Design and Access Statement
15th December 2023

Contents

1. Introduction & site analysis

Introduction

Purpose of document

This Design and Access statement outlines the proposal for a new family bungalow situated at the rear of 1236 & 1238 Greenford Road, Greenford, Middlesex, UB6 0HH. The document is structured into the following sections:

1. Introduction & site analysis
2. Planning history
3. Design proposal

Brief

The brief is to construct a proposed family sized bungalow at the rear of 1236 & 1238 Greenford Road.

Site and Surroundings

The proposed site is currently an unused and overgrown space with a derelict shed to the eastern corner, fenced off from the rear back gardens of 1236 & 1238 Greenford Road. To the east of the proposed site, the rear of the gardens of Greenford Road runs an accessway accessed via Berkeley Avenue.

1236 & 1238 Greenford Road is located on the junction of Greenford Road and Berkeley Avenue, which is a lightly trafficked residential street. The area is predominately residential with a mix of semi-detached and terraced 2/3 storey homes. The area is located in Greenford, in the northwest corner of Horsenden Hill, a large park, and the area is estimated to have been constructed in the 1930s.

In 2022, a new single-storey axillary residential structure was constructed opposite the site at the rear of 1232 & 1234 Greenford Road with a tall sloped roof with a height of 4.5m. This structure forms part of the planning application 191870FUL.

Transportation

The site's Public Transport Accessibility Level (PTAL) is classified as 1b. The site is within walking distance of Greenford railway station and underground, Sudbury Hill underground and Sudbury Hill Harrow railway station. There is also bus route 92 within close proximity. The proposal is a car-free development in line with GLA policies to promote more sustainable modes of travel. The proposed bungalow will not affect any existing on-street car parking spaces as no drop curb will be introduced. Parking in the area is not a controlled parking zone.

Proposal Overview

The proposal involves the construction of a three-bedroom single-storey family bungalow, with a L shaped layout around a primary amenity space, topped with a hipped green roof.

Planning History

A recent planning application ref: 235050FUL – Feb 2024 was submitted and refused for a single family bungalow. This revised planning application has taken on board the planning officer's comments and presents a revised proposal.

The key revision to the proposal is the site layout. The bungalow is now a L shaped place with a single large single amenity to the rear, aways form the main street. The proposed bungalow is also set back form the back of pavement.

Please see Section 2 of this DAS – Planning History of this DAS for a full response to the Planning Officer's comments for planning application ref: 235050FUL – Feb 2024

Principle

The proposed site is currently a derelict site but was historically designated for residential use. Its size, position, and accessibility from Berkeley Avenue make it an ideal location for a family bungalow.

Within the Planning Officer's report for application 235050FUL he states:

"The proposed density of one single storey dwelling would be acceptable within the local context and considering the size of the available land."

This would establish the principle of the house at the site.

Design Approach

Our design approach involves creating an attractive, bespoke single-storey family home that will enhance this derelict site and create overlooking and a attractive corner onto Berkley Avenue / side alleyway. The proposed bungalow is laid out in a L shape with a central amenity space, topped with a hipped green roof. The main frontage to the proposed bungalow is to Berkeley Avenue in line with the building line established by 1236 Greenford Road

The proposed pitched green roofs serve multiple purposes, including providing a visual amenity for neighbouring homes to look down at, aiding with SUDs at the site, enhancing biodiversity, assisting with thermal insulation, and enabling 55% of the site to be soft landscaping.

The local architectural vernacular clearly established hipped roof forms. This can be seen at the 1236 Greenford Road, adjacent to the proposed site.

Height

The proposed family bungalow is a single-storey building with a green hipped pitched roof, meaning it will have minimal impact on neighboring amenities.

Daylight and sunlight

Given the proposed single-storey height with an inward-sloping pitched roof, it is considered to have negligible impact on neighbouring amenities.

1240 Greenford Road already has a large outbuilding to its rear, which obscures the proposed bungalow. The proposed northwest courtyard has been placed adjacent to the garden of 1240 Greenford Road to reduce the impact.

The southeast proposed courtyard is placed adjacent to the frontage of 1 Berkeley Avenue to reduce the impact on that home.

Sustainability

Energy calculations have been carried out for the proposed bungalow, demonstrating the proposed bungalow has a 90% carbon saving above the requirements of Part L 2021 for carbon emission during occupation. This is achieved predominately through the use of air-source heat pumps and solar panels.

The green roof provides biodiversity, thermal insulation, rainwater retention and an attractive outlook from the street and when looking down onto the first floor of the surrounding homes.

Please see a full list of sustainability principles under the section Sustainability Statement. The detailed energy calculations have been submitted with this application.

Overall, this is a highly sustainable proposed home on a highly sustainable site.

Access and Accessibility

Access is provided via Berkeley Avenue. The proposed bungalow has been designed to meet Building Regulation M4(2) adaptable standards. Level access is provided from the pavement into the building.

Introduction

Overlooking

As the proposed family home is a single-storey building, there are no issues of overlooking. Perimeter-high fences at 1.8m height provide privacy to the front and rear courtyard. So that these perimeter fences are not overly oppressive, they have been designed with low walls with metal rails above. This configuration allows for the brick wall to provide privacy when sitting and when standing the rails provide some openness.

Cycles

The proposed bungalow has two secure and covered cycle spaces to the front of the proposed bungalow courtyard.

Refuse

Wheelie bins will be located adjacent to the main street. The following will be provided: 1x 240 litre general waste, 1x 240 litre recycling waste, and 1x standard caddy for food waste.

Proposed amenity spaces

A single private amenity space of 44sqm is proposed, which is not visible from Berkeley Avenue and is adjacent to the amenity spaces at 1236, 1238 and 1240 Greenford Road. Ealing's planning policy 7D outlines the requirements for private amenity space. For a three-bedroom, four-person home, a minimum of 7 sqm of private amenity space is required in line with the London Plan. The policy also refers to a guide of 50sqm for houses, which given the London context seems unrealistic for a new house. However ,we have managed to provide 40sqm of amenity space to the rear and 4sqm more to the front of the proposed bungalow, giving a total of 44sqm of private amenity space.

Existing Amenity of 1236 & 1238 Greenford Road

The existing rear gardens of 1236 & 1238 Greenford Road will be expanded by 0.5 metres to increase their ground floor amenity spaces from 22.2sqm to 24.8sqm for 1238 Greenford Road and 34.1sqm to 37.6sqm for 1236 Greenford Road.

Conclusion

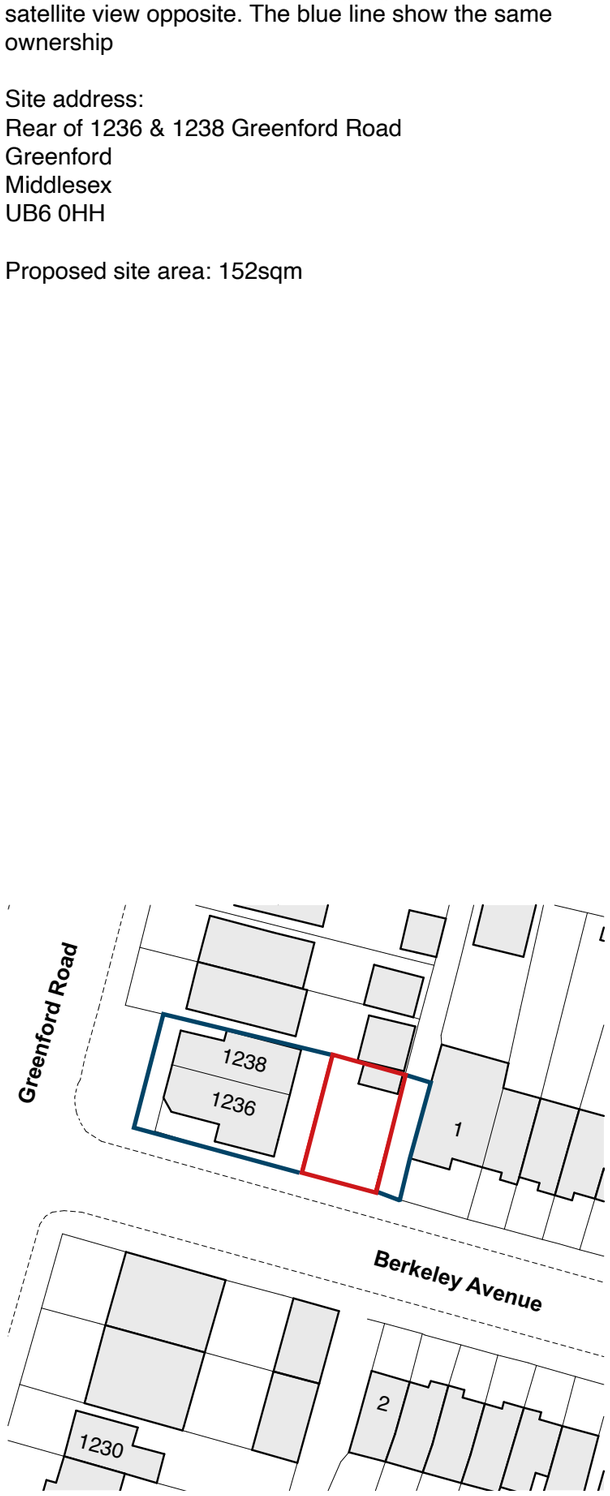
- The proposed bungalow meets and exceeds the requirements of the National Planning Standards, the London Plan Housing Design Standards, and the Ealing Planning policies.
- The proposed bungalow is a bespoke contemporary design, similar to the award-shortlisted and highly published Haringey Brick Bungalow, a house built by Satish Jassal Architects on a more constrained site.
- Satish Jassal Architects is a RIBA award-winning architect who specialises in designing and delivering homes on small backland sites such as this one.
- The single-storey height and attractive green roof mean there is no significant impact on neighbouring amenities.
- The proposed bungalow is highly sustainable and will achieve 90% carbon savings above the requirements of Part L 2021 for energy use during occupation.
- The proposed bungalow provides a positive street frontage to the unsightly overgrown existing unused space.
- The proposed bungalow helps to overlook the accessway east of the site to provide overlooking and security.
- The proposed bungalow increases the existing amenity spaces of 1236 & 1238 Greenford Road by 0.5 metres. From 22.2sqm to 24.8sqm for 1238 Greenford Road and 34.1sqm to 37.6sqm for 1236 Greenford Road.
- A much-needed self-build family home is introduced to the borough on an underutilised and sustainable site.
- The principle of a new home at the site was established within the previous application ref: 235050FUL.

Site and surroundings

The proposed planning site is highlighted in red on the satellite view opposite. The blue line show the same ownership

Site address:
Rear of 1236 & 1238 Greenford Road
Greenford
Middlesex
UB6 0HH

Proposed site area: 152sqm



Location plan

Satellite view of the site

Planning boundary

Same ownership

N

Existing aerial views

Aerial view of the site looking North West

Planning boundary

Same ownership

Existing aerial views

Aerial view of the site looking South East

Planning boundary

Same ownership

Existing pictures

These photographs are taken of the proposed site rear of 1236 & 1238 Greenford Road.

1. View looking over the proposed site from the first floor at 1238 Greenford Road

2. View looking inside the proposed site

3. View looking inside the proposed site

4. View looking North West towards the proposed site

Existing pictures

These photographs are taken around the proposed site rear of 1236 & 1238 Greenford Road.

1. View looking towards the front of 1236 & 1238 Greenford Road

2. View looking towards 1236 & 1238 Greenford Road from the junction of Greenford Road and Berkeleey Avenue

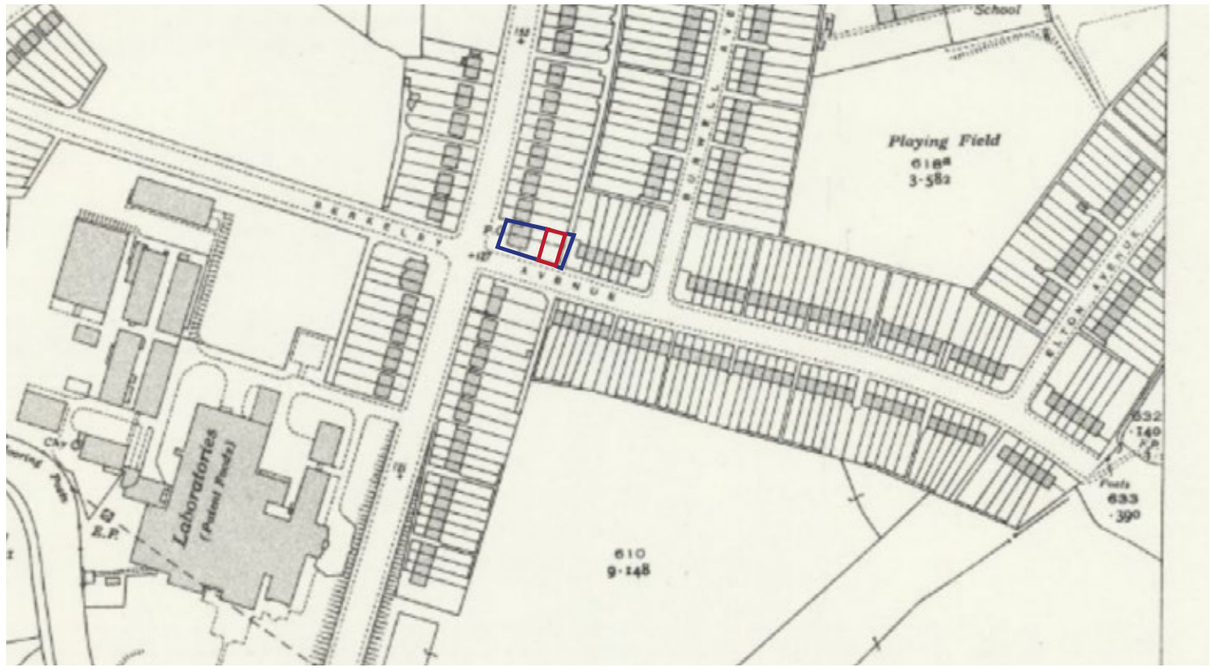
3. View looking towards 1 Berkeley Avenue

4. View looking to the rear of 1234 Greenford Road opposite the site

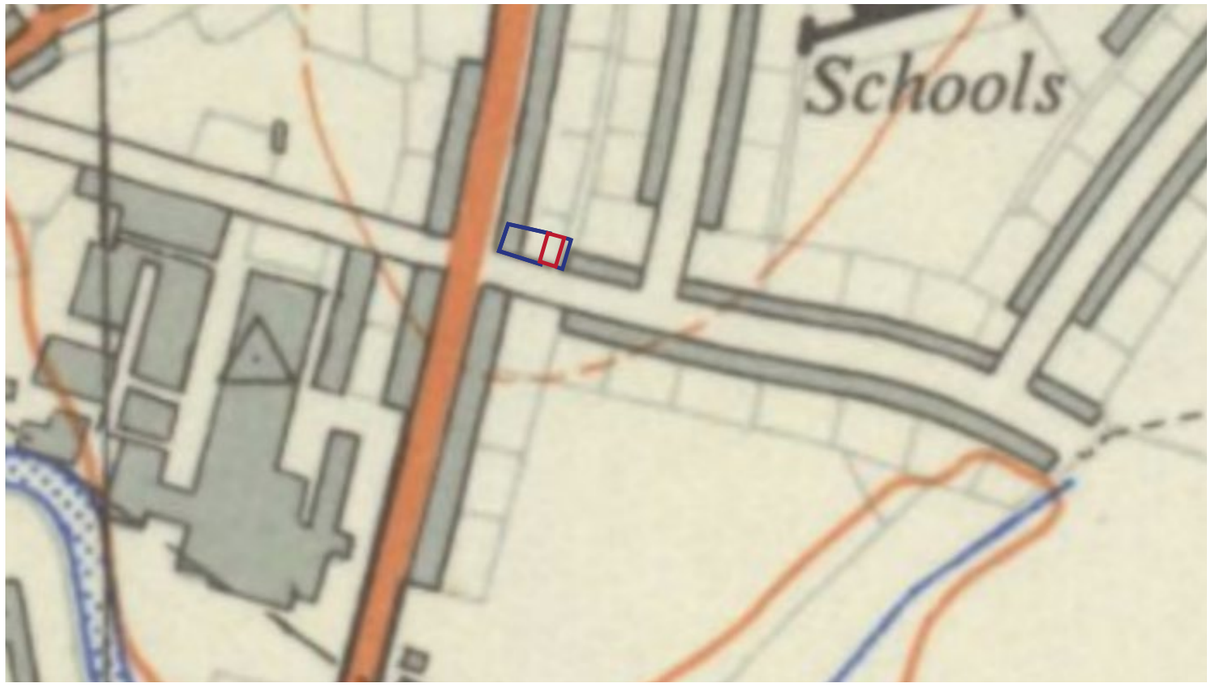
Historic maps

These historic maps demonstrate the evolution of the site over time.

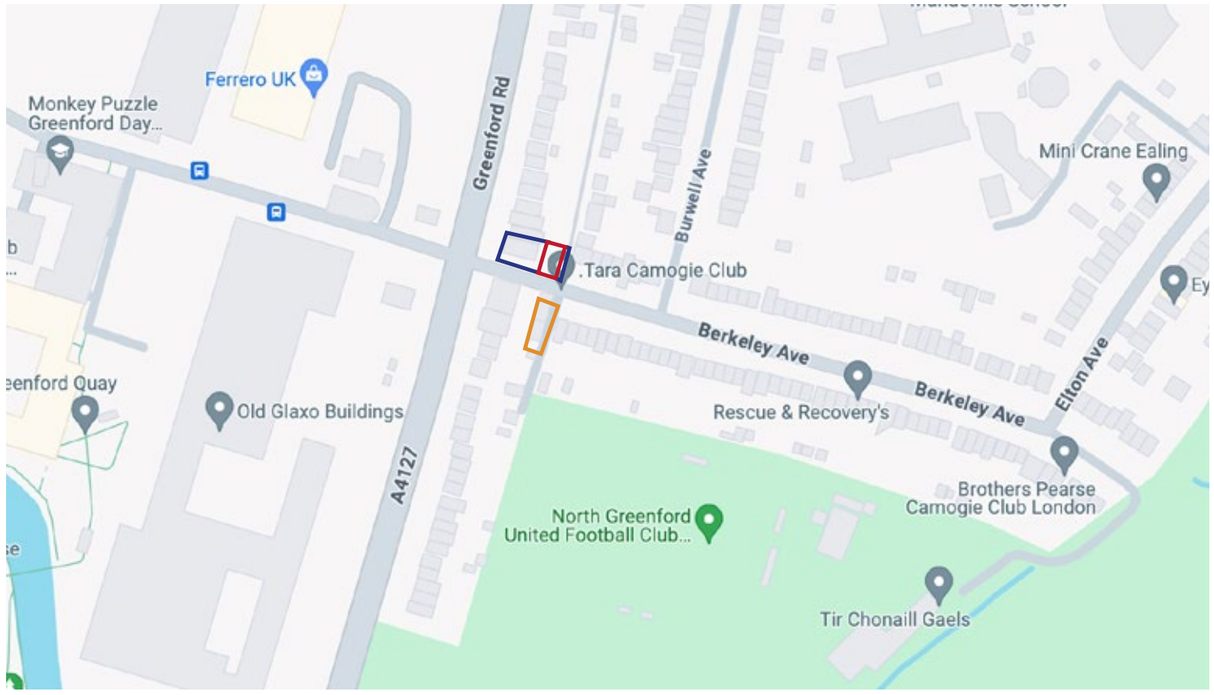
1896 - The proposed site was positioned and surrounded by agricultural land.



1938 - The terrace housing has been developed around the proposed site.



1956 - The extended site has remained the same.



2022 - Rear single storey structures have been built rear of 1234 &1232 Greenford Road, opposite the site (highlighted in orange).

Planning boundary Same ownership

2. Planning history

Updates to proposal based on application 235050FUL

We have revised our proposal in response to the detailed refusal points outlined in the planning officer's report for application 235050FUL. Here is a summary of the modifications:

Tree Preservation

A tree survey and protection plan have been included in this application. The report confirms that the tree adjacent to the proposed site does not have roots extending into the site, thus it will not be affected by the proposed bungalow. A strategy to safeguard the tree during construction is outlined in the arboricultural report.

Building Line

The proposed building line aligns with the existing line established by 1236 Greenford Road. The bungalow is now set back 1.5m from the back of the pavement. We believe that the main public frontage should be off Berkeley Avenue, in line with established urban design principles. This offers a safe entrance off a main street, complying with secure by design principles. The entrance off Berkeley Avenue is deemed more suitable due to safety concerns regarding vehicle access to the side alleyway.

Footprint/Layout

The bungalow now has an L-shaped plan, wrapping around a single private amenity space. This reduces the footprint and provides a larger, protected amenity space.

Frontage

The frontage is set back 1.5m from the back of the pavement, with a 1.2m high brick wall and rail perimeter, overlooked by habitable windows from the living space. This design is in keeping with the character of Berkeley Avenue.

Roof Design

The proposed hipped roof forms are consistent with the local area, as seen at 1236 Greenford Road and 1 Berkeley Avenue. The green roof enhances biodiversity, provides insulation, and reduces water runoff.

Cycle Store

The cycle store has been moved to the front of the house, providing a secure and covered space, eliminating the need to take cycles through the house.

Private Amenity

A single private amenity space of 44sqm is proposed, which is not visible from Berkeley Avenue and is adjacent to the amenity spaces at 1236, 1238 and 1240 Greenford Road. Ealing's planning policy 7D outlines the requirements for private amenity space. For a three-bedroom, four-person home, a minimum of 7 sqm of private amenity space is required in line with the London Plan. The policy also refers to a guide of 50sqm for houses, which given the London context seems unrealistic for a new house. However ,we have managed to provide 40sqm of amenity space to the rear and 4sqm more to the front of the proposed bungalow, giving a total of 44sqm of private amenity space.

Boundary Conditions

The front boundary to Berkeley Avenue is 1200mm high, consisting of a brick wall with rails above, consistent with other similar boundary walls along Berkeley Avenue. The rear amenity boundary currently has a closed boarded timber fence at 2100mm. Our proposal is to provide a brick wall with open rails above, with a maximum height of 1800mm. This design approach will reduce the impact of the boundary treatment to 1236, 1238 and 1240 Greenford Road. Planting is proposed behind both proposed enclosures, which will be visible from above and through the rails.

Previous planning proposal 235050FUL

View to rear

Street view

Current planning proposal

View to rear

Street view

Planning history

A. Pre-application

11.07.2017
173513PAC

Land Rear Of 1236 & 1238 Greenford Road, Greenford, Middlesex, UB6 0HH

Construction of a detached two storey building in the rear garden of 1236-1238 Greenford Road to accommodate two self-contained units (1 x 1 bed; 1 x studio), with associated cycle and vehicular parking and refuse storage.

Summary of pre-application advice:

While the principle of increasing residential accommodation in this location is acceptable, there are a number of concerns with this proposal in terms of its scale, footprint, siting and its relationship with adjoining buildings, particularly Nos. 1236-1238 Greenford Road.

The main concerns with this proposal include:

• the proposed building would form a cramped form of development on the site that is out-of-keeping with the streetscene and pattern of development in the area;
• the siting and scale of the proposed building appear likely to result in overlooking, loss of outlook and light to the existing dwellings on the site;
• the proposed 2 storey building would overshadow and have an overbearing effect on the rear garden of No. 1240 Greenford Road;
• only roof lights are proposed for the roof space room and it is considered that its level of outlook would be poor.

The current proposal does not adequately deal with some issues raised in previous refusals and the appeal decision on this site and it would not be recommended for approval unless all of the above issues are fully addressed.

Any development on the rear part of this site would need to ensure that it integrates into the context of the area, that it does not harm the residential amenity of neighbouring occupiers and should provide good quality amenity space and landscaping. It is not clear that an acceptable form of detached residential development can be achieved in this location but, if it were, it would probably need to be no more than single storey and of much smaller scale and footprint.

PROPOSED FRONT ELEVATION

Proposed elevation submitted along pre-application ref. 173513PAC

Planning history

B. Planning Application

05.12.2016
166225FUL

1236 & 1238 Greenford Road, Greenford, Middlesex, UB6 0HH

Change of use of part of building from shop (A1 use class) to residential (C3 use class) to create three self-contained residential flats (1 x studio and 2 x 1 bed) including external alterations to remove a door and access ramp in front elevation; and part single storey rear extension (following demolition of part single storey rear extension)

Status: Granted with Conditions (01.02.2017)

C. Planning Application

02.05.2008
P/2008/1575

Land Rear Of 1236 & 1238 Greenford Road, Greenford, Middlesex, UB6 0HH

Erection of two storey detached house with off street parking

Status: Refused (25.06.2008)

Main reasons for refusal:

1. The proposal would result in the loss of a car parking space to the rear of 1236-1237 Greenford Road which is in an area where there is a high level of demand for on-street parking. The proposal would not provide any on-site parking to serve the existing residential unit and thus would exacerbate car parking stress in the area, to the detriment of the amenity of existing residents and to highway safety.
2. The proposed development, by reason of its plot coverage and proximity to site boundaries, would represent a cramped and incongruous form of development on this garden infill development, out of keeping with the general pattern of development in the area.
3. The proposal would result in a cramped form of development, which would provide inadequate private amenity space to serve the new family dwelling house and which would result in an unacceptable loss of garden space to the existing property on the application site, to the detriment of the residential amenities of the occupiers of both properties.

Appeal - APP/A5270/A/09/2093238

Status: Dismissed (28.04.2009)

Main reasons for dismissal:

The main issues are the effect of the proposed development on the character and appearance of the west end of Berkeley Avenue and any effect on the living conditions of the occupants of the proposed house and of the adjoining residential properties.

D. Planning Application

16.05.2006
P/2006/0982

Land Rear Of 1236 & 1238 Greenford Road, Greenford, Middlesex, UB6 0HH

Construction of a two storey detached house and parking

Status: Refused (11.07.2006)

Main reasons for refusal:

1. The proposal would result in the loss of a car parking space to the rear of 1236-1237 Greenford Road which is in an area where there is a high level of demand for on-street parking. The proposal would not provide any on-site parking to serve the existing residential unit and thus would exacerbate car parking stress in the area, to the detriment of the amenity of existing residents and to highway safety.
2. The proposed development, by reason of its plot coverage and proximity to site boundaries, would represent a cramped and incongruous form of development on this garden infill development, out of keeping with the general pattern of development in the area, harmful to the appearance of the streetscene and the locality.
3. The proposal would result in a cramped form of development, which would provide inadequate private amenity space to serve the new family dwelling house and which would result in an unacceptable loss of garden space to the existing property on the application site, to the detriment of residential amenities of occupiers of both properties.

E. Planning Application

24.11.2004
P/2004/5245

1236 Greenford Road, Greenford, Middlesex, UB6 0HH

Part single storey side extension, conversion of building into two self contained flats and external staircase to side of building

Status: Granted with Conditions (19.01.2005)

F. Planning Application

14.03.2004
P/2004/0861

1236 Greenford Road, Greenford, Middlesex, UB6 0HH

Dormer window extension to side roof slope of residential unit above and to rear of retail shop

Status: Granted with Conditions (11.05.2004)

G. Planning Application

08.06.2000
P/2000/2010

Post Office Counters Ltd 1238, Greenford Green Post Office Greenford Road Greenford Middlesex UB6 0HH

Display of one double sided static internally illuminated free standing advertising display unit on the forecourt of existing shop

Status: Granted with Conditions (18.01.2001)

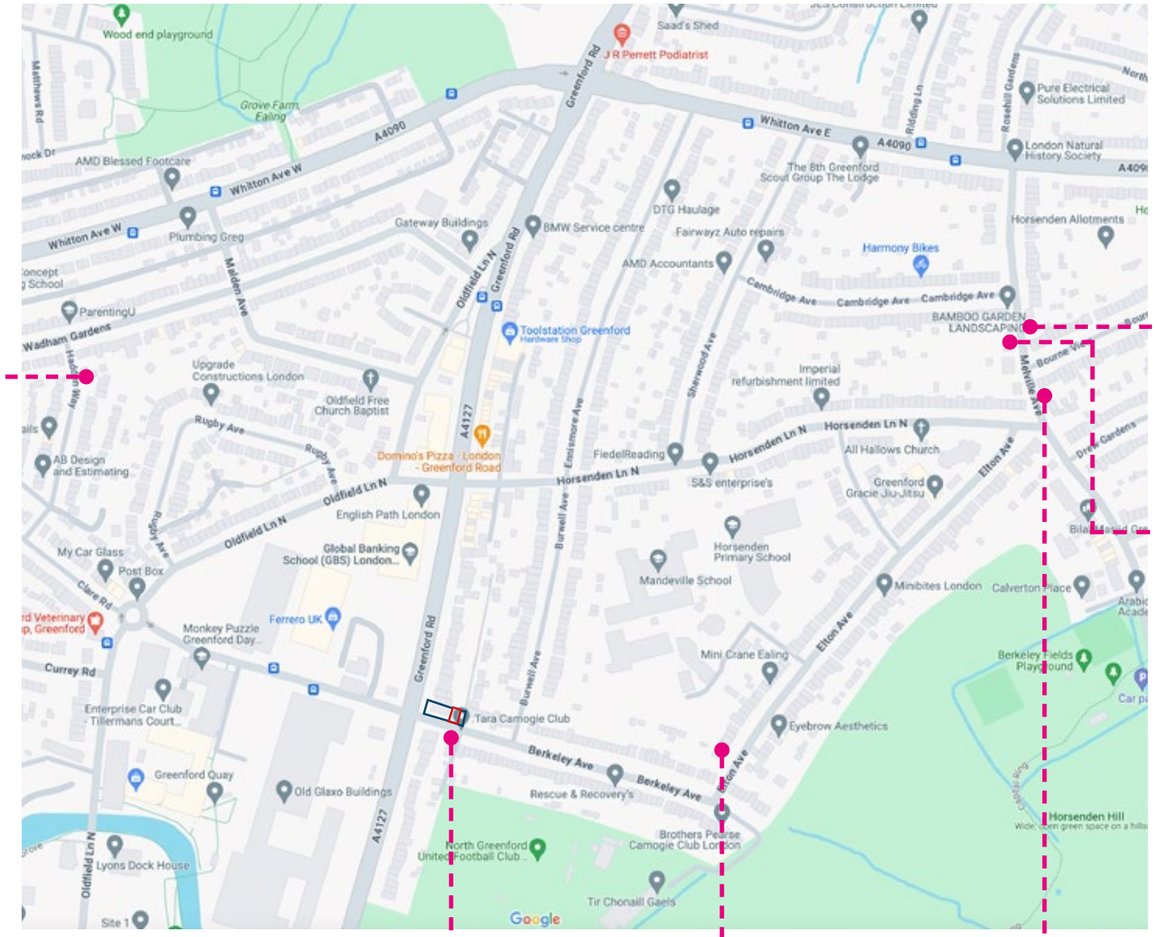
Similar developments

The map and images below identities single and double storey homes on similar infill sites which have been built recently in the immediate area.

Planning boundary

Same ownership

40 Hadden Way



6 Melville Avenue

2 Melville Avenue

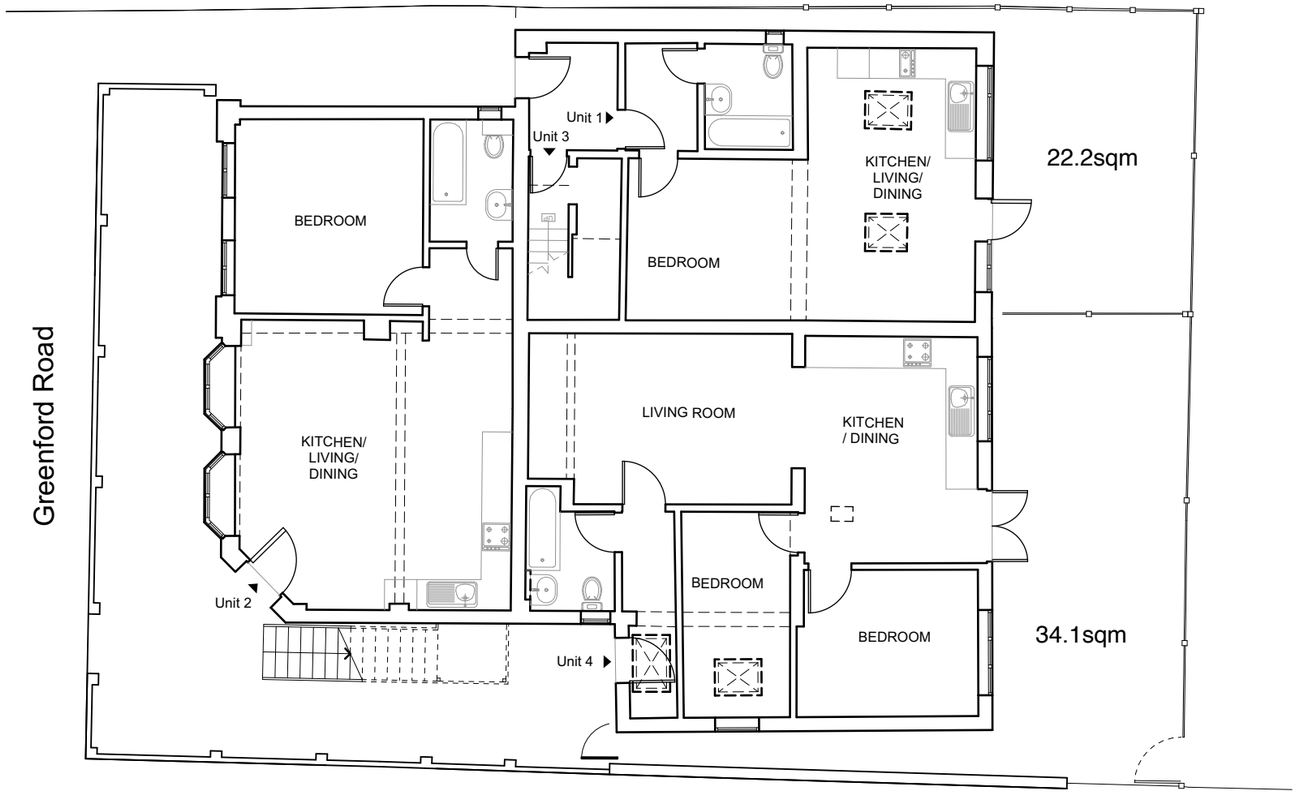
Rear of 1234 Greenford Road

13 Elton Avenue

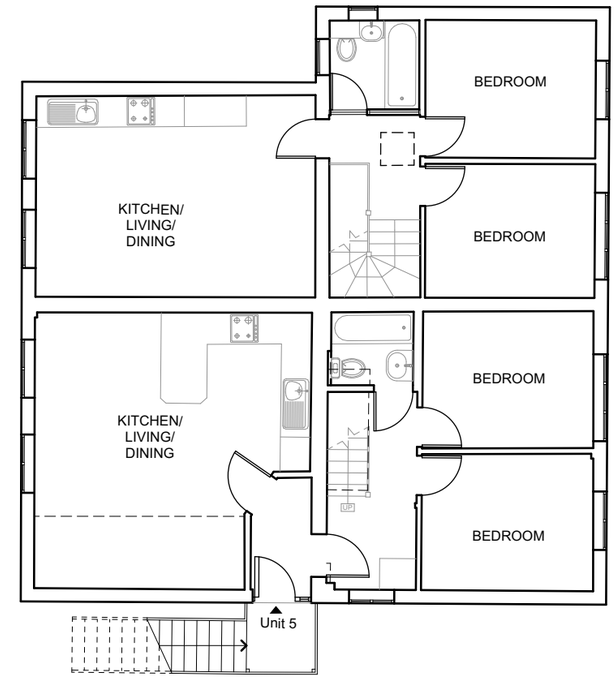
2A Melville Avenue

1236 & 1238 Greenford Road plans

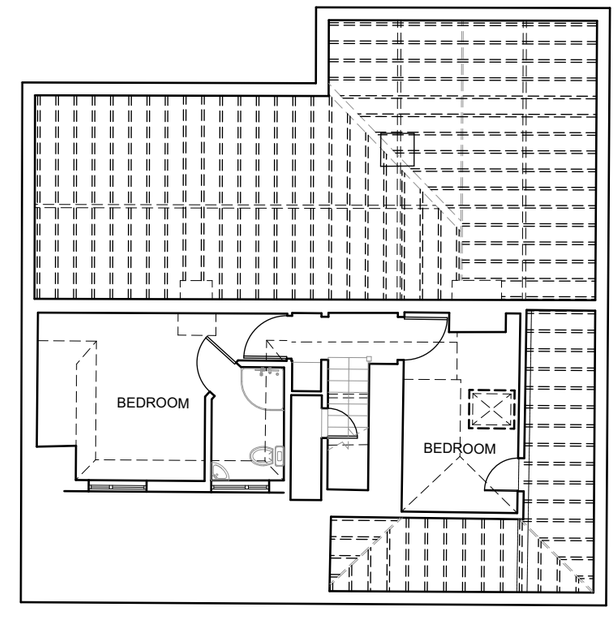
These plans show the existing floor plans of 1236 & 1238 Greenford Road, in accordance with granted planning permissions 166225FUL, P/2004/5245 and P/2004/0861. A total of 5 self contained flats have been established.



Ground floor



First floor



Second floor

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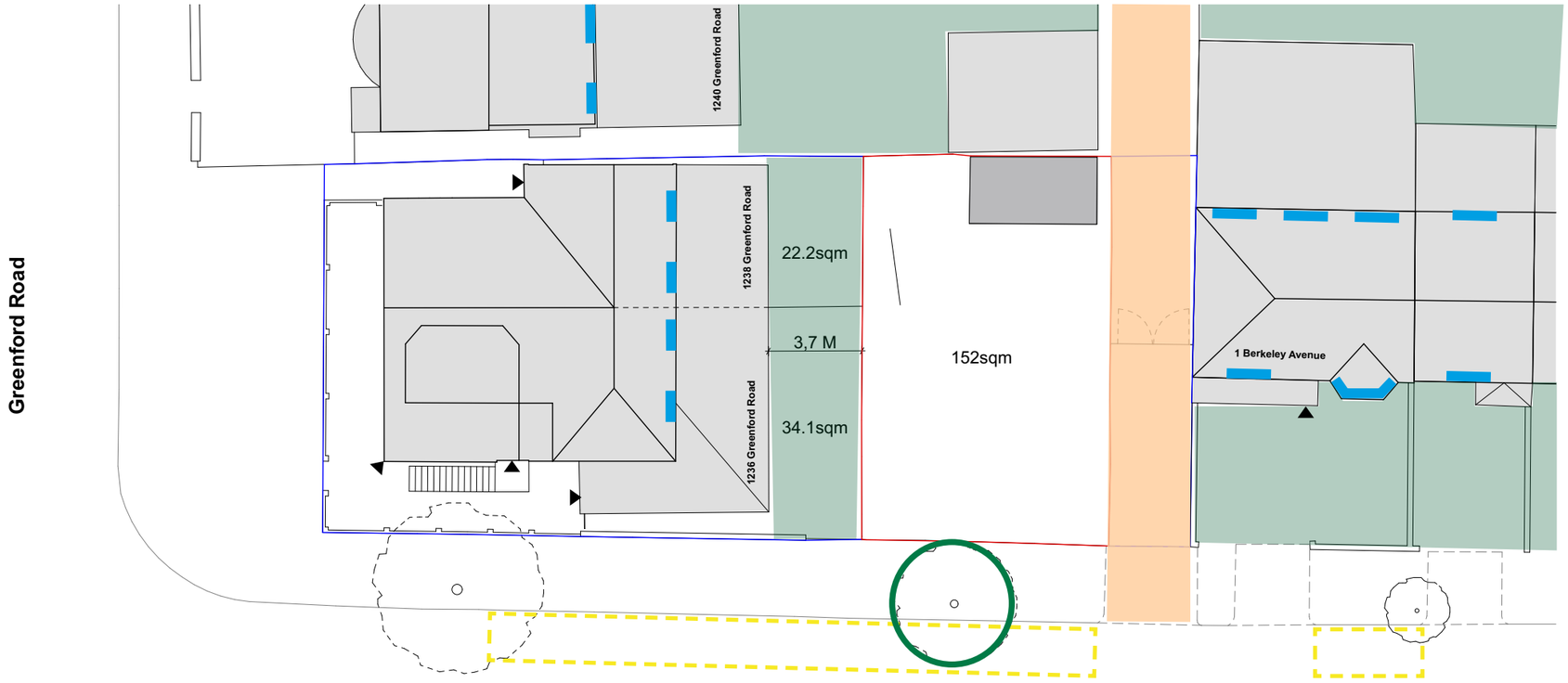
Site constraints



Habitable windows at first floor

Existing tree close to proposed site

Neighbouring amenity

Surrounding buildings

Accessway

On-street parking

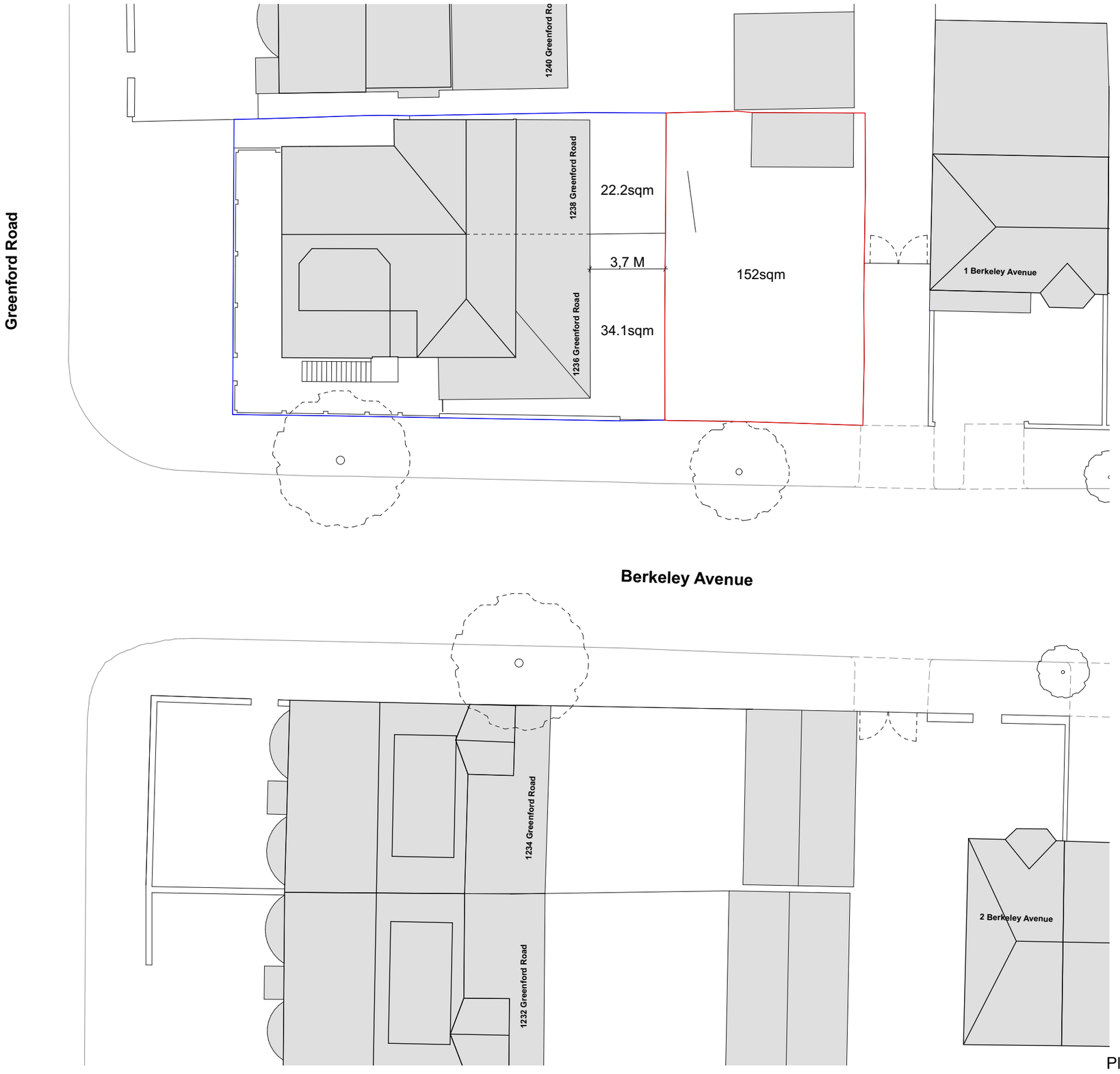
Similar built form

Existing site plan

Planning boundary Same ownership

3. Design proposal

Existing site plan



Siting principles

Proposed bungalow

Courtyards

Separation distances

Amenity for 1236 & 1238 Greenford Road increased by 0.5 metres

Neighbouring amenity

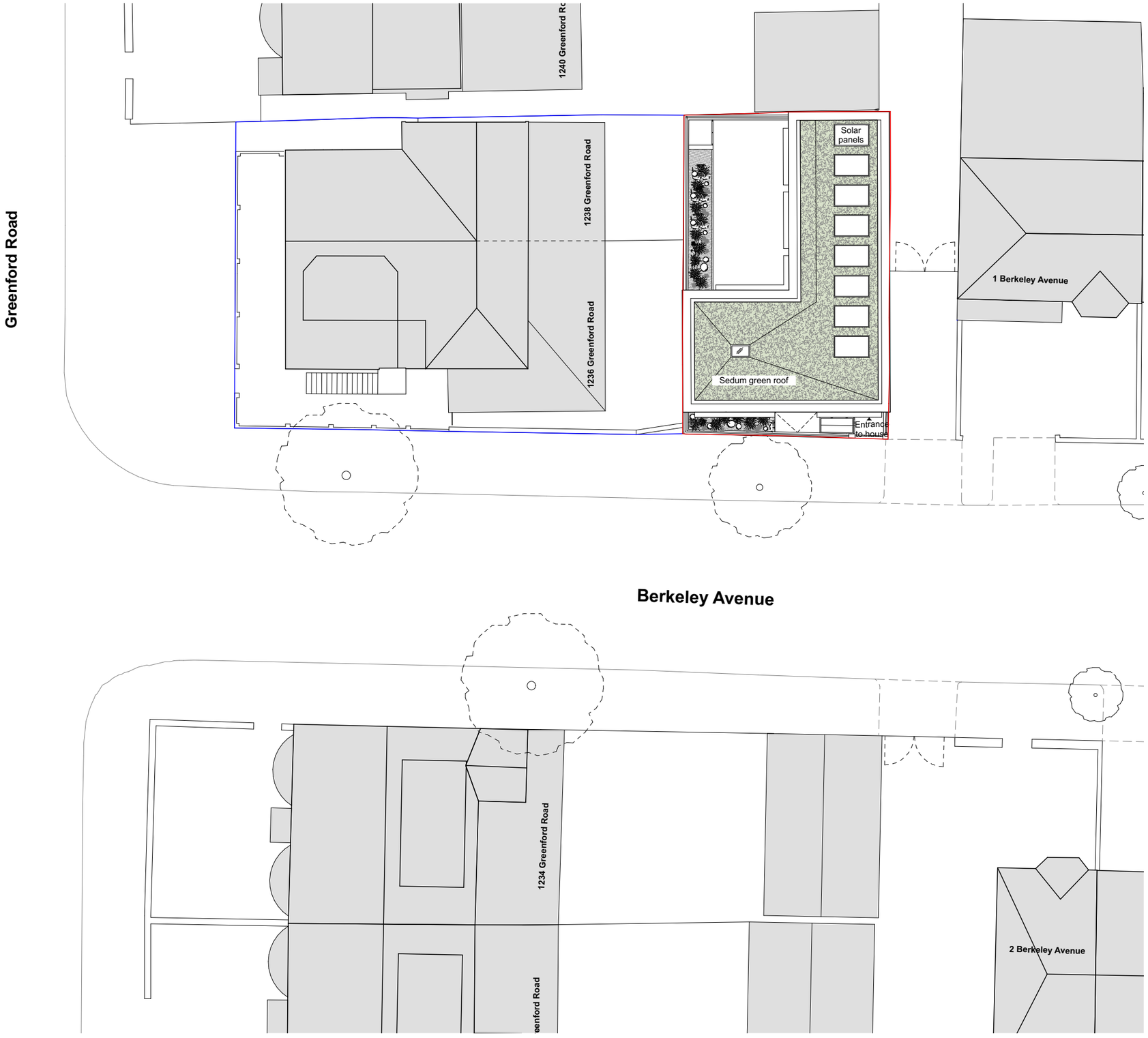
Existing single storey structures

Open corner

Existing site plan

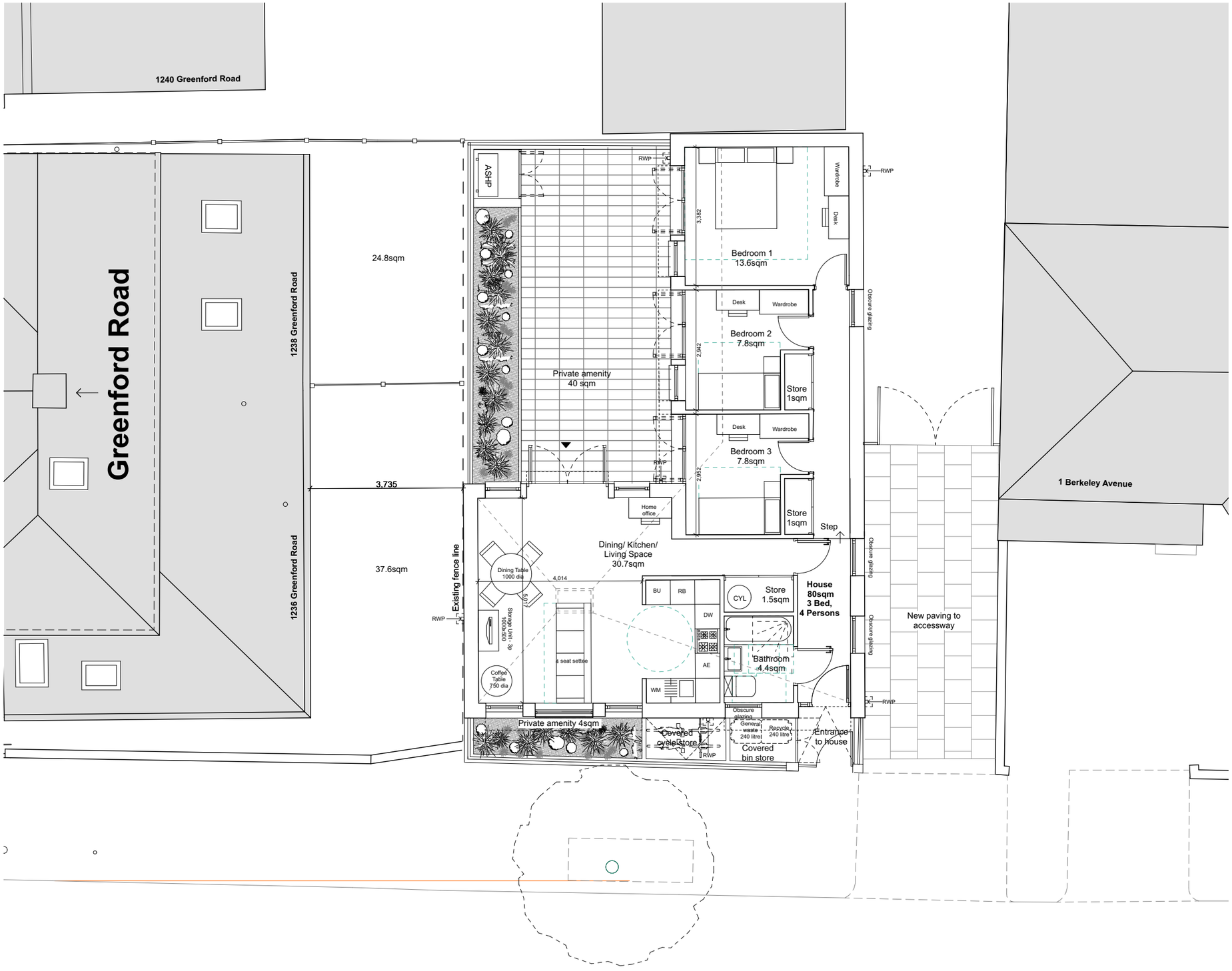
Planning boundary Same ownership

Proposed site plan



Planning boundary Same ownership 0 1 2 3 4 5 N

Proposed ground floor plan



3 bedroom / 4 people home

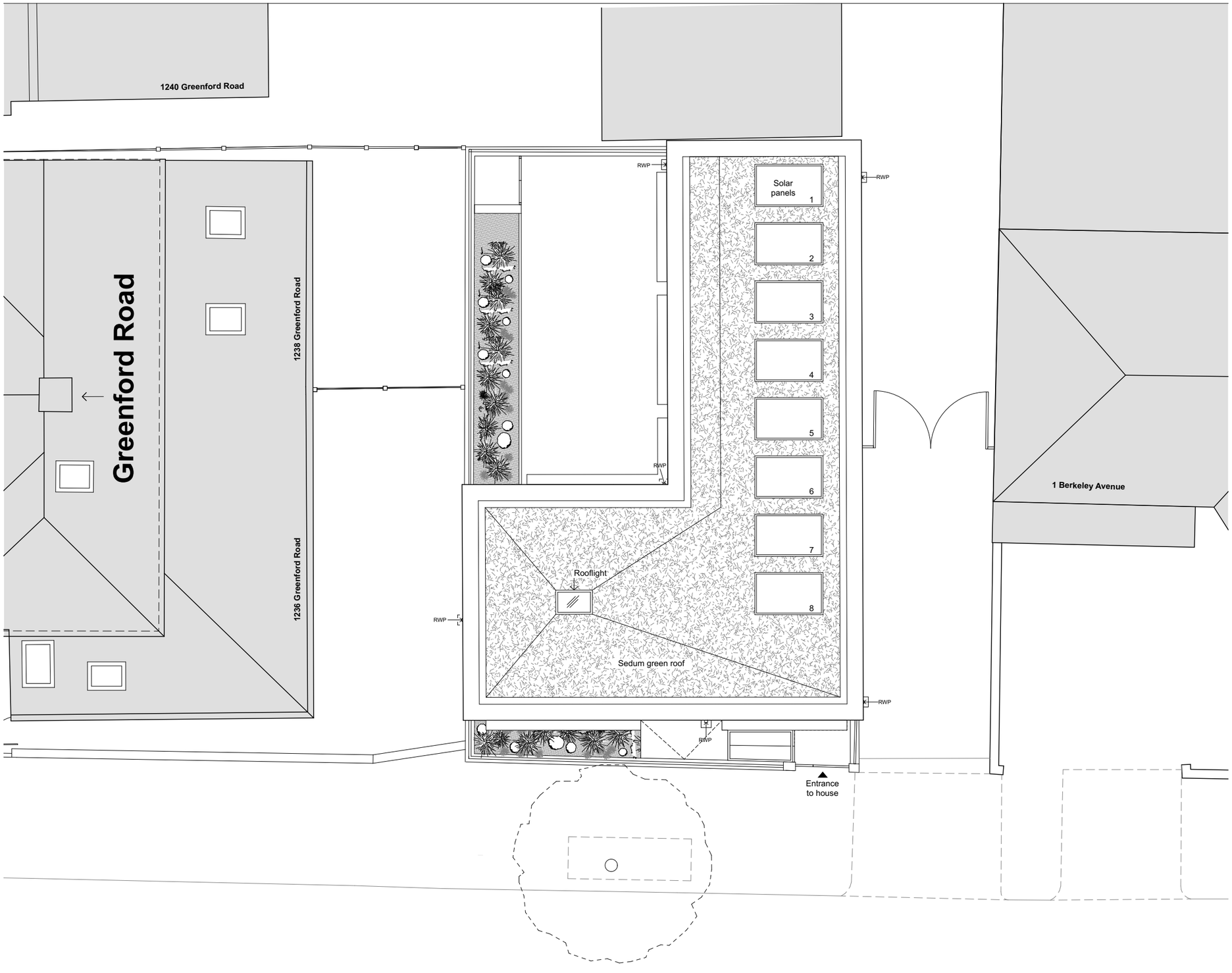
Area standards	Proposed	Min. req*
Internal area (GIA)	80sqm	74sqm
Double bedroom 1	13.5sqm	11.5sqm
Single bedroom 2	7.8sqm	7.5sqm
Single bedroom 3	7.8sqm	7.5sqm
Living/kitchen/dining	30.6sqm	27sqm
Internal storage	3.5sqm	2.5sqm
Private amenity space	44sqm	7sqm
Cycle spaces	2	2
Refuse - recycling	240litre	240litre
Refuse - general	240litre	240litre
Refuse - food waste	stnd. caddy	stnd. caddy

*As per National Housing Standards, London Plan Guidance and Ealing Planning Policies.

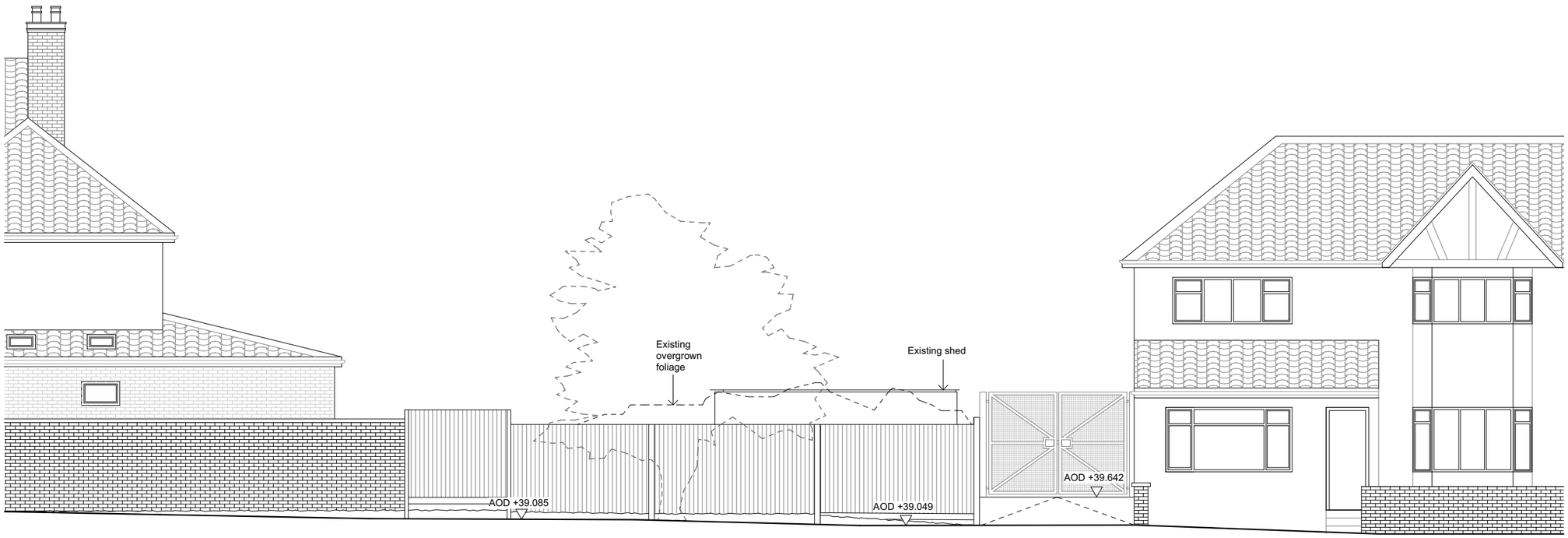
N

0 1 2 3

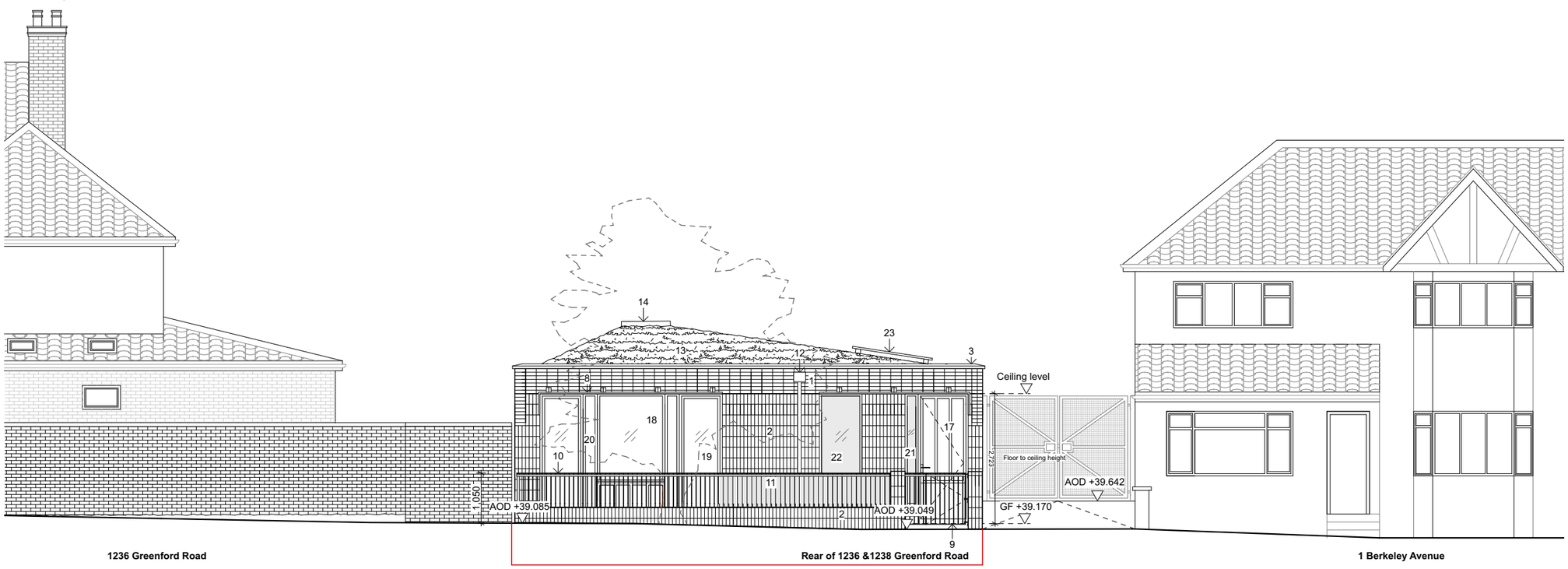
Proposed roof plan



Proposed and existing street elevation



Existing street scene

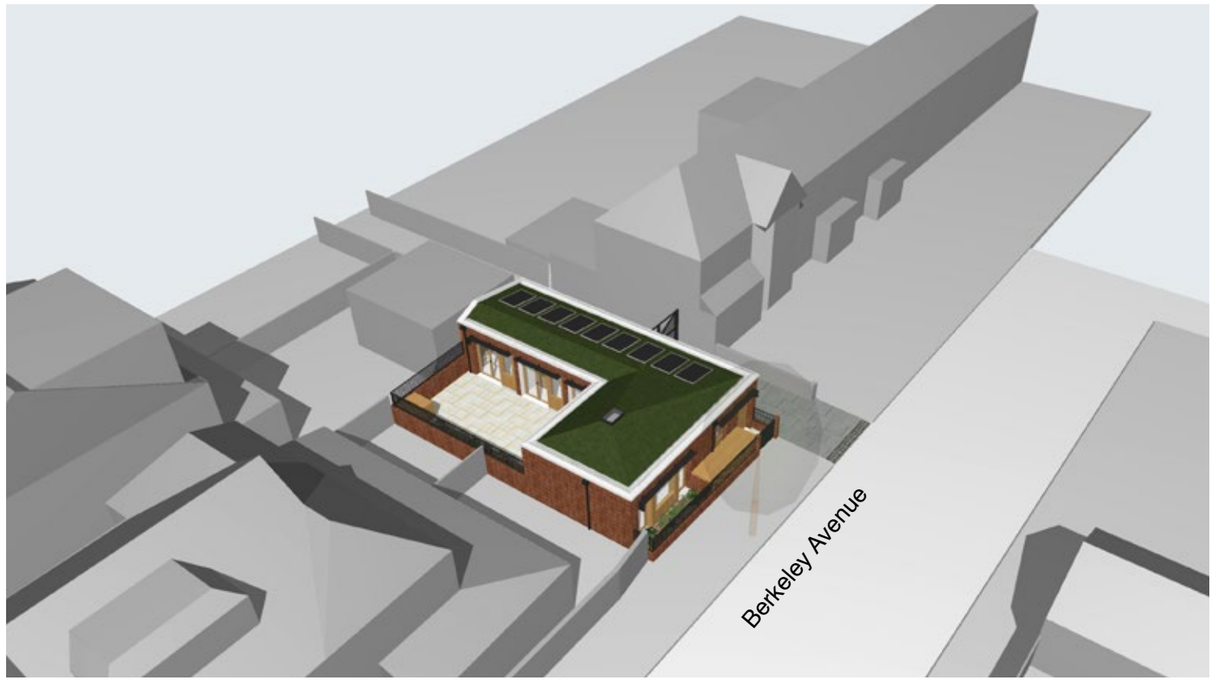


Proposed street scene

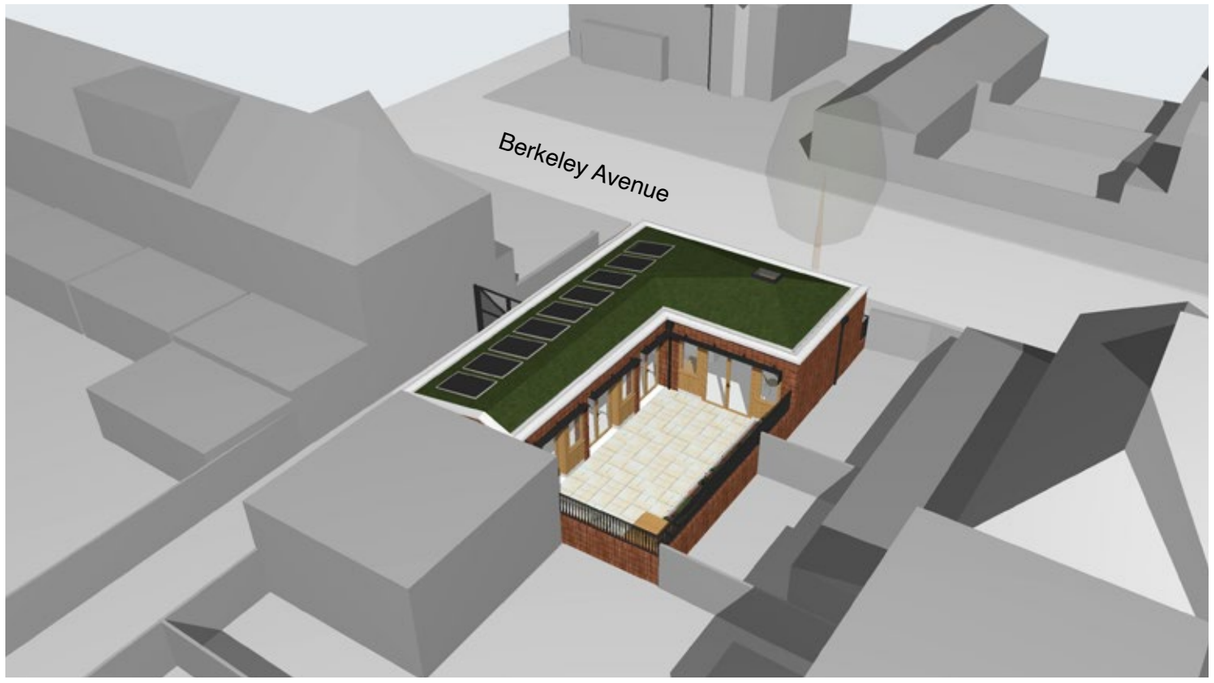
0 1 2 3

Proposed massing in context

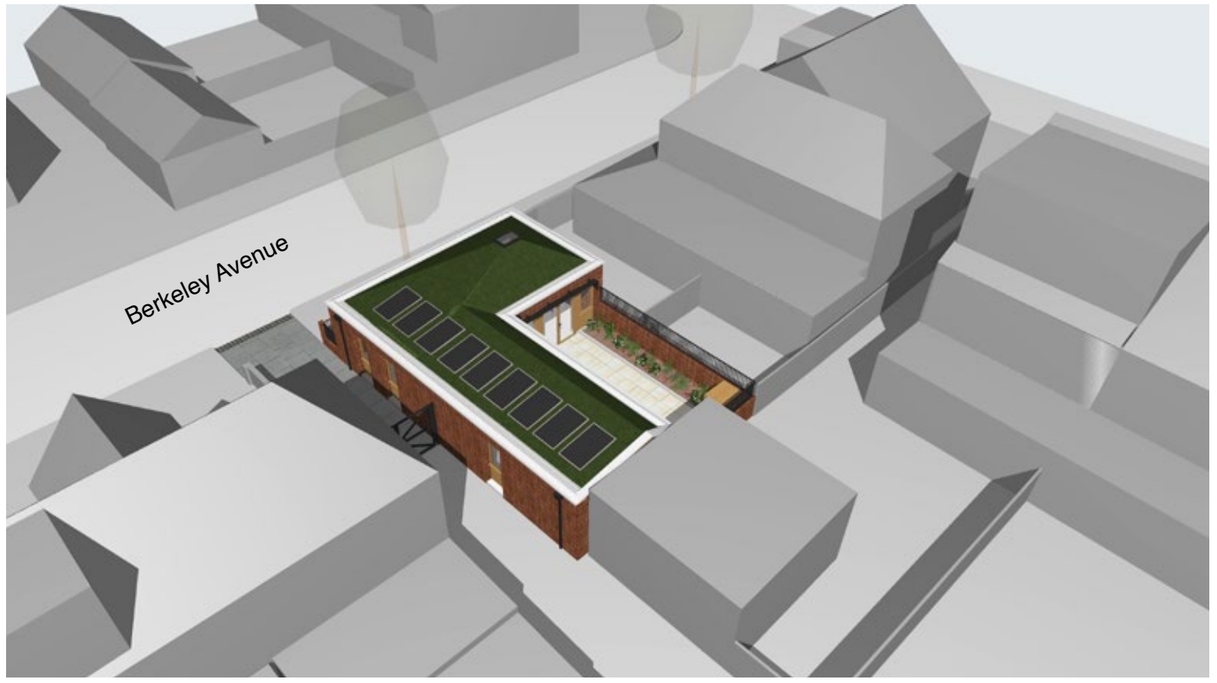
1. Aerial view looking North West



2. Aerial view looking North East



3. Aerial view looking South East



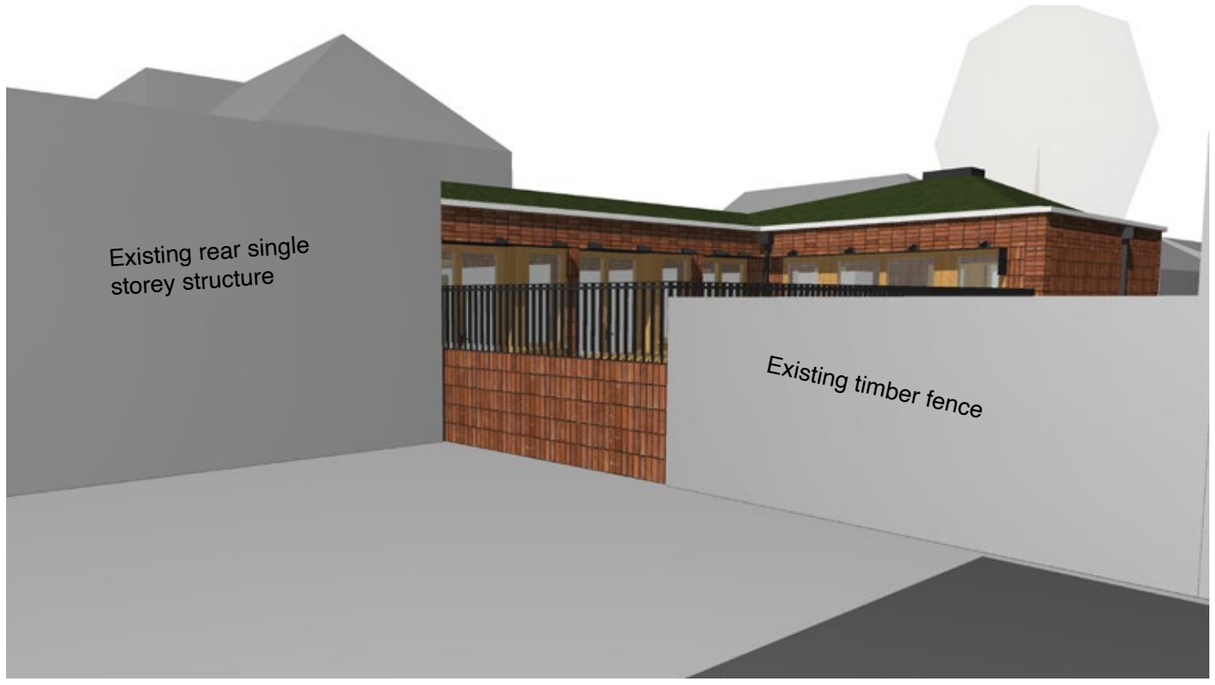
4. Aerial view looking South West

Proposed views in context

1. Street view looking North West

2. Street view looking North

3. View looking towards 1236 & 1238 Greenford Road from the junction of Greenford Road and Berkeley Avenue



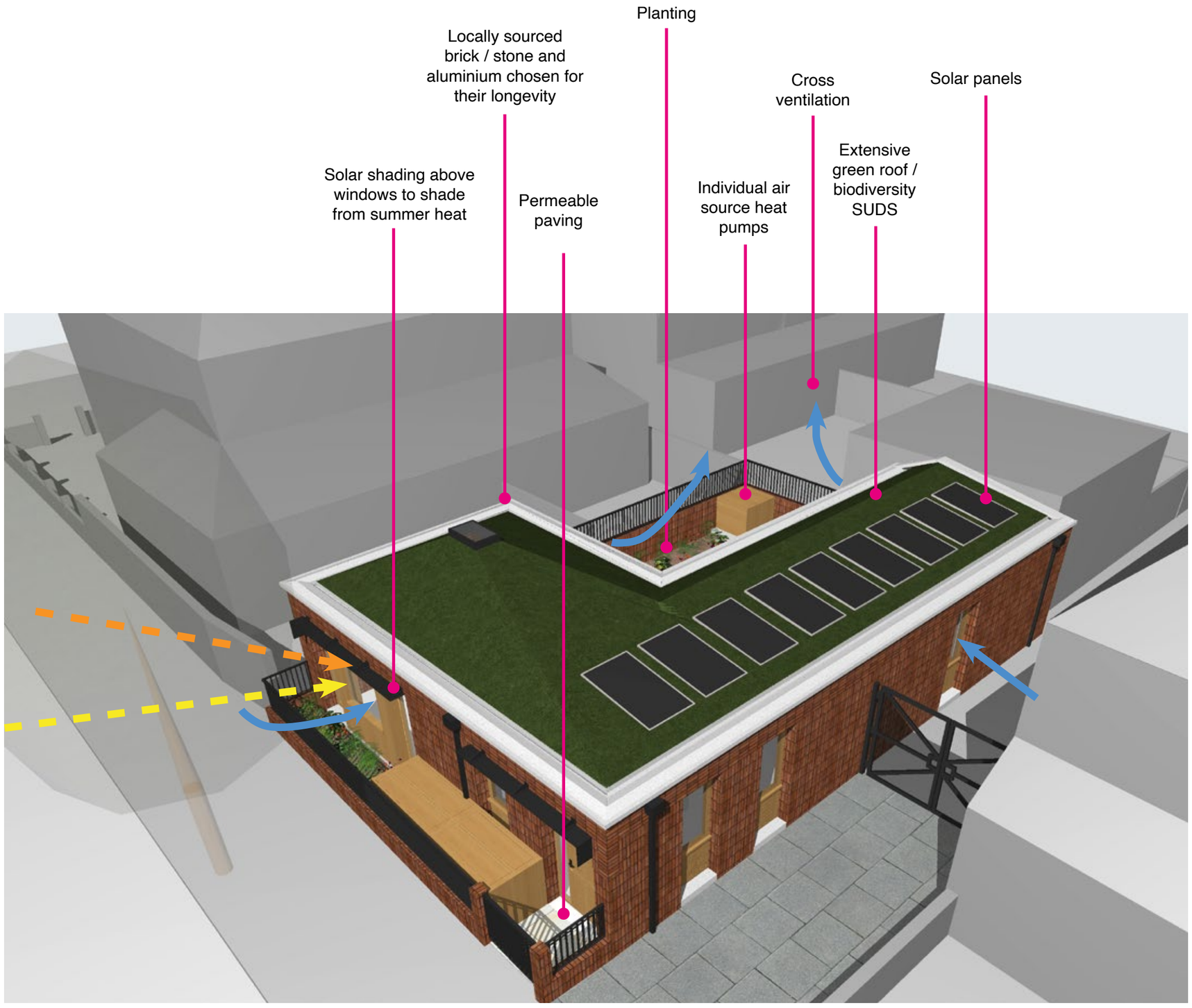
4. View looking from neighbouring garden at 1240 Greenford Road

Sustainability statement

The proposed scheme adheres to established principles of sustainable development. The proposals would achieve a 90% reduction over the Part L 2021 baseline.

Summery of the reduction of carbon dioxide emissions and the sustainability principles:

- Developing a site of low ecological value;
- Accessible location close to public transport;
- Promote cycling and walking with the proposal of a car free scheme;
- Minimise internal water consumption to 105 litres per person per day;
- Incorporate measures to improve site biodiversity, including biodiverse planting, green roofs and a swift bird nesting box;
- Reduce surface water runoff rates through the use of sustainable drainage measures, including permeable paving and green roofs;
- Minimise energy demand through the specification of locally sourced materials with low U-values;
- Careful detailing using insulation with low thermal conductivity, low air permeability and low thermal bridging to reduce heat loss;
- Double glazed windows
- Utilise rooftop photovoltaic panels to provide renewable electricity;
- Efficient heating strategy using a low noise air source heat pump;
- Using a traditional construction method involving brick and timber which avoids the need to use machinery and vechicles powered by fossil fuels;
- Have a good level of natural light;
- Have natural cross ventilation;
- Multiple outlooks.



Sustainability principles overlaid onto the proposed home

Air Source Heat Pump - Datasheet

Mitsubishi Ecodan R32 Monobloc PUZ, WM60

Mitsubishi Ecodan R32 Monobloc PUZ

Air Source Heat Pump

R32

Self-contained unit, requires only plumbing and electrical connections

Outside operation temperature as low as -25°C

Single phase power supply from 5 - 14kW and 3 phase available for 14kW

Latest R32 'Green Refrigerant'

Ultra quiet noise levels

Energy monitoring as standard

Help to tackle the climate crisis

Multiple cascade system available

MELCloud™

MITSUBISHI ELECTRIC

Business Solutions Partner

ecodan®

Renewable Heating Technology

ALTO ENERGY

A Design to meet Today's Heating Demand

Mitsubishi uses proven heat pump technology to deliver a complete heating and hot water solution. Mitsubishi Electric's award winning Ecodan air source heat pump provides a simple, renewable solution that rivals traditional heating systems such as LPG, oil and gas.

5 year warranty

5 year warranty as standard*

Models shown are the 14kW (back unit), 6kW, 8.5kW & 11kW (middle unit) and 5kW (front unit).
Other models in this line may vary.
**7 year warranty available*

Mitsubishi Ecodan R32 Monobloc PUZ

Air Source Heat Pump

Mitsubishi are a pioneer in the development of renewable heat pump technology, and have been the UK's market leader in air source heat pumps for some time.

The Mitsubishi Ecodan is one of the most advanced, efficient air source heat pumps available on the market today.

Whether your project is a new build, retrofit or barn conversion, the Mitsubishi Ecodan air source heat pump is suitable for any application.

Technical Specification for the Ecodan PUZ

Model	WM50	WM60	WM85	WM112	HWM140V
ErP Rating - Heat Pump @ 55°C	A++	A++	A++	A++	A++
SCOP - Heat Pump @ 55°C	3.22	3.56	3.47	3.34	3.35
ErP Rating - Heat Pump @ 35°C	A+++	A+++	A+++	A+++	A+++
SCOP - Heat Pump @ 35°C	4.57	4.76	4.79	4.78	4.48
ErP Rating - Domestic Hot Water [1]	A+	A+	A+	A+	A+
Heating - Capacity (kW) [2]	5	6.0	8.5	11.2	14.0
Heating - Power Input [kW] [2]	1.67	1.88	3.27	3.73	5.71
Heating - COP [2]	3.00	3.20	2.60	3.00	2.45
Operating Ambient Temp [°C DB]	-20~+35	-20~+35	-20~+35	-25~+35	-28~+35
Sound Pressure Level at 1m [dBA] [3]	47	45	45	45	53
Sound Power Level [dBA] [3] [4]	61	58	58	60	67
Pipework Size [mm]	22	22	28	28	28
Flow Rate [l/min]	14	17	24	32	40.1
Water Pressure Drop [kPa]	12.0	8.0	15.0	24.0	20.0
Width [mm]	950	1050	1050	1050	1020
Depth [mm]	330+30 [8]	480	480	480	330+30 [8]
Height [mm]	943	1020	1020	1020	1350
Weight [kg]	71	98	98	119	132
Electrical Supply [V]	220-240	220-240	220-240	220-240	220-240
Phase	Single	Single	Single	Single	Single
Nominal Running Current [A] (MAX) [5]	4.64 (13)	5.68 (13)	9.1 (22)	10.9 (28)	13.8 (35)
Fuse Rating - MCB Sizes [A] [6]	16	16	25	32	40
Refrigerant Charge [kg] - R32	2.0	2.2	2.2	3.0	3.3

1) Combination with E*PT20X Cylinder
2) Under normal heating conditions at outdoor temp: -7°CDB / -8°CWB, outlet water temp 35°C, inlet water temp 30°C
3) Under normal heating conditions at outdoor temp: 7°CDB / 6°CWB, outlet water temp 55°C, inlet water temp 47°C as tested to BS EN14511
4) Sound power level tested to BS EN12102
5) Under nominal heating conditions at output temp: 7°C, outlet water temp at 35°C
6) MCB Sizes BS EN60898-2 & BS EN60947-2
7) Flow Temperature Controller (FTC) for standalone systems PAC-IF062B-E Dimensions WxDxH [mm] - 520x150x450
8) Grille

Solar panels - Datasheet

Sunpower Maxeon 3, 400W Residential Solar Panel

SUNPOWER | MAXEON

Fundamentally different, and better

Back Contact | White Backsheet Black Frame | Residential

MAXEON 3

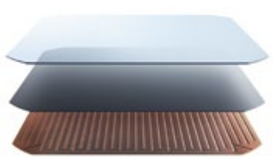
POWER RANGE: 390-400 W | EFFICIENCY: Up to 22.6%

Part of the record-setting SunPower Maxeon product line, the SunPower Maxeon 3 solar panel offers homeowners the highest efficiency available in the market today, maximising long-term energy production, as well as savings potential per available space. [1]

SunPower Maxeon panels are world-renowned for their energy production and savings advantages that combine unmatched efficiency and reliability with an industry-leading warranty and an estimated 40-year useful life.[2,3,4]

SunPower Maxeon Solar Cell Technology

- Proven technology across 3.5 billion cells shipped
- Most efficient cell in commercial solar [1]
- Only solar cell with a solid-metal foundation, providing patented protection from breakage and corrosion



sunpower.maxeon.com

Maximum Lifetime Energy and Savings

The SunPower Maxeon 3 solar panel is designed to deliver 35% more energy in the same space over 25 years in real-world conditions such as partial shade and high temperatures. [5,6,7]

A Better Product. A Better Warranty.

The 25-year SunPower Complete Confidence Panel Warranty is backed by testing and field data from more than 30 million SunPower Maxeon panels deployed—and a demonstrated warranty return rate of .005%. [8]

25-yr SunPower Complete Confidence

• Year 1 Minimum Warranted Power Output	98.0%
• Maximum Annual Degradation	0.25%
• Year 25 Warranted Power Output	92.0%

Leadership in Sustainable Manufacturing

SunPower Maxeon panels—and the facilities in which they are produced—raise the bar for environmental and social responsibility. Included below are highlights of the certifications and recognition received by some of our products and manufacturing sites.

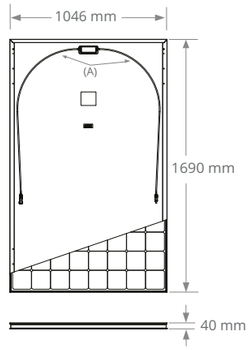
MAXEON 3 POWER: 390-400 W | EFFICIENCY: Up to 22.6%

Electrical Data	SPR-MAX3-400	SPR-MAX3-395	SPR-MAX3-390
Nominal Power (Pnom) [9]	400 W	395 W	390 W
Power Tolerance	+5/0%	+5/0%	+5/0%
Panel Efficiency	22.6%	22.3%	22.1%
Rated Voltage (Vmpp)	65.8 V	65.1 V	64.5 V
Rated Current (Impp)	6.08 A	6.07 A	6.05 A
Open-Circuit Voltage (Voc) (+/–3%)	75.6 V	75.4 V	75.3 V
Short-Circuit Current (Isc) (+/–3%)	6.58 A	6.56 A	6.55 A
Max. System Voltage	1000 V IEC		
Maximum Series Fuse	20 A		
Power Temp Coef.	−0.27% / °C		
Voltage Temp Coef.	−0.236% mV / °C		
Current Temp Coef.	0.060% mA / °C		

Tests And Certifications	
Standard Tests [10]	IEC 61215, IEC 61730
Quality Management Certs	ISO 9001:2015, ISO 14001:2015
Ammonia Test	IEC 62716
Desert Test	IEC 60068-2-68, MIL-STD-810G
Salt Spray Test	IEC 61701 (maximum severity)
PID Test	1000 V: IEC 62804, PVEL 600 hr duration
Available Listings	TUV

Sustainability Tests and Certifications	
IFLI Declare Label	First solar panel labeled for ingredient transparency and LBC-compliance.[12]
Cradle to Cradle Certified™ Bronze	First solar panel line certified for material health, water stewardship, material reutilization, renewable energy & carbon management, and social fairness.[13]
Green Building Certification Contribution	Panels can contribute additional points toward LEED and BREEAM certifications.[14]
EHS Compliance	RoHS, OHSAS 18001:2007, lead free, REACH SVHC-163

Operating Condition And Mechanical Data	
Temperature	−40°C to +85°C
Impact Resistance	25 mm diameter hail at 23 m/s
Solar Cells	104 Monocrystalline Maxeon Gen III
Tempered Glass	High-transmission tempered anti-reflective
Junction Box	IP-68, Stäubli (MC4), 3 bypass diodes
Weight	19 kg
Max. Load [11]	Wind: 2400 Pa, 244 kg/m² front & back Snow: 5400 Pa, 550 kg/m² front
Frame	Class 1 black anodized (highest AAMA rating)



FRAME PROFILE

A. Cable Length: 1000 mm +/-10 mm

B. LONG SIDE: 32 mm
SHORT SIDE: 24 mm

Please read the safety and installation guide.

1 Based on datasheet review of websites of top 20 manufacturers per IHS, as of Jan, 2020.
2 Jordan, et. al. Robust PV Degradation Methodology and Application. PVSC 2018.
3 Based on Oct. 2019 review of warranties on manufacturer websites for top 20 manufacturers per IHS 2018.
4 "SunPower Module 40-Year Useful Life," SunPower whitepaper. 2013.
5 SunPower 370 W, 22.7% efficient, compared to a Conventional Panel on same-sized arrays (310 W mono PERC, 19% efficient, approx. 1.64 m²)
6 PV Evolution Labs "SunPower Shading Study," 2013. Compared to a conventional front contact panel.
7 Based on temperature coefficients provided in manufacturer datasheets 2020.
8 SunPower panels are less than 50 dppm, or 0.005%, on over 15 million panels shipped - Source: SunPower White Paper, 2019.
9 Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25° C). NREL calibration Standard: SOMS current, LACCS FF and Voltage.
10 Class C fire rating per IEC 61730.
11 Safety factor 1.5 included.
12 SunPower Maxeon DC panels first received the International Living Future Institute Declare Label in 2016.
13 SunPower Maxeon DC panels are Cradle to Cradle Certified™ Bronze - www.c2ccertified.org/products/scorecard/e-series_x-series_solar_panels_-_sunpower_corporation. Cradle to Cradle Certified™ Bronze. Cradle to Cradle Certified™ is a certification mark licensed by the Cradle to Cradle Products Innovation Institute.
14 Maxeon panels can contribute to LEED Materials and Resources categories and BREEAM certification.

Designed in U.S.A. by SunPower Corporation
Made in Philippines (Cells)
Assembled in Mexico (Module)

Specifications included in this datasheet are subject to change without notice.

sunpower.maxeon.com

SUNPOWER
FROM MAXEON SOLAR TECHNOLOGIES

536423 REV B / A4_EN
Publication Date: July 2020

Energy calculations - GLA summary table

The tables below shows the GLA summary for Part L 2021 performance demonstrating the proposed bungalow has a 90% carbon saving above requirements of Part L 2021. The detailed calculations have been submitted with this application within a spreadsheet.

Residential

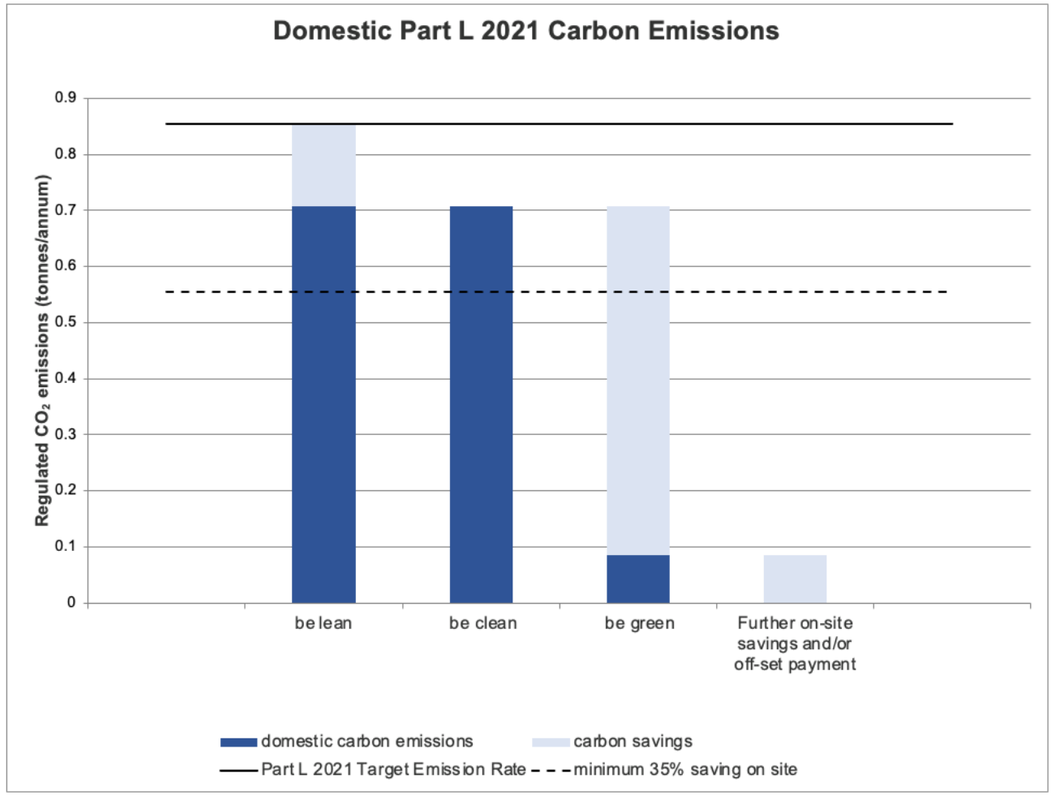
Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for residential buildings

	Carbon Dioxide Emissions for residential buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	0.9	0.7
After energy demand reduction (be lean)	0.7	0.7
After heat network connection (be clean)	0.7	0.7
After renewable energy (be green)	0.1	0.7

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for residential buildings

	Regulated residential carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Be lean: savings from energy demand reduction	0.1	17%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.6	73%
Cumulative on site savings	**0.8**	**90%**
Annual savings from off-set payment	0.1	-
	(Tonnes CO_2)	
Cumulative savings for off-set payment	**3**	-
Cash in-lieu contribution (£)	**241**	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab



As found in *231207_Part_l_2021_gla_carbon_emission_reporting_spreadsheet_v2.0_0_Greenford Road*, Fifth tab named *GLA Summary Tables*

Energy calculations - GLA summary table

SITE-WIDE

	Total regulated emissions (Tonnes CO_2 / year)	CO_2 savings (Tonnes CO_2 / year)	Percentage savings (%)
Part L 2021 baseline	0.9		
Be lean	0.7	0.1	17%
Be clean	0.7	0.0	0%
Be green	0.1	0.6	73%
Total Savings	-	0.8	90%
	-	**CO_2 savings off-set (Tonnes CO_2)**	-
Off-set	-	**2.5**	-

	Target Fabric Energy Efficiency (kWh/m²)	Dwelling Fabric Energy Efficiency (kWh/m²)	Improvement (%)
Development total	47.66	47.78	0%

	Area weighted non-residential cooling demand (MJ/m^2)	Total non-residential cooling demand (MJ/year)
Actual		
Notional		

EUI & space heating demand (predicted energy use)

Residential

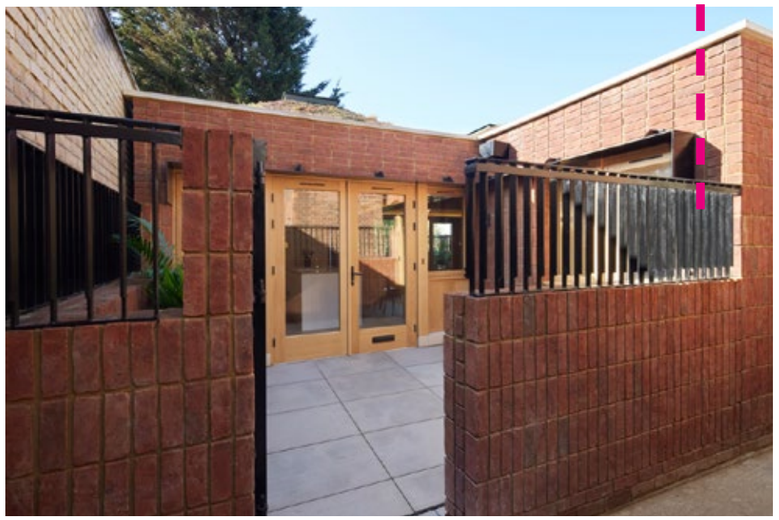
Building type	EUI (kWh/m^2/year) (excluding renewable energy)	Space heating demand (kWh/m^2/year) (excluding renewable energy)	EUI value from Table 4 of the guidance (kWh/m^2/year) (excluding renewable energy)	Space heating demand from Table 4 of the guidance(kWh/m^2/year) (excluding renewable energy)	Methodology used (e.g. 'be seen' methodology or an alternative predictive energy modelling methodology)	Explanatory notes (if expected performance differs from the Table 4 values in the guidance)
Residential	30.80953089	10.53468381	35	15	Part L1 - SAP 10.2 & CIBSE TM54 dwellings / & Landlord Circulation	

As found in *231207_Part_l_2021_gla_carbon_emission_reporting_spreadsheet_v2.0_0_Greenford Road*, Fifth tab named *GLA Summary Tables*

Modern architectural influences

Oak doors/ windows with oak panelling and white stone base sill. Metal brise soleil

Interior space with exposed timber roof structure



Brick enclosures with metal railing

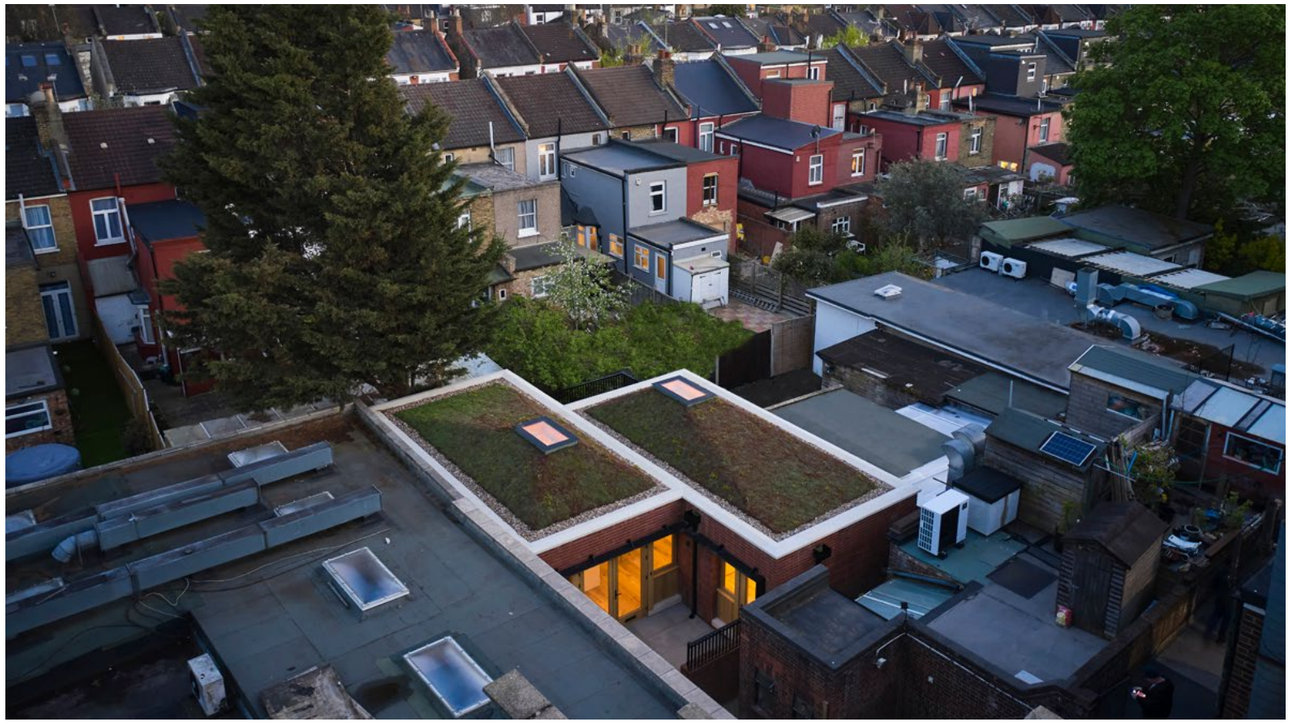
White stone parapet and extensive green roof with rooflights

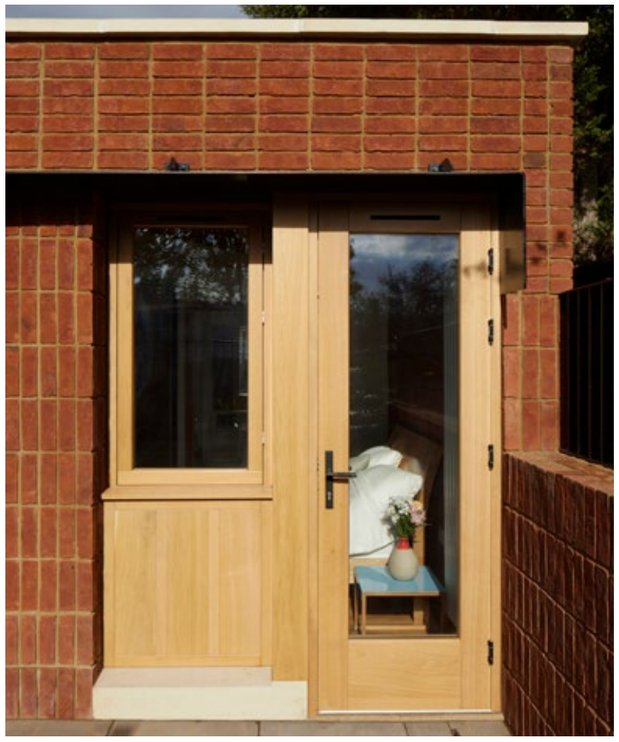
Oak doors/ windows with oak panelling and white stone base sill. Metal brise soleil

Precedent - Haringey Brick Bungalow by Satish Jassal Architects

The proposed bungalow to the rear of 1236 & 1238 Greenford Road is similar to this completed bungalows located to the rear of a retail unit in a very dense site in Haringey

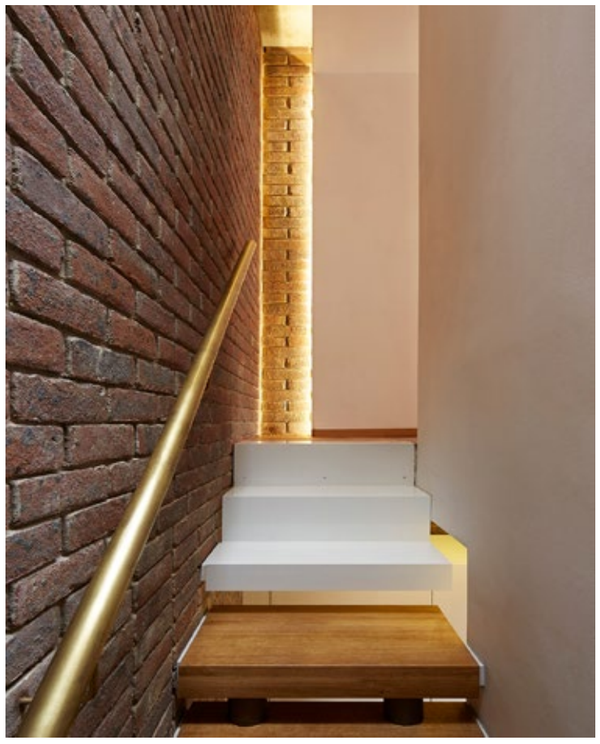
• Short listed for the Surface Design Award 2024





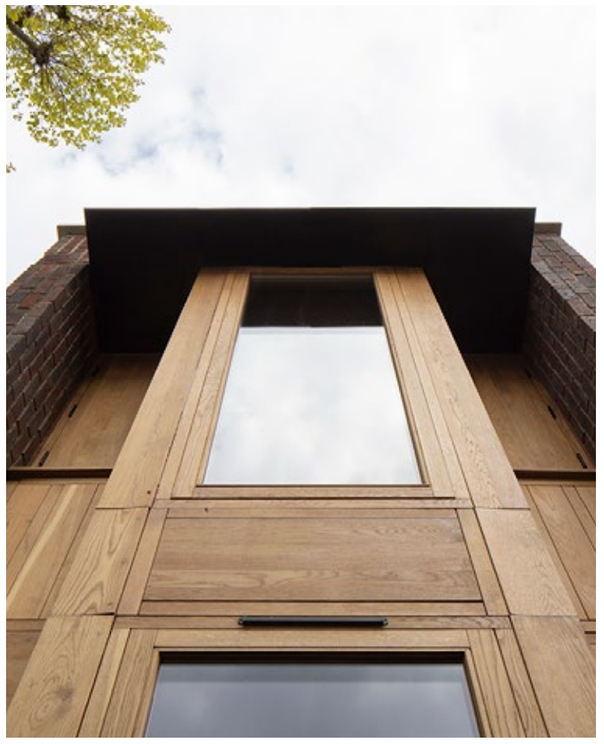
Precedent - Haringey Brick House by Satish Jassal Architects

- Short listed for the RIBA 2015 London Design Awards
- Short listed for the AJ Small Projects 2016 Awards
- Highly commended at the LABC 2016 Awards
- Short listed for the BDA Brick Awards 2019



Precedent - Southwark Brick House by Satish Jassal Architects

- Winner of RIBA London awards 2023
- Winner for Housing at the Surface Design Awards 2023
- Short listed for the exteriors at the Surface Design Awards 2023
- Short listed for the BDA Brick Awards 2022



Proposed view 1

This view shows the proposed and existing street view looking North West from Berkeley Avenue.

Proposed view

Existing view

Proposed view 2

This view shows the proposed and existing view looking toward the proposed site from the first floor at 1238 Greenford Road.

Proposed view

Existing view