77 Bastwick Street

Re-use in focus in our new London office

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WHITE PAPER

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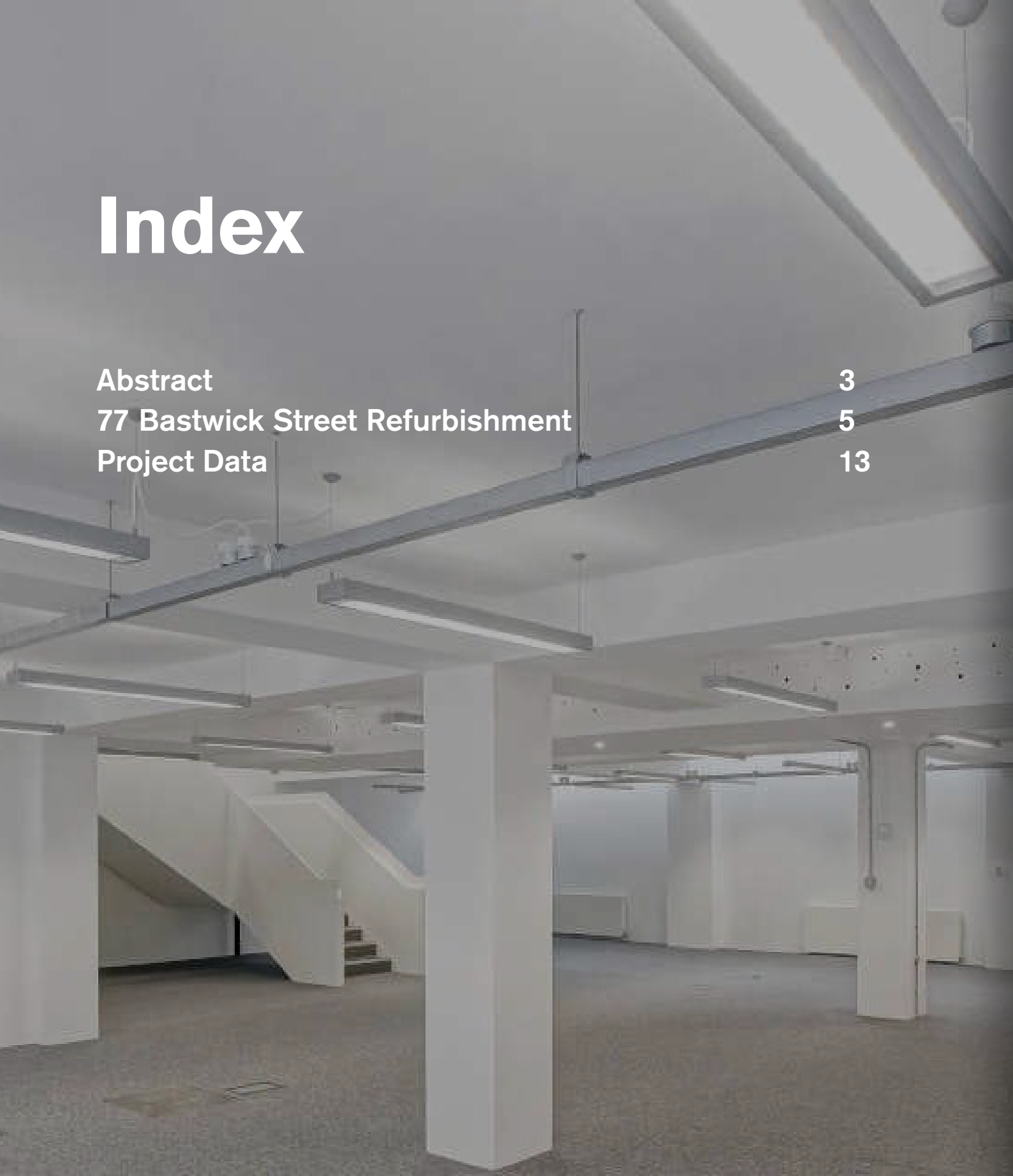

This is a self-published report from White Arkitekter. The format white paper is used for informational documents presenting offers, projects, or methodology in depth. The work presented has been conducted with support from White Research Lab, our organisation for practical research, environmental monitoring and knowledge transfer.

Abstract

When relocating its London office from Shoreditch to Farringdon in May 2023, White Arkitekter committed to a circular-economy fit-out of its new home on Bastwick Street. The aim was to reuse materials wherever possible, reducing waste, embodied carbon, and operational energy. Although the process took longer than a traditional fit-out (lasting five months including the tender process and work on site), the project achieved 80% furniture reuse and significantly lowered carbon emissions, setting a strong sustainability precedent. Additionally, it saved 40% in costs, cutting the budget from an estimated £180,000 to £100,000.

This decision was driven by the growing awareness of the commercial building sector's environmental impact. With the built environment responsible for about 40 percent of global carbon emissions—15 percent of which come from commercial buildings—the need for sustainable, energy-efficient refurbishment was clear. In London alone, around 27 million square meters of office space undergoes refurbishment every seven to ten years, leading to significant environmental consequences. The goal was to use this office move as an opportunity to set a sustainable example by embracing a circular approach that minimized waste, carbon, and energy use, while also promoting employee well-being.

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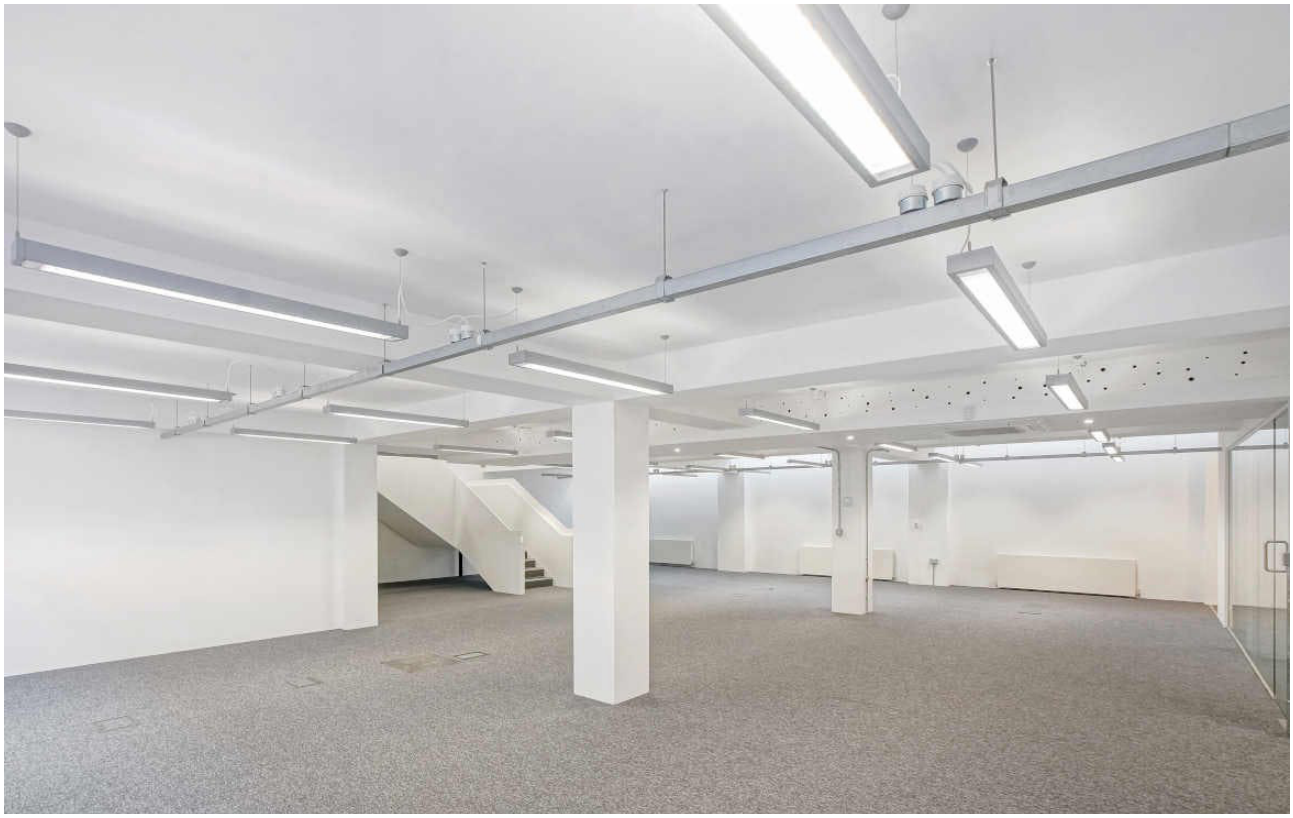


77 Bastwick Street Refurbishment

White Arkitekter has a longstanding history of driving sustainability and championing decarboniszing potential across projects. When planning the move into the new London office, the aim was to integrate these principles into the design and as a result significant savings were observed throughout the project - both through carbon and cost.

11 % of UK construction spending is on fit out. Buildings may have 30 to 40 fit outs in their lifecycle, including more minor changes. Source: RICS 2021 report. Understanding the significant environmental impact of this, a circular approach was adopted for the new office design. This involved making minimal interventions to the space and prioritizing the reuse of as many elements as possible, including furniture, acoustic panels, electronic hardware etc. Although, not a streamlined process - this resulted in great results for the space.

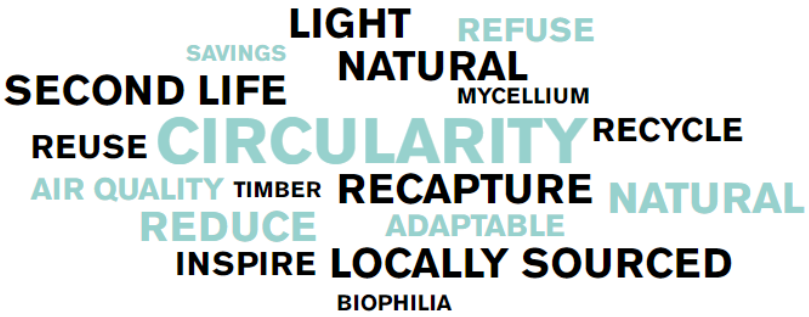
CHALLENGES AND OPPORTUNITIES

1. The main challenges stemmed from the condition of the original office space – a 1960s concrete-framed building. The existing space had lacklustre finishes, grey carpet and overclad columns which ate into the space. There was also the issue of inadequate ventilation, and poor lighting on the lower level. Insights were taken from previous occupants that confirmed the impact of the poor quality of the space on their overall wellness and efficiency. Many reported headaches - and inability to work on the lower ground floor. White Arkitekter undertook a comprehensive renovation process to address these issues, guided by clear objectives of the prioritising health and well-being of the user and a reducing environmental impact of the new design.

2. The first step in the design process was to make minimal interventions to the space to reduce the carbon footprint of the design. The team also decided to reuse elements like the raised floor, floor boxes, ventilation grills, and ceiling panels, albeit in a not 'as new' condition. Exposing the concrete columns by removing the cladding maximized space and minimized material use. One major challenge encountered during the process of reusing was sourcing of materials due to lack of standardized processes for the same . For example - the appropriate size of partition glazing for acoustic separation between meeting rooms was particularly difficult to attain. Although the glazing was intended to be reclaimed and fitted with new frames, the contractor was unable to source the glass within the required timeframe.

3. A significant opportunity that was

Original pictures of the lower ground floor space before the refurbishment. There was carpeted flooring, boxing around columns and inadequate lighting.



recognised early on in the project was reusing as many services/existing architectural elements as possible. The ventilation system was recommissioned and adapted, drawing fresh air from the roof, reducing reliance on occupant control, and obviating the necessity for installing an entirely new system. This dramatically improved air quality, reduced operational energy demand, and aligned with the goal of designing the office to operate with minimal energy consumption, enhancing both sustainability and operational efficiency. Further, internal secondary sliding windows had already been installed to minimize heat loss through the 1960s single-pane glazing without altering the building's external appearance, so these were also reused.

4. The project also took advantage of the open plan and designed a variety of different spaces, from open-plan desk areas to quiet pods, break out spaces etc supporting diverse working styles and allowing flexibility.

5. A significant challenge was maintaining a project timeline that balanced the complexities of circular procurement with the need to deliver a functional office space. Nevertheless, the team achieved substantial cost savings compared to a conventional fit-out, demonstrating the financial viability of a circular approach.

6. Another opportunity was materials. These were selected based on sustainability, focusing on natural materials and low carbon footprint. For example, timber flooring and timber joinery were used in the office 'quiet pods.

7. To accurately track the carbon savings, the process began with the formulation of Bill of Quantities (BOQs) and detailed documentation. However, challenges arose due to the lack of accessible environmental performance data, necessitating assumptions and the creation of a comprehensive database. The final carbon calculations for the Cat A fit-out elements were conducted using One Click software and manufacturer data. This process established a standardised approach for future White projects to reference.

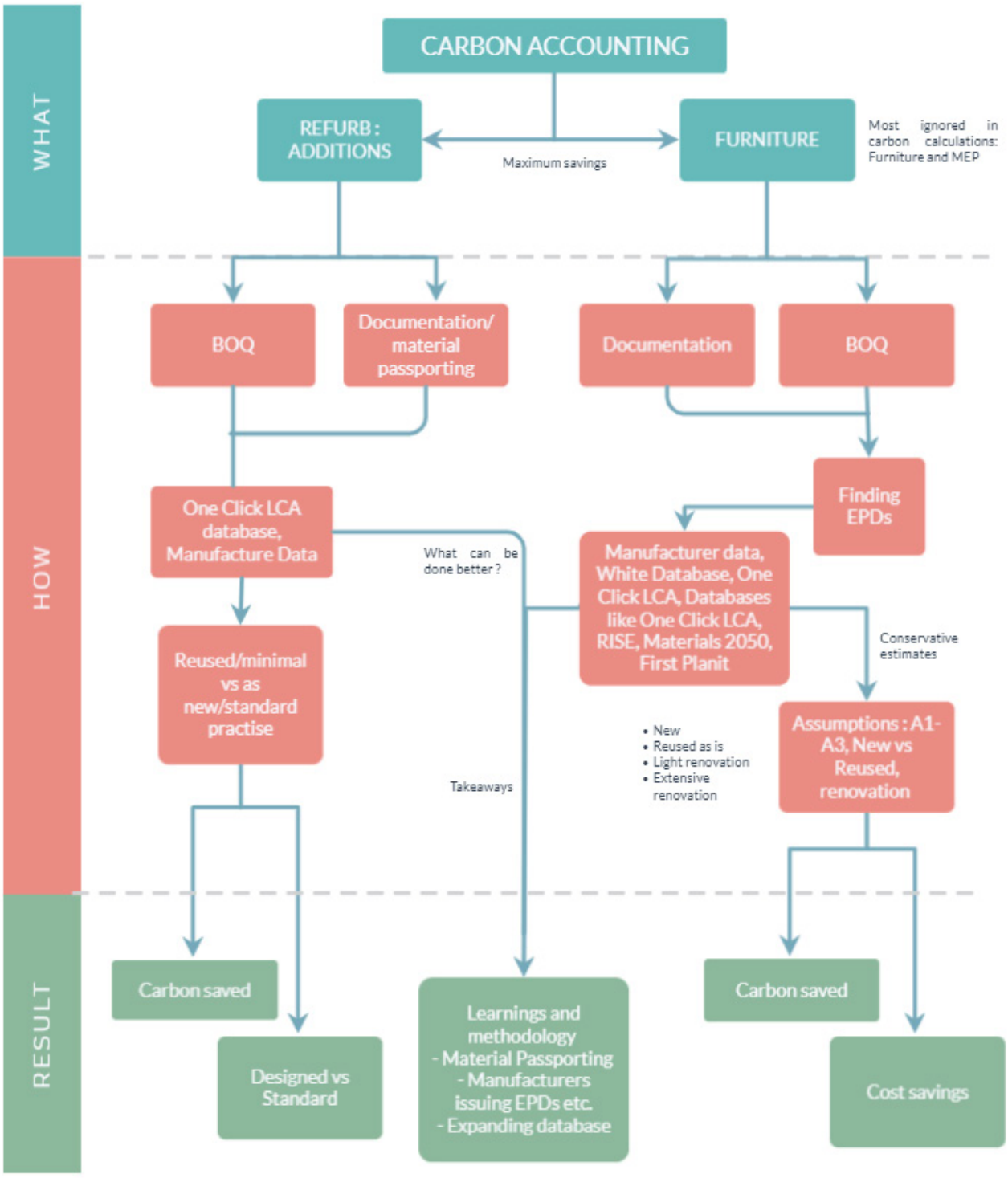
PROCESS

1. The first step was preserving raised access metal floor tiles, which secured about 60% of carbon savings compared to installing new tiles. Vent grills and power sockets were reconfigured, with broken socket boxes repaired to suit the new desk arrangement and floor plan. New wooden flooring was introduced to create a lighter, more natural ambiance.

2. The next step involved exposign concrete columns by removing the encasement, increasing the spaciousness of the office layout.

3. The third move was to recommission the existing out of use ventilation system, which draws fresh air from the

Pictures of the lower ground floor after the refurbishment process: the area is more spacious, airy, and well lit.


WHAT
HOW
RESULT
CARBON ACCOUNTING
REFURB : ADDITIONS
FURNITURE
Maximum savings
Most ignored in carbon calculations: Furniture and MEP
BOQ
Documentation/ material passporting
Documentation
BOQ
Finding EPDs
One Click LCA database, Manufacture Data
What can be done better ?
Manufacturer data, White Database, One Click LCA, Databases like One Click LCA, RISE, Materials 2050, First Planit
Conservative estimates
Reused/minimal vs as new/standard practise
• New
• Reused as is
• Light renovation
• Extensive renovation
Assumptions : A1-A3, New vs Reused, renovation
Takeaways
Carbon saved
Designed vs Standard
Learnings and methodology
- Material Passporting
- Manufacturers issuing EPDs etc.
- Expanding database
Carbon saved
Cost savings

roof. MEP services make up about 15% of the embodied carbon in a new office building. They are often replaced before the end of their lifespan and contribute significantly to the embodied carbon associated with maintenance and replacement cycles (about 45% of a building's whole life carbon). By choosing to recommission instead of replacing the existing system, the air quality on the two floors was dramatically improved, and substantial embodied carbon savings were gained.

4. Addressing the lighting on the lower ground floor was pivotal. Transitioning from stark to warm lighting and incorporating task-specific illumination for various functions created a desirable variation in atmosphere. Additionally, the introduction of indirect daylight markedly transformed the mood and utility of the lower level. The space planning of different working and meeting spaces was designed to exploit varying natural daylighting conditions and reduce reliance on task lighting.

5. The next step was to reimagine the office layout to accommodate flexible working styles, fostering employee well-being and encouraging productivity through features like hot-desking, standing desks, diverse breakout spaces and quiet pods. Specifically, the addition of non fitted furniture is designed to be reconfigured to allow future adaptability of the space.

6. Throughout the process, a circular strategy was observed to complete the interior fit-out. The aim was to incorporate as many previously cherished furniture items as possible. These were reused from either the old office, old projects or sourced from different buisenesses in the city. These second-hand finds now hold a prominent place in the office space. Reuse items include perforated plywood panels that were obtained from another project, for which the 'used' condition has been embraced, with an added layer of lacquer, and acoustic baffles that were sourced from the supply chain as surplus orders to other projects.

Following the above steps - the final office design made significant cost and carbon savings. The final accounting gave the following results :

The project saw an overall of 7-ton carbon savings and 40% cost savings for new vs 80% reused furniture. There was 6% carbon savings in new vs reused – Cat A fit-out additions (reused acoustic panels; addition of timber flooring, paint, glass partitions, plywood walls and plaster wood partitions). There would be a 60% jump in these savings if calculated for total strip out i.e. the metal access floor is replaced.

The final outcome was a warm, naturally inspiring environment conducive to the team's work, featuring flexible spaces, biophilic principles, and natural materials, which all overall contributed to low carbon emissions and maximizing circularity principles.

RISK AND LESSONS LEARNED

The main risks were potential cost increases and delays due to the complex procurement and uncertain condition of reclaimed items. The usable lifespan of reclaimed items also presented a risk, with potential functionality issues over time.

One of the standout lessons from this project is the value of reviving overlooked spaces with minimal intervention. It's a reminder that flexibility and adaptability can lead to great results, encouraging a shift from rigid design norms to more creative and responsive solutions.

Another risk was conducting the carbon accounting process after design completion. This necessitated sourcing environmental data from multiple databases and making calculations based on approximations when exact numbers were unavailable.

The process of carbon accounting was quite tedious and time consuming as it involved sourcing information from different databases. This method outlines the steps taken to ensure accurate representation of the results. Graphic: Shreya Aneja

Results - Refurbishment

Principles

- Minimal interventions
- Not a complete Strip out. E.g. Metal raised floor tiles retained
- Reuse
- MEP – contributes 15% in a typical office space
- The ventilation system was recommissioned

Additions

- Acoustic panels (50% reused)
- Timber flooring
- Paint
- Glass partitions
- Plywood walls
- Plaster wood partition

Co2e saved

Reuse

6%

Reuse vs As new

Learnings – Carbon accounting

Difficulties/Scope

Finding EPDs Specifically for reused materials. Discrepancy between EPDs

Doing accounting post design and construction

Tracking product, specifications after completion

Carbon emission of demolition, recommissioning not accounted for.

Whole life carbon, operational energy, carbon of MEP, equipment etc. not accounted for. Assessing major impact areas

Recommendations

Designing for disassembly

Carbon rating of products

Tracking and material passporting in early stage

Life span consideration before demolition or buying new; Recommissioning

Mandatory measurement and reporting

Comparison to standards

Post occupancy evaluation : Nabers UK monitoring – energy assessment s

Ideal scenario

Design
- Reduce
- Reuse
- Disassembly
- Accounting
- Material Passport

↓

Reporting

↓

Standards

↓

Post occupancy evaluation

Results – Furniture

Although this approach facilitated the development of a method for future calculations, it proved to be tedious and time-consuming. The lesson learned is the importance of initiating this process from the outset and meticulously documenting it as it progresses. In the broader industry context, there is a pressing need for standardized methods of measuring carbon emissions to enable quicker and more accurate accounting.

A key takeaway was the benefit of material passporting for future reuse and recycling efforts. The in-house 'remake' tool, using 3D scanning and BIM, proved to be an asset. As identified in other projects, the appetite for re-use is growing, but supply chains need to catch up. For example, the use of post-consumer glazing needs allowances for the glass to be sourced then sent for installation by a framing manufacturer before it is delivered to site.

Overall, a circular fit-out proved more time-intensive, but being the client ourselves - it allowed for greater flexibility, even enabling operational use of the space before project completion.

TOP TIPS AND OBSERVATIONS

1. Building connections early in the process with suppliers supportive of circular procurement can be extremely beneficial to the entire process .

2. It is also important to integrate space for storage at an early stage for the timeline gaps that might occur due to the chain of custody of reused materials/ furniture from different stake holders.

3. Incorporate the visibly 're-used' aesthetic into a positive narrative, it champions both decarbonisation and circularity.

4. Allow for disassembly - it is important for an office space to be not only adaptable to its future needs but also flexible for evolving working styles of individuals. This choice helps reduce environmental impact by reducing number of refurbishment cycles in the lifespan of a space. Overall, our decision to adopt a circular economy approach proved to be challenging but effective. The design approach of the office was heavily influenced by London's unique environmental and urban challenges. As a major commercial hub, London's intense construction activity has significant environmental impacts, while the health and well-being of its workforce is also becoming increasingly critical in the city's fast-paced environment. Recognizing these factors, our office redesign focused on sustainability, operational efficiency, and creating flexible, health-conscious spaces that support diverse working styles. This approach not only enhanced employee well-being but also achieved significant cost reductions and carbon savings, demonstrating the viability and benefits of circular practices for wider adoption across the city.

Top tips for a smother carbon accounting process for a low carbon circular fit out of an office space.

Project Data

CLIENT
White Arkitekter
Needspace Ltd – landlord
BSB Group
Site Specialist Services D&B Ltd - Contractor

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Shreya Aneja – LCA, Sustainability report
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Louis Hermawan

COLLABORATORS
Stolab Furniture
Rockfon acoustic panels
Muuto
Benjamin's workshop (manufacture and supply)
Vitra
XAL Lighting
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