Flood Risk Assessment

in connection with
proposed development at

53 Platt's Lane
London
NW3 7NL

for

Mr. Hasan Hameed

LBH4502fra Ver. 1.2
January 2018

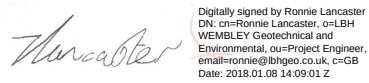
LBH WEMBLEY
ENGINEERING

Project No: LBH4502

Report Ref: LBH4502fra Ver 1.2

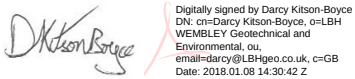
Date: 8th January 2018

Report prepared by:



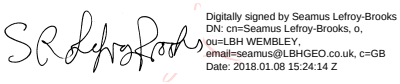
Ronnie Lancaster
BSc (Hons) MSc DIC FGS

Report supervised by:



Darcy Kitson-Boyce
MEng (Hons) GMICE FGS FRGS

Report approved by:



Seamus R Lefroy-Brooks
BSc(hons) MSc CEng MICE CGeol FGS CEnv MIEnvSc FRGS SiLC RoGEP UK Registered Ground Engineering Adviser

LBH WEMBLEY ENGINEERING
Unit 12 Little Balmer
Buckingham Industrial Park
Buckingham
MK18 1TF

Tel: 01280 812310

email: enquiry@lbhgeo.co.uk
website: www.lbhgeo.co.uk

Contents

Foreword - Guidance Notes

GENERAL

This report has been prepared for a specific client and to meet a specific brief. The preparation of this report may have been affected by limitations of scope, resources or time scale required by the client. Should any part of this report be relied on by a third party, that party does so wholly at its own risk and LBH WEMBLEY disclaims any liability to such parties.

The observations and conclusions described in this report are based solely upon the agreed scope of work. LBH WEMBLEY has not performed any observations, investigations, studies or testing not specifically set out in the agreed scope of work and cannot accept any liability for the existence of any condition, the discovery of which would require performance of services beyond the agreed scope of work.

VALIDITY

Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances shall be at the client's sole and own risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should therefore not be relied upon in the future and any such reliance on the report in the future shall again be at the client's own and sole risk. LBH WEMBLEY should in all such altered circumstances be commissioned to review and update this report accordingly.

THIRD PARTY INFORMATION

The report may present an opinion on the disposition, configuration and composition of soils, strata and any contamination within or near the site based upon information received from third parties. However, no liability can be accepted for any inaccuracies or omissions in that information.

DRAWINGS

Any plans or drawings provided in this report are not meant to be an accurate base plan, but are used to present the general relative locations of features on, and surrounding, the site.

1. Introduction

It is proposed to construct a front lightwell that will be set at the same level as the existing basement beneath a Victorian terraced property.

This Flood Risk Assessment (FRA) has been prepared, alongside a Basement Impact Assessment (LBH4502bia Ver. 1.2), in support of a forthcoming planning application to the London Borough of Camden.

An FRA is required in order to assess the potential for the development to increase flood risk elsewhere through the addition of hard surfaces and the potential effect of the new development on surface water run-off, in addition to assessing the site vulnerability to flooding from other sources including groundwater and overland runoff, rivers and the sea.

The purpose of this report is to assess the existing flood risk, including mitigation measures and whether the site is suitable for residential usage. The report identifies whether there are any flooding or surface water management issues, whether the site lies within an area that is at risk of flooding or whether the development may increase flood risk due to increased run-off. This is achieved through Identification of the sources of flooding which may affect the site, and includes the following:-

- An appraisal of the availability and adequacy of existing information
- A qualitative appraisal of the flood risk posed to the site, and potential impact of the development on flood risk elsewhere
- An appraisal of the scope of possible measures to reduce the flood risk to acceptable levels

The report will demonstrate to the Local Planning Authority (LPA) that the applicant is considering flood risk to the development from all sources and how this will be managed. The assessment also considers the disposal of drainage water, potential impacts on adjacent land and climate change effects.

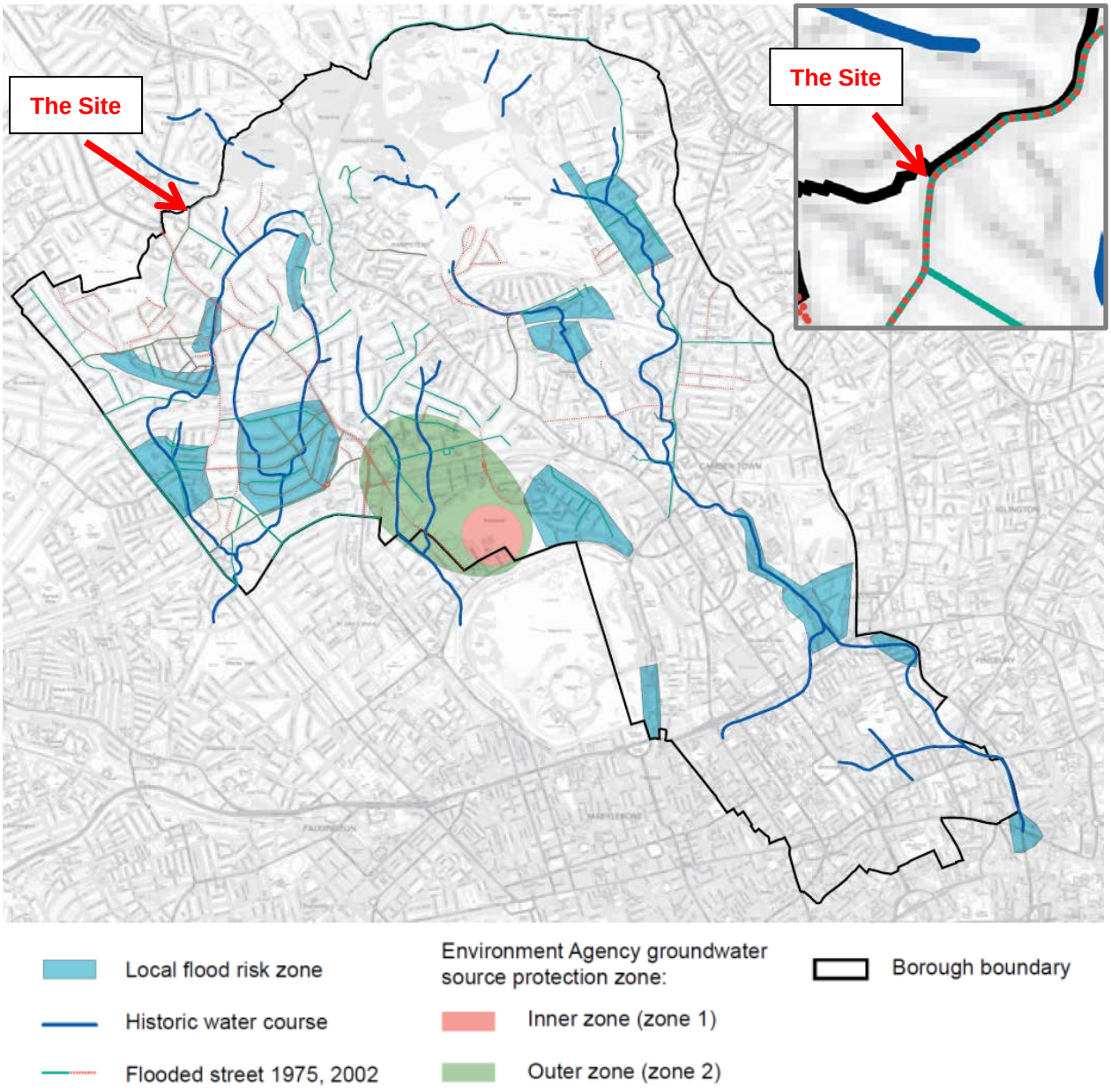
The assessment has been based on existing reports and archive information together with information from historical maps and photographs.

1.1 Site-Specific Flood Risk Assessment

The Camden Local Plan states that a Flood Risk Assessments is necessary for:

- *All sites of 1 hectare or greater;*
- *All major planning applications in areas at high risk to flooding; and*
- ***All basement development on streets identified as being at flood risk or in an area where historic underground watercourses are known to have been present, or in areas where there is an elevated risk of groundwater flooding.***

The site has been identified as being situated in an area that has historically experienced localised surface water flooding, both in 1975 and 2002.



Map extract of Camden Local Plan Map 6: Historic Flooding and Local Flood Risk Zones (Camden Local Plan, 2017)

In accordance with the Camden Local Plan, a FRA is therefore required in order to demonstrate that the proposed scheme will result in a minimal impact on surface water drainage conditions.

1.2 Documents

The following documents have been taken into consideration in the preparation of this report:

- Basement Impact Assessment of 53 Platt's Lane, LBH Wembley (LBH4502bia Ver. 1.2), December 2017

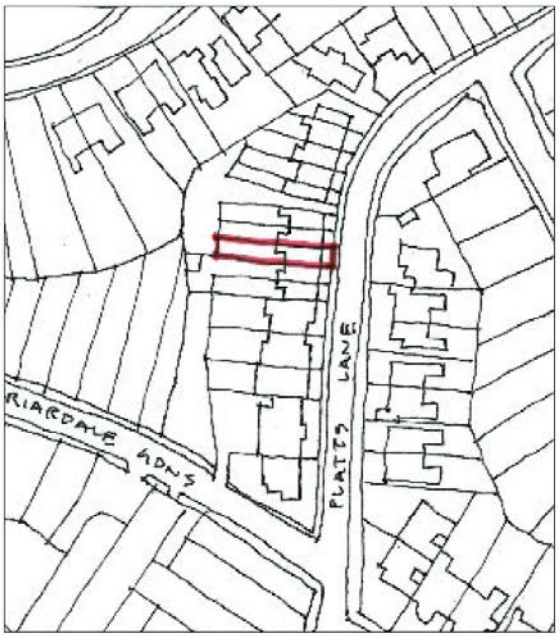
- Camden Local Plan, Adoption Version, London Borough of Camden, June 2017
- Camden Planning Guidance 4, Basement and Lightwells, London Borough of Camden, July 2015
- London Borough of Camden SFRA, URS, July 2014
- Surface Water Management Plan for London Borough of Camden, London Borough of Camden, July 2011
- Floods in Camden, Report of the Floods Scrutiny Panel, London Borough of Camden, June 2003
- Camden Geological, Hydrogeological and Hydrological Study (CHGGS), November 2010, Ove Arup & Partners Limited

2. The Site

2.1 Site Location

The site is situated on the western side of Platt's Lane, some 350m to the southwest of West Heath.

The site may be located approximately by postcode NW3 7NL or by National Grid Reference 525280, 186185.



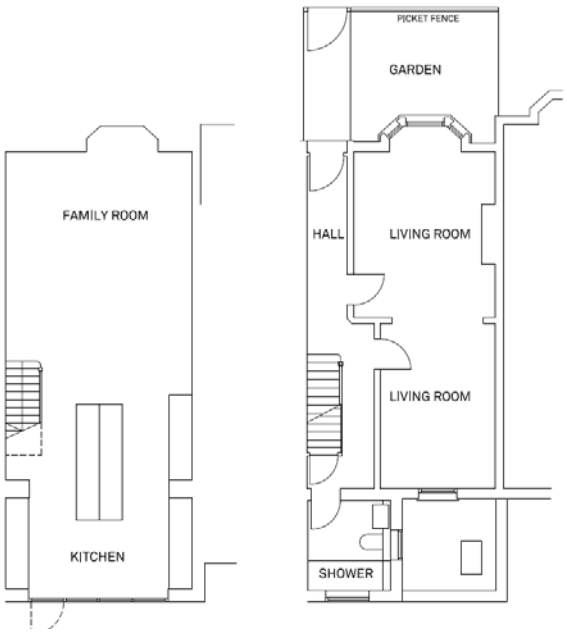
Location Plan

2.2 Topographical Setting

The site lies on the slopes of Hampstead Hill that is gently falling to the west towards a culverted tributary of the River Brent.

Street level immediately to the east of the site appears to be situated at approximately +91m OD.

2.3 Site Description



Existing Floor Plans –

Left: Lower Ground Floor. Right: Ground Floor

The site is currently occupied by a Victorian terraced house comprising two storeys and attic accommodation. The dwelling also contains a single storey basement beneath the full extent of the house.

The existing ground floor level of the house appears to be located at around street level, hence is situated at approximately +91m OD. The existing basement extends to roughly 3m below existing ground level, at around +88m OD.

A small patio area is located immediately to the front of the house, which is bordered by a hedge. A c.120mm diameter vitreous clay pipe, possibly a private rainwater drain, is present beneath this patio area at roughly 1m depth and appears to run along the front gardens to the properties fronting onto Platt's Lane. The pipe may be disused.

A garden is present to the rear of the house and comprises several trees.

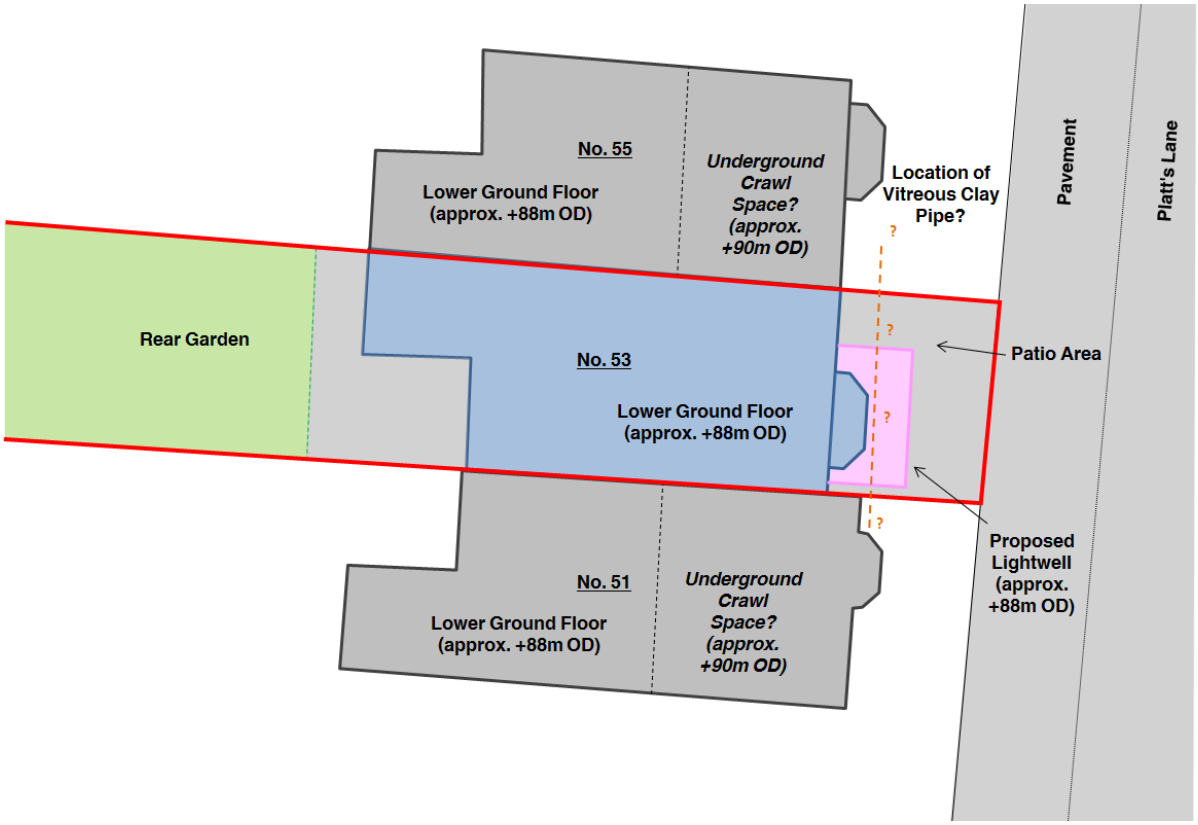
The site is adjoined to the north and south by terraced properties at 55 and 51 Platt's Lane respectively.

These dwellings appear to comprise single storey lower ground floors beneath the rear halves of their footprints. In addition, shallow underfloor spaces are understood to be present beneath the front halves, which are situated at roughly +90m OD.

2.4 Proposed Development

It is proposed to construct a lightwell to front of the existing house, which will be set at the same level as the existing basement (roughly +88m OD).

It is envisaged that a vitreous clay pipe that runs beneath the proposed lightwell will need to be diverted in order to allow the development.



Site plan showing proposed development and existing features

3. Background

The Department for Communities and Local Government have published their online Planning Practice Guidance (PPG) that supercedes the National Planning Policy Framework Technical Guidance of March 2012. The following section has been prepared in accordance with the PPG.

3.1 Existing Flood Alleviation Measures

No evidence of any existing flood alleviation measures in the vicinity of the site has been found.

3.2 Flood Risk Vulnerability Classification

Table 2 of the Planning Practice Guidance (PPG) indicates that as the basement will be occupied by residential space, hence the site use falls into the "highly vulnerable" flood risk classification.

3.3 The Sequential Test

The PPG requires that the risk based sequential test should be applied at all stages of planning, which aims to steer new development to areas at the lowest probability of flooding (Flood Zone 1). It is also recognised that some areas will also be at risk of flooding from sources other than tidal and fluvial.

As shown on the Environment Agency (EA) flood map of flood risk from rivers and the sea, the site is locately entirely within Flood Zone 1. In addition, the EA flood map of surface water flood risk indicates the site to be at a very low risk to surface water flooding. As a result, it is considered that the Sequential Test is satisfied.

3.4 The Exception Test

Table 3 of the PPG does not require the Exception Test to be applied given that in Flood Zone 1 "*Development is appropriate*".

4. Hazard Identification

4.1 Flooding from Rivers and the Sea

All main rivers located within the London Borough of Camden are culverted and are incorporated into the Thames Water sewer network.

As a result, the London Borough of Camden is located entirely within Flood Zone 1 and the site itself is located over 2km from the nearest higher Flood Zone, Flood Zones 2 and 3 associated with River Brent. This indicates that the assessed annual probability of flooding at the site is less than 1 in 1000 (<0.1%).

In addition, the Camden SFRA records that no flooding has occurred within the borough from fluvial or tidal sources.

4.2 Flooding from Land

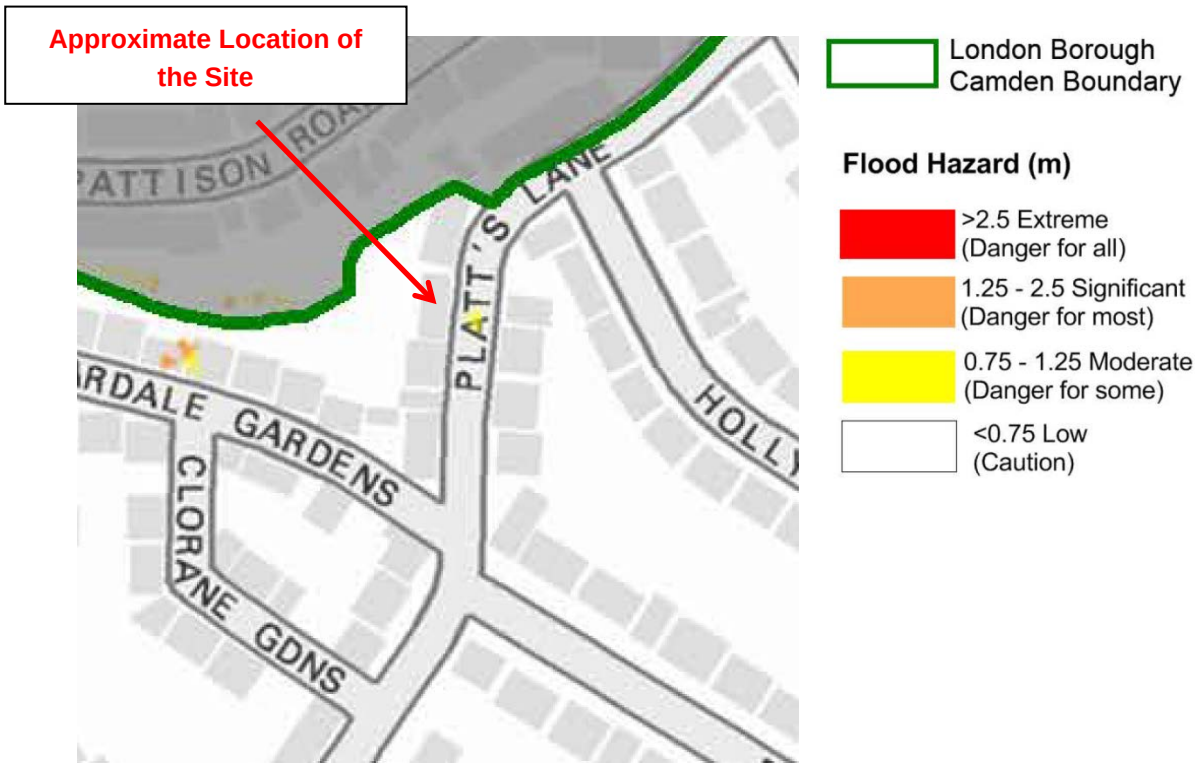
The EA's Surface Water Flood Map indicates that, in the worst case scenario (i.e. the 1 in 1000 event (0.1% AEP)), the site is at a very low risk to flooding from surface water.

This risk corresponds to a flood depth of below 300mm.

Extract of the EA's Surface Water Flooding map showing the flood risk from surface water

Hazard mapping created by the EA indicates the hazard to people following a methodology presented by Defra in its R&D report on Flood Risks to People[1]

The following map indicates that even in the event of a 1 in 1000 rainfall event (<0.1%), the surface water flood hazard affecting the site is still classed as Low (Caution).



Extract of Figure 3 ix: Hazard 1 in 1000 year flood event (Camden SFRA, 2014)

Historic flood records indicate that the London Borough of Camden experienced significant flooding in 1975 and 2002. Platt's Lane was affected by surface water flooding during both events.

The report of the Floods Scrutiny Panel concluded that for both flood events, the sewer system capacity was exceeded, which resulted in surcharging of the sewer system at a number of locations.

Following the 2002 flood event, it is understood that a flood alleviation scheme was created at Sumatra Road, West Hampstead. This involved the construction of a sewer that was designed to intercept and divert flow towards a storage tank that provides around 1,700m^3 of storage during extreme rainfall events.

4.3 Flooding from Groundwater

Groundwater flooding occurs when water levels within the ground rise above surface levels.

The British Geological Survey (BGS) records indicate that the site is underlain by the Claygate Member, which the Environment Agency (EA) classifies a 'Secondary A Aquifer'.

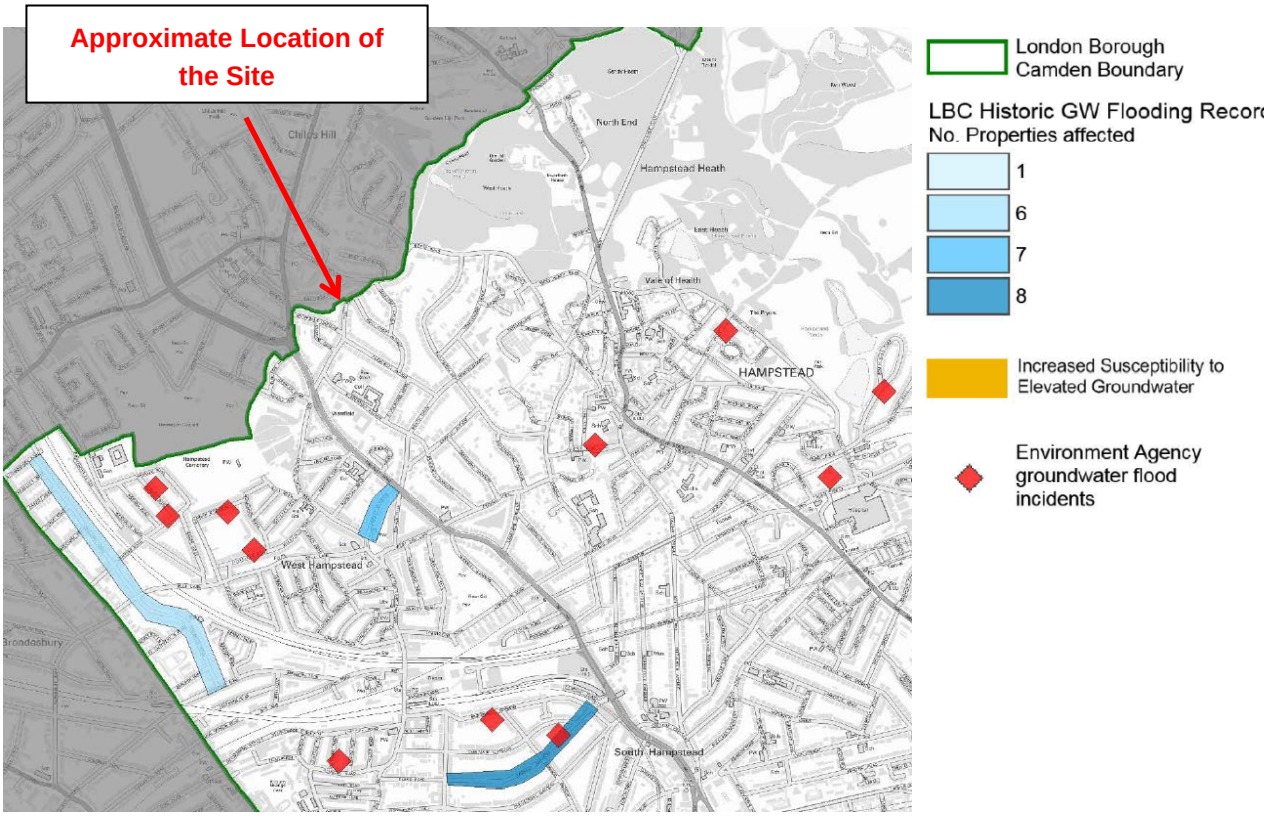
[1] Defra (2006) Defra Guidance Document FD2321/TR2: Flood Risks to People

However, a recent ground investigation has indicated the strata beneath the site to comprise around 1m of made ground resting upon Downwash Deposits consisting of sandy clay with gravel. The EA classifies the Downwash Deposits as a 'Secondary Undifferentiated Aquifer'. These deposits extend to around 2.5m depth and are underlain by the Claygate Member comprising sandy clay.

Groundwater monitoring has indicated perched groundwater seepages emanating from the Claygate Member at roughly 3.5m depth.

The following figure identifies areas where there is increased potential for groundwater levels to rise within 2m of the ground surface following periods of higher than average groundwater recharge. In addition, the figure illustrates any recorded groundwater flood incidents.

The site does not lie within an area that is deemed to be at an increased susceptibility to elevated groundwater, nor does it lie in close proximity to any recorded groundwater flood incidents.



Extract of Figure 4e: Increased susceptibility to elevated groundwater (Camden SFRA, 2014)

The CGHHS (2010) indicates that perched water tables are more likely to represent a slope stability issues, rather than a flood risk issue, and this is addressed in the BIA (LBH4450bia Ver. 1.0).

It is therefore concluded that the risk of groundwater flooding at the site is very low.

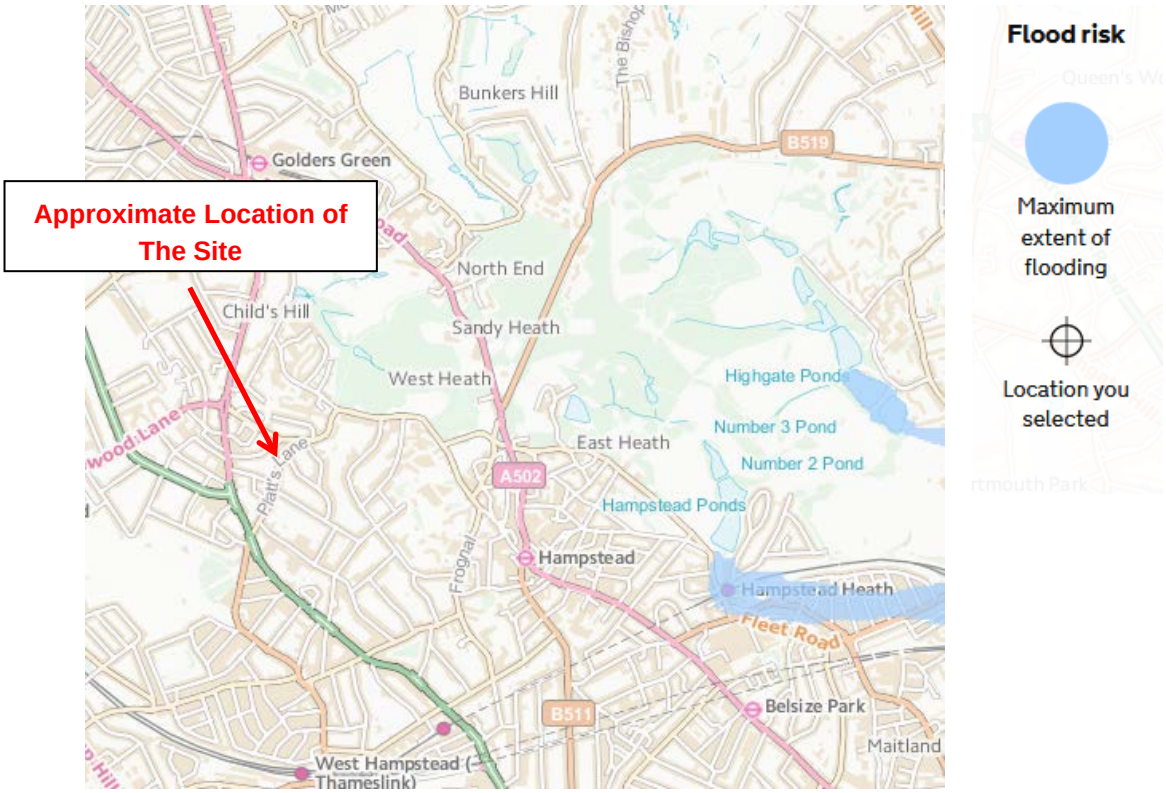
4.4 Flooding from Sewers

A sewer flooding history enquiry made to Thames Water[2] states "*The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers*".

4.5 Flooding from Reservoirs, Canals and other Artificial Sources

The SFRA indicates that there are roughly 30 ponds located within Hampstead Heath, three of which are classified as large raised reservoirs under the Reservoirs Act 1975.

The EA's Reservoir Flood Map identifies areas that could be flooded if a large reservoir were to fail or release the water it holds. The map shows that the site lies outside the area at risk of reservoir flooding, with the nearest area at risk of flooding located roughly 2km from the site, associated with the flooding of Highgate Ponds on Hampstead Heath.



Extract of the EA's Reservoir Flooding map showing the maximum extent of flooding

The SFRA has not identified any other significant artificial sources of flood risk within the borough that may adversely affect the site.

[2] *Thames Water, December 2017, Sewer Flooding History Enquiry, Ref: SFH/SFH Standard/2017_3706338*

5. Risk Estimation

5.1 Strategic Flood Risk Assessment

The SFRA provides local guidance in respect of flood risk.

5.1.1 Probability of Site Flooding

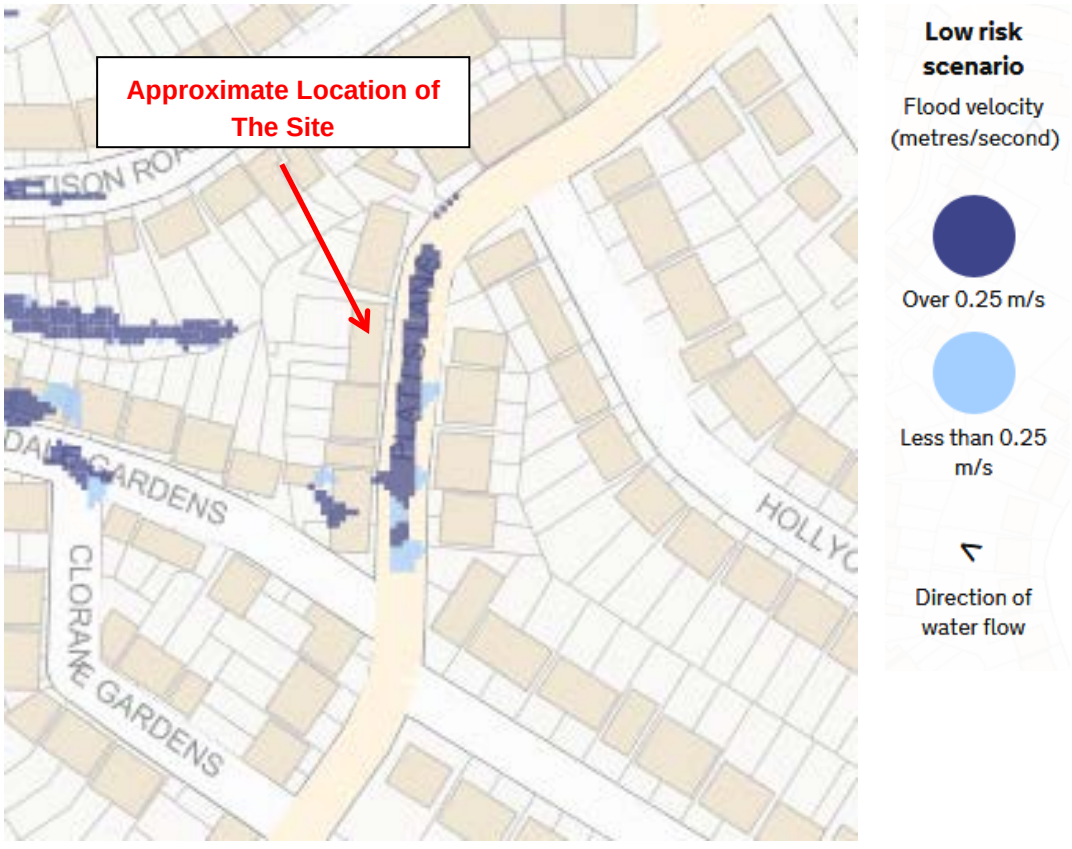
The risk of flooding at this site is indicated to be low.

5.1.2 Rate and Duration of Flooding

No information is available on the predicted duration of any pluvial flooding.

The EA's surface water flooding map shows that, during a 0.1% AEP pluvial event, Platt's Lane would experience floods moving at a rate of over 0.25m/s, which appears to act as a conduit for flood waters.

As part of this pluvial event, it would appear that the site would remain unaffected by the flooding.



Extract of the EA's surface water flooding map showing the flood velocities predicted in the vicinity of the site during a 0.1%AEP pluvial event.

5.2 Climate Change

5.2.1 Adjustment for Potential Flooding from the Sea

The site is not considered to be at risk of flooding from tidal sources and no adjustment is required.

5.2.2 Adjustment for Potential Flooding from the Land and Rivers

The predicted effects of climate change - more intense summer rainfall events and higher winter rainfall - could increase the risk of surface water flooding.

The Environment Agency Flood Map and Flood Zones do not currently take account of possible future climate change impacts. The potential extent of an extreme flood shown on the Flood Map might in future become more 'normal' as a result of climate change.

The EA provides recommendations for precautionary sensitivity ranges for estimates of peak rainfall intensities and peak river flows in the next 100 years (Climate Change Allowances for Planners [September 2013]). These range from +5% up to +30% for rainfall intensity and from +10% up to +20% for river flow.

6. Risk Evaluation

6.1 Existing Situation

The risk of flooding from various sources has been evaluated and none of the sources give rise to anything above a low risk.

6.2 Potential Situation after Development

The situation is not expected to significantly change, given that the proposed lightwell will replace a small patio area to the front of the existing house.

As the proportion of hard standing / soft landscaping is not considered to change, the volume of surface water run-off that is likely to be generated from the development is not envisaged to significantly increase from the present amount. Therefore, the proposed scheme will result in a minimal impact on surface water drainage conditions.

The design capacity of the existing sewers (including the waste main that will need to be diverted) will need to be assessed, including an account for the increased frequency and intensity of rainfall that is predicted as a result of climate change.

7. Flood Risk Mitigation

There is not deemed to be a requirement to mitigate against flood risk.

7.1 Residual Flood Risk

Flood risk to people and property associated with new developments can be managed but it can never be completely removed; a residual risk will always remain after flood management or mitigation measures have been put in place.

The residual risk will need to be identified following the detailed drainage design for the new development and an assessment should be made to detail any potential economic, social and environmental consequences of a flood event occurring at the site.

8. Conclusion

The risk of flooding at this site is considered to be low.

Whilst the proposed development does comprise a 'highly vulnerable' residential classification, based on the risks identified within this FRA, this is considered acceptable. Furthermore even when future climate change is taken into consideration, the site does not appear to experience a significantly greater risk.

The development should not result in any significant impact to flood risk elsewhere.

APPENDIX

EXISTING AND PROPOSED DRAWINGS

SEWER FLOODING HISTORY ENQURY

Sewer Flooding
History Enquiry

Property Searches

LBH Wembley Geotechnical & Environmental

Little Balmer

Search address supplied	53 Platts Lane London NW3 7NL
Your reference	LBH4502
Our reference	SFH/SFH Standard/2017_3706338
Received date	**11 December 2017**
Search date	**11 December 2017**

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

Sewer Flooding
History Enquiry

Property Searches

Search address supplied: 53,Platts Lane,London,NW3 7NL

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

Sewer Flooding
History Enquiry

Thames Water Property Searches

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

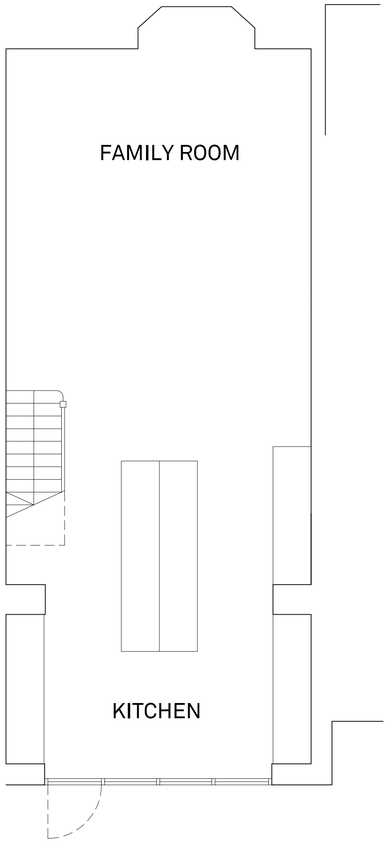
For your guidance:

- A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- "Internal flooding" from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- "At Risk" properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

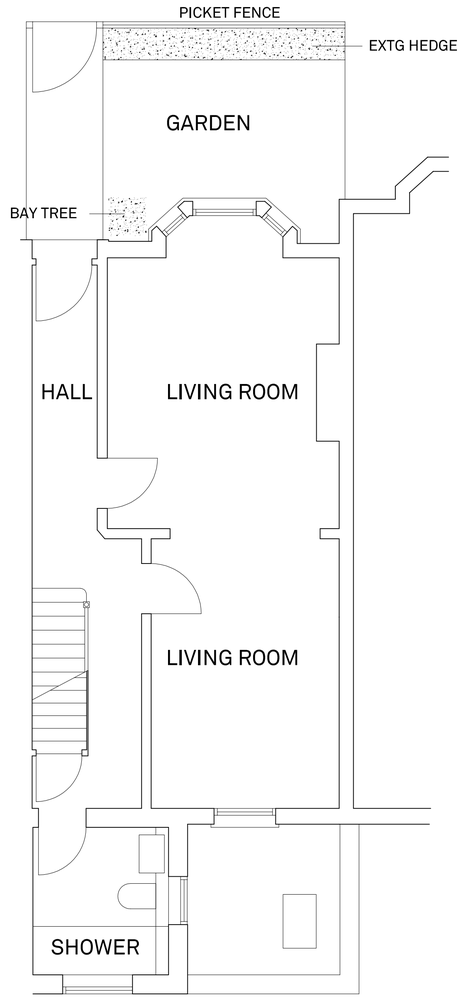
searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148



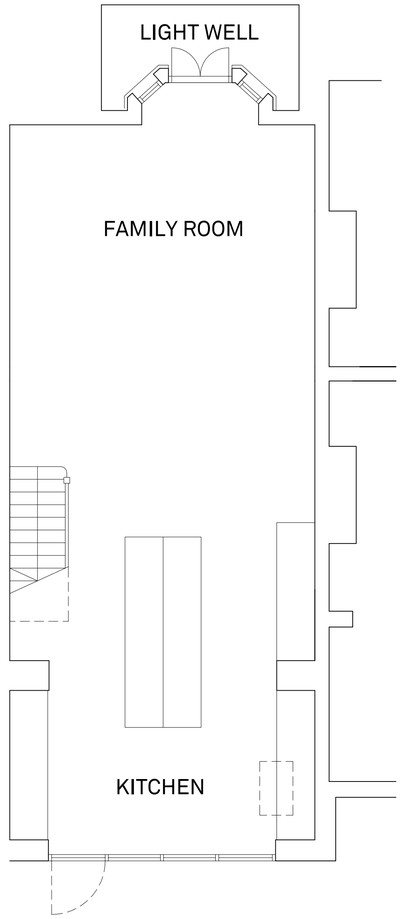
LOWER GROUND FLOOR PLAN

AS EXISTS



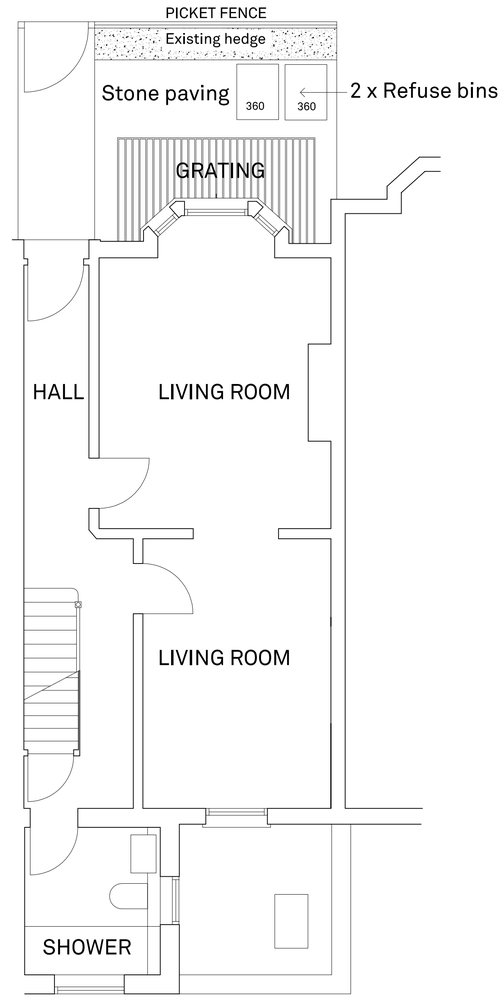
GROUND FLOOR PLAN

AS EXISTS



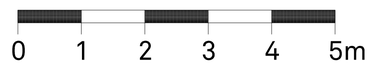
LOWER GROUND FLOOR PLAN

AS PROPOSED



GROUND FLOOR PLAN

AS PROPOSED



FOR CONSTRUCTION

Notes:

1. This drawing to be read in conjunction with all other relevant architectural structural and consultants drawings and specifications.
2. Any discrepancies between this and any other relevant drawing must be brought to the attention of the architect immediately.
3. Note to Builder: Only written dimensions are to be used. Do not scale from any part of this drawing.
4. This drawing remains the property of R O H Architects Limited and is protected by copyright.

Rev	Date	Description
-	-	-

Client
Hasan Hameed
2 South Hill Park
London NW3

Project
53 Platts Lane
LONDON NW3 7NL

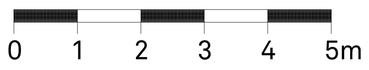
Title
Plans as Existing and Proposed

Job No	Dwg No	Rev	Stage
16019	P-100	P3	-
Date	Scale	Drwn	Chkd
June 17	1:50 @ A1	ROH	-

R O H ARCHITECTS
25 Lonsdale Road
London NW6 6RA
Tel +44 (0)20 7372 7576
Fax +44 (0)20 7372 0078
info@roh-architects.com
www.roh-architects.com

FRONT ELEVATION
AS EXISTING

FRONT ELEVATION
AS PROPOSED



FOR CONSTRUCTION

Notes:
1. This drawing to be read in conjunction with all other relevant architectural structural and consultants drawings and specifications.
2. Any discrepancies between this and any other relevant drawing must be brought to the attention of the architect immediately.

3. Note to Builder:
Only written dimensions are to be used.
Do not scale from any part of this drawing.

Rev	Date	Description
-	-	-

Client
Hasan Hameed
2 South Hill Park
London NW3

Project
53 Platts Lane
LONDON NW3 7NL

Title
Front Elevation as Existing and as Proposed

Job No	Dwg No	Rev	Stage
16019	P-101	P3	-
Date	Scale	Drwn	Chkd
June 17	1:50 @ A1	ROH	-

R O H ARCHITECTS
25 Lonsdale Road
London NW6 6RA
Tel +44 [0]20 7372 7576
Fax +44 [0]20 7372 0078
info@roh-architects.com
www.roh-architects.com