

Figure 5: Historical Map Extract

Map Date: 1951

Scale: Not to scale

RPS 35 New Bridge Street

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200-7280-3200300 www.rpsgroup.com

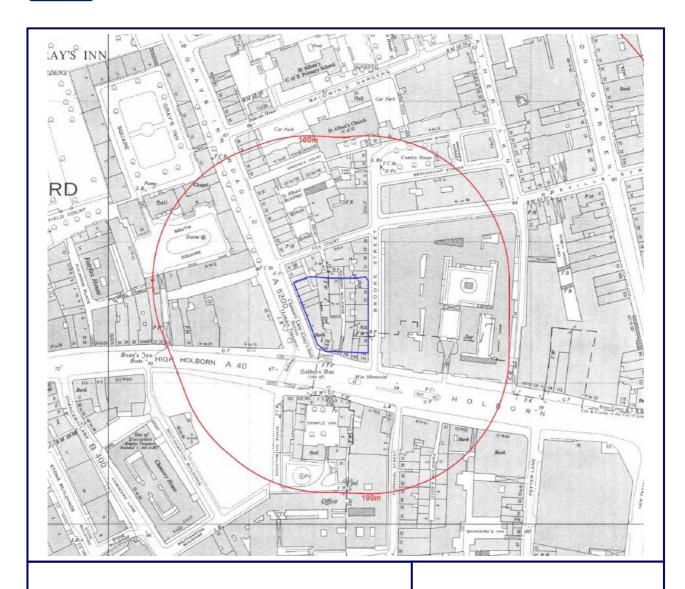


Figure 6: Historical Map Extract

Map Date: 1967

Scale: Not to scale

RPS 35 New Bridge Street London EC4V 6BW

20-7280-320030-7280-3200

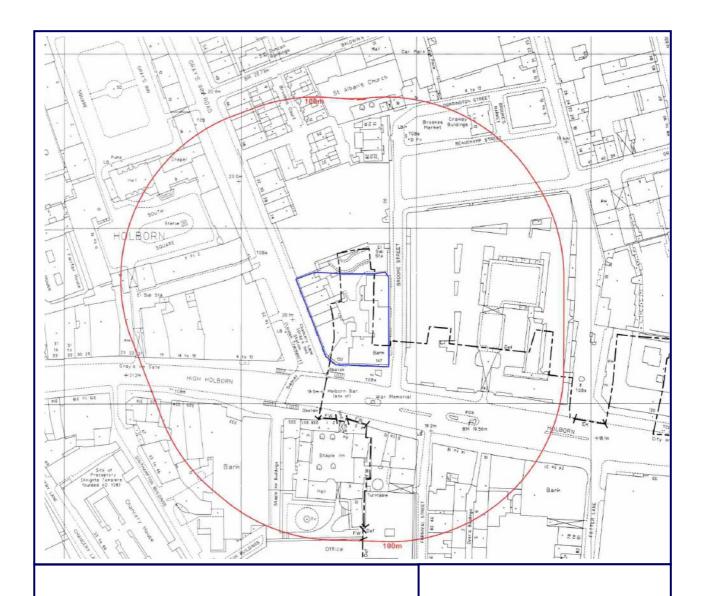


Figure 7: Historical Map Extract

Map Date: 1991

Scale: Not to scale

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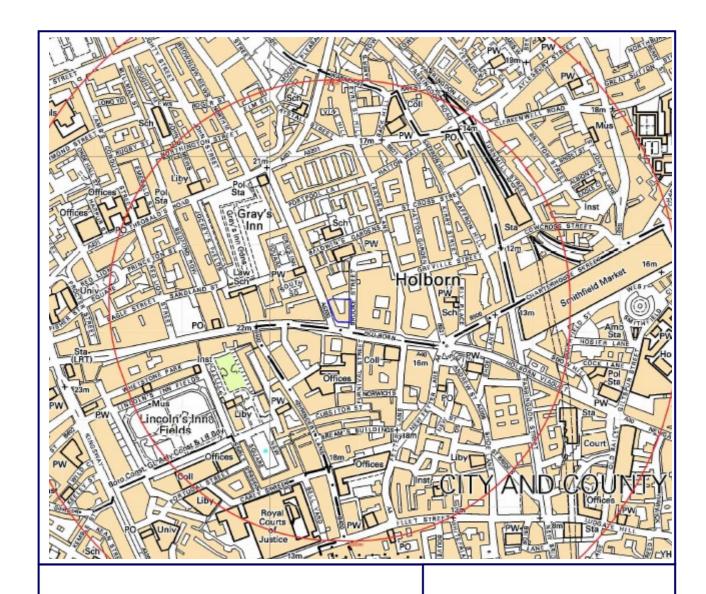


Figure 8: Historical Map Extract

Map Date: 2002

Scale: Not to scale

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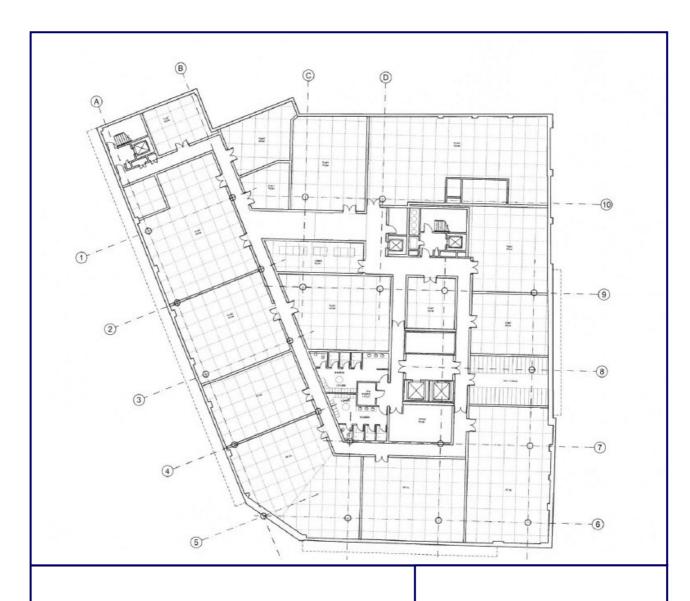
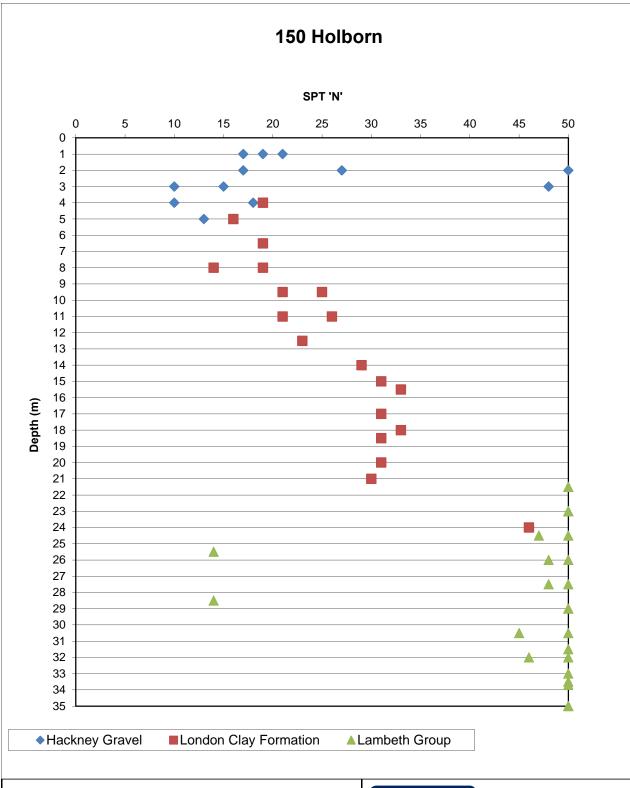


Figure 9: Proposed Development Plan

Scale: Not to scale

RPS 35 New Bridge Street London EC4V 6BW

20-7280-320030-7280-3200



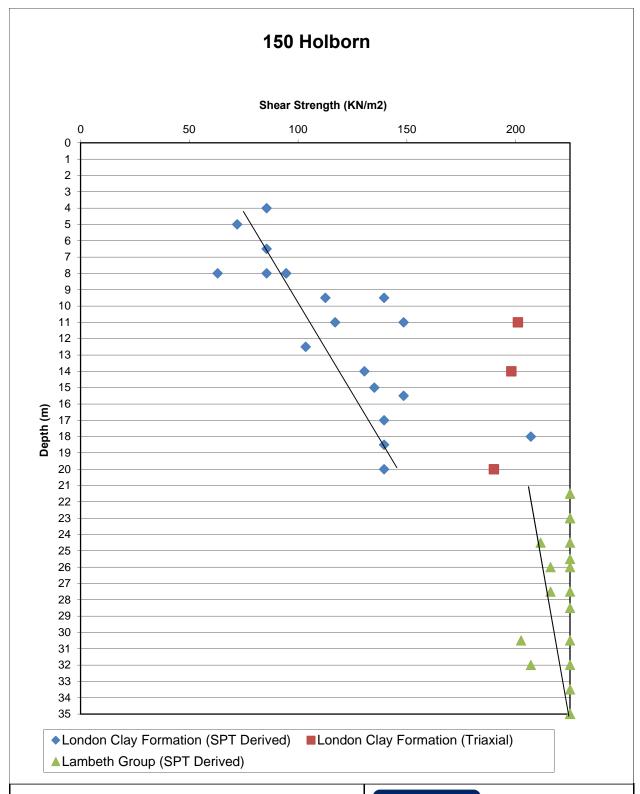
Project: 150 Holborn
Project no: HLEI 39025
Date: May-16

Figure 10: SPT 'N' vs. Depth



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Project: 150 Holborn
Project no: HLEI 39025
Date: May-16

Figure 11: Shear strength vs. Depth



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APPENDIX A

General Notes



RPS HEALTH, SAFETY & ENVIRONMENT

Phase 1 - Environmental Risk Assessment / Desk Study Environmental Review

General Notes

- 1. A "desk study" means that no site visits have been carried out as any part thereof, unless otherwise specified.
- 2. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the Client.
- 3. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.
- 4. The accuracy of maps cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.
- 5. No sampling or analysis has been undertaken in relation to this desk study.
- 6. Any borehole data from British Geological Survey sources is included on the basis that: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".
- 7. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS for inaccuracies in the data supplied by any other party.
- 8. This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission.
- 9. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the Client deemed to be granted on payment in full to the RPS Company by the Client of the outstanding amounts.
- 10. The report is provided for sole use by the Client and is confidential to them, their professional advisors, no responsibility whatsoever for the contents of the report will be accepted to any person other than the Client. [Unless otherwise agreed]
- 11. These terms apply in addition to the RPS HSED "Standard Terms & Conditions" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms & Conditions the said Standard Terms & Conditions shall prevail.) In the absence of such a written contract the Standard Terms & Conditions will apply.



RPS HEALTH, SAFETY & ENVIRONMENT

Phase 2 - Site Investigations

General Notes

- 1. The assessments made in this report are based on the ground conditions as revealed by intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination ("hot spots") and there can be no certainty that any or all such areas have been located and/or sampled.
- 2. There may be special conditions appertaining to the site which have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.
- 3. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS Companies for inaccuracies within the data supplied by other parties.
- 4. Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.
- 5. Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.
- 6. This report is prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or part after its original submission.
- 7. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the client deemed to be granted on payment in full to the RPS Company by the client of the outstanding amounts.
- 8. The report is provided for sole use by the Client and is confidential to them and their professional advisors. No responsibility whatsoever for the contents of the report will be accepted to any person other than the Client.
- 9. These terms apply in addition to the RPS Group "Standard Terms of Business" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms of Business the said Standard Terms of Business shall prevail). In the absence of such a written contract the Standard Terms of Business will apply.



APPENDIX B

Part 2A (The Contaminated Land Regime)



Contaminated Land Definition

Under Section 57 of the Environmental Act 1995, Part 2A was inserted into the Environmental Protection Act 1990 to include provisions for the management of contaminated land.

Subsequent regulations were first implemented in England in April 2000, Scotland in July 2000 and Wales in July 2001¹, providing a definition of 'contaminated land' and setting out the nature of liabilities that can be incurred by owners of contaminated land and groundwater.

According to the Act, contaminated land is defined as 'any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land that:

- a) significant harm is being caused or there is a significant possibility of such harm being caused; or
- b) *significant pollution* of controlled waters² is being caused or there is a significant possibility of such pollution being caused³,

The guidance on determining whether a particular possibility is significant is based on the principles of risk assessment and in particular on considerations of the magnitude or consequences of the different types of significant harm caused. The term 'possibility of significant harm being caused' should be taken, as referring to a measure of the probability, or frequency, of the occurrence of circumstances that could lead to significant harm being caused.

The following situations are defined where harm is to be regarded as significant:

- i. Chronic or acute toxic effect, serious injury or death to humans
- ii. Irreversible or other adverse harm to the ecological system
- iii. Substantial damage to, or failure of, buildings
- iv. Disease, other physical damage or death of livestock or crops
- v. The pollution of controlled waters⁴.

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¹ In England by The Contaminated Land (England) Regulations 2000, updated by The Contaminated Land (England) (Amendment) Regulations 2012; in Scotland by The Contaminated Land (Scotland) Regulations 2000, updated by the Contaminated Land (Scotland) Regulations 2005; and in Wales by The Contaminated Land (Wales) Regulations 2001, updated by the Contaminated Land (Wales) Regulations 2006.

² In Scotland the term "controlled water" has been updated to "water environment" under the Contaminated Land (Scotland) Regulations 2005 in line with the Water Environment and Water Services (Scotland) Act 2003.

³ The definition was amended in 2012 by implementation of the Water Act 2003.

⁴ Groundwater in this context does not include waters within underground strata but above the saturated zone.



With regard to radioactivity, contaminated land is defined as 'any land which appears to be in such a condition, by reason of substances in, on or under the land that harm is being caused, or there is a significant possibility of such harm being caused⁵.

The Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected with the hazard via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks.

The Risk Assessment

By considering where a viable pathway exists which connects a source with a receptor, this assessment will identify where pollutant linkages may exist. A pollutant linkage is the term used by the DEFRA in their standard procedure on risk assessment. If there is no pollutant linkage, then there is no risk. Therefore, only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. Risk should be based on a consideration of both:

- The likelihood of an event (probability) takes into account both the presence of the hazard and receptor and the integrity of the pathway.
- The severity of the potential consequence takes into account both the potential severity of the hazard and the sensitivity of the receptor.

For further information please see the Contaminated Land section on the DEFRA website (www.defra.gov.uk).

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⁵ The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 and Contaminated Land (Wales) Regulations 2006.



APPENDIX C

Exploratory Hole Logs

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Borehole No. **BH1**

Sheet 1 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 01/03/2016 - 04/03/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Location: Holborn Cut Down Cable Precussive Casing Depth (m) Scale: Northing: Ground Level Client: CNM 1:25 15.40 Logged By:

Client:	CNM		(mA	ind Level DD):	15.40	Log	ged By:	SD 1:25	
Well Wat		nples & In	Situ Testing Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Sca
	Deput (III)	Туре	resuits	0.00		15.40		Concrete (CONCRETE)	
				0.38	(0.42)	15.02		Dark brown gravelly fine to medium SAND. Gravel is fine to medium, angular to subrounded flint. (HACKNEY GRAVEL)	
	1.00 1.00 - 1.50	SPT(C) B	N=21 (2,2/3,5,6,7)	0.80	(1.00)	14.60		Slightly orangey brown very sandy medium to coarse angular to subrounded flint GRAVEL. Sand is fine to coarse. Contains cobbles of flint. (HACKNEY GRAVEL)	1
	1.60 2.00 - 2.50	ES B		1.80		13.60		Orange brown very gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded flint. (HACKNEY GRAVEL)	
	2.45	SPT(C)	N=27 (3,5/7,8,7,5)		(1.90)				
	3.00 3.00 - 3.50	SPT(C)	N=10 (2,3/5,2,1,2)						
	3.80	ES SPT(S)	N=19 (1,4/4,4,5,6)	3.70	(0.20)	11.70 11.50	X X	Reddish brown mottled black slightly silty CLAY. Contains occasional pockets of red fine sand. (LONDON CLAY FORMATION) Stiff dark grey very slightly silty CLAY. (LONDON CLAY FORMATION) Contains occasional pockets of fine red sand.	
	4.50	D					× × × × × × × × × × × × × × × × × × ×		
							× -		

	Groundwater		Chiselling				
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)		



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Borehole No. **BH1**

Sheet 2 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 01/03/2016 - 04/03/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Location: Holborn Cut Down Cable Precussive Casing Depth (m) Scale: Northing: Ground Level Client: CNM 15.40 1:25 Logged By: SD

Client:		CNM		(mA	DD):	15.40	Logg	ged By:	SD			1:25	
Well	Water Strike(s)	Sam Depth (m)	ples & In S	Situ Testing Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend		Stra	atum Description		Scale
		5.50	D					X					-
		6.50	SPT(S)	N=19 (1,3/3,5,5,6)				X					6 -
		8.00 - 8.45	U										8 -
													9 -
		9.50 9.50 - 9.95 10.00	SPT(S) D	N=25 (2,4/5,6,7,7)				X X X _ X X X X _ X		Con	tinued on next sheet		10 -

		Groundwater		Chiselling					
D	epth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m) Base Depth				



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Borehole No. **BH1**

Sheet 3 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 01/03/2016 - 04/03/2016 Hole Type: Easting: Project No: HLEI39025 Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Location: Cut Down Cable Precussive Casing Depth (m) Scale: Holborn Northing: Ground Level (mAOD): Client: CNM 15.40 Logged By: SD 1:25

iciit.	CIVIVI		(m/	AOD):	10.40	Logi	ged by.	<u> </u>			1.23	
Water Value	Samp	les & In S	Situ Testing	Depth	Thickness	Level						
Water Strike(s)	Depth (m)	Туре	Results	Depth (mbGL)	(m)	Level (mAOD)	Legend		Stra	atum Description		Scale
	Depth (m)	Type	Results	(mbGL)	(m)	(mAOD)	Legend		SILE	ашн Безсприон		11 ·
	12.50	SPT(S)	N=23 (2,3/5,5,6,7		(17.10)		X					13
14.	00 - 14.45	U					X					14
	14.50	D					× x × x × x × x × x		Cont	tinued on next sheet		15

	Groundwater		Chiselling				
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Base Depth (m)			



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Project Name:
Project No:
Location:
O

Borehole No. **BH1**

Sheet 4 of 7

150 Holborn Co-ordinates: Date(s): 01/03/2016 - 04/03/2016 Hole Type: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Cut Down Cable Precussive Casing Depth (m) Scale: Holborn Northing: Ground Level (mAOD): 15.40 CNM 1:25 Client: Logged By: SD

Cilciii.		CIVIVI		(mAO	D):	15.40		уса Бу.	00			1.23	
Well	Water Strike(s)			Situ Testing	Depth (mbGL)	Thickness	Level (mAOD)	Legend		Stra	tum Description		Scale
·····	Strike(s)	Depth (m)	Туре	Results	(mbGL)	(m)	(mAOD)						
		15.50	SPT(S)	N=33 (3,5/8,8,8,9)									- 16 -
		17.00 - 17.45	U										17 —
		18.50	SPT(S)	N=31 (4,6/7,7,8,9)									18 -
		20.00 - 20.45	U					X		Cont	inued on pext sheet		19 -
		_0.00 20.10	•							Cont	inued on next sheet		-0
									L		Ole in a III a a		

Remarks	
(1) Groundwater encountered at 1.4m bgl.	

	Groundwater		Chiselling					
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)			



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Borehole No. **BH1**

Sheet 5 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 01/03/2016 - 04/03/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Location: Cut Down Cable Precussive Casing Depth (m) Scale: Holborn Northing: Ground Level Client: CNM 15.40 1:25 Logged By: SD

Client:		CNM		(m	AOD):	15.40	Log	ged By:	SD			1:25	
Well	Water Strike(s)	Sam Depth (m)	ples & In S	Situ Testing Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend			rum Description		Scale
	Water Strike(s)	Sam		Situ Testing	Depth (mbGL) 21.00				Grey n	Stratins coarse angular of the strategy of the	gravel of claystone.		21 —
		23.50	D										24 -
		24.50 25.00	SPT(S)	N=60 (5,10/13,14,16,17				X		Contir	nued on next sheet		25 —

	Groundwater		Chiselling					
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)			



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Borehole No. **BH1**

Sheet 6 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 01/03/2016 - 04/03/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Location: Casing Depth (m) Scale: Holborn Northing: Cut Down Cable Precussive Ground Level Client: CNM 15.40 1:25 Logged By: SD

Client:		CNM		(mAOD):	15.40	Logg	ged By:	รบ			1:25	
Well	Water Strike(s)	Sam Depth (m)	Type	Situ Testing Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend		Stra	tum Description		Scale
		26.00 26.50	SPT(S)	48 (6,10/48 fo 225mm)		(7.10)							26 -
		27.50	SPT(S)	50 (8,9/50 for 225mm)				X					28 -
		29.00	SPT(S)	53 (8,10/53 fo 150mm)	28.80	(1.70)	-13.40		Brown gre (LAMBET		ey silty fine SAND.		29 -
										Cont			
Remarks							G	Groundwate	er	1	Chisellina		

(1) Groundwater encountered at 1.4m bgl.



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Borehole No. **BH1**

Sheet 7 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 01/03/2016 - 04/03/2016 Hole Type: Easting: Project No: HLEI39025 Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Location: Cut Down Cable Precussive Casing Depth (m) Scale: Holborn Northing: Ground Level (mAOD): Client: CNM Logged By: SD 1:25 15.40

Ollerit.		CINIVI		(mAO	D):	15.40	Logi	ged by.	00			1.20	
Well	Water Strike(s)			Situ Testing	Depth (mbGL)	Thickness	Level (mAOD)	Legend		Strat	tum Description		Scale
- 	Oure(s)	Depth (m)	Туре	Results	(MDGL)	(m)	(MAOD)	;			r		<u> </u>
		30.50	SPT(S)	45 (5,7/45 for 225mm)	30.50		-15.10		Blueish is fine. (LAMB	h grey mottled red BETH GROUP)	and yellow silty sar	ndy CLAY. Sand	31 -
		32.00	SPT(S)	N=46 (3,4/5,8,14,19)									32 -
						(4.50)							33 -
		34.00	D					X					34 -
								X———X X———X					
		35.00	SPT(S)	50 (7,11/50 for 170mm)				X——x X———x X———x		End of	Borehole at 35.00m		35 -

	Groundwater		Chiselling					
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)			



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Borehole No. **BH2**

Sheet 1 of 8

Project Name: 150 Holborn Co-ordinates: Date(s): 09/03/2016 - 14/03/2016 Hole Type: Easting: Project No: HLEI39025 Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Casing Depth (m) Scale: Location: Holborn Northing: Ground Level (mAOD): Client: CNM 1:25 15.40 LW Logged By:

Name	CIII.		CIVIVI		(mA	OD):	13.40	Log	geu by.	1.25	
100				1				Level	Legend	Stratum Description	Sca
1.00	100	שמותפ(צ)	Depth (m)	Туре	Results	1 '	(m))	·	<u> </u>
14.95 14.95 2.00 2.00 - 2.50 2.50 D N=17 (2.23,4,5,5) 2.00 13.40 2.50 D 0.300 - 3.50 B E E E E E E E E E										(MADE GROUND)	Λ
1.00	145						(0.44)			Concrete.	
1.00							(0.44)			(CONCRETE)	
1.00											
2.00 SPT(C) B SPT(C)						0.45		14.95	× · · · × ·		1
1.00 1.00 1.00 SPT(C) B N=19 (2,3/4,4,5,6)									× × ×		
1.00									× × , ×		
1.00									×××		
1.00									×××		
2.00 SPT(C) B N=17 (2.2/3,4.5.5) 2.00 13.40 Orange brown very sandy fine to coarse subrounded to angular flint GRAVEL. Sand is medium to coarse. Contains subrounded to rounded cobbles of flint. (HACKNEY GRAVEL) 2.50 D N=15 (2.2/3,3.4.5) 3.00 12.40 Orange brown gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded flint. (HACKNEY GRAVEL) 4.00 SPT(C) N=10 (2.2/1,2.2.5) 4.30 11.10 Reddish brown mottled grey brown slightly silty CLAY. (LONDON CLAY FORMATION)	. • .			ES					×		1
2.00 SPT(C) B N=17 (2,2/3,4,5,5) 2.00 13.40 Orange brown very sandy fine to coarse subrounded to angular film GRAVEL. Sand is medium to coarse. Contains subrounded cobbles of flint. 2.50 D (1.00) 3.00 SPT(C) B Orange brown gravely fine to coarse SAND. Gravel is fine to medium subangular to subrounded fint. 4.50 D (1.30) 4.30 Table 1.10 Reddish brown mottled grey brown slightly sitty CLAY. (LONDON CLAY FORMATION) 4.50 D Reddish brown mottled grey brown slightly sitty CLAY.	7:1				N=19 (2,3/4,4,5,6)				× · · · × ·		
2.00 2.00 - 2.50 B N=17 (2,2/3,4.5,5) 2.00 13.40 Orange brown very sandy fine to coarse subrounded to angular fint GRAVEL. Sand is medium to coarse. Contains subrounded to rounded cobbles of flint. 2.50 D (1.00) To angular fint GRAVEL Sand is medium to coarse. Contains subrounded to rounded cobbles of flint. 3.00 3.00 - 3.50 B Orange brown gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded flint. 4.00 SPT(C) N=10 (2,2/1,2,2,5) (1.30) The following flint of the coarse SAND. Gravel is fine to medium subangular to subrounded flint. 4.50 D Reddish brown mottled grey brown slightly silty CLAY. (LONDON CLAY FORMATION)]:]		1.00 - 1.50				(1.55)		× × ×		
2.00 - 2.50 B 2.50 D 3.00 3.00 - 3.50 3.20 SPT(C) B ES (1.30) 4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 4.50 D (1.00)	∃ ::1						() ,		× × ×		
2.00 - 2.50 B 2.50 D 3.00 3.00 - 3.50 3.20 SPT(C) B ES (1.30) 4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 4.50 D (1.00)	-								× × ×		
2.00 - 2.50 B 2.50 D 3.00 3.00 - 3.50 B 3.20 SPT(C) B ES (1.30) 4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 (1.30) 4.50 D (1.00) (1.0	7:1								×××		
2.00 - 2.50 B 2.50 D 3.00 3.00 - 3.50 3.20 SPT(C) B ES (1.30) 4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 4.50 D (1.00)	<u> </u>								×		
2.00 - 2.50 B 2.50 D 3.00 3.00 - 3.50 3.20 SPT(C) B ES (1.30) 4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 4.50 D (1.00)	- :								× ·		
2.00 - 2.50 B 2.50 D 3.00 3.00 - 3.50 B 3.20 SPT(C) B ES (1.30) 4.00 SPT(C) N=10 (2.2/1,2,2,5) 4.30 (3.40) 4.50 D (1.00) (1.0									××××		
2.00 - 2.50 B 2.50 D 3.00 3.00 - 3.50 B 3.20 SPT(C) B ES (1.30) 4.00 SPT(C) N=10 (2.2/1,2,2,5) 4.30 (3.40) 4.50 D (1.00) (1.0									××××		
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2.50 D (1.00) 3.00 3.00 -3.50 B ES SPT(C) N=15 (2,2/3,3,4,5) 3.00 12.40 Orange brown gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded flint. (HACKNEY GRAVEL) 4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 11.10 Reddish brown mottled grey brown slightly silty CLAY. (LONDON CLAY FORMATION)	-		2.00 - 2.50	B						angular flint GRAVEL. Sand is medium to coarse. Contains	
2.50 D (1.00) 3.00 3.00 -3.50 B ES N=15 (2,2/3,3,4,5) 3.00 (1.30) 4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 T1.10 Reddish brown mottled grey brown slightly slity CLAY. (LONDON CLAY FORMATION)											
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3.00 - 3.50 B SES (1.30) 4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 The deciding subangular to subrounded flint. (HACKNEY GRAVEL) (1.30) 11.10 Reddish brown mottled grey brown slightly silty CLAY. (LONDON CLAY FORMATION) Reddish brown mottled grey brown slightly silty CLAY. (LONDON CLAY FORMATION)			2.50	D			(1.00)				
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4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30 11.10 Reddish brown mottled grey brown slightly silty CLAY. (LONDON CLAY FORMATION)										to medium subangular to subrounded flint.	
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4.00 SPT(C) N=10 (2,2/1,2,2,5) 4.30]::]										
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4.30 11.10 Reddish brown mottled grey brown slightly silty CLAY. (LONDON CLAY FORMATION)	-		4.00	SDT/C	N=10 (2 2/1 2 2 5)	1					
4.50 D (0.40) Readish brown motiled grey brown slightly slity CLAY. (LONDON CLAY FORMATION)			4.00	3F1(C)	11-10 (2,2/1,2,2,5)						'
4.50 D (0.40) Reddisn brown motted grey brown slightly slity CLAY. (LONDON CLAY FORMATION)	 								N. N.		
4.50 D (0.40) Readish brown motted grey brown slightly slity CLAY. (LONDON CLAY FORMATION)						4 30		11 10			
4.50 D (0.40)						4.30		11.10	××	Reddish brown mottled grey brown slightly silty CLAY.	
			A 50	D			(0.40)		×—_×	(LONDON CLAT FORWATION)	
10.70			4.50				(0.40)		××		
10.70 Dark grey CLAY with occasional partings of light grey silt						4 70		10.70	× ×		
LONDON CLAY FORMATION)						4.70		10.70		Dark grey CLAY with occasional partings of light grey silt.	
									L	(LONDON GLAT FORWATION)	
5 00 SPT(S) N=16 (2 2/3 4 4 5)			5.00	SPT(S)	N=16 (2 2/3 4 4 5)] ,
Continued on next sheet			3.00	0. 1(0)	14-10 (2,2/0,7,7,0)					Continued on next sheet	,
5.00 SPT(S) N=16 (2,2/3,4,4,5) Continued on next sheet			5.00	SPT(S)	N=16 (2,2/3,4,4,5)					Continued on next sheet	

Remarks Groundwater Chiselling

Depth Strike (m) Depth Casing (m) Level After 20 Mins Chiselling Top Depth (m) Base Depth (m)



RF	PS ®			В	BOREHOLE LOG								
Project Nam	ne: 150 Ho	olborn		Co-d	ordinate	es:			Date(s)): 09/03/2016 - 1	14/03/2016	Hole Type	e:
				Easti	ng:		D	rilling Met	hod:		eter: 50mm	CP	
Location:	Holbor	n		North	ning:					Casing Diameter (mm)	Casing Depth (m)	Scale:	
Client:	Client: CNM			Groun (mAOI	d Level O):	15.40	Log	ged By:	LW			1:25	
Well Water Strike(s		ples & In	Situ Testing Results		Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend		Strat	um Description		[5
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	Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)	



Continued on next sheet

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Scale

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Borehole No. **BH2**

Sheet 3 of 8

Project Name:	150 Holborn	Co-ordinates:	Date(s):	Date(s): 09/03/2016 - 14/03/2016				
Project No:	HLEI39025	Easting:	Drilling Method:	Pipe Diame	eter: 50mm	CP		
Location:	Holborn	Northing:		Casing Diameter (mm)	Casing Depth (m)	Scale:		
Client:	CNM	Ground Level 15.40	Logged By: LW			1:25		

	-			(mAO				, , · 				20	1
Well	Water				Depth	Thickness	Level	Legend		Stra	tum Description		Scale
	otrike(s)	Depth (m)	Туре	Results	(mbGL)	(m)	(mAOD)	304					1 20.0
	Water Strike(s)		SPT(S)	Results N=26 (3,3/5,6,7,8)	Depth (mbGL)	Thickness (m)			Contains occ		tum Description		11 —
		14.00	SPT(S)	N=29 (3,4/6,7,7,9)					Contains occ		ks of light grey silt.		14 -
Remarks								roundwate	er		Chiselling		
Julia								Donth Cooine	Laural Affect 20	Duration	- Institute		

Depth Casing Level After 20 Mins

Top Depth (m) Base Depth (m)

Depth Strike (m)

	RP	S			BOR	REH	OLE L	00	3		Borehole N BH2 Sheet 4 of	
Projec	t Name	e: 150 Ho	olborn	C	Co-ordinate	es:	[Date(s)): 09/03/2016 - 1	14/03/2016	Hole Typ	
Projec	t No:	HLEI3	9025	E	asting:		Drilling Met	thod:		eter: 50mm	СР	
Locati	on:	Holbor	n	N	lorthing:				Casing Diameter (mm)	Casing Depth (m)	Scale:	
Client		CNM		G (r	Fround Level mAOD):	15.40	Logged By:	LW			1:25	
Well	Water Strike(s)			Situ Testing	Depth	Thickness	Level Legend		Strat	um Description		Scale
Well	Strike(s)	Depth (m) 17.00	SPT(S)	Results	(mbGL)	(m)	(mAOD) Legend		Strat	um Description		16 —

1					-			· · · · · · · · · · · · · · · · · · ·	1	
Remarks	5					Groundwate	r	Chiselling	9	
		20.00	SPT(S)	N=31 (4,6/7,7,8,9)				Continued on nex		 20 -
										-
						<u> </u>				

Depth Strike (m) Depth Casing (m) Level After 20 Mins Duration (hh:mm) Top Depth (m) Base Depth (m)

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Borehole No. BH2

Sheet 5 of 8

Project Name: 150 Holborn Co-ordinates: Date(s): 09/03/2016 - 14/03/2016 Hole Type: Easting: Project No: HLEI39025 Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Location: Casing Depth (m) Scale: Holborn Northing: Ground Level (mAOD): Client: CNM 1:25 15.40 Logged By: LW

Client:		CINIVI		(mA	OD):	15.40	Logi	gea By:	LVV			1:25	
Well	Water Strike(s)	Sam Depth (m)	ples & In S	Situ Testing Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend		Stra	tum Description		Scale
		Sopar (III)	1,500	riosuno	20.40	, ,	-5.00		Reddis (LAMB	sh brown mottled li ETH GROUP)	ght grey and yellow	r silty CLAY.	-
		21.50	SPT(S)	N=52 (5,6/9,12,15,16)		(2.60)							21 —
		23.00	SPT(S)	N=52 (4,7/9,11,14,18)	23.00	(1.80)	-7.60		Red m of fine (LAMB	ottled light blueish sand. ÆTH GROUP)	grey silty CLAY wit	h white speckles	23 -
		24.50	SPT(S)	47 (4,8/47 for 225mm)	24.80		-9.40	X	Yellowi silty CL	_AY.	light blueish grey al	nd red brown	24 -

Remarks Groundwater Chiselling

Depth Strike (m) Depth Casing (m) Level After 20 (Mins Mins Chimm) Top Depth (m) Base Depth (m)



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Borehole No. BH2

Sheet 6 of 8

Project Name: 150 Holborn Co-ordinates: Date(s): 09/03/2016 - 14/03/2016 Hole Type: Easting: Project No: HLEI39025 Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Location: Casing Depth (m) Scale: Holborn Northing: Ground Level (mAOD): Client: CNM 1:25 15.40 Logged By: LW

26.00 SPT(S) 55 (8,10/65 for 225mm) 26 27.50 SPT(S) 48 (7,10/48 for 150mm) 28.20 -12.80 -12.80 -14.00 -14.40 -14.40 -14.40 -14.40 -14.40 -15.80 -14.40 -14.40 -15.80 -14.40 -14.40 -15.80 -14.40 -14.40 -15.80 -14.40 -14.40 -15.80 -15.80 -14.40 -15.80 -15.	Jilent:	CINIVI		(1	nAOD):	15.40	Log	gea By:	LVV			1:25	
26.00 SPT(S) 55 (6.10/65 for 228mm) 26 26 27 28 20 27 28 20 27 28 20 20 28 20 20 20 20 20 20 20 20 20 20 20 20 20	Well Water Strike(s)				Depth (mbGL)	Thickness	Level	Legend		Stra	tum Description		Scal
28.00 D 28.20 -12.80 Light blueish grey and yellow silty fine SAND. (LAMBETH GROUP) 29.00 SPT(S) 51 (3,8/51 for 225mm) 29.40 -14.40 Blueish grey, black and white clayey silty fine SAND. (LAMBETH GROUP) -14.40 Mottled yellow, orange, blueish grey and red CLAY with small pockets of dark red fine sand.	vveii Strike(s)	Depth (m)	Type SPT(S)	Results 55 (6,10/55 for 225mm) 48 (7.10/48 for	(mbGL)	(m)	(mAOD)	××	(LAMB		num Description		26 -
29.00 SPT(S) 51 (3,8/51 for 225mm) 29.40 -14.00 Blueish grey, black and white clayey silty fine SAND. (LAMBETH GROUP) 29.80 -14.40 Mottled yellow, orange, blueish grey and red CLAY with small pockets of dark red fine sand.		28.00	D		28.20		-12.80	×——— × × × ×	Light b	olueish grey and ye BETH GROUP)	ellow silty fine SAND.		28
small pockets of dark red fine sand.		29.00	SPT(S)	51 (3,8/51 for 225mm)			-14.00		Blueisl (LAMB	n grey, black and v BETH GROUP)	white clayey silty fine	SAND.	29 -
		30.00	D		29.80		-14.40	× × × × × × × × × × × × × × × × × × ×	Mottled small p	oockets of dark red	d fine sand.	CLAY with	30



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Borehole No. BH2

Sheet 7 of 8

Project Name: 150 Holborn Co-ordinates: Date(s): 09/03/2016 - 14/03/2016 Hole Type: Easting: Project No: HLEI39025 Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm) Casing Depth (m) Scale: Location: Holborn Northing: Ground Level (mAOD): Client: CNM 1:25 15.40 LW Logged By:

30.50 SPT(S) 53 (5.11/53 for 22/3mm) 31.00 D		Water	Sami	ples & In	Situ Testing	Depth	Thickness]					
30.50 SPT(S) 63 (5.11/53 for 22/5mm) 31.00 D 32.00 SPT(S) 64 (6.10/64 for 22/5mm) 32.00 SPT(S) 50 (25 for 40/mets)0 for 30/mm) 33.50 SPT(S) 50 (25 for 40/mets)0 for 30/mm) 34.00 -18.60 Dank grey clayey sandy medium to coarse rounded first GRAVIL with angular investore fragments. Sand is fine. (LAMSETH GROUP) 35.00 SPT(S) 62 (8.10/65 for 20/mm) 34.80 (1.20) 34.80 (1.20) 34.80 (1.20) 34.80 (1.20) 35.00 SPT(S) 62 (8.10/65 for 20/mm) 34.80 (1.20) 34.80 (1.20) 34.80 (1.20) 35.00 SPT(S) 62 (8.10/65 for 20/mm) 35.00 SPT(S) 62 (8.10/65 for 20/mm) 36.00 SPT(S) 62 (8.10/65 for 20/mm) 36.00 SPT(S) 62 (8.10/65 for 20/mm) 37.00 SPT(S) 62 (8.10/65 for 20/mm) 38.80 (1.20) 38.80 (1.20) 39.80 (1.20) 3	Well	Water Strike(s)				(mbGL)	(m)	(mAOD)	Legend		Stra	atum Description		Scale
31.00 D 32.00 SPT(S) 54 (6,10/54 for 225mm) 32.00 SPT(S) 55 (6,10/54 for 225mm) 33.50 SPT(S) 50 (25 for 40mm)50 for 30mm) 34.00			1 ()	7.					-	(LAMBETH (GROUP)			
31.00 D 32.00 SPT(S) 54 (6,10/54 for 225mm) 32.00 SPT(S) 55 (6,10/54 for 225mm) 33.50 SPT(S) 50 (25 for 40mm)50 for 30mm) 34.00									F_=_					
31.00 D 32.00 SPT(S) 54 (6,10/54 for 225mm) 32.00 SPT(S) 55 (6,10/54 for 225mm) 33.50 SPT(S) 50 (25 for 40mm)50 for 30mm) 34.00														
31.00 D 32.00 SPT(S) 54 (6,10/54 for 225mm) 32.00 SPT(S) 55 (6,10/54 for 225mm) 33.50 SPT(S) 50 (25 for 40mm)50 for 30mm) 34.00														
31.00 D 32.00 SPT(S) 54 (6,10/54 for 225mm) 32.00 SPT(S) 55 (6,10/54 for 225mm) 33.50 SPT(S) 50 (25 for 40mm)50 for 30mm) 34.00				007(0)	50 /5 /4/50 6				L					
31.00 D 32.00 SPT(S) 54 (6,10/54 for 225mm) 32.00 SPT(S) 55 (6,10/54 for 225mm) 33.50 SPT(S) 50 (25 for 40mm)50 for 30mm) 34.00			30.50	SPT(S)	53 (5,11/53 for 225mm)				<u> </u>					
32.00 SPT(S) 54 (6.10/54 for 225mm) 34.00 -18.60 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (LAMSETH CROUP) 35.00 SPT(S) 52 (8.19/52 for 75mm) 34.80 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (LAMSETH CROUP) 35.00 SPT(S) 52 (8.19/52 for 75mm) 34.80 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (SAMSETH CROUP)					22311111)				<u></u> -					
32.00 SPT(S) 54 (6.10/54 for 225mm) 34.00 -18.60 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (LAMSETH CROUP) 35.00 SPT(S) 52 (8.19/52 for 75mm) 34.80 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (LAMSETH CROUP) 35.00 SPT(S) 52 (8.19/52 for 75mm) 34.80 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (SAMSETH CROUP)														
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32.00 SPT(S) 54 (6.10/54 for 225mm) 34.00 -18.60 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (LAMSETH CROUP) 35.00 SPT(S) 52 (8.19/52 for 75mm) 34.80 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (LAMSETH CROUP) 35.00 SPT(S) 52 (8.19/52 for 75mm) 34.80 Dark grey clayer sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (SAMSETH CROUP)									L					
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33.50 SPT(S) 50 (25 for 40mm/50 for 30mm) 34.00 -18.60 Dark grey clayey sandy medium to coarse rounded flint GRAVEL with angular limestone fragments. Sand is fine. (LAMBETH GROUP) 35.00 SPT(S) 52 (8,19/52 for 75mm) 36.00 SPT(S) 52 (8,19/52 for 75mm) 37.00 SPT(S) 52 (8,19/52 for 75mm) 38.00 SPT(S) 52 (8,19/52 for 75mm)														
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34.80 (0.80) SPT(S) 52 (8,19/52 for 75mm) One of the continued on next sheet										GRAVEL wit	th angular lin	nestone fragments.	Sand is fine.	
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34.80 (0.20) The state of the s														
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			35.00	SPT(S)	52 (8.19/52 for									35 -
			, .	(-)	75mm)						Cont	unuea on next sheet		
	Remarks							(Groundwate	L er		Chiselling		

Remarks Groundwater Chiselling

Depth Strike (m) Depth Casing (m) Level After 20 Duration (hh:mm) Top Depth (m) Base Depth (m)



	RP	®			В	OR	EH	О	LE	ΞL	OG	3			Borehole N	0.
															Sheet 8 of	
	t Name					Co-ordinates:						1		4/03/2016	Hole Typ	e:
Projec		HLEI39			Eastin	ng:			Dri	lling Met	hod:			eter: 50mm	СР	
Location	- (1111)		Casing Depth (m)	Scale:												
Client:				(118 (82).			Logg	ed By:	LW				1:25			
Well	Water Strike(s)	Samı Depth (m)	oles & In Si Type	itu Testing Results		Depth (mbGL)	Thicknes (m)	s Le	vel (OD)	Legend			Strat	um Description		Scale
		200()	.,,,,,	- Robalto		, ,	, ,	,			fragme	ents. San	d is fine to OUP)	medium.		_
																36
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Remarks									Gr	oundwate	er			Chiselling		

	Groundwater		Chiselling					
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)			





Borehole No. **BH3**

Sheet 1 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 30/03/2016 - 08/04/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: Pipe Diameter: 50mm CP Casing Diameter (mm)
150 Casing Depth (m) Location: Scale: Holborn Northing: 32.50 Client: Ground Level CNM 1.25 16 83 Logged By: MA

lient:		CNM		(m	ound Level AOD):	16.83	Log	ged By:	MA	200	13.50	1:25	
Well	Water Strike(s)	Sam Depth (m)		Situ Testing Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend		Stra	atum Description		Sca
		Берит (ті)	Туре	Results	0.00	()	16.82		Concre (CONC	ete. CRETE)			
						(0.90)							
									-				
		1.00	SPT(S)	N=17 (1,1/1,4,4,8	0.90		15.92		coarse	gravelly clayey fir subangular to su GROUND)	ne to coarse sand. G brounded flint.	ravel is fine to	1
						(0.50)			Ì	,			
		1.40 - 2.00	В3		1.40		15.42		GRAVE	EL of flint. Sand is	erse subrounded to su s fine to coarse.	ıbangular	
									HACK	NEY GRAVEL)			
		2.00	SPT(C)	N=50 (2,3/50 fo					· ·				
		2.00 - 2.50	B4	275mm)									
		3.00 3.00 - 3.50	SPT(C) B5	N=48 (3,8/8,15,14,11)									
						(4.50)							
		4.00 4.00 - 4.50	SPT(C) B6	N=18 (1,1/3,4,4,7	')								
		5 00	SPT(C)	N=13 (1 1/2 3 4 4									
		5.00 5.00 - 5.50	B7	N=13 (1,1/2,3,4,4						Con	tinued on next sheet		L`

	Groundwater		Chiselling					
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)			
1.50 12.00								



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Borehole No. **BH3**

Sheet 2 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 30/03/2016 - 08/04/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter Casing Depth (m) Scale: Location: Holborn Northing: (mm) 150 32.50 Ground Level (mAOD): Client: CNM 1:25 16.83 MA Logged By:

Olient.		CIVIVI		(mAO	D):	10.00		geu by.	1717 (200	13.50	1.20	
\\/oli	Water			Situ Testing	Depth	Thickness	Level	Legand	Stratum Description			Scale	
vveii	Strike(s)	Depth (m)	Туре	Results	(mbGL)	(m)	(mAOD)	Legend			Lum Description		Scale
	Water Strike(s)	Samp		Results	Depth (mbGL) 5.90 6.50				Brown (LONE	Stra Sandy CLAY. Sand OON CLAY FORMA	tum Description d is fine to coarse. ATION)		Scale
		9.00	D10	N=21 (2,3/4,4,6,7)						Conti	inued on next sheet		9
									L		Ola 'a a II' a a		

(1) Groundwater encountered at 1.50m bgl.



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Borehole No. BH3

Sheet 3 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 30/03/2016 - 08/04/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter Casing Depth (m) Location: Holborn Northing: Scale: (mm) 150 32.50 Ground Level (mAOD): Client: CNM 1:25 16.83 MA Logged By:

	- 1						· •			
Nell s	Water Strike(s)			Situ Testing	Depth (mbGL)	Thickness (m)	Level	Legend	Stratum Description	Sca
X///A	אוועה(צ)	Depth (m)	Туре	Results	(mbGL)	(m)	(MAOD)	J		1
		10.50	D11							
		11.00	SPT(S)	N=21 (2,3/5,5,5,6)						11
		12.00	D12		12.00 12.10	(0.10)	4.82 4.72		Grey claystone recovered as coarse angular GRAVEL. (LONDON CLAY) Grey silty slightly sandy CLAY. Sand is fine. (LONDON CLAY)	12
		13.00 13.00 - 13.50	D13 U14	Blows=130						13
										14
		15.00		N=30 (2,4/6,7,8,9)						15

(1) Groundwater encountered at 1.50m bgl.



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Borehole No. BH3

Sheet 4 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 30/03/2016 - 08/04/2016 Hole Type: Easting: Project No: HLEI39025 Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm)
150
200 Location: Casing Depth (m) Scale: Holborn Northing: 32.50 13.50 Ground Level (mAOD): Client: CNM 1:25 16.83 MA Logged By:

iient:		CINIVI			OD):	10.83	Logo	jea By:	IVIA	200	13.50	1:25	
Well	Water Strike(s)			Situ Testing	Depth (mbGL)	Thickness	Level (mAOD)	Legend		Stra	tum Description		Sca
/////	Suive(9)	Depth (m)	Туре	Results	(ITIDGL)	(m)	(IIIAUD)				•		
\times / \rangle													
		16.00	D15										16
		16.50	U16	Blows=52									
		10.50		DIOW3-32									
		17.00	D17										1
						(12.50)							
						(12.50)							
		18.00	SPT(S)	N=33 (4,5/7,7,8,11)								1
								<u> </u>					
\mathbb{X}/\mathbb{X}													
		19.00	D18										1
		40.50	1110	Dia . of									
		19.50	U19	Blows=65									
		20.00	D20										20
		_0.00	220							Cont	nued on next sheet		_

	Groundwater		Chiselling					
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)			
1.50 12.00								



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Borehole No. BH3

Sheet 5 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 30/03/2016 - 08/04/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter Casing Depth (m) Location: Holborn Northing: Scale: (mm) 150 32.50 Ground Level (mAOD): Client: CNM 1:25 16.83 MA Logged By:

		CINIVI		(mA	JU).	10.00		jeu by.		200	13.50	1.25	
\A/=II	Water	Sam	ples & In	Situ Testing	Depth	Thickness	Level			04	t December		
Well	Water Strike(s)	Depth (m)	Туре	Results	Depth (mbGL)	(m)	Level (mAOD)	Legend		Stra	tum Description		Sc
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		21.00	SPT(S)	N=30 (3,5/6,7,8,9)									2
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W()		22.00	D21										2
									-				
XX													
		22.50	1100	Blows=63									
		22.50	U22	Blows=63					-				
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)X()													
								<u> </u>					
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		23.00	D23										2
		23.00	D23										1
)X()													
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		24.00	SPT(S)	N=46				H	-				2
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(1) Groundwater encountered at 1.50m bgl.

Groundwater Chiselling

Depth Strike (m) Depth Casing (m) Level After 20 Duration (hh:mm) Top Depth (m) Base Depth (m)

1.50 12.00



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Borehole No. **BH3**

Sheet 6 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 30/03/2016 - 08/04/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter Casing Depth (m) Location: Holborn Northing: Scale: (mm) 150 32.50 Ground Level (mAOD): Client: CNM 1:25 16.83 MA Logged By:

	-			(mAC				1	200	10.00	
Well	Water Strike(s)			Situ Testing	Depth (mbGL)	Thickness (m)	Level	Legend		Stratum Description	Scale
VVCII	Strike(s)	Depth (m)	Туре	Results	(mbGL)	(m)	(mAOD)	Legena	· ·	Stratam Description	Ocaic
)X//)											
		25.50	U25	Blows=77							·
\mathbb{X}/\mathbb{X}											
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								<u> </u>			26 -
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X								<u> </u>			
X//X		27.00	SPT(S)	50 (6.12/50 for							27
		27.00	01 1(0)	50 (6,12/50 for 185mm)							21
X								<u> </u>			
								<u> </u>			
											
											
$\langle \langle \rangle \rangle$								[- [-]			
						(6.90)					
											
$\langle \langle \rangle \rangle$								<u> </u>			
											
											
)X()		28.00	D26								28
											
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)X(()		28.50	U27	Blows=50				H	1		
$\rangle\rangle\rangle\rangle$											
)X((
		29.00	D28								
$\langle \langle \rangle \rangle$		29.00	D20								29
											
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$\langle \langle \rangle \rangle$								H			
		30.00	SPT(S)	50 (5.10/50 for						Onethernal Control	 30
			-: (0)	165mm)					(Continued on next sheet	55
		30.00	SPT(S)	50 (5,10/50 for 165mm)						Continued on next sheet	3

(1) Groundwater encountered at 1.50m bgl.

Groundwater Chiselling

Depth Strike (m) Depth Casing (m) Level After 20 (hh:mm) Top Depth (m) Base Depth (m)

1.50 12.00



®
RPS

Borehole No. **BH3**

Sheet 7 of 7

Project Name: 150 Holborn Co-ordinates: Date(s): 30/03/2016 - 08/04/2016 Hole Type: Project No: HLEI39025 Easting: Drilling Method: CP Pipe Diameter: 50mm Casing Diameter (mm)
150
200 Location: Casing Depth (m) Scale: Holborn Northing: 32.50 13.50 Ground Level Client: CNM 16.83 1:25 Logged By: MA

Well Water Strike(s	er Sam (s) Depth (m) 31.00	Туре	Situ Testing Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend		Strat	um Description		Scale
	31.50 32.00 - 32.50 33.00 33.00 - 33.50	D29 U30 B31 SPT(S) B32	50 (6,15/50 for 175mm) 50 (5,12/50 for 160mm)		(2.50)	-14.68		Brown sandy s (LAMBI		ND with bands of g off-white / brown sl	rey brown very hell fragments.	31 - 32 - 34 -

	Groundwater		Chiselling				
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)		
1.50 12.00							





APPENDIX D

Geotechnical Laboratory Certificates



LABORATORY REPORT



4043

Contract Number: PSL16/1211

Report Date: 29 March 2016

Client's Reference: HLEI39025

Client Name: RPS Health, Safety and Environment

14 Cornhill London EC3V 3ND

For the attention of: Rob Philip

Contract Title: 150 Holborn

Date Received: 17/3/2016
Date Commenced: 17/3/2016
Date Completed: 29/3/2016

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson A Watkins R Berriman (Director) (Director) (Quality Manager)

EK#

D Lambe S Royle L Knight (Senior Technician) (Senior Technician) (Senior Technician)

Page 1 of

5 – 7 Hexthorpe Road, Hexthorpe,

Doncaster DN4 0AR

tel: +44 (0)844 815 6641 fax: +44 (0)844 815 6642

e-mail: rgunson@prosoils.co.uk awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH1		В	1.00	1.50	Brown very sandy GRAVEL.
BH1		В	3.00	3.50	Brown slightly silty SAND & GRAVEL.
BH1		D	4.50		Greyish brown CLAY.
BH1		D	5.50		Greyish brown CLAY.
BH1		U	8.00	8.45	M
BH1		D	9.50	9.95	Greyish brown CLAY.
BH1		D	10.00		Greyish brown CLAY.
BH1		U	11.00	11.45	Very stiff greyish brown CLAY.
BH1		D	13.00		Greyish brown CLAY.
BH1		U	14.00	14.45	Very stiff greyish brown CLAY.
BH1		D	14.50		Greyish brown CLAY.
BH1		U	17.00	17.45	Greyish brown CLAY.
BH1		U	20.00	20.45	Very stiff greyish brown CLAY.
BH1		D	22.00		Brown CLAY.
BH1		D	23.50		Brown CLAY.
BH1		D	25.00		Brown slightly sandy CLAY.
BH1		D	26.50		Brown slightly sandy CLAY.
BH1		D	28.00		Brown slightly sandy CLAY.
BH1		D	34.00		Brown slightly sandy CLAY.

Cit	BOI	Checked / Approved	£KH	Date	29/03/16	Contract No:
(≯≮)	PSL					PSL16/1211
U K A S TESTING	Professional Sails Laboratory		150 Holburn			Client Ref:
4043	Professional Soils Laboratory					HLEI 39025

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH2		В	2.00	2.50	Brown very gravelly slightly silty SAND.
BH2		В	3.00	3.50	Brown very gravelly slightly silty SAND.
BH2		D	4.50		Brown slightly gravelly slightly sandy CLAY.
BH2		D	5.50		Greyish brown CLAY.
BH2		U	6.50	6.95	Greyish brown CLAY.
BH2		D	8.50		Greyish brown CLAY.
BH2		U	9.50	9.95	Very stiff greyish brown CLAY.
BH2		U	12.50	12.95	M
BH2		D	13.00		Greyish brown CLAY.
BH2		D	14.50		Greyish brown CLAY.
BH2		D	28.00		Greyish brown slightly clayey very silty SAND.
BH2		D	30.00		Greyish brown brown CLAY.
BH2		D	31.00		Greyish brown brown CLAY.

Cit	BAT	Checked / Approved	EX	Date	29/03/16	Contract No:
(≯≮)						PSL16/1211
U K A S TESTING	Professional Sails Laboratory		150 Holburn			Client Ref:
4043	Professional Soils Laboratory					HLEI 39025

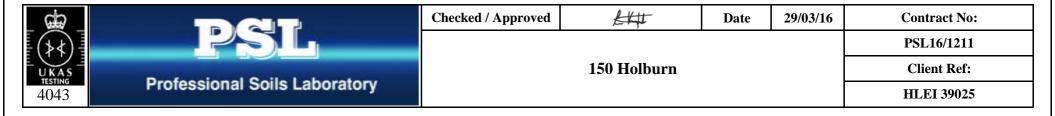
SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377: PART 2: 1990)

Hole Number	Sample Number	Sample Type	Top Depth	Base Depth	Moisture Content	Linear Shrinkage %	Particle Density Mg/m ³	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing .425mm	Remarks
			m	m	Clause 3.2	Clause 6.5	Clause 8.2	Clause 4.3/4	Clause 5.3	Clause 5.4		
BH1		D	4.50		30							
BH1		D	5.50		35			73	30	43	100	Very high plasticity CV.
BH1		U	8.00	8.45								
BH1		D	9.50	9.95	27							
BH1		D	10.00		28			72	29	43	100	Very high plasticity CV.
BH1		U	11.00	11.45	22							
BH1		D	13.00		28			74	30	44	100	Very high plasticity CV.
BH1		U	14.00	14.45	22							
BH1		D	14.50		26			71	29	42	100	Very high plasticity CV.
BH1		U	17.00	17.45	21							
BH1		U	20.00	20.45	20							
BH1		D	22.00		22			74	30	44	100	Very high plasticity CV.
BH1		D	23.50		28							
BH1		D	25.00		27			61	26	35	100	High plasticity CH.
BH1		D	26.50		26							
BH1		D	28.00		28			65	27	38	100	High plasticity CH.
BH1		D	34.00		23			64	27	37	100	High plasticity CH.
BH2		D	4.50		29			67	28	39	96	High plasticity CH.
BH2		D	5.50		29							

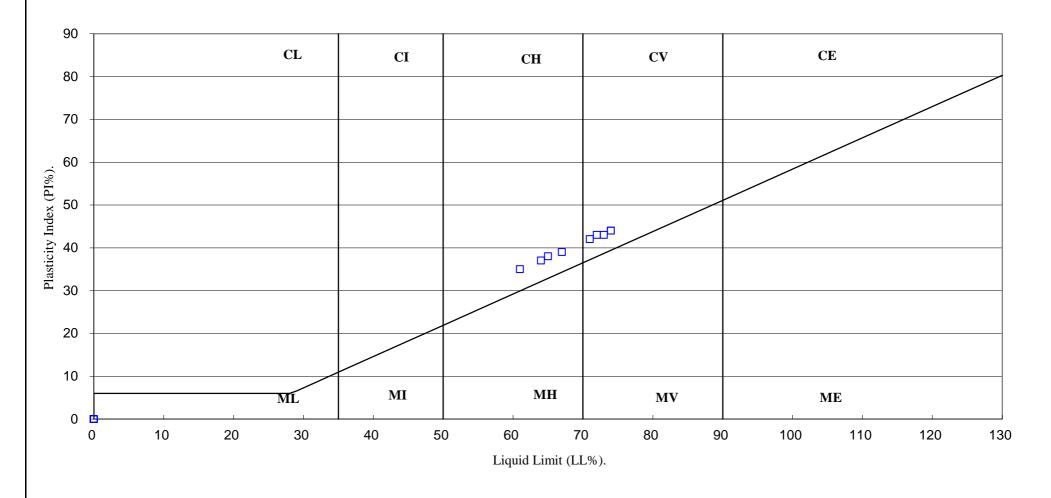
SYMBOLS: NP: Non Plastic

^{*:} Liquid Limit and Plastic Limit Wet Sieved.



PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930:2015)



cia Cia		Checked /Approved	£K#	Date	29/03/16	Contract No:
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4043	Professional Soils Laboratory					HLEI 39025

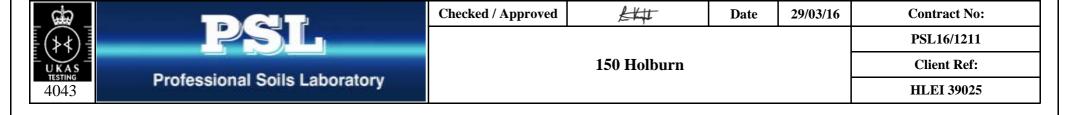
SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377: PART 2: 1990)

Hole Number	Sample Number	Sample Type	Top Depth	Base Depth	Moisture Content %	Linear Shrinkage %	Particle Density Mg/m ³	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing .425mm %	Remarks
			m	m	Clause 3.2	Clause 6.5	Clause 8.2	Clause 4.3/4	Clause 5.3	Clause 5.4		
BH2		U	6.50	6.95	25							
BH2		D	8.50		32			75	31	44	100	Very high plasticity CV.
BH2		U	9.50	9.95	25							
BH2		U	12.50	12.95								
BH2		D	13.00		25			71	29	42	100	Very high plasticity CV.
BH2		D	14.50		28							
BH2		D	28.00		18				NP			
BH2		D	30.00		26							
BH2		D	31.00		20			72	29	43	100	Very high plasticity CV.

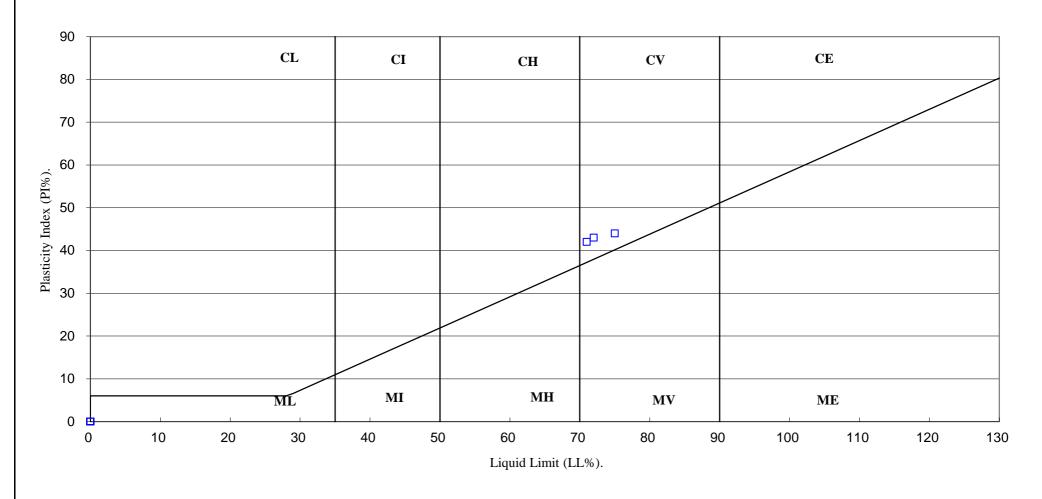
SYMBOLS: NP: Non Plastic

^{*:} Liquid Limit and Plastic Limit Wet Sieved.



PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930:2015)



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4043	Professional Soils Laboratory					HLEI 39025

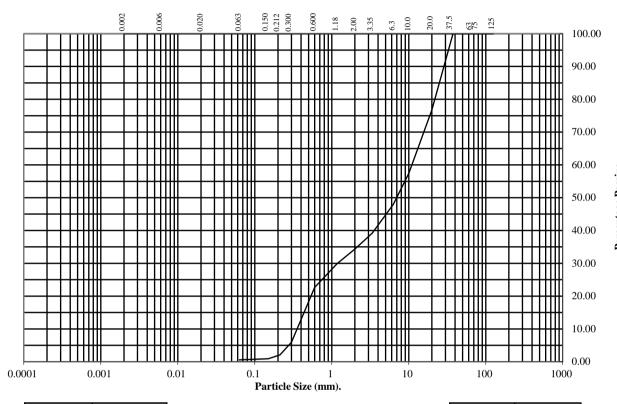
BS1377: Part 2: 1990

Wet Sieve, Clause 9.2

Hole Number: BH1 Top Depth (m): 1.00

Sample Number: Base Depth(m): 1.50

Sample Type: B



BS Test	Percentage
Sieve	Passing
125	100
75	100
63	100
37.5	100
20	77
10	57
6.3	48
3.35	39
2	34
1.18	30
0.6	23
0.3	6
0.212	2
0.15	1
0.063	1

Soil	Total
Fraction	Percentage
Cobbles Gravel Sand Silt/Clay	0 66 33 1

Remarks:

See summary of soil descriptions.



<u> PSL</u>	
Professional Soils Laboratory	

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Date

29/03/16

Contract No: PSL16/1211

150 Holburn

Client Ref: HLEI 39025

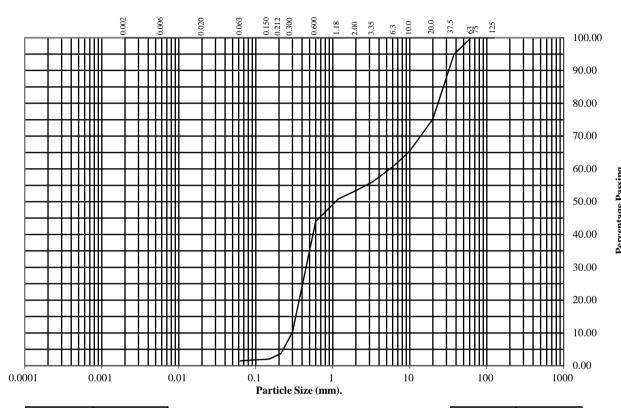
BS1377: Part 2: 1990

Wet Sieve, Clause 9.2

Hole Number: BH1 Top Depth (m): 3.00

Sample Number: Base Depth(m): 3.50

Sample Type: B



BS Test	Percentage
Sieve	Passing
125	100
75	100
63	100
37.5	95
20	75
10	65
6.3	61
3.35	56
2	53
1.18	51
0.6	44
0.3	10
0.212	4
0.15	2
0.063	2

Soil	Total
Fraction	Percentage
Cobbles Gravel Sand Silt/Clay	0 47 51 2

Remarks:

See summary of soil descriptions.

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<u> PSL</u>
Professional Soils Laboratory

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Client Ref:		
HLEI 39025		

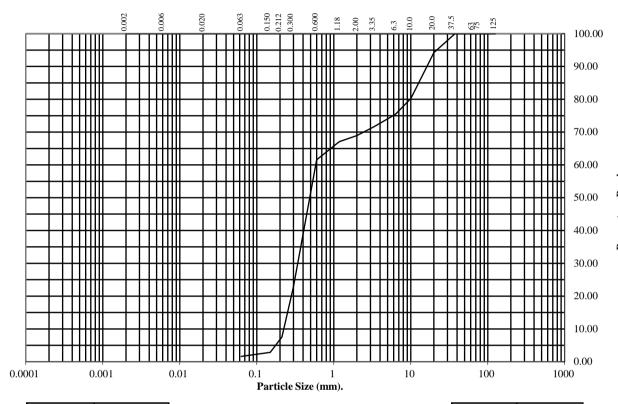
BS1377: Part 2: 1990

Wet Sieve, Clause 9.2

Hole Number: BH2 Top Depth (m): 2.00

Sample Number: Base Depth(m): 2.50

Sample Type: B



BS Test	Percentage	
Sieve	Passing	
125	100	
75	100	
63	100	
37.5	100	
20	94	
10	80	
6.3	75	
3.35	72	
2	69	
1.18	67	
0.6	62	
0.3	23	
0.212	8	
0.15	3	
0.063	2	

Soil	Total
Fraction	Percentage
Cobbles Gravel Sand Silt/Clay	0 31 67 2

Remarks:

See summary of soil descriptions.



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Professional Soils Laboratory	

Checked / Approved	EKH	Date	29/03/16	

150 Holburn

PSL16/1211		
Client Ref:		
HLEI 39025		

Contract No:

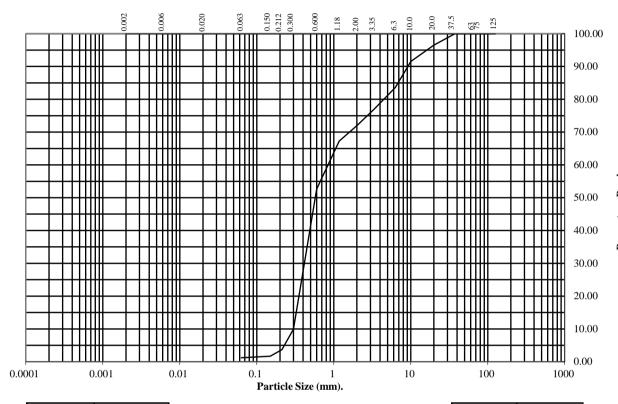
BS1377: Part 2: 1990

Wet Sieve, Clause 9.2

Hole Number: BH2 Top Depth (m): 3.00

Sample Number: Base Depth(m): 3.50

Sample Type: B



BS Test	Percentage	
Sieve	Passing	
125	100	
75	100	
63	100	
37.5	100	
20	96	
10	92	
6.3	84	
3.35	77	
2	72	
1.18	67	
0.6	53	
0.3	10	
0.212	4	
0.15	2	
0.063	1	

Soil	Total
Fraction	Percentage
Cobbles Gravel Sand Silt/Clay	0 28 71 1

Remarks:

See summary of soil descriptions.



Professional Soils Laboratory

Checked /	Approved
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EKH

Date

29/03/16

Contract No: PSL16/1211

150 Holburn

Client Ref: HLEI 39025

ONE DIMENSIONAL CONSOLIDATION TEST

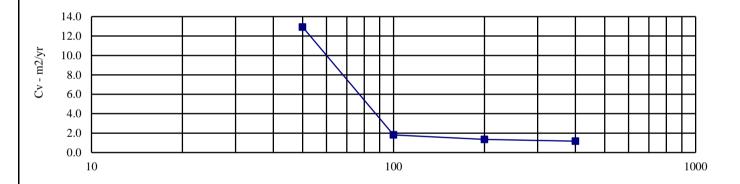
BS 1377: Part 5: 1990: Clause 3

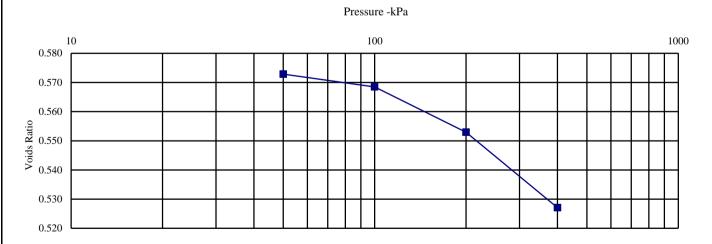
Hole Number: BH1 Top Depth (m): 17.00

Sample Number: Base Depth (m): 17.45

Sample Type: U

Initial Conditions		Pressure	Range	Mv	Cv	Specimen location		
Moisture Content (%):	21	kPa		m2/MN	m2/yr	within tube: To		
Bulk Density (Mg/m3):	2.03	0	50	0.134	12.925	Method used to		
Dry Density (Mg/m3):	1.67	50	100	0.056	1.808	determine CV:	T90	
Voids Ratio:	0.583	100	200	0.099	1.351	Nominal temperature		
Degree of saturation:	96.3	200	400	0.083	1.170	during test 'C:	20	
Height (mm):	19.876					Remarks:		
Diameter (mm)	75.03					See summary of soils description.		
Particle Density (Mg/m3):	2.65							
Assumed	2.03							





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4043	Professional Soils Laboratory					

ONE DIMENSIONAL CONSOLIDATION TEST

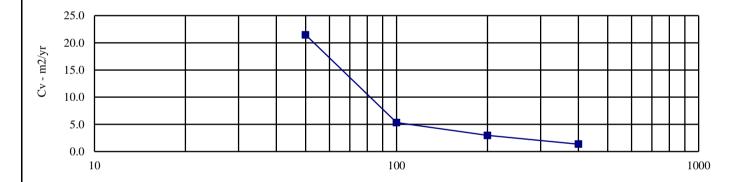
BS 1377: Part 5: 1990: Clause 3

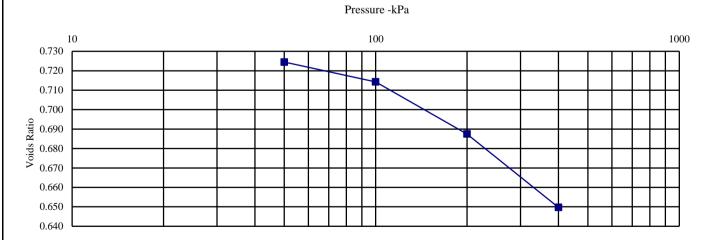
Hole Number: BH2 Top Depth (m): 6.50

Sample Number: Base Depth (m): 6.95

Sample Type: U

Initial Conditions		Pressure	Range	Mv	Cv	Specimen location		
Moisture Content (%):	25	kPa		m2/MN	m2/yr	within tube:	Top	
Bulk Density (Mg/m3):	1.91	0	50	0.092	21.454	Method used to		
Dry Density (Mg/m3):	1.53	50	100	0.118	5.320	determine CV:	T90	
Voids Ratio:	0.732	100	200	0.156	2.962	Nominal temperature		
Degree of saturation:	90.1	200	400	0.112	1.363	during test 'C:	20	
Height (mm):	20.024					Remarks:		
Diameter (mm)	75.013					See summary of soils description.		
Particle Density (Mg/m3):	2.65							
Assumed	2.03							





<u>ab</u>		Checked / Approved	£##	Date	31/03/16	Contract No:
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4043	Professional Soils Laboratory					

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

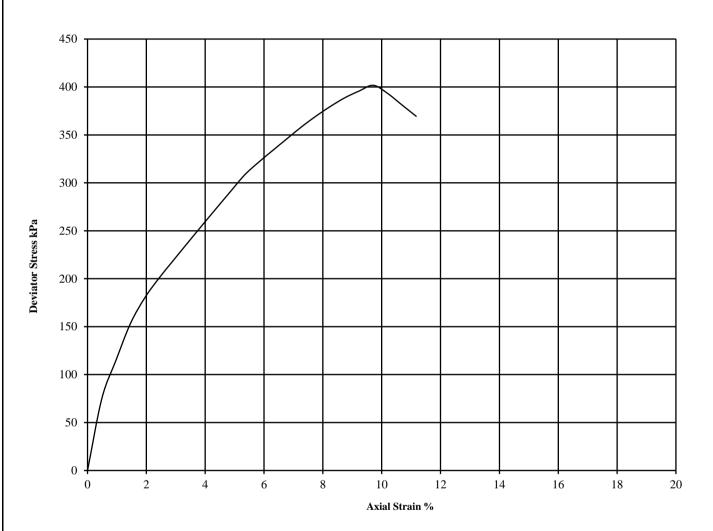
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377: Part7: 1990: Clause 8

Hole Number: BH1 Top Depth (m): 11.00

Sample Number: Base Depth (m): 11.45

Sample Type U



Diamet	er (mm):	102.0	Height	(mm):	210.0	Test:	UU Sing	gle Stage	Remarks
Specimen	Moisture	Bulk	Dry	Cell	Corr. Max.	Shear	Failure	Mode	Undisturbed Sample
	Content	Density	Density	Pressure	Deviator	Strength	Strain	of	Sample taken from top of tube
	(%)	(Mg/m3)	(Mg/m3)	(kPa)	Stress	Cu	(%)	Failure	Rate of strain = 2 %/min
					(kPa)	(kPa)			Latex Membrane used 0.2 mm thick,
				θ_3	$(\theta_1 - \theta_3)_f$	$^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$			Correction applied 0.35
1	22	1.97	1.62	220	402	201	9.7	Brittle	See summary of soil descriptions.

air	Det	Checked / Approved	EKH	Date	29/03/16	Contract No:
(> 4)				PSL16/1211		
U KAS	Professional Called about	150	Client Ref:			
4043	Professional Soils Laboratory		HLEI 39025			

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

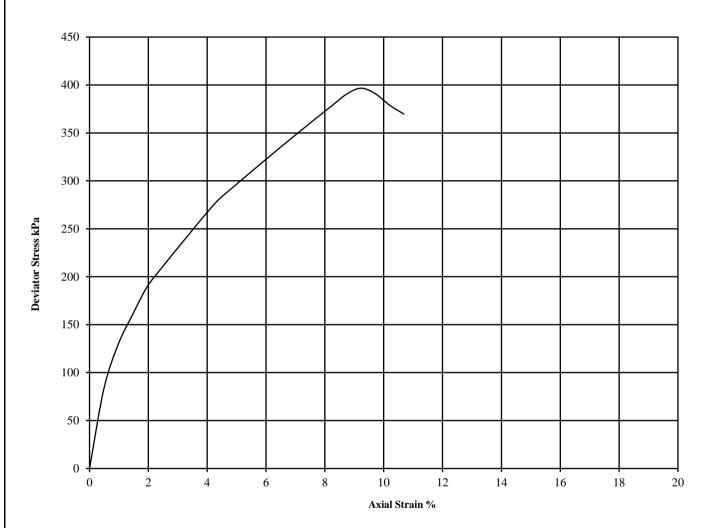
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377: Part7: 1990: Clause 8

Hole Number: BH1 Top Depth (m): 14.00

Sample Number: Base Depth (m): 14.50

Sample Type U



Diamet	er (mm):	102.0	Height	(mm):	210.0	Test:	UU Sing	gle Stage	Remarks	
Specimen	Moisture	Bulk	Dry	Cell	Corr. Max.	Shear	Failure	Mode	Undisturbed Sample	
	Content	Density	Density	Pressure	Deviator	Strength	Strain	of	Sample taken from top of tube	
	(%)	(Mg/m3)	(Mg/m3)	(kPa)	Stress	Cu	(%)	Failure	Rate of strain = 2 %/min	
					(kPa)	(kPa)			Latex Membrane used 0.2 mm thick,	
				θ_3	$(\theta_1 - \theta_3)_f$	$^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$			Correction applied 0.36	
1	22	2.06	1.69	280	397	198	9.2	Brittle	See summary of soil descriptions.	

air	Det	Checked / Approved	EKH	Date	29/03/16	Contract No:
(><)				PSL16/1211		
U K A S TESTING	Professional Called about	15	Client Ref:			
4043	Professional Soils Laboratory		HLEI 39025			

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

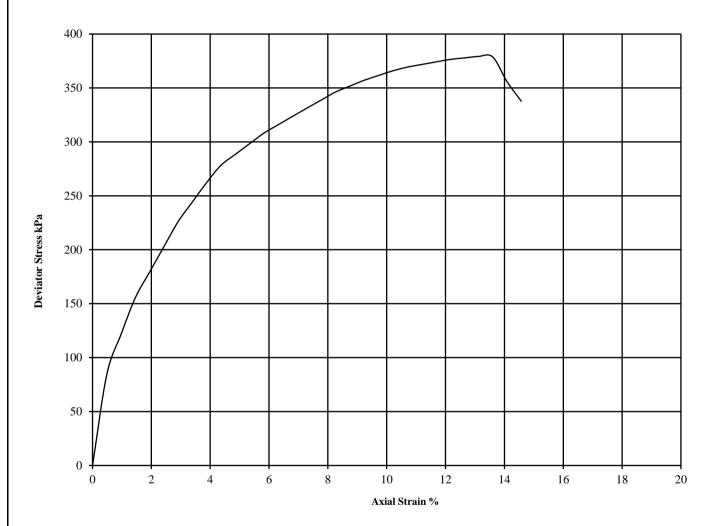
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377: Part7: 1990: Clause 8

Hole Number: BH1 Top Depth (m): 20.00

Sample Number: Base Depth (m): 20.45

Sample Type U



Diamet	er (mm):	102.0	Height	(mm):	210.0	Test:	UU Sing	gle Stage	Remarks
Specimen	Moisture	Bulk	Dry	Cell	Corr. Max.	Shear	Failure	Mode	Undisturbed Sample
	Content	Density	Density	Pressure	Deviator	Strength	Strain	of	Sample taken from top of tube
	(%)	(Mg/m3)	(Mg/m3)	(kPa)	Stress	Cu	(%)	Failure	Rate of strain = 2 %/min
					(kPa)	(kPa)			Latex Membrane used 0.2 mm thick,
				θ_3	$(\theta_1 - \theta_3)_f$	$^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$			Correction applied 0.35
1	20	2.02	1.68	400	379	190	13.1	Brittle	See summary of soil descriptions.

Gia		Checked / Approved	Contract No:	
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4043	Professional Soils Laboratory		HLEI 39025	