

Prepared on behalf of

Ari Andricopoulos

FLOOD RISK ASSESSMENT

**Change of Use Office to Residential Development
92 Prince of Wales Road, London**

Flood Risk Assessment

Acknowledgements:

Existing and Proposed Drawings of the Works undertaken by Norton Mayfield Architects
Camden Planning Guidance CPG4 Basements and Lightwells
London Borough of Camden - Floods In Camden 2003
SFRA extracts from the North London Strategic Flood Risk Assessment.

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1 Introduction

- 1.1 Sanderson Associates Consulting Engineers Ltd have been appointed to undertake a Flood Risk Assessment for a proposed conversion from office to residential use at 92 Prince of Wales Road, London, NW5 3NE. The site location is shown on drawing 8586/001 included in Appendix A of this report.
- 1.2 The assessment discusses the present and future flood risk to the site over the lifetime of the development. The report also recommends suitable mitigation measures that should be applied to the site to reduce the effects of a potential flood event and to ensure a development does not increase flood risk to the site itself and the surrounding area.
- 1.3 The Assessment has been undertaken in accordance with the National Planning Policy Framework (NPPF), and the associated Planning Policy Guidance 2014. The North London Strategic Flood Risk Assessment has also been reviewed whilst producing the report.
- 1.4 Prince of Wales Road is classified as a secondary street at risk of surface water flooding in line with Camden Planning Guidance *CPG4 Basements and Lightwells*. All applications for a basement extension within streets identified as either 'primary' or 'secondary' locations will be expected to include a Flood Risk Assessment with any application for a basement development, in line with the criteria set out in NPPF. The local authority development policy DP27, states the Council will not allow habitable rooms and other sensitive uses for self contained basement flats and other underground structures in areas at risk of flooding.

2 Existing Situation

2.1 *Existing Site Description*

2.1.1 The site is located in the middle of Prince of Wales Road at its junction with Talacre Road. This is at the Southwest corner of the Talacre Gardens. Drawing 8586/001 included in Appendix A shows the sites location.

2.1.2 The site is rectangular in shape, located on the North side of Prince of Wales Road, which runs in an East-West direction. The site is bound with residential properties to the North and West and Talacre Road and Park to the East.

2.1.3 The building's ground floor is currently used as an office and is located within a predominantly residential area including a rich mix of accommodation types ranging from traditional terraced properties to modern blocks of flats

2.1.4 The River Thames is the closest watercourse to the site. It's located approximately 4.5km to the South of the site at its closest point and flows generally West to East.

2.2 *Existing Site Analysis*

2.3 The property is to change in terms of use from an B1 Office Building to a C3 Dwelling House.

2.4 The site is considered to lie within Flood Zone 1, as confirmed by the Environment Agency. The site therefore has a less than 0.1% annual probability of river flooding.

3 Consultation

- 3.1 As part of this Flood Risk Assessment the Environment Agency (EA) have not been consulted regarding the site.
- 3.2 The site is within Flood Zone 1 as confirmed by the Environment Agency and the North London Strategic Flood Risk Assessment. The site therefore is considered to have less than a 1 in 1000 (greater than 0.1%) annual probability of flooding from a fluvial source in any given year, which is classified as being in an area with a low probability of flooding by the NPPF.
- 3.3 It is proposed that the surface water from the site would connect into the existing public sewer located to the north of the site on Prince of Wales Road.
- 3.4 Research into the North London Strategic Flood Risk Assessment has been undertaken in order to see if any additional information was available for the site, providing an overview of the flood risk issues across North London and has been used in assessment of the site.

4 Proposed Development

- 4.1 The proposal is to convert the existing ground floor office into a residential flats.
- 4.2 All accesses to site will remain unchanged, the access on Prince of Wales Road will still provide access to the internal staircase to the first floor residential accommodation. The architect's drawings show two entrances being utilised to provide access to the proposed ground floor flats.
- 4.3 The total impermeable area of the site will remain the same to existing, as all changes are proposed to the property's internal layout. As the proposals do not increase the amount of impermeable areas within the site compared to that of the existing, there will not be an increase to the amount or rate of surface water run-off and the development will have no significant effect on the existing surface water drainage system on the site.

5 Sequential and Exception Test

5.1 The proposed site has been assessed in accordance with (Planning Practice Guidance, PPG 2014) and the site has been subjected to the Sequential Test.

5.2 The site is considered to lie within Flood Zone 1, as confirmed by the Environment Agency. The site therefore has a less than 0.1% annual probability of river flooding.

5.3 *The Sequential Approach*

5.3.1 The site is considered to lie within Flood Zone 1 as confirmed by the Environment Agency mapping.

5.3.2 The proposed Residential Development, in accordance with Table 2 (PPG 2014) is classed as being 'More Vulnerable' in terms of flood risk.

5.3.3 In accordance with Table 3 (PPG 2014) a 'More Vulnerable' (Office) development in Flood Zone 1 is an appropriate development in terms of flood risk, therefore the Exception Test would not be required as part of a planning application for this development.

6 Assessment of Flood Risk

6.1 *Surface Water Flooding*

- 6.1.1 The main risk of flooding from surface water comes from the adjacent highway and impermeable areas within the vicinity of the site.
- 6.1.2 The adopted highway to the southern boundary of the site is lower than the main site. Therefore the risk of flooding from overland flow from adjacent sites is not significant.
- 6.1.3 However Prince of Wales Road is classified as a secondary street at risk of surface water flooding, having flooded in 2002 as stated within the Camden Planning Guidance *CPG4 Basements and Lightwells*.
- 6.1.4 Map 22 of the North London SFRA also shows that the Prince of Wales Road flooded in 2002.
- 6.1.5 The London Borough of Camden - Floods In Camden 2003 states that during the evening rush hour period on 7 August 2002, a series of thunderstorms unleashed torrential rainfall on Camden. The resultant flooding inflicted considerable damage on Camden residents and their homes, public services facilities and private businesses. Nearly all the flooding occurred north of the Euston Road, and primarily in West and South Hampstead (NW2 and NW6 postcode areas), although there was also flooding in parts of the NW3 postcode area, in Kentish Town (NW1 and NW5), and in a few other roads elsewhere.
- 6.1.6 Many residents were affected and those who were unfortunate enough to have the flood water and sewage enter their properties suffered both damage to their homes and a great deal of distress. A number of people had to vacate their homes and such was the magnitude of the impact, some had been unable yet to return home some eight months later.

- 6.1.7 This was mainly due to excessive rainfall with the main sewer system becoming completely full and under what is technically known as 'surcharge pressure', forcing the water to find whatever outlet it could not only back onto the streets through manholes and gully gratings but also directly into residents' homes, at basement and ground floor level. Even were the gullies were blocked, this would have made no difference as the flood water could not drain to the trunk sewer. Secondly, Thames Water's evidence confirmed that the flooding was caused by its sewer system reaching maximum capacity very quickly so that the roads could not be drained at the rate the rain fell.
- 6.2 The total impermeable area of the site will remain the same to existing, as all changes are proposed to the property's internal layout. As the proposals do not increase the amount of impermeable areas within the site compared to that of the existing, there will not be an increase to the amount or rate of surface water run-off and the development will have no significant effect on the existing surface water drainage system on the site.
- 6.2.1 The mitigation measures recommended to be put in place to deal with this potential flood risk are discussed in Section 7 discusses and outlines all the sustainable drainage techniques which are to be incorporated into this development to decrease flood risk.
- 6.3 *Flooding from Rivers/Watercourses***
- 6.3.1 As discussed in Section 3, the site falls within Flood Zone 1 with a less than 0.1% annual probability of river flooding.
- 6.3.2 Map 8 of the North London SFRA shows the flood zones within the area and confirms that the site is located within Flood Zone 1, therefore the risk of flooding from rivers and watercourses is not considered significant.

6.4 *Flooding from Sewers*

- 6.4.1 As discussed in section 6.1 the 2002 surface water flooding along Prince of Wales Road was mainly due to excessive rainfall with the main sewer system becoming completely full and under what is technically known as ‘surcharge pressure’, forcing the water to find whatever outlet it could not only back onto the streets through manholes and gully gratings but also directly into residents’ homes, at basement and ground floor level.
- 6.4.2 Thames Water’s evidence confirmed that the flooding was caused by its sewer system reaching maximum capacity very quickly so that the roads could not be drained at the rate the rain fell.
- 6.4.3 If any of the sewers adjacent to the site were to surcharge and flood, the mitigation measures recommended in Section 7 would protect the development against this source of flooding.

6.5 *Flooding from Groundwater*

- 6.5.1 The potential for groundwater flooding has been assessed with the aid of groundwater mapping from the Environment Agency and British Geological Survey Borehole records. The EA mapping shows the site does not overlay an aquifer of any significance.
- 6.5.2 The online British Geological Survey Borehole records have been reviewed and they confirm that a number of boreholes have been historically drilled within 250m of the site. The first referenced TQ285SE845 was bored in Prince of Wales Road/Harmood Street to the East of the site and the second set referenced TQ28SE725 were bored in Maitland Park to the North West of the site. The borehole records show a clay strata which is predominant in this area as part of the London Clay Formation. Water was not struck in borehole TQ285SE845 to a depth of 15m. One of the four boreholes TQ28SE725 had seepage at approximately 3m the others remained dry. The records are shown in Appendix B.

6.5.3 Therefore from the evidence available in the borehole and geological records there is a very low risk of groundwater flooding in this area.

6.5.4 The mitigation measures proposed which are predominantly to reduce flood risk from other sources also deal with any flood risk from this source should the position change in the future.

6.6 *Flooding from Climate Change*

6.6.1 It is generally considered that the intensity of rainfall will increase by up to 30% by the year 2115 and that winter months will become proportionately wetter.

6.6.2 Peak river flows are anticipated to increase by up to 20% due to climate change.

6.6.3 These factors should be considered when establishing relevant criteria for the hydraulic design of any surface water infrastructure given the expected lifetime of the development.

6.6.4 The site is situated within Flood Zone 1 and is unlikely to be adversely affected by changes due to climate change in terms of risk of flooding from watercourse.

6.6.5 However the 30% increase in rainfall intensity could have impact on the existing surface water issue along the Prince of Wales Road. The existing impermeable area will not change, therefore there will be no impact from the proposed development to the existing developments in close proximity to the site. Section 7 discusses mitigation measures to be put in place which would provide additional protection for the proposed development which would more than offset any increase in flood risk due to climate change.

7 Recommended Mitigation Measures

- 7.1 It is important that any proposed development that has the potential to change the flood mechanisms on a site is designed such that there is no increased flood risk to the site itself or in the sites vicinity.
- 7.2 Internal ground floor walls if plastered, should be plastered using a lime based plaster which is much more resistant to damage from water and dries out much quicker than Gypsum based plaster (Gypsum plaster is significantly more susceptible to water damage).
- 7.3 The developer should also refer to the publication 'Improving the flood performance of new buildings' published by the Office of the Deputy Prime Minister in May 2007. This document is an interim guidance for improving the flood resistance of domestic properties and small businesses.

8 Conclusions

- 8.1 This report serves to review and assess the sources of potential flooding to the site, the impact of the proposed development on the flooding mechanisms of the site and the impact on the surrounding area.
- 8.2 The site is considered to lie within Flood Zone 1, as confirmed by the Environment Agency. The site therefore has a less than 0.1% annual probability of river flooding.
- 8.3 The main risk of flooding to the site is from the Prince of Wales Road as it is classified as a secondary street at risk of surface water flooding, having flooded in 2002 as stated within the Camden Planning Guidance CPG4 Basements and Lightwells. The mitigation measures recommended in section 7 should be implemented to reduce the risk of surface water to the site.
- 8.4 Nanayaa Ampoma the Planning Officer at Local Authority stated that 'This street flooded in 2002 (green line). DP23 requires "development within this area to be designed to cope with being flooded without placing additional pressure on adjoining sites and on the combined sewer system. For example, development should not prevent the flow of water across its site where this would lead to water build up or divert water onto an adjoining site. Instead, water should be captured and stored for reuse or for slow release to the combined sewer. Where a site is known to have a particular drainage issue, development should not place additional strain on the existing drainage infrastructure.
- 8.5 As the proposals are for a change of use, the building structure will remain the same and therefore will not place additional strain on the existing drainage infrastructure, therefore the report concludes that the site will not increase the flood risk to the site itself or other sites in the vicinity and meets the above requirement set by the Local authority.

APPENDIX A

8586-001 Site Location Plan

Architects Layout Plans



O.S. Grid Reference
528398,184647

Rev	Amendment	Drawn	Date	Checked



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Project Name
**Flood Risk Assessment
92 Prince of Wales Road
London**

Drawing Title
Site Location

Scale 1:200	Drawn By KB
Drawing Size A3	Checked By DH
Date 27.03.15	Approved By DH

	Drawing Number 8586-001	Rev
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Proposed Alterations to:

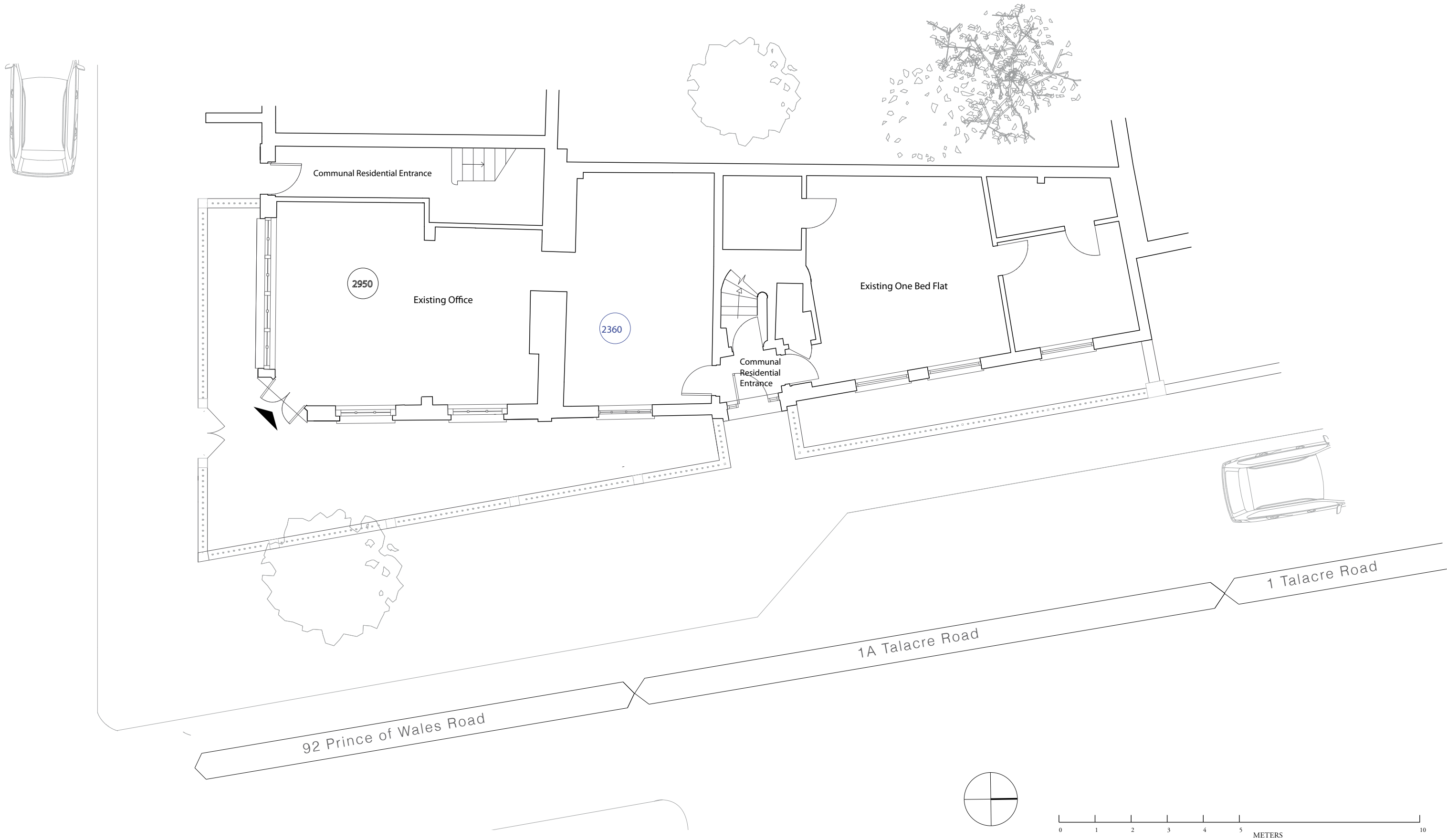
92 Prince of Wales Road NW5 3NE
& Adjoining 1a Talacre Road NW5 3PH

Existing & Proposed
Drawings



Prior Notification Application

F A C T O T U M
L O N D O N - R O T T E R D A M



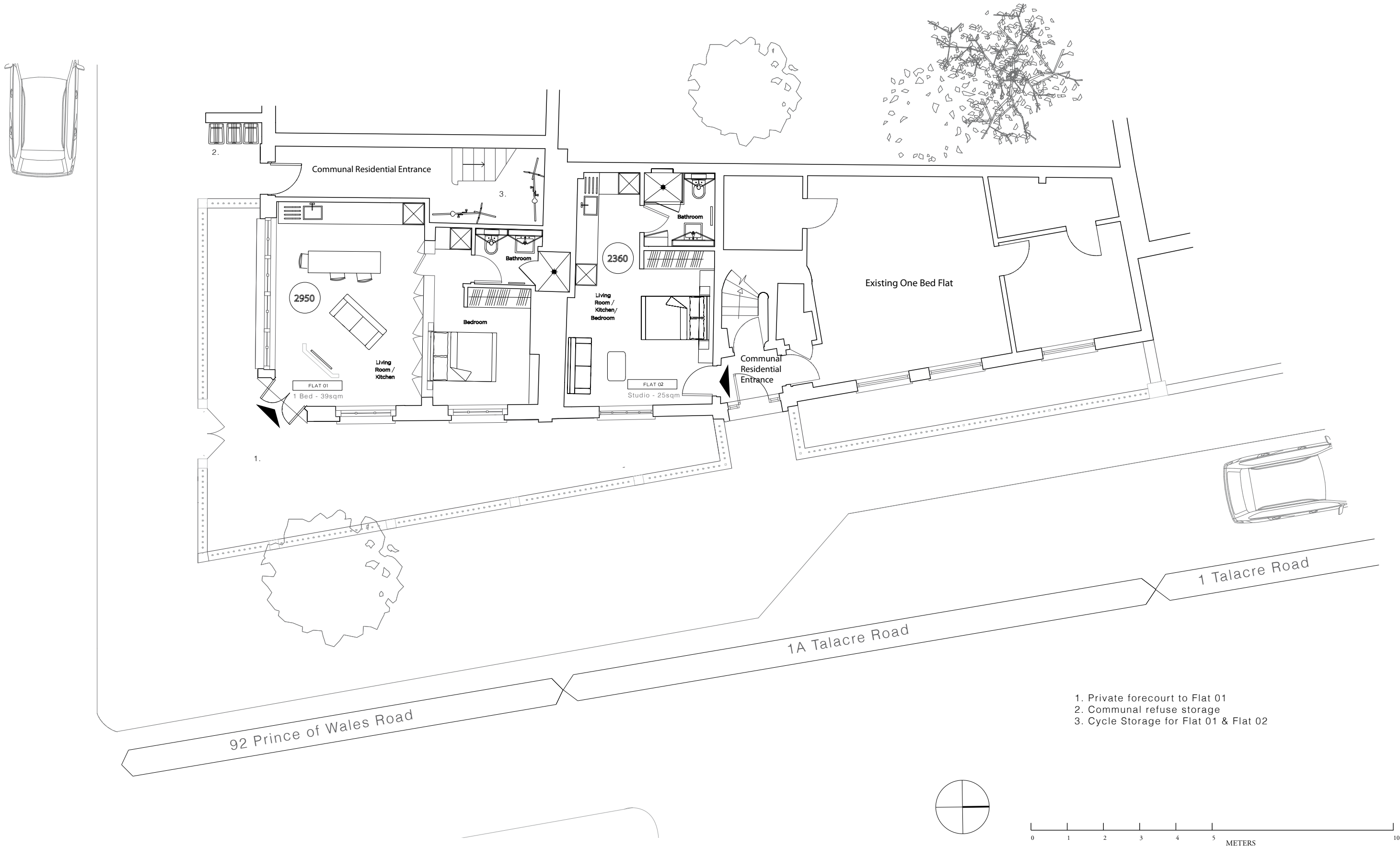
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no:	rev:	project:	Prince of Wales Road 02036			drawing title:	Existing Ground Floor		
	Prior Notification		date:	08.12.2014	scale	1:100 @A3 1:50 @A1	dwg no:	02036-01	rev no:



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no:	rev:	project:	Prince of Wales Road 02036			drawing title:	Proposed Ground Floor		
	Prior Notification	date:	08.12.2014	scale	1:100 @A3 1:50 @A1	dwg no:	02036-02	rev no:	01

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APPENDIX B
Consultation



Boring method		Shell and luger		Location		Record of BOREHOLE 1 TQ28SE	
Boring diameter (mm)		200		Orientation		(sheet 1 of 2)	
Casing diameter (mm)		200 to 2.7m		Ground level (m O.D.)		30.25	
Boring equipment		Pileon 20		Date commenced		2.7.74	
Samples and in situ tests		Casing Depth (m)	Water Depth (m)	Date and Depth (m)	DESCRIPTION OF STRATA	O.D. Level (m O.D.)	Legend
Depth (m)	Type						
1.85	U	1.70		1.80	Fill (Topsoil with gravel and brick fragments)	28.45	
2.10	D				Firm to stiff fissured brown slightly sandy silty CLAY with grey staining in the fissures and small pockets of orange-brown fine sand.		
2.30	U						
2.75	D						
3.20	D						
3.60	U						
4.25	D						
4.90	D			4.80		25.45	
5.30	U				Stiff to very stiff fissured grey-brown silty CLAY with partings of silty fine sand and some selenite crystals. A claystone was encountered at 12.00m to 12.20m depth.		
5.75	D						
6.20	D						
6.60	U						
7.25	D						
7.70	D						
8.30	U						
8.75	D						
9.20	D						
9.80	U						

REMARKS

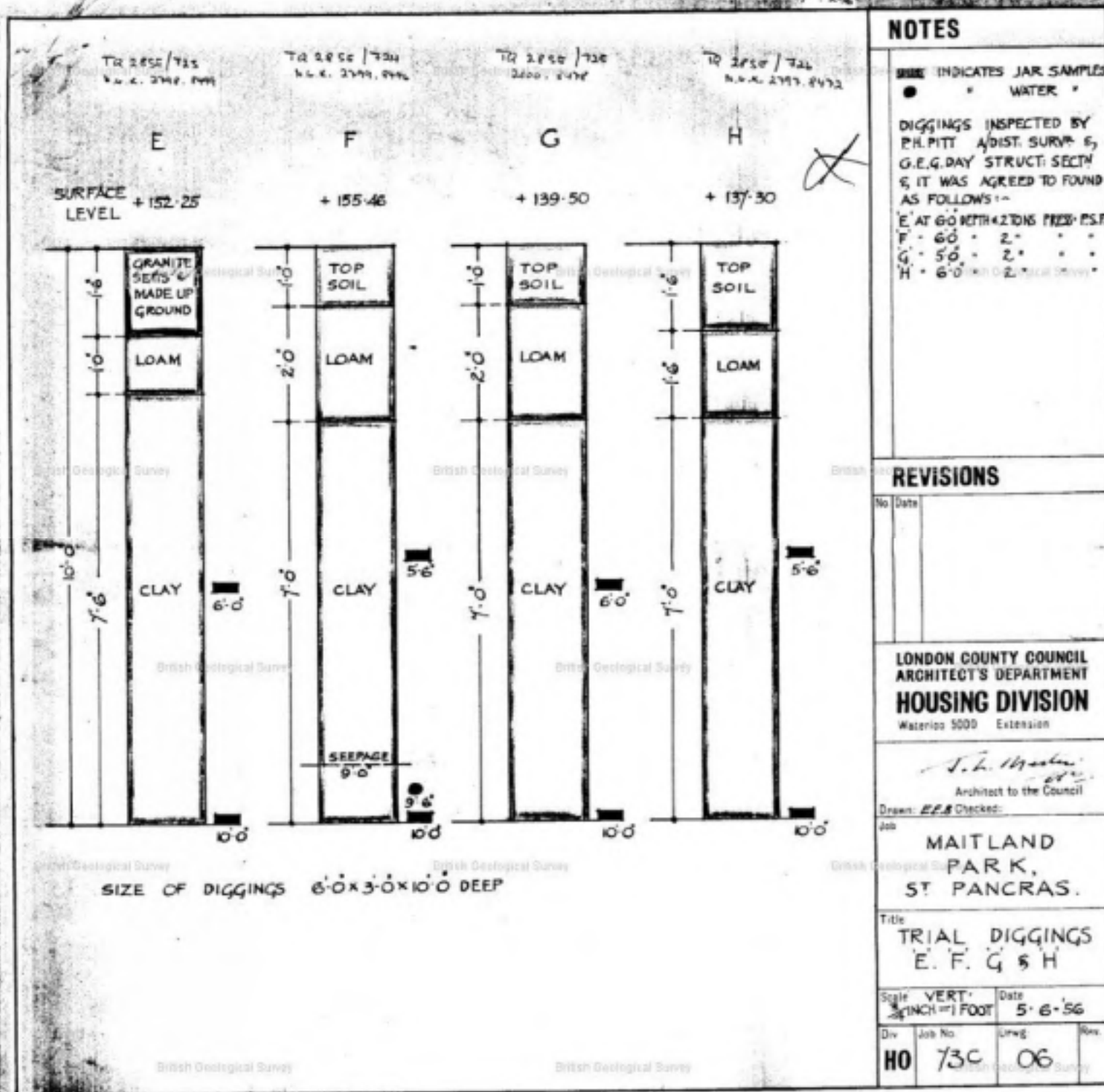
For explanation of symbols and abbreviations see Notes, pages (i) and (ii)

LAB Ref. No. S/10721

CAMDEN - HAMMOOD STREET

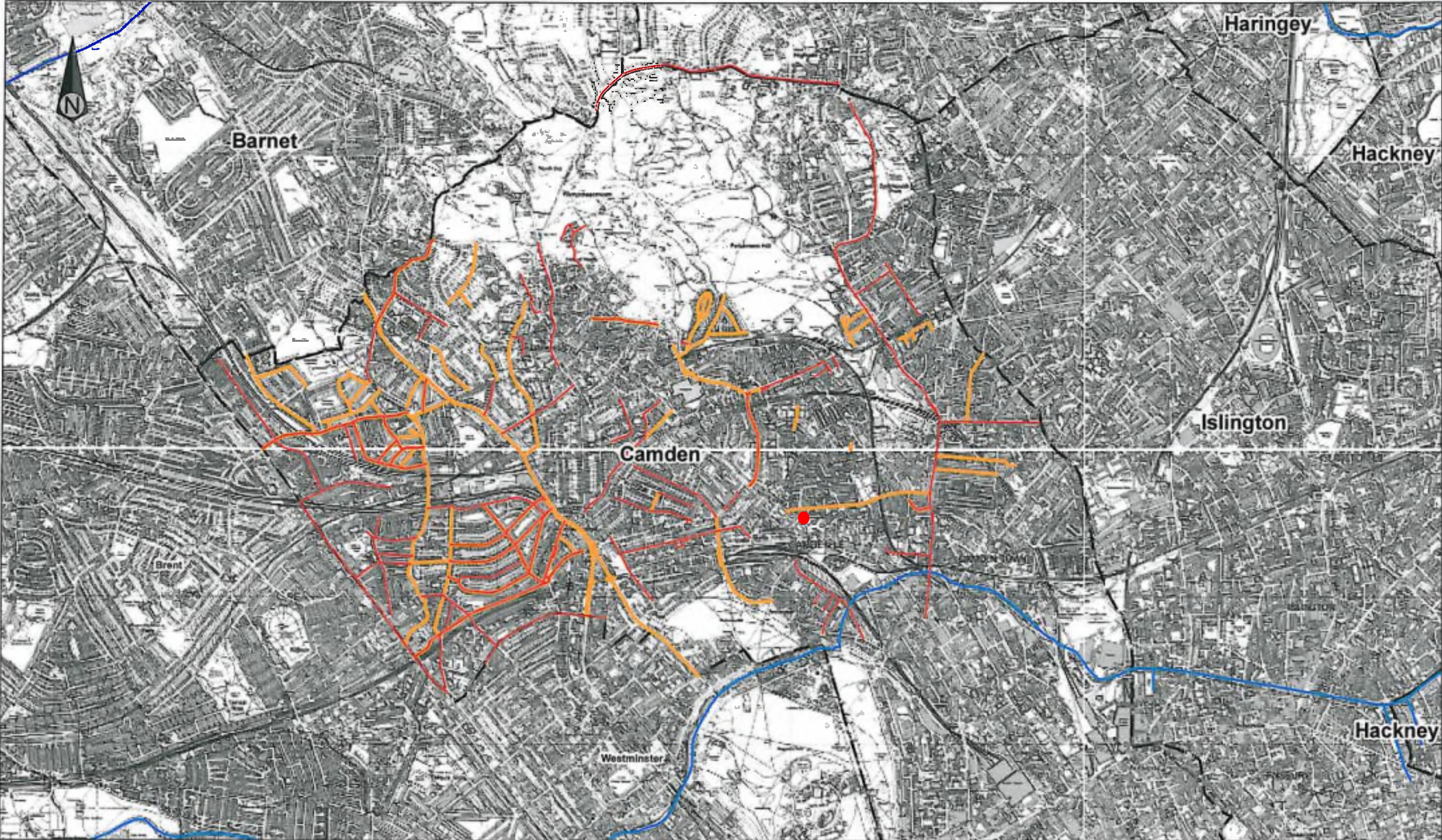
Fig. 1

Boring method						Location		Record of BOREHOLE no. 1	
Boring diameter (mm)								(sheet 2 of 2)	
Casing diameter (mm)						Orientation		Ground level (m.O.D.)	
Boring equipment								Date commenced	
Samples and in situ tests		Casing Depth (m)	Water Depth (m)		Date and Depth (m)	DESCRIPTION OF STRATA	O.D. Level (m.O.D.)	Legend	
Depth (m)	Type								
10.25	D	2.70	DRY		12.50 3/7	(See previous sheet)			
10.70	D								
11.30	U								
11.75	D								
12.20	D								
12.80	U		DRY						
13.25	D								
13.90	D								
14.55	U								
15.00	D		DRY		15.00	END OF BOREHOLE	15.25		
REMARKS									
Ground-water was not encountered.									
For explanation of symbols and abbreviations see Notes, pages (i) and (ii)									
LAB Ref. No. S/10721		CAMDEN - HAMMOOD STREET						Fig. 1 (Cont'd)	



APPENDIX C

SFRA Extracts



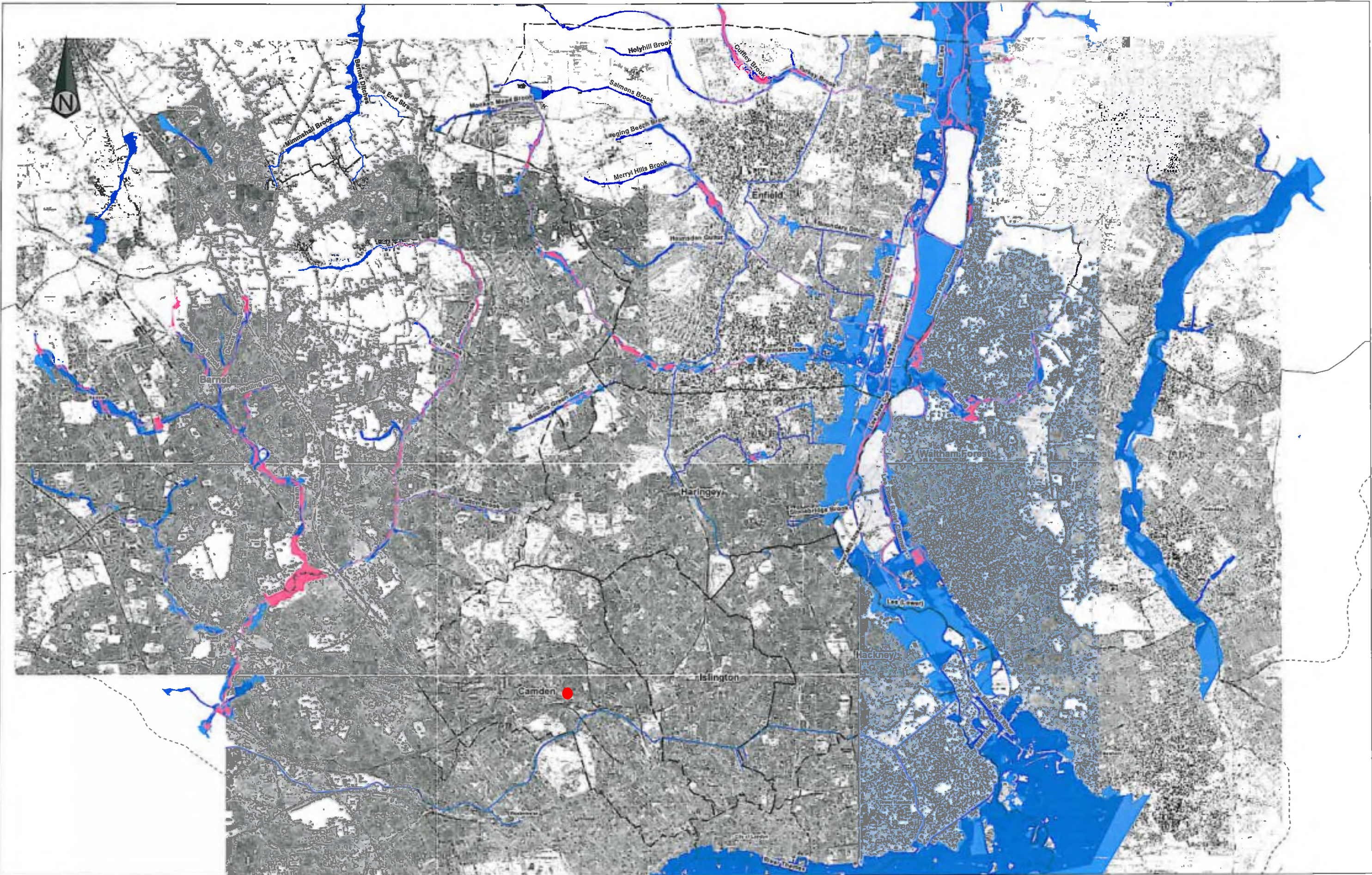
- Legend**
- Flood Streets 1975
 - Flood Streets 2002
 - Canals
 - Watercourses
 - Borough Boundaries

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Data Origin
Flood data provided by LB Camden. Canal data was provided by the EA.

		Client		North London Waste Plan	
		Project		North London Strategic Flood Risk Assessment	
Purpose Information		Drawing Title		Map 22: Camden Flooding Map	
		Issuing Office		Sutton Coldfield	
Draft		Scale (at A3 size)		Drawing Number	
Issue		1:25,000		722586/002	
		Telephone		0121 355 8949	
				Rev B	



Legend

Borough Boundaries

Flood Zone 1 = Non - coloured areas

Flood Zone 3b

Flood Zone 3a

Flood Zone 2

Canals

Watercourses

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Data Origin
Flood Zones 2, 3a and 3b were provided by the EA. The flood zone 3b for the Silk Stream is based on the 1 in 25 yr outline. The EA also provided the canals and watercourse information.

mouchel		Client		North London Waste Plan	
		Project		North London Strategic Flood Risk Assessment	
Purpose		Drawing Title		Map 8: Flood Risk Zones	
Information		Issuing Office		Sutton Coldfield	Drawing Number
Drawn	SL	Checked	RR	Approved	FP
Date	01/08/10	Date	01/08/10	Date	01/08/10
Draft		Scale (at A1 size)		Telephone	0121 355 0949
Issue		1:40,000			722506/008
					Rev C