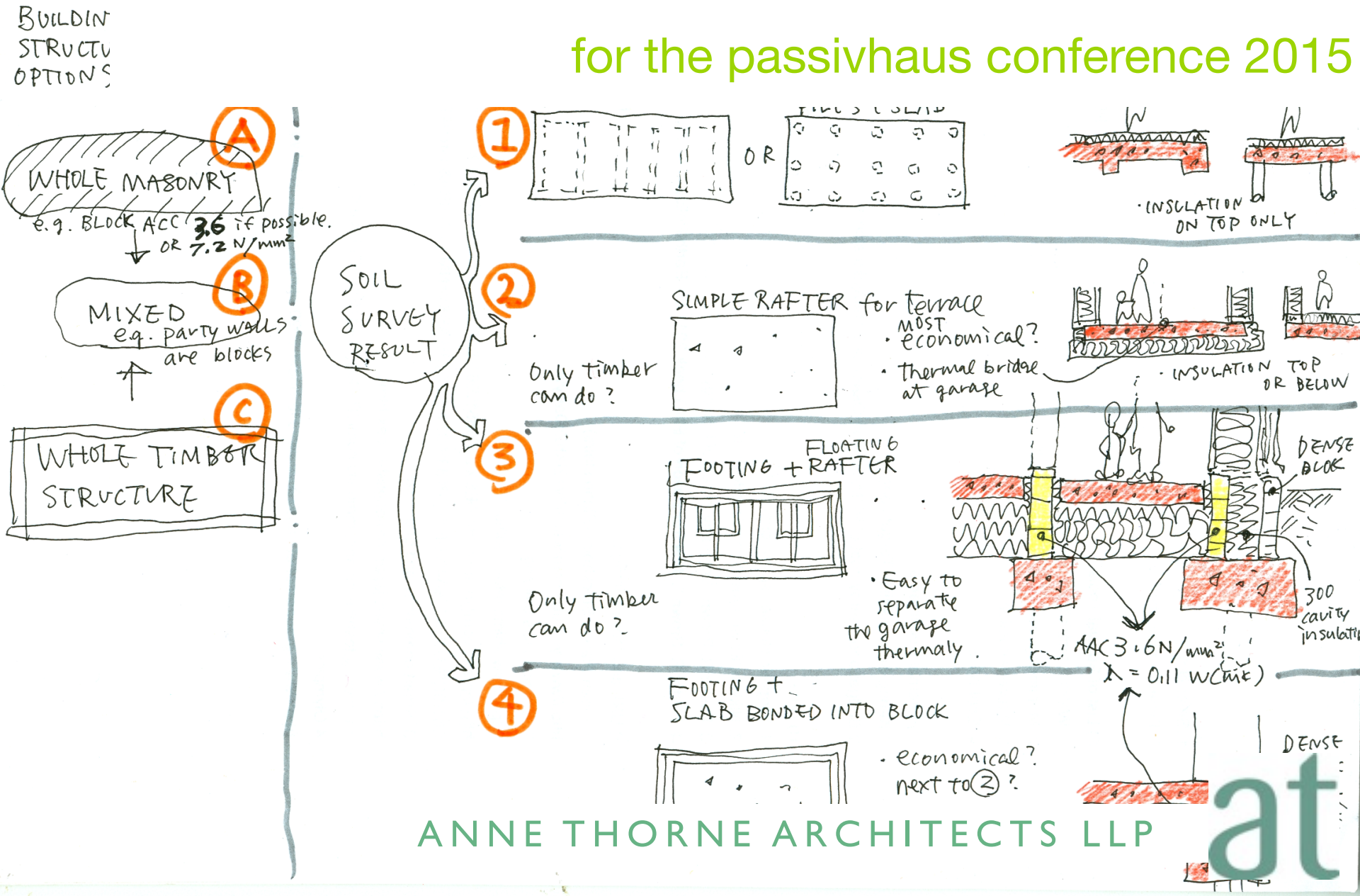
design challenges & system choices

for the passivhaus conference 2015



ANNE THORNE ARCHITECTS LLP

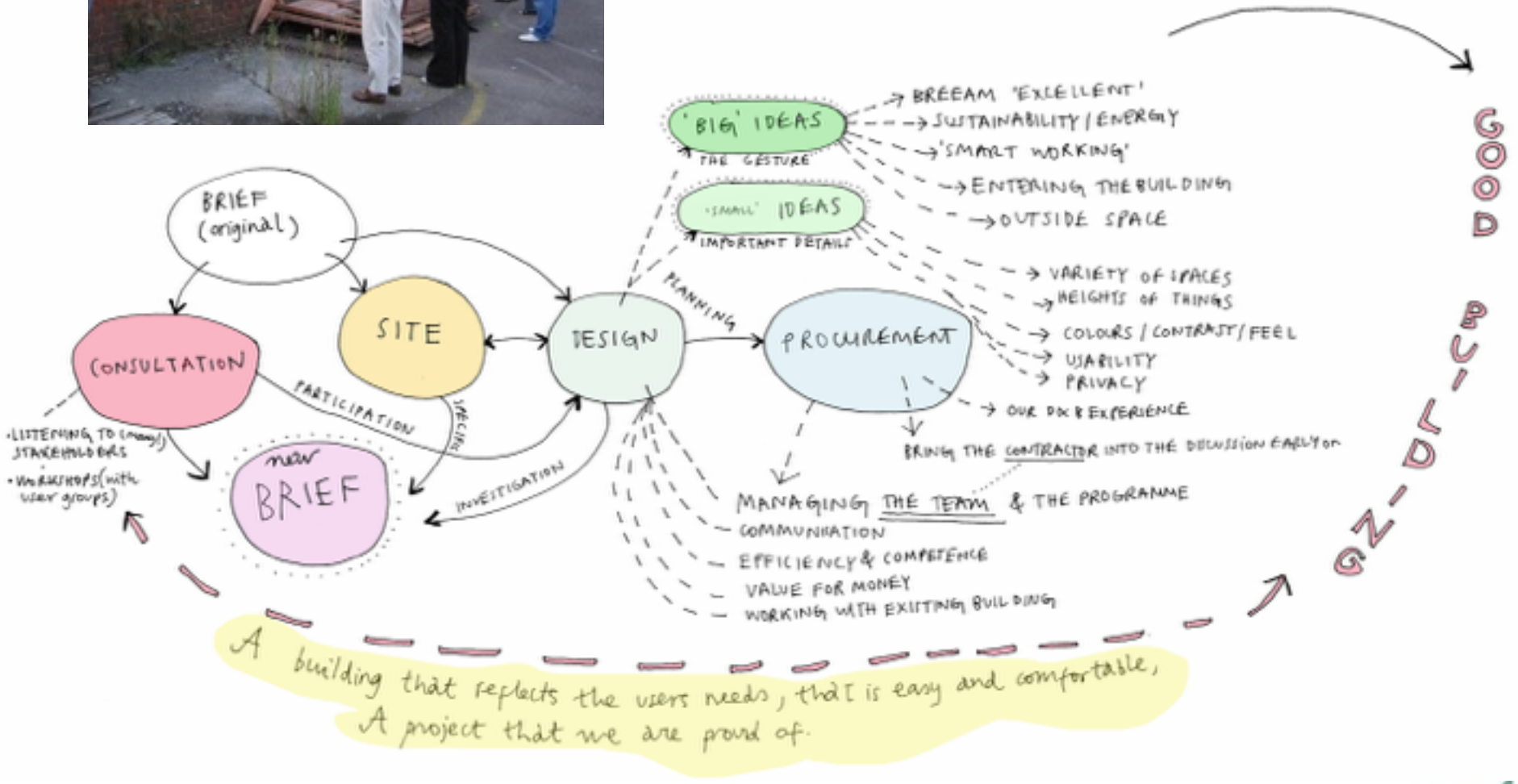
design challenges

what's changed ?

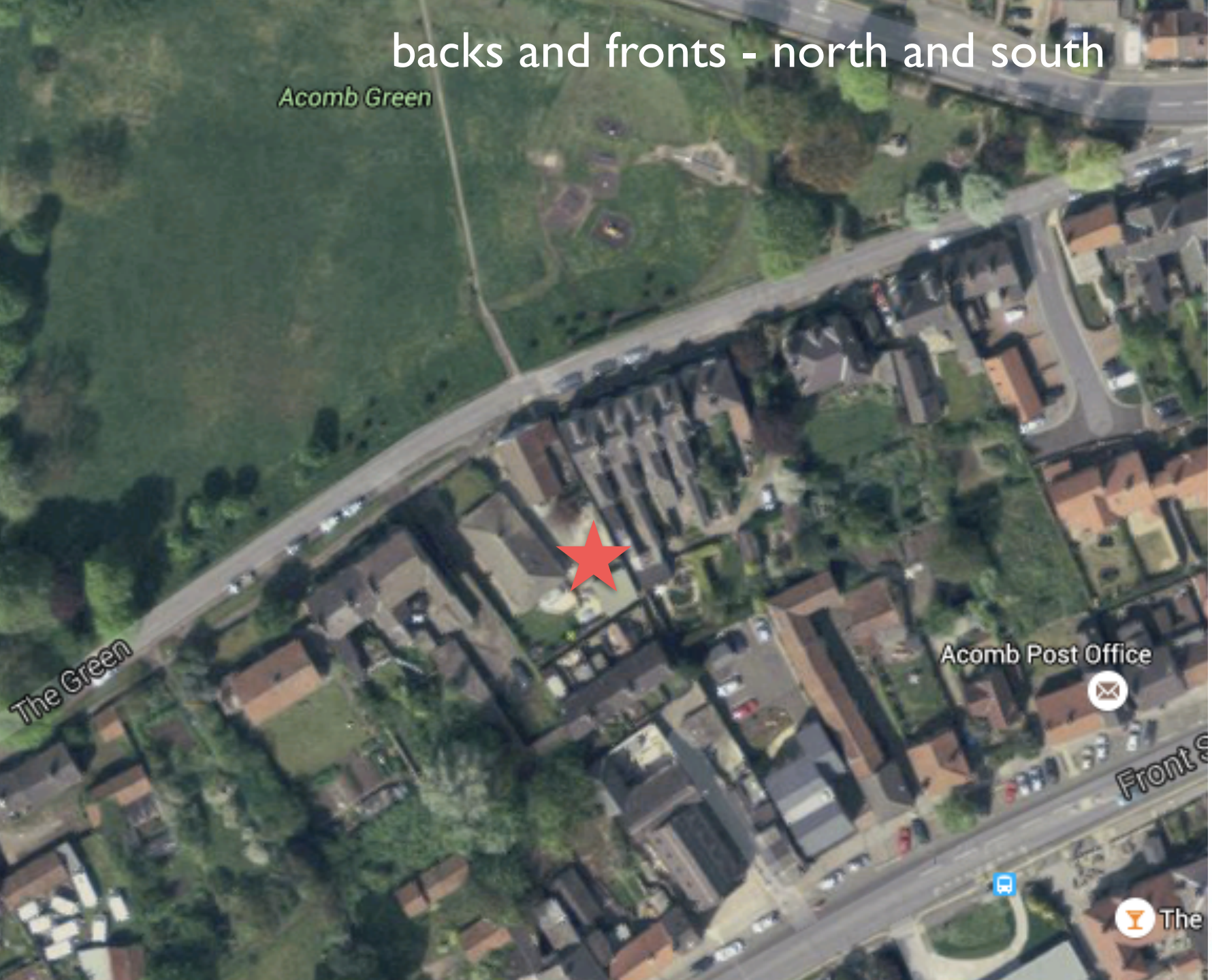
Boatemah Walk completed in 2006, used a FSC prefabricated timber frame and cellulose insulation, with ventilated cavity to timber/ceramic cladding


Angela Carter Close

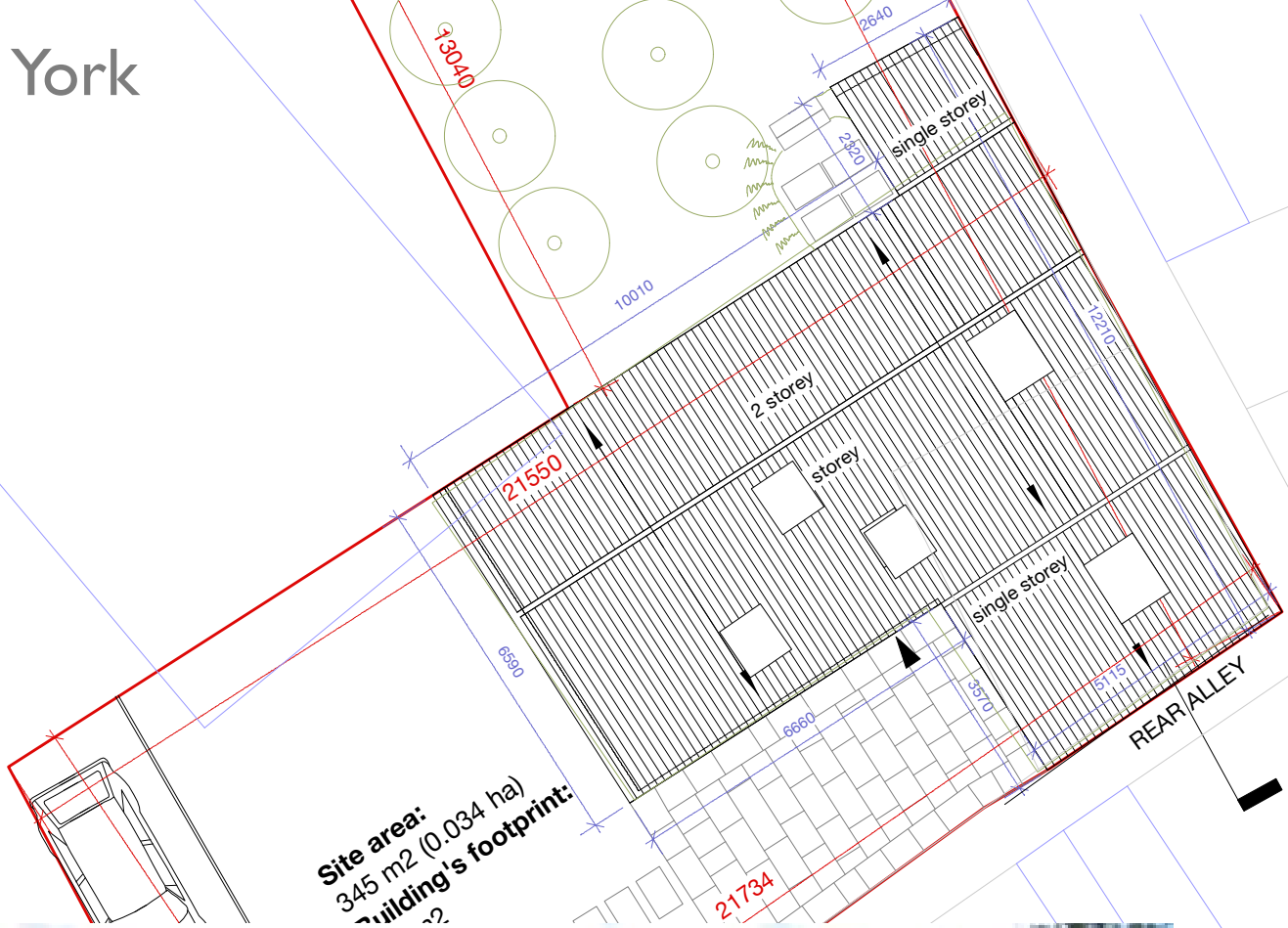
an inclusive process



backs and fronts - north and south



new brick house in York



backs and fronts
north and south

new brick
house in York

at


planning constraints


BATEMAN MEWS

planning constraints

3 first floor plan
S=1:200

Ground floor plan

new house in NW London

at

Loco Co-housing

planning constraints

at

Loco Co-housing *trouble with cars: planning constraints*

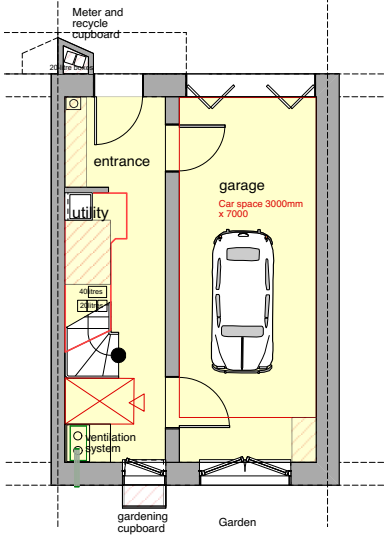
Planners want 56 car parking spaces i.e. 2.25 per household.
What can we do?
Make 11 houses with integrated garages and glass doors. With 23 households in the cohousing community we plan to have 8 dedicated car share vehicles, which will have 8 dedicated spaces.

All except one household won't use their garage for a car…….

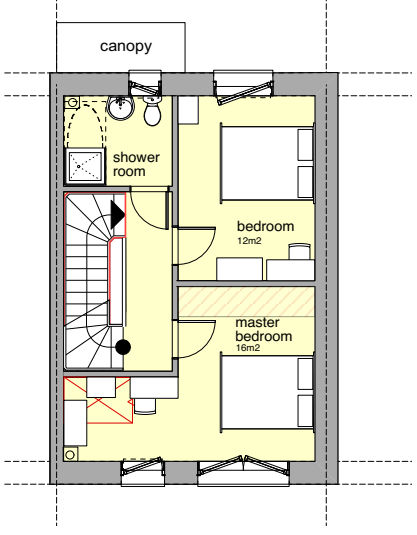
"We have discussed current car ownership costs amongst our members and calculated that these vary between £3,500 and £10,000, a year. If we take a very conservative average of £5,000 per household this gives a current expenditure across 23 units of £115,000. We anticipate that our car sharing scheme will reduce these costs by 50% while giving access to a wider range and better maintained vehicles."

Loco Co-housing

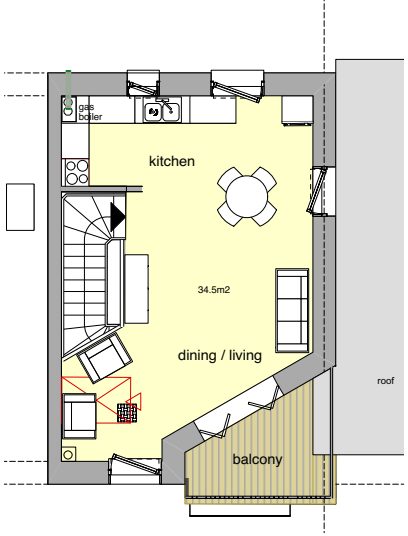
1 2bed 3storey with GARAGE GROUND FLOOR
S=1:100

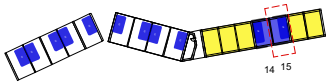


2 2bed 3storey with GARAGE FIRST FLOOR
S=1:100



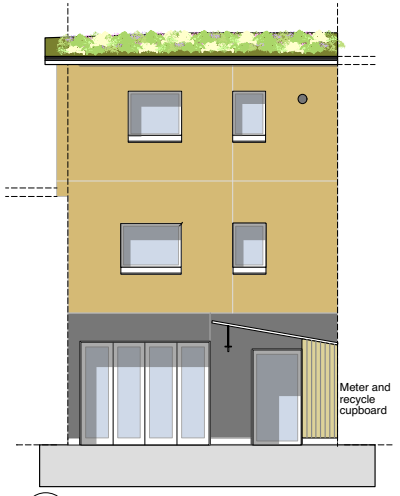
3 2bed 3storey with GARAG
S=1:100



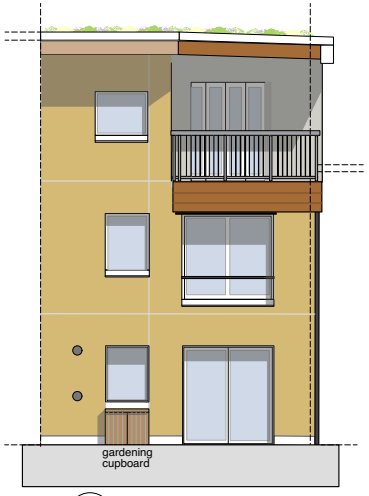


2 Bed House 3-Storey

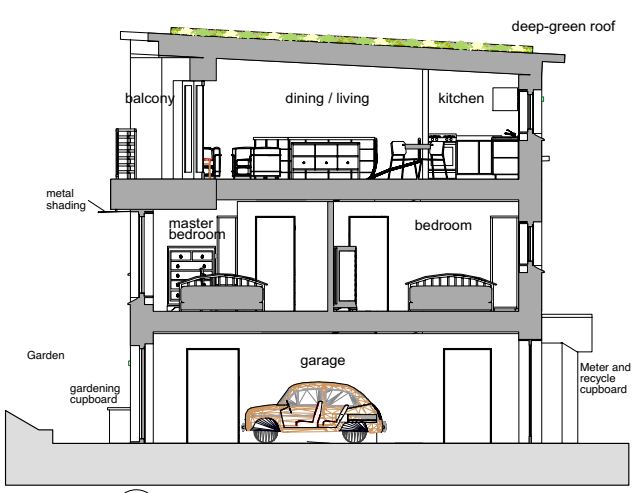
Gross Internal Area: 120.68 M²
Second floor: 34.59 M²
First Floor: 43.27 M²
Ground Floor: 42.82 M²



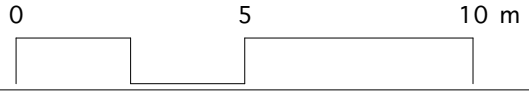
4 2bed 3storey with GARAGE NORTH Elevation
S=1:100



5 2bed 3storey with GARAGE SOUTH ELEVATION
S=1:100



6 2bed 3storey with GARAGE SECTION
S=1:100



General storage

Rev	Date	Appr	Rev by	Revision Notes

at
ANNE THORNE ARCHITECTS LLP
INDUSTRY, Adelaide Wharf, 21 Whiston Road London E2 8EX
020 7749 6931 info@annethornearchitects.co.uk annethornearchitects.co.uk

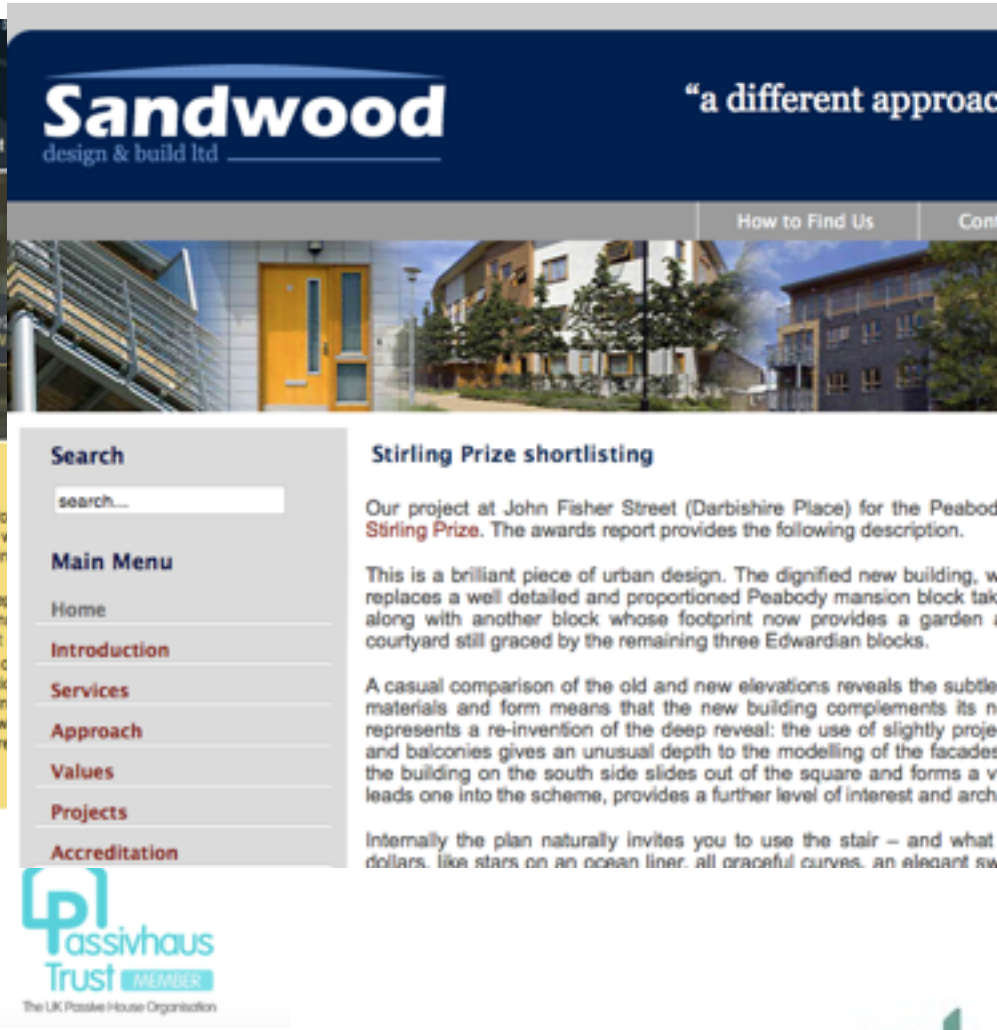
Client: LoCo Cohousing

Site: Cannock Mill , Old Heath Road, Colchester, Essex. CO2 8AA

Drawing Title: House 2 bed 3 storey with garage

Drawn By	Job No.	Revision
JS/CSG	245E	
Reviewed By		
JS		
First Issue	Drawing No.	
23.02.2015	151	
Scale	Size	
1:100	A3	

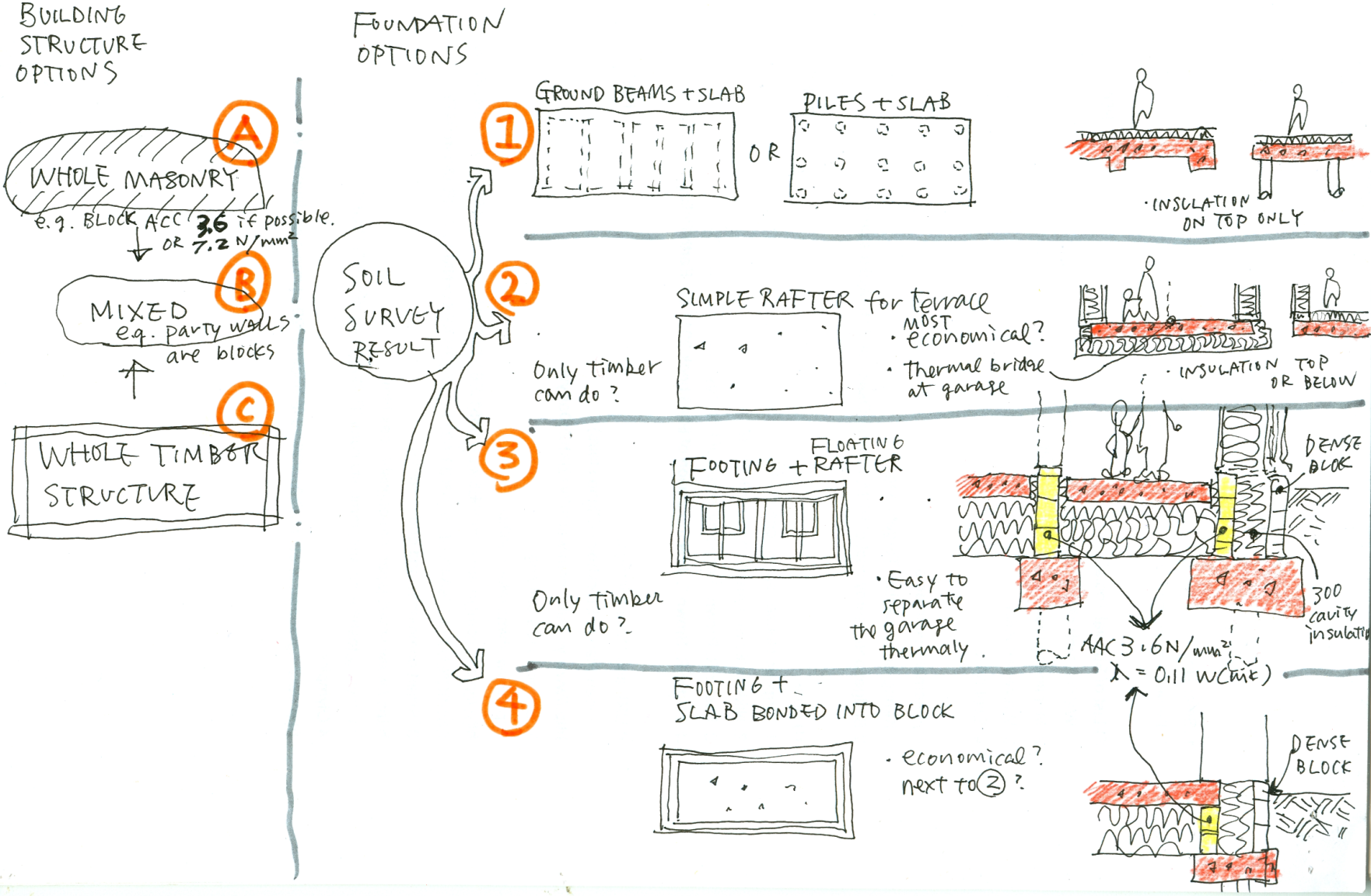
who's doing the building work?



at

Questions about FOUNDATION TO HOUSES

23/7/2014
ATA



system choices

15-40 at
ARCHITECTURE COLLECTIVE

prefabricated timber frame

At Boatemah Walk and at Angela Carter Close, prefabrication reduced time on site, building site nuisance to residents, site waste and CO2 emissions.

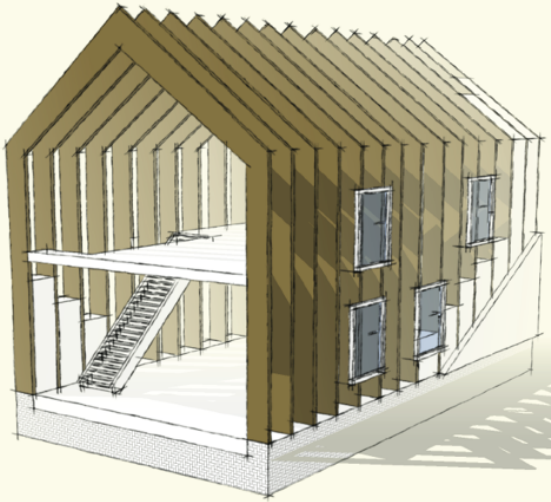
new build uses the PH15 passivhaus system

PH I5
PASSIVHAUS SYSTEM

All the Passivhaus specific elements (timber frame, windows, MVHR, tapes etc.) are supplied by the Passivhaus Store ensuring informed technical support on site. We also deliver initial contractor training for the system.

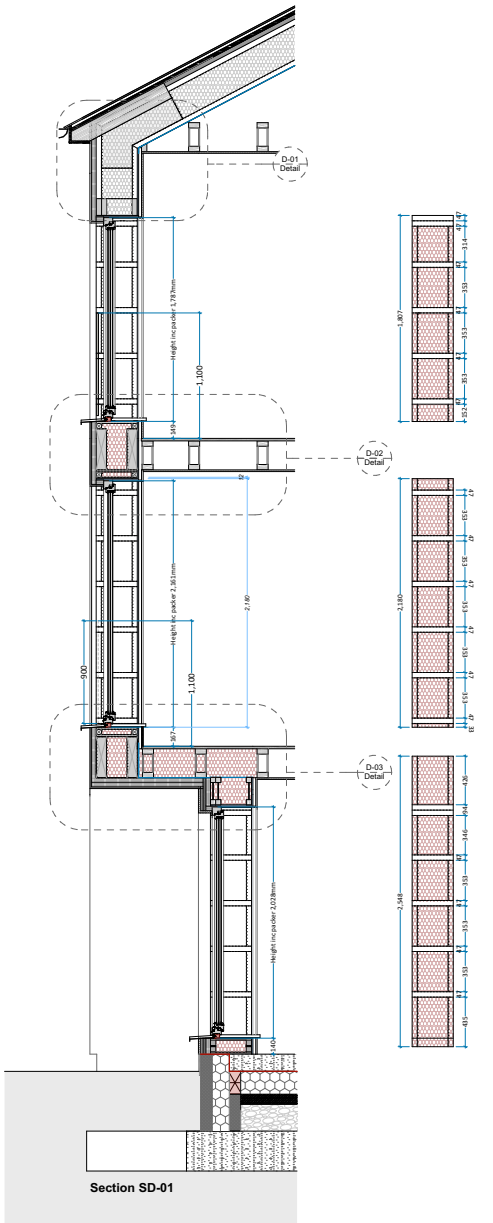
PROJECT OVERVIEW
Annual heat demand: <15.0 kW/m².a
Heating load: <10.5 W/m²
Airtightness: <0.6ach
TFA: 97m²+ Form factor: variable
Cost: From £1000/m² gross.

A certifiable self build system kit aimed at CLTs and other self build projects to provide an affordable Passivhaus.

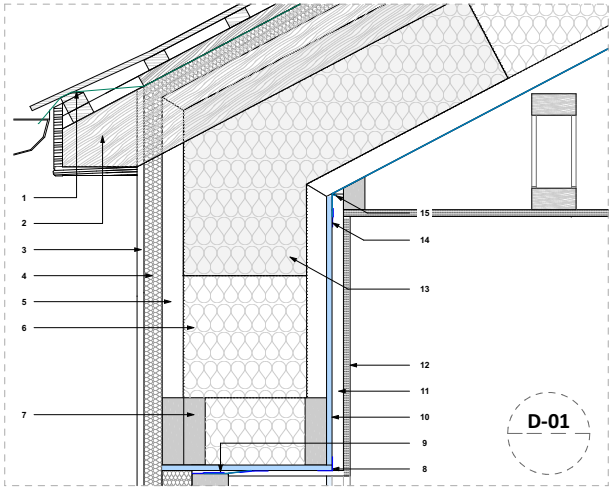


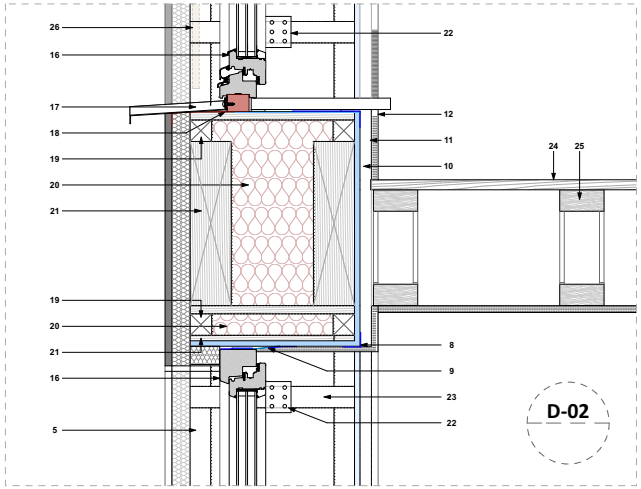
15-40 ARCHITECTURE COLLECTIVE

at

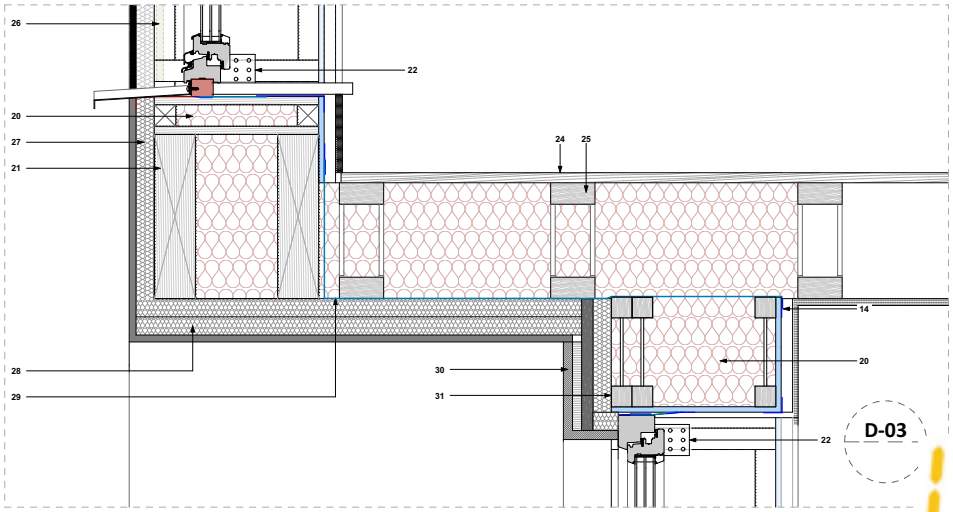


Section SD-01





1 Solitex Plus membrane [***15***] fitted over woodfibre insulation boards.
2 147 x 47 sawn treated timber 'dummy' rafter screwed to flange of I-joist.
3 Lime Green external render system [***23***]. Follow Lime Green guide lines for application.
4 40mm Steico Protect insulation board [***8***]
5 Passivhaus Homes PH15 timber frame kit.
6 Thermofloc [***14***] blown in cellulose insulation by qualified installer.
7 147 x 47 C16 timber lintels, 2 on outer leaf and 1 on inner leaf.
8 All joints in the airtightnes layer to be taped with Tescon Vana [***18***].
9 Pro Clima DA-S tape [***21***] to be stapled to perimeter of all windows, with a 7mm 'ear' formed at each corner and sealed with a combination of Tescon Vana [*18*] and Orcon F adhesive [***17***].
10 Spanotech Durelis Vapour Block [***13***] - airtightness, vapour control and racking layer combined fixed in accordance with engineer's specifcation.
11 25mm counter battens to form service void.
12 12.5mm plasterboard.
13 Plywood connection plates - part of the PH15 kit [***36***]
14 Tescon Vana [*18*] tape between Intello Plus membrane [***16***] and Spanotech board [*13*].
15 Form 20mm 'ear' in the Intello membrane to allow for differential movement.
16 Katbeck 'Massiva' triple glazed window - part of the PH15 kit [*36*].
17 Katzbeck aluminium cill.
18 Pro Clima Extoseal Encors [***22***].
19 Wall head section - part of the PH15 kit [*36*].
20 During construction insulate inaccessible areas by **fully** filling with Thermafleece Cosywool [***12***]
21 10mm packer above windows.
22 Window fixing plate - windows to be fixed at each vertical fixing point and at head and cill.
23 47 x 47 sawn timber.
24 22mm EGGER Protect P5 particle board flooring fixed in accordance with manufacturer's specification.
25 254 x 97 Eco-joists - part of the PH15 kit [*36*].
26 Toughened glass balastade fixed with stainless steel brackets.
27 Fix woodfibre insulation with 60mm diameter insulated fixing washer [***11***] and flange head screw long enough to give a minimum fixing depth of 35mm in studs.
28 Fix 2 x 40mm layers of Steico Protect board [*8*] to soffits
29 Intello Plus membrane [16] forming airtightness layer at 1st floor overhang taped to Spanotech boards [13]. Ensure that correct sequencing allows for the insulation of all inaccessible voids using Thermafleece Cosywool [12]
30 QUICKBRICK SYSTEM [***35***] with Ibstock Funtons Orchard Mix brick slips system to Quickbrick standard timber frame details.
31 240mm I-joist lintels - particular attention should be paid to ensure the void between pairs of lintels is insulated.



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at 15-40 ARCHITECTURE COLLECTIVE

Client
Regeneration & Housing Dept Lambeth

Job Title
54 Akerman Road

Job Number
233

Project Address
54-58 Akerman Road SW9

Drawing Name
Section Details
SD-01 Section through front elevation

Drawing Status
Construction Drawings

Drawn by
JRW

Date
16 February 2015

wing Scale
20, 1:5

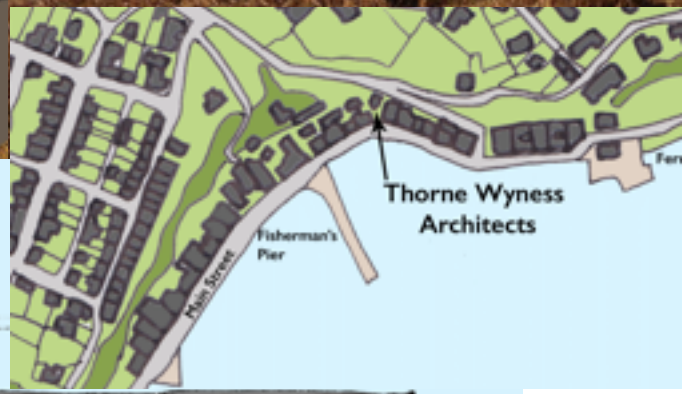
Sheet Size
A1

out ID
3.1

Status
Tender

Revision

cross laminated timber



Thorne Wyness Architects

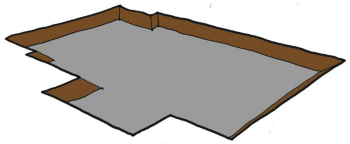
at

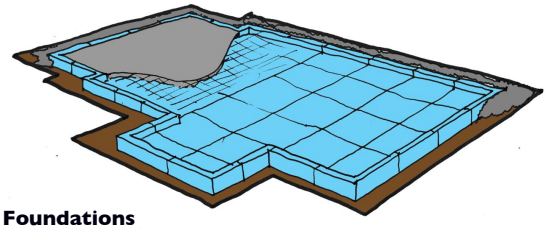
Our Island Home

Construction

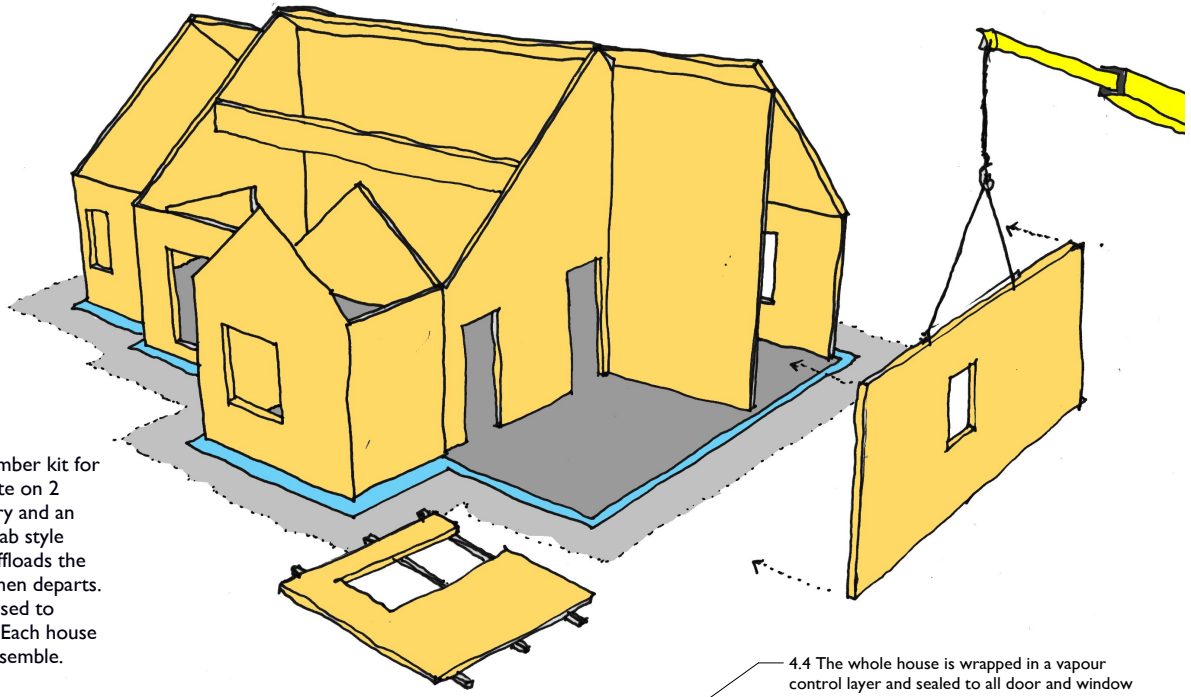
The design seeks to reduce construction time on site with the use of pre-made cross laminated timber panels, externally clad with sheet metal and natural Scottish larch. A mix of cladding materials breaks the buildings down visually and adds interest to the site whilst responding to the existing vernacular palette. All of the materials used are recyclable. As our office is located in Tobermory on the Isle of Mull, we are in a unique position to maintain a high level of close site supervision in order to ensure a smooth delivery of an innovative form of construction for the prototype site at Dervaig

1 - Groundworks
Time: 1 wk
Total time: 1 wk
The site is excavated and made level to within a set tolerance with a well compacted blinding layer.



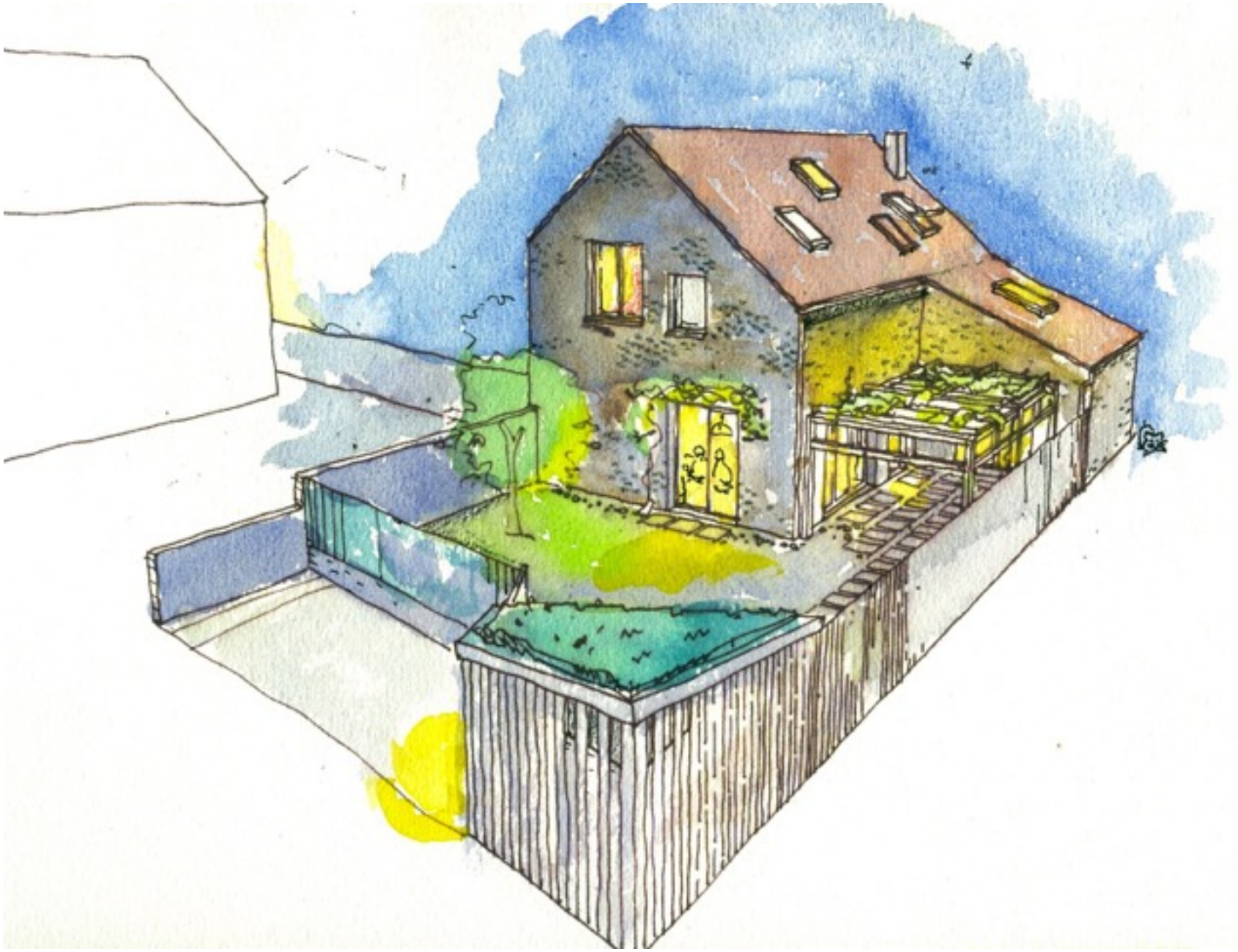


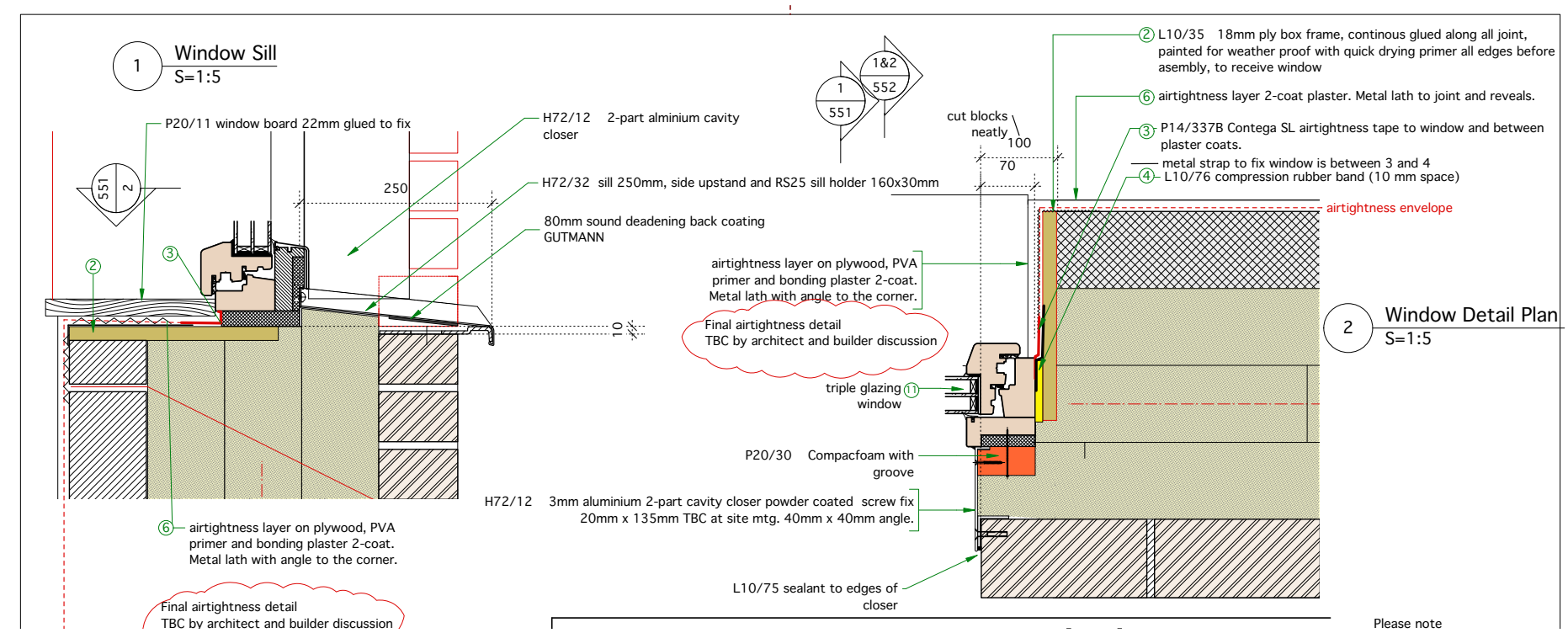
2 - Foundations
Time: 6 wk
Total time: 7 wk
The under slab insulation arrives as a prefabricated kit and slots together on site to form the setting out for the house. Once the parts are located correctly, the battered edge of the excavation is backfilled level with the top of the upstand. This secures the insulation in position and allows it to be used as permanent formwork for casting the concrete slab. The concrete slab then cures for 28 days. The insulation under the slab is designed around the use of a void former more usually used in substructures on large construction projects. Void formers are used in large projects to reduce loads on substructures by filling voids that would previously have been backfilled with hardcore or weak mix concrete with a lightweight but non compressible material. They compress very little under high loads. They also happen to have a pretty good U-value, are cheap and can be easily prefabricated into specialised sections. We are proposeing a kit of parts with a built in upstand which provides the formwork for casting the floor slab..

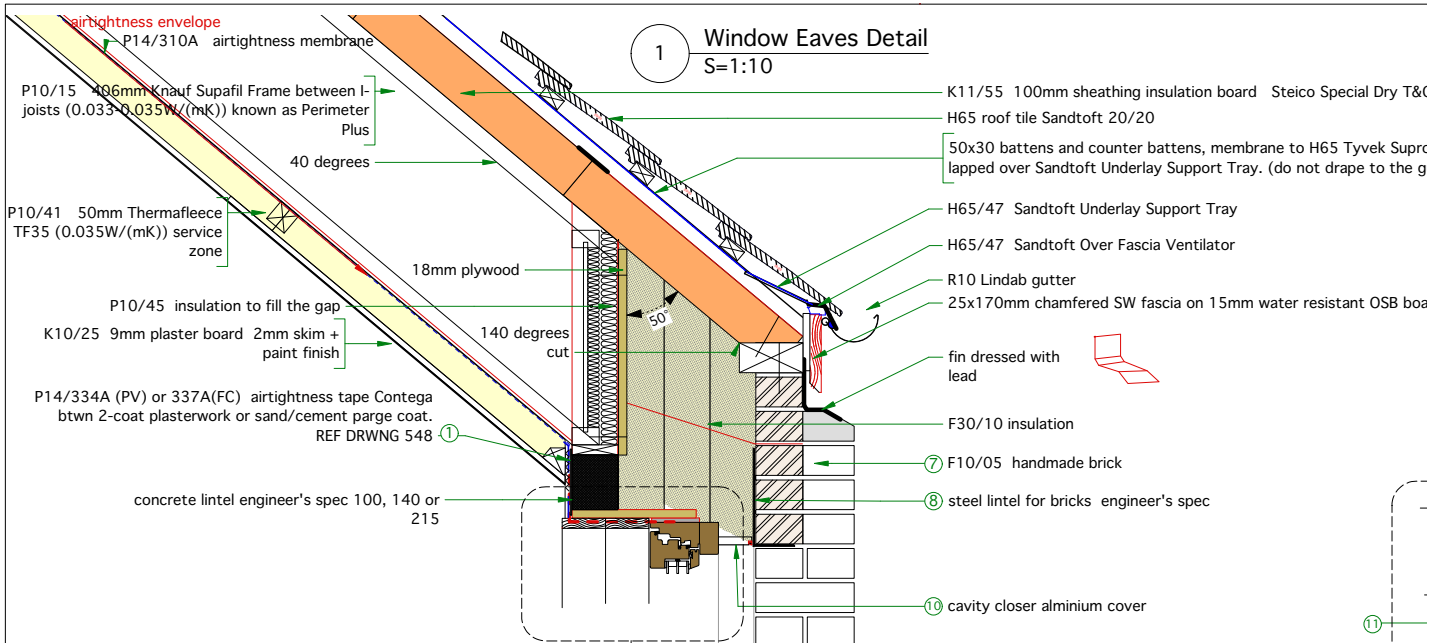


3 - Structure
Time: 1wk for 2 houses.
Total time: 8 wks
The Cross Laminated Timber kit for two houses arrives on site on 2 lorrys, an articulated lorry and an 11m rigid truck with a hiab style crane. The small truck offloads the articulated lorry which then departs. The small truck is then used to assmeble the kit on site. Each house will take 2-2.5 days to assemble.

4.4 The whole house is wrapped in a vapour control layer and sealed to all door and window




1
Window Sill
S=1:5
P20/11 window board 22mm glued to fix
H72/12 2-part alminium cavity closer
H72/32 sill 250mm, side upstand and RS25 sill holder 160x30mm
80mm sound deadening back coating GUTMANN
250
10
6 airtightness layer on plywood, PVA primer and bonding plaster 2-coat. Metal lath with angle to the corner.
Final airtightness detail TBC by architect and builder discussion
2 L10/35 18mm ply box frame, continous glued along all joint, painted for weather proof with quick drying primer all edges before asembly, to receive window
6 airtightness layer 2-coat plaster. Metal lath to joint and reveals.
3 P14/337B Contega SL airtightness tape to window and between plaster coats.
metal strap to fix window is between 3 and 4
4 L10/76 compression rubber band (10 mm space)
cut blocks neatly
100
70
airtightness envelope
airtightness layer on plywood, PVA primer and bonding plaster 2-coat. Metal lath with angle to the corner.
Final airtightness detail TBC by architect and builder discussion
triple glazing window 11
P20/30 Compacfoam with groove
H72/12 3mm aluminium 2-part cavity closer powder coated screw fix 20mm x 135mm TBC at site mtg. 40mm x 40mm angle.
L10/75 sealant to edges of closer
2
Window Detail Plan
S=1:5
Please note


airtightness envelope
P14/310A airtightness membrane
1
Window Eaves Detail
S=1:10
P10/15 406mm Knauf Supafil Frame between I-joists (0.033-0.035W/(mK)) known as Perimeter Plus
40 degrees
P10/41 50mm Thermafleece TF35 (0.035W/(mK)) service zone
18mm plywood
P10/45 insulation to fill the gap
K10/25 9mm plaster board 2mm skim + paint finish
140 degrees cut
50°
P14/334A (PV) or 337A(FC) airtightness tape Contega btwn 2-coat plasterwork or sand/cement parge coat. REF DRWNG 548 1
concrete lintel engineer's spec 100, 140 or 215
K11/55 100mm sheathing insulation board Steico Special Dry T&(
H65 roof tile Sandtoft 20/20
50x30 battens and counter battens, membrane to H65 Tyvek Suprc lapped over Sandtoft Underlay Support Tray. (do not drape to the g
H65/47 Sandtoft Underlay Support Tray
H65/47 Sandtoft Over Fascia Ventilator
R10 Lindab gutter
25x170mm chamfered SW fascia on 15mm water resistant OSB boa
fin dressed with lead
F30/10 insulation
7 F10/05 handmade brick
8 steel lintel for bricks engineer's spec
10 cavity closer alminium cover
11


timber and straw


timber piles
recycled telegraph poles

straw works

working with volunteers

lordship rec festival /open house


low / high tech

timber piles