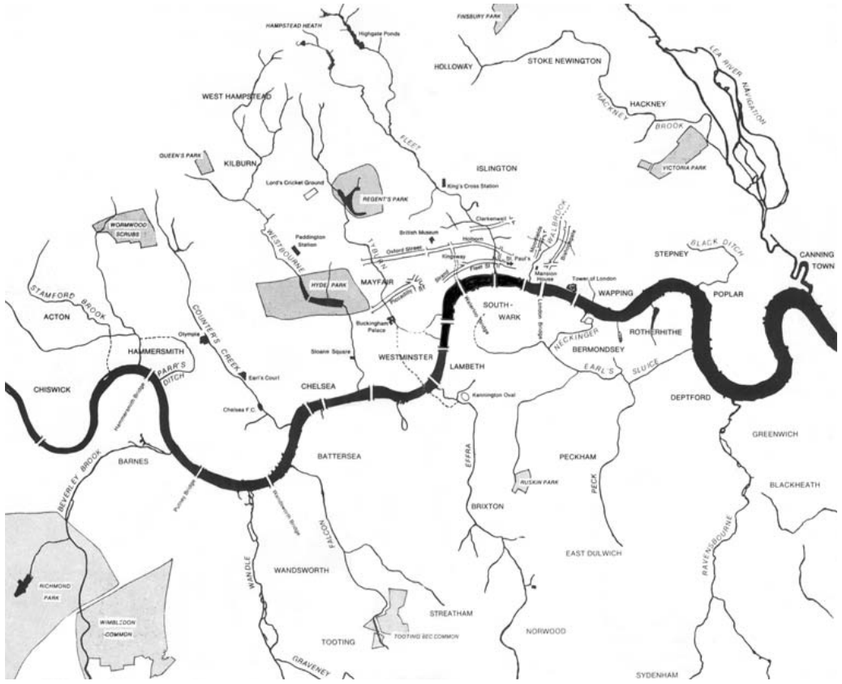
Pringuer-James Consulting Engineers
Preliminary Risk Assessment

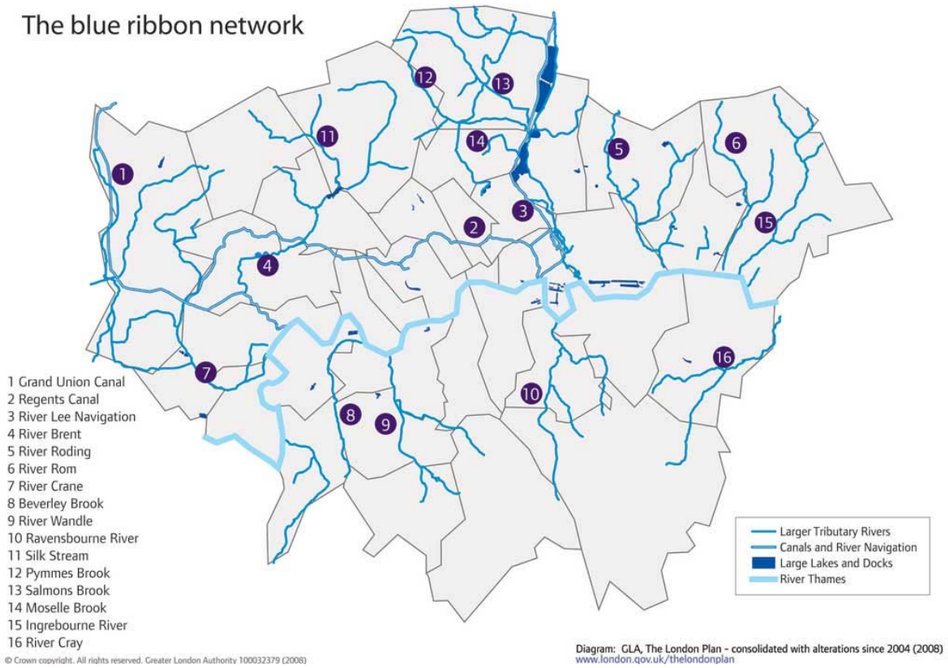
APPENDIX D

Environmental Data – Hydrology, Water Extraction/Discharge

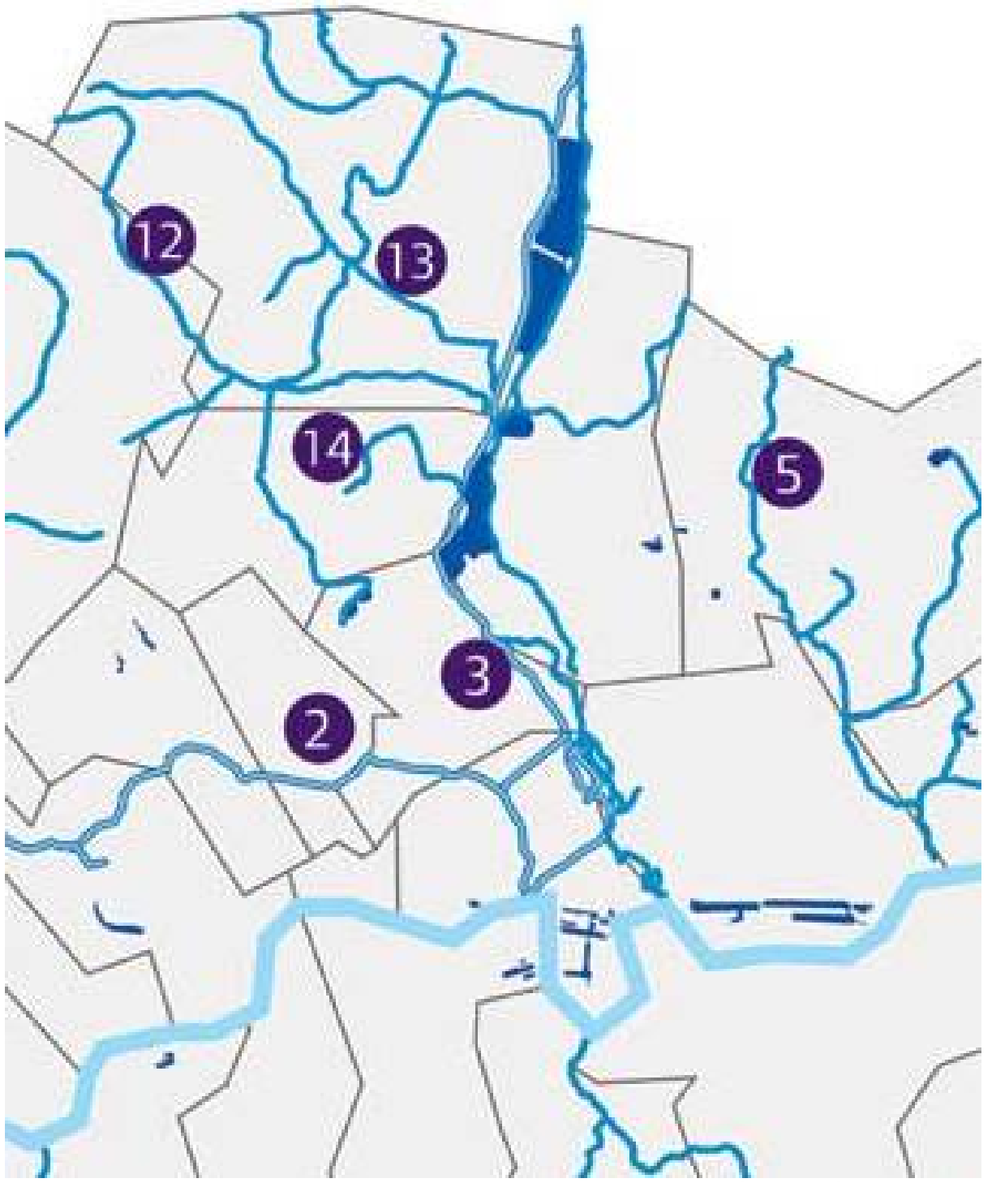
Hydrology – Surface Water Features



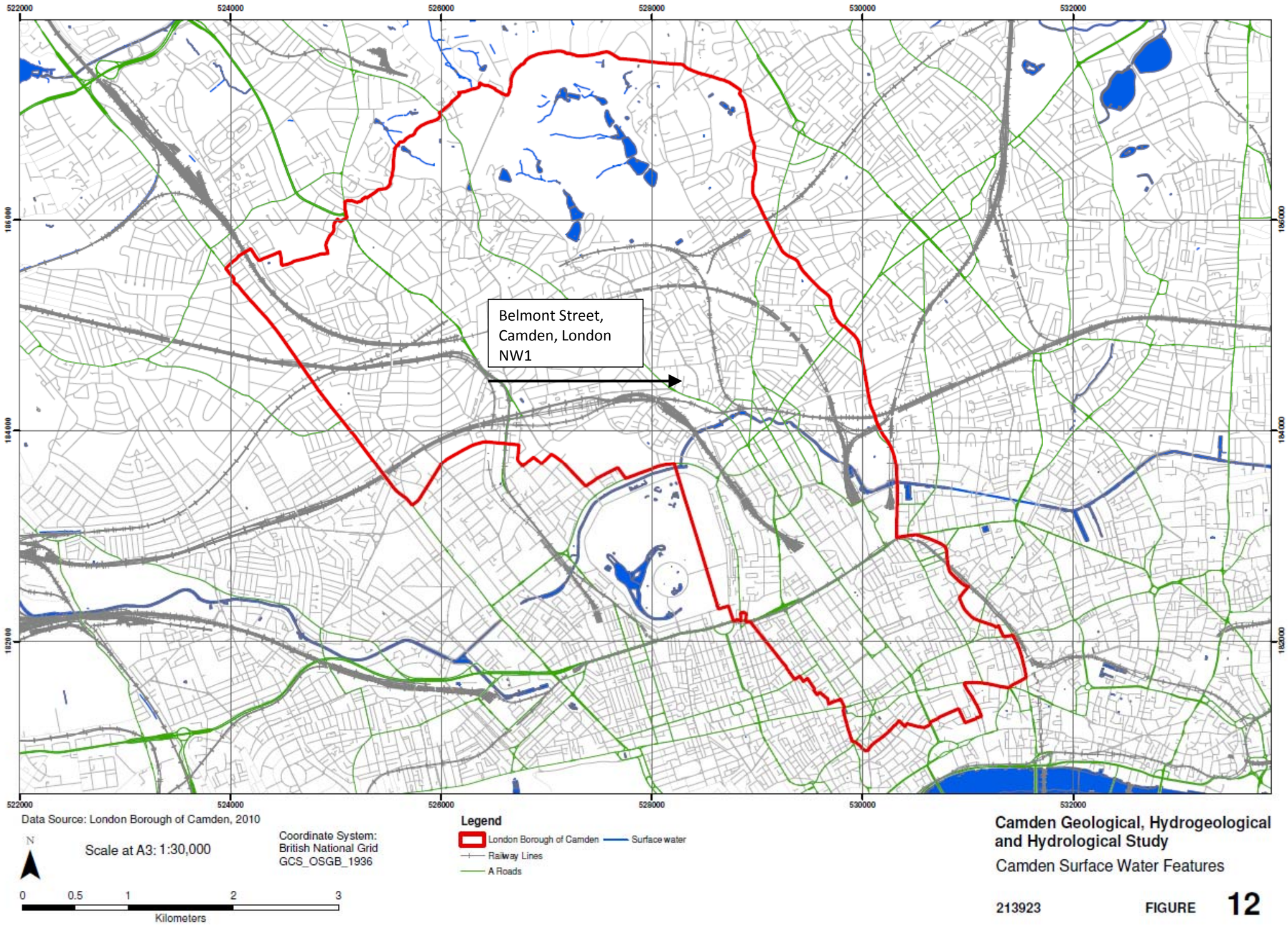
D.1 – HYDROLOGY - LOST RIVERS OF LONDON



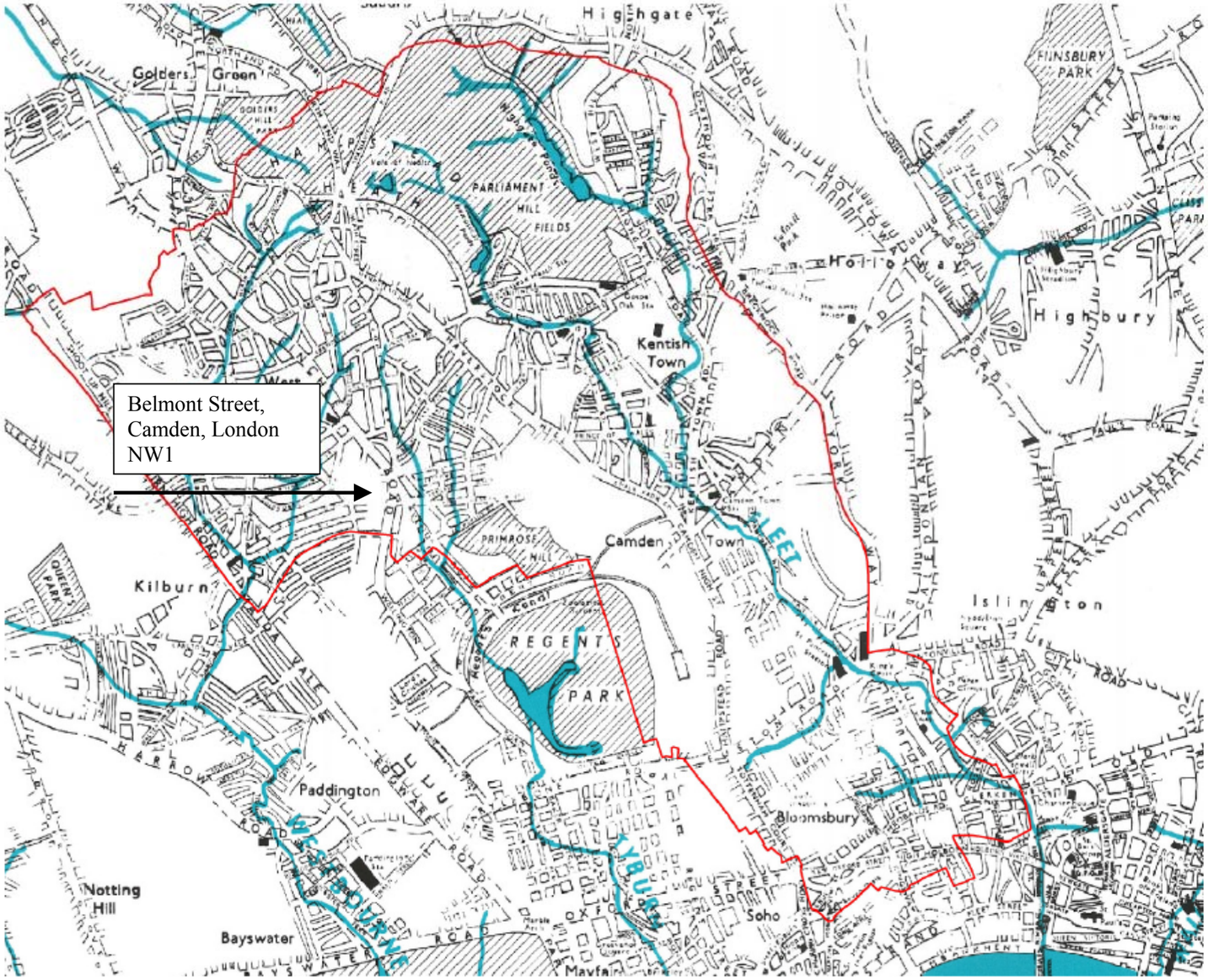
D.2 – HYDROLOGY – GREATER LONDON SURFACE WATER FEATURES



D.3 – HYDROLOGY – GREATER LONDON SURFACE WATER FEATURES (PARTIAL)



D.4 – HYDROLOGY - CAMDEN SURFACE WATER FEATURES



Source – Barton, Lost Rivers of London

Camden Geological, Hydrogeological and Hydrological Study
Watercourses

213923 FIGURE **11**

D.5 – HYDROLOGY - CAMDEN WATERCOURSES

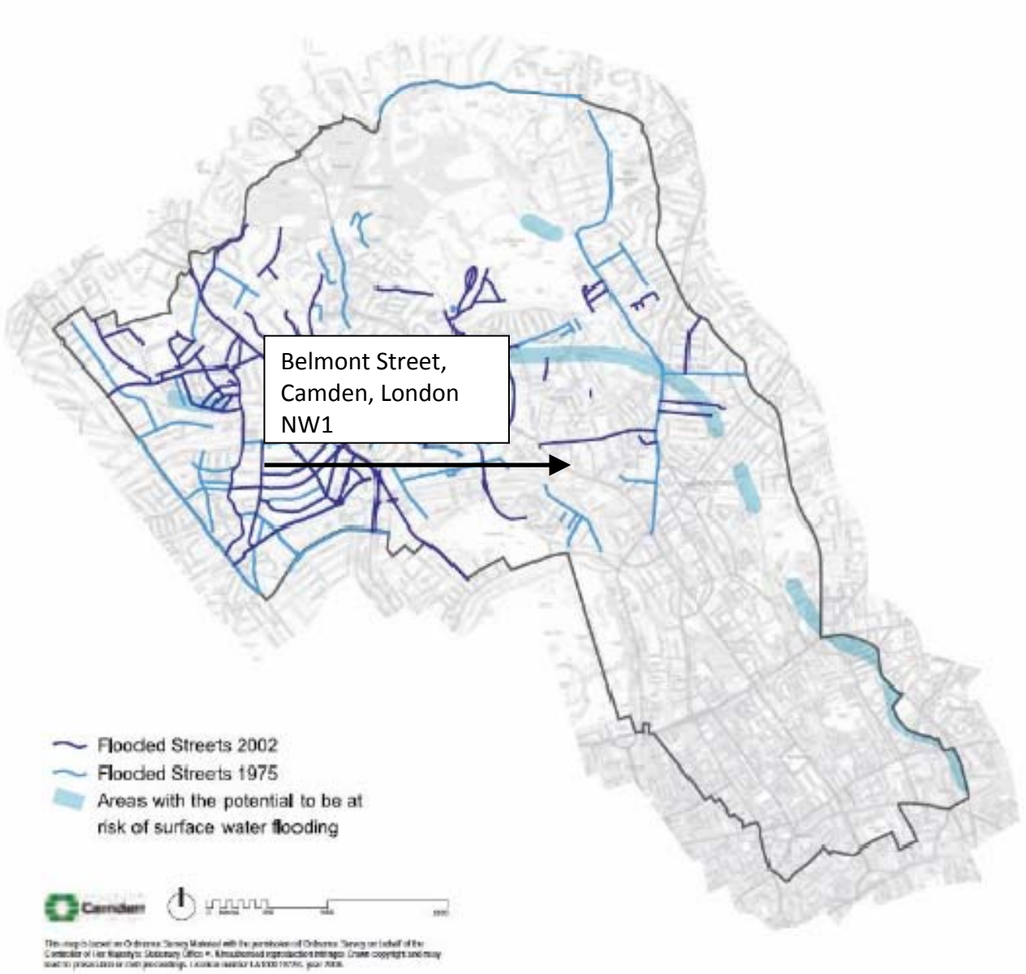


Figure 5 from Core Strategy, London Borough of Camden

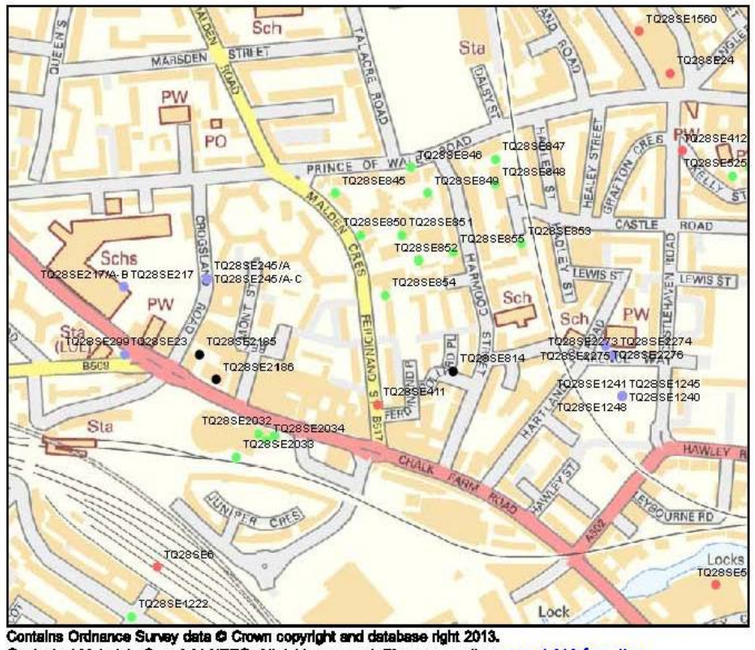
Camden Geological, Hydrogeological and Hydrological Study
Flood Map

213923 FIGURE 15

D.6 – HYDROLOGY - CAMDEN FLOOD MAP

Water Extraction – Boreholes & Waterwells

Borehole Records



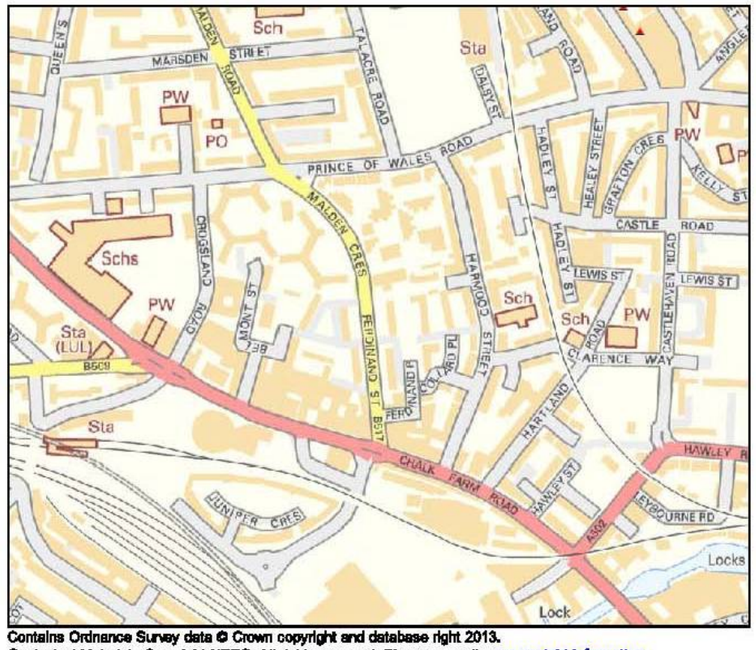
Legend

Borehole records

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+

D.7 – WATER EXTRACTION

Waterwell Records



Legend

Water wells

- Not Available
- 0 - 10m
- 10 - 30m
- 30m+

D.8 – WATER EXTRACTION

The boreholes and waterwells located in the area and available as part from the British Geological Survey have been indicated on the mapping data above and tabulated in the following pages.

BOREHOLE RECORDS

Reference	Name	Length	Year Known	Site Report	Held At	Easting	Northing
TQ28SE24	BATHS PRINCE OF WALES ROAD ST PANCRAS BORING NO.1	146.46	1904		WLKW	528796	184742
TQ28SE412	METROPOLITAN WATER BOARD 30	40.08			KW	528810	184650
TQ28SE26	ST PANCRAS	13.71			KW	528762	184063
TQ28SE2269	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 TP4	1.8	2006	53518	KW	528770	183970
TQ28SE2270	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 TP6	1.08	2006	53518	KW	528770	183980
TQ28SE2272	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 TP8	1.08	2006	53518	KW	528770	183990
TQ28SE2264	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 1	10	2006	53518	KW	528780	184000
TQ28SE2265	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 WS1	4	2006	53518	KW	528770	183960
TQ28SE2268	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 TP3	0.58	2006	53518	KW	528770	183960
TQ28SE2035	THE ROUNDHOUSE DEVELOPMENT, CHALK FARM ROAD, LONDON 4	18.28	1972	34842	KW	528329	184313
TQ28SE845	HARMOOD ST. CAMDEN 1	15.25			KW	528400	184600
TQ28SE850	HARMOOD ST. CAMDEN 6	20			KW	528430	184550
TQ28SE411	METROPOLITAN WATER BOARD 29	31.44			KW	528450	184350
TQ28SE854	CAMDEN,HARMOOD ST. 10	15			KW	528460	184480
TQ28SE851	HARMOOD ST. CAMDEN 7	15			KW	528480	184550
TQ28SE846	HARMOOD ST. CAMDEN 2	20			KW	528490	184630
TQ28SE852	HARMOOD ST. CAMDEN 8	20			KW	528500	184520
TQ28SE849	HARMOOD ST. CAMDEN 5	15			KW	528510	184600
TQ28SE814	OFF HAMMOND ST NEAR CHALK FARM RD	-1			KW	528540	184390
TQ28SE855	CAMDEN,HARMOOD ST. 11	15			KW	528540	184530
TQ28SE847	HARMOOD ST. CAMDEN 3	15			KW	528590	184640
TQ28SE848	HARMOOD ST. CAMDEN 4	15			KW	528590	184610
TQ28SE853	HARMOOD ST. CAMDEN 9	15			KW	528620	184540
TQ28SE2275	MOST HOLY TRINTY WITH ST BARNABAS CHURCH KENTISH TOWN LONDON WS3	4	2006	53528	KW	528720	184420
TQ28SE2276	MOST HOLY TRINTY WITH ST BARNABAS CHURCH KENTISH TOWN LONDON WS4	3	2006	53528	KW	528720	184420
TQ28SE2273	MOST HOLY TRINTY WITH ST BARNABAS CHURCH KENTISH TOWN LONDON WS1	4	2006	53528	KW	528730	184410
TQ28SE2274	MOST HOLY TRINTY WITH ST BARNABAS CHURCH KENTISH TOWN LONDON WS2	4	2006	53528	KW	528730	184410
TQ28SE1250	HAWLEY RD CAMDEN P8	5		11090	KW	528740	184360
TQ28SE1243	HAWLEY RD CAMDEN P1	5		11090	KW	528740	184360
TQ28SE1247	HAWLEY RD CAMDEN P5	5		11090	KW	528740	184360
TQ28SE1239	HAWLEY RD CAMDEN 1	3		11090	KW	528740	184360
TQ28SE1244	HAWLEY RD CAMDEN P2	5		11090	KW	528740	184360
TQ28SE1249	HAWLEY RD CAMDEN P7	5		11090	KW	528740	184360
TQ28SE1242	HAWLEY RD CAMDEN 4	3		11090	KW	528740	184360
TQ28SE1246	HAWLEY RD CAMDEN P4	5		11090	KW	528740	184360
TQ28SE1248	HAWLEY RD CAMDEN P6	5		11090	KW	528740	184360
TQ28SE1241	HAWLEY RD CAMDEN 3	3		11090	KW	528740	184360
TQ28SE1245	HAWLEY RD CAMDEN P3	5		11090	KW	528740	184360
TQ28SE1560	ST PANCRAS BATHS, PRINCE OF WALES ROAD	146.45	1907		WL	528760	184790
TQ28SE1216	GLOUCESTER AVE SEWER 2	15		11095	KW	528250	183880

BOREHOLE RECORDS

Reference	Name	Length	Year Known	Site Report	Held At	Easting	Northing
TQ28SE1829	CHANNEL TUNNEL RAIL LINK TP3739	2.81	1995	33075	KW	528440	183933
TQ28SE686/A	GILBEY'S WAREH'SE CAMDEN.BH.1-	3			KW	528550	184000
TQ28SE1240	HAWLEY RD CAMDEN 2	3		11090	KW	528740	184360
TQ28SE686/A-D	GILBEYS WAREHOUSE CAMDEN TOWN BH1-3	3.96			KW	528550	184000
TQ28SE2271	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 TP7	1.75	2006	53518	KW	528740	183970
TQ28SE2266	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 TP1	1.78	2006	53518	KW	528760	183950
TQ28SE2267	ARLINGTON HOUSE 220 ARLINGTON ROAD CAMDEN LONDON NW1 TP2	1.78	2006	53518	KW	528760	183950
TQ28SE2177	OLD PEOPLES DWELLINGS REGENTS PARK 3	-1	1963	44005	KW	527982	183857
TQ28SE2175	OLD PEOPLES DWELLINGS REGENTS PARK 1	-1	1963	44005	KW	527983	183889
TQ28SE1221	GLOUCESTER AVE SEWER 7	15		11095	KW	528100	183990
TQ28SE2065	MAITLAND PARK ST PANCRAS B	9.14	1956	37047	KW	527960	184880
TQ28SE1490	ALEXANDRA HOUSE, HAVERSTOCK HILL	118.87	1844		WL	527890	184940
TQ28SE2064	MAITLAND PARK ST PANCRAS A	9.14	1956	37047	KW	527950	184950
TQ28SE724	MAITLAND PARK ST PANCRAS F	3.05			KW	527990	184960
TQ28SE2066	MAITLAND PARK ST PANCRAS D	9.14	1956	37047	KW	527950	184790
TQ28SE726	MAITLAND PARK ST PANCRAS H	3.05			KW	527970	184720
TQ28SE725	MAITLAND PARK ST PANCRAS G	3.05			KW	528000	184780
TQ28SE217/A-B	HAVERSTOCK SECONDARY SCHOOL CHALK FARM 1	5.03			KW	528150	184490
TQ28SE217	HAVERSTOCK SECONDARY SCHOOL CHALK FARM 2	5.03			KW	528150	184490
TQ28SE299	CHALK FARM STATION HAMPSTEAD	10.36			KW	528150	184410
TQ28SE23	UNDERGROUND ELECTRIC NO.15 ST PANCRAS	9.14			KW	528151	184410
TQ28SE1222	GLOUCESTER AVE SEWER 8	15		11095	KW	528160	184100
TQ28SE6	L.X.W.R. CAMDEN STREET ST PANCRAS	121.92	1849		WLKW	528190	184159
TQ28SE2185	CHALK FARM LONDON 1	-1	2007	51895	KW	528240	184410
TQ28SE245/A	HAVERSTOCK SECONDARY SCH.EXT.	4			KW	528250	184500
TQ28SE245/A-C	HAVERSTOCK SEC SCHOOL CHALK FARM	4.57			KW	528250	184500
TQ28SE2186	CHALK FARM LONDON 2	-1	2007	51895	KW	528260	184380
TQ28SE2033	THE ROUNDHOUSE DEVELOPMENT, CHALK FARM ROAD, LONDON 2	12.49	1972	34842	KW	528284	184288
TQ28SE2032	THE ROUNDHOUSE DEVELOPMENT, CHALK FARM ROAD, LONDON 1	18.28	1972	34842	KW	528310	184316
TQ28SE2034	THE ROUNDHOUSE DEVELOPMENT, CHALK FARM ROAD, LONDON 3	21.33	1972	34842	KW	528320	184307
TQ28SE2178	OLD PEOPLES DWELLINGS REGENTS PARK 4	-1	1963	44005	KW	527918	183887
TQ28SE410	METROPOLITAN WATER BOARD 28	43.59			KW	527950	184000
TQ28SE2176	OLD PEOPLES DWELLINGS REGENTS PARK 2	-1	1963	44005	KW	527953	183903
TQ28SE668/A	REGENTS PARK RD. 1	12			KW	527960	183880
TQ28SE668/A-D	REGENTS PARK ROAD BHS1-4	12.19			KW	527960	183880

WATERWELL RECORDS

Reference	Location	Regno	Depth	Year	Datum	Easting	Northing	Aquifer	Geology	Hydrogeology	Chemical
TQ28/47	Alexandra House, Haverstock Hill	TQ28SE1490/BJ	118.9	1844	51.82	527890	184940	Chalk Group	Yes	Yes	No
TQ28/48A	St Pancras Baths, Prince Of Wales Rd	TQ28SE1559/BJ	137.2	1904		528740	184820	Chalk Group	Yes	Yes	Yes
TQ28/48B	St Pancras Baths, Prince Of Wales Rd	TQ28SE1560/BJ	146.5	1907		528760	184790	Chalk Group	Yes	Yes	Yes

Pringuer-James Consulting Engineers
Preliminary Risk Assessment

APPENDIX E

Geotechnical Data – Site Investigation Report
Soil Consultants Ltd.
Report Ref: C9117/JRCB/OT

Soil Consultants Ltd

Ground Investigation - Geotechnical Analysis – Contamination Assessment

GROUND INVESTIGATION REPORT

PROPOSED REDEVELOPMENT:

10A BELMONT STREET
LONDON NW1 8HH

Client:	**RISETALL LTD** **46 Great Marlborough Street** **London W1F 7JW**
Consulting Engineers:	**PRINGUER-JAMES CONSULTING ENGINEERS LTD** **16 Kew Foot Road, Richmond** **London TW9 2SS**
Report ref:	**9117/JRCB/OT**
Date:	**1st February 2012 [Rev 1]**

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GROUND INVESTIGATION REPORT

PROPOSED REDEVELOPMENT:

10A BELMONT STREET
LONDON NW1 8HH

DOCUMENT ISSUE STATUS:

Issue	Date	Description	Author	Checked/approved
Rev 0	30 January 2012	First issue	John Bartley	Opher Tolkovsky
Rev 1	1 February 2012	Client name change	John Bartley	Opher Tolkovsky

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2.0 Site Description 1
3.0 Exploratory Work 1
4.0 Ground Conditions 2
4.1 Made ground 2
4.2 London Clay 2
4.3 Ground-water 2
5.0 Geotechnical Assessment 2
5.1 Piled foundations 2
5.2 Ground floor slab 3
5.3 Foundation concrete 3

APPENDIX

Fieldwork, in-situ testing and monitoring

- Borehole records
- Standard Penetration Test results

Laboratory testing

- Index property testing
- Plasticity chart
- Unconsolidated undrained triaxial test results [QUT]
- Soluble sulphate/pH testing

Ground profiles

- Plot of SPT 'N' value and undrained cohesion versus elevation

Plans & drawings

- Development plans
- Piling GA drawings and loading sheet
- Site Plan
- Location Plan

1.0 INTRODUCTION

Consideration is being given to the construction of a new 5-storey extension to 10A Belmont Street, together with two additional storeys on the existing building. In connection with the proposed works, Soil Consultants were commissioned to carry out a ground investigation to identify the ground sequence and determine the geotechnical parameters of the soils.

This report describes the investigation undertaken, gives a summary of the ground conditions encountered and then provides foundation design recommendations. The required scope of work did not include a Desk Study of Contamination/Environmental Appraisal.

This report has been prepared for the benefit of the Client and associated parties directly involved with the design and construction of the project under direction of the Client. No reliance can be assumed by others without the written agreement of Soil Consultants Ltd.

2.0 SITE DESCRIPTION

The site is located in a mixed commercial/residential area in Chalk Farm, north London, with its centre at approximate NGR 528360N 184390E. The existing building, which measures about 12m x 37m in plan, is a 5-storey brick-built office block which lies to the east of Belmont Street. Access to the front of the building [west facing] is via a paved walkway off Belmont Street that passes behind a commercial property immediately to the west. A number of 3-storey residential properties adjoin the north facing elevation of the building.

A car park is present to the rear [east side] of the building with approximate dimensions 35m x 20m - this is accessible via a short lane off Ferdinand Street, the entrance to which is approximately 35m from the junction with the A502 Chalk Farm Road. The access road is spanned by a commercial property on the east side of the car par. On the northern side of the car park are a number of small businesses, including what appears to be a builders merchants or similar, and on the south side is a wholesale beverages depot that adjoins the south-east corner of the building.

An electricity substation is present approximately 10m north-east of the building, behind a builders merchants on the north side of the car park. Some semi mature to mature trees are present in between the surrounding buildings and lining Belmont Street, with the closest tree being located approximately 5m north-east, adjacent to the substation.

The site and its surroundings are generally flat and level, with an approximate elevation of +29mOD [interpolated form OS data].

The current site features are shown on the Site Plan, which is included in the Appendix, and in a number of photographs on the front cover of this report.

3.0 EXPLORATORY WORK

The investigation comprised the following elements.

Cable percussive borehole

One borehole [BH No 1] was carried out at a position agreed with the Consulting Engineers in December 2011. The borehole was taken to a depth of 20m and in-situ Standard Penetration Tests [SPT] and sampling were carried out at appropriate intervals - a monitoring pipe was installed to 4m depth.

Geotechnical laboratory testing

The following geotechnical laboratory testing was completed:

- natural moisture content
- index properties [Atterberg Limits]
- unconsolidated undrained triaxial compression tests [102mm diameter sample]

The engineering logs of the exploratory holes and the laboratory testing results are included in the Appendix.

4.0 GROUND CONDITIONS

The geological survey map indicates that London Clay is present in this area with no superficial deposits identified. Our investigation confirmed the presence of the London Clay beneath a moderate thickness of made ground.

4.1 Made ground

Beneath 250mm of asphalt surfacing, the made ground extended to a depth of 3.10m. The made ground initially comprised dark grey/black ashy sand with gravel and clinker, extending to 0.95m depth. The underlying fill comprised soft, locally very soft, brown/grey and brown/orange sandy clay with brick fragment, flint gravel and occasional clinker. SPT 'N' values of 7 were recorded confirming the generally soft consistency of the made ground.

4.2 London Clay

The London Clay was encountered beneath the made ground at 3.10m depth. The formation generally comprised an upper weathered layer of firm to stiff brown fissured clay with scattered selenite crystals which extended to about 11.30m depth. Stiff grey fissured clay was then present and this extended to maximum depth investigated [20m]. The clay was locally silty and slightly sandy, with scattered silt partings and generally classifies as a very high plasticity material [CV], as shown on the appended plasticity chart. A plot of the laboratory undrained cohesion/SPT 'N' values against depth is included in the Appendix.

4.3 Ground-water

A slow inflow of ground-water was observed at 1.80m depth within the made ground deposit. A short term standing water level was recorded at 1.58m depth following a 20 minute rest period [Dec 2011]. It should be noted that water levels can undergo significant seasonal variation.

5.0 GEOTECHNICAL ASSESSMENT

The proposed development comprises the construction of a new 5-storey extension which will adjoin the eastern side of the existing building. Current proposals do not envisage a basement but we understand that one may be constructed at some time in the future. The proposed works will also include the construction of two additional storeys to the existing 5-storey building – the scope of our investigation did not include analysis of the performance of the existing foundations. The current development plans and sections are included in the Appendix.

We understand that piled foundations are proposed for the new extension. Our investigation encountered a 3.1m thickness of made ground overlying firm London Clay, with a perched ground-water table within the fill material - we agree that piles will probably present the optimum foundation solution. The provisional piling GA drawings are included in the Appendix.

5.1 Piled foundations

For the ground conditions encountered either CFA piles or conventional rotary augered piles could be considered for this site, with the latter type requiring temporary casing through any made ground. As discussed above, a basement may be constructed at some time in the future therefore the contribution of the upper zone of soil will need to be ignored when assessing pile capacity.

The following table of coefficients may be used for the design of CFA and conventionally augered piles, based upon the measured strength/depth profile included in the Appendix.

Shaft adhesion

Stratum	Depth/elevation	Undrained cohesion [from design line]	Ultimate unit shaft adhesion 'q_s'
All soils above 4m	-	N/A	Ignore [possible future basement]
London Clay	Below 4m	Increases linearly from 60kN/m^2 at a rate of 6.88kN/m^2/m	Increases linearly from 30kN/m^2 at a rate of 3.44kN/m^2/m [incorporates α = 0.50]

Notes:
a] Unit shaft adhesion 'q_s' = α x c_u [where α = 0.50 and c_u is the undrained cohesion from the design line]
b] The α value of 0.5 is based upon 102mm diameter triaxial tests and this should not be varied
c] The average shaft adhesion over the pile length should be limited to 110kN/m^2
d] The maximum value for unit shaft adhesion should be limited to 140kN/m^2

End bearing

Stratum	Depth/elevation	Undrained cohesion [from design line]	Ultimate unit base resistance 'q_b'
London Clay	Below 15m depth	Increases linearly from 135kN/m^2 at a rate of 6.88kN/m^2/m	Increases linearly from 1012.5kN/m^2 at a rate of 61.92kN/m^2/m [incorporates Nc = 9.0]

Notes:
a] Unit base resistance 'q_b' = Nc x c_u [where Nc = 9.0 and c_u is the equivalent undrained cohesion from the design line]

As a guide to the use of the above coefficients, we have calculated the following capacities for various diameter single piles terminating at various depths:

Pile diameter [mm]	Toe depth [mbgl]	Pile length [Note c] [m]	Ultimate load [kN]	Working load [kN]
450	15	11	955	365
	20	16	1545	595
600	15	11	1360	525
	20	16	2170	835
750	15	11	1805	695
	20	16	2845	1095
900	15	11	2300	885
	20	16	3575	1375

Notes:
a] Working load is calculated using F_{shaft} and F_{base} = 2.6
b] Concrete stress should be considered in the final design
c] Pile length based upon underside of pile cap at 4m depth

An overall Factor of Safety of 2.6 has been used in the above examples, in line with the current guidelines by the London District Surveyors Association [LDSA]. If comprehensive pile testing is undertaken for this redevelopment a lower factor of safety is likely to be appropriate. Our examples are indicative only and do not constitute a recommendations as to the pile length and diameter to be adopted.

We recommend that a specialist piling contactor is consulted at an early stage to advise on the most appropriate pile type and to ultimately provide the final pile design.

5.2 Ground floor slab

The investigation has indicated that >3m of non-engineered made ground is present and we therefore recommend that a suspended floor slab, supported by the main foundations, is adopted. A suitably reinforced suspended slab could also be utilised during the possible future basement construction.

5.3 Foundation concrete

Low to moderate levels of soluble sulphates were measured in selected soil samples with near neutral pH values. The results fall into Site Design Classes DS-1 to DS-3 of Table C2 given in BRE Special Digest 1 [2005]. We assess the site as having 'static' ground water conditions and recommend that a minimum of ACEC Site Class AC-2S should be adopted for the design of buried concrete.

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9117/JRCB/OT
Client: Risetall Ltd
Site Investigation Report – 10A Belmont Street, London NW1 8HH
Consulting Engineers: Pringuer-James

APPENDIX

Fieldwork, in-situ testing and monitoring
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- Standard Penetration Test results

1st February 2012 [Rev 1]
Soil Consultants Ltd

Soil Consultants Ltd

Ground Investigation - Geotechnical Analysis – Contamination Assessment

FOREWORD FOR CABLE PERCUSSIVE DRILLING - GUIDANCE NOTES

GENERAL
The Borehole Records are compiled from the driller's description of the strata encountered, an examination of the samples by our Geotechnical Engineer and the results of in-situ and laboratory tests. Based on this data, the report presents an opinion on the configuration of strata within the site. However, such reasonable assumptions are given for guidance only and no liability can be accepted for changes in conditions not revealed by the boreholes.

BORING METHODS
The Cable Percussion technique of boring is normally employed and allows the ground conditions to be reasonably well established. However, some disturbance of the ground is inevitable, particularly some "softening" of the upper zone of clay immediately beneath a granular soil. The presence of thin layers of different soils within a stratum may not always be detected.

GROUND WATER
The depth at which ground water was struck is entered on the Borehole Records. However, this observation may not indicate the true water level at that period. Due to the speed of boring and the relatively small diameter of the borehole, natural ground water may be present at a depth slightly higher than the water strike. Moreover, ground water levels are subject to variations caused by changes in the local drainage conditions and by seasonal effects. When a moderate inflow of water does take place, boring is suspended for at least 10 minutes to enable a more accurate short-term water level to be achieved. An estimate of the rate of inflow is also given. This is a relative term and serves only as a guide to the probable flow of water into an excavation.

Further observations of the water level made during the progress of the borehole are shown including end of shift and overnight readings and the depth at which water was sealed off by the borehole casing, if applicable.

Whilst drilling through granular soils, it is usually necessary to introduce water into the borehole to permit their extraction. When additional water has been used a remark is made on the Borehole Record and the implications are discussed in the text.

SAMPLES
Undisturbed samples of the predominantly cohesive soils are obtained using a 100mm diameter open-drive sampler. In granular soils, disturbed bulk samples are taken and placed in polythene bags. Small jar samples are taken at frequent intervals in all soils for subsequent visual examination. Where ground water is encountered in sufficient quantity, a sample of the ground water is also taken.

IN-SITU STANDARD PENETRATION TESTS
This test is performed in accordance with the procedure given in B.S.1377:1990. The individual blow count record for each test is given on a separate table. The 'N' value is normally the number of blows to achieve a penetration of 0.3m following a seating distance of 0.15m and is quoted at the mid-depth of the test zone. However if a change of stratum occurs within the test zone then a revised 'N' value is calculated to assess one layer in particular. In hard strata full penetration may not be obtained. In such cases the suffix + indicates that the result has been extrapolated from the limited penetration achieved. Where ground water has affected the measured values, the resultant 'N' values have been placed in brackets since it is unlikely to represent the true in-situ density of the soil.

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Site Location	**10A Belmont Street, London NW1 8HH**	Borehole No:	**1**
Client:	**Risetall Ltd**	Sheet	**1 of 3**
Engineer:	**Pringuer-James Consulting Engineers Ltd**	Report No:	**9117/JRCB**

Comments	Samples Type	Samples Depth(m)	Field Test	Strata Depth(m)		Strata Level(mOD)	Strata Description	Legend
				0.00	D	+ 29.00	ASPHALT surfacing [100mm] over road-base and brick	0
BH ccarried out on 13 Dec 2011	D	0.25		0.25		+ 28.75	MADE GROUND: dark grey and black ashy sand with gravel, brick fragments and clinker - locally clayey	
	D	0.50						
				0.95		+ 28.05	MADE GROUND: soft [locally very soft] brown/grey and borwn/orange sandy clay with brick fragments, gravel and occasional clinker	
	D	1.00			1			1
Service pit to 1.20m								
BH/casing dia: 150mm								
Ground-water inflow at 1.80m	S/D	1.80	7					
Rose to 1.58m [20 minutes]	D	2.00			2			2
	S/D	2.80	7					
	D	3.00		3.10	J	+ 25.90	Firm becoming stiff brown fissured CLAY with blue/grey gleying and scattered selenite crystals. Locally silty and slightly sandy	3
BH cased to 3.50m								
	S/D	3.80	12					
	D	4.00			4			4
	U	4.50						
	D	5.00			5			5
					6			6
	S/D	6.30	19					
	D	6.75						
					7			7
	U	7.50						
	D	8.00			8			8
					9			9
	S/D	9.30	22					
	D	9.75						
					10			10

Constructed using cable percussive techniques

Key: U = Undisturbed B = Bulk D = Small disturbed W = Water S = SPT 'N' [split spoon sample] C = SPT 'N' [solid cone] HV = Hand Vane [kPa] PP = Pocket Penetrometer [kg/cm²]

Remarks :- BH level inferred from OS contours - approximate only

Borehole No: **1**

[* = extrapolated SPT 'N' value]

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SCL Chart Generator Ver_1.2

Site Location	10A Belmont Street, London NW1 8HH	Borehole No: 1
Client:	Risetall Ltd	Sheet 2 of 3
Engineer:	Pringuer-James Consulting Engineers Ltd	Report No: 9117/JRCB

Comments	Samples Type	Samples Depth (m)	Field Test	Strata Depth (m)	Strata Level (mOD)	Strata Description	Legend
				10.00	+ 19.00	Stiff brown fissured CLAY with blue/grey gleying and scattered selenite crystals. Locally silty and slightly sandy	
	U	10.50					
	D	11.00		11.30	+ 17.70	Stiff becoming very stiff grey fissured CLAY, locally silty and slightly sandy with occasional partings of silty fine sand	
	S/D	12.30	27				
	D	12.75					
	U	13.50					
	D	14.00					
	S/D	15.30	30				
	D	15.75					
	U	16.50					
	D	17.00					
	S/D	18.30	40				
	D	18.75					
	U	19.50					
BH dry on completion	D	19.80		20.00	+ 9.00	End of Borehole at 20m depth	

Constructed using cable percussive techniques

Key: U = Undisturbed B = Bulk D = Small disturbed W = Water S = SPT 'N' (split spoon sampler) C = SPT 'N' (solid cone) HV = Hand Vane (kPa) PP = Pocket Penetrometer (kg/cm²)

Remarks :-

Borehole No: 1

[* = extrapolated SPT 'N' value]

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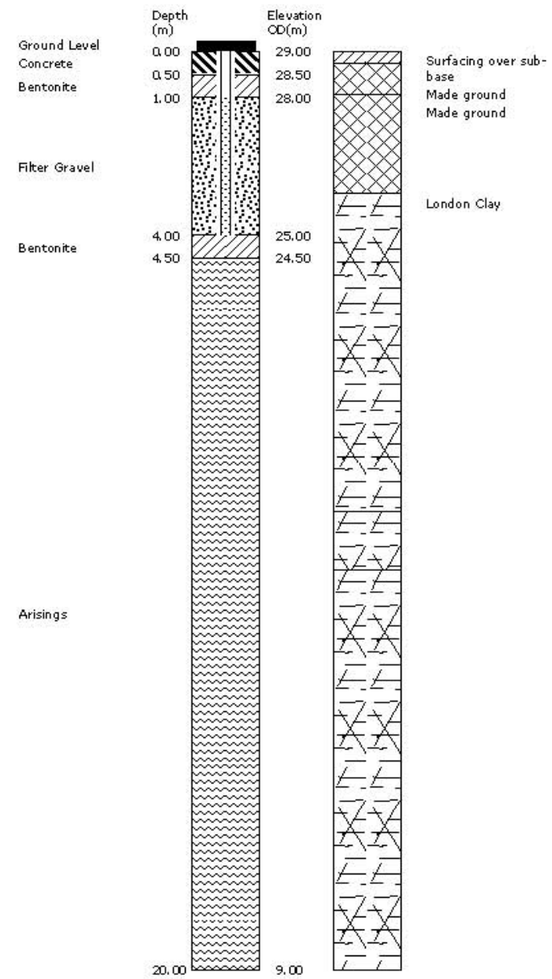
SCLChartGeneratorVer_1_0

Site Location	10A Belmont Street, London NW1 8HH	Borehole No: 1
Client:	Risetall Ltd	Sheet 3 of 3
Engineer:	Pringuer-James Consulting Engineers Ltd	Report No: 9117/JRCB

Borehole Installation and Backfill Details



Remarks :- [i] Pipe diameter: 35mm
[ii] Tip at 4m depth [25m OD approx]
[iii] Gas tap fitted

Borehole No: 1

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SCLChartGeneratorVer_1_0

Site Location	10A Belmont Street, London NW1 8HH	Report No:	9117/JRCB

IN-SITU STANDARD PENETRATION TEST RESULTS

Borehole No:	Start depth [m]	Test Type	Blow counts per 75 mm	SPT (N)	Remarks
1	1.50	S	1 1 2 2 1 2	7	
1	2.50	S	2 2 1 1 2 3	7	
1	3.50	S	2 2 3 3 3 3	12	
1	6.00	S	3 3 4 4 5 6	19	
1	9.00	S	3 4 5 5 6 6	22	
1	12.00	S	4 6 6 6 7 8	27	
1	15.00	S	5 6 6 7 8 9	30	
1	18.00	S	6 7 8 10 10 12	40	

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[SPT Sheet 1 of 1]

APPENDIX

Laboratory testing

- Index property testing
- Plasticity chart
- Unconsolidated undrained triaxial test results [QUT]
- Soluble sulphate/pH testing

Site Location	10A Belmont Street, London NW1 8HH	Report No:	9117/JRCB

INDEX PROPERTY TEST RESULTS

Sample Location	Depth [m]	Sample Description	Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	Percent Passing 425µm	Remarks
BH1	10.50	Brown CLAY with blue/grey gleying	31	81	35	46	>95	
BH2	19.50	Grey CLAY	28	77	31	46	>95	

Notes:

- Moisture content test: BS 1377:Part 2 [1990] Clause 3.2 [value in brackets = calculated matrix moisture content for comparison with LL and PL]
- Liquid and Plastic Limit: BS 1377:Part 2 [1990] Clauses 4.4, 5.2, 5.3, 5.4 is carried out on fine grained soil matrix
- Percent passing 425 micron sieve is by estimation, by hand* or by wet sieving**
- LOI = Loss on Ignition

Sample examined by JRCB (Engineer)

Results checked by JRCB (Engineer) Certificate date : 30-Jan-12

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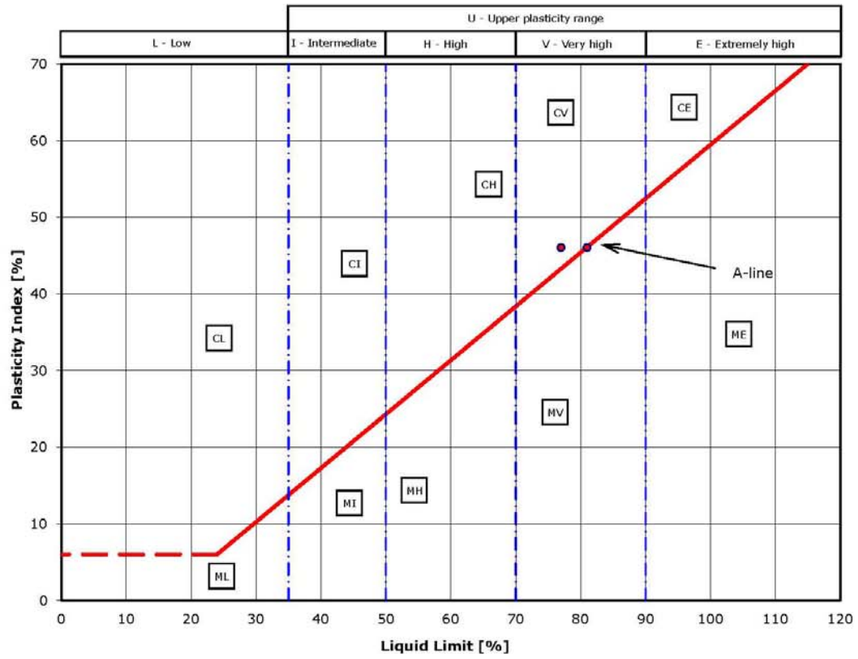
Site Location	10A Belmont Street, London NW1 8HH	Report No.	9117/JRCB

PLASTICITY CHART - BS5930 classification



M - Silt [M-soil] plots below the A-line
C - Clay plots above the A-line
} M and C may be combined as F, FINE SOIL

Note: Classification based upon BS5930:1999 'Code of practice for site investigations'

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Site Location	10A Belmont Street, London NW1 8HH	Report No:	9117/JRCB

TRIAXIAL COMPRESSION TEST RESULTS

Key : 38, 102 = dia in mm, U=Undrained, M= Multistage, MC = Moisture Content, QD = Quick Drained Test

Borehole No:	Depth [m]	Test Type	Cell Pressure [kN/m2]	Comp Strength [kN/m2]	Bulk Density [Mg/m3]	Moisture Content [%]	Cohesion [kN/m2]	Angle of Friction [deg]	Remarks
1	4.50	102U	100	122	1.80	35	61	0	
1	7.50	102U	180	152	1.92	34	76	0	
1	10.50	102U	210	169	1.95	31	85	0	
1	13.50	102U	270	318	1.97	28	159	0	
1	16.50	102U	330	252	1.98	28	126	0	
1	19.50	102U	390	323	1.99	28	161	0	

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[Triaxial Sheet 1 of 1]

Site Location	10A Belmont Street, London NW1 8HH	Report No:	9117/JRCB

TRIAXIAL COMPRESSION TEST RESULTS

Key : 38, 102 = dia in mm, U=Undrained, M= Multistage, MC = Moisture Content, QD = Quick Drained Test

Borehole No:	Depth [m]	Test Type	Cell Pressure [kN/m2]	Comp Strength [kN/m2]	Bulk Density [Mg/m3]	Moisture Content [%]	Cohesion [kN/m2]	Angle of Friction [deg]	Remarks
1	4.50	102U	100	122	1.80	35	61	0	
1	7.50	102U	180	152	1.92	34	76	0	
1	10.50	102U	210	169	1.95	31	85	0	
1	13.50	102U	270	318	1.97	28	159	0	
1	16.50	102U	330	252	1.98	28	126	0	
1	19.50	102U	390	323	1.99	28	161	0	

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[Triaxial Sheet 1 of 1]

Site Location	10A Belmont Street, London NW1 8HH	Report No:	9117/JRCB

TRIAXIAL COMPRESSION TEST RESULTS

Key : 38, 102 = dia in mm, U=Undrained, M= Multistage, MC = Moisture Content, QD = Quick Drained Test

Borehole No:	Depth [m]	Test Type	Cell Pressure [kN/m2]	Comp Strength [kN/m2]	Bulk Density [Mg/m3]	Moisture Content [%]	Cohesion [kN/m2]	Angle of Friction [deg]	Remarks
1	4.50	102U	100	122	1.80	35	61	0	
1	7.50	102U	180	152	1.92	34	76	0	
1	10.50	102U	210	169	1.95	31	85	0	
1	13.50	102U	270	318	1.97	28	159	0	
1	16.50	102U	330	252	1.98	28	126	0	
1	19.50	102U	390	323	1.99	28	161	0	

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[Triaxial Sheet 1 of 1]

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UKAS TESTING 4480 mCERTS 4480

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t: 01622 851105
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 8289

Site Reference: Belmont St

Project / Job Ref: 9117/JRCB

Order No: None Supplied

Sample Receipt Date: 05/01/2012

Sample Scheduled Date: 05/01/2012

Report Issue Number: 1

Reporting Date: 11/01/2012

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

QTS Environmental Ltd
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Rose Lane
Lenham Heath
Maidstone
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Tel : 01622 851105

4480 4480

Soil Analysis Certificate						
QTS Environmental Report No: 8289	Date Sampled	13/12/11	13/12/11	13/12/11		
Soil Consultants Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Belmont St	TP / BH No	BH1	BH1	BH1		
Project / Job Ref: 9117/JRCB	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	3.00	8.00	14.00		
Reporting Date: 11/01/2012	QTSE Sample No	37990	37991	37992		

Determinand	Unit	MDL	Accreditation					
Stone Content	%	<0.1	NONE	<0.1	<0.1	<0.1		

General Inorganics	Unit	MDL	Accreditation					
pH	pH Units	+ / - 0.1	MCERTS	7.8	7.6	8.0		
W/S Sulphate as SO_4 (2:1)	g/l	<0.01	NONE	0.19	2.46	0.49		

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content
Stone content is classified as material greater than 10mm in diameter

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Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 8289	
Soil Consultants Ltd	
Site Reference: Belmont St	
Project / Job Ref: 9117/JRCB	
Order No: None Supplied	
Reporting Date: 11/01/2012	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
37990	BH1	None Supplied	3.00	21.3	Brown clay
37991	BH1	None Supplied	8.00	20.2	Brown clay
37992	BH1	None Supplied	14.00	20.5	Brown clay

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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 8289
Soil Consultants Ltd
Site Reference: Belmont St
Project / Job Ref: 9117/JRCB
Order No: None Supplied
Reporting Date: 11/01/2012

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	AR	Fibrous Material Screen	Visual screening of samples for fibrous material	E024
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water followed by titration using silver nitrate	E021
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by turbidimeter	E020
Soil	D	Fluoride - Water Soluble	Test Kit	E023
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	D	Phosphorus	Determination of phosphorus by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Sulphate (as SO_4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	D	Sulphate (as SO_4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	AR	Sulphide	Determination of sulphide by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia, potassium iodide/iodate followed by ICP-OES	E002
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E009
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E009
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E010
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E009
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	EPH (with florisil cleanup)	Determination of acetone/hexane extractable hydrocarbons with florisil cleanup step by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001

Key

D Dried
AR As Received

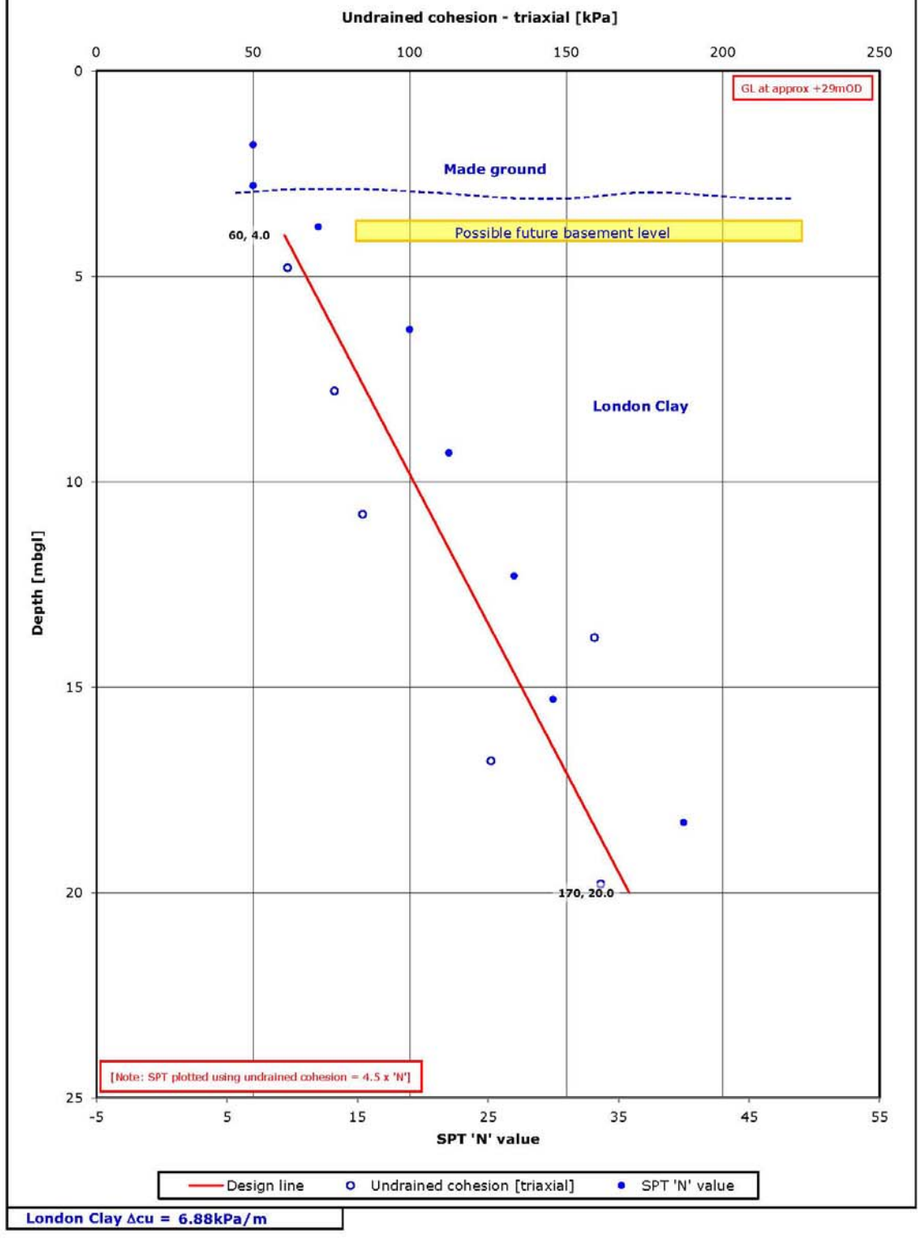
APPENDIX

Ground profiles

- Plot of SPT 'N' value and undrained cohesion versus depth

Site Location	10A Belmont Street, London NW1 8HH	Report No: 9117/JRCB

Undrained cohesion & SPT versus depth



London Clay Δcu = 6.88kPa/m

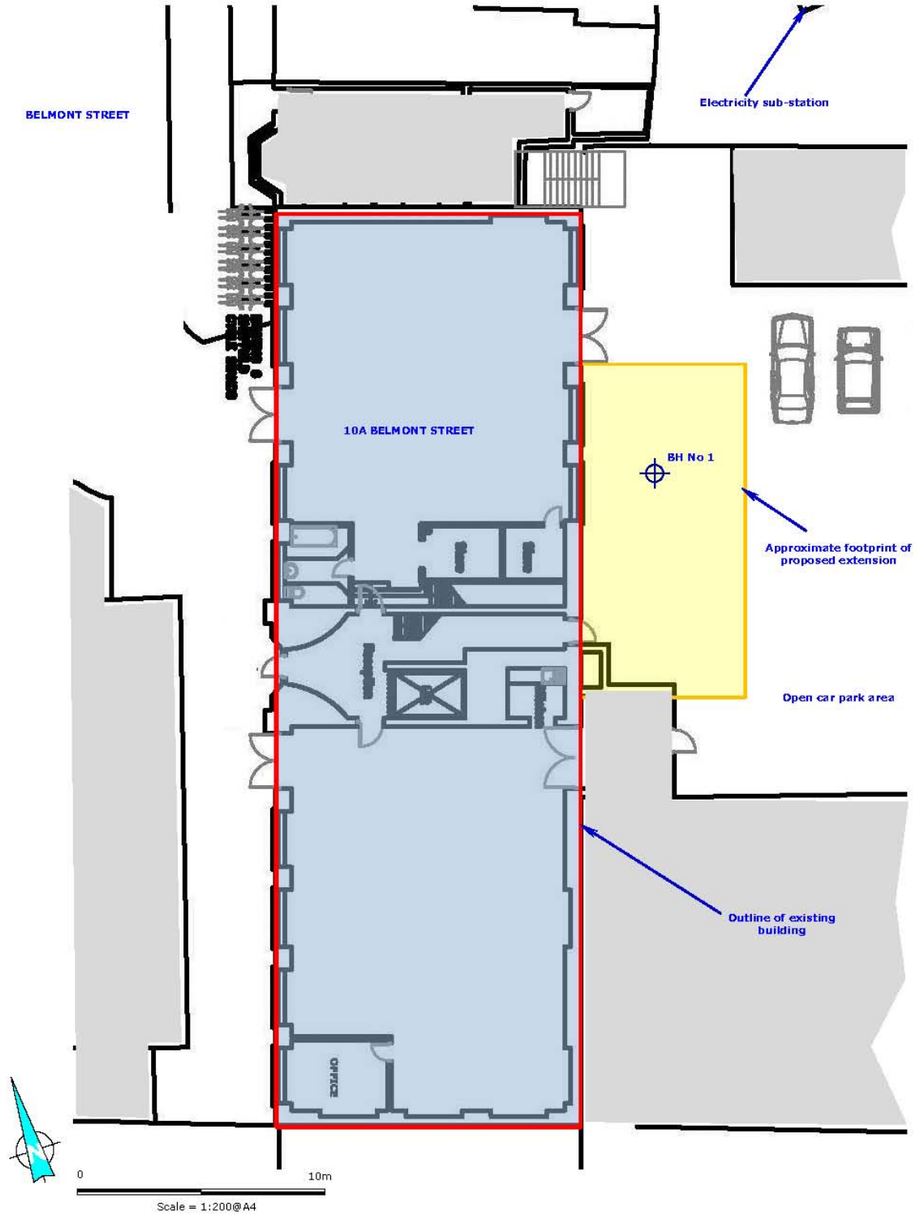
APPENDIX

Plans & drawings

- Development plans
- Piling GA drawings and loading sheet
- Site Plan
- Location Plan

Site Location	10A Belmont Street, London NW1 8HH	Report No: 9117/JRCB

Site Plan



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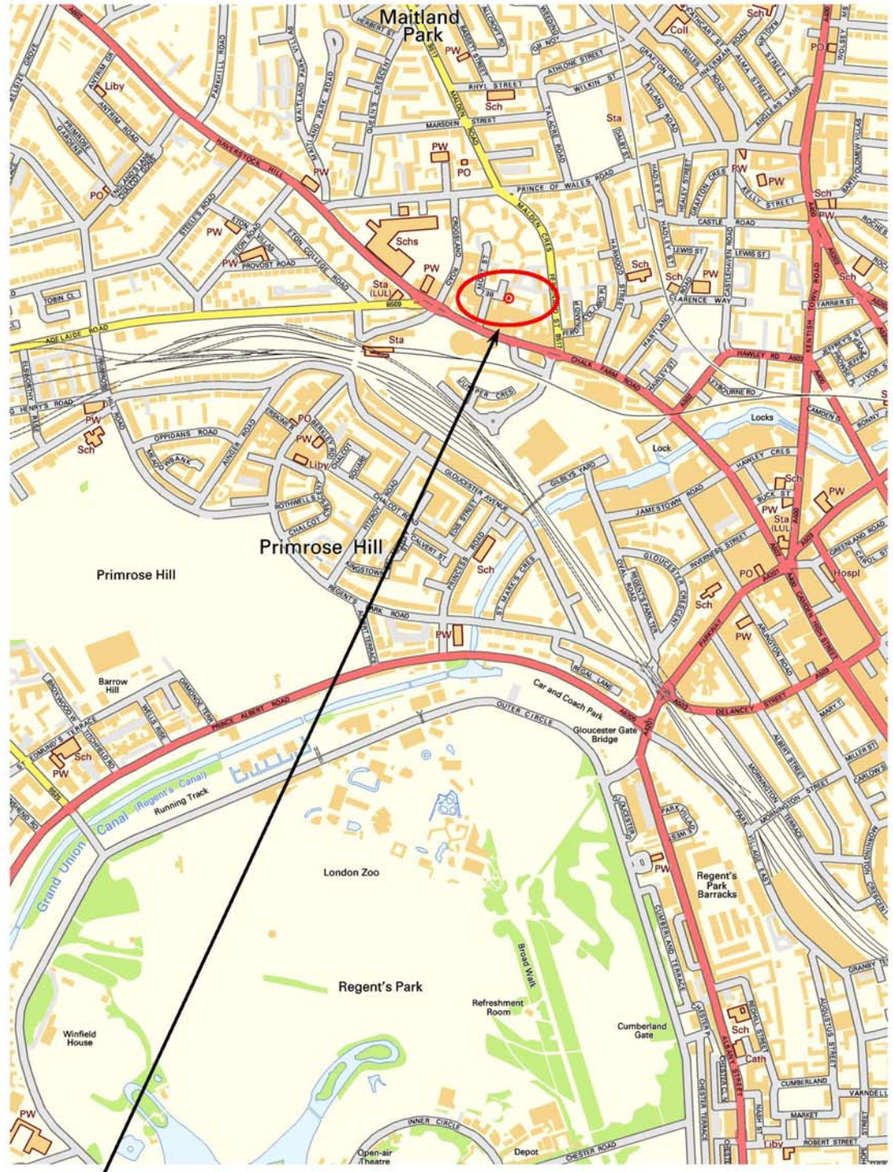
Site Location	10A Belmont Street, London NW1 8HH	Report No: 9117/JRCB

Location Plan



[Contains Ordnance Survey data © Crown copyright and database right 2010]

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Soil Consultants Ltd

Pringuer-James Consulting Engineers
Preliminary Risk Assessment

APPENDIX F

Historical Data – Archive Information, Historical OS Maps, Aerial Photographs

E.1 Camden Goods Yard and Chapells Piano Factory, Camden, 1920

E.2 Camden Goods Yard and Chapells Piano Factory, Camden, 1920