THE ENGINEERS REUSE COLLECTIVE

# Talking Reuse: Reuse in Action

THE ENGINEERS REUSE COLLECTIVE

# Welcome

Andy Yates - tERC

# The Engineers Reuse Collective is a not-for-profit group of practising engineers championing, accelerating and delivering reuse in the built environment to support the transition of the UK's built environment to Net Zero Carbon.

Our mission is to dramatically increase reuse within the built environment, with minimal reprocessing, to support the transition to circular economy principles and to urgently reduce the carbon intensity of the built environment.

WORK TOGETHER

CHANGE MINDSETS

WASTE LESS

REUSE MORE

THE ENGINEERS REUSE COLLECTIVE

# Agenda

1. News
2. Stonecutter
3. 42 Southwark Bridge Road
4. Hobhouse
5. Mary Ward Centre
6. Q+A

Please submit any questions via Slido: #3021166

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# News

Andy Yates - tERC

# Talking Reuse: Reuse in Action

## News

Department
for Environment,
Food & Rural Affairs

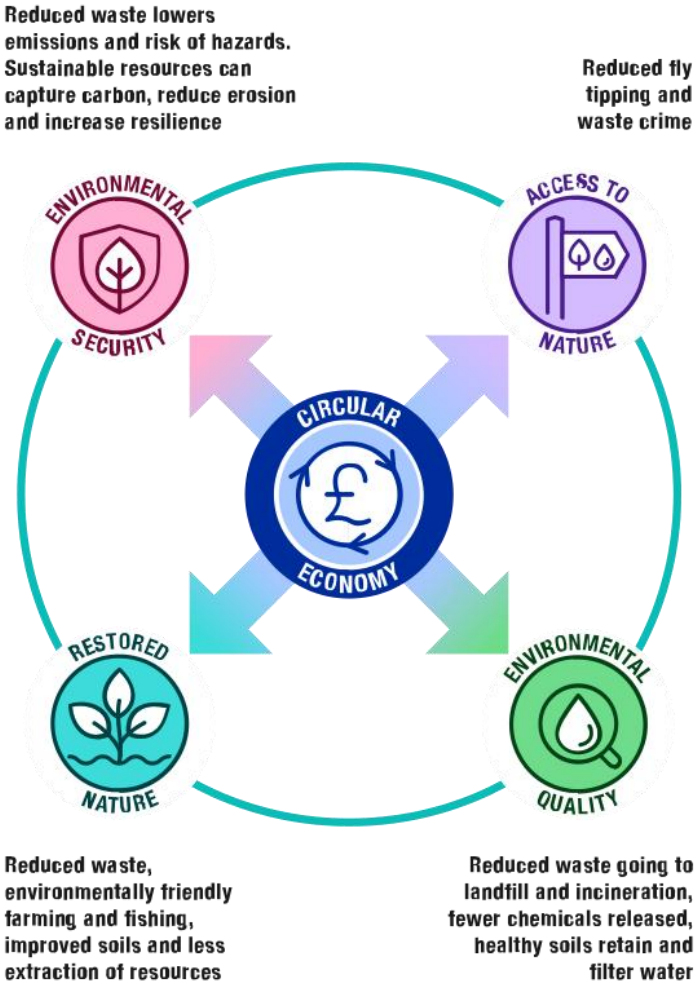
Corporate report

**Environmental Improvement Plan (EIP) 2025**

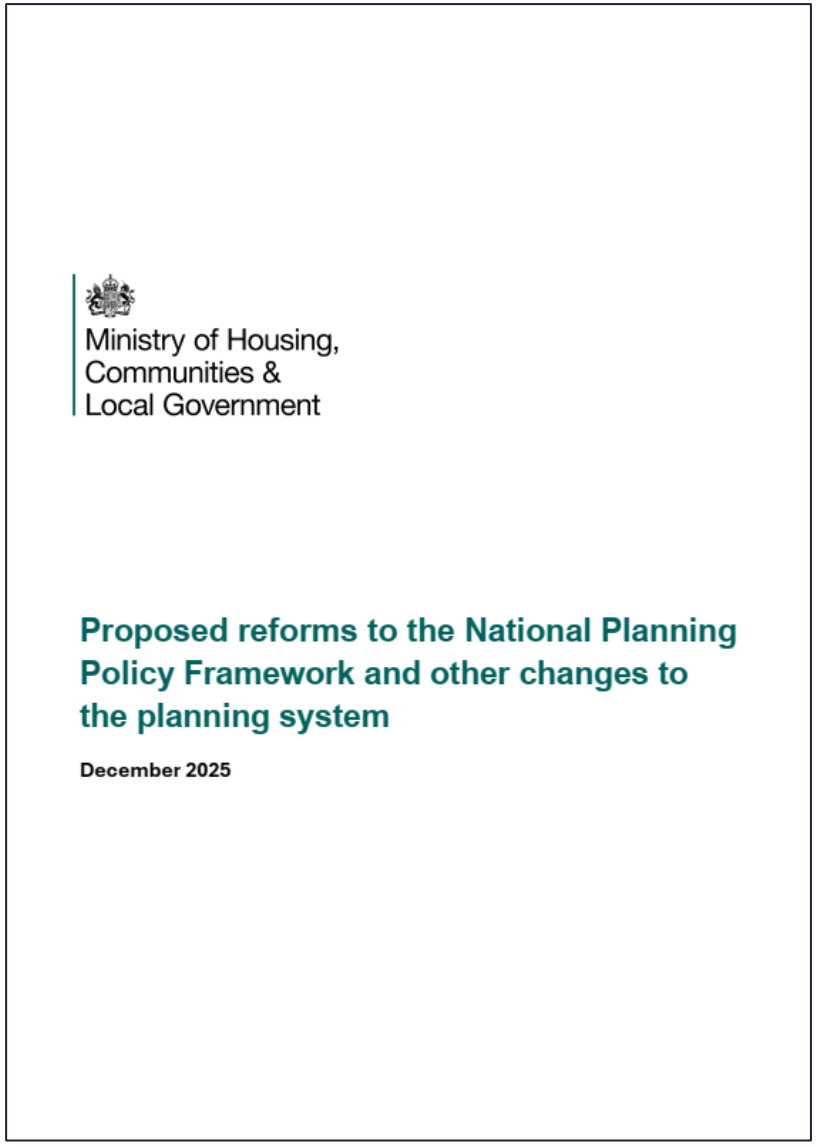
Published 1 December 2025

**Commitment 51:**

**Publish the circular economy growth plan in early 2026, followed by its implementation.**



News




# National decision-making policies

**CC2**: **Mitigation of climate change**

The policy sets out key considerations for decision-making, including:

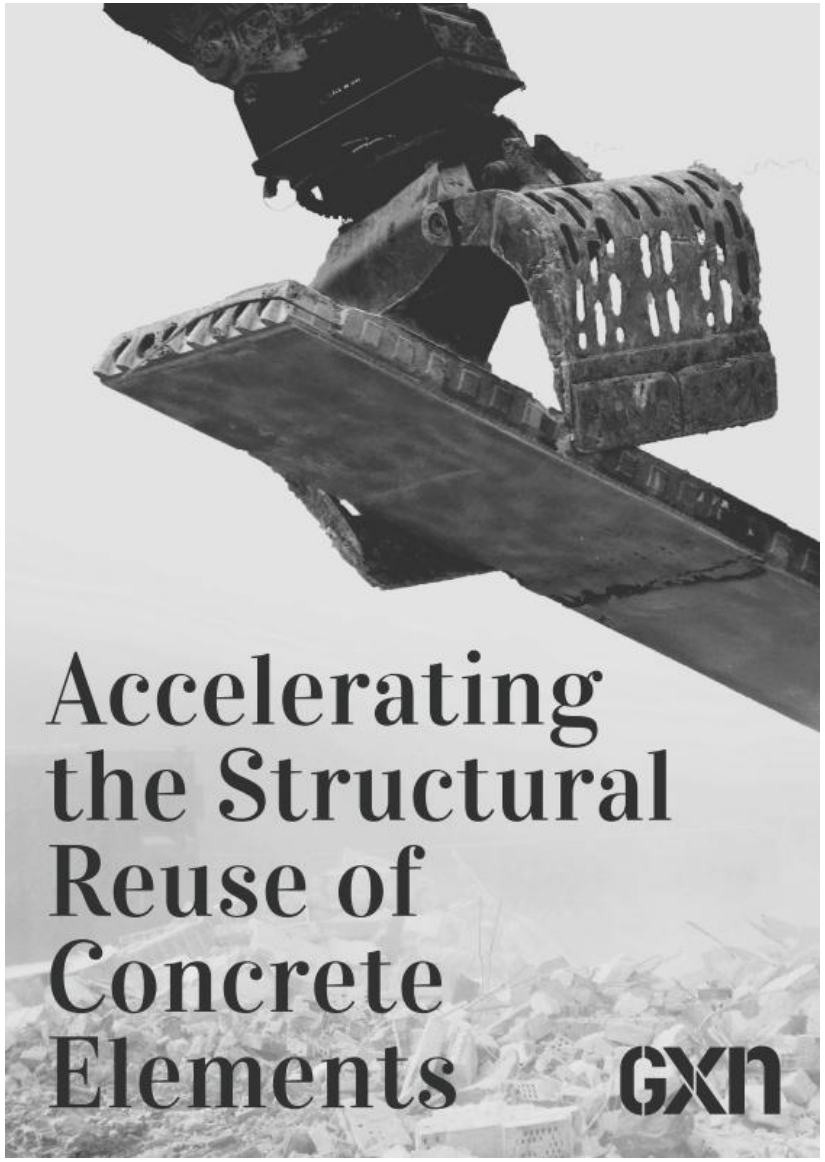
- Promoting sustainable transport and development patterns;
- Encouraging design approaches that conserve energy and other resources;
- Supporting opportunities to reuse existing structures and materials;
- Protecting and restoring habitats which can act as important carbon stores; and
- Restricting fossil fuel extraction.

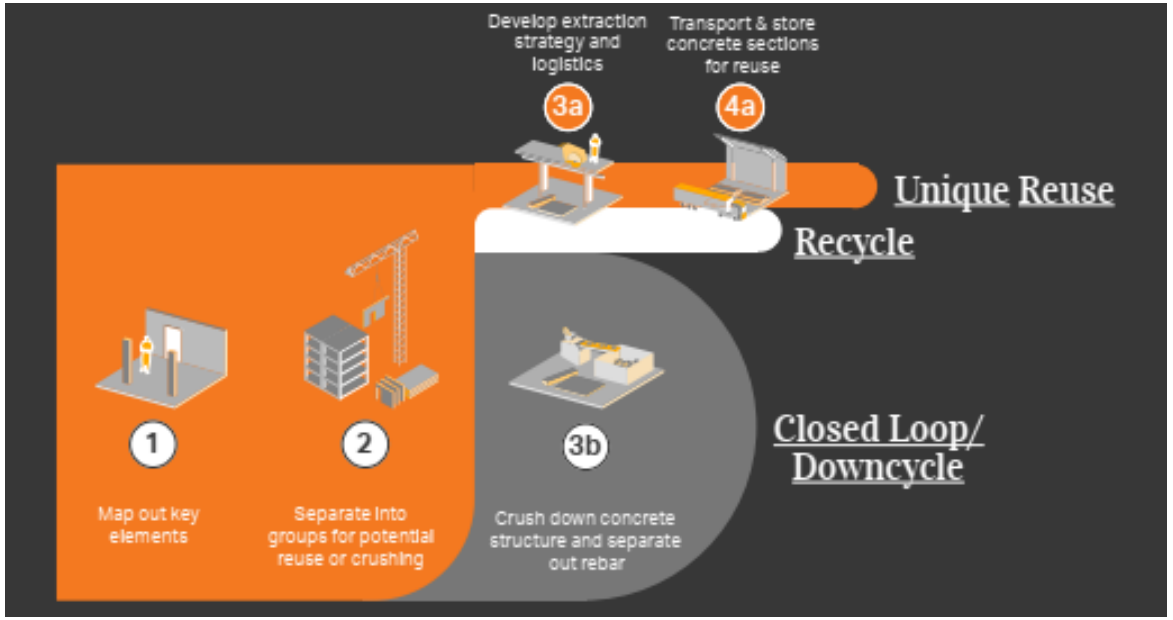
1. In order to contribute to climate change mitigation and the transition to net zero, development proposals should, where relevant to the proposal:

   d. Take advantage of opportunities to re-use existing structures and materials, including by re-using non-contaminated excavated soil and hardcore within the site;

# Talking Reuse: Reuse in Action

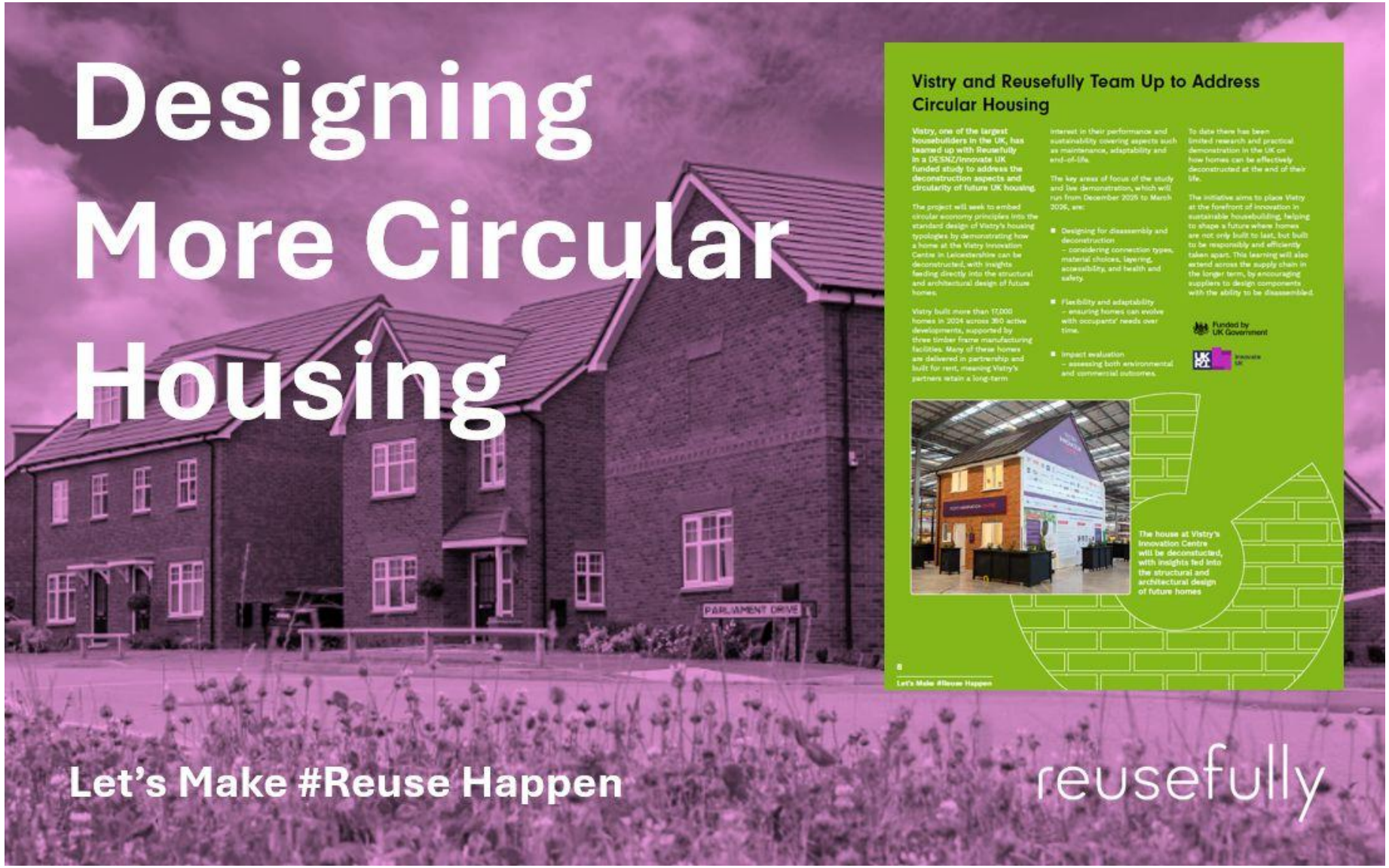
## News



# Talking Reuse: Reuse in Action

News



# Talking Reuse: Reuse in Action

## News

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STEEL TUBES

## Talking Reuse: Reuse in Action

Steel tubes

THE ENGINEERS REUSE COLLECTIVE

CLEVELAND STEEL & TUBES LTD

Around 91,000t of tubes in stock,
44,00t certified and 47,000t uncertified, plus
around 8,000t of open sections in stock

John Lawrie TUBULARS

Around 25,000t of tubes in stock,
certified and uncertified

# Talking Reuse: Reuse in Action

## Steel tubes

PD CEN/TS 1090-201:2024

BSI Standards Publication

**Execution of steel structures and aluminium structures — Reuse of structural steel**

bsi.



TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

**CEN/TS 1090-201**

October 2024

ICS 91.010.30; 91.080.13

English Version

**Execution of steel structures and aluminium structures - Reuse of structural steel**

Ausführung von Stahltragwerken und Aluminiumtragwerken - Wiederverwendung von tragenden Stahlbauteilen

This Technical Specification (CEN/TS) was approved by CEN on 5 August 2024 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

cen

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels



Ref. No. CEN/TS 1090-201:2024 E

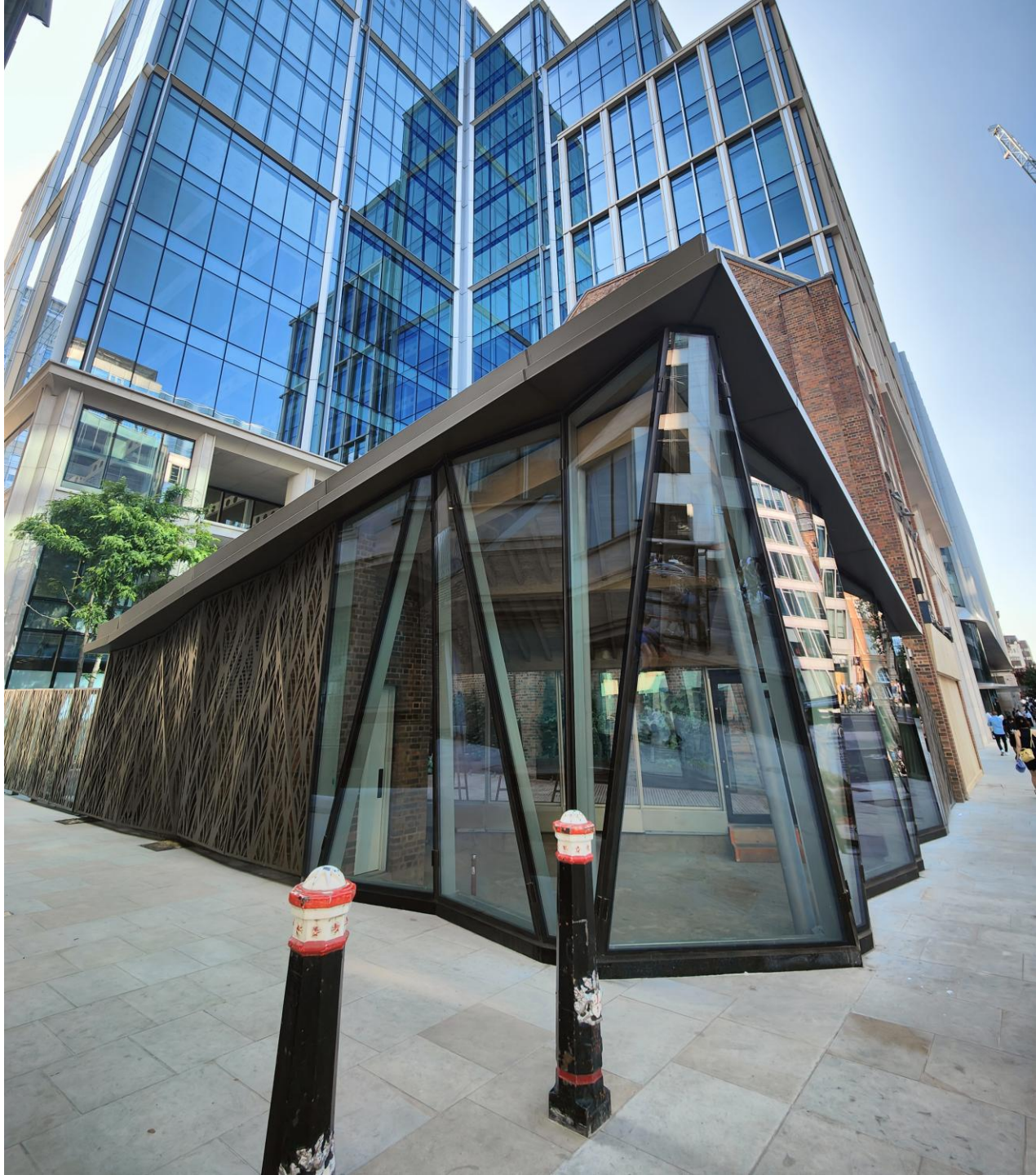
THE ENGINEERS REUSE COLLECTIVE

# Stonecutter

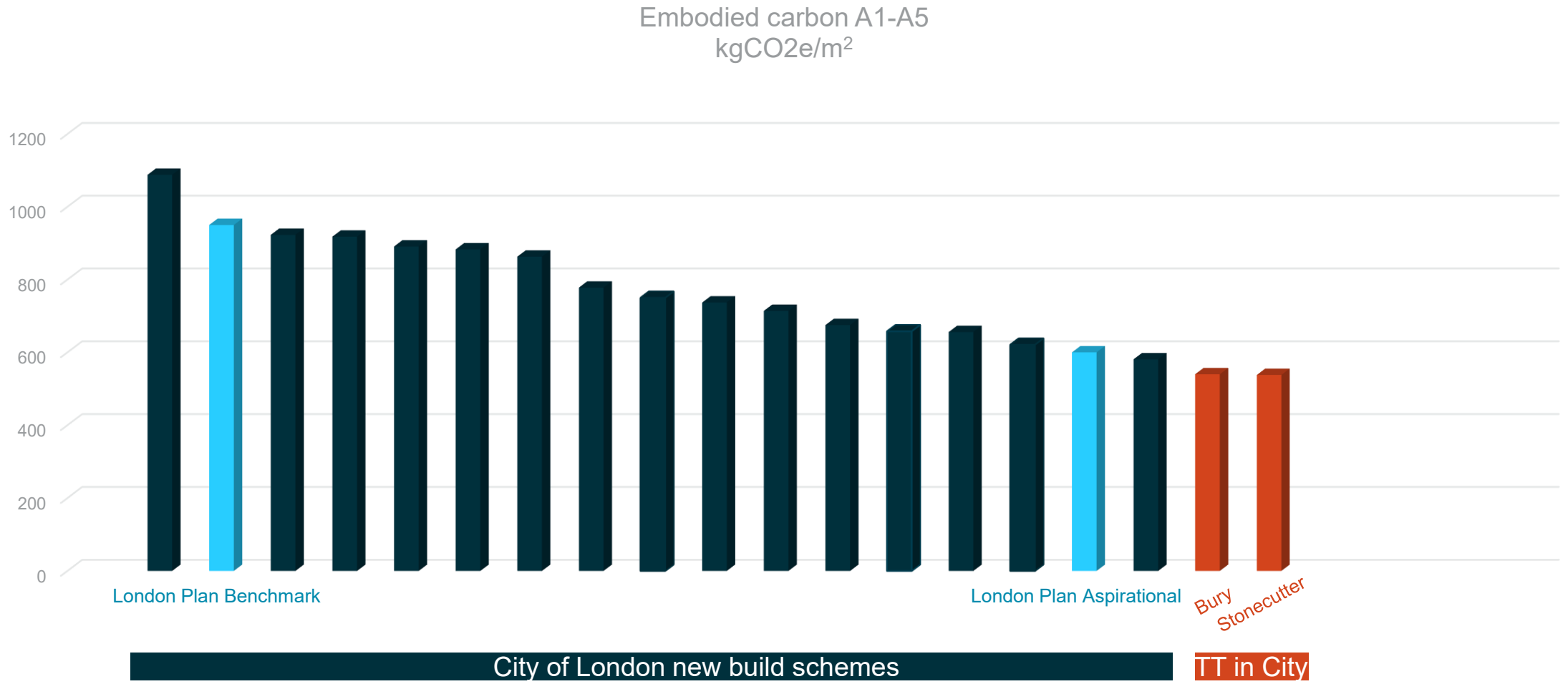
Eddie Jump – Thornton Tomasetti
Hamed Shariff – A-squared

# STONECUTTER

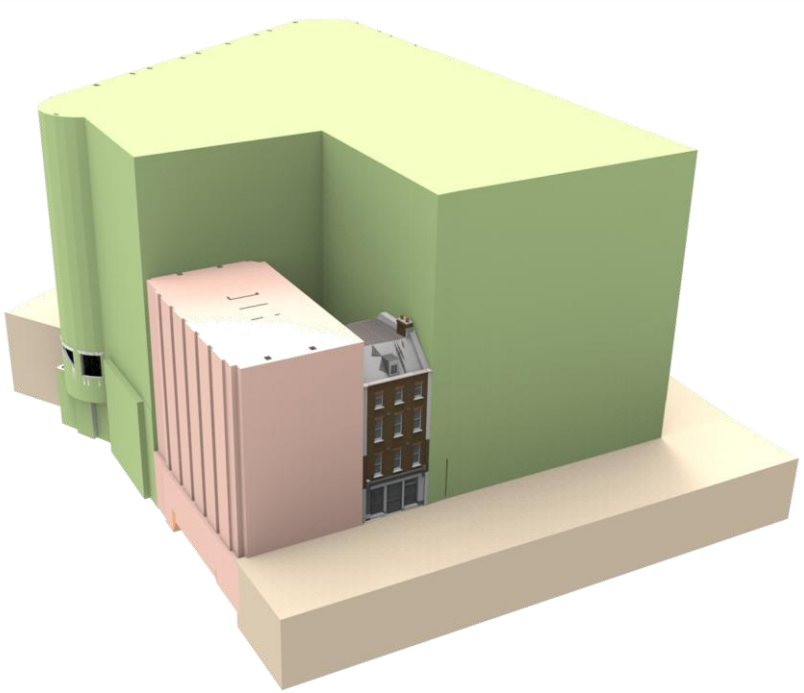
# ICONOGRAPHY



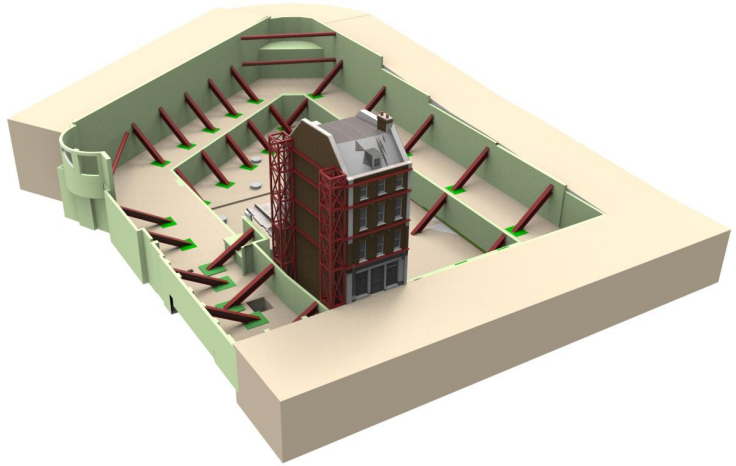
# PUBLISHED CITY OF LONDON SCHEMES VS TT



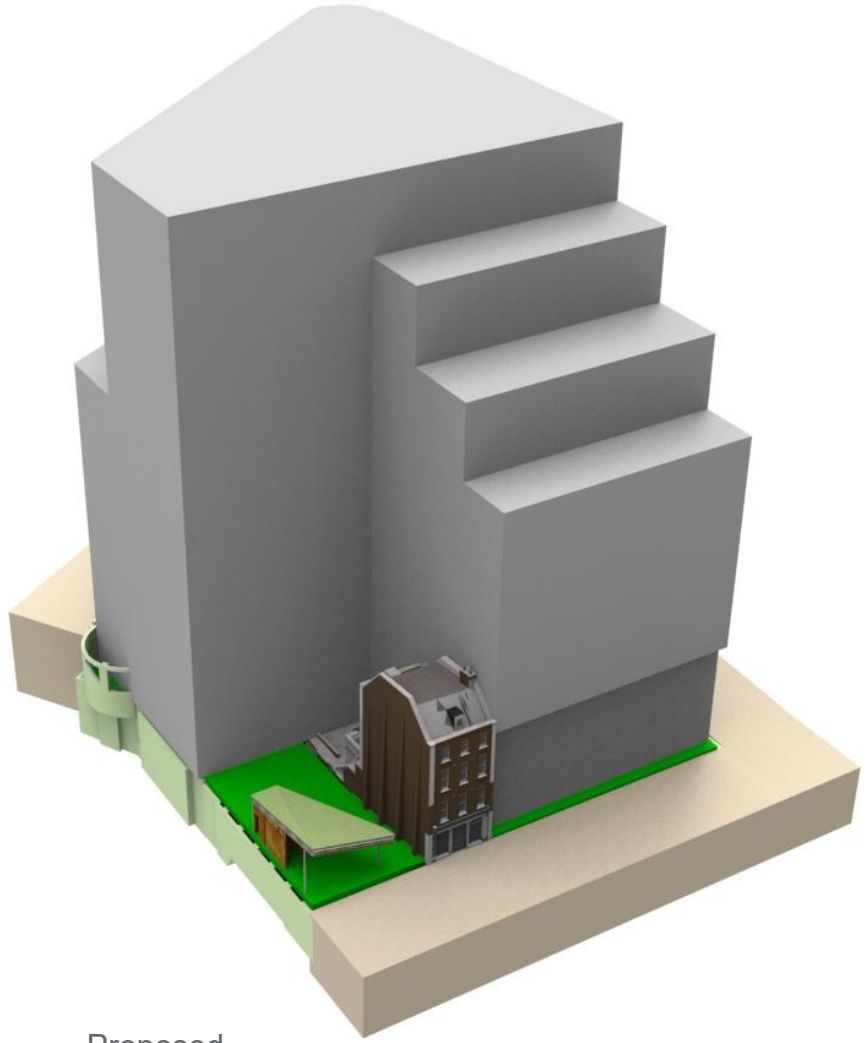
# SAME WEIGHT, SAME FOUNDATIONS
# 100% MORE BUILDING



Existing

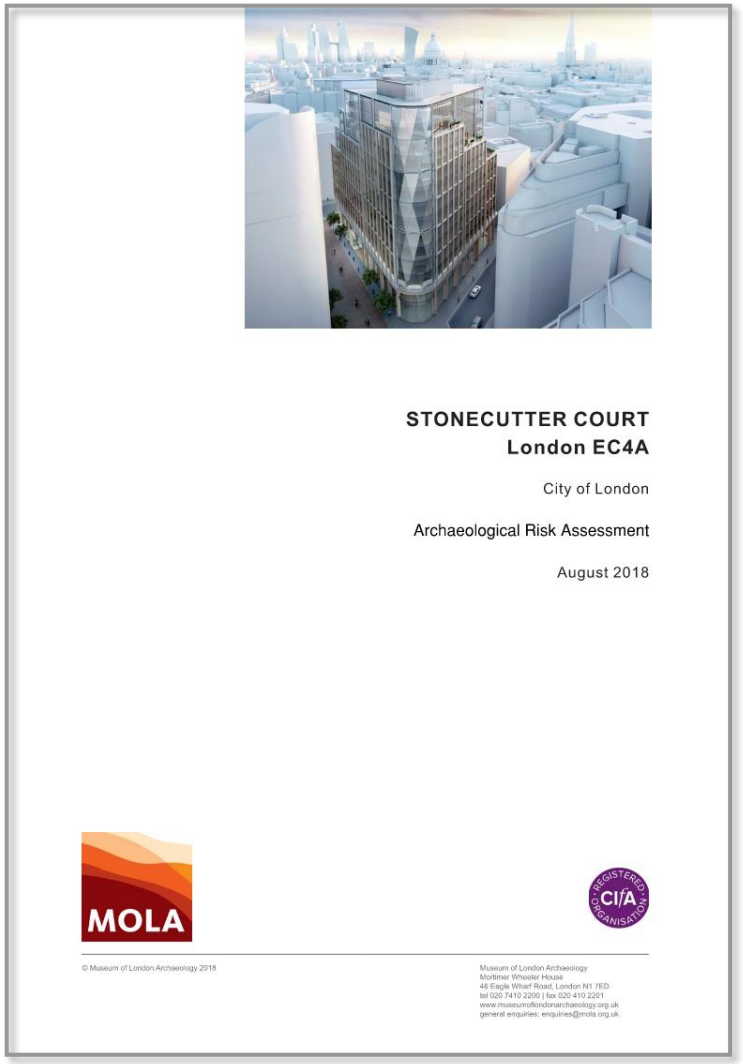


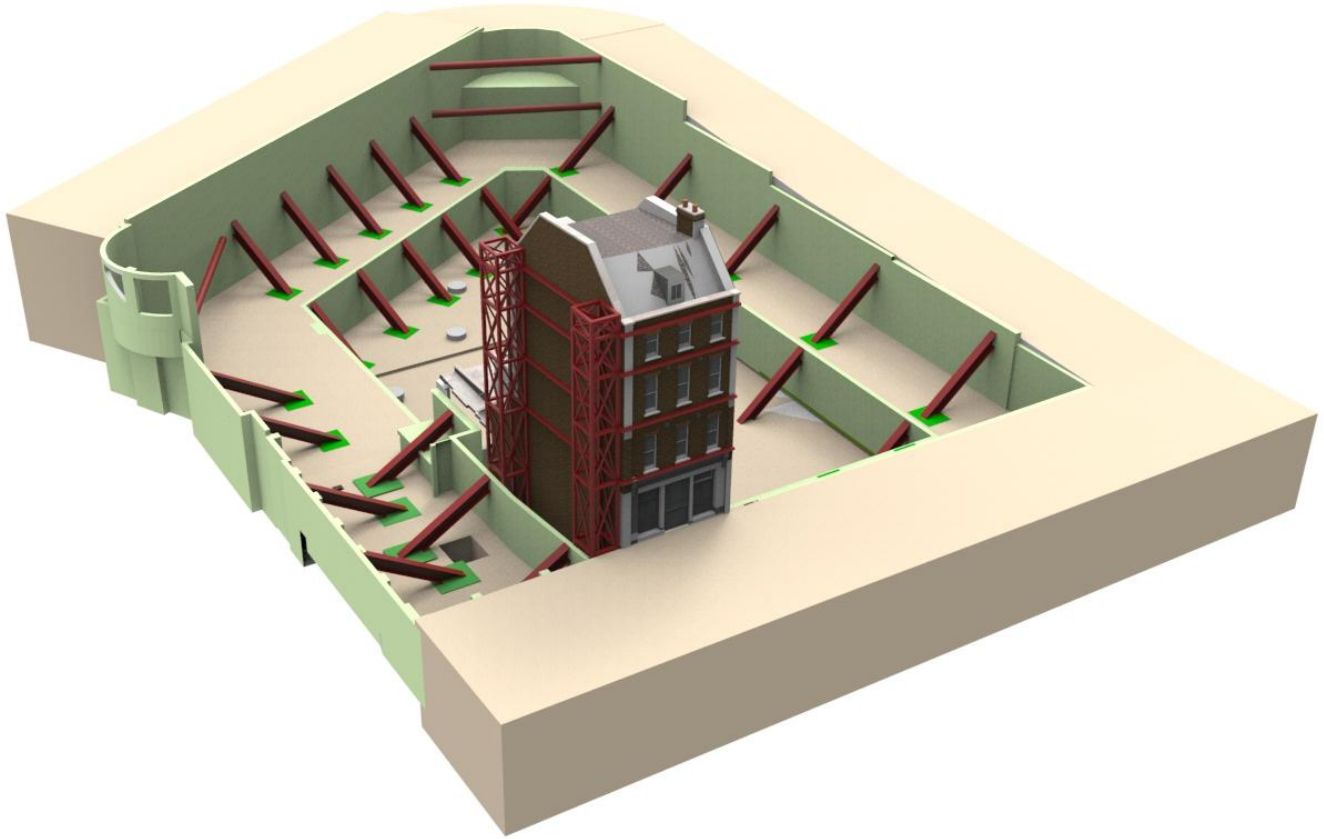
Temporary

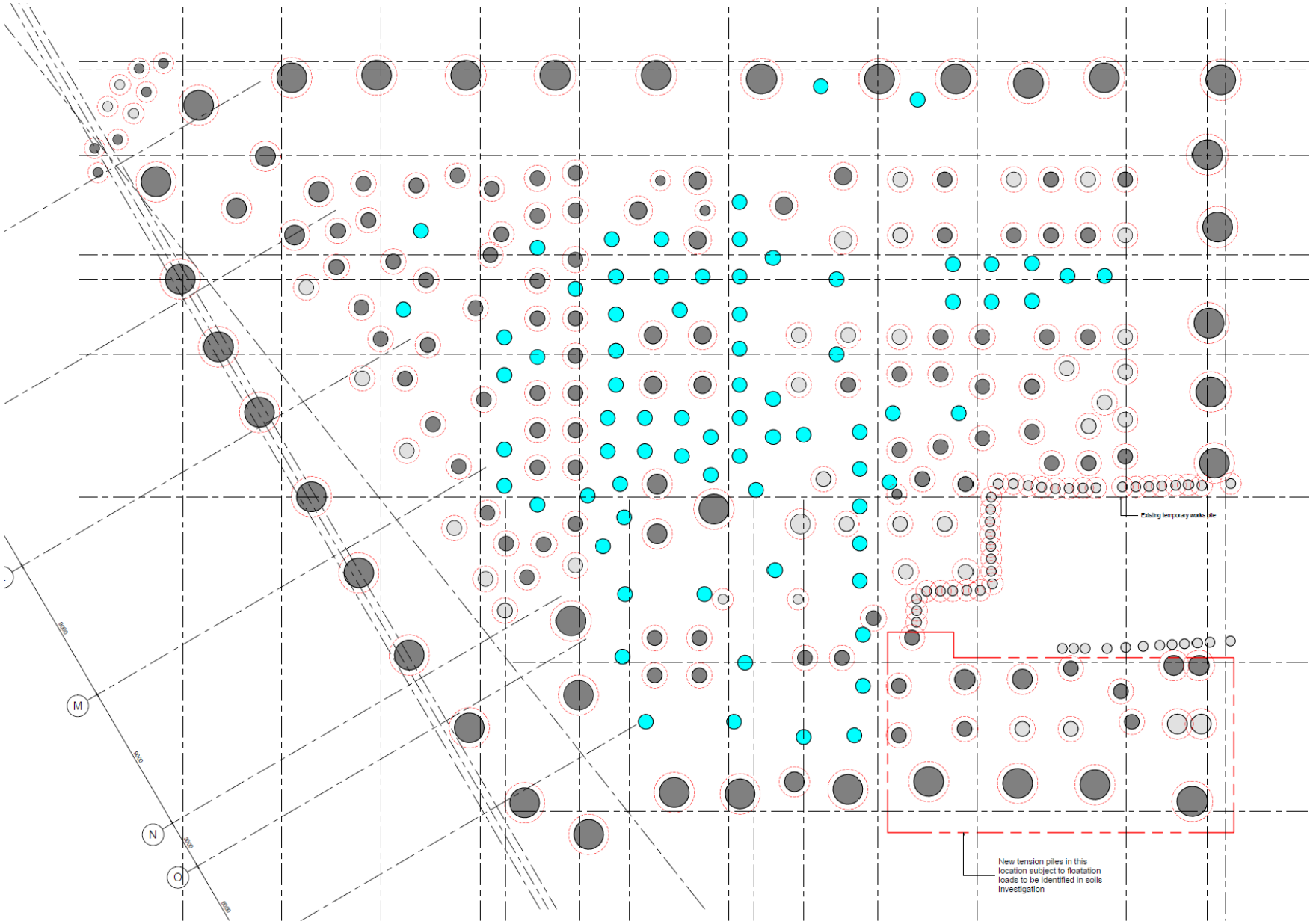


Proposed

# GROUND RISK


STONECUTTER COURT
London EC4A
City of London
Archaeological Risk Assessment
August 2018
MOLA
REGISTERED ORGANISATION
CIfA
© Museum of London Archaeology 2018
Museum of London Archaeology
Mortimer Wheeler House
46 Eagle Wharf Road, London N1 7ED
tel 020 7410 2200 | fax 020 410 2201
www.museumoflondonarchaeology.org.uk
general enquiries: enquiries@mola.org.uk



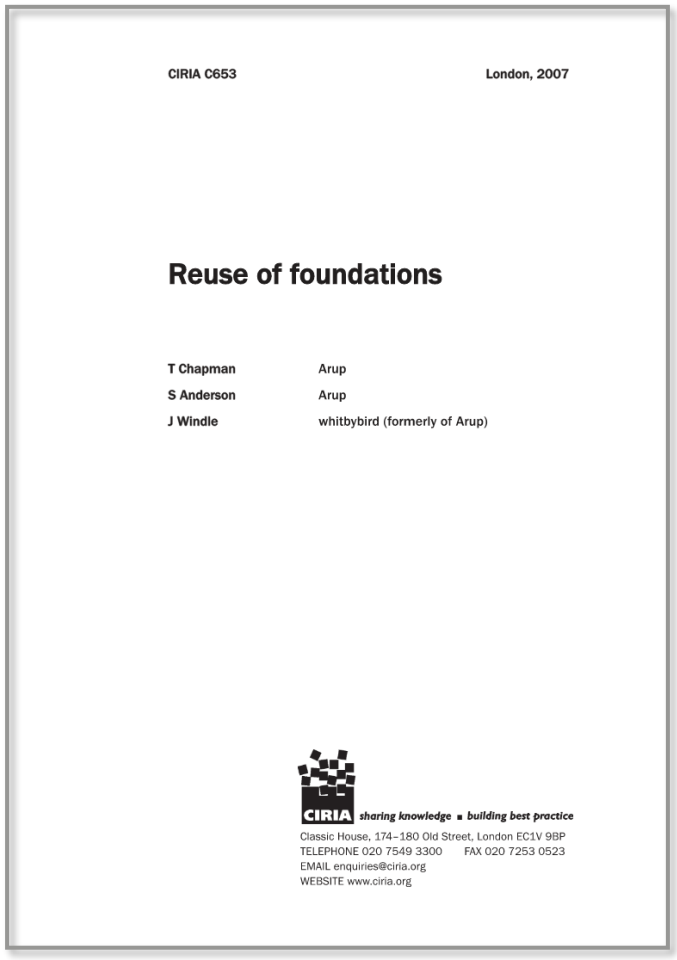



# 71%

Retained piles

Thornton Tomasetti

# NOTHING IS NEW



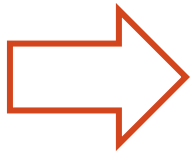
CIRIA C653 London, 2007

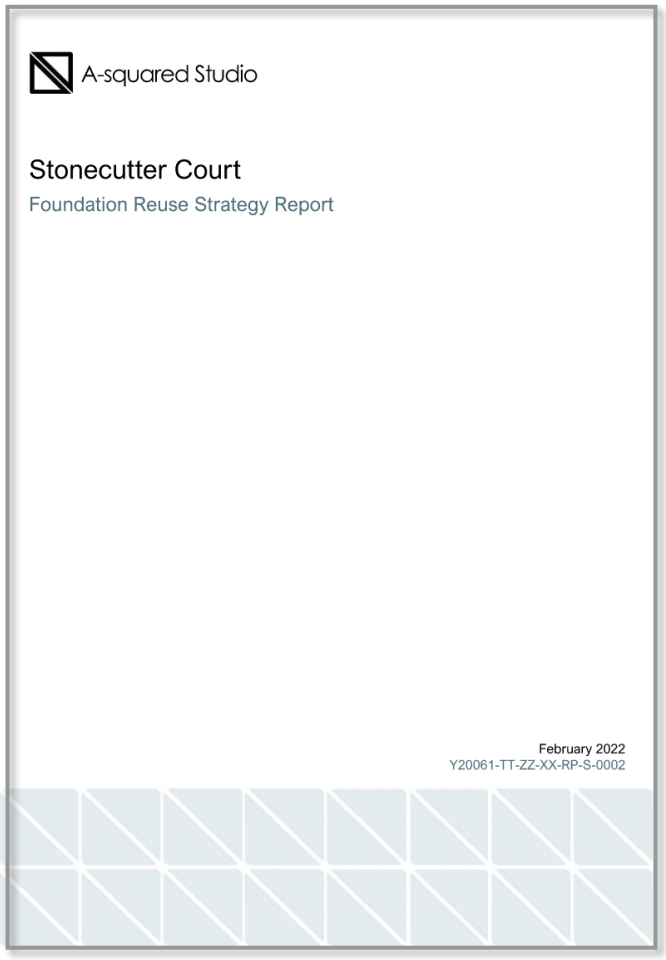
## Reuse of foundations


T Chapman Arup
S Anderson Arup
J Windle whitbybird (formerly of Arup)



CIRIA sharing knowledge ■ building best practice
Classic House, 174–180 Old Street, London EC1V 9BP
TELEPHONE 020 7549 3300 FAX 020 7253 0523
EMAIL enquiries@ciria.org
WEBSITE www.ciria.org

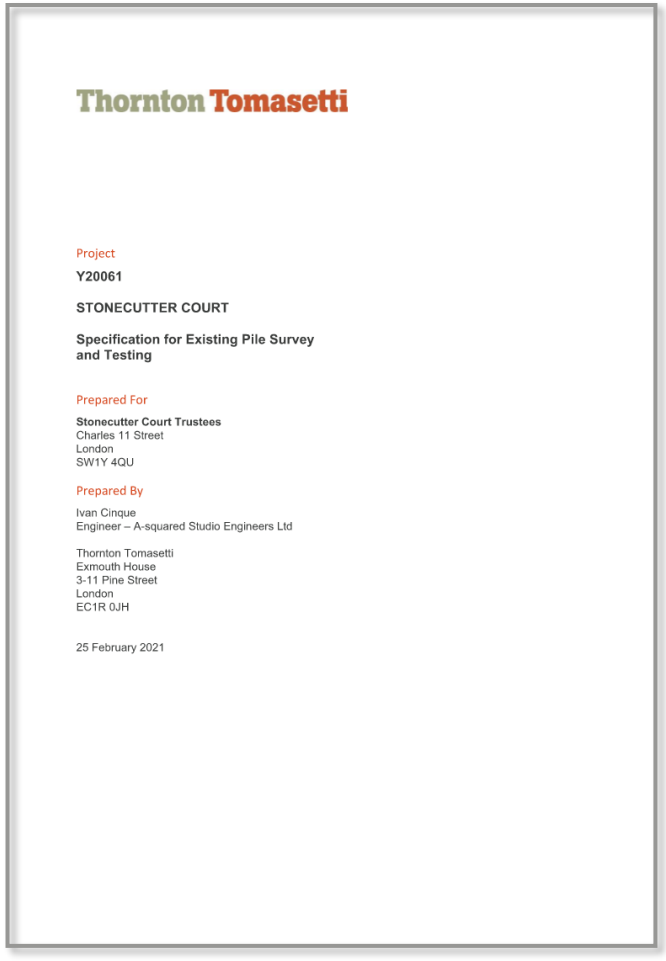


A-squared Studio

Stonecutter Court

Foundation Reuse Strategy Report

February 2022
Y20061-TT-ZZ-XX-RP-S-0002



Thornton Tomasetti

Project

**Y20061**

**STONECUTTER COURT**

**Specification for Existing Pile Survey and Testing**

Prepared For

**Stonecutter Court Trustees**
Charles 11 Street
London
SW1Y 4QU

Prepared By


Ivan Cinque
Engineer – A-squared Studio Engineers Ltd

Thornton Tomasetti
Exmouth House
3-11 Pine Street
London
EC1R 0JH


25 February 2021

# KEY REUSE CONSIDERATIONS

- Below-ground congestion

  ***Limited space for new piles***

- Compatibility with proposed scheme

  ***New support locations near existing piles***

- Available archive information

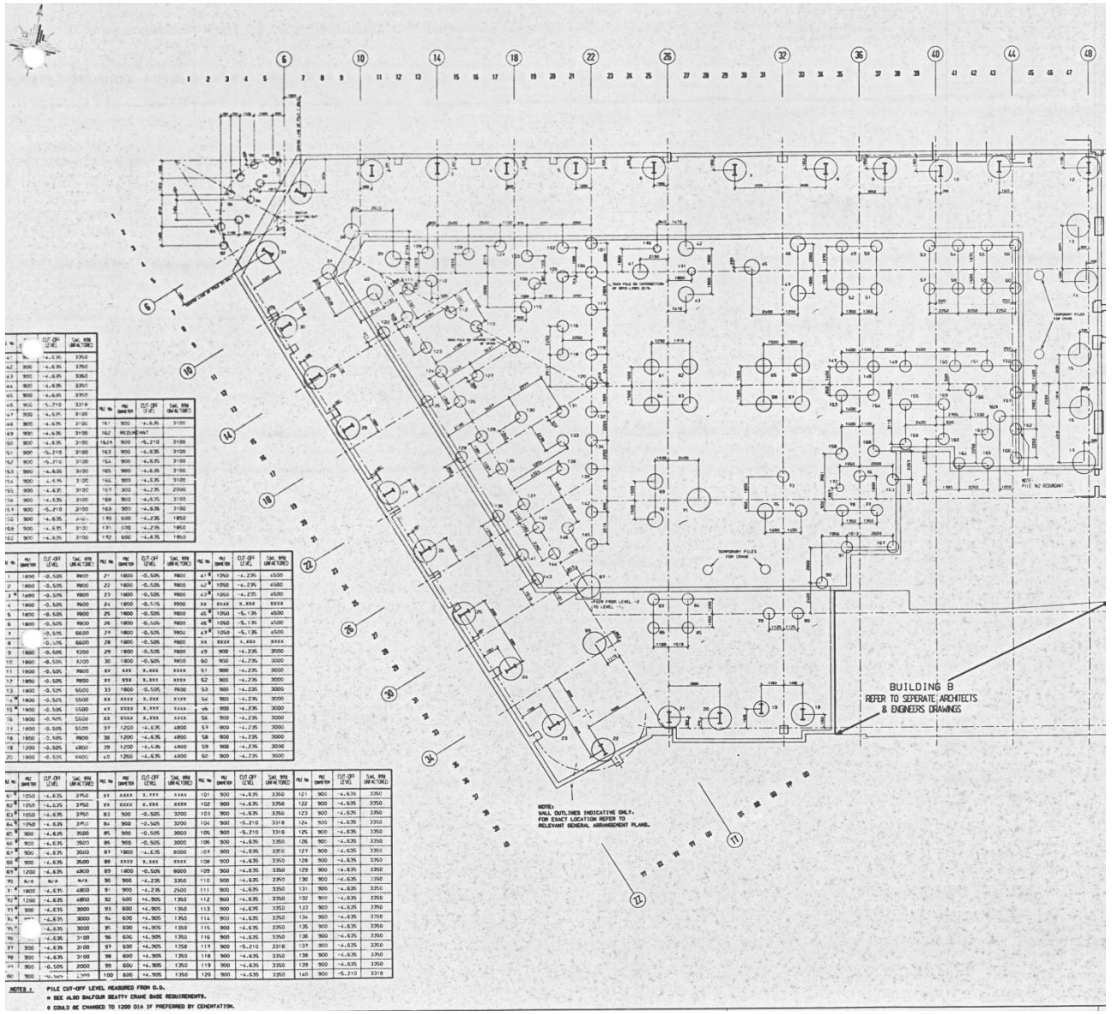
  ***Pile locations, diameters and design loads***

  ***Cementation pile design calculations***

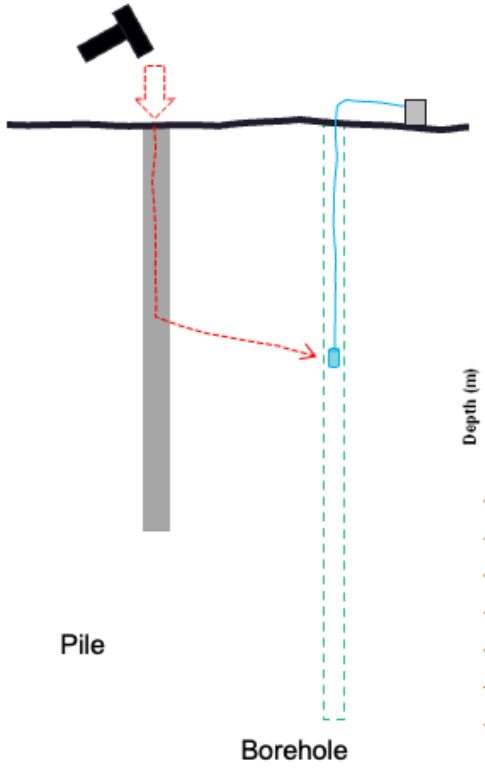
- Intrusive investigations

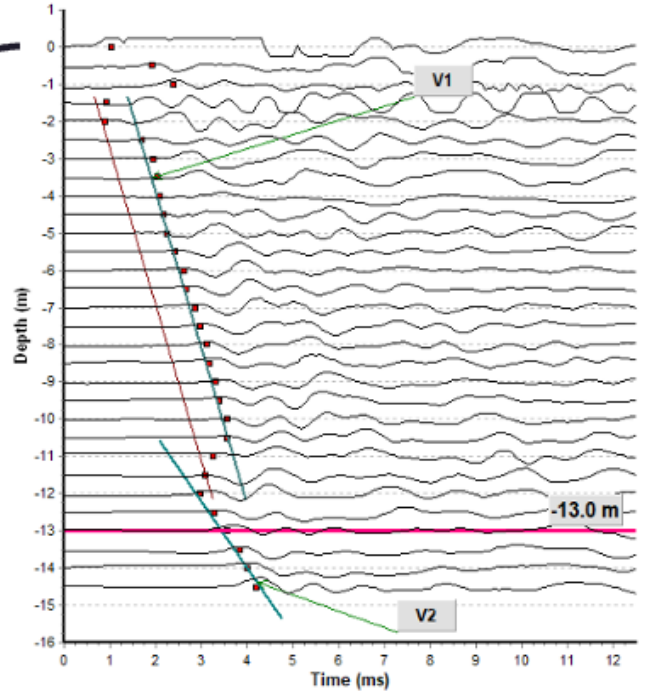
  ***Validating pile diameter and pile length***

  ***During demolition due to access constraints***



# INVESTIGATION OF EXISTING PILES

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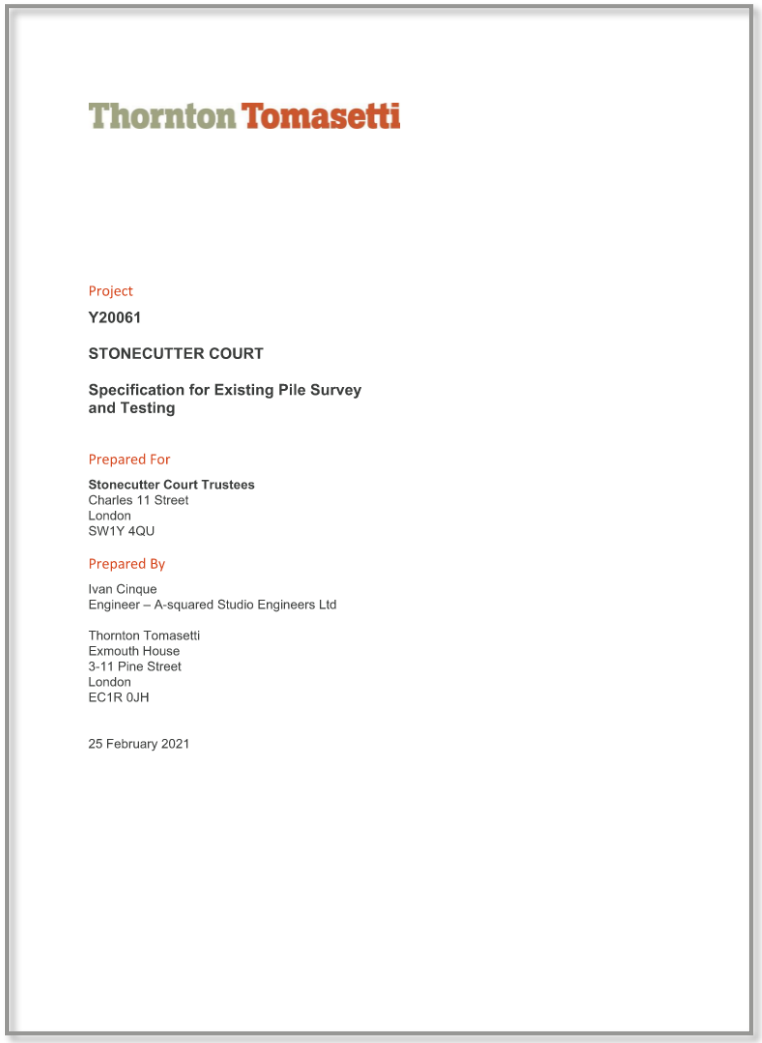

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25 February 2021

**Desk study**

- Obtain engineers archive information
- Back assessment through load takedown
- Obtain original piling records

**Model**

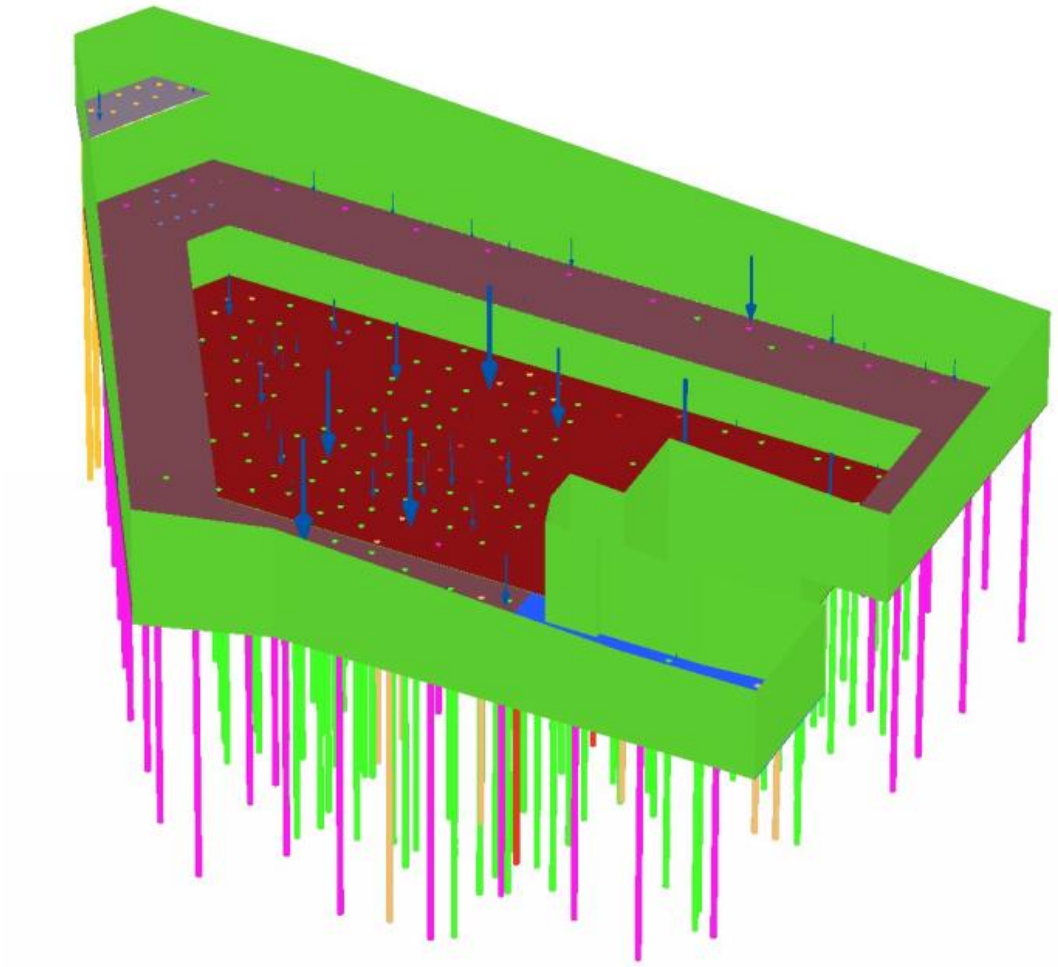
- New building loads
- Pile and piled raft spring analysis for settlement

**Survey and test**

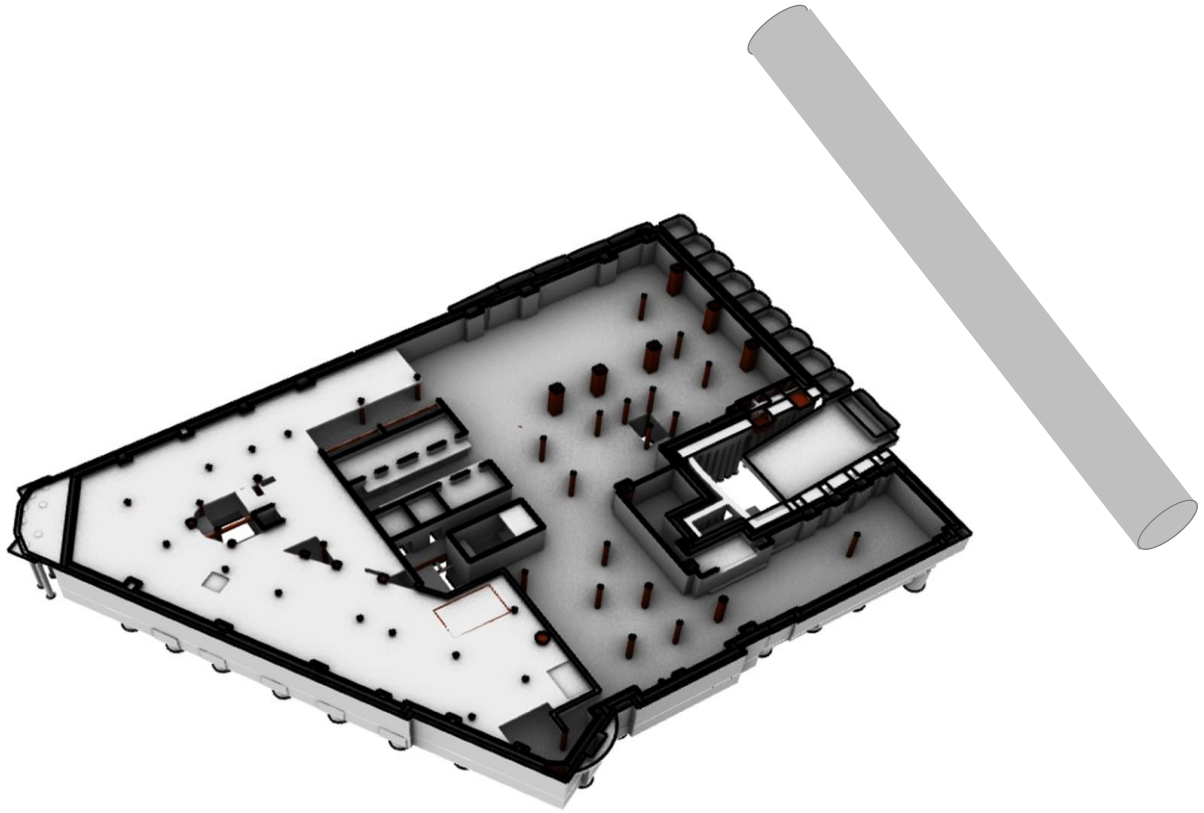
- Monitoring heave of piles in demolition against load off predictions
- Survey location
- Measure reinforcement present
- Test for concrete and rebar grade
- Measure concrete cover
- Test for concrete derogation – carbonation and chemical attack
- Pile load test to working load and destruction
- Integrity test 100%
- Sonic echo tests

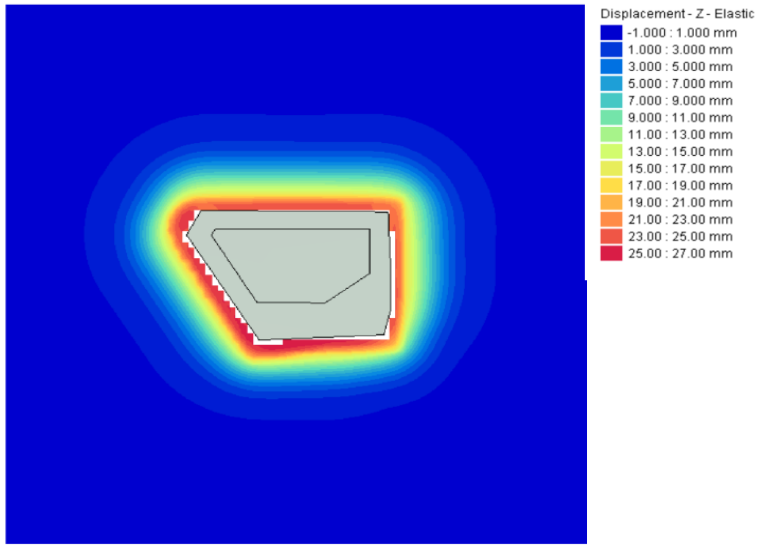
# MODERN COMPLICATIONS

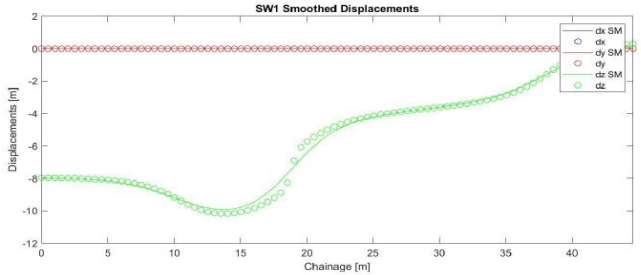
- **Management of stakeholder expectations**
  - Transport for London and Thames Water
  - Building Control
- **Soil-structure interaction**
  - Performance of old and new elements
  - Settlement of structure above
- **Coordination with contractor design**
  - Availability of information
  - Validation of assumptions
  - A-squared supporting both parties



# MODERN COMPLICATIONS

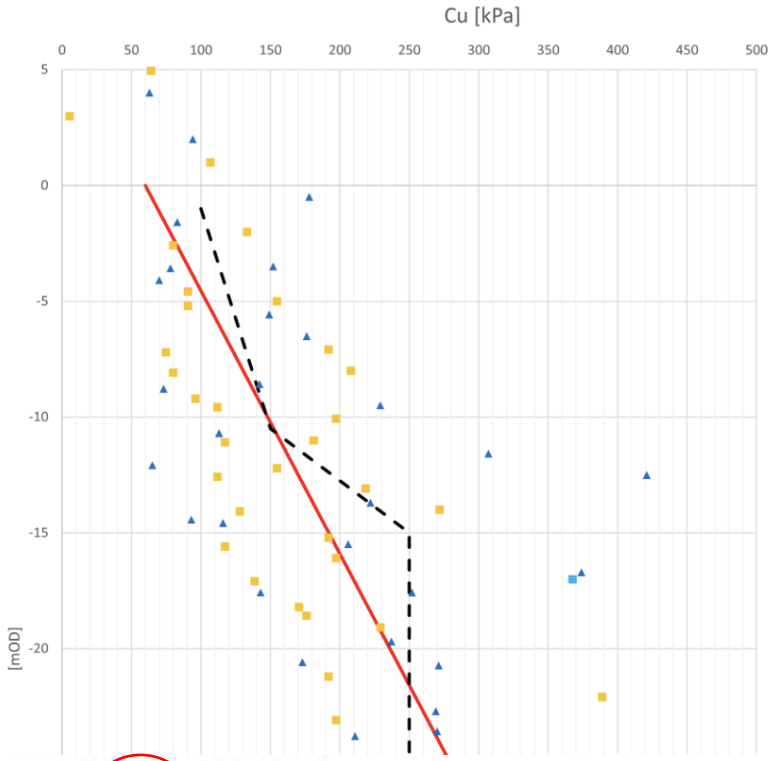




# MODERN COMPLICATIONS

- **Unlocking Additional Pile Capacity**
  - Reviewing previous design assumptions
  - Comparison of design lines
  - Historical PTP
- **Verification of Existing Pile Capacity**
  - Compression + concrete
  - Tension + cage
  - Consideration of historical PTP?




FARRINGDON STREET (LOL = -0.5mOD)

LARGE DIAMETER STRAIGHT SHAFT SCHEME

FACTORS OF SAFETY USED ARE THE LESSER OF:-
SHAFT/ 2.00 + BASE/ 2.00 OR (SHAFT+BASE)/ 2.00

| | |
|---|---|
| DESIGN DATUM | +6.00 m |
| WATER LEVEL | +2.00 m |
| DENSITY OF TOP STRATUM | 18.00 KN/m3 |
| CASING LENGTH | 3.50 m |

STRATA DETAILS:-

| TOP LEVEL | DENSITY | PHI | Ks/ALPHA | C(top) | C(bot) |
|---|---|---|---|---|---|
| 6.0 | 18.0 | 0 | ---- | 0 | 0 |
| 2.0 | 8.0 | 0 | ---- | 0 | 0 |
| -0.5 | 10.0 | 0 | 0.40 | 100 | 150 |
| -10.5 | 10.0 | 0 | 0.40 | 150 | 250 |
| -15.0 | 10.0 | 0 | 0.40 | 250 | 250 |
| -26.0 | 10.0 | 0 | 0.40 | 250 | 250 |

PILE BASE GEOMETRY REDUCTION FACTORS FOR STRAIGHT SHAFT PILES:-
UPTO AND INCLUDING 900 mm DIA. BASE = 1.00
FOR LARGER BASE SIZES = 1.00

NC FACTOR 9.00

Talking Reuse: Reuse in Action

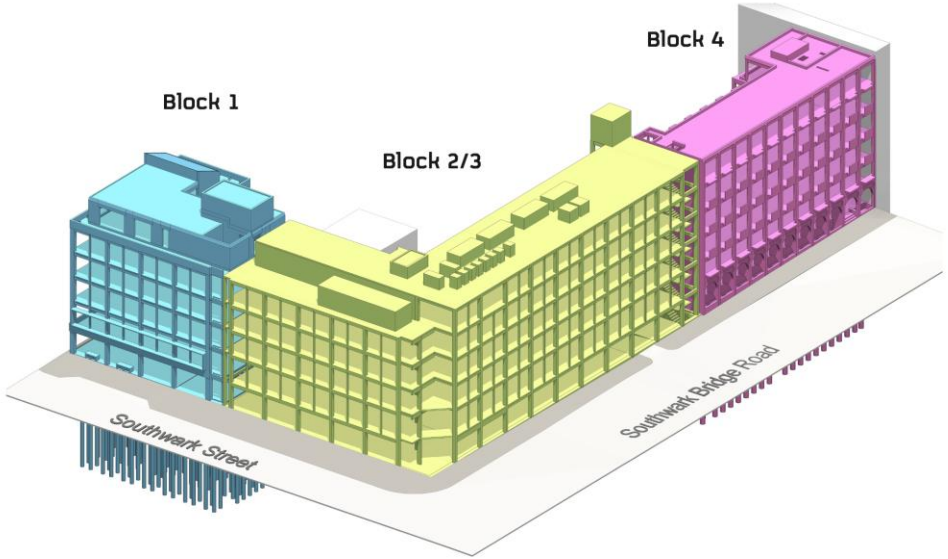
THE ENGINEERS REUSE COLLECTIVE

# 42 Southwark Bridge Road

Hamed Shariff – A-squared

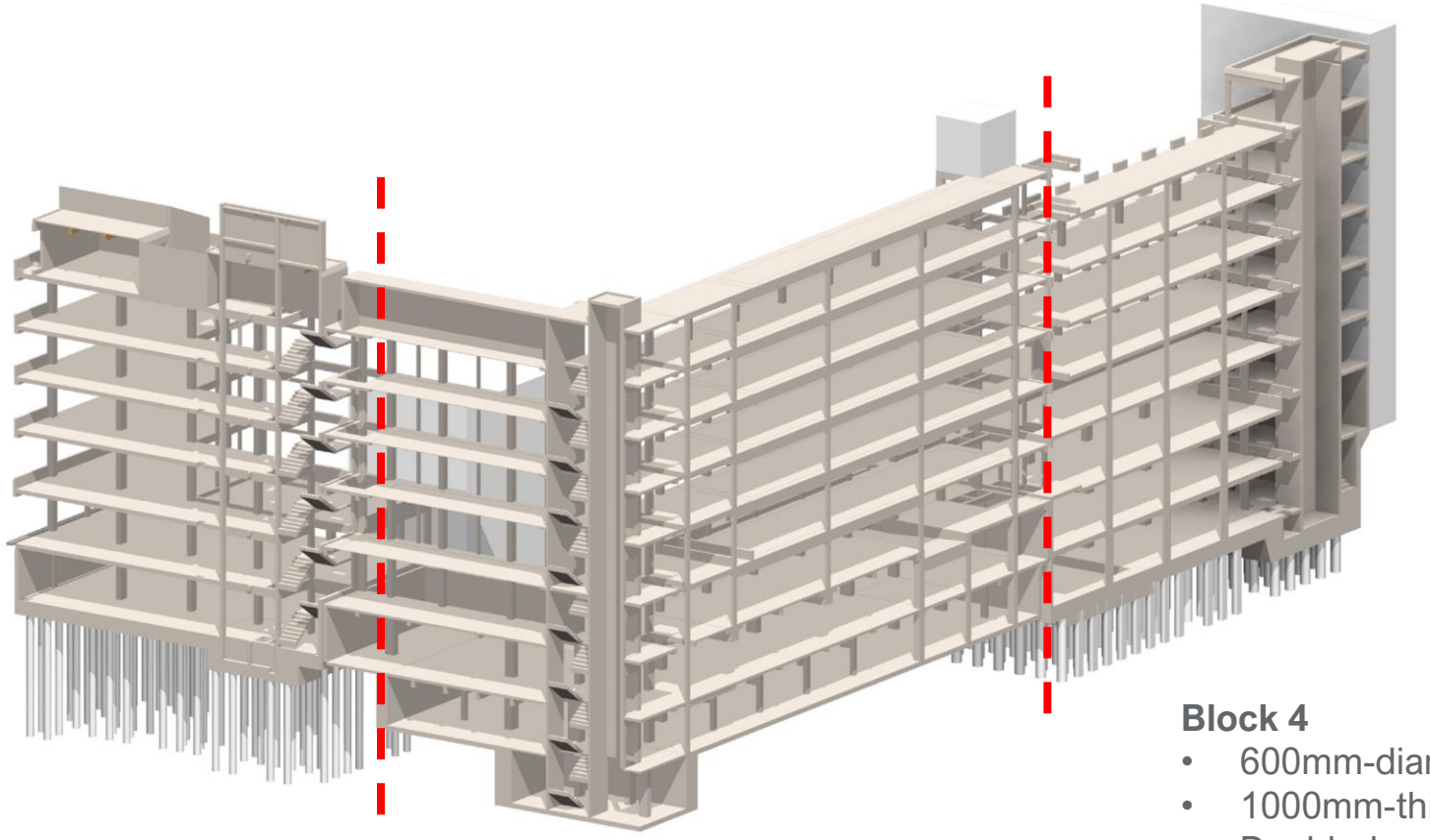
# 42 SOUTHWARK BRIDGE ROAD

# SITE SETTING




# EXISTING SUBSTRUCTURE

- Up to three levels of basement
- Combination of bearing piles and raft
- Reinforced concrete retaining walls
- Unproven sheet piles

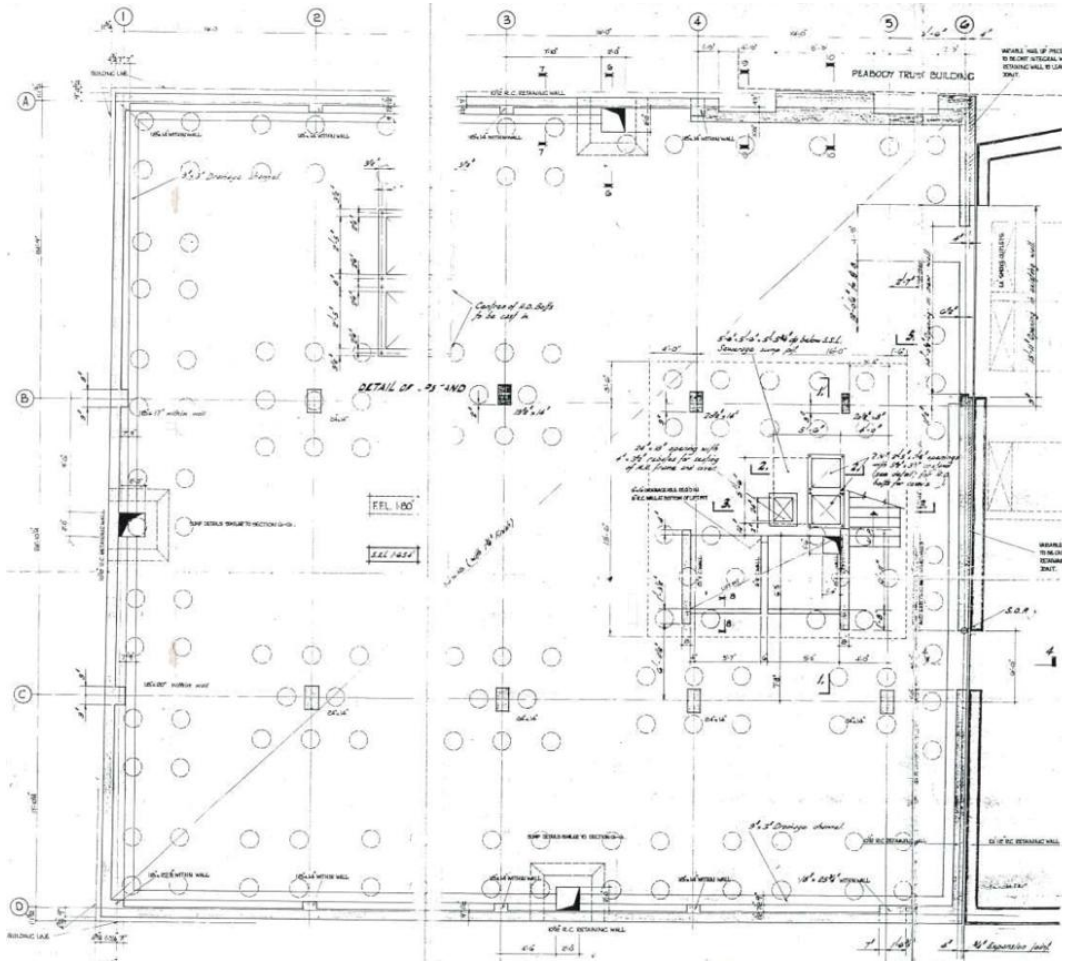


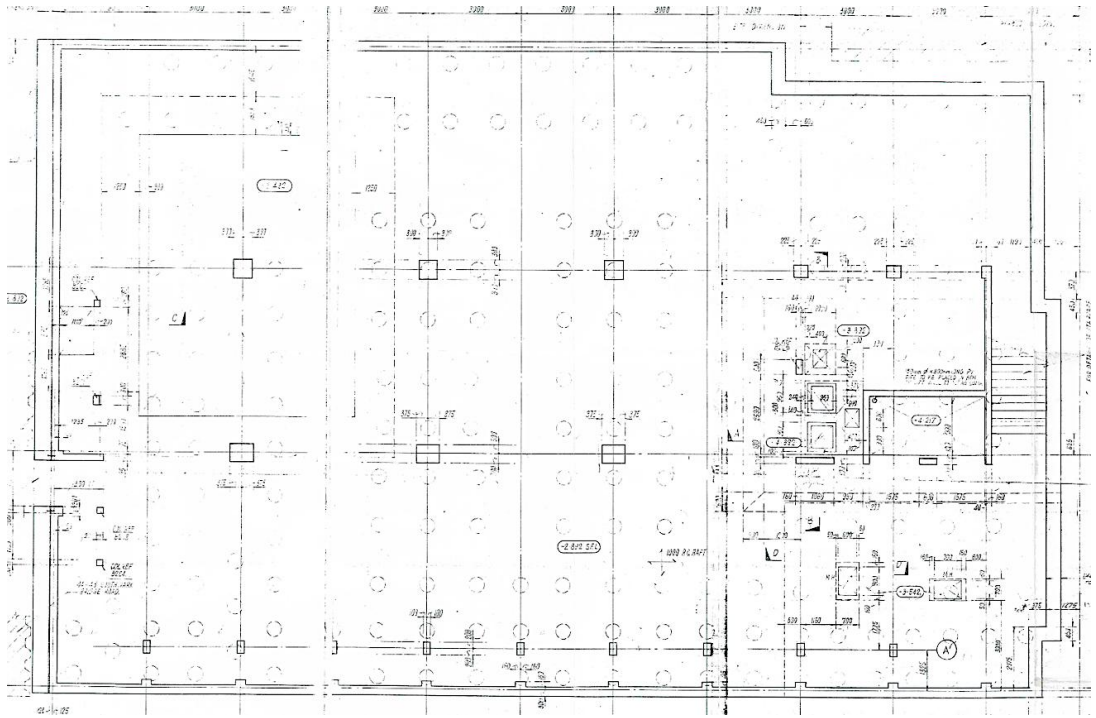
**Block 1**
- 450mm-diameter piles
- 1000mm-thick pile cap
- Single-level basement

**Blocks 2 and 3**
- 1000mm-thick raft
- Double-level basement with local B3

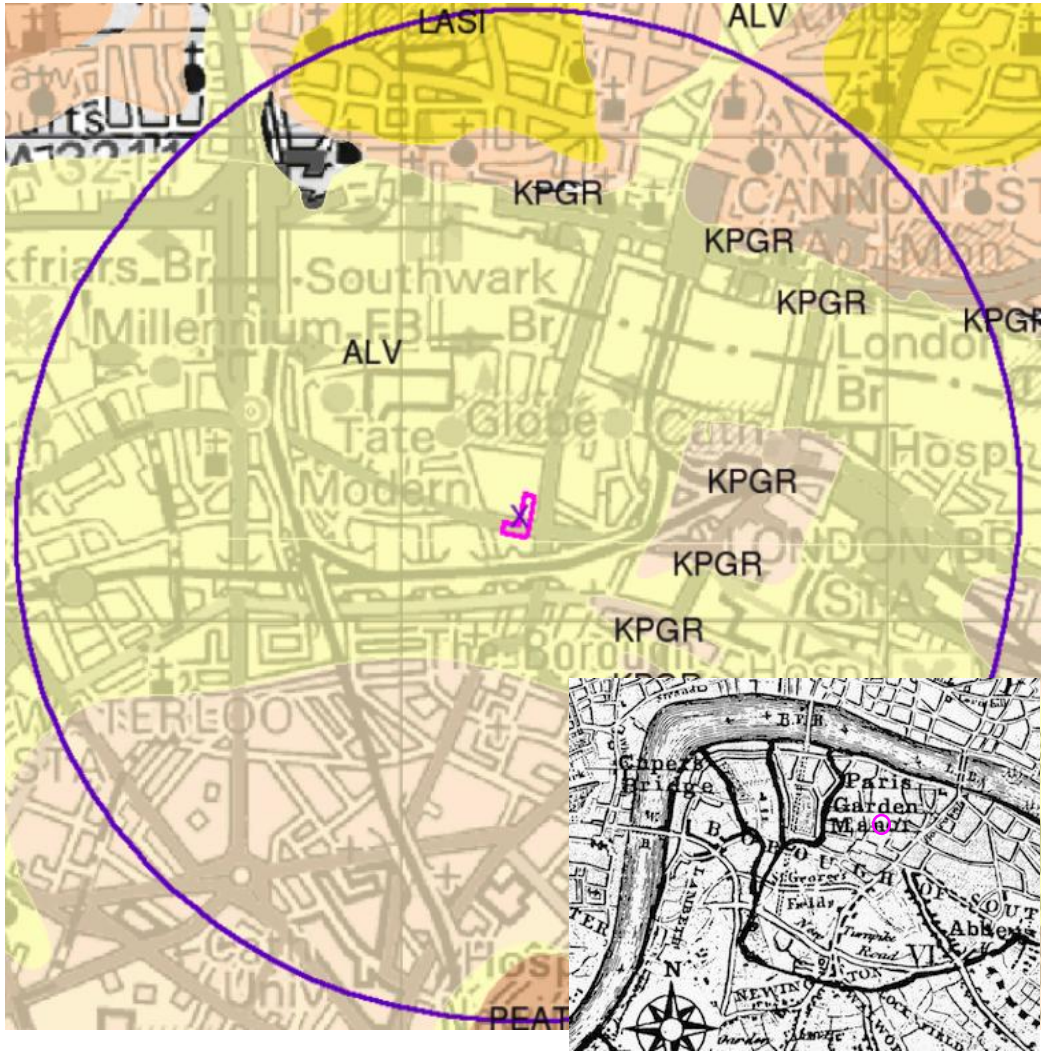
**Block 4**
- 600mm-diameter piles
- 1000mm-thick pile cap
- Double-level basement

# EXISTING SUBSTRUCTURE



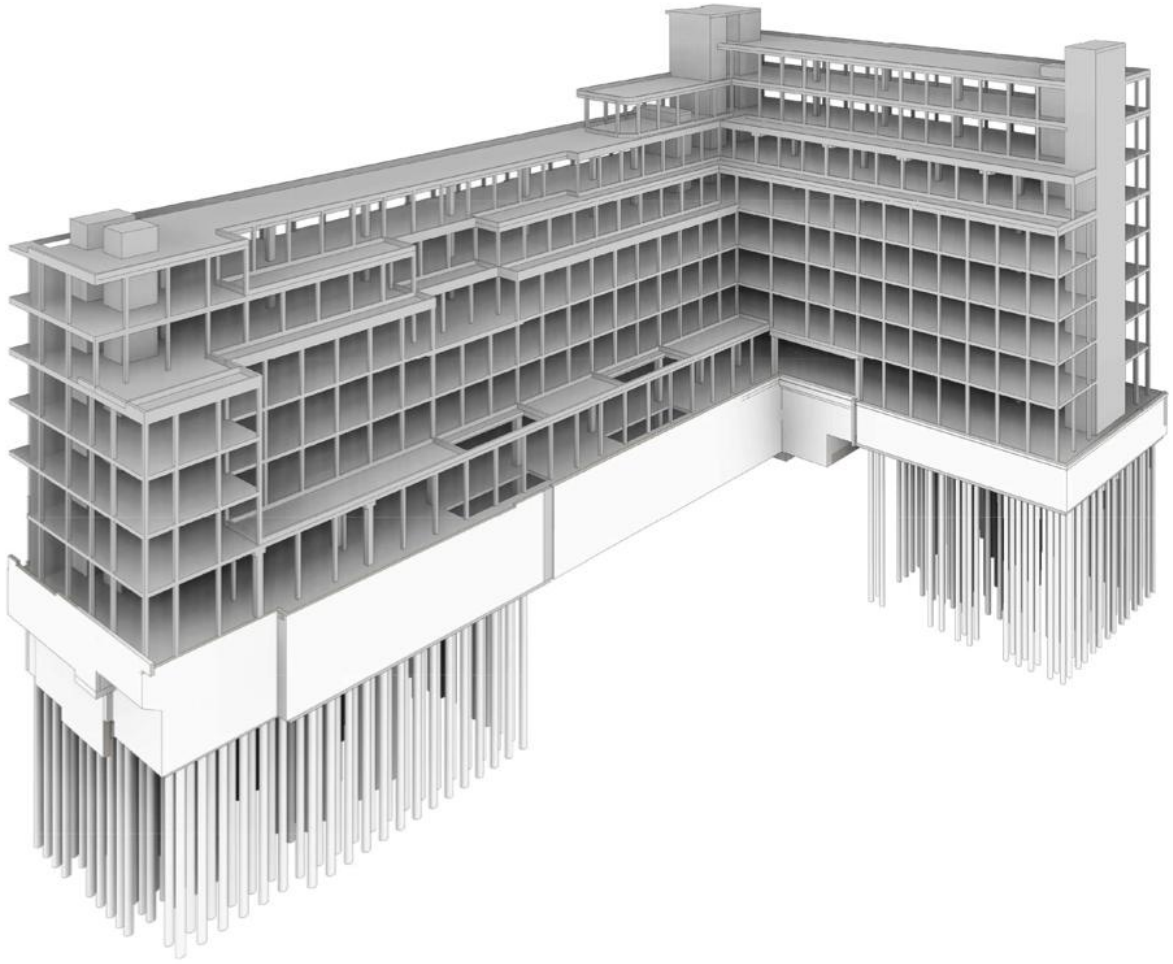
# GEOLOGICAL SETTING




- Alluvium and Kempton Park Gravels over London Clay
- Local increases in Alluvium thickness
- High, sub-artesian perched water table
- Nearby Lost Rivers of London
- Light tidal influence from River Thames

# PROPOSED DEVELOPMENT

- Demolition of superstructure
- Retention of first and second level basement
- Construction of similar sized structure
- New column and core arrangement

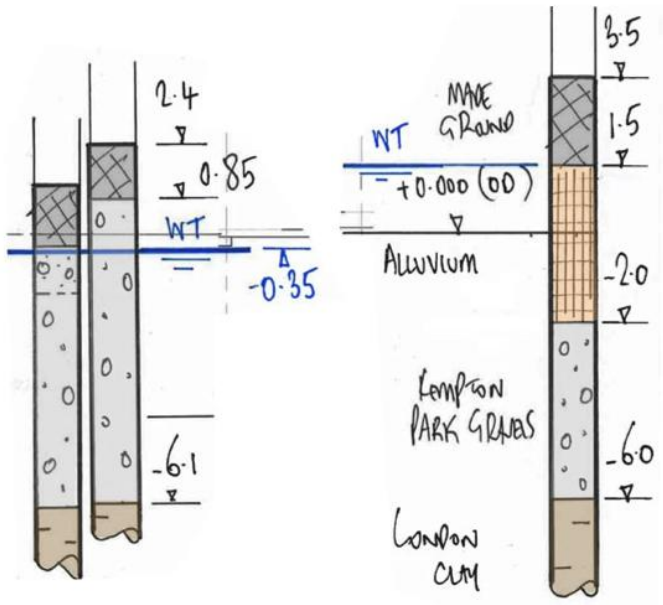


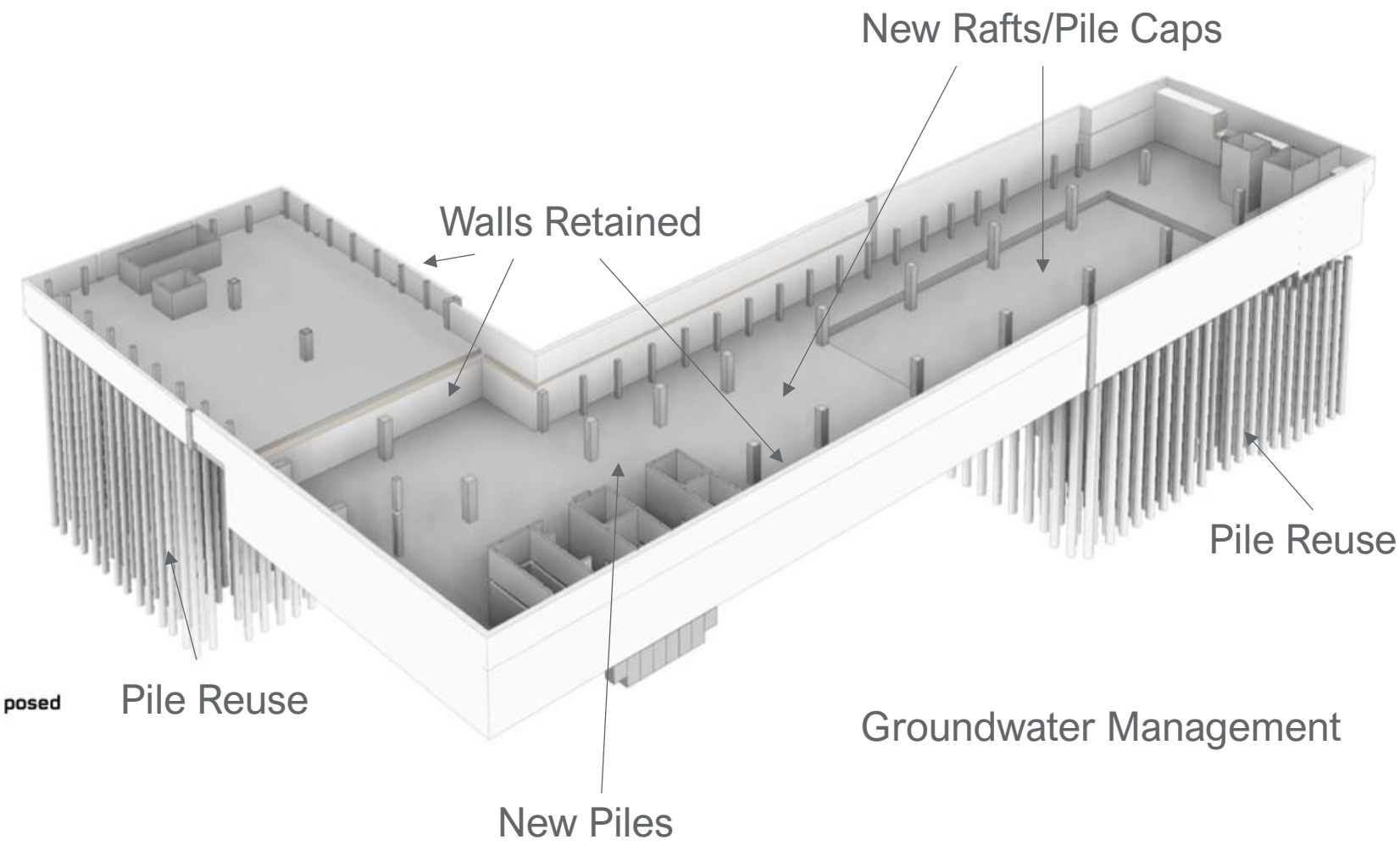
# INITIAL SUBSTRUCTURE STRATEGY REVIEW

Maximise substructure reuse

(*direct* or *indirect* reuse)

Geotechnical / Groundwater Risks

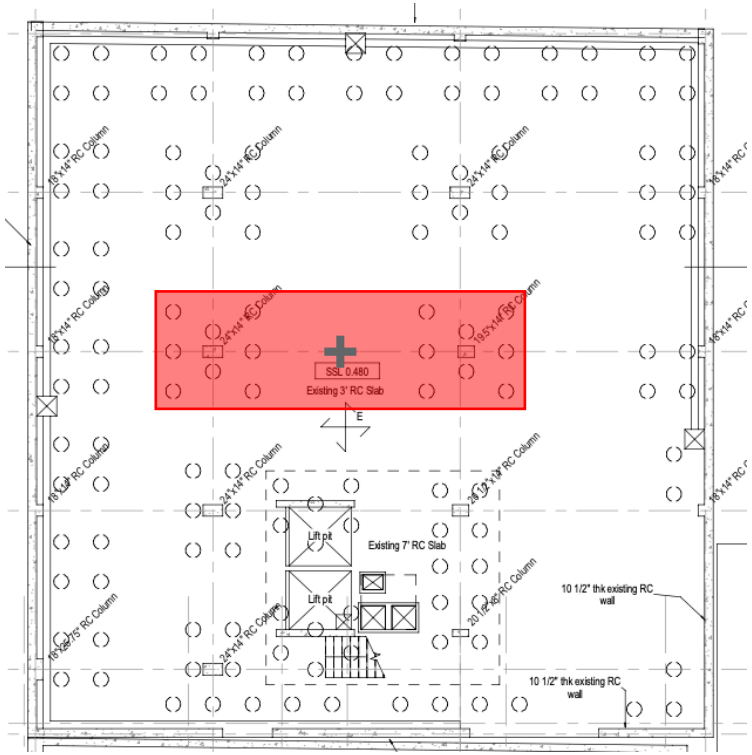


# SUBSTRUCTURE REUSE OPTIONS

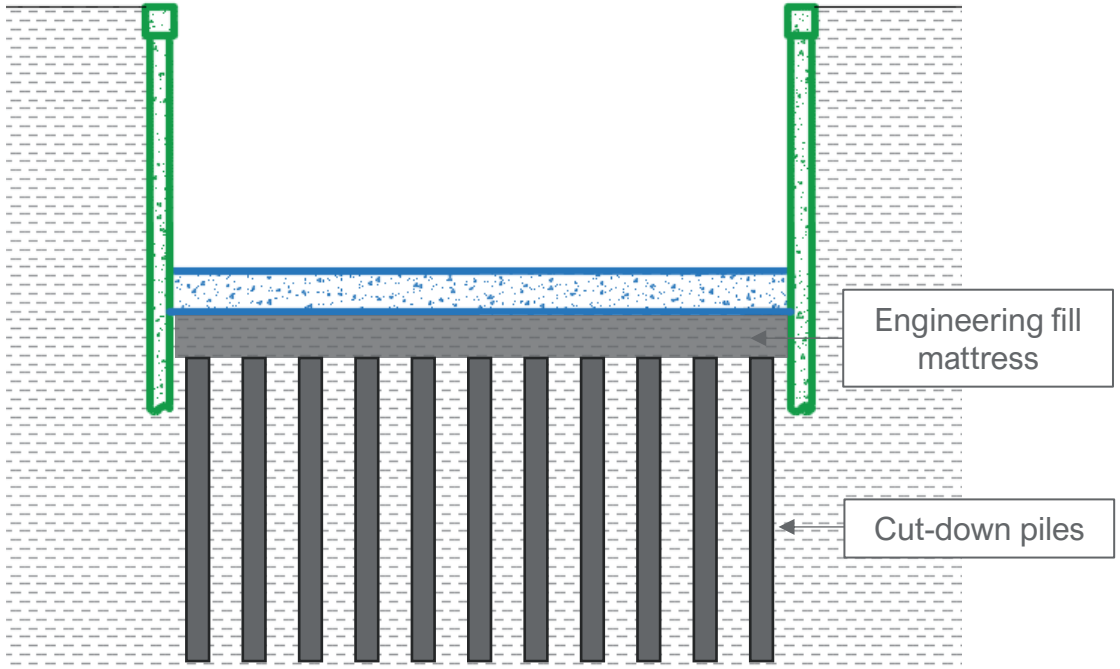
## Direct Reuse

- Existing piles directly loaded
- Local strengthening of pile cap



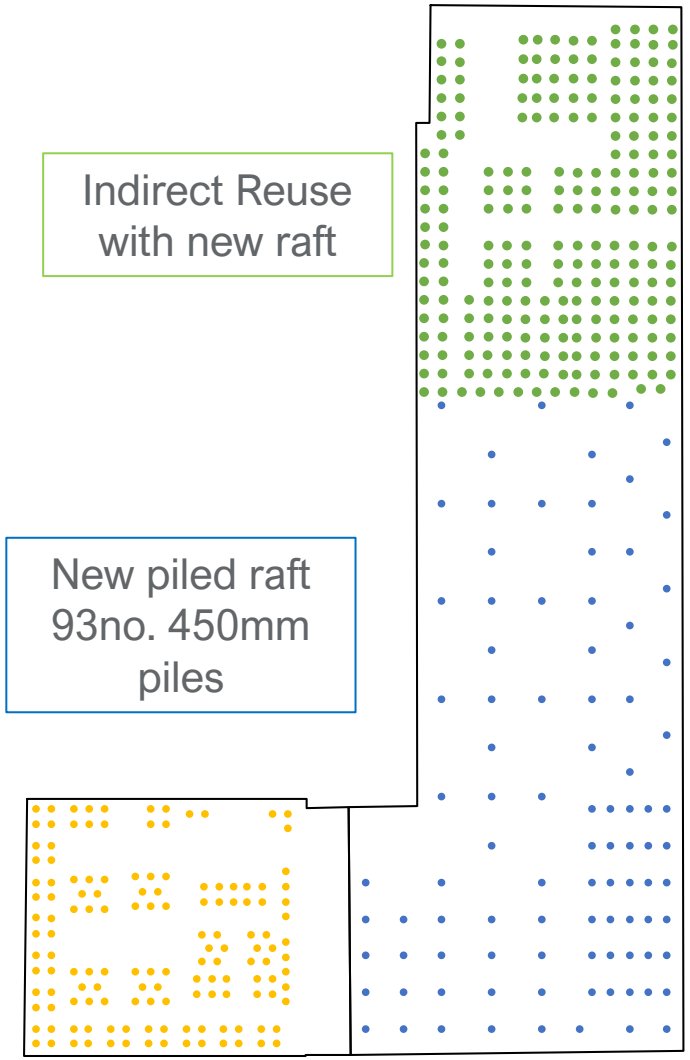

## Indirect Reuse

- Existing piles cut down
- New raft foundation system



# CHOSEN SOLUTION

## Solution

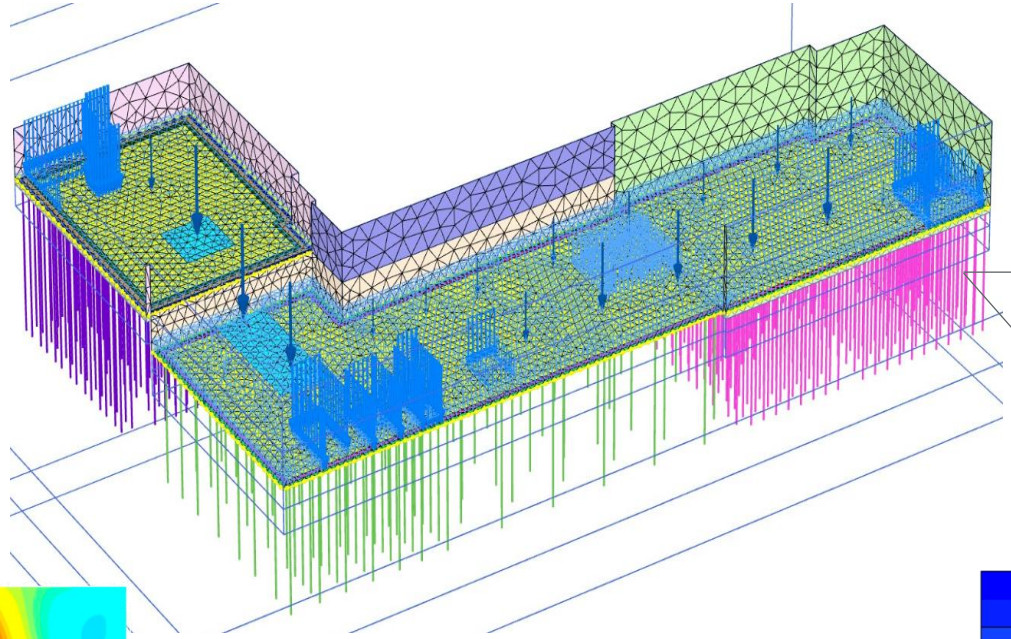


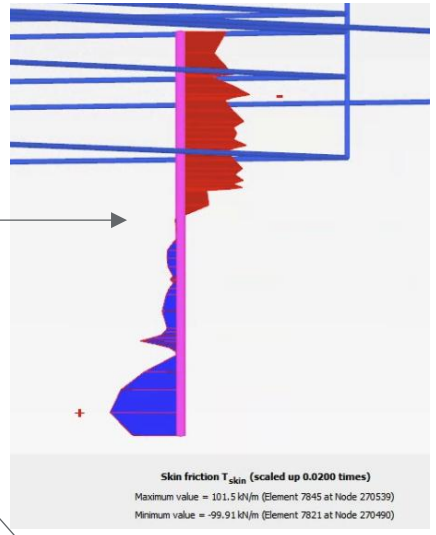

## Solution Drivers

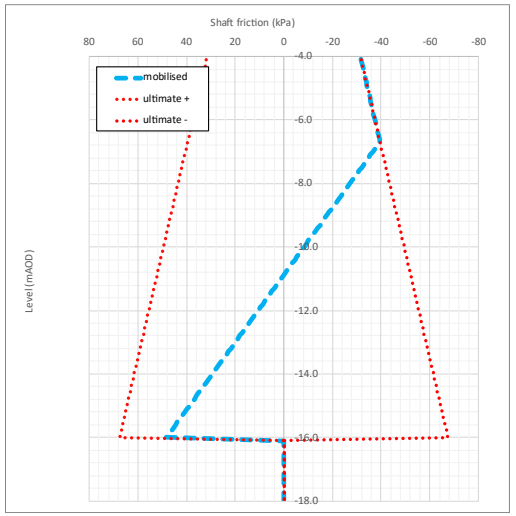
- Compatibility of foundation systems
- Constructability
- Structural strengthening
- Risk management

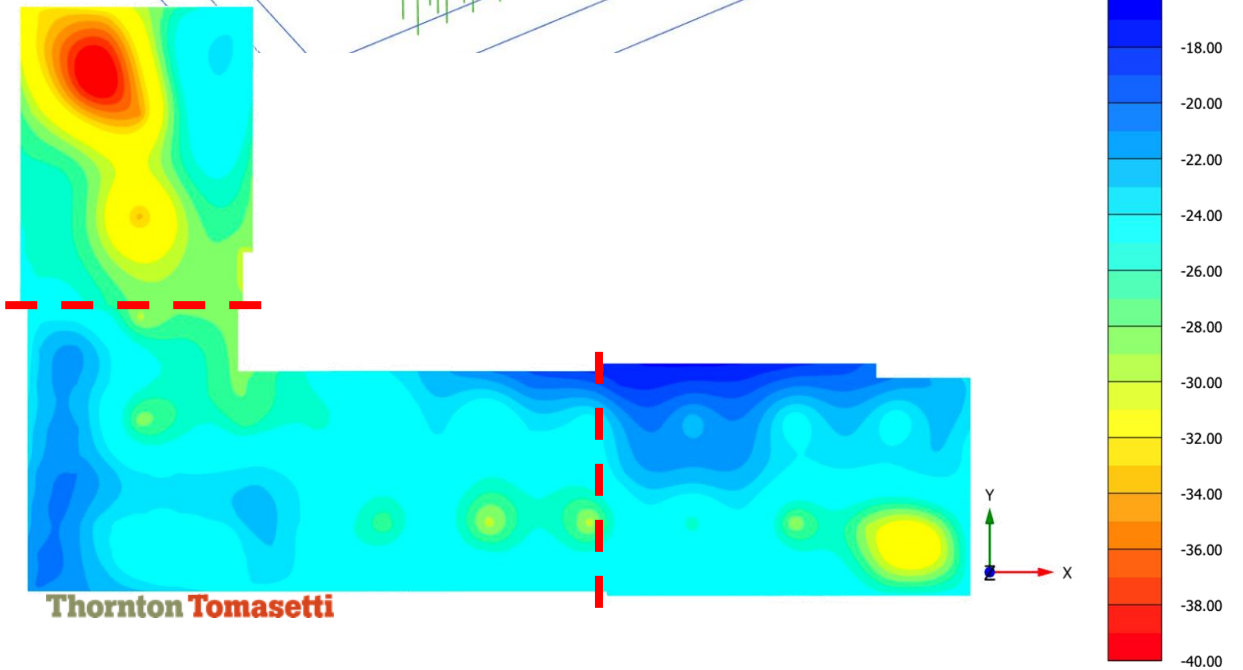
90%+ reduction in piling requirements

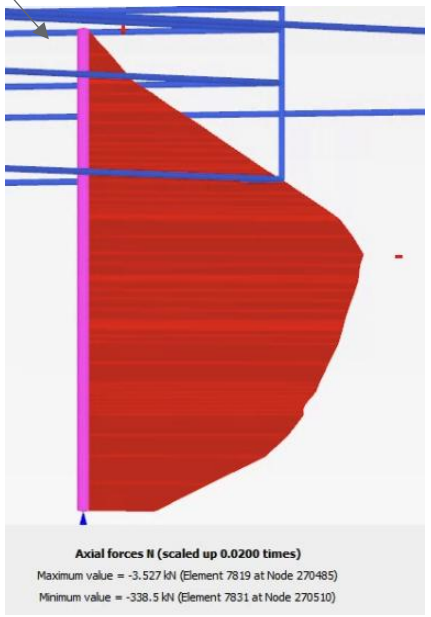
# VALIDATING PERFORMANCE

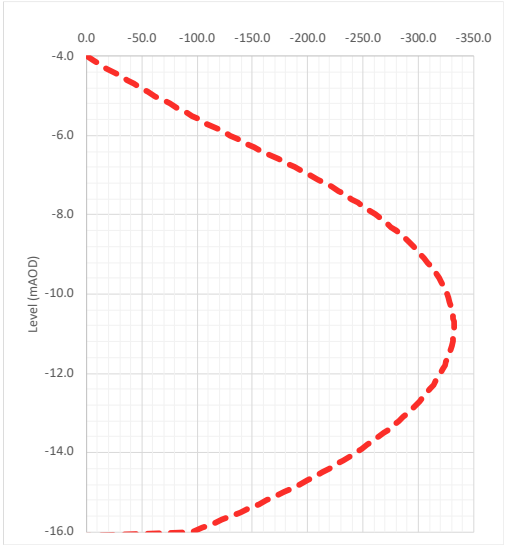





Thornton Tomasetti

# FOUNDATION PERFORMANCE RISKS

- Ground model and geotechnical parameters
  - Management of groundwater below raft formation level
  - Variation in selected geotechnical parameters

- Differential movements between foundation systems
  - Relative behaviour of piled raft and rigid inclusion piles
  - Bounding of relative movements using extensive parametric studies
  - Validation of individual foundation components

- In-Situ Behaviour
  - Validation of modelling output using live monitoring data
  - Back-analysis and refined assessment to inform superstructure design

THE ENGINEERS REUSE COLLECTIVE

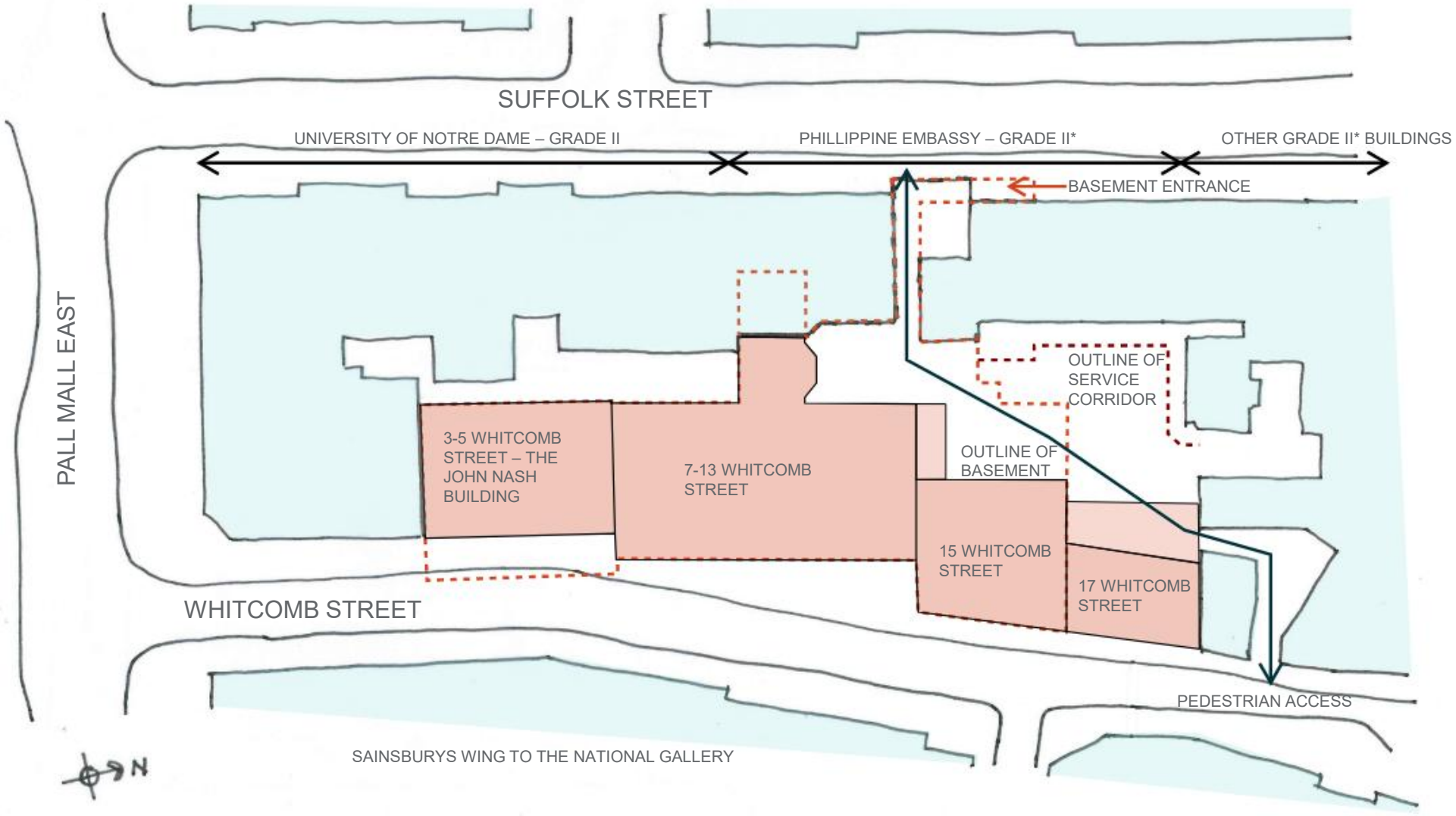
# Hobhouse, London

Simon Cross – Thornton Tomasetti

# HOBHOUSE, LONDON

- Mixed use development in Central London
- Retention, restoration and redevelopment
- Robust, sustainable and adaptable building
- Minimised structural intervention
- Works typically split into two zones

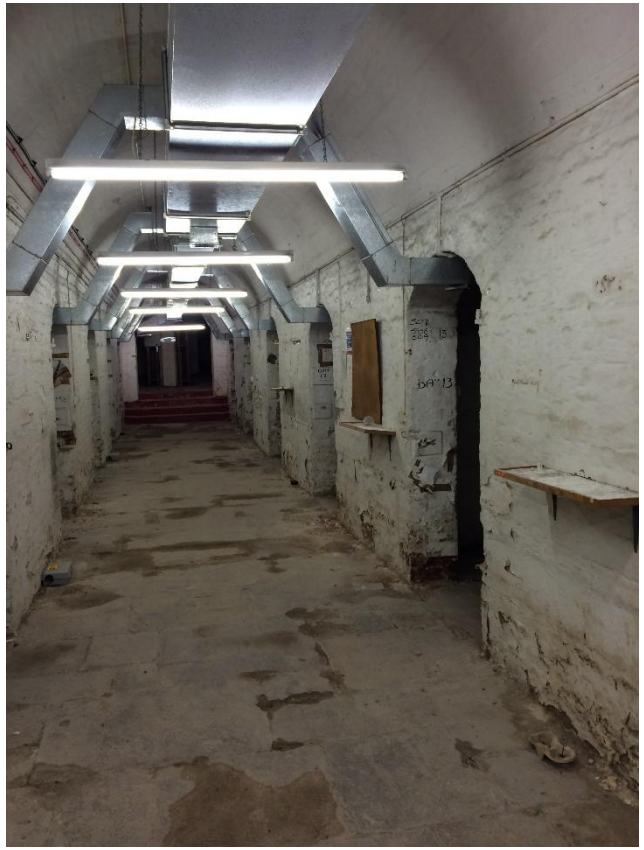
# EXISTING SITE

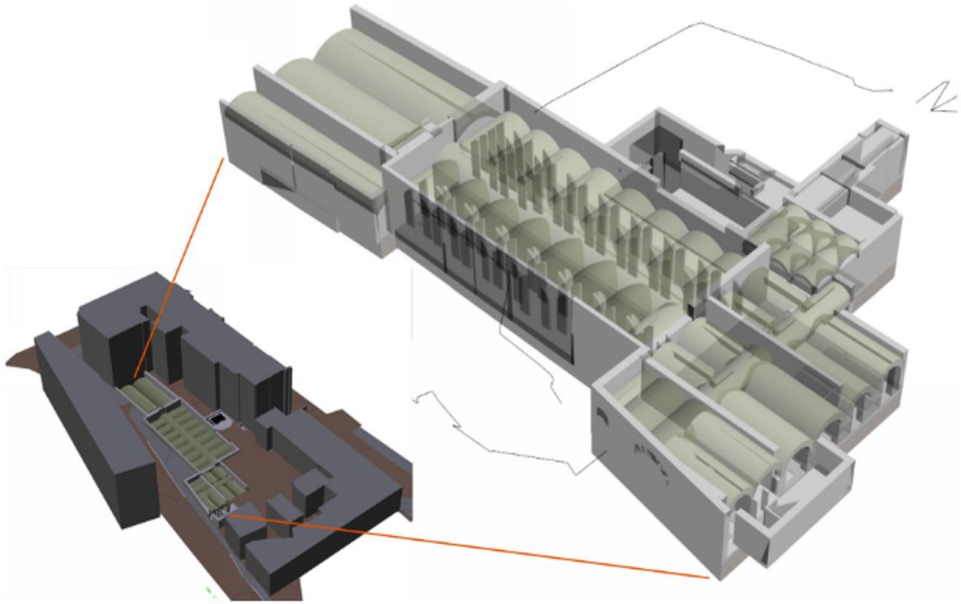


# EXISTING SITE

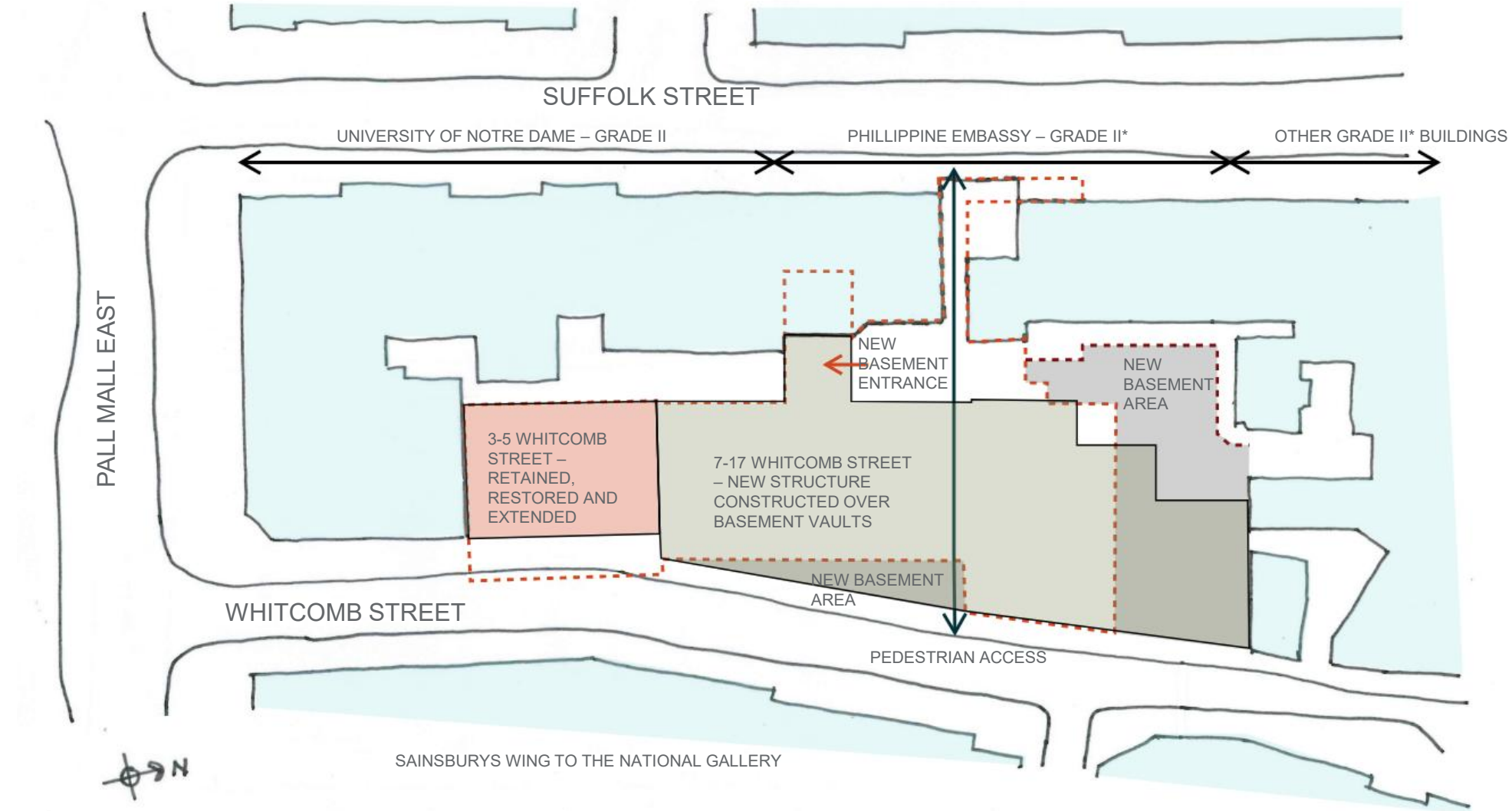
# EXISTING BUILDINGS


# EXISTING BASEMENT SPACES



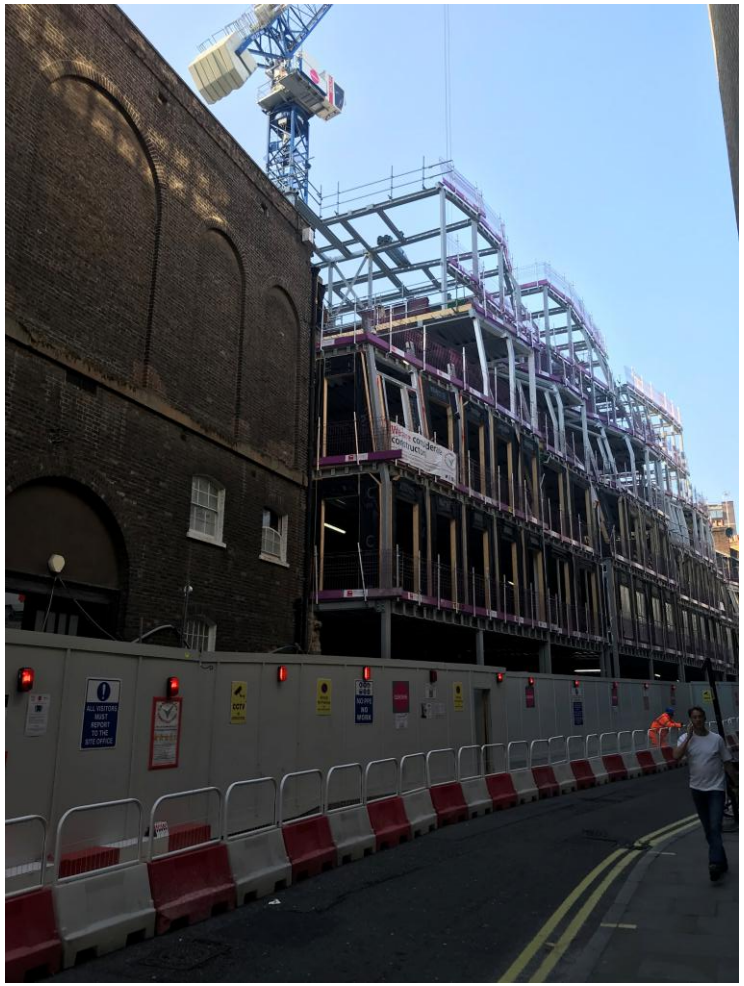


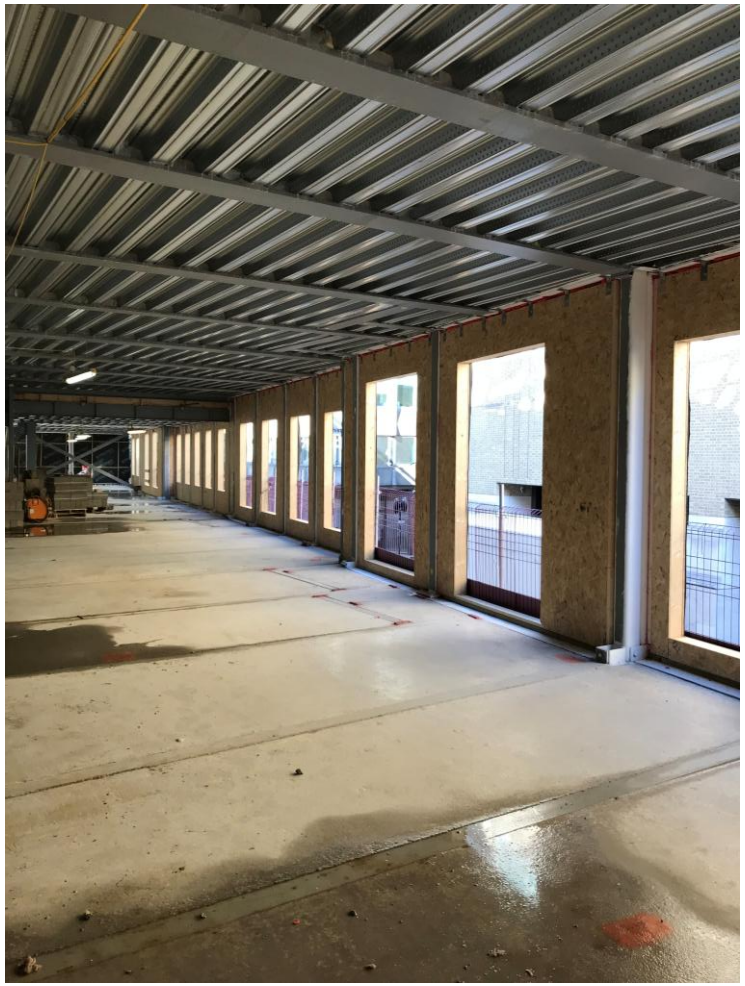
# PROPOSED SITE



# HOBHOUSE, LONDON

## New Building

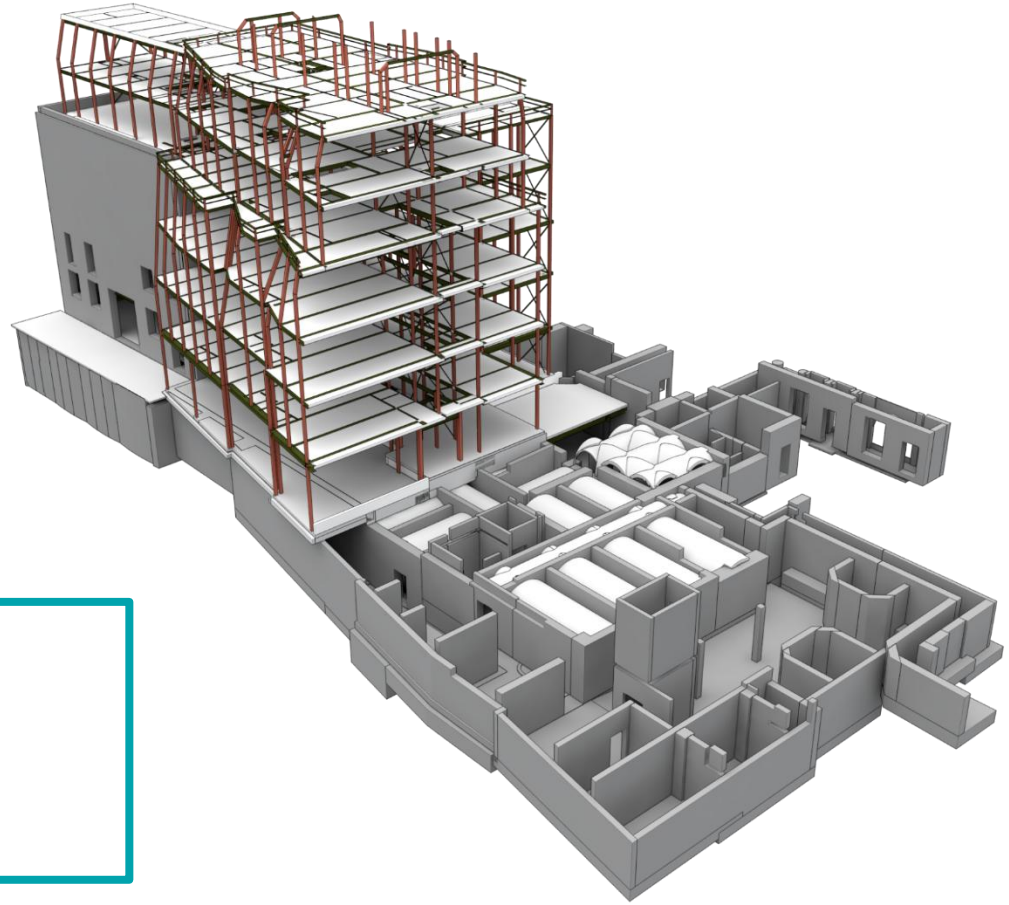




# HOBHOUSE, LONDON

## Building re-use

- Satisfying the Client's aspirations
- Agreed structural philosophies early
- Preservation of the historic fabric
- Restoration of the spaces
- Economic and social contribution

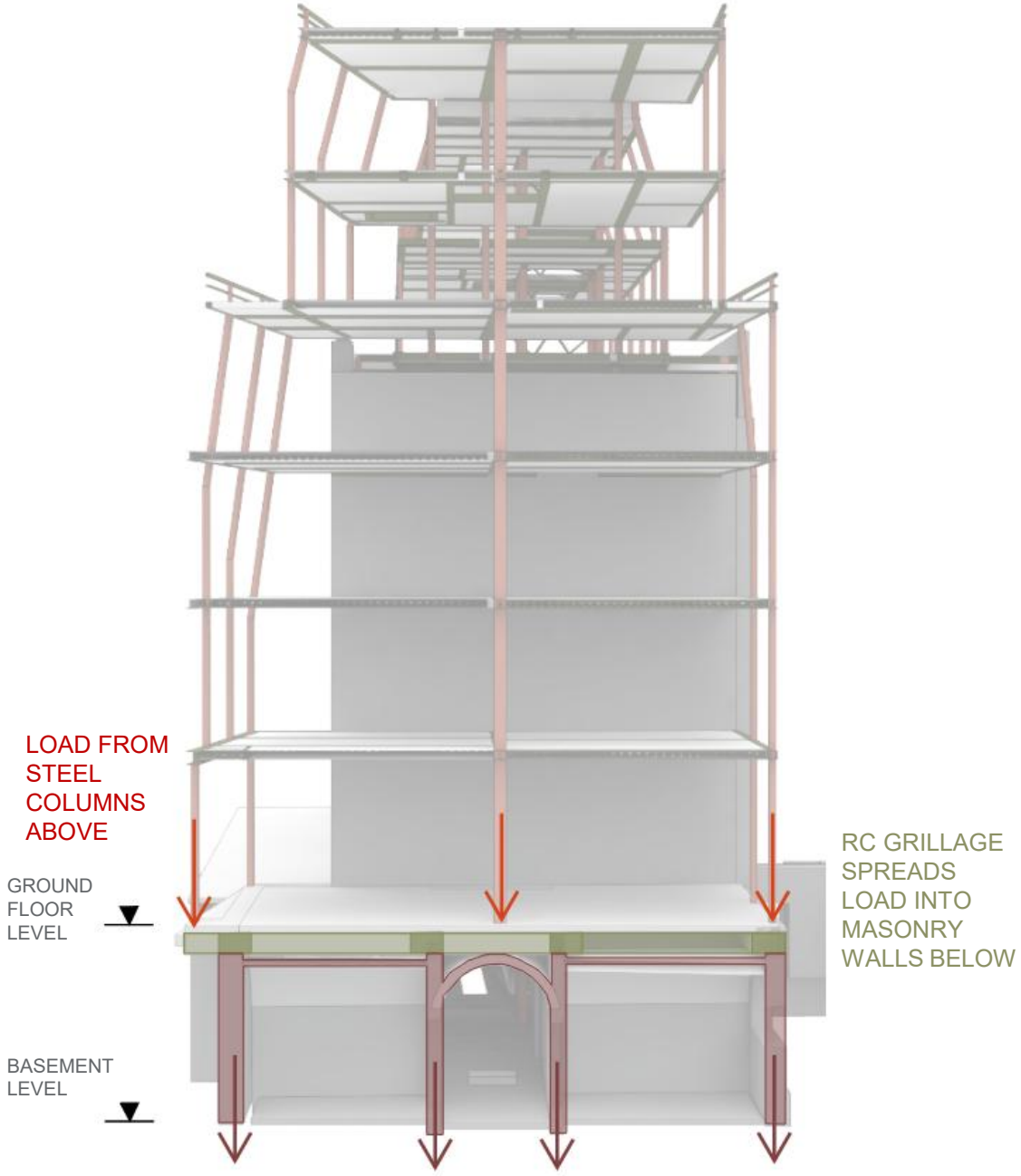


**In re-using the existing basement vaults**
- **Removal of 1100m$^3$ of demolition spoil**
- **Saving of 350 tonnes CO2e in new construction**

# HOBHOUSE, LONDON

## Working with the Existing Structures

- Within 7-17 Whitcomb Street

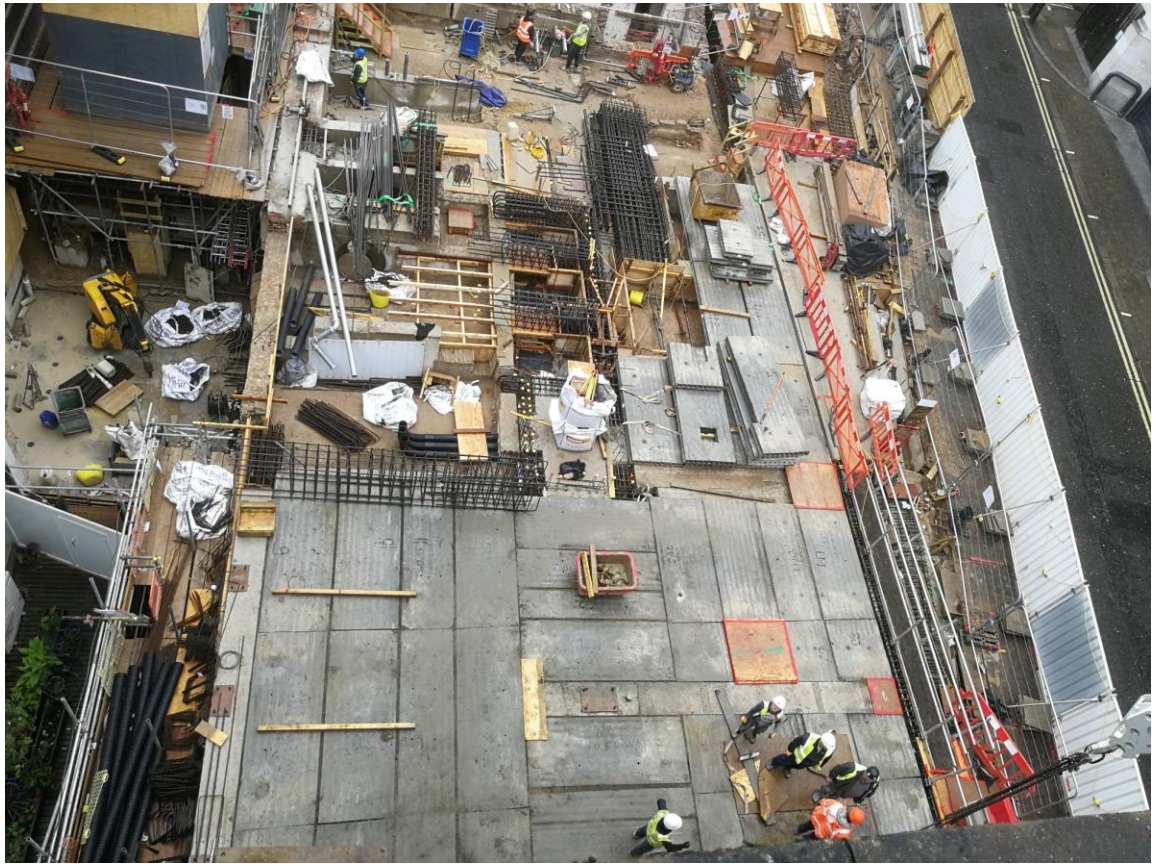


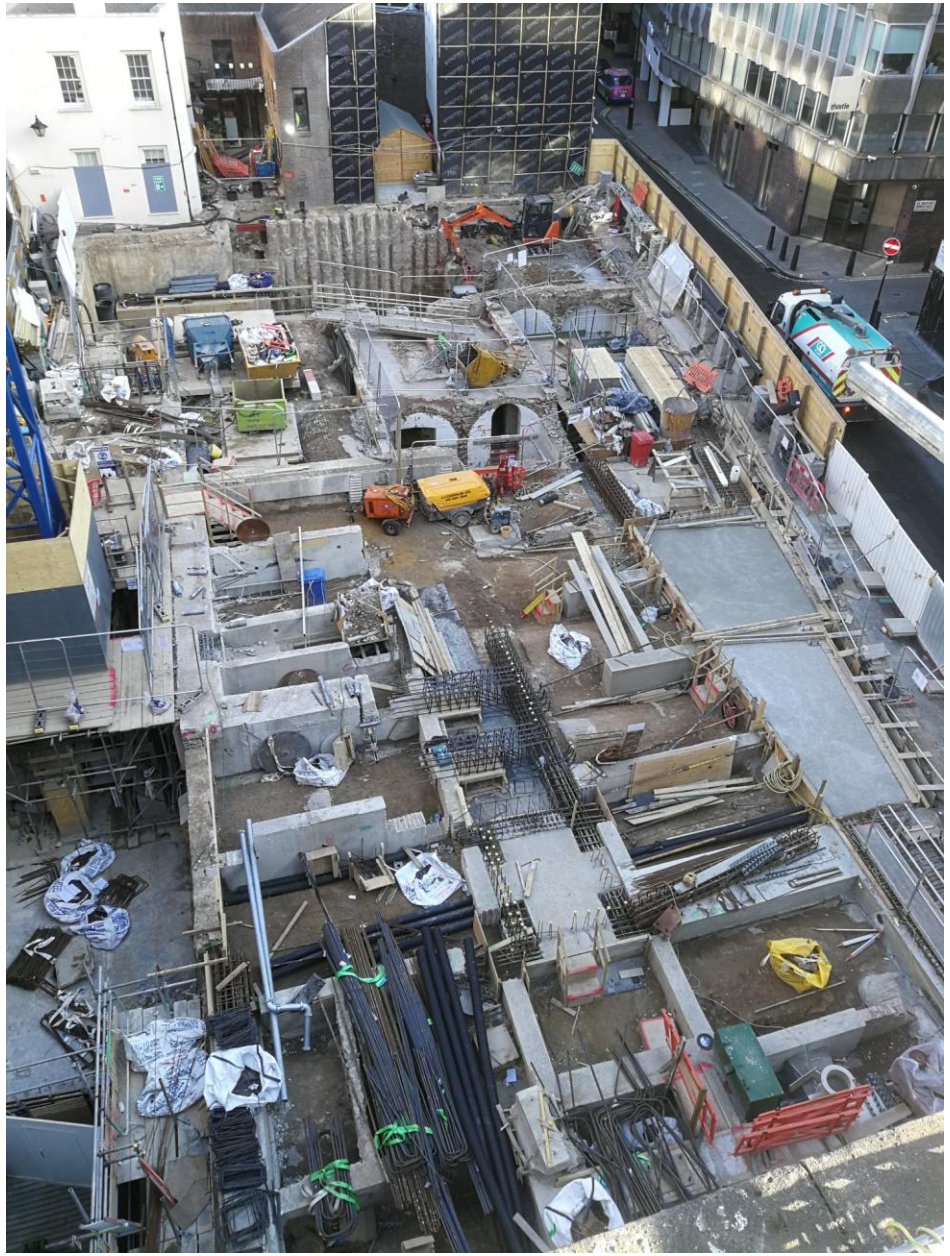

EXISTING MASONRY WALLS AND FOUNDATIONS TRANSFER LOADING TO GROUND

# HOBHOUSE, LONDON

## Working with the Existing Structures

- Within 7-17 Whitcomb Street

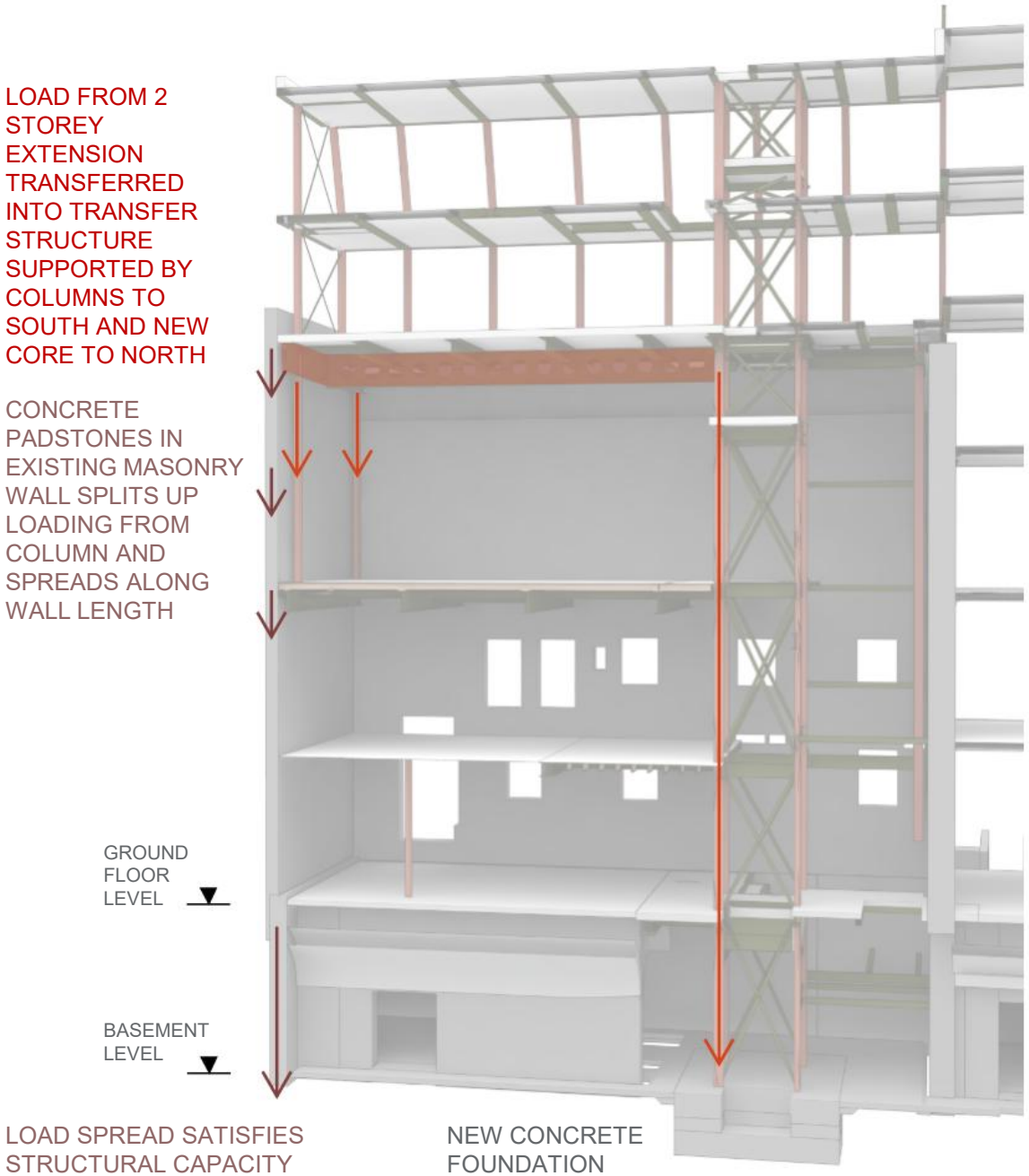




# HOBHOUSE, LONDON

## Working with the Existing Structures

- Within 3-5 Whitcomb Street



# HOBHOUSE, LONDON

## New Basement Areas to 7-17 Whitcomb Street

- RC basement
- Temporary works
- Interface with existing basement
- Unknown service corridor

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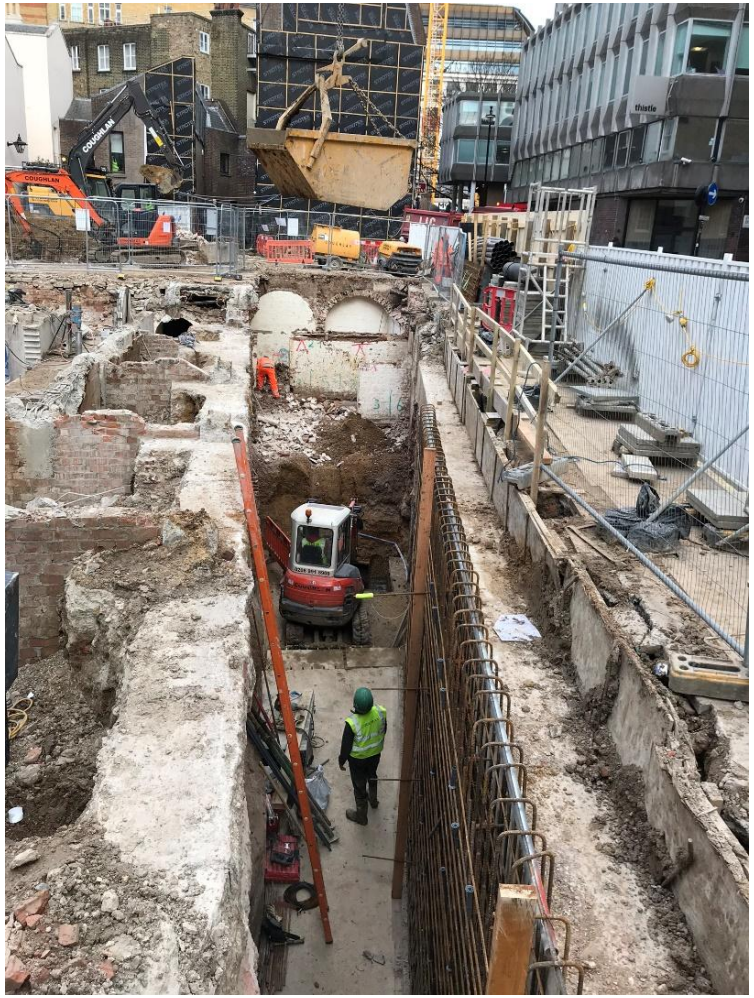

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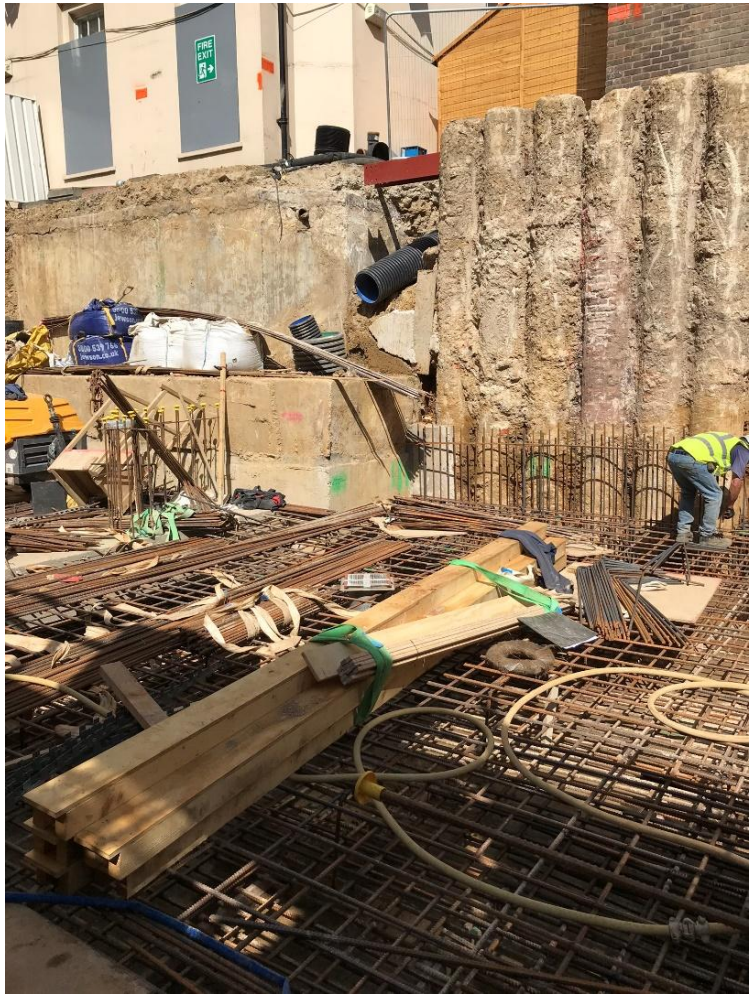
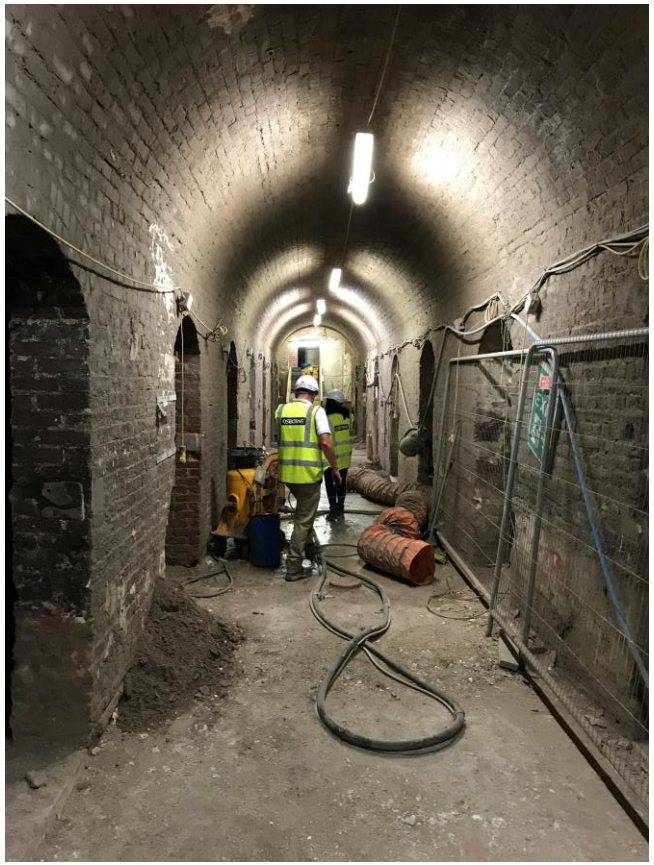


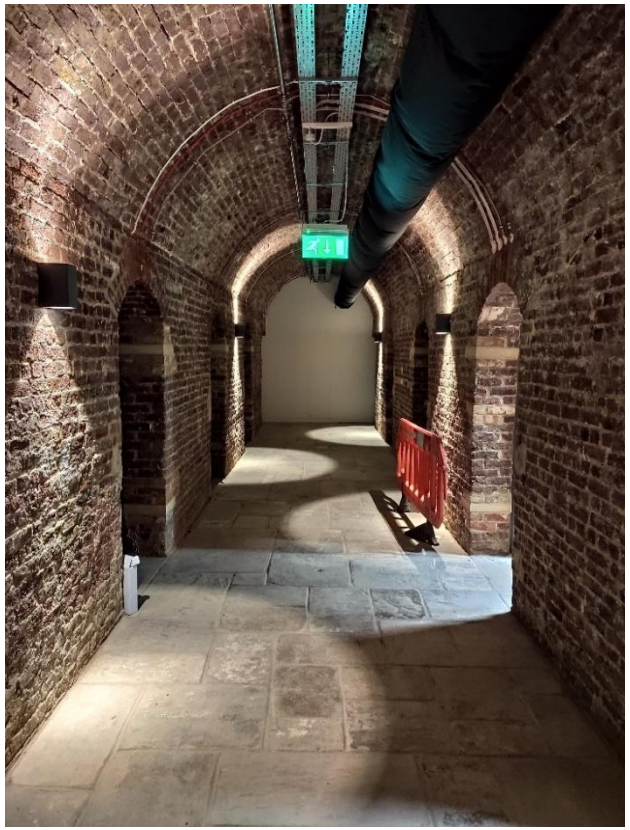
# HOBHOUSE, LONDON

## Restoration of the existing basement vaults

- Dry ice blasting
- Yorkstone paving reuse
- Gallery spaces

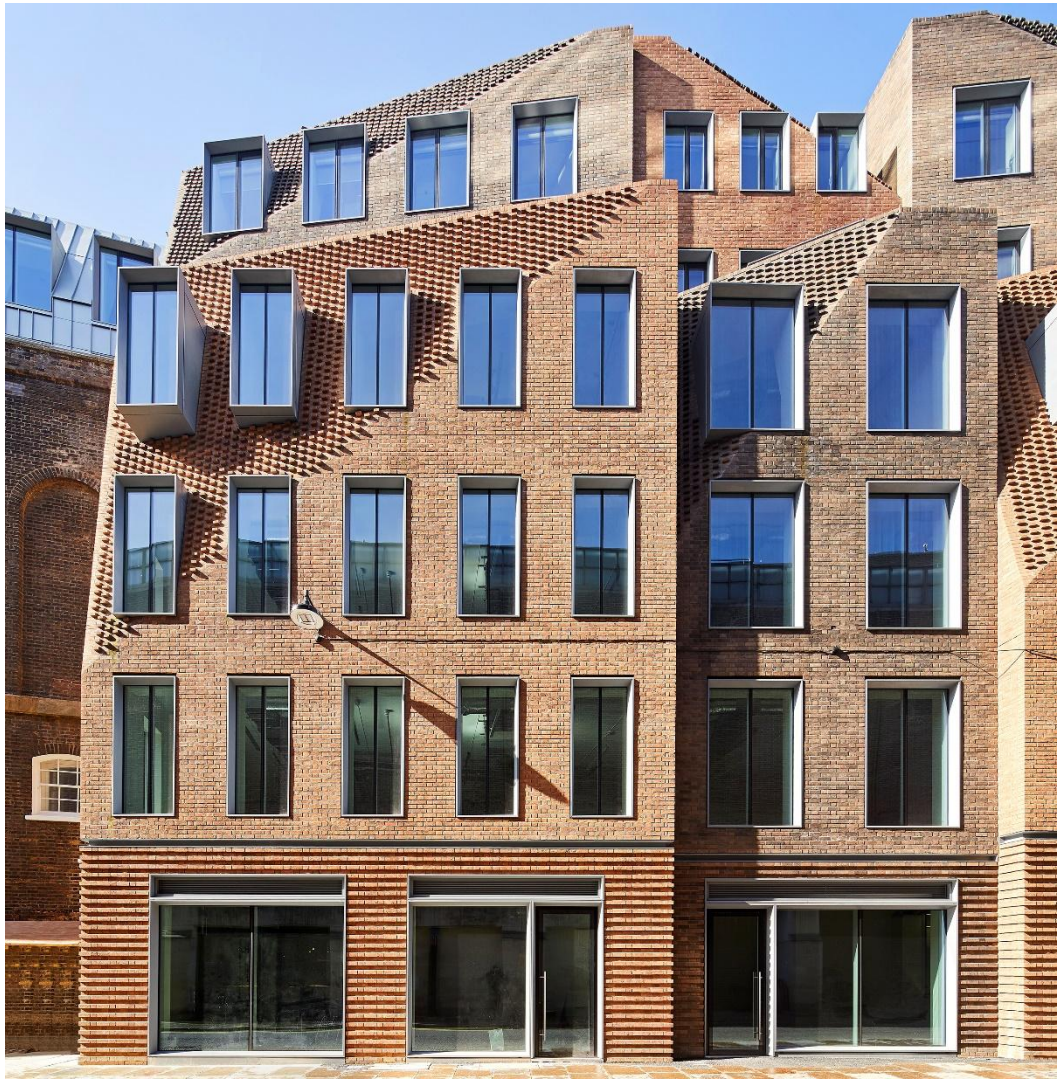


# HOBHOUSE, LONDON



Courtesy of Osborne

# HOBHOUSE, LONDON



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THE ENGINEERS REUSE COLLECTIVE

# Mary Ward Centre

Mike Davies – SD Engineers

# Mary Ward Centre
# Stratford, London

Mike Davies MEng (Hons) CEng MIStructE
Director

Thursday 22nd January 2026
The Engineers Reuse Collective

# About Us

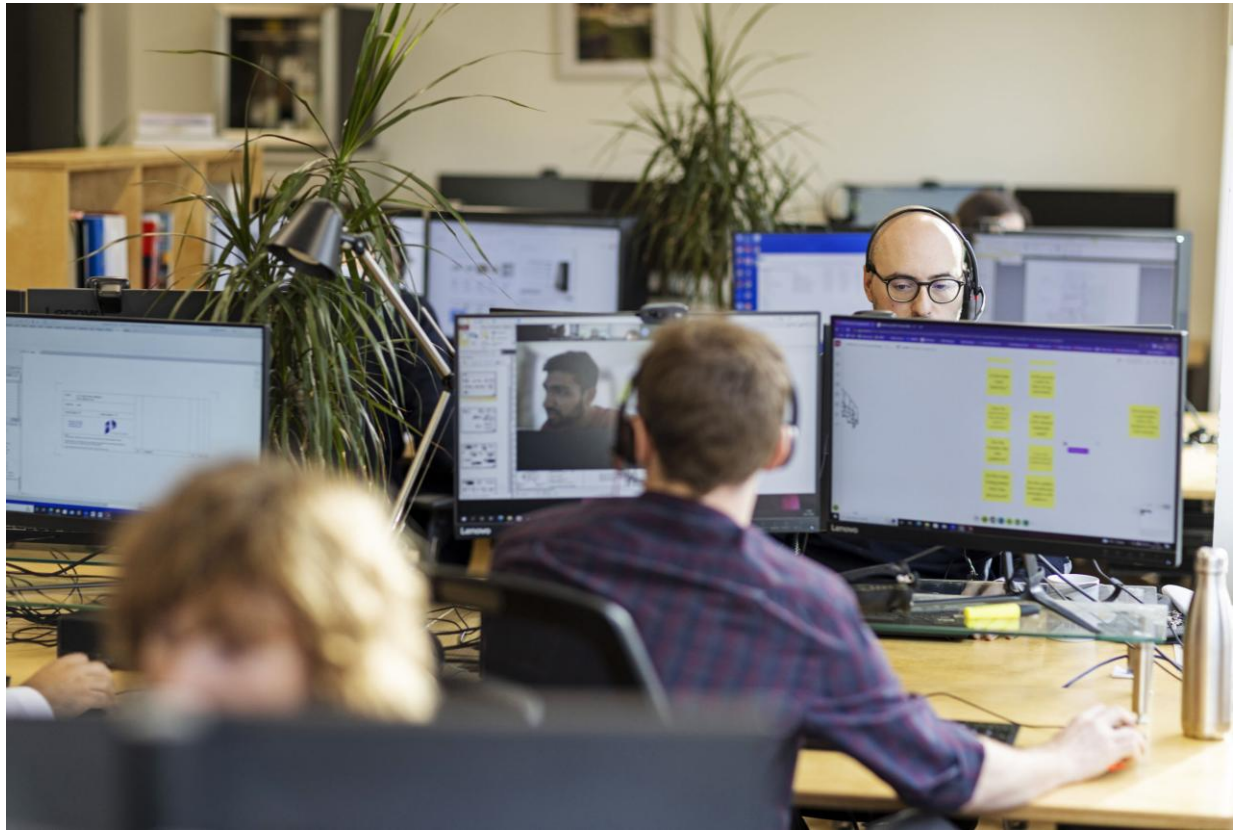
Established in 2014 by Mike Davies and Andy Simpson

The team has grown to 30 creative engineers, technicians and business support

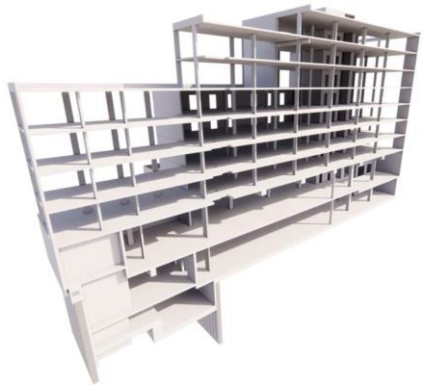
We focus on delivering efficient designs by minimising material amounts, lowering embodied carbon, simplifying design and construction, and overall reducing costs for clients

Core Services:

- Structural Engineering
- Temporary Works
- Civil Engineering
- Site and Building Appraisal
- SuDS



# Our Experience



# Mary Ward Centre, Stratford, London

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## Brief and Constraints

Design developed to Stage 3 for demolition and new build. Funding became available for a low carbon retention scheme.

- Foundations founded in a very thin layer of made ground
- Vibrations concern from a dance studio at the top level
- Weak existing roof
- Limited stability system not suitable for vertical extension
- Aging building frame
- Unknown structural capacity

# Mary Ward Centre, Stratford, London

## Our Approach

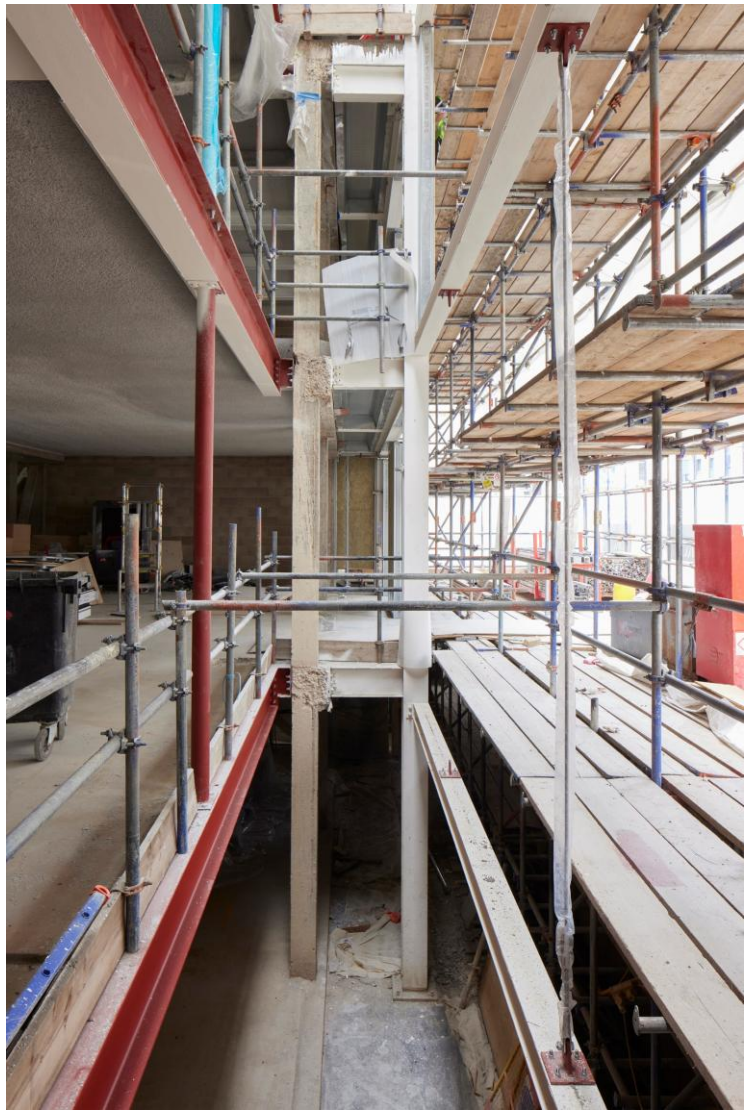
- Extensive testing and analysis
- Detailed ground settlement analysis to confirm the 40% load increase did not require the foundation to be strengthened
- Sensitivity analysis to combine the core stiffness with additional vertical bracing to ensure existing foundations were not subjected to uplift

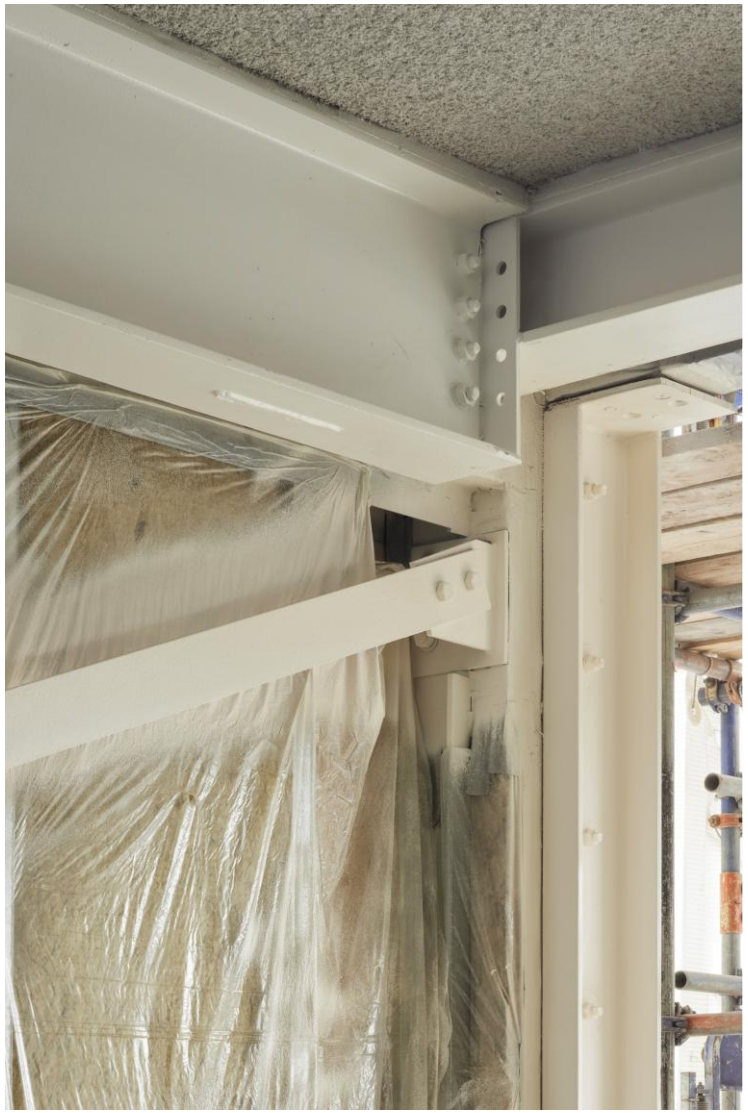
# Mary Ward Centre, Stratford, London

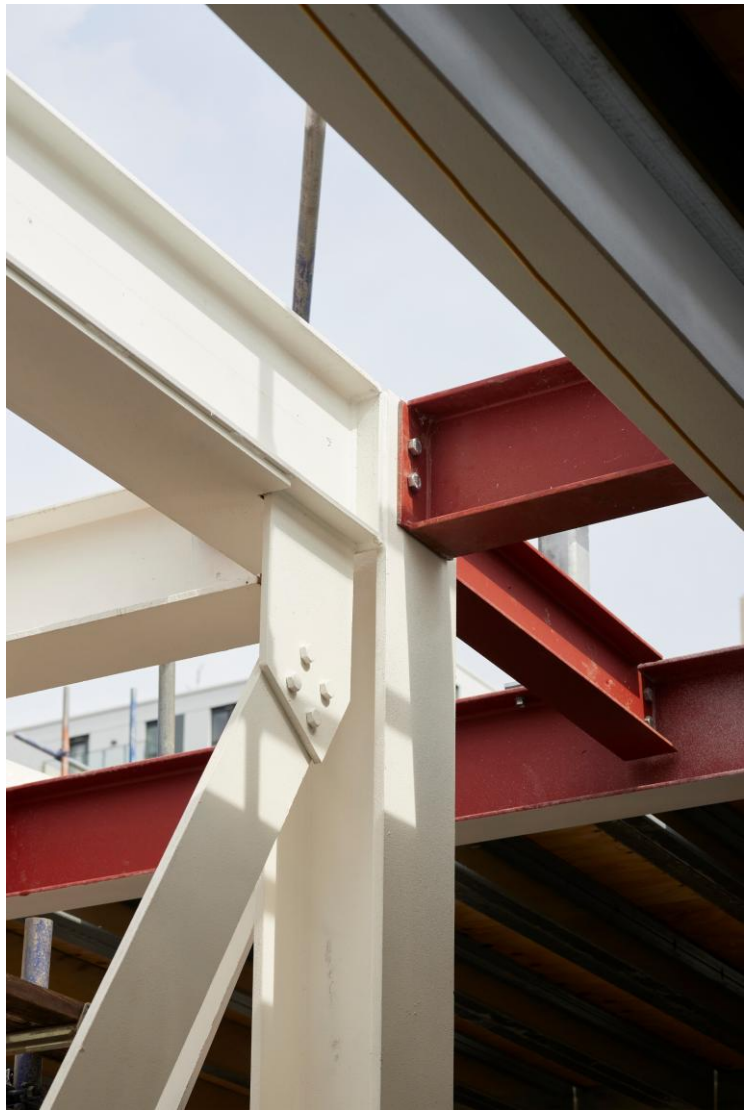
## Solutions

- Re-coring of the building to provide new feature stairs and lifts which contributes to the building stability
- Isolation of the floor from the structural frame
- Plant room relocated to areas with ground bearing slabs
- Retention of the existing roof through strengthening
- Retention of the existing slabs to reduce temporary works requirements
- Localised repairs to frame

# Mary Ward Centre, Stratford, London

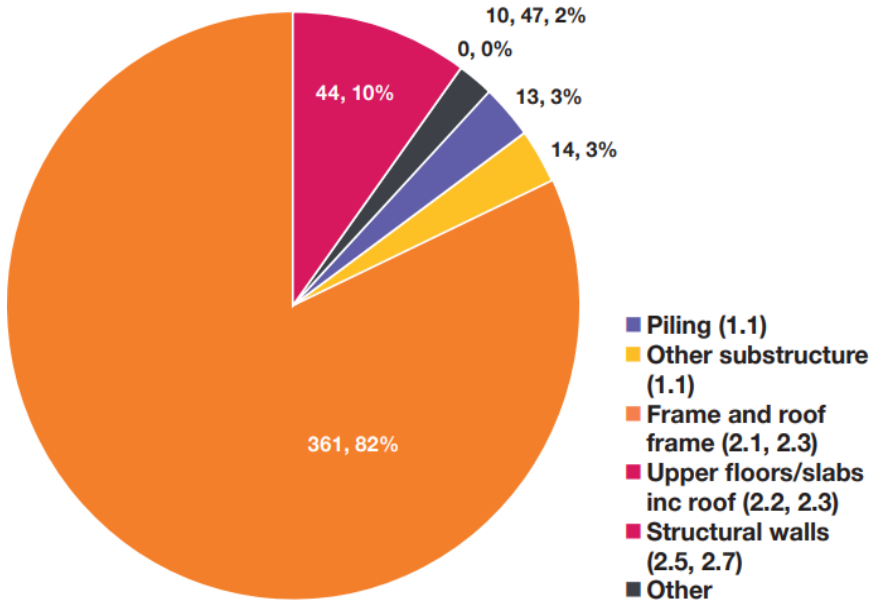


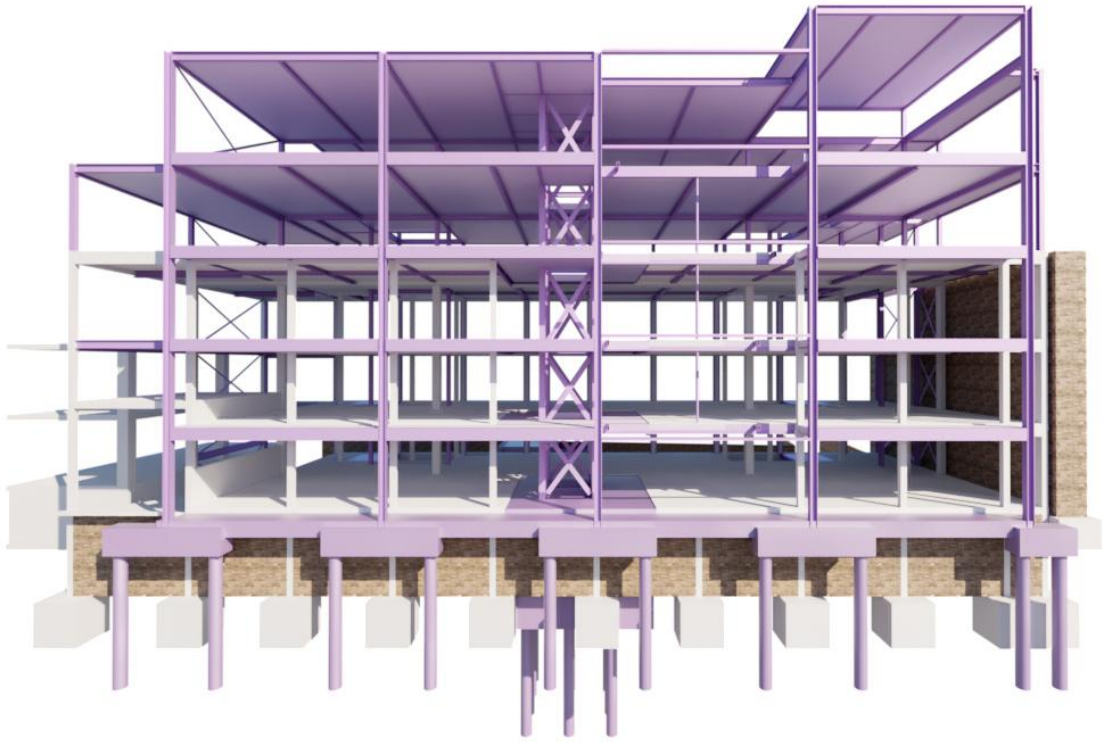




# Carbon Counting at Mary Ward Centre

- Steel and concrete samples of the frame confirmed only 38% of the columns required strengthening
- Our design had a 40% reduction in embodied carbon when compared to a demolition and new build approach



**This project scheme releases carbon equivalent to:**

**522 one-way flights from London to New York**

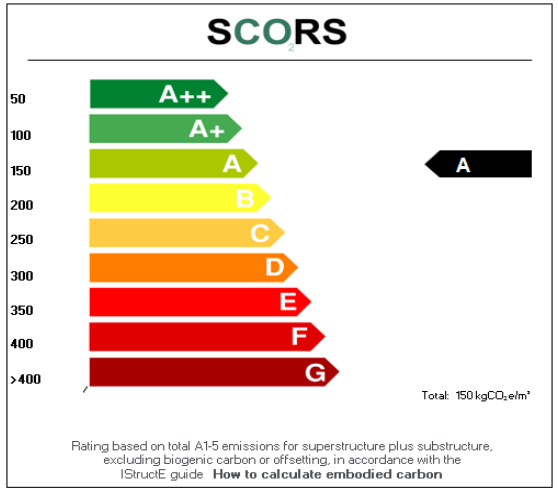
**261 people's consumption of meat, dairy and beer for 1 year**

**144 average family cars runnings for 1 year**

**Scheme performance against targets:**

| | | |
|---|---|---|
| **SCORS:** | **137 kgco$_2$e/m$^2$** | **Scheme does not meet target** |
| **RIBA:** | **156 kgco$_2$e/m$^2$** | **Scheme meets target** |
| **LETI:** | **228 kgco$_2$e/m$^2$** | **Scheme meets target** |

**This project scheme has a SCORS rating of A**



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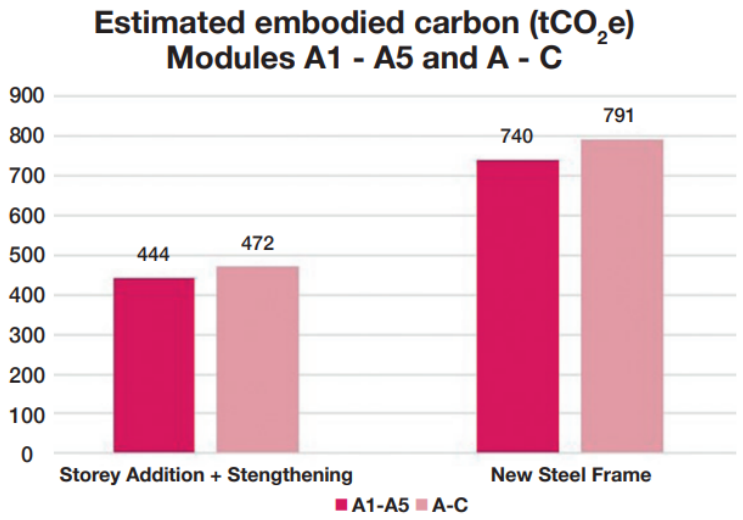


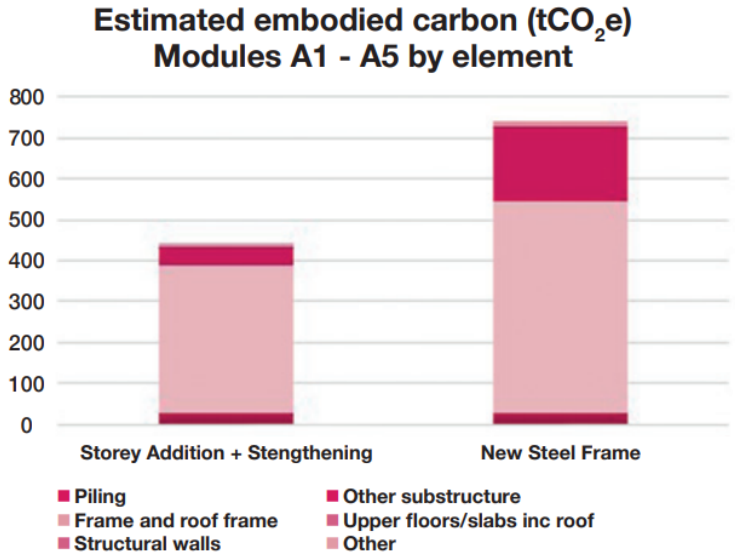


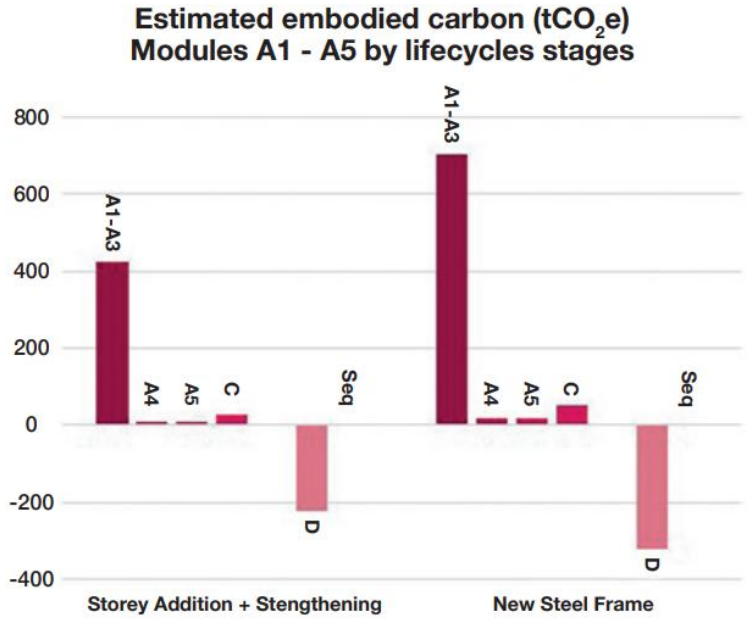


**2**

Strengthening works required to only two pad foundations

**38%**

Only thirty-eight percent of the columns required strengthening

**300 $tCO_2e$**

Retaining the existing structure translated into an estimated reduction of over 300 $tCO_2e$ (Modules A1-A5) compared to a new construction approach

# Key Takeaways

- Sufficient detailed investigative works required for refurbishment projects
- Work closely with the geotechnical consultant to identify bearing strata and maximise possibilities
- Systematic risk management needed to fully understand commercial viability
- Sufficient contingency required to cover additional challenges discovered
- Oversimplistic or conservative approach limits new innovations in construction and detrimental in the fight against climate change

“The engineers played a fundamental role in giving the client and stakeholders the confidence to strengthen and reuse the existing building rather than demolish. Their diligent and determined approach demonstrated a viable future for the existing structure. The project is a substantial retrofit and vertical extension which doubled the building size, achieving a complete transformation with significant carbon savings. The before and after transformation is remarkable.”

Structural Award Judge’s citation

“As the only Institute for Adult Learning in East London, the building demonstrates a firm commitment to learning, support, and access to justice - attracting local partners, encouraging connections, and cross-sector working. This is beginning to build a strong web of referrals and connected support for our local communities, with more plans on the horizon to provide additional community services at our Stratford Centre.”

Therese Reinheimer-Jones
CEO of the Mary Ward Settlement

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# Q+A

THE ENGINEERS REUSE COLLECTIVE

# Thank you


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COLLECTIVE