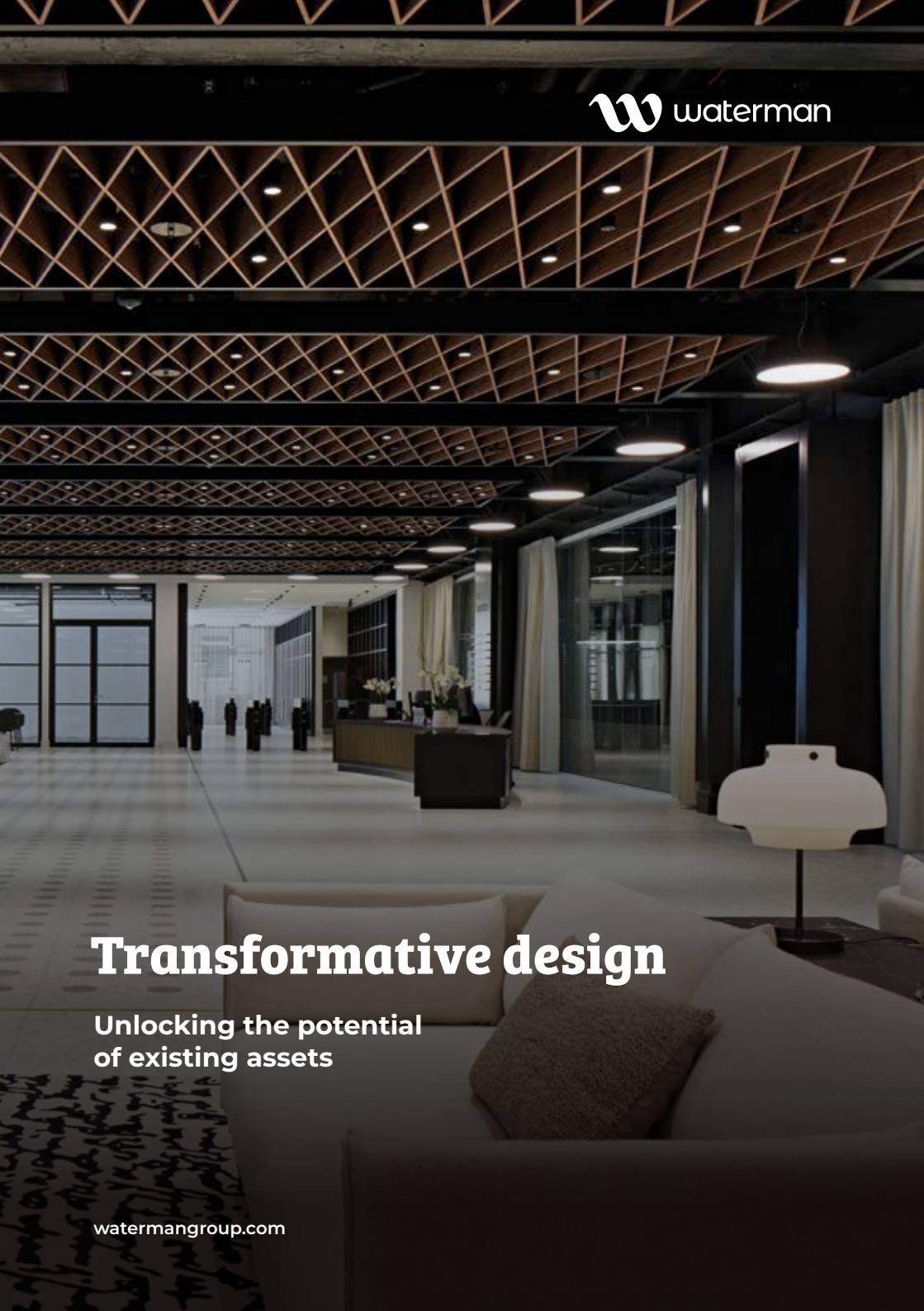
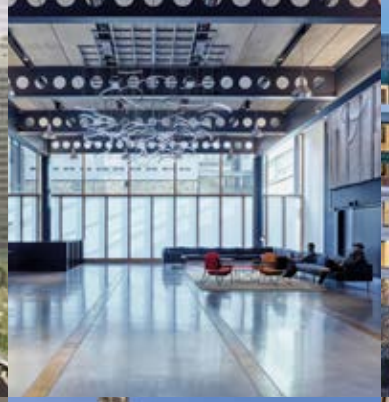


Transformative design

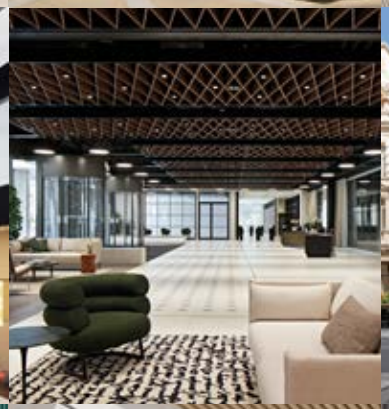
Unlocking the potential of existing assets

watermangroup.com









Contents

Introduction

As our industry gears-up to delivering a Net Zero built environment, the re-use of existing buildings, and the materials they contain, will play a vital role in securing a greener future for the UK.

With two-thirds of a building's carbon footprint resulting from its initial design, procurement and, construction, our engineering experts are focused on extending the lifespan of existing buildings to maximise return on investment and minimise embodied carbon.

Our approach

Our designs are helping to re-invent the UK's existing building stock to deliver exceptional, user-focused buildings. We harness innovative techniques to release usable floor space through sensitive design interventions, harnessing cutting-edge technology to assess superstructure capacities and analyse floor layouts to maximise their potential and deliver incredible buildings.

Our team of structural experts is helping unlock the potential of buildings across a wide range of sectors, spanning everything from commercial offices to heritage buildings, and from education facilities to residential premises.

We embed circular economy principles in all our solutions, designing for future re-use to ensure material lifespans continue far beyond their initial use. In many cases, we revisit projects multiple times across their lives, giving us the opportunity to use our detailed knowledge of a base build to bring a new lease of life to existing assets, slashing embodied carbon and maximising asset values.

We embed circular economy principles in all our solutions, designing for future re-use to ensure material lifespans continue far beyond their initial use.

Our Expert Team

Led by Richard Whitehead, our Structures experts have a deep understanding of retrofit schemes, using targeted engineering solutions to deliver exceptional outcomes for buildings across every sector.

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Tackling embodied carbon through Transformative Design

With the development industry forging a path to Net Zero by 2050, the sector is striving towards reducing embodied, whole life and operational carbon emissions wherever possible.

Waterman's Managing Director for Structures, Richard Whitehead, said that addressing embodied carbon is already high on the agenda: *"Tackling the embodied carbon of an office's base build and future adaptation is the next major hurdle for our industry. I believe that repurposing, retrofitting and repositioning existing buildings is the best way of economically recycling dated assets, whilst reducing delivery programmes and minimising embodied carbon to create stunning facilities from the most modest of beginnings."*

The importance of retrofitting to regenerate existing building stock crosses all aspects of the built environment. Perhaps one of the most significant misconceptions is that older buildings cannot become energy efficient, but with the government's commitment to 'greening the grid', the application of electric-driven heat pump technology on carbon emissions is often underestimated. Mark Terndrup, Waterman's Managing Director for Building Services – South, stated: *"By replacing conventional fossil fuel boiler-based heating systems with heat pumps as part of a refurbishment, carbon emissions from space heating in a typical commercial office can be cut substantially. Coupled with the addition of high-efficiency heat reclamation on ventilation systems and the replacement of fluorescent lighting with LED lamp technology, the overall carbon emissions are typically cut by over 50%. These are relatively simple systems to retrofit as part of a building upgrade and can make a huge impact on both the EPC rating and energy bills."*

With interventions on existing facades often seen as too complex when trying to improve a building's carbon footprint, Mark said: *"Generally, the best value is achieved through window replacements rather than complex enhancement of roof and wall insulation. In the context of a typical façade, the windows are the major source of heat gain and heat loss. By investing in high performance replacement glazing, annual energy use can be cut by as much as 50%."*

To maximise the overall impact of retrofitting, Waterman's structural specialists appraise existing buildings to help unlock their potential. Richard said: *"Using 3D technology, we analyse an existing building's structure, assess what is there and design a new facility around this. This allows us to massively reduce the potential embodied carbon of a project when compared with complete demolition and rebuilding from the ground up, and we've applied this concept to a diverse array of assets. From historic, listed buildings through to more recent properties constructed in the late 1990s, we've utilised existing structures to reduce embodied carbon, making sensitive additions to deliver outstanding new facilities which meet the needs of modern occupiers."*

As planning policy continues to evolve over time, it has enabled an increase in height and massing for many buildings. By carrying out 3D computer analysis of an existing building's structures – which was often not possible when these buildings were first designed – opportunities for retaining much of an original structure can be realised, commonly with only minimal structural strengthening required. The benefits of this approach also include minimising the need for alterations to existing basement and foundations, reducing project risk and eliminating the need for archaeological works or groundworks.

To accompany this structural analysis, Richard said: *"We simultaneously carry out advanced geotechnical investigation of the structure/soil interaction to justify load increases on the foundations, and to demonstrate that the changed loadings will not cause issues with local infrastructure or neighbouring buildings."*

Such detailed early design input can be invaluable where there is a lack of building records, allowing our structural engineers to calculate any available capacity within the existing structural frame. This often occurs as a result of changes in design codes and standard practice over overt time. A common example of this are historic underestimates of permissible steel stresses, which can be improved and justified by testing and sampling.

Ultimately, the extent of structural intervention has to be considered project by project. The 'light touch' approach sees the greatest reuse of existing structures, but there are also often substantial gains to be made with partial demolition and re-use where it increases building longevity.

Transformative design techniques

Realising your asset's potential

Picture Courtesy of WAX Architectural Visualisations

Hill House

Location: London
Client: Landsec
Architect: Apt Architects

This scheme will see the total reimagining of an existing 1970s concrete building into a terraced, 20-storey mixed-use tower punctuated by a vertical urban forest. This new City of London landmark will offer 380,000 sq ft of Grade A office space with rooftop amenities including club room, terrace, restaurant, and a cultural events space. A gym, auditorium, cafe and retail space will also be incorporated, along with a new ground floor arrangement which will accommodate the existing Shoe Lane Library.

Our team provided multidisciplinary support for the scheme, including material circularity analysis as part of a pre-demolition audit, in addition to structural and civil engineering designs. Our specialists retained approximately 60% of the existing structure, reusing materials from the original building wherever possible and repurposing decommissioned steel pipes from the oil and gas industry as structural columns. This approach saw the existing substructure and foundations entirely retained, whilst the superstructure has been designed in curves to deliver accessible terraces at every level.

BREEAM®

BREEAM Outstanding

230%
increase in GIA

No new foundations

A sustainable and healthy workplace with access to landscaped terraces at every level.

Significant tree planting on the curated terraces creates a vertical forest that climbs up the building, hosting wildlife and improving biodiversity.

Picture Courtesy of
WAX Architectural Visualisations

YY London

Location: Canary Wharf, London
Client: Oaktree Capital & Quadrant Estates
Architect: Buckley Gray Yeoman

Previously home to Reuters, this landmark building in the heart of London's Canary Wharf was completely reimagined through an extensive deep retrofit scheme. The low carbon design delivered 100,000 sq ft of office accommodation across three additional storeys, with the existing floors rationalised and re-calibrated to deliver an exceptional building.

BREEAM®

BREEAM Outstanding

NIA Increase
9,733 sqm

Retained Materials

95%
Steelwork retained

100%
Foundations re-used

84%
Slab retained

Pictures Courtesy of Buckley Gray Yeoman

Retaining the existing structure saves

10,260 tonnes CO_2

Equivalent to 7,600 flights to Sydney

51,300 trees planted to offset

798 million cups of tea from a kettle

1-5 London Wall

Location: City of London
Client: Angelo Gordon and Endurance Land
Architect: Carmody Groarke

This major sustainability-focused refurbishment transformed and extended the existing multi-tenanted Grade II-listed building, creating over 20,000 sqm of open-plan workspace through key structural interventions. At ground level, 2,753 sqm of retail space was added, incorporating three restaurants and various co-working facilities.

Major alterations include the recladding of two elevations and the reconfiguration of the ground floor reception areas. Elsewhere, existing office spaces were refurbished to CAT A, and key structural additions enabled the addition of two new floors, a new roof top plant area and a double-mansard roof extension, providing an eighth floor with external terraces.

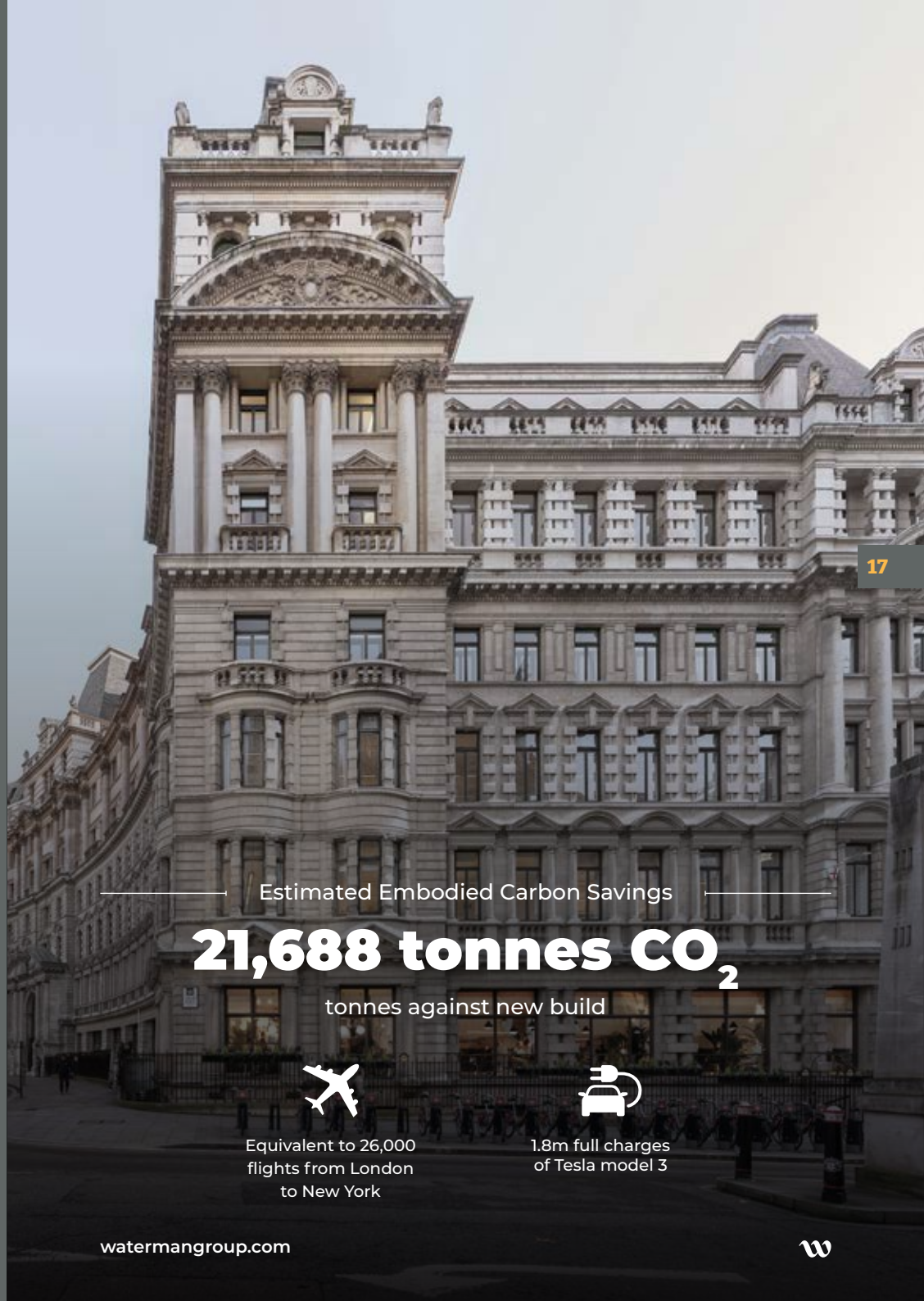
A philosophy of balancing maximum flexibility with embodied carbon was adopted throughout the design process, helping to ensure the longevity of the interventions. This included strengthening rather than replacing the existing structural columns, minimising the weight of the new façade and utilising a lightweight structural steel solution for the extension.

BREEAM®

BREEAM Excellent

13,000 sq ft
of new net area created

Additonal floors created in CLT hybrid structure



Warwick Court

Location: Paternoster Square, London
Client: Stanhope
Architect: Fletcher Priest Architects

This major refurbishment transformed the dated existing commercial building on Paternoster Square. Offering 180,000 sq ft of prime office space across eight storeys, this comprehensive remodelling unlocked amenity space and rationalised floor plates to deliver a flexible, adaptable and SMART tech-enabled facility fit for many years to come.

BREEAM®

BREEAM Excellent

NIA Increase
420 sqm approx.
additional slab area

Retained Materials

99%
Steelwork retained

100%
Foundations re-used

99%
Slab retained

Embodied Carbon Savings

20,789 tonnes CO_2

tonnes against new build

4,300 People on return trips to Tokyo

166,00 trees planted

Gresham St. Pauls

Location: City of London
Client: Stanhope
Architect: WilkinsonEyre

This low carbon, deep retrofit of a 1990s office building delivered 165,000 sq ft of Grade-A office and retail space. Set across ten floors and a basement level, the scheme focused on the getting the most from the existing structure, using targeted interventions to deliver additional floors and create exceptional open, flexible office space.

BREEAM®

BREEAM Excellent

NIA Increase
1,092 sqm

Retained Materials

92%
Steelwork retained

100%
Foundations re-used

88%
Slab retained

6,660 tonnes CO_2e

savings versus new build (equivalent to the annual carbon footprint of over 1,200 people in the UK)

Image Courtesy of Dirk Lindner

The Northcliffe

Location: City of London
Client: Confidential
Architect: John Roberston Architects

Formerly the Daily Mail's HQ, this exceptional 1920s building has been completely reinvigorated following a deep sustainability-focused retrofit. Set behind the retained Grade II-listed façade, the existing building has been completely remodelled, with two new upper floors boosting the Grade-A workspace up to 200,000 sq ft. The existing 1990s steel frame was retained and strengthened, while additions were made to maximise floorplate potential and facilitate the new floors and a reimagined entrance atrium space.

BREEAM®

BREEAM Outstanding

NIA Increase

An increase to the building's net lettable space of 1,150 sqm with the extension of two new levels. as well as the addition of 9,000 sq ft worth of green space.

Retained Materials

98%
Steelwork retained

100%
Foundations re-used

99%
Slab retained

326 kgCO_2eq/m²

Embodied/whole-life carbon

100%

of operational building waste diverted from landfill

All non-hazardous waste has been recycled and zero to landfill

Image courtesy of
GG Archard - www.ggarchard.com

The Bower

Location: Old Street, London
Client: Helical Plc
Architect: Allford Hall Monaghan Morris Architects

This mixed-use landmark development offers 320,000 sq ft of prime office space across three unique buildings, along with a range of vibrant retail and restaurant space. Taking an innovative design approach, this exceptional scheme showcases the original buildings' heritage whilst also delivering significant embodied carbon savings. The buildings were totally remodelled and extended, harnessing the existing building fabric and using sensitive engineering to unlock frame capacity and boost available space.

The Tower's existing 14 storeys were previously home to a British Telecoms telephone exchange. By removing the original 1960s cladding and screeded floors, three additional floors were included at roof level alongside staggered side extensions to create dramatic double-height 'living room' spaces for the tenants.

The Warehouse was completely refurbished and stripped back to expose the existing structure, increasing its overall floorplan to 122,000 sq ft across 11 storeys with the addition of both side and rooftop extensions. Private roof terraces were inserted on the fourth, eighth and ninth floors to complement the dynamic working spaces.

The new three-storey office building, The Studio, was constructed from exposed reinforced concrete flat slabs and separated from its towering neighbours by a ramped pedestrian walkway that portrays Old Street's urban history with a dramatic 'art wall'.

BREEAM®

BREEAM Excellent

Picture Courtesy of Timothy Soar

Embodied Carbon Savings

6,931 tonnes CO_2

Paper Garden – Canada Water

Location: London
Client: British Land
Architect: Jan Kattein Architects

Nestled at the heart of the major Canada Water regeneration scheme, this unique community building is London's largest circular economy structure at 300 sqm. With the structure featuring 60% recycled materials, the design utilised components harvested from other buildings with the design team collaborating throughout the process to source materials and tailor the design to suit.

Our structures design helped to deliver a range of community spaces including multi-functional teaching rooms, a kitchen and outdoor growing area, along with offices and toilets.

BREEAM®

BREEAM Outstanding

Frame made from
60%
recycled materials

Designed for disassembly

Flexible layout for future reuse

Grimsby Ice Factory

Location: Grimsby
Client: Tom Shutes
Architect: Waugh Thistleton Architects

The derelict Garde-II* listed Great Grimsby Ice Factory site will be transformed to breathe new life into this historic location. Centred around a major renovation of the derelict Ice Factory, proposals incorporate a 1,000-seat events venue, 56,000 sq ft of office space and a research and development area for offshore renewables.

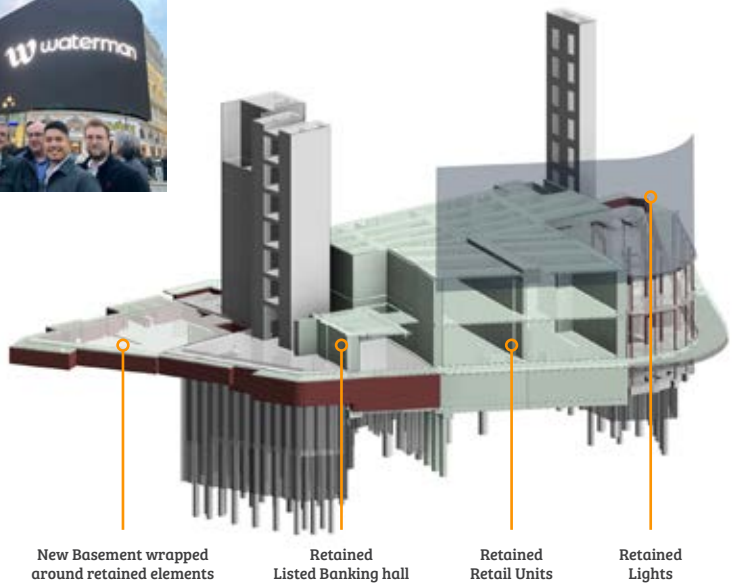
Elsewhere, a newly built 161-bed Kasbah Hotel is also proposed for a key on-site location near the dock entrance. Our structural, civil engineering and flood risk experts are helping unlock the site's potential through a series of sensitive design interventions, including an extension to the south building to incorporate a new entrance, along with two new first-floor bridges enabling access between the two buildings.

Picture Courtesy of
Waugh Thistleton Architects

Lucent

Location: Piccadilly Circus, London
Client: Landsec
Architect: Fletcher Priest Architects

Located directly behind London's iconic Piccadilly Lights, this major retrofit and extension offers 144,000 sq ft of high-quality office, hospitality, retail and residential units. The space has been brought back to life through the addition of two new stories, and features 20 landscaped terraces and an openair wintergarden atrium. This transformation was enabled by key design interventions to the basement and superstructure, including a new roof truss spanning 36m across the existing buildings, carrying the three new floors above.



BREEAM®

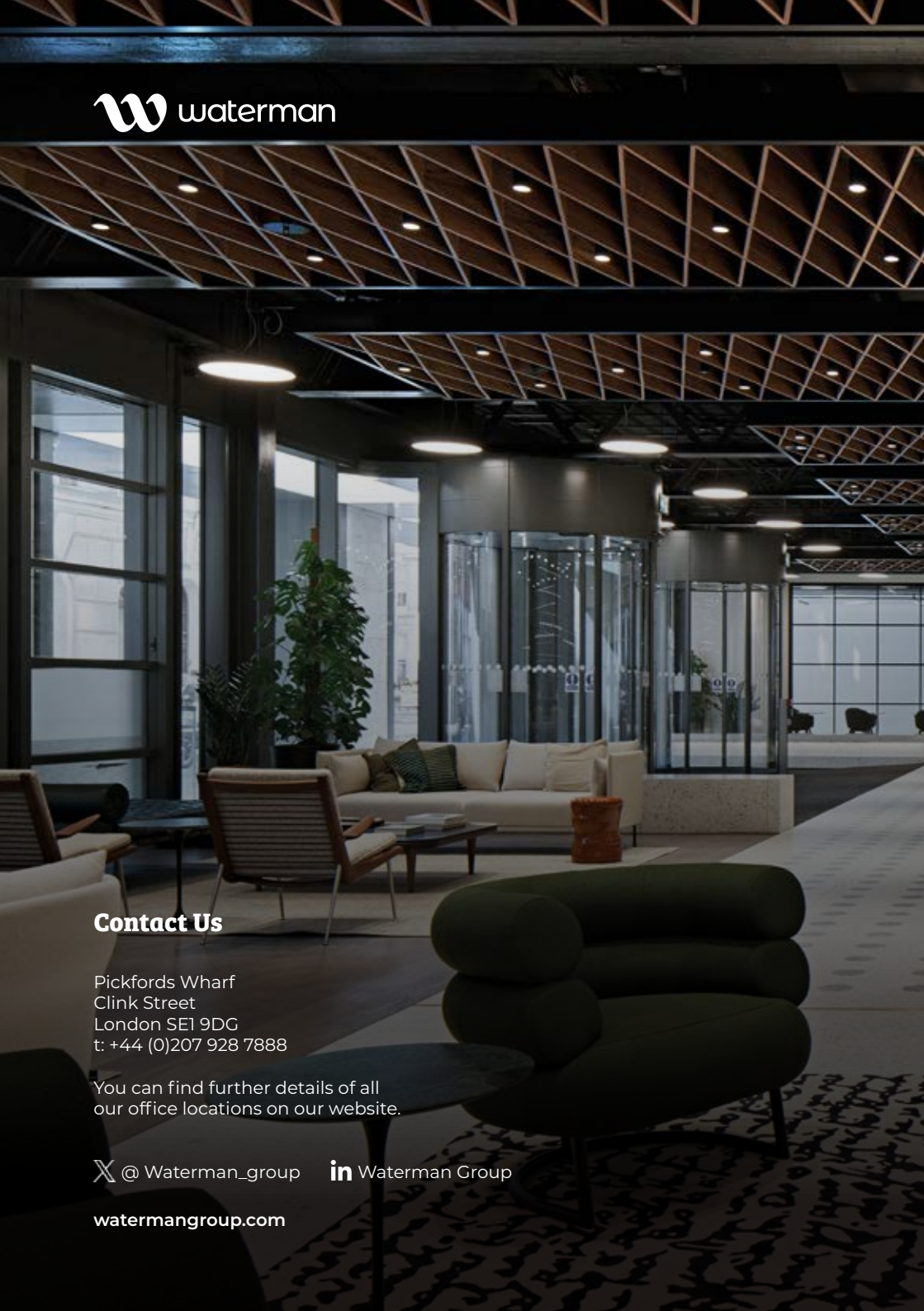
BREEAM 'Outstanding' targeted

Substructure:

Re-use of existing foundations plus 40% GGBS concrete mix for new elements - Saved 900-1,000 tonnes CO2

40%

of the Lucent footprint is occupied by retained buildings. The new development is supported by these buildings and a truss that spans them at high level.



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