



BROWN FISHER
ENVIRONMENTAL
REPORTS 4 PLANNING

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FLOOD RISK ASSESSMENT

White House
Chywoone Hill
Newlyn
Cornwall

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ABBREVIATIONS

AEP	Annual Exceedance Probability
EA	Environment Agency
FEH	Flood Estimation Handbook
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
m AOD	Metres Above Ordnance Datum
NPPF	National Planning Policy Framework
SFRA	Strategic Flood Risk Assessment

1 SUMMARY

1.1 Purpose

This flood risk assessment is intended to accompany a retrospective planning application to cover the recent extension and alteration works including provision of an additional storey and proposed use of site as a self-contained dwelling at White House, Chywoone Hill, Newlyn, TR18 5AR ("The Site").

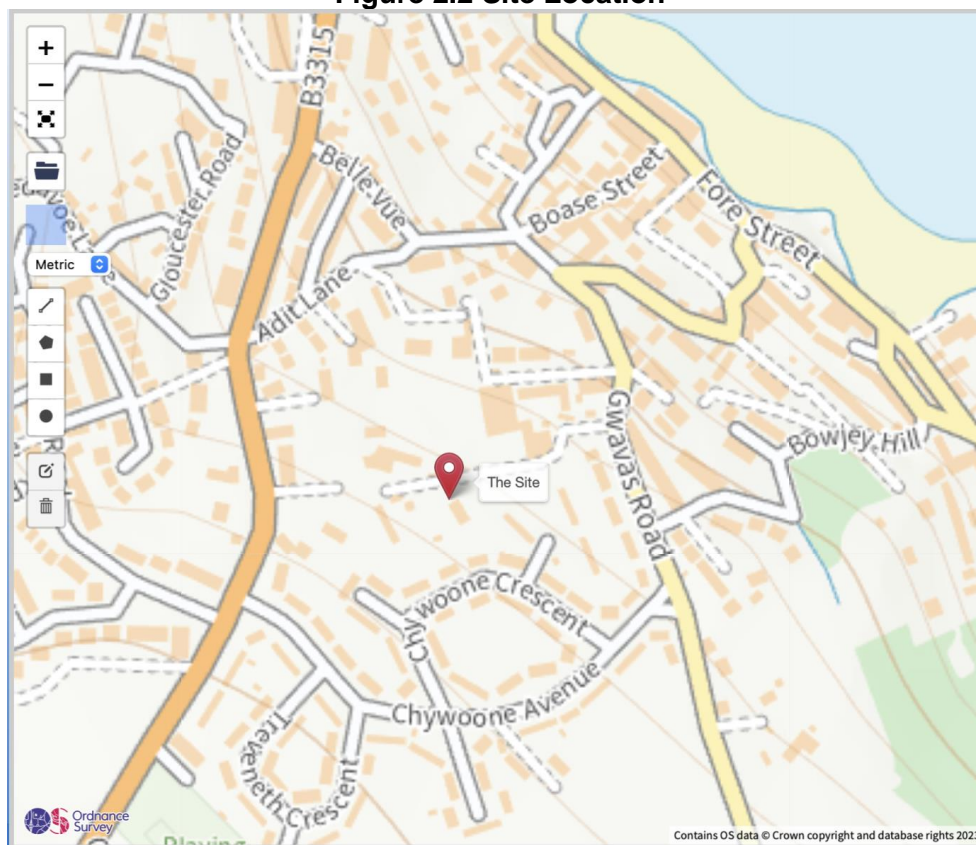
1.2 Overview

Site characteristics					
Location	White House, Chywoone Hill, Newlyn, TR18 5AR				
NGR	SW 46205 28263 146205,028263	Approx. Size (m²)	-	Existing land use status	Residential
Development proposal	Extension and alteration works including provision of an additional storey and proposed use of site as a self-contained dwelling.				

Flooding issues						
Source of flooding	Flood risk				Comments	Further investigation required?
	Very Low	Low	Medium	High		
Rivers	✓				The development site is in Flood Zone 1 and has a very low risk of fluvial flooding	No
Sea	✓				The site is unaffected by current or predicted future tidal levels	No
Surface water	✓				There is no mapped surface water flood risk at the site or in the surrounding area	No
Groundwater		✓			The site is underlain by a secondary aquifer, and groundwater quantities are likely to be low	No
Artificial sources		✓			The site is not within a mapped risk of reservoir failure. No other significant sources have been identified	No

Other Issues	
Drainage	The site is in a Critical Drainage Area. There will be an increase in drained area in the proposed development but a soakaway now avoids any discharge into the drainage system.
Mitigation	As the risk of flooding from all sources is low no specific mitigation is required. No surface water should be discharged into the drainage system
Safe Access	Access should remain flood-free to the site.

Figure 2.2 Site Location



2.2 The Site

The site is within a residential area and is occupied by existing buildings. It is at an approximate elevation of 75 metres AOD and lies on sloping ground which falls to the coast approximately 320 metres to the northwest.

The Newlyn Coombe River lies 720 metres to the north of the site and a flooded quarry is approximately 650 metres to the south-east.

Both these water features are at a lower elevation than the site.

There are no other nearby watercourses.

2.2.1 Geology

The site is underlain by the Mylor Slate Formation, a metamorphosed siltstone, with no superficial deposits recorded at this location¹.

The soils are described as “freely draining loamy soils”².

The bedrock is classified as a Secondary A aquifer (permeable layers that can support local water supplies and may form an important source of base flow to rivers).

The site is not in a source protection zone.

¹ BGS Geology of Britain viewer, <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

² Soilscales online soils viewer, Cranfield University, <http://www.landis.org.uk/soilscales>

2.2.2 Existing runoff

The site is already developed. It is understood from the client that previously the roof drainage was to sewer.

The pre-existing discharge rate has been estimated in accordance with the Modified Rational Method, the peak existing run-off from the site is calculated from the formula:

$$Q = 3.61 \times C_v \times A \times i$$

where C_v is the volumetric runoff coefficient, A is the effective drainage area in hectares and i is the peak rainfall intensity in mm/hr. The calculation has been made for the building area which is 52.95 m² (0.005295 Ha). As the Site is small a critical duration of 30 minutes has been estimated, and rainfall intensities for this duration have been obtained from the Flood Estimation Handbook 2013 rainfall analysis for the location (Appendix 2).

For the peak 1 in 1 year return period storm event, this gives the existing discharge rates from the site as:

$$Q_1 = 3.61 \times 0.75 \times 0.0053 \times 17.6 = \mathbf{0.3 \text{ litres/sec}}$$

and, for the peak 1 in 100 year return period storm event, this gives an existing discharge rate from the site of:

$$Q_{100} = 3.61 \times 0.75 \times 0.0053 \times 76.0 = \mathbf{1.1 \text{ litres/sec}}$$

2.2.3 Flood Defences

There are no Environment Agency Flood Defences (walls or embankments) protecting this site.

3 PLANNING POLICY

3.1 National Flood Policy

National policy on planning and flood risk is provided by the National Planning Policy Framework (NPPF) and supplementary guidance.

Residential development is classified in technical guidance to the NPPF as “more vulnerable”.

Flood risk has been mapped nationally by the Environment Agency to show the flood zones used in the NPPF. Figure 3.1 shows the site is in planning flood zone 1 which is defined as Low risk and has an annual exceedance probability³ (AEP) less than 0.1%.

These estimated flood risks cover only flooding from main rivers and the sea, not from other flood sources. These other sources are considered in subsequent sections of this report.

Figure 3.1 Planning flood zones



More vulnerable development, such as is proposed at the site, is considered by the NPPF as acceptable in flood zone 1 and is not subject to the sequential and exception tests.

The site has been identified by the Environment Agency as being within a Critical Drainage Area. In these areas the drainage of surface water requires extra consideration to prevent flooding from the drainage system downstream of the site.

³ The annual exceedance probability is the risk of flooding within any one year. An AEP of 1% indicates an annual risk of flooding of 1%, or more loosely a 100-year return period.

3.2 Strategic Flood Risk Assessment

The Strategic Flood Risk Assessment (SFRA)⁴ provides more detailed information on local sources of flooding, historical incidence of flooding and policy requirements to minimise flood risk impacts. The SFRA is supported by an interactive map⁵ and has been used in compiling this assessment.

⁴ Cornwall Council Local Development Framework. Strategic Flood Risk Assessment Level 1 November 2009

⁵ <https://map.cornwall.gov.uk/website/ccmap/>

4 DEFINITION OF FLOOD HAZARD

4.1 Historical records

Environment Agency hold no historic records of flooding in the area.

4.2 Sources of flooding

4.2.1 Flooding from Rivers and the Sea

The flood risk arising from rivers and the sea is mapped nationally by the Environment Agency, and the extent of the modelled flood outline is shown in

Figure 4.1. This shows the site is within an area with a very low risk of flooding, meaning an AEP of less than 0.1%.

Figure 4.1 Flood Risk from Rivers and Sea



Extent of flooding from rivers or the sea



4.2.2 Surface water flooding

A map of modelled surface water flooding is also available online and is reproduced in Figure 4.2. The risk of flooding from surface water at the site and surrounding area is very low (annual flood risk less than 0.1%).

Surface water is therefore not a significant source of flood risk at the site.

Figure 4.2 Flood Risk from Surface Water



4.2.3 Groundwater flooding

The area is shown as being susceptible to groundwater flooding on the Cornwall Council interactive map. However, this is applied as a blanket category to most of Cornwall on the map and is clearly not a result of detailed investigation. In addition, the SFRA states “Due to its geology Cornwall has only minor aquifers and generally does not experience much groundwater type flooding”.

The underlying bedrock holds limited volumes of groundwater and the site is in a sloping area leading to the sea and it is concluded that the site is not particularly susceptible to groundwater flooding and it is likely to be a low risk on the site.

4.2.4 Catastrophic flooding

This source includes release of large volumes of stored water, such as in reservoirs and canals, due to catastrophic failure. The site is not mapped as being at risk of potential reservoir failure and there are no canals in the area so the risk of flooding from a canal breach is negligible.

There are no other known large volumes of stored water above the site.

The risk of catastrophic flooding at the site is therefore low.

4.3 Flood Hazard at the Site

The above review has indicated that the site is a low risk of flooding from all sources considered. The only issue of concern is the general risk of flooding in the area from the inadequate drainage system and the potential for development to increase this risk or perhaps provide opportunities for betterment.

5 FLOOD RISK MANAGEMENT MEASURES

5.1 Mitigation

As the risk of flooding from all sources is low there are no specific flood mitigation measures needed at the site.

5.2 Safe Access and Egress

Dry access to the site should remain feasible during the 1% surface water and fluvial floods.

5.3 Runoff

The extension of the existing building will generate runoff which will have to be managed to avoid creating a flood risk to nearby property. In addition, any opportunity to reduce runoff from the site should be investigated to reduce the potential for flooding from the drainage system, as identified in the Critical Drainage Area designation.

Prior to the development the roof drainage from the property was taken to sewer. As no increase to the drainage system is likely to be permitted, drainage from the re-developed, enlarged property should not be to the drainage system.

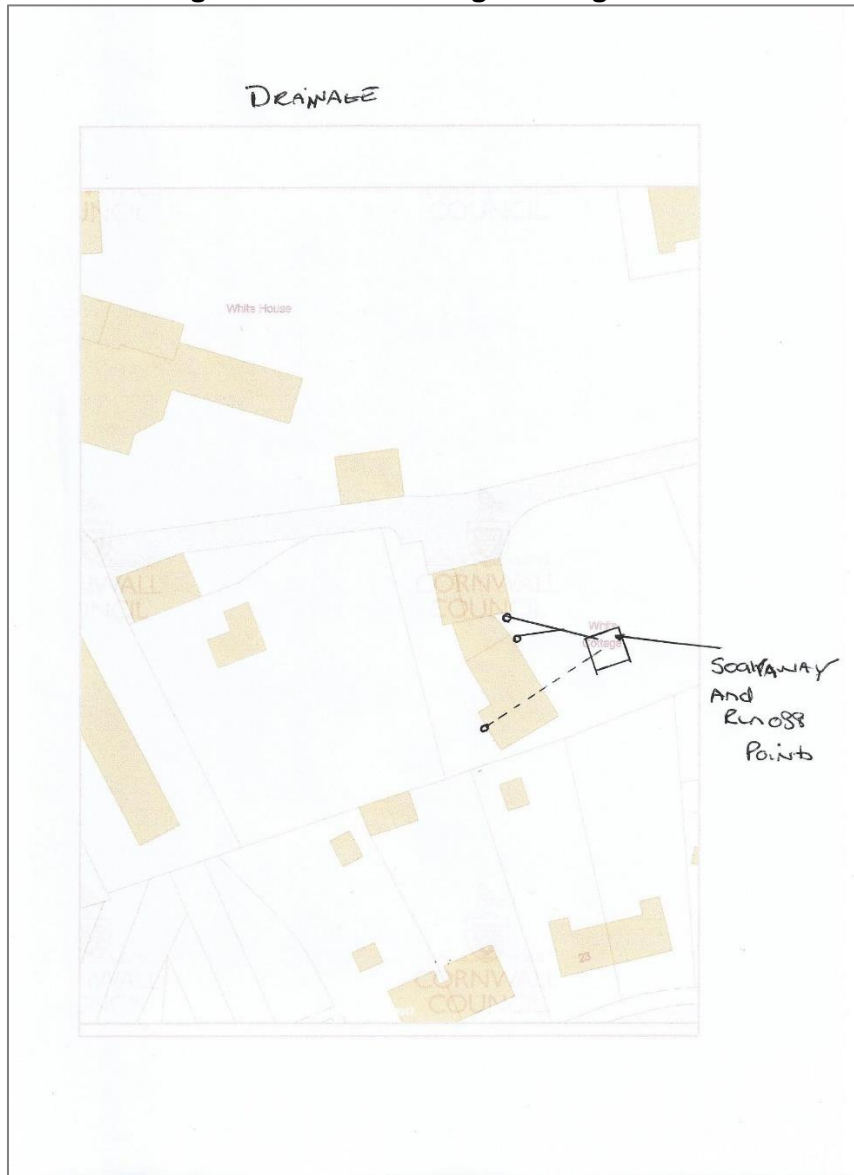
The potential to discharge to ground appears to be high as the soils are classed as freely draining and it is understood that drainage from the development has been taken to a new soakaway within the curtilage of the property but more than 5 metres away from a building, as shown in Figure 5.1.

The discharge from the site has therefore been reduced from the rates estimated in Section 2.2.2 (1.1 l/s for a 1 in 100 year 30 minute event) to 0.0 l/s. The new discharge rate will remain 0.0 l/s regardless of climate change and therefore represents a significant betterment within the Critical Discharge Area.

5.4 Off-site impacts on flood risk

As there is very low risk of flooding from fluvial and surface water sources the proposed building will not occupy flood storage volume or interfere with surface water or fluvial flow paths. With adequate management of runoff from the proposed building there will be no flood risk impacts arising from the proposed development.

Figure 5.1 New Drainage Arrangements



6 CONCLUSIONS

- Extension and alteration works including provision of an additional storey and proposed use of site as a self-contained dwelling has been undertaken at White House, Chywoone Hill, Newlyn.
- The site is in flood zone 1 and has a low or very low risk of flooding from all sources considered.
- Dry access to the site should remain feasible during the 1% surface water and fluvial floods.
- There is no mapped risk of surface water flooding, but the site is in an identified Critical Drainage Area.
- No specific flood mitigation measures are required for the property but all surface water drainage should be to ground to avoid any discharge into the formal drainage system.
- It is understood that roof drainage from the properties was previously to sewer. This has been replaced by a drainage system taking roof drainage to a new soakaway.
- There is no discharge of surface water from the site. This represents a reduction in discharge to sewer within the Critical Drainage Area estimated at 1.1 l/s in a 1 in 100 year 30 minute rainfall event.
- There are no other flood risk impacts arising from the proposed development.

7 REPORT LIMITATIONS

This report has been prepared with all reasonable skill, care and diligence. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources.

The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned.

Information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data with respect to site conditions. Should additional information become available which may influence the opinion expressed in this report, the right to review such information and, if warranted, to alter the opinions accordingly is reserved.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed.

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices at this time and as such do not guarantee that the sites are free of hazardous conditions.

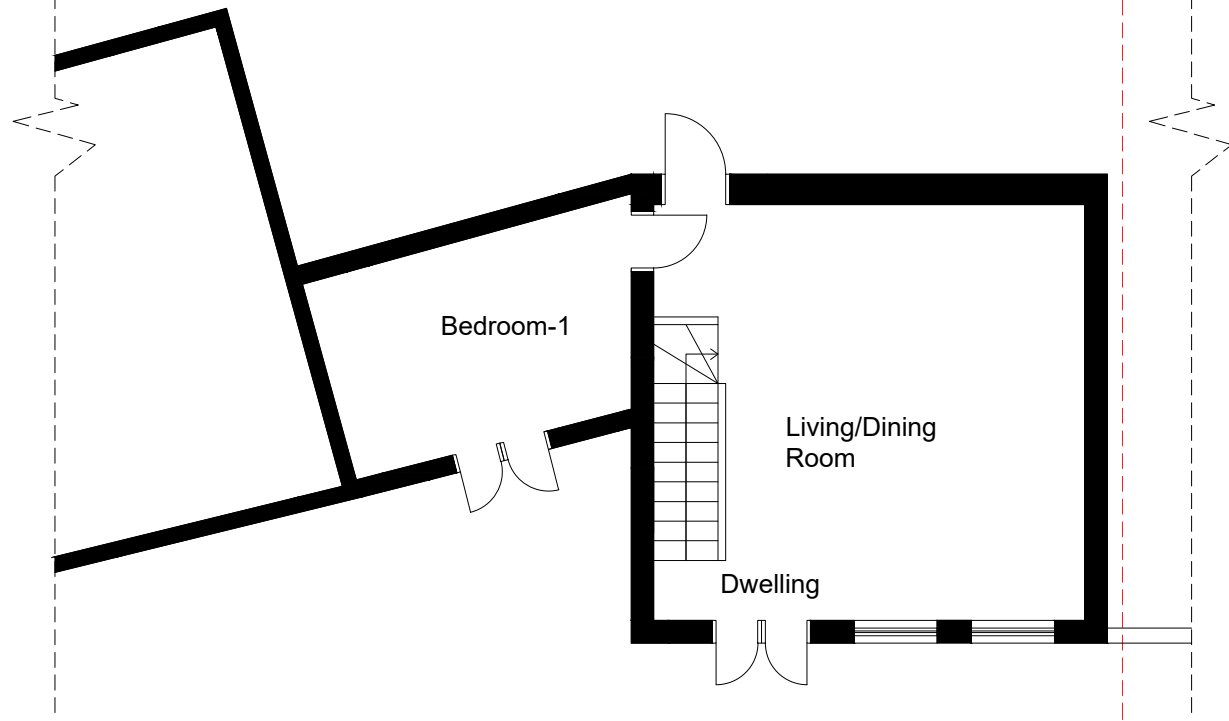
This report has been prepared solely for the use of the named client and may not be relied upon by other parties without written consent.

8 APPENDICES

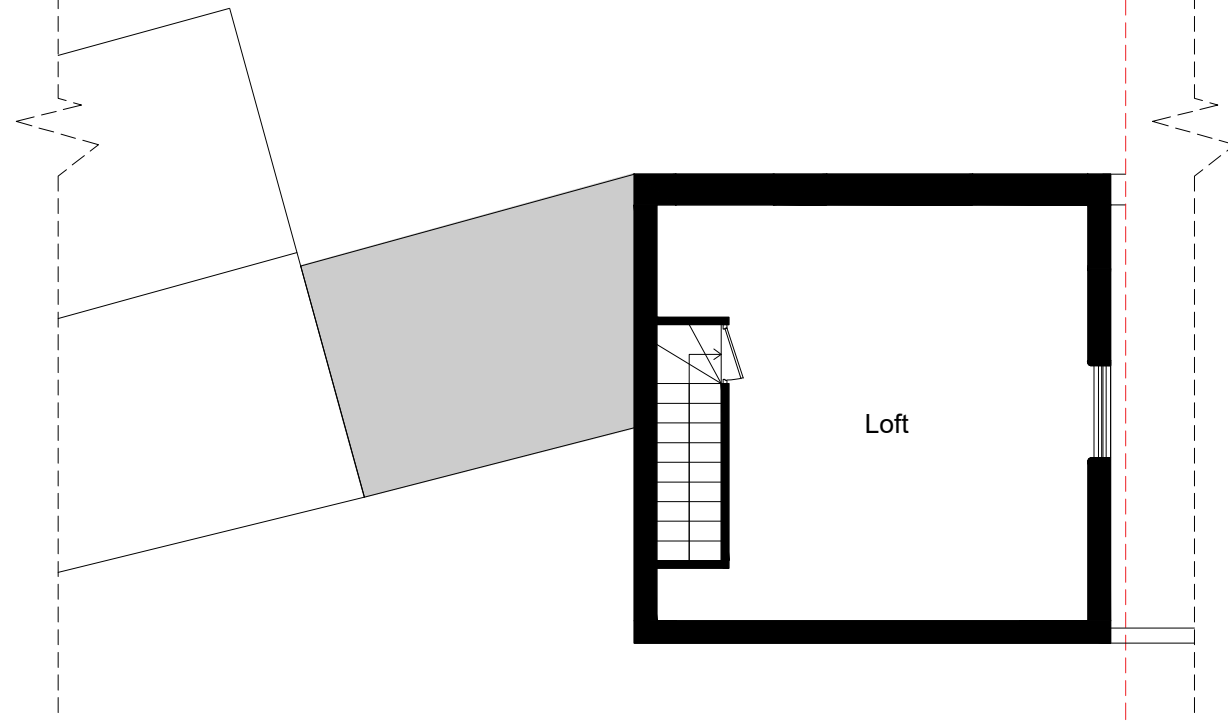
APPENDIX 1 – SITE PLAN

Any dimensions shown should be checked on site and discrepancies reported to the Architect prior to construction. Designs are not coordinated with engineer projects. Do not scale for construction purposes.

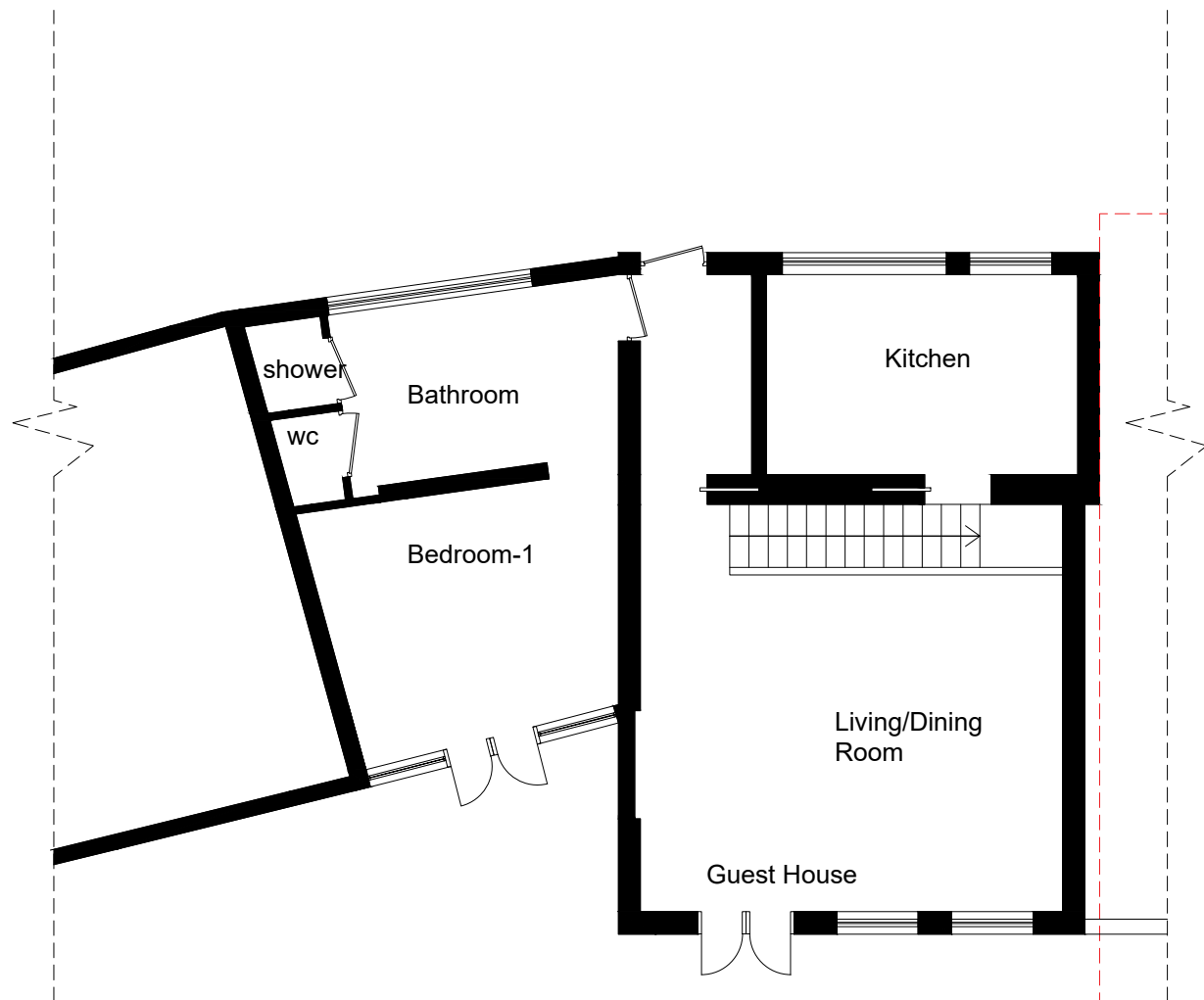
Block Plans are scaled from the Ordnance Survey Location Maps. Please see the licence number for the Os Maps in the Location Plans



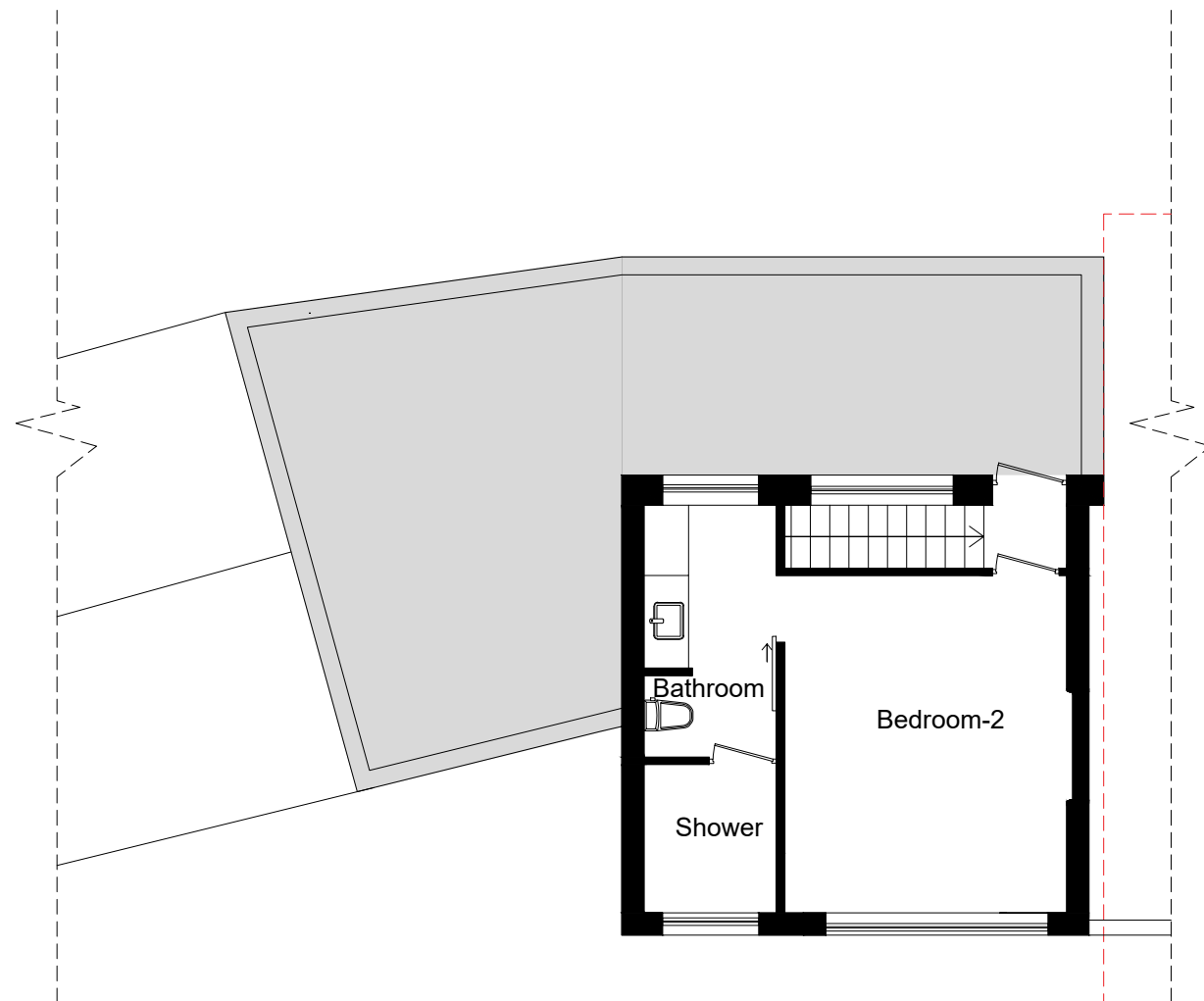
Pre-Existing Ground Floor Plan



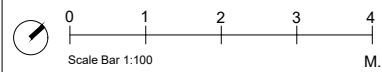
Pre-Existing First Floor Plan



Existing Ground Floor Plan



Existing First Floor Plan



Drawing Name Pre Existing Plans	
Project Address White House, Chywoone Hill Newlyn, Penzance TR18 5AR	
Scale 1/100 at A3	Date 26.01.2023
Designer DG	Revision V1
Drawing No. WhiteHouse_ Plans_V1	



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APPENDIX 2 – FEH RAINFALL DATA

VERSION	"FEH Web S Version	1.0.0	exported at	21:44:26 GMT	Mon	16-Oct-23				
Parameters										
Rainfall mod FEH13										
Calculation type Design rainfall										
Calculation n For a point										
Calculation k Point	GB	146205	28263 SW	46205	28263					
Fixed duration no										
Annual maximums										
Duration (h)	Duration day	2 year rainfa	5 year rainfa	10 year rainf	20 year rainf	30 year rainf	50 year rainf	75 year rainf	100 year rain	
0.25	0.01041667	7.88	12.31	15.6	18.88	20.86	23.48	25.79	27.58	
0.5	0.02083333	10.53	16.57	20.98	25.63	28.41	32.25	35.52	38	
0.75	0.03125	12.28	19.31	24.57	30.08	33.46	38.08	41.98	44.94	
1	0.04166667	13.6	21.48	27.32	33.46	37.28	42.46	46.92	50.32	
1.25	0.05208333	14.97	23.23	29.33	35.73	39.75	45.21	49.94	53.58	
1.5	0.0625	16.25	24.71	30.97	37.54	41.68	47.35	52.29	56.1	
1.75	0.07291667	17.42	25.99	32.36	39.05	43.3	49.13	54.24	58.2	
2	0.08333333	18.48	27.13	33.58	40.38	44.71	50.68	55.94	60.02	
2.25	0.09375	19.35	28.16	34.7	41.65	46.08	52.22	57.64	61.86	
2.5	0.10416667	20.15	29.09	35.71	42.81	47.33	53.62	59.2	63.55	
2.75	0.11458333	20.87	29.95	36.65	43.87	48.49	54.92	60.65	65.11	
3	0.125	21.55	30.75	37.52	44.86	49.56	56.13	61.99	66.56	
3.25	0.13541667	22.18	31.49	38.33	45.78	50.56	57.26	63.25	67.92	
3.5	0.14583333	22.77	32.18	39.08	46.65	51.5	58.32	64.44	69.2	
3.75	0.15625	23.33	32.83	39.8	47.46	52.39	59.33	65.55	70.4	
4	0.16666667	23.86	33.45	40.48	48.23	53.23	60.28	66.61	71.54	
4.25	0.17708333	24.36	34.02	41.13	48.96	54.03	61.19	67.62	72.62	
4.5	0.1875	24.84	34.58	41.75	49.65	54.79	62.05	68.57	73.65	
4.75	0.19791667	25.3	35.1	42.34	50.31	55.52	62.87	69.48	74.62	
5	0.20833333	25.74	35.6	42.91	50.94	56.21	63.66	70.35	75.55	
5.25	0.21875	26.16	36.08	43.45	51.55	56.87	64.41	71.18	76.44	
5.5	0.22916667	26.57	36.54	43.97	52.13	57.51	65.13	71.97	77.28	
5.75	0.23958333	26.96	36.98	44.47	52.68	58.12	65.82	72.73	78.1	
6	0.25	27.33	37.41	44.96	53.22	58.71	66.48	73.46	78.88	