10.5.1.2 Table 2 presents the co-ordinates used to input the main elements of the basement's geometry into PDISP, together with the net changes in overburden pressure resulting from a combination of the gross unloading from the excavation down to the basement founding level, the self-weight of the underpins and the maximum imposed loads from the superstructure, excluding live loads, as given by TS Consulting (see 'Load-01' sheet in Appendix C).

Gross unloading:

- Depth of excavation = 3.8m (paragraph 3.4)
- Estimated unit weight, γb = 17.0 kN/m^3.

Basement dimensions:

- 11.8m wide by 12.7m long, excluding strip footings (also taken from the TS Consulting's 'Load-01' sheet).

Table 2: Co-ordinates and loading detail of the underpin zones

	Dimension		Centroid		Angle with X-Axis	Net change in Bearing Pressure (kPa)
Zone	X (m)	Y (m)	Cx (m)	Cy (m)		
Wall A	2	8.755	1.48	6.35	6.43	6
Wall B	2	8.755	11.3	6.35	6.43	6
Wall C	11.8	2	5.9	11.7	0	-31
Wall D	11.8	2	6.88	1	0	-24
Wall E	2	8.755	6.39	6.35	6.43	14
Excavation 1	2.863	8.755	3.94	6.35	6.43	-65
Excavation 2	2.863	8.755	8.84	6.35	6.43	-65

10.5.2 Ground Conditions:

10.5.2.1 The ground profile was based on the site-specific ground investigation by Chelmer Site Investigations, as presented in Section 9 above, and the desk study information.

10.5.2.2 The geotechnical soil properties adopted for the analysis by PDISP are summarized in Table 3 below, based on the log of the borehole drilled by CSI and our previous experience of basement projects in the London Clay.

Table 3: Soil parameters for PDISP analyses

Strata	**Level** (m bgl)	**SPT blowcount** N	**Short term, undrained Young's Modulus,** Eu (MPa)	**Long term, drained Young's Modulus,** E' (MPa)
Made Ground	3.8-5.9	17	35	20
London Clay	5.9 27.5	20	40 120	25 70

Where:
Drained Young's Modulus = 2 x N
London Clay: Undrained shear strength, Cu assumed = 80kPa at 5.9m bgl
Eu = 500 * Cu Hence profile of Eu = 40 + 3.75z
Drained Young's Modulus was estimated based on E' = 0.6 Eu
where z = depth below the top of the London Clay stratum.

10.5.3 PDISP Assessment:

10.5.3.1 Three dimensional analyses of vertical ground movements (heave or settlement) have been undertaken using PDISP software in order to assess the potential magnitudes of movements which may result from the changes of vertical stresses caused by excavation of the basement and underpinning of the relevant walls. These analyses used the basement geometry, loads/stresses and ground conditions outlined above. PDISP analyses have been carried out as follows:

- Stage 1 – Effect of underpin loads
- Stage 2 – Effect of excavation – Short-term condition
- Stages 3 & 4 – Construction of basement slab leading to Long-term conditions

10.5.3.2 The results of the short-term and long-term analyses are presented as contour plots on Figures C3 and C4 respectively in Appendix C.

10.5.3.3 The analyses indicated that small heave movements are likely to develop beneath the underpins to the perimeter walls, while slightly larger heave movements are predicted beneath the basement slab. The ranges of predicted short-term and long-term movements for each of the main walls are presented in Table 3 below. These values are approximate, so should be used as a general guide to possible movements rather than definitive values.

Table 3: Summary of predicted heave displacements

Location	**Short-Term** (Figure 3)	**Long-Term** (Figure 4)
Front wall (Wall D)	2 - 5mm Heave	2 - 8mm Heave
15/17 Party Wall (Wall B)	2 - 5mm Heave	2 - 7mm Heave
Rear wall (Wall C)	2 – 5.5mm Heave	3 - 9mm Heave
11/13 Party wall (Wall A)	2 - 5mm Heave	3 - 7mm Heave
Central wall (Wall E)	3 - 5mm Heave	4 - 8mm Heave
Centre of basement slab	Max 7mm Heave	Max 11mm Heave

10.5.3.4 When the analyses were re-run including live loads, the heave magnitudes generally decreased by 1mm beneath the walls and 2mm beneath the central slab areas.

10.5.3.5 Excavation of the basement will cause immediate elastic heave in response to the stress reduction, followed by long term plastic swelling as the underlying overconsolidated clays take up groundwater (although minimal or none in the case of the alluvial clays). The rate of plastic swelling will be determined largely by the availability of water and as a result, given the low permeability of the London Clay, can take many years to reach full equilibrium.

10.5.3.6 All the short-term ground movement would have occurred before the basement slab is cast, so only the post-construction incremental heave is relevant to the slab. The maximum predicted heave beneath the slab is in the central area of excavation, where the maximum post-construction heave beneath the basement slab is predicted to be approximately 4mm.

10.5.3.7 Given the presence of Made Ground below the basement and the resulting importance of balancing, as far as possible, predicted heave and settlement magnitudes which will result from construction of the basement, it is recommended that further ground movement analyses must be undertaken during the design stage in order to assess further the likely range of heave/settlement magnitudes.

10.6 Surface Flow and Flooding

10.6.1 The evidence presented in Section 5 has shown that:

- the site lies within the Environment Agency's Flood Zone 1 which means that it is considered to be at negligible risk of fluvial flooding;
- the site is not at risk of flooding from reservoirs, as mapped by Environment Agency;
- John's Mews was not affected by the surface water flooding events in either 1975 or 2002;
- there are no surface water features within 250m of the site;
- the latest flood modelling by the Environment Agency gives a 'Very Low' risk of surface water flooding (the lowest category, which represents the national background level of risk) for this property (see Figure 6).

10.6.2 The site is also known to lie close to the former alignment of one of the Fleet's tributaries which has been culverted (as described in Section 5 above) so it is no longer able to receive direct surface water run-off, although the highway drains are probably connected to the culvert in Roger Street. Whether the culvert remains connected hydraulically to the perennial surrounding groundwater is unknown.

10.6.3 <u>Change in Paved Surfacing & Surface Water Run-off:</u>
The proposed basement will be entirely beneath the existing building, so there will be no change in the area of hard surfacing. Thus the surface water run-off will remain unchanged.

10.6.4 <u>Surface Water (Pluvial) Flooding:</u>
The latest surface water flood modelling shows a ribbon of 'Low' risk of flooding along the east side of the carriageway to John's Mews, which must represent a flow route when highway gullies are surcharged. No.13's garage opening and No.15's entrance door are already both raised above the gutter level by approximately 0.2m. The lower part of the new screen which will replace No.13's garage door should be designed and specified to be fully watertight. Further flood resistance could, optionally, be provided by the provision of watertight entrance doors although it is considered very unlikely that flood water would ever rise above the level of the thresholds under the modelled event.

10.6.5 The enclosed courtyards to be created at the rear of the new houses will receive only direct rainfall, so flood resistance measures should be limited to provision of suitably raised thresholds to the doorways giving access to those areas.

10.6.6 <u>Sewer Flooding:</u>
No drainage system can be guaranteed to have adequate capacity for all storm eventualities and all drainage systems only work at full capacity when they are properly maintained, including emptying gullies and regular checks of the sewers themselves for condition and blockages. Maintenance of the adopted sewers is the responsibility of Thames Water, so is outside both the Applicant's and the Council's control.

10.6.7 Drainage systems are designed to operate under 'surcharge' at times of peak rainfall. Non-return valves or above ground loop systems should be fitted on the drains serving the basement and the enclosed courtyards, in order to ensure that water from the combined/foul sewer system cannot enter the basement or flood the courtyards when the sewers are operating under surcharge.

10.6.8 If non-return valves are used, then no surface water would be able to enter the sewer whenever the surcharge in the main sewer is sufficient to close the valves. The basement could then be vulnerable to flooding while the rainfall continues. Sufficient temporary interception storage should therefore be provided if non-return valves are used, in order to hold temporarily the predicted maximum volume of surface water run-off from all sources (roof and courtyards) and foul water for the duration of a design storm. This temporary interception storage would require formal design to ensure satisfactory performance.

10.6.9 Cumulative Impact:
No cumulative impact would be expected on surface water flooding from construction of both the proposed basement beneath No.13/15 and the 27JS-21JM basement (No.21 John's Mews and the linking section to No.27 John Street).

10.7 Mitigation

10.7.1 The following mitigation measures should be implemented:

- All structural crack damage in walls that are to be underpinned, which will have weakened the building's structural integrity, should be fully repaired in accordance with recommendations from the appointed structural engineers before any underpinning is carried out. Consideration should be given to stitching these cracks with resin-bonded tie bars (eg: Helifix bars) as part of this repair.
- Subject to Party Wall Award negotiations, consideration should be given to the inclusion of transitional underpinning blocks beneath the load-bearing walls to the adjoining properties, except where the existing foundations would provide sufficient transition.

10.8 Monitoring

10.8.1 Condition surveys should be undertaken of the neighbouring properties before the works commence, in order to provide a factual record of any pre-existing damage. Such surveys are usually carried out while negotiating the Party Wall Award and are beneficial to all parties concerned.

10.8.2 Precise movement monitoring should be undertaken weekly throughout the period during which the basement walls and slab are constructed, with initial readings taken before excavation of the basement starts. Readings may revert to fortnightly once all the perimeter walls and the basement slab have been completed. This monitoring should be undertaken with a total station instrument and targets attached at the following locations:

- internally, at intervals along both party walls;
- externally, on the adjacent front and rear walls to Nos.11 & 17;
- the front and rear walls to No.13/15, and the internal former party wall.

This monitoring frequency should be increased to daily for a minimum of one week at the start of the dewatering operation, and at any change in the dewatering regime (see 10.3.1).

10.8.3 If any undue movements are recorded, the frequency of readings should be increased as appropriate to the severity of the movement and consideration should be given to installing additional targets.

10.8.4 If any structural cracks appear in the main loadbearing walls, then those cracks should be monitored using the Demec system (or similar) on the same frequency as the target monitoring.

11.0 NON-TECHNICAL SUMMARY – STAGE 4

11.1 This summary considers only the primary findings of this assessment; the whole report should be read to obtain a full understanding of the matters considered.

11.2 The site-specific ground investigation has found that the building has already been partially underpinned, although the extent and depth of underpinning remains unclear and will require further investigation. The investigation also recorded Made ground to a depth of 5.9m, which is compatible with two other nearby boreholes, the lower part of which appeared to be disturbed alluvium (Section 9 & paragraph 10.1.1).

11.3 A services search should be undertaken, with particular enquiries regarding the known nearby government communications tunnel (10.1.3).

11.4 The proposed basement will be wholly within the Made Ground and is considered acceptable in relation to the apparently limited flow of groundwater through the Made Ground (10.2.1, 10.2.2).

11.5 The basement will be constructed below the water level, so will need to be fully waterproofed (10.2.2, 10.2.3, 10.2.6). Consideration should be given to making the basement gas-tight (10.2.7).

11.6 Groundwater monitoring must be continued during detailed design (10.2.3). A provisional design groundwater level at 1.0m below ground level is proposed, which means that the basement must be able to resist a minimum buoyant uplift pressure (un-factored) of 28 kPa (10.2.8, 10.2.9).

11.7 Groundwater control will be required, probably by pumping from multiple screened sumps. As the buildings are founded in Made Ground over possible weak alluvium precise monitoring of building movements should be carried out during the initial de-watering period and whenever the dewatering regime is altered (10.3.1). The clays onto which the underpins and the basement slab will be constructed must be blinded with concrete immediately following excavation and inspection (10.3.4).

11.8 There are no concerns regarding slope stability (10.4.1).

11.9 The basement will be constructed using underpinning techniques; best practice methods using high stiffness temporary support systems will be required. Full face support must be allowed for excavations in the Made Ground, and grouting may be required if the high rubble content makes it difficult to maintain stable faces (10.4.3 to 10.4.6).

11.10 The construction sequence provided by TS Consulting should be expanded to conform with the recommendations herein (10.4.7).

11.11 Preliminary damage category assessment calculations, for movements in the ground alongside the retaining walls, indicated that the damage, if any, could be expected to fall within Burland Category 1 – ‘very slight’, close to the boundary with Burland Category 0 ‘negligible’ (10.4.8 to 10.4.10).

11.12 The basement slab should be supported on piles bearing into the London Clay and designed to resist the maximum uplift pressure from the groundwater (10.4.13).

11.13 Various other guidance is provided in relation to the geotechnical design and construction of the basement’s perimeter walls (10.4.11 to 10.4.14).

11.14 The basement slab must be designed to accommodate swelling displacements/ pressures generated by heave of the underlying clays. PDISP ground movement analyses have indicated that heave in the order of 2-9mm could be expected beneath the underpins, with about 4mm post-construction incremental heave beneath the central slab areas, if the basement slab is constructed after the underpins (Section 10.5).

11.15 The basement will be wholly below the existing building, so there will be no change in the area of hard surfacing and hence no change in surface water run-off (10.6.3).

11.16 Flood resistance measures to protect the protect the property from the Very Low risk of surface water flooding include making the lower part of the screen which will replace No.13's garage door fully watertight, possible provision of watertight front entrance doors, and provision of suitably raised thresholds to the rear courtyard access doors (10.6.4, 10.6.5).

11.17 Non-return valves or an above ground loop system should be fitted to the drains serving the basement and gullies in the lightwells (10.6.7).

11.18 If non-return valves are fitted, then temporary interception storage should be provided for the surface water from an appropriate design period storm; formal design would be required (10.6.8).

11.19 Mitigation measures should include repair of the structural cracking before any underpinning is carried out, and installation of non-return valves or an above ground loop system to prevent flooding of the basement when the main sewer is operating under surcharge (Section 10.7).

11.20 Condition surveys of the neighbouring properties should be commissioned and a programme of monitoring the adjoining structures should be established before the works start (Section 10.8).

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MSc DIC CGeol FGS
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Project:

13/15 John's Mews, London, WC1N 2PA

15321

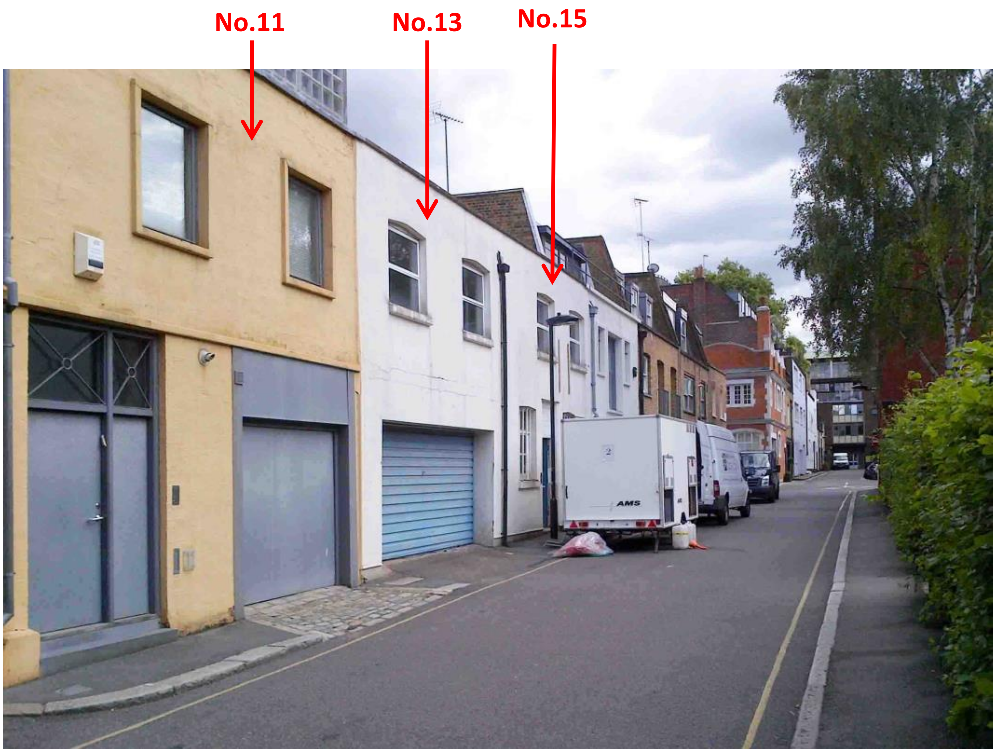


Photo 1: Front elevations of terrace looking south (uphill)

Photo 2: Front elevations of terrace looking north (downhill)

Title:	**Photographs - Sheet 1**					Sheet	**A1**
Date:	19 August 2014	Checked:	KRG	Approved:	KRG	Scale :	NTS

Project:

13/15 John's Mews, London, WC1N 2PA

15321

Photo 3: No.11 (on right) and adjoining commercial property.
Note lightwell to lower ground floor (behind railings) and steep ramp down from vehicle access.

Photo 4: Threshold to No.15.

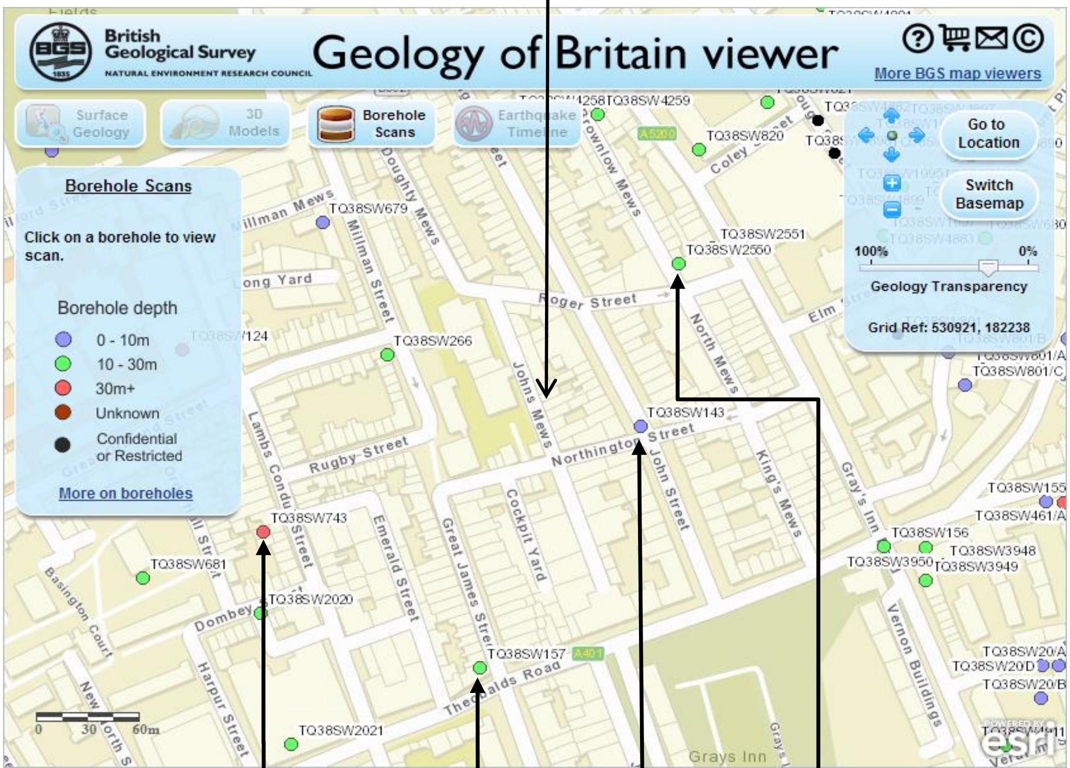
Title:	**Photographs - Sheet 2**					Sheet	**A2**
Date:	19 August 2014	Checked:	KRG	Approved:	KRG	Scale :	NTS

Project:

13/15 John's Mews, London, WC1N 2PA

15321

13/15 John's Mews



TQ38SW/143

TQ38SW/743 **TQ38SW/157** **TQ38SW/2550**

Title:	**Location Plan of BGS Boreholes**					Sheet	**B1**
Date:	August 2014	Checked:	JHG	Approved:	KRG	Scale :	NTS

VII SW | Base + Depth | at below +48'0 | | TQ38SW143

A6

	John St. Theobalds Rd.	1908
11. 0	Road to Basement	11. 0
7. 0	Made ground & Loam	18. 0
3. 0	Loamy Sand & gravel	21. 0

TQ 38 SW 143 Lift Hole

3085 8204

S79

BGS REGISTRATION No.TQ 38 SW - 143

BRITISH GEOLOGICAL SURVEY

SHEET :- 1 of 1

BOREHOLE LOG

NAME OF BOREHOLE :- JOHN STREET

O.D. LEVEL:- 69 ft

TOWN OR VILLAGE :- HOLBORN

COUNTY:-

NGR :- 3085 8204

DATE :- 1908

FOR WHOM MADE :-

PURPOSE :-

MADE BY :-

INFORMATION FROM :-

ADDITIONAL NOTES

DATA

DESCRIPTION OF STRATA	THICKNESS (m)		DEPTH(m)	
Road to Basement	(11ft)	3.35	(11ft)	3.35
Made ground & loam	(7ft)	2.13	(18ft)	5.48
Loamey sand & gravel	(3ft)	0.91	(21ft)	6.39

Base of drift at below +48' OD

 Transposed by :- KCS

J.16.

WELL BORING at Corner of Bedford Row & Theobalds Rd. County

Geol. map 1 in. map New Series 256 6 in. map 7 SW.

Made by TQ 38 SW 157 Date 1859.

Sunk feet. Bored feet.

Communicated by L. C. C.

Height above Ordnance Datum 80.82' (24.63 m) Rest level of water 68.57' above OD.

Yield Very copious.

Quality (with copy of analysis on separate sheet) 3076 8189

GEOLOGICAL FORMATION	NATURE OF STRATA	THICKNESS Feet	THICKNESS Inches	DEPTH Feet	DEPTH Inches
MGRD	Road Metal.		6		
–	Made ground.	9	10½	10	4½ 3.15
–	Loamy red clay.		2	10	6½ 3.21
	Loamy gravel.	1	10½	12	5
	Coarse gravel & sand	5	7	18	–
	Sand	2	6	20	6
–	Coarse gravel.	1	–	21	6 6.55
	Yellow clay.	1	6	23	–
LC	London clay.	31	5	54	5 16.60

Base of Drift at +59.32' OD

TQ38SW 2550

Contract: GRAYS INN ROAD
Client: Taylor Woodrow Developments Ltd

Borehole No. 1
Sheet No. 1 Of 3.
Depth 0 to 10 metres.

Equipment and Methods
Light cable percussion boring 150mm diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39\644

Location :

Dates : 11/9/89
12/9/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description
				B 100	0.00		
					(0.70)		MADE GROUND (concrete)
					0.70		
			S 6	J 101			MADE GROUND (brown silty sandy clay, gravel and brick)
				B 102			
					(2.30)		
			S 9	J 103			
				B 104			
			S 2	J 105	3.00		
				U 106			Soft to firm orange brown silty CLAY with occasional rounded gravel
					(1.50)		
				J 107			
				J 108			
					4.50		
		Vertical Worm tubes? infilled with tufa 4.60m to 5.00m.		U 109			Soft to firm orange brown silty sandy CLAY with occasional thin bands of sand
				J 110			
				J 111	(1.70)		
				U 112			
11/9				J 113			
				J 114	6.20		
				U 115			Firm to stiff fissured brown and grey CLAY with small pockets and partings of orange brown fine sand and silt (London Clay)
				J 116	(0.80)		
				J 117	7.00		
				U 118			Firm to stiff becoming stiff fissured dark brownish grey silty CLAY with numerous small pockets and partings of fine sand and silt (London Clay)
				J 119			
				J 120			
				U 121			
					(7.00)		
				J 122			
				J 123			
				U 124			
				J 125			
					10.00		Continued

Operator
GW

General Remarks:

Appendix
1

Scale
10m/sheet

Sheet No.
1

TQ 38 SW 2550

Contract: GRAYS INN ROAD
Client: Taylor Woodrow Developments Ltd

Borehole No. 1
Sheet No. 3 Of 3.
Depth 20 to 30 metres.

Equipment and Methods
Light cable percussion boring 150mm diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39\644

Location :

Dates : 11/9/89
12/9/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
11/9					20.00			
		Becomes grey from 21.50m		J 147, U 148, J 150, J 151	(7.70)		Very stiff fissured becoming finely fissured brown and grey mottled silty CLAY	
				U 152, J 153, J 154	22.50 (1.50)		Very stiff grey silty CLAY partings of fine sand and silt some layers of carbonised plant remains, bands of shells towards base.	
				U 155, J 156	24.00 (0.50)		Very stiff to hard fissured grey CLAY with scattered rounded gravel	
				J 157, U 158, J 159	24.50 (1.40)		Hard fissured yellow brown and grey mottled slightly sandy very silty CLAY	
				J 160, U 161, J 162	25.90 (2.10)		Hard yellow brown and grey mottled sandy CLAY becomes sandier with depth with bands of dense clayey SAND	
				J 163, U 164, J 165	28.00 (1.30)		Hard fissured reddish brown and grey mottled silty CLAY with small partings of medium sand	
				J 166, U 167, J 168	29.30 (0.70)		Hard fissured dark grey and brown mottled silty sandy CLAY with medium to fine rounded gravel	
12/9					30.00		End of Borehole	

Operator
GW

Scale
10m/sheet

General Remarks:

Appendix
1

Sheet No.
3

TQ 38 SW 2550

Contract: GRAYS INN ROAD
Client: Taylor Woodrow Developments Ltd

Borehole No. 1
Sheet No. 2 Of 3.
Depth 10 to 20 metres.

Equipment and Methods
Light cable percussion boring 150mm diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39\644

Location :

Dates : 11/9/89
12/9/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
		Pockets and partings of fine sand and silt lens frequent below 10.00m		J 126, U 127, J 128, J 129, U 130, J 131, J 132, U 133, J 134	10.00 (7.00) 14.00		Firm to stiff becoming stiff fissured dark brownish grey silty CLAY with numerous small pockets and partings of fine sand and silt (London Clay)	
				J 135	(0.80) 14.80		Stiff fissured dark brownish grey silty CLAY with numerous small pockets and partings of fine sand and silt	
		Becomes hard below 19.00m		U 136, J 137, J 138, U 139, J 140, J 141, U 142, J 143, J 144, U 145, J 146	(7.70) 20.00		Very stiff fissured becoming finely fissured brown and grey mottled silty CLAY	

Continued

Operator
GW

General Remarks:

Appendix
1

Scale
10m/sheet

Sheet No.
2

CONFIDENTIAL

TQ 38 SW / 743.

63.5 A.O.D. (Newlyn)

+19.39 8" Casing to to 0

BOREHOLE No. 10 Contd.

10/3/50 to 18/3/50

Groundwater Level	Date	Sample Depth	Depth	R.L.	Description of Strata
			80'-0"		Stiff grey, brown & red mottled fissured clay
		83'-6	83'-0"	-19.5	Stiff dark grey fissured clay
		87'-0"	86'-0"	-22.5	Stiff light blue clay
			88'-0"	-24.5	Stiff grey & brown mottled silty clay
		92'-0"	92'-0"	-28.5	Stiff grey & brown mottled fissured clay
		97'-0"			
		98'-6"			
		101'-0"	100'-6"	-37.0	Stiff grey sandy clay
		104'-0"	103'-0"	-39.5	Stiff green, grey & brown mottled silty sandy clay Traces of gravel at 108'-0"
		108'-0"	108'-0"	-44.5	
			32.92		

REMARKS:
Boring 8" dia. from GL. to 108 ft.

SAMPLES
■ Undisturbed
● Disturbed

SCALE $\frac{1}{8}$" to 1'-0"

SOILS No. S/380

DRWG. No. S/R/674

GEORGE WIMPEY & CO. LTD. CENTRAL LABORATORY, SOUTHALL

CONFIDENTIAL

TQ 38 SW/743

GROUND LEVEL. 63·5 AOD. (Newlyn)

NOMINAL B.H. DIA. 8" Casing to 40'·0' +17.37

DATE OF BORING: 10/3/50 to 18/3/50

BOREHOLE No. 10

GROUNDWATER LEVEL	GROUNDWATER DATE	SAMPLE DEPTH	DEPTH	R.L.		DESCRIPTION OF STRATA
			3'·0"	+60·5	0.91	Fill (Bricks, ashes etc)
		5'·0"	9'·0"	+54·5	2.74	Medium sand & gravel
		10'·0"	10'·0"	+53·5		Soft dark brown clay
15'·0"	14/3/50	15'·0", 20'·0", 25'·0", 30'·0", 35'·0", 40'·0", 45'·0", 50'·0"	52'·6"	+11·0		Stiff grey - blue silty fissured clay getting sandy with depth
52'·6"	15/3/50	53'·0"	54'·0"	+9·5		Soft dark grey silty clay
		55'·0"	57'·0"	+6·5	17.37 (+2 oz)	Stiff dark grey silty clay LC
		58'·0", 61'·0", 64'·0", 66'·0", 68'·0", 73'·0", 75'·0", 80'·0"	80'·0"	-16·5		Stiff grey, brown & red mottled fissured clay WRB Cont'd.

REMARKS. Water at 15'·0" appeared to have percolated behind the casing from the sand & gravel above. Water at 52'·6' appeared to enter from the soft clay at that level. This was later sealed off by B.H. Casing.

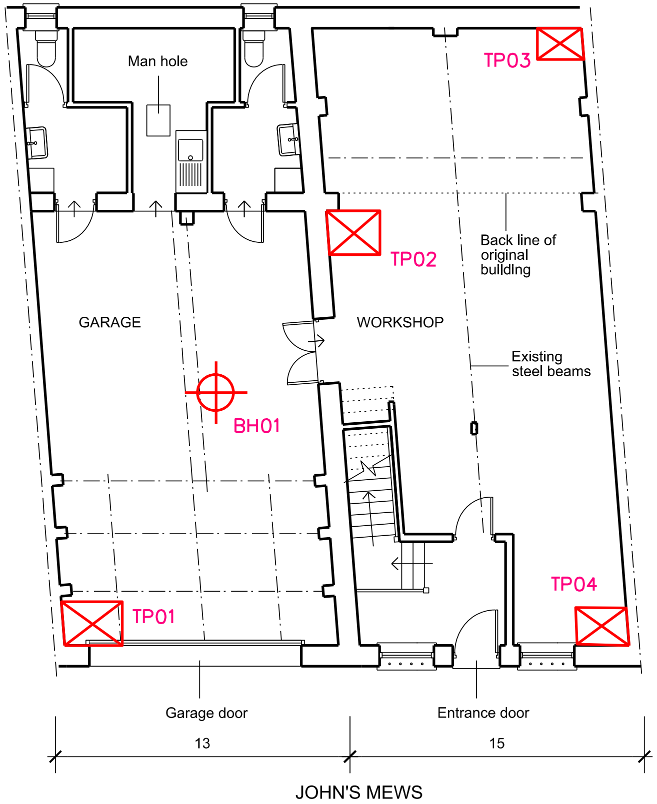
SAMPLES: ▮ Undisturbed ● Disturbed

SCALE: 1/8" to 1'·0"

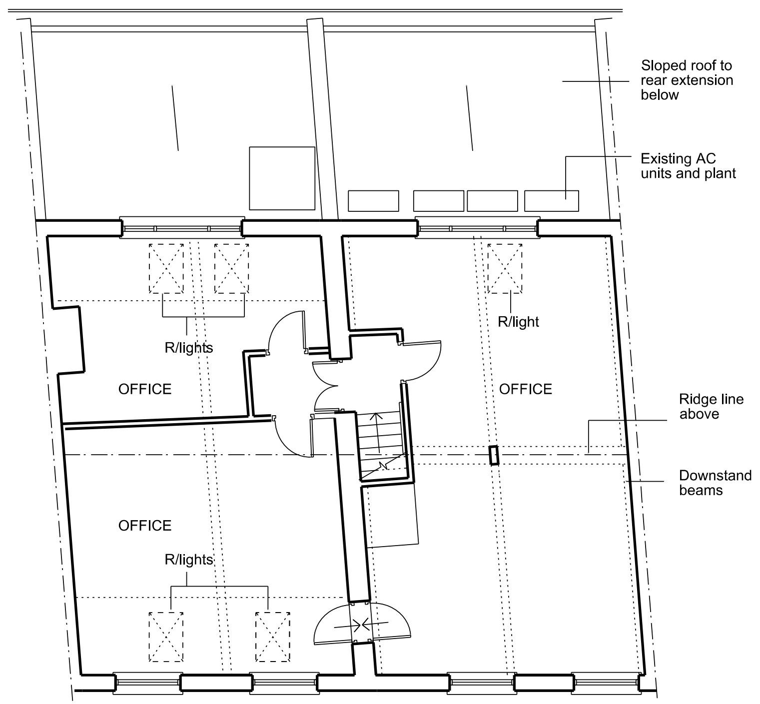
SOILS No. S/380

DRWG. No. S/R/674

GEORGE WIMPEY & CO. LTD., CENTRAL LABORATORY, SOUTHALL. 20



EXISTING GROUND FLOOR PLAN



EXISTING FIRST FLOOR PLAN

TRIAL PITS AND BOREHOLE LOCATIONS ADDED

SCALE
0 (metres) 5

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

ALL DIMENSIONS MUST BE CHECKED ON SITE AND ANY DISCREPANCIES VERIFIED WITH THE ARCHITECT.

CLIENT
WANDSWORTH SAND + STONE LTD.

JOB TITLE
13/15 JOHN'S MEWS
LONDON
WC1N 2PA

DRAWING TITLE
EXISTING GROUND AND 1ST FLOORS

SCALE **1:100@A3**
DATE **26.07.13**

FT ARCHITECTS LTD

Hamilton House
Mabledon Place
Bloomsbury
WC1H 9BB

020 7953 0388

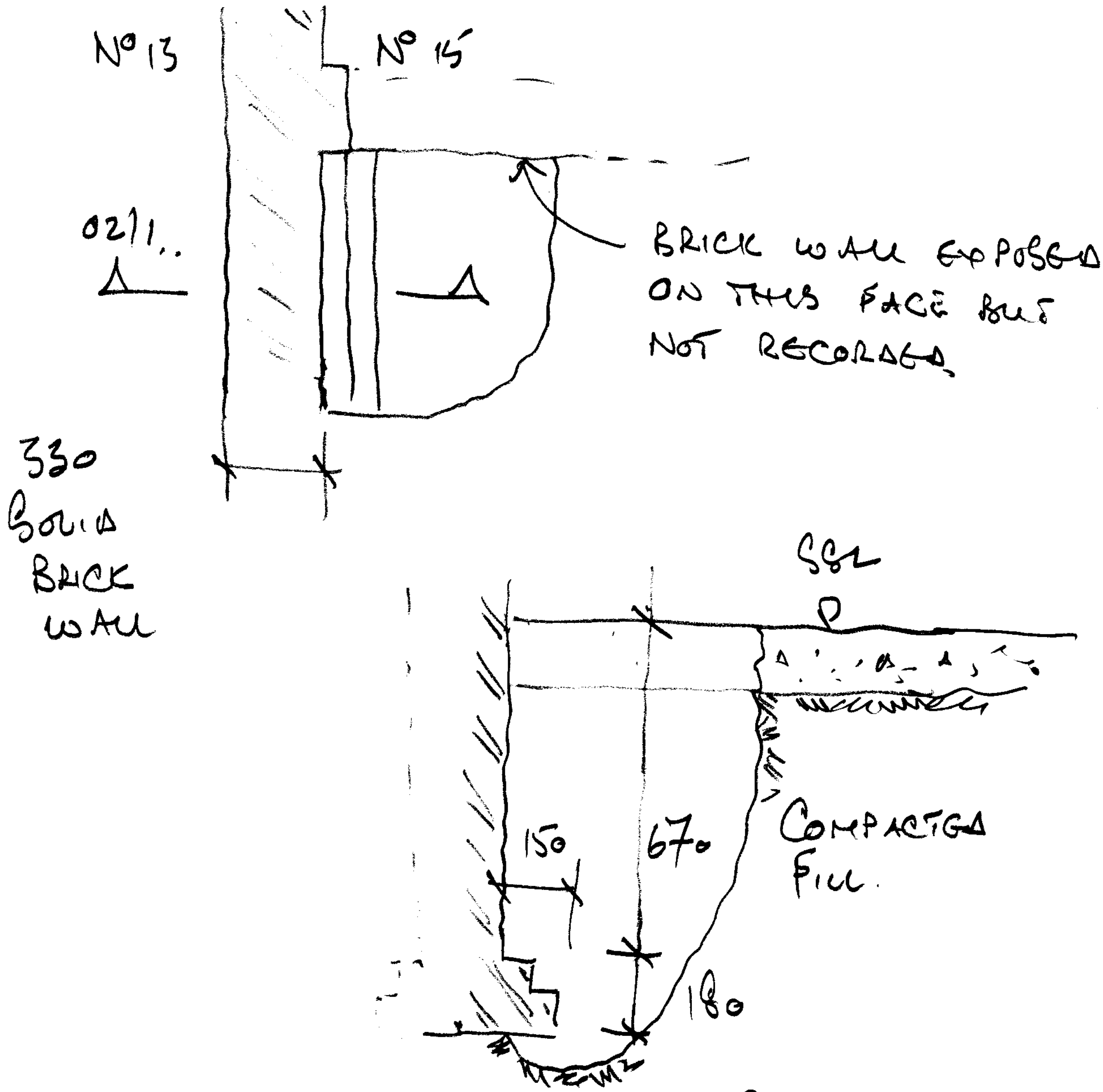
www.ftarchitects.co.uk

DRAWING No. **200_32_01**
REVISION

13/15 John's Mews

Trial Pit Logs - 26.06.2014.

TP02

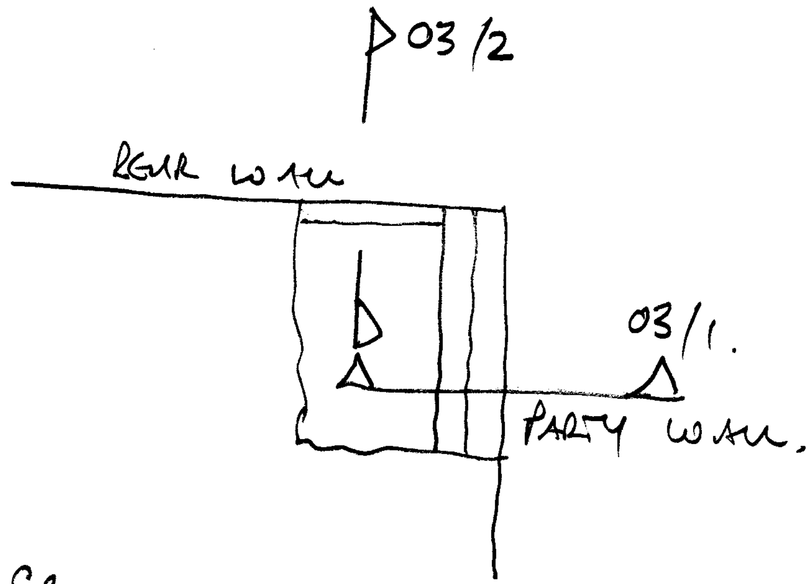


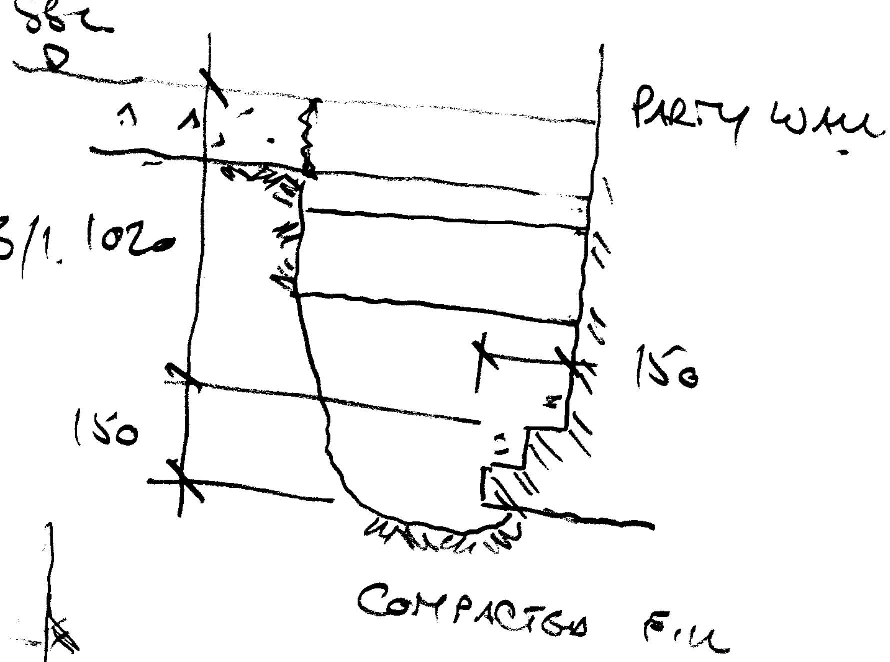
Section 02/1.

13/15 John's Mews

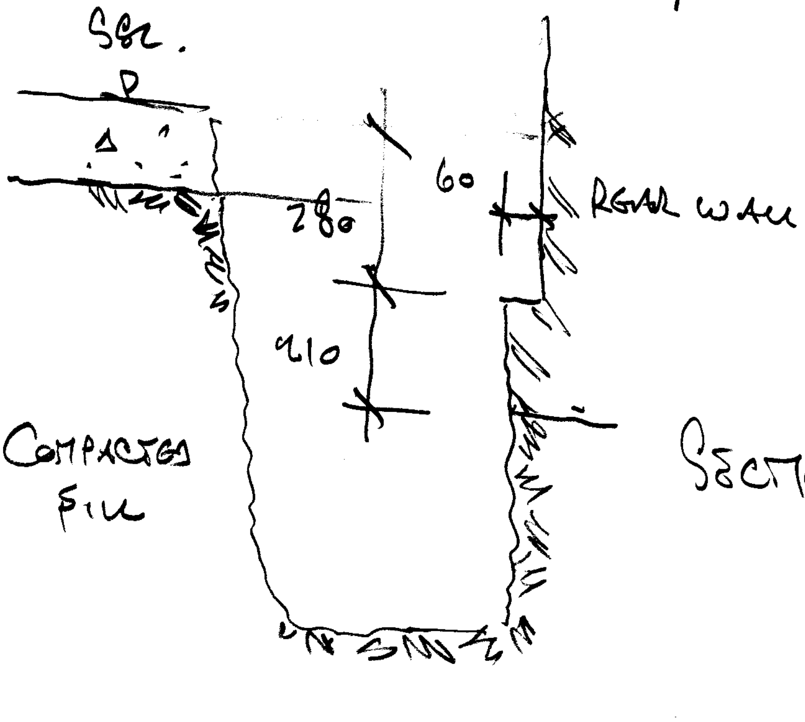
Trial Pit Logs - 26.06.2014.

TP03





Section 03/1. 1020



Section 03/2

Site	11, John Street	Borehole No:	WS1
Location	London WC1N 2EB		
Client:	Mr Ian Rosenfeld & Ms Mariana Segato	Sheet	1 of 2
Engineer:	ESI Environment Specialists	Report No:	9393/AW

Comments	Samples Type	Samples Depth[m]	Field Test	Strata Depth[m]	Strata Level[mSD]	Strata Description
				0.13	-3.34	York stone and reinforced concrete to 0.13m depth over MADE GROUND : Soft dark grey silty clay with occasional gravel size fragments of brick, tile and old clay pipe.
Borehole constructed: 14 Jun 13	D	0.30				
BH dia: 100mm reducing to 70mm	D	0.50				
	D	0.80				
						...becoming black with slight organic odour below 1.0m depth.
	D	1.30				
	D	1.55				
	D	1.80				
	D	2.70				
						...piece of metal at 2.8m depth
				3.00	-6.21	Soft black peaty CLAY and brown clayey SILT.
Groundwater first encountered at about 3.5m depth	D	3.50				
				3.90	-7.11	Firm to stiff brown and blue grey fissured CLAY.
	D	4.00				
	D	4.50				
				5.00	-8.21	Stiff dark grey occasionally blue grey fissured CLAY.
	D	5.20				
Groundwater standing at 2.25m on completion				5.50	-8.71	End of Borehole at 5.50m

Constructed using tracked rig with cased percussive sampling system [plastic liner]

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 :- WS1 constructed in front lightwell at basement level.
Standpipe installed on completion - details on separate sheet.

Borehole No: WS1

[* = extrapolated SPT 'N' value]

Soil Consultants

Site:	11, John Street	Borehole No:	WS2
Location:	London WC1N 2EB		
Client:	Mr Ian Rosenfeld & Ms Mariana Segato	Sheet	1 of 2
Engineer:	ESI Environment Specialists	Report No:	9393/AW

Comments	Samples Type	Samples Depth[m]	Field Test	Strata Depth[m]	Strata Level[mSD]	Strata Description
Borehole constructed: 14 Jun 13 BH dia: 100mm reducing to 70mm				0.10	-0.98	Carpet over timber over concrete to 0.1m depth over MADE GROUND: Brown sand and gravel size fragments of brick, flint, mortar, ceramic tile, occasional clinker and charcoal.
	D	0.80				
	D	1.50				...becoming dark brown and slightly clayey below 1.5m depth
	D	3.00				...more mortar and brick below 3.0m depth
				3.30	-4.18	MADE GROUND: Soft black silty organic clay with gravel size fragments of brick, flint and mortar.
	D	3.50				
						...becoming grey and moist below 4.0m depth
						...clay pipe fragment at 4.4m depth
	D	5.50		5.50	-6.38	Soft to firm grey clayey SILT.
Groundwater first encountered at about 6m depth	D	6.00				
	D	6.50		6.50	-7.38	Firm brown CLAY with some flint gravel.
				6.90	-7.78	Firm to stiff brown and blue grey fissured CLAY.
Groundwater standing at 5.70m on completion				7.00	-7.88	End of borehole at 7.00m

Constructed using tracked rig with cased percussive sampling system [plastic liner]

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 :- WS2 constructed in ground floor area.
Standpipe installed on completion - details on separate sheet.

Borehole No: WS2

[* = extrapolated SPT 'N' value]

Soil Consultants

SCL.theme.borehole_1_3_17

Chelmer Consultancy Services
Unit 15, East Hanningfield Industrial Estate, Old Church Road
East Hanningfield, Essex CM3 8AB
Telephone: 01245 400 930 **Fax:** 01245 400 933
Email: info@siteinvestigations.co.uk **Website**: www.siteinvestigations.co.uk

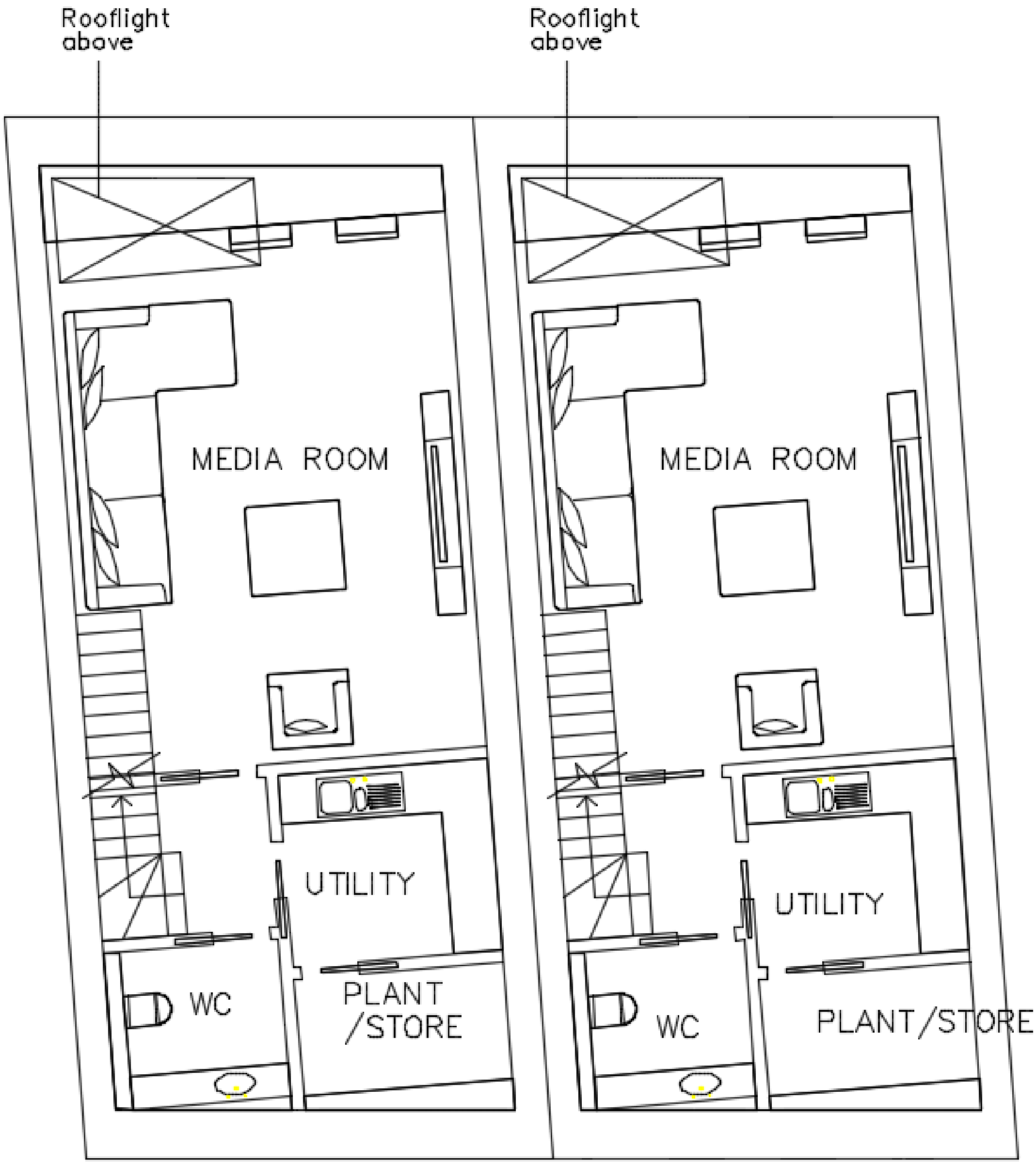


Figure C1. Layout of the basement

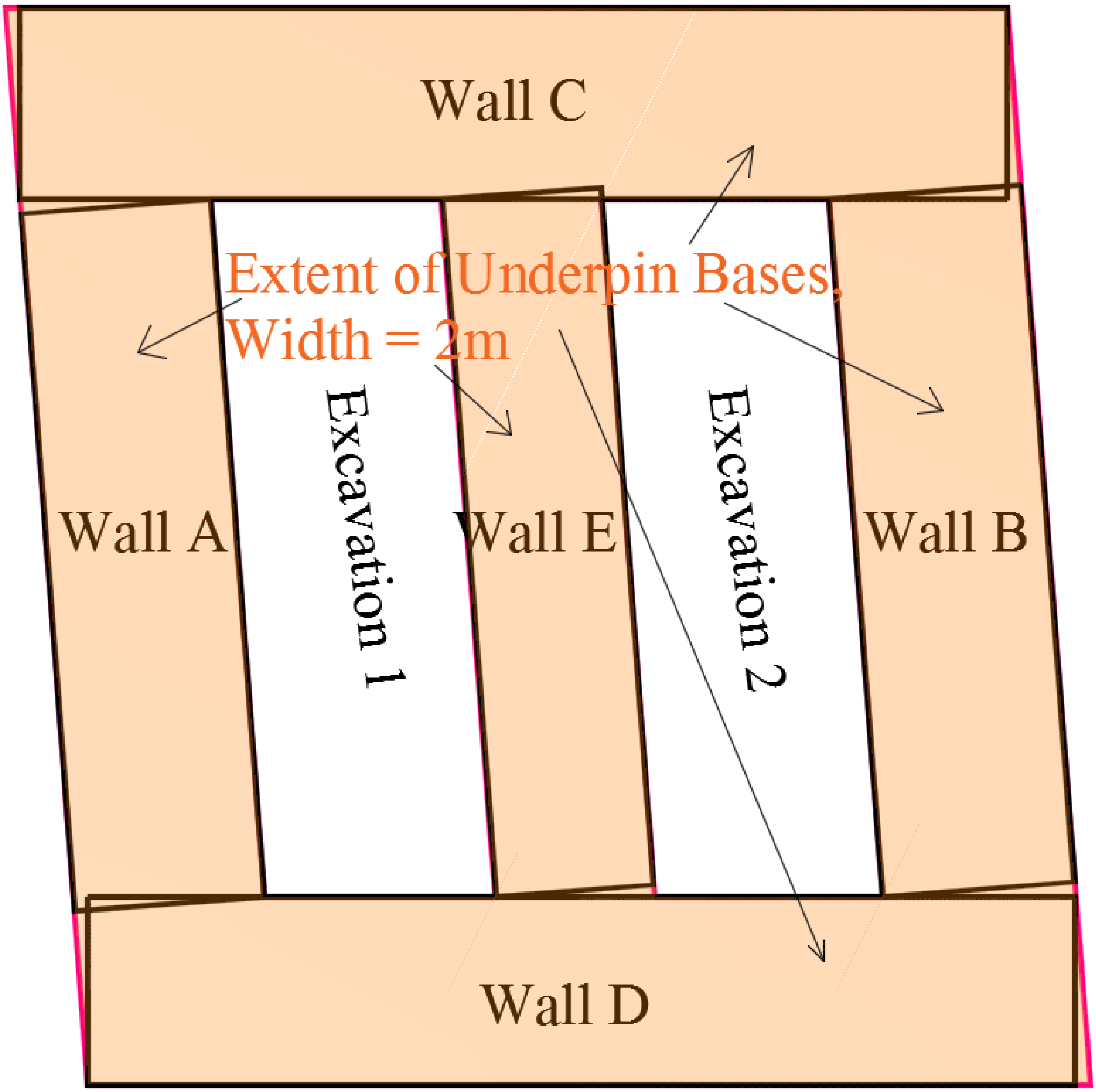


Figure C2. Layout of the proposed underpins

Chelmer Consultancy Services
Unit 15, East Hanningfield Industrial Estate, Old Church Road
East Hanningfield, Essex CM3 8AB
Telephone: 01245 400 930 **Fax:** 01245 400 933
Email: info@siteinvestigations.co.uk **Website**: www.siteinvestigations.co.uk

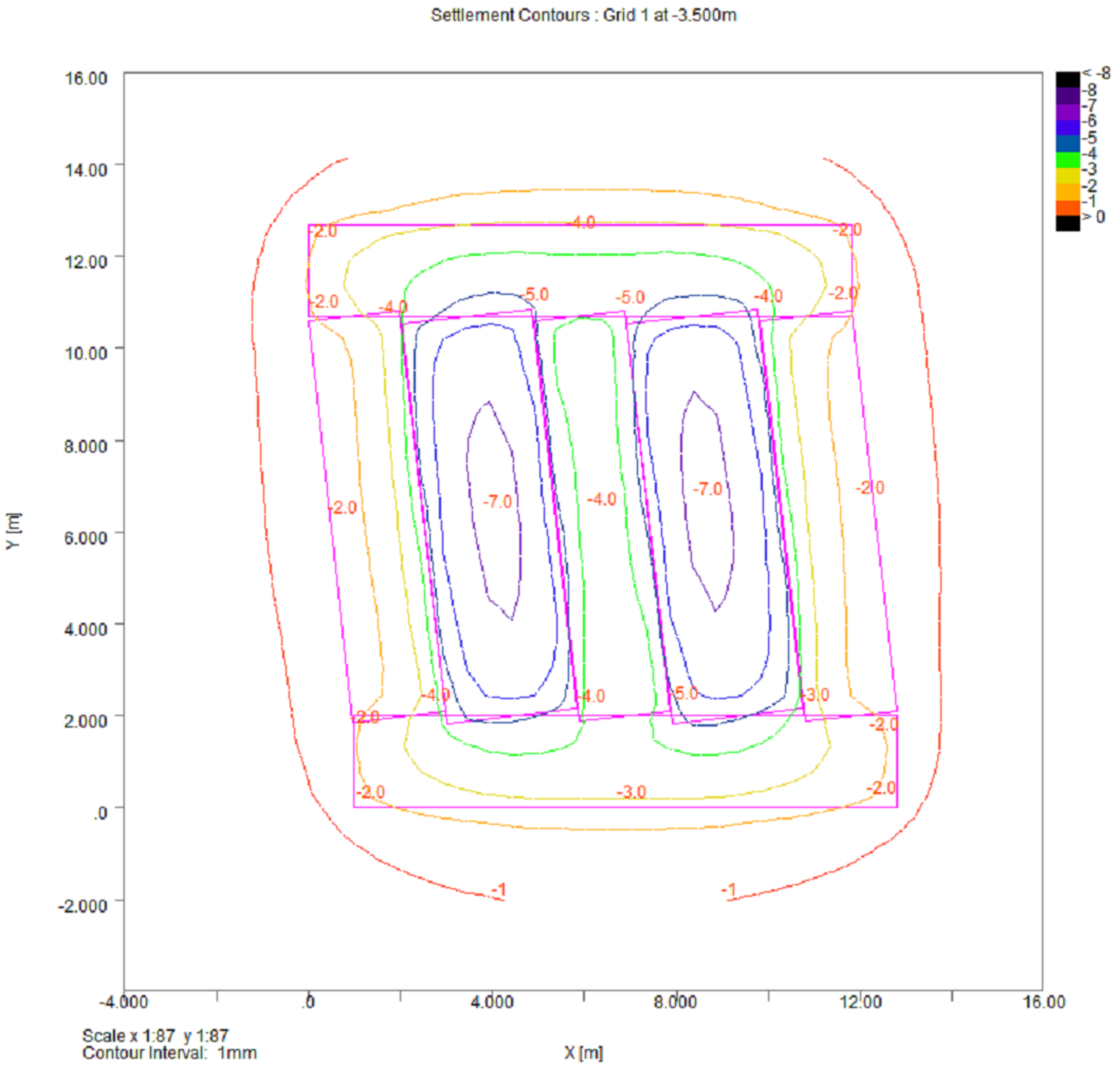


Figure C3. Short term (Stage 2) heave assessment contour

Chelmer Consultancy Services
Unit 15, East Hanningfield Industrial Estate, Old Church Road
East Hanningfield, Essex CM3 8AB
Telephone: 01245 400 930 **Fax:** 01245 400 933
Email: info@siteinvestigations.co.uk **Website**: www.siteinvestigations.co.uk

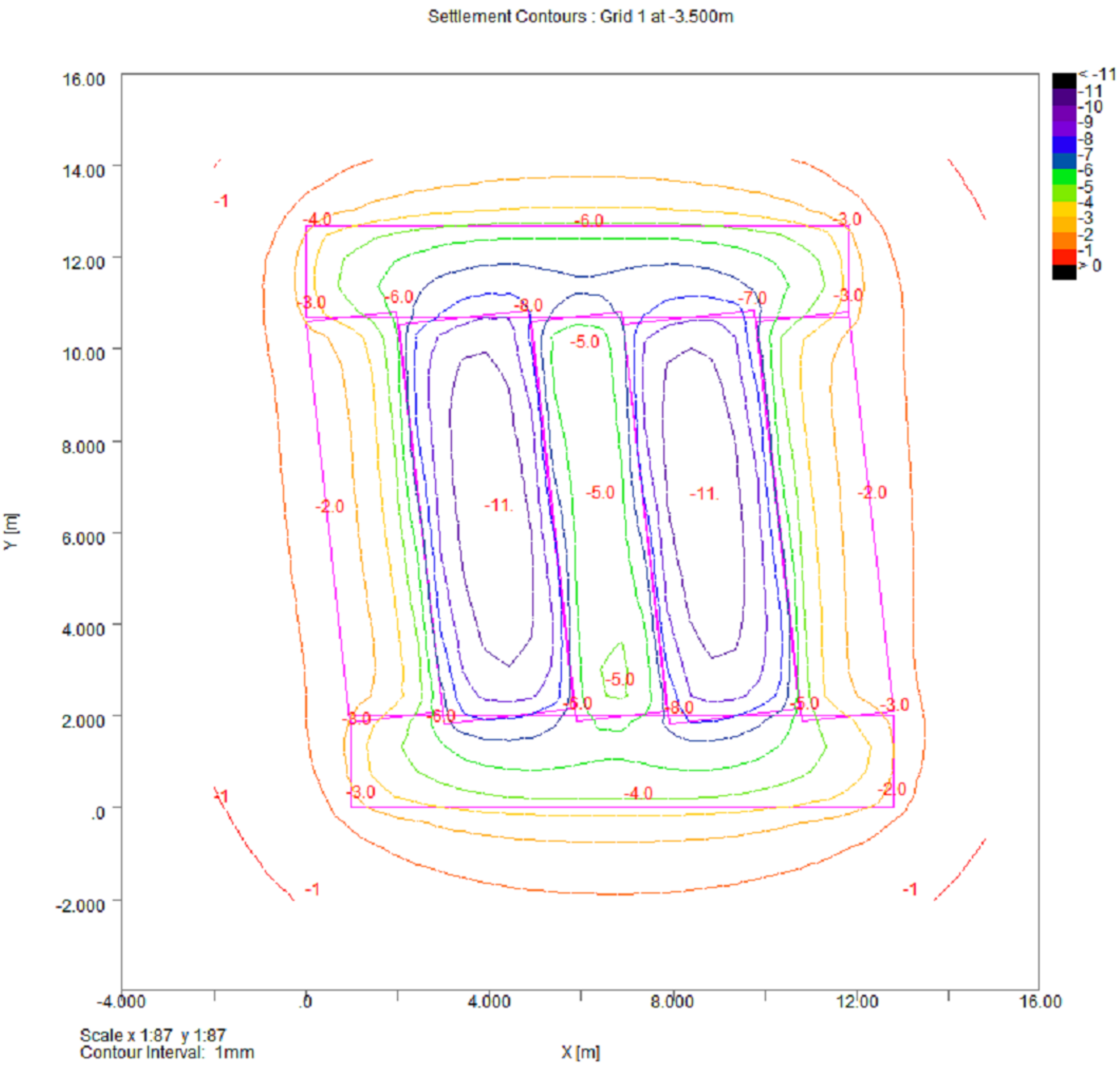
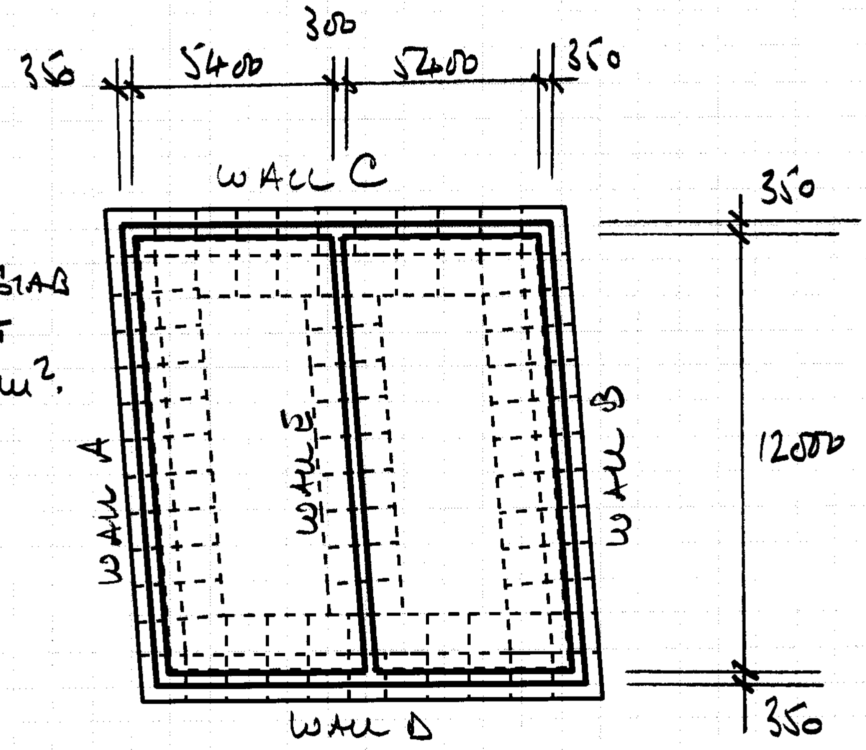


Figure C4. Long term (Stage 4) heave assessment contour

PLAN ON BASEMENT SHOWING LOADBEARING WALLS



LOADING SUMMARY - ALL VALUES ARE UNFACTORED

WALL REF	LOADING / METRE RUN.
A	101 D + 15 L (MIN.) 124 D + 24 L (MAX.) *
B	101 D + 15 L (MIN) 124 D + 24 L (MAX.) *
C.	50 D + 5 L
D	65 D + 5 L
E	140 D + 30 L.

* MAXIMUM VALUES ASSUME SIMILAR FLOOR LOADS APPLIED FROM ADJACENT PROPERTIES AT 1ST, 2ND + ROOF LEVELS. VALUES INCLUDE BASEMENT R.C. WALLS BUT NOT SLAB.

Gabriel GeoConsulting Ltd

Highfield House, Rolvenden Road,
Benenden, TN17 4EH

GroundSure Reference:	HMD-1661663
Your Reference:	GGC15321
Report Date	12 Sep 2014
Report Delivery Method:	Email - pdf

GroundSure Geoinsight

Address: 13-15,JOHNS MEWS,LONDON, WC1N 2PA

Dear Sir/ Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure GeoInsight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above GroundSure reference number.

Yours faithfully,

Managing Director
Groundsure Limited

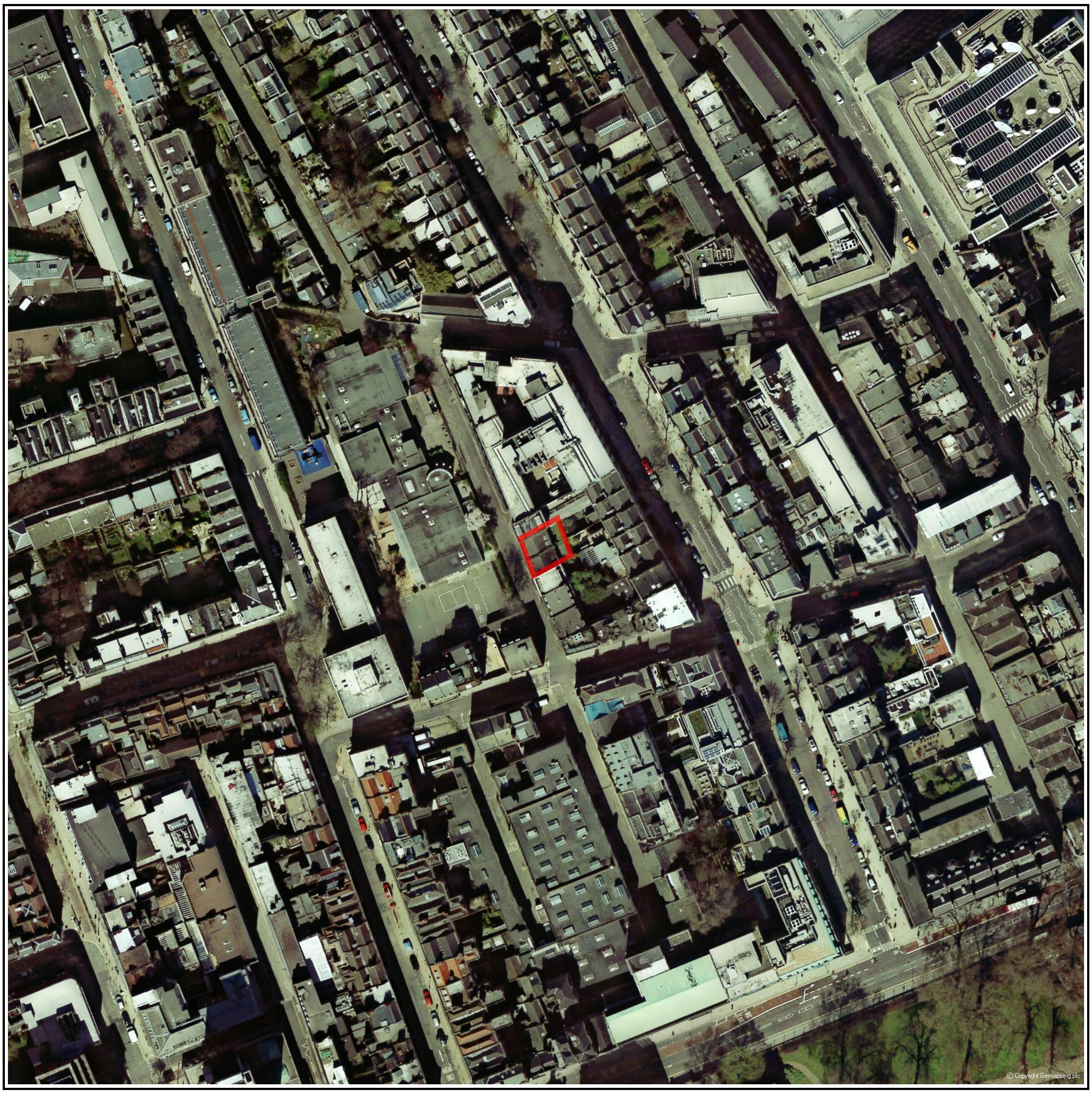
Enc.
GroundSure GeoInsight

GroundSure GeoInsight

Address:	13-15,JOHNS MEWS,LONDON, WC1N 2PA
Date:	12 Sep 2014
Reference:	HMD-1661663
Client:	Gabriel GeoConsulting Ltd

NW N NE

W



E

SW S SE

Aerial Photograph Capture date:	20-Apr-2013
Grid Reference:	530793,182058
Site Size:	0.01ha

Contents Page

Overview of Findings

The GroundSure GeoInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1:Geology		
1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	No
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

Section 2:Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	0	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	8	15
2.3 Current Ground Workings	0	0	0	0	0

Section 3:Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0