The Material World

Phil Coffey

Coffey Architects

20 Years

Brimming with energy and a touch of wit sharpened by diligence, Coffey embodies a diverse mix of personalities, strengths, and skills. It’s our blend of zest and technical expertise that moulds our work into creations that bring joy and satisfaction.

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PRODUCTION
MODELLING
PRESENTATION
VISUALISATION
DELIVERY

- **Materials we have used**
- **Materials we are excited to start using**
- **Sectors: Office, BTR, Co-Living, Later Living, Social Housing**

The Material World

Introduction

Construction industry under pressure: Rising material costs + ESG expectations

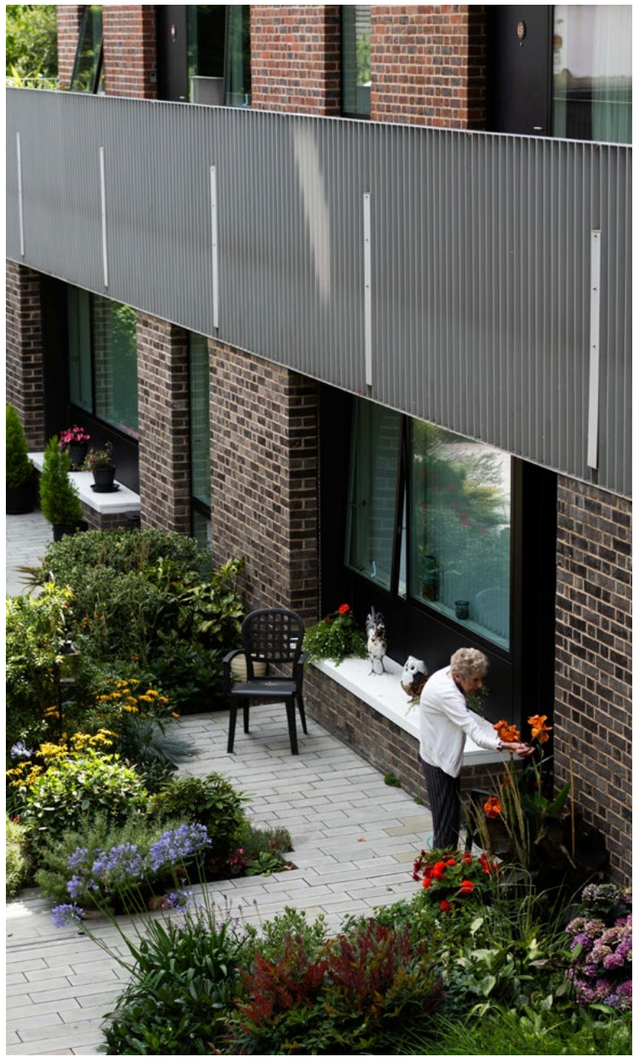
Hidden challenge: Operational costs and long-term management

Materials impact more than carbon: They shape building performance and durability.
Decisions affect maintenance, energy use, and total costs over 30+ years

Goal: Balance upfront cost, sustainability, and long-term value

Light & Landscape

As materials



Three Types of Sustainable Materials

That we have enjoyed using

Metal

Circular design

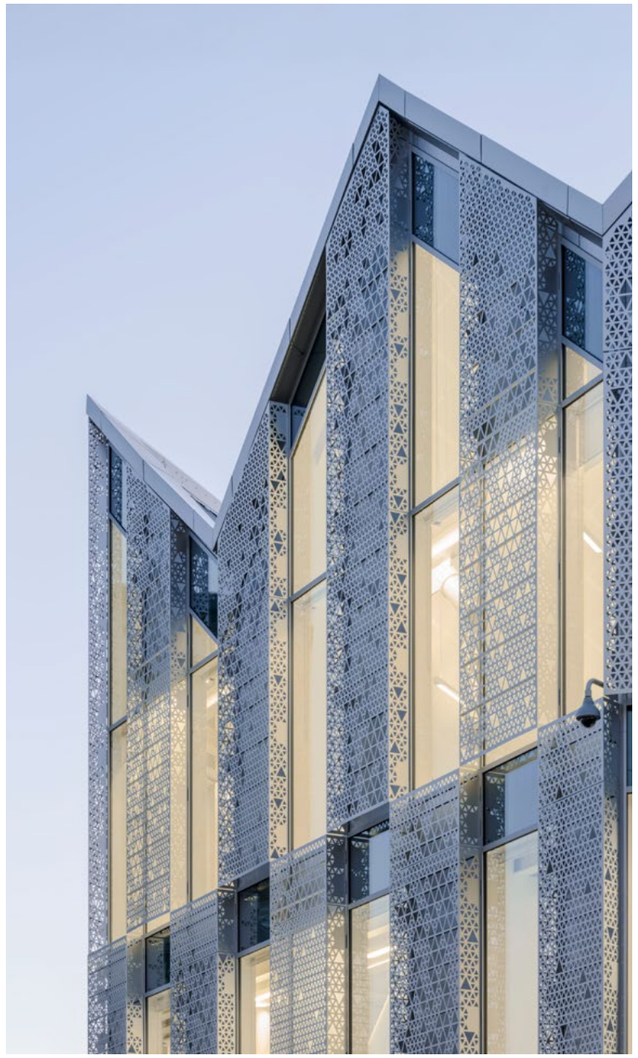
Brick

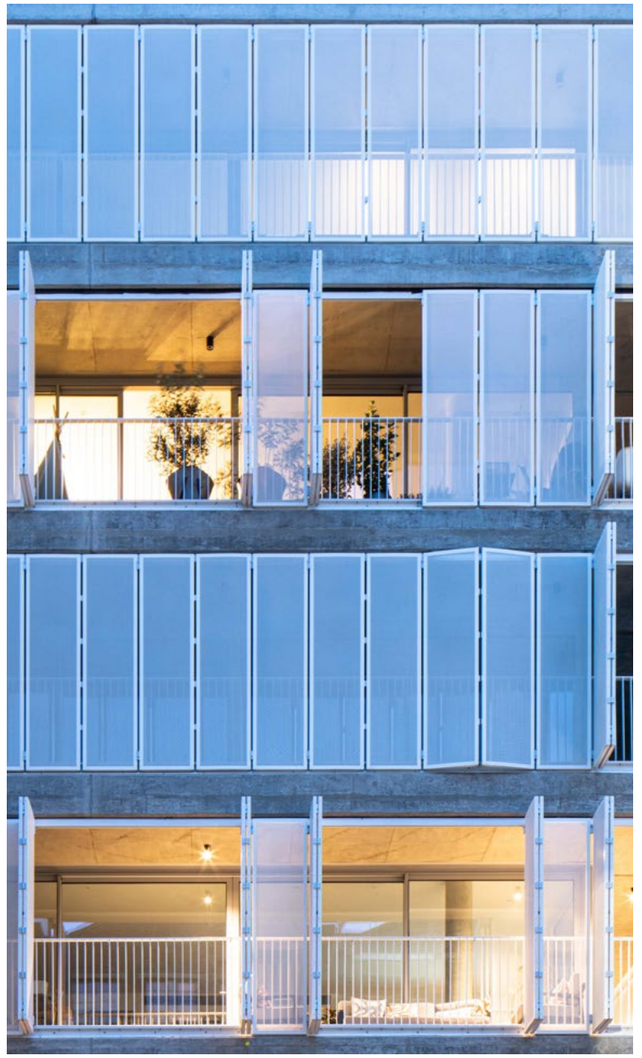
Durability and gracefully aging

Wood

Low carbon

Metal





Metal

Construction Materials Pyramid

- CO_2 footprint

- By CINARK at the Royal Danish Academy

Metal

So Why Do We Use It?

- Light façades - less structure - less material

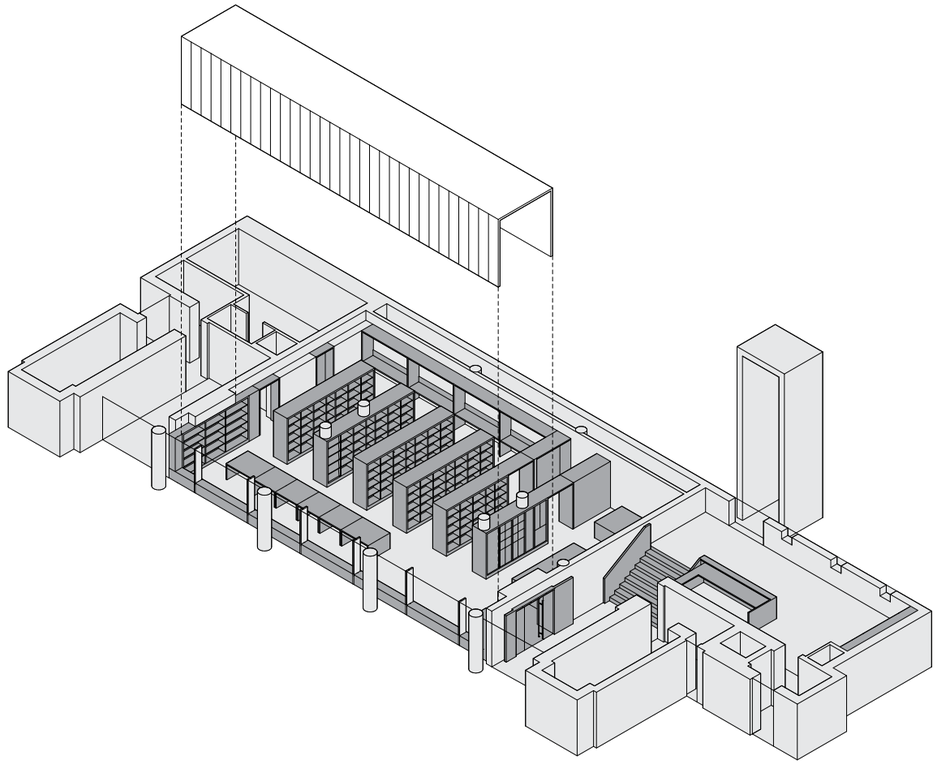
- Manipulation of thin material to create depth and good daylighting

- Recycled metal offers greener solution

- Circular design: Assembly details are important to ensure disassembly is possible in the future

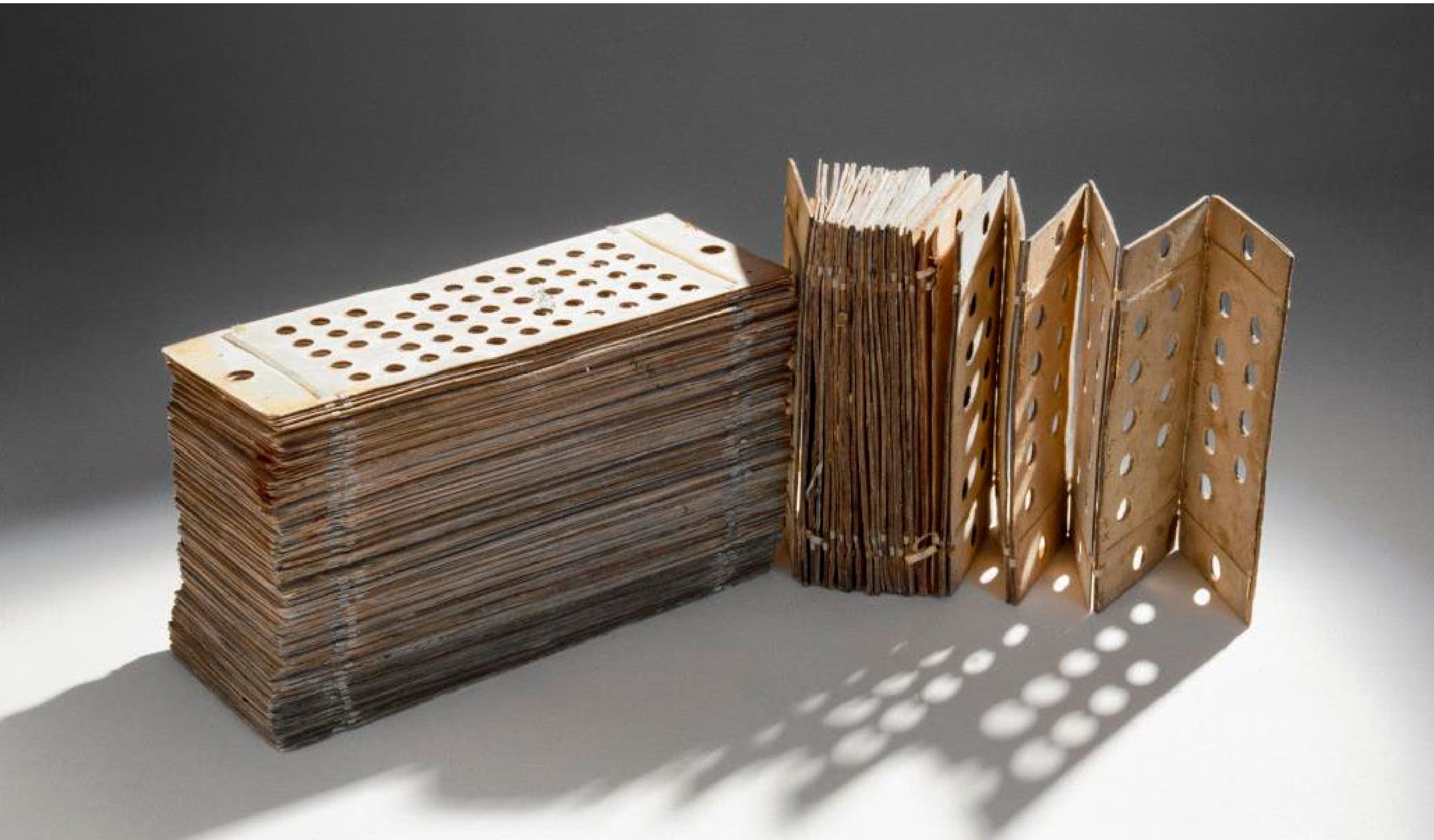
Science Museum Research Centre

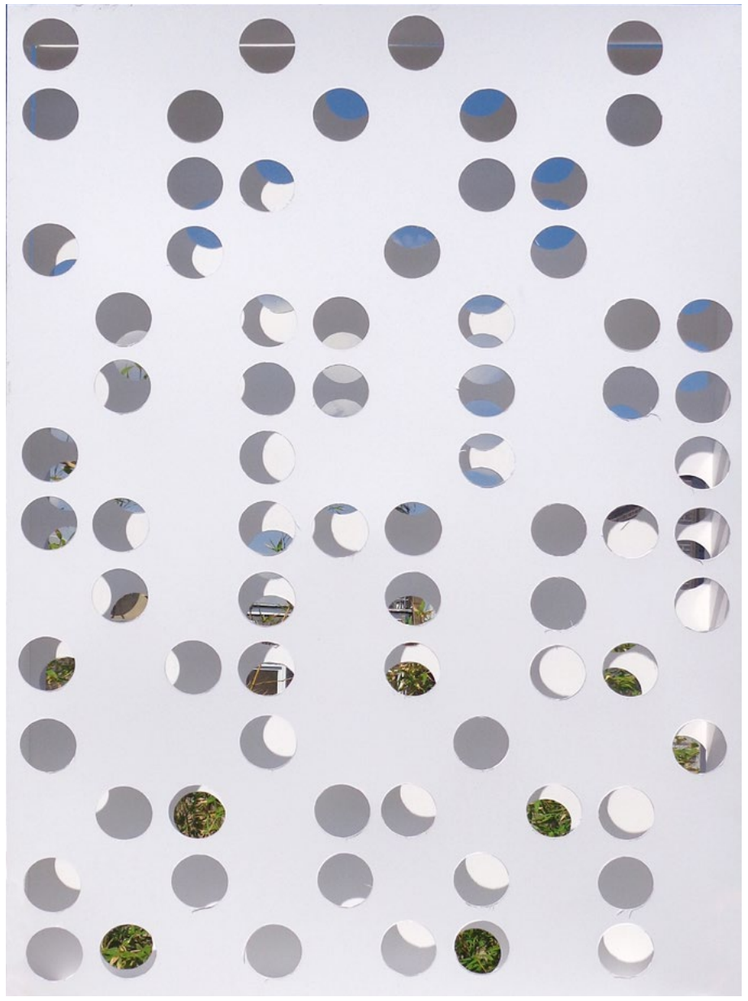
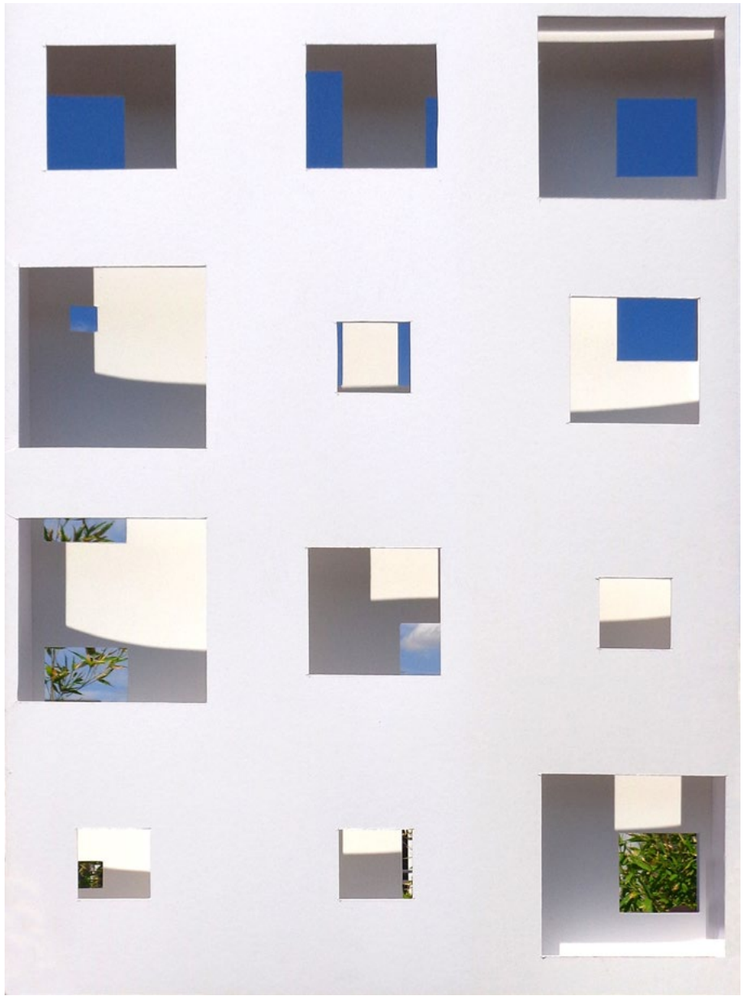
for SCIENCE MUSEUM GROUP

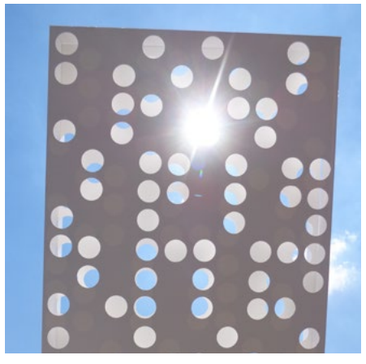


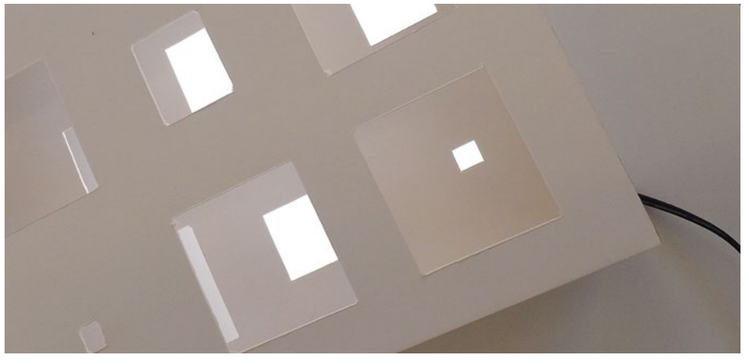
- Surface Design Award - won
- Civic Trust Award - regional finalist
- RIBA London Award - won
- Lighting Design Award - shortlisted
- AJ Retrofit Award - shortlisted
- GIA: 6,000 sqft

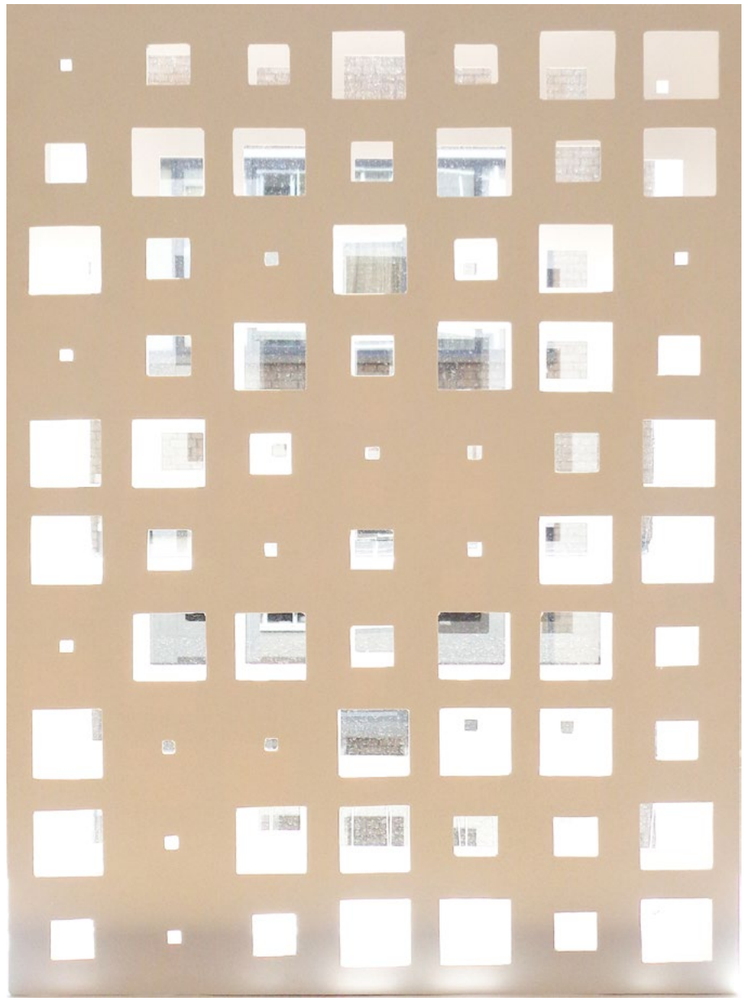
Isaac Newton sitting under the tree leading to his discovery of universal gravitation by observing an apple fall.

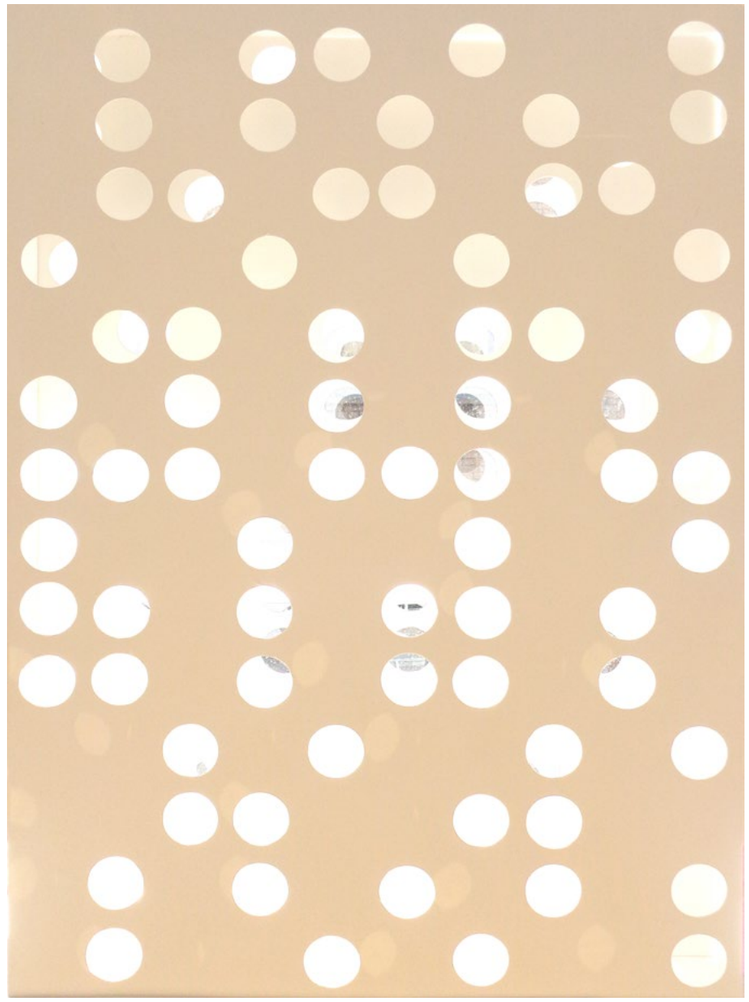


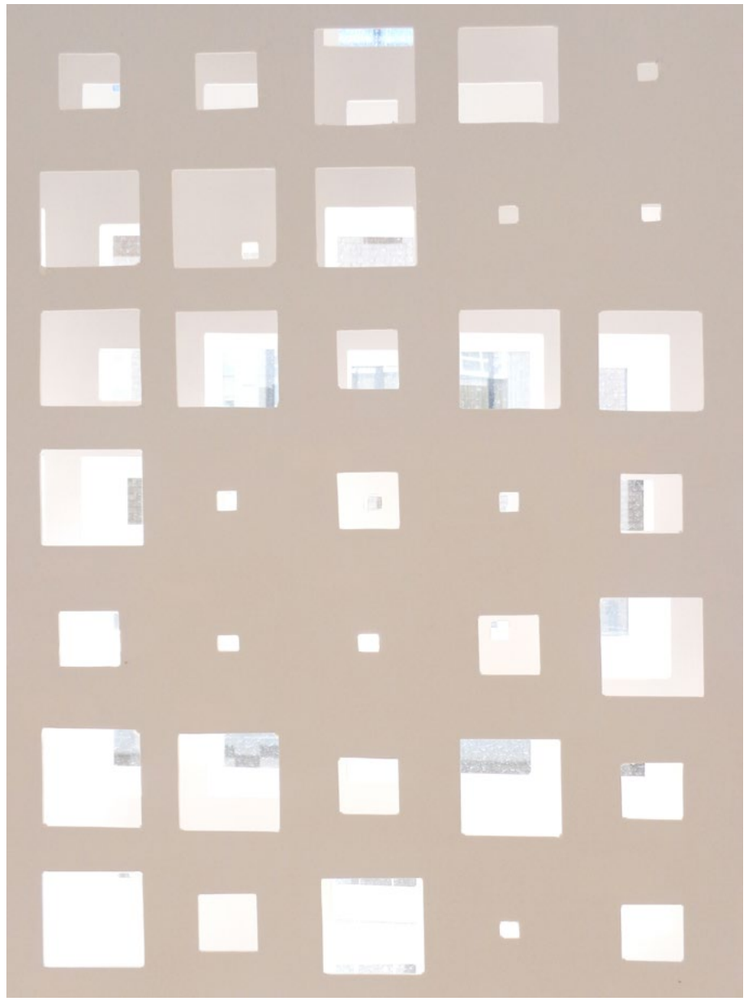




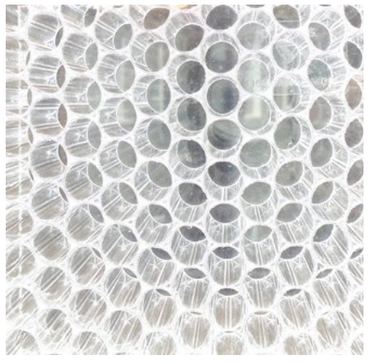


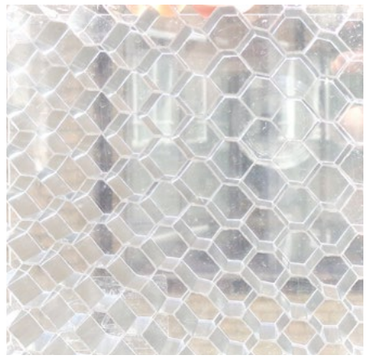



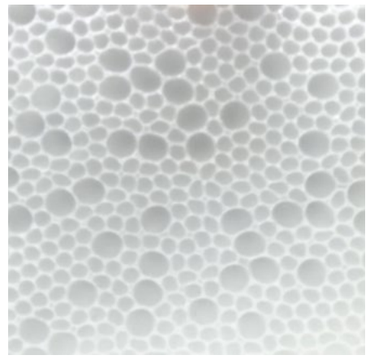


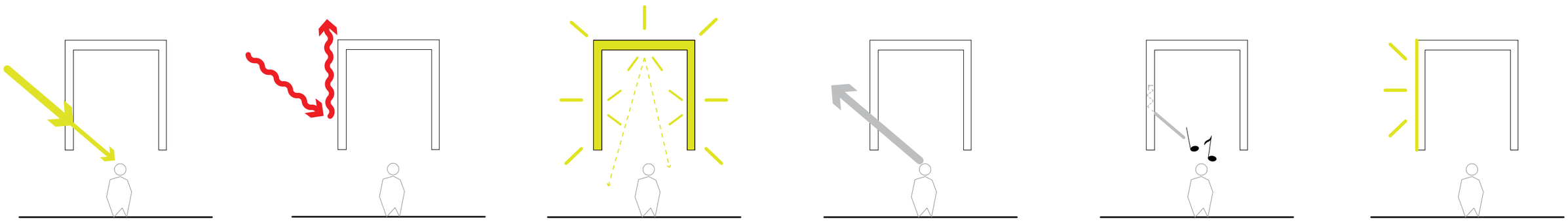












Daylight

Solar filter
Control of daylight glare and sunlight

Thermal Comfort

Assisting natural ventilation strategy
Control of heat gain
Passive control

Artificial Light

Balance the space visually and for lighting
Flexible lighting settings
Subtle variance through the day

View & Transparency

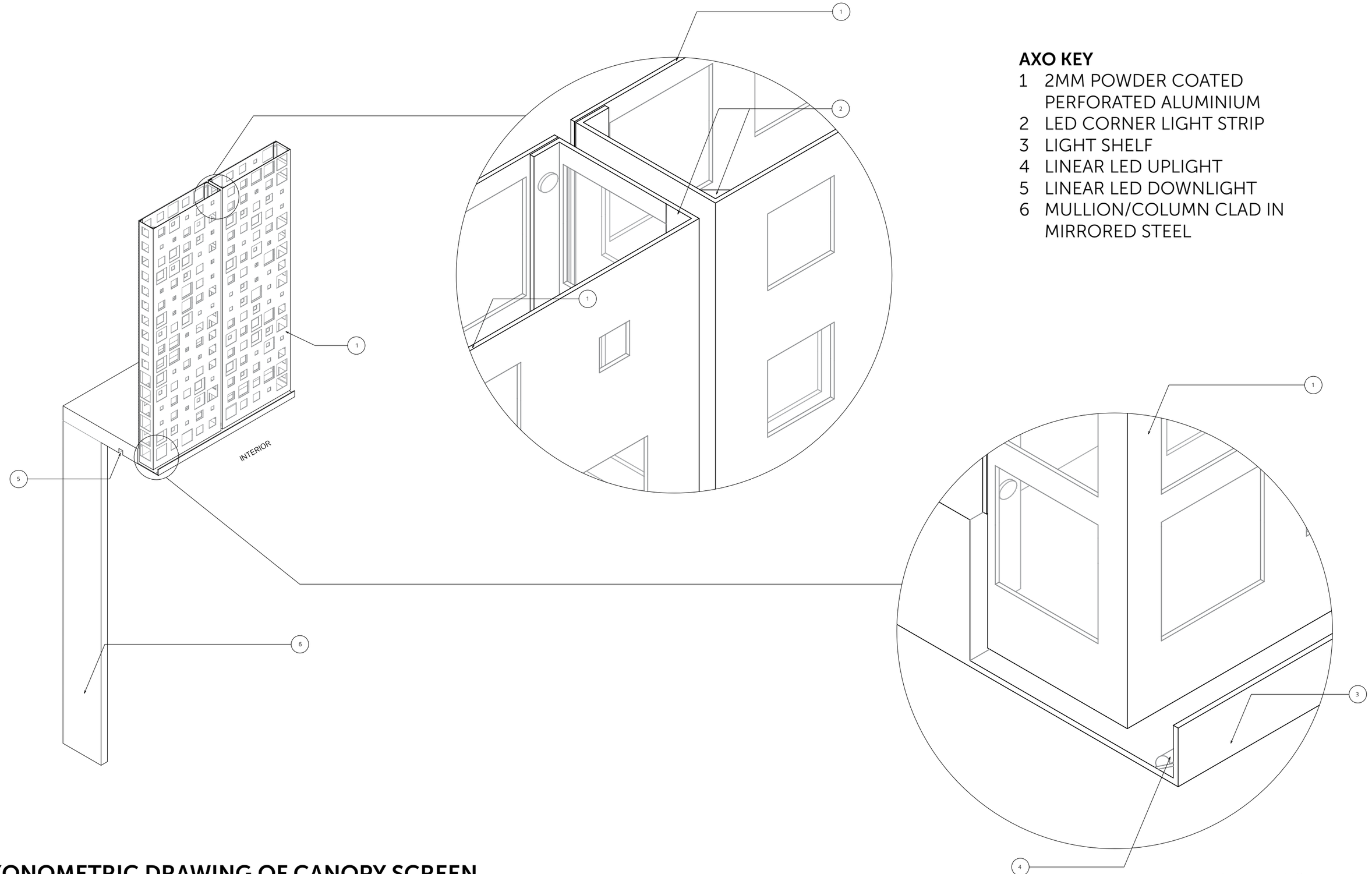
Maintain views to outside

Acoustics

Enhance acoustic performance

Identity

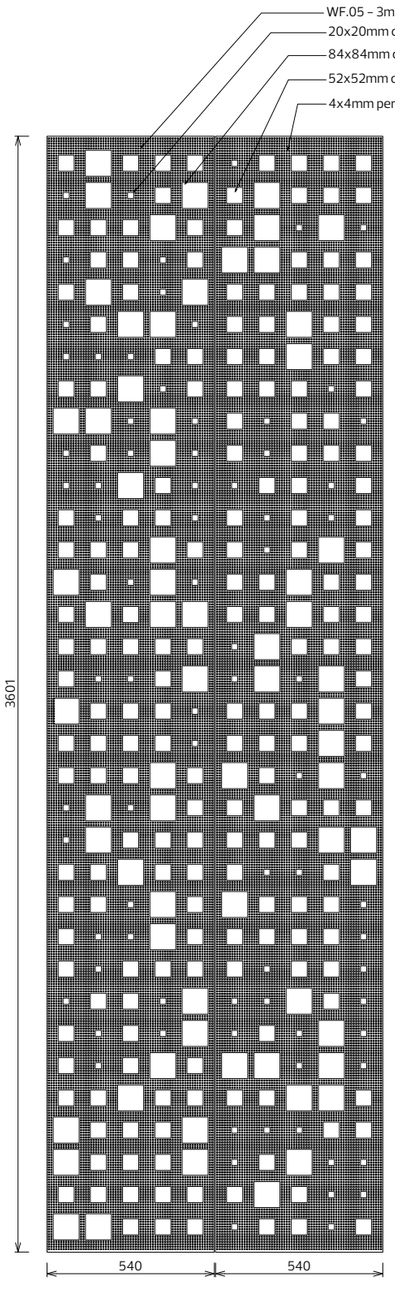
Two sided design provides signage and identity to exterior and mezzanine



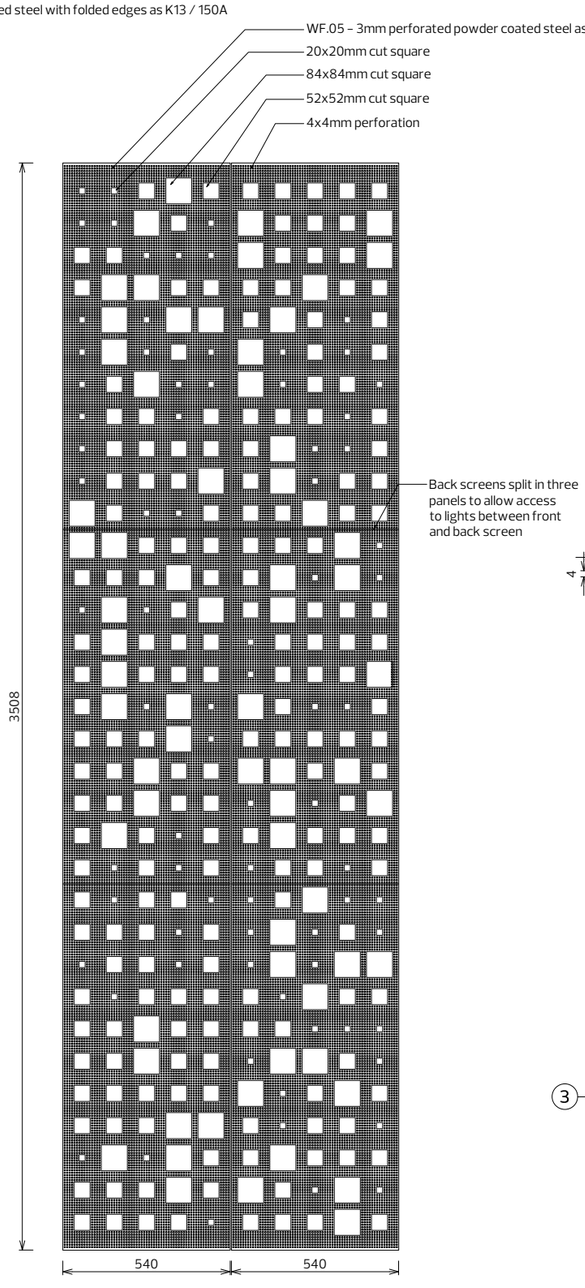
AXO KEY

1 2MM POWDER COATED PERFORATED ALUMINIUM
2 LED CORNER LIGHT STRIP
3 LIGHT SHELF
4 LINEAR LED UPLIGHT
5 LINEAR LED DOWNLIGHT
6 MULLION/COLUMN CLAD IN MIRRORED STEEL

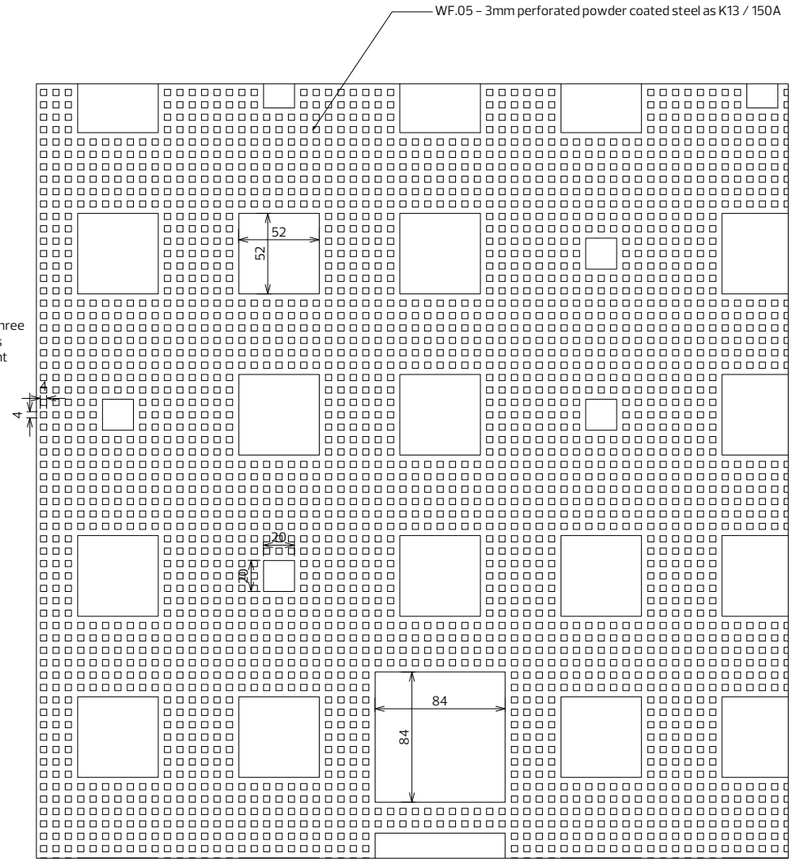
AXONOMETRIC DRAWING OF CANOPY SCREEN



1 CANOPY FRONT SCREEN ELEVATION
Scale 1:10



2 CANOPY BACK SCREEN ELEVATION
Scale 1:10



3 DETAIL ELEVATION
Scale 1:2

See drawing 860_415 & 860_410 for detailed plan and section

KEY:

WT X – Wall Type Schedule

FT X – Floor Type Refer to Specification

D X.XX – Door Refer to Door Schedule

J X.XX – Joinery Refer to Joinery Section in Specification / Joinery Schedule

WF XX – Wall finishes Refer to Finishes Schedule

WALL FINISHES KEY:
WF.01 – Painted Finish M60/110
WF.02 – Mirror L40/550
WF.03 – Make Good Existing Concrete C42
WF.04 – Glass L40/450
WF.05 – Canopy steel panel as K13/150A
WF.06 – Tiles M40/110B

JOINERY FINISHES KEY:
JF.01 – Quarter Cut European Oak with hardwood lipping N10 & Z10
JF.02 – Laminate N10 & Z10

CEILING FINISHES KEY:
CF.01 – Painted Finish K10/225
CF.02 – Make Good Existing Concrete C42
CF.03 – Concrete Render M20/220

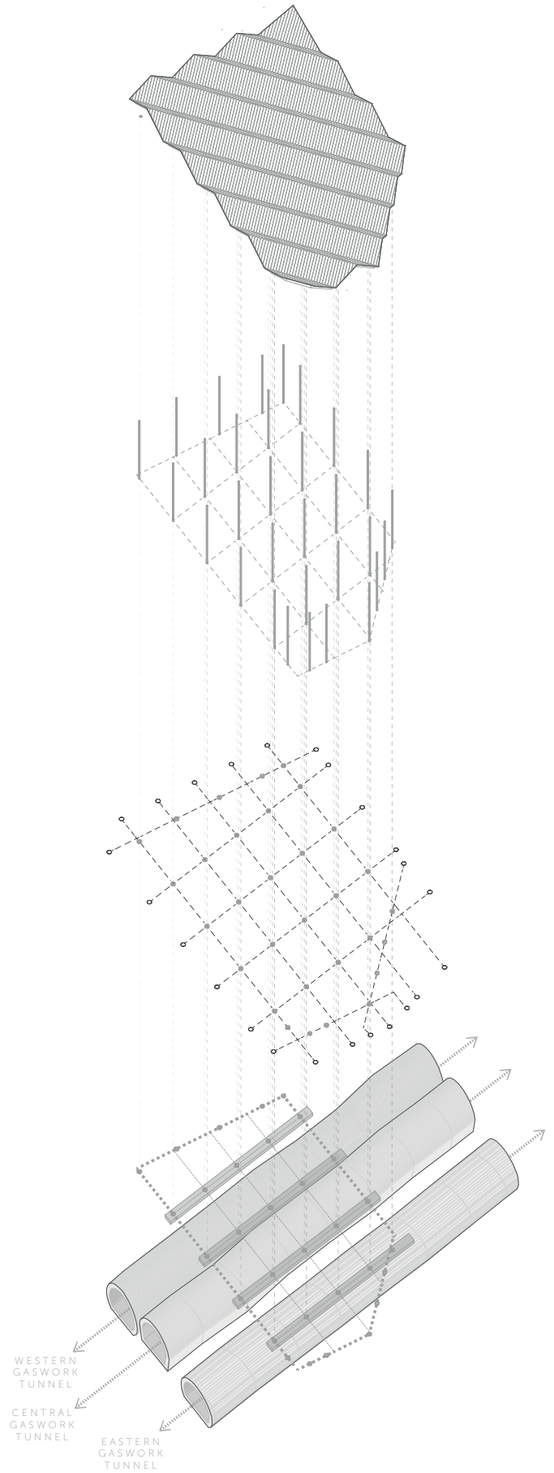
FLOOR FINISHES KEY:
FF.01 – Tiled Stone / Concrete Flooring M40/110
FF.02 – Quarter Sawn Oak Boarding M21/115
FF.03 – Carpet M50/130
FF.04 – Rubber Roll Flooring M50/150
FF.05 – Coir Matting M50/151

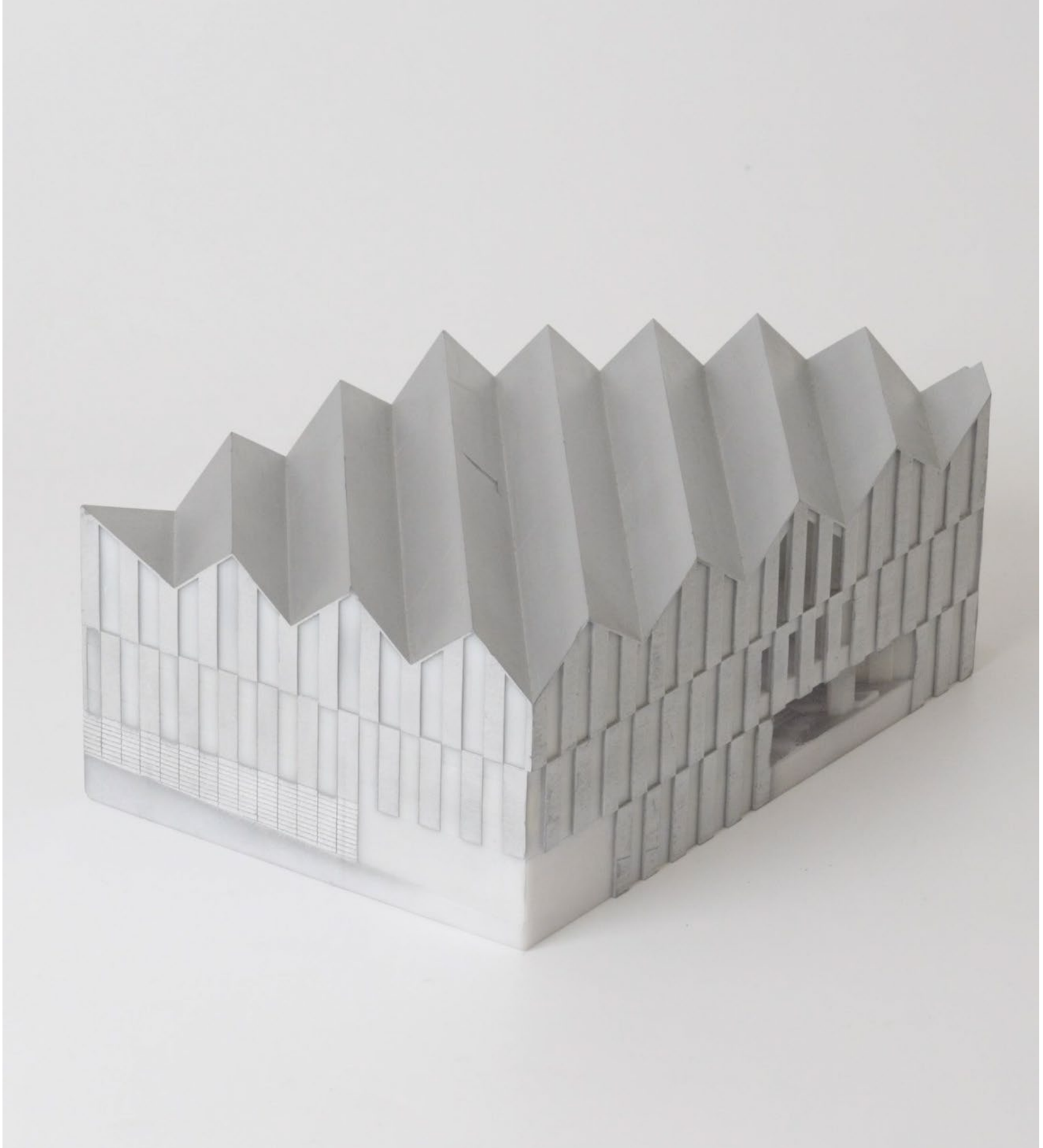

ENCYCLOPEDIA OF
SCIENCE & TECHNOLOGY

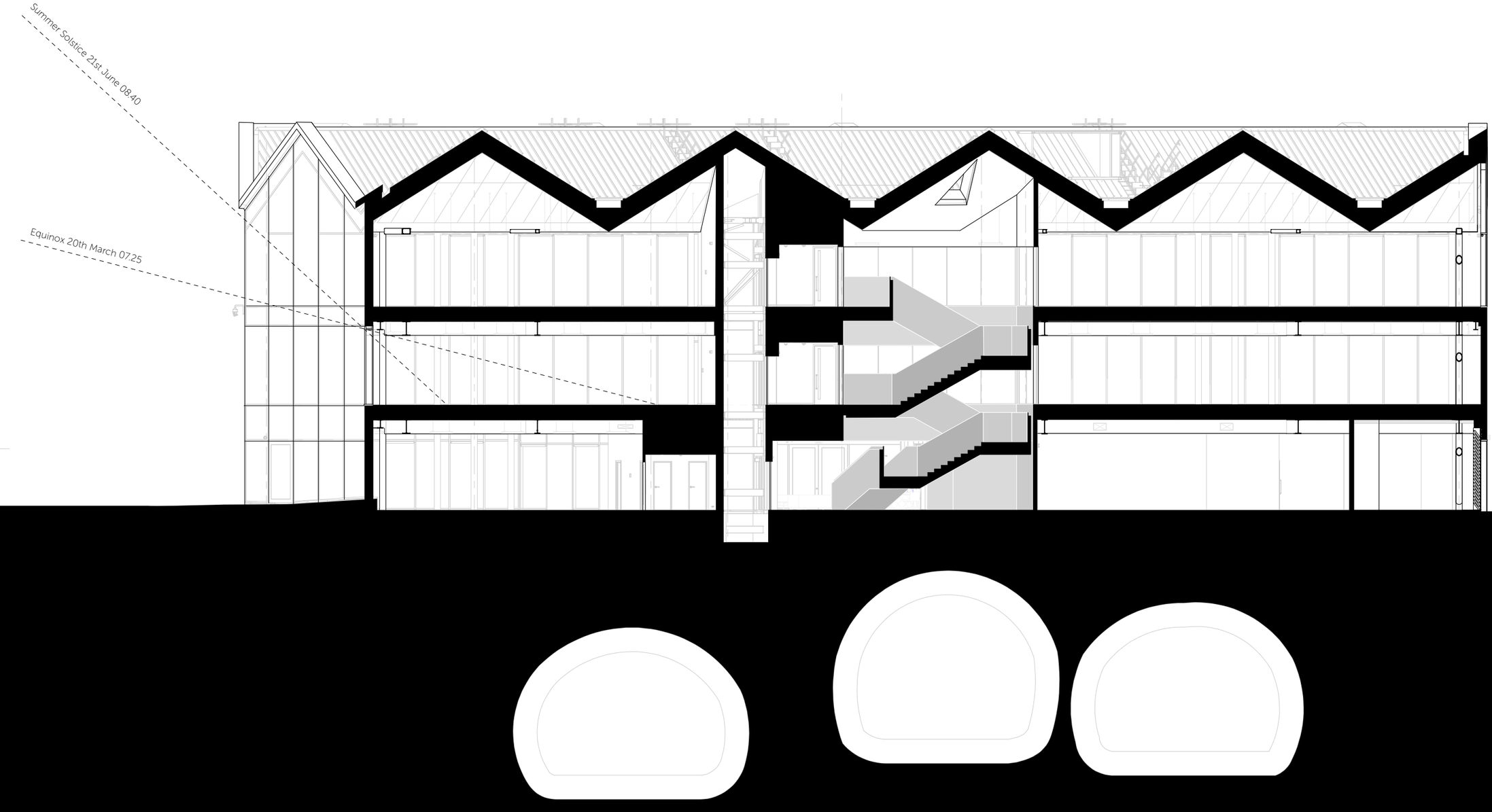
22 Handyside Street

for ARGENT

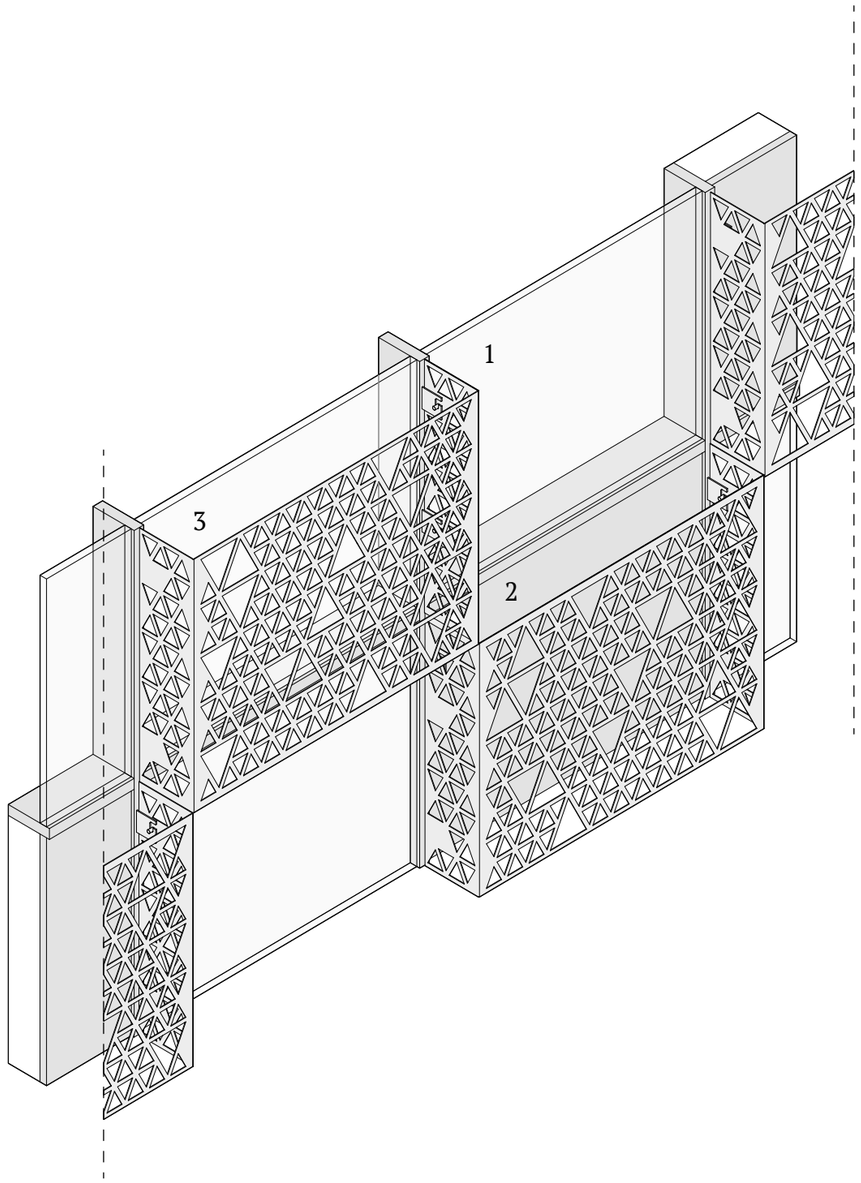
- 2024 RIBA London Award
- 2021 Schuco Excellence Award
- BREEAM Outstanding
- Speculative new build office that prioritises sustainability
- Carefully built above three Grade II listed tunnels
- GIA: 50,000 sq ft






Summer Solstice 21st June 08.40
Equinox 20th March 07.25

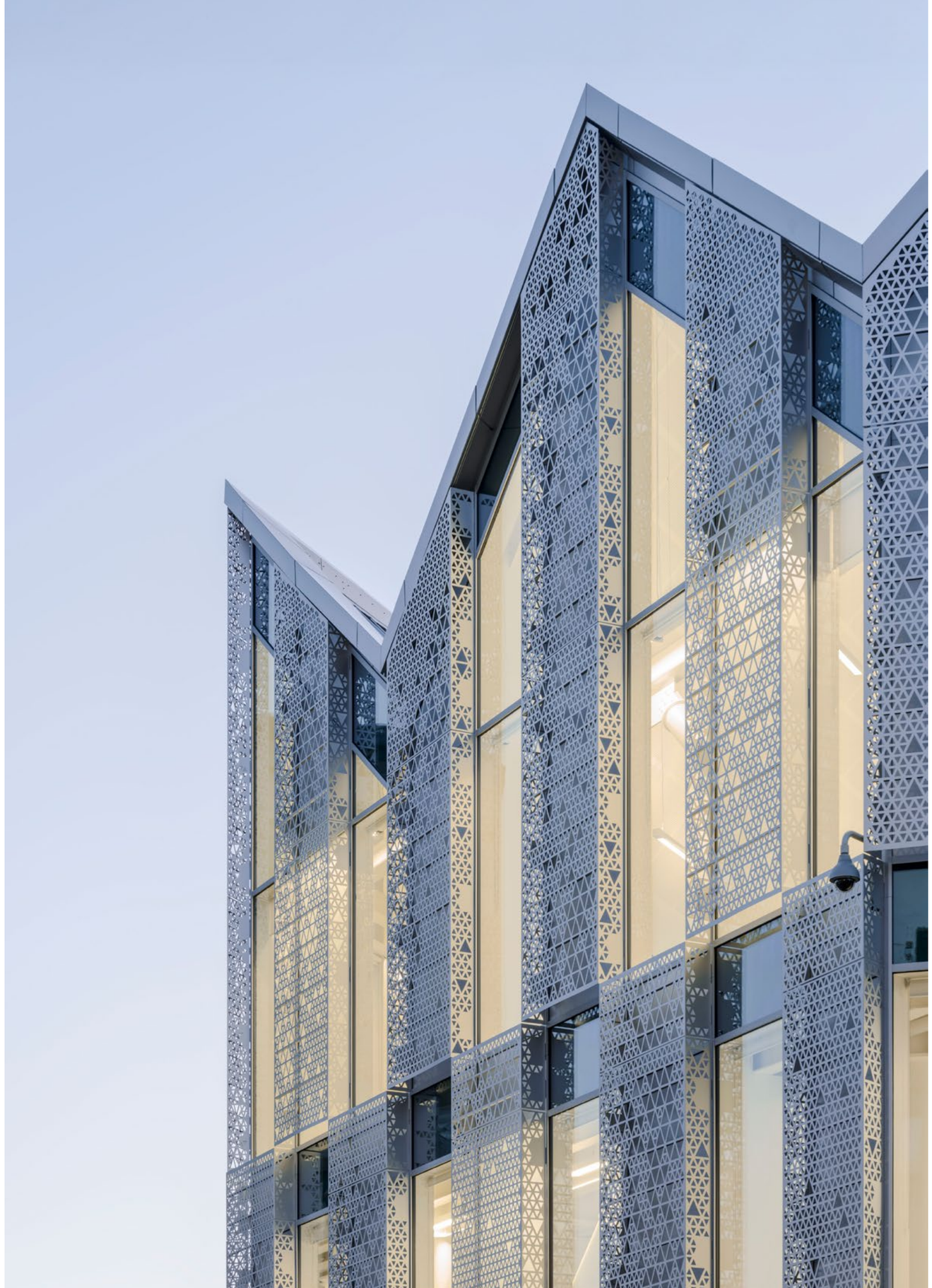

2



Perforated screens allows:

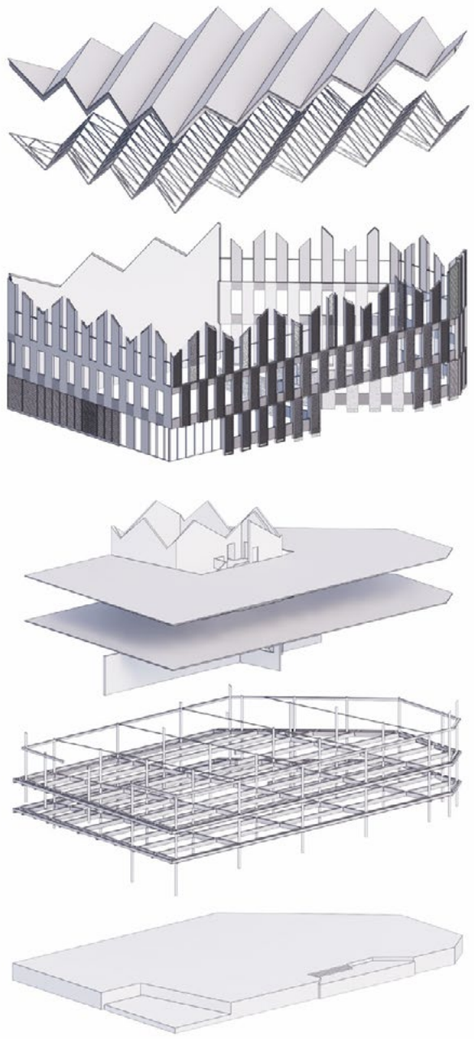
- Depth to a thin material
- Light weight on top of tunnels
- Interesting shadows across the interior preventing fatigue

1 Clear glazing
2 Double layered facade - perforated panel in front of solid facade panel
3 Double layered facade - perforated panel in front of translucent glazing



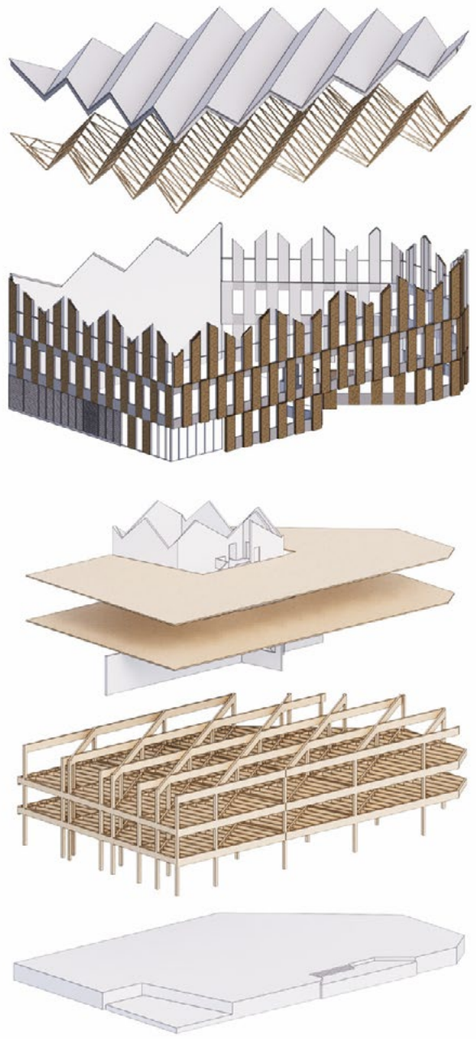
“Many of us have been up to see the building early in the morning to watch the autumn sunrise reflecting in the façade – it’s one of those truly magical moments and the concept has been absolutely nailed.”

Will Colthorpe - Partner, Argent LLP



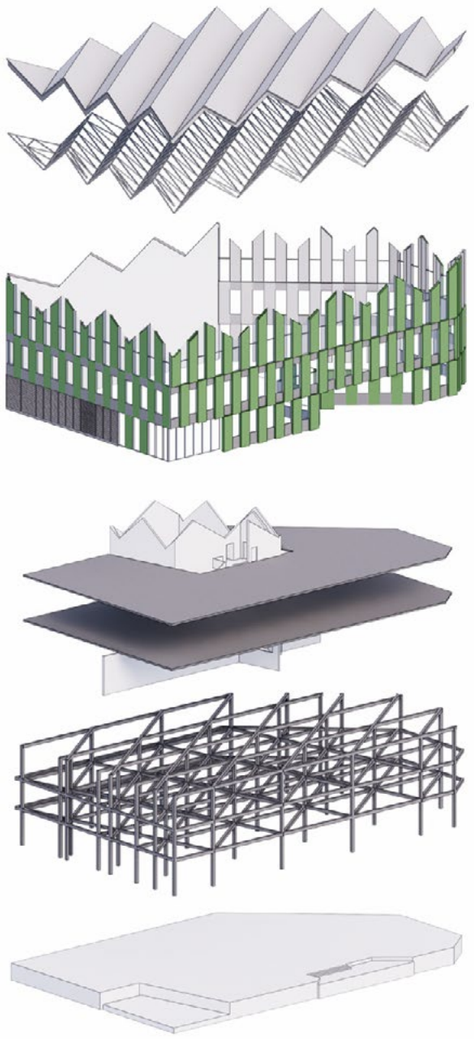
OPTION A - BUILT

STEEL FRAME / ALUMINIUM PANELS FACADE



OPTION B

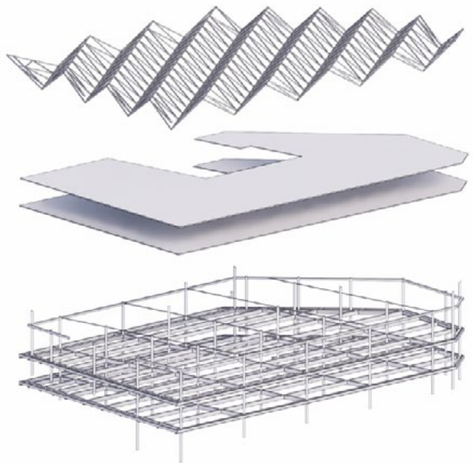
TIMBER FRAME / BRICK FACADE



OPTION C

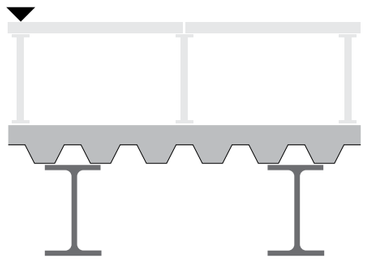
CONCRETE FRAME / GRC PANELS FACADE

OPTION A - AS-BUILT



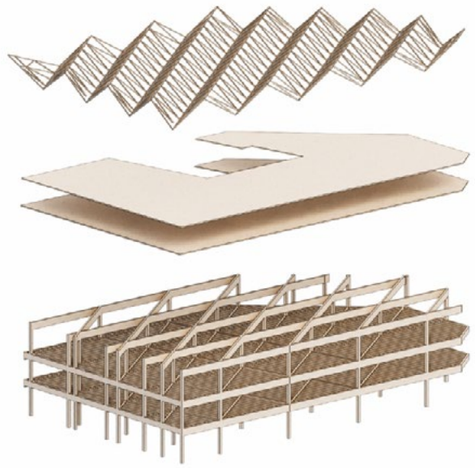
STEEL FRAME

GF Slab	92 t CO_2e
Steel columns	198 t CO_2e
Steel primary & secondary beams	440 t CO_2e
Steel composite deck 140 mm	75 t CO_2e
Ready-mix concrete	101 t CO_2e
Reinforcement steel fine mesh	18 t CO_2e
Steel roof profiles	282 t CO_2e



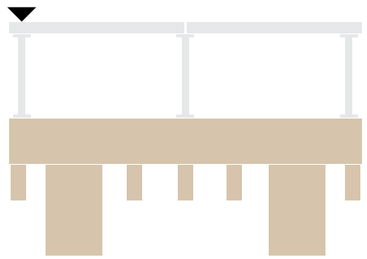
1206 t CO_2e

OPTION B



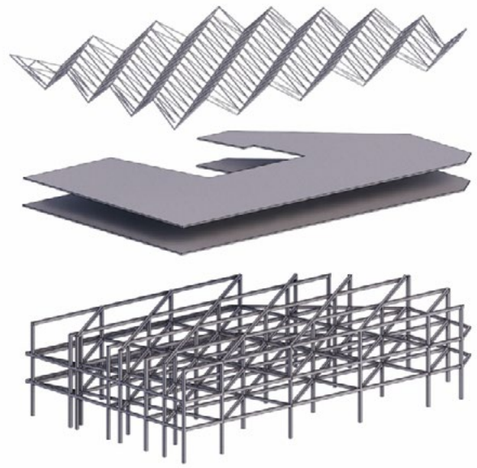
TIMBER FRAME

GF Slab	92 t CO_2e
Glulam columns 400 x 400 mm	11 t CO_2e
Glulam primary beams 1100 x 260 mm & secondary beams 860 x 260 mm	54 t CO_2e
Glulam ribs 160 x 520 mm	50 t CO_2e
CLT floor 160 mm deep	70 t CO_2e
Glulam roof profiles & ribs	52 t CO_2e



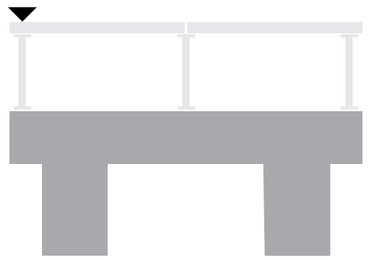
329 t CO_2e

OPTION C



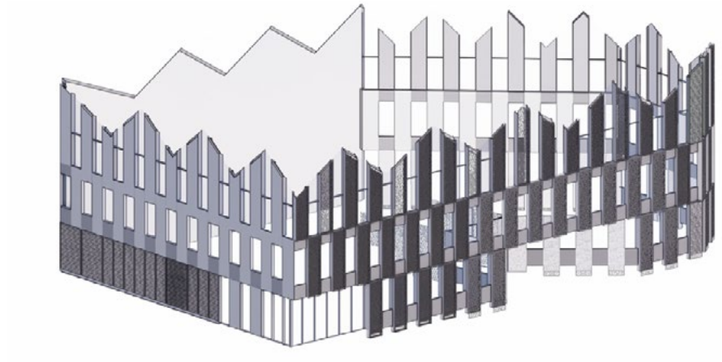
CONCRETE FRAME

GF Slab	92 t CO_2e
Concrete columns 400 x 400 mm	35 t CO_2e
Concrete primary beams 400 x 450 mm	121 t CO_2e
Concrete secondary beams 350 x 400 mm	26 t CO_2e
Concrete cast-in-situ floor (240 mm deep)	280 t CO_2e
Steel roof profiles	282 t CO_2e



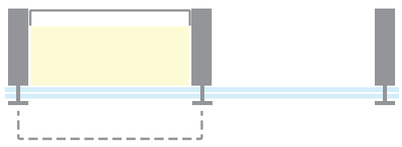
836 t CO_2e

OPTION A - AS-BUILT



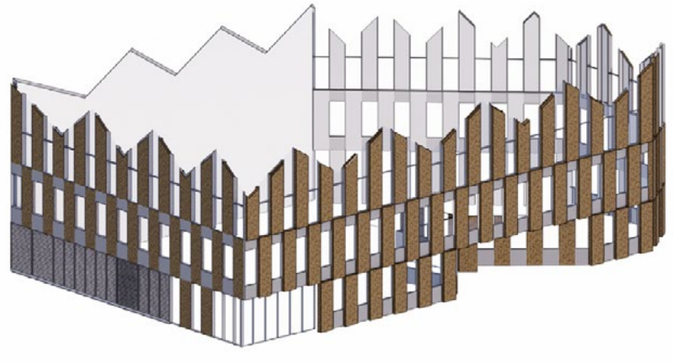
ALUMINIUM PANELS

Glazed curtain wall	145 t CO_2e
Solid aluminium panels	46 t CO_2e
Perforated aluminium panels 3 mm	41 t CO_2e
Rainscreen aluminium cladding 1,5 mm	11 t CO_2e
Retail glazing, plant louvres, external ceiling, lobby finish, galvanized steel gratings	45 t CO_2e



288 CO_2e

OPTION B



BRICK

Double glazed windows	72 t CO_2e
Gypsum-based plaster	0.8 t CO_2e
Gypsum plasterboard	4 t CO_2e
Metal framing	4.8 t CO_2e
Polyethylene membrane	0.9 t CO_2e
Rock wool insulation panels (70 & 130 mm)	9 t CO_2e
Laminated HDPE	0.9 t CO_2e
Red brick	38 t CO_2e
Retail glazing, plant louvres, external ceiling, lobby finish, steel gratings	45 t CO_2e

175.4 t CO_2e

OPTION C

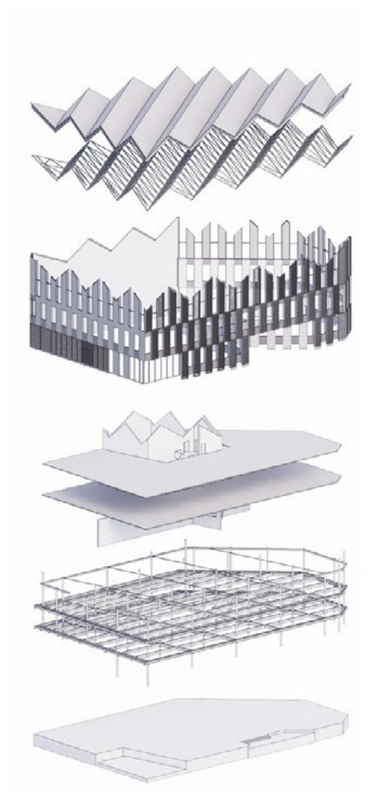
GRC PANELS

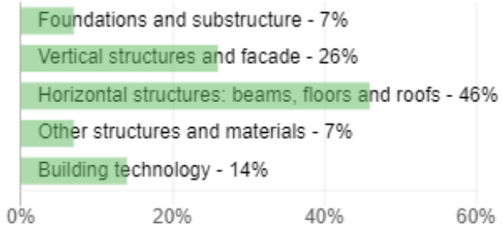
Double glazed windows	72 t CO_2e
Gypsum-based plaster	0.8 t CO_2e
Gypsum plasterboard	4.1 t CO_2e
Metal framing	7.2 t CO_2e
Vapour-proof membrane	0.5 t CO_2e
Rock wool insulation panels (150 mm)	12.8 t CO_2e
Laminated HDPE	0.9 t CO_2e
GRC panels (15 mm)	24 t CO_2e
Secondary aluminium framing	13 t CO_2e
Retail glazing, plant louvres, external ceiling, lobby finish, steel gratings	45 t CO_2e

180.3 t CO_2e

OPTION A - BUILT

STEEL FRAME / ALUMINIUM PANELS FACADE

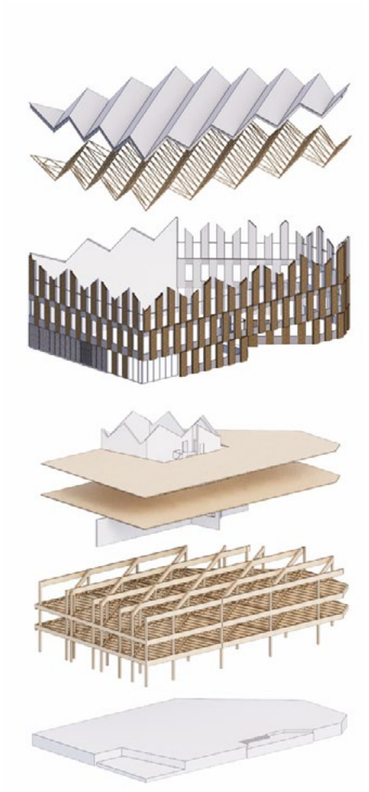


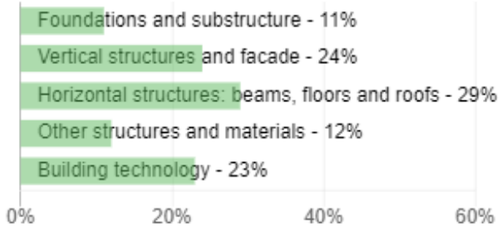


(A1-A3) 2,474 t CO_2e

OPTION B

TIMBER FRAME / BRICK FACADE

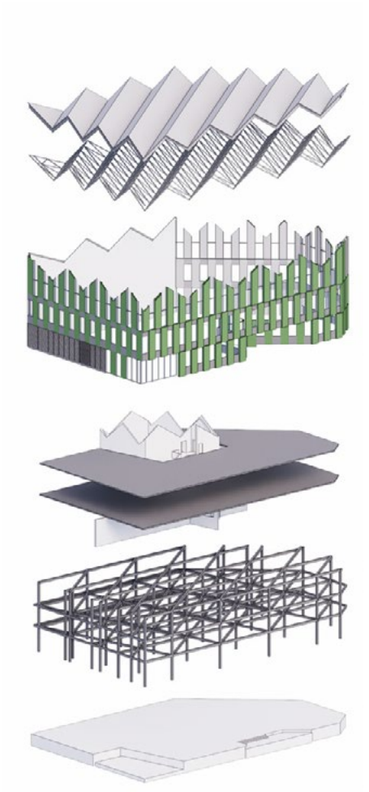


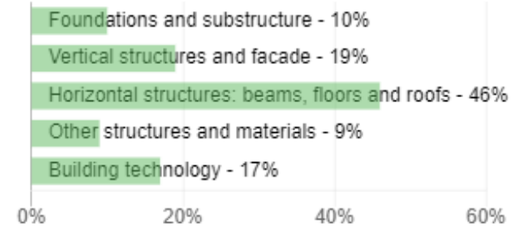


(A1-A3) 1,495 t CO_2e

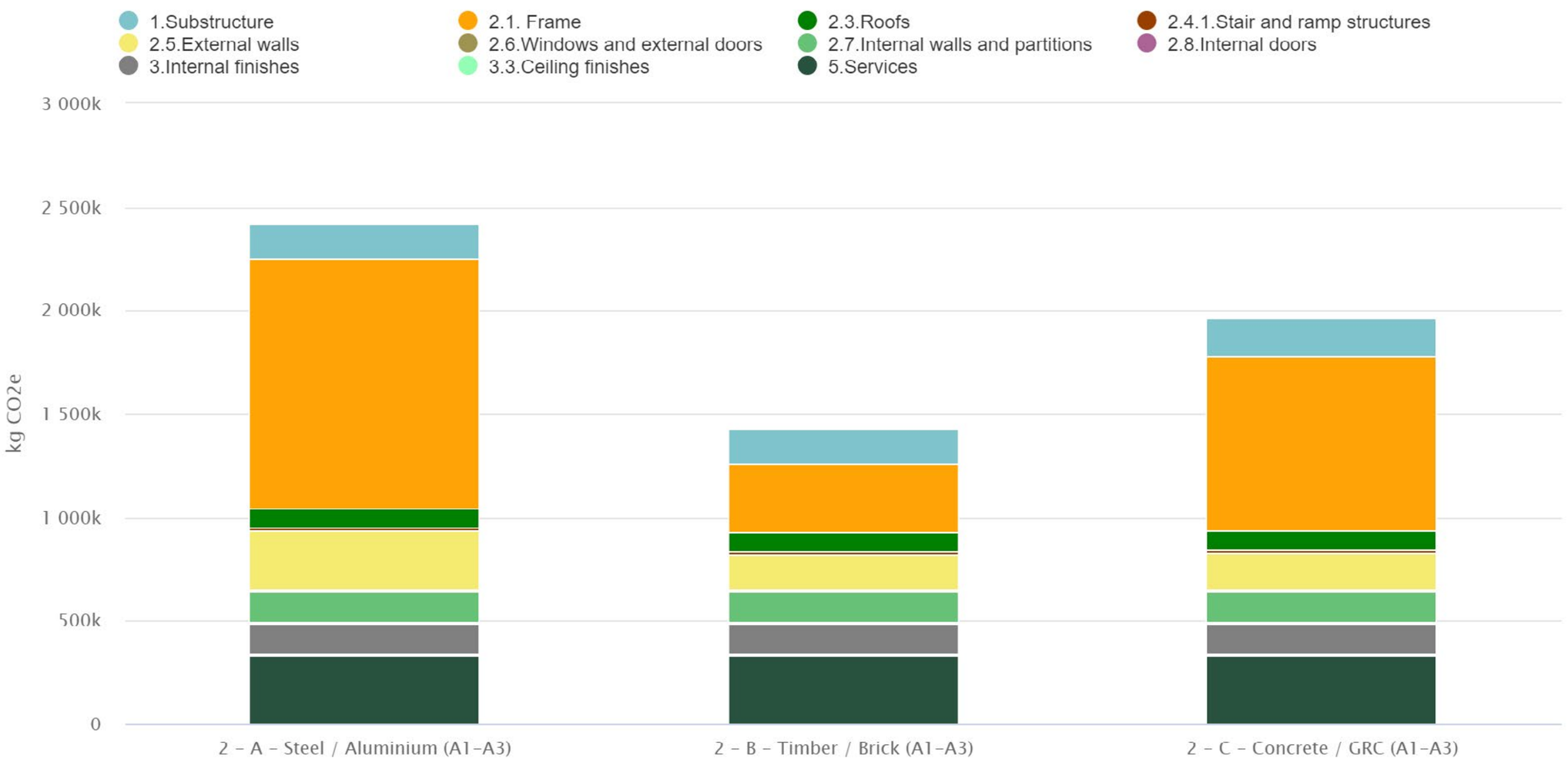
OPTION C

CONCRETE FRAME / GRC PANELS FACADE





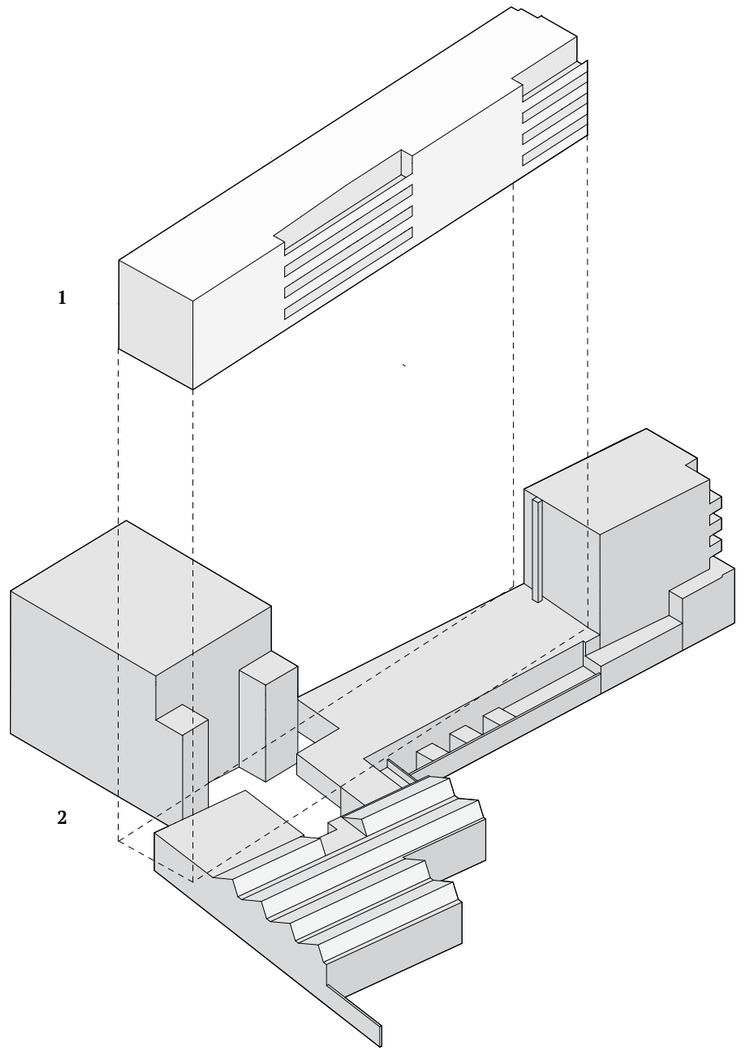
(A1-A3) 2,027 t CO_2e


1.Substructure
2.1. Frame
2.3.Roofs
2.4.1.Stair and ramp structures
2.5.External walls
2.6.Windows and external doors
2.7.Internal walls and partitions
2.8.Internal doors
3.Internal finishes
3.3.Ceiling finishes
5.Services
3 000k
2 500k
2 000k
1 500k
1 000k
500k
0
kg CO2e
2 – A – Steel / Aluminium (A1–A3)
2 – B – Timber / Brick (A1–A3)
2 – C – Concrete / GRC (A1–A3)

The Tannery

for LONDON SQUARE

- 2024 Housing Design Award shortlist
- Contract value: £28m
- GIA: 9500 m2
- Cost per m2: £2,947
- 71 mixed-tenure homes set within an existing cultural community
- Arts facility: Drawing Room Gallery and Tannery Arts studios



Key

1 Bar of Light

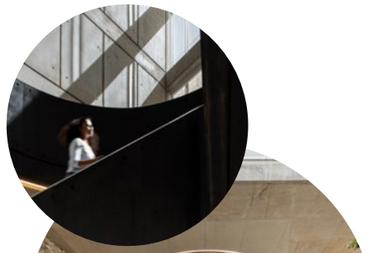
2 Brick Crust

1 Existing Unit 12 warehouse conversion
2 Bar of Light
3 The Tannery new build
4 Townhouse
5 Drawing Room gallery

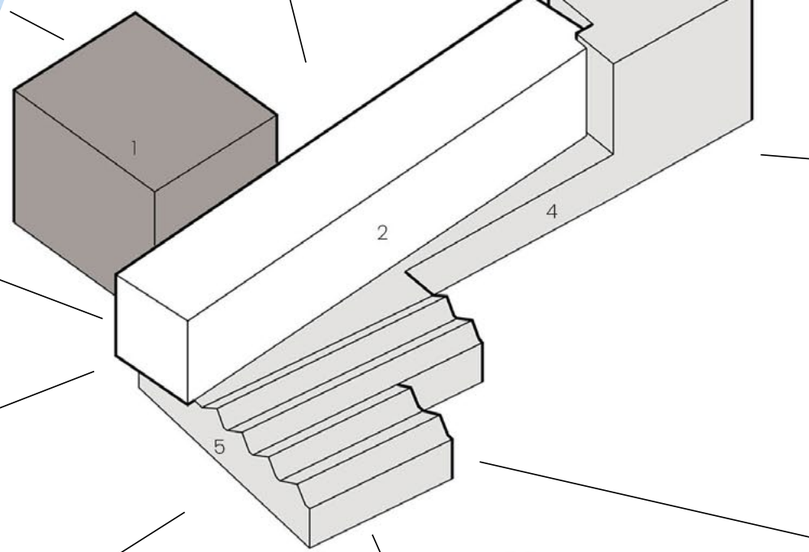
BAR OF LIGHT AND COURTYARD

AFFORDABLE HOUSING

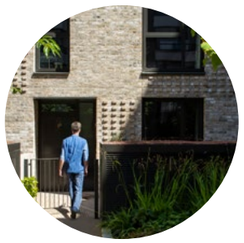
UNIT 12 WAREHOUSE CONVERSION



GRAND STAIRWAY

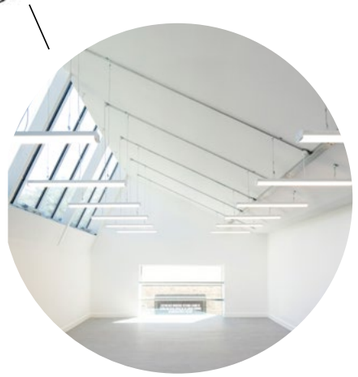


TOWNHOUSES



FACADE SCREEN

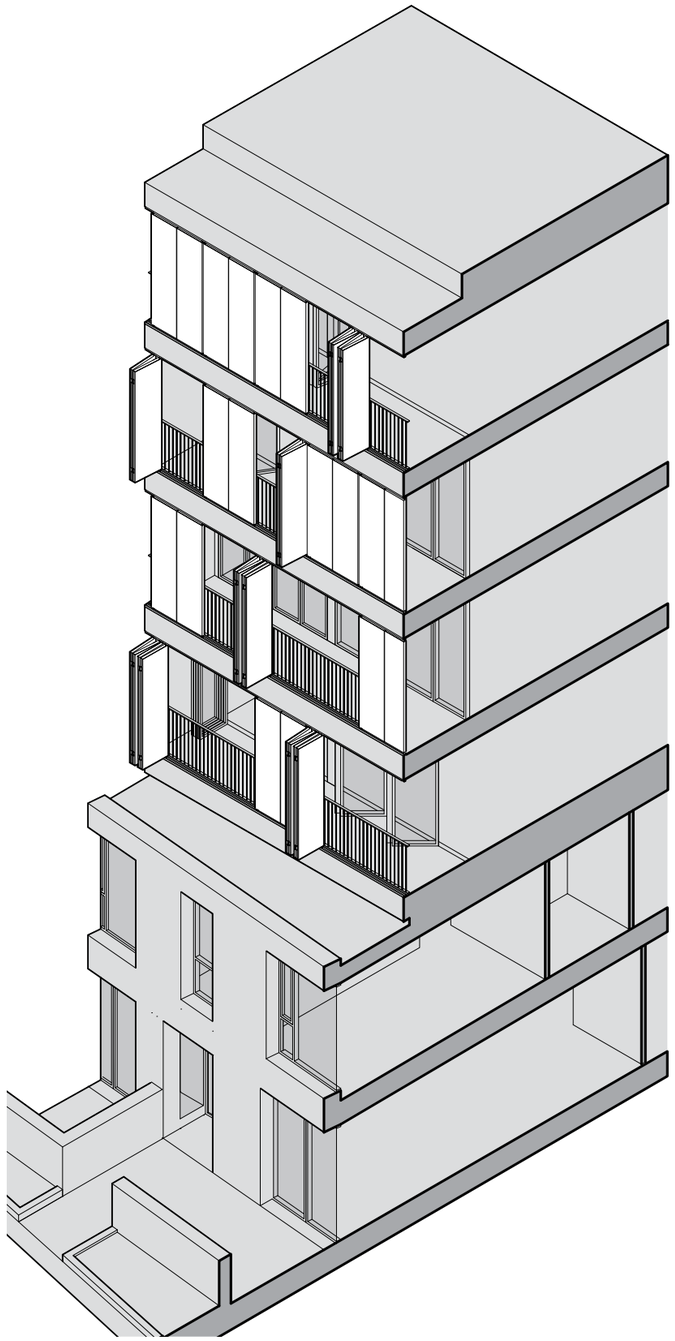
NEW PUBLIC REALM AND POCKET PARK



THE DRAWING ROOM GALLERY, STUDIOS AND OFFICES

THE DRAWING ROOM GALLERY


CONCIERGE

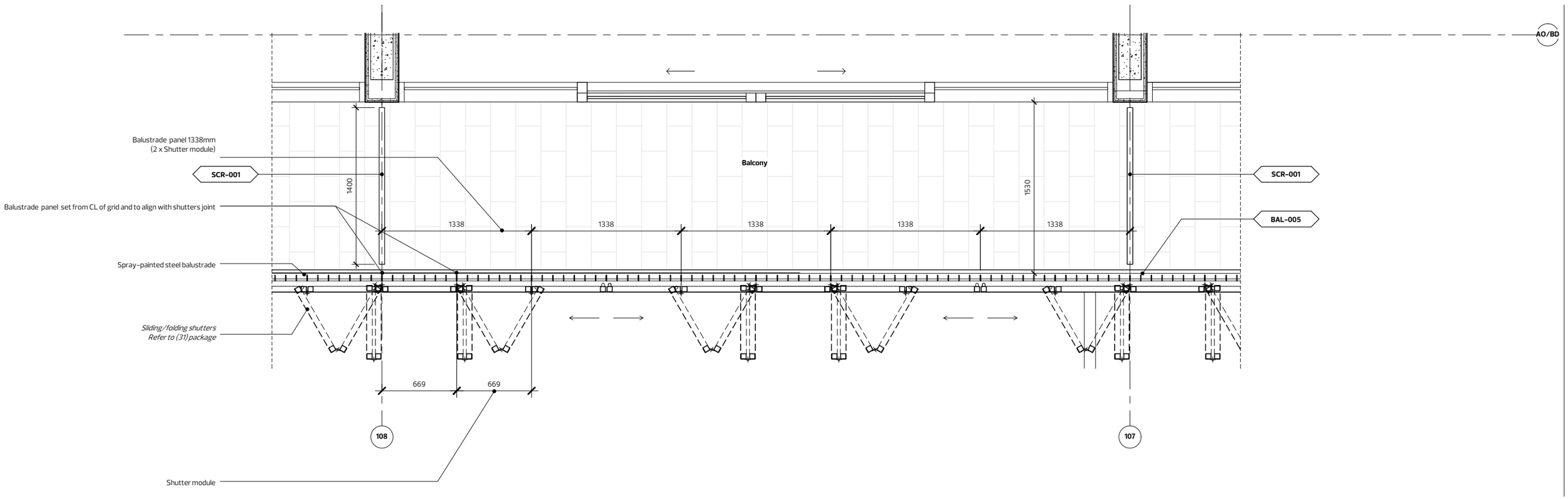


Perforated screens allow:

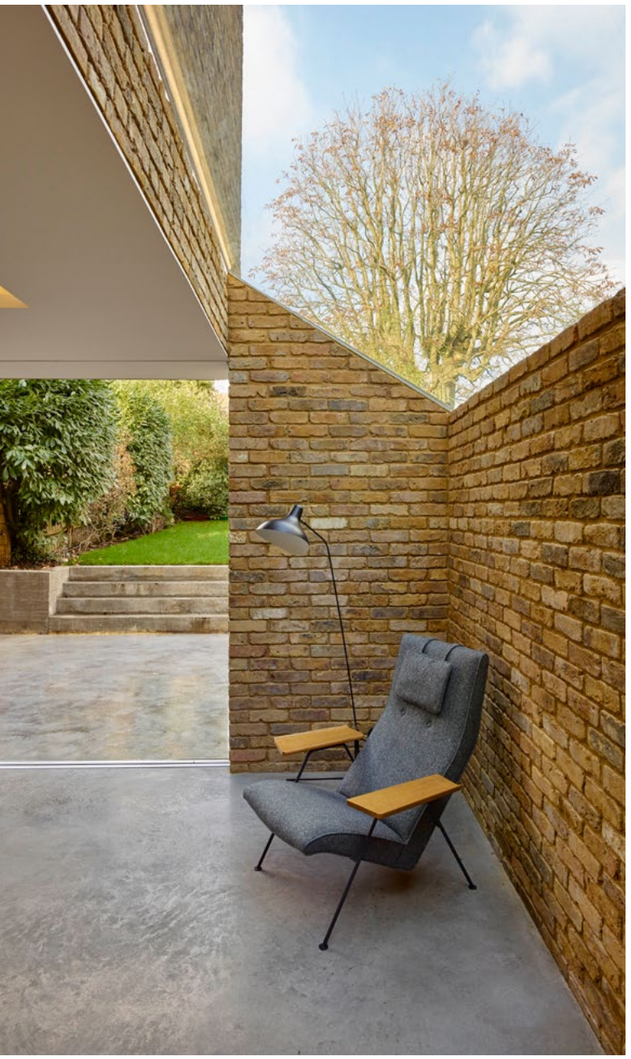
- Dual-aspect residences maximize natural light and cross-ventilation, reducing reliance on artificial heating and lighting

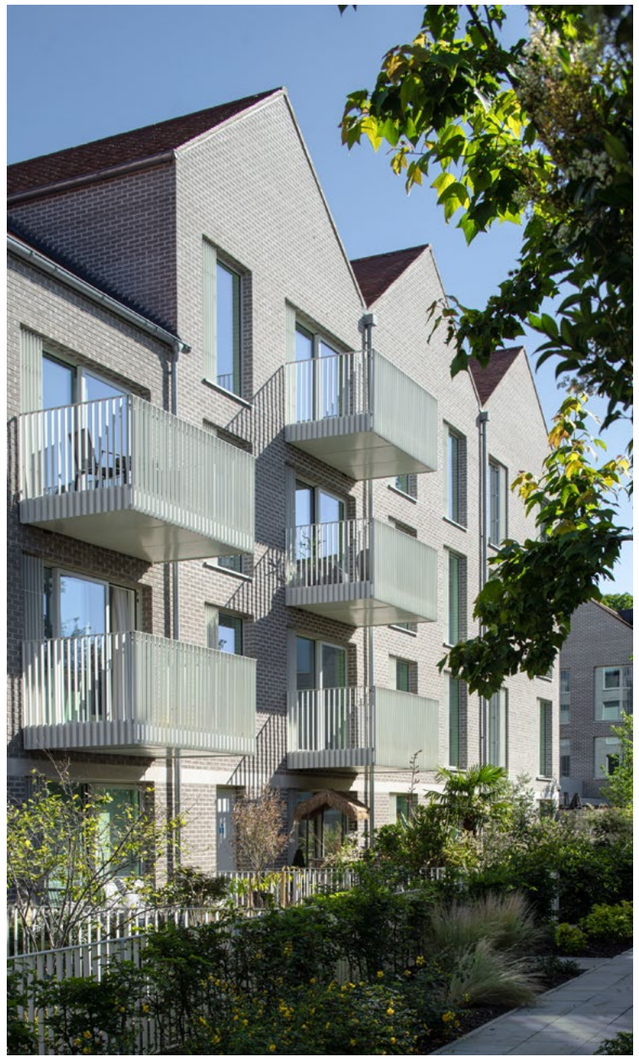
- Perforated shutters manage solar gain, enhance façade aesthetics, and allow residents to control privacy and sunlight

- Outdoor circulation with external staircases reduces enclosed corridors, boosts efficiency, encourages community interaction, and promotes physical activity


AO/BD
Balustrade panel 1338mm
(2 x Shutter module)
SCR-001
Balustrade panel set from CL of grid and to align with shutters joint
Spray-painted steel balustrade
Sliding/folding shutters
Refer to (31) package
Shutter module
Balcony
1400
1530
1338
1338
1338
1338
1338
669
669
SCR-001
BAL-005
108
107

Brick





Roughly between 70% to 80% of newly built residential properties in the UK involve bricks - commonly in masonry construction or as brick façades.

Brick

Construction Materials Pyramid

Brick

So Why Do We Use It?

- Planning friendly

- Depth and richness

- Durable

- Familiarity

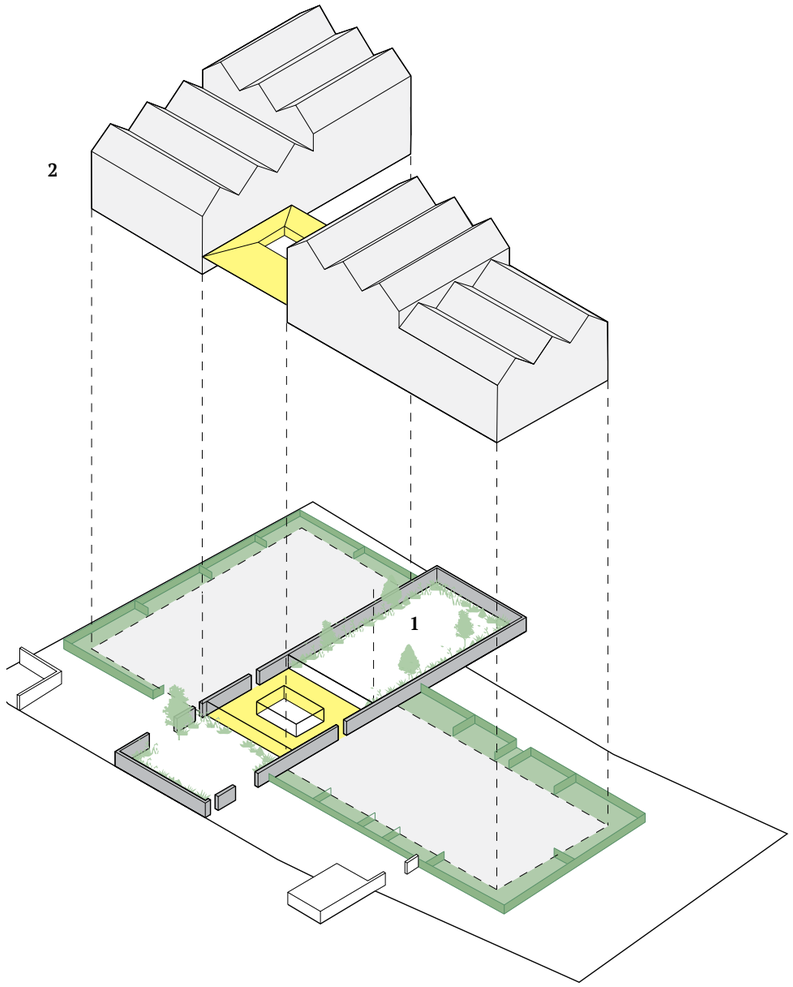
- Use lime mortar to allow for reuse in future

- Great greener brick alternatives are becoming more common

Cobham Bowers

for PEGASUS HOMES

- 2024 RIBA South East Award
- 2024 RIBA South East Building of the Year sponsored by EH Smith
- Contract value: £16.9m
- GIA: 6,726m2
- Cost per m2: £2,513
- Highly efficient with four repeating flat layouts



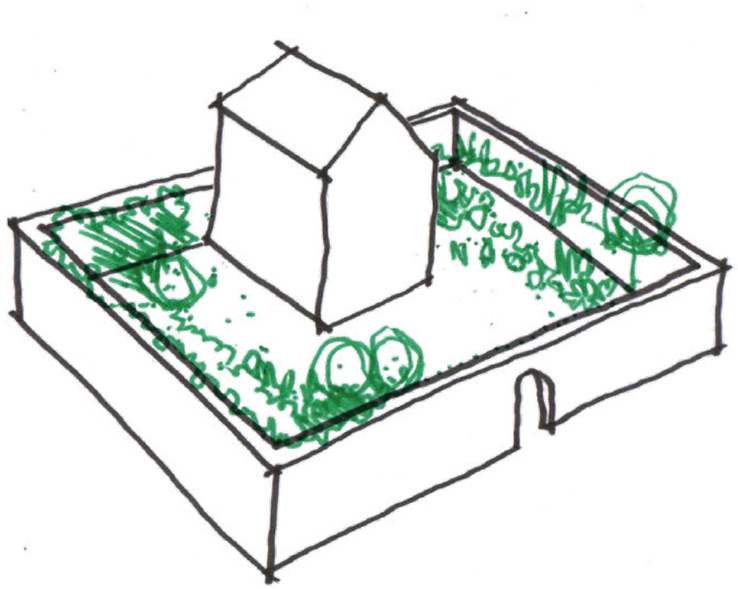
Key

1 Walled garden

2 Strong form linked with pavilion

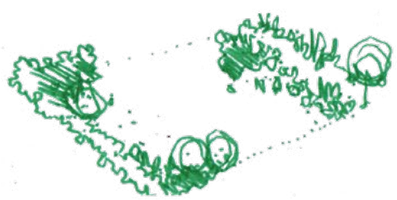
Vernacular Concept

Framework for community

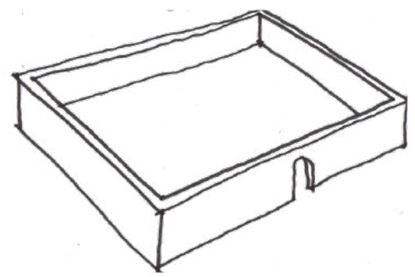


CONCEPT BASED ON KEY CHARACTERISTICS OF COBHAM VILLAGE
STRONG SENSE OF IDENTITY, SETTING & ENCLOSURE

IDENTITY VERNACULAR TYPOLOGY



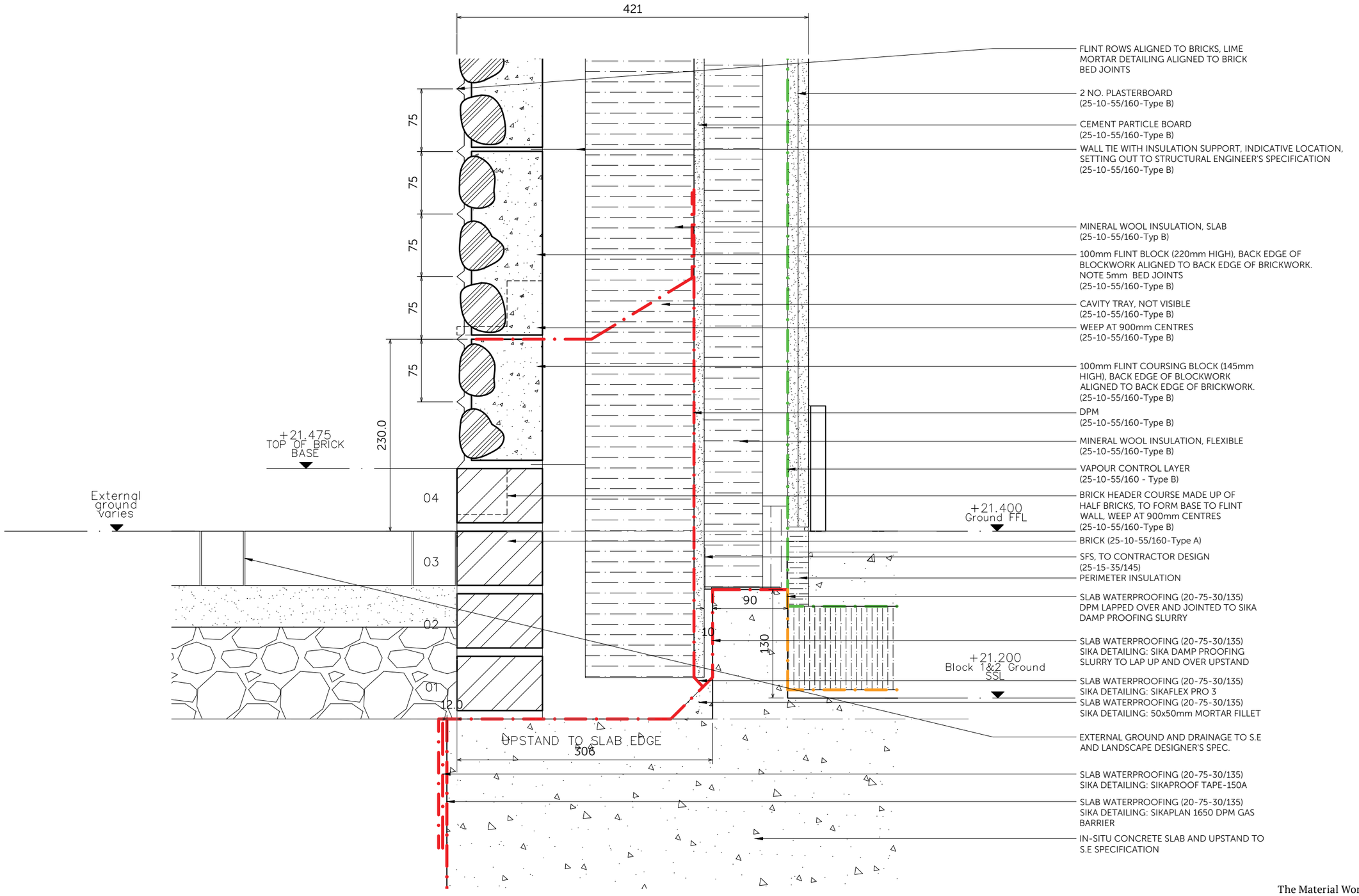
SETTING LANDSCAPE



ENCLOSURE WALLED GARDEN

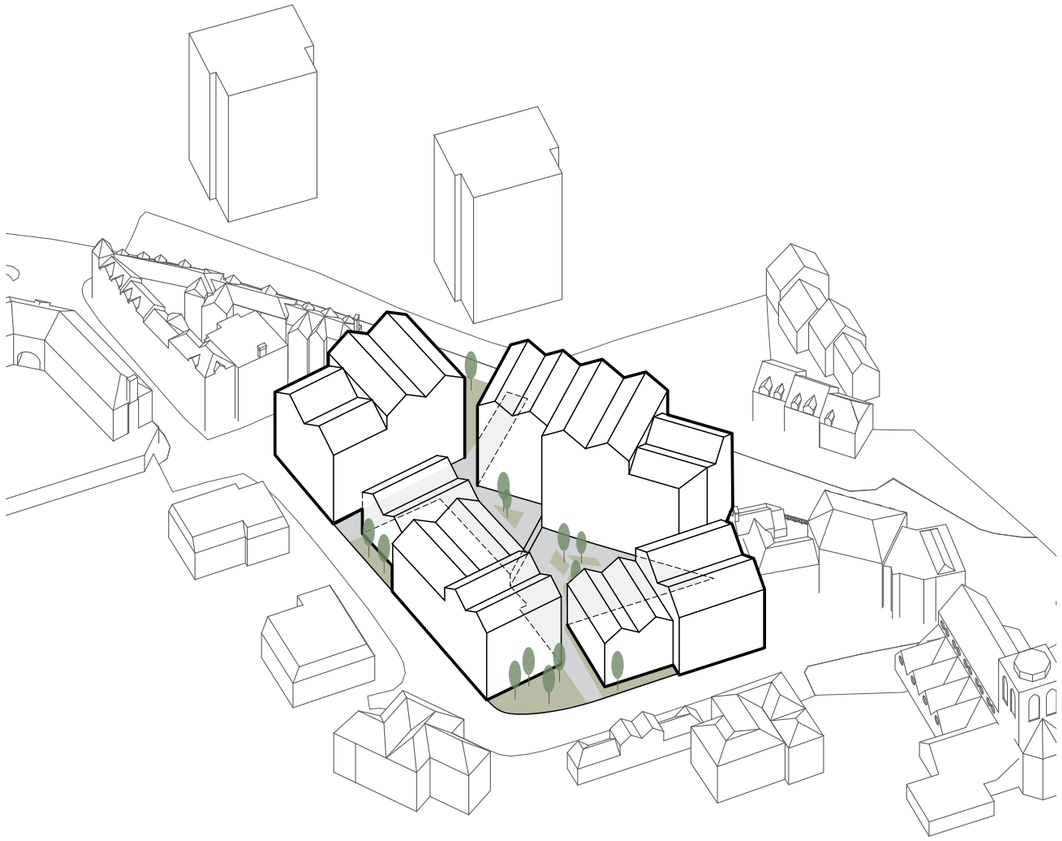
Durable Materials

Locally sourced, blocks quick to install



Guildford Plaza

for tigerdevelopments

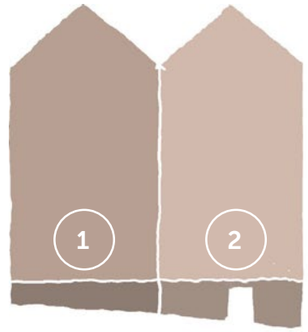


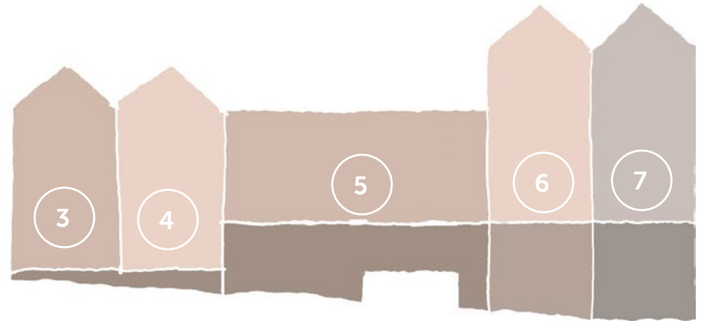
- Coffey Architects for Tiger Developments, through Stage 4
- GIA: 15,900 sqft
- Construction cost: £27,189,000
- Mix of studio apartments and cluster flats arranged around communal kitchens and lounges

Articulation

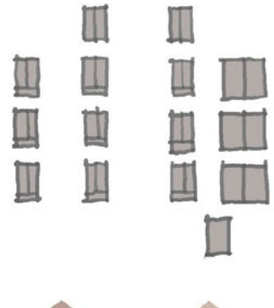
Individual Elements

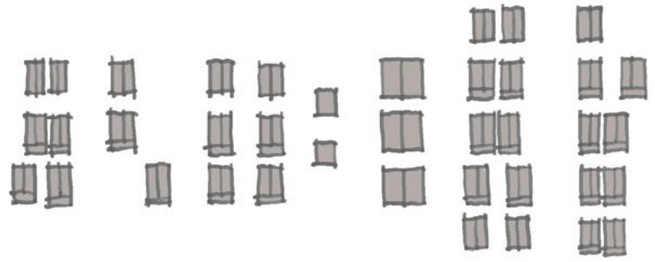
1 - MATERIALS & ARTICULATION
Each elevation reads clearly as series of clearly defined blocks with each bay articulated as an individual element within the whole.





2 - WINDOW TYPES & SIZES
A variety of window types and sizes have been introduced with subdivision in smaller units for scale and privacy,





3 - INFORMAL & PLAYFUL FENESTRATION.
Each elevation bay is individually composed to create a loose and playful composition.

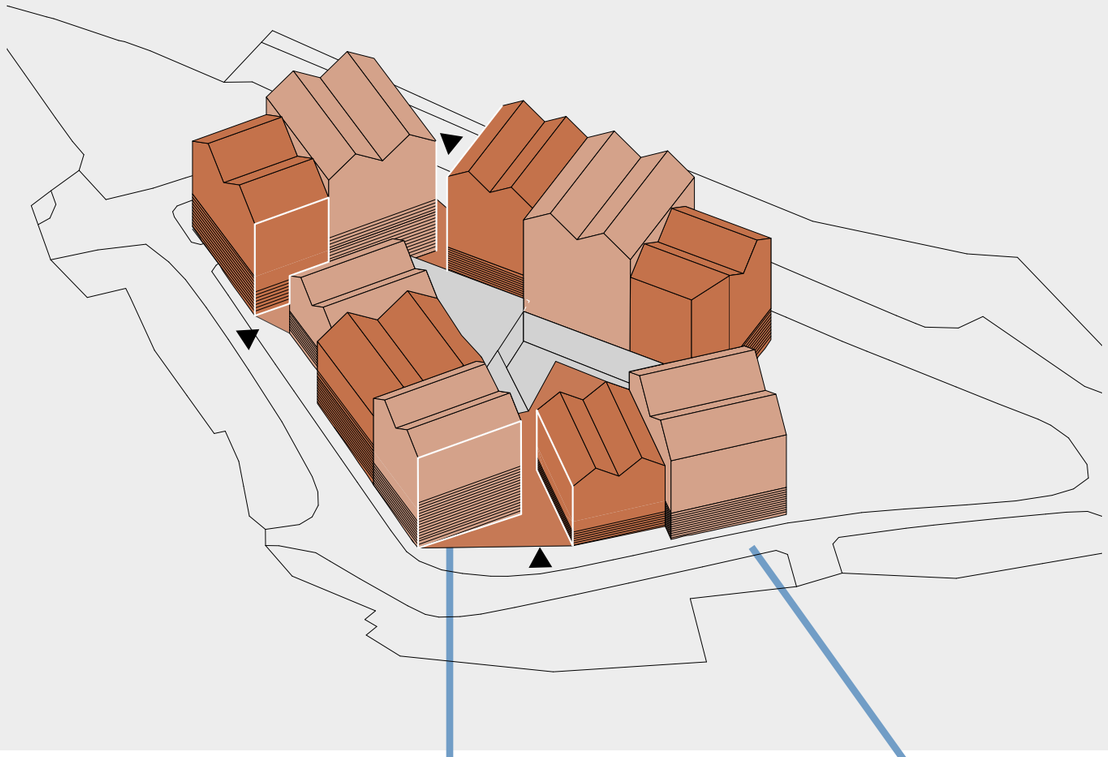
4 - OVERALL COMPOSITION
Final composition balances response to immediate local context with interior function and operational needs.

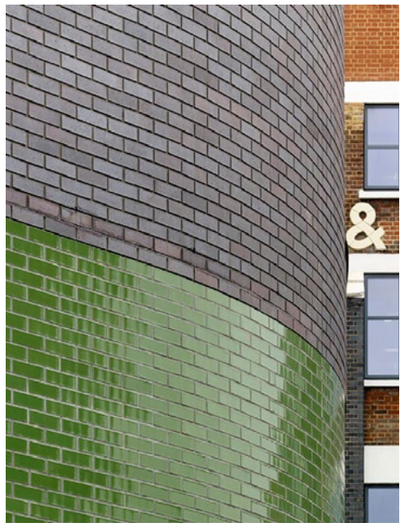
Marking Entrances

Linking to History

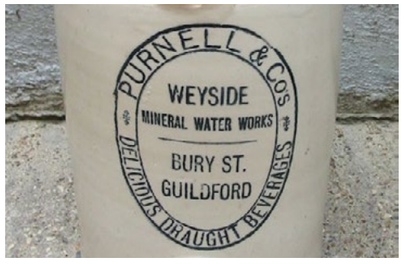
5 / HIGHLIGHTING THRESHOLDS AND ENTRANCES

- Gable ends are enhanced and embellished to emphasise routes into the development
- Achieved through the use of glazed bricks for projecting headers that reflect the site's manufacturing history of glass and glazed stoneware bottles
- A green colour is proposed for projecting glazed bricks reminiscent of some of the original glass bottle colours manufactured on site

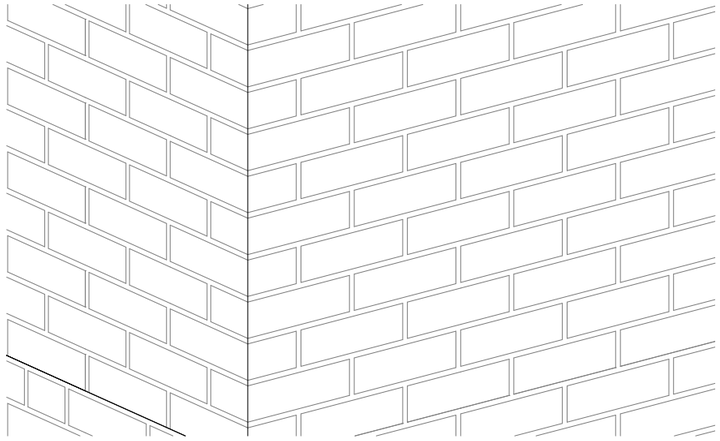




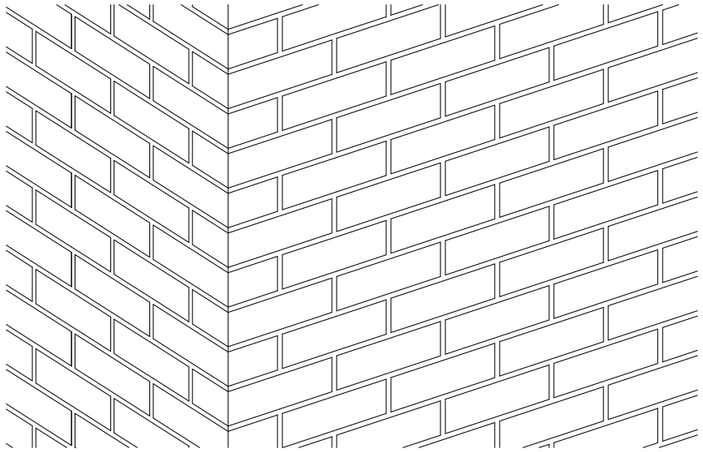
laterial precedent - brick facade with projecting headers and glazed face



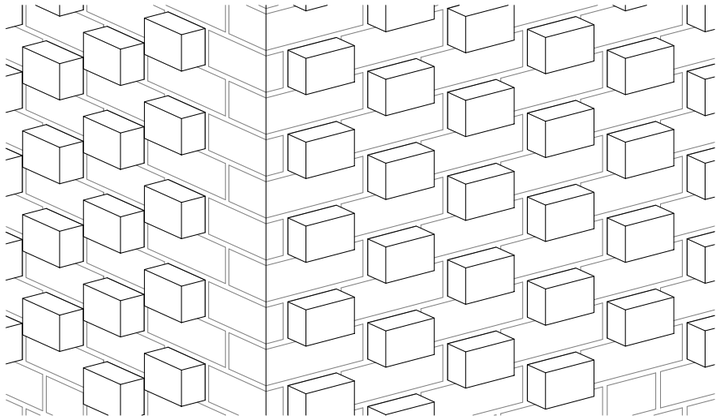
Historical references - glass products and glazed stoneware manufactured on site



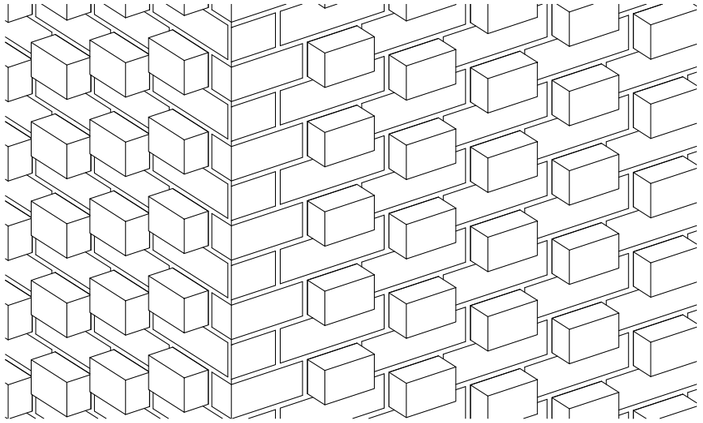
External Wall Type A1



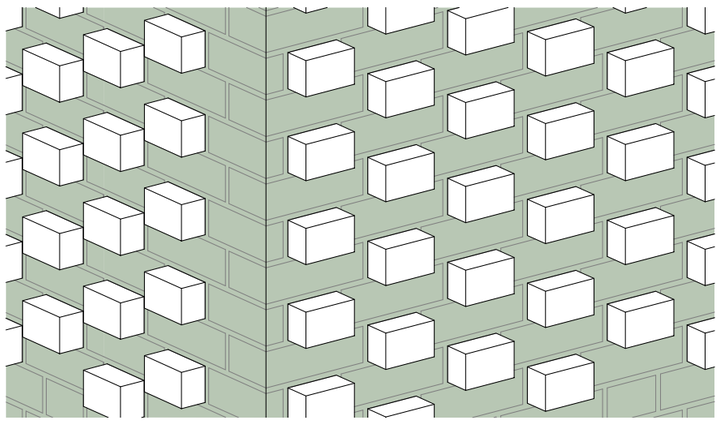
External Wall Type B1



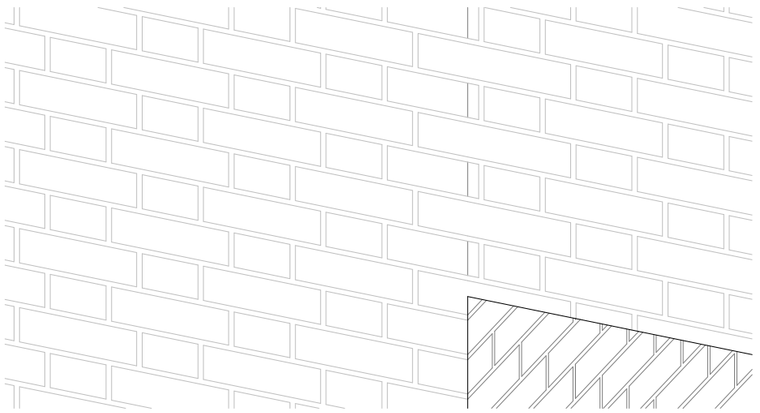
External Wall Type A2



External Wall Type B2



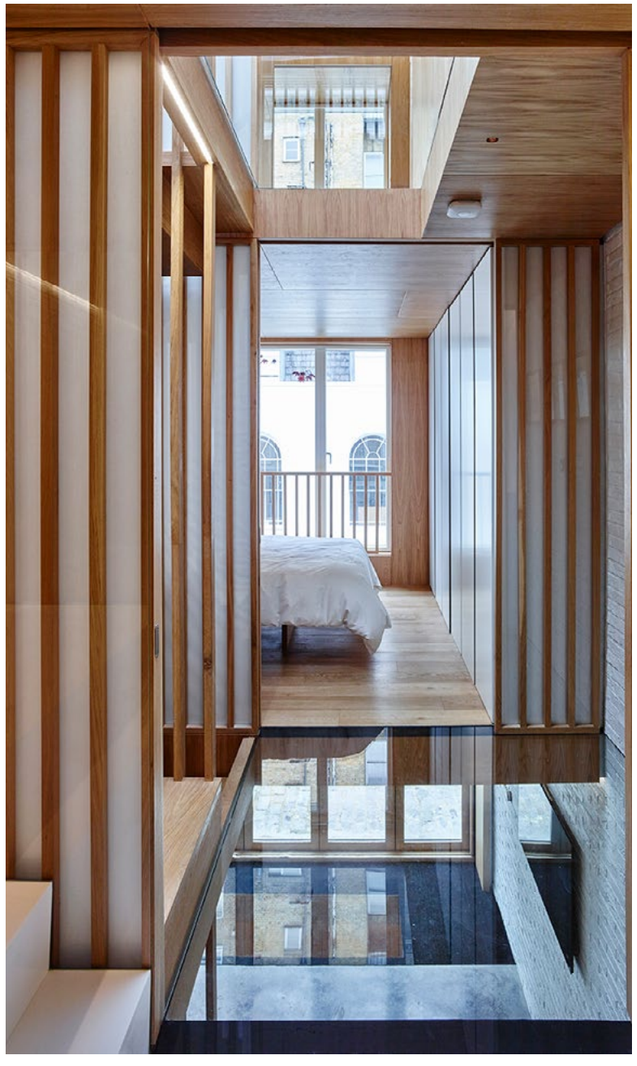
External Wall Type C

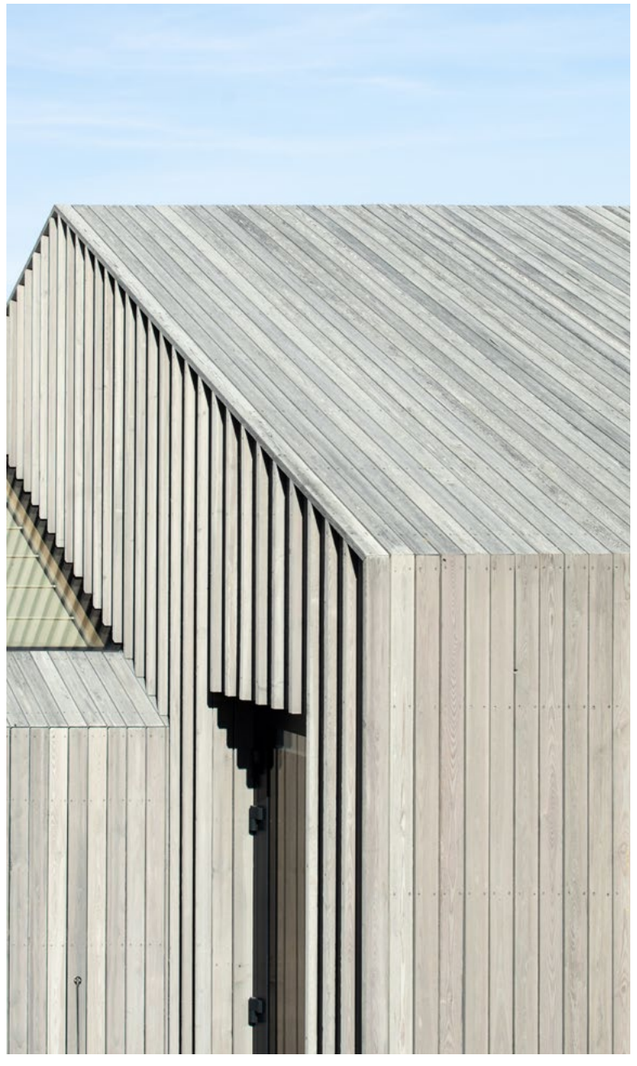


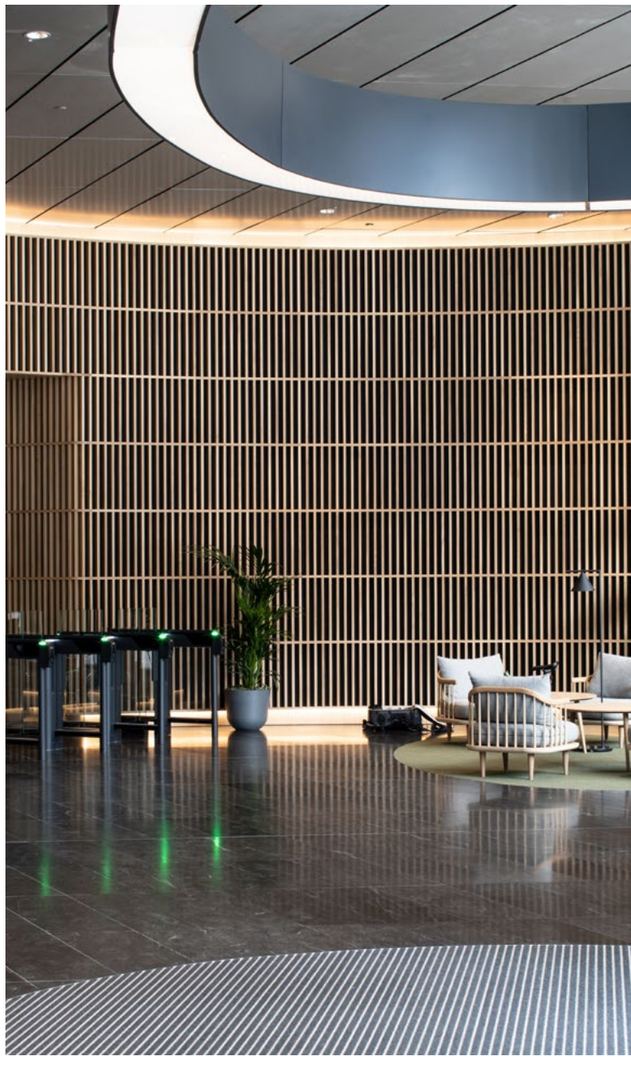
External Wall Type D


GIVE
WAY
WARNING
Arthur Security
CoField

Timber



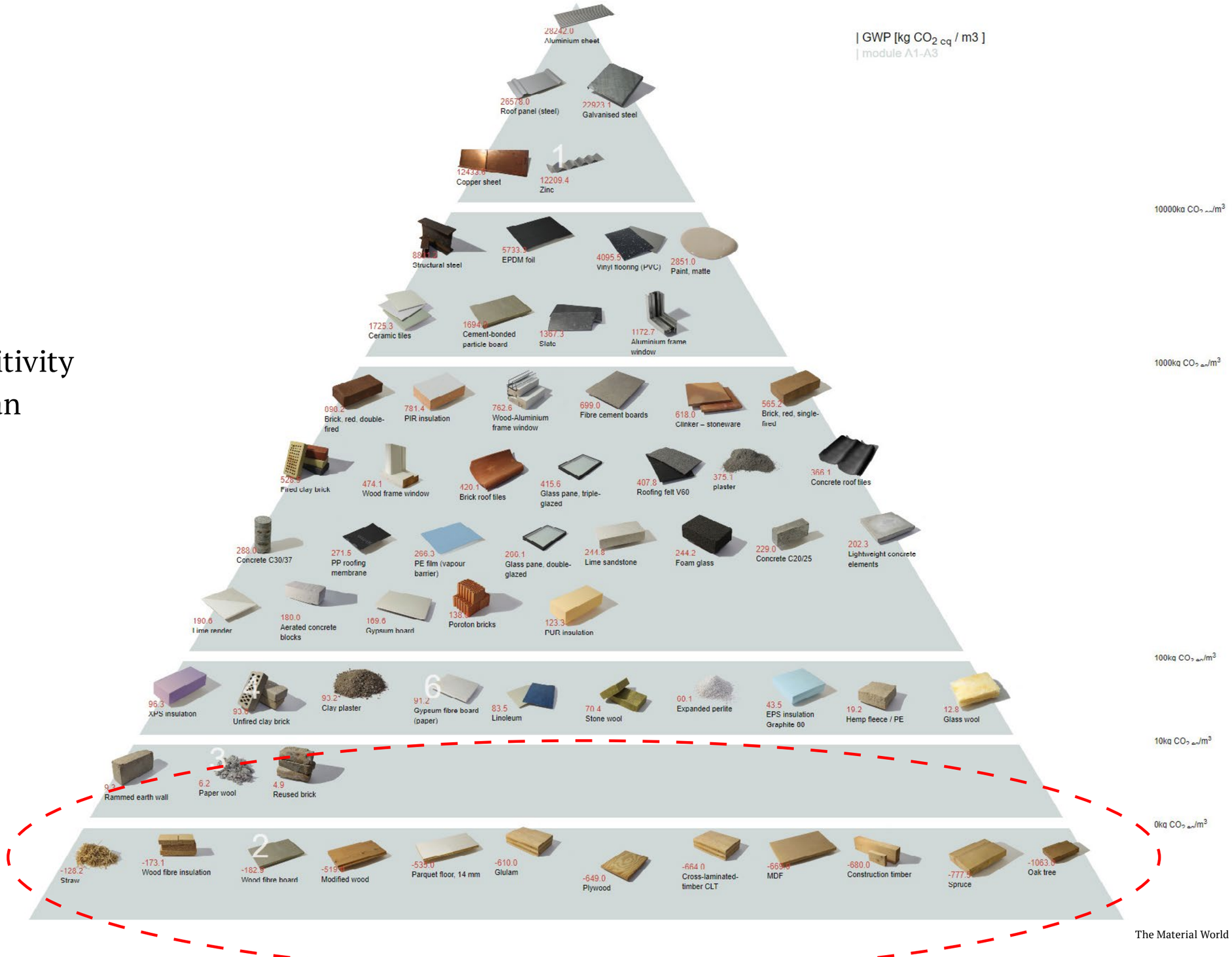




Timber

Construction Materials Pyramid

But:
- Maintenance
- Fire
- Moisture sensitivity
- Shorter lifespan



Timber

So Why Do We Use It?

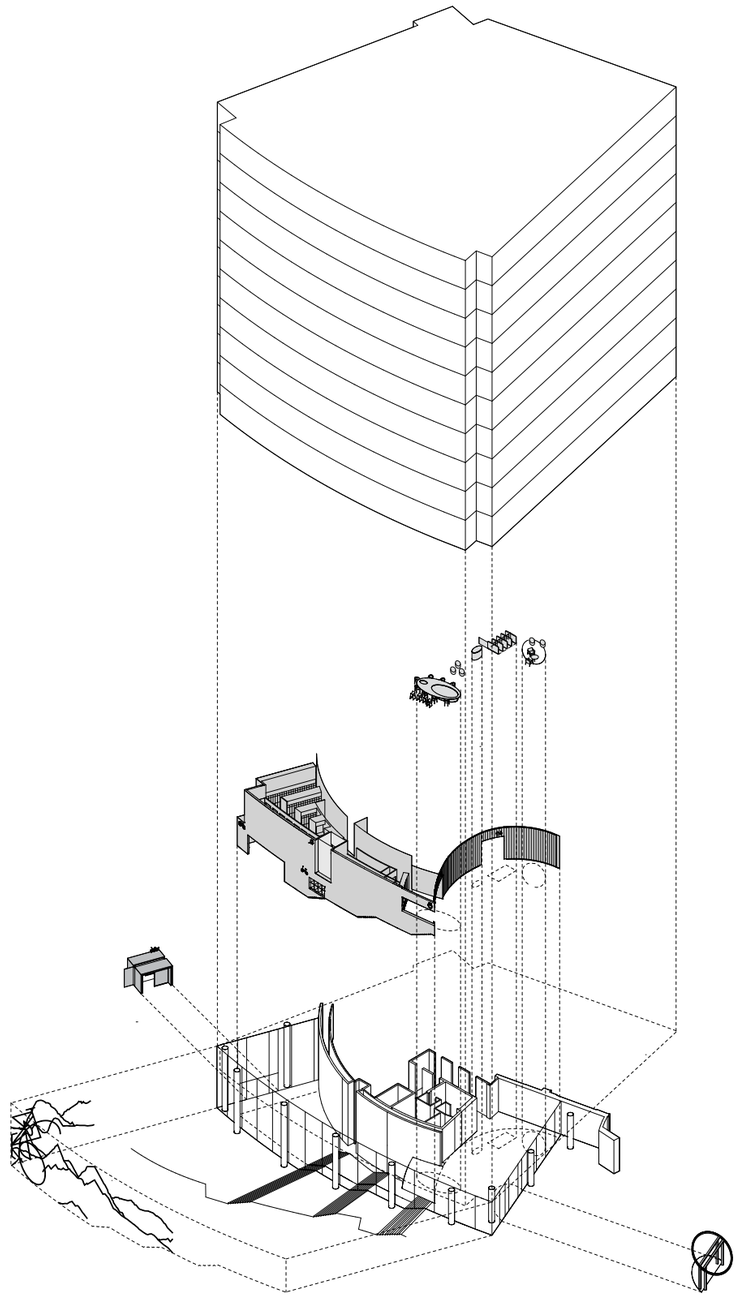
- Environmentally friendly

- Warmth

- Crafted

10 Exchange Square

for British Land



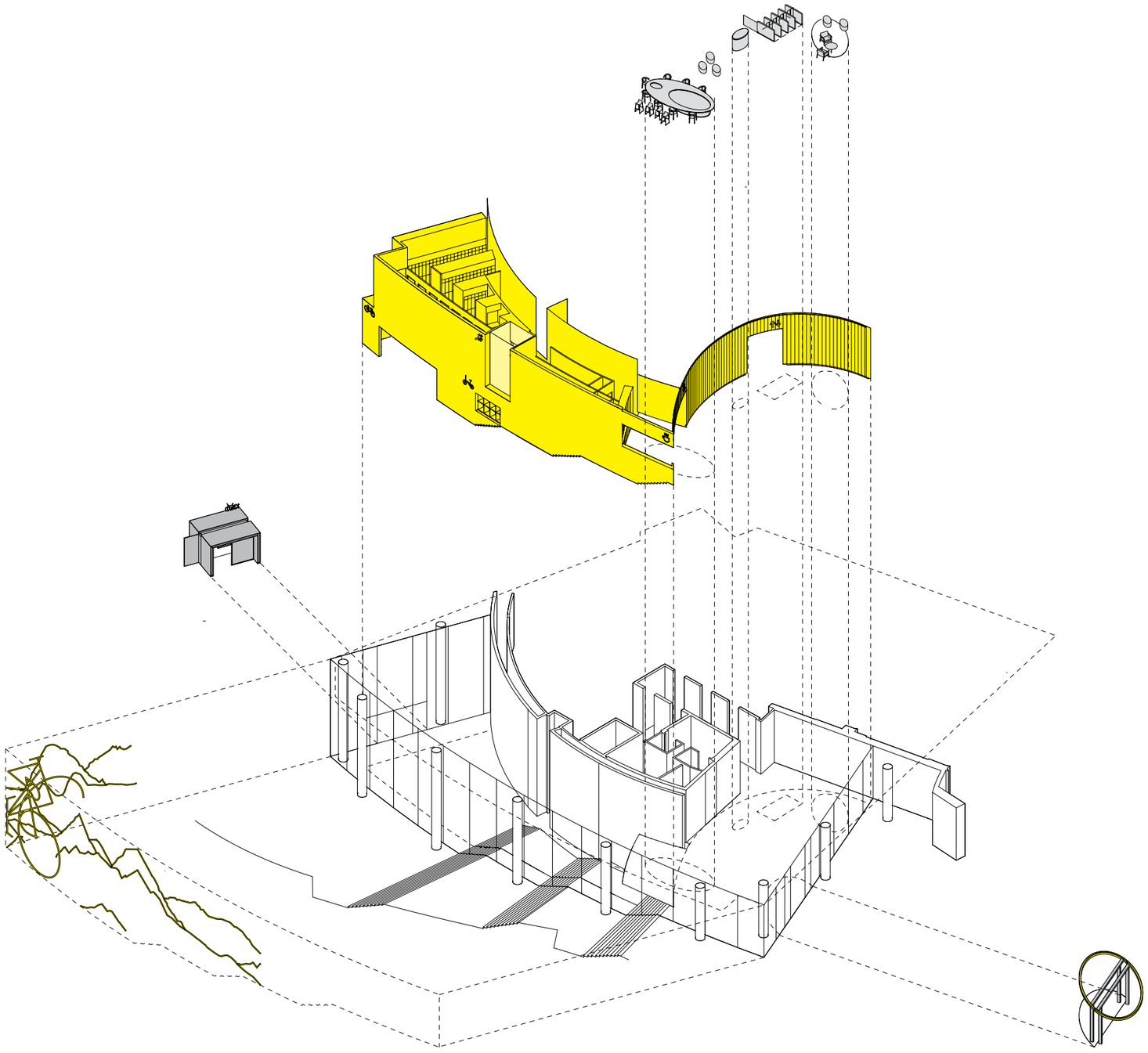
- 93% reduction in embodied carbon compared to the average industry new build benchmark
- 19% decrease in carbon emissions throughout the building's lifecycle
- 99% of all refurbishment waste reused or recycled: retained existing raised access flooring, ductwork, toilets + lifts = 400 tonnes of carbon saved
- 133 secure bike spaces + luxurious end of journey facilities
- 161,000 sq ft building
- 75,000 sq ft workspace

Connecting to Exchange Square

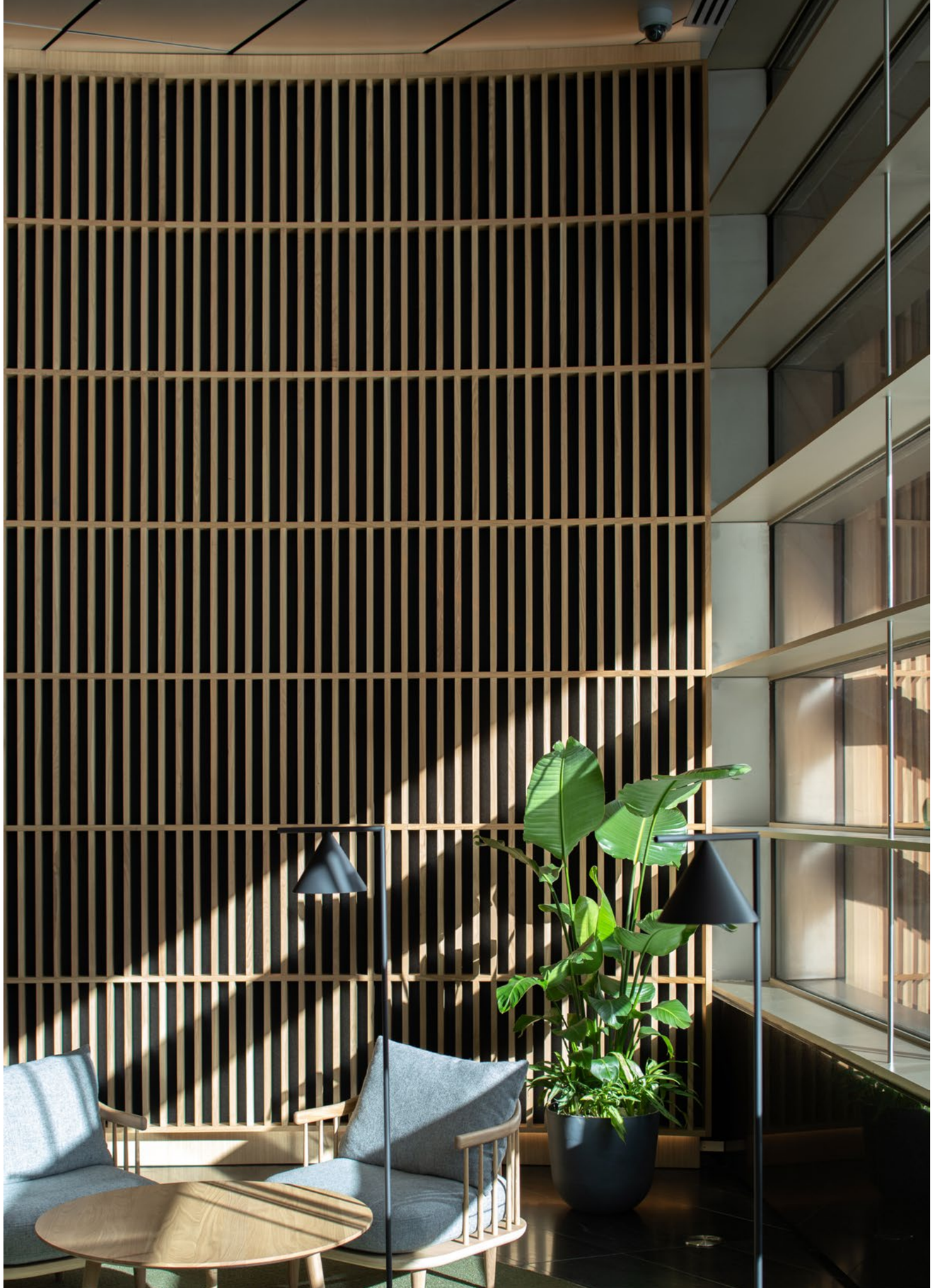
The Ellipse

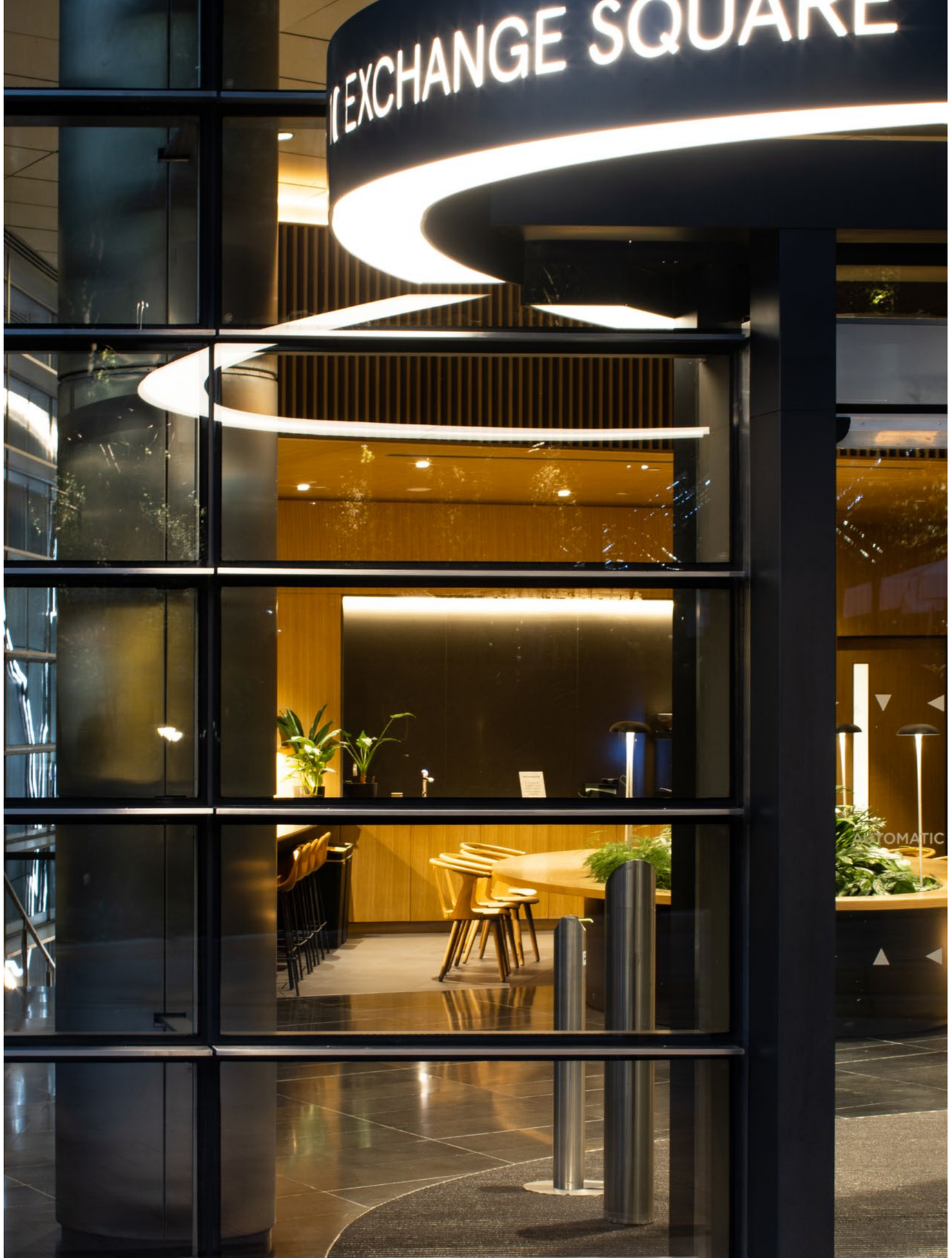
Pavilion

Sustainability and armth




10 EXCHANGE SQUARE




EXCHANGE SQUARE

MMC

Timber & Concrete

MMC Timber Stud Walls

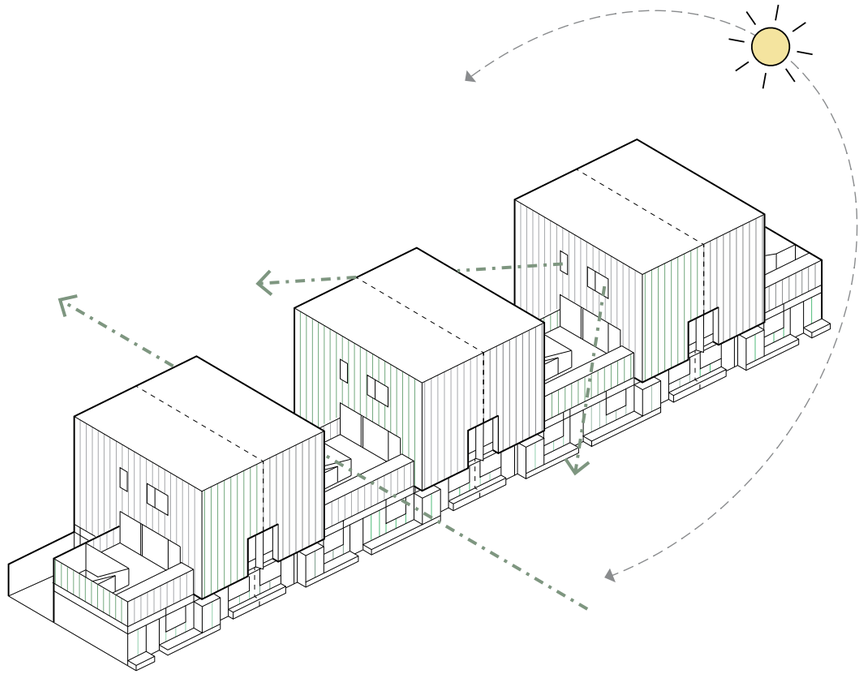
Pros & Cons

Strengths: Fast, sustainable, lightweight, highly energy-efficient, less site labour needed.

Weaknesses: Fire/moisture risks, durability perceptions, acceptance issues with lenders/insurers, and reliance on specialist supply chains.

Warbank Crescent

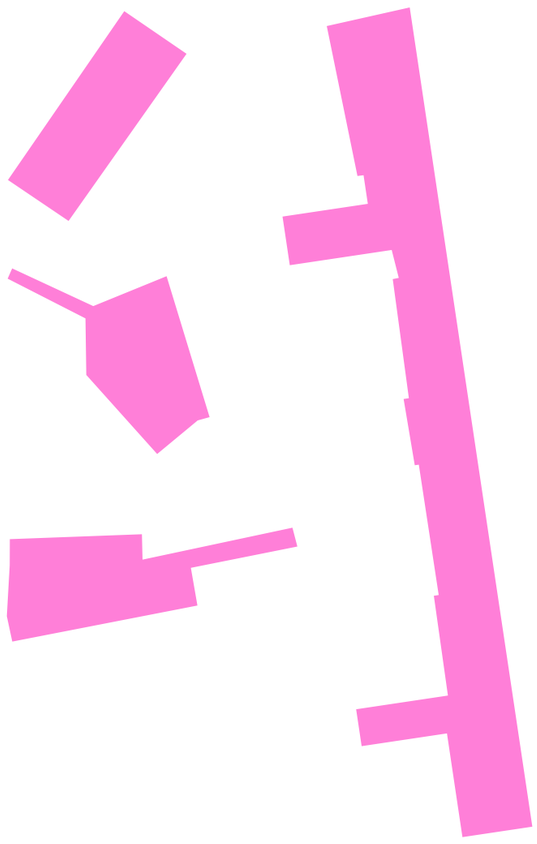
for BRICK BRICK



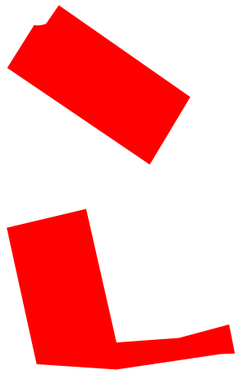
- AJ Architecture Award, Housing Project of the Year - shortlisted
- Housing Design Award, Croydon Smaller Sites Programme – won
- New London Award, Croydon Smaller Sites Programme – won
- 36 affordable homes
- Courtyard typology to avoid overlooking

Croydon Smaller Sites Framework

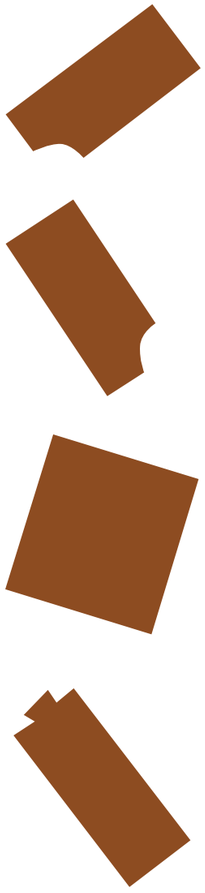
Site Cotegorisation



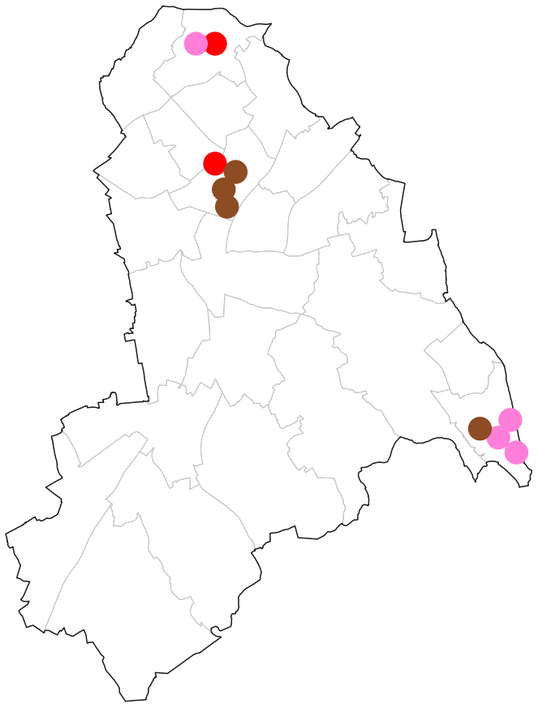
backland



suburban frontage



urban infill

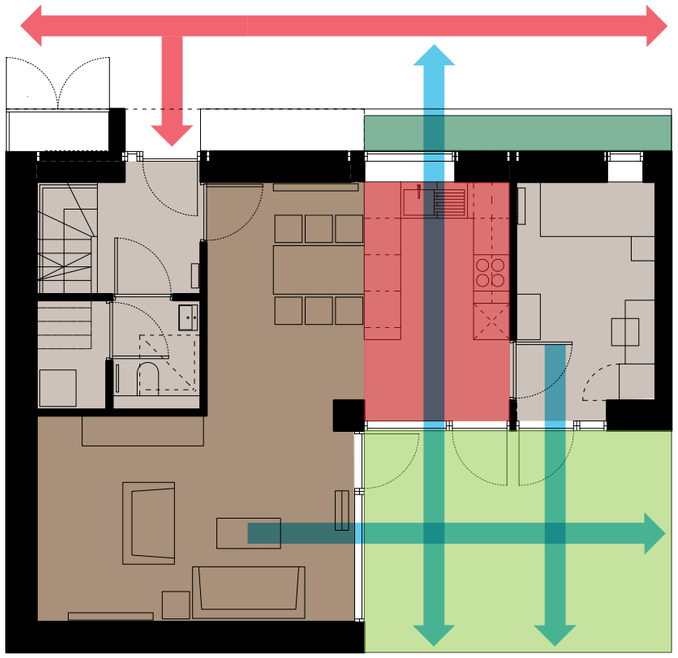


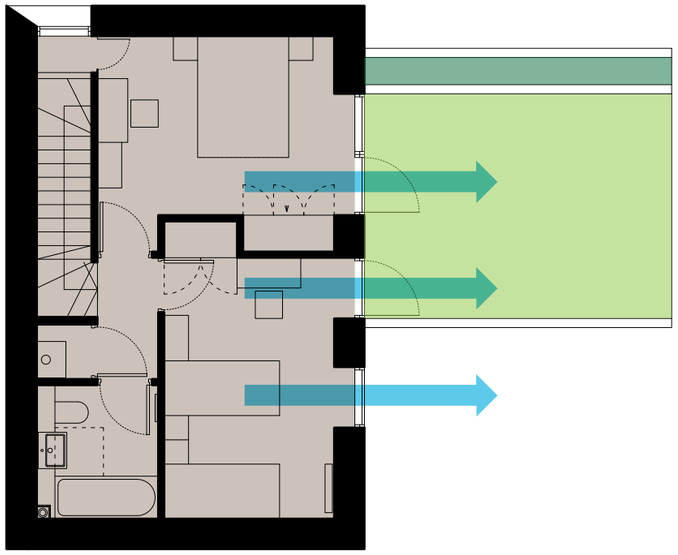
SITE LOCATIONS

Courtyard Typology

Avoiding overlooking

access route / shared courtyard





neighbouring garden

COURTYARD TYPOLOGY

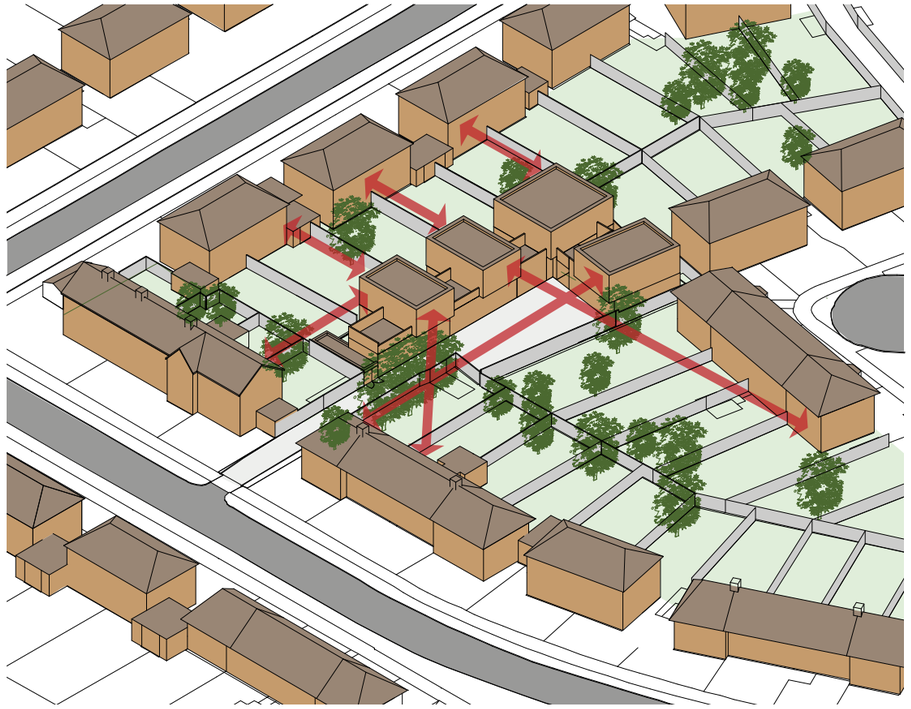
rooms arranged around courtyard garden and roof terrace

views into these rather than neighbours gardens

Materiality as Contextural Response

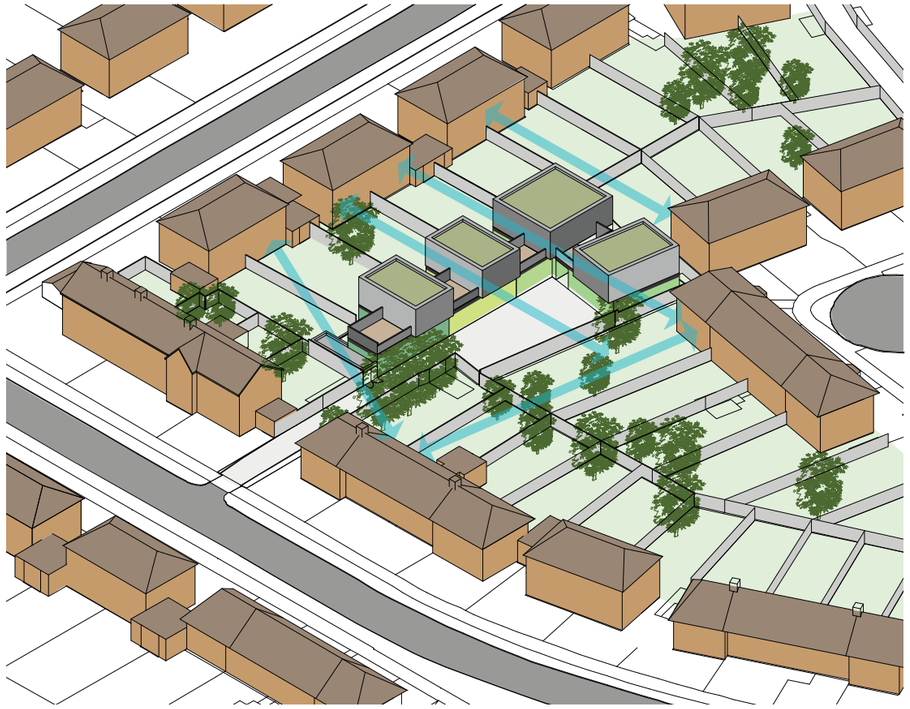
Contrast instead of mimicking

MATERIALITY OF THE CONTEXT



incursion of the same materials halves the garden zone

MATERIALITY AS CONTEXTUAL RESPONSE



contrasting materiality
brick to brick distance remains
pavilions in garden zone
presence to street

Colour Planes

Zinc and aluminium cladding

This diagram illustrates the design intent of applied colours and materials on Warbank Crescent.

MATERIAL KEY

1: Zinc rainscreen cladding: Rheinzink.

2: Aluminium rainscreen cladding : PPC aluminium panels.

3: Aluminium windows and doors : PPC aluminium composite windows

4: Fibre cement certical rainscreen cladding: Marley Eternit Cedral Click Smooth

5: Brick work: Karma Grey Stock, Light Grey flush pointing.

6: Fencing: Feather edge timber fence

7: Concrete benches and ground floor planters: In-situ cast concrete, fair faced finish.

8: PPC metal gate: PPC galvanised steel gates with vertical railings

9: Zinc rainwater goods: Rheinzink Water Cube

10: Green roof: Seeded extensive green roof with biodiverse substrate

Colour / Material Palette

Durability, tactility and lightness

2.0 SAMPLE BOARD

Shown across are the materials and colour selections for the external palette.

Material Key

1: Zinc rainscreen cladding: Standing seam zinc at 500mm centres in Moss Green (Colour range), Graphite Grey, Blue Grey and Bright (Patina range), by Rheinzink. All colours also apply to zinc parapets. All zinc soffits in Graphite Grey.

2: Aluminium rainscreen cladding : PPC aluminium panel finished flush with window and door system, in RAL 7038, RAL 6021, RAL 6010, RAL 7021.

3: Aluminium windows and doors : RAL coloured PPC aluminium composite windows, door frames in RAL 1000, RAL 2020, RAL 7021.

4: Fibre cement certical rainscreen cladding: Marley Eternit Cedral Click Smooth vertical cladding in Pewter. Hidden fixings on ventilated cavity.

5: Brick work: Karma Grey Stock, Light Grey flush pointing.

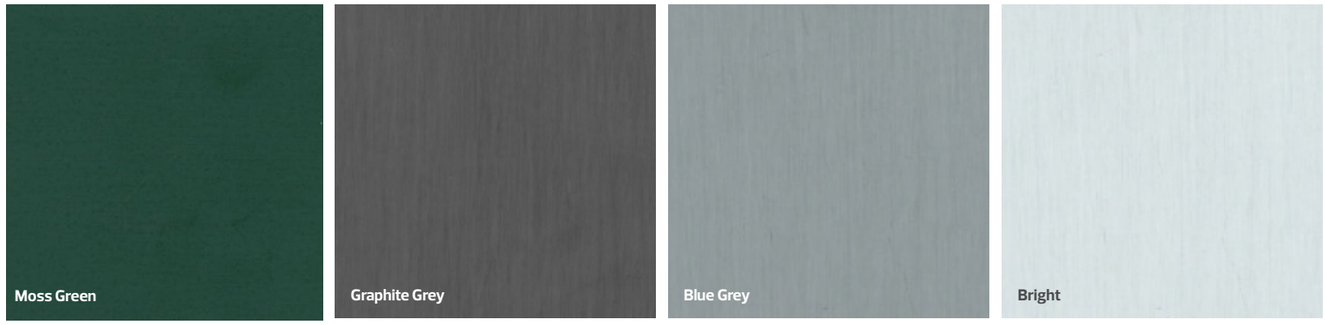
6: Fencing: Feather edge timber fence in larch (natural weathering to grey).

7: Concrete benches and ground floor planters: In-situ cast concrete, fair faced finish.

8: PPC metal gate: PPC galvanised steel gates with vertical railings in RAL 6010, 6021 and 7038.

9: Zinc rainwater goods: Rheinzink Water Cube rainwater hopper and downpipes in bright rolled, “preweathered pro blue-grey” and „preweathered pro graphite-grey”.

10: Green roof: Seeded extensive green roof.



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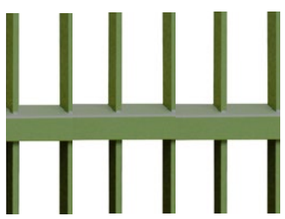

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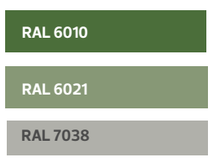

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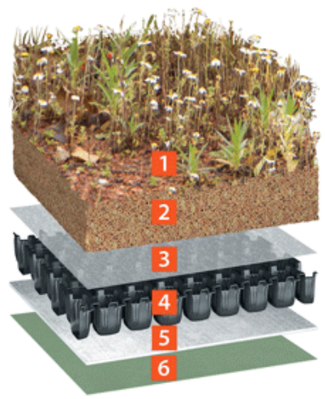
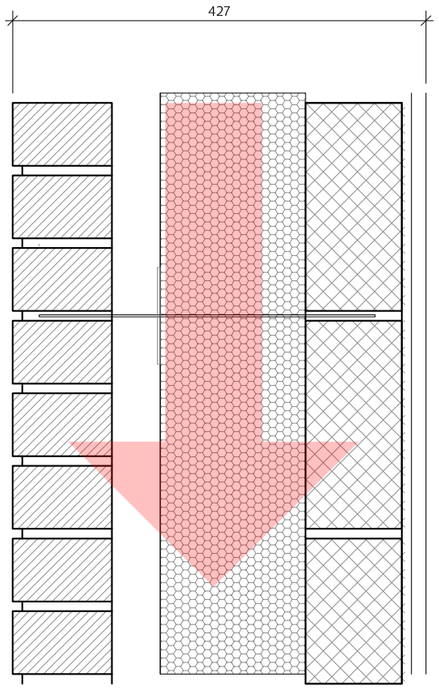


10

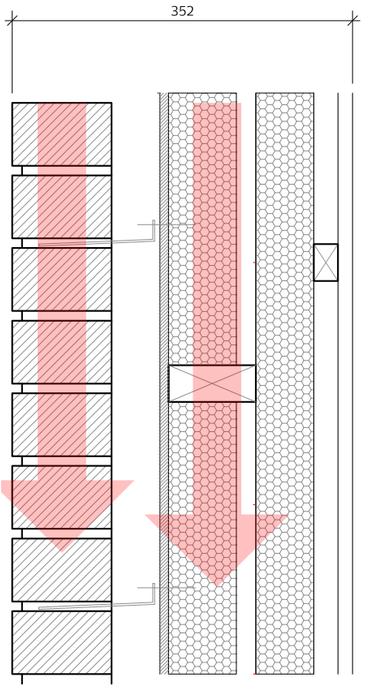
Honest Wall Construction

Brick vs Timber



brick & block

tied into operating as one structural unit supporting the building

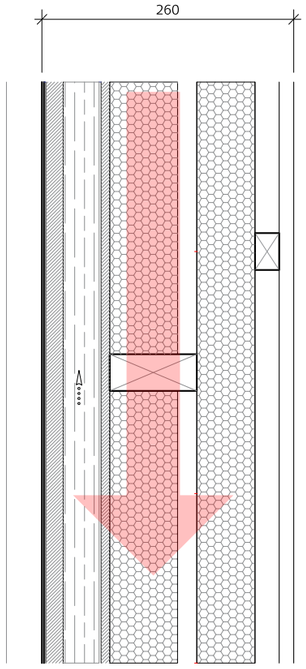


brick & timber frame

bricks are mere cladding, bearing their own weight only

can’t be supported by timber frame, need to go to ground

takes back time saved by using timber frame panels manufactured off site



timber frame & lightweight cladding

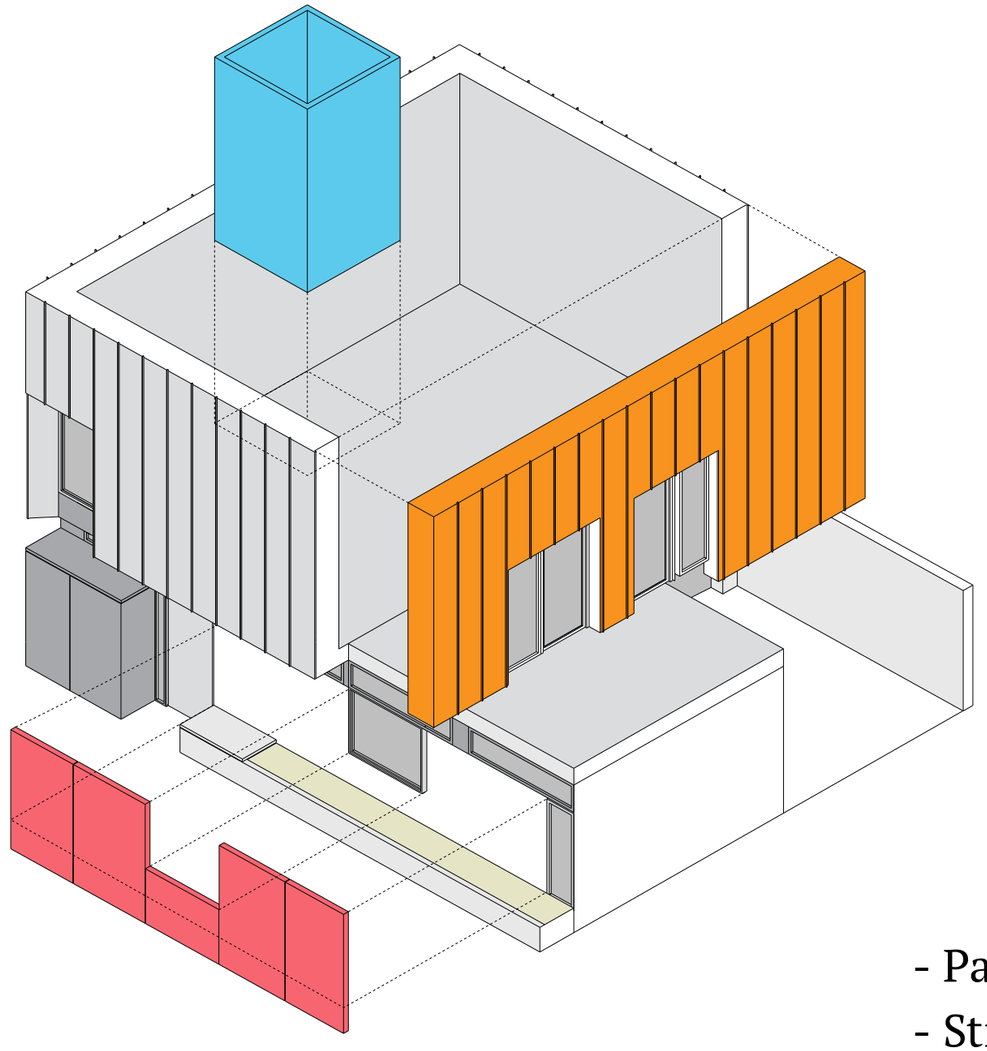
honest expression of the structural system

best technical fit with MMC

needs appropriate architectural response

MMC

Brick vs Timber



- Panellised
- Structure
- Time / cost
- Quality / energy performance


30

MMC Precast Panels

Pros & Cons

Strengths: Fast build, excellent fire resistance, durability, acoustic performance, and aesthetic flexibility (including brick-slip finishes).

Weaknesses: Heavy, expensive upfront, high carbon footprint, and requires large-scale projects with early design lock-in to be most viable.

MMC Precast Panels

So Why Do We Use It?

- Quick / viable construction large projects

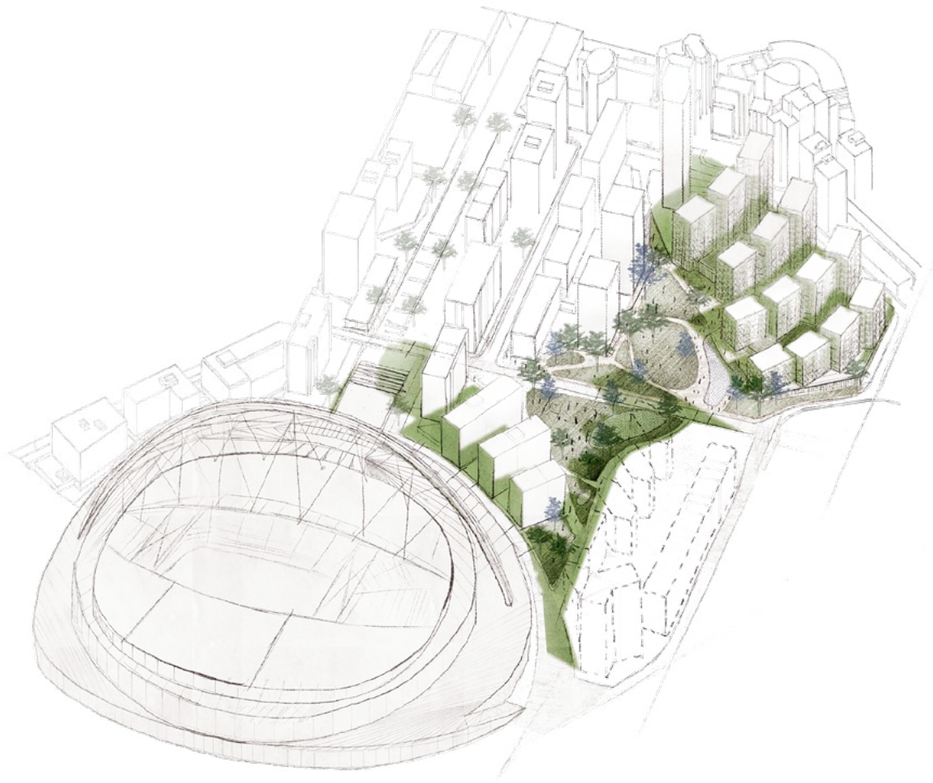
- Structure and decoration in one - no need for additional external finish

- High degree of quality control

- Wembley concrete trials shows 70% carbon savings compared to standard concrete

Wembley Park

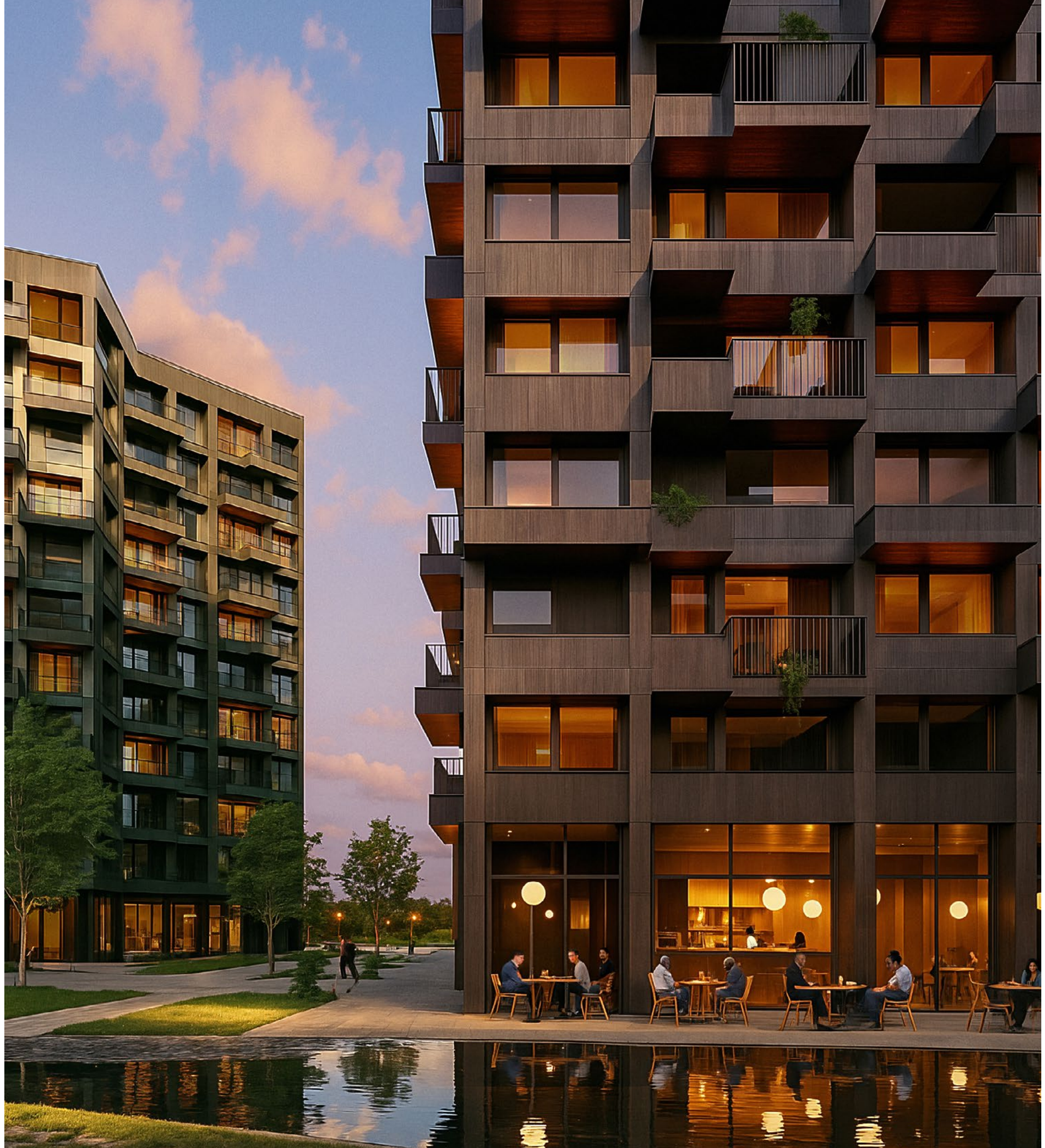
for QUINTAIN LIVING



- 600 Build-to-Rent homes
- Targeting BRE Residential Homes Quality Mark 5-Star Outstanding certification and WELL Building Standard Platinum certification
- High proportion of dual-aspect flats, daylight-focused massing, and prefab pigmented pre-cast concrete cladding

The Knuckles

Increasing dual aspect ratio



The Alternatives

The Alternatives

Material of the Week

Material of the Week →

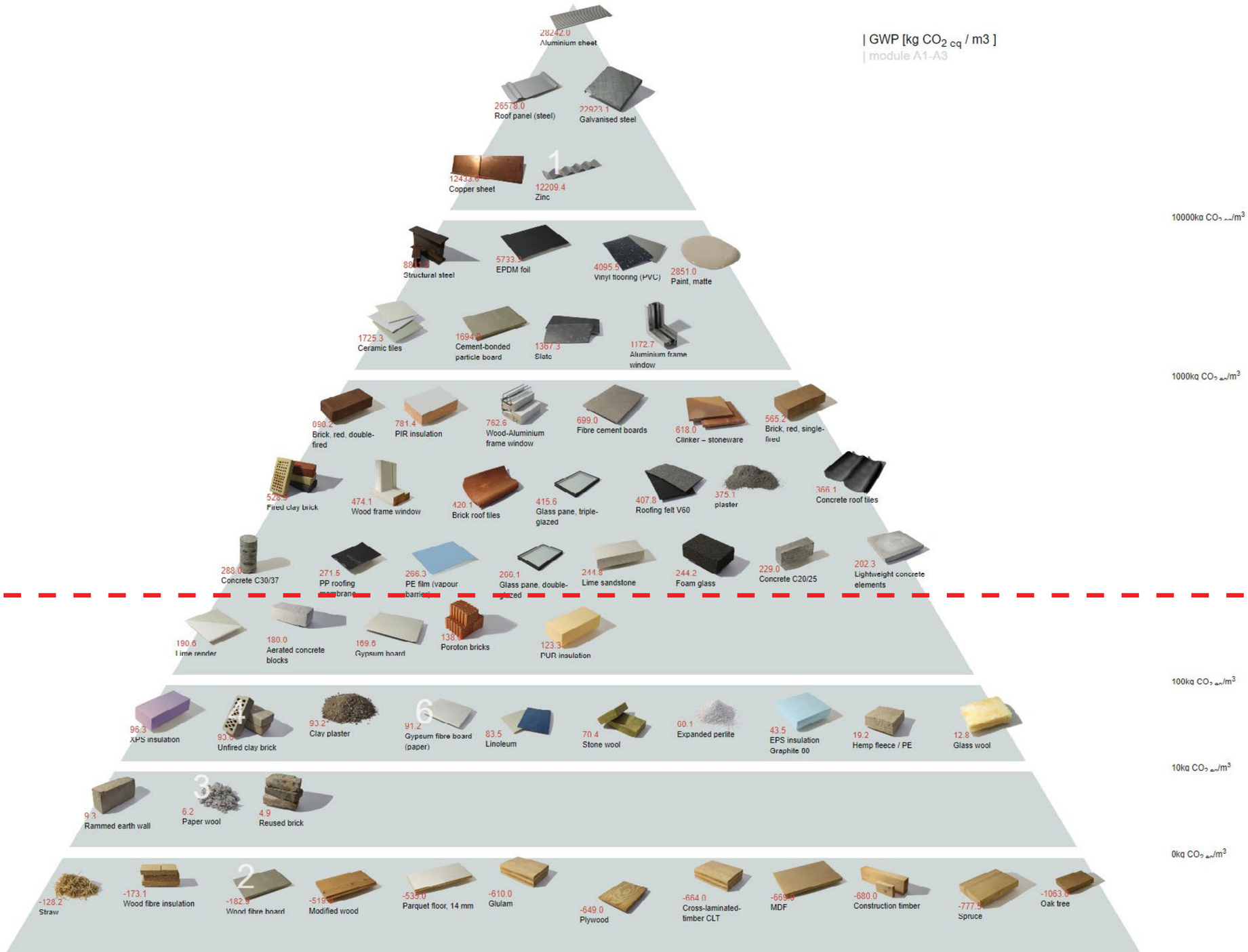
Material of the Week →

Material of the Week →

The Alternatives

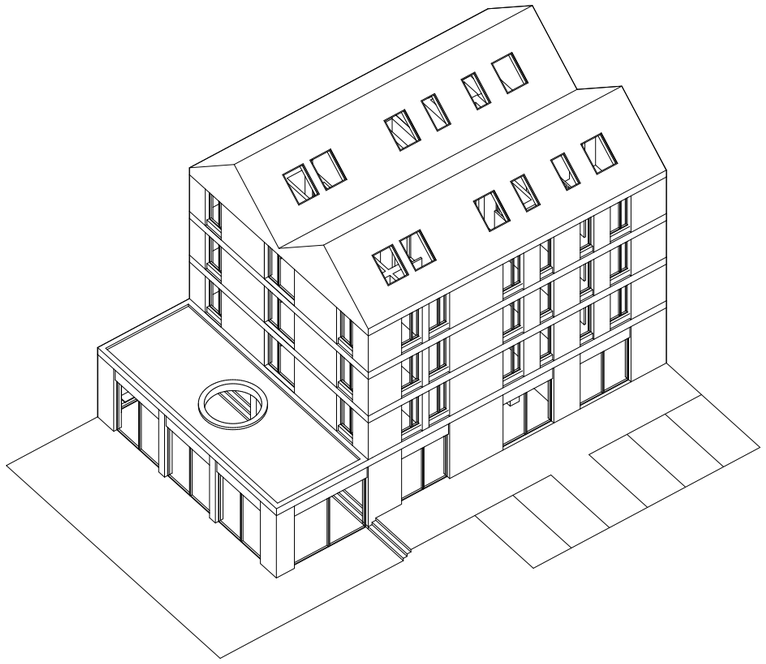
Staying at the low end

This and below



The Future

Case Study



The Future

Walls - Brick Alternatives

Unfired bricks from waste

Wool bricks

Stone bricks

Bricks from waste

Unfired Bricks

K-Briq

Produced in Scotland - manufactured near Edinburgh

Unfired brick - low carbon footprint - ~95% less compared to traditional fired bricks.

Made from nearly 100% construction and demolition waste. And no cement.

Stone Bricks

A Better Brick by Polycor

Made from waste limestone fragments. Too small for typical limestone tiles / slabs / blocks but perfect for brick format.

No firing required so much lower than fired clay bricks.

Great for load bearing due to great strength.

Can be recycled and reused in the future.

Wool Bricks

University of Seville &
Glasgow’s University of Strathclyde

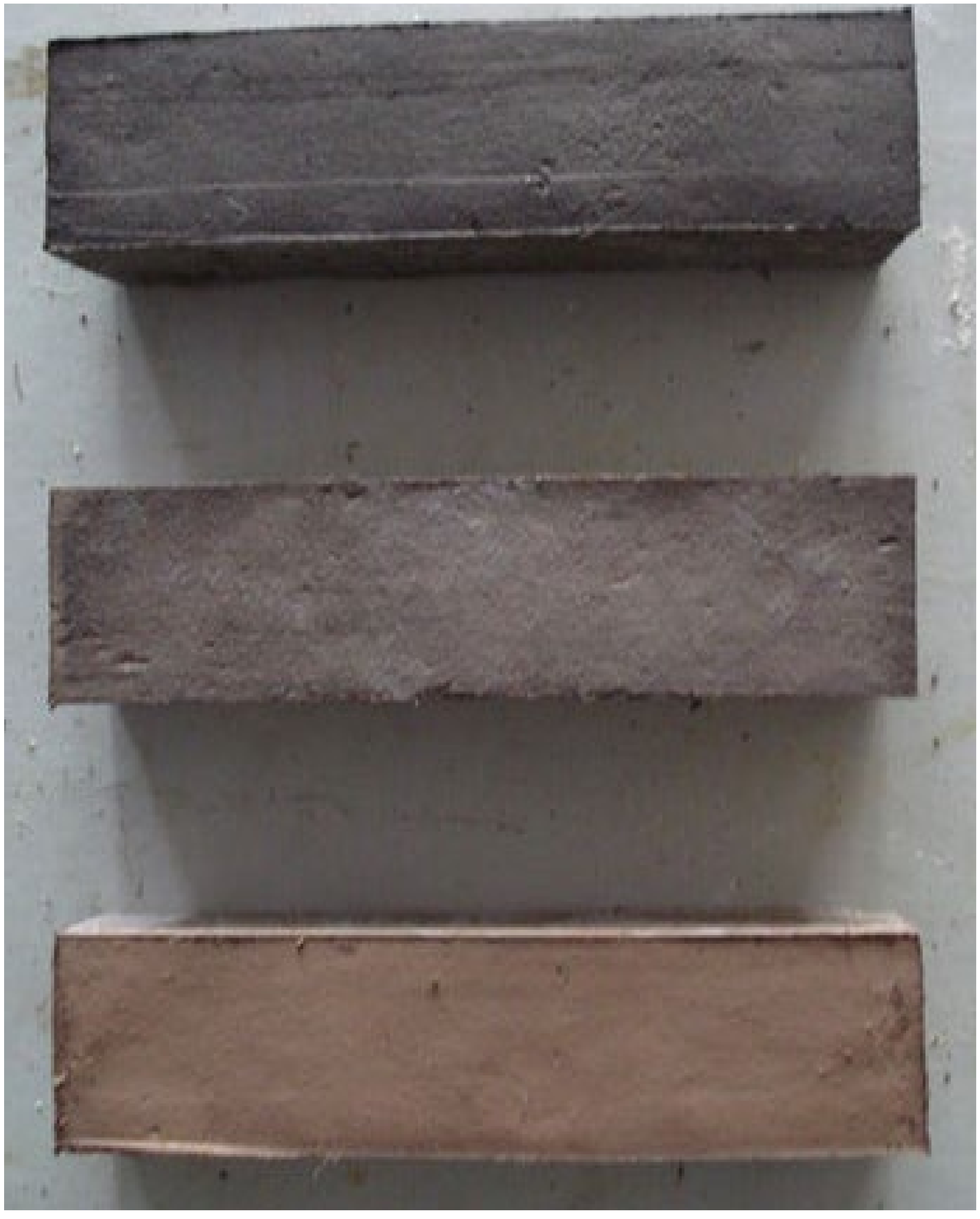
Unfired brick made from wool fibres and optionally seaweed, combined with clay.

Wool makes it 37% stronger than traditional unfired stabilised earth bricks.

Wool minimise cracking and deformation during drying.

Wool reduces the drying time and improves production efficiency.

Energy-efficient production – manufactured without firing, lowering energy use and carbon emissions.



Waste Bricks

Fragma by Terraformæ

Terrazzo-like brick

Bricks made from waste material from historic S. Anselmo kiln in Italy.

Mixed with patented 70Materia® mixture to minimise virgin raw material use.

The Future

Walls - Other Materials

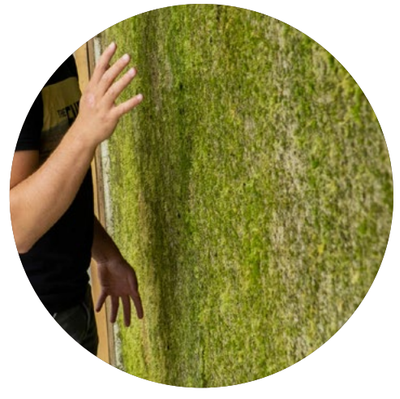
Translucent aluminium

Transparent wood

Cork

Recycled plastic

Cork Spray



Moss Concrete

Translucent Aluminium

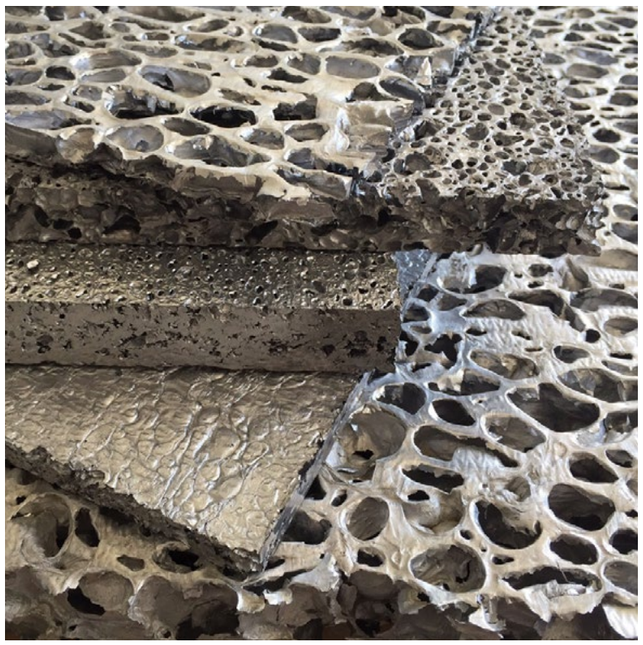
Alusion

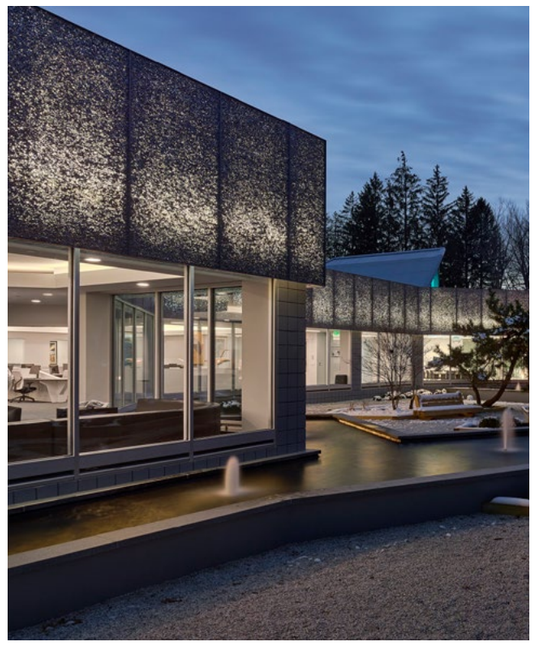
Aluminium foam made from up to 100% recycled aluminium.

Foam-like structure when cut creates perforation great for lighting and ventilation.

Different densities of ‘perforation’ available.

Resistant to corrosion, mould, mildew, and insects, ensuring long lifespan.





Transparent Wood

Swedish KTH University

Transparent material made of wood.

Absorbs carbon as it is wood.

Five times more thermally efficient than glass, reducing heating/ cooling energy use by ~25–33% in medium to large offices.

Biodegradable – reduces long-term environmental impact compared to glass or plastics.

Cork Facade

Amorim

Cork is typically used for floors but works great as insulation and even façades.

One of the most sustainable materials you can get. 100% natural and renewable – harvested from cork trees every 8-9 years without harming them.

Trees absorb more CO_2 during regeneration than if they hadn't been harvested.

Production uses minimal energy, reducing carbon emissions.

Fire-safe and brilliant water resistant.

Cork Spray

Vipeq

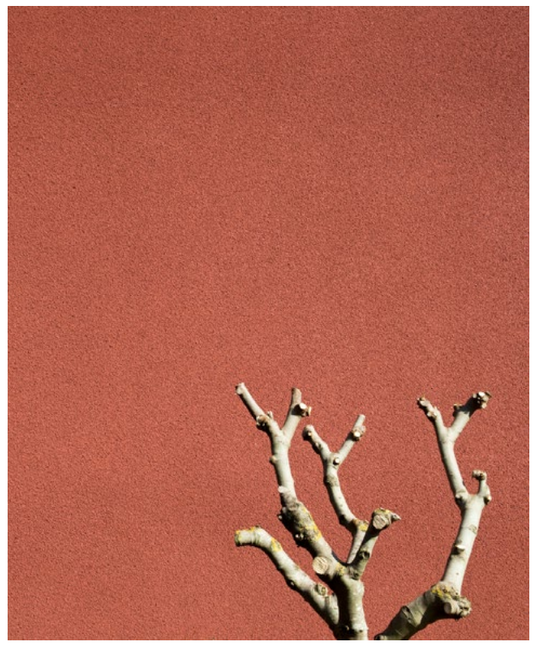
Sprayed material made from cork granules mixed with water-based resins, organic polymers, mineral fillers, and other organic additives to create an eco-friendly and flexible insulation and coating

Suitable for exterior façades, roofs, thermal insulation, moisture protection, fire-resistant coating, refurbishment projects, and decorative finishes. Works well for organic forms as can be applied to any shape.

Weather-, fire- and waterproof

Great durability and minimal fading (~1% per year).

It’s a breathable material that allows moisture escape, preventing condensation and mould growth.



Recycled Plastic

Pretty Plastic

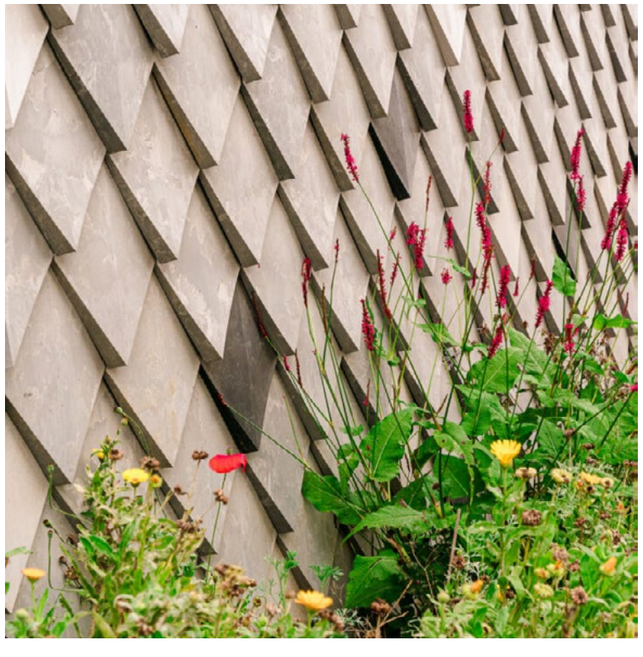
Developed in Holland.

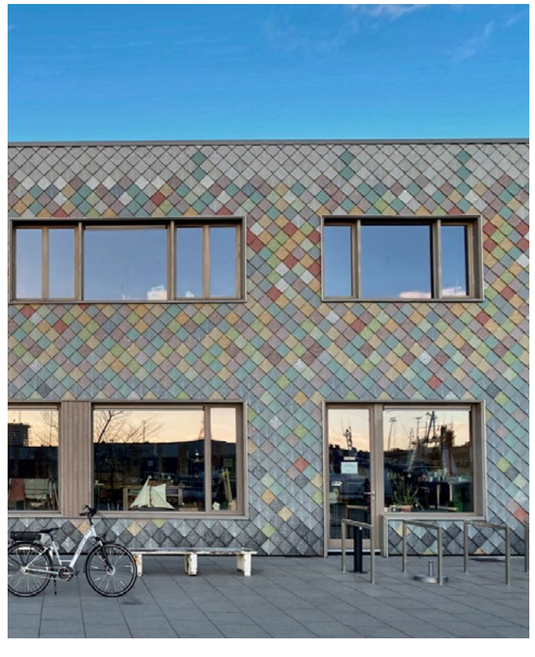
Made from 100% recycled PVC from post-consumer and construction waste.

Comes in several formats for façades.

High circularity – 98.21% circularity score, indicating strong resource efficiency.

Fire safety compliant – meets regulations for high and low-rise buildings.





Moss Concrete

Respyre

70% recycled concrete with moss growing from its surface.

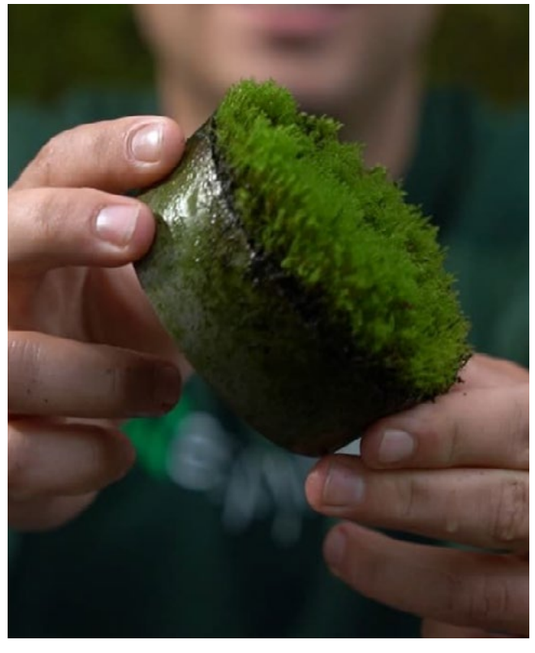
The moss evapotranspiration can reduce surface temperatures by up to 30%.

Moss absorbs fine particulate matter and nitrogen oxides helping to achieve cleaner air.

Great for biodiversity as it creates micro habitats for urban wildlife.

Minimal upkeep required; no irrigation needed.

Moss actively absorbs CO_2, contributing to carbon capture.



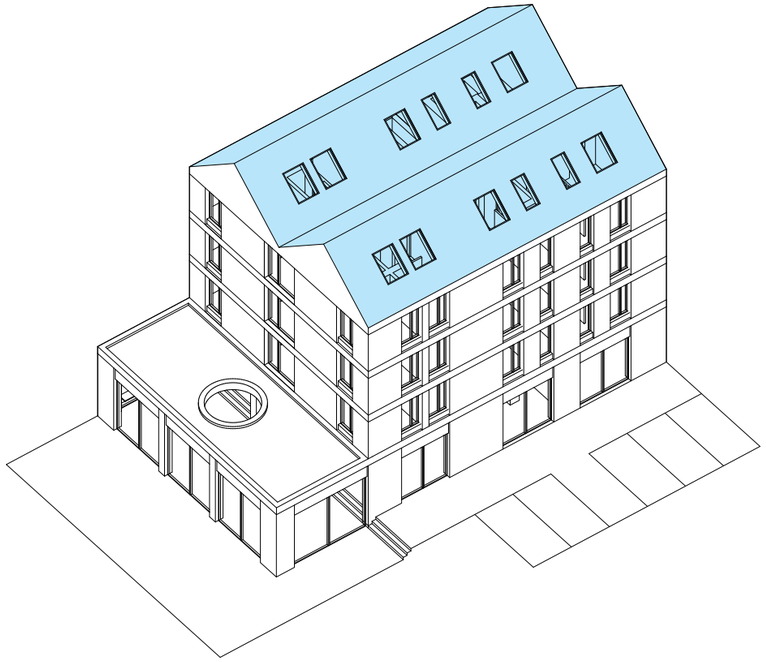
The Future

Roofs

Recycled plastic

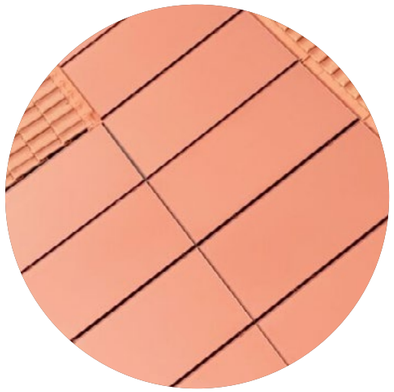
Standing seam PV roofs

Transparent wood



Transparent PVs

Cork green roof



Coloured PVs

Standing Seam PV

Roofit Solar

PVs supplied as standing seam panels blending with roof line, maintaining architectural integrity.

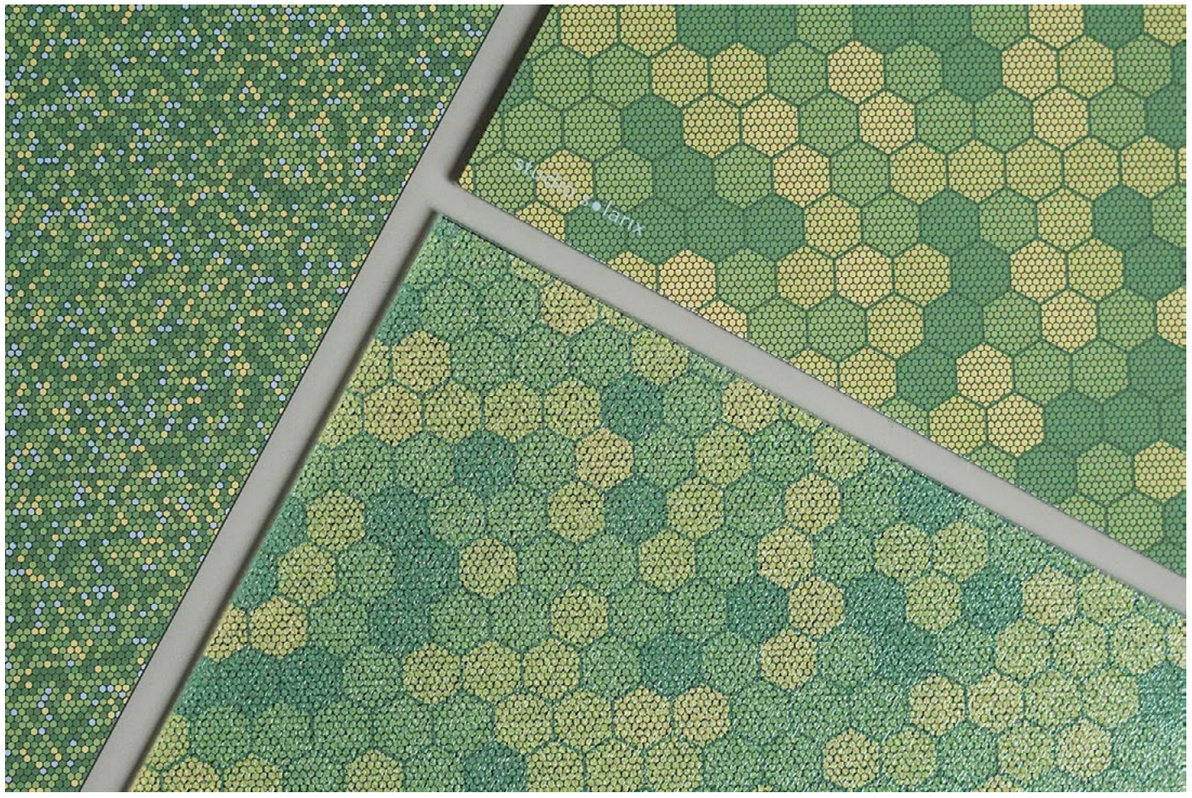
Production of energy while not looking like an additional element on the roof.

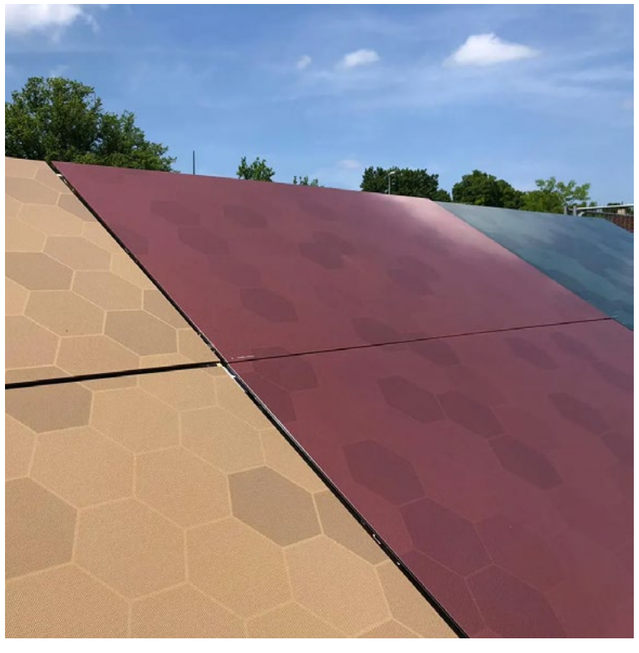
Coloured Solar Panels

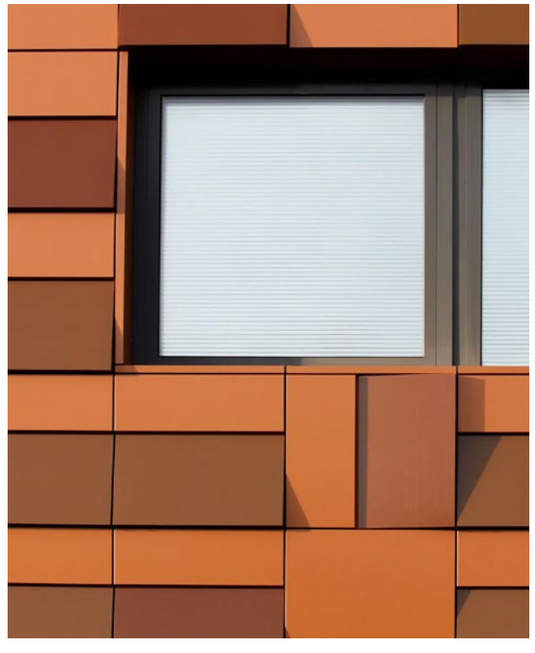
Solarix

PVs designed to blend with stone, composite, wood, and aluminium façades and roofs.

Ceramic colour techniques maintain strong PV performance.







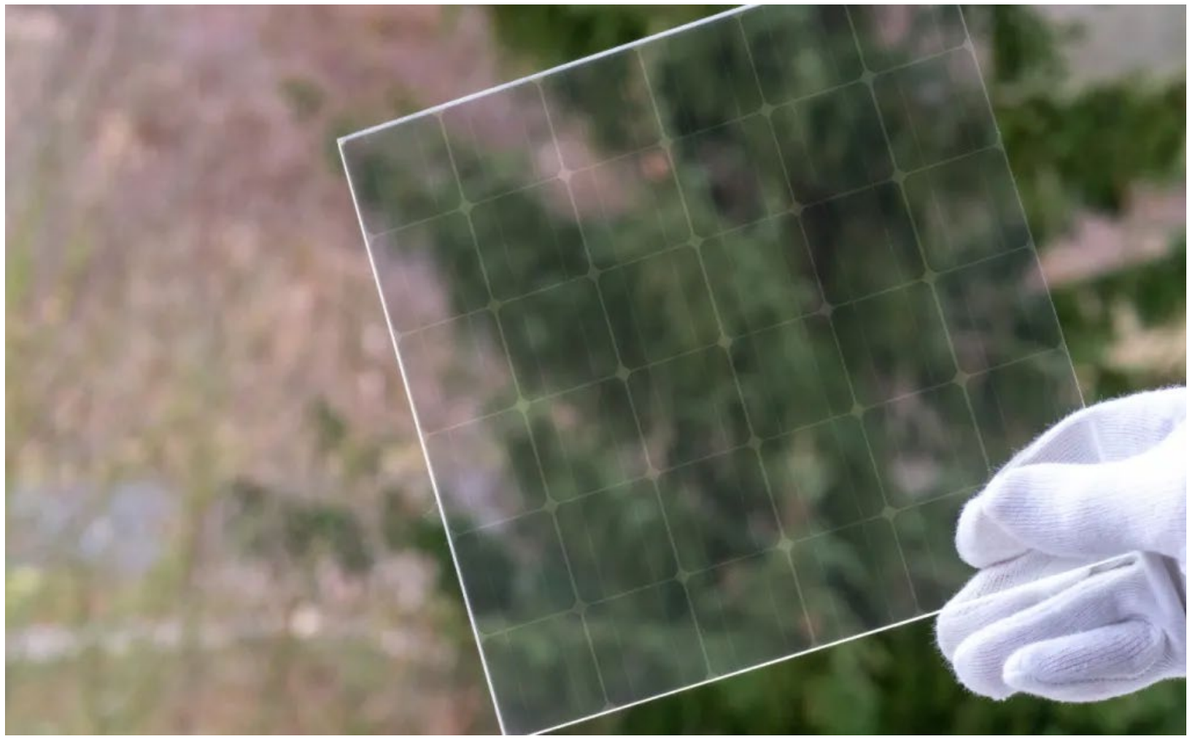
Transparent Solar Glass

Polysolar

A thin-film PV technology that can be integrated in glazing.

Means that windows can generate clean electricity.

Improves insulation and solar shading, lowering heating/cooling demand.



Cork Green Roof

Earth Kweek

Cork already highlighted for its great environmental credentials.

This green roof system made of cork boards.

Much more natural and environmental than other systems.

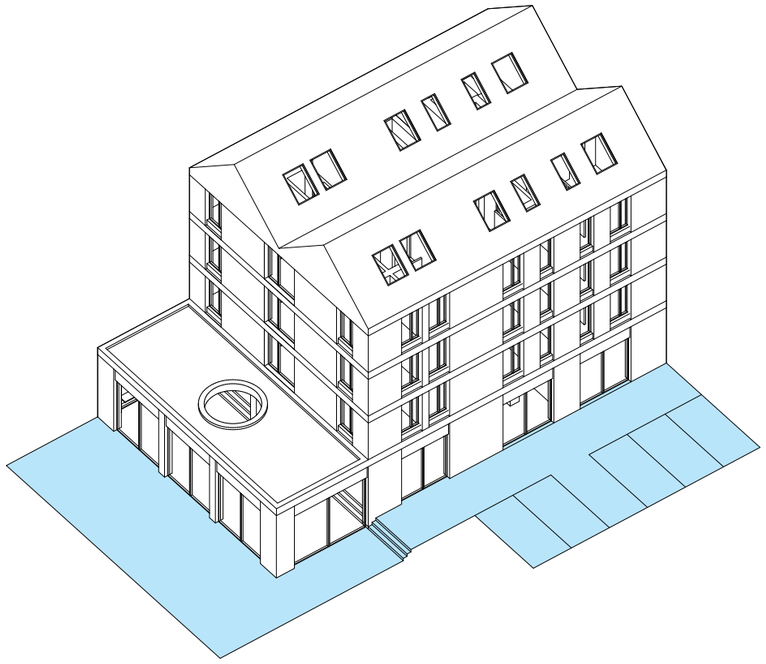
Modular boards make it easy to install - and roof below is accessible in the future if needed.

Cork also works as insulation as well as good drainage layer.

The Future

External flooring

Biochar mixed / low carbon concrete



Light emitting cement

Biochar Mixed Concrete

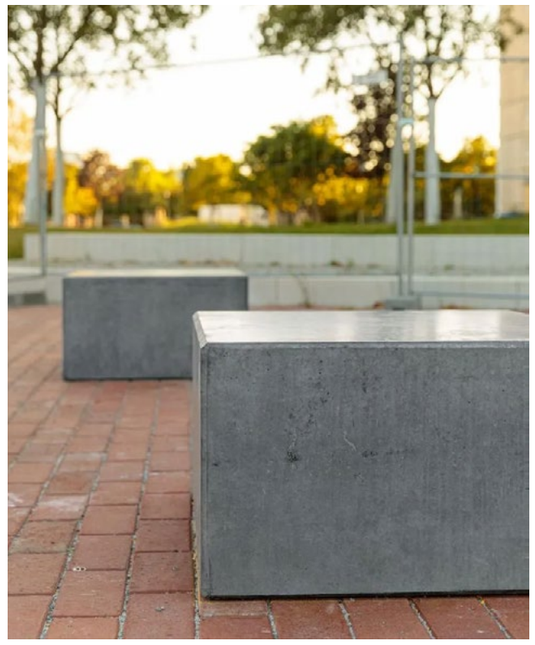
EcoLocked

Low carbon concrete is explained later but one way to lower carbon of concrete is by using carbon storing materials.

Biochar is a carbon storing material and can be used in concrete to store carbon permanently.

Biochar is produced from local biomass residues, reducing reliance on fossil fuels.

Further to that it also enhances thermal insulation, durability, and strength of concrete for sustainable building designs.

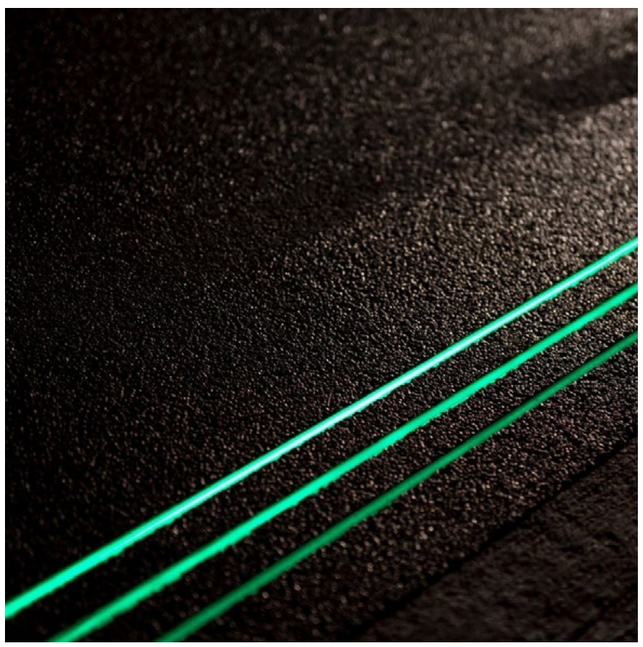


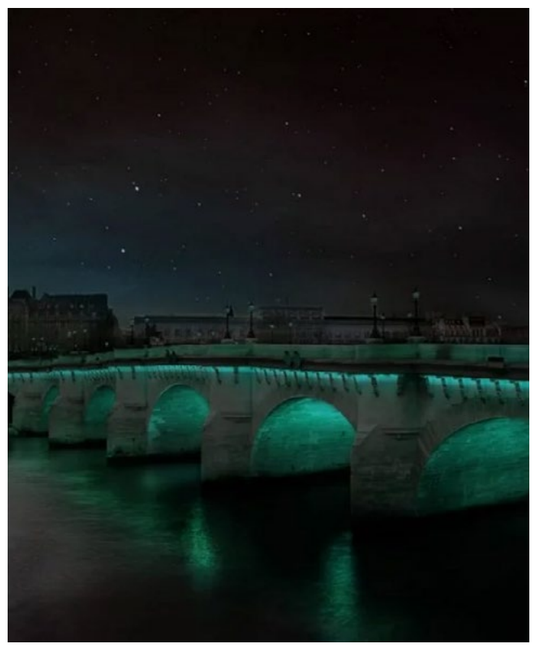
Light Emitting Cement

Universidad Michoacana de San Nicolas de Hidalgo

Energy-efficient illumination that absorbs solar energy during the day and emits light at night, reducing artificial lighting needs.

Interesting uses could be car park bay marking or building illumination at night.



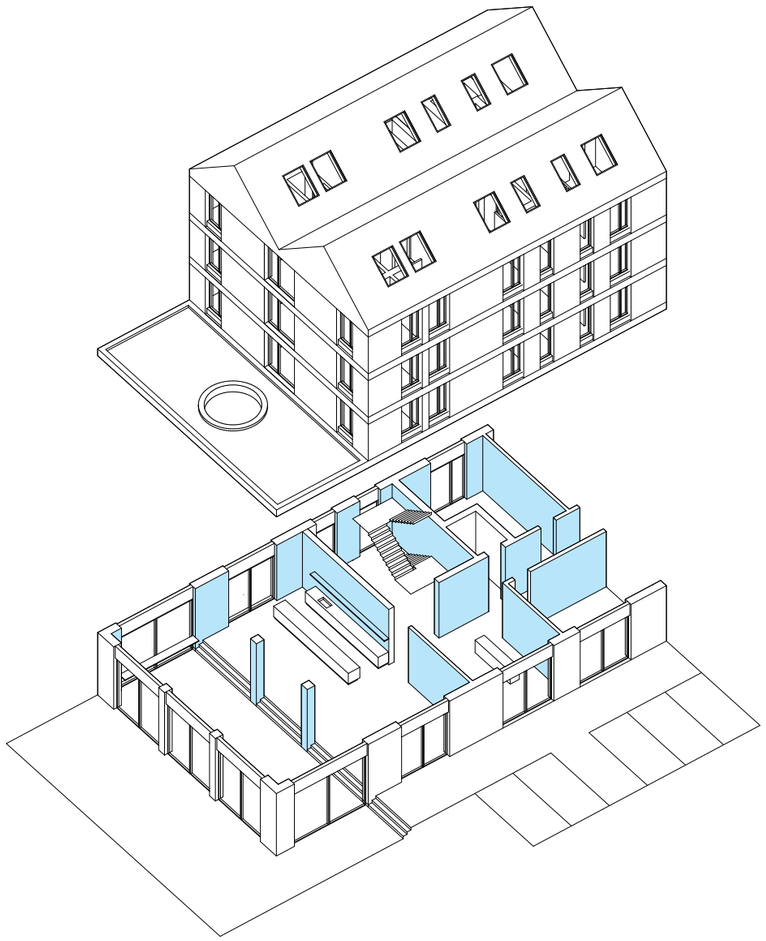


The Future

Internal Wall Surfaces

Breathaboard

Reclaimed wood frame glazed partitions



Cork spray

Eelgrass

Plasterboard Alternative

Breathaboard & Breathaplasta

Can’t ignore plasterboard as it’s being used everywhere. This material offers a great alternative.

Board and skim made of natural materials.

Helps indoor air quality by passively regulating moisture leading to reduction of condensation, mould/mildew risks.

Fully compostable/end-of-life biodegradable.

Lighter weight compared to traditional plasterboard makes it even easier to install.

Cork Spray

CoolCork by Cooloo

Cork again!

Spray material made from repurposed wine corks and water-based adhesive.

Seamless and durable coating for furniture and interior surfaces.

Great for acoustics of communal spaces.

Eelgrass Acoustic Panels

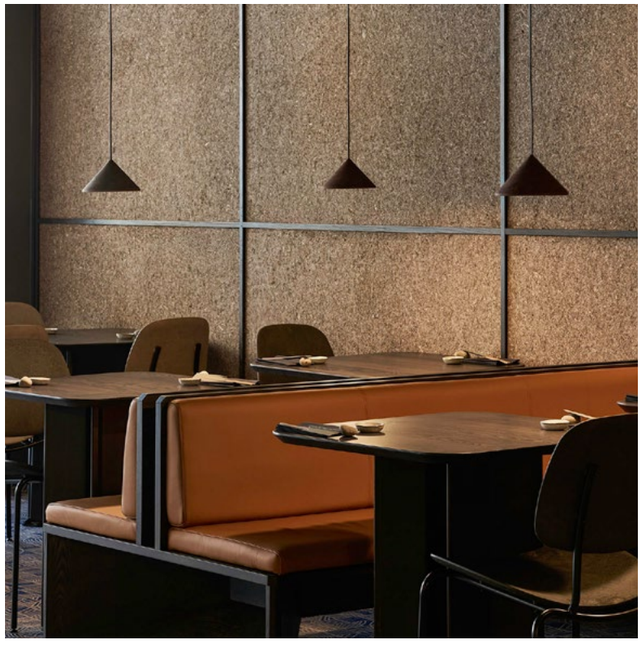
Søuld

Manufactured in Denmark.

Acoustic panels made from eelgrass.

Eelgrass is a rapidly renewable sea plant.

Eelgrass naturally absorbs CO_2, aiding climate mitigation.



Recycled Wood Glazed Partitions

WoodFrame Slim by Intermontage

Glass partitions with wood instead of metal frames.

90% reclaimed European oak from furniture production leftovers.

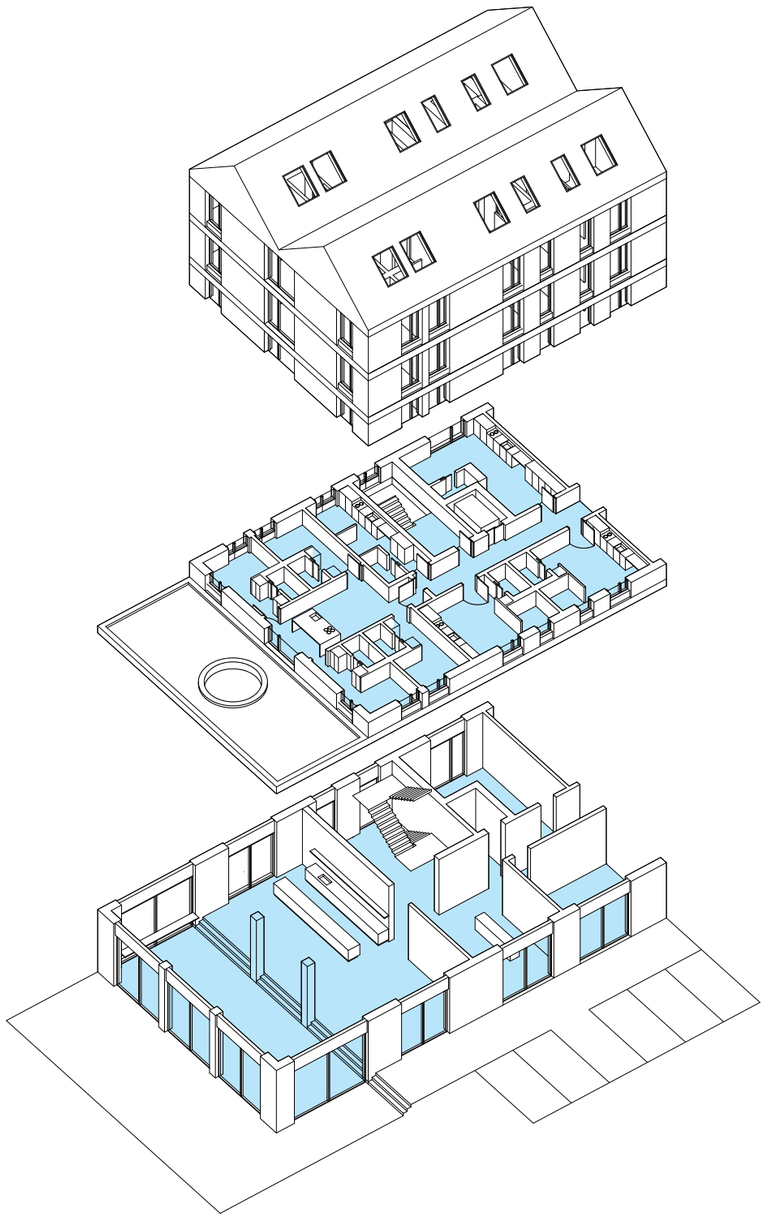
Circular design – easy disassembly and reinstallation for reuse and extended product life.

The Future

Internal flooring

Plant-based
biopolymer resin

Hemp floorboards



End grain floor made of waste
timber from window industry

Tiles from waste

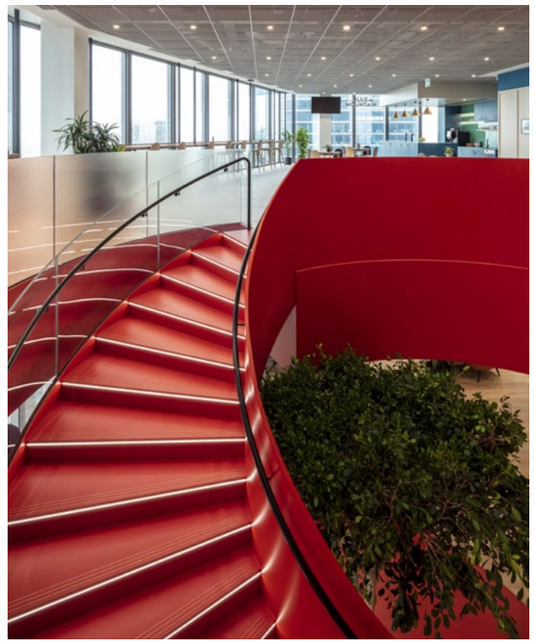
Plant-Based Resin

Sphere 8

We like seamless materials and this material offers a good environmental alternative to traditional resin and polished concrete floors.

Plant-based and renewable – made primarily from castor bean resins.

Suitable for floors, walls, and joinery. And is waterproof so can be used in bathrooms.



Hemp Floorboards

HempWood

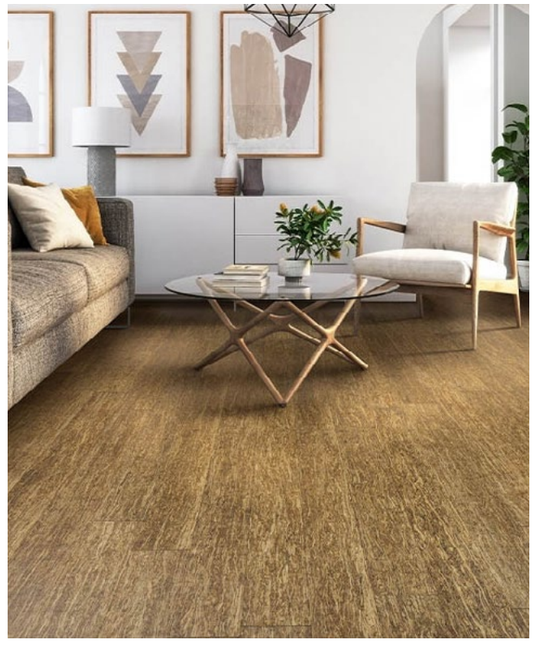
Engineered floor boards made of hemp.

This is one of the latest hemp products.

Engineered flooring made from compressed hemp stalks with soy-based adhesive offering a hard-wearing floor material.

Hemp absorbs more CO_2 while growing than is emitted in production. It matures in ~120 days vs. decades for hardwood trees.

95% bio-based and reduces deforestation – provides a sustainable alternative to hardwood.



End Grain Floor

Hjælmø by a:gain

End grain flooring made from pine offcuts (usually discarded due to knots) from timber window industry.

Design versatility – available in patterns like banded and herringbone.

Waste can look beautiful.

Tiles from Waste

Matterpieces

Another example of how waste can look beautiful.

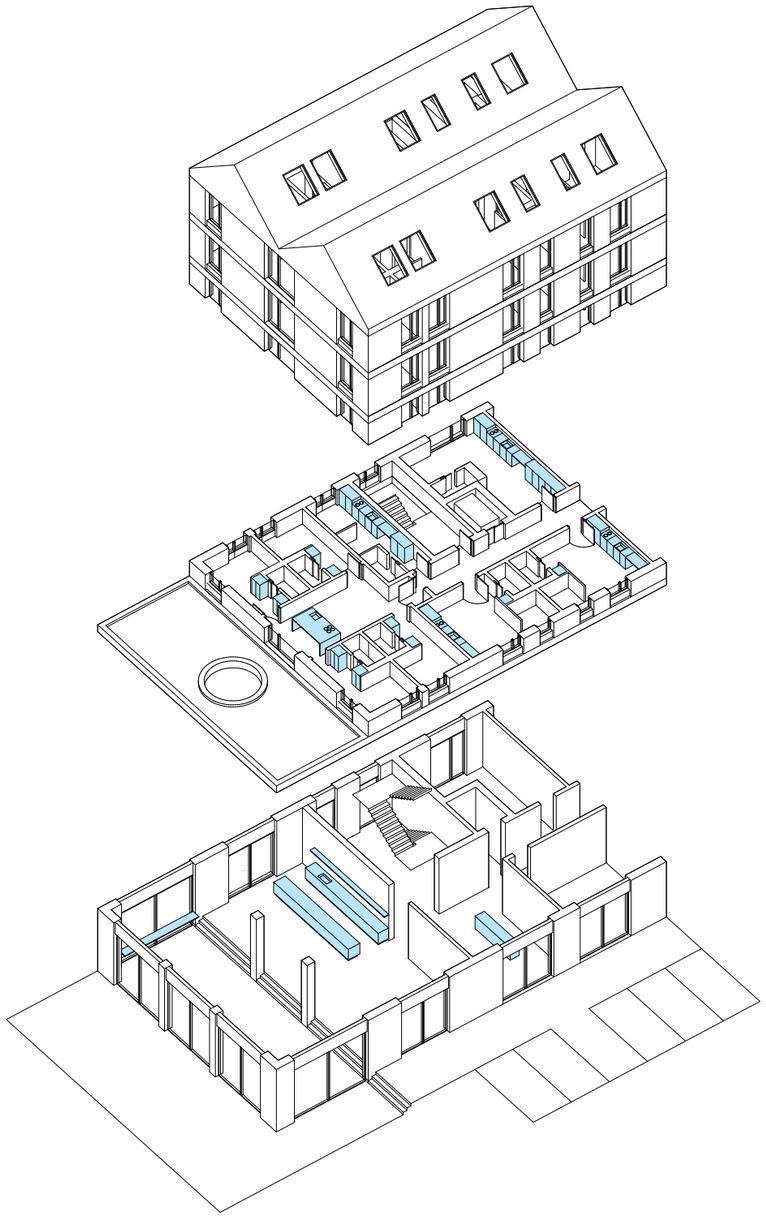
Tiles incorporates brick, glass, concrete, and granite from construction debris.

Standard series of tiles are offered from Portugal but on larger option they offer tailored solutions – they would come to site and analyse the waste and then use it for site specific materials.

The Future

Joinery

Made by Air
Biochar filler panels



Wood Chip Sanitary Ware

SeaWood

Biochar Filler Panels

Made by Air

Biochar isn’t just used in concrete.

These MDF-like panels have biochar fillers in them storing carbon.

Waterproof so can be used for façades as well.

Wood Chip Sanitary Ware

Woodio

Waterproof, impact-resistant, dirt-repellent material made of 70% wood chips, 30% resin binder.

Comes in panels as well as specific sanitary ware products.

Significantly less CO_2 than ceramic or stone due to low-energy, no-firing production.

Seaweed Panels

SeaWood by BlueBlocks

Panels crafted from brown seaweed - 100% natural and compostable.

Like eelgrass seaweed absorbs CO_2 during growth, storing carbon in the material.

Can be used for interior wall panels, acoustic panels, furniture, veneer finishes etc.

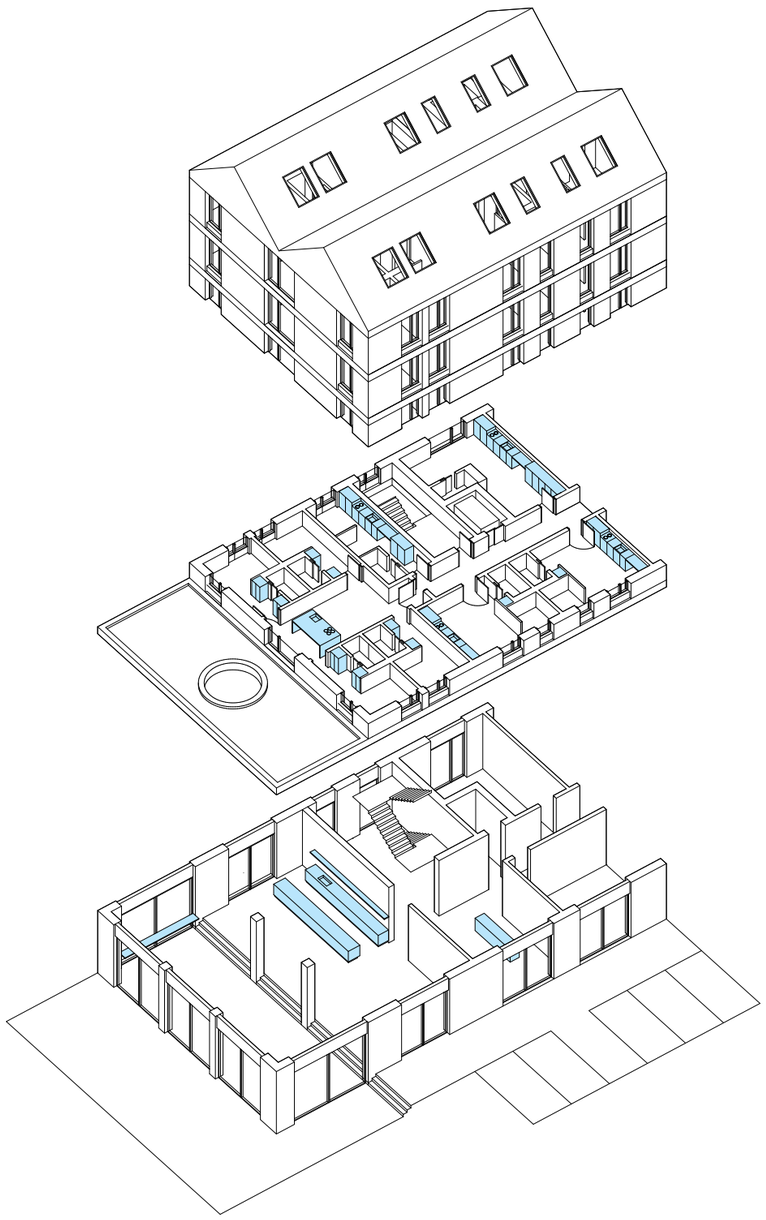
The Future

Building Systems

DLT

Biobased building systems

Monolithic clay blocks



Hemp blocks

Low Carbon Concrete

DLT

Eurban

Similar to CLT but no adhesives needed.

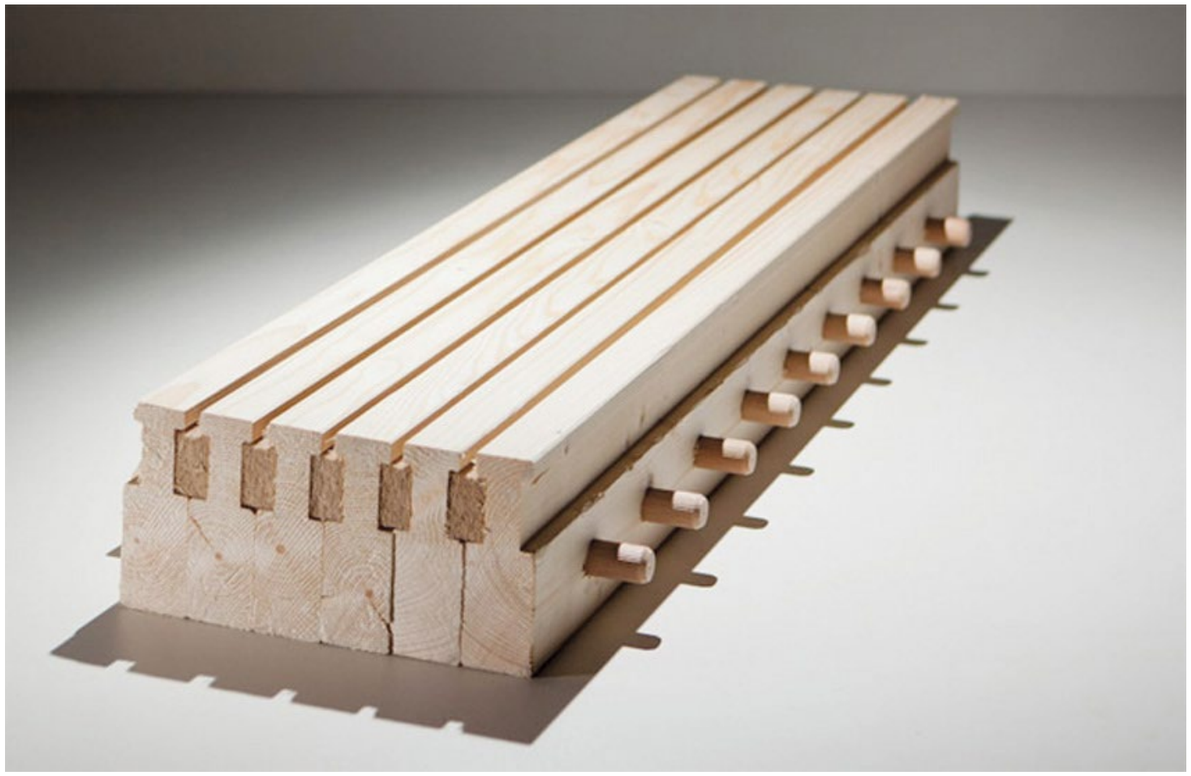
A method using hardwood dowels to join softwood planks without adhesives, nails, or screws.

No synthetic materials - 100% natural - no bad fumes.

Like any other wood DLT panels stores CO_2, lowering greenhouse gas emissions over the building's lifespan.

Low-grade timber can be used which supports sustainable forest management and reduces waste by using fast-growing or low-grade species.

Grooved finish can easily be achieved - soft materials in grooves can achieve good acoustic properties.



Natural Building System

Adept Modular

Bio-based materials and precision-engineered components to create low-carbon, energy-efficient buildings designed for disassembly and reuse.

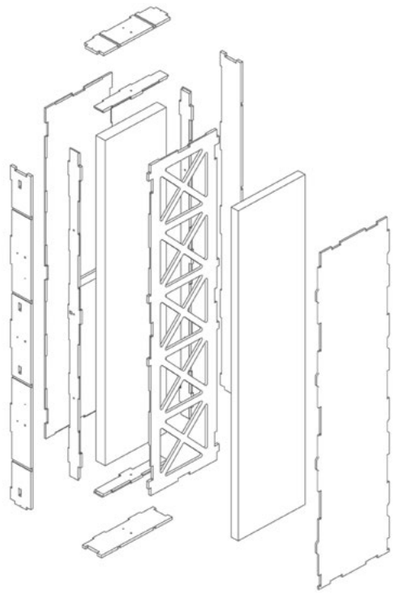
Can be used for floors, walls, ceilings and roofs.

Incorporates hemp and wood-fibre, renewable resources with lower embodied carbon.

Sequesters more CO_2 than is emitted during production and construction.

Kit-of-parts approach enables easy disassembly, reuse, and reduced construction waste.

Energy efficiency – high thermal performance and moisture regulation reduce energy consumption and improve indoor comfort.



Straw Wall System

EcoCocon

Another modular building system with natural materials

Made of straw and timber, 98% renewable materials.

Sequesters more CO_2 than emitted during production.

Fire resistance – clay-plastered panels: 120 min; bare straw segments: 30 min.

11 storey building has been built in Sweden.

Monolithic Blocks

Porotherm

Clayblocks are precision-engineered, multi-cellular clay blocks for sustainable, high-performance wall construction, offering excellent thermal, acoustic, and fire performance.

Cellular structure means very good U-values.

~30% of materials are alternative, recycled, or secondary sources

Monolithic construction means less labour. Only one layer instead of cavity of three layers (brick, insulation, blocks)

150 years lifespan.

Thin mortar means very little water used at installation.

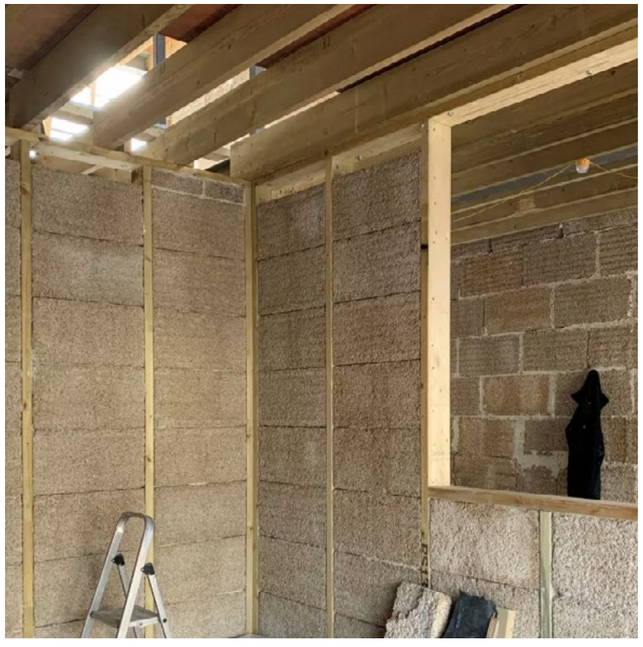
Low embodied carbon – immediate reductions in carbon impact compared to traditional blockwork.

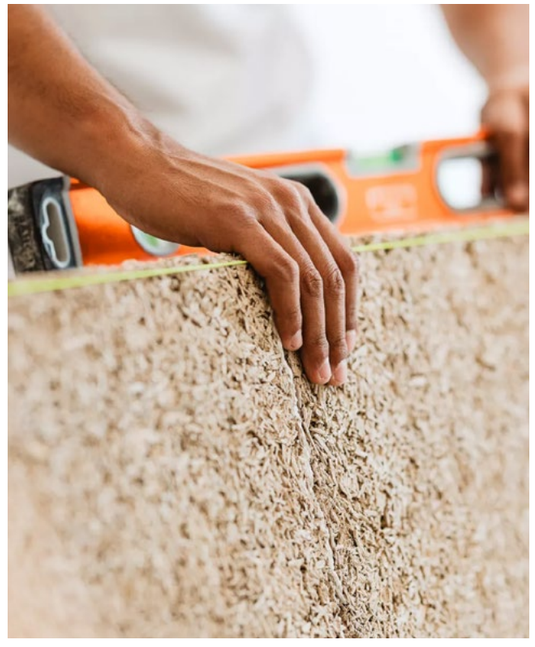
Hemp Blocks

IsoHemp

Hemp Blocks are a great alternative to blockwork. They are pre-cast masonry units made from hemp and lime, offering a sustainable alternative with excellent thermal and acoustic performance and low environmental impact.

Fully recyclable and biodegradable, supporting circular economy principles.





Low Carbon Concrete

Various

Low-Carbon Concrete – concrete manufacturers can significantly reduce the carbon footprint of their products through:

- **changes in fuel sources**
- **cement substitution**
- **carbon capture technologies.**

Depending on implementation, these strategies can lower concrete's carbon footprint by up to ~70%.

Conclusion

Why use greener materials

Why Developers Should Invest in Sustainable Materials

Future-Proofing: Regulations are moving toward mandatory sustainability — early adoption avoids future penalties.

Higher Asset Value: Green buildings often sell/rent at premium rates.

Investor & Lender Appeal: ESG (Environmental, Social, Governance) standards are increasingly important in securing funding.

Lower Lifecycle Costs: Energy-efficient and durable materials save owners money long-term.

Resilience: Sustainable materials can make buildings more resistant to climate change impacts.

Positive Public Image: Enhances brand credibility and attracts eco-conscious buyers/tenants.

Thank you!