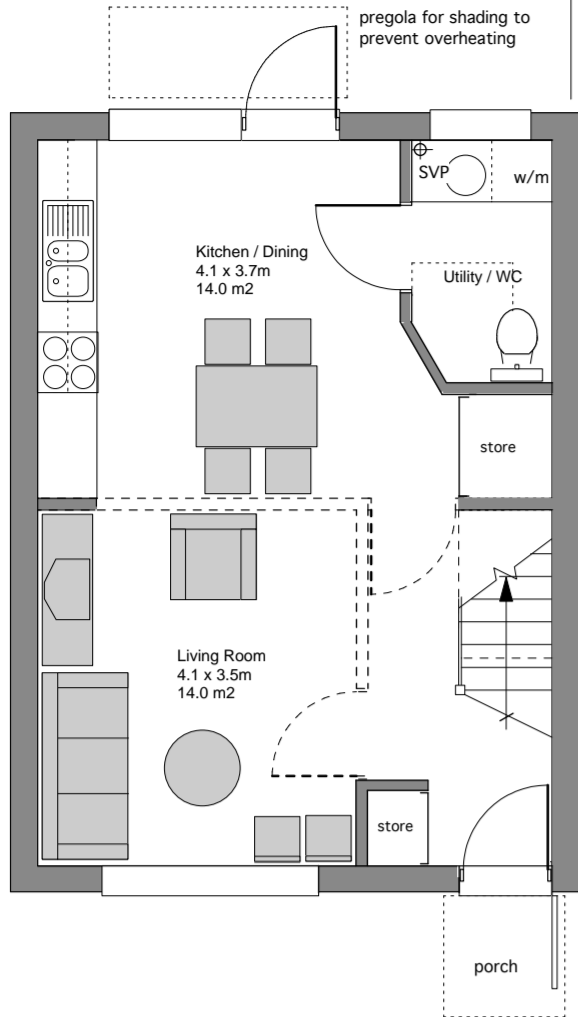


GROUND FLOOR

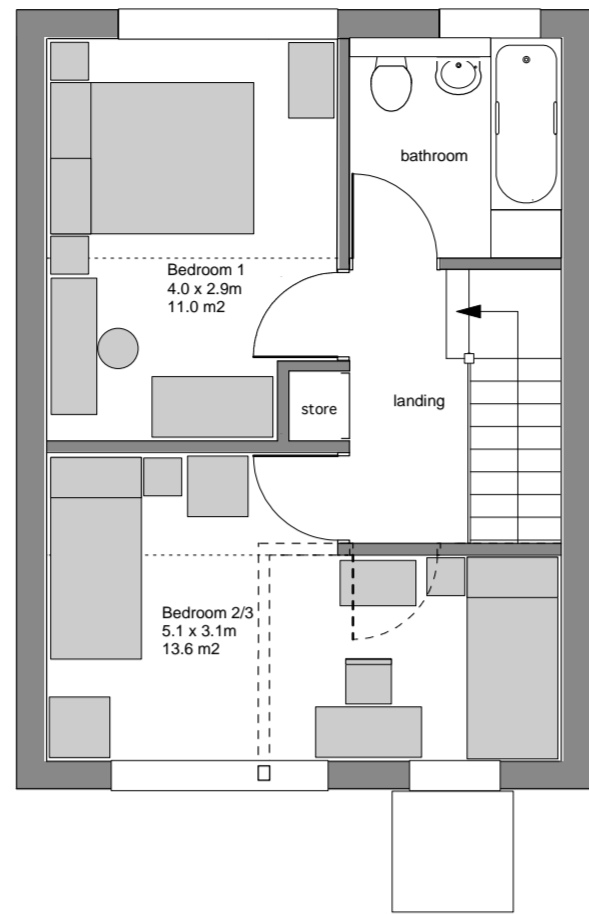


The house is designed to offer a number of possible layouts

- open plan or separate living room
- 2 double bedrooms or 1 double & 2 singles
- kitchen facing the street with living room opening off the back garden or kitchen off the garden as shown.

Ground floor shower and utility room usually only found in larger houses. Space for a washing machine, waste bins and sink.

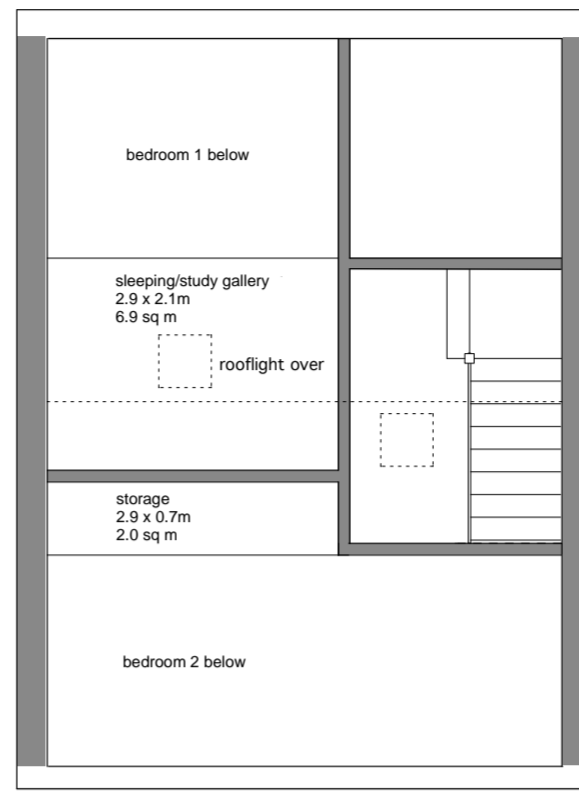
FIRST FLOOR



Incorporates Lifetime Homes standards to make homes more convenient for all including people with permanent or temporary disabilities as well as making access easier for pushchairs and so on.

Good standard of built in storage including at mezzanine level which is more accessible than a traditional loft.

MEZZANINE

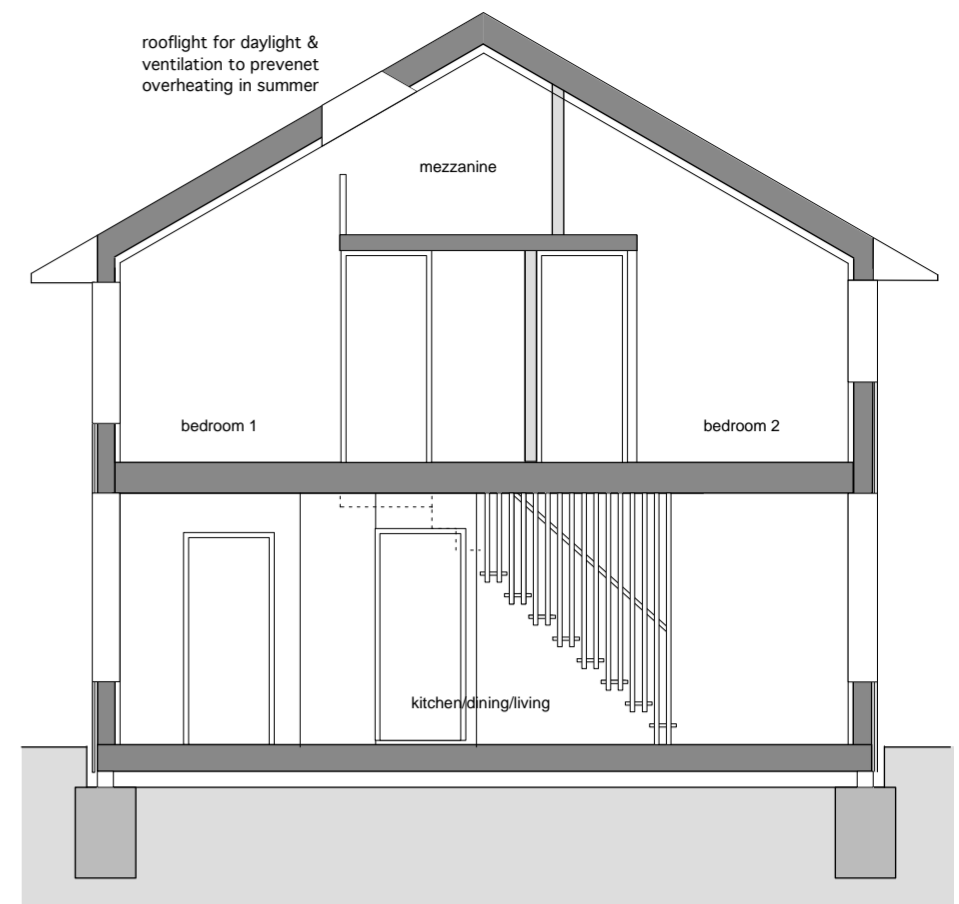


1st floor open to the underside of the roof

- provides a mezzanine off one of the bedrooms accessible by ladder.
- increases the usable area without adding significantly to the cost
- creates a spacious feel to the rooms
- makes it much easier to achieve an airtight envelope.

SECTION

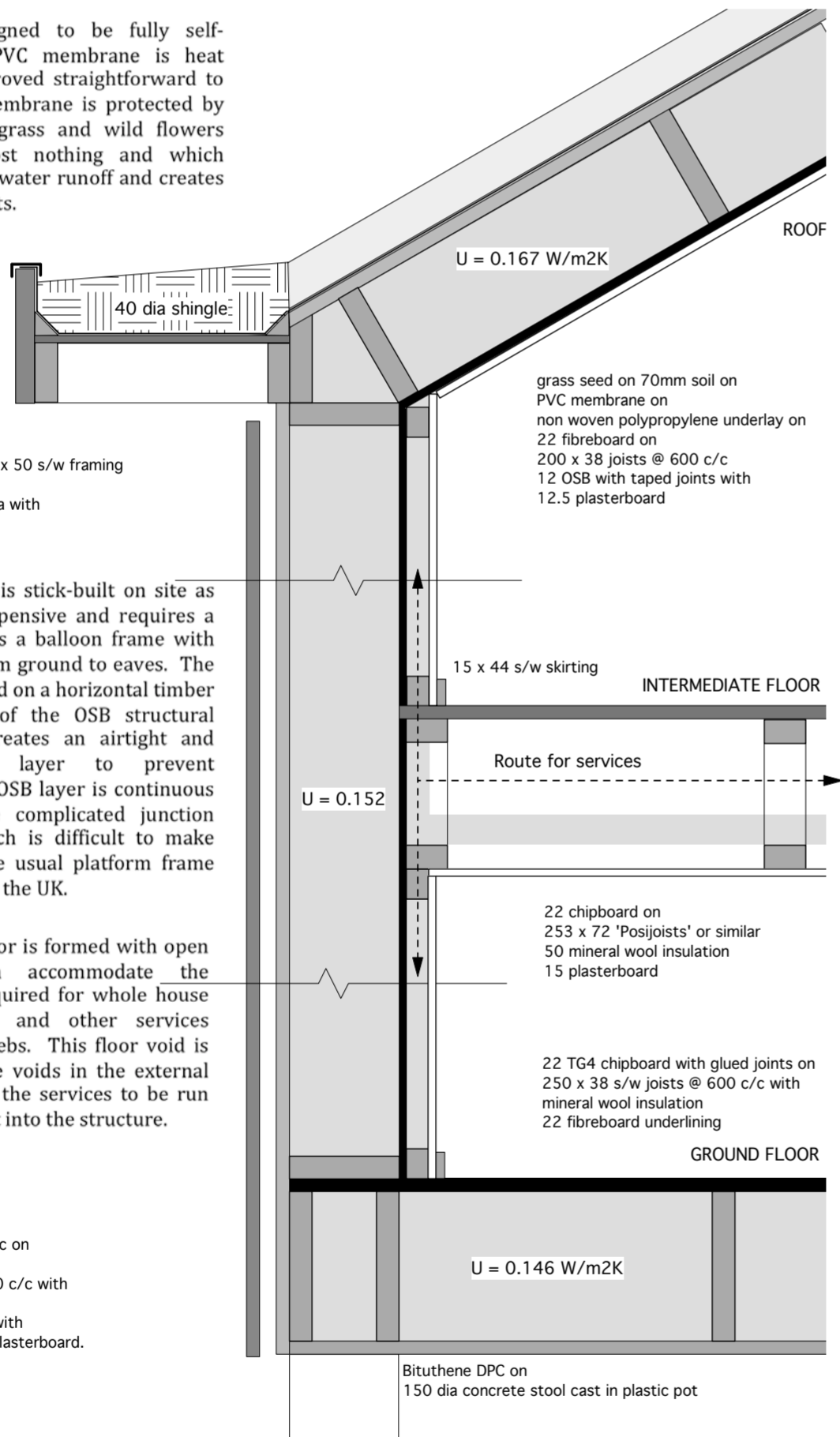
SCALE 1 : 75



The eaves level is reduced to 1.8m above first floor level to reduce the built volume and cost and this lends an intimate feel to the bedrooms.

The stair is designed to be easy for self-builders to construct. The treads are supported on hangars from above which enables the whole stair to be constructed by simply screwing timber together at right angles. Similarly, the kitchen is constructed of open plywood carcasses fitted with prefabricated drawer kits so that the whole kitchen can be assembled by self-builders.

The roof is designed to be fully self-buildable. The PVC membrane is heat welded and has proved straightforward to carry out. The membrane is protected by soil seeded with grass and wild flowers which costs almost nothing and which moderates surface water runoff and creates new wildlife habitats.



gutter of 12 ply on 100 x 50 s/w framing with 50 x 50 s/w fillets and 225 x 32 fs/w fascia with aluminium trim

The superstructure is stick-built on site as prefabrication is expensive and requires a crane. The frame is a balloon frame with full height studs from ground to eaves. The 1st floor is supported on a horizontal timber fixed to the face of the OSB structural sheathing which creates an airtight and vapour resistant layer to prevent condensation. The OSB layer is continuous and eliminates the complicated junction with the floor which is difficult to make airtight in the more usual platform frame construction used in the UK.

The intermediate floor is formed with open web joists which accommodate the ventilation ducts required for whole house ventilation systems and other services through the open webs. This floor void is linked to the service voids in the external walls and allows all the services to be run without having to cut into the structure.

cladding on 50 x 25 battens @ 600 c/c on 22 fibreboard on 184 x 38 s/w studs @ 600 c/c with mineral wool insulation 12 OSB with taped joints with 38 x 50 battens with 15 plasterboard.

The substructure is reduced to 4 mass concrete pads 600 in diameter and 900 deep cast in holes made with a post-hole auger. This has proved quick, easy and cheap. It is self-buildable and significantly reduces the need for digging and concrete.

SECTION

SCALE 1 : 10



A timber suspended ground floor deck is supported on 150mm high concrete blocks cast in a plastic bucket. In the case of a sloping site, the floor is supported on a concrete drainpipe filled with concrete with reinforcement bars which has proved easy for self-builders to construct. In this way you can build on a sloping site at little extra cost making difficult to develop sites feasible for development.

A conventional pitched roof is shown which lends a conventional appearance which will be preferred in many situations.

The roof finish is shown as a green roof which looks good and is self-buildable and economic to construct. A conventional tiled roof can be provided if the context demands but tiles would have to be fixed by a roofer at additional cost.

A fat roof can be provided as an alternative which has a number of advantages; it is simpler to build, easier to re-plan rooms below and easier to extend.

A range of lightweight 'dry' cladding materials can be used to suit the budget and the context. Timber in a number of configurations, horizontal, vertical, board-on-board etc. is the cheapest, cladding panels are expensive but require no maintenance as are brick slips on a backing or tile hanging.

This proposal is for high performance, self-build homes at a cost that makes them truly affordable; a 2 bedroom Passivhaus for £45,000.

Costs are reduced principally by maximizing self-build labour input but also by keeping the design and construction simple.

The construction is based on simple tried and tested timber frame construction which has been shown to be straightforward to build by people without previous building experience. The design of the foundations and the frame are refined to reduce costs, improve performance and increase the ease of construction.

Reducing costs creates an opportunity to make houses affordable but also to increase quality and standards to Passivhaus levels appropriate for the 21st century which will radically reduce climate change emissions and resident's fuel bills.

The house has an annual heating demand of 15 kWh/m² per annum as determined using the Passive House PHPP software. This compares to around 80kWh/m² per annum for a Building Regulations compliant house. A solar hot water system will provide around half the annual hot water demand reducing energy consumption still further.

Timber construction has an inherently low environmental impact & reducing costs emphasises the use of natural materials used in a natural state which also tends to reduce environmental impacts. The house incorporates low water use fittings and other low environmental impact measures including a green roof which moderates surface water runoff and creates new wildlife habitats.

The house is designed so that it can be built in a terraced or semi-detached layout which is important so that overall costs can be significantly reduced. A terraced house requires half the land which accounts for around half the overall cost and so the overall cost is reduced by around 25%.

The design is conventional in layout and appearance with a pitched roof and choice of finishes to make it generally acceptable to potential self-builders, neighbours, local councillors, funders and others.

The front and back walls and the internal partitions do not carry any structural loads so that the construction is adaptable and extendable. All mechanical and electrical services are incorporated within the intermediate floor and service voids in the external walls so that they are easily accessible and capable of modification and upgrading if necessary.

Works Package	Construction Element	Materials	Labour	Total
Works Package 1	Set up, Clearance, Demolitions....	£ 1,000.00	£ 1,000.00	£ 2,000.00
Works Package 2	Foundations (<i>up to DPC</i>)	£ 1,358.00	£ -	£ 1,358.00
Works Package 3	Ground Floor Slab or Suspended Floor	£ 1,510.00	£ -	£ 1,510.00
Works Package 4	Drainage & Service Trenchwork	£ 500.00	£ -	£ 500.00
Works Package 5	Specialist Building System (<i>eg timber frame, SIPs, etc if applicable</i>)	£ -	£ -	£ -
Works Package 6	External & Internal Walls	£ 5,246.00	£ 3,020.00	£ 8,266.00
Works Package 7	Intermediate Floor Zone (<i>if applicable</i>)	£ 1,800.00	£ -	£ 1,800.00
Works Package 8	Fireplace & Chimney (<i>if applicable</i>)	£ -	£ -	£ -
Works Package 9	Roof Structure, Insulation & Covering	£ 4,789.00	£ -	£ 4,789.00
Works Package 10	Joinery (<i>Windows, doors, stairs, skirtings...</i>)	£ 8,880.00	£ -	£ 8,880.00
Works Package 11	Specialist Products (<i>eg; Eco products...</i>)	£ 4,000.00	£ -	£ 4,000.00
Works Package 12	Electrical Installation	£ 4,100.00	£ 300.00	£ 4,400.00
Works Package 13	Plumbing Installation	£ 1,450.00	£ -	£ 1,450.00
Works Package 14	Heating Installation	£ 2,500.00	£ -	£ 2,500.00
Works Package 15	Plastering (<i>or dry-lining</i>)	£ 1,267.00	£ -	£ 1,267.00
Works Package 16	Kitchen and Utility Units (<i>+ appliances</i>)	£ 950.00	£ -	£ 950.00
Works Package 17	Decorations & Wall Ceramics	£ 708.00	£ -	£ 708.00
Works Package 18	Floor Finishes	£ 550.00	£ -	£ 550.00
	TOTAL	£ 40,608.00	£ 4,320.00	£ 44,928.00

Detailed costs have been produced by quantity surveyor Gordon Hutchinson based on rates from recent projects plus Spon's House Improvement Price Book all checked against Wickes.co.uk also suppliers for specific items eg MVHR.

Costs assume a terraced house. A semi-detached house adds an additional £2,550; extra roof overhangs £200 and £2,350 cladding and a detached house adds £5,100.

GORDON HUTCHINSON
CHARTERED QUANTITY SURVEYORS

Item	Description	Quant	Rate			Total	Total	Cost/m2	%
			Lab. £	Mat. £	Plant £				
	Structural timber head plate: 47 x 184	21 m		3.50		3.50	74		
	Sundry timberwork and fixings					10%	83		
	Mineral wool insulation: 184 mm between studs	72 m2		5.00		5.00	360		
	Fibreboard lining: 22mm to outer face	85 m2		7.00		7.00	595		
	OSB lining: 12mm to inner face	85 m2		5.00		5.00	425		
	ENVELOPE								
	<u>Total Area: Split</u>	<u>151 m2</u>		0.00		0.00	0		
	Timber cladding on and including 50 x25 battens @ 600 c/c: Front and rear elevations	33 m2		50.00		50.00	1,650		
	Timber cladding on and including 50 x25 battens @ 600 c/c: Side elevations [Note can be omitted if Terrace]	94 m2		50.00		50.00	Excl.		
	Cladding panel: Front and rear elevations	6 m2		50.00		50.00	300		
	Triple glazed windows and external doors: Certified to Passivhaus	18 m2		300.00		300.00	5,400		
		<u>151 m2</u>							
	Aluminium window sill	9 m		20.00		20.00	180		
	External door threshold	2 m		25.00		25.00	50		
	External porch: Allow	1 item		500.00		500.00	500		
	TOTAL: EXTERNAL WALLS/WINDOWS AND EXTERNAL DOORS						<u>10,376</u>	126.54	23.10
2G	INTERNAL WALLS AND PARTITIONS								
	Timber stud partitions comprising								
	Structural timber base plate: 38 x 75	26 m		1.50		1.50	39		
	Structural timber stud: 38 x 75 @ 600 c/c	178 m		1.50		1.50	267		
	Note: Measured over door openings to include formation								
	Structural timber head plate: 38 x 75	33 m		1.50		1.50	50		
	Sundry timberwork and fixings					10%	36		
	Mineral wool insulation between studs: 75mm	63 m2		3.00		3.00	189		
	Plasterboard lining: 15mm with taped edges and jointing	140 m2		3.00		3.00	420		
	TOTAL: INTERNAL WALLS AND PARTITIONS						<u>1,000</u>	12.20	2.23
2H	INTERNAL DOORS								
	Doors, frames and ironmongery; Decoration: Single door	7 no		200.00		200.00	1,400		
	TOTAL: INTERNAL DOORS	<u>7 no</u>					<u>1,400</u>	17.07	3.12
	TOTAL: SUPERSTRUCTURE						<u>20,215</u>	<u>246.52</u>	<u>44.99</u>
3A	WALL FINISHES								
	<u>Backing</u>								
	Perimeter wall: Plasterboard lining: 15mm on and including 50x38 battens @ 600 c/c with mineral wool insulation	103 m2		8.00		8.00	824		
	Internal plasterboard walls: See Section 2G	132 m2		0.00		0.00	0		
		<u>235 m2</u>							
	<u>Finish</u>								
	Emulsion painted finish	225 m2		1.00		1.00	225		
	Ceramic tiling: 3 courses 150 x 150 tiles around bath and kitchen and utility worktops. Allow 3m2 tiling around Utility shower	10 m2		40.00		40.00	400		
		<u>235 m2</u>							
	<u>Window opening details:</u>								
	Head: Painted plasterboard lining on battens with insulation	11 m		5.00		5.00	55		
	Jamb: Painted plasterboard lining on battens with insulation	26 m		5.00		5.00	130		
	Sill: Softwood window board with painted finish	9 m		10.00		10.00	90		
	TOTAL: WALL FINISHES						<u>1,724</u>	21.02	3.84
3B	FLOOR FINISHES								
	<u>Sub-Floor</u>								
	Chipboard sub-floor: See Sections 0 and 2B	79 m2		0.00		0.00	0		
	Staircase: See Section 2D	3 m2		0.00		0.00	0		
		<u>82 m2</u>							
	<u>Finish</u>								
	Linoleum to kitchen area, utility and bathroom	22 m2		25.00		25.00	550		
	Chipboard surface unfinished	53 m2		0.00		0.00	0		
	Staircase: See Section 2D	3 m2		0.00		0.00	0		
	Internal walls, Ducts etc	4 m2		0.00		0.00	0		
		<u>82 m2</u>							
	Skirting: 15x 44 softwood painted	90 m		4.00		4.00	360		
	External door threshold	2 m		25.00		25.00	50		
	TOTAL: FLOOR FINISHES						<u>960</u>	11.71	2.14
3C	CEILING FINISHES								
	<u>Backing</u>								
	Ground Floor and under Mezzanine: Plasterboard soffit: 15mm	41 m2		3.00		3.00	123		
	First Floor: Plasterboard soffit: 12mm	35 m2		2.50		2.50	88		
	Stair void [Ground]	2 m2		0.00		0.00	0		
	Internal walls, Ducts etc	4 m2		0.00		0.00	0		
		<u>82 m2</u>							
	Measured on plan: Extra for sloping soffits over First	7 m2		2.50		2.50	18		
	<u>Finish</u>								
	Emulsion painted finish	76 m2		1.00		1.00	76		
	Stair void [Ground]	2 m2		0.00		0.00	0		
	Internal walls, Ducts etc	4 m2		0.00		0.00	0		
		<u>82 m2</u>							

GORDON HUTCHINSON
CHARTERED QUANTITY SURVEYORS

Item	Description	Quant	Rate			Total	Total	Cost/m2	%
			Lab. £	Mat. £	Plant £				
	Measured on plan: Extra for sloping soffits over First	7 m2		1.00		1.00	7		
	Rooflight lining: 800 x 1,000 x 200 deep	1 no		30.00		30.00	30		
	TOTAL: CEILING FINISHES						341	4.16	0.76
	TOTAL: INTERNAL FINISHES						3,025	36.89	6.73
4A	FITTINGS AND FURNISHINGS								
G03	Kitchen / Dining: Self build units: Laminate on 40 Chipboard worktops on 15 ply carcasses and doors. PVC drawer kits: Built in sink. Allow	1 Item		700.00		700.00	700		
G04	Utility / WC14/09/2013 : Self build units: Laminate on 40 Chipboard worktops on 15 ply carcasses and doors. PVC drawer kits. Built in sink. 15 ply ducts: Allow	1 Item		200.00		200.00	200		
F06	Bathroom: 15 Ply ducts: Allow	1 Item		50.00		50.00	50		
	TOTAL: FITTINGS AND FURNISHINGS						950	11.59	2.11
5A	SANITARY APPLIANCES								
G04	Utility / WC: WC: Shower fitting	1 Item		400.00		400.00	400		
F06	Bathroom: Bath, WC, WHB	1 Item		550.00		550.00	550		
	TOTAL: SANITARY APPLIANCES						950	11.59	2.11
5C-G	MECHANICAL SERVICES								
	Hot and cold water supplies	1 Item		300.00		300.00	300		
	Waste plumbing	1 Item		200.00		200.00	200		
	Minimum output combination gas balanced flue boilers serving 6 no small radiators	1 Item		2,500		2,500	2,500		
	Solar hot water installation	1 Item		1,500		1,500	1,500		
	Heat recovery ventilation system	1 Item		2,500		2,500	2,500		
	TOTAL: MECHANICAL SERVICES						7,000	85.37	15.58
5H, L	ELECTRICAL SERVICES								
	Lighting and power supplies by Self-Builder: Allow/m2 GFA	82 m2		50.00		50.00	4,100		
	Testing by Certified Electrician	1 Item	300.00	0.00		300.00	300		
	TOTAL: ELECTRICAL SERVICES						4,400	53.66	9.79
5J	LIFT AND CONVEYOR INSTALLATIONS								
	NOT APPLICABLE						0	0.00	0.00
5N	BUILDER'S WORK IN CONNECTION WITH SERVICES								
	Allowance for all general BWIC services and attendances on specialist Sub Contractors: By Self Builder: Allow sundry material in other sections	1 Item		0.00		0.00	0		
	TOTAL: BUILDER'S WORK IN CONNECTION WITH SERVICES						0	0.00	0.00
	TOTAL: SERVICES						12,350	150.61	27.49
6A	SITE WORKS								
	No Site Works allowed						0		
	Pergola to Rear Elevation						Excl.		
	TOTAL: SITE WORKS						0	0.00	0.00
6B	DRAINAGE								
	Drain connection to site manhole: Allow	1 Item		500.00		500.00	500		
	Connection to local authority sewer						Excl.		
	TOTAL: DRAINAGE						500	6.10	1.11
6C	EXTERNAL SERVICES								
	Water, Gas and Electric mains: Assume services provided as part of Self-Build initiative/future fuel consumption	1 Item		0.00		0.00	0		
	TOTAL: EXTERNAL SERVICES						0	0.00	0.00
	TOTAL: EXTERNAL WORKS						500	6.10	1.11
	SUB-TOTAL						39,907	486.68	88.83
7	ON-COSTS								
7A	PRELIMINARIES								
	No Main Contractor: Allow for site facilities, small tools and plant, insurances, Professional inspections etc.	1 Item	1,000	0.00	1,000	2,000	2,000		
	Scaffolding: Allow/m2 External Wall Area	151 m2	20.00				3,020		
	TOTAL: PRELIMINARIES						5,020	61.22	11.17
7B	OVERHEADS AND PROFIT								
	NOT APPLICABLE						0	0.00	0.00
7C	CONTINGENCIES								
	Allowance for contingencies						10% Excluded	0.00	0.00
	TOTAL: ON-COSTS						5,020	61.22	11.17
	TOTAL: CONSTRUCTION AT CURRENT COST 3RD QUARTER 2013						£44,927	£547.90	100.00