

Preliminary Flood Risk Assessment

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138 Northwood Way, Northwood, HA6 1RE

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1. Introduction

The following document is a Preliminary Flood Risk Assessment carried out by Oakshire Environmental, and includes details of the site, vulnerability classification, flood linkages and an evaluation of risk.

1.1 Project Overview

The client's proposed project involves the erection of a front infill extension, part rear extension, part garage conversion, raised rear patio at 138 Northwood Way, Northwood, HA6 1RE. Oakshire Environmental have carried out a Preliminary Flood Risk Assessment, as described below.

1.2 Purpose of Investigation

The objectives of the Preliminary Flood Risk Assessment were to:

- Develop a detailed assessment of the site.
- Identify potential flood sources, receptors and pathways at the site.
- Assess the level of potential flood risk.
- Determine the requirement or scope of further investigations or mitigation measures.

1.3 Scope of Work

- Brief introductory information has been noted to provide context to the report and include an Introduction, Project Overview, Scope of Work and Limitations.
- To develop a detailed assessment of the site, desk studies have been carried out to collate information obtained from sources including the Environment Agency, Local & National Authorities, Strategic Flood Risk Assessments and Digital Terrain Model (DTM) LiDAR topographical surveys.
- This information has been used to identify potential flood sources, receptors and pathways at the site, as part of an initial Conceptual Site Model.
- To assess the level of potential flood risk, a Conceptual Site Model has been produced to categorise the potential severity of the impact of the flood linkage on the receptor and the probability of the flood linkage being present.
- Following the assessment of flood linkages, an evaluation of flood risk, mitigation measures, surface water management and safe access and egress has been conducted to determine the requirement or scope of further investigations.
- Supporting appendix include photographs, maps, and plans of the site.

1.4 Limitations

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This report excludes consideration of potential hazards arising from any activities at the site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities. Oakshire Environmental does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions. It should be noted that this report has been produced for environmental purposes only.

2. Site

The following section provides a description of the site, location, proposed development and vulnerability classification, utilising information obtained from the client and publicly available sources.

2.1 Site Description and Location

The site is located at 138 Northwood Way, Northwood, HA6 1RE, and is approx. 500m² in area.

The site comprises a residential house and garden with the house being towards the east of the plot. Site boundaries comprise residential fencing and hedges.

The site slopes from 80.00m AOD at the east to 76.90m AOD at the west boundary. External levels at the front threshold to the house are approx. 78.70mAOD.

Levels on Northwood Way are approx. 79.20mAOD adjacent to the site and fall from north to south.

The site is bordered by buildings associated with Acre Surgery to the west with all other surrounding land use being residential.

National Grid Reference: 510210E, 190705N

2.2 Proposed Development

The proposed development involves the erection of a front infill extension, part rear extension, part garage conversion and a raised rear patio.

2.3 Vulnerability Classification

The NPPF technical guidance determines the suitability of a proposed development in a particular location based on its flood risk vulnerability. Based on Annex 3 of the NPPF, the proposed residential development falls within the category of 'more vulnerable'.

The flood map for planning indicates that the site falls within Flood Zones 1.

More vulnerable developments are permitted in Flood Zone 1. A Sequential Test is not required.

It should be noted that these Flood Zones do not take into account the impact of any flood defences or site-specific mitigation measures.

Table 1: Flood Risk Vulnerability Classification table from National Planning Policy Framework Technical Guidance

Flood Risk Vulnerability Classification					
Flood Zones	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	●	●	●	●	●
Zone 2	●	Exception Test required	●	●	●
Zone 3a	Exception Test required	✘	Exception Test required	●	●
Zone 3b	Exception Test required	✘	✘	✘	●

Key: ● Development is appropriate
✘ Development should not be permitted

3. Flood Risk Assessment

The following section outlines potential flood sources, pathways and receptors, utilising information gathered in the previous sections.

3.1 Potential Flood Sources

Rivers & Seas

The site is situated within Flood Zone 1 and is such at very low risk of fluvial flooding, <0.1% AEP.

The site is indicated to remain within Flood Zone 1 when accounting for climate change.

Surface Water

Surface water runoff is caused by heavy rainfall that can overwhelm the drainage network. The Environment Agency Risk of Flooding from Surface Water mapping can be used to identify areas at risk of surface water flooding. Map data shows that surface water predominantly follows topographical flow paths of existing watercourses or dry valleys and can pond in low-lying areas. The risk is most often confined to roads with some run-off flow routes around properties.

Environment Agency maps show that there is a very low likelihood of surface water flooding at the site and no surface water flooding would occur in a 0.1% AEP event.

The West London SFRA identifies areas at high risk of surface water flooding as being within Flood Zone 3a for surface water, the site is not within one of these areas.

To assess the impacts of climate change on peak rainfall intensity in large rural catchments the peak river flow allowances should also be used.

Surface water modelling, taking into account climate change, shows that there is a low risk that surface water flooding would occur on the site in a 0.1% AEP event between the years 2040 and 2060 with risk focused at the eastern edge of the building. Flood depths are indicated to reach 300mm in a 0.1% AEP event with no flooding in a 1% event.

Groundwater

Flooding from groundwater can occur when the water table rises and reaches ground level allowing water to seep through to the surface. This means that water may rise up through floors or underground rooms such as cellars or basements. Groundwater flooding is much slower to occur than river flooding and will usually happen days, weeks or even months after heavy or prolonged rainfall. And it may last weeks or even months.

BGS mapping indicates the site lies on a bedrock of clay of the London Clay Formation and no superficial deposits are indicated. The underlying bedrock is an unproductive aquifer, suggesting a very low risk of flooding from groundwater.

The London Borough of Hillingdon Surface Water Management Plan 2013 indicates the site is not in an area of potentially elevated groundwater levels. The Environment Agency's Areas Susceptible to Groundwater Flooding map indicates that the site lies within an area considered to be of very low susceptibility to groundwater flooding while the West London SFRA mapping indicates the site is not susceptible. Furthermore, there are no records of groundwater flooding in the vicinity of the site suggesting a negligible risk of groundwater flooding. It should be noted that this map shows the proportion of each 1km grid square where geological and hydrogeological conditions indicate a susceptibility to groundwater emergence. It does not show the likelihood of groundwater flooding occurring.

Sewers

Sewer flooding occurs when heavy rainfall and flooding overloads sewer capacity or when sewers cannot discharge to watercourses due to high water levels. Sewer flooding can also be caused by blockages, collapses, equipment failure or groundwater leaking into sewer pipes. Sewer flooding is often synonymous with other sources of flooding such as river, surface water and groundwater flooding.

The London Borough of Hillingdon Surface Water Management Plan indicates the postcode 'HA6 1' has 21-50 recorded incidents of sewer flooding, locations of the flooding are not given. This information is based on Thames Water DG5 records.

The Pre-Planning Application for the site notes that the site is within a Critical Drainage Area according to the London Borough of Hillingdon Surface Water Management Plan.

Analysis of the London Borough of Hillingdon Local Plan Part 2 Adopted Policies map and the London Borough of Hillingdon Surface Water Management Plan 2013 Evidence Base mapping indicates that the site is not within a Critical Drainage Area and is approx. 1km southeast of Critical Drainage Area ref 016.

However more recent Hillingdon online mapping identifies that the site is within Critical Drainage Area 056 Northwood Gatehill and as such should be treated as being within an operational Critical Drainage Area.

Given the low risk of surface water flooding at the site, any surcharge from sewers in the area is highly unlikely to affect the site and would flow southwards along Northwood Way.

Reservoirs

The level and standard of inspection and maintenance required for reservoirs means that the risk of flooding from reservoirs is generally very low.

There are no reservoirs close to the site and Environment Agency mapping shows that the site is not at risk of flooding in the event of a reservoir failure or overtopping.

3.2 Potential Flood Receptors

Given the proposed use of the site, the following receptors are considered:

- Residential end users
- Proposed extension
- Existing dwelling

3.3 Potential Flood Pathways

Based on the expected on-site receptors, relevant pathways for the above receptors include:

- Surface water along Northwood Way
- Low-permeability underlying bedrock
- Local sewers

Pathways between off-site sources and off-site receptors is beyond the scope of this assessment.

3.4 Risk Assessment Methodology

The potential level of risk posed by a particular source is determined by assessing the potential severity of the impact of the flood linkage on the receptor, if it is assumed to be present, and the probability of the flood linkage being present.

Severities are categorised from Minor to Severe and probabilities are categorised from Unlikely to High Likelihood to give a potential level of risk output.

Table 2: Risk Matrix

Probability	Severity of Consequence			
	Severe	Medium	Mild	Minor
High Likelihood	Very High Risk	High Risk	Moderate Risk	Low / Moderate Risk
Likely	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk
Low Likelihood	Moderate Risk	Low / Moderate Risk	Low Risk	Very Low Risk
Unlikely	Low / Moderate Risk	Low Risk	Very Low Risk	Very Low Risk

Very High Risk

There is a high probability that severe harm could arise to a designated receptor from an identified source; or there is evidence that severe harm to a designated receptor is currently happening.

High Risk

Harm is likely to arise to a designated receptor from an identified source.

Moderate Risk

It is possible that harm could arise to a designated receptor from an identified source. It is relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that the harm would be relatively mild.

Low Risk

It is possible that harm could arise to a designated receptor from an identified source, however, it is likely that this harm, if realised, would normally be mild.

Very Low Risk

There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

4. Conclusions

4.1 Risk Evaluation

- There is a **very low risk** to residential end users, the existing dwelling and extension from river flooding.
- There is a **low risk** to residential end users and the dwelling from surface water flooding.
- There is a **very low risk** to residential end users, the existing dwelling and extension from groundwater flooding through the permeable underlying bedrock.
- There is a **low risk** to residential end users, the existing dwelling and extension from sewer flooding in local sewers.
- There is a **very low risk** to residential end users, the existing dwelling and extension from reservoir flooding.

4.2 Existing Flood Mitigation Measures

There are no formal flood mitigation measures installed at the site.

The existing raised thresholds and threshold channel drainage is considered to reduce the risk of surface water flooding at the site as this is indicated to become 'trapped' close to the existing house.

4.3 Proposed Flood Mitigation Measures

Based on the identified flood risk, flood mitigation measures are not considered necessary.

4.4 Surface Water Management

Generally, it is desirable to discharge surface water runoff into the ground before allowing discharge to a surface water body, surface water sewer, highway drain, or a combined sewer.

The proposed development will result in a slight increase to the impermeable surface cover across the site, therefore, the rate and volume of runoff will be increased and the flood risk off-site will need to be appropriately managed so that it is not increased.

4.5 Safe Access and Egress

The risk of flooding at the site is low, safe access and egress is not a consideration.

4.6 Summary

The site lies within Flood Zone 1 based on the Environment Agency's Flood Map for Planning. Assessment of the risk to the site from all sources of flooding, including consultation of the West London SFRA, shows that the site is considered to be at very low risk from river, reservoir failure and groundwater, and low risk from surface water and sewer flooding.

The site lies within the non-adopted but operational Critical Drainage Area ref. 056 named Northwood Gatehill.

The development will slightly increase the amount of impermeable surfaces, site drainage will need to be appropriately managed so that flood risk off-site is not increased.

It should be noted that these conclusions are based on the currently proposed development plan, therefore, flood risk at the site should be re-assessed if material changes are made to the proposed development.

5. References

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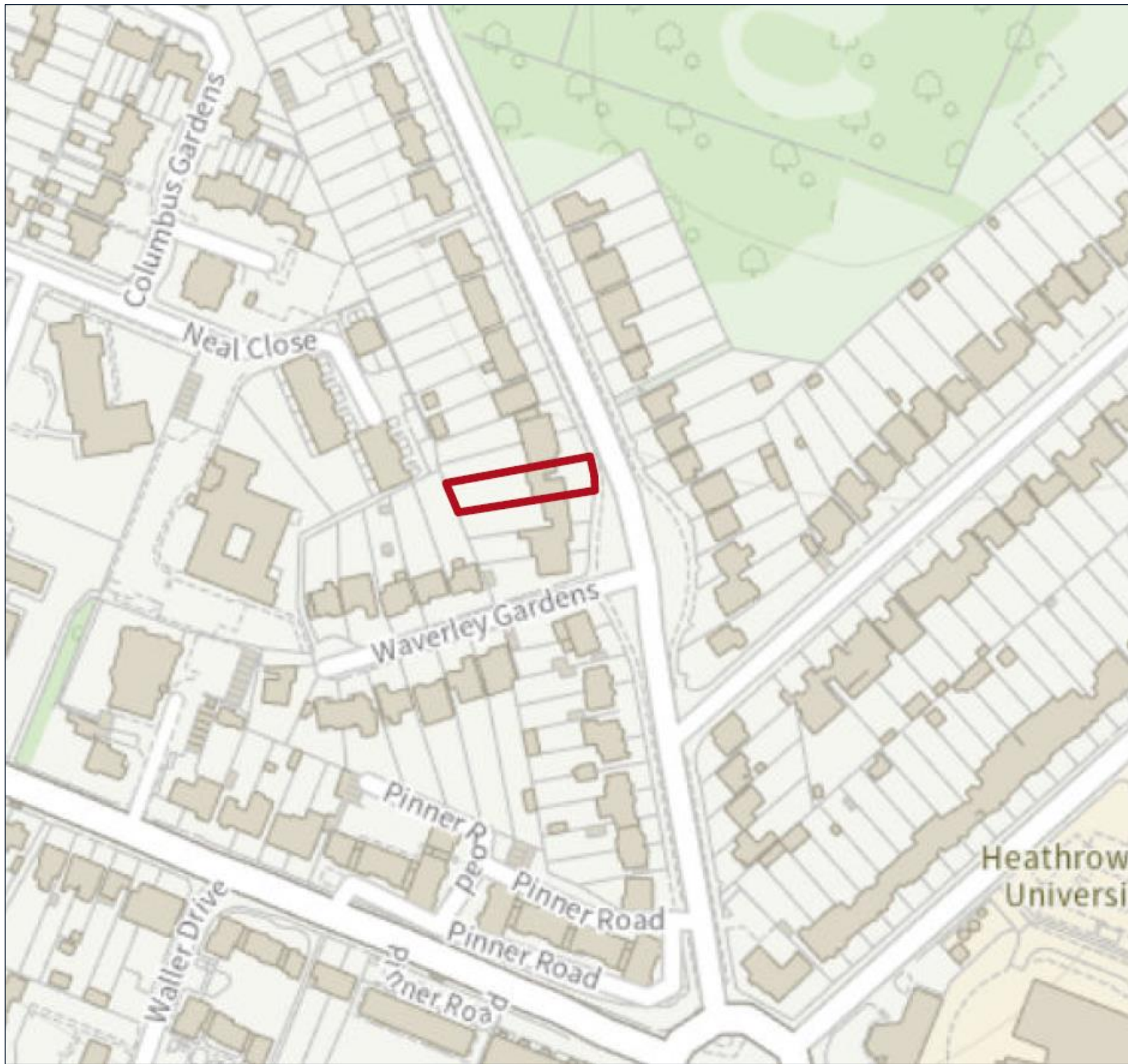
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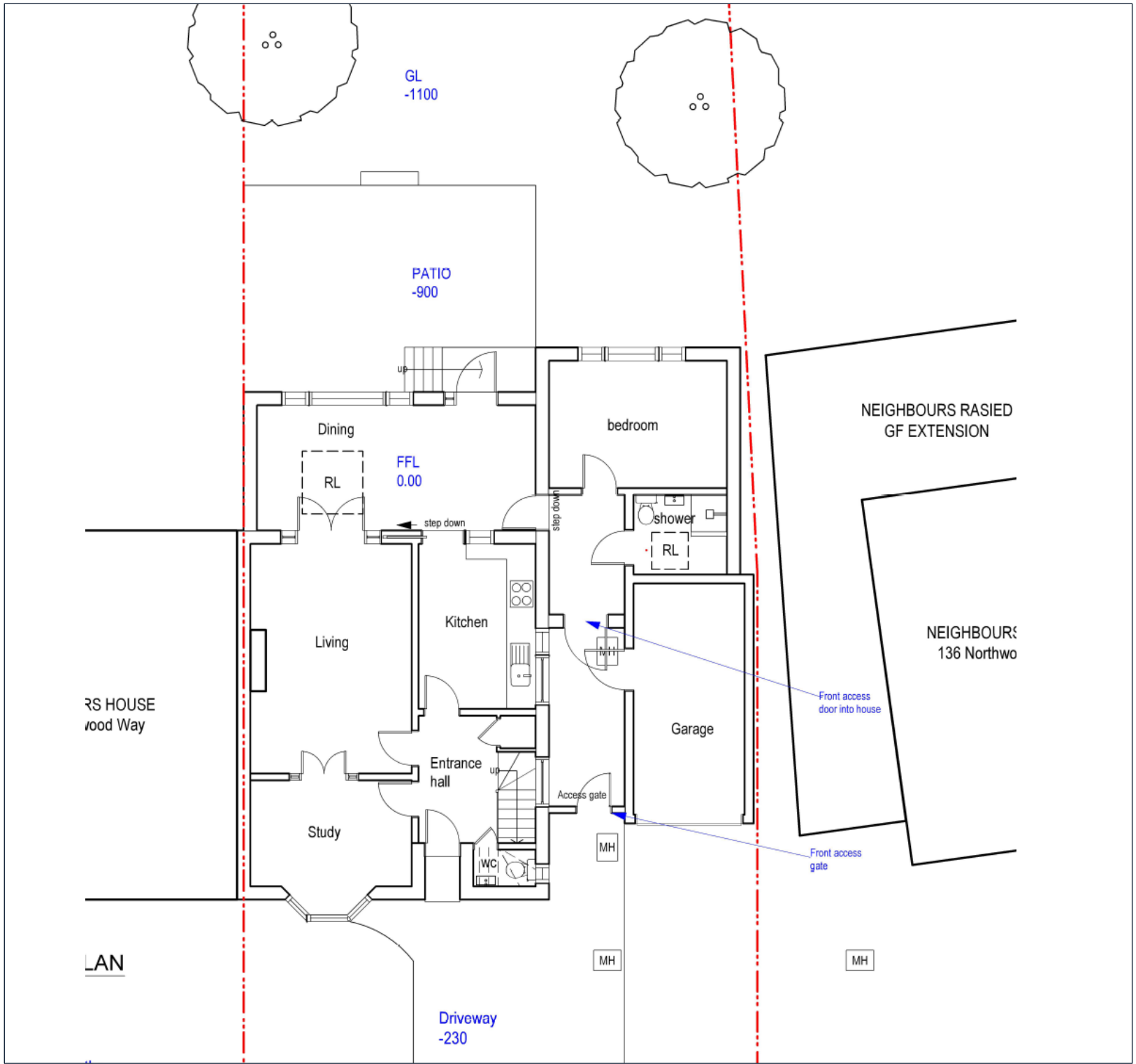
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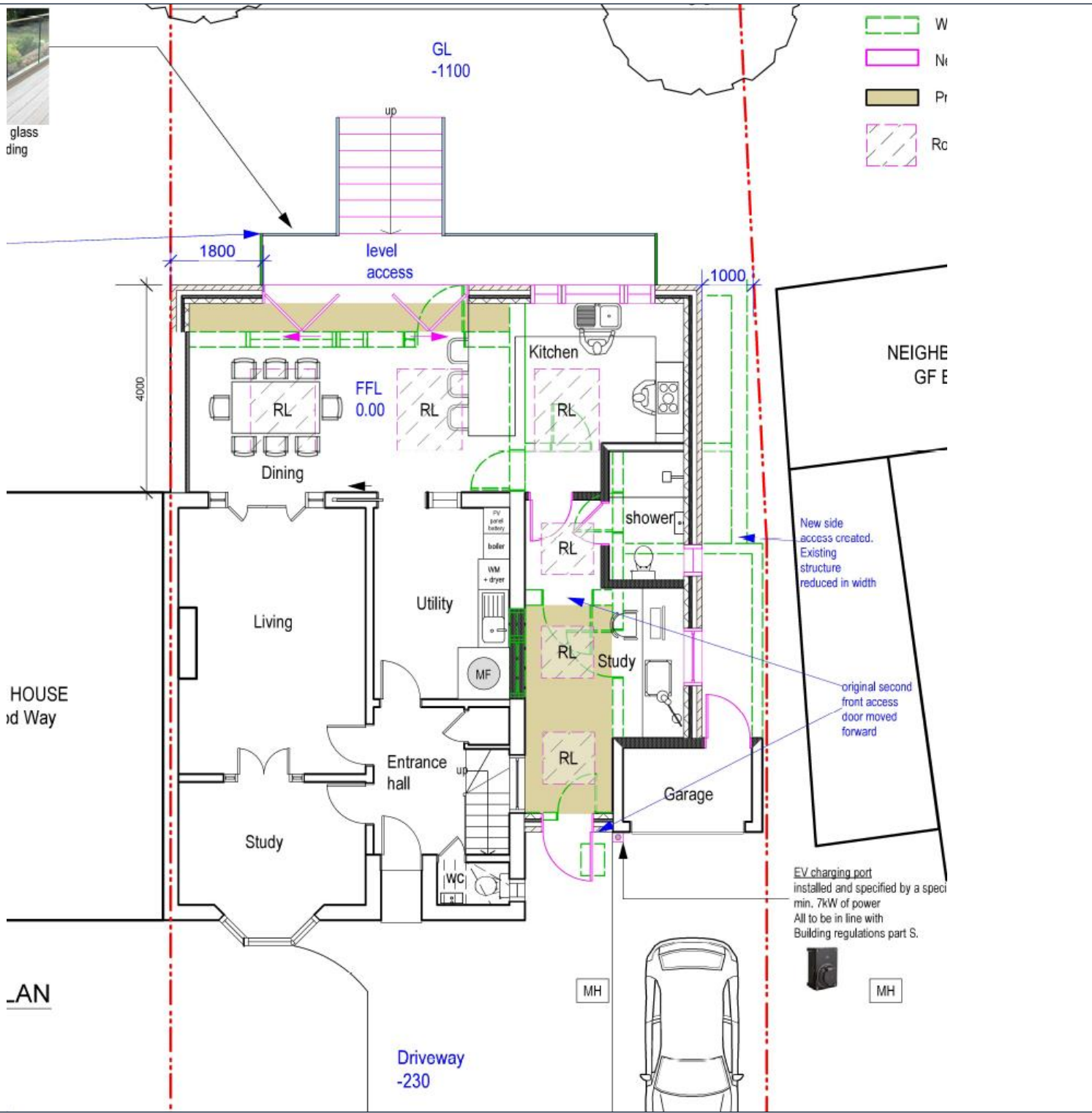
Appendix - Site Maps & Plans	
Description	
Site location plan	
Sources	
Contains OS data © Crown copyright and database rights	
Key	
	Site boundary
	North



Appendix - Site Maps & Plans	
Description	
Existing ground floor plan	
Sources	
SSK Architects	
Key	
	Site boundary
▲	North

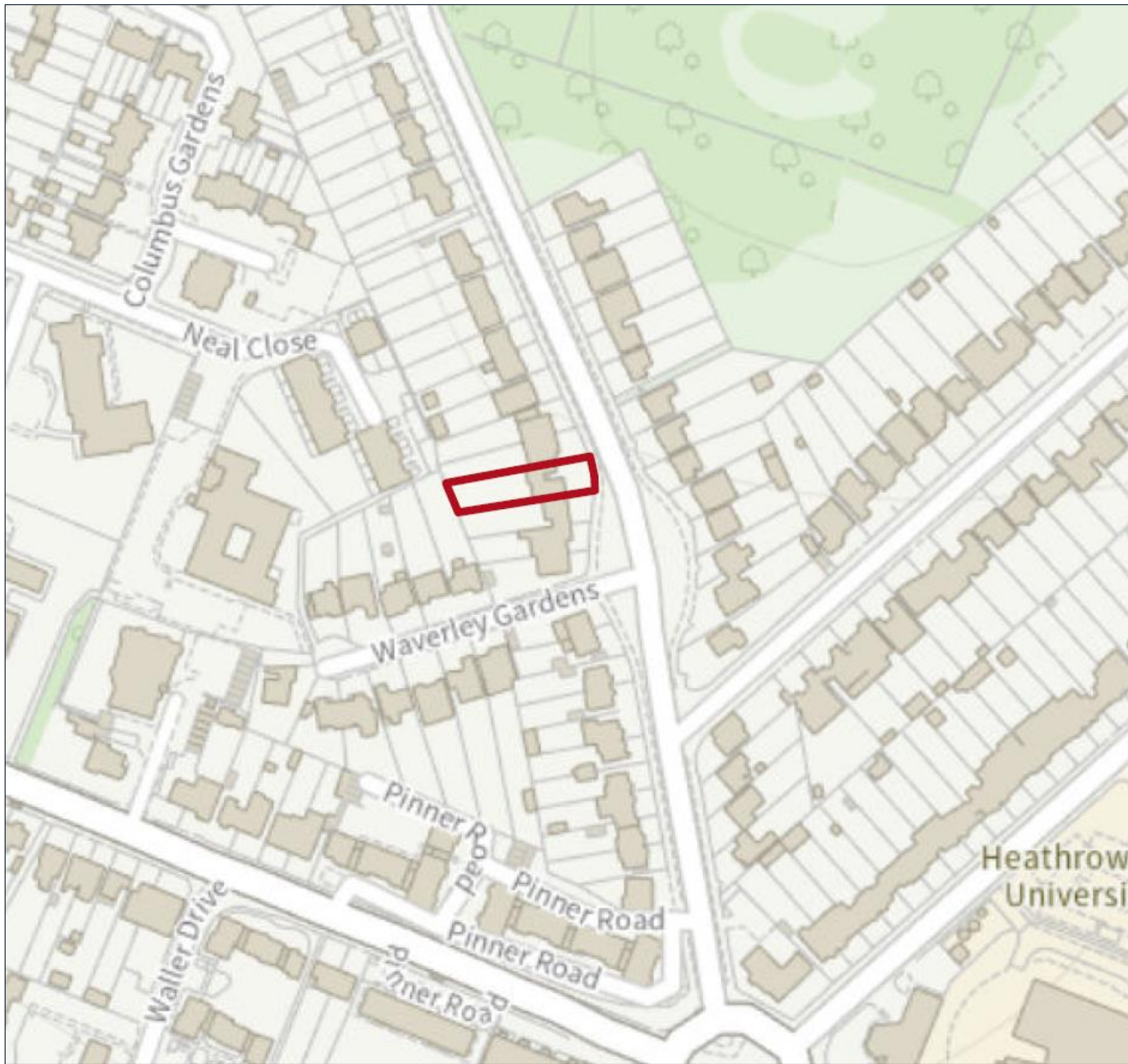









glass dining








- W
- Nl
- Pr
- Rc

Appendix - Site Maps & Plans	
Description	Proposed ground floor plan
Sources	SSK Architects








Appendix – Flood Risk Maps	
Description	
Flood map for planning	
Sources	
Environment Agency OS data © Crown copyright and database rights	
Key	
	Site boundary
	Flood Zone 1
	Flood Zone 2
	Flood Zone 3
	Main river
	Flood defence
	North








Appendix - Flood Risk Maps	
Description	
Environment Agency map showing the extent of flooding from surface water for a range of flood events	
Sources	
Environment Agency OS data © Crown copyright and database rights	
Key	
	Site boundary
	0.1% AEP (Low)
	1% AEP (Medium)
	3.33% AEP (High)
	North



Appendix - Flood Risk Maps	
Description	
Environment Agency map showing the extent of flooding from surface water for a range of flood events between 2040 and 2060	
Sources	
Environment Agency OS data © Crown copyright and database rights	
Key	
	Site boundary
	0.1% AEP (Low)
	1% AEP (Medium)
	3.33% AEP (High)
	North



Appendix - Flood Risk Maps	
Description	
Environment Agency map showing the likelihood of surface water flooding to a depth of up to 0.2m for a range of flood events between 2040 and 2060	
Sources	
Environment Agency OS data © Crown copyright and database rights	
Key	
	Site boundary
	0.1% AEP (Low)
	1% AEP (Medium)
	3.33% AEP (High)
	North

