HILLTOP ROAD

DESIGN AND ACCESS STATEMENT

CONTENTS

1 INTRODUCTION

The proposal is for a new single dwelling to replace the existing cottage, with address ***The Cottage, Hilltop Road, London, NW6 2QA***. The proposed new dwelling is designed to be able to accommodate the owner's current and future requirements. It has been carefully considered in its context, so that it makes a positive architectural contribution to Hilltop Road. The massing of the building has been tested and adjusted to avoid negatively affecting the neighbours' amenity. The new dwelling is designed to achieve very high sustainability standards, both in carbon footprint from the construction process, as well as energy use during occupation.

The owner and applicant has lived on Hilltop Road since the early 80s and is a member of the West Hampstead Gardens & Residents Association. The brief from the owner is to create a retirement home that will meet current and future needs.

View from corner of Sherriff Road and Hilltop Road showing the proposed single dwelling.

2 PLANNING HISTORY

The owner has previously applied for planning approval for a roof extension, replacing the flat roof with a new pitched roof with planning reference 2012/6230/P. This was granted on 30.01.2013.

This application was submitted together with a daylight study that showed negligible loss of daylight to neighbours.

The proposal, which is now issued for planning approval, has been discussed with the Planning Officer at the Local Authority. The proposal is the result of two rounds of pre-application advice from the council. The valuable feedback and comments from this process have been incorporated into the current proposal.

Proposed front elevation for the roof extension.

3 EXISTING COTTAGE

3.1 Applicant's Assessment

The existing building was bought by the applicant in 2009. It offered the opportunity to upgrade his accommodation from his existing flat in Hilltop Road whilst remaining in the area.

The previous owner had not made any investment in the house for some time and it was in dire need of modernisation. The priorities for the new owner, the current applicant, were to install external insulation, increase storage space, modernise the kitchen, bathroom and heating system, replace the windows and doors and to improve the general decorative order.

Secondary goals were to improve the appearance of the garden and paved areas.

Early in the 2010s it became clear that there was subsidence near the front entrance and subsequent site investigations revealed that the foundations were inadequate, adding underpinning to the significant works required.

The Cottage seen from the street. The front facade shows clear signs of structural issues.

Initial design culminated in the planning application approved in 2013. The works were started but ran into delays due to issues with the contractor. Further difficulties in negotiating with one of the neighbours, to erect scaffolding on his land and to give access to the walls bordering on their property, meant that most of the works have still not started.

In the meantime, the owner retired from work and the Covid-19 pandemic occurred. This increased his desire for comfortable living space and caused him to give more thought to the ability of the dwelling to adapt to his increasing age and possible eventual infirmity.

The initial refurbishment plans began to be regarded as falling short of requirements in a number of important ways.

Firstly, the steps needed between the split levels of both existing floors were potential trip hazards and made the convenient installation of a future platform lift infeasible. It would also be difficult to comply fully with fire regulations on the open ground floor level.

Secondly, the kitchen, although slightly larger than the existing one, was still rather cramped and only just provided enough space for the necessary appliances, worktops and a small breakfast bar: it would not achieve the convenience common in modern houses.

Thirdly, the low level and eastern aspect of the living room and the overshadowing of the kitchen by adjacent buildings, made the ground floor rather gloomy. Although the refurbishment project included a new

The proposed new south-facing terrace.

south-facing opening from the living room, it is clear that a higher level terrace, as in the current proposal, less obscured by the adjacent house, would offer a lighter, more pleasant external space than the rear part of the existing driveway (see illustration on this page).

Finally, ways of overcoming the objections from the neighbouring owner were investigated and it seemed that demolition of the existing building and its replacement with a lightweight structure could offer a way of accelerating the work and thus reducing the time for which scaffolding was needed.

As well as overcoming the disadvantages of the refurbishment option, a rebuild with a larger footprint also presented the following significant opportunities:

- to provide three good-sized floors with reasonable headroom,
- to make space for a good-sized kitchen/dining room on the first floor and a hobby/exercise room on the ground floor,
- to provide flexibility for the future needs of the owner by providing space for a platform lift and allowing for part of the ground floor to be converted into a self-contained studio flat for use by a carer or possibly for the owner if he was unable to afford or use the platform lift,
- to propose a more attractive and valuable house overall, thus enhancing the immediate environment and designing in energy-saving and low-carbon technology from the outset.

Placing the ground floor at a level between the two levels of the the existing ground floor will enable access from the street without significant steps or ramps. It will also allow more daylight into the lower rooms and make them feel more airy and bright.

Elevation of Hilltop Road. The approved roof extension scheme is shown with dashed line.

3.2 Architectural

The existing house was built in the early 20th century, on land that appears to have been parcelled off from No. 10 Sherriff Road. It consists of two storeys, both of which are split level. The ground floor comprises of the entrance hall, a sunken living room (four steps down) and a small kitchen towards the rear courtyard. On the first floor there are two bedrooms, a bathroom and a small storage room. This floor is also split with three steps.

The existing cottage is around 100 years old, but it is not a typical or unique example of architecture of its period. The building was built to a much lower standard than the surrounding buildings with little or no facade treatment. The construction was likely of substandard or mismatched bricks as the whole facade has been clad in roughcast render. This render has been repaired numerous times over the years and this shows in large patches on the facade.

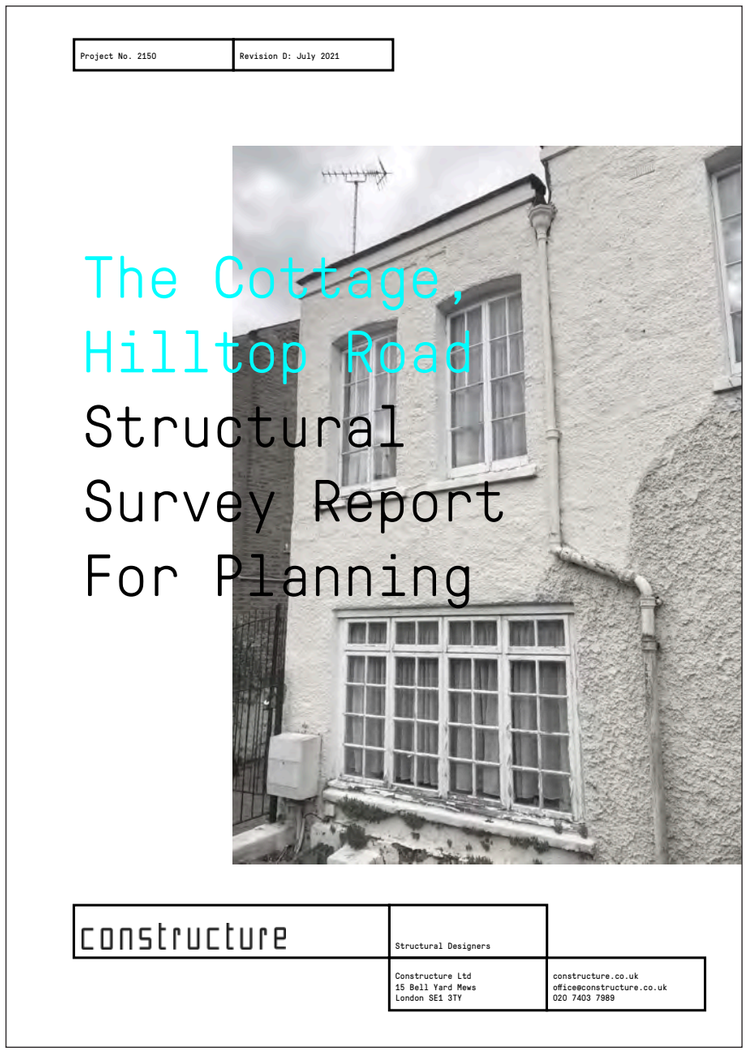
The orientation of the existing cottage follows that of No. 10 Sherriff Road, which means that the facade of The Cottage is at an angle to the facade line of Hilltop Road. The massing and main elevation of The Cottage is not congruent with the other houses on Hilltop Road.

3.3 Structural

Constructure Ltd. was appointed by the applicant to do a structural survey of the existing cottage. The survey found that the building is suffering from various structural issues that will need to be remedied. These can be summarised here as:

- Large crack in main facade, likely due to movement and foundations issues.
- Other cracks in brickwork seen internally.
- Defective wall in interface with No. 10 Sherriff Road.
- Cracks in western boundary wall.
- South facade has numerous cracks and defective render resulting in water ingress.
- Dips in external paving due to settlement.
- Damp/rot to timber structure.
- Sloping first floor level.

Please refer to structural survey for further details.



Excerpts from the Structural Engineer's report.

3.4 Energy use and Sustainability

The building fabric of the existing cottage is very clearly in a poor condition for the retention of heat. The external masonry walls are without any form of insulation or cavity, as are the flat roof and the floor. The windows are drafty single-glazed windows. Most services are outdated.

The owner has commissioned an Energy & Sustainability Statement from The Design Collective that looks at the existing building fabric, the proposed building and the suitability of various renewable energy options.

In their statement they have shown that the performance of the existing building fabric's thermal conductivity is extremely poor, with a negative difference of up to 91% when compared with the minimum requirements for Part L1B compliance.

The new proposal, on the other hand, "could achieve an overall improvement (DER/TER) in regulated emissions at over 71.65% above Part L 2013 standard, depending on the measures implemented".

THE COTTAGE, HILLTOP ROAD
LONDON, NW6 2QA

Energy & sustainability Statement

Rev 1

09th August 2021

THE DESIGN COLLECTIVE

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.5.41
Printed on 22 June 2021 at 09:42:37

Project Information:

Assessed By: Neil Ingham (STRO010943) **Building Type:** Semi-detached House

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 132.24m²
Site Reference : Hilltop Road - BASE **Plot Reference:** Hilltop Road
Address :

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)
Target Carbon Dioxide Emission Rate (TER) 17.98 kg/m²
Dwelling Carbon Dioxide Emission Rate (DER) 15.98 kg/m² OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 65.4 kWh/m²
Dwelling Fabric Energy Efficiency (DFEE) 58.3 kWh/m²
OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	0.15 (max. 0.25)	0.15 (max. 0.70)	OK
Roof	0.12 (max. 0.20)	0.12 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 OK

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 89.5 % SEDBUK2009
Minimum 88.0 % OK

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder
N/A

Stroma FSAP 2012 Version: 1.0.5.41 (SAP 9.92) - http://www.stroma.com Page 1 of 2

Excerpts from the Energy and sustainability statement.

4 PRINCIPLE OF DEMOLITION

In line with the previous pre-application advice and the council's SPG's we have considered carefully the various options for the existing cottage. We have looked at the possibilities for refit, refurbish, substantial refurbishment and extension, and reclaim and recycle

4.1 Refit

A refit of The Cottage would not make the plan layout suitable for its intended use, which is as the retirement home for the owner. The current layout is fairly cumbersome and inefficient. There is very little space to introduce mobility-assisting measures and there is only one bathroom, which is on the top floor and not level with the main bedroom. There is no space to install a platform lift that could serve the various levels, should this be required in the future, and the existing structure is not designed to introduce this. And there is not enough space to accommodate a potential future live-in carer.

The sunken living room sits below ground and is susceptible to damp and mould problems as the building is not built with proper damp proofing. This is likely to be very costly to fix and could lead to poor and unhealthy living conditions.

The layout issues with the current building would not suit its intended use as a retirement home for the owner. A simple refit would not rectify the numerous structural issues with the cottage nor would it bring the existing building fabric up to current building regulation requirements.

4.2 Refurbishment

Similar to the issues outlined in 4.1 Refit, a refurbishment would not address the many issues with the layout and space for improvements to be suitable as a retirement home for the owner. A refurbishment would not rectify the numerous structural issues with the cottage. A refurbishment could make some improvements to the fabric, bringing parts of it up to current building regulation requirements.

4.3 Substantial refurbishment and extension

Here two options have been investigated. Option A is the proposed roof extension, which currently benefits from planning approval, and option B, which is similar to the proposed dwelling in this application, but with certain building elements retained, such as the rear facade and parts of the southern facade.

- ***Option A*** would require underpinning of the entire house, which is disruptive, costly and energy intensive. The works would likely take care of the structural issues with the existing house, but would not, in a meaningful way, change the layout to a more suitable organisation.
- ***Option B*** would require substantial temporary steel propping structures to keep the retained facades in place whilst the construction works are completed between and around these retained elements. This steel propping structure would be energy intensive with little likelihood that the steel could be reused other than to be melted down. The retained elements would also likely need to be underpinned with concrete foundations. Retaining some of the structure would mean that off site production of prefabricated timber would be much more difficult to implement and would likely lead to increased disruption to neighbours during construction. It would also be much more difficult to achieve overall fabric u-values and air-tightness that are as good as in a completely prefabricated building, meaning that the building would use more energy during its life span. These negatives would seem to outweigh the positives in retaining some of the existing facades.

4.4 Reclaim and recycle

The conclusion we have reached after the investigations outlined on this page, is that the best use of the land (Policy D3 of the New London Plan) would be to demolish the existing building and reclaim and recycle as much of the existing building fabric as possible.

The upper level timbers may be in a condition that could warrant reuse and the masonry could be crushed and recycled as sub base material under the new dwelling. Please refer to the structural engineer's report for more details on these options.

Existing elevation of Hilltop Road (south to north)

Proposed elevation of Hilltop Road (south to north)

5.1 Context

The site is located at the north western corner of Hilltop Road. It sits between No. 10 Sherriff Road to the north, a corner building, and No. 2 Hilltop Road to the south, a detached house.

Further down Hilltop Road we find the main row of houses, Nos. 22 – 8, are terraced townhouses over four storeys. These all have rectangular bay windows over three storeys. These houses are arranged as more or less symmetrical pairs, eight in total, or four pairs. As we approach the northern part of the road, the building height steps down, first to No. 6 a slightly lower townhouse with an angled, rather than rectangular bay window, and then again to No. 4 Hilltop Road which is only two storeys in height, plus a loft storey. No. 4 is similar to No. 2 with a full-height rectangular bay window and a one-storey angled bay window. No. 2 and No. 4 have central entrance doors.

The corner building, No. 10 Sherriff Road, has both a prominent facade and its main entrance onto Hilltop Road. The ridge level is back up to the height of the terrace of townhouses on the southern end of the road. This is due both to its absolute height and the fact that the road slopes down from the north to the south. This building has the same facade motif as No. 2 and No. 4 Hilltop Road, with a full-height rectangular bay window, a one-storey angled bay window and a central entrance door.

The buildings Nos. 6, 4 and 2 Hilltop Road, as well as No. 10 Sherriff Road, have clearly defined storeys with horizontal lines across the facade between storeys. Many of the houses on the street appear to have a non-uniform floor-to-ceiling height, differentiating the height of the lower storeys with the top floor, which is clearly lower in height.

The buildings directly to the north of the site, No 10 Sherriff Road, and to the south of the site, No. 2 Hilltop Road, differentiate between the base, or ground floor, and the storeys above by using different facade finishes.

Massing comparison between 2012 approved scheme (red) and new proposed scheme (blue)

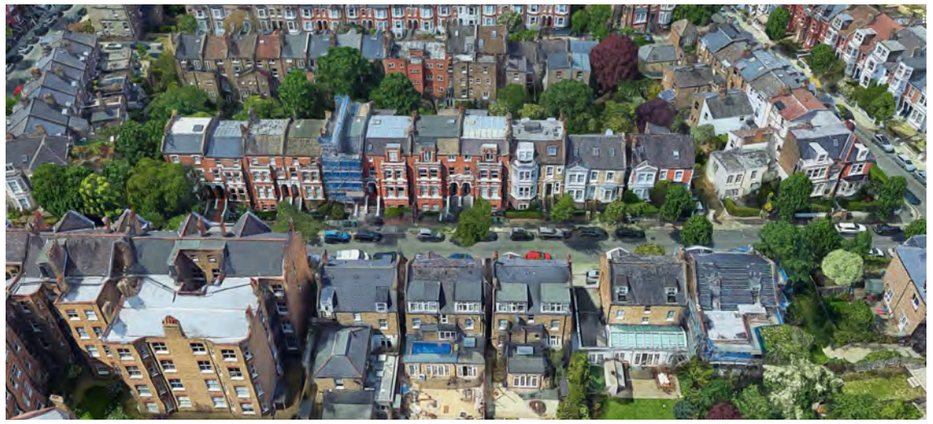


Image from Google showing the western side of Hilltop Road

Image from Google showing the eastern side of Hilltop Road

The existing context viewed from south east.

View from south east showing the proposed building in its context.

Proposed elevation of the dwelling shown together with No. 2 Hilltop Road (left) and No. 10 Sherriff Road (right).

The proposal responds to the context in the following ways:

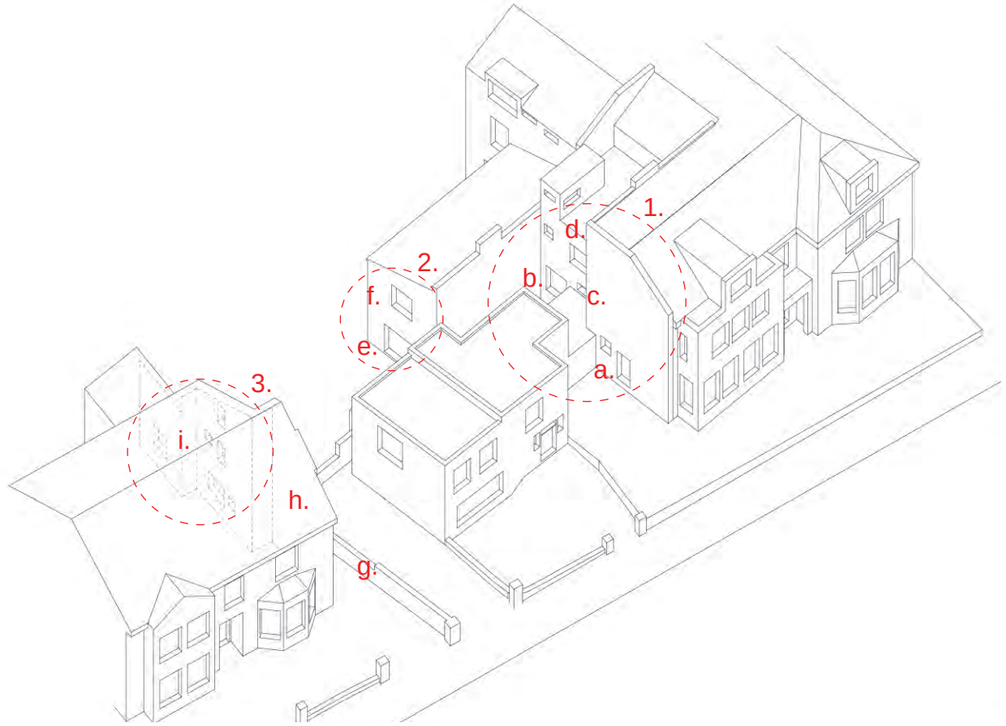
- The new proposal changes the orientation of the main facade of the existing cottage to be in line with No. 2 Hilltop Road, rather than Sherriff Road.
- The height of the building has been set out to match the surrounding buildings, with the terrace on the south side aligning with the eaves of No. 2 Hilltop Road and the parapet above the second floor aligning with the lowest point of the flank wall of No. 10 Sherriff Road.
- The facade has been organised with a full height rectangular bay window to one side as found in the surrounding buildings.
- Each floor is clearly separated with a line across the whole facade.
- The top floor appears smaller in elevation to match the arrangement on the road.
- The entrance is located centrally on the main facade as is the case with neighbouring buildings.
- The ground floor facade is rendered, whilst the facade to the upper floors is left unrendered, to match neighbouring buildings.

5.2 Massing

The site shares a boundary on the north side with No. 10 Sherriff Road. The boundary conditions vary from adjoining gardens at the front, the two buildings then directly abut each other and towards the rear No. 10 overlooks the rear courtyard belonging to The Cottage. In the front garden at ground-floor level No. 10 has an entrance door to Flat D, and a window to their bathroom (a.). Overlooking the rear courtyard at ground-floor level is a window to a bedroom in Flat B (b.). Above the kitchen roof of The Cottage is a high-level window to Flat B's kitchen (c.). At first-floor level there are two windows in use, one facing south and one facing west (not shown on drawing) and one blocked-off window (d.).

The Cottage shares a boundary with No. 12 Sherriff Road to the west. The northern part of this boundary is a two-storey blank brick wall and the southern end is a low garden wall in brick. No. 12 has recently submitted an application, which has been approved, for a rear extension, 3 metres in depth and height directly to the rear of the closet wing. This extension will likely replace some of the low garden wall. The current configuration of No. 12 Sherriff Road has a bi-fold door overlooking their garden at ground floor level (e.) and a window at first floor level in the rear elevation of the rear outrigger (f.). Both openings are understood to be to bedrooms.

To the south a low brick wall (g.) separates the parking area belonging to The Cottage from a side passage belonging to No. 2 Hilltop Road. No. 2 has a flank wall with no windows directly facing The Cottage (h.). Further west this building has a few windows serving rooms of unknown description (i.).

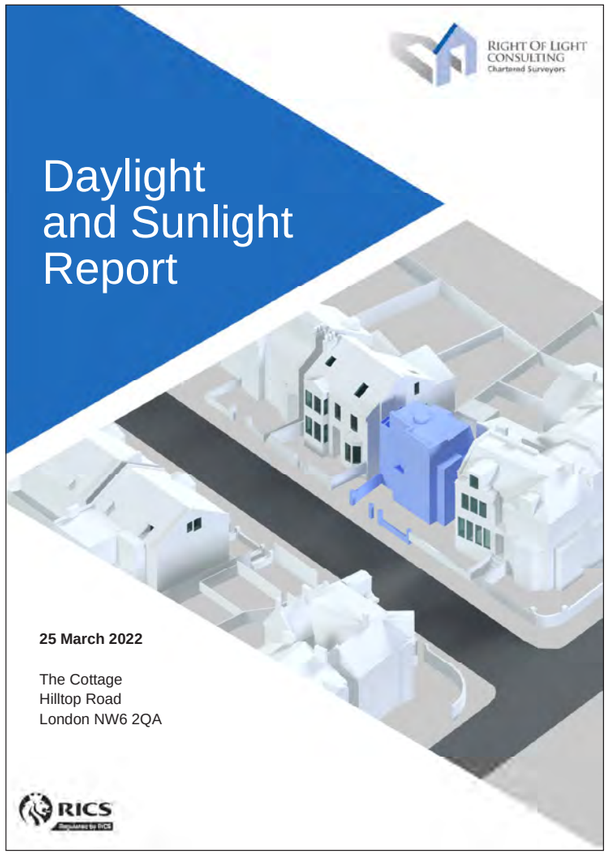


Axonometric drawing of the existing building. The drawings show the neighbouring windows in close proximity that the design has considered specifically. 1.) No. 10 Sherriff Road, 2.) No. 12 Sherriff Road, 3.) No. 2 Hilltop Road.

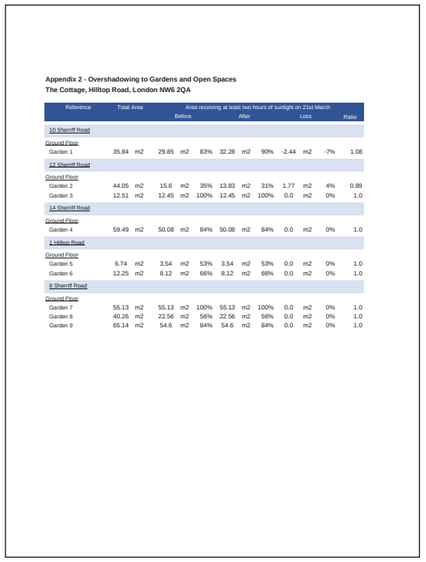
Axonometric drawing of the approved roof extension.

When working up the massing of the current proposal we started with defining these three clusters of adjoining windows and responded with stepping back in plan and section to avoid loss of light. The final proposal is the result of these first principles being analysed and checked by specialist daylight surveyors. Their calculations and advice was used to amend the proposal to achieve a final massing which respects the neighbour's amenity.

All the results from this study can be found in the appended Sunlight and Daylight report, which follows the council's prescribed BRE guide to good practice. The report found the development acceptable due to the high level of compliance.



Excerpts from the Daylight and sunlight report.

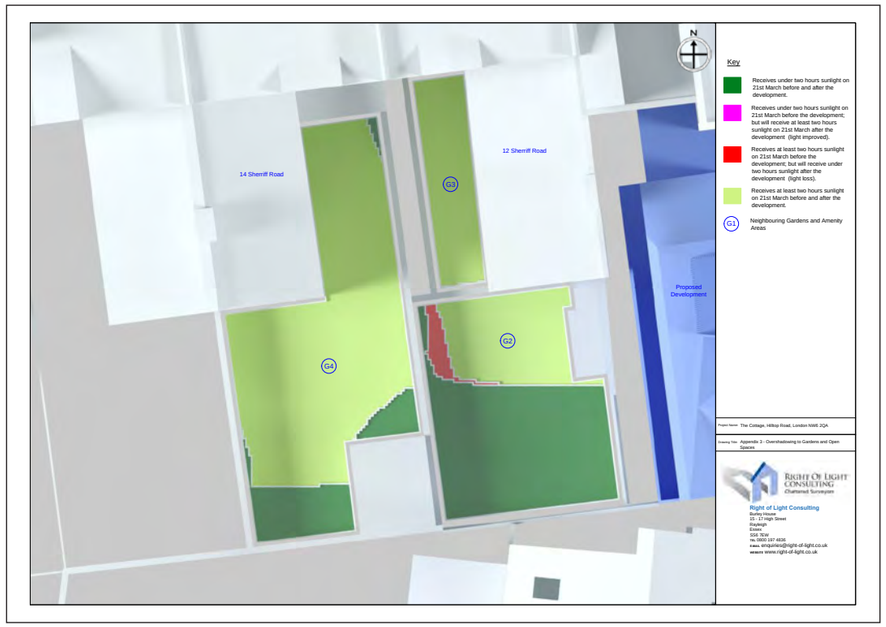


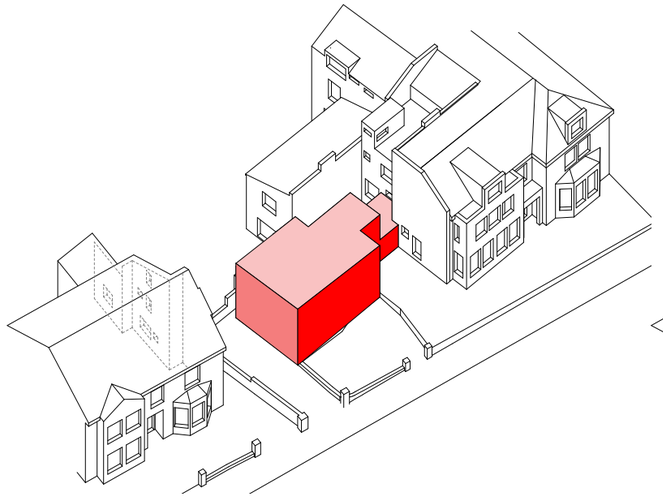
Appendix 2 - Overshadowing to Gardens and Open Spaces
The Cottage, Hilltop Road, London NW6 2QA

Reference	Total Area		Area receiving at least two hours of sunlight on 21st March								
			Before			After			Loss		Ratio
10 Sherriff Road											
Ground Floor											
Garden 1	35.84	m2	29.85	m2	83%	32.28	m2	90%	-2.44	m2	-7% 1.08
12 Sherriff Road											
Ground Floor											
Garden 2	44.05	m2	15.6	m2	35%	13.83	m2	31%	1.77	m2	4% 0.89
Garden 3	12.51	m2	12.45	m2	100%	12.45	m2	100%	0.0	m2	0% 1.0
14 Sherriff Road											
Ground Floor											
Garden 4	59.49	m2	50.08	m2	84%	50.08	m2	84%	0.0	m2	0% 1.0
1 Hilltop Road											
Ground Floor											
Garden 5	6.74	m2	3.54	m2	53%	3.54	m2	53%	0.0	m2	0% 1.0
Garden 6	12.25	m2	8.12	m2	66%	8.12	m2	66%	0.0	m2	0% 1.0
8 Sherriff Road											
Ground Floor											
Garden 7	55.13	m2	55.13	m2	100%	55.13	m2	100%	0.0	m2	0% 1.0
Garden 8	40.26	m2	22.56	m2	56%	22.56	m2	56%	0.0	m2	0% 1.0
Garden 9	65.14	m2	54.6	m2	84%	54.6	m2	84%	0.0	m2	0% 1.0

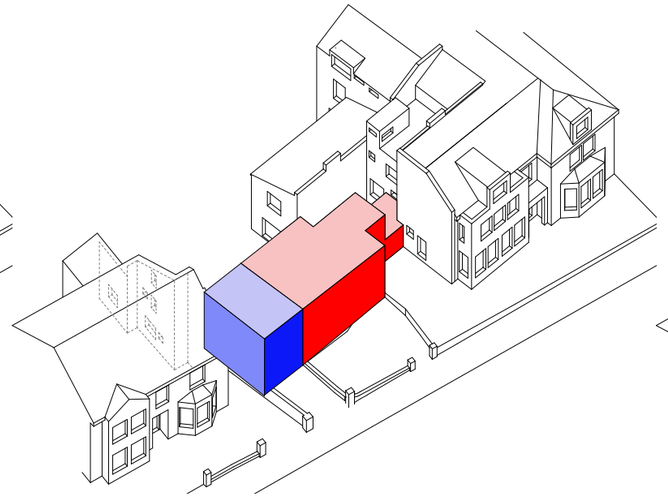
10 Sherriff Road

10 Sherriff Road

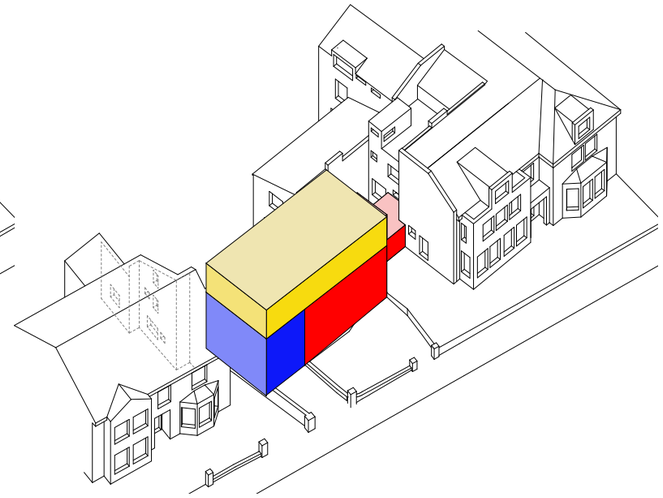




1. The massing of the existing cottage.



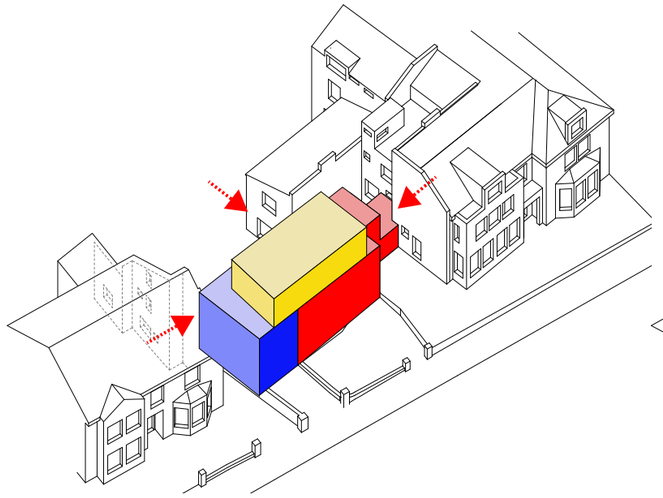
2. A two-storey volume is added to the southern part of the site.



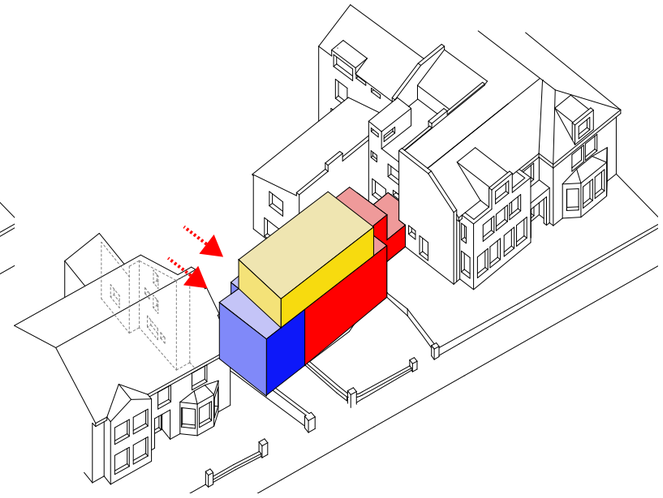
3. A volume is added on top.

The additional volumes added to the south side of the site and to the top floor respond to the neighbouring windows at No. 10, No. 12 and No. 2, by stepping back in volume towards north, west and south.

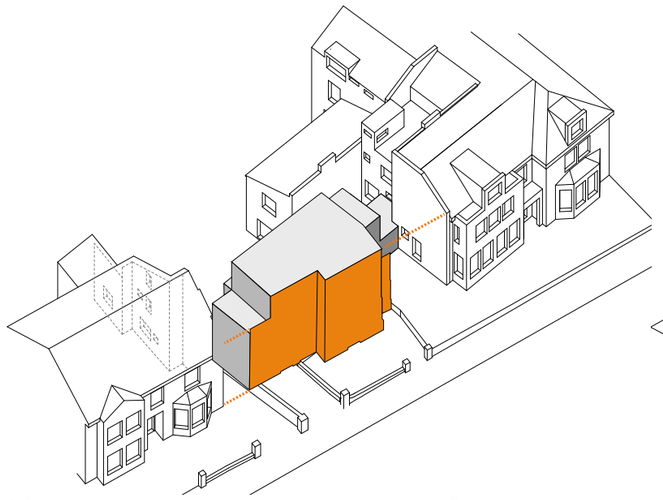
1. The massing of the new dwelling is based on the massing of the existing cottage (red).
2. An additional two-storey volume (blue) is added on the southern side of the site.
3. A one-storey volume (yellow) is added on top to bring it in line with surrounding building heights.
4. The top floor is set back from on the north, west and south side to prevent loss of daylight to neighbours.
5. The two-storey volume to the south is set back on the west side to prevent loss of daylight to No. 2 Hilltop Road.
6. The front has been adjusted (orange) to follow the main facade line and building heights of Hilltop Road.
7. The setback of the top volume (yellow) is designed as a mansard roof to give the building a less boxy and more traditional appearance, when seen from the rear.



4. The top volume (yellow) is set back from the neighbours' windows.



5. The side volume (blue) is set back from No. 2 Hilltop Road's windows.



6. The front elevation is adjusted to be in line with Hilltop Road and heights to neighbouring buildings.

7. The new proposal with a mansard roof to the rear.

The top of the building is given a different formal expression at the front and at the rear to better respond to its surroundings. This navigates the difference is scales between the taller front elevations and the lower rear of the neighbouring buildings

While the front is design with a parapet wall sticking up above the roof, at the rear the roof slopes down the side of the building as a mansard roof. The roof gives the building a traditional crown and naturally sets back in volume.

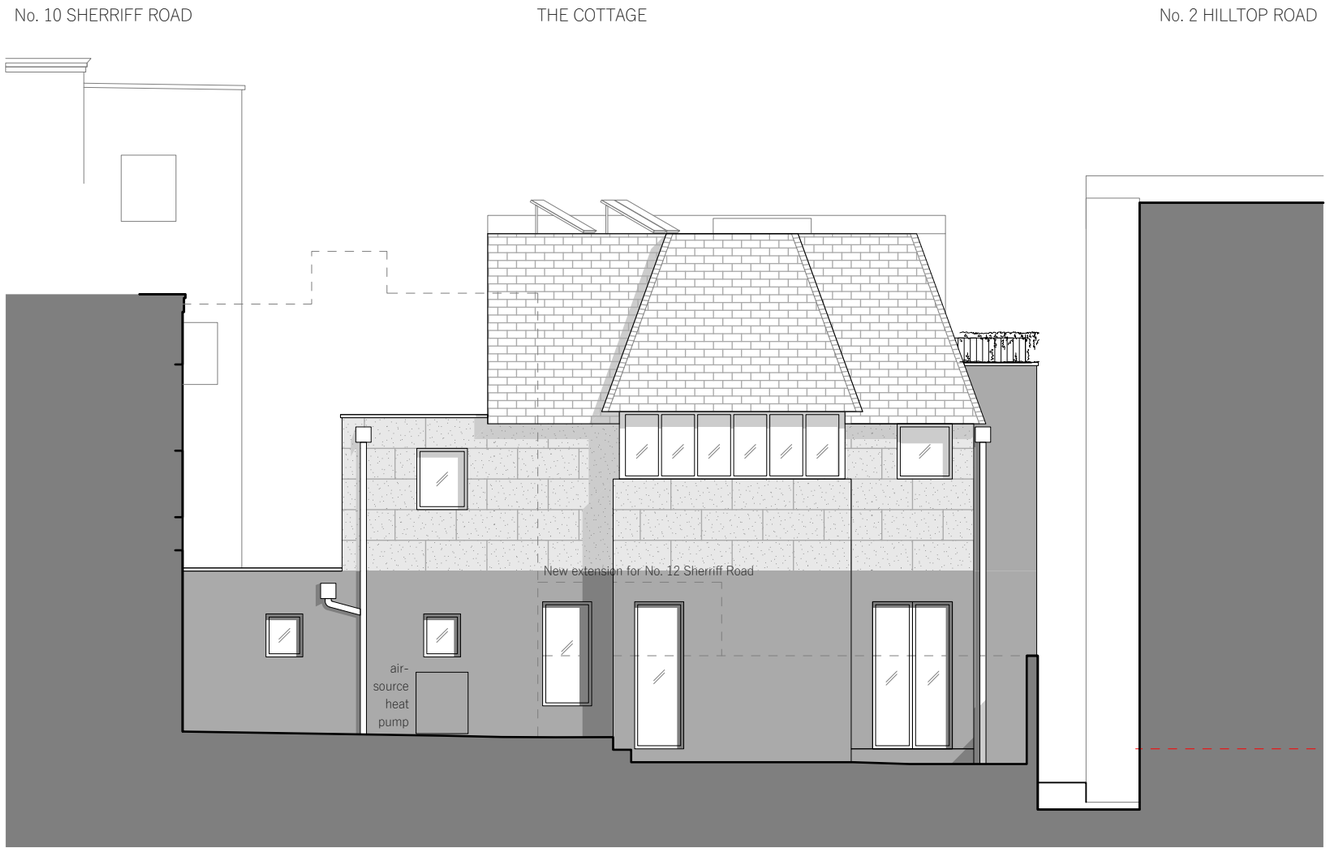
The proposal's rear massing in its context,. Note its relatively small size compared with its neighbours.

The proposal's rear massing compared with the approved plans for roof extenion. Note the similar height.

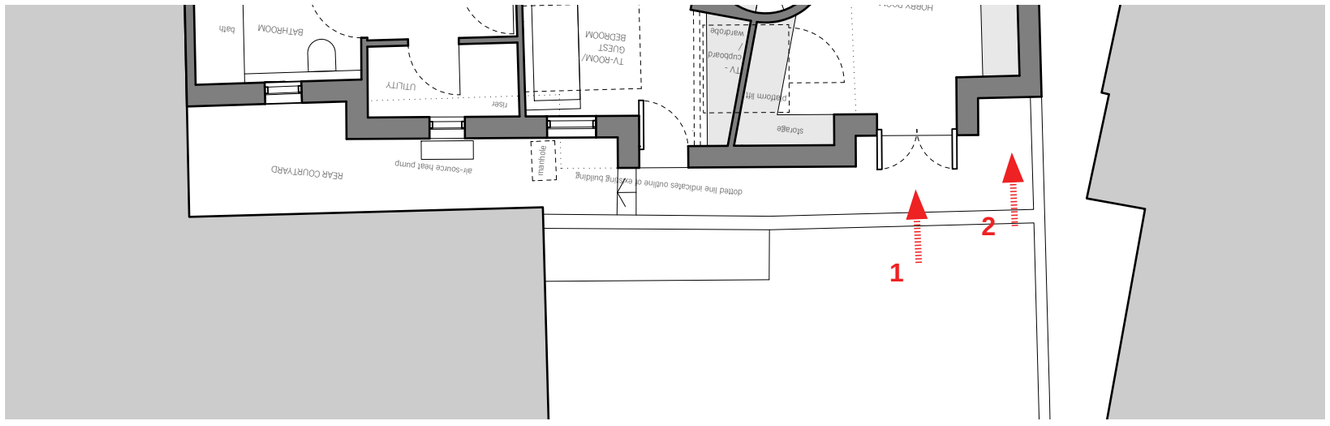
Materially the elevation is split into three horizonthal parts, rendered ground floor, cork clad first floor and timber shingled roof. This breaks up the volume.

The south western corner also steps back twice. The volume formed by the second set back, which is the volume of the roof terrace, is rendered from top to bottom, further breaking up the overall volume of the house.

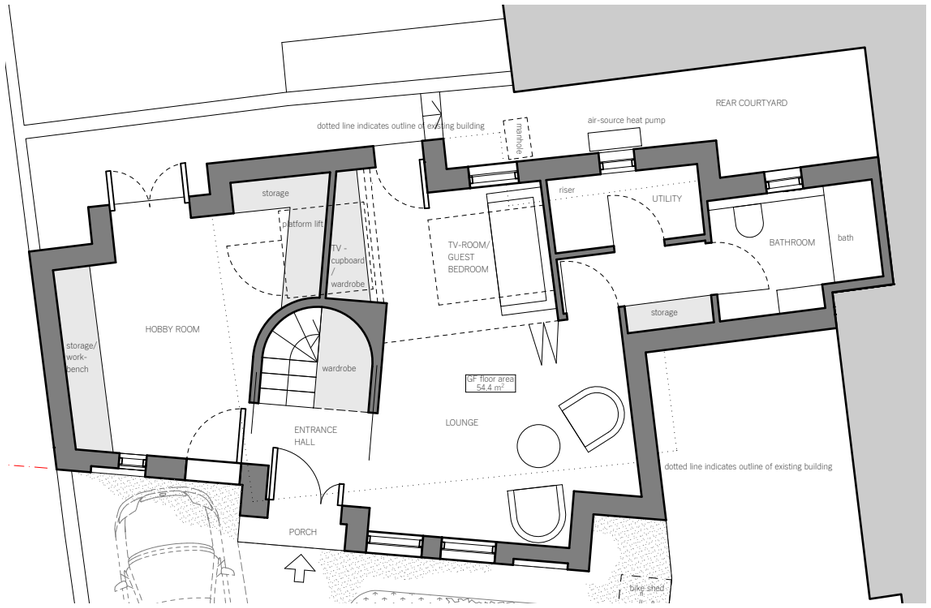
The stepping of the facade removes some of the building from view when seen from the first floor in No. 12 Sherriff Road.



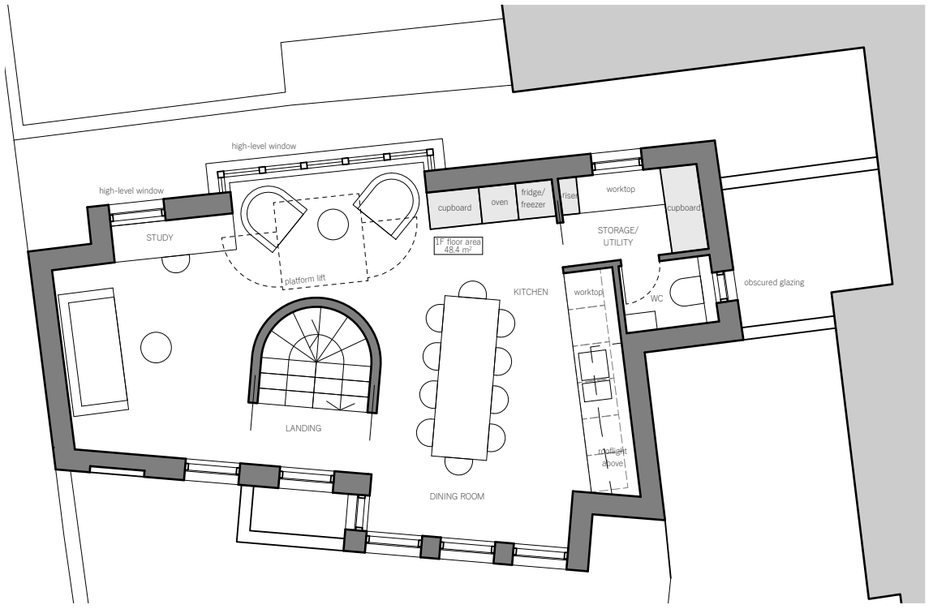
The proposal's rear elevation.



Cropped view of the proposed ground floor plan showing how the facade steps back towards No. 2 Hilltop Road.



Ground floor plan



First floor plan

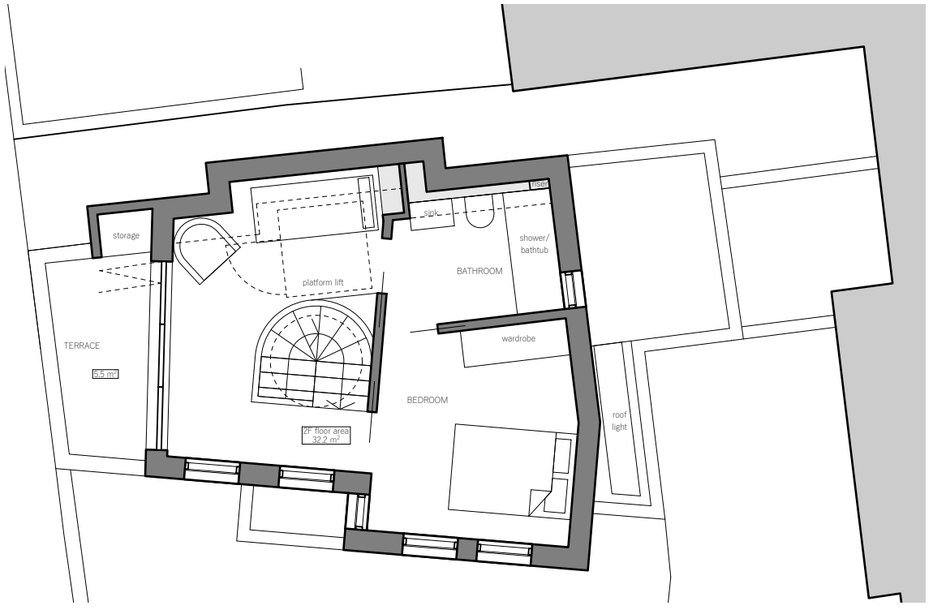
5.3 Layout and Future-proofing

The proposal is a single family dwelling arranged over three levels.

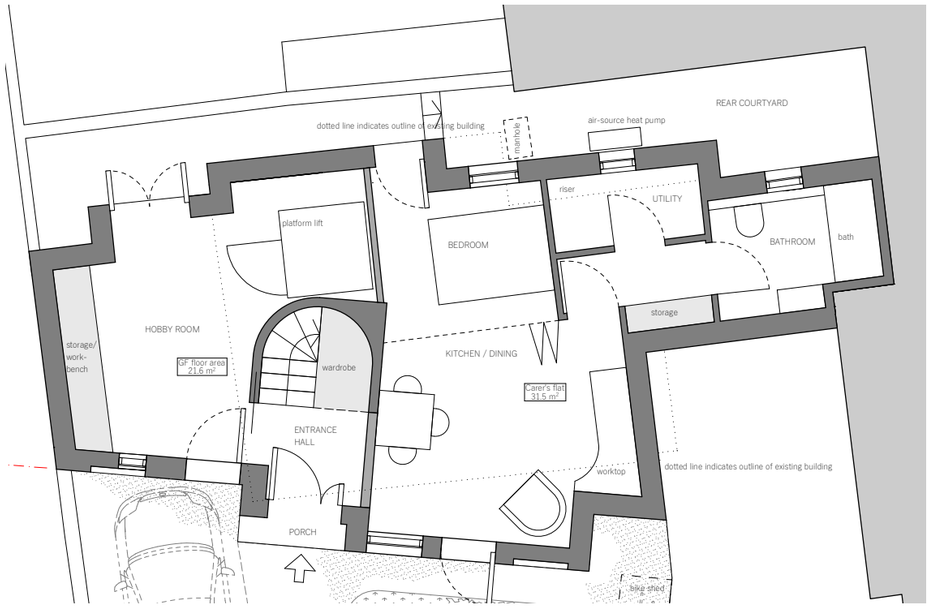
Ground floor:
- Entrance hall
- Lounge
- TV-room and guest bedroom
- Hobby room
- Bathroom
- Utility

First floor
- Open plan kitchen, dining area and study
- Storage / utility
- WC

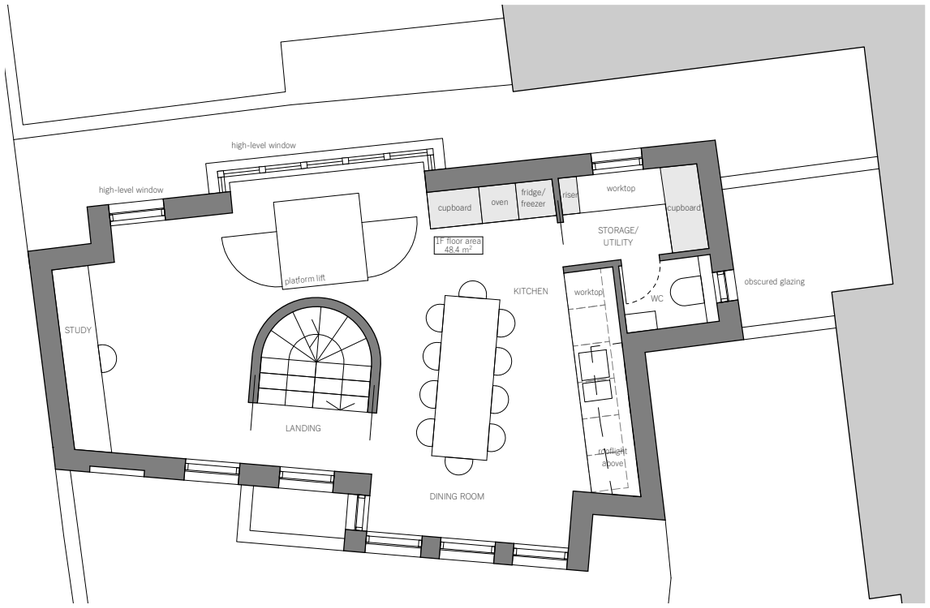
Second floor
- Master bedroom
- Bathroom
- Landing with access to terrace



Second floor plan



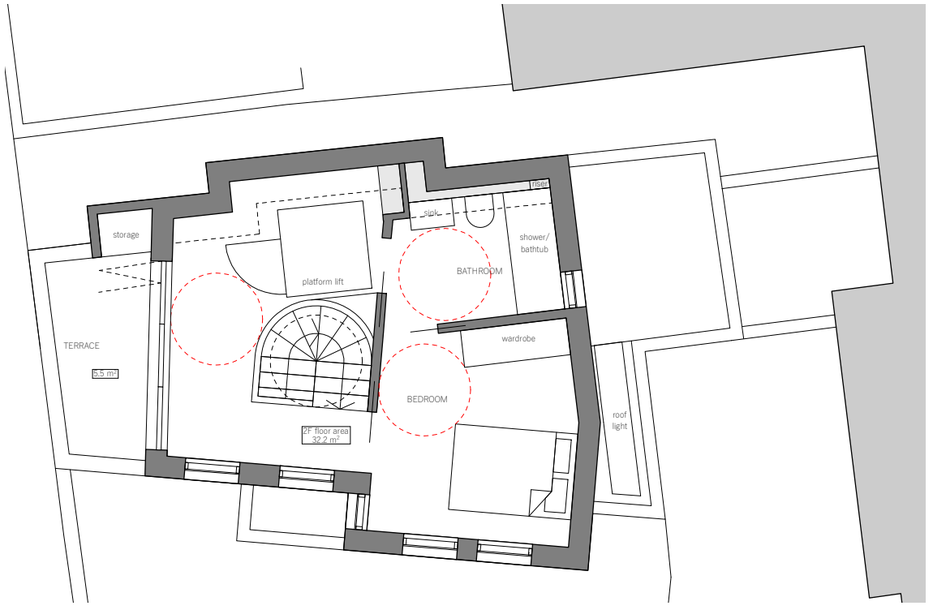
Ground floor plan with platform lift and live-in-carer's flat.



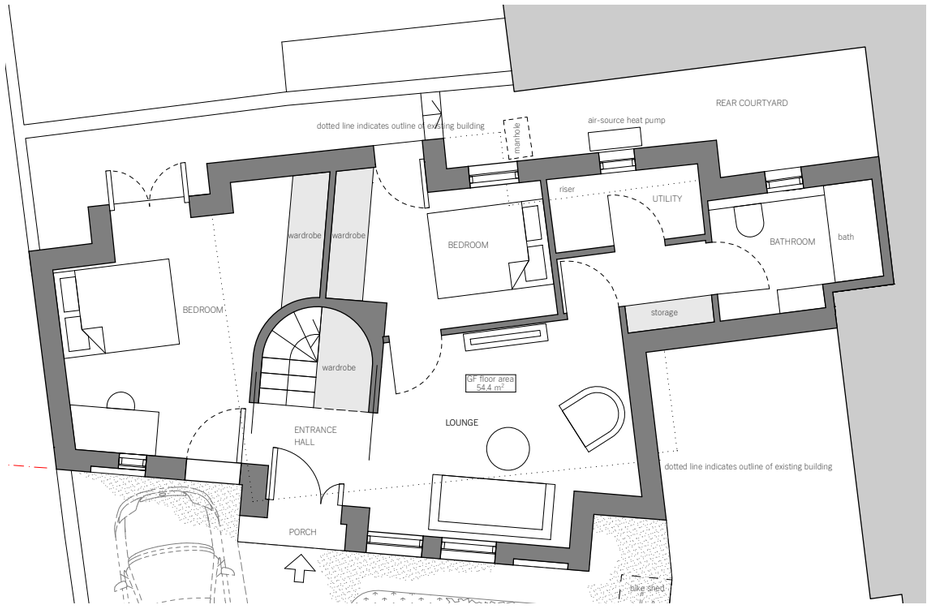
First floor plan with platform lift.

The layout of the house is specifically designed to meet current and future needs of the owner/applicant:

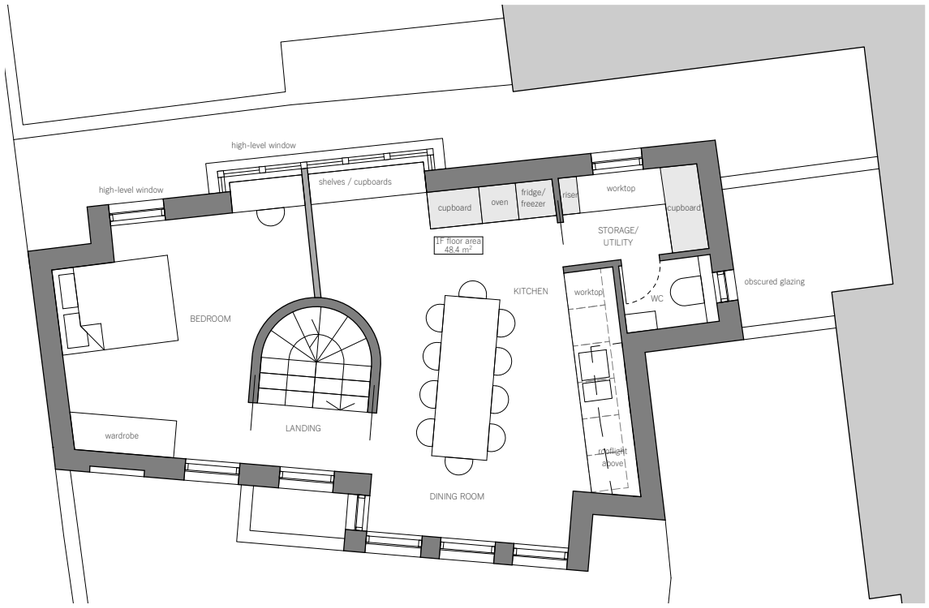
- Floors without level change
- Room for future installation of a platform lift.
- A part of the ground floor can easily be transformed into a live-in-carer's flat.
- A ground floor hobby room.
- An open plan main living space at first floor level, with kitchen, dining area and study.



Second floor plan with platform lift.



Ground floor plan showing alternative 4-bedroom house layout.



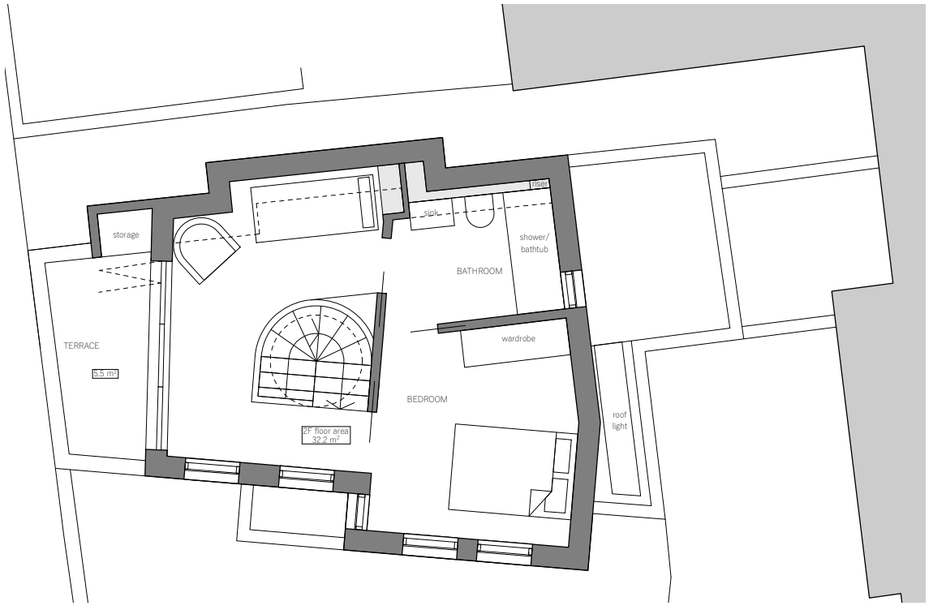
First floor plan showing alternative 4-bedroom house layout.

The layout has been future proofed for any future occupiers. With minor works to the house it can be transformed into a family house with 4 bedrooms.

Houses often see many occupants in their life spans and we think that the design should take this into consideration.

Potential transformation:

- Ground floor hobby room ► bedroom
- Ground floor guest bedroom ► bedroom
- First floor study ► bedroom



Second floor plan showing alternative 4-bedroom house layout.

5.4 Windows and Overlooking

The project is to be 100% naturally ventilated in line with AD Part F System 1; background (trickle) ventilation, with purge ventilation via opening windows and intermittent extracts to wet rooms.

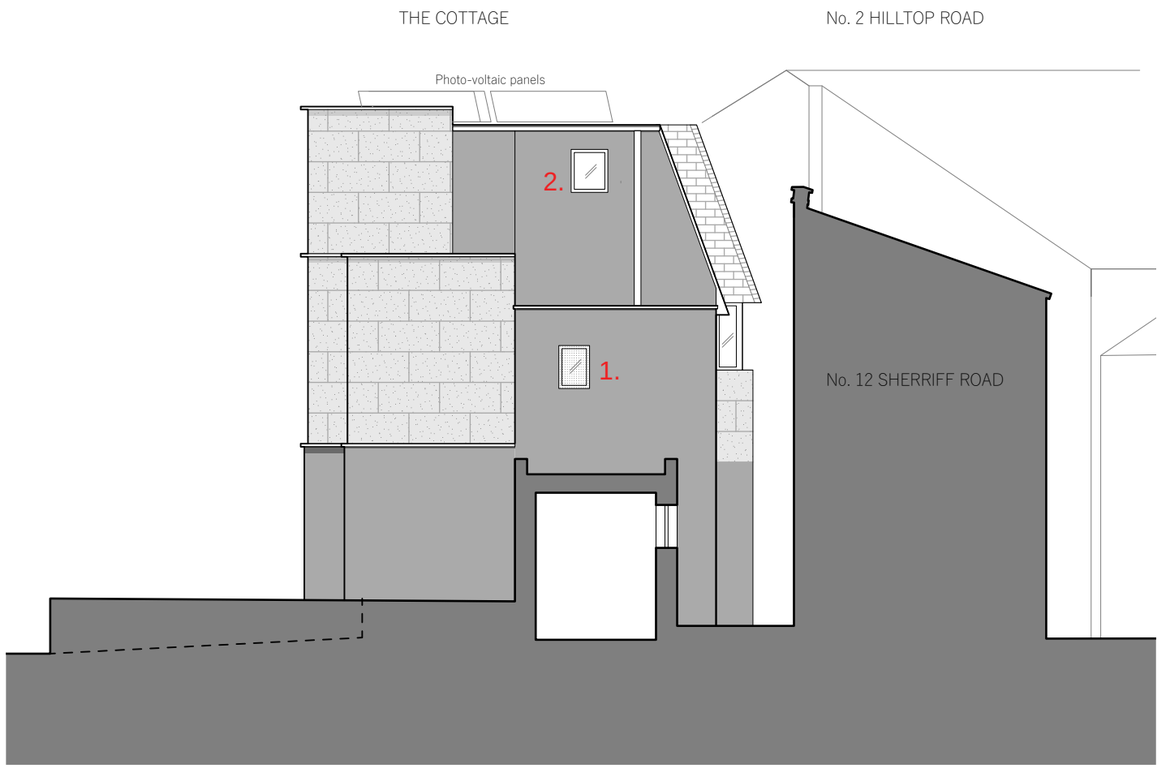
All windows will be fitted with trickle vents to provide background ventilation.

Purge ventilation will be provided by opening windows. The main windows will be casement windows (up to 2m tall) without any transoms.

The windows that face towards the neighbouring properties are described here. Their placement and design has been considered to avoid overlooking issues.

North elevation:

1. At first-floor level one window with obscured glazing to provide light and ventilation to the WC.
2. At second-floor level one single high-level window (sill 1.7m from floor level) in the bathroom to provide light and ventilation.

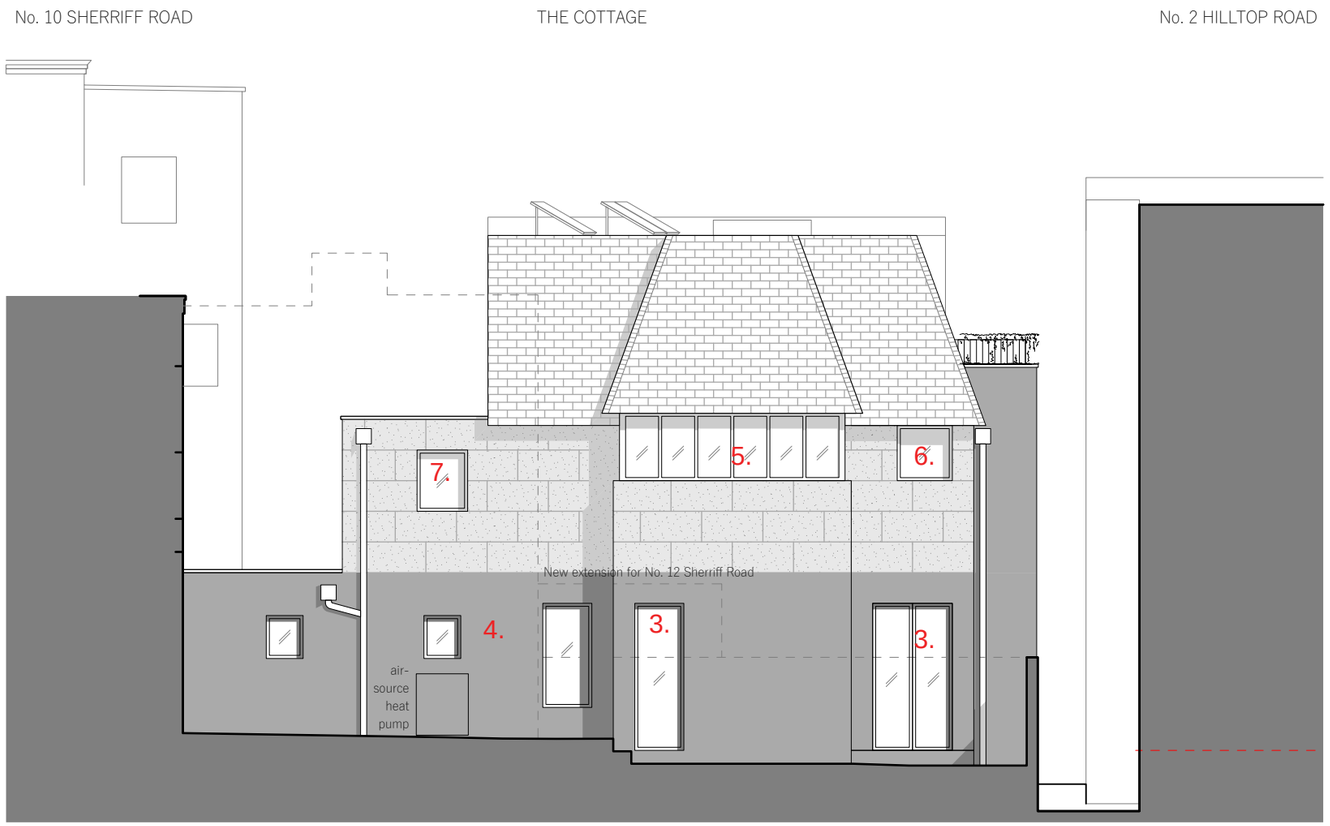


The proposal's north elevation.

Rear elevation:

3. At ground level, a glazed double door to the hobby room and a glazed door to the guest bedroom are proposed. This should not cause any overlooking as it is at ground floor level and opposite the neighbour's garden.
4. A further three windows will be at the ground floor level to serve the guest bedroom, the utility room and the bathroom. These will be opposite the blank brick wall of No. 12 and not cause overlooking.
5. At first-floor level one high-level bay window (sill 1.7m from floor level) to provide light and ventilation to the open plan living and dining areas.
6. A high-level window (sill 1.7m from floor level) is proposed above the study.
7. The window to the pantry is directly opposite the blank brick wall and will not cause overlooking.

The terrace is set back around the corner of the mansard roof, which prevents overlooking to bedroom in No. 12 Sherriff Road.

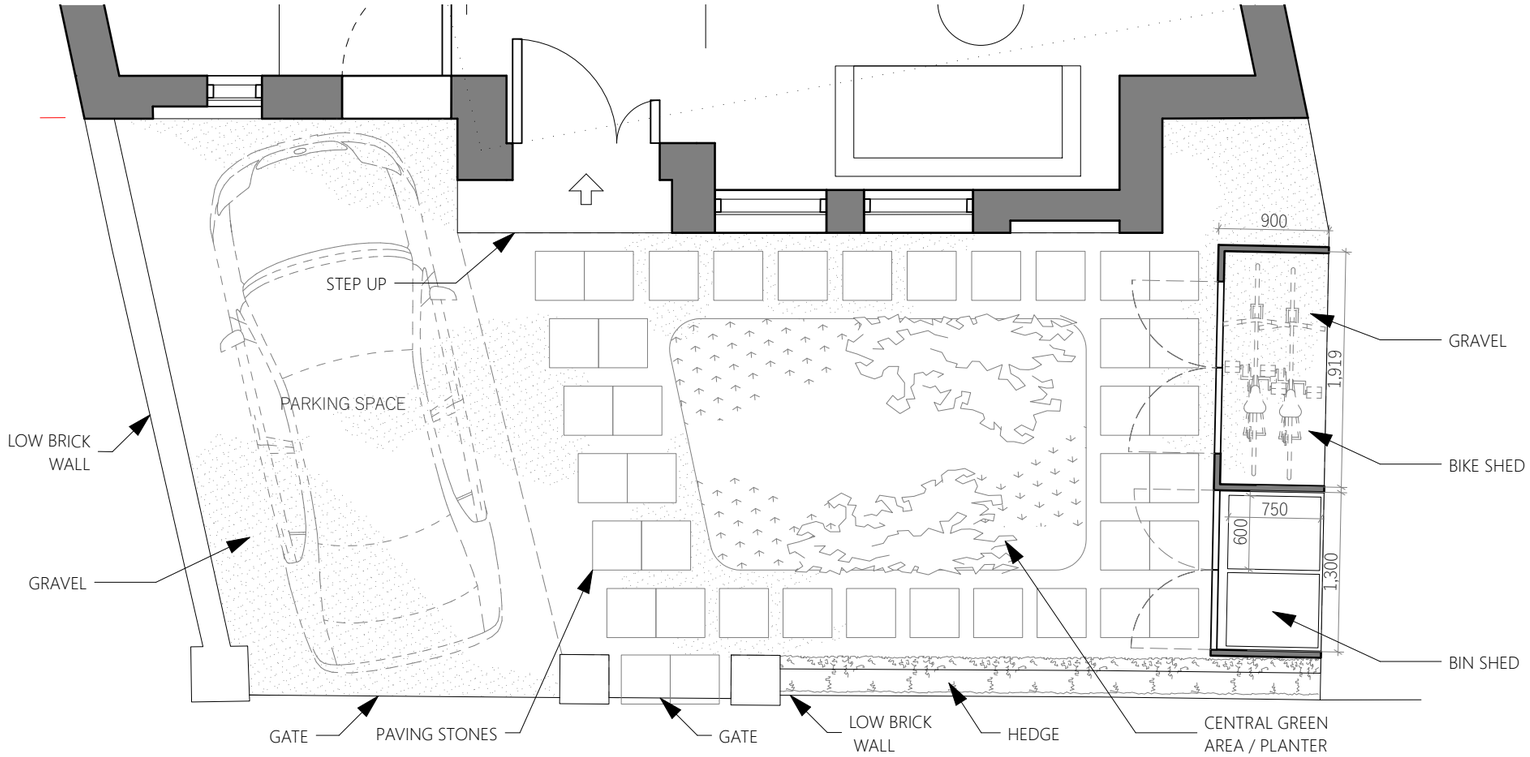


The proposal's rear elevation.

5.5 Green Spaces

The front garden will be similar in size and appearance to the existing front garden, with a few changes described here.

The parking space is brought forwards but kept on the southern side. The entrance gate is moved to be directly adjacent to the parking gate. In the northern part of the garden a timber shed is proposed up along the boundary fence to No. 10 Sherriff Road. It will house a bin shed with space for 2x240L wheelie bins and a bike shed suitable for two bicycles.

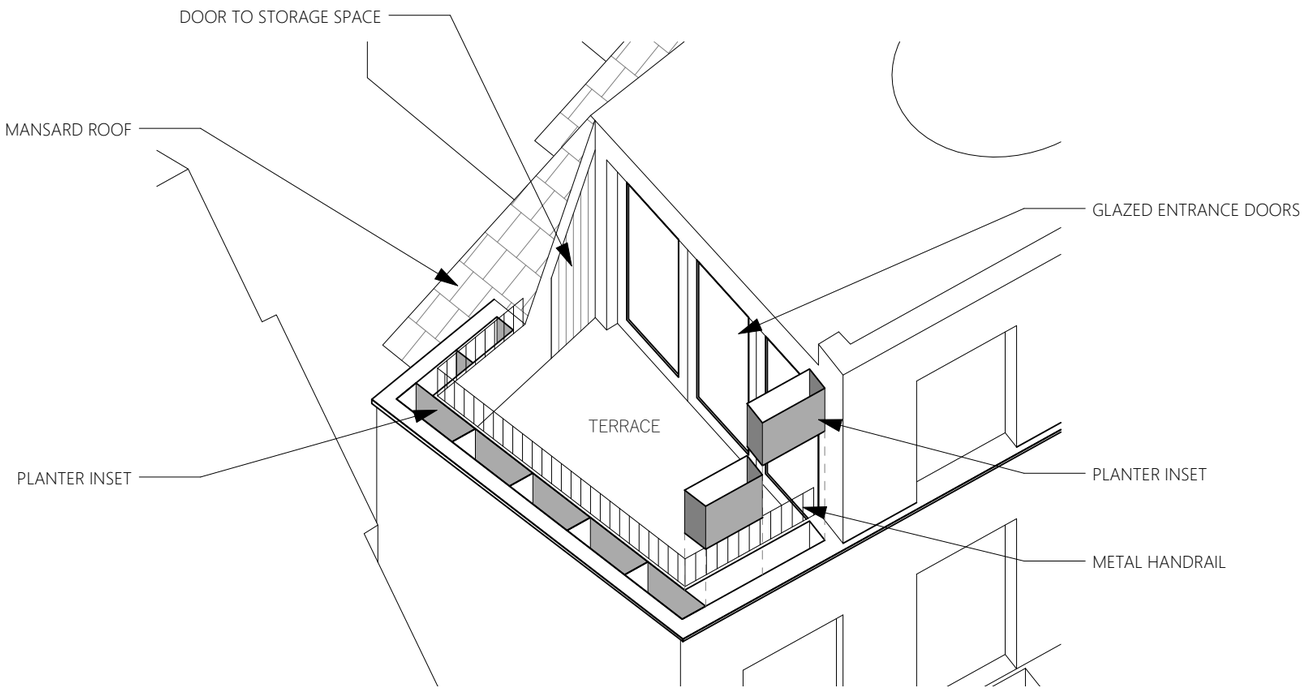


Plan drawing of front garden.

The proposal includes a south facing terrace on the top floor.

The wall around the terrace will include built-in planters. For ease of use these are proposed to be metal or plastic inset of roughly 200mm deep and 350mm high.

On the inside of the planters there will be thin metal balustrades up to the required height of 1100mm (in line with AD K) to prevent falling.



Axonometric of terrace showing the proposed planters

5.6 Structure

The proposal has considered carefully the structure and construction technique in order to:

- minimise noise and disruption during construction,
- ensure the construction materials have low carbon footprints and
- ensure that energy use during occupation is minimal (and sustainably sourced).

The proposal will largely be made from timber, which is a highly sustainable building material with potential to be carbon negative.

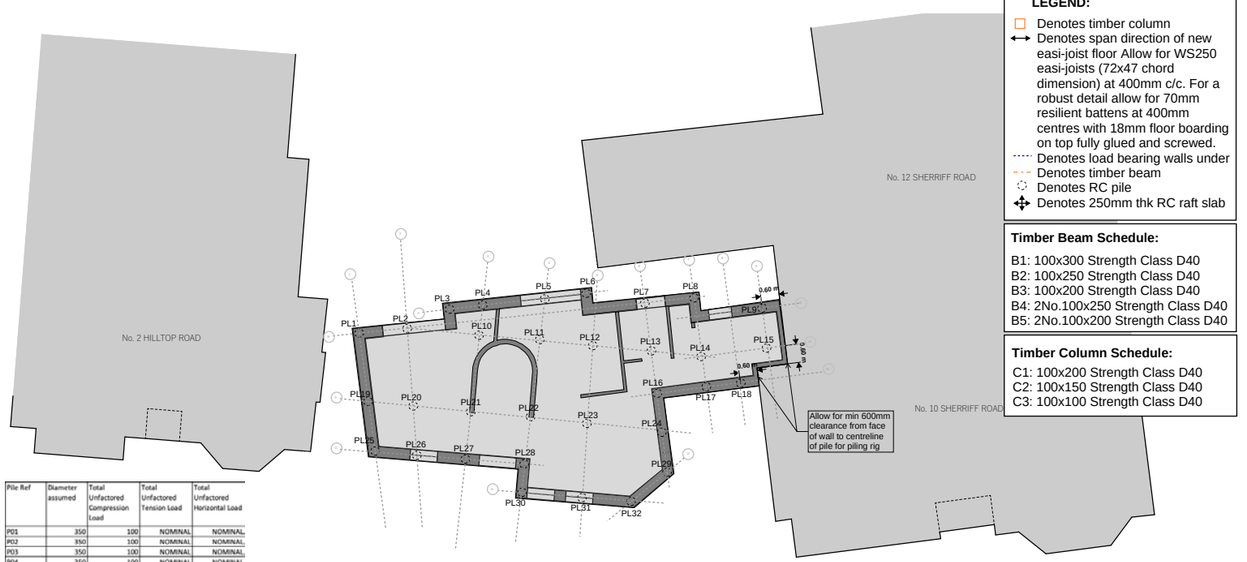
Timber cassettes can be constructed off site with very high precision. The finished elements are then craned into place. This minimises disruption and noise on the building site compared with building it all on site. Prefabricated elements will also achieve a better air tightness due to their high precision of joints.

A lightweight timber construction will allow reduced concrete foundations and alternative foundations that are less carbon intensive and less disruptive to construct.

Internal view showing the timber structure.

The current proposal's structure has been designed and tested by Constructure to be made 100% from timber (apart from foundations). This should reduce the carbon footprint when compared with a more energy-intensive steel structure.

The foundations are proposed to be made of mini screw piles. This further reduces the carbon footprint and disruption during construction. Screw piles minimise the need for digging and avoid the pouring of large concrete foundations. The only concrete needed is a base element that is used to tie the piles together.



LEGEND:

- Denotes timber column
- Denotes span direction of new easi-joist floor Allow for WS250 easi-joists (72x47 chord dimension) at 400mm c/c. For a robust detail allow for 70mm resilient battens at 400mm centres with 18mm floor boarding on top fully glued and screwed.
- Denotes load bearing walls under
- Denotes timber beam
- Denotes RC pile
- Denotes 250mm thk RC raft slab

Timber Beam Schedule:

B1: 100x300 Strength Class D40
B2: 100x250 Strength Class D40
B3: 100x200 Strength Class D40
B4: 2No.100x250 Strength Class D40
B5: 2No.100x200 Strength Class D40

Timber Column Schedule:

C1: 100x200 Strength Class D40
C2: 100x150 Strength Class D40
C3: 100x100 Strength Class D40

Pile Ref	Diameter assumed	Total Unfactored Compression Load	Total Unfactored Tension Load	Total Unfactored Horizontal Load
P01	350	100	NOMINAL	NOMINAL
P02	350	100	NOMINAL	NOMINAL
P03	350	100	NOMINAL	NOMINAL
P04	350	100	NOMINAL	NOMINAL
P05	350	100	NOMINAL	NOMINAL
P06	350	100	NOMINAL	NOMINAL
P07	350	100	NOMINAL	NOMINAL
P08	350	100	NOMINAL	NOMINAL
P09	350	100	NOMINAL	NOMINAL
P10	350	100	NOMINAL	NOMINAL
P11	350	100	NOMINAL	NOMINAL
P12	350	100	NOMINAL	NOMINAL
P13	350	100	NOMINAL	NOMINAL
P14	350	100	NOMINAL	NOMINAL
P15	350	100	NOMINAL	NOMINAL
P16	350	100	NOMINAL	NOMINAL
P17	350	100	NOMINAL	NOMINAL
P18	350	100	NOMINAL	NOMINAL
P19	350	100	NOMINAL	NOMINAL
P20	350	100	NOMINAL	NOMINAL
P21	350	100	NOMINAL	NOMINAL
P22	350	100	NOMINAL	NOMINAL
P23	350	100	NOMINAL	NOMINAL
P24	350	100	NOMINAL	NOMINAL
P25	350	100	NOMINAL	NOMINAL
P26	350	100	NOMINAL	NOMINAL
P27	350	100	NOMINAL	NOMINAL
P28	350	100	NOMINAL	NOMINAL
P29	350	100	NOMINAL	NOMINAL
P30	350	100	NOMINAL	NOMINAL
P31	350	100	NOMINAL	NOMINAL
P32	350	100	NOMINAL	NOMINAL

PROJECT

constructure

Site/Job	The Cottage, Hilltop Road		
Title	Proposed Foundation Plan		
Project/No	2150	Sheet	SK_01
Rev	D		
Date	June 2021	Eng.	AM
Dwn	AH		

Preliminary testing of screw piles as alternative to concrete foundations.

Screw piles can be installed with minimal disruption and digging close to existing buildings.

Internal view of the kitchen showing the timber structure.

5.7 Materials

The proposed facade cladding follows the principles of the main structure – lightweight, sustainable and low carbon footprint. A number of cladding options were considered with natural expanded cork panels coming out as the best alternative for the upper floors and rendered wood fibre insulation for the ground floor and flank walls.

Although cork is not commonly found as a cladding material in the UK, it is currently gaining in popularity, due to its green credentials and pleasing appearance. Cork is a tried and tested traditional and natural building material that is moisture- and mold-resistant, fire retardant, biodegradable, recyclable has low thermal conductivity, is waterproof and provides excellent acoustic performance.

We strongly believe that to achieve a forward looking and sustainable building, an alternative to brick, which is common in the area, should be used. Brick, even when used only as a cladding material, will increase the weight of the structure, negating some of the gains achieved when designing it as a lightweight structure.

The creation of brick is of course energy demanding and results in carbon emissions. Cork on the other hand is made by nature, harvesting the energy from the sun and carbon from the atmosphere as it grows.

Cork House - A house where the structural walls are made entirely of cork, by Matthew Barnett Howland with Dido Milne and Oliver Wilton

Cork Study - A garden shed in London clad in cork, by Surman Weston Architecture.

Close up of the cork walls of Cork House (above). Please note that the cork joints have been given a shadow gap to exaggerated separation between elements, which this proposal will not emulate.

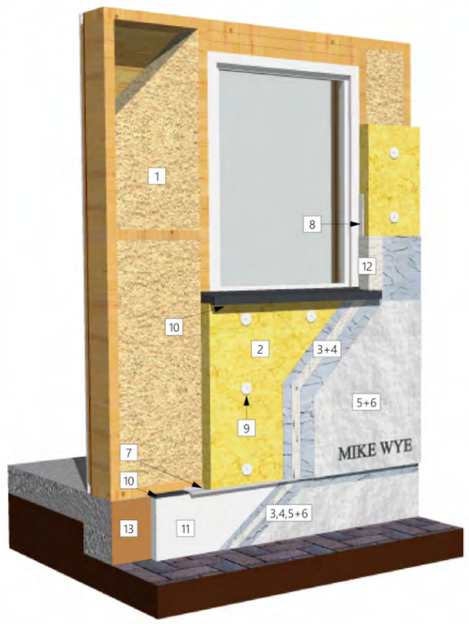
The natural tones and textures of the cork cladding are very similar to the appearance of weathered London stock. We believe this makes the material a very good choice as a sustainable alternative in a context with historical brick buildings. As the cork is exposed to sunlight it gains a brighter and desaturated appearance.

The ground floor at the front and rear of the building, in addition to some flank walls, are proposed rendered. It is common in the area to have certain elements of the facade exposed brick and others rendered.

These rendered areas are also proposed made from timber. In this instance wood fibre, specifically engineered to work as part of an external render system.

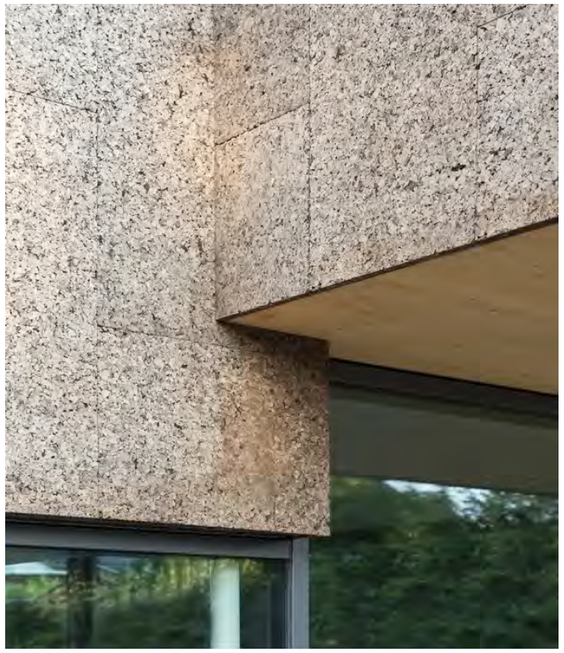
Links:

- https://www.architecture.com/awards-and-competitions-landing-page/awards/riba-regional-awards/riba-south-award-winners/2019/cork-house
- https://www.youtube.com/watch?v=5sANFZWMd9w&ab_channel=Architects%27Journal
- https://www.dezeen.com/2019/02/13/cork-cladding-house-hotel-architecture/



An example build up of rendered wood fibre boards.

Rendering of wood fibre boards on a building site.



Detail of Corkscrew House by Rundzwei Architects, Berlin. Note this cork has been brigthened by exposure to UV light.

Cork cladding fitted to the exterior of a wall. Note: this cork is the natural darker brown colour, which will brighten over time as its exposed to UV light.

The proposal's front elevation seen in its context. The ground floor is rendered with the upper floors clad in cork. The cork cladding is installed in a strecher bond pattern with vertical elements around the bay windows.

5.8 Sustainability and Reuse of Material

We have referenced the guidance from LETI when designing the proposal.

- The fabric u-values for walls and roof are proposed to follow Passive House levels.
- The floor will have improved u-values, although these will likely not quite achieve Passive House standard as there is an existing sewer under the house, limiting the depth of floor slab we can achieve.
- All windows (and doors that are glazed) will be fitted with double glazing with a maximum u-value of 1.4 and a g-value between 0.6 and 0.5.
- Prefabricated elements are proposed to achieve high air tightness throughout the building.
- All construction details will follow best practice principles to reduce the thermal bridging or y-value.
- Windows will be openable for natural ventilation throughout the building.
- The bathrooms and kitchen have all been placed above each other in the north part of the building. This is to minimise dead leg for hot water and excessive plumbing.
- An air source heat pump is proposed to be installed to make heating energy-efficient and reliant principally on the electricity the pump requires.
- Photovoltaic panels are proposed to be installed to supplement the electricity requirements.

The Energy Statement from the Design Collective shows that the proposal would achieve an overall improvement in regulated emissions over Part L of the Building Regulations of 71.65%.

The design team has considered green roofs for the proposal. The design requirements for a green roof is such that it cannot be laid all the way to the edge of the roof. This means that the smaller flat roofs would be too small to be effective and therefore not suitable for installing a green roof. A similar problem occurs on the main flat roof over the second floor, where the large rooflight and the solar panels decrease the available area of the roof such that it is no longer suitable for a green roof installation.

The development will be futureproofed for connecting to the Heat Network in the future.

The proposal is aiming to reuse as much material from the existing cottage as possible. The actual useability of the existing materials can only finally be considered when the building is being demolished. The assumptions from the structural engineer's report on what materials can be reused are as follows (from page 11 of Constructure's report):

- *Possible re-use of some upper levels timbers in new building (where found to be suitably intact and in good condition), with existing floor boards stripped down in-situ and re-used*
- *Existing masonry crushed and used as sub-base material beneath the new property, with material spread across site to provide pile mat*

6 List of Supporting Documents

Architectural drawings:

- PA099 Location Plan
- PA100 Existing Ground Floor Plan
- PA101 Existing First Floor Plan
- PA130 Existing Street Elevation
- PA131 Existing Rear Elevation
- PA132 Existing North Elevation
- PA133 Existing South Elevation
- PA199 Site Plan
- PA200 Proposed Ground Floor Plan
- PA201 Proposed First Floor Plan
- PA202 Proposed Second Floor Plan
- PA210 Proposed Roof Plan
- PA300 Proposed Street Elevation
- PA301 Proposed Rear Elevation
- PA302 Proposed North Elevation
- PA303 Proposed South Elevation
- PA401 Proposed Section B

Reports:

- *Structural Survey Report For Planning* - Constructure Structural Engineers
- *Energy & Sustainability Statement* - The Design Collective
  - Appendix A
  - Appendix B
  - Appendix C
  - Appendix D
- *Daylight and Sunlight Report* - Right of Light Consulting