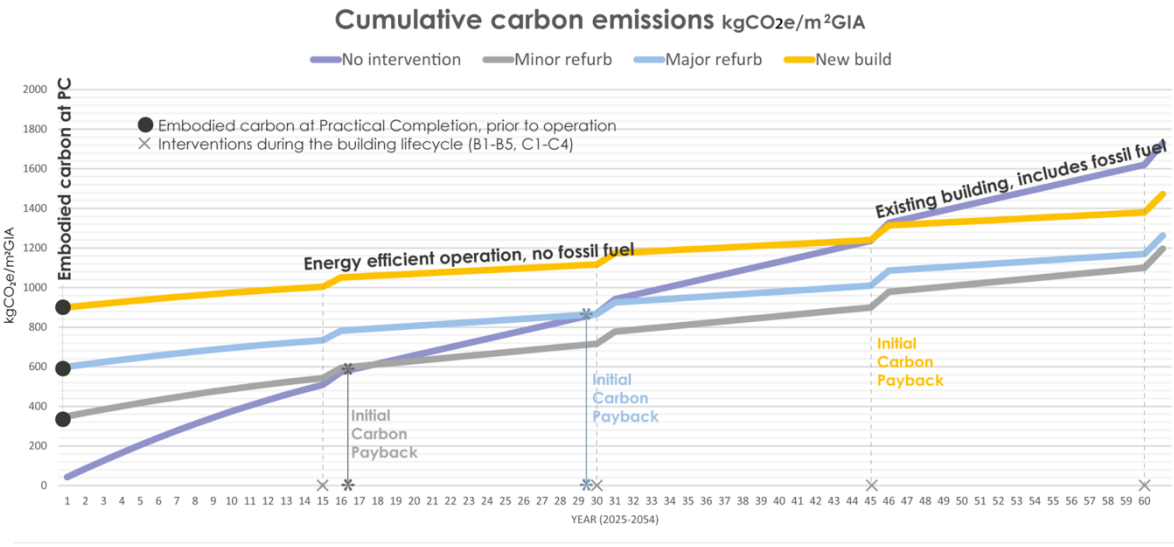


Figure 11. Examples of initial embodied carbon payback during building operational lifecycle for different options, indicative only

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- This diagram clearly shows that the refurbishment route (whether major or minor) represents a lower carbon option than new build. This is of significance as it clearly supports GLA Policy Principle No 1 to prioritise retrofit and illustrates that to achieve its net zero objectives, the City of London should be following this route.
- Section 6, 'Other Policy Opportunities, specifically reference the GLA's 'Circular Economy Statements Guidance'.
- Planning Applicants are required to complete 'Dashboard 1: Pre-Application Options Appraisal'. This shows the above graph and recommends that where applicable, all options from minor through major refurbishment to new build, be included.

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