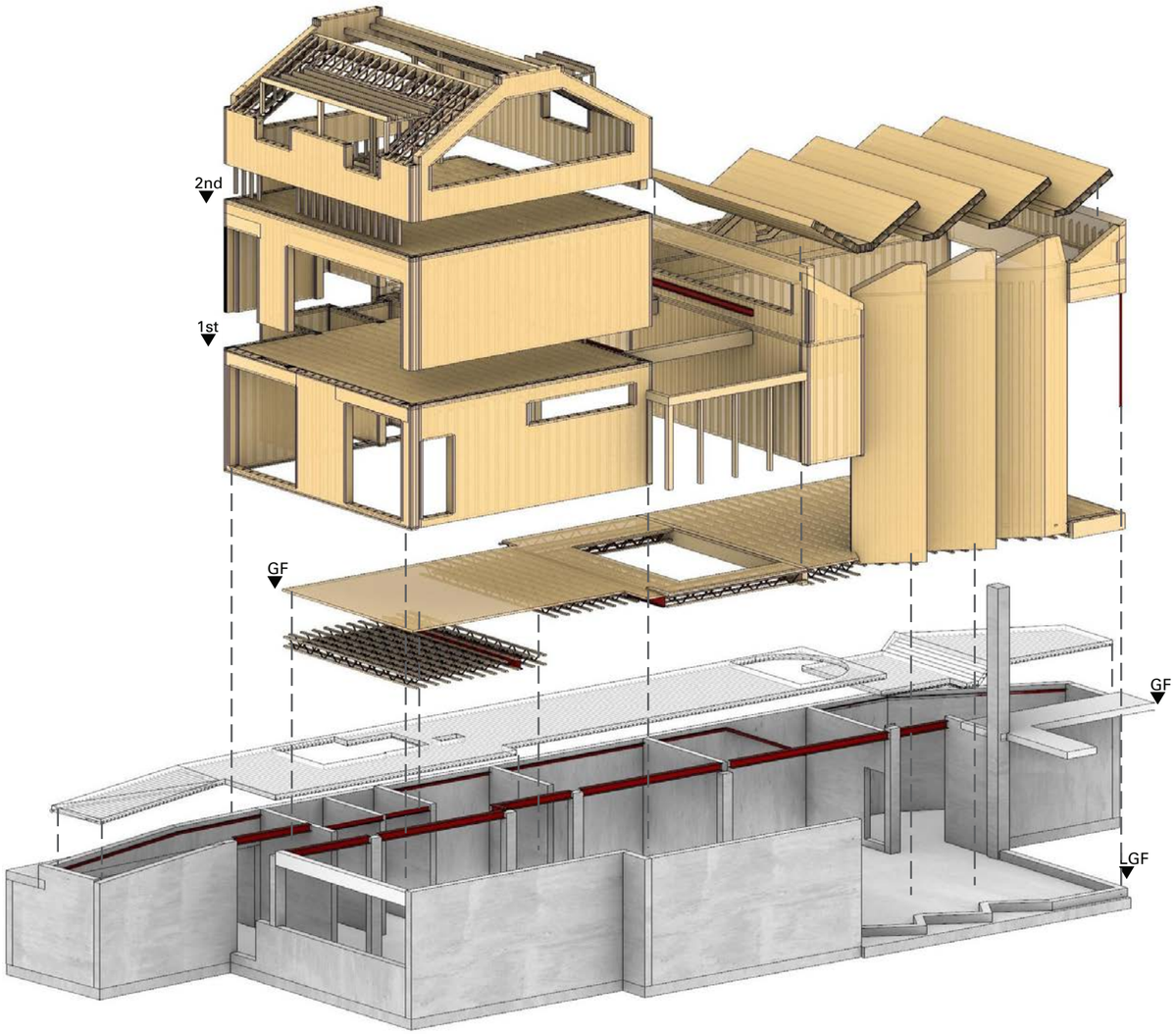
STRUCTURAL STRATEGY



ABOVE GROUND

Engineered Timber:
lightweight, pre-fabricated.

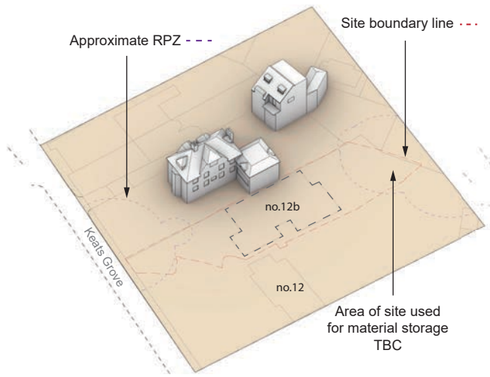
BELOW GROUND

Reinforced Concrete:
durable, waterproof.

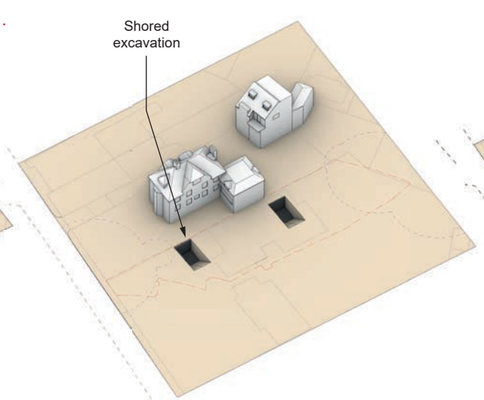
BELOW-GROUND STRUCTURE
BASEMENT CONSTRUCTION

PROPPED SEQUENCE ALLOWS FOR:
-LOWER REQUIREMENTS FOR CONCRETE EARLY STRENGTH GAINS (I.E. REDUCTION OF CEMENT CONTENT)

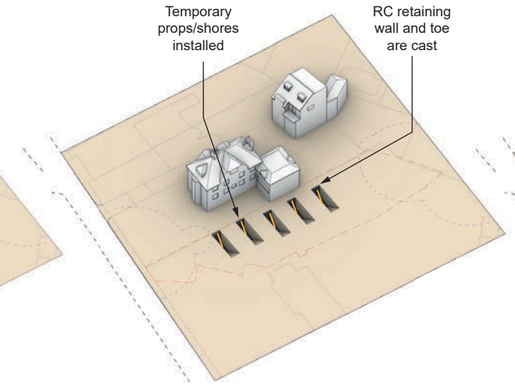
-REDUCTION IN OVERALL CONCRETE USE (THICKNESS OF THE RETAINING WALL, AND SWITCH TO TIMBER FLOOR FOR THE EAST SIDE OF THE GROUND FLOOR)



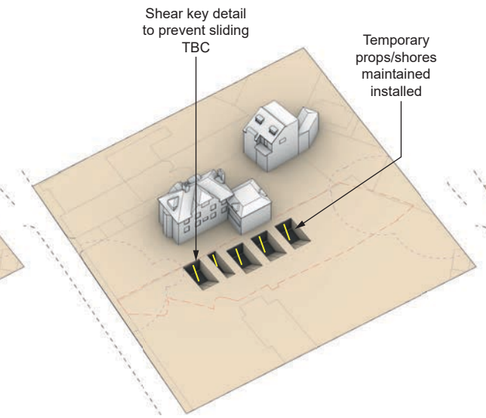
1. DISMANTLING OF EXISTING STRUCTURE AND TEMPORARY STORAGE



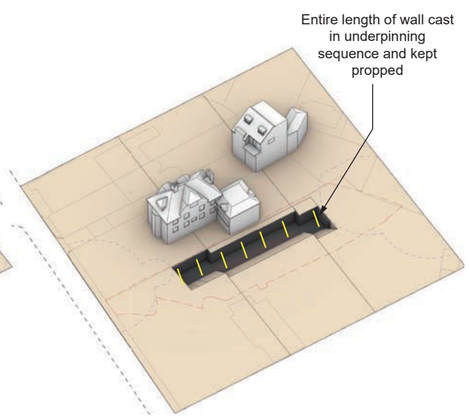
2. SHORED EXCAVATION TO BASEMENT LEVEL IN UNDERPINNING SEQUENCE



3. CAST RETAINING WALL IN UNDERPINNING SEQUENCE (I)



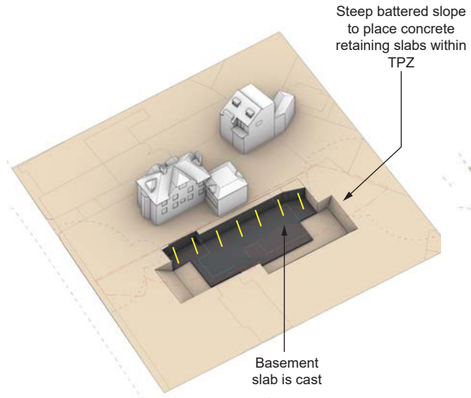
4. CAST RETAINING WALL IN UNDERPINNING SEQUENCE (II)



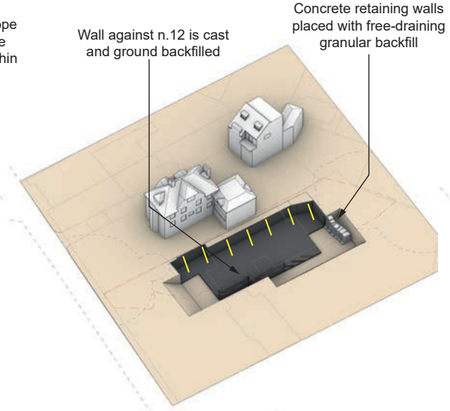
5. CAST RETAINING WALL IN UNDERPINNING SEQUENCE (III)

Concrete retaining walls placed with free-draining granular backfill

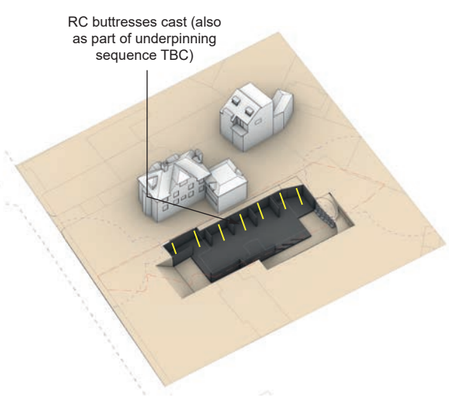
Timber



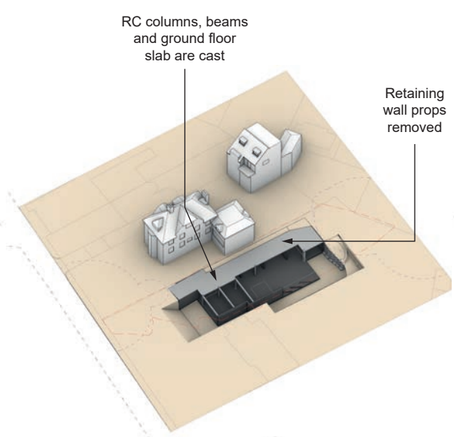
6. OPEN-CUT EXCAVATION AND BASEMENT SLAB CASTING



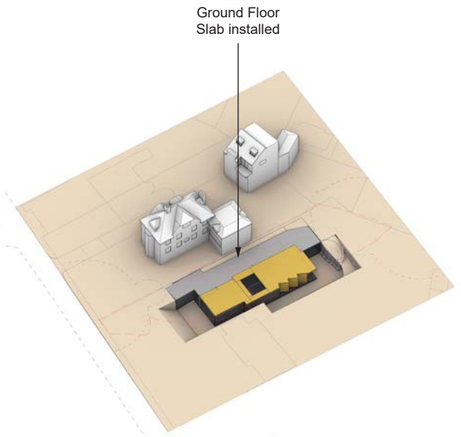
7. CAST WALL AGAINST NO.12 BASEMENT



8. CAST BUTTRESSES



9. CAST GROUND FLOOR RC SLAB AND DE-PROP BASEMENT



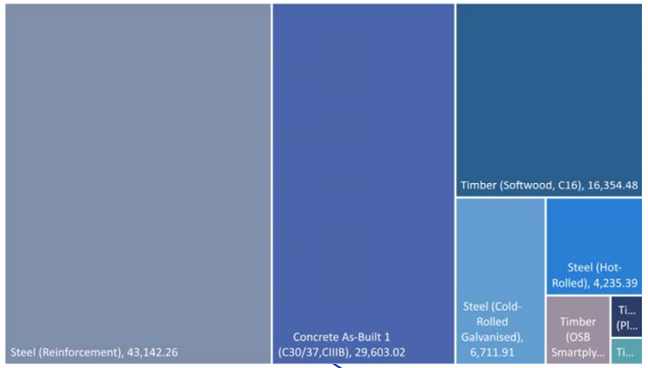
10. INSTALL TIMBER GROUND FLOOR SLAB

EMBODIED CARBON

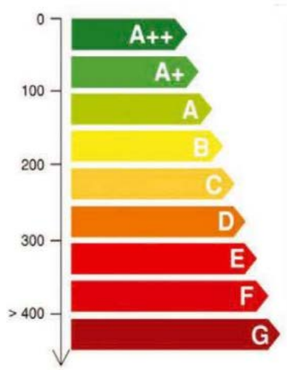
ITERATIVE PROCESS CARRIED OUT DURING THE WHOLE DESIGN STAGE

OPTION STUDIES ASSESSING EMBODIED CARBON AS A KPI HAVE BEEN PRODUCED FOR NUMEROUS AREAS OF THE STRUCTURE

SCORS RATING & MATERIAL BREAKDOWN



Structural embodied carbon, from Cradle to Completion (A1-A5)
$kgCO_2e / m^2$ GIA



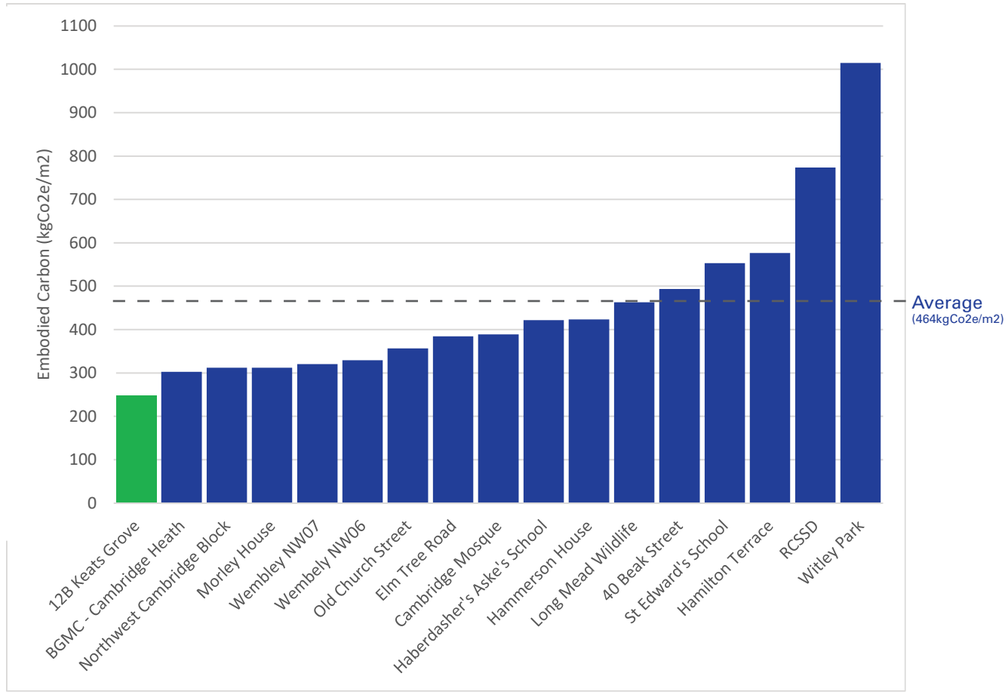
C **248.1** $kgCO_2e / m^2$

These figures assume the use of cement replacement like GGBS. Confirmation from waterproofing supplier that up to 70% GGBS is possible has already been received.

STRUCTURAL MATERIALS:

- Concrete (CEM I - currently no cement replacement)
- Steel Reinforcement
- Timber (CLT-from KLH EPD)

P&M BASEMENT PROJECTS



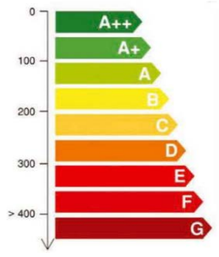
CARBON DESIGN PROGRESSION

CHARTING HOW THE DESIGN HAS CHANGED OVER TIME

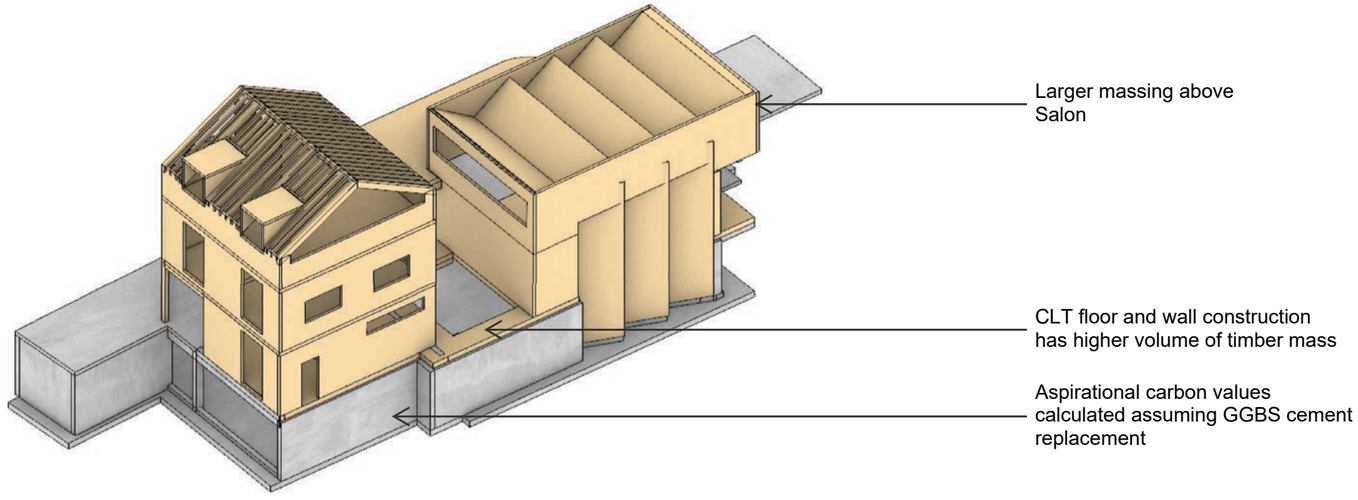
Initial Structural design and Embodied Carbon

SCORS Rating

Structural embodied carbon, from Cradle to Completion (A1-A5)
$kgCO_2e / m^2$ GIA



D **279** $kgCO_2e / m^2$



Larger massing above Salon

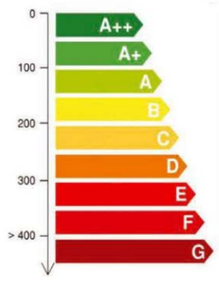
CLT floor and wall construction has higher volume of timber mass

Aspirational carbon values calculated assuming GGBS cement replacement

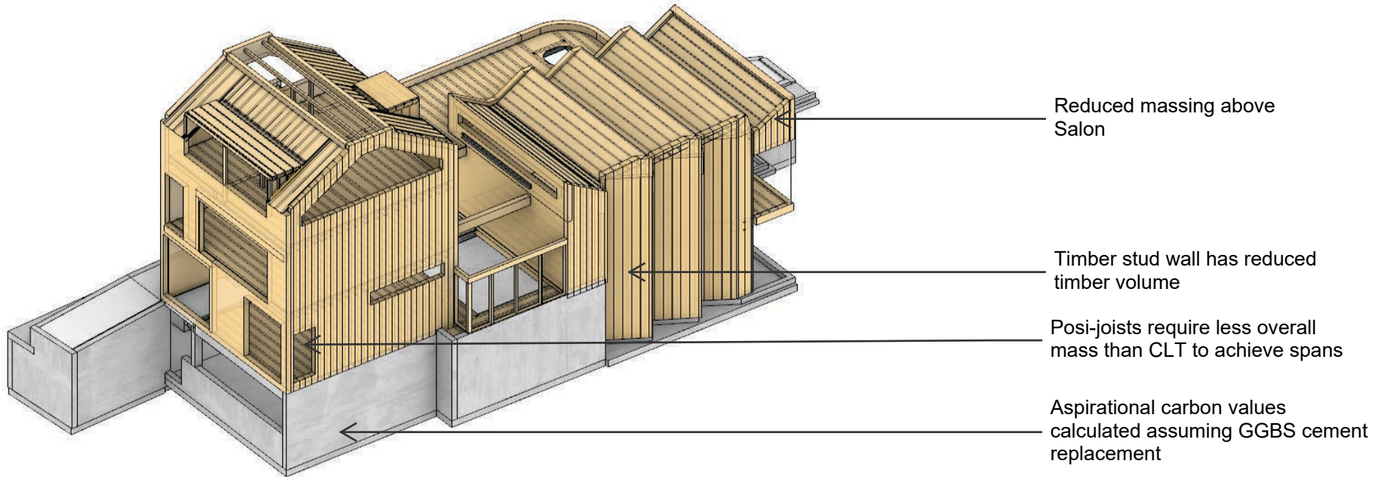
Developed Structural design and Embodied Carbon

SCORS Rating

Structural embodied carbon, from Cradle to Completion (A1-A5)
$kgCO_2e / m^2$ GIA



C **248.1** $kgCO_2e / m^2$



Reduced massing above Salon

Timber stud wall has reduced timber volume

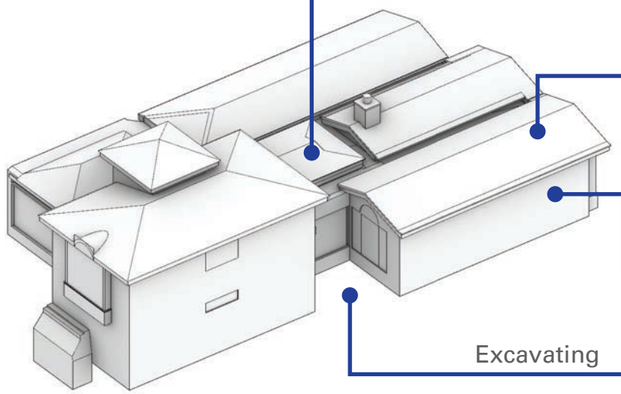
Posi-joists require less overall mass than CLT to achieve spans

Aspirational carbon values calculated assuming GGBS cement replacement

MATERIAL RE-USE STRATEGY

PRIORITY IS GIVEN TO MATERIAL RE-USE ON-SITE
DIAMOND SAW CUTTING REDUCES NOISE, DUST AND VIBRATION OPPOSED TO CONCRETE CRUSHING.

EXISTING



Diamond-saw cutting

RC FOUNDATION SLAB
~50/70m³

ROOF TILES
~230m²

LINTELS
TBC

MASONRY BRICKS
~30m³ (Outer leaf)

Excavating

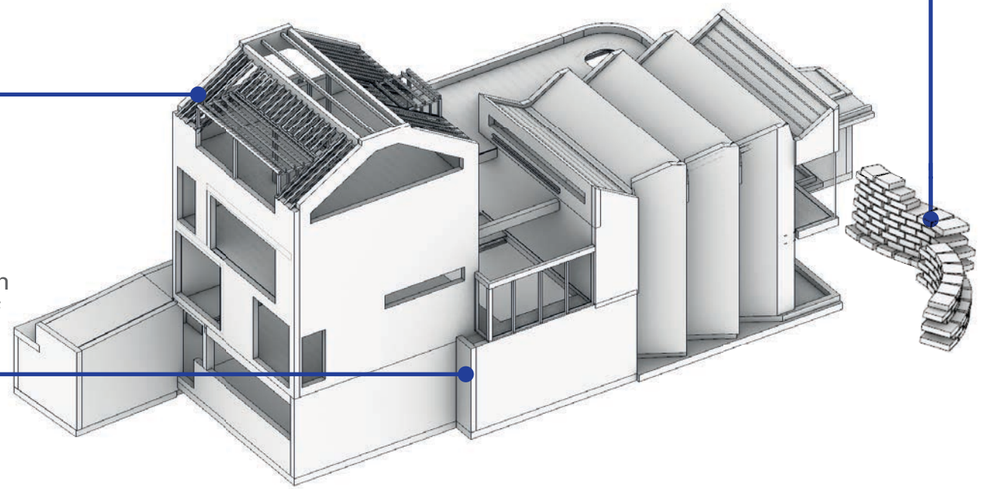
EXCAVATED SOIL
~1400m³

PROPOSED

Cut in blocks and re-used within garden landscaping as gravity retaining wall

Re-use tiles as in excellent condition

Cut in panels and re-used in basement cavity inner leaf



OFF-SITE

Excavated clay put to beneficial use

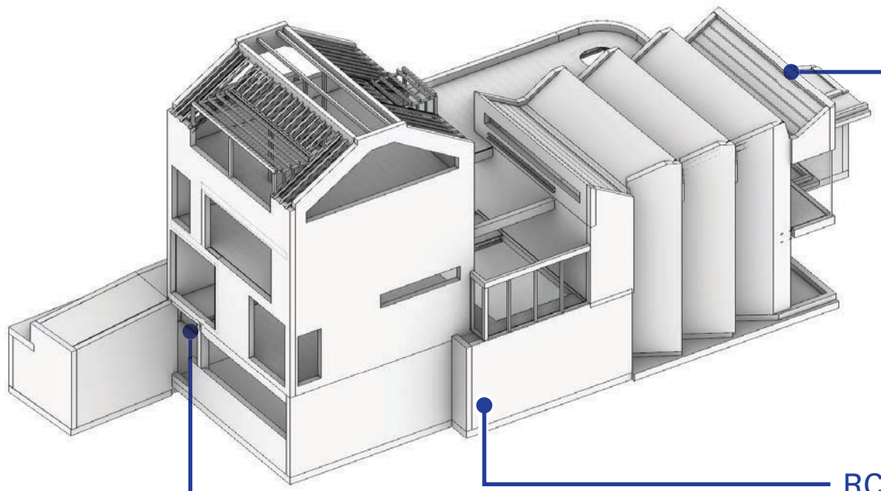
Cutting of external walls as panels

Diamond-saw cutting of RC slab as blocks

Re-use of roof tiles

MATERIAL FUTURE RE-USE STRATEGY

SOME ASPECTS OF THE PROPOSED CONSTRUCTION USE MODERULARIZATION MEANING THEY COULD BE REUSED IN THE FUTURE



TIMBER COMPONENTS

Timber stud walls and posi-joist floors can be easily reused in future projects. This is because they are modular/panellised components which can be fixed in place with screws and bolts wherever possible. Glue should be minimised to assist with future demount-ability.

RC WALLS AND SLABS

Concrete - either saw cut (for a similar approach to this scheme) or crushed up to recycle as aggregate

STEEL BEAMS

Our scheme has minimal welded connections and mainly bolted fixings which are demountable. End plates can be sawn off and the size adjusted if beam needs adapting for future use