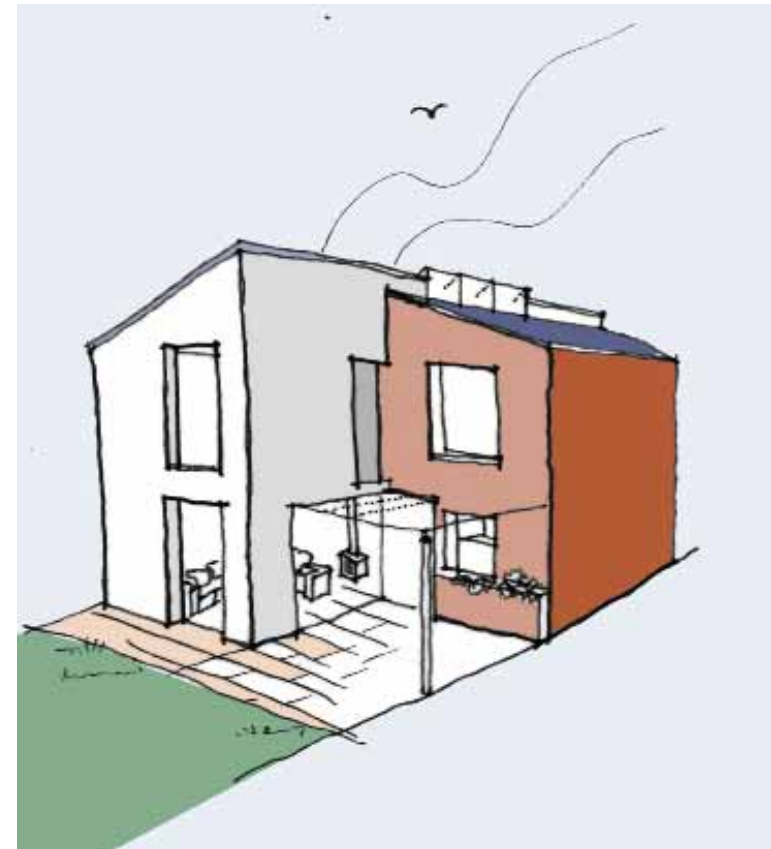


Client: Mr and Mrs Howarth  
Project Ref: 1305/Planning-  
Date: 1st November 2013

## DESIGN AND ACCESS STATEMENT



**New Passiv Haus Dwelling to 40 Alexandra Road, Heaton Moor Stockport SK4 2QE**

Client

Mr and Mrs Howarth  
No 2 Warwick Road  
Heaton Moor  
Stockport  
SK4 4NQ

Architect

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**CONTENTS**

	page
Design Context - Design Approach	2
Evaluation:-	2
- Amount	
- Layout	
Site context	3
Site Analysis, Flood risk and Contamination	4-5
Planning History - neighbours	6
Historical Maps	7
Figure ground diagram	
Pre Planning Consultation	9
Streetscape	
Design Evaluation	11
Access - Inclusive Design	11
Energy Statement	11
Passiv Haus Principles	12-13
Precedents, concept sketches and renders	14-15
PHPP calculation, U values and Construction detail	16-17

# 2

## DESIGN APPROACH

The project is to develop the site of an existing detached property (40 Alexandra Road, Heaton Moor), by constructing a new dwelling adjacent to the existing house. The existing garage to the side of the property is to be demolished and the land at the side property utilized for the new dwelling.

The proposal is to build a Passiv Haus (the principles of which are described on page 12). The Passiv Haus objective is to maximise the efficiency of the building fabric and utilizing heat recovery systems, heat the house by primarily passive measures. This requires the fabric of the building to be designed to the maximum energy efficiency and for the dwelling to utilize solar gains through south facing fenestration and internal heat gains.

The new detached dwelling is to comprise 3 bedrooms, an open plan kitchen dining and living room (facing the garden) and a further reception room that can be used as a bedroom in the future as required.

## EVALUATION

### AMOUNT

The accommodation, over 2 storeys, has a gross internal floor area of 136m<sup>2</sup>.

### ACCOMMODATION

Ground Floor  
Open plan kitchen/dining /living room  
Utility room  
Shower room/WC  
Study (large enough to become a double bedroom)

First Floor



2 double/twin bedrooms

Master bedroom with en suite shower room

Main family bathroom with separate shower and bath

### LAYOUT

The site has an east westerly orientation, with a large garden facing the west. The proposals are to locate an open plan kitchen/dining /living room to the west side of the dwelling in an L shaped configuration to afford a proportion of south facing glazing and maximise passive solar gain.

The proposal also orientates a large degree of south facing roof for solar thermal panels to provide hot water for the dwelling and potential for a solar PV array.

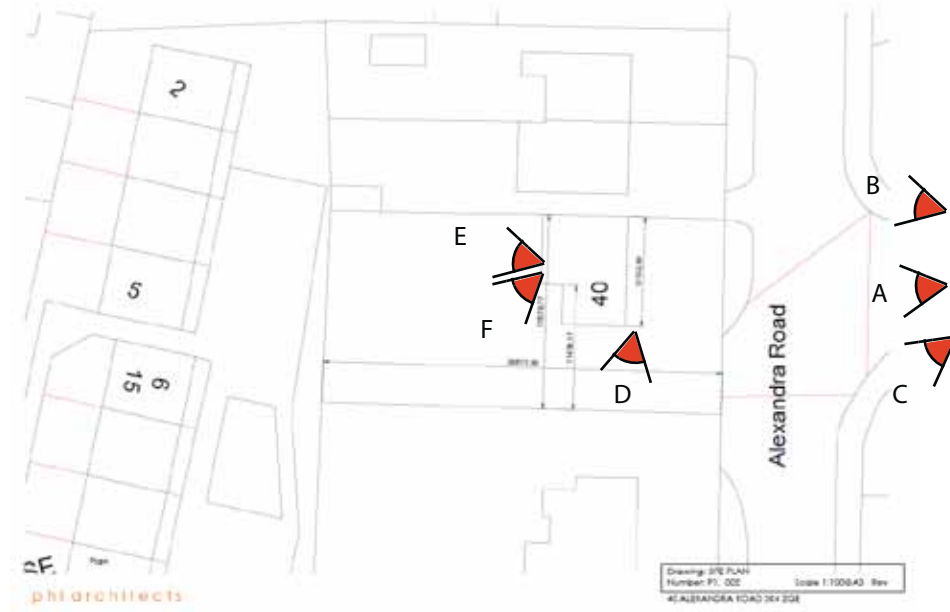
SITE CONTEXT



View A towards site from Pendennis Road



View B above, view C below



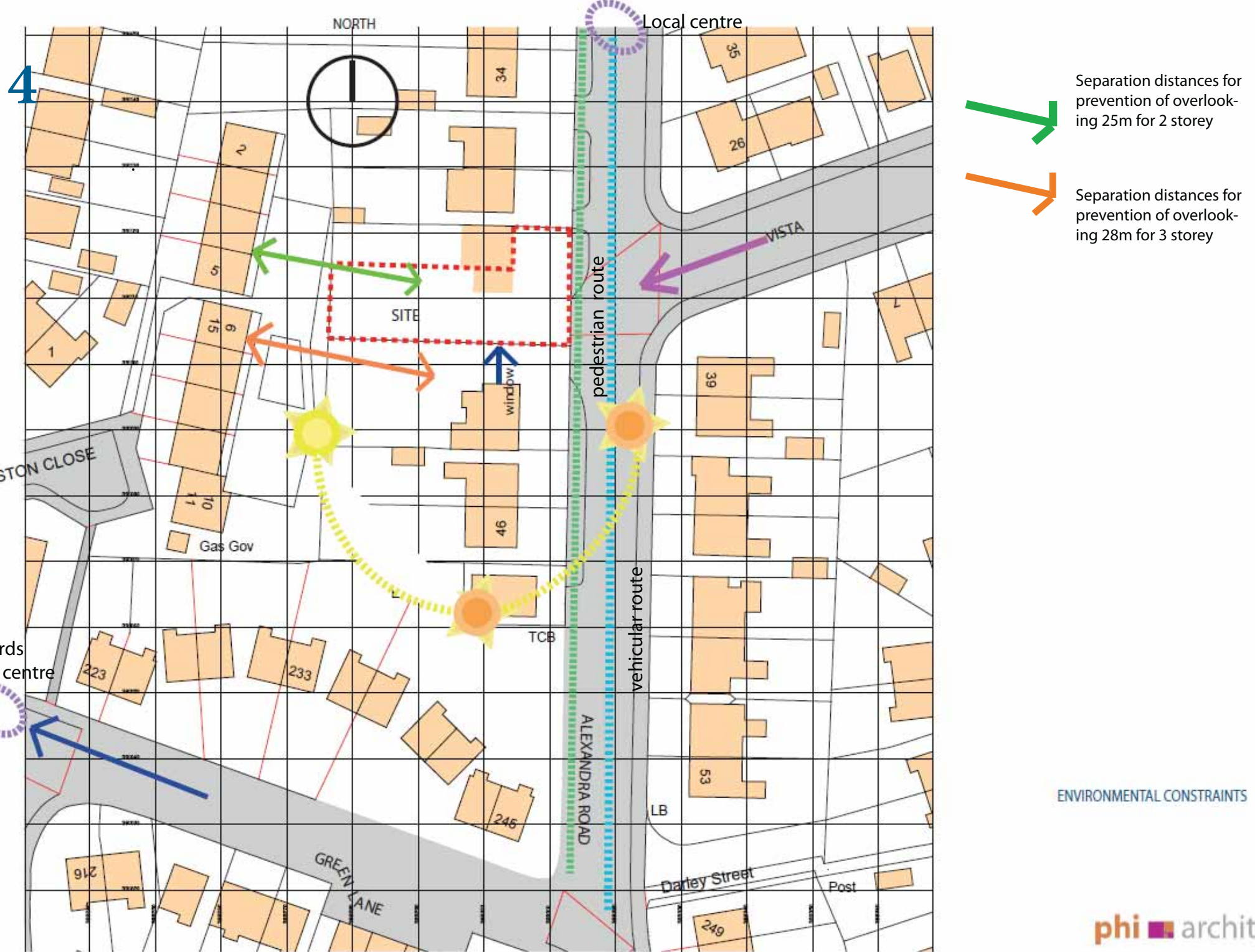
View D towards number 42 Alexandra Rd

View F 3 storey flats to rear



View E towards 2 storey sheltered housing





Separation distances for prevention of overlooking 25m for 2 storey

Separation distances for prevention of overlooking 28m for 3 storey

ENVIRONMENTAL CONSTRAINTS

## SITE ANALYSIS AND ENVIRONMENTAL ISSUES

site of new dwelling



The site is situated on a minor residential road. Although this road acts as one of the primary routes through Heaton Moor to the A6, it is a relatively quiet road.

To the rear of the property are 2 and 3 storey dwellings to Garston Close. The separation distances have been considered for this development and do not impact on the proposals.

A side window to number 42 overlooks the southern elevation of number 40.

The Strategic Housing Land Availability Assessment (SHLAA) as set down in Planning Policy Statement 3: Housing (PPS3) which identifies specific sites with potential for housing and assesses their housing potential (in terms of number of dwellings).

This site is highlighted on the SHLAA map and scores 64 for accessibility, which demonstrates its suitability for a new dwelling in this location.

### CONTAMINATION REPORT

An Environmental Search was conducted as part of the conveyancing for the property prepared by Argyll Environmental (17.04.12). The report states that the site is in an area affected by radon, but reports that no radon protective measures are necessary. Also the report states that the property would not be designated "contaminated land" within the meaning of Part IIA of the Environmental Protection Act.

### FLOOD RISK

The Envirosearch states that the site is within 50m of potential flooding.

As indicated on the Environment Agency's flood risk map, the site does not lie in an area at risk of flooding (see opposite)

# 6

## PLANNING HISTORY - NEIGHBOURING PROPERTY

42 Alexandra Road has a bedroom to the front elevation with an additional window in the north elevation facing the land to the side of no 40 Alexandra Road. Consultation with the duty planning officer (June 2013) concluded that the weight this window carries depends upon whether it was an 'original window'. The original house is circa 1930 and a planning search shows the following previous planning applications for the property:-

Planning Approval ref: J/19181 - 03/1980 - Granted permission for a flat roof rear extension. The plans show a previous extension to the side with a flat roof. This would have been a later addition to the house and comprised a garage at ground floor with a bedroom above. It appears from these plans that this flat roof side extension was not original. (see photos).

DC013679 Rear extension and pitched roof - Granted 05/12/2003



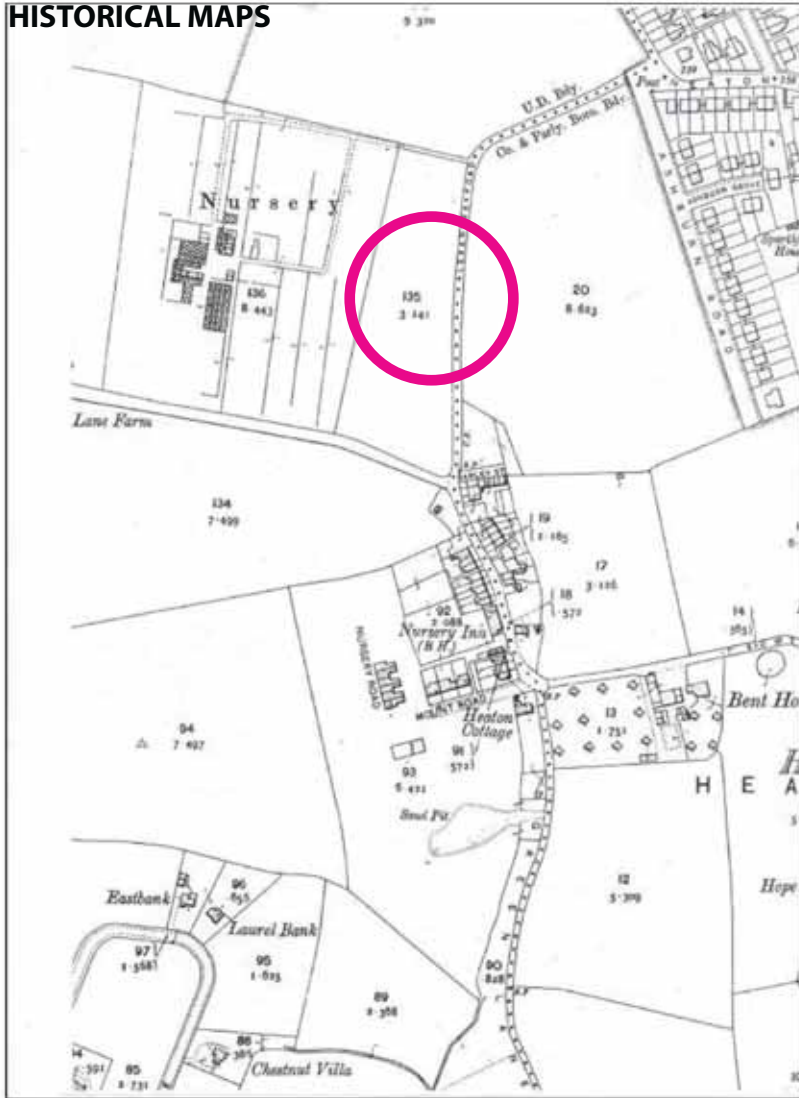
Planning Approval ref: J/19181 - 03/1980



DC013679 Rear extension and pitched roof



HISTORICAL MAPS



3. Ordnance Survey Map 1907, Survey revised 1904



4. Ordnance Survey Map 1934

NORTH



DRAWING NUMBER 1305/P1.011 FIGURE-GROUND DIAGRAM  
NEW DWELLING - 40A ALEXANDRA ROAD, STOCKPORT SK4 2QE

## DESIGN DEVELOPMENT AND PRE PLANNING CONSULTATION

A number of options have been developed and discussed with the client for the layout of the dwelling. The principle of the L shaped living, kitchen and dining room is a fundamental relationship shaping the design of the whole dwelling. A double height space over the main circulation area, with natural daylighting from a rooflight is also important and the entrance hall/arrival space with views through the dwelling to the garden are the main principles of the design. The staircase is a feature, an open free-standing form with natural daylight from a rooflight and a tall first floor window providing good daylighting from the street (east elevation).

Plans were submitted to the planners in a Pre Application Discussion Form. The following comments were received from the Council's Design Officer:-

- *I am generally fairly comfortable with the principle of the subdivision of the plot as I view that it will have limited impact on the established urban grain.*
- *I am also comfortable with the principle of the proposed dwelling being of a contemporary design in this context.*
- *The front building line reflects the common building line to Alexandra Rd, and a two storey dwelling is proposed, which is reflective of the surrounding context.*
- *However the building is a little too tight to either side boundaries (in terms of visual spacing between dwellings), with an uncharacteristically wide frontage building frontage, so it would sit more comfortably within the street-scene if the proposed building was narrowed slightly.*
- *I note that there is a window in the side elevation of the neighbouring dwelling at 1st floor level. However given its positioning I would assume that it is a secondary window, and it also appears to not be an original window as it is located in what appears to be an extension of the original house. I therefore raise no concerns in terms of the relationship of the proposed development to neighbours.*
- *In terms of the form and appearance of the dwelling, it will be important for the front garden/driveway area and boundaries to be carefully considered to ensure they harmonise with their surroundings, and for the roof's eaves and ridge level to*

*relate to those existing within the street-scene. I would also encourage the use of a palette of materials that complements materials characteristic of the surrounding area.*

In response to these comments, further supporting evidence was submitted to the Planning Officer, Catherine Hodgson. The advice returned was to submit a full plans application.

## DESIGN EVALUATION

The surrounding streetscape has been analysed and the proposed design is not an 'uncharacteristically wide' frontage. A number of properties along Alexandra Road have been extended to the maximum width of the plot. The following plans illustrate this:-

Figure ground diagram 1305 P1.011  
Streetscape Analysis 1305 P1.010

The first diagram illustrates the site, which sits in the existing 'gap' in the urban grain. The streetscape analysis drawings and photos show the existing and proposed street elevations. The new property sits comfortably with its neighbours, the garage adjacent to the boundary at number 42, creates adequate separation between the 2 storey dwellings. The proposed new dwelling reinforces the urban density of the existing street. Photos of other properties along the street are included illustrating where extensions fill the gaps between the semi-detached houses, widening the house frontages.

In order to articulate the street elevation, a split ridge to the roof is proposed to create a vertical proportion to the elevation and to create sufficient area of south facing roof to accommodate the solar panels. The design of the interlocking ridges and rooflight is illustrated on the rendered 3d drawings submitted.



VIEW TOWARDS SUB STATION

VIEW FROM PENDENNIS ROAD



EXTENDED DWELLINGS ON EAST SIDE OF ALEXANDRA ROAD

DRAWING NUMBER 1305/P1.010 STREET SCAPE ANALYSIS  
 NEW DWELLING - 40A ALEXANDRA ROAD, STOCKPORT SK4 2QE

## DESIGN EVALUATION (CONT.)

### SCALE AND MASSING

The building is set in line with number 40, although there is a step forward in the building line at number 42. As recommended by the Council's Design Officer, the ridgeline relates to the neighbouring properties and eaves are a similar height. The floor level is set slightly lower than neighbouring properties in order to provide a level access to the dwelling.



Example of render and dark grey windows in Dalton Grove, Heaton Moor

### MATERIALS

The design approach is to create a modern dwelling reflecting the exemplary sustainable approach and using Modern Methods of Construction for construction. Timber SIPS (structurally insulated) panels are proposed and this lightweight structure is overlaid by insulated render cladding and metal standing seam cladding to the entrance porch. Render is used on the majority of dwellings in the area. Brickwork was not considered in this instance as a 'lightweight' construction is more sustainable (lightweight construction using less materials for foundations and timber being a sustainable building material). An example of a rendered house with dark grey aluminium windows is found on Dalton Grove.

Windows are proposed to be framed in dark grey aluminium faced uPVC to obtain the best U values. A dark blue/grey lightweight artificial slate is proposed for the roof material, which is in keeping with other properties in the wider area.

### ACCESS - INCLUSIVE DESIGN

The dwelling has been designed along the guidelines for Lifetime Homes in respect of flexibility and adaptability over the lifetime of the occupants.

- Level access

The houses along the street have a raised entrance (+435mm at no 40), with steps up to the main door. The floor level of the new dwelling will be set approximately 140mm lower than the adjacent dwelling in order to provide a level access. The footpath from back of pavement will be less than 1:20 to the entrance door.

- Car parking

2 spaces are allowed for in accordance with Planning Policy (maximum 2 spaces for new dwellings). Alternatively this could be one disabled parking space with a transfer space.

- Potential for entrance level bedspace

A ground floor study/reception has been designed to be adapted to a double bedroom should this be required in the future.

- Accessible WC

An entrance level WC to meet part M is provided. A shower is also provided which could make the ground floor self contained by utilizing the study as a bedroom

- Low cill levels

max +600mm to ground floor living areas

- Open plan

wheelchair accessible ground floor layout

### ENERGY STATEMENT

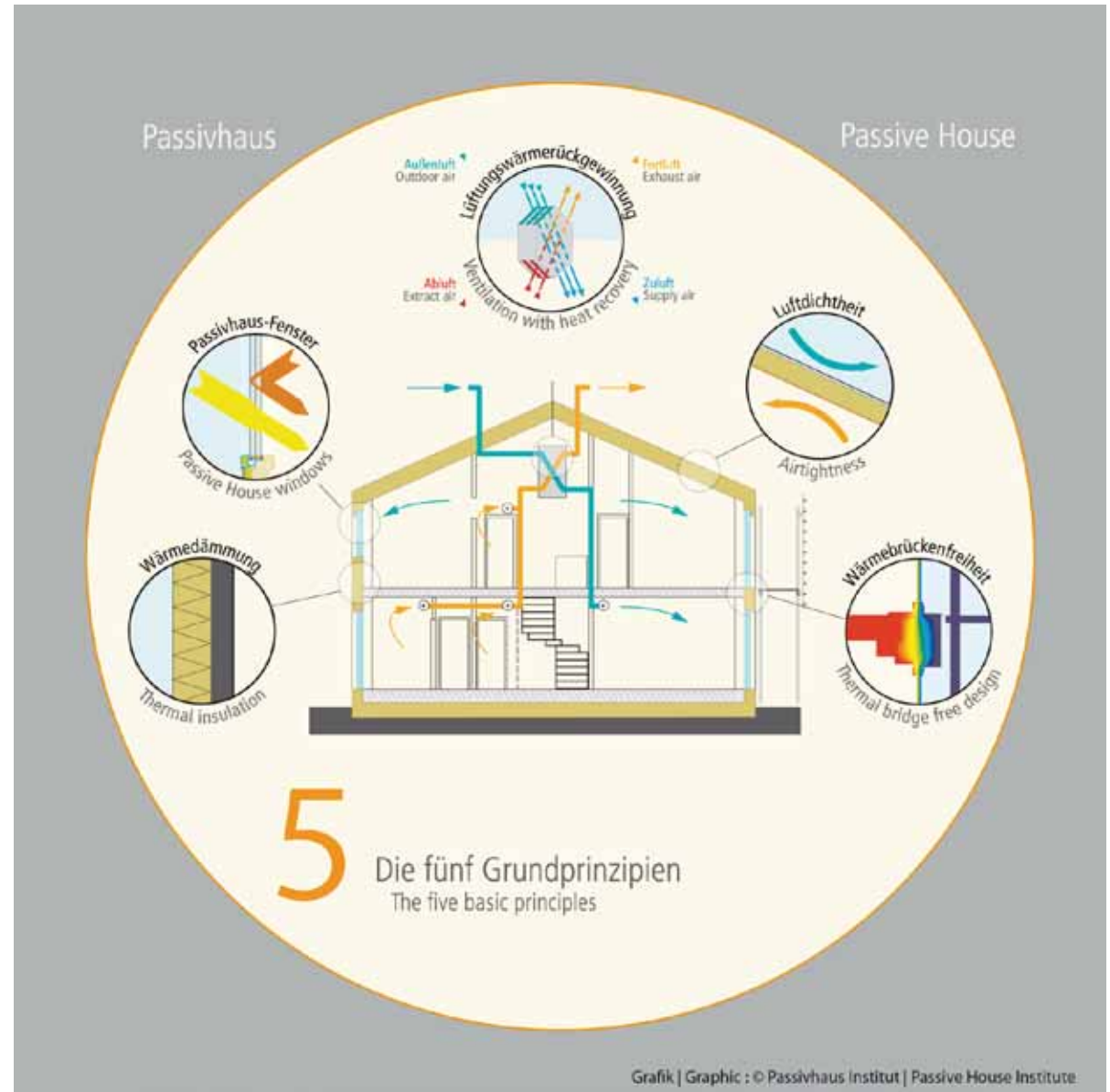
The Energy Statement as required by Development Management Policy SD - 3 is attached see Appendix A.

# 12

## PASSIV HAUS PRINCIPLES

The proposal for a new dwelling on this site is for a dwelling certified to Passiv Haus principles.

- Annual heat requirement  $\leq 15$  kWh/m<sup>2</sup>/year
- Primary Energy  $\leq 120$  kWh/m<sup>2</sup>/year
- Fabric U values  $\leq 0.15$  W/m<sup>2</sup>/K
- Window u-value  $\leq 0.8$  W/m<sup>2</sup>/K
- Ventilation system with heat recovery with  $\geq 75\%$
- Heating Load  $\leq 10$  W/m<sup>2</sup>
- Thermal Bridge Free Construction  $\leq 0.01$  W/mK
- Airtightness  $\leq 0.6$  ACH @ 50 pascal pressure



**PASSIV HAUS PRINCIPLES**

Energy Balance

A typical Passiv Haus uses only 10% of the energy of a traditional dwelling

The heat losses through the fabric are minimised and the heat gains from solar and incidental (appliances and people) are balanced leaving a very small residual energy demand.

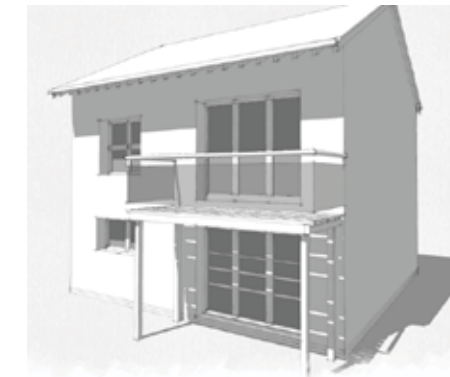
In order to achieve this, not only is the fabric highly efficient but the following are maximized:-

- Building Form and Orientation 1
- Glazing Solar gains and shading 2
- Air tight construction 3
- Thermal Bridge Free construction 4

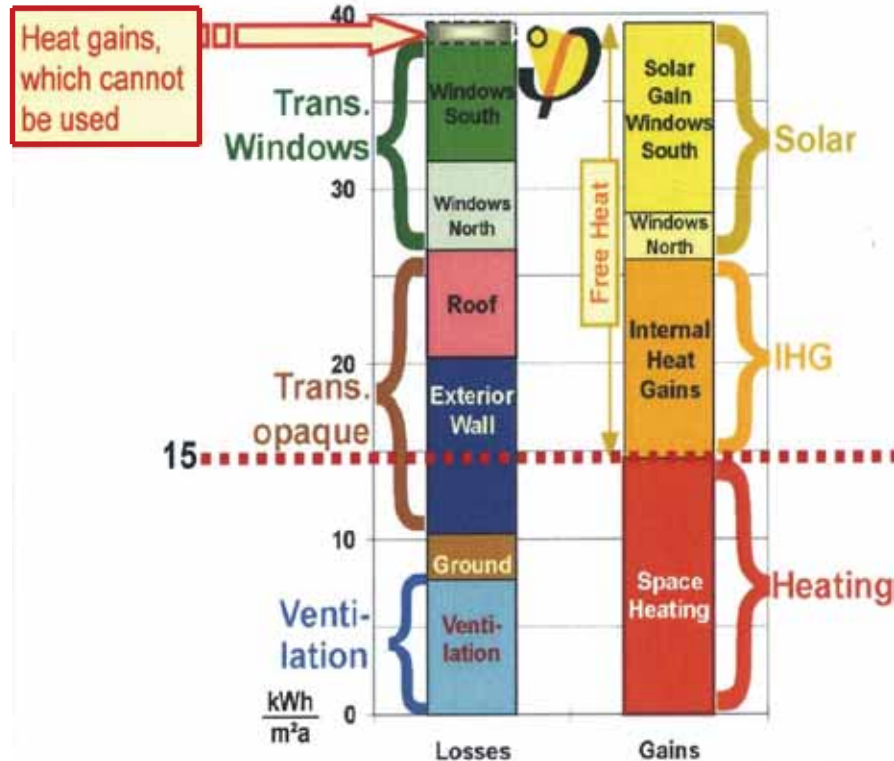
**PASSIV HAUS EXAMPLES**



1 Orientate living spaces to the south on the site



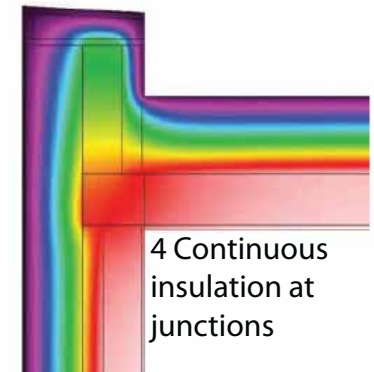
2 Maximise solar gain in winter with south facing windows shaded in summer



Heat gains, which cannot be used



3 Air tight construction using air barriers



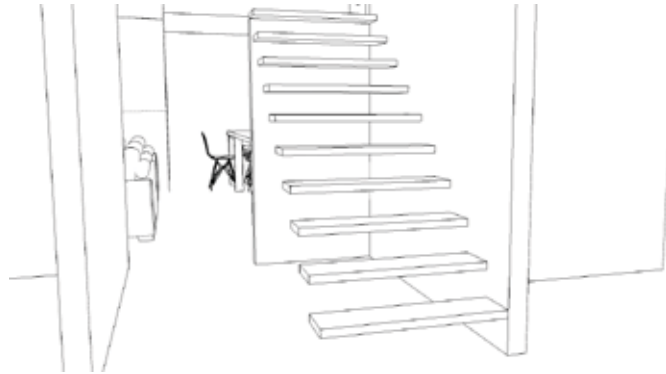
4 Continuous insulation at junctions



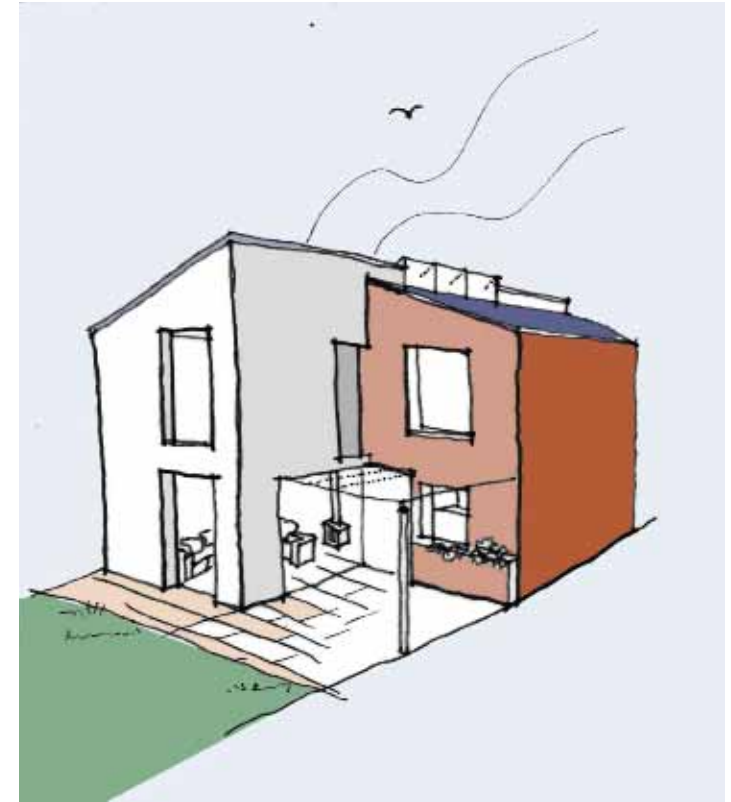
# 14

## PRECEDENTS AND CONCEPT SKETCHES

Examples of interior spaces



Entrance hall sketch



Sketch of the rear of the dwelling showing an L shaped configuration to form a courtyard affording south facing glazing

Street elevation (early sketch)- materials to be self coloured render with blue black eternit slates and dark grey window frames  
Early sketch of streetscape below







Rear View - West Elevation - afternoon sun on courtyard



Axo - showing interlocking roofs and rooflight



Courtyard View



View from living room



View through entrance hall to garden

# Passive House verification



**Building:** 40A  
**Street:** Alexandra Road  
**Postcode / City:** SK4 2QE  
**Country:** UK  
**Building type:** Single detached dwelling  
**Climate:** [UK] - West Pennines (Fairfield) Altitude of building site (in [m] above sea level): 76

**Home owner / Client:** Mr and Mrs Howarth  
**Street:** 2 Warwick Road  
**Postcode/City:** SK4 4NQ

**Architecture:** Phi Architects  
**Street:** 31 Hawthorn Grove  
**Postcode / City:** SK4 4HZ

**Mechanical system:**  
**Street:**  
**Postcode / City:**

**Year of construction:** Interior temperature winter: 20.0 °C Enclosed volume  $V_e$  m<sup>3</sup>:  
**No. of dwelling units:** 1 Interior temperature summer: 25.0 °C Mechanical cooling:  
**No. of occupants:** 3.5 Internal heat sources winter: 2.1 W/m<sup>2</sup>  
**Spec. capacity:** 60 Wh/K per m<sup>2</sup> TFA Ditto summer: 2.6 W/m<sup>2</sup>

Specific building demands with reference to the treated floor area				
	Treated floor area	123.2 m <sup>2</sup>	Requirements	Fulfilled?*
<b>Space heating</b>	Heating demand	19 kWh/(m <sup>2</sup> a)	15 kWh/(m <sup>2</sup> a)	-
	Heating load	10 W/m <sup>2</sup>	10 W/m <sup>2</sup>	yes
<b>Space cooling</b>	Overall specif. space cooling demand	kWh/(m <sup>2</sup> a)	-	-
	Cooling load	W/m <sup>2</sup>	-	-
	Frequency of overheating (> 25 °C)	9.9 %	-	-
<b>Primary energy</b>	Heating, cooling, defumidification, DHW, auxiliary electricity, lighting, electrical appliances	kWh/(m <sup>2</sup> a)	120 kWh/(m <sup>2</sup> a)	-
	DHW, space heating and auxiliary electricity	kWh/(m <sup>2</sup> a)	-	-
	Specific primary energy reduction through solar electricity	kWh/(m <sup>2</sup> a)	-	-
<b>Airtightness</b>	Pressurization test result n <sub>50</sub>	0.6 1/h	0.6 1/h	yes

\* empty field: data missing; '-' no requirement

Passive House?

We confirm that the values given herein have been determined following the PHPP methodology and based on the characteristic values of the building. The PHPP calculations are attached to this application.

Name: \_\_\_\_\_  
 Surname: \_\_\_\_\_  
 Company: \_\_\_\_\_

PHPP Version 8.4  
 Registration number PHPP: \_\_\_\_\_  
 Issued on: \_\_\_\_\_  
 Signature: \_\_\_\_\_

# Passive House planning: U-VALUES OF BUILDING ELEMENTS

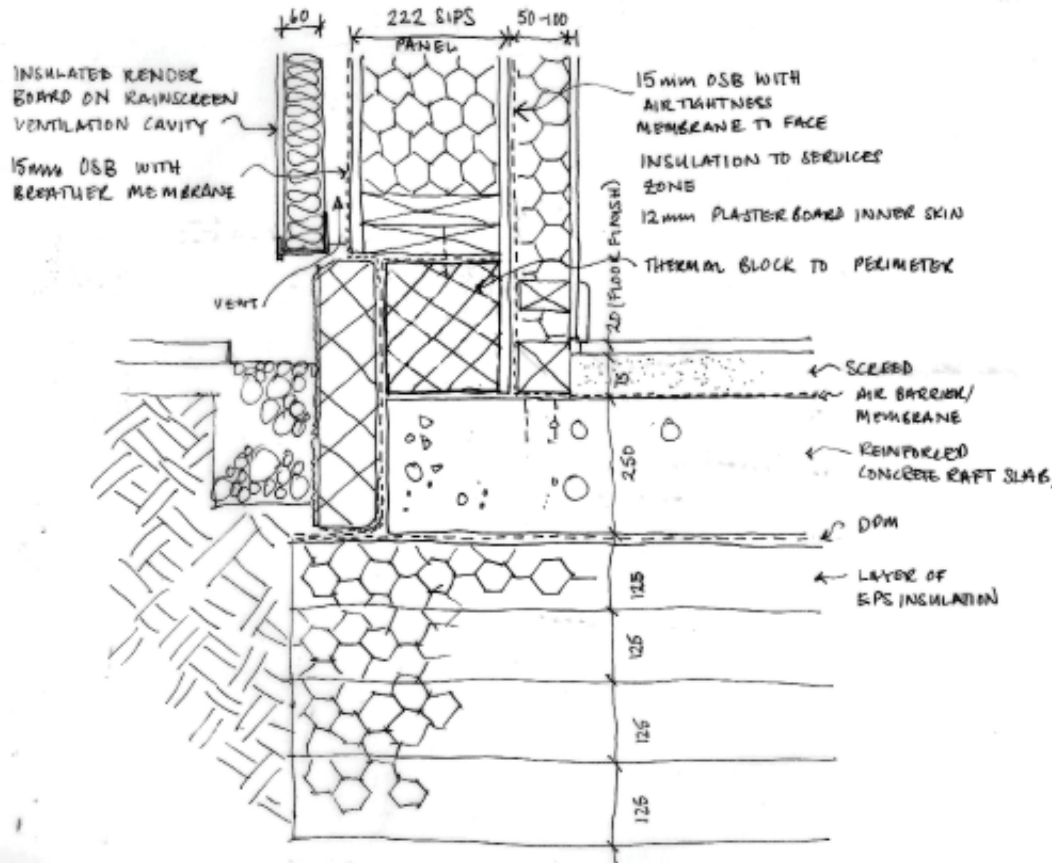
Building: 40A Wedge-shaped building assemblies (tapered insulated unventilated air layers and unheated interior insulation) --> Auxiliary calculation to it

Assembly no.	Building assembly description	Heat transfer resistance (m <sup>2</sup> K/W)				Interior insulation
1	External Wall					
		Interior R <sub>si</sub>		0.13		
		exterior R <sub>se</sub>		0.04		
Area section 1	λ [W/mK]	Area section 2 (optional)	λ [W/mK]	Area section 3 (optional)	λ [W/mK]	Thickness [mm]
1.	plasterboard	0.210				12
2.	Steico flex wood fibre	0.038	Tiaber studs	0.180		50
3.	OSB	0.130				15
4.	Polyurethane	0.026				222
5.	OSB	0.130				15
6.	Favatherm insulation	0.038		Tiaber studs	0.180	75
7.						
8.						
		Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total	
		64%	8.0%	8.0%	38.9	
U-value supplement		W/(m <sup>2</sup> K)		U-Value: 0.085		W/(m <sup>2</sup> K)

Assembly no.	Building assembly description	Heat transfer resistance (m <sup>2</sup> K/W)				Interior insulation
2	Roof					
		Interior R <sub>si</sub>		0.10		
		exterior R <sub>se</sub>		0.04		
Area section 1	λ [W/mK]	Area section 2 (optional)	λ [W/mK]	Area section 3 (optional)	λ [W/mK]	Thickness [mm]
1.	Plasterboard	0.210				12
2.	Steico flex wood fibre	0.038	Tiaber studs	0.180		50
3.	OSB	0.130				15
4.	PCB	0.026				222
5.	OSB	0.130				15
6.	Favatherm	0.038		Tiaber studs	0.180	60
7.						
8.						
		Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total	
		64%	8.0%	8.0%	37.4	
U-value supplement		W/(m <sup>2</sup> K)		U-Value: 0.088		W/(m <sup>2</sup> K)

Assembly no.	Building assembly description	Heat transfer resistance (m <sup>2</sup> K/W)				Interior insulation
3	Ground floor slab					
		Interior R <sub>si</sub>		0.17		
		exterior R <sub>se</sub>		0.00		
Area section 1	λ [W/mK]	Area section 2 (optional)	λ [W/mK]	Area section 3 (optional)	λ [W/mK]	Thickness [mm]
1.	Screed	1.400				65
2.	reinforced concrete	2.100				250
3.	insulation	0.040				300
4.						
5.						
6.						
7.						
8.						
		Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total	
		100%			61.5	
U-value supplement		W/(m <sup>2</sup> K)		U-Value: 0.128		W/(m <sup>2</sup> K)

## TYPICAL FLOOR / WALL JUNCTION



## SPECIFICATION - Main Elements of Thermal Envelope 17

### Ground Floor

Extruded polystyrene insulation below reinforced concrete raft ground bearing slab with screed and floor finishes.  
Air tightness layer to be a membrane on top of slab

### Walls

SIPs panels - maximum thickness approx 222mm with 15mm OSB to each face. Internal insulation to provide service layer.  
Air tight layer to be fixed to face of OSB internal layer.  
Externally an insulated render system on a rainscreen cavity

### Roof

SIPs panels to match walls. Glulam beams as required at ridge and internal supports.  
Roof finish to be Eternit artificial slate on battens and counter battens with additional layers of insulation over SIPs panels and on inside behind plasterboard layer.

### Windows

Triple glazed Internorm frames - either timber or uPVC internal frame faced with aluminium profile to external face.  
Ug to be approximately 0.6W/m<sup>2</sup>K  
g value to be approx 0.6 for south facing glass (or 0.50)