City of London Corporation

Carbon Options Guidance

Refurbishment Guide

CITY OF LONDON

Hilson Moran

Contents

1 Appold Street

Approximate Project Construction Cost: no information provided
Total Project Cost: no information provided

Location: London, UK
Planning Authority: City of London
Building Type: Office & Leisure
Project Type: Deep retrofit
RIBA stage: RIBA Stage 2

DESIGN TEAM
Client: Bluebutton Properties UK Limited
Developer: British Land
Project Manager: Opera
Architect: Piercy & Co

Structure: AKT II
MEP: MTT
Sustainability: Hilson Moran

Overview

Pre-refurb

Building Age: 1989

GIA: 28,992 m²

NIA: *information not provided*

Clear height *: 3.8m

EPC: D

Heating fuel: Gas

Source: Piercy & Company

Post-refurb

Completion Date: TBC

Status: RIBA Stage 2

GIA: 51,869 m²

NIA: 31,834 (Office)
4,242 (Gym)
360 (Café)

Clear height *: 3.8m

EPC: A

Heating fuel: Electricity

Cat A: Shell & Floor

Cat B: N/A

Source: Piercy & Company

* Clear height means the finished floor level to ceiling height

Deep Retrofit

Scope of works

Comprehensive refurbishment and extension: The scheme comprises the repurposing of existing retail building to provide a commercial office building with leisure to the basement and some food and beverage spaces.

The scheme includes additional floors (5 additional storeys and a pavillion), additional balcony areas to each level and a replacement of the existing façade. With the aditional floors, the proposed superstructure consists of 13 storeys. A new public realm area to north of the building is being added.

75% of the structure is being retained. The basement is to be retained, and all existing foundations are to be reused. A new core is provided through the centre of the building to provide lateral stability with associate reinforce concrete piles. The plant rooms are relocated.

Retained and installed elements

0% retained

External Walls (1)

Recycled content in everything 'new', min 20% by value targeted. The facade will be replaced due to quality and the extent.

0% retained

Openings (2)

The existing facade is being replaced to minimise internal heat generation through energy efficient design (optimised glazing areas and solar control coating)

0% retained

Services (3)

The services will be demounted and set for recycling. New systems will be installed.

100% retained

Substructure (4)

Almost 100% retention. New piled foundations will be installed to support the RC core in the centre of the building.

0% retained

Roofs (5)

The roof will be demolished with the majority of materials set to recycling.

75% retained

Floors (6)

Approximately 75% retention of upper floors. Additional supports to the floors, concrete C32/40 with 50% GGBS is proposed within the development.

99% retained

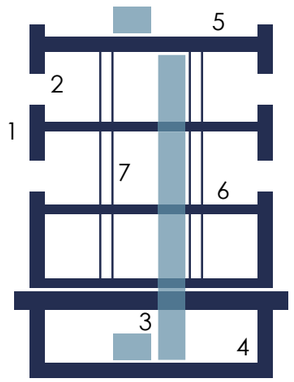
Frame (7)

Majority of the existing frame is being retained. Concrete frame system and reinforced concrete floors are being proposed for the extension areas and alterations on the existing frame.

100% installed

Low Carbon/Renewable Technologies

Installation of air source heat pumps and PV panels.



1 Appold Street

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**623.4*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**414.9*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**495.0*[1]** $kgCO_2$ e/m^2 GIA

*1 Based on British Land Whole Life Carbon Reporting template

Energy Use intensity (kWh/m^2/yr (Based on NIA)	59.4 (landlord rated areas)
Heating Fuel type (heat network, electric)	100% electrified
Low and Zero Carbon Technologies	PV installation and Air Source Heat Pumps (heating & cooling)
Recycled Content % by Value	Min 20% targeted

WLC Assessment Method:
RICS WLC and City of London compliance

WLC Assessment Scope:
Modules A-C

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	15.6 17.3
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	185.1 259.0
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	118.6 123.4
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	7.7 9.6
Finishes	A1 A5 (excl. seq. carbon) A-C (incl. seq. carbon)	37.1 105.7
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	1.6 4.8
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	45.2 94.4
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	3.8 6.1

Certifications

Targeting BREEAM 2018 Office New Construction Shell and Core Outstanding rating

Targeting NABERS UK 5.0-5.5 Star rating

Key Insights

Insights

- Retention of existing structure and foundations.
- Optimising design for longevity, flexibility, adaptability, standardisation, leasing of products, disassembly, deconstruction and end-of-life (EoL), and recoverability.
- Increasing use of recycled content for new materials and maintaining materials at their highest value i.e., reuse or upcycle before recycling / downcycling and using materials and products that are appropriately durable and easily re-used at their end-of-life.
- Adoptation of Material Passport strategy, exploring the future reuse options of materials and components, and aiming 100% of materials not going waste.

Opportunities

- Enabling circular economy approach through the integration of circular design principles, investigation of secondary material market opportunity, early engagement with the main contractor, and the definition of materials' passport strategy.
- Embodied carbon savings with retention of existing foundations, and at least 70% of existing structure.
- Minimised cooling demand through passive measures and non-combustion-based energy solution.
- Installation of PV panels.
- WELL-enabled approach to enable tenant/s to achieve WELL Building Standard certification.
- Intensive green roof (biodiverse extensive) and greywater recycling.

Challenges

- Lightweight concrete in the composite slabs is critical to reduce the weight of the floors and limit the strengthening work of the existing structure. However this poses a challenge for the its embodied carbon as concrete mix with lightweight aggregates is considerably higher than traditional dense concrete and mitigation strategy must be implemented to meet the EC target.
- Circular economy is the biggest challenge for the scheme, as there is not enough experience in the industry. Many circular economy opportunities identified during the design stage are under the main contractor responsibility and this represents an uncertainty until the strip-out and construction processes start.
- Specifying reused elements (e.g., reused steel) is dependent on market availability at the time of construction. Reuse opportunities for the existing building's element depend on secondary market demand at the time of strip out and deconstruction.

3 Sheldon Square

Approximate Project Construction Cost: £20-50m
Total Project Cost: £20-50m

Location: London, UK
Planning Authority: Westminster City Council
Building Type: Office & Retail
Project Type: Refurbishment

RIBA stage: RIBA Stage 5
DESIGN TEAM
Client: British Land
Developer: U+I
Project Manager: Opera

Architect: Morris and Company
Structure: Heyne Tillet Steel (HTS)
MEP: Ramboll
Sustainability: Ramboll

Overview

Pre-refurb

Building Age: 2002

GIA: 17,543 m²

NIA: 13,355 m²

Clear height *: *information not provided*

EPC: D

Heating fuel: Gas

Source: British Land

Post-refurb

Completion Date: 2024

Status: RIBA Stage 5

GIA: 17,543 m²

NIA: 13,463 m²

Clear height *: 3.8m

EPC: A

Heating fuel: Electricity

Cat A: Shell & Core

Cat B: N/A

Source: British Land

* Clear height means the finished floor level to ceiling height

Refurbishment

Scope of works

Refurbishment and reposition of the existing building: The works consist of replacement of main plant to deliver an 'all electric' building, addition of balconies to the retained façade and an internal refurbishment to the existing building, including upgrades to the reception, on floor and end of trip provision.

The existing superstructure consists of steel frame supporting composite concrete slabs cast on metal decking. The slabs are connected to the steel beams via through deck welded shear studs.

Steel balcony structures have been added as part of the 2023 refurbishment works which are supported on fabricated steel beam cantilevers and high tensile Macalloy bars.

The refurbished scheme benefits from an Electric Strategy whereby the existing gas fired boilers have decommissioned. Heating and Cooling will be provided via 4 pipe ASHP system to capitalise on the opportunities for heat recovery.

Retained and installed elements

100% retained

External Walls (1)
Existing curtain walling (aluminium spandrel glazing panels) is to be retained.

75% retained

Openings (2)
Minimising internal heat generation through energy efficient design (optimised glazing areas and solar control coating)

31% retained

Services (3)
The Schemes accentuates the opportunity for retaining and reusing MEP systems where deemed feasible.

100% retained

Substructure (4)
The existing substructure is to be 100% retained..

100% retained

Roofs (5)
All roof finishes to be retained with minor interventions where new steel cantilever beams fix back to the existing building structure.

68% retained

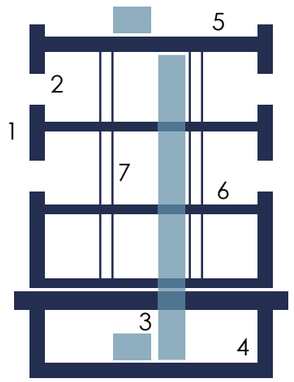
Floors (6)
All structural floors are to be retained.

98% retained

Frame (7)
The works comprise the installation of a series of hanging Balconies to the facades facing onto the public square.

100% installed

Low Carbon/Renewable Technologies
Installation of air source heat pumps.



3 Sheldon Square

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**321.0*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**104.0*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**1,153.5*[1]** $kgCO_2$ e/m^2 GIA

*1 Figures based on the Stage 4 WLC Assessment report

Energy Use intensity (kWh/m^2/yr (Based on NIA)	57.5 (estimated, excludes retail unit)
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	4 Pipe Air Source Heat Pumps (heating & cooling) and PV panels
Recycled Content % by Value	N/A

WLC Assessment Method:
RICS WLC

WLC Assessment Scope:
Modules A1-A5, B3-B4, B6, C1-C4

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.0 3.6
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	29.8 50.8
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	1.6 73.5
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	5.7 15.6
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	17.1 37.2
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	29.3 120.0
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope

Certifications

BREEAM 2014
RFO Outstanding
(Design Stage Certificate)

Targeting
NABERS 4.5
star rating

Targeting WELL
Pre-certification

Key Insights

Insights

- The retain & retrofit first approach. The project highlights the opportunities that retrofitting an existing 23yr old development to be fit for the our low carbon and circular economy future. Key success to this was having a clear sustainability brief from the outset that embedded the ambition and required outcomes from the project.
- Using materials and products that are appropriately durable and easily re-used at their end-of-life.
- Optimising design for adaptability and disassembly.
- Exploring the future reuse options of materials and components.
- Achieving better space utilisation and efficiency through tenant diversification.

Opportunities

- An estimated 80% reduction in embodied carbon emissions through re-use compared with a best-in-class new development (based on GLA Aspirational benchmark) in delivering the project to completion.
- Offsite production to reduce waste and strip-out material upcycled through local take back schemes.
- Enhanced planting to balconies and internal features to deliver a net biodiversity gain (100% Biodiversity Net Gain achieved).
- Installation of PV panels.

Challenges

- Difficulties in achieving exemplar NABERS/energy performance due to the limitation of the retained existing building fabric.
- Retention of pipework, while ensuring pipework and water quality are safeguarded.
- Existing fire-stopping material not meeting current regs. Condition of the existing dry lining meeting current regs.
- Tenant modifications to ductwork not aligning with proposals following removal of ceilings.
- Balancing the durability and performance of finishes and intumescent products with the requirements to deliver low / no VOC products throughout the building.
- Regarding circular economy there were some challenges reported around coordination of take back to some of the strip out materials. There were some ‘no shows’ reported.

50 Finsbury Square

Approximate Project Construction Cost: no information provided
Total Project Cost: no information provided

Location: London, UK
Planning Authority: London Borough of Islington
Building Type: Office & Retail
Project Type: Refurbishment

RIBA stage: RIBA Stage 6
DESIGN TEAM
Client: Great Portland Estates
Developer: Great Portland Estates
Project Manager: Blackburn & Co. Ltd.

Architect: Doone Silver Kerr
Structure: Heyne Tillet Steel
MEP: Hilson Moran
Sustainability: ARUP

Overview

Pre-refurb

Building Age: 1999

GIA: 16,729 m²

NIA: 11,749 m²

Clear height *: 2.75 m

EPC: D

Heating fuel: Gas

Source: Foster + Partners

Post-refurb

Completion Date: 2023

Status: RIBA Stage 6

GIA: 17,181 m²

NIA: 11,997 m²

Clear height *: 2.85 m

EPC: A

Heating fuel: Electricity

Cat A: Shell & Core

Cat B: N/A

Photographer: Tudor McManus

* Clear height means the finished floor level to ceiling height

Refurbishment

Scope of works

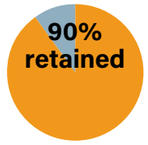
Refurbishment of the existing building: 50 Finsbury Square is an existing 8-storey building with two basement levels plus plant level, comprising primarily commercial office (B1) use. Retail areas are provided at the ground floor fronting Finsbury Pavement

The works consist of the refurbishment of existing building including erection of single-storey roof-level office pavilion, repositioning of office entrance, reconfiguration of retail/office unit layout at ground floor, and flexible retail/leisure (Class B1/D2) at ground and lower ground level, installation of internal mezzanine infills to existing office atrium area, replacement of external stone cladding and associated works.

Retained and installed elements

External Walls (1)

Plant screen was replaced, new external walls were added for the pavilion.

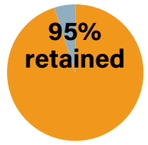


Openings (2)

Ground floor/reception glazing including. entrance doors were fully replaced; pavilion glazing was added. Atrium glazing and all upper floor curtain walling retained.

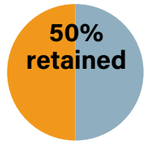
Services (3)

More efficient and larger plant and equipment were installed.



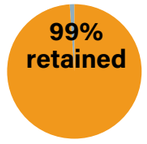
Substructure (4)

Piling and majority of basement area were retained. Changes to underground drainage meant sections of the slab were removed and replaced.



Roofs (5)

Roof slab was retained, all insulation/ finishes were replaced on main roof and plant room roof. Pavilion roof was added.



Floors (6)

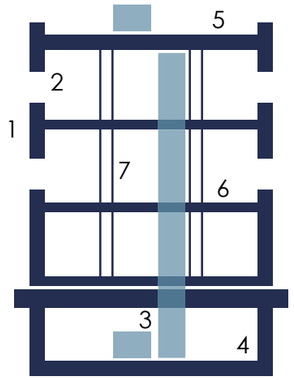
Majority of floor was retained. New floor was added for the pavillion and floorplate extensions.

Frame (7)

Majority of frame was retained. The car lift was removed and a new service core serving the lower levels was installed. New frame was added for the pavillion area.

Low Carbon/Renewable Technologies

Installation of air source heat pumps.



50 Finsbury Square

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**1,041.0*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**270.0*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**261.0*[1]** $kgCO_2$ e/m^2 GIA

1 Based on emission factors: 0.0376 $kgCO_2e$/kWh for electricity (FES 2022)

Energy Use intensity (kWh/m^2/yr (Based on GIA)	115.7 (excluding retail units)
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	Air source heat pumps
Recycled Content % by Value	Information not available

WLC Assessment Method:
RICS WLC and GLA compliant

WLC Assessment Scope:
Modules A-C (excl. B6 & B7)

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	1.0 6.0
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	18.0 31.0
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	35.0 61.0
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	28.0 52.0
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	39.0 119.0
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	2.0 12.0
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	143.0 757.0
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope

Certifications

BREEAM 2014
RFO Excellent

Targeting WELL
Pre-certification

Key Insights

Insights

- Increasing the office floorspace and improving the primary vertical circulation and the spatial relationship with the atrium.
- Creating an office building to meet highest possible sustainable standards through replacing the building services with new efficient systems and introducing high performance glazing and low carbon materials.
- Requirement of the repair and upgrade works on the existing facade to reduce cooling and lighting loads of the building.
- Requirement of a comprehensive replacement of mechanical and electrical services to upgrade the building performance.

Opportunities

- Saving on operational carbon through enhanced envelope performance and energy efficient systems for heating, cooling and ventilation.
- Having low embodied carbon footprint by retaining key elements of the building.
- Consideration of reduced waste and use of materials with low embodied carbon.
- Consideration of biodiversity; introducing green roofs and greening of walls.
- Offering an increase on office spaces and improved spatial relationship between them and the atrium.

Challenges

- LBI planning policy relating to building height and the conservation area, planning limitations on changing appearance of the façade and involving technical challenges of installation of the existing limestone clad external wall frame. Resistance to building the pavilion on the roof. Restrictions on roof plant making coordination.
- Difficulty in upgrading the thermal elements (e.g increasing the roof insulation) to meet Part L.
- Coordination a challenge as existing plantrooms and risers not designed to cater for modern services that require more space due to current energy and fire compliance needs.
- Due to limited space on the roof level and limitations on altering the façade, installation of PV panels was deemed unfeasible.

100 New Bridge Street

Approximate Project Construction Cost: no information provided
Total Project Cost: no information provided

Location: London, UK
Planning Authority: City of London
Building Type: Office & Retail
Project Type: Refurbishment
RIBA stage: RIBA Stage 2

DESIGN TEAM
Client: Helical
Developer: Helical
Project Manager: Avison Young
Architect: Gensler

Structure: ARUP and Watermans Group
MEP: L&P Group
Sustainability: L&P Group

Overview

Pre-refurb

Building Age: 1992

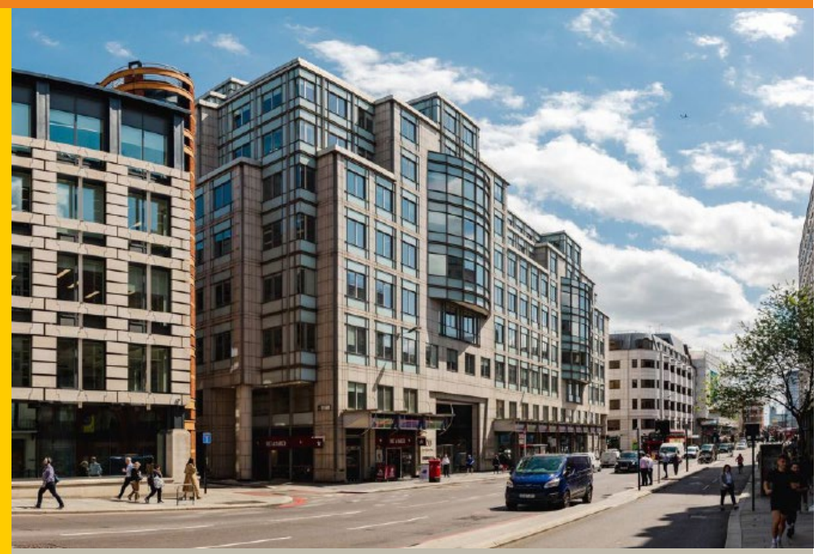
GIA: 15,517 m²

NIA: *information not provided*

Clear height *: *information not provided*

EPC: D

Heating fuel: Gas



Copyright issue! Images are needed!!!

Post-refurb

Completion Date: 2025

Status: RIBA Stage 2

GIA: 23,047 m² (office)
346 m² (retail)

NIA: *information not provided*

Clear height*: *information not provided*

EPC: *information not provided*

Heating fuel: Electricity

Cat A: Shell & Core

Cat B: N/A

Copyright issue! Images are needed!!!

* Clear height means the finished floor level to ceiling height

Refurbishment

Scope of works

The existing building was 9 stories in height. The proposed development constitutes the comprehensive refurbishment and extension of the existing office building whilst retaining majority of the existing structure. The extension works comprise the provision of an additional floor of office accommodation at 10th floor level, alongside a revised approach to the massing which seeks to push out the building envelope at upper levels.

The existing basement structure is proposed to be retained and no additional basement excavation is proposed. The refurbishment works comprise the rationalisation of the existing floorplates, alongside the provision of new facades on the north, west and south elevations with the existing brick elevation to the west being retained.

Retained and installed elements

Data not available

External Walls (1)

85% of RC walls were retained. Minority of existing brick walls retained. Majority of them was renewed. Lightweight blocks for building envelope were proposed.

TBC% retained

Openings (2)

For the new glazing frames and cladding panels, aluminium frame with a 35% recycled content was proposed in the design.

TBC

Services (3)

The development proposes installation of air source heat pumps as heating, hot water, and cooling demands.

TBC% retained

Substructure (4)

100% retained, and no additional basement floor was proposed.

TBC% retained

Roofs (5)

The scope of works proposes an additional floor and roof terraces incorporating hard and soft landscaping for use by office tenants.

TBC% retained

Floors (6)

Retaining 90% of metal deck floors. Majority of floors were retained because of that the existing building has already had generous floor to ceiling heights and a solid structure.

TBC% retained

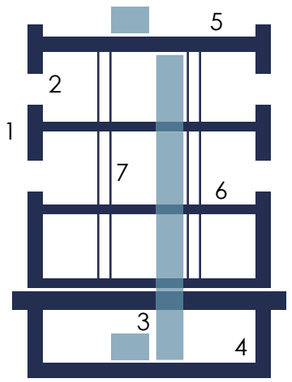
Frame (7)

Majority of frame system was retained because of that the existing building has already had generous floor to ceiling heights and a solid structure. Using CLT for structural interventions.

TBC

Low Carbon/Renewable Technologies

Installation of PVs and air source heat pumps.



100 New Bridge Street

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**883.0*** $kgCO_2$ e/m² GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**459.0*** $kgCO_2$ e/m² GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**N/A*** $kgCO_2$ e/m² GIA

Energy Use intensity (kWh/m²/yr (Based on GIA)	79.8 (estimated, only for Office)
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	Air source heat pumps and PV panels
Recycled Content % by Value	Min 20% targeted

WLC Assessment Method:
RICS WLC and GLA compliant

WLC Assessment Scope:
Modules A-C

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m²) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.0 0.0
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	115.0 127.0
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	101.0 196.0
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	124.0 323.0
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope

Certifications

BREEAM 2018 New Construction 3.0 Outstanding

Targeting NABERS 5.5 star rating

The development also is required to be WELL Platinum and WiredScore enabled

Key Insights

Insights

- The retain & retrofit first approach.
- A material specification strategy that prioritises products with recycled components and Environmental Product Declarations (EPDs).
- Aiming to meet 95% reuse/recycling/recovery of construction and demolition waste.
- Proposing C32/40 20% cement replacement, and using steel reinforcement bars with 97% recycled content and using CLT for structural interventions.
- Optimising design for adaptability and flexibility, ensuring to keep a high quantity of materials and systems within the system, and adopting of Building as a Material Bank strategy.

Opportunities

- Reducing embodied carbon impacts through the significant proportion of retaining/reusing of the existing building structure.
- Proposing an air source heat pump system for heating, hot water, and cooling demands of the development and installation of PV panels.

Challenges

- Given the location of the site, there are no existing District Energy Networks immediately adjacent to the site, and a possible connection with the existing networks may not be available for several years.

The Kensington Building

Approximate Project Construction Cost: no information provided
Total Project Cost: £50m

Location: London, UK
Planning Authority: Royal Borough of Kensington and Chelsea
Building Type: Office & Retail
Project Type: Deep Retrofit

RIBA stage: RIBA Stage 6
DESIGN TEAM
Client:
Developer: Ashby Capital & Janson Urban
Project Manager:

Architect: Pilbrow & Partners
Structure: WSP
MEP: WSP
Sustainability:

Overview

Pre-refurb

Building Age: 1970

GIA: 10,534 m²

NIA: 8,052 m²

Clear height *: 3 to 5.5 m

EPC: F

Heating fuel: Gas

Source: Pilbrow & Partners

Post-refurb

Completion Date: 2021

Status: RIBA Stage 6

GIA: 15,133 m² (office)
346 m² (retail)

NIA: 11,865 m²

Clear height *: 3 to 5.5 m

EPC: B

Heating fuel: Gas

Cat A: Shell & Core

Cat B: N/A

Source: Pilbrow & Partners

* Clear height means the finished floor level to ceiling height

Deep Retrofit

Scope of works

The scope of works is to transform a tired and bleak four-storey 1970s block into a six-storey mixed-use building providing next-generation office space and, through the creation of a new retail arcade, better connectivity to High Street Kensington Underground Station.

The development is designed to be six storeys high, and with ceiling heights up to 5.5m, the building combines 8,801 m² of office space with 1,145 m² of terraces on the three upper floors. 4 retail units are located on the ground floor, totalling 465 m², as well as a 2,787 m² retail unit.

The development proposed to use white roman brick on masonry support system with curtain wall infill windows to primary elevations. For the secondary elevations, metal rain screen panelling with punched window openings were proposed.

Retained and installed elements

20% retained

External Walls (1)
The existing basement perimeter walls were retained / 6.0m deep basement. New systems were proposed for the rest of external walls.

100% installed

Openings (2)
New systems were proposed to provide good themal performance.

100% installed

Services (3)
The buildings are served by a central heating system served by gas fired boilers only, with a seasonal efficiency of 92%.

100% retained

Substructure (4)
100% retained with micro-piling for the new foundations.

100% new build

Roofs (5)
New roof was proposed.

65% retained

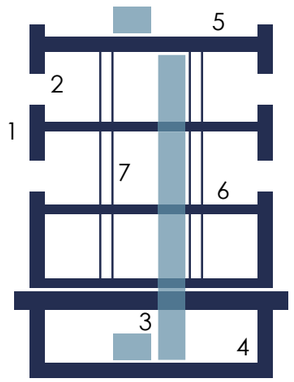
Floors (6)
The existing floors are 65% retained. Additional floors are of a thin 200mm post-tensioned composite deck slab.

65% retained

Frame (7)
The existing concrete frame was 65% retained with minimal structural intervention through load-balancing to the structural capacity of the retained frame.

100% installed

Low Carbon/Renewable Technologies
Installation of PV panels at roof.



The Kensington Building

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**1,050.0*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**700.0*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**1,237*[1]** $kgCO_2$ e/m^2 GIA

1 Based on emission factors: 0.21 $kgCO_2e$/kWh for gas (Part L) and 0.0376 $kgCO_2e$/kWh for electricity (FES 2022).

Energy Use intensity (kWh/m^2/yr (Based on NIA)	88 (gas), 73 (electricity)
Heating Fuel type (heat network, electric)	Gas
Low and Zero Carbon Technologies	PV panels
Recycled Content % by Value	Information not available

WLC Assessment Method:
RICS WLC and GLA

WLC Assessment Scope:
Modules A-C (excl. B6 & B7)

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	28.0 N/A
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	182.0 N/A
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	168.0 N/A
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	14.0 N/A
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	105.0 N/A
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	7.0 N/A
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	161 N/A
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	7 N/A

Certifications

BREEAM 2014
New Construction

WELL Gold

Key Insights

Insights

- Providing a sustainable building, reuse the construction programme.
- Mitigating any impacts to the London Underground Station.
- Creating an office and retail building fit for the contemporary market with longevity.
- Adapting a more architectural urbanistic response, satisfying the need to respond to the adjacent conservation area with a similar or equal material palette.

Opportunities

- Approximately 30% saving in embodied carbon through 100% retention of substructure and piling as well as nearly 80% retention of the upper concrete frame thanks to the good column grid and excellent floor to ceiling height of the existing building.
- Meeting 31% reduction on operational carbon through replacing completely the external envelope and the mechanical service which had reached the end of their service life.
- Installation of PV panels at roof level.
- Having excellent health and wellbeing standards, mitigating climate change and encouraging biodiversity through designed terraces and balcony areas.

Challenges

- Retaining and operating a retail store on site during the entire planning and construction period.
- Having a diffent superstructre and various set of bricks in each floor of the existing building as well as requiring to deal with special bricks in the existing building.
- Project site constraints: building directly adjacent to the TFL / Kensington High St Tube Station.
- Providing an enhanced fire rating to the façade abutting the TFL/ tube site.

Pall Mall

Approximate Project Construction Cost: £20-50m
Total Project Cost: £20-50m

Location: Manchester, UK
Planning Authority: Manchester City Council
Building Type: Office
Project Type: Deep Retrofit

RIBA stage: RIBA Stage 6
DESIGN TEAM
Client: Bruntwood
Developer: Bruntwood
Project Manager: Bruntwood

Architect: Sheppard Robson
Structure: DW Consulting
MEP: Ramboll
Sustainability: Ramboll

Overview

Pre-refurb

Building Age: 1969

GIA: 11,892 m²

NIA: 7,446 m²

Clear height *: 2.25 m

EPC: D

Heating fuel: Gas

Source: Bruntwood

Post-refurb

Completion Date: 2025

Status: RIBA Stage 5

GIA: 11,904 m²

NIA: 7,724 m²

Clear height *: 2.25 m

EPC: A

Heating fuel: Electricity

Cat A: Mixed

Cat B: Only for office areas

Source: Bruntwood

* Clear height means the finished floor level to ceiling height

Deep Retrofit

Scope of works

The property will include 7,897 m² of office and hospitality space across three interlinked tower blocks. The building is structured using a reinforced concrete frame with original single-glazed windows and time-expired building services. The redevlopment constitutes providing all new building services and undertaking a complete internal refurbishment.

Although the building is Grade II listed, the design team obtained a consent for replacing the existing glazing/curtain walling with providing the energy modelling and net zero targets for the building. Due to listing, the curtain walling needs to replicate the existing layout and design team is unable to touch the mosaic tiling to the cores. This results in a slightly compromised building fabric performance, however, a significant reduction in energy demand compared with the original building was achieved.

The height of the main tower will remain the same. Part of the King Street wing (less than half of the roof space) will increase in height by two storeys following the addition of a plant room with plant deck above. The height of the Marsden Street wing will increase by one storey following the addition of a plant deck above a newly constructed floor of office space (the office space will be constructed in place of the old caretakers flat which is being demolished so net increase in height is one storey).

Retained and installed elements

100% retained

External Walls (1)
The existing external walls were 100% retained.

100% installed

Openings (2)
Existing glazing curtain walls were replaced.

100% installed

Services (3)
New services were proposed.

100% retained

Substructure (4)
The existing substructure was 100% retained.

100% retained

Roofs (5)
The existing roof structure was 100% retained. The new roof coverings were proposed.

100% retained

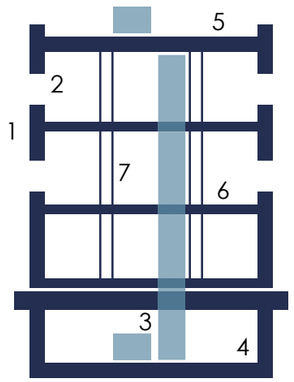
Floors (6)
The existing floors were 100% retained.

100% retained

Frame (7)
The existing frame was 100% retained.

100% installed

Low Carbon/Renewable Technologies
Installation of air source heat pumps.



Pall Mall

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**522.0*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**189.6*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**994.7*[1]** $kgCO_2$ e/m^2 GIA

1 Figures based on the Bruntwood Whole Life Carbon Reporting template.

Energy Use intensity (kWh/m^2/yr (Based on NIA)	159 (estimated)
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	Air source heat pumps
Recycled Content % by Value	Information not available

WLC Assessment Method:
RICS WLC

WLC Assessment Scope:
Modules A-C

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.0 0.0
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	1.2 1.9
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	58.9 86.2
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	5.0 8.8
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	24.3 65.5
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	62.7 318.6
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.2 0.2

Certifications

BREEAM 2014
Refurbishment &
Fit Out

Key Insights

Insights

- The retain & retrofit first approach.
- Wellbeing as one of the key focusses.
- Protected and safeguarded the charactericrics of the existing building.
- Creating a robust piece of local townscape integrating and safeguarding the positive qualities of the immediate heritage context.
- The developer does not see ceiling height as a barrier for providing a quality product.

Opportunities

- Reducing embodied carbon impacts through the significant proportion of retaining/reusing of the existing building structure.
- Reducing operational carbon emissions through a switch from gas heating to hybrid VRF, with ASHP serving domestic hot water and AHU coils.
- Climate change adoptation thanks to new facade and glazing system.
- Deep retrofit opportunity as building vacant.
- Rental growth, retail amenities, and public realm improvement.

Challenges

- It's not possible to achieve 'Paris Proof' targets for operational carbon due to existing building constraints, particularly listed facade.

160 Old Steet

Approximate Project Construction Cost: no information provided
Total Project Cost: no information provided

Location: London, UK
Planning Authority: London Borough of Islington
Building Type: Office & Retail
Project Type: Refurbishment

RIBA stage: RIBA Stage 6
DESIGN TEAM
Client: Great Portland Estates and Great Ropemaker Partnership
Developer: Great Portland Estates

Project Manager: Jackson Coles
Architect: ORMS
Structure: Heyne Tillett Steel
MEP: Hilson Moran
Sustainability: Hilson Moran

Overview

Pre-refurb

Building Age: 1974

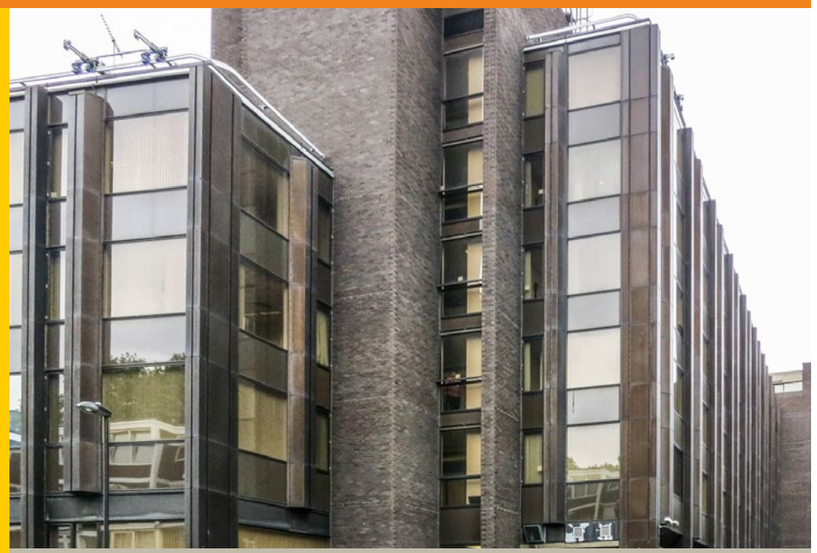
GIA: 13,462 m²

NIA: 7,985 m²

Clear height *: 2.15 m

EPC: G

Heating fuel: Gas



Source: Heyne Tillett Steel (HTS)

Post-refurb

Completion Date: 2018

Status: RIBA Stage 6

GIA: 14,544 m² (Office)
622 m² (Retail)

NIA: *information not provided*

Clear height *: 2.7 m

EPC: A

Heating fuel: Electricity and gas

Cat A: N/A

Cat B: Fully fitted

Source: Great Portland Estates (GPE)

* Clear height means the finished floor level to ceiling height

Refurbishment

Scope of works

The existing building was a 1974 conversion of the 1896 Bovril building (where only the basement perimeter structure was retained). The building, with poor quality office space and poor energy efficiency, did not meet modern occupier needs. The cladding and mechanical services were nearing the end of their life and needed replacing. Floor-to-floor heights were a slightly claustrophobic (3 m); internal spaces had low ceilings and old services.

The development retains the existing 1970s concrete frame, stripping away both the façade and a host of internal finishes to undertake an extensive retrofit, with consequent savings in embodied carbon. At the upper levels, the partial floorplate extensions along the spine of the building create good-quality office spaces with excellent daylight penetration, improving the form factor and helping create a rich variety of spaces suitable for the modern workplace. Two additional top storeys were added with four new retail units along the Old Street frontage. Basement areas were converted from carpark to office units.

Retained and installed elements

not provided

External Walls (1)
The existing façade was extensively replaced with subtle detailing of the white and dark brickwork panels.

100% installed

Openings (2)
Double glazed window with aluminium frame was proposed for the development.

100% installed

Services (3)
All MEP systems were new build and smart-enabled.

100% retained

Substructure (4)
100% retained. Basement car parks were converted to the office units.

not provided

Roofs (5)
Concrete roof deck was proposed, and the blue roof system was proposed.

not provided

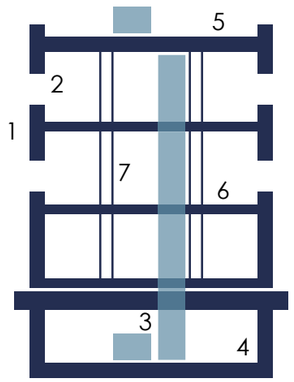
Floors (6)
The existing floors were retained. For the new floors, it was used a lightweight composite solution of structural steelwork supporting metal decking.

100% retained

Frame (7)
The frame was retained. The concrete columns and vulnerable edges were repaired. For the additional floors, steel frame solution was used to minimise weight and loads.

100% installed

Low Carbon/Renewable Technologies
Installation of PV panels and air source heat pumps.



160 Old Steet

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**N/A*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**N/A*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**809.1*[1]** $kgCO_2$ e/m^2 GIA

1 Based on emission factors: 0.21 $kgCO_2e$/kWh for gas (Part L) and 0.0376 $kgCO_2e$/kWh for electricity (FES 2022).

Energy Use intensity (kWh/m^2/yr (Based on NIA)	159.4 (electricity) and 22.6 (gas) Based on worst case scenario results (excl. retail and plant rooms)
Heating Fuel type (heat network, electric)	Electricity and gas
Low and Zero Carbon Technologies	Air source heat pumps and PV panels
Recycled Content % by Value	Information not available

WLC Assessment Method:
N/A

WLC Assessment Scope:
N/A

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.3 0.5
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	162.0 184.0
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	141.0 195.0
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	28.0 57.0
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	30.0 169.0
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	8.0 39.0
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	94.0 248.0
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	7.0 13.0

Certifications

BREEAM 2011 Offices
Excellent rating

Key Insights

Insights

- Creating an office building to meet highest possible sustainable standards through improved performance of the building.
- Retention of existing building to save significant amount of embodied carbon.
- Flexible design to allow accomodating both single and multi-occupant configurations.
- Enhancing biodiversity and ecology.
- When the building was designed an completed, it was not typical to conduct embodied carbon analysis and therefore today the data related to carbon is not available.

Opportunities

- Achieving considerable embodied carbon reduction through the retention of existing building structure and minimising the application of internal finishes as well as a successful reduction on demolition of the existing structure.
- Achieving energy efficiency with the design of new cladding and glazing systems and installation of air source heat pumps, PVs, and green and blue roofs.
- Reduction on construction costs through retaining the existing building frame, improvement on internal rate reurn (IRR), and reduction on overall programme time.
- Rental growth with significant additional office area achieved by utilising the basement car park.
- Enhancing ecology through the design of a green roof and biodiverse surface finishes.

Challenges

- Resulting to design a quite large and open reception area due to that the original E shaped plan of the existing building did not allow to create flexible office space.
- Challenging task to solve problems resulting from the steel and concrete connection where steel frames were proposed for the new floors.

The Gilbert and One Lackington Street

Approximate Project Construction Cost: no information provided
Total Project Cost: no information provided

Location: London, UK
Planning Authority: London Borough of Islington
Building Type: Office & Retail
Project Type: Refurbishment

RIBA stage: RIBA Stage 6
DESIGN TEAM
Client: Brookfield Office Property Mgmt.
Developer: Brookfield Office Property Management

Project Manager: Jackson Coles LLP
Architect: Stiff + Trevillion
Structure: Heyne Tillett Steel
MEP: Hilson Moran
Sustainability: Hilson Moran

Overview

Pre-refurb

Building Age: 1928

GIA: *information not provided*

NIA: 13,657 m²

Clear height *: *information not provided*

EPC: E

Heating fuel: Gas

Source: Heyne Tillett Steel (HTS)

Post-refurb

Completion Date: 2020

Status: RIBA Stage 6

GIA: 21,050 m²

NIA: 14,845 m²

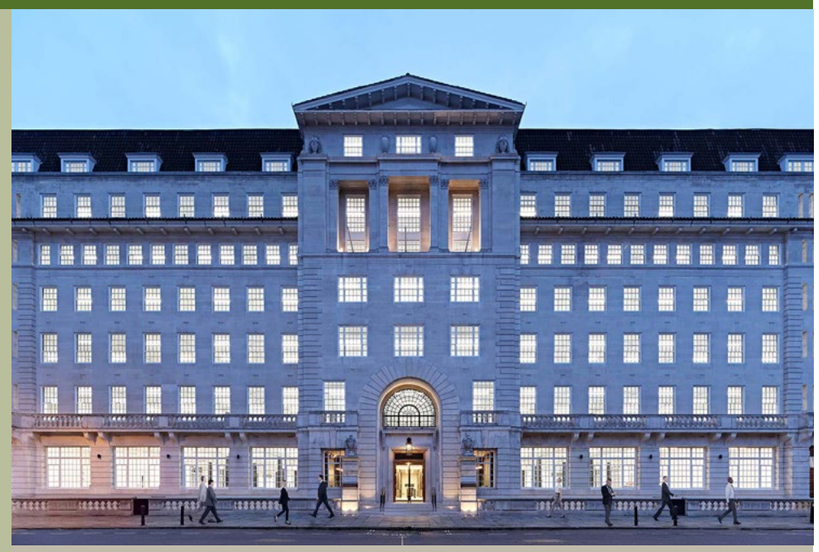
Clear height *: 2.3-2.45 m

EPC: B

Heating fuel: Electricity and gas

Cat A: Offices

Cat B: N/A



Source: Brookfield Properties

* Clear height means the finished floor level to ceiling height

Refurbishment

Scope of works

Substantial refurbishment: Additional storey extension to the central wing and reframing of the mansard roof floors, reconfiguration and extension of the existing central core to provide additional vertical circulation, retaining five storeys of the existing façade around the core, which is to be reconfigured, strengthening of the original 1930s riveted steel columns and beams and provision of external rooftop terrace spaces.

Previously the building, called City Gate House, was a highly resilient building for Bloomberg's London headquarters. The existing structure consisted of a steel frame. The main façade of City Gate House fronted on to Finsbury Square and was predominately constructed from Portland stone. Other than the Lackington Street elevation the remainder of the building was generally clad in glazed brick. A large proportion of the building retained existing single glazing, some also with steel frames. Due to the conservation status it is not possible to alter the façade.

Retained and installed elements

100% retained

External Walls (1)
The existing brick and stone-faced external walls had poor thermal performance. However, they were retained due to the conservation status.

100% retained

Openings (2)
The original windows were refurbished and resealed due to the conservation status.

100% installed

Services (3)
New services were proposed.

90% retained

Substructure (4)
Majority of the existing substructure was retained. Some reinforcement works were undertaken.

90% retained

Roofs (5)
The existing tiled mansard roofs were retained (repaired and re-layered where necessary). Inverted roof construction was proposed.

90% retained

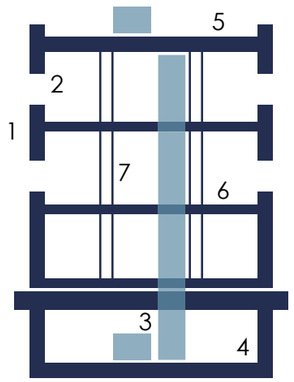
Floors (6)
Some concrete repair works were undertaken. Steel decking lightweight concrete composite floors were proposed.

90% retained

Frame (7)
Majority of the existing frame was retained. Some strengthening works on columns were undertaken. Level 6 & 7 were partly demolished to provide additional space.

100% installed

Low Carbon/Renewable Technologies
Installation of air source heat pumps



The Gilbert and One Lackington Street

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**250.3*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**147.1*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**718.6*[1]** $kgCO_2$ e/m^2 GIA

1 Based on emission factors: 0.21 $kgCO_2e$/kWh for gas (Part L) and 0.0376 $kgCO_2e$/kWh for electricity (FES 2022).

Energy Use intensity (kWh/m^2/yr (Based on NIA)	49 (electricity) and 77 (gas)
Heating Fuel type (heat network, electric)	Electricity and gas
Low and Zero Carbon Technologies	Air source heat pumps
Recycled Content % by Value	Information not available

WLC Assessment Method:
UKGBC Net Zero Carbon

WLC Assessment Scope:
Modules A-C

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	15.9 18.3
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	67.1 (incl. internal walls) 83.6 (incl. internal walls)
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	6.7 11.3
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	reported above reported above
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	30.5 51.1
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	26.8 86.0
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope

Certifications

BREEAM 2014
Non Domestic
Refurbishment and Fit-out
Very Good rating

Key Insights

Insights

- Upgrading the operational performance of the existing building through the energy efficient systems, upgrading the poor thermal performance of the historical facade.
- Preserving the historical heritage and prolonging the lifespan of the building.
- Providing more spaces and modern workplaces at market appropriate standards and usable terrace spaces for the occupants.
- Reducing the operational costs of the building.

Opportunities

- Achieving significant embodied carbon reduction through retention and reducing the operational energy costs.
- Extending the lifespan of the 1930s building and preserving architectural heritage with retaining 90% of the original structure.
- Creating open plan floorplates to provide occupants more usable and flexible office spaces.
- Improving wellbeing for occupiers.
- Providing outdoor spaces including a courtyard and seven terraces with views.

Challenges

- Due to the conservation status of the building, heat loss and leakage from the historical facade created a challenge to reduce heating related energy consumption and operational emissions.
- Due to the restrictions for the alterations on the historical facade, the development could not be operated fully electricity and it needed for a backup gas boiler. This impacted on operational emissions.
- Due to the constraints of the existing building, the air conditioning design was limited to installing an underfloor heating and cooling system to maximise the floor to ceiling heights and at the same time minimise the high level visual impact of a traditional fan coil and associated high level services distribution. This resulted to have a small reduction in office NIA.

Coal Drops Yard

Approximate Project Construction Cost: £80-100m
Total Project Cost: £100m+

Location: London, UK
Planning Authority: London Borough of Camden
Building Type: Retail & Public Space
Project Type: Refurbishment
RIBA stage: RIBA Stage 6

DESIGN TEAM
Client: King's Cross Central Limited Partnership (KCCLP)
Developer: KCCLP
Project Manager: Argent (Development Manager)

Architect: Heatherwick Studio (Concept), BAM Design (Delivery)
Structure: Arup
MEP: Hoare Lea (Concept), BAM Design (Delivery)
Sustainability: N/A

Overview

Pre-refurb

Building Age: 1850s

GIA: 6,624 m²

NIA: *Information not provided*

Clear height *: 2.9-6.0 m

EPC: N/A

Heating fuel: Gas

No image provided

Post-refurb

Completion Date: 2018

Status: RIBA Stage 6

GIA: 12,715 m²

NIA: 8,468 m²

Clear height *: 2.8-8.0 m

EPC: E (shell spaces) *
Listed building, restricting performance

Heating fuel: Heat network (green gas)

Cat A: N/A (Fit out: Shell and Core)

Cat B: N/A

No image provided

* Clear height means the finished floor level to ceiling height

Refurbishment

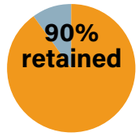
Scope of works

The project comprises three heritage buildings; the Eastern Coal Drops (ECD) and Viaduct (ECDV) (both Grade II listed), the Western Coal Drops (WCD) and Viaduct (WCDV) and, the 'Western Wharf Road Arches' (WWRA). All three buildings (with their associated Viaducts) are located within the Regent's Canal Conservation Area.

The three existing buildings were converted from derelict warehouse spaces, formerly coal sorting and distribution spaces, into retail units forming the public heart of King's Cross. In between the buildings is a central yard that is curated for events, art installations and markets. Three new bridge structures were added to connect buildings together and overlook the central yard.

The largest intervention was the addition of an anchor retail space at the Upper Level between the ECD and WCD. This floorplate was formed to create the perception of the slate roofs 'peeling' away from the existing buildings and meeting at a single point above the central yard, whilst retaining the appearance of two individual buildings.

Retained and installed elements



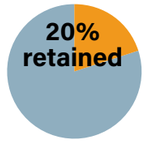
External Walls (1)
90% of brick and cast iron structure was retained.

Openings (2)
The existing metal and wooden framed windows were retained and refurbished.

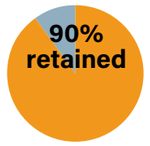
Services (3)
New services were proposed.

Substructure (4)
Existing substructure was retained and reinforced, along with new piled foundations to support the new structure.

Roofs (5)
The existing wooden roof trusses and sarking boards were partly retained. A new standing seam roof to new roof profile with aluminium rain-screen cladding.

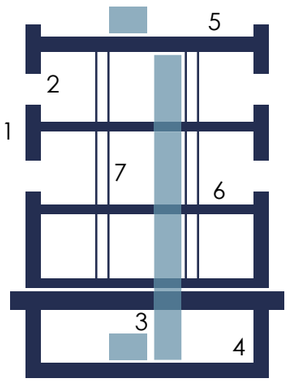


Floors (6)
Approximately 20% of the existing floors was retained, and replaced with new steel framed floor. The existing floor of the East Coal Drops had the removed and replaced at a different level.



Frame (7)
Majority of the existing brick and cast iron structure were retained. New steel frame was added to support new roof structure.

Low Carbon/Renewable Technologies
The buildings were connected to a district energy system which has since moved to use green gas.



Coal Drops Yard

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**N/A*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**N/A*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 25yr design life	**N/A*[1]** $kgCO_2$ e/m^2 GIA

1 Carbon figures could not be provided at the time, in 2018, due to lack of project data

Energy Use intensity (kWh/m^2/yr (Based on NIA)	410 (including unregulated energy as well)
Heating Fuel type (heat network, electric)	District energy network - green gas
Low and Zero Carbon Technologies	N/A
Recycled Content % by Value	Information not available

WLC Assessment Method:
N/A

WLC Assessment Scope:
N/A

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A

Certifications

BREEAM UK Refurbishment and Fit-Out 2014, Very Good

Key Insights

Insights

- The redevelopment aimed to provide a long-term, sustainable future for the buildings with sufficient flexibility for the building to further adapt as the retail market changes over time, preserving the Victorian spirit of industry and innovation.
- The addition of the top floor extension was driven by a need to create a critical mass of retail floorspace, which could not be provided by the existing buildings alone.
- The architectural design aimed to create something new and of note, to attract a wider pool of visitors to support the buildings' success as a retail destination into the future, and help create a sense of place, and discovery, within the wider King's Cross masterplan.
- When the building was designed and completed, it was not typical to conduct embodied carbon analysis.

Opportunities

- This development presented an opportunity to extend the life span of the buildings which were previously run-down and not accessible to the general public.
- The configuration of the buildings naturally created a central space between them, providing new public space activated by the surrounding retail.
- The cellular nature of the buildings derived from their original use as coal drops, was well suited to the retail use proposed, with each individual retail space able to showcase the historic fabric of the buildings for the public to appreciate.
- Achieving a reduction in operational carbon, by providing a connection to the King's Cross district energy network.

Challenges

- The existing levels of the Eastern and Western Coal Drops were complex and varied within and between buildings. This required careful consideration to provide inclusive and accessible spaces, whilst ensuring the buildings' historic use and form could still be read and understood.
- Due to the presence of the viaduct structures within the central yard, sightlines to upper levels from the central yard, key for its future retail use, were limited in some areas. The removal of existing structure to address this issue was balanced with the aim to retain as much historic fabric as possible.
- The existing building structures could not take any new loads; this necessitated designing the new structure independently of the existing buildings.
- Due to lack of basement and the inability to locate plant on the historic pitched roofs, there was not an obvious place for plant rooms to be positioned. This necessitated a creative approach to building services whereby service corridors utilised existing interim levels in the building. The corridors sit in between the upper and lower levels, allowing floorspace to be maximised.
- The cellular nature of the buildings and small size of the existing arch openings created constraints in construction, which elements of the design (eg, piles) needed to respond to.

International House

Approximate Project Construction Cost: £50m-£80m
Total Project Cost: £50m-£80m

Location: London, UK
Planning Authority: Ealing Council
Building Type: Office
Project Type: Refurbishment
RIBA stage: RIBA Stage 4

DESIGN TEAM
Client: British Land
Developer:
Project Manager: RPP
Architect: Barr Gazetas

Structure: Evolve
MEP: INsignis Consulting
Sustainability: INsignis Consulting

Overview

Pre-refurb

Building Age: 1980s

GIA: 12,329 m²

NIA: 9,502 m²

Clear height *: *information not provided*

EPC: Multiple (E-D)

Heating fuel: Gas

Source: British Land

Post-refurb

Completion Date: 2025

Status: RIBA Stage 4

GIA: 19,730 m²

NIA: 15,365 m²

Clear height *: 2.35-2.80 m

EPC: B (subject to achieve A)

Heating fuel: Electricity

Cat A: Offices

Cat B: N/A

Source: Bar Gazetas & British Land

* Clear height means the finished floor level to ceiling height

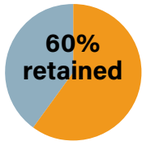
Refurbishment

Scope of works

The International House is a complex refurbishment at the heart of Ealing. The interventions include remodelling 5 floors of flexible office accommodation set above a live shopping centre (one of which is formed from a new roof extension). A new main entrance and arrival experience, atrium, end of trip facilities and two vibrant central courtyards add to the refurbishment.

Within the design proposals, a unique and welcoming arrival experience greets visitors as they are transported to the second-floor reception on escalators lined with a green wall. The new atrium is the heart of the scheme and has its own identity and function. Its roof offers a distinctive quality, and emphasises the relationship with the ground floor, connecting the two spaces. The atrium also opens directly into the courtyard, connecting inside and outside. The courtyards complement the architecture in a way that provides a seamless and multifunctional workspace and completes the design, delivering a class-leading, contemporary workplace environment.

Retained and installed elements



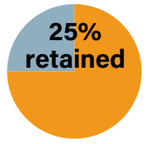
External Walls (1)
The existing brick walls were retained. New aluminium curtain walling were porposed.

Openings (2)
New windows and doors were proposed.

Services (3)
New services and systems were proposed.

Substructure (4)
Retention rate of the existing substructure was not provided.

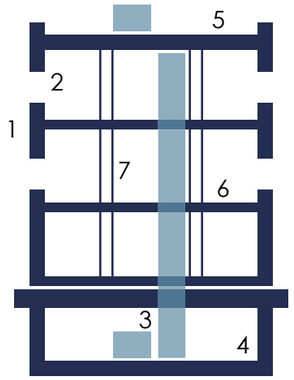
Roofs (5)
New zinc cladded roof were proposed. New landscape green roofs to courtyards and sedum roof were proposed.



Floors (6)
Increasing footprint by extending floor plate into courtyard areas. Refurbished RAF and new finishes for the office floor plates.

Frame (7)
Retention rate of the existing concrete frame was not provided.

Low Carbon/Renewable Technologies
Installation of PVs and air source heat pumps.



International House

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**509.8*** $kgCO_2$ e/m² GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**322.3*** $kgCO_2$ e/m² GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**1,255.8*** $kgCO_2$ e/m² GIA

1 Figures based on the Stage 4 WLC Assessment report

Energy Use intensity (kWh/m²/yr (Based on NIA)	119 (for whole building)
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	Air source heat pumps and PVs
Recycled Content % by Value	Calculation not completed

WLC Assessment Method:
RICS WLC

WLC Assessment Scope:
Modules A-C (excl. B6 & B7)

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m²) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.0 0.0
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	183.2 254.1
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	45.7 46.9
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	31.5 35.7
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	35.8 129.1
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.9 4.2
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	24.1 73.1
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	1.2 1.2

Certifications

BREEAM 2018
New Construction
Outstanding

Targeting
NABERS 5 star
rating

Key Insights

Insights

- Establishing an open and refreshing new identity for the building using sustainable and contemporary materials throughout to revitalise the building, creating strong links between the internal and external spaces.
- Aiming to upgrade the thermal performance of the existing building through imporvements on fabric.
- Climate change resilience and biodiversity.
- Safeguarding heritage sites.
- 96.3% retention of concrete material from exising to final development.

Opportunities

- Achieving both considerable embodied carbon reductions through retention and operational energy and carbon reductions through high thermal performance and energy efficient building services specification.
- Renewables and onsite generation through 950 m² PV array.
- Targetting minimum 20% GGBS in most applications and zero waste to landfill.
- Proportion of materials with a reused or recycled content to be at least 20%.
- Development of the Material Passports and utilisation of Globechain platfor for strip-out recycling.
- Enhancement of occupier health and wellbeing through the adoption of WELL building standard design principles.

Challenges

- Challenges in meeting building fabric performance requirements for compliance with the 'Be Lean' stage of the London Plans Energy Hierarchy.
- Challenges in achieving carbon reductions required for sufficient BREEAM ENE 01 credits to ensure 'Outstanding' rating can be achieved.
- Challenges in achieving sufficient thermal comfort levels in the atrium due to high level of glazing. This was mitigated through appropriate ventilation and external shading measures.

One Exchange Square

Approximate Project Construction Cost: £100m+
Total Project Cost: £100m+

Location: London, UK
Planning Authority: City of London
Building Type: Workspace & Retail
Project Type: Deep Retrofit
RIBA stage: RIBA Stage 5

DESIGN TEAM
Client: Permodalan Nasional Berhad PNB and LaSalle Investment Management
Developer:
Project Manager: M3 Consulting

Architect: Fletcher Priest Architects
Structure: Heyne Tillett Steel
MEP: Sweco
Sustainability: Sweco

Overview

Pre-refurb

Building Age: 1989

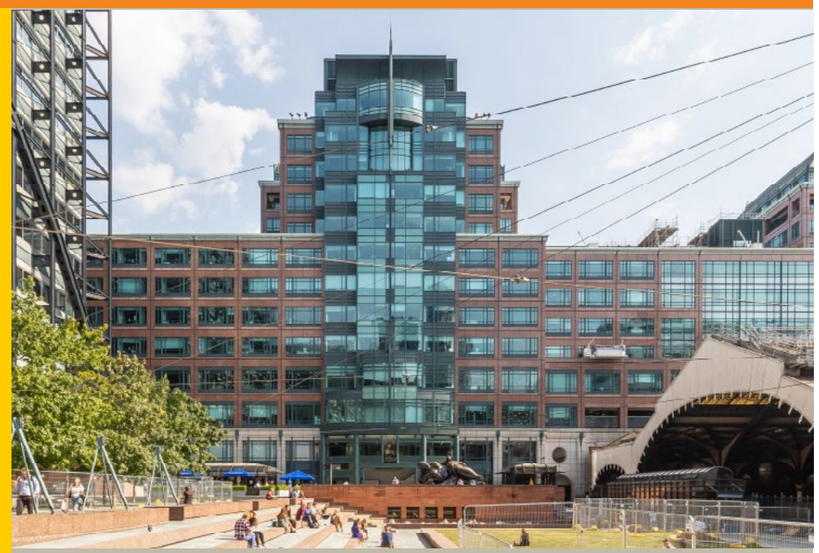
GIA: 49,987 m²

NIA: 35,314 m²

Clear height *: 2.75-3.65 m

EPC: E

Heating fuel: Gas



Source: Fletcher Priest Architects

Post-refurb

Completion Date: 2025

Status: RIBA Stage 5

GIA: 58,400 m²

NIA: 42,000 m²

Clear height *: 2.75-3.65 m (to underside of ceiling rafts)

2.7-3.4 m (exposed soffit option, revealing generous volumes above the exisitng suspended ceiling)

EPC: A

Heating fuel: Electricity

Cat A: Raised access floor only to all floors

Cat B: Amenity spaces only

Source: Fletcher Priest Architects

* Clear height means the finished floor level to ceiling height

Deep Retrofit

Scope of works

The major redevelopment project addresses the existing poor relationship with the park by positioning the principal entrance off this important public space at the base of a new 11 storey extension suspended above the square and NWR platforms below with an exoskeleton which creates visual depth and provides a fifth of the solar shading to this façade. Alongside retention of 90% of structural fabric this approach significantly reduces the building's embodied carbon.

The project further aims to minimise embodied and operational carbon through extensive reuse and enhancement of half of the existing façade whilst creating an intelligent envelope design to the Exchange Square façade presenting a new face to the City. It is targeting BREEAM Outstanding and WELL Platinum for the base build. The scheme aspires to be one of the first registered refurbishment projects in the UK to achieve NABERS UK Design for Performance 5 Star Rating at Design Stage.

One Exchange Square will be 100% electric. The development uses intelligent façade design and mechanical services twinned with building management systems to limit operational energy use.

Retained and installed elements

50% retained

External Walls (1)

50% of the existing granite facade and associated supporting steelwork are retained. 17% of new facade consists of retained elements from existing facade

100% installed

Openings (2)

New triple glazed windows with opening elements are installed within the existing granite facades.

99% installed

Services (3)

3 of the existing generators are retained and reused. New services are proposed.

100% retained

Substructure (4)

The existing substructure is 100% retained.

90% retained

Roofs (5)

The existing roof finishes are removed. The slab becomes floor plate or terrace and was counted in the 90% retained structure.

90% retained

Floors (6)

90% of the floors are retained. Vertical and lateral extensions, as well as infills within retained floors adds c.4,400 m² GIA to the existing building.

90% retained

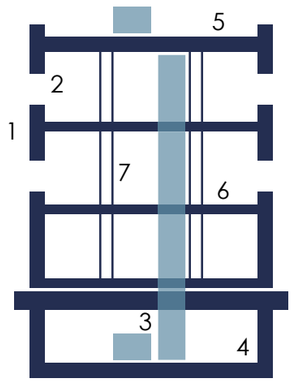
Frame (7)

90% of structure is retained.

100% new

Low Carbon/Renewable Technologies

Installation of air source heat pumps and PVs.



One Exchange Square

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**939.0*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**525.0*** $kgCO_2$ e/m^2 GIA (target 469)
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**186.6*[1]** $kgCO_2$ e/m^2 GIA

1 Based on emission factors: 0.0376 $kgCO_2e$/kWh for electricity (FES 2022).

Energy Use intensity (kWh/m^2/yr	115 (for whole building)
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	Air source heat pumps and PVs
Recycled Content % by Value	Information not available

WLC Assessment Method:
RICS WLC

WLC Assessment Scope:
Modules A-C (excl. B6 & B7)

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.3 0.5
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	162.0 184.0
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	141.0 195.0
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	28.0 57.0
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	30.0 169.0
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	8.0 39.0
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	94.0 248.0
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	7.0 13.0

Certifications

Targeting BREEAM 2018 New Construction Outstanding

NABERS 5 star rating

WELL Platinum

WiredScore Platinum

Key Insights

Insights

- Redevelopment of the building into a new high quality workplace.
- Creating a contemporary and sustainable workspaces, enhancing the thermal comfort and reducing the operational carbon footprint and energy costs.
- Biodiversity and occupants' health and wellbeing, promoting circular resource use.
- The building will a 45% improvement than a new typical office building based on the standard GLA benchmark and is below the GLA's 'Apsirational' carbon targets of 650 $kgCO_2e/m^2$ GIA (upfront A1-5).
- Generous internal volumes, fresh air via opening windows and plant-filled entrances.

Opportunities

- Providing high quality public realm and repurposing the out-of-date work space.
- Achieving considerable embodied carbon reductions through retention and operational energy.
- Acheiving operational carbon reductions through energy efficient building services specification and passive solar shading design.
- Consideration of the demountability and reusability for the new facade elements to highlight future circularity and use of reclaimed materials.
- Promoting circularity though earmarking the existing building materials (steel, facade elements, marbles, carpet tiles, raised access flooring) to several building projects across the UK and Nigeria as well as art projects.

Challenges

- Challenges in increasing the NIA of the existing building due to the structural limitations of the building site as the building is above Liverpool Street Station.
- Challenge in repurposing the existing building due to its stong post-modern aesthetic.
- Challenge to create welcoming arrival experience due to multiple entrances at different levels to the existing building.
- Challenge of undertaking a heavy refurbishment that sits directly above Liverpool Street Station railway lines and platforms and London Underground's Central line.

Quay Quarter Tower

Approximate Project Construction Cost: no information provided
Total Project Cost: no information provided

Location: Sydney, Australia
Planning Authority: The City of Sydney
Building Type: Office & Mixed-use
Project Type: Redevelopment
RIBA stage: RIBA Stage 6

DESIGN TEAM
Client: AMP Capital Investors
Developer: AMP Capital
Project Manager:
Architect: 3XN

Structure: BG&E
MEP: Arup
Sustainability: Arup

Overview

Pre-refurb

Building Age: 1976

GIA: 57,000 m²

NIA: 52,500 m²

Clear height *: *XXXX*

EPC: *no certificate equivalent (Australia)*

Heating fuel: XXX

Source: 3XN

Post-refurb

Completion Date: 2022

Status: RIBA Stage 6

GIA: 102,000 m²

NIA: 88,500 m²

Clear height *: 2.7 m

EPC: *no certificate equivalent (Australia)*

Heating fuel: Electricity and gas

Cat A: Shell only (Tower)

Cat B: Landlord areas (reception, lift lobbies

Source: 3XN

* Clear height means the finished floor level to ceiling height

Redevelopment

Scope of works

In 2014, the AMP Centre, completed in 1976, was nearing the end of its commercial life. The façade and building services were not performing well, and the relatively small floor plates did not appeal to prospective tenants, resulting in diminishing returns for the building owners. Although an important part of Sydney's history and once the tallest building in the city, it was no longer commercially viable and had become an unloved building. However, a solid superstructure and reasonable floor-to-floor heights meant that it had the potential to be transformed into something better.

The design and construction of Quay Quarter Tower uses much of the existing structure, extending the core and floorplates which are then wrapped in a new cladding.

The design adds approximately 45,000 m² of new construction, doubling the floor area and creating a new world-class high-rise office from an outdated, underperforming, and unloved building, becoming the most significant adaptive reuse high-rise ever completed.

Retained and installed elements

100% new build

External Walls (1)
New insulated aluminium system was proposed to minimise be functional, sustainable and elegant.

100% installed

Openings (2)
A new self-shading aluminium façade was proposed to reduce solar gain and conduction across the facade whilst maximising views out over Sydney.

100% installed

Services (3)
New systems were installed.

100% retained

Substructure (4)
The existing substructure was retained.

100% new build

Roofs (5)
The existing roof was removed and a new roof was installed.

65% retained

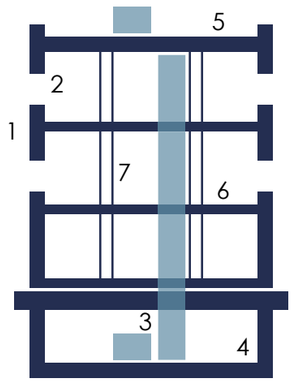
Floors (6)
With 65% retention, a series of vertical atria floors within each of the 'blocks' of the tower were preovided to be adaptable for future changing needs.

65% retained

Frame (7)
The design retains 65% of the beams and columns. For new structure, a hybrid steel and concrete construction were used.

N/A

Low Carbon/Renewable Technologies
The development does not include any low and zero carbon technologies (such as PVs and heat pumps).



Quay Quarter Tower

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**N/A*** $kgCO_2$ e/m² GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**818.0*** $kgCO_2$ e/m² GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 50yr design life	**N/A*** $kgCO_2$ e/m² GIA

Energy Use intensity (kWh/m²/yr (Based on NIA)	62.6
Heating Fuel type (heat network, electric)	Electricity and gas
Low and Zero Carbon Technologies	N/A
Recycled Content % by Value	*XXXX*

WLC Assessment Method:
TBC

WLC Assessment Scope:
TBC

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m²) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A

Certifications

6-star Green Star Office v3 As-Built

NABERS 5.5 Energy for Office

WELL V1 Core Platinum

NABERS Water for Office (whole building)

Key Insights

Insights

- Saving considerable amount of embodied carbon as well as time and money by using the existing structure of the building.
- Improving the user experience and upgrading the existing building condition with enhancing the thermal performance and increasing the floor area.
- Creating a livelier public realm, providing spaces within the focus of social sustainability and occupiers' health and wellbeing.

Opportunities

- Providing a fully coordinated design and the reduced operational energy requirements whilst also providing best-in-class internal environment quality for users of the building.
- Providing a more sustainable construction through achieveing considerable amount of embodied carbon reduction which is rooted in the retention of the majority of building structure.
- Saving embodied carbon through 40% Portland cement reduction in new concrete.
- Using environmentally friendly building materials having recognised forest certifications, EPDs, and GreenTag certifications.
- Achieving Green Star compliance through selection of materials based on emission limits.

Challenges

- Challenges in the retention and subsequent extension of the existing tower core due to tying old and new concrete elements.

The Hickman

Approximate Project Construction Cost: no information provided
Total Project Cost: £20-50m

Location: London, UK
Planning Authority: Tower Hamlets Council
Building Type: Office & Retail
Project Type: Retrofit

RIBA stage: RIBA Stage 6
DESIGN TEAM
Client: Great Portland Estates
Developer: Great Portland Estates
Project Manager: Hush PM&C Ltd

Architect: DSDHA
Structure: Heyne Tillett Steel
MEP: Milieu Consult
Sustainability: Milieu Consult

Overview

Pre-refurb

Building Age: 1950s

GIA: *information not provided*

NIA: 4,180 m²

Clear height *: 2.8-3.0 m

EPC: N/A

Heating fuel: Gas

Image credit: Derek Kendall ----- copyright issue (waiting for images)

Post-refurb

Completion Date: 2020

Status: RIBA Stage 6

GIA: 9,150 m²

NIA: 6,972 m²

Clear height *: 2.8-3.0 m

EPC: A

Heating fuel: Gas

Cat A: Shell & Core

Cat B: N/A

Image credit: The Hickman by GPE

* Clear height means the finished floor level to ceiling height

Retrofit

Scope of works

The Hickman is a complex refurbishment of a commercial building within the Whitechapel High Street Conservation Area, a neighbourhood with a rich industrial past. The existing site comprised six buildings patched together and reconstructed over time, each with varying structures, the earliest of which dates back to the 1800s. No record of the original structural information was available for the existing building.

The project was focused on adaptive reuse of the existing building. The former building was an amalgamation of five separate structures, some parts dating back to the late 19th century. The objective was to create a building designed for the new ways of working – with collaboration, creativity, digitisation and socialising at the core. The delivery of a flexible office building was a key component of the development. A new exposed concrete core was inserted in the middle of the existing structure and the building extended vertically, with three additional floors introduced beyond Level 4. Minimal strengthening of columns and foundations were required. This was achieved by using a lightweight exposed structural frame and composite deck floor slabs with 50% GGBS content.

Retained and installed elements

not provided

External Walls (1)
The retention rate of the existing external walls was not provided.

not provided

Openings (2)
Information not provided

100% installed

Services (3)
MEP design was subsequently overhauled, with an alternative system and core design, realising more NIA and cohesion.

100% retained

Substructure (4)
The existing substructure was retained. Minimal strengthening was undertaken.

not provided

Roofs (5)
Information not provided

100% retained

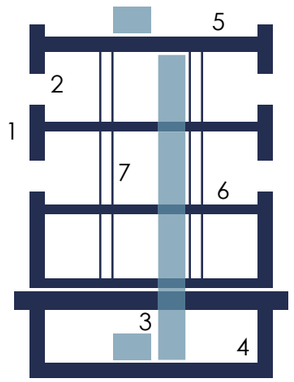
Floors (6)
The existing floors were retained. For the new floors, a lightweight exposed structural frame and composite deck floor slabs with 50% GGBS content.

50% retained

Frame (7)
Approximately 50% of the existing frame was retained..

N/A

Low Carbon/Renewable Technologies
N/A



The Hickman

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**N/A*** $kgCO_2$ e/m² GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**337.0*** $kgCO_2$ e/m² GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**N/A*** $kgCO_2$ e/m² GIA

Energy Use intensity (kWh/m²/yr (Based on NIA)	124
Heating Fuel type (heat network, electric)	Gas
Low and Zero Carbon Technologies	N/A
Recycled Content % by Value	Information not provided

WLC Assessment Method:
information not provided

WLC Assessment Scope:
information not provided

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m²) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A

Certifications

BREEAM 2014
New Construction - Excellent rating

SmartScore PLATINUM
SmartScore Platinum

WiredScore PLATINUM
WiredScore Platinum

Key Insights

Insights

- Considering sustainability, wellbeing and technology as core principles, delivery of a flexible office building providing options for customers.
- Saving considerable amount of embodied carbon by using the existing structure of the building and revealing the historical adaptation of previous occupiers.
- Upgrading the existing building condition through enhancing the thermal performance and increasing the floor area.
- Designing for future adaptive reuse and providing sustainable spaces that promote health and wellbeing.

Opportunities

- Achieveing to save significant amount of embodied carbon through retaining nearly 50% of original structure minimising the extend of demolition.
- Reducing operational carbon and energy through improving thermal performance of the external envelope.
- Improving air quality and biodiversity, increasing urban greening, installing a green roof, terraces and planting with the courtyard.
- Implementation of Digital Twin and GPE's sesame platforms to collect data regarding occupancy levels, temperature, light levels, air quality and energy use.

Challenges

- Challenges regarding the retention of former differing building structures due to the complicated structure of the existing building.

YY London

Approximate Project Construction Cost: no information provided
Total Project Cost: no information provided

Location: London, UK
Planning Authority: Tower Hamlets Council
Building Type: Office & Retail
Project Type: Refurbishment

RIBA stage: RIBA Stage 5
DESIGN TEAM
Client: Quadrant and Oaktree Capital
Developer: Quadrant
Project Manager: Avison Young

Architect: Buckley Gray Yeoman
Structure: Watermans Group
MEP: Hilson Moran
Sustainability: Hilson Moran

Overview

Pre-refurb

Building Age: 1991

GIA: 40,337 m²

NIA: 28,156 m²

Clear height *: 2.75 m

EPC: F

Heating fuel: Electricity

Source: Wikimedia Commons

Post-refurb

Completion Date: 2022

Status: RIBA Stage 6

GIA: 48,997 m²

NIA: 35,610 m²

Clear height *: 3.13 m

EPC: A

Heating fuel: Electricity

Cat A: Shell & Core

Cat B: N/A

Source: Buckley Gray Yeoman (BGY)

* Clear height means the finished floor level to ceiling height

Refurbishment

Scope of works

The development of YY London involves a major refurbishment to reinvent the existing building to create a highly sustainable modern workspace, integrated seamlessly into the public realm as well as addition of three new floors. The existing building was 13-storey in height comprising a lower ground floor, ground floor, mezzanine and upper 10 floor levels. There were two storeys of enclosed plant above this.

In this development, the steel structures and slabs were retained as possible. The design includes a new façade to dramatically change the appearance, infill the atrium, relocate the cores, create natural lights on all sides, rearrange the ground floor and create a new entrance and increase the NIA of the building.

Within an aspiration to achieve net zero carbon in operation, the building design incorporates various measures to reduce energy demand and improve efficiency.

Retained and installed elements

100% new build

External Walls (1)
The existing marble facade was removed and new glazing systems were installed.

100% installed

Openings (2)
New glazed panels and high perfromance solar coatings on the facade were installed.

100% installed

Services (3)
New high-efficiency systems were installed.

100% retained

Substructure (4)
The existing piled foundations and basement were reused.

100% new build

Roofs (5)
The existing roof was removed and a rooftop garden was designed.

84% retained

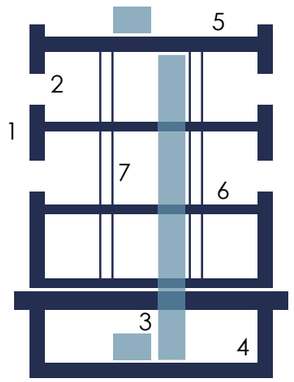
Floors (6)
Majority of the existing floors was retained. Cellular plate girders have been used to form the new upper floors.

86% retained

Frame (7)
Majority of the existing steel frame was retained. Steel frame was used for the extentions.

100% installed

Low Carbon/Renewable Technologies
Air Source Heat Pumps with heat recovery systems and PVs were installed.



YY London

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**N/A*** $kgCO_2$ e/m² GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**N/A*** $kgCO_2$ e/m² GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**264.0*[1]** $kgCO_2$ e/m² GIA

1 Based on emission factors: 0.0376 $kgCO_2e$/kWh for electricity (FES 2022).

Energy Use intensity (kWh/m²/yr (Based on NIA)	133 (projected, office only)
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	Air Source Heat Pumps and PVs
Recycled Content % by Value	25% (in new steel & concrete structures)

WLC Assessment Method:
N/A

WLC Assessment Scope:
N/A

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m²) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	N/A N/A

Certifications

BREEAM 2018 Offices Outstanding

NABERS 4.5 star rating

Targeting WELL Platinum

Wired and SmartScore ratings

Key Insights

Insights

- Upgrading the existing building condition through enhancing the thermal performance to provide high levels of energy efficiency.
- Creating a modern, smart-enabled, and sustainable workplace considering health and wellbeing of the occupants.
- Utilising and reinventing the existing building structure and avoiding demolition to reduce the construction carbon footprint.
- Adopting an all-electric strategy to allow the project to achieve net zero carbon in operation through the procurement of 100% renewable REGO certified energy.

Opportunities

- Achieving operational carbon and energy savings through introducing passive design measures, energy efficiency, renewable technology as well as integrating operational energy monitoring and control systems.
- Optimising the building energy consumption and carbon emissions through the CO_2-controlled ventilation, energy monitoring and cloud-based analytics enable systems.
- Achieving significant reduction in embodied carbon through the retention of the existing structure of the building.
- Introducing terraces on every floor as secondary breakout spaces and increasing the biodiversity through the design of a planted rooftop garden to create additional space for wildlife as well as providing direct access to nature for the building's tenants.

Challenges

- Challenges in the addition of the new floors due to that the existing building sits over water and essentially built on stilts.
- Limitiations on the selection and use of materials for the structural works due to ensuring to keep the overall weight of the building down. Therefore, the only viable option was steel.
- Design for Performance modelling was undertaken at a very late stage this meant that there was very limited opportunity to feed into and provide recommendations of improving the design to improve operational carbon predictions.

62 Threadneedle Street

Approximate Project Construction Cost: £5-10m
Total Project Cost: £5-10m

Location: London, UK
Planning Authority: City of London
Building Type: Office & Retail
Project Type: Retrofit
RIBA stage: RIBA Stage 6

DESIGN TEAM
Client: Royal Sun Alliance Insurance
Developer: information not found
Project Manager: Jones Lang LaSalle
Architect: Rolfe Judd Architects

Structure: Watermans Group
MEP: Elementa
Sustainability: Mecserve Ltd

Overview

Pre-refurb

Building Age: 1970s

GIA: 6,632 m²

NIA: 4,908 m²

Clear height *: 2.55 m (1st floor ro 3rd floor and mezzanine) ; 3.95 m (ground floor)

EPC: D

Heating fuel: Gas

Source: Wikimedia Commons

Post-refurb

Completion Date: 2022

Status: RIBA Stage 6

GIA: 7,019 m²

NIA: 5,401 m²

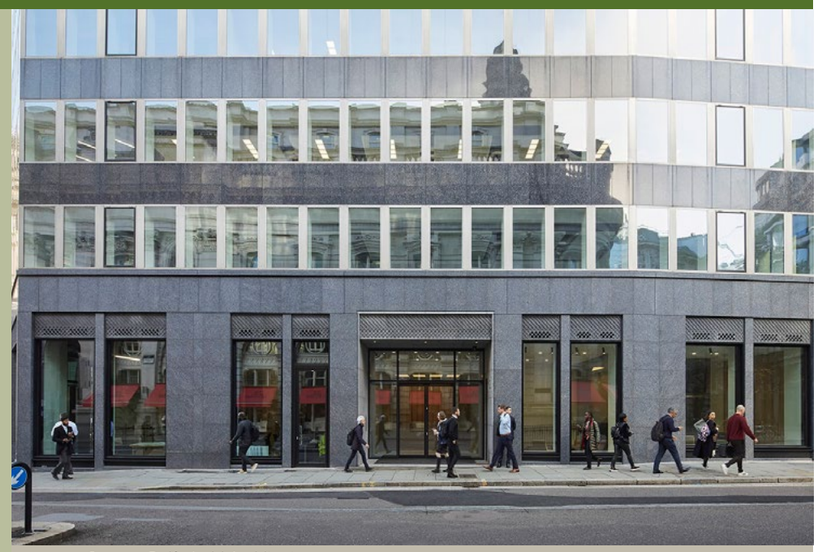
Clear height *: 2.60 m (1st floor to 3rd floor); 2.65 (mezzanine); 4.76 (ground floor)

EPC: B

Heating fuel: Electricity (future-proofed)

Cat A: Offices

Cat B: N/A



Source: Rolfe Judd Architecture

* Clear height means the finished floor level to ceiling height

Retrofit

Scope of works

The development, comprising 2 basement levels and 8 upper floors including ground floor, is a refurbishment and extension of the existing 1970's office and bank building at 62-63 Threadneedle Street in the City of London. Although the planning approval obtained for the extensions up to 4th, 5th, 6th floors, the scope of refurbishment involves only basement floors, ground floor and 1st, 2nd and 3rd floors.

As part of the extension works new steelwork columns were introduced from basement level and founded on piled foundations as part of the primary support system for the new (extended) structural floors. The new main office entrance was moved to the centre bay of the Threadneedle Street façade. This gave the building a stronger street presence as well as increased the size of the lobby. The works to Levels 1, 2 & 3 incorporated rear extensions to expand the office floor plates offering a greater NIA and a series of external terraces. The structure allows for further upward expansion when upper leases align and is fully demountable if future change is required. The new steel framework and its interface with the existing concrete frame was left exposed and rafts were co-ordinated in line with BCO zoning to hide FCU whilst exposing ductwork and cable trays on a painted pot and beam soffit.

Retained and installed elements

80% retained

External Walls (1)
Majority of the existing walls were retained. The exsiting fabric was enhanced where possible.

100% installed

Openings (2)
New high performing double glazed units to ground floor and extension floors were installed.

50% retained

Services (3)
Utilising existing MEP systems and installing VRF systems were employed.

95% retained

Substructure (4)
The existing foundations were utilised except for two new pile caps were formed to carry the extensions.

95% retained

Roofs (5)
Majority of the existing roof was retained but new terraces were added.

95% retained

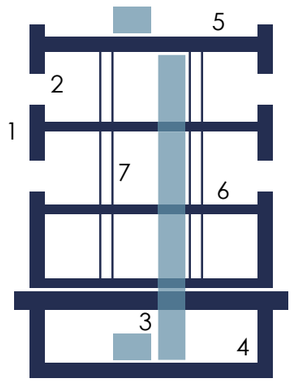
Floors (6)
Majority of the floor structure was retained. New build elements were limited to the extension areas.

85% retained

Frame (7)
Majority of the existing frame was retained and exposed where possible. A steelwork solution was chosen to minimise loading path.

N/A future-proofed

Low Carbon/Renewable Technologies
The scope of refurbishment involves future proved installation of high efficiency air source heat pumps.



62 Threadneedle Street

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**403.0*** $kgCO_2$ e/m² GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**192.0*** $kgCO_2$ e/m² GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**1,116.6*[1]** $kgCO_2$ e/m² GIA

1 Figures based on the Stage 4 WLC Assessment report.

Energy Use intensity (kWh/m²/yr (Based on GIA)	N/A
Heating Fuel type (heat network, electric)	Electricity (future-proofed)
Low and Zero Carbon Technologies	Future-proofed utilisation of air source heat pumps
Recycled Content % by Value	20% (for structural steel sections)

WLC Assessment Method:
RICS WLC

WLC Assessment Scope:
Modules A-C

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m²) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	5.0 5.3
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	47.9 50.5
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	16.2 29.3
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	10.6 20.8
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	72.3 196.8
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	Out of scope Out of scope
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	14.2 73.3
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.3 1.4

Certifications

BREEAM 2018
New Construction
Excellent

Key Insights

Insights

- Discounted initial option of proposing a new build which involved increased massing and height due to the unattractive increased carbon intensity and commercial spend implication.
- Contributing to the conservation area as a neutral building, with a darker coloured granite which contrasts with the other grade listed buildings of lighter colour making them stand out in the landscape.
- Bringing to life elements of the existing building that were hidden as well as extending the building lifespan and providing a series of spaces that focus on sustainability, wellbeing, flexibility, and reuse to reduce carbon at every opportunity. Upgrading the thermal and acoustic performance of the building façade. Enhancing the accessibility of the building to give it a stronger street presence.
- Building does not have continuous ceiling heights across all floors. The used of rafts gives the impression of a higher floor-to-ceiling heights.

Opportunities

- Achieving to improve thermal performance through replacing the single glazed units with double glazed units whilst retaining the original window frames. Improving the building lifespan and enhancing its commercial value.
- Achieving spatial improvements in the building plan with new arrangement of entrances, providing level access, and converting car park basement to the end-of-trip facilities (shower rooms, cycle stores).
- Introducing terraces on every floor as breakout spaces involving plants and greenery design and providing direct access for the building's tenants. Maximising natural light by introducing rooflights in specific floors.
- Designing the building with consideration of future enhancements onto the remaining floors outside of the redevelopment scope. These floors have been future proofed to enable redevelopment at the end of tenant lease. This would include transition to air source heat pumps and introduction of terraces.

Challenges

- Due to the age of the existing building, challenge in dealing with asbestos.
- Challenge in ensuring to prevent condensation due to the requirement of adding internal insulation layers in order to improve the thermal performance of the fabric.
- Maintaining a portion of the building operational during the redevelopment. Respecting and avoiding disruption to the services serving the tenants on top floors (retaining ductwork in the risers).
- Due to the site constraints and location, bringing materials such as steel onto the site was logistically challenging.
- Influencing entire design team and agent to welcome the design of exposed elements of the buildings such as columns, rough concrete finish and slabs.

Portland House

Approximate Project Construction Cost: £100m+
Total Project Cost: £100m+

Location: London, UK
Planning Authority: London Borough of Westminster
Building Type: Office & Retail
Project Type: Refurbishment

RIBA stage: RIBA Stage 5
DESIGN TEAM
Client: Landsec
Developer: Landsec
Project Manager: Opera

Architect: Buckley Gray Yeoman
Structure: Parmar Brook
MEP: Watkins Payne
Sustainability: Buro Happold

Overview

Pre-refurb

Building Age: 1962

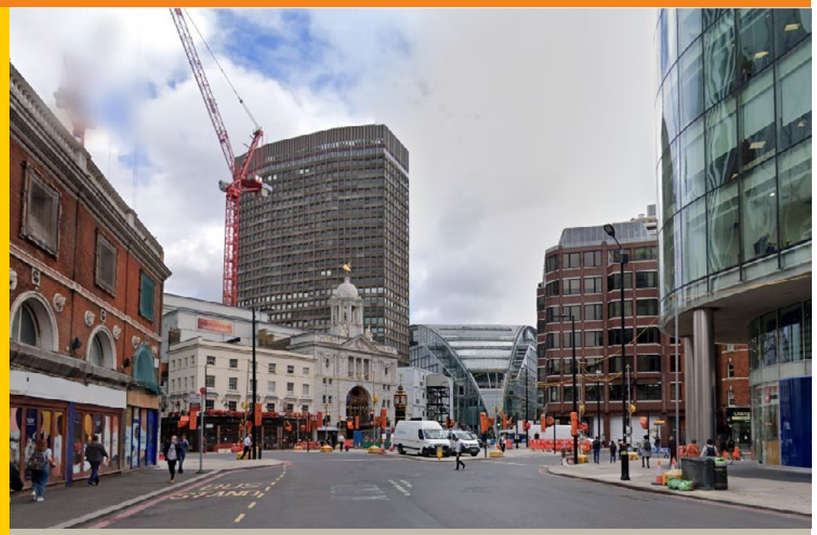
GIA: 45,026 m²

NIA: 25,384 m²

Clear height *: 2.9 m (unfinished slab to softfit)

EPC: E (some floors had D rating)

Heating fuel: Gas



Post-refurb

Completion Date: 2025

Status: RIBA Stage 5

GIA: 46,179 m²

NIA: 27,778 m²

Clear height *: 2.7 m

EPC: A

Heating fuel: Electricity

Cat A: XXX

Cat B: N/A

* Clear height means the finished floor level to ceiling height

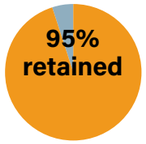
Refurbishment

Scope of works

Portland House is a large 29-story building which is largely in office use (Class B1) but other existing uses within the building include a private gym at basement level, retail at ground and first floor levels and mechanical plant at roof level. The building is fully clad in pre-cast concrete elements in a brutalist style that were fixed internally to avoid the need of scaffolding. With it being 60 years old with increasingly inefficient systems, a severely weathered façade and the need for additional capacity, Portland House is requiring refurbishment.

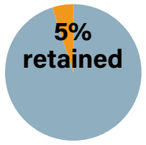
The comprehensive refurbishment scheme includes a new double height reception on Bressenden Place, a refurbished façade, new windows throughout and a Level 30 rooftop extension and installation of new modern efficient plant equipments to provide high quality of office space and improve the building's sustainability credentials.

Retained and installed elements



External Walls (1)

Majority of the external walls are retained with new walls for the two storey extension.



Openings (2)

Majority of windows and external doors are changed with new elements.

Services (3)

Installation of hybrid VRF systems and traditional VRF systems are installed.

Substructure (4)

The existing substructure is 100% retained.

Roofs (5)

The existing roof is 100% reused but some elements will be removed. New roof will be constructed for the enten

Floors (6)

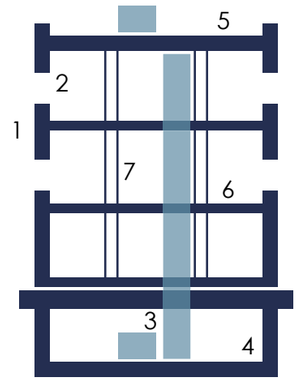
The existing floors are 100% retained with some remedial works. For extention flroos, GGBS percentage is 36% to 65% with target of 66% to 80%.

Frame (7)

The existing frame is 100% retained. New frame system is proposed for the extension floors.

Low Carbon/Renewable Technologies

Installation of Air Source Heat Pumps.



Portland House

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**758.0*** $kgCO_2$ e/m² GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**348.0*** $kgCO_2$ e/m² GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**183.2*[1]** $kgCO_2$ e/m² GIA

1 Based on emission factors: 0.0376 $kgCO_2e$/kWh for electricity (FES 2022).

Energy Use intensity (kWh/m²/yr (Based on NIA)	135
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	Air source heat pumps
Recycled Content % by Value	Information not provided

WLC Assessment Method:
RICS WLC

WLC Assessment Scope:
Modules A-C

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m²) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.0 0.0
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	48.0 63.0
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	62.0 119.0
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	27.0 41.0
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	61.0 122.0
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	11.0 12.0
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	100.0 353.0
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	2.0 2.0

Certifications

BREEAM 2014 RFO Bespoke Assessment Outstanding

Targeting NABERS 5 star rating

WELL Gold

Key Insights

Insights

- Refurbishing and remodelling the office space within the existing building to ensure it is attractive to modern office occupiers and improving the public realm around the site to make it more welcoming and accessible.
- Vastly improving the building's sustainability credentials through a series of measures, including new modern efficient plant equipment and the application of façade treatment to the existing building as well as the introduction of new windows throughout the building to improve the appearance of the building while respecting its existing character.
- Enhancing the biodiversity and air quality by introducing new urban greening on the proposed two storey extension and roof terrace.

Opportunities

- Achieving significant reductions in embodied carbon through the high retention of existing structure.
- Saving operational carbon through the replacement of the existing windows with new high-performance energy efficient windows, thermally insulated the internal perimeter walls and installation of modern and efficient all-electric renewable energy heating and cooling system.
- Increasing the biodiversity and occupants' health and wellbeing.
- Recycling the glass from the windows back into the supply chain to use on other developments.
- Prioritising the use of low carbon materials with high recycled content and responsibly sourced from the UK or Europe.

Challenges

- Challenges in meeting the embodied carbon targets due to the wall to floor ratio and the net to gross area ratio.
- Due to the limited roof space, challenges in meeting the Urban Greening Factor target and unfeasibility of PV installation.
- Challenges in façade intervention during the pre-planning process which resulted unfeasibility of on floor heating and cooling.
- Due to the amount of damage and weathering at the existing façade, challenges in reducing embodied carbon footprints sourced from the requirement of new protective coating and sealant instead of a cleaning treatment.

81 Newgate Street - Panorama St Pauls

Approximate Project Construction Cost: not disclosed
Total Project Cost: not disclosed

Location: London, UK
Planning Authority: City of London
Building Type: Office
Project Type: Refurbishment
RIBA stage: RIBA Stage 5

Design team:
Client: Orion Capital Managers
Development manager: Pella Real Estate Partners
Project Manager: Arcadis

Architect: KPF
Structure: AKT II
MEP: Chapmanbdsp
Sustainability: Chapmanbdsp

Overview

Pre-refurb

Building Age: 1984

GIA: 47,905 m²

NIA: 28,081 m²

Clear height *: 2.5 m

EPC: D

Heating fuel: Gas

Post-refurb

Completion Date: April 2025 (estimated)

Status: RIBA Stage 5

GIA: 76,798 m²

NIA: 54,965 m²

Clear height *: avg. 2.7 m

EPC: A

Heating fuel: Electricity (heat pumps)

Cat A: Shell & Core by Developer, Cat A by Tenant

Cat B: Offices (by tenant)

* Clear height means the finished floor level to ceiling height

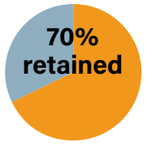
Refurbishment

Scope of works

81 Newgate Street is the location of the former 1980's office building which was home to the British Telecom's (BT) Headquarters. The building is being transformed to a contemporary mixeduse sustainable development that will feature flexible office, retail and leisure space. The Project will be one of the first net-zero carbon enabled office development within the City of London.

The scheme involves a part refurbishment and part demolition, excavation and redevelopment involving the erection of an additional four storeys to provide a ground plus 13 storey building with gym and swimming pool at basement levels, gym and flexible floor area uses at basement level, retail at ground floor level with access to offices and rooftop restaurant and public viewing gallery, office accommodation from levels 1-13 roof top restaurant (Use Class A3) and publicly and privately accessible roof terraces, and landscaping.

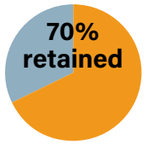
Retained and installed elements



External Walls (1)
The existing Portland limestone façade will be reused.

Openings (2)
New double glazed units are going to be installed.

Services (3)
New services are going to be installed.



Substructure (4)
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Roofs (5)

Floors (6)
All 10 floorsof the existing structure are retained with an additional 3 constructred above.

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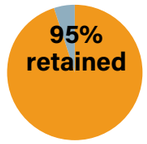

Frame (7)
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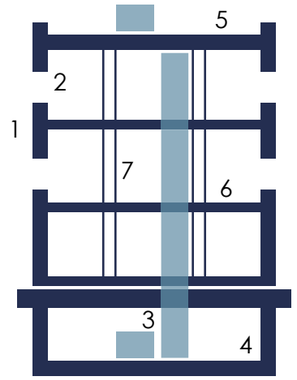
Low Carbon/Renewable Technologies
Installation of Air Source Heat Pumps



81 Newgate Street

Key Performance Data

Whole Life Carbon *Module A-C (excl. B6 & B7)	**646*** $kgCO_2$ e/m^2 GIA
Upfront Embodied Carbon elements *Module A1-A5 (excl. seq. carbon)	**455*** $kgCO_2$ e/m^2 GIA
Operational Carbon *Module B6 (excl. seq. carbon) across 60yr design life	**672*** $kgCO_2$ e/m^2 GIA

Energy Use intensity (kWh/m^2/yr (Based on NIA)	47.1 (base build) 125.3 (whole building)
Heating Fuel type (heat network, electric)	Electricity
Low and Zero Carbon Technologies	Air Source Heat Pumps
Recycled Content % by Value	76% of the existing strcuture saving of circa 465 $kgCO_2/m^2$

WLC Assessment Method:
RICS WLC, GLA, and City of London compliant

WLC Assessment Scope:
Modules A-C, excl. B6 & B7

Building element	Lifecycle Module	Emissions ($kgCO_2$ e/m^2) GIA
Substructure	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	9.20 9.43
Superstructure (frame, upper floors, roof, stairs & ramps)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	213.42 228.77
Superstructure (external walls, windows & external doors)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	66.57 67.42
Superstructure (internal walls and partitions)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	11.43 15.45
Finishes	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	67.22 216.51
Fittings, furnishings, and equipment (FF&E)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	0.00 0.00
Services (MEP)	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	46.01 66.76
External works	A1-A5 (excl. seq. carbon) A-C (incl. seq. carbon)	10.72 10.76

Certifications

BREEAM 2018 Assessment Outstanding

NABERS 5 star rating

WELL Platinum

Key Insights

Insights

- Shell & Core by Developer and Cat A/B by Tenant.
- All electric building to enable zero carbon operation (i.e. Air Source Heat Pumps).
- High efficiency heat recovery with air handling plant.
- Grey Water and Rain water Harvesting offset the non-potable water demand as they contribute to flushing, irrigation and washdown.
- Façade Re-use of stone (Existing 483m^3, Reused 417m^3).
- Introduction of cyclist facilities inside the building (both short and long stay, monitored by security and key card access) as well as introduction of sports hall and swimming pool at Level B2.

Opportunities

- Retained structure, approximately 20,600t of CO2 savings will be made which the equivalent to approximately 50 acres of woodland.
- 417m^3 of the origional 483m3 stone façade is being reused. The design team have aimed to maximise the re-use of stone from the original 1980s facades, effectively using the original building as a quarry. By doing so, it was possible to make very substantial carbon savings over newly quarried stone. The proportion of new stone required for the building has been minimised and is only limited to areas where the existing stone could not be-used.
- The aim is to deliver a net zero operational carbon strategy for the base building energy consumption, targeting 2050 Paris Proof target by 2024.

Challenges

- St Pauls Heights Grid Policy which forms part of the 2012 Protected Views SPD. The relationship with Christchurch Greyfriars Church Garden. Pixellated approach to the new build portion in response to view restriction and context. Renewal of facades.
- Improved building efficiency by infill of the existing atrium. Inserting new main core within existing atrium void.
- Selective changes to the existing structure to improve floor plate efficiency and occupier experience.
- An east west route through the site to centralise office access and tie the building in to its emerging context.
- Mechanical and electrical strategies and an extension of basements to free roof space for people.