# PROPOSED REAR DORMER AND FRONT ROOF LIGHTS TO CONVERT A LOFT INTO A HABITABLE ROOM AT 37 LANGLEY CRESCENT, HILLINGDON

# FLOOD RISK ASSESSMENT

**SEPTEMBER 2022**

**REPORT REF: 3019/RE/09-22/01**

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## CONTRACT

Evans Rivers and Coastal Ltd has been commissioned by Mrs Samina Tariq to carry out a flood risk assessment for a proposed rear dormer and front roof lights to convert a loft into a habitable room at 37 Langley Crescent, Hillingdon.

## QUALITY ASSURANCE, ENVIRONMENT AND HEALTH AND SAFETY

Evans Rivers and Coastal Ltd operates a Quality Assurance, Environmental, and Health and Safety Policy.

This project comprises various stages including data collection; depth analysis; and reporting. Quality will be maintained throughout the project by producing specific methodologies for each work stage. Quality will also be maintained by providing specifications to third parties such as surveyors; initiating internal quality procedures including the validation of third party deliverables; creation of an audit trail to record any changes made; and document control using a database and correspondence log file system.

To adhere to the Environmental Policy, data will be obtained and issued in electronic format and alternatively by post. Paper use will also be minimised by communicating via email or telephone where possible. Documents and drawings will be transferred in electronic format where possible and all waste paper will be recycled. Meetings away from the office of Evans Rivers and Coastal Ltd will be minimised to prevent unnecessary travel, however for those meetings deemed essential, public transport will be used in preference to car journeys.

The project will follow the commitment and objectives outlined in the Health and Safety Policy operated by Evans Rivers and Coastal Ltd. All employees will be equipped with suitable personal protective equipment prior to any site visits and a risk assessment will be completed and checked before any site visit. Other factors which have been taken into consideration are the wider safety of the public whilst operating on site, and the importance of safety when working close to a water source and highway. Any designs resulting from this project and directly created by Evans Rivers and Coastal Ltd will also take into account safety measures within a "designers risk assessment".

Report carried out by:

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## DISCLAIMER

This report has been written and produced for Mrs Samina Tariq. No responsibility is accepted to other parties for all or any part of this report. Any other parties relying upon this report without the written authorisation of Evans Rivers and Coastal Ltd do so at their own risk.

## COPYRIGHT

## CONTENTS

# 1. INTRODUCTION

## 1.1 Project Scope

1.1.1 Evans Rivers and Coastal Ltd has been commissioned by Mrs Samina Tariq to carry out a flood risk assessment for a proposed rear dormer and front roof lights to convert a loft into a habitable room at 37 Langley Crescent, Hillingdon.

1.1.2 It is understood that this Flood Risk Assessment will be submitted to the Planning Authority as part of a planning application. Specifically, this assessment intends to:

a) Review any literature and guidance specific to this area;

b) Assess the risks to people and property and propose mitigation measures accordingly;

c) Review existing evacuation and warning procedures for the area;

d) Carry out an appraisal of flood risk from all sources as required by NPPF;

e) Report findings and recommendations.

1.1.3 This assessment is carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) dated 2021. Other documents which have been consulted include:

- DEFRA/EA document entitled *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2)*, 2005;
- Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.
- DEFRA/EA document entitled *The flood risks to people methodology (FD2321/TR1),* 2006;
- EA *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose*, 2008;
- National Planning Practice Guidance – Flood Risk and Coastal Change.
- UK Government's climate change allowances guidance.
- Environment Agency guidance entitled *Flood risk assessments: Climate change allowances – Hertfordshire and North London Area.*
- West London Strategic Flood Risk Assessment for the boroughs of Barnet, Brent, Ealing, Harrow, Hillingdon and Harrow dated 2018.
- London Borough of Hillingdon Strategic Flood Risk Assessment (SFRA) dated 2008 and 2015;
- London Borough of Hillingdon Flood Investigation Report dated 28th July 2014;
- London Borough of Hillingdon Local Flood Risk Management Strategy (LFRMS) dated 2016;

- London Borough of Hillingdon Preliminary Flood Risk Assessment (PFRA) dated 2011;

- London Borough of Hillingdon Surface Water Management Plan (SWMP).

## 2. DATA COLLECTION

2.1 To assist with this report, the data collected included:

- Ordnance Survey 1:10,000 street view map obtained via Promap (Evans Rivers and Coastal Ltd OS licence number 100049458).
- British Geological Survey, *Online Geology of Britain Viewer*.
- 1:250,000 *Soil Map of Eastern England* (Sheet 4) published by Cranfield University and Soil Survey of England and Wales 1983.
- 1:625,000 *Hydrogeological Map of England and Wales*, published in 1977 by the Institute of Geological Sciences (now the British Geological Survey).
- Filtered LIDAR data at 1m resolution.
- Environment Agency defence information via https://environment.data.gov.uk/asset-management/index.html

## 3. SITE CHARACTERISTICS

### 3.1 Existing Site Characteristics and Location

3.1.1 The site is located at 37 Langley Crescent, Hillingdon. The approximate Ordnance Survey (OS) grid reference for the site is 509902 177226 and the location of the site is shown on Figure 1.

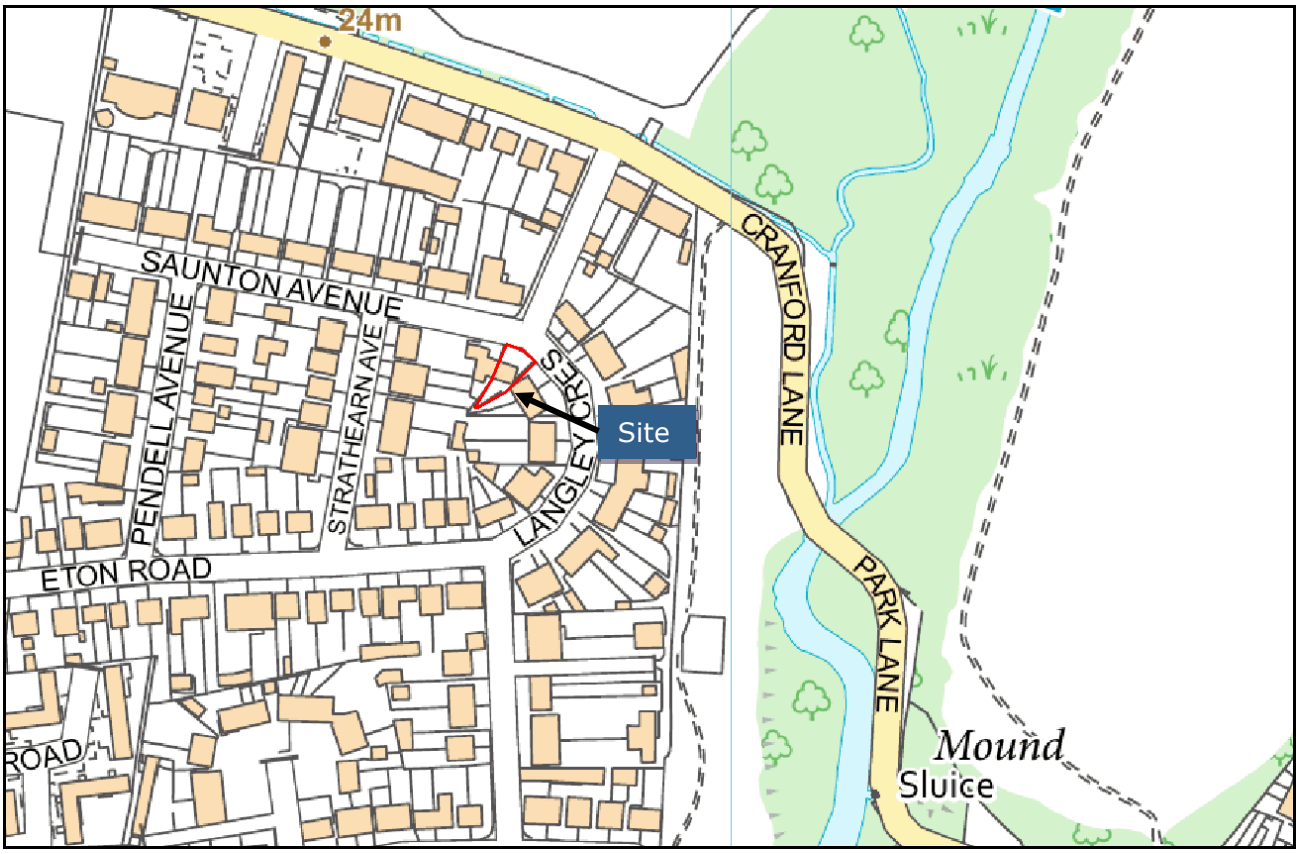



**Figure 1: Site location plan (Source: Ordnance Survey)**

3.1.2 The site comprises an existing two-storey dwelling together with a front and rear garden. The site is accessed from Langley Crescent adjacent to the northern frontage of the site. The existing site layout can be seen on Drawing Number SD2218(P)13 and SD2218(P)14.

3.1.3 Filtered LIDAR data at 1m resolution has been obtained to determine and illustrate the topography of the site and surrounding area (Figure 2).

3.1.4 It can be seen that there is a slight fall in ground level across the site in a southerly direction.

3.1.5 The ground floor of the dwelling is set 150mm higher than external ground level and at 23.55m AOD.


**Figure 2: LIDAR survey data where higher ground is denoted as red, orange and yellow colours and lower areas denoted by blue and green colours**

### 3.2 Site Proposals

3.2.1 The Client proposes a rear dormer and front roof lights to convert a loft into a habitable room.

3.2.2 The site proposals can be seen on Drawing Number SD2218(P)11-A and SD2218(P)12-A.

3.2.3 Paragraph: 066 Reference ID: 7-066-20140306 of the NPPG confirms that residential development is classified as a 'more-vulnerable' use.

3.2.4 Paragraph 33 (ID 7-033-20140306) of the NPPF Planning Practice Guidance (NPPG) states that the Sequential Test does not apply to minor householder development.

## 4. BASELINE INFORMATION

### 4.1 Environment Agency Flood Zone Map

4.1.1 The Environment Agency's Flood Zone Map (Figure 3) and the 2018 West London SFRA show that the site is partially within the NPPF Flood Zone 2 associated with the River Crane located 163m east of the site.

4.1.2 The Flood Zone 2 'Medium Probability' floodplain is defined as having between a 1 in 100 year annual probability and 1 in 1000 year annual probability of flooding. The threshold of the Flood Zone 2 floodplain is the 1 in 1000 year extreme event.

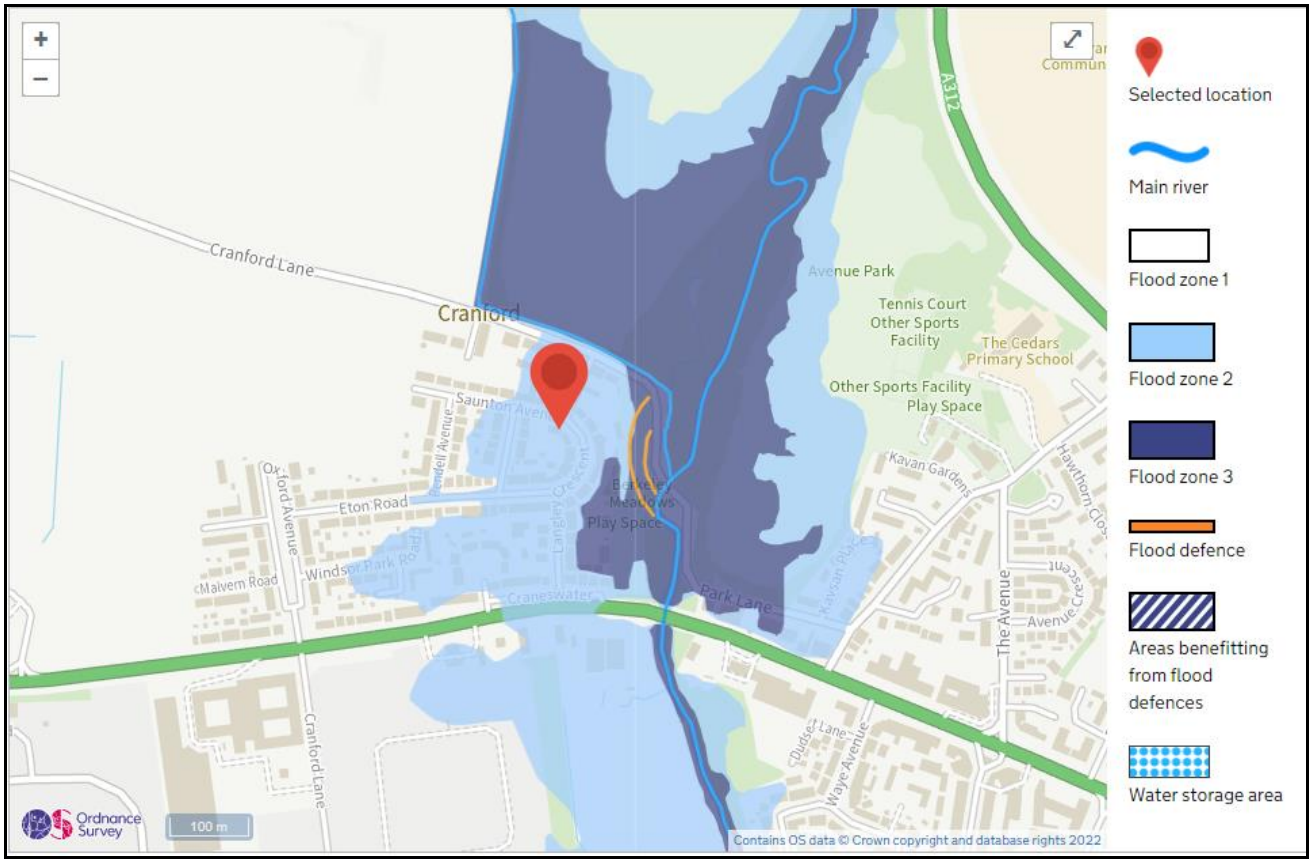



**Figure 3: Environment Agency Flood Zone Map (Source: Environment Agency, 2022)**

### 4.2 Flood Defences and Environment Agency Flood Levels

4.2.1 The Environment Agency flood defence information via https://environment.data.gov.uk/asset-management/index.html and other flood defence data received from the Agency indicates that two embankments exist to the east of the site which are set up to 23m AOD and are in a good to fair condition.

4.2.2 At the time of writing the fluvial flood levels were not available from the Agency. However, further assessment of the flood risk using the 2018 West London SFRA has been carried out in Chapter 5.

4.2.3 The UK Government's climate change allowances guidance states that for more-vulnerable development, the "Central" climate change allowance should be used in FRA's. For the London Management Catchment the climate change allowance is 17% up to year 2080s.

### 4.3 Flood Warning and Emergency Planning

4.3.1 The site is located within an Environment Agency Flood Warning Area 062FWF36Cranford.

4.3.2 Sites at risk of fluvial flooding could have a minimum of 2 hours warning before any of the levels of flood warning is issued (the Agency's warning scheme only applies to areas at risk of flooding from main rivers and not IDB controlled drains).

4.3.3 Flood Alerts, Flood Warnings and Severe Flood Warnings are issued to residents and businesses within flood risk areas by the Agency's *Floodline Warnings Direct* (FWD) service. This system is managed by the Environment Agency and dials out a message to the recipient when a particular category of flood warning is being advised. The message is conveyed by a constant ringing of the telephone or can alternatively be communicated to mobile phones and computers. The system functions at all times, issuing flood warnings and alerts in conjunction with announcements on radio and other media. Owners and occupiers of dwellings or businesses thought to be at risk can sign up to the scheme. **The owners are encouraged to confirm details with the Agency and to sign up for these warnings.** The various flood warning codes can be seen on Figure 4.


**Figure 4: Flood warning codes (Source: Environment Agency)**

4.3.4 It is understood that in the event of flooding, evacuation is managed by a multi-agency team in conjunction with the Police. The multi-agency team provides suitable premises for shelter, first aid, refreshments and possible transportation with consideration given to the elderly and vulnerable groups. It is essential that occupants produce robust Emergency Flood Plans to avoid putting themselves or emergency services at risk and that they do not rely solely on emergency services during the event.

## 5. FLUVIAL FLOOD RISK

5.1 In the absence of flood level data from the Agency, the 2018 West London SFRA shows that the site would be located within the climate change (25%) 1 in 100 year extent (Figure 5).

5.2 By comparing the flood extent with the LIDAR it can be seen that the flood contour would be approximately 23.50m AOD.

5.3 The ground floor level of the dwelling is estimated to be set at 23.55m AOD and therefore would be above the flood depth.

5.4 The proposals will be set well above the flood level thus providing safe dry refuge.

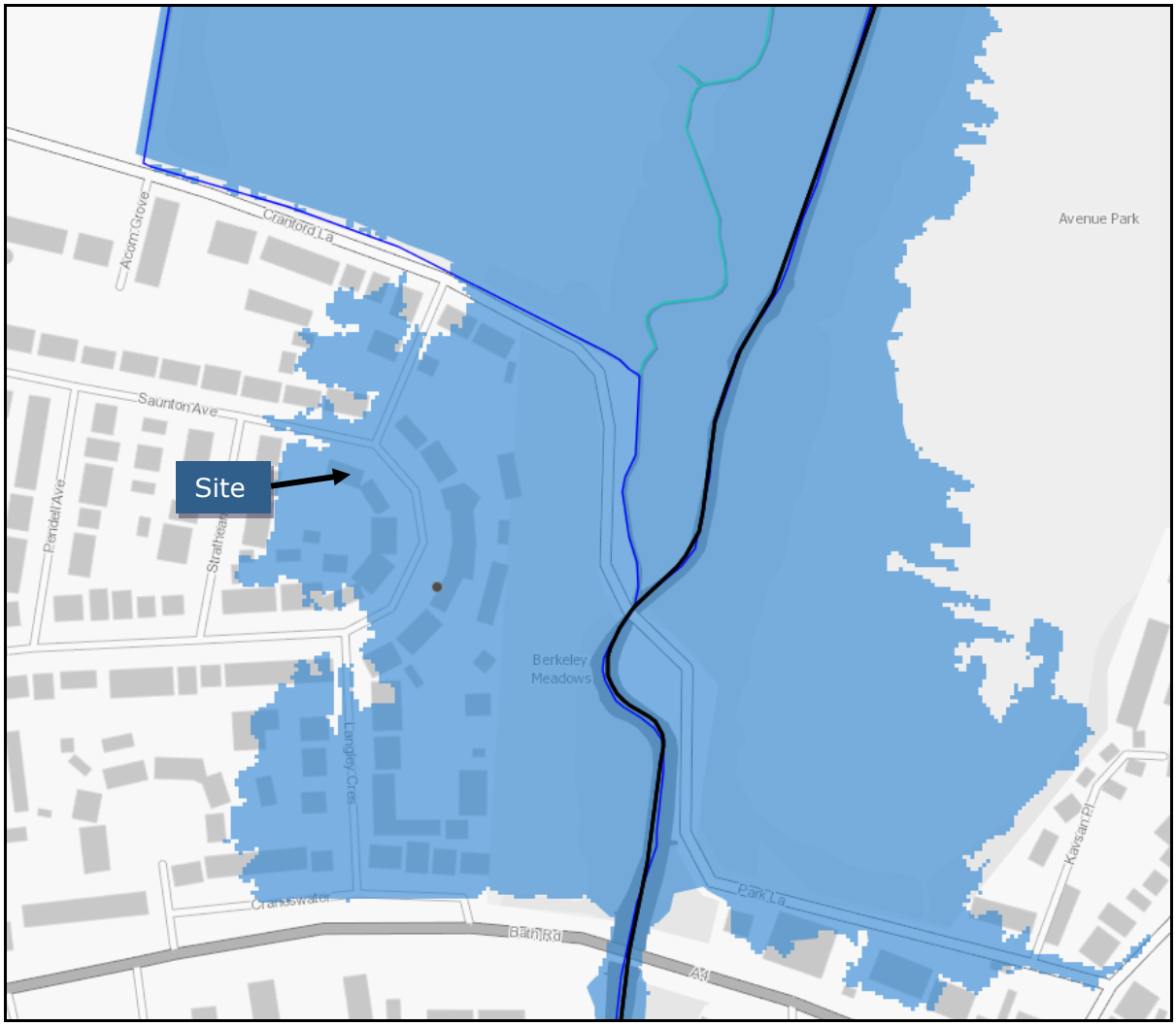



**Figure 5: Flood extent during climate change (25%) 1 in 100 year event (Source: 2018 West London SFRA)**

## 6. FLUVIAL FLOOD RISK MITIGATION AND EVACUATION

### 6.1 Reducing Exposure to the Hazard

6.1.1 In order to assess and reduce the exposure to the hazard and the vulnerability to the hazard after the site has been developed, the guidance outlined in the DCLG/DEFRA/EA document entitled *Flood Risk Assessment Guidance for New Development Phase 2*; *Flood Risks to People, Phase 2*; *Improving the Flood Performance of New Buildings* has been consulted.

6.1.2 Paragraph 060 (ID 7-060-20140306) of the NPPF Planning Practice Guidance states that the first preference is to avoid flood risk by raising floor levels above the design flood level.

6.1.3 The proposals will be set above the climate change 1 in 100 year flood level thus complying with the NPPG.

### 6.2 Reducing Vulnerability to the Hazard

6.2.1 The Agency aims to provide up to 2 hours notice before the issue of a *Flood Warning* for fluvial events. People at the site will need to make a judgment themselves with regards to the flood hazard if evacuation is attempted and not solely rely on the emergency services.

6.2.2 It is recommended that the occupants liaise with the Agency in order to register with the Agency's Flood Warnings Direct service and ensure that they are aware of the flood risk so that they have the option to escape/evacuate upon receipt of a *Flood Warning* or upon the instruction of the emergency services.

6.2.3 The occupants should develop a *Family Flood Plan*. Further guidance is offered in the Environment Agency's guidance document entitled *What to do before, during and after a flood*. The *Family Flood Plan* should consider, for example, information about vital medication needed and a *Flood Kit*.

6.2.4 A *Flood Kit* is a useful precautionary measure especially if evacuation from the site is prolonged. The kit should be stored in an accessible location to ensure that it is not affected by floodwater. The contents should also be checked every 6 months and items replaced if necessary.

6.2.5 It may be sensible to compile two *Flood Kit's* to suit each eventuality. For example, a smaller kit could be compiled which would allow the occupants to carry it during evacuation. A larger kit could also be compiled which included additional food and beverage items in case of ongoing refuge within the property. Both kits should contain the necessary items as suggested below.

1. Important documents
2. Torch and batteries
3. Mobile phone (fully charged)
4. First-aid kit
5. Wind-up radio
6. Important telephone numbers
7. Bottled water
8. Non-perishable food provisions
9. Rubber Gloves and wellington boots
10. Medication or information relating to medication and its location

11. Blankets, warm clothes
12. Essential toiletries
13. Camera to record any damage
14. Emergency cash

**Table 1: Flood Event Action Plan**

| Environment Agency Flood Warning Code | What to do! | Evacuate? |
|---|---|---|
| **Flood Alert** (Flooding Possible. Be aware/prepared! Watch Out).<br>  <br> | • Monitor flood risk through media and Floodline Warnings Direct.<br>• Locate family members and inform them of risk. If away from the site make assessment on risk if considering returning to site (i.e. how long it will take to return etc).<br>• Check flood kit, check occupants, check pets – BE PREPARED in case the situation gets worse. | Not necessary.<br><br>Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external flood hazard. Take flood kit, occupants and pets with you. |
| **Flood Warning** (Flooding of homes, businesses and main roads is expected. Act now!).<br>  <br> | • Maintain communication through Floodline Warnings Direct and the media.<br>• Begin to implement Flood Plan.<br>• Consider advice given from emergency services/Environment Agency.<br>• Check insurance, Check flood kit, Check Pets.<br>• Check alternative accommodation arrangements. | Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external flood hazard. Take flood kit, occupants and pets with you.<br><br>People who do not evacuate should reside within the building.<br><br>No formal evacuation or rest centre set-up will be undertaken at this warning level, however, if flooding is experienced across the area emergency services will rescue people. |

| | | |
|---|---|---|
| **Severe Flood Warning** (Severe flooding is expected. Imminent danger to life and property. Act now!).<br>  <br> | • Leave site immediately if not already done so.<br>• Take flood kit, occupants and pets with you.<br>• Follow advice given by Emergency Services and Council. | Leave site according to advice given by Emergency Services and Council. Take flood kit, occupants and pets with you.<br><br>If evacuation cannot be undertaken, people should reside within the building with *flood kit* and maintain communication with the emergency services. |
| **Warnings no longer in force** (No further flooding is expected in the area. Be careful). | • Return to site upon instruction from emergency services and assess any damage.<br>• Contact insurance company depending on damage caused.<br>• Beware of flood debris.<br>• Do not touch sources of electricity.<br>• Arrange for utilities to reconnect services.<br>• Do not dispose of damaged property until your insurance company has agreed. | Not applicable, however site may be uninhabitable.<br><br>Return to site upon instruction from emergency services as floodwater may not have receded. |

## 6.3 Vulnerable Groups

6.3.1 The occupants at the site may include vulnerable groups such as elderly people, those with sensory or physical disabilities, minority ethnic groups, or the infirm. Priority will need to be given to these people during the flood event.

6.3.2 Vulnerable groups should be identified and priority should be given to these groups.

## 6.4 Safe Access/Egress

6.4.1 Safe refuge is available during all flood events.

6.4.2 The LIDAR data and flood data outlined in Chapter 5 above indicates that safe access/egress would be available during the climate change (25%) 1 in 100 year event using the hazard data in Table 13.1 of *FD2320/TR2.*

6.4.3 A flood response plan will be compiled to ensure that the occupants are aware of the flood risk and procedures to take before, during and after a flood.


**Figure 6: Preferred evacuation route for fluvial events.**

## 6.5 Insurance

6.5.1 The Association of British Insurers (ABI) published a guidance document in 2012 entitled *Guidance on Insurance and Planning in Flood Risk Areas for Local Planning Authorities in England*.

6.5.2 The ABI guidance sets out the requirements of the insurance industry when considering flood risk and insurability of the property. The guidance suggests that properties should be protected for flood events up to the 1 in 100 year event in order to access insurance at a competitive price.

6.5.3 The guidance also states that insurers would of course prefer to cover properties which are not at risk of flooding, however, for those properties which are at risk of flooding insurers would prefer that the properties are raised above the flood level, over resistance measures which prevent floodwater from entering the building, or resilience measures which allows floodwater to enter the building.

6.5.4 The proposals are set above the climate change 1 in 100 year event and 1 in 1000 year event. Therefore, the ABI's requirement of protection during a 1 in 100 year event will be met and there will be a good chance of the property being insured at a competitive rate.

# 7. OTHER SOURCES OF FLOODING

## 7.1 Groundwater Flooding

7.1.1 In order to assess the potential for groundwater flooding during higher return period rainfall events, the Jacobs/DEFRA report entitled *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study*, published in May 2004, was consulted, together with the guidance offered within the document entitled *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*, commissioned by DEFRA and carried out by Jacobs in 2006.

**Soil and Geology at the Site**

7.1.2 It can be seen from the various soil and hydrogeological data, listed in Section 2, that the soils beneath the site comprise sand and gravel.

**Groundwater Flooding Potential at the Site**

7.1.3 There have been no recorded groundwater flood events across the site between 2000 and 2003, as indicated by the Jacobs study. Figure 10.2 of the SWMP and the 2018 SFRA mapping shows that there have been no recorded groundwater flooding incidents across the site.

7.1.4 The 2018 SFRA mapping shows that there is a >75% susceptibility to groundwater flooding. Figure 10.2 and 2018 SFRA mapping indicates an increased potential for elevated groundwater.

7.1.5 It is considered that there is an overall low groundwater flooding risk across the site as the building footprint will confine the water table and also the proposals are set well above the ground surface.

## 7.2 Surface Water Flooding and Sewer Flooding

7.2.1 Surface water and sewer flooding across urban areas is often a result of high intensity storm events which exceed the capacity of the sewers thus causing them to surcharge and flood. Poorly maintained sewer networks and blockages can also exacerbate the potential for sewer flooding.

7.2.2 The 2018 SFRA mapping shows that the site is not located within a Critical Drainage Area (CDA). Figure 9.2 of the SWMP and the 2018 SFRA indicates on the interactive mapping that the site is located in an area where there have been a very low number of previous sewer flood events.

7.2.3 The site did not form part of the LLFA Section 19 Flood Investigation Report dated 2014 and 2016.

7.2.4 The Agency's Surface Water Flooding Map (Figure 7) and the 2018 SFRA mapping (Figure 8) indicates that there is a very low surface water flood risk across the building (i.e. less than 1 in 1000 year chance).

7.2.5 It is generally accepted that the low risk flood event (i.e. between 1 in 1000 years and 1 in 100 years) on the Agency's map is used as a substitute for the climate change 1 in 100 year event to provide a worst-case scenario.


**Figure 7: Environment Agency Surface Water Flooding Map (Source: Environment Agency, 2022)**

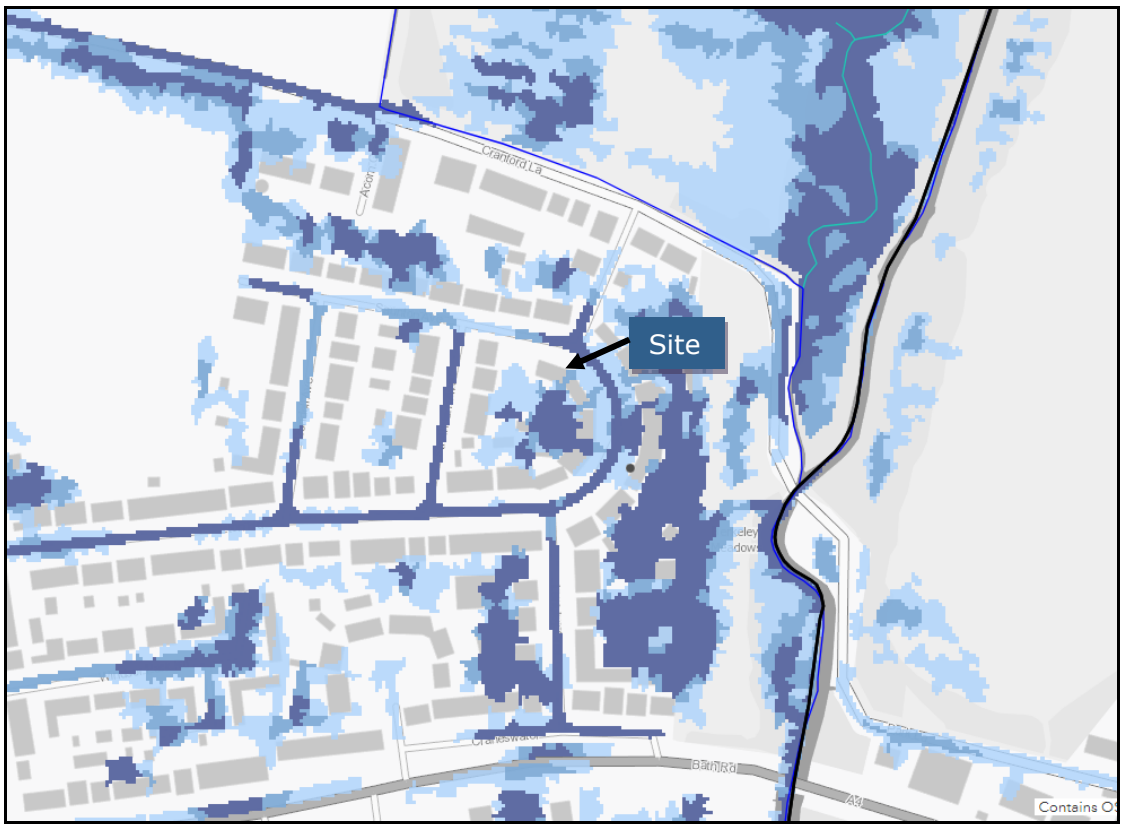



**Figure 8: Environment Agency Surface Water Flooding Map (Source: 2018 West London SFRA)**

**Safe Access/Egress**

7.2.6 The EA surface water flood map on Figure 7 and 8 above shows that Langley Crescent would be affected during low to high surface water flood events.

7.2.7 To determine the hazard, further more detailed data has been obtained via the Data.gov.uk site (https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsw). The flood extent, depth and hazard GIS *shape file* was downloaded from Data.gov.uk (for tile TQ_07).

7.2.8 The flood hazard is calculated based on different combinations of floodwater depth and velocity, and subsequently by using the hazard equation as cited in the DEFRA/EA R&D Document *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2).* The numerical hazard rating is then categorised into four degrees of flood hazard in accordance with *FD2320/TR2*, shown on Table 2 below.

7.2.9 By reviewing the flood hazard GIS *shape file* downloaded from Data.gov.uk, the hazard to people leaving the site via the evacuation route on Figure 6 above during the peak of the low risk event would be 0.50-0.75 and therefore *Very low.*

7.2.10 People at the site will need to make a judgment themselves with regards to the flood hazard if evacuation is attempted and not solely rely on the emergency services.

**Table 2: Hazard to people categories (based on *FD2320/TR2)***

| Hazard Rating | Degree of Flood Hazard | Description |
|---|---|---|
| < 0.75 | Very low hazard | Caution<br>"Flood zone with shallow flowing water or deep standing water" |
| 0.75 – 1.25 | Danger for Some | Dangerous for some (i.e. children)<br>"Danger: Flood zone with deep or fast flowing water" |
| 1.25 – 2.0 | Danger for Most | Dangerous for most people (i.e. general public)<br>"Danger: Flood zone with deep fast flowing water" |
| > 2.0 | Danger for All | Dangerous for all<br>"Extreme danger: flood zone with deep fast flowing water" |

**Reducing Vulnerability to the Hazard**

7.2.11 Flood Warnings for surface water flooding do not currently exist, however, the occupants should sign up to the Met Office weather warning system https://www.metoffice.gov.uk/public/weather/warnings and safe refuge is available at all times.

**Table 3: Flood Event Action Plan**

| Alert | Level Definition | Action | Responsibility |
|---|---|---|---|
| Yellow: be aware | Yellow warnings can be issued for a range of weather situations.<br><br>Many are issued when it is likely that the weather will cause some low level impacts, including some disruption to travel in a few places.<br><br>Other yellow warnings are issued when the weather could bring much more severe impacts to many people but the certainty of those impacts occurring is much lower.<br><br>It is important to read the content of yellow warnings to determine which weather situation is being covered by the yellow warning. | Monitor flood risk through media.<br><br>Locate family members and inform them of risk. If away from the site make assessment on risk if considering returning to site (i.e. how long it will take to return etc).<br><br>Check flood kit, check occupants, check pets – BE PREPARED in case the situation gets worse. | Occupants |
| Amber: be prepared | There is an increased likelihood of impacts from severe weather, which could potentially disrupt your works plans.<br><br>This means there is the possibility of travel delays, road and rail closures, power cuts and the potential risk to life and property. | Monitor weather through media and local observations.<br><br>Consider advice given from authorities including Council, Environment Agency and emergency services.<br><br>Begin to implement Flood Plan.<br><br>Check insurance, Check flood kit, Check Pets. | Occupants |

| | | | |
|---|---|---|---|
| Red: Take Action | Dangerous weather is expected and, if you haven't already done so, you should take action now to keep yourself and your works force safe from the impact of the severe weather.<br>It is very likely that there will be a risk to life, with substantial disruption to travel, energy supplies and possibly widespread.<br><br>You should avoid travelling, where possible, and follow the advice of the emergency services and local authorities. | Follow advice given by Emergency Services, Environment Agency and Council.<br><br>Maintain communication through the media.<br><br>Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external flood hazard. Take flood kit, occupants and pets with you.<br><br>People who do not evacuate should reside across building. | Occupants |

### 7.3 Reservoirs, Canals And Other Artificial Sources

7.3.1 The failure of man-made infrastructure such as flood defences and other structures can result in unexpected flooding. Flooding from artificial sources such as reservoirs, canals and lakes can occur suddenly and without warning, leading to high depths and velocities of flood water which pose a safety risk to people and property.

7.3.2 The Environment Agency's "Risk of flooding from reservoirs" map suggests that the site is at risk from reservoirs during periods when the river is also in flood.

7.3.3 However, as the information associated with the maps suggest, it is considered that reservoir flooding is extremely unlikely to happen and such features are regularly inspected by qualified engineers under the Reservoir Act 1975.

## 8. CONCLUSIONS

- The site is located within Flood Zone 2.
- The climate change (25%) 1 in 100 year flood contour has estimated to be 23.50m AOD.
- The ground floor level of the dwelling is estimated to be set at 23.55m AOD and therefore would be above the flood depth. The proposals will be set well above the flood level thus providing safe dry refuge.
- A warning and evacuation strategy has been developed within this assessment. It is proposed that the occupants register with the Agency's *Flood Warnings Direct* and prepare a *Family Flood Plan*.
- There is a low groundwater flood risk and low risk from reservoirs. There is a very low surface water flood risk across the building.
- Safe access/egress can be achieved during the peak of the fluvial design event and during the low risk surface water flood event.

## 9. BIBLIOGRAPHY

i. Association of British Insurers 2012. *Guidance on Insurance and Planning in Flood Risk Areas for Local Planning Authorities in England.*

ii. CIRIA 2005. *Standards for the repair of buildings following flooding, Report 623.* CIRIA.

iii. CIRIA 2000. *Groundwater Control – design and practice, Report 515*. CIRIA.

iv. Cobby, D., et al. 2009. *Groundwater flood risk management: advances towards meeting the requirements of the EU Floods Directive.* Journal of Flood Risk Management.

v. Communities and Local Government 2019. *National Planning Policy Framework.*

vi. Communities and Local Government 2012a. Technical Guidance to the *National Planning Policy Framework.*

vii. Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.

viii. DEFRA/EA 2007. *Public Response to Flood Warning, Flood and Coastal Defence R&D Programme, R&D Technical Report SC020116.* Environment Agency.

ix. DEFRA/EA 2006. *Flood Risks to People, Phase 2, R&D Technical Report FD2321/TR1, Flood and Coastal Defence R&D Programme*. Water Research Council.

x. DEFRA/EA 2006a. *Flood Risks to People, Phase 2, R&D Technical Report FD2321/TR2, Flood and Coastal Defence R&D Programme*. Water Research Council.

xi. DEFRA/EA 2005. *Framework and guidance for assessing and managing flood risk for new development, Phase 2, Flood and Coastal Defence R&D Programme, R&D Technical Report FD2320/TR2*. Water Research Council.

xii. DEFRA/EA 2005a. *Flood Warning for Vulnerable Groups: A review of the literature, Flood and Coastal Defence R&D Programme*. Environment Agency.

xiii. DEFRA/Jacobs 2006. *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*.

xiv. DEFRA/Jacobs 2004. *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study (LDS), Final Report, Volumes 1 and 2*.

xv. Dickie et al. 2010. *Planning for SUDS – Making it happen*. *Report C687*. London: CIRIA

xvi. Environment Agency 2008. *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1.*

xvii. Geological Society of London 2006. *Groundwater and Climate Change.* Geoscientist magazine, Volume 16, No 3.

xviii. Institute of Geological Sciences 1976. *Hydrogeological Map of Northern East Anglia*, 1:125,000.

xix. Institute of Geological Sciences 1977. *Hydrogeological Map of England and Wales,* 1:625,000. NERC.

xx. NERC 2009. *Flood Estimation Handbook* [CD-ROM], Version 3. Institute of Hydrology.

xxi. NERC 1975. *Flood Studies Report (FSR)*. Institute of Hydrology.

xxii. Newman, A.P. 2004. *Protecting groundwater with oil-retaining pervious pavements: historical perspectives, limitations and recent developments*. Quarterly Journal of Engineering Geology and Hydrogeology.

xxiii. ODPM 2003. *Preparing for Floods*. London: ODPM.

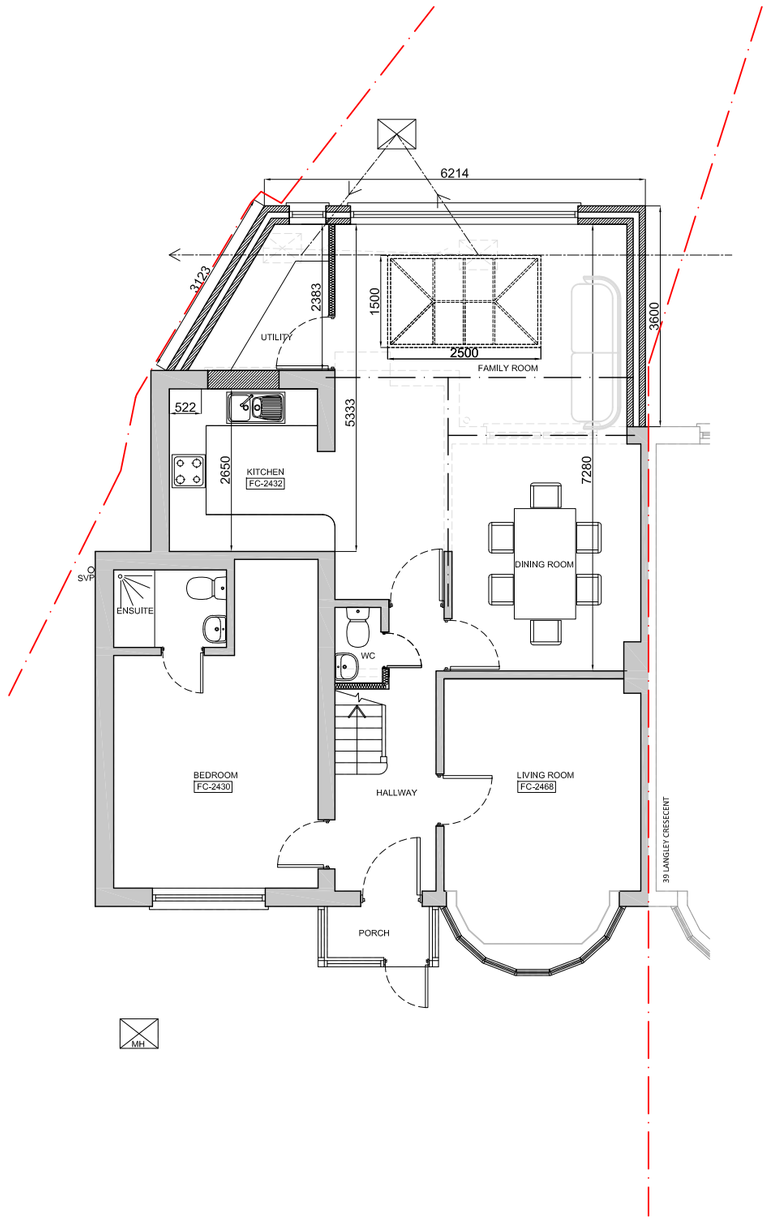
xxiv. Pratt, C., Wilson, S., and Cooper, P. 2002. *Source control using constructed pervious surfaces; hydraulic, structural and water quality performance issues, Report C582*. London: CIRIA.

xxv. Soil Survey of England and Wales 1983. *Soil Map of Eastern England (Sheet 4)*, 1:250,000. Cranfield University.

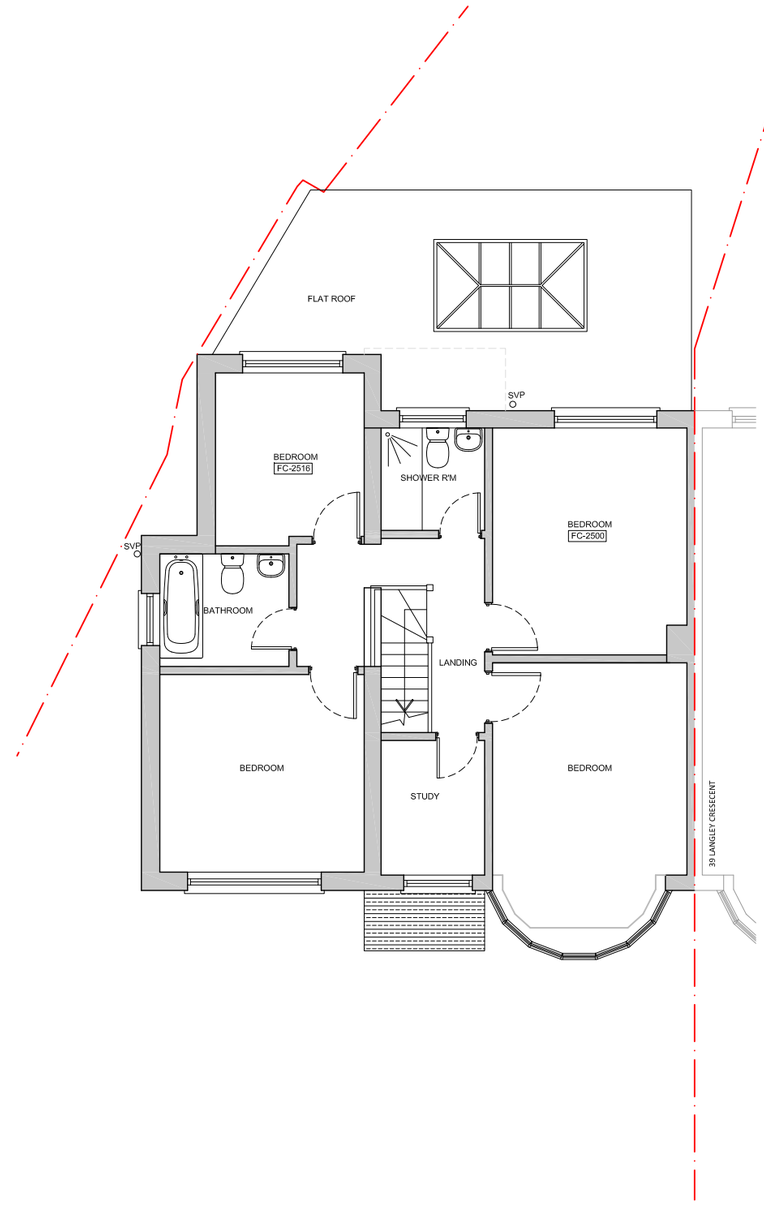
xxvi. UK Groundwater Forum. *Groundwater Resources and Climate Change.* http://www.groundwateruk.org/Groundwater_resources_climate_change.aspx [accessed 27/01/2015]

xxvii. Woods-Ballard., et al. 2007. *The SUDS Manual, Report C697*. London: CIRIA.

# DRAWINGS




EXISTING GROUND FLOOR PLAN
SCALE 1:100




EXISTING FIRST FLOOR PLAN
SCALE 1:100

PLANNING ISSUE
SUBJECT TO APPROVAL

## GENERAL NOTES

All dimensions, levels, sizes, positions and locations of particulars as indicated on drawings are to be verified by the appointed Contractor on site prior to engaging in works.

Any discrepancies must be reported to the Architect/Surveyor/Engineer or responsible person/s immediately.

No dimension to be scaled from the drawings for construction purposes unless otherwise indicated. All work is to comply with current Building Regulations.

Party Wall etc. Act 1996 would apply and contractor is to assure that no work is commenced until this formality is completed.
The sole purpose of this drawing is the procurement of Planning Permission and Building Regulation approval and work is NOT to commence before such approvals.

Where this drawing is used for the works, contractor should request at the time of tender, from the tenderer, full specification and schedule of work. To avoid any disputes, this schedule of works in conjuction with the drawings would be used to resolve matters.
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The competent person is to send to the local authority via the scheme provider) a self-certification certificate within 30 days of the electrical works' completion. The client must receive both a copy of the self certificate and a BS7671 Electrical Installation Test Certificate. (Reg. P1)

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The Contractor is responsible for ensuring compliance with the CDM Regulations, and appropriate Health & Safety on site precautions.

SHAH DESIGNS LTD
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0 1m 2m 3m 4m 5m
Scale 1:100

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Scale 1:50

PROJECT
37 LANGLEY CRESCENT
UB3 5HN

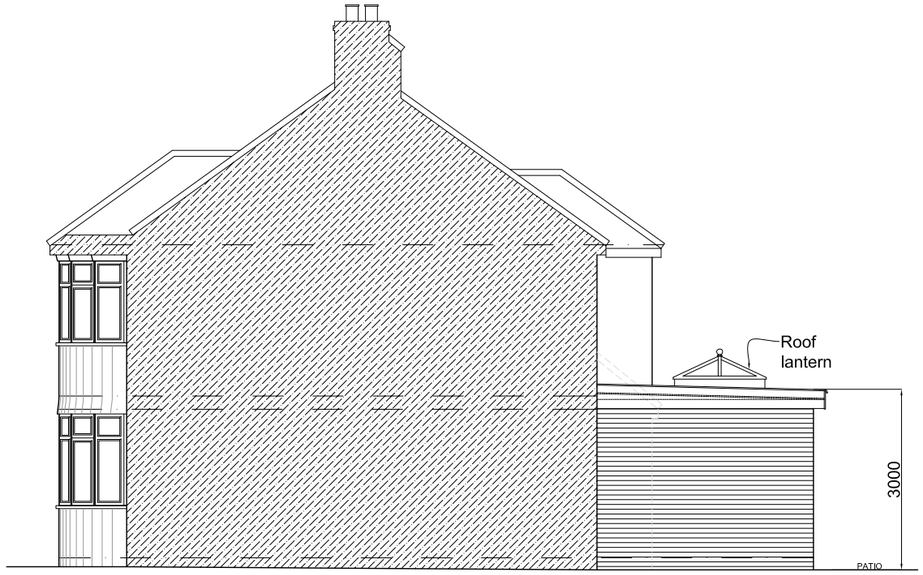
| REVISION | DESCRIPTION | BY | DATE |
|---|---|---|---|

DRAWING TITLE
EXISTING FLOOR PLANS

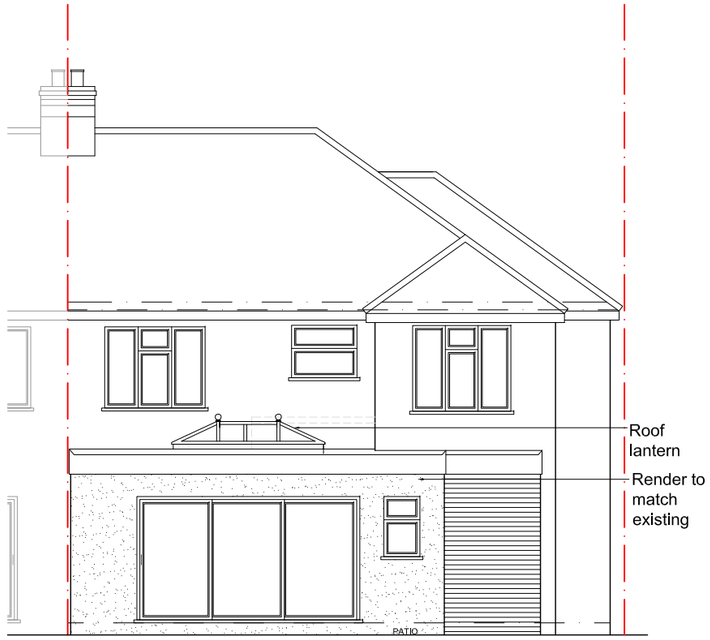
| DATE | 23.04.2022 | DRAWN BY | DS |
|---|---|---|---|
| SCALE | 1:100@A3 | CHECKED BY | DS |

DRAWING NO. SD2218(P)13
REVISION

EXISTING FRONT ELEVATION
SCALE 1:100




EXISTING SIDE ELEVATION
SCALE 1:100




EXISTING REAR ELEVATION
SCALE 1:100


EXISTING SIDE ELEVATION
SCALE 1:100

PLANNING ISSUE
SUBJECT TO APPROVAL

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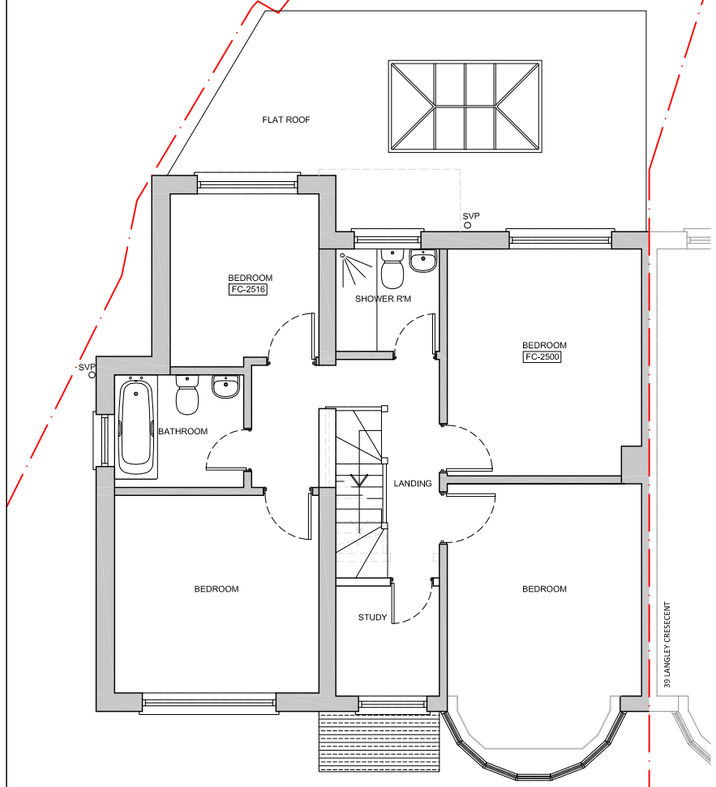
PROJECT
37 LANGLEY CRESCENT
UB3 5HN

| REVISION | DESCRIPTION | BY | DATE |
|---|---|---|---|

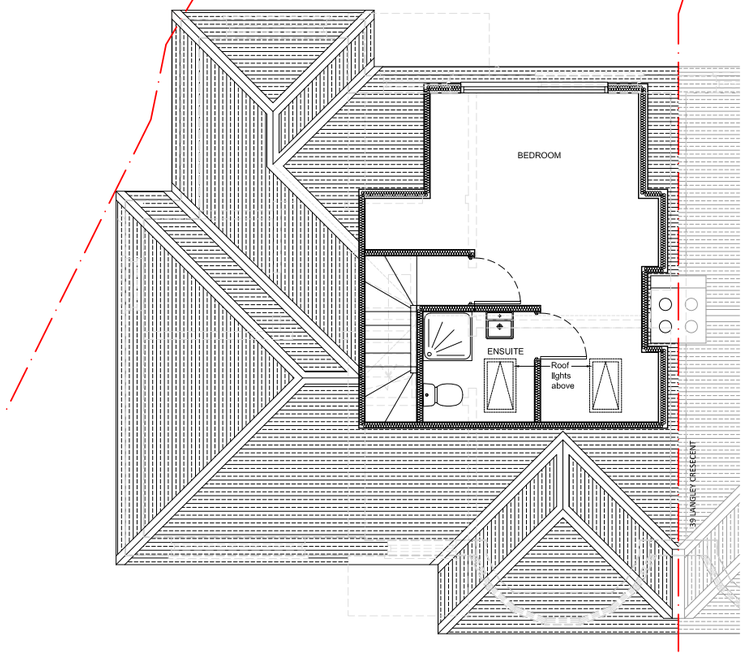
DRAWING TITLE
EXISTING ELEVATIONS

| DATE | 23.04.2022 | DRAWN BY | DS |
|---|---|---|---|
| SCALE | 1:100@A3 | CHECKED BY | DS |

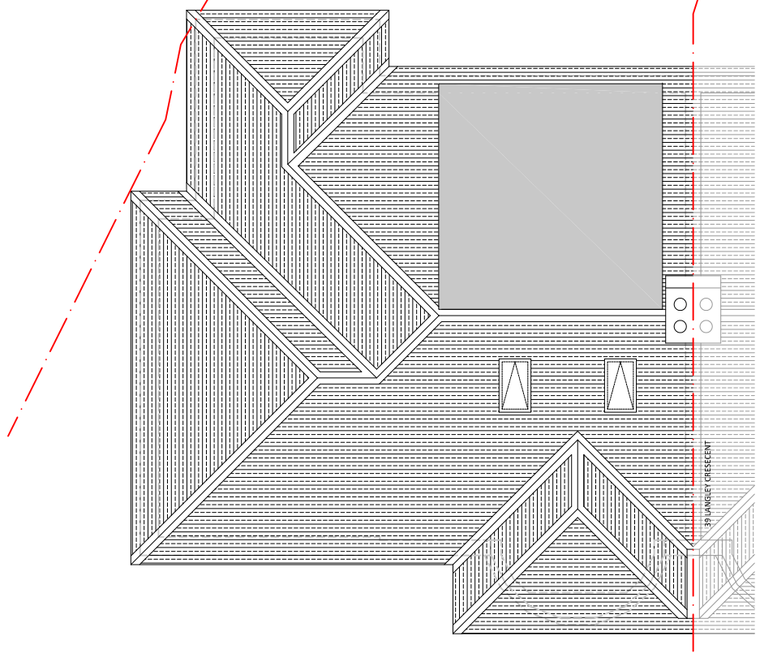
DRAWING NO. SD2218(P)14
REVISION




PROPOSED FIRST FLOOR PLAN
SCALE 1:100




PROPOSED LOFT PLAN
SCALE 1:100




PROPOSED ROOF PLAN
SCALE 1:100

PLANNING ISSUE
SUBJECT TO APPROVAL

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Scale 1:100

0 1m 2m
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PROJECT
37 LANGLEY CRESCENT
UB3 5HN

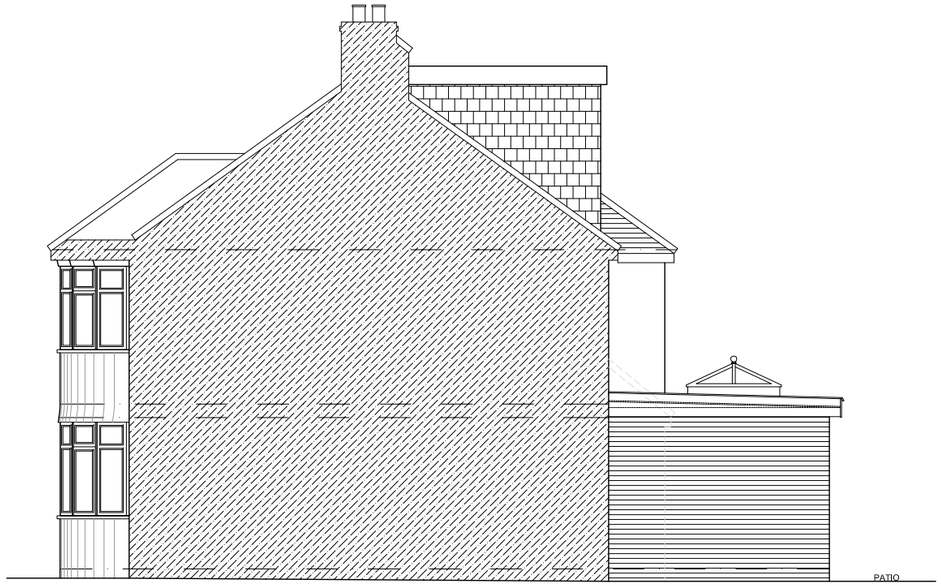
| REVISION | DESCRIPTION | BY | DATE |
|---|---|---|---|
| A | LABEL CHANGED | DS | 02-08-2022 |

DRAWING TITLE
PROPOSED FLOOR PLANS

| | | | |
|---|---|---|---|
| DATE | 23.04.2022 | DRAWN BY | DS |
| SCALE | 1:100@A3 | CHECKED BY | DS |

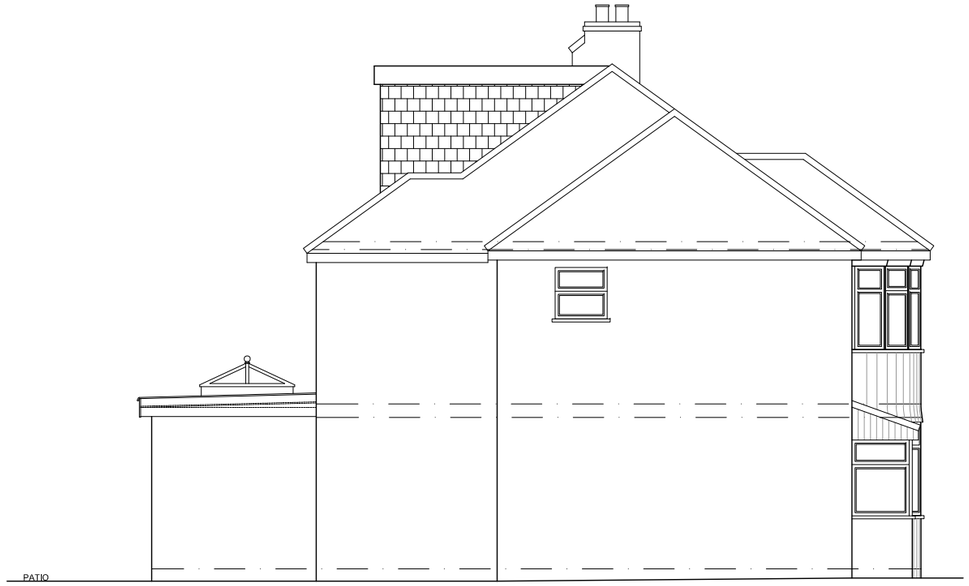
DRAWING NO. SD2218(P)11-A
REVISION

PROPOSED FRONT ELEVATION
SCALE 1:100




PROPOSED SIDE ELEVATION (VIEW FROM NO. 39)
SCALE 1:100


PROPOSED REAR ELEVATION
SCALE 1:100




PROPOSED SIDE ELEVATION (VIEW FROM NO. 41)
SCALE 1:100

PLANNING ISSUE
SUBJECT TO APPROVAL

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Scale 1:100

0 1m 2m
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PROJECT
37 LANGLEY CRESCENT
UB3 5HN

| REVISION | DESCRIPTION | BY | DATE |
|---|---|---|---|
| A | MINOR AMENDMETS | DS | 02-08-2022 |

DRAWING TITLE
PROPOSED ELEVATIONS

| | | | |
|---|---|---|---|
| DATE | 23.04.2022 | DRAWN BY | DS |
| SCALE | 1:100@A3 | CHECKED BY | DS |

DRAWING NO. SD2218(P)12-A
REVISION


EVANS
Rivers and Coastal