

48 Shepherds Hill, London N6

Basement Impact Assessment

Executive Summary

The project involves the development of 48 Shepherds Hill, located in Highgate, North London.

The existing property is a three-storey end of terrace house located on a sloping site. The house has previously been subject to a number of alterations over the years.

The proposed development involves the extension of the current lower ground floor beneath the footprint of the house (but stopping short of the Party Wall) and to the East, towards the pavement, as part of a new two storey extension.

The extension of the lower ground floor will not affect any surrounding structures nor affect the groundwater regime in the area.

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Revision	Date	Status
A	26.07.2022	Minor Amendments
-	21.07.2022	Issued for Planning
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Approved By:		Dave Rayment

Introduction

Morph Structures were instructed by Sebastian Espinosa to consider the structural aspects of the redevelopment and extension of the house at 48 Shepherds Hill and to produce a Structural Basement Impact Assessment in support of a detailed Planning Application.

This report covers the work undertaken during the initial stage of the project. A description of the main elements of the structure is given, plus aspects of the construction methodology which has influenced the structural design.

The report was prepared by Dave Rayment, MEng CEng MIStructE.

The Project

The project involves the extension and refurbishment of 48 Shepherds Hill located in Highgate, North London.

The proposed development involves the construction of a new two-storey side extension to the East, along with the extension of the lower-ground level beneath the footprint of the existing house and the relocation of the main entrance door to the lower ground floor level.

The Site

3.1

Site Location

The site is located at the corner of Shepherds Hill and Broughton Gardens in Highgate, North London. The local topography gently slopes from Shepherds Hill at the North down to the rear, southern boundary, however ground levels have been built up as part of the current external landscaping which results in external levels sloping from the front of the existing house down to Shepherds Hill.

The National Grid Reference for the site is TQ292882 (E529277, N188221).

3.2

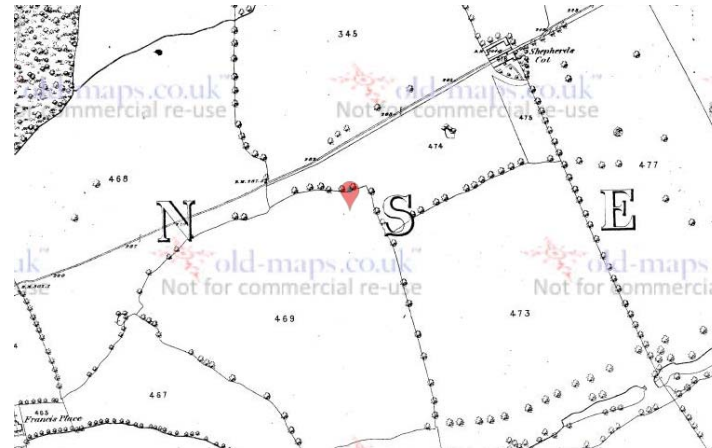
Site History

From online resources, the earliest map available for the area dates back to 1850. Historically, the site formed part of a large extent of farmland, accessed through a country lane, now formally known as Shepherd's Hill Road.

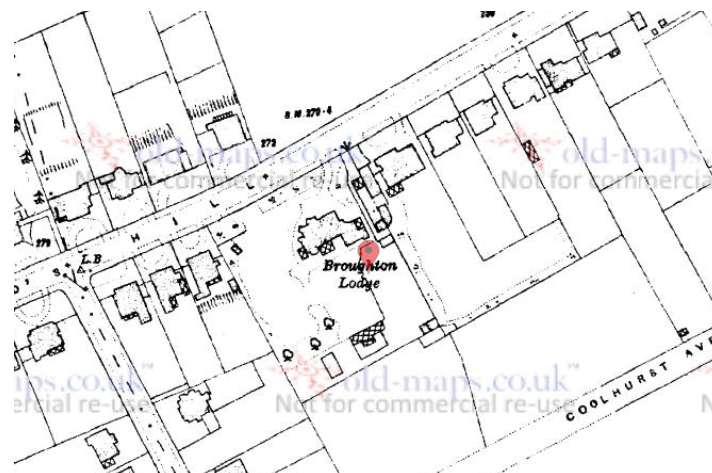
The historic maps show the land occupied by the site and surrounding areas was beginning to be developed on by the 1915's, with 'Broughton Lodge' occupying the cul-de-sac that now houses the residential properties in Broughton Gardens.

By 1935, Broughton Lodge had been demolished and replaced with what resembles today's Broughton Gardens. The site and surrounding areas appear to have been developed with semi-detached residential properties.

By 1960s, all the properties within Broughton Gardens cul-



1860's map



1915's Map



1935's Map



1960's Map



Aerial view of Site



Aerial view of Site

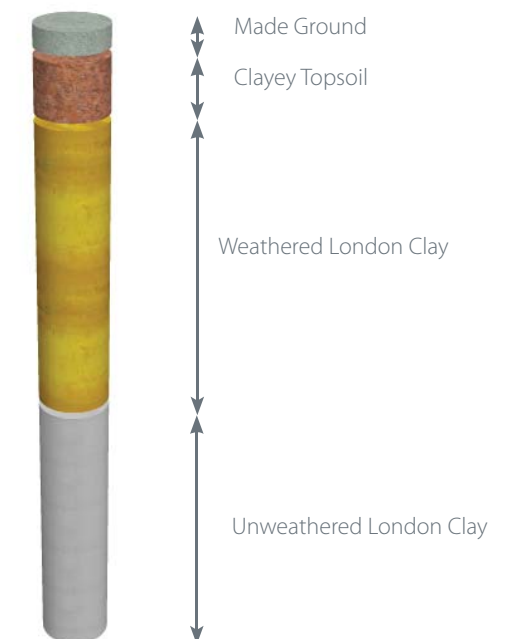
de-sac have been developed.

3.3

Geotechnical Data

Published geotechnical maps from British Geological Survey indicate that the local geological strata comprise of London Clay Formation which is of clay, silt and sand. The records show no superficial deposits.

The nearest borehole from the British Geological Survey shows a ground build-up of approximately 1.0m of Made Ground, followed by approximately 3.6m of clayey topsoil with roots before hitting London Clay Formation. The borehole shows 40.0m data depth before termination of investigations. There was no water level recorded at the same time.



Geotechnical Profile

3.4

The Existing House

The existing house is a three-storey, end of terrace house which is assumed to be formed of traditional load-bearing masonry walls supporting timber floors and roof.

The property appears to have been subject to a number of alterations over the years, with existing masonry walls transferred in several locations throughout the property.

3.5

Neighbouring Properties

The site is located at the entrance to the Broughton Gardens cul-de-sac and is one of fourteen properties. The property is an end of terrace house, sharing a party wall with no. 46 Shepherds Hill.

The site's garden shares its boundary line with neighbouring garden fences.



View of house from Shepherds Hill



View of house from Broughton Gardens

The Proposed Development

4.1

Overview

The proposed development involves the construction of a new two-storey side extension to the East, along with the extension of the lower-ground level beneath the footprint of the existing house and the relocation of the main entrance door to the lower ground floor level.

4.2

Superstructure

The proposed extension comprises load-bearing masonry cavity walls supporting softwood floor joists and softwood flat roof joists.

Minor alterations to the position of walls within the existing house require the introduction of steel beams to re support the existing floors and walls above.

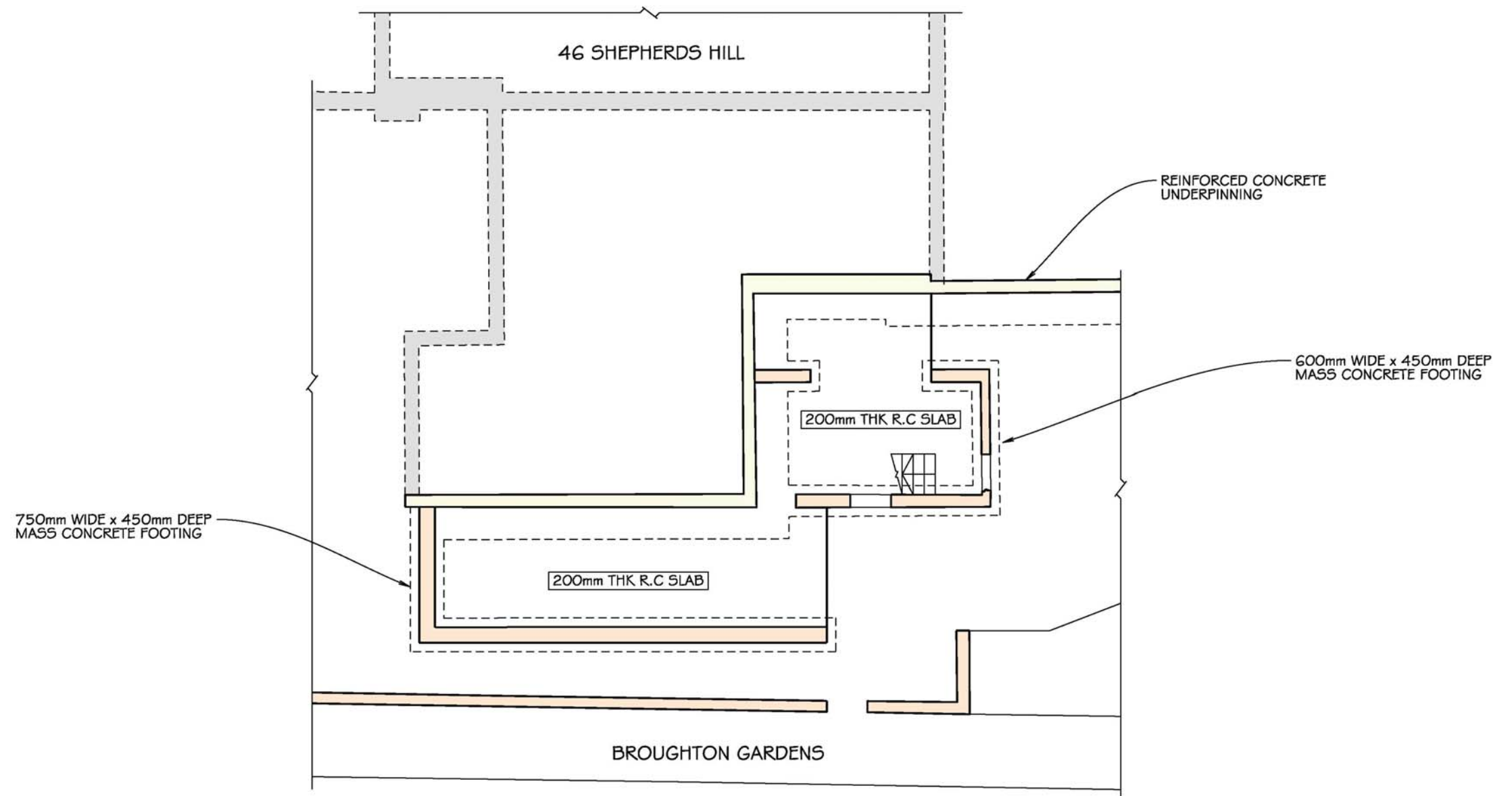
The existing stability system of the house remains unaltered.

4.3

Substructure

In order to allow the extension of the lower ground floor beneath the house, some of the walls are to be underpinned with reinforced concrete. These reinforced concrete underpins will transfer the foundation loads down to the underlying clay and act as retaining walls to maintain the ground behind.

The foundations to the new extension comprise simple mass concrete strip footings transferring loads into the underlying clay. The lower ground floor is to be formed by a reinforced suspended cast in-situ concrete slab.



Proposed Lower Ground Floor Plan

Construction Methodology

The methodology set out below has been assumed for the purposes of undertaking the planning stage and is provided to demonstrate that the works can be executed with due consideration of the surrounding buildings.

SITE SET UP

- There is access to the site from Broughton Gardens and Shepherds Hill.
- A banksman will be present during deliveries and removals to ensure that there is no risk to pedestrians from these activities
- Construct site hoarding, entrance gates to provide protection to pedestrians from site activities.
- Provide a site survey of all Party Walls to record the condition prior to construction and monitor any movement occurring during the works.
- Terminate, protect or temporarily redirect services and drainage.
- Provide protection boundaries to any trees in accordance to the arboricultural report.

SITE CLEARANCE

- Carefully clear vegetation and material from the site ensuring they are properly disposed of.
- Reduce levels across site and demolish low-level garden retaining walls

CONSTRUCTION OF LOWER GROUND FLOOR

- Existing house and front garden walls to be underpinned in maximum 1m sections, incorporating reinforced concrete toe, in such a manner that adequate support is at all times maintained to the underside of the wall for at least three quarters of its length and that sections of work in progress at any one time are separated by a distance of at least 3m. The bottoms of excavations will be prepared as specified for foundations generally, as far as practicable excavation and concreting of any section of underpinning shall be carried out on the same day.
- The concrete will be stopped off approximately 75mm below the underside of the existing footing, and the final pinning up over the whole extent of the latter will be carried out with a semi dry fine concrete well rammed in as soon as possible after the foundation has set hard. The pinning up concrete is to consist of 1 part by volume of portland cement to 3 parts of sharp sand with a low water/ cement ratio.
- Projecting portions of the existing brick and/or concrete footings are to be carefully cut off.
- The excavation to any section of underpinning will not be commenced until at least 48 hours after completion of the adjacent sections of the works.
- The contractor will keep a record on site of the sequence and dimensions of underpinning as actually executed, including the dates of starting excavation, casting concrete and pinning up for each section.
- Once the retaining wall construction is complete, temporary mass concrete pads will be cast to support temporary steel framing which will support the front and side walls of the existing house incorporating needles to support the walls above.
- The lower ground area will subsequently be excavated down to formation level, with trench footings cast for the new extension and for the extended walls below the front and side of the existing house.
- The extension cavity masonry walls will then be constructed, along with in-situ lower ground floor slab and

timber upper ground floor and roof

- Solid masonry walls will be constructed beneath the existing front and side walls of the house, with a minimum of 25mm sand:cement drypack rammed between new and brickwork and underside of existing
- Temporary support steelwork will then be removed

FOLLOW ON TRADES

The principal structural works are now complete and weather proofing the building and finishing trades can start.

CONSTRUCTION GENERALLY

The works are required to be undertaken in accordance with all statutory legislation relating to construction works.

The Contractor will be required to demonstrate a positive attitude and commitment toward minimising environmental disturbance to local residents and will be required to be registered with the Considerate Contractors Scheme.

Noise, dust and vibration will be controlled by employing Best Practicable Means (BPM) as prescribed in the following legislative documents and the approved code of practice BS 5228:

- The Control of Pollution Act 1972
 - The Health & Safety at Work Act 1974
 - The Environmental Protection Act 1990
 - Construction (Design and Management) Regulations 1994
 - The Clean Air Act 1993
- General measures to be adopted by the Contractor to reduce noise, dust and vibration include:
- Erection of site hoarding to act as minor acoustic screen.
 - Use of super silenced plant where feasible.
 - Use of well-maintained modern plant.
 - Site operatives to be well trained to ensure that noise minimisation and BPM's are implemented.
 - Effective noise and vibration monitoring to be implemented.
 - Reducing the need to adopt percussive and vibrating machinery.
 - Vehicles not to be left idling.
 - Vehicles to be washed and cleaned effectively before leaving site.

Surrounding Structures

PARTY WALL CONSIDERATIONS

The works comprise the extension of the lower ground floor which at it's closest location is approximately 4m from the Party Wall with the adjacent property at 46 Shepherds Hill. These works may fall under The Party Wall etc. Act 1996 and consideration of the proposed works on the adjacent property will be taken into account.

The neighbouring property is assumed to be of traditional load bearing masonry with timber floor construction similar to 48 Shepherd's Hill.

The structural scheme adopted has been designed with due regard to maintaining the structural stability and integrity of neighbouring buildings & structures and surrounding land. The method of construction has been developed to ensure that lateral deflections, and associated ground movements, are kept within acceptable limits during and post construction.

MONITORING OF NEIGHBOURING PROPERTIES

The category of damage to adjacent buildings, as classified under Burland et al, anticipated from the proposed construction of the new basement is expected to be category 1 or less . The Contractor will be required to monitor ground movements during the works to check the performance of the temporary works and working methods. A 'traffic light' system of green, amber, red trigger values will be set with specific Contractor actions set against each trigger values.

The monitoring method is to be developed further during detailed design but may take the form of precise levelling, geospatial surveying, crack width gauges, strain gauges, inclinometers, or extensometers or a combination of these methods. The monitoring will be undertaken prior to demolition and continue through to completion of the structure.

TRAFFIC LIGHT	TRIGGER VALUE (mm)	CONTRACTOR ACTION
Green	<8	No action required.
Amber	8-12	Notify the CA and Party Wall Surveyor(s). Increase frequency of monitoring. Implement contingency measures if movement continues.
Red	>12	Notify the CA and the Party Wall Surveyor(s). Implement measures to cease movement and stop work.
Indicative Ground Movement Trigger Values		

Ground Water Assessment

From the historical nearby borehole obtained from BGS, no water was encountered when the borehole was carried out. From the historical record and location of the property, it is considered unlikely that ground water would be encountered during construction. Perched water may be encountered after periods of prolonged rain fall.

A site investigation will be carried out at the next stage to confirm the water level for the site.

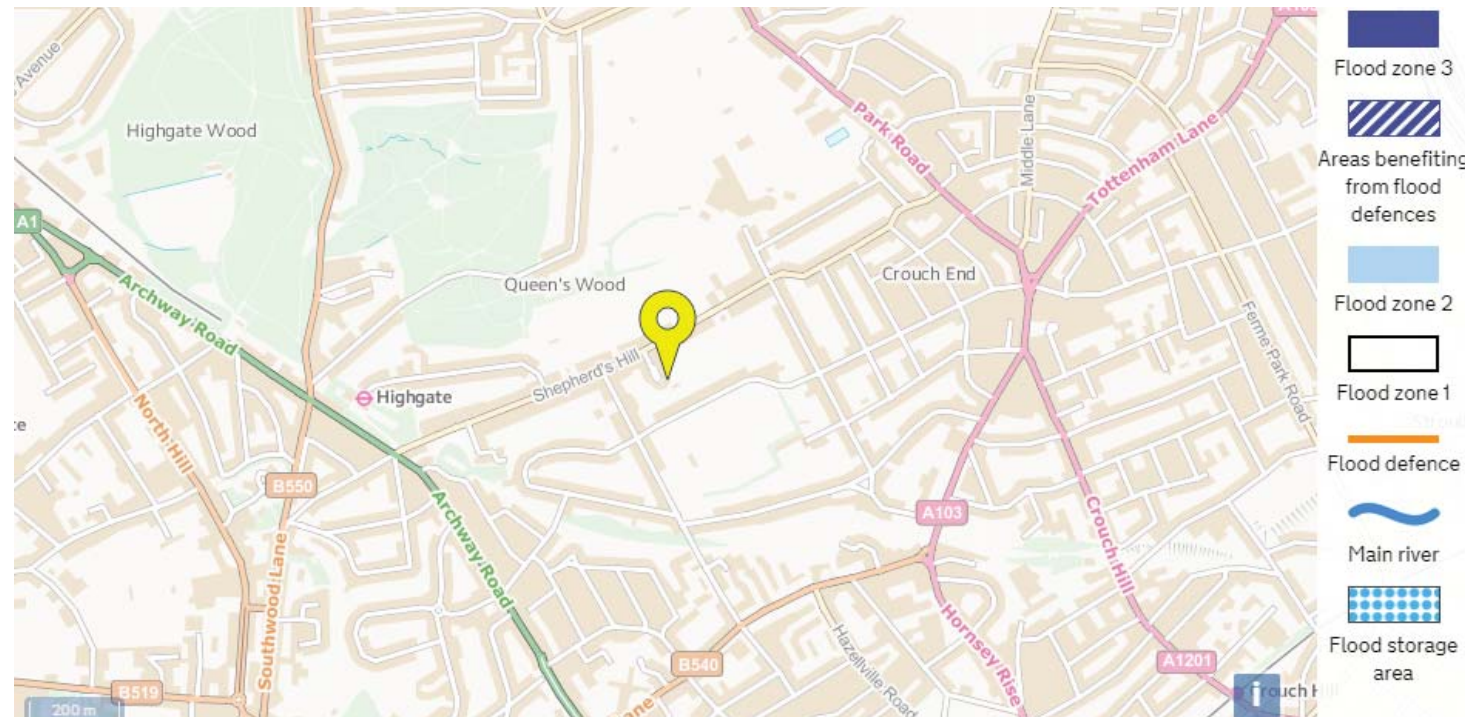
FLOOD RISK

The Environmental Agency map shows that the site is not in a zone of flood risk from river or the sea.

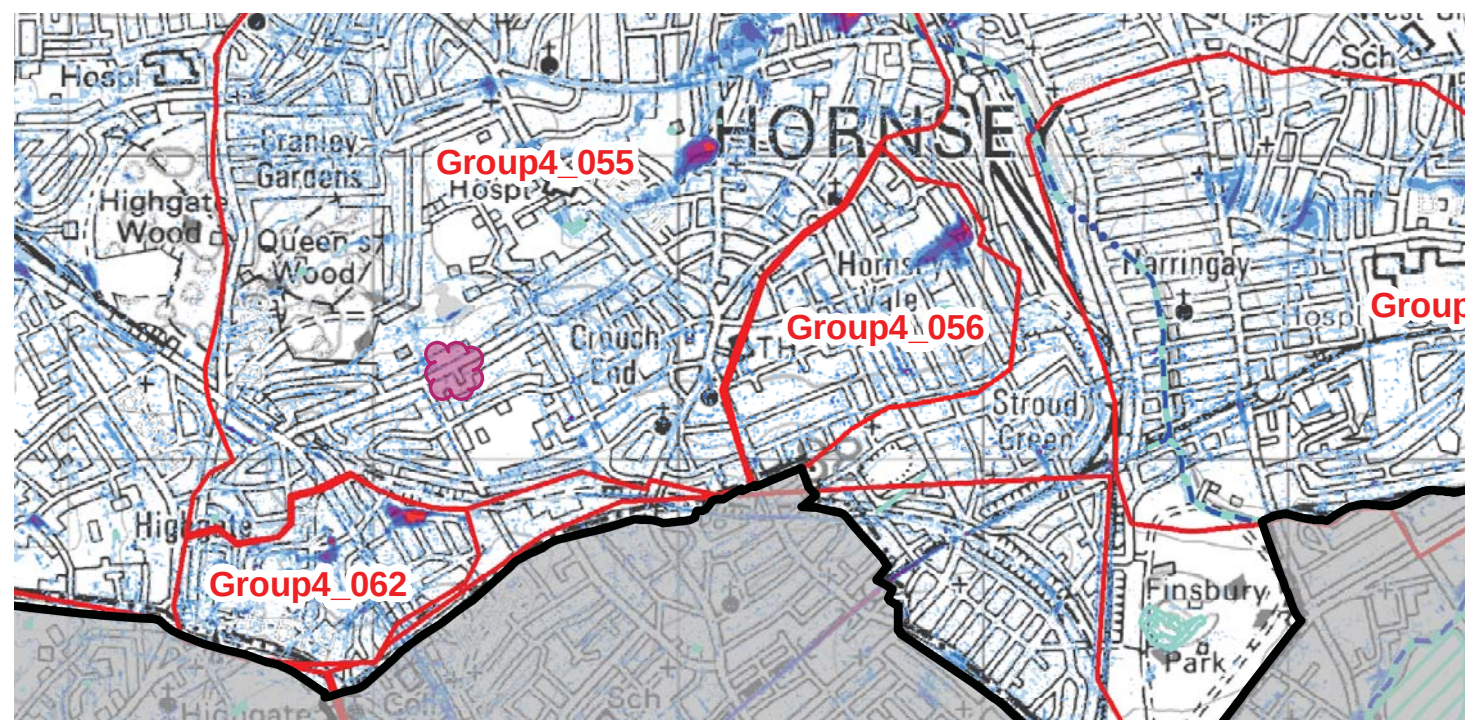
The site occurs in a Critical Drainage Area according to Haringey Council.

A Critical Drainage Area is an area within which the LFRZ's occur. A Critical Drainage Area is usually a discrete geographic area (usually a hydrological catchment) where single or multiple, interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) may cause flooding in one or more Local Flood Risk Zones during severe weather, thereby affecting people, property or local infrastructure

However according to the Haringey Surface Water Management Plan which references further Environmental Agency information, the site appears to be very low risk from surface water flooding. Following this preliminary flood risk assessment, it is expected that no additional remediation will be required.



Environmental Agency Map - Flood Risk



Haringey Council - Critical Damage Area Map

GROUND WATER AND CUMULATIVE EFFECTS

Due to the sloped topography of the site, the extended lower ground floor will not act as a dam and any water can be displaced around and migrate under the property.

There will be a minor increase in the amount of hardstanding water in the proposed development which will be incorporated into the proposed drainage design.

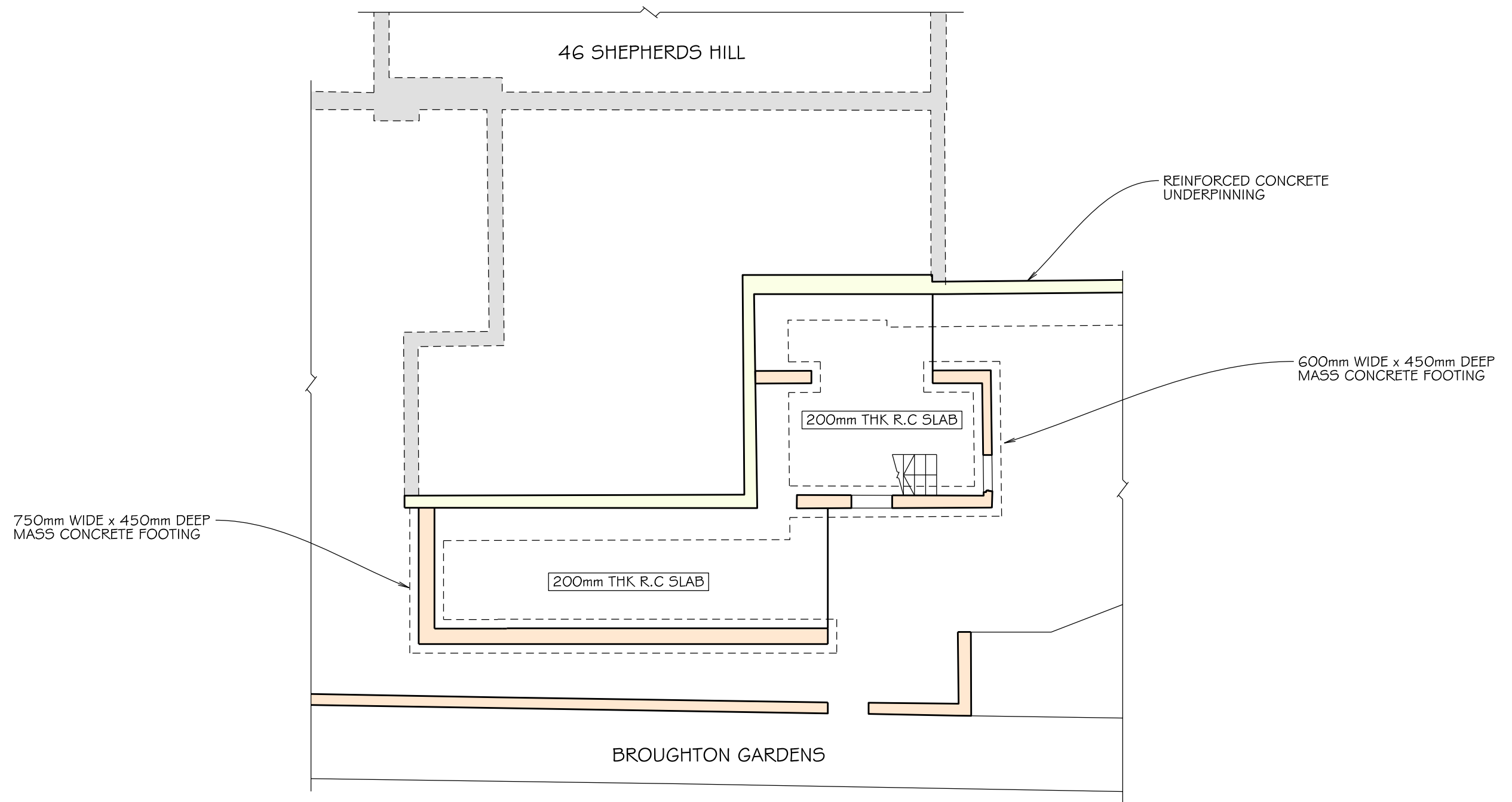
DRAINAGE

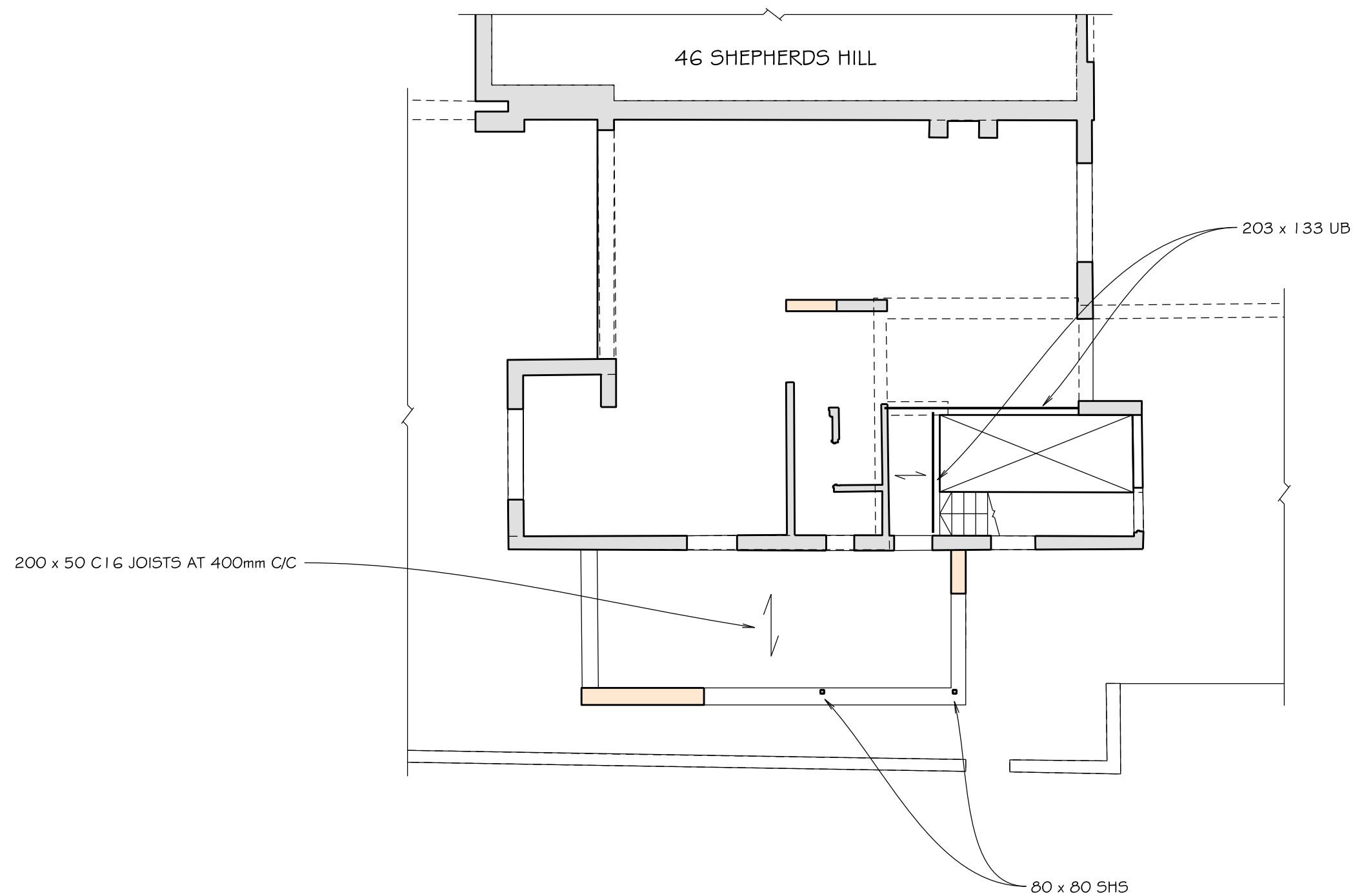
According to Haringey Council surface water management plan, the site is classified as 'Infiltration SUDs Potentially Unsuitable'. If required there is space on the site for attenuation, or the roof to the new extension could be specified to allow for some attenuation.

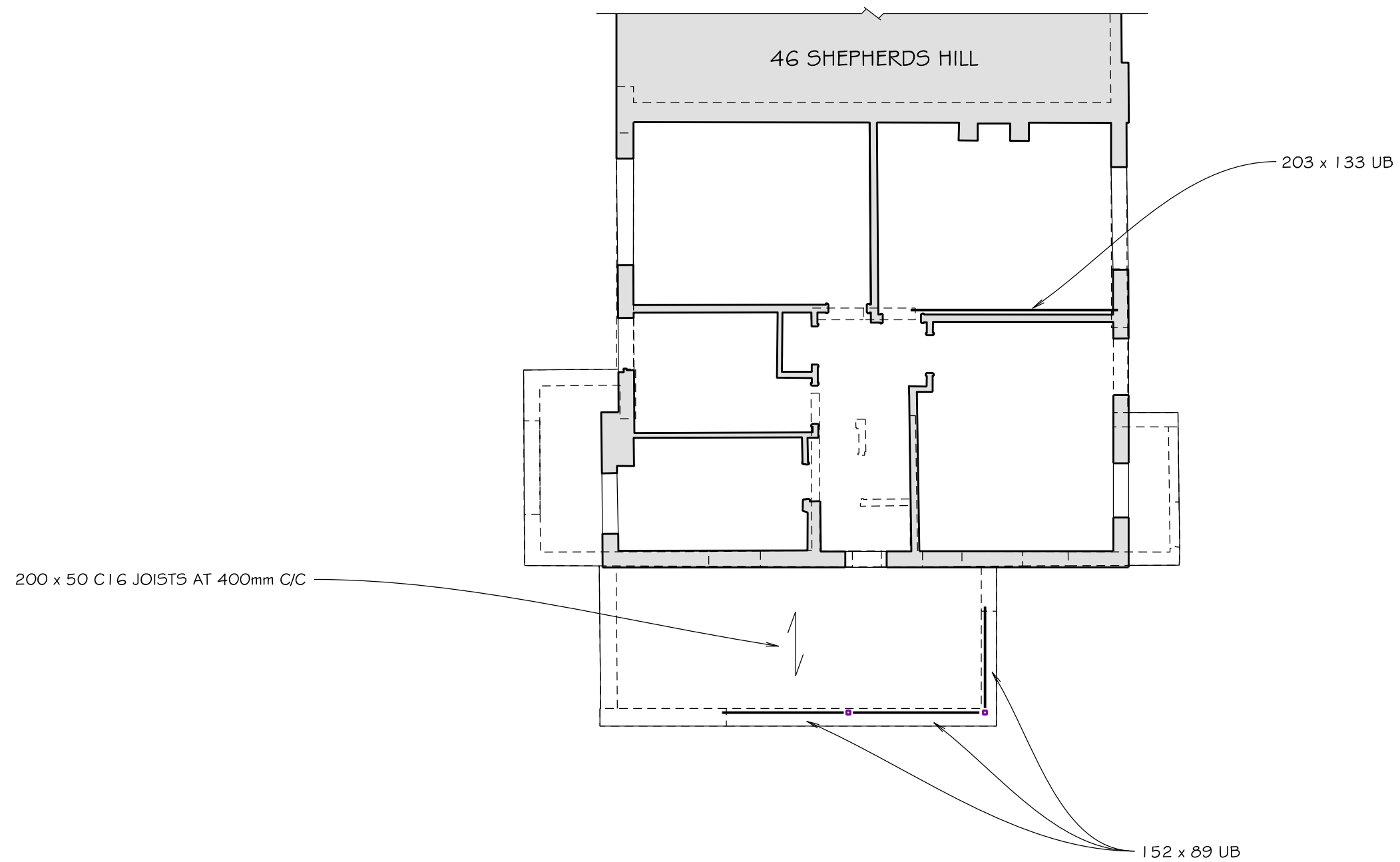
The new drainage system will be designed to minimise maintenance requirements and will be managed in accordance with current local and national policy requirements.

Appendix A

Design Sketches







P1	20.07.22	ISSUED FOR INFORMATION	BB	DR
REV	DATE	DESCRIPTION	BY	CHECKED
3274-MORPH-ZZ-01-SK-S-1002				
P1				

