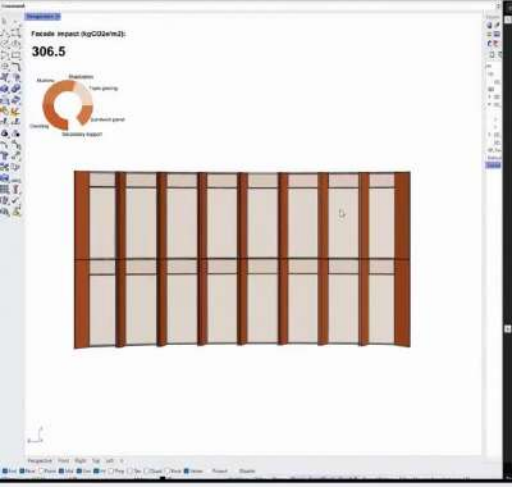
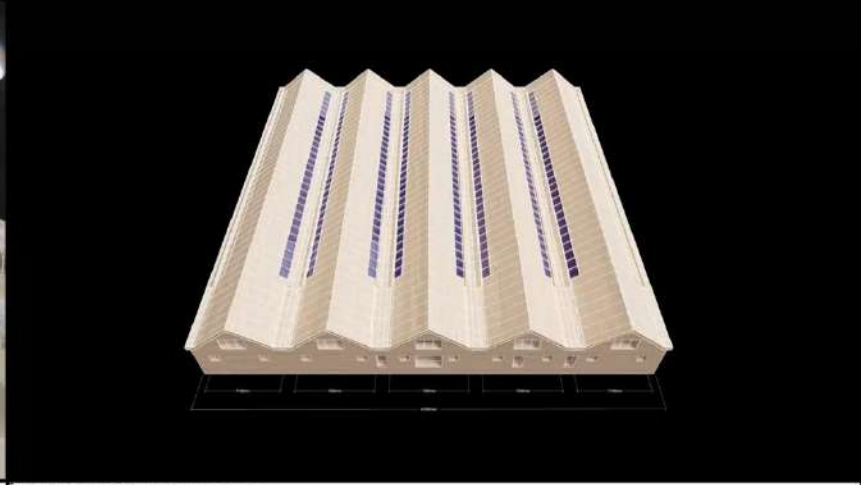
A RESOURCEFUL LEAP

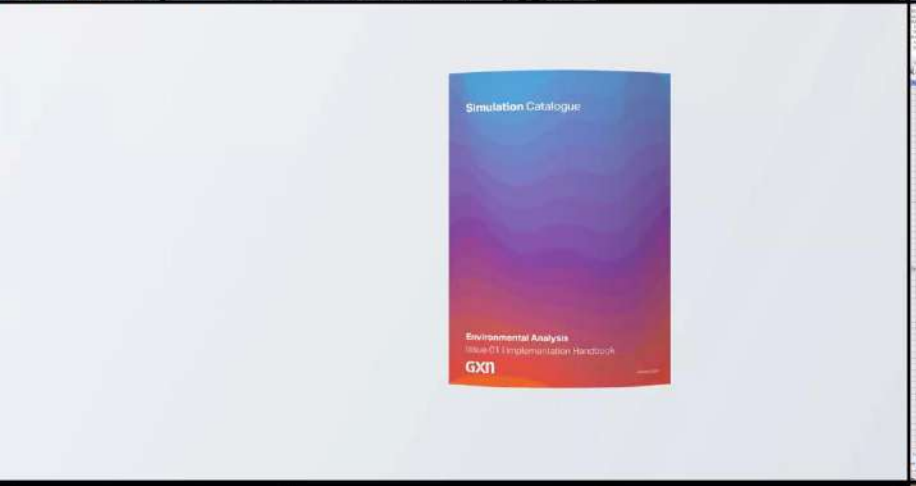
FROM THEORY TO PRACTICE

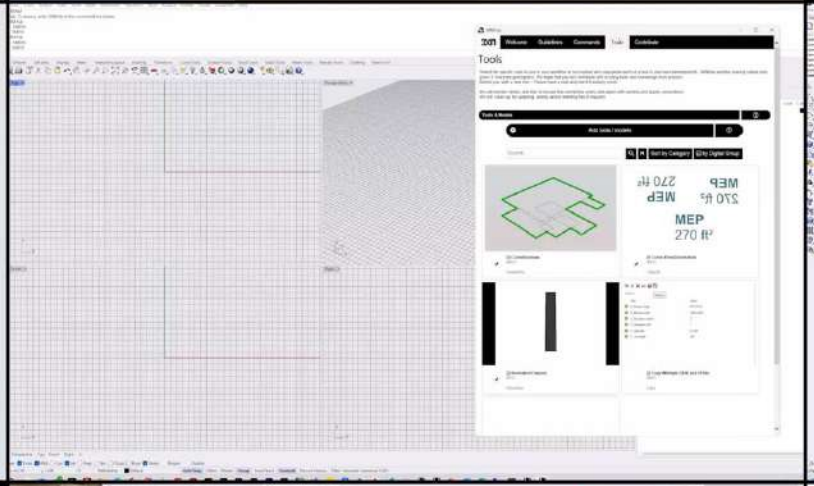
26.11.2025 - Regenerative Design, RESET

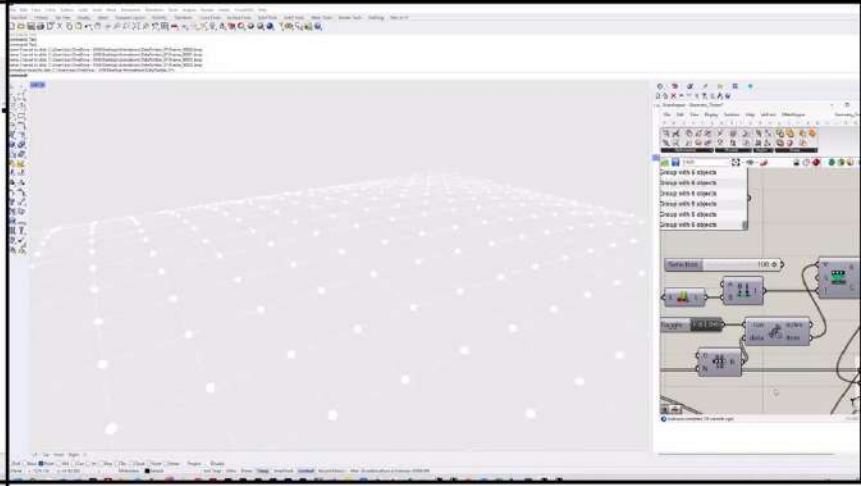
Aleksander Guldager Kongshaug
Associate Architect 3XN/GXN
agk@3xn.dk

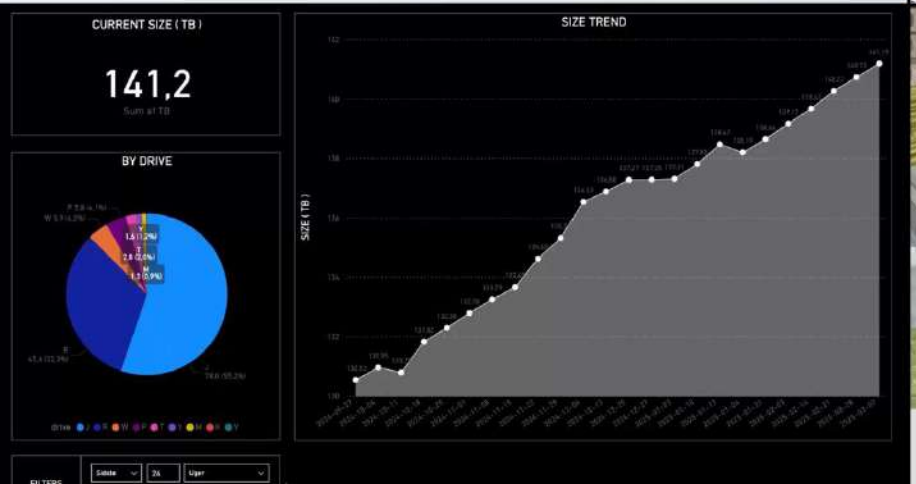

Facade impact (kgCO2e/m2):
306.5



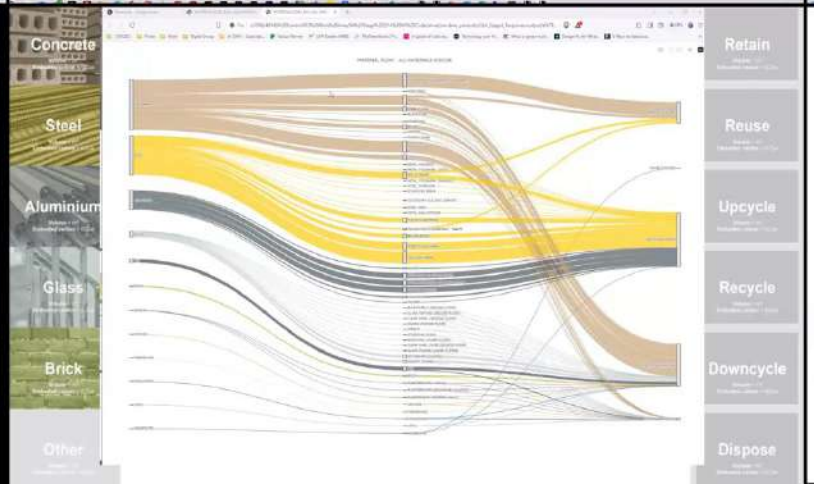

Simulation Catalogue
Environmental Analysis
Issue 01 | Implementation Handbook
GXN

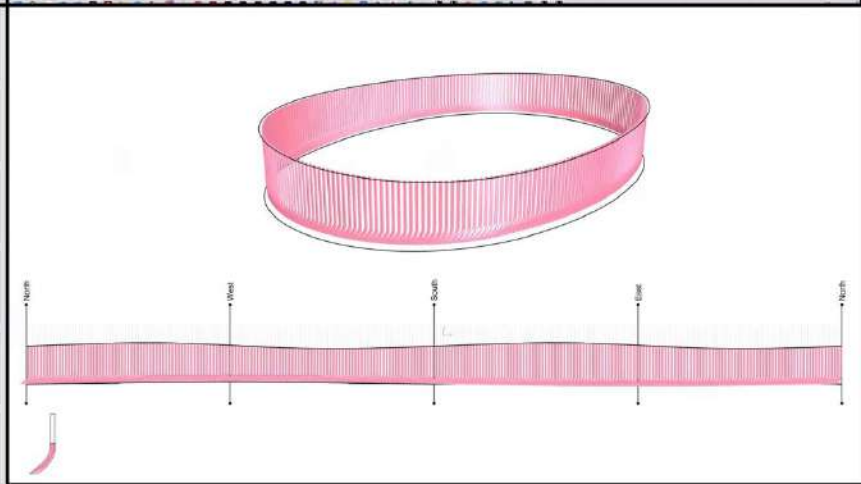

Tools
MEP
270 ft²



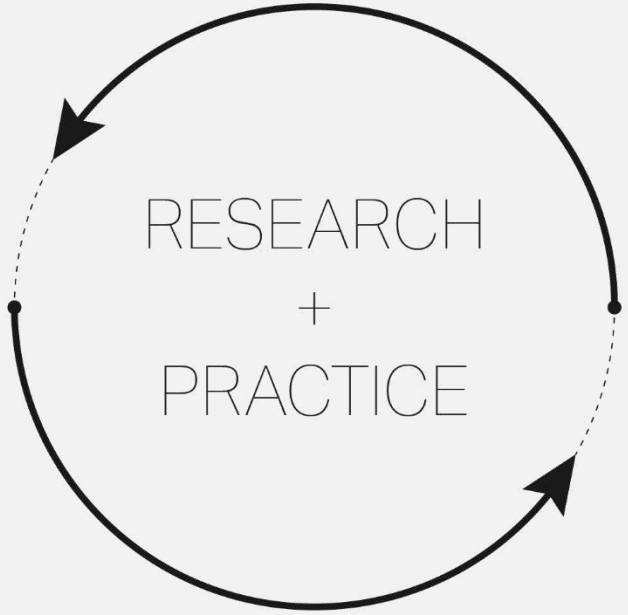

CURRENT SIZE (TB)
141,2
Sum of TB
BY DRIVE

SIZE TREND
SIZE (TB)


Concrete
Steel
Aluminium
Glass
Brick
Other
Retain
Reuse
Upcycle
Recycle
Downcycle
Dispose


North
West
South
East
North

3XN
architects



GXN
innovation

AGENDA

A RESOURCEFUL LEAP

CIRCLE HOUSE – 90% REUSE WITH EXTENDED VALUE

EUSTON TOWER – DIRECT CONCRETE REUSE, BIG SCALE

QQT TOWER – RETROFITTING A 60s SKYSCRAPER

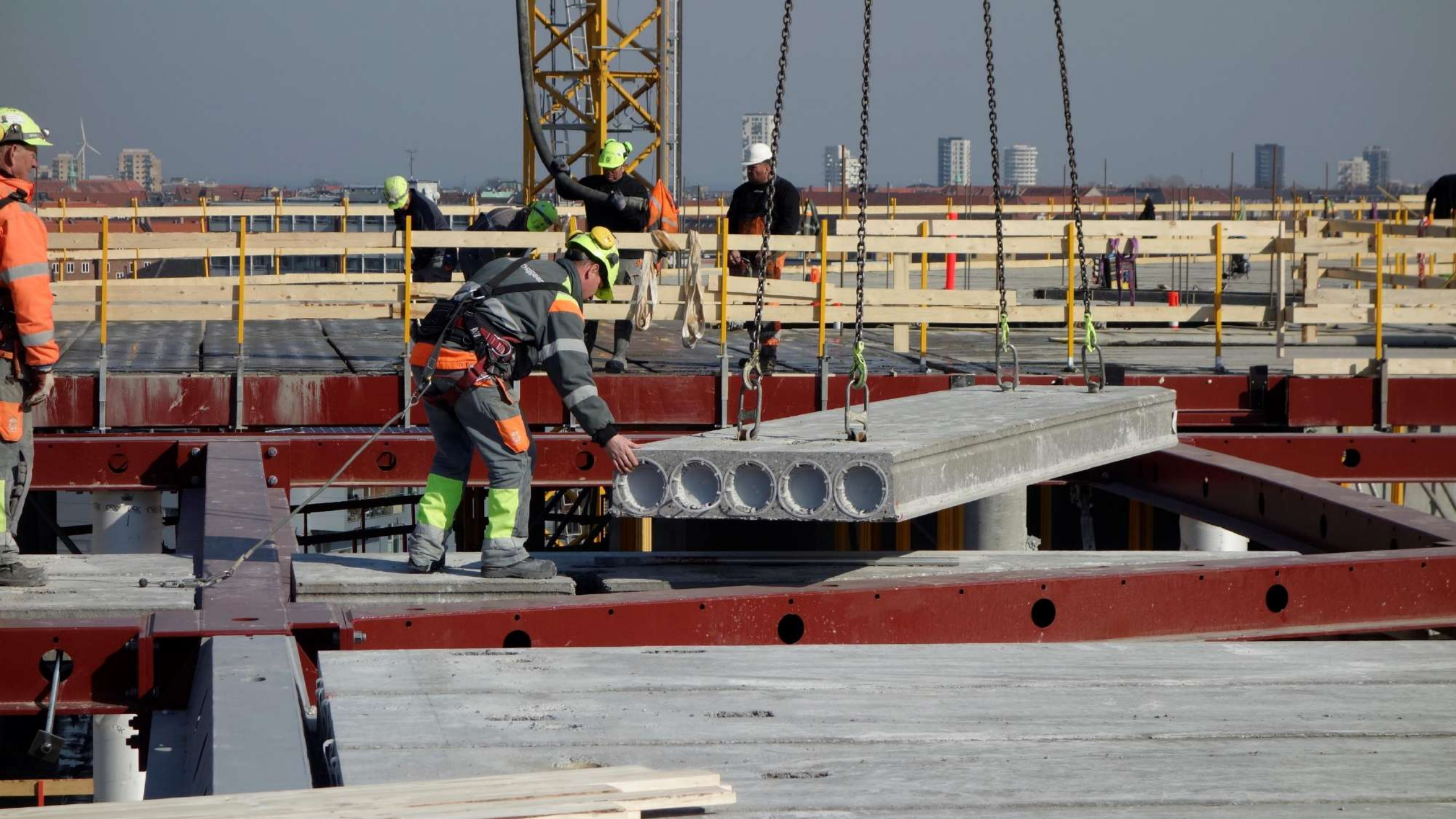
LOCAL RESOURCE / COLLECTIVE KNOWLEDGE - WHAT MIGHT ARCHITECTURE BECOME IF WE BEGAN WITH PLACE?

CIRCLE HOUSE

DESIGNING FOR A FLEXIBLE FUTURE

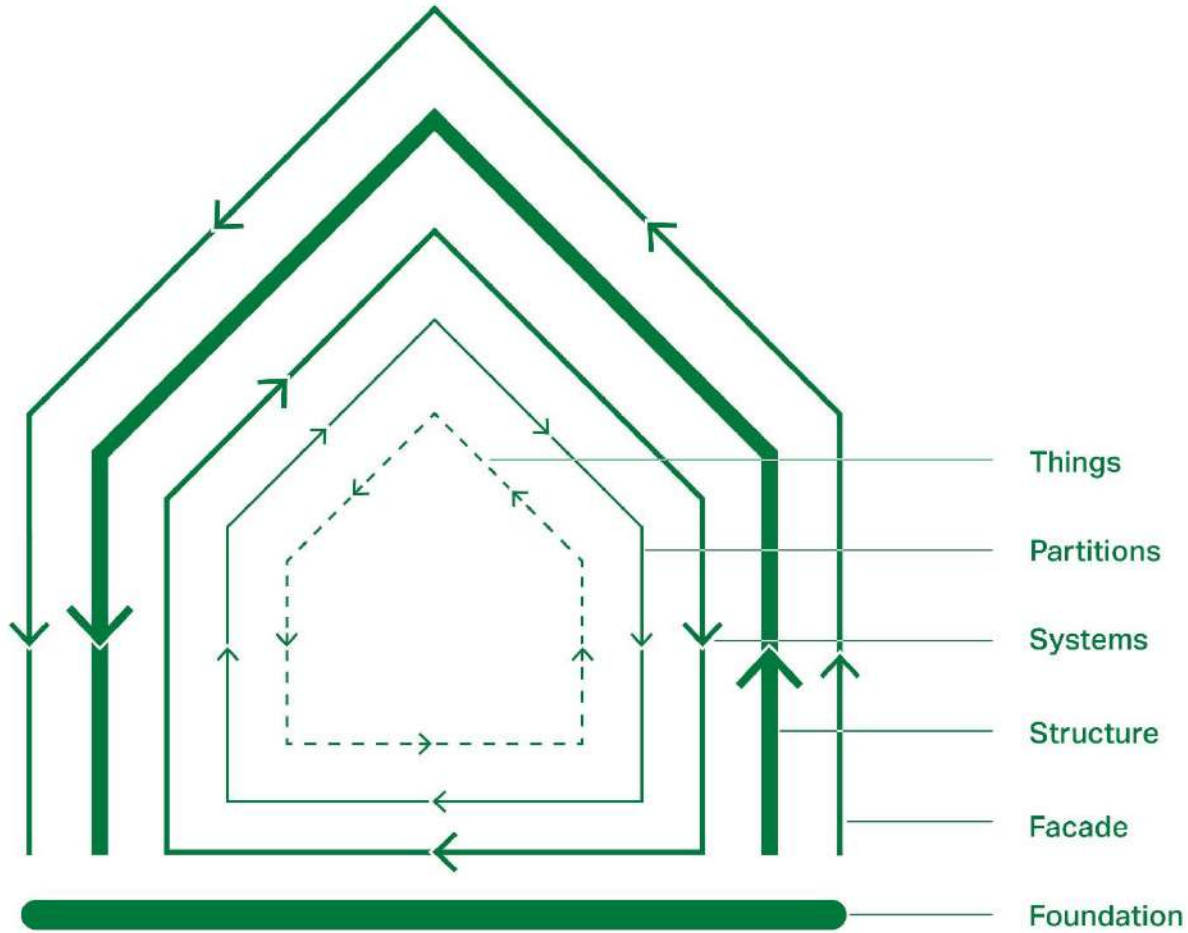
90% REUSE WITH EXTENDED VALUE

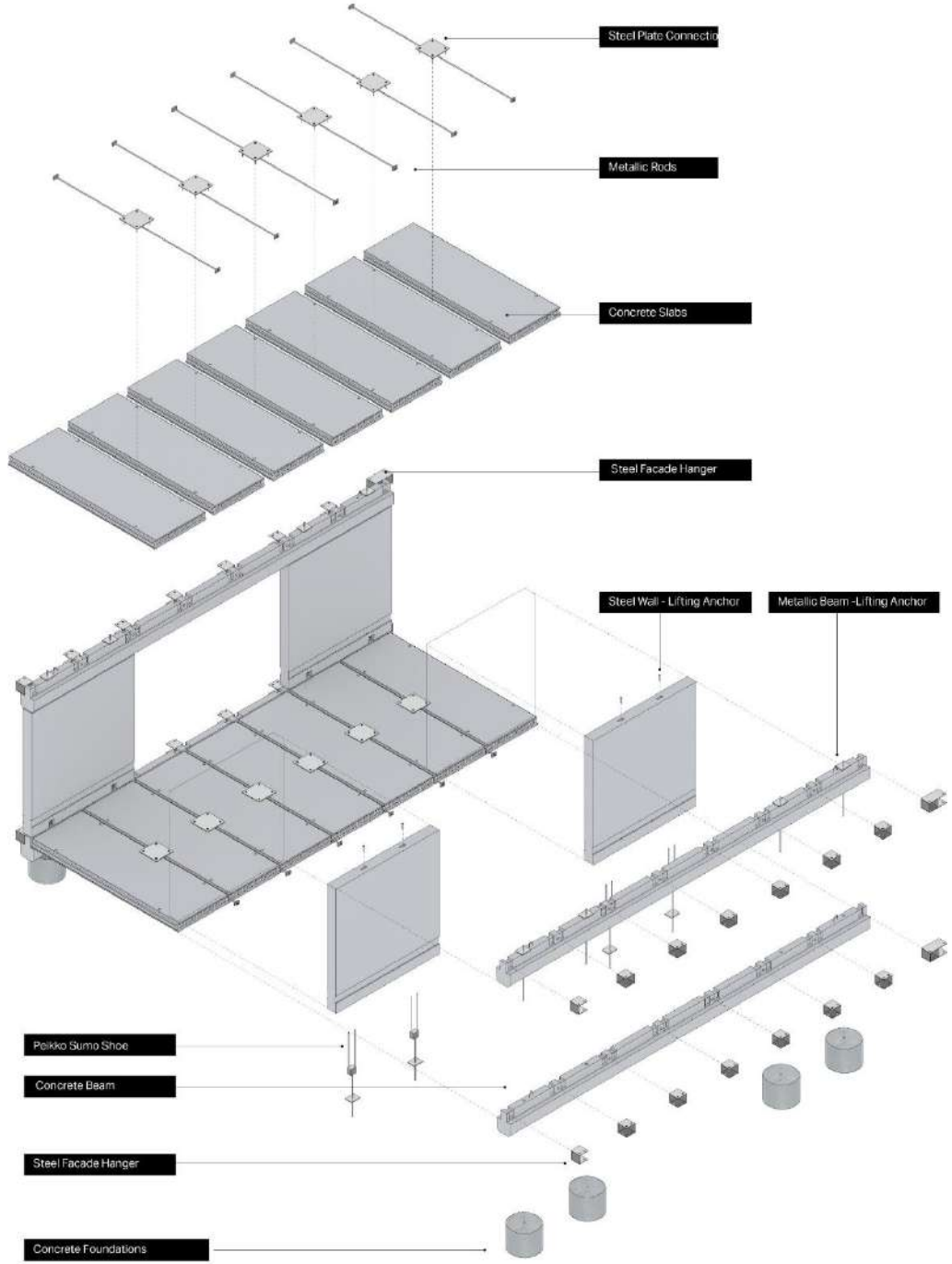

WERNER
5416T




3XN
ORBICON
Gyproc
SAINT-GOBAIN
Vandkunsten
RHEINZINK
convert
HAKI
kvadrat
Synbra
GUTEX
ISOLENAWOLLE
Healthy insulation can naturally do more.
Scan Underlay
Upcycled Product
BEWi
THORS
THORS-DESIGN
Troldtekt
FORENINGEN FOR
BYGGERIETS
SAMFUNDSANSVAR
kebony
KALK
FISCHER
LIGHTING
FOR A BRIGHTER FUTURE
THERMO
CELL
INGENIØRHØJSKOLEN
AARHUS UNIVERSITET
Taasinge
Elementer
Tarkett
CBIDanmark
ege
Mētisse
Sustainable insulation
ENKL
DOVISTA
Caverion
CONSOLIS
SPÆNCOM
NCC
RGSNORDIC
STATENS BYGGEFORSKNINGSINSTITUT
AALBORG UNIVERSITET KØBENHAVN
Lejerbo
dansk
beton
peikko
group
DERBIGUM
MAKING BUILDINGS SMART
Miljø- og Fødevareministeriet
Miljøstyrelsen
wehlers
H & B
KOMPROMENT
TAG OG FACADE
GXN
CINARK
center for industriel arkitektur
Responsible Assets*
Realdania
ROCKWOOL
VELFAC
LAURITZEN
ADVISING
MTHøjgaard
HUNTON
Kingo
AMORIM
CLIMATE
RECOVERY
LENDAGER ARKITEKTER
HORTEN
TSCHERNING

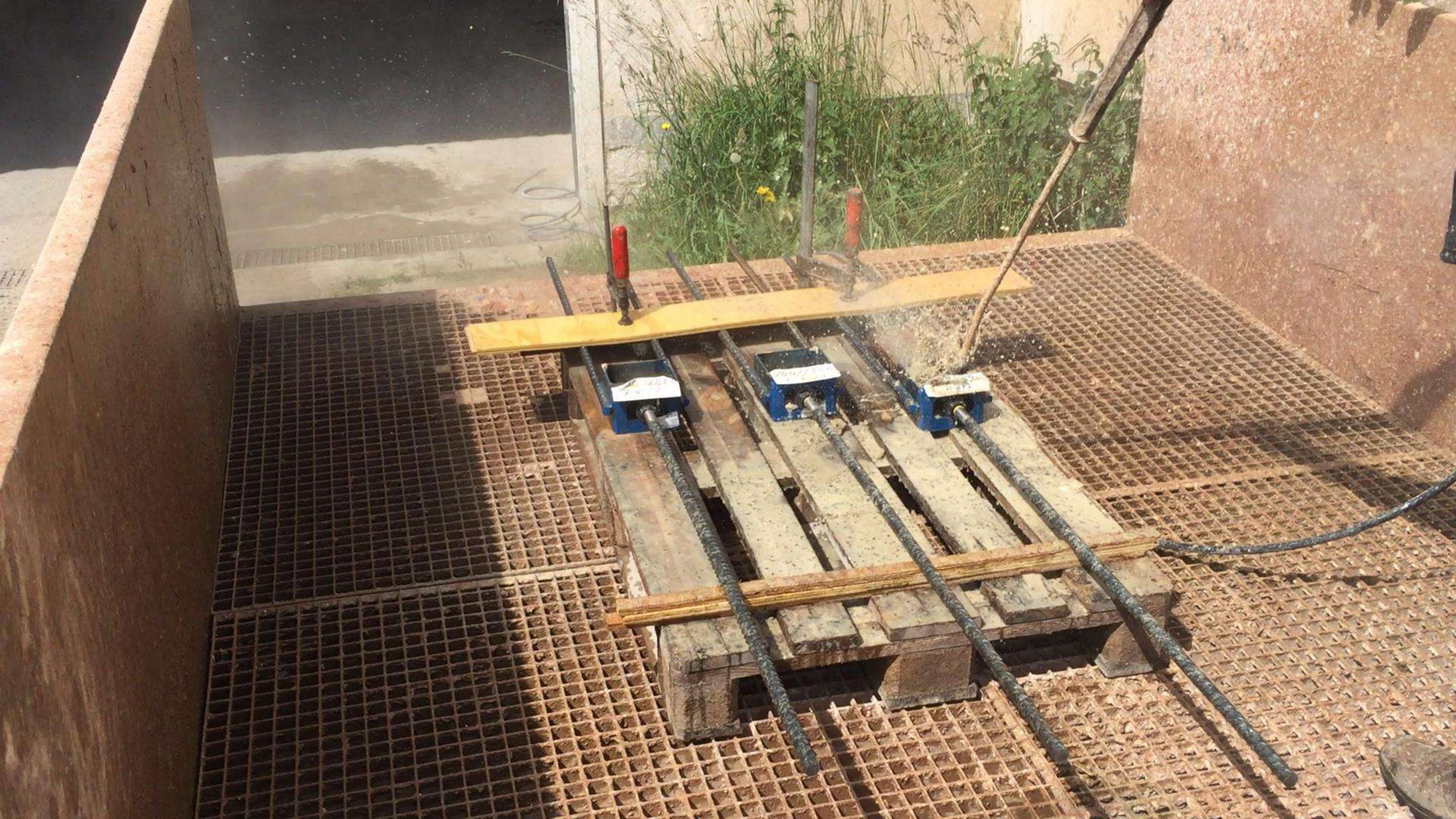
60 boligenheder
4 typologier

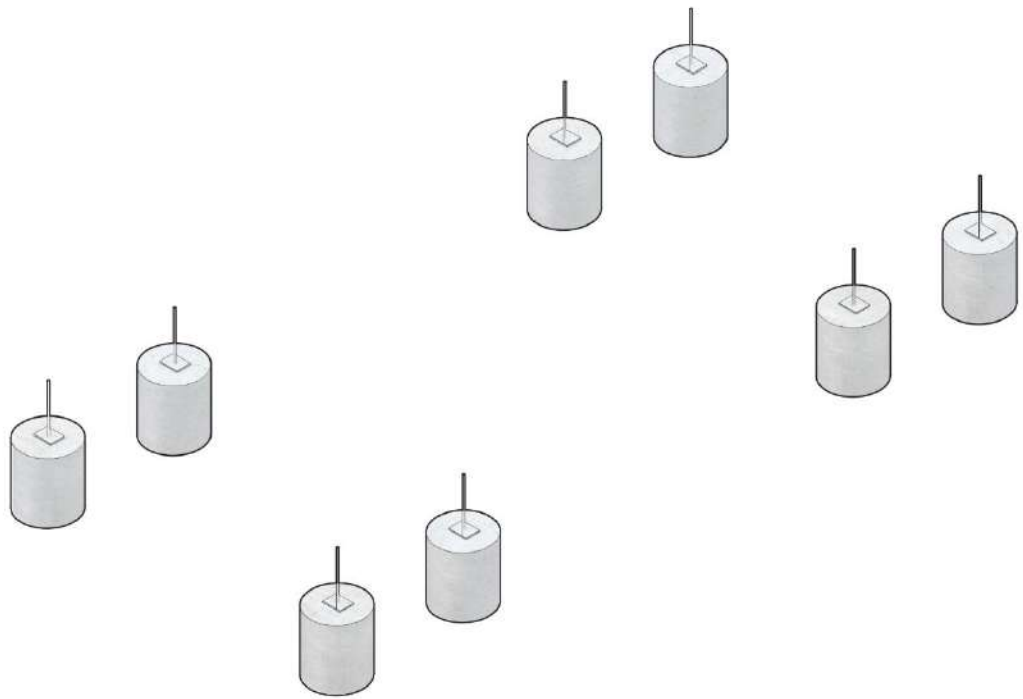

Things
Partitions
Systems
Structure
Facade
Foundation

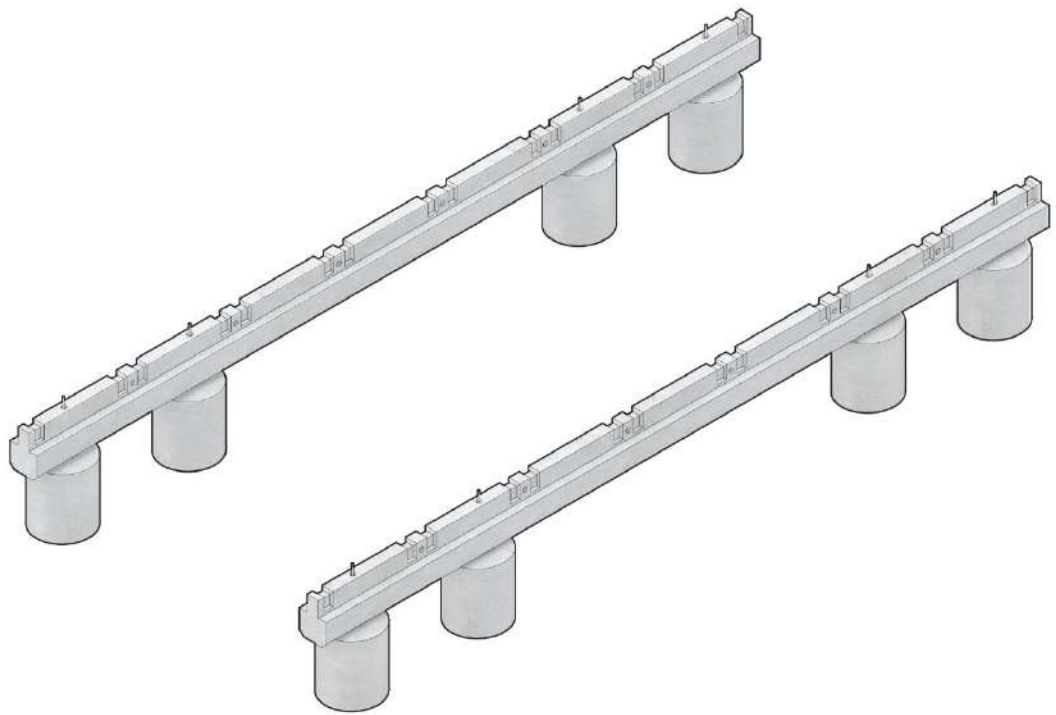

Steel Plate Connectio
Metallic Rods
Concrete Slabs
Steel Facade Hanger
Steel Wall - Lifting Anchor
Metallic Beam -Lifting Anchor
Peikko Sumo Shoe
Concrete Beam
Steel Facade Hanger
Concrete Foundations

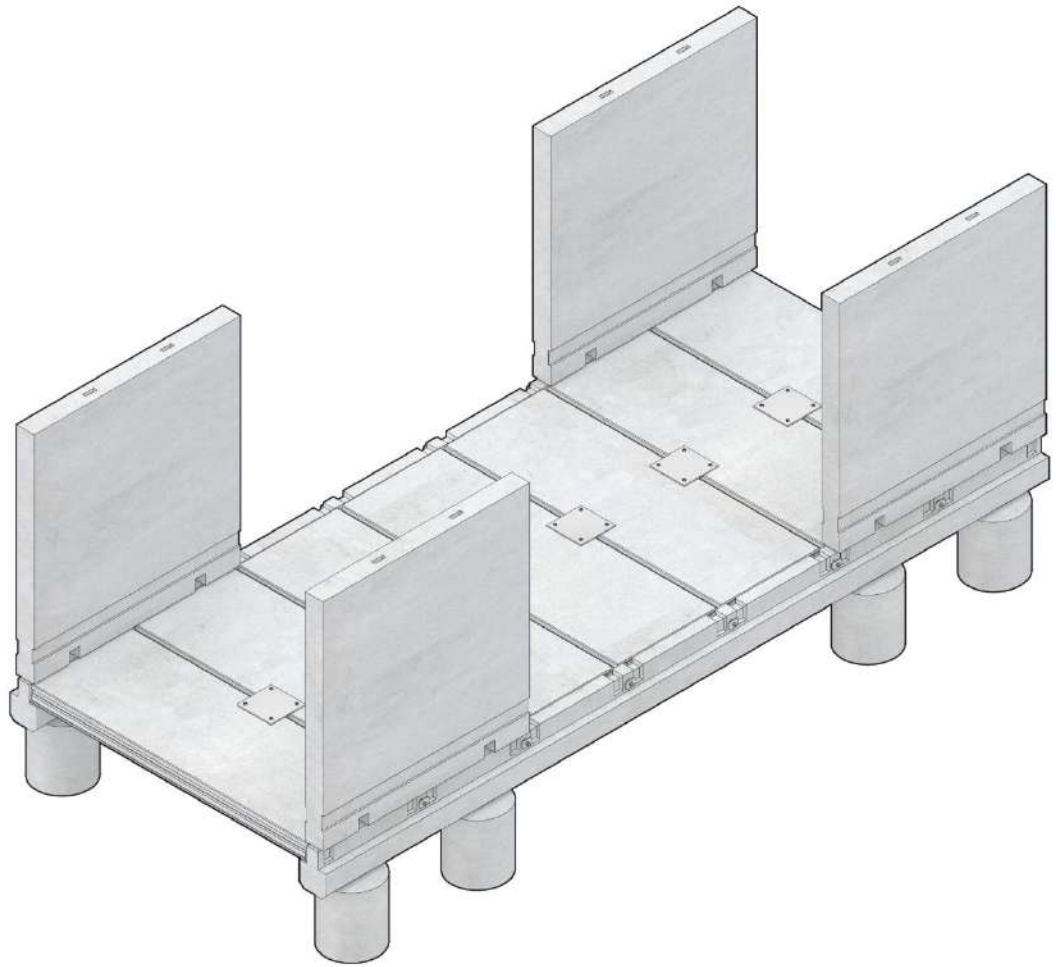

SPÆNCOM
SPÆNCOM

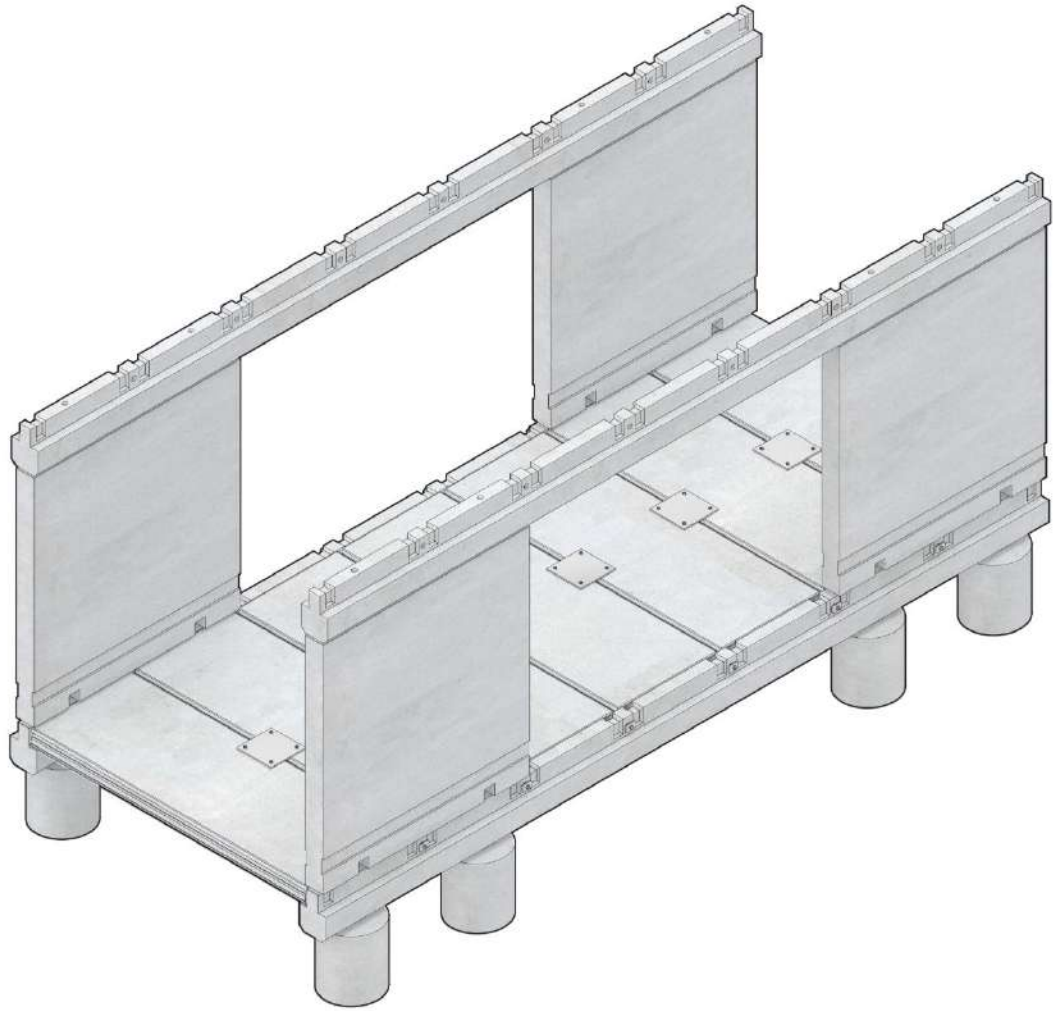

KALK
– Build lasting culture
Rødvig Kalkvand












MANOLO

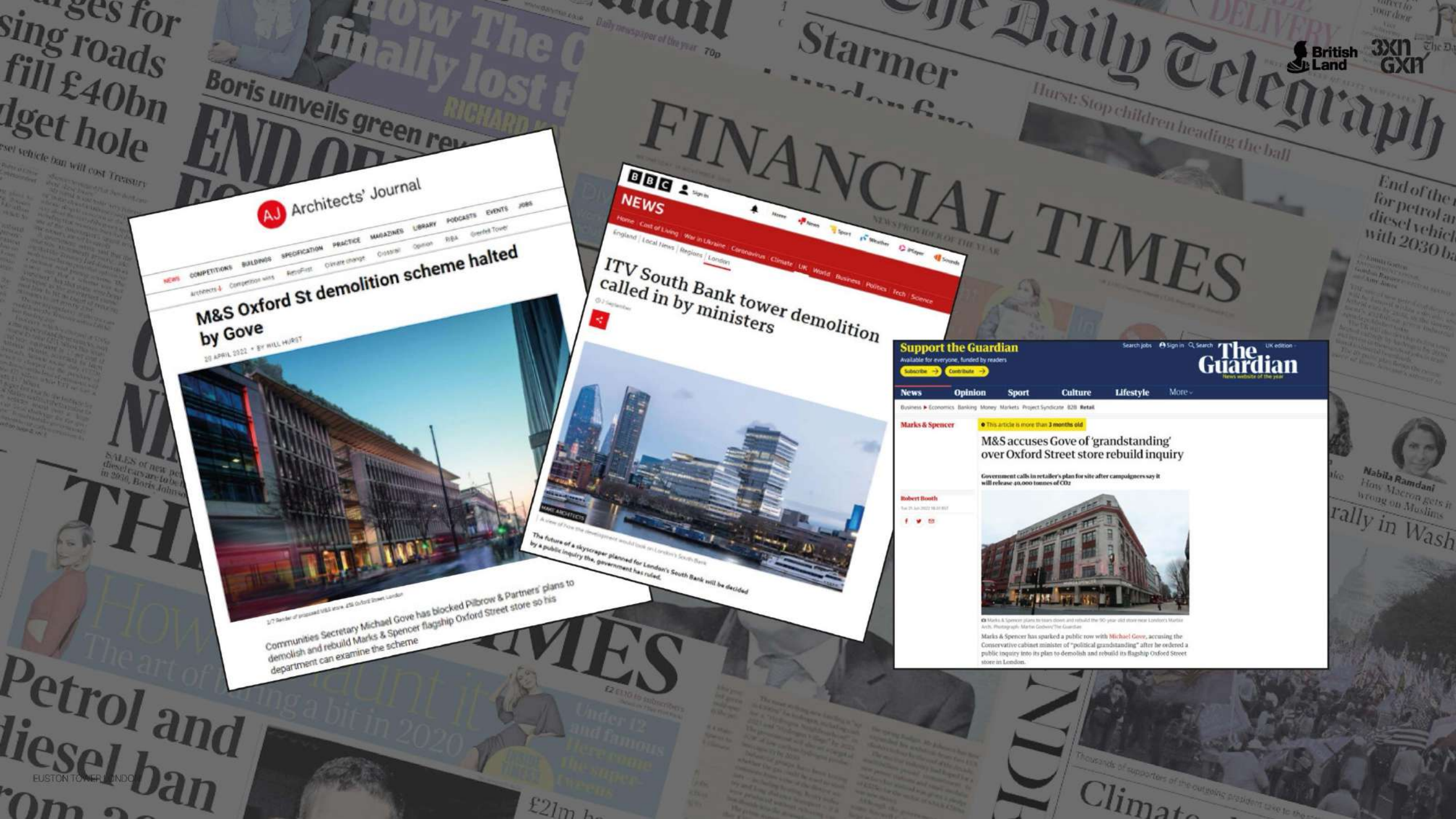
EUSTON TOWER

DIRECT CONCRETE REUSE, BIG SCALE

BRIDGING THE GAP TO REUSED MATERIALS

“Talking to an occupier about an 18-year old building which they are saying is becoming obsolete, I actually fear for our business to build like this....”

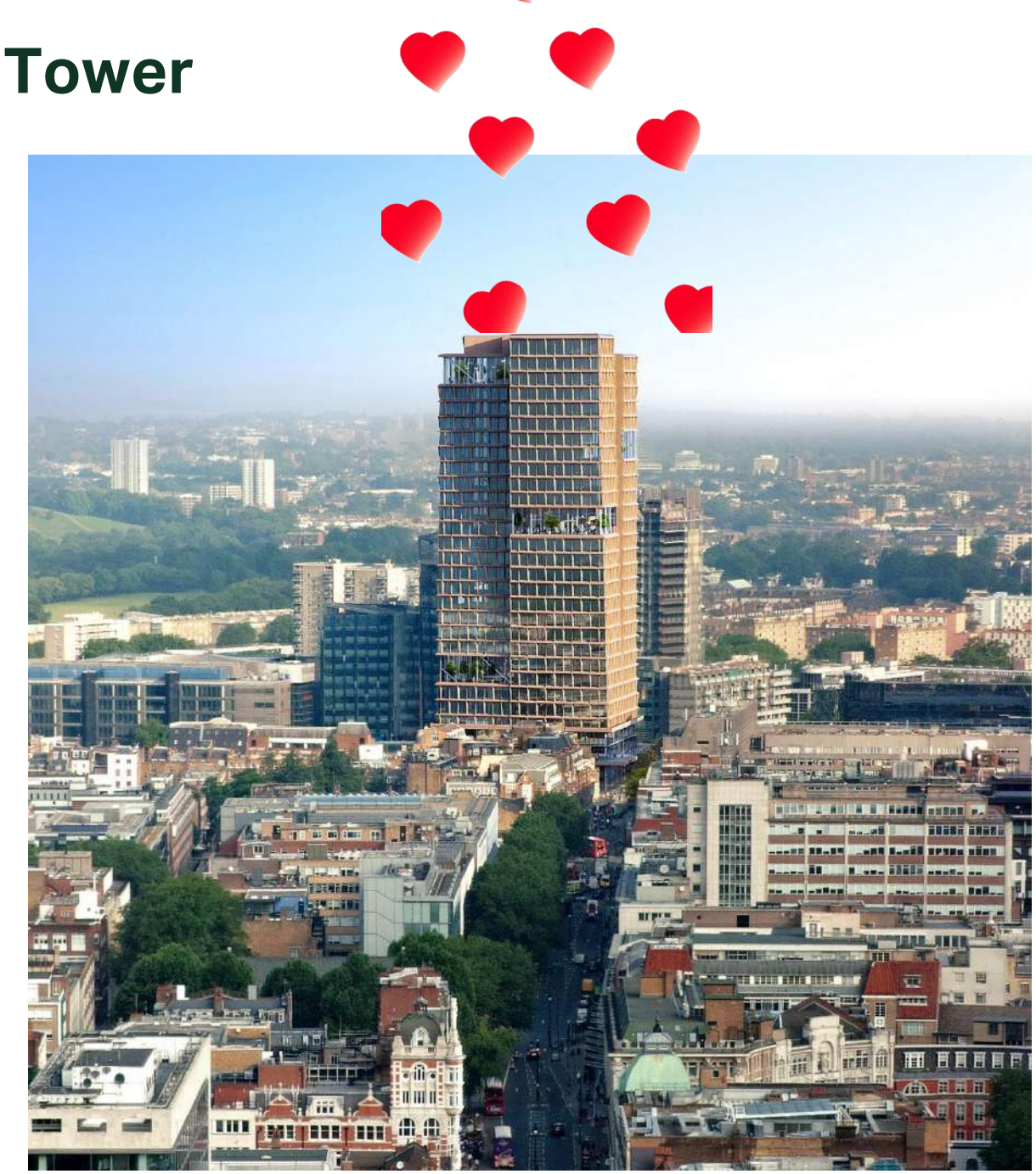
Head of Office Leasing,
European developer

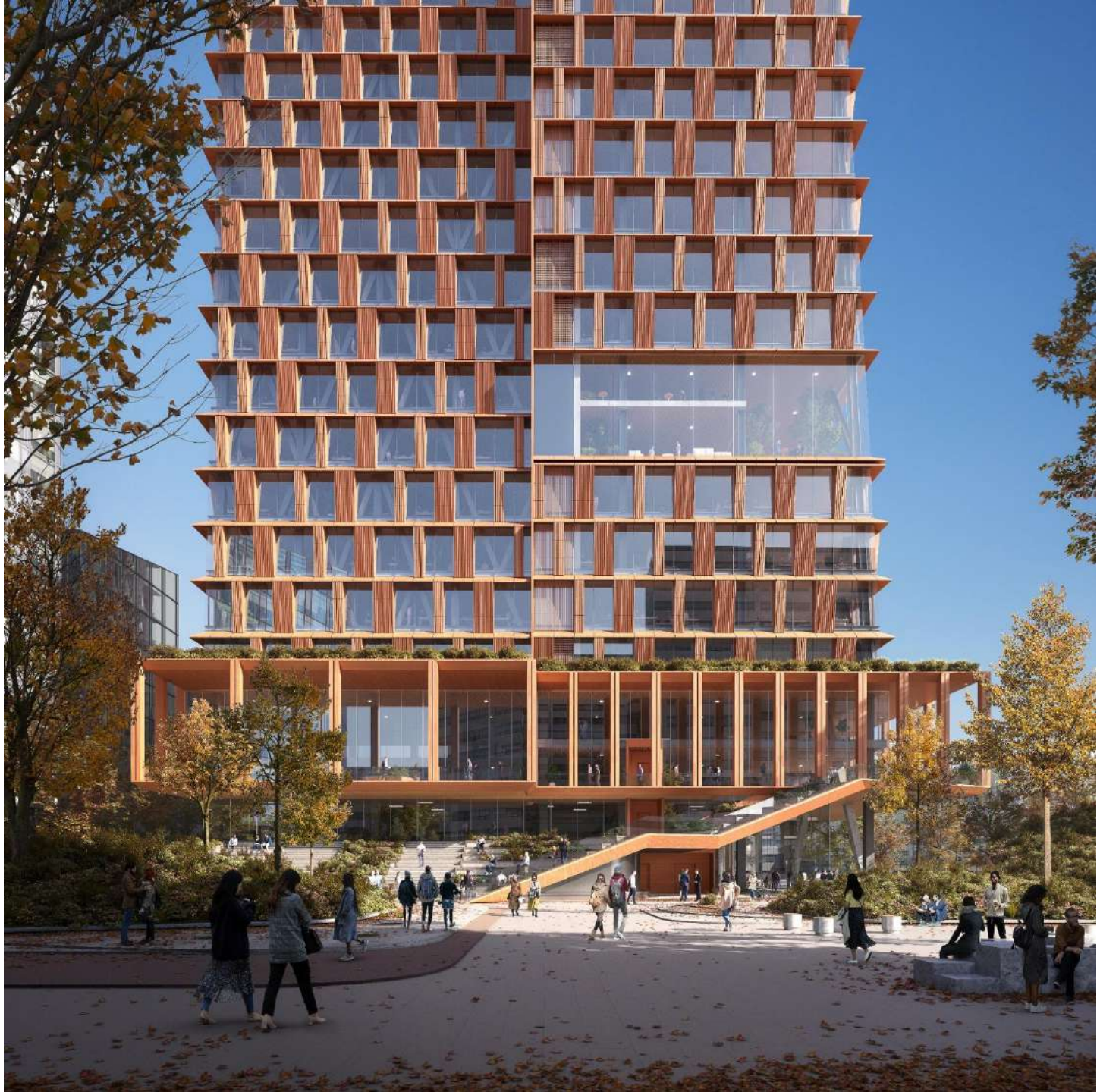

Architects' Journal
M&S Oxford St demolition scheme halted by Gove
20 APRIL 2022 • BY WILL HURST
Communities Secretary Michael Gove has blocked Pilbrow & Partners' plans to demolish and rebuild Marks & Spencer flagship Oxford Street store so his department can examine the scheme
BBC NEWS
ITV South Bank tower demolition called in by ministers
The future of a skyscraper planned for London's South Bank will be decided by a public inquiry the, government has ruled.
Support the Guardian
The Guardian
Marks & Spencer
M&S accuses Gove of 'grandstanding' over Oxford Street store rebuild inquiry
Government calls in retailer's plan for site after campaigners say it will release 40,000 tonnes of CO2
Robert Booth
Marks & Spencer has sparked a public row with Michael Gove, accusing the Conservative cabinet minister of "political grandstanding" after he ordered a public inquiry into its plan to demolish and rebuild its flagship Oxford Street store in London.
FINANCIAL TIMES
The Daily Telegraph
Petrol and diesel ban
EUSTON TOWER LONDON

A Vacant Unloved Tower

3XN GXN

A Vibrant Loved Tower






CURRENT OFFICE CONDITION

Idiosyncratic Structural System

In-situ Slab

Ring Beam

Ribbed Slab

Minimum Upgrades

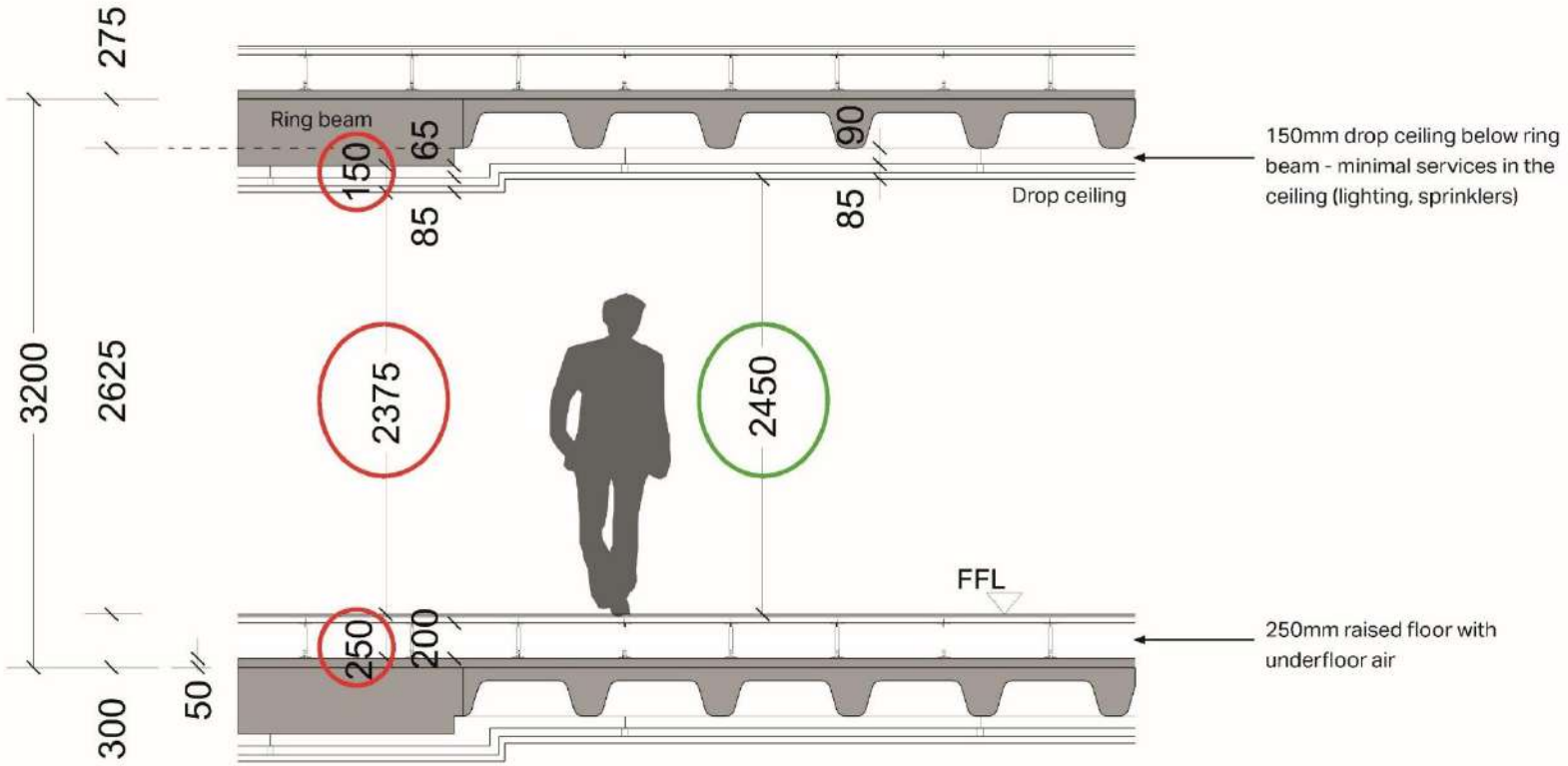
BCO 2019 floor to ceiling height recommendations

Floor to ceiling (new build)	2.6-2.8 m
Floor to ceiling (refurbishment)	2.45-2.8 m

Another option is to have minimal services in the ceiling (lighting, sprinklers) and to provide a taller raised floor with underfloor air. Floor trunking is not desired as it limits flexibility.

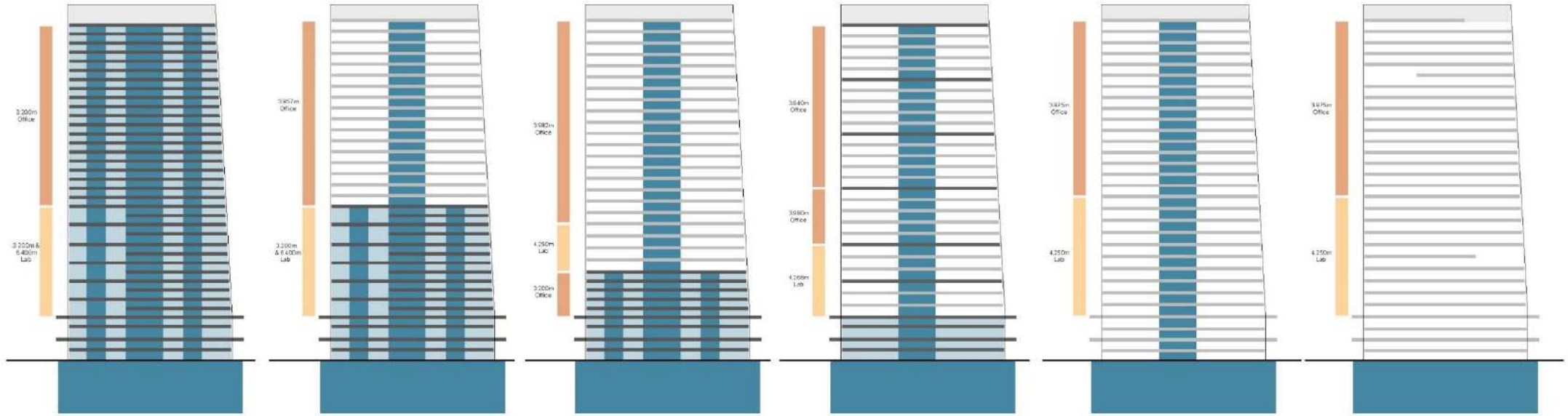
Clear height is 2,375mm, below BCO recommendation, over an extensive area of the floor plate. The minimal ceiling build-up and services zone shown would be subject to detailed co-ordination and integration of the services as well as require compromises in the fitout.

This option assumes 4 no. AHUs per floor. Fewer AHUs results in a taller raised floor.



Options

Existing Core
Existing Slabs
New Slabs
Office
Lab-Enabled

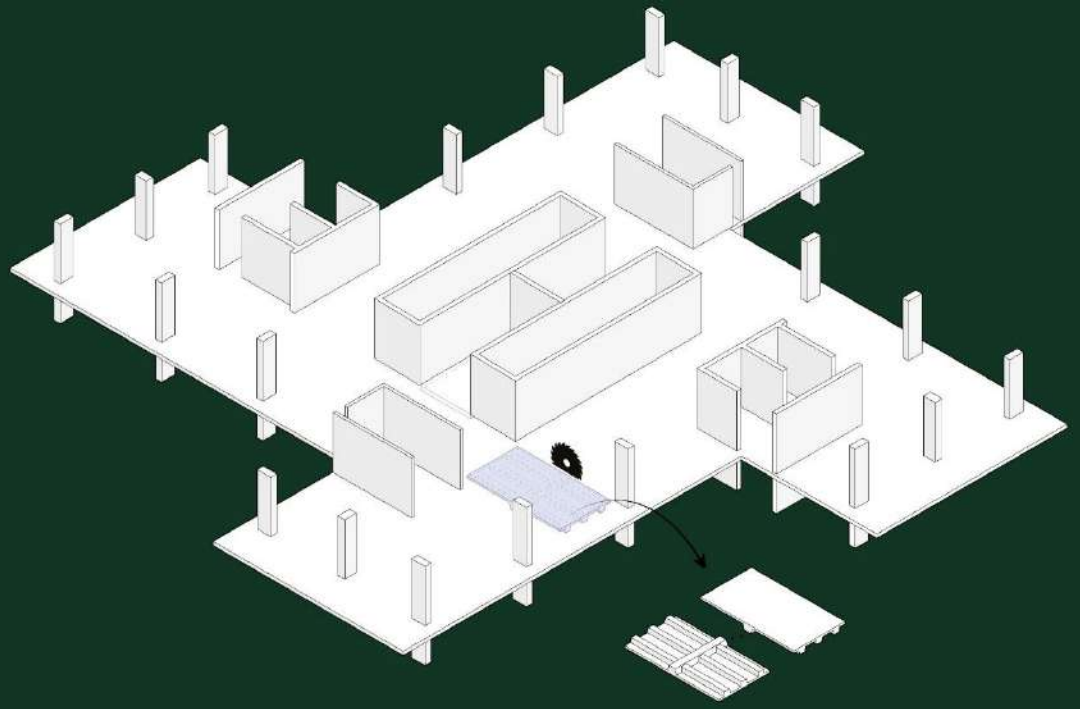


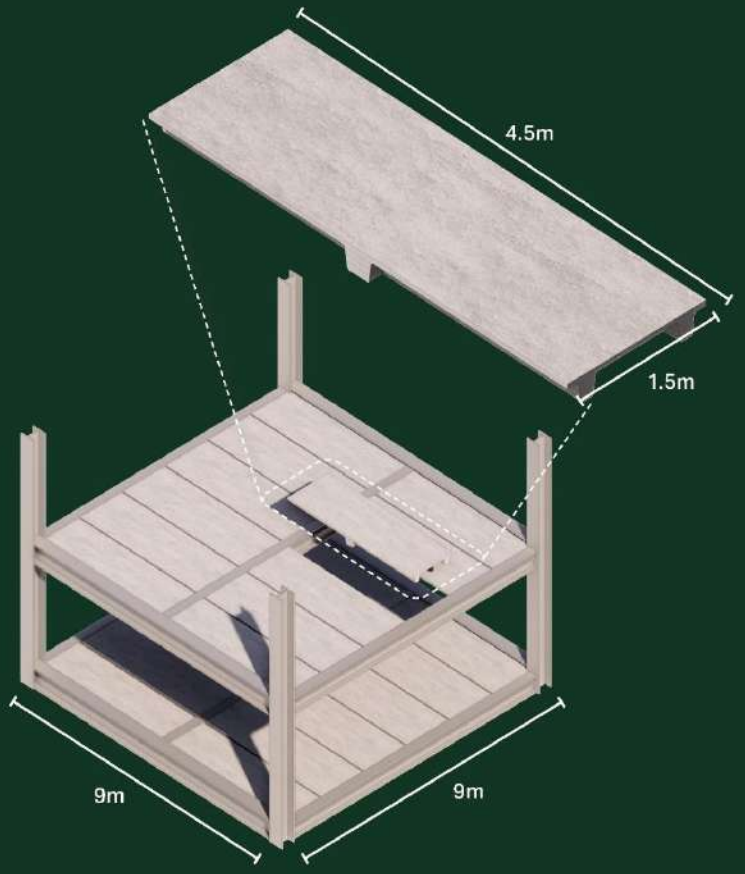
	Refurb	Hybrid 01	Hybrid 02	Hybrid 03	Hybrid 04	Hybrid 05 New Build
# Storeys	**36**	**33**	**31**	**30**	**30**	**30**
# Office Levels	**20**	**16**	**23**	**20**	**16**	**16**
# Lab Levels	**12**	**12**	**4**	**6**	**10**	**10**
# Slabs Retained	**36**	**15**	**9**	**10**	**0**	**0**
% Structure Retained*	**85%**	**55%**	**50%**	**57%**	**30%**	**25%**
GIA (m^2)	**89,843**	**84,700**	**85,000**	**82,200**	**82,100**	**77,667**

*Estimate based on structural volume using ARUP GH script

Our Work

The parti diagram





Our Work

The testing roadmap

British Land ARUP 3XN GXN

Prior concrete and rebar testing conducted 2021-2023

REMOVAL

MARCH 2024
Cut out test panel, manoeuvre out of building and transport to contractor's yard

TRANSPORT

APRIL 2024
Transport test panel to University of Surrey (with a little layover)

TESTING AT UNIVERSITY

JUNE 2024
Three bending tests carried out on slab specimen at Structures and Materials Testing Labs at the University of Surrey

ANALYSIS AND REPORTING

JULY-AUGUST 2024
Reports and documentation summarising the testing procedure, results, lessons learnt, and next steps

John F Hun

Our Work

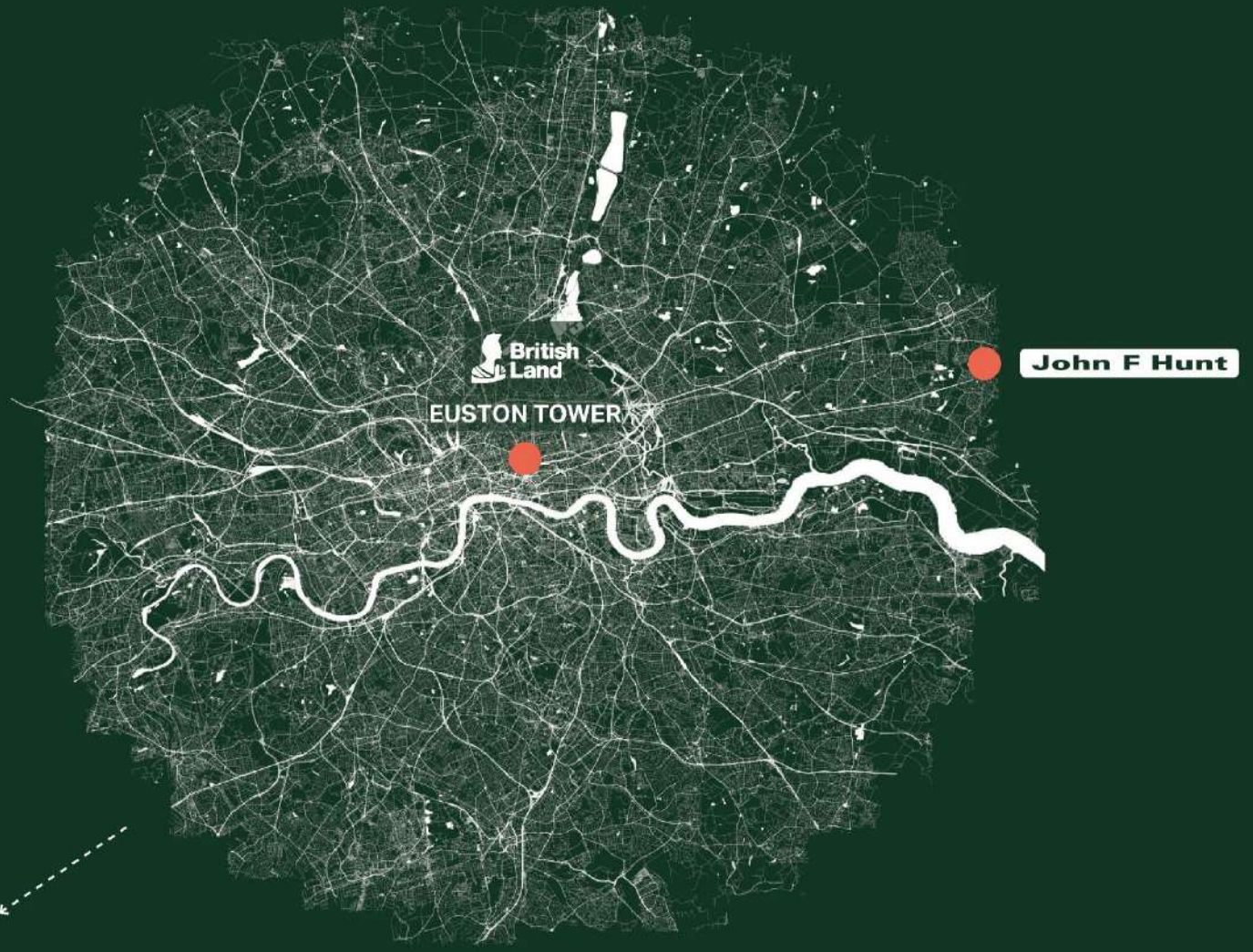
Slab removal

Our Work

Slab removal

Our Work

Transport - where it went



Our Work

Transport

Our Work

Testing at University of Surrey

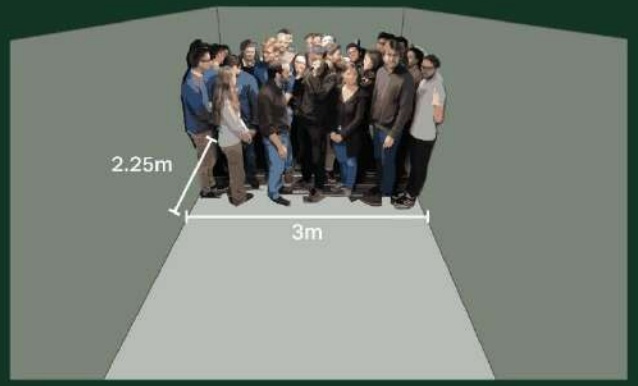
Our Work

We did break the right concrete

Our Work
Results - strength

British Land ARUP 3XN GXN

Typical office live load capacity



NEED
3 kPa

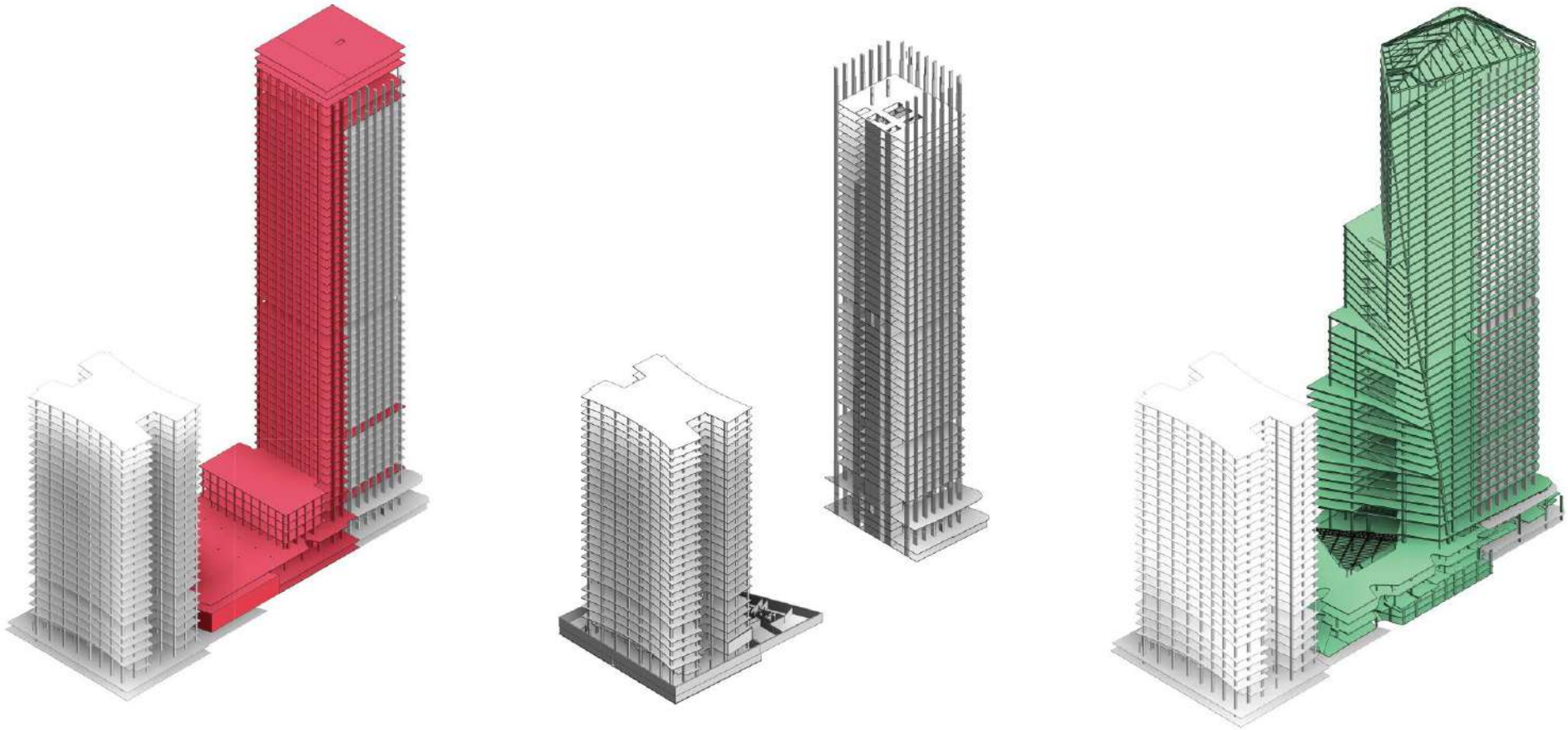
29 people in 6.75m²
4.3 persons/m²

GOT
43 kPa

~400 people in 6.75m²
60 persons/m²

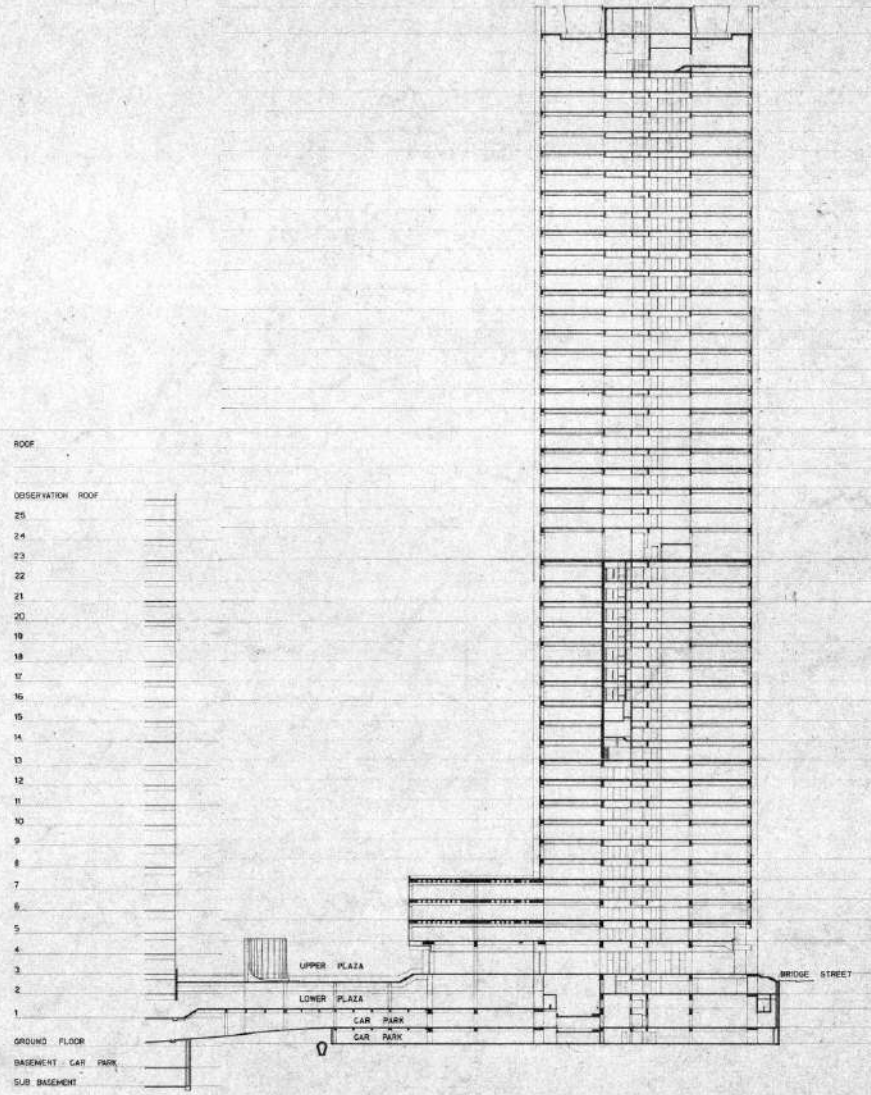
QQT TOWER

RETROFITTING A 60s SKYSCRAPER

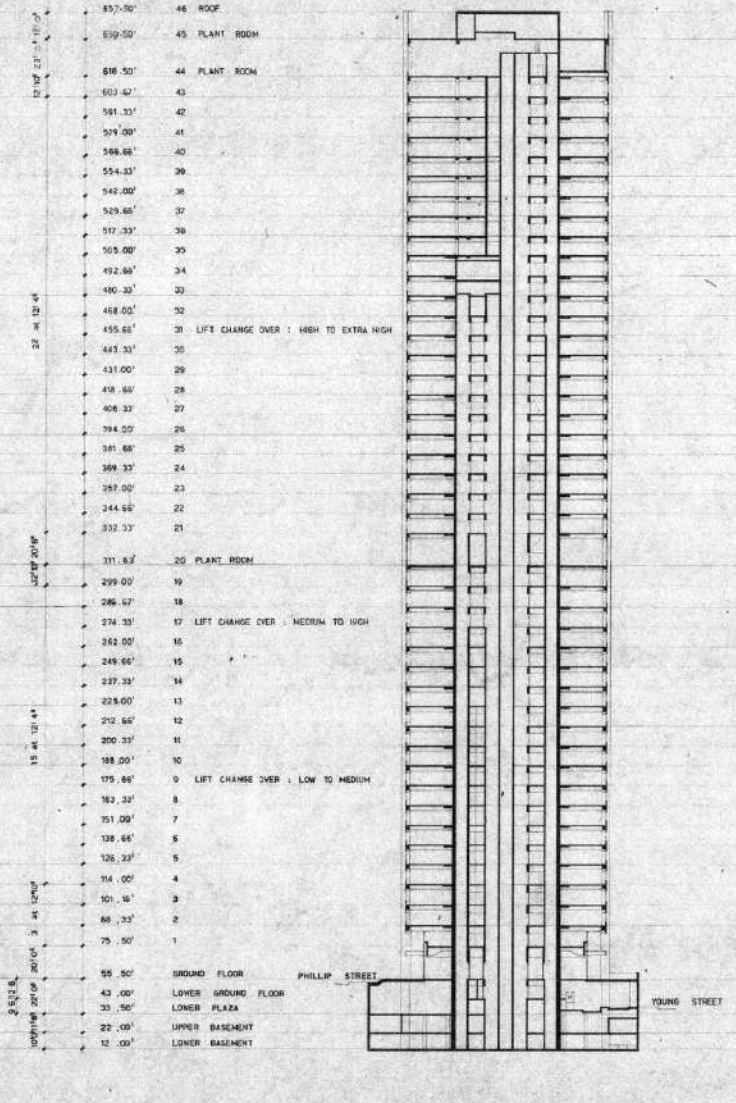


RETAINING 98%

STRUCTURAL WALLS



1 SECTION NORTH-SOUTH



2 SECTION EAST-WEST

A-p Centre/Bldg/218

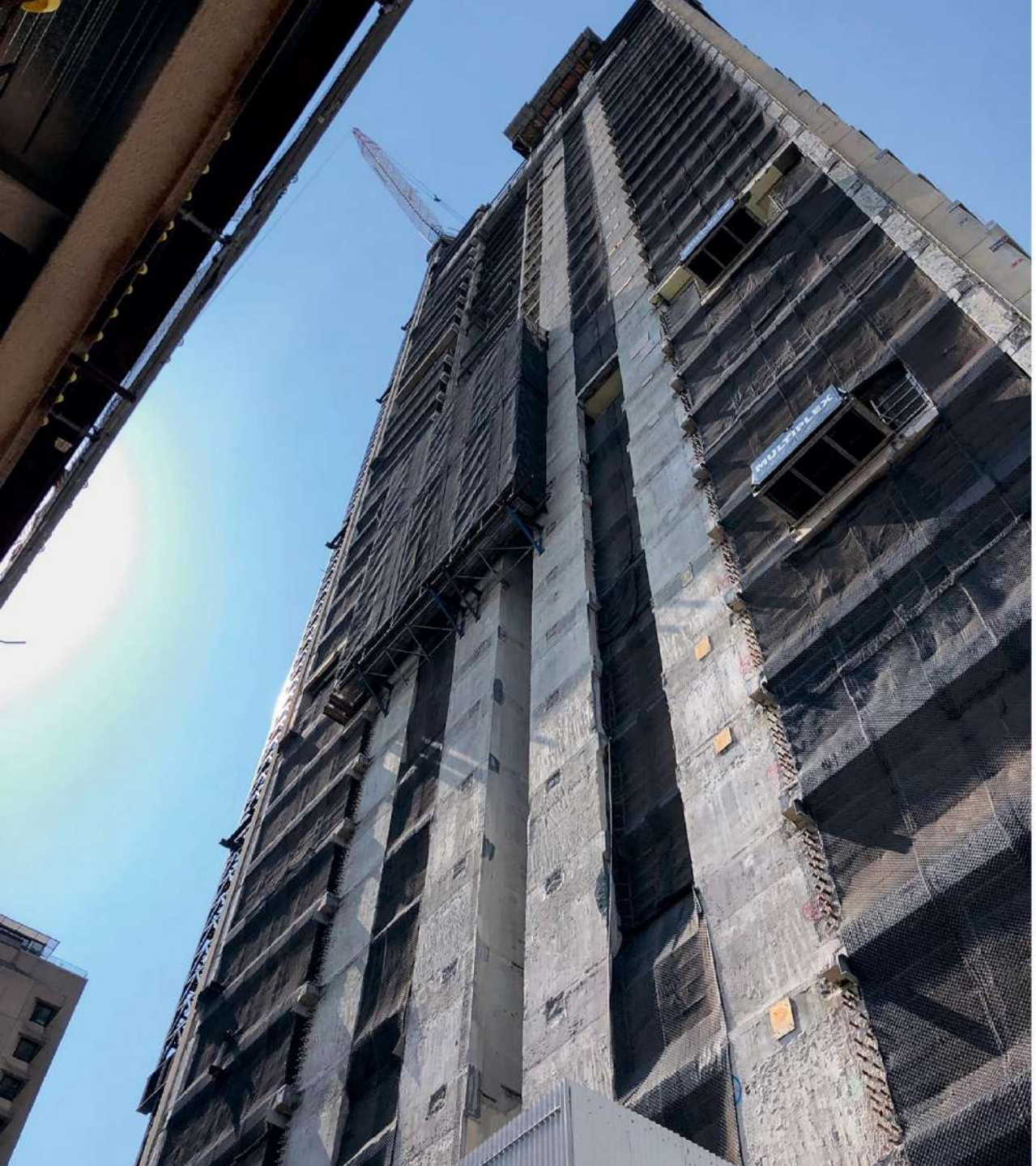
PEDDLE, THORP & WALKER
ARCHITECTS A.M.P. BUILDING, SYDNEY COVE 27 6451

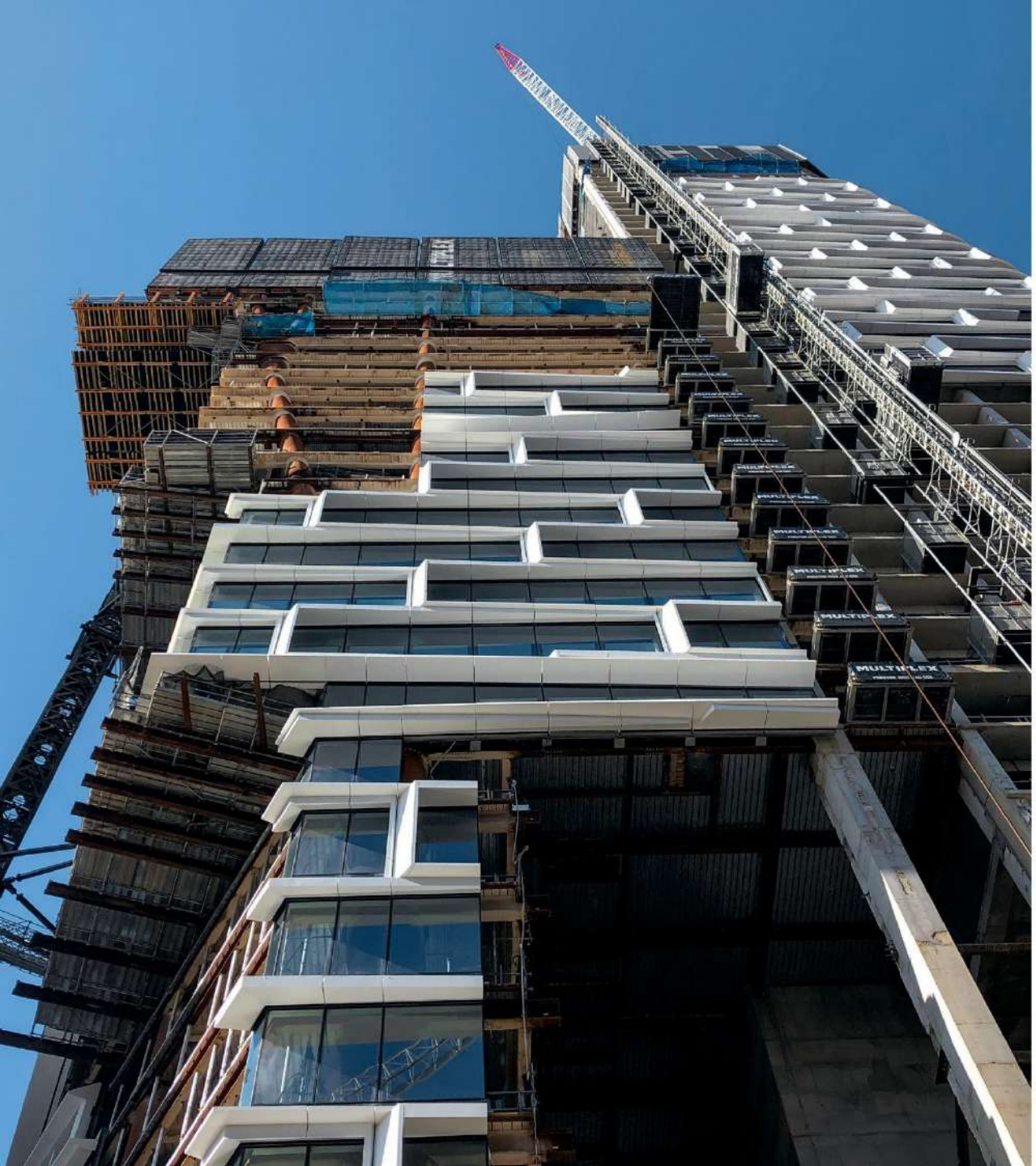
AMP CENTRE
OFFICE BUILDING, BRIDGE ST. SYDNEY
FOR AMP SOCIETY

TITLE DIAGRAMMATIC SECTIONS

DRAWING NO. P 232

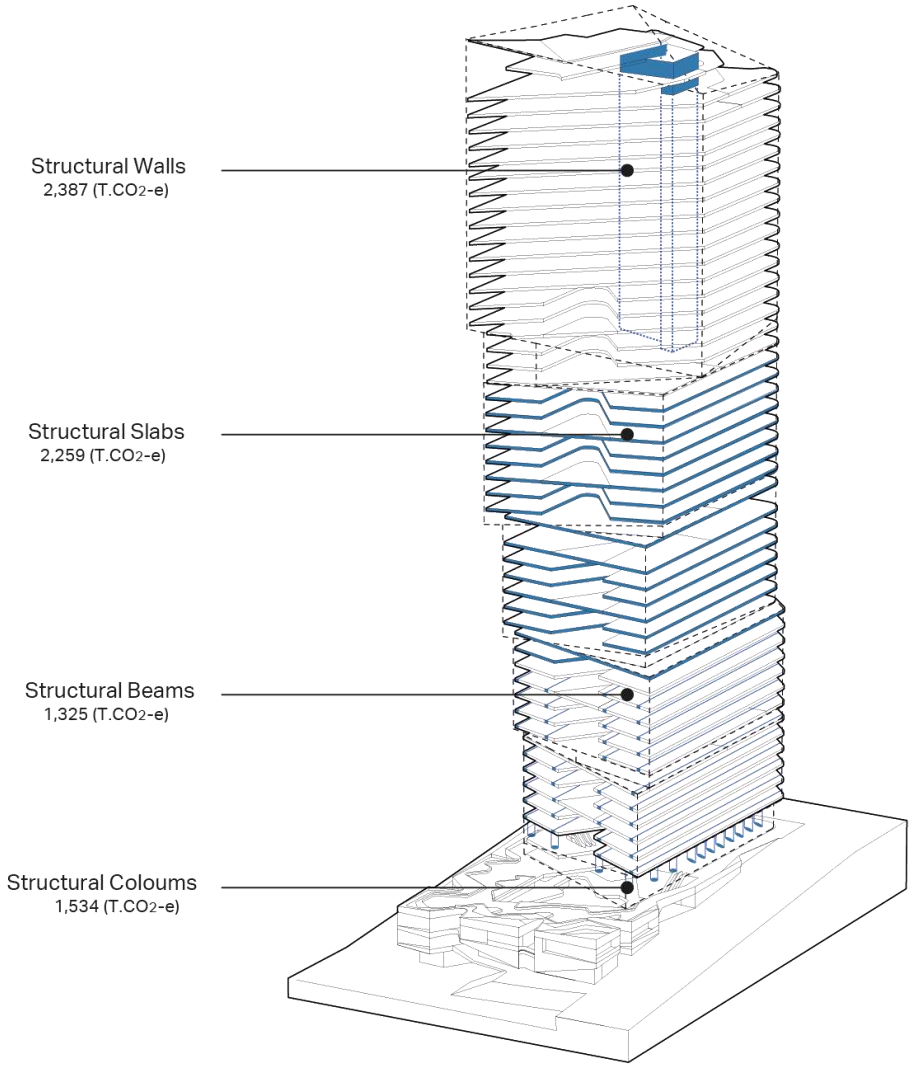
JOB 65349


MULTIFLEX


MULTIFLEX

+12.000 Tons of CO_2 *

EMISSIONS SAVED



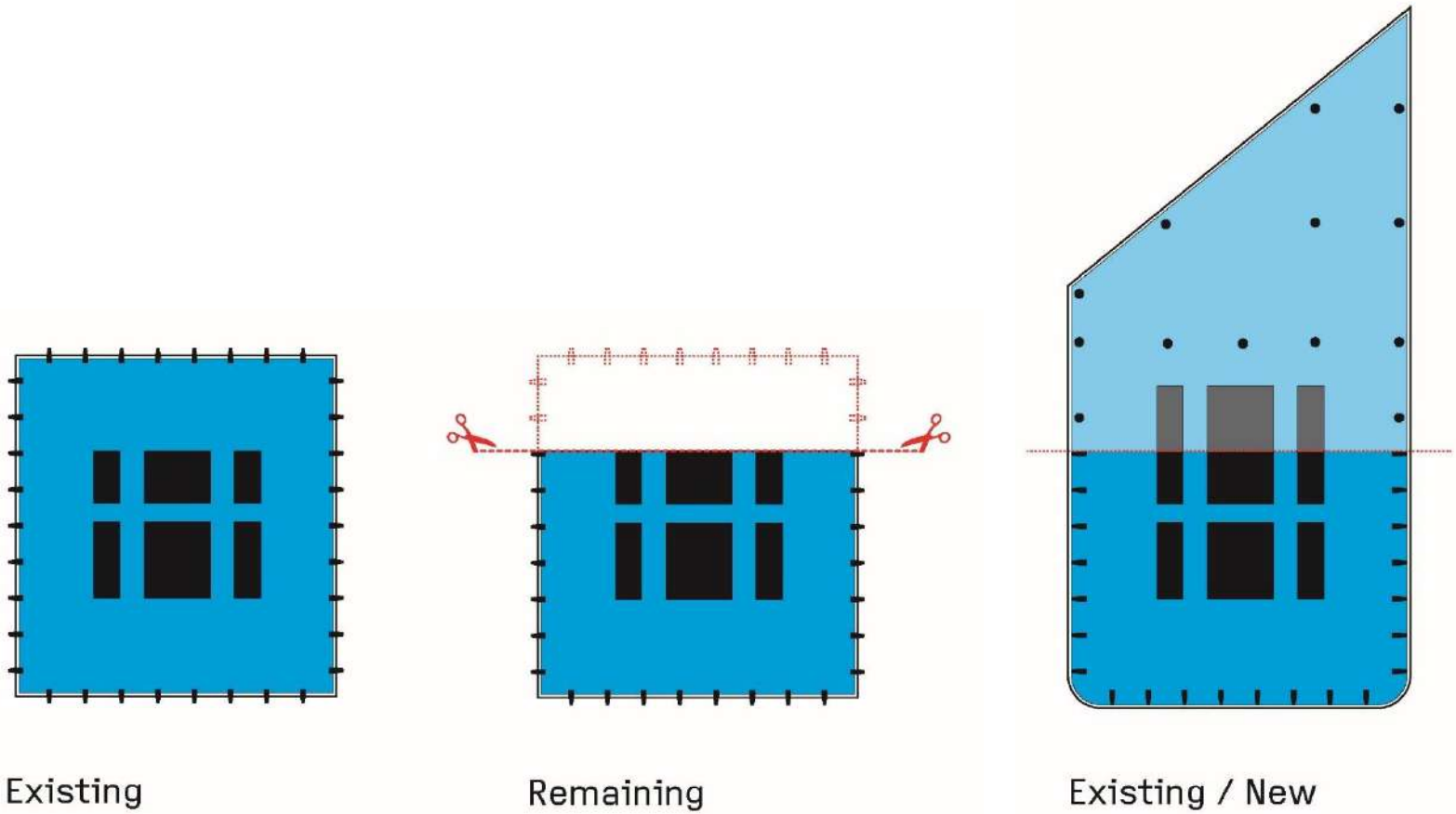
* The results are based on a published Australian data.

LOW CARBON LIVING CRC

3XN

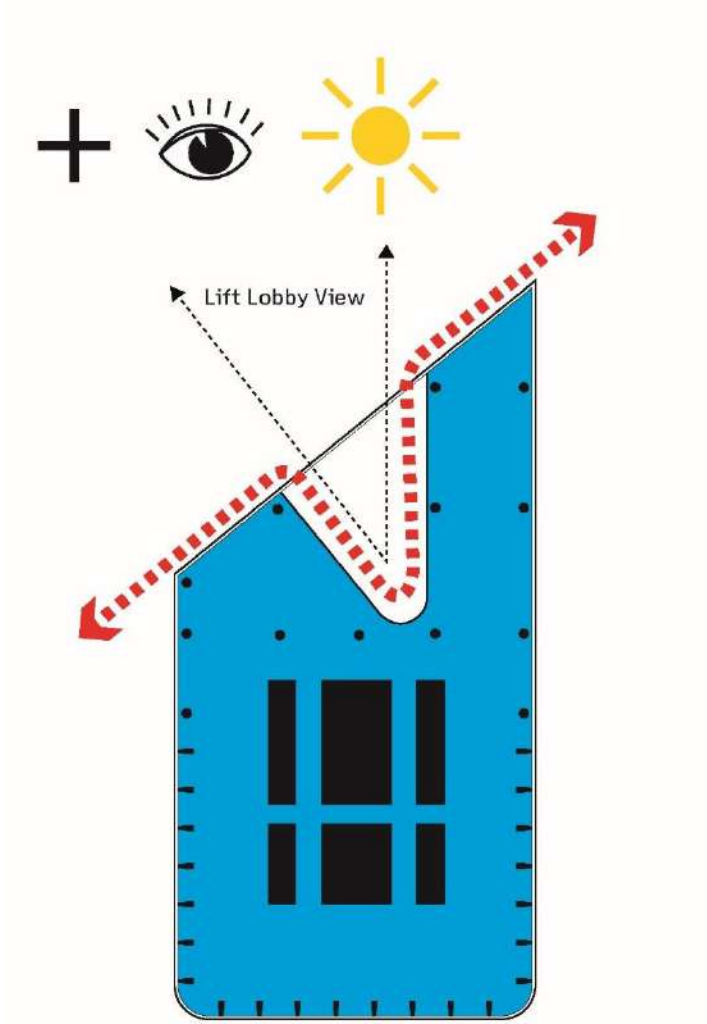
DOUBLED THE FLOORPLATE & POPULATION

1100m² to 2200m² / 4500ppl to 9000ppl

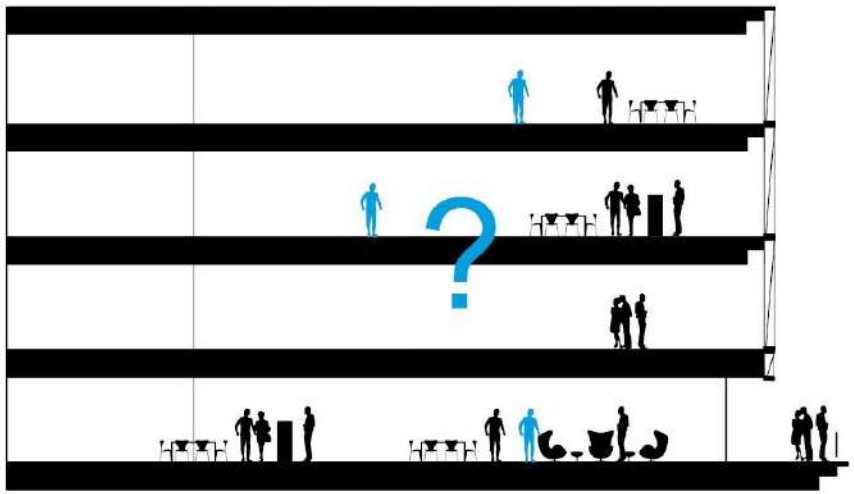


$130,000,000

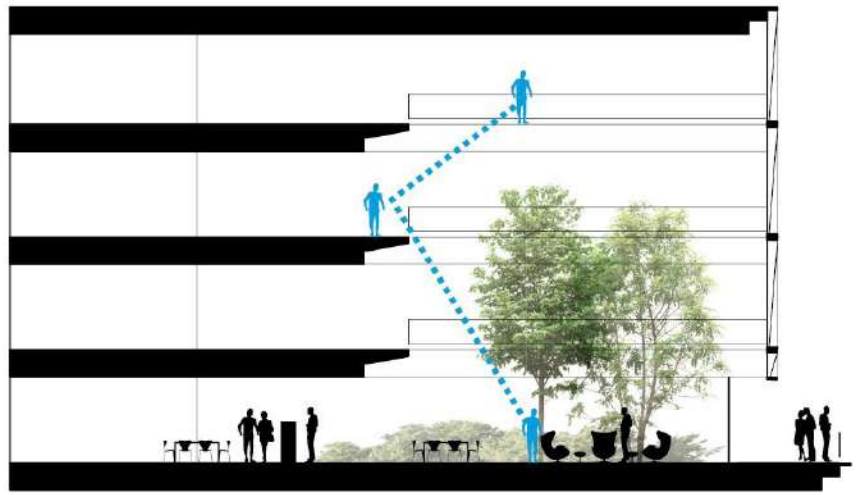
MATERIAL + TIME SAVED



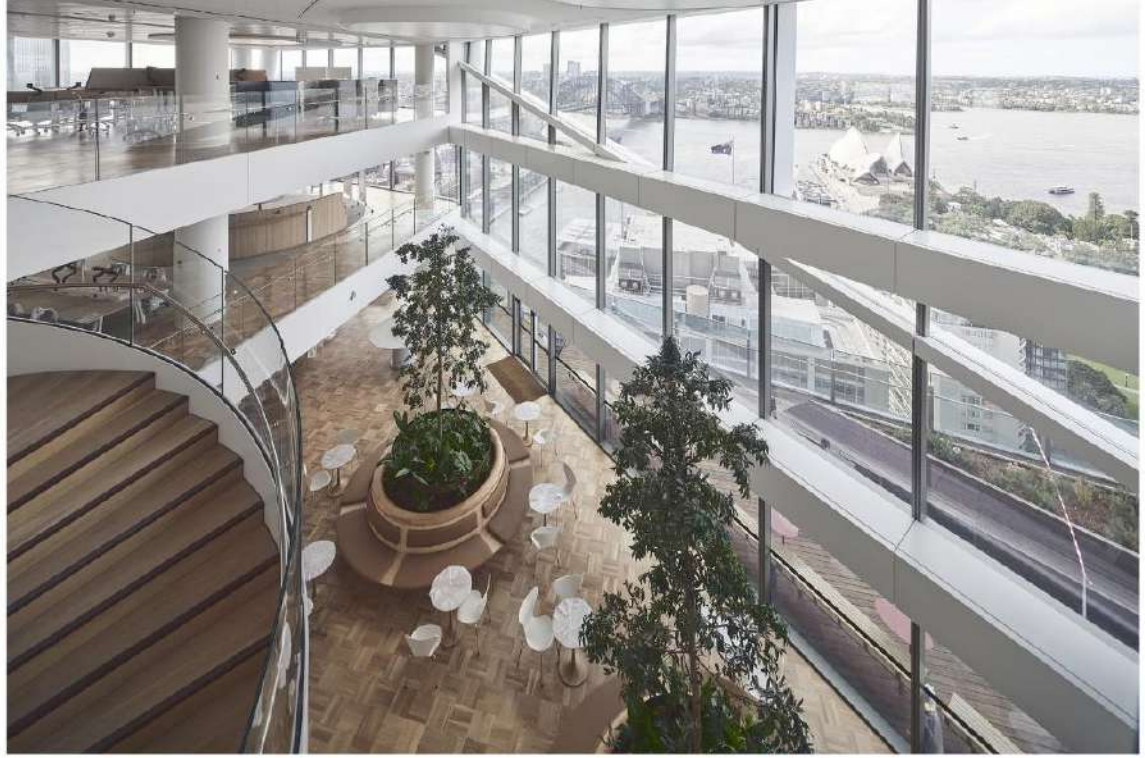
Increased Views / Daylighting

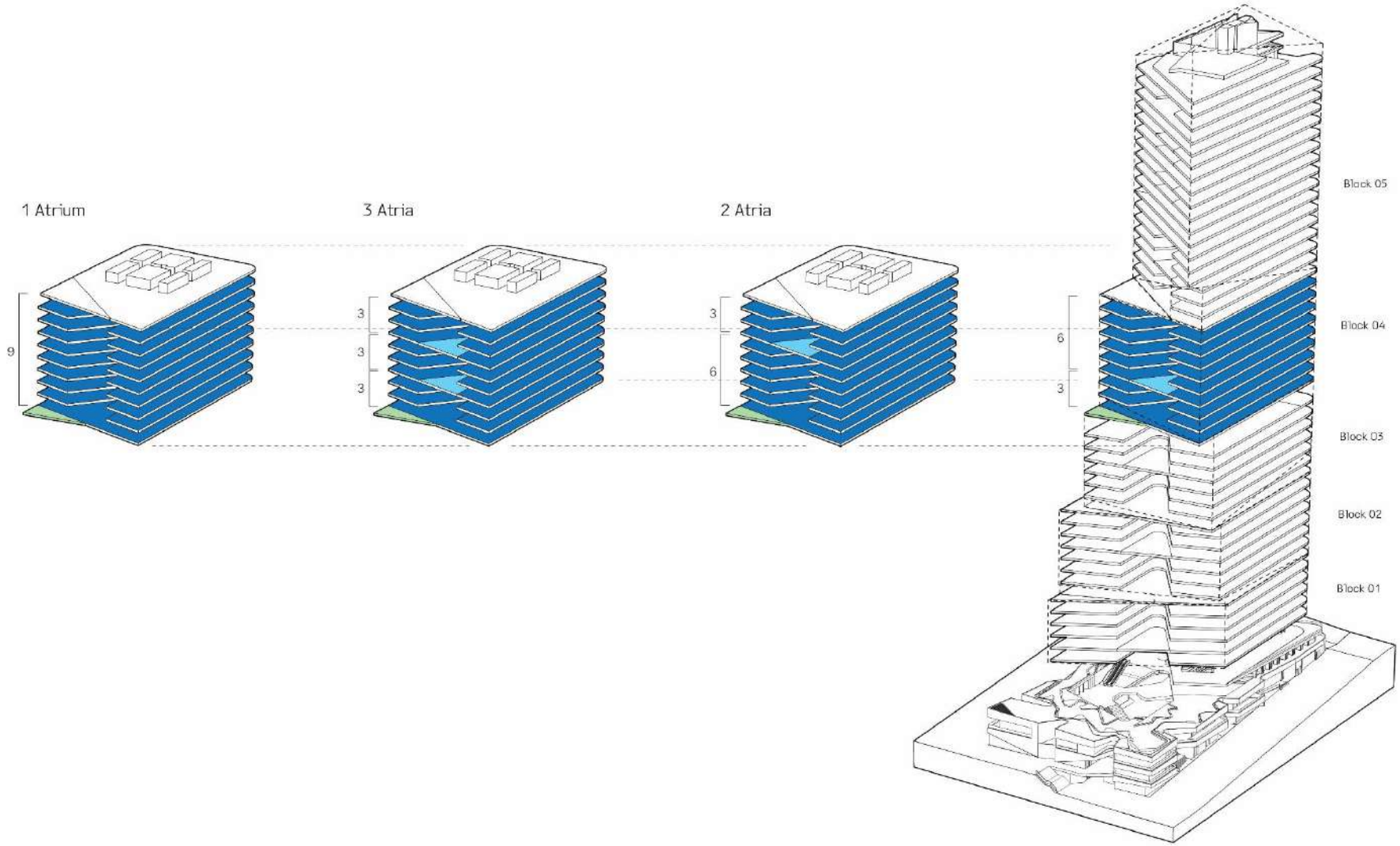


Typical High Rise

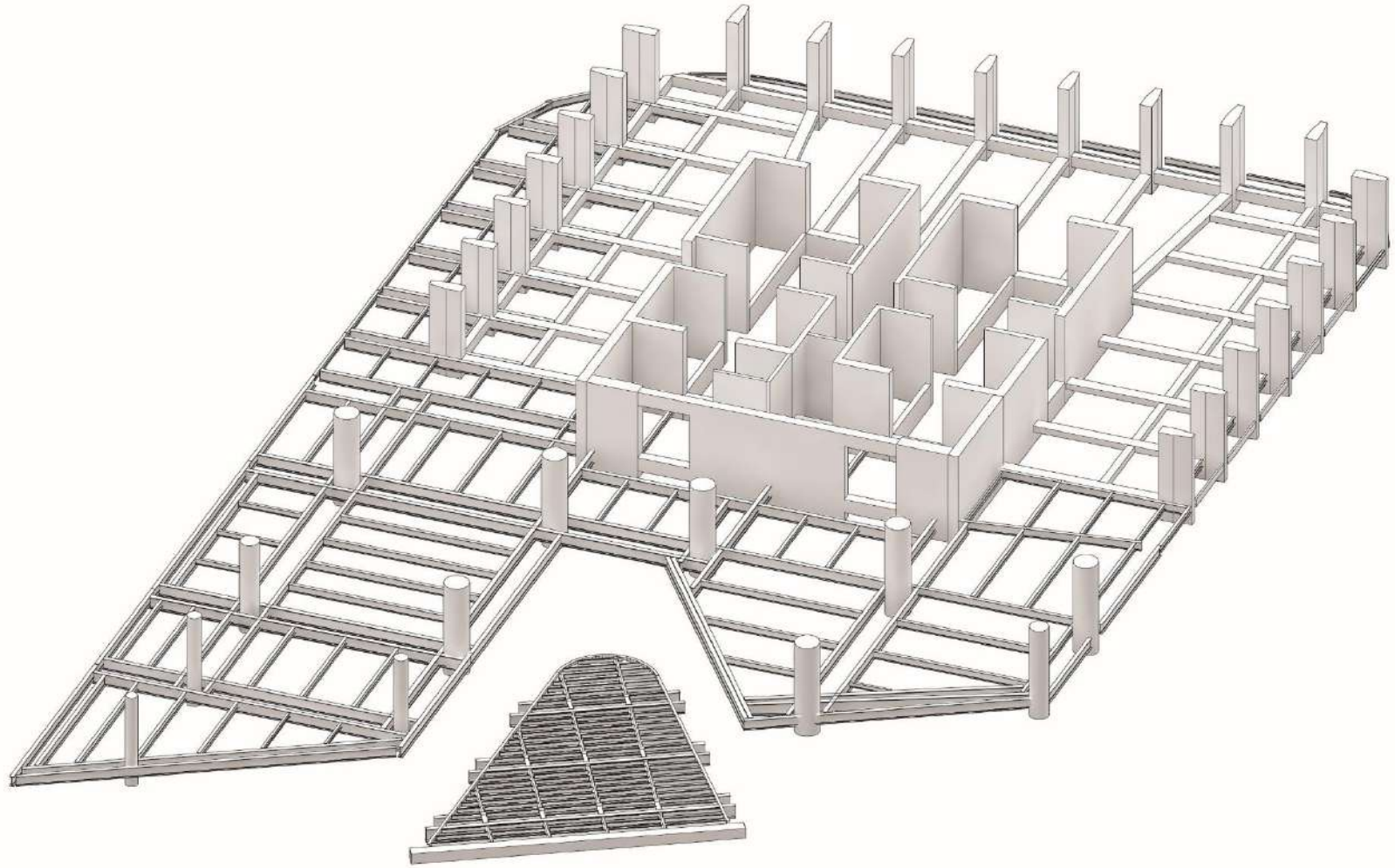


Proposal

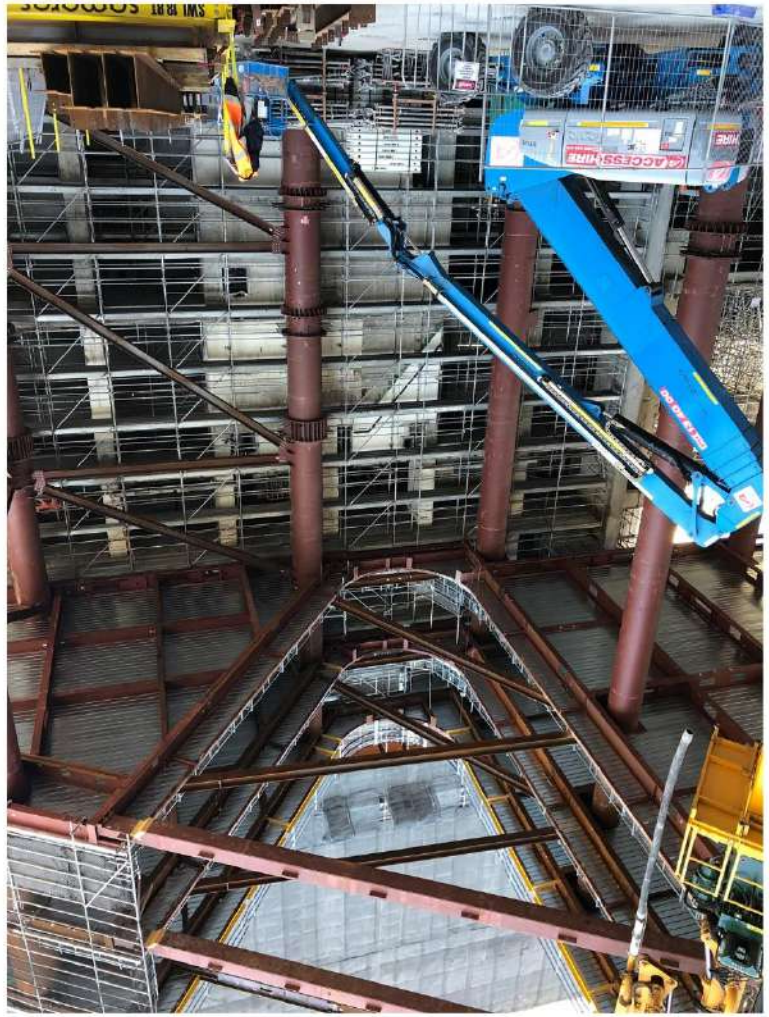


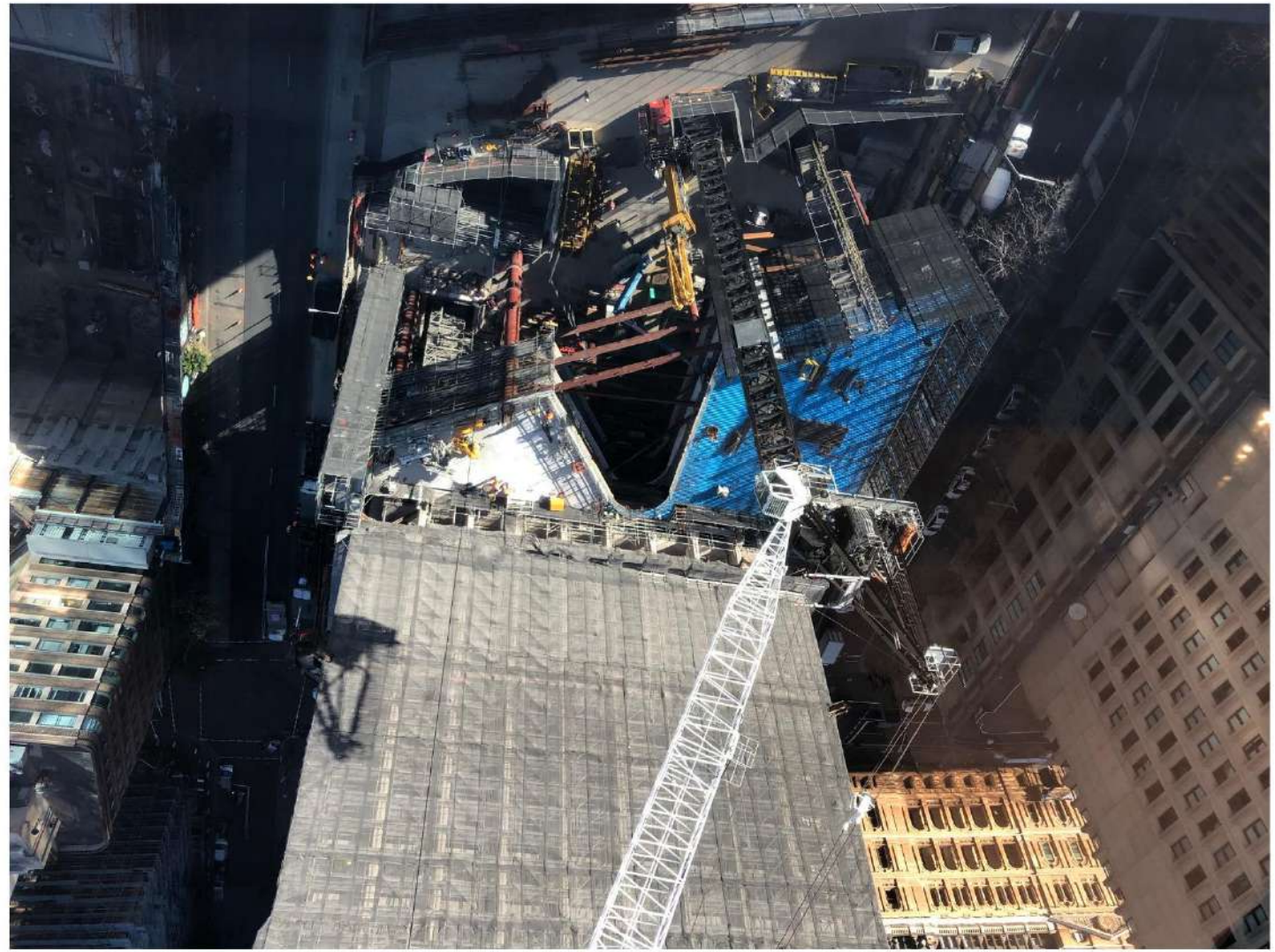

1 Atrium
3 Atria
2 Atria
9
3
3
3
3
6
6
3
Block 05
Block 04
Block 03
Block 02
Block 01

3XN




RIX
EXIT


ACCESS HIRE




Marriott

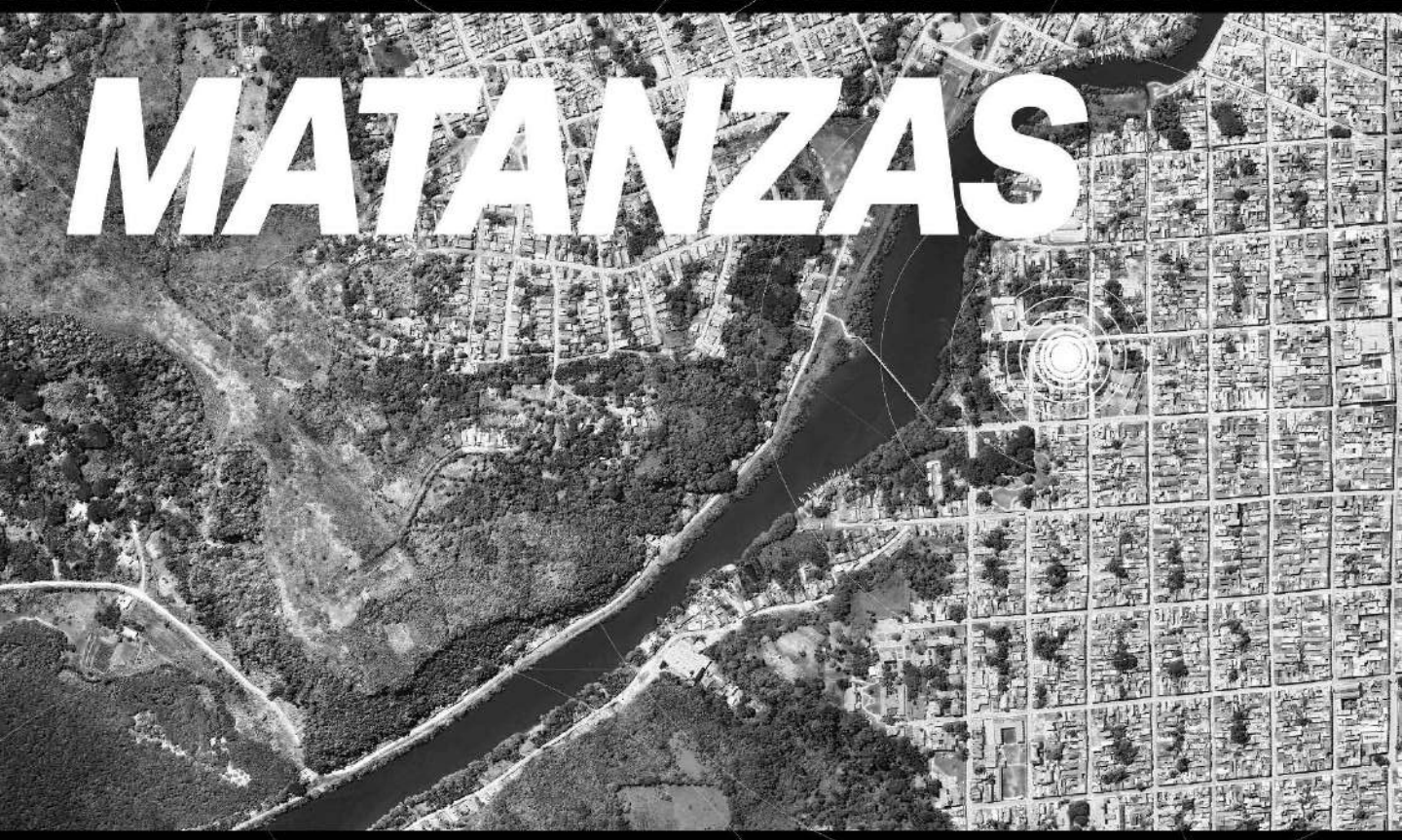

AMP
AMP

Local Resource / Collective Knowledge

Intelligens. Natural. Artificial. Collective. 2025

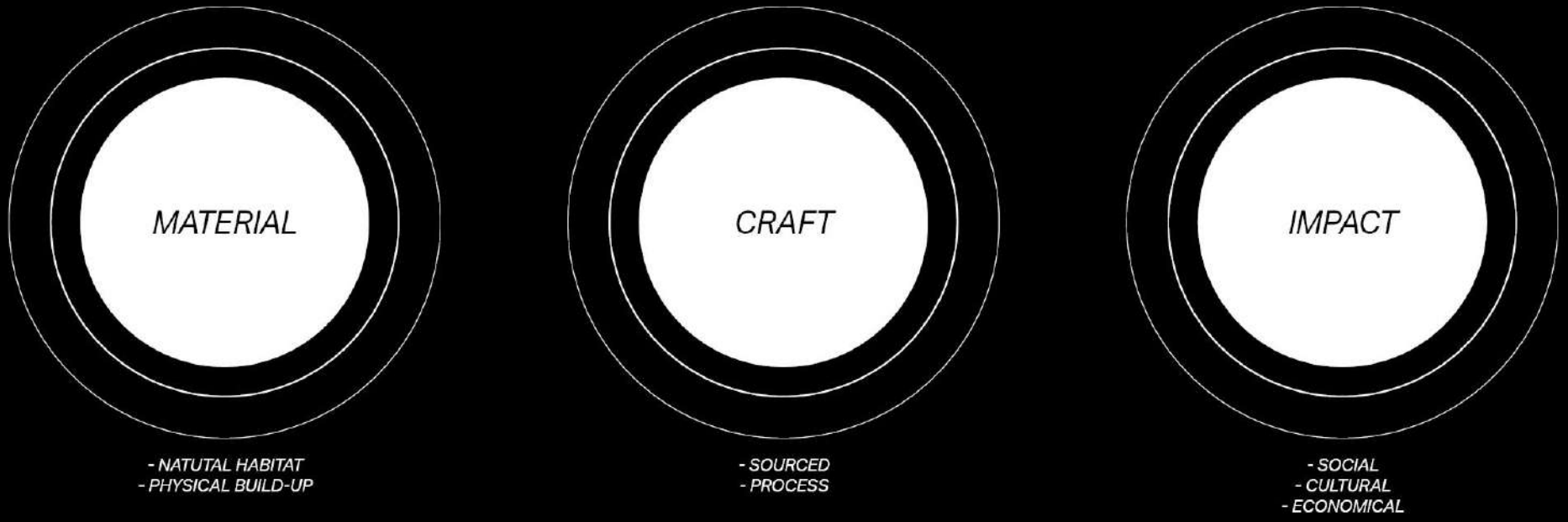

What might
architecture become if
we began with place?


VENETO


MATANZAS


JUTLAND

Mapping


MATERIAL
- NATUTAL HABITAT
- PHYSICAL BUILD-UP
CRAFT
- SOURCED
- PROCESS
IMPACT
- SOCIAL
- CULTURAL
- ECONOMICAL

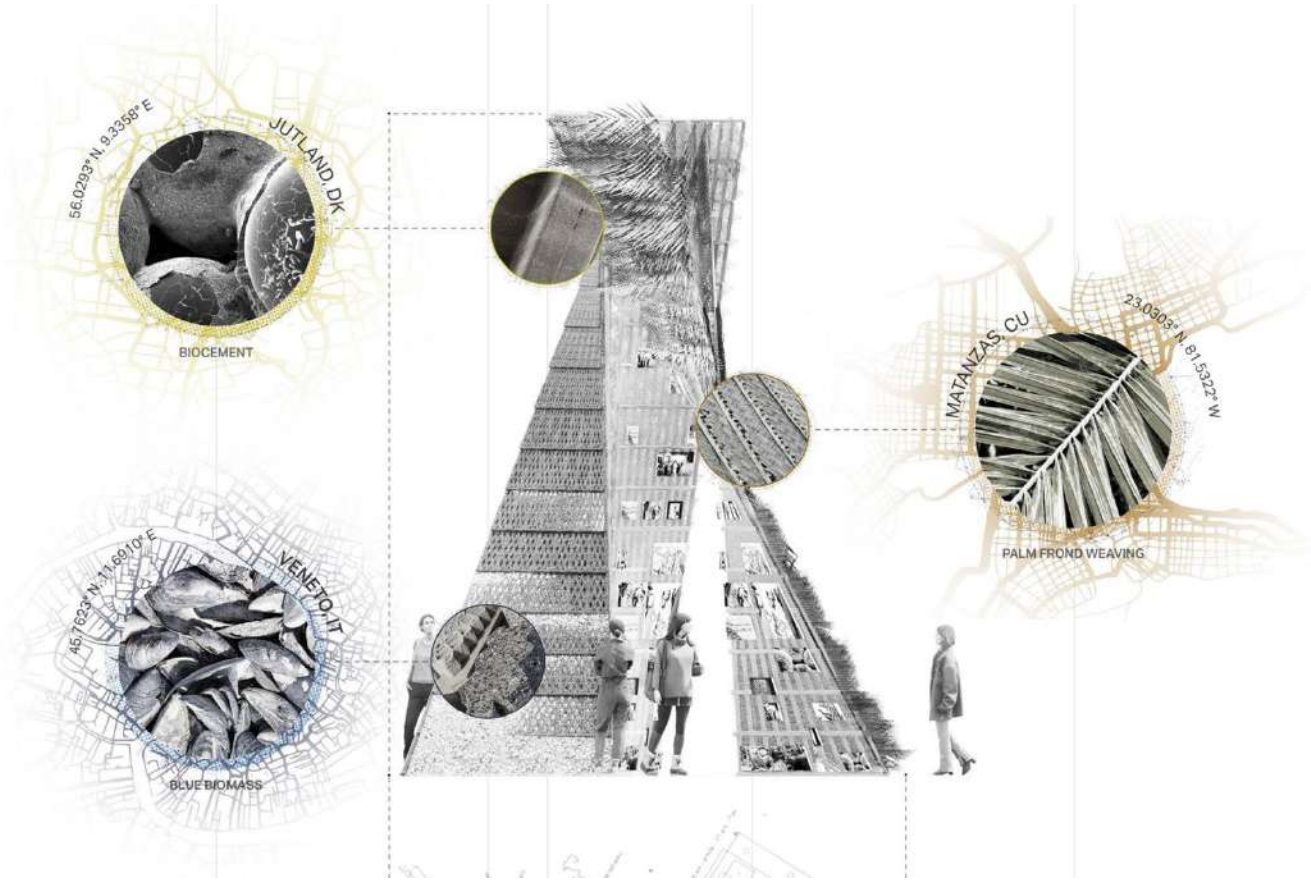
Materials


45.7623° N, 11.6910° E
VENETO, IT
BLUE BIOMASS


MATANZAS, CU
23.0303° N, 81.5322° W
PALM FROND WEAVING


56.0293° N, 9.3358° E
JUTLAND, DK
BIOCEMENT

Exhibition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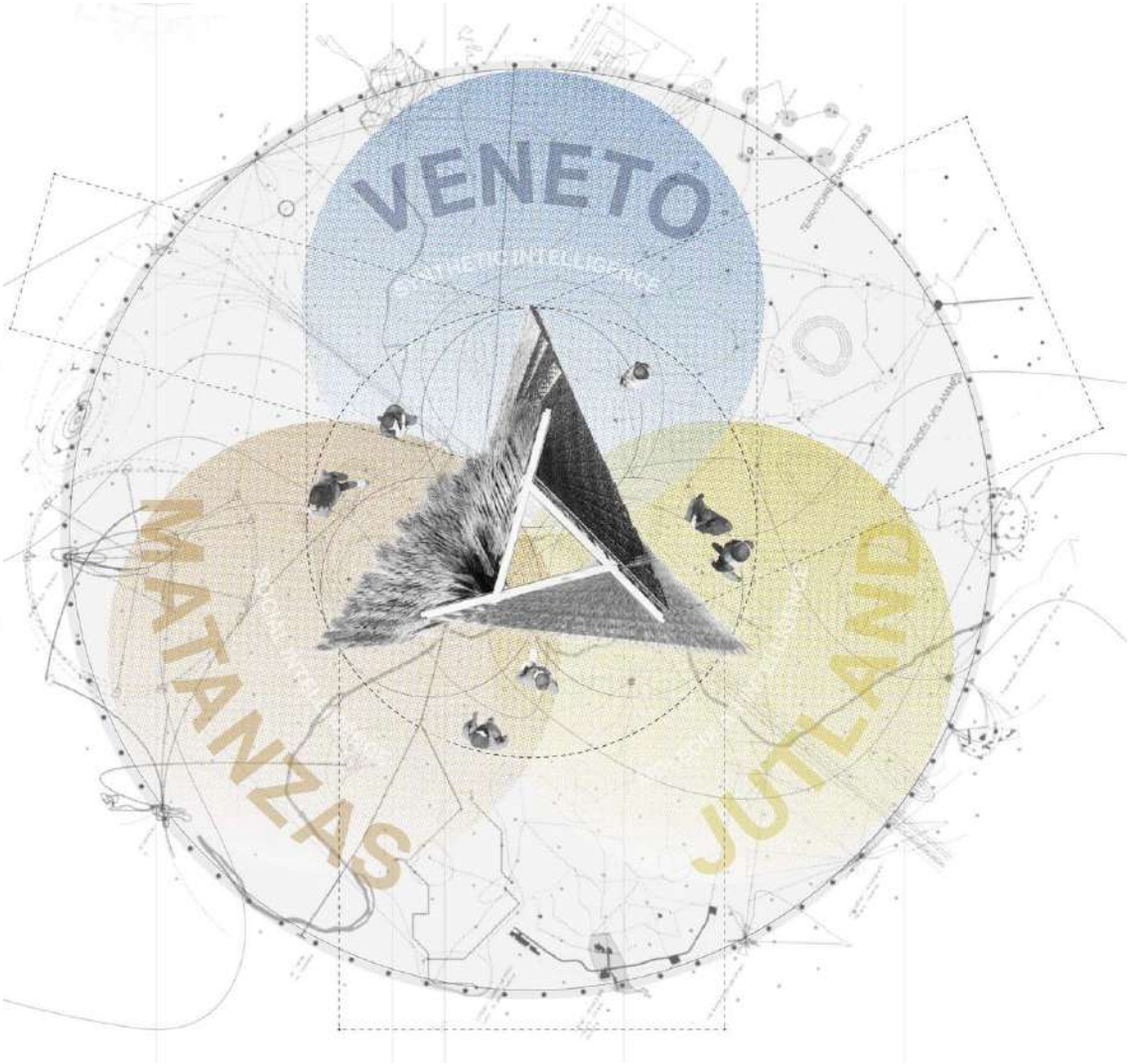
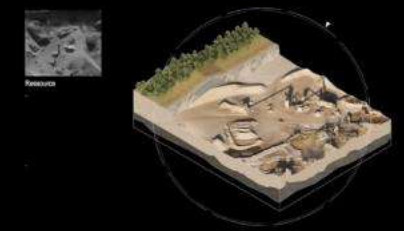
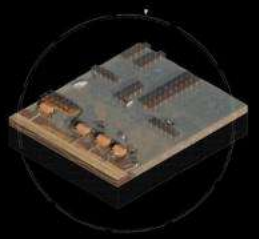

VENETO
MATANZAS
JUTLAND


Ressource

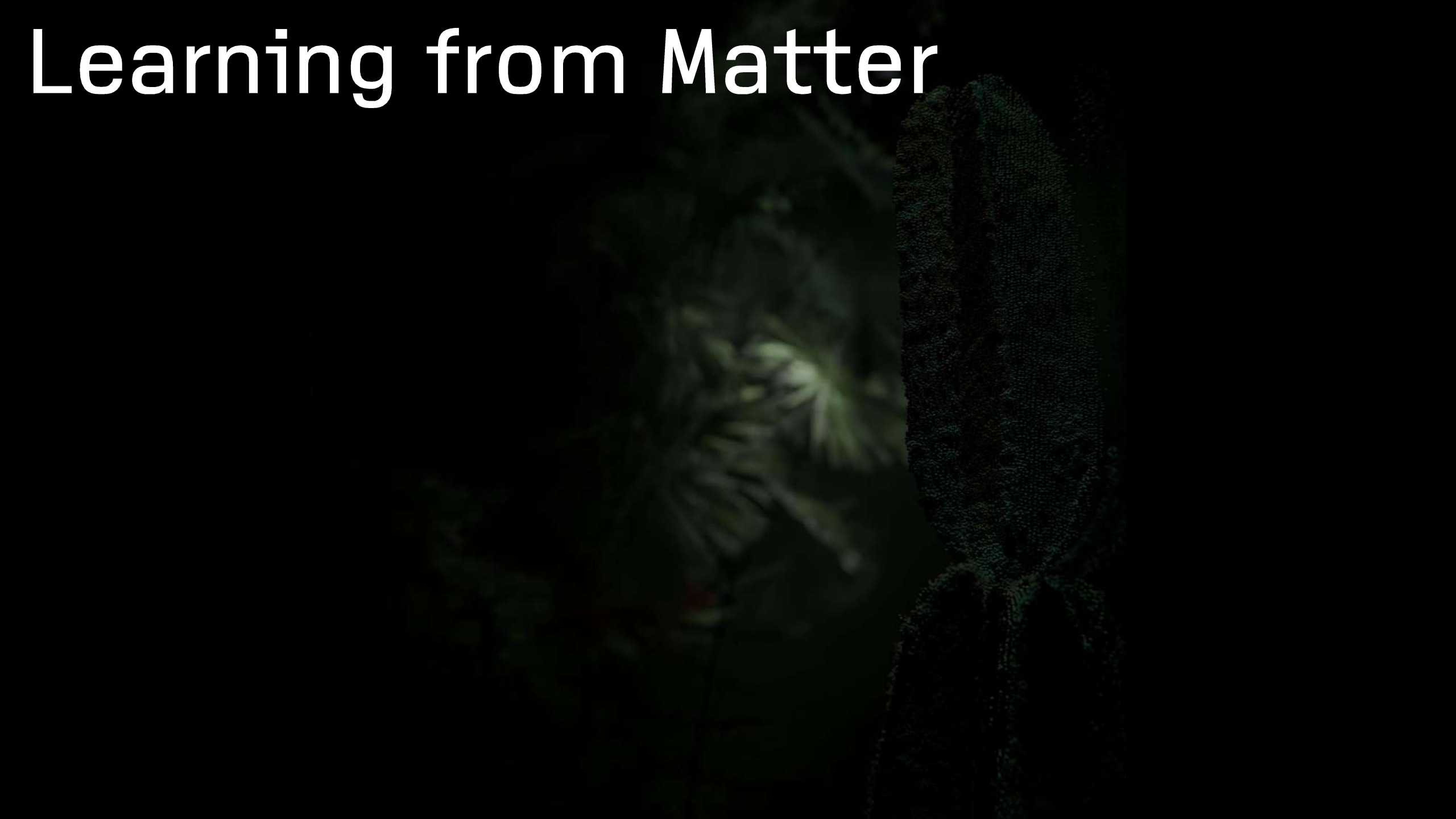
Learning from Place



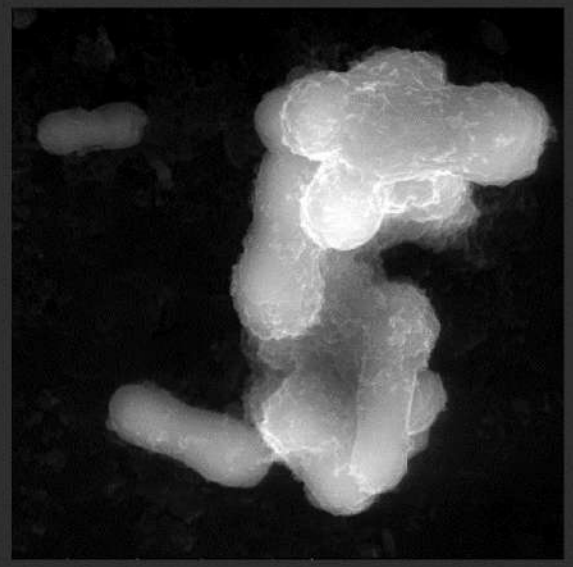
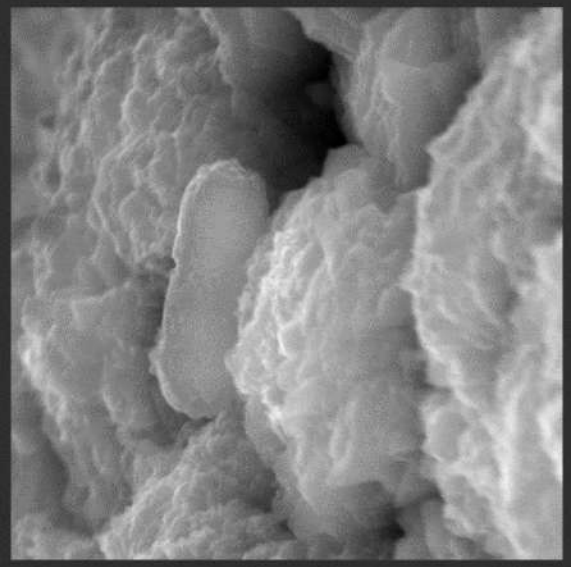
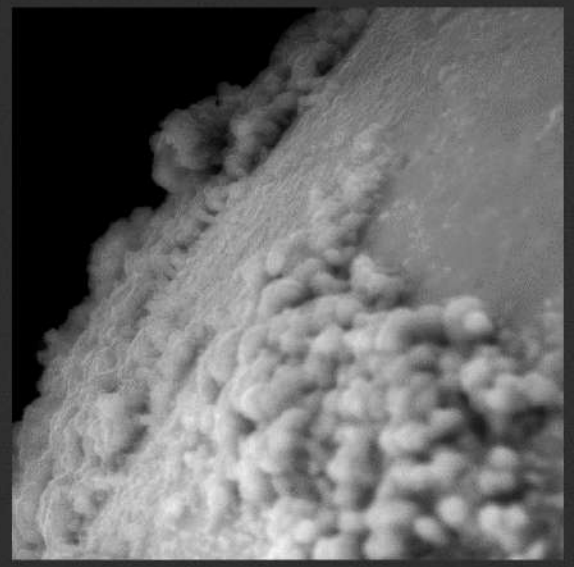
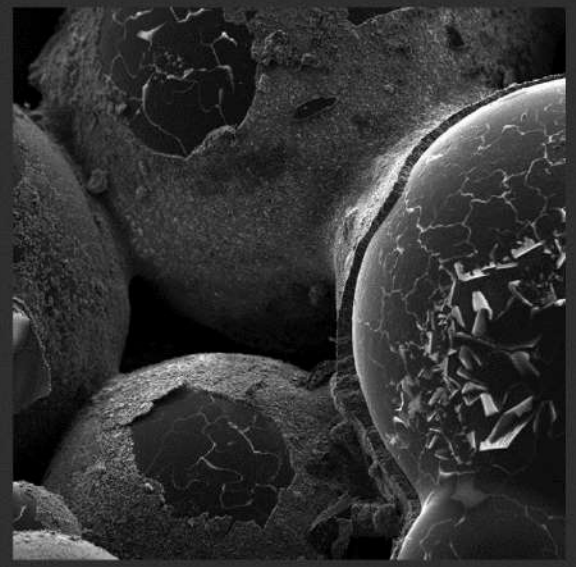


Learning from People

Learning from Matter



Growing Process

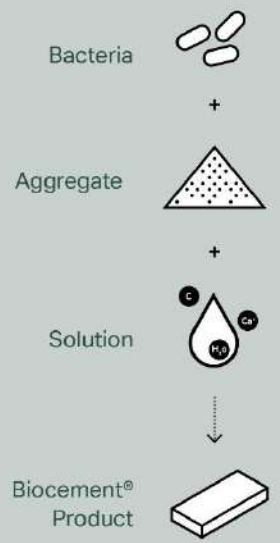





How Biocement® is made

Biomineralization is seen throughout nature.
For example, corals or stalacites are macro-organisms that carry out biomaterialisation to construct a sandstone-like 'skeleton.'

Biological

Unlike traditional Ordinary Portland Cement (OPC), Biocement® incorporates bacteria into a mix of gravel, sand, and nutrients, eliminating the need for fossil fuel-fired kilns or limestone calcination. This innovative process significantly reduces carbon emissions.



Growing Tiles

Biolith®

The Market ready Biolith® tile is ***3x stronger & 20% lighter*** than standard concrete tiles.

3x Stronger

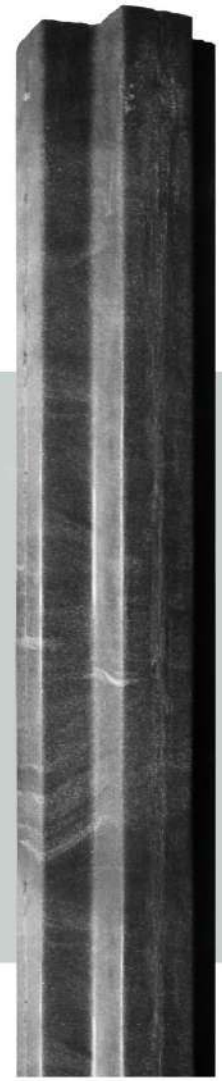
20% Lighter

Growing Structures

The Column

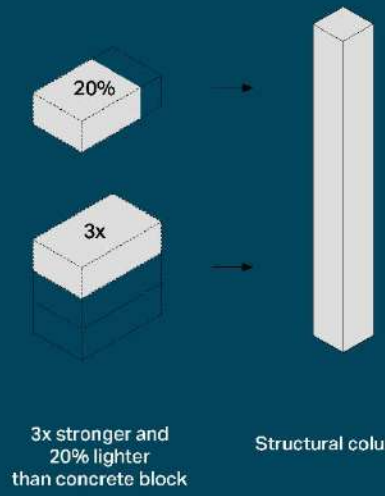
Imagine a building system fully grown by natures smallest organisms – bacteria – with the strength and capabilities of concrete.

With this project we seek to investigate the structural applications of the revolutionary Biocement® technology, which uses natural processes inspired from coral reef to bind aggregate material together to a strong and firm material reminiscent of concrete.



The scalability

BioMason: Why scale the use of The BioMason technology into a large tectonic use in the build environment; A æow C02 footprint, 3 stronger the regular concrete & 20% lighter then concrete blocks.



The Challenge

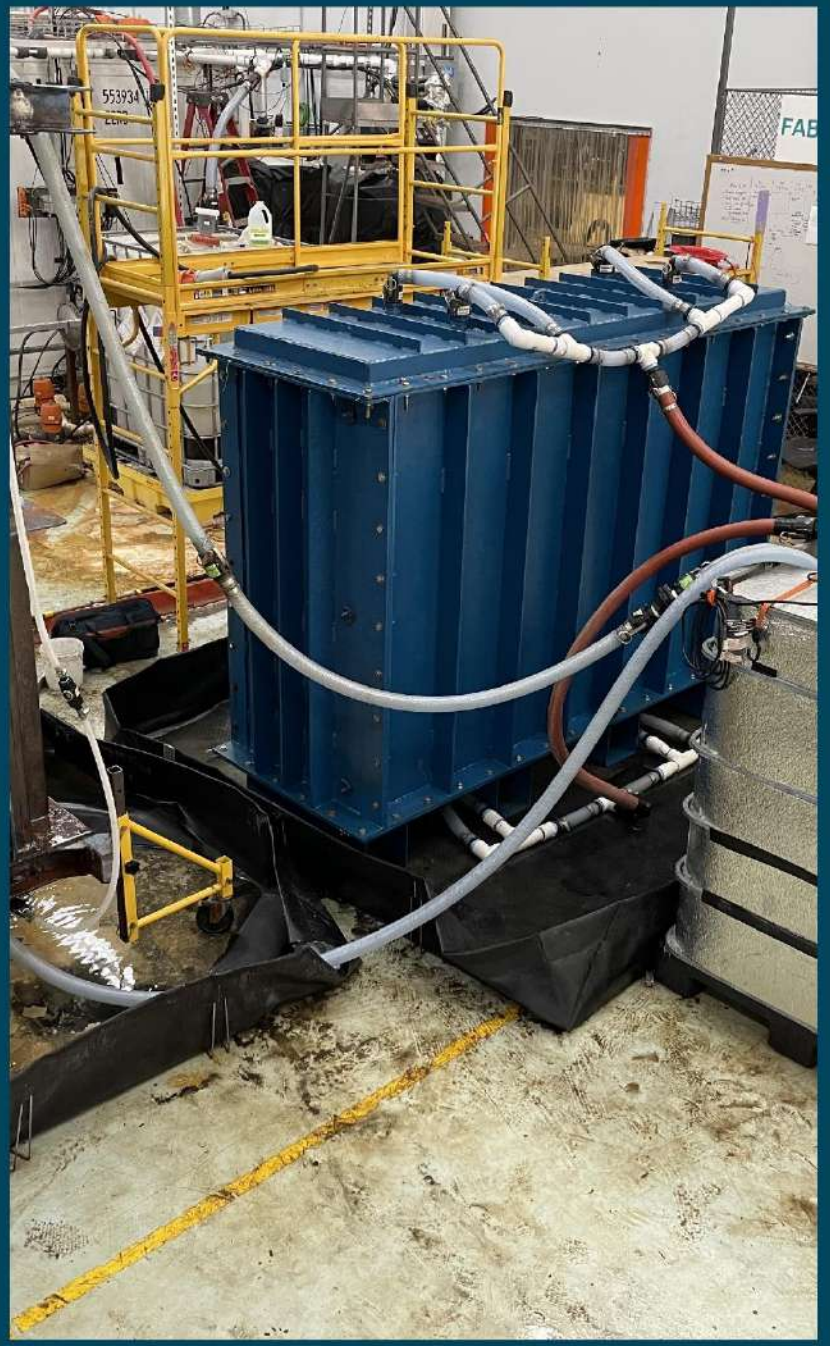
The Context: The cement production in Denmark emitted 2.25 million tonnes of CO2, last year (2022). - The largest C02 emitter in Denmark.

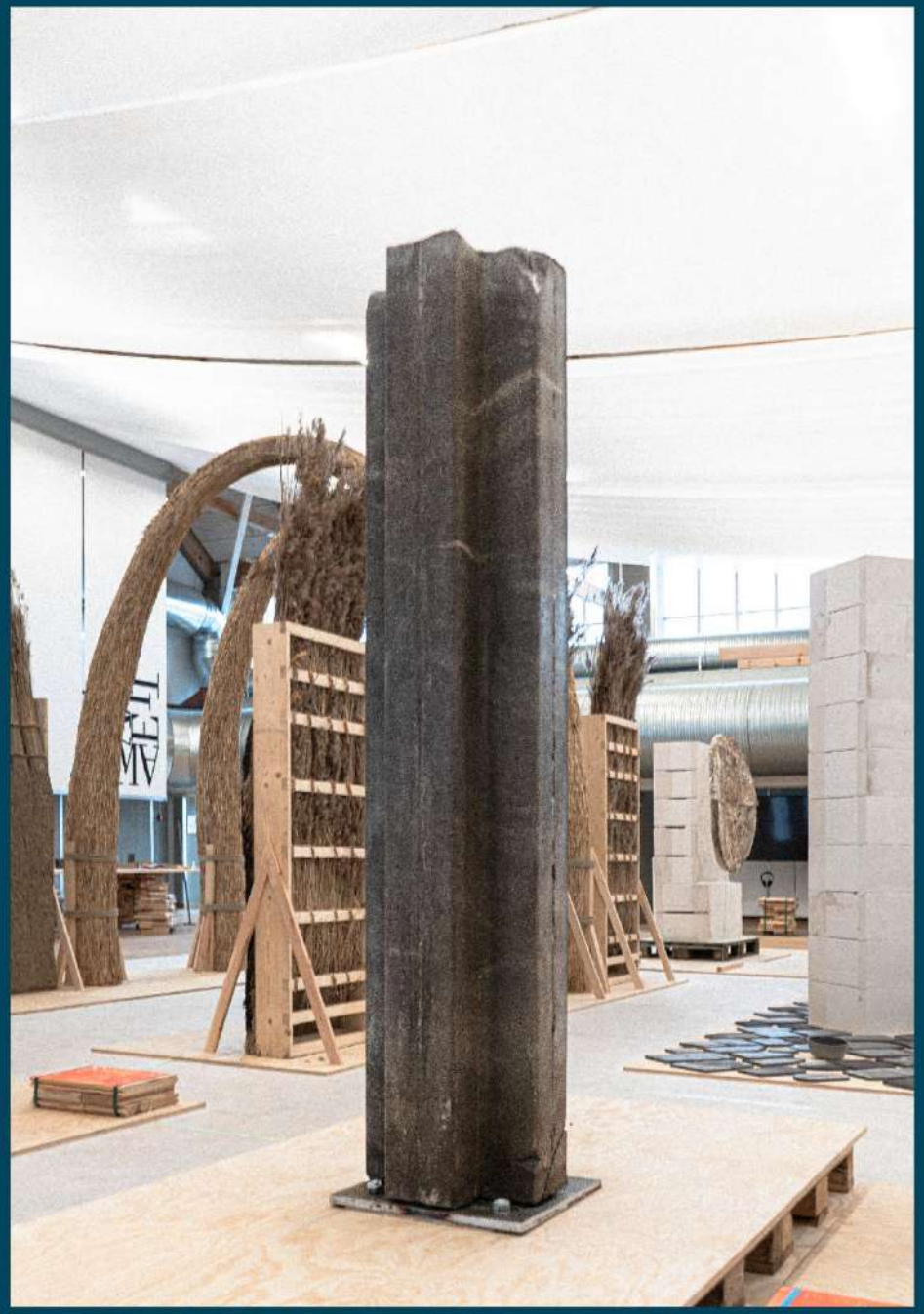
35%
Materials

40%
CO_2

37%
Waste


DANGER
GASOLINE





A RESOURCEFUL LEAP

FROM THEORY TO PRACTICE

26.11.2025 - Regenerative Design, RESET

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