APPENDICES

APPENDIX E EXPLORATORY HOLE LOGS

Borehole Log

Borehole No. **BH1**

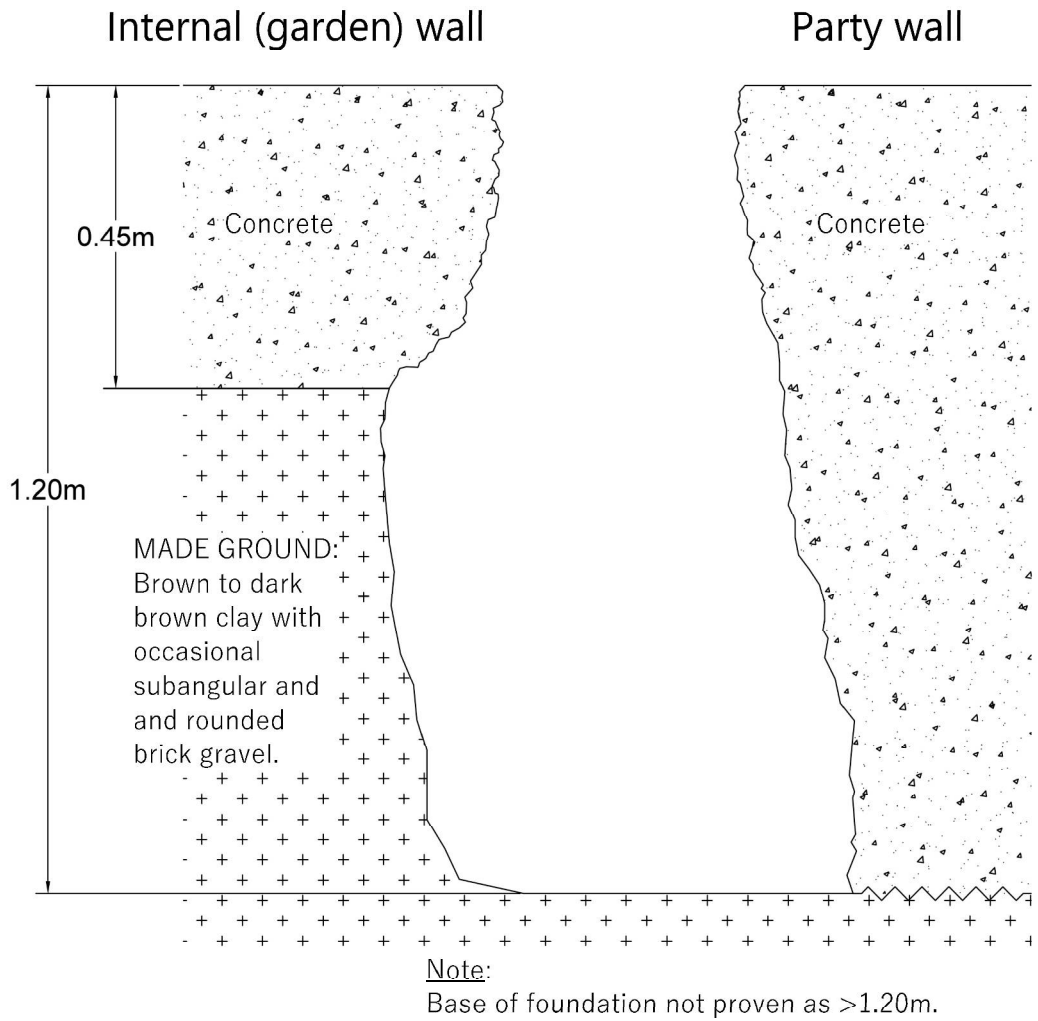
Sheet 1 of 1

Project Name: 35 Pilgrims Lane	Project No. LMB_PIlgrims	Co-ords: -	Hole Type WLS
Location: London NW3		Level:	Scale 1:50
Client: Symmetrys		Dates: 29/11/2017 - 29/11/2017	Logged By PIL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.35			MADE GROUND: dark brown sandy clay with rootlets. *occasional rootelts*
		1.00	ES					MADE GROUND: brown locally orange brown slightly gravelly clay. Gravel sub-angular brick and rare concrete.
		1.00		N=6 (1,1/1,2,1,2)				
		2.00		N=5 (1,1/1,1,2,1)				
		2.90	ES					
		3.00		N=8 (5,4/3,1,2,2)	3.00			MADE GROUND: brown very gravelly clay with occasional brick and concrete cobbles. Gravel sub-angular brick and concrete.
					3.25			Firm brown CLAY with occasional blue/grey veining. (LONDON CLAY FORMATION). *3.60m Calcareous mudstone nodule* *relict root traces and occasional orange/brown silty partings.*
		3.50	D	HVP=60				
		4.00		N=13 (2,3/3,3,3,4)				
		4.50	D	HVP=65	4.50			Firm brown to grey slightly silty CLAY with occasional orange/brown silty fine sand partings. Closely to very closely fissured (LONDON CLAY FORMATION). *Mudstone nodule*
		5.00		N=10 (2,2/2,2,3,3)				
		5.50	D	HVP=65				
		6.00		N=14 (2,3/3,3,4,4)	6.00			Stiff dark grey brown CLAY. Very closely fissured. (LONDON CLAY FORMATION). *6.0m frequent blue/grey veining.*
		6.70	D	HVP=80				
		7.00		62 (4,4/62 for 230mm)				
					7.30			Hard grey calcareous MUDSTONE.
					7.35			End of borehole at 7.00 m

Remarks

AGS



Note:
Base of foundation not proven as >1.20m.

PLATE 1: EXCAVATION

ENVIRONMENTAL SAMPLES:
- ES 0.6m
- D 0.6m

TRIAL PIT 1 (TP1)

LMB
Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

PHOTOGRAPHS AND SECTIONS

PROJECT:
35 PILGRIM'S LANE

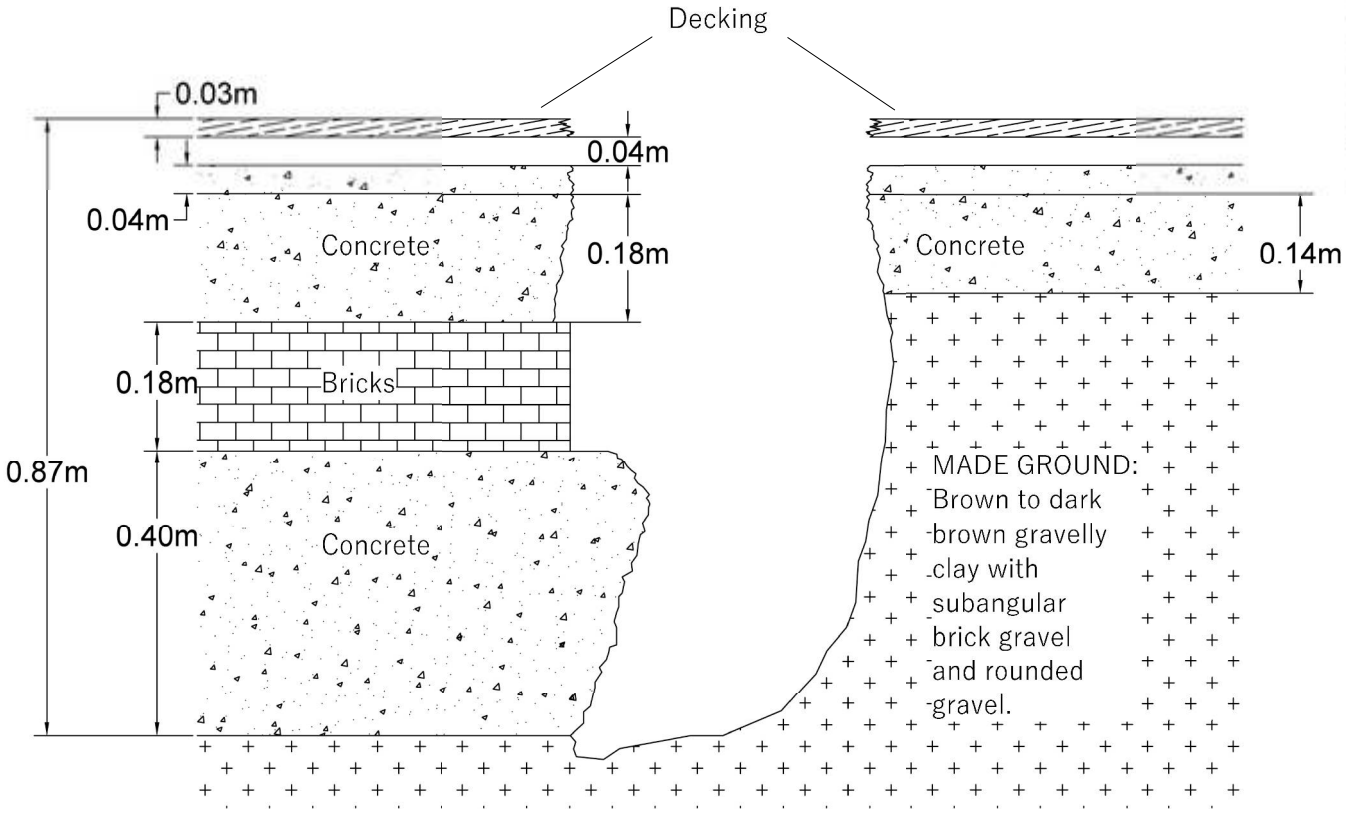


PLATE 1: EXCAVATION

ENVIRONMENTAL SAMPLES:
- ES 0.8m
- D 0.8m

TRIAL PIT 2 (TP2)

LMB
Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

PHOTOGRAPHS AND SECTIONS

PROJECT:
35 PILGRIM'S LANE

APPENDICES

APPENDIX F GEOTECHNICAL LABORATORY RESULTS

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

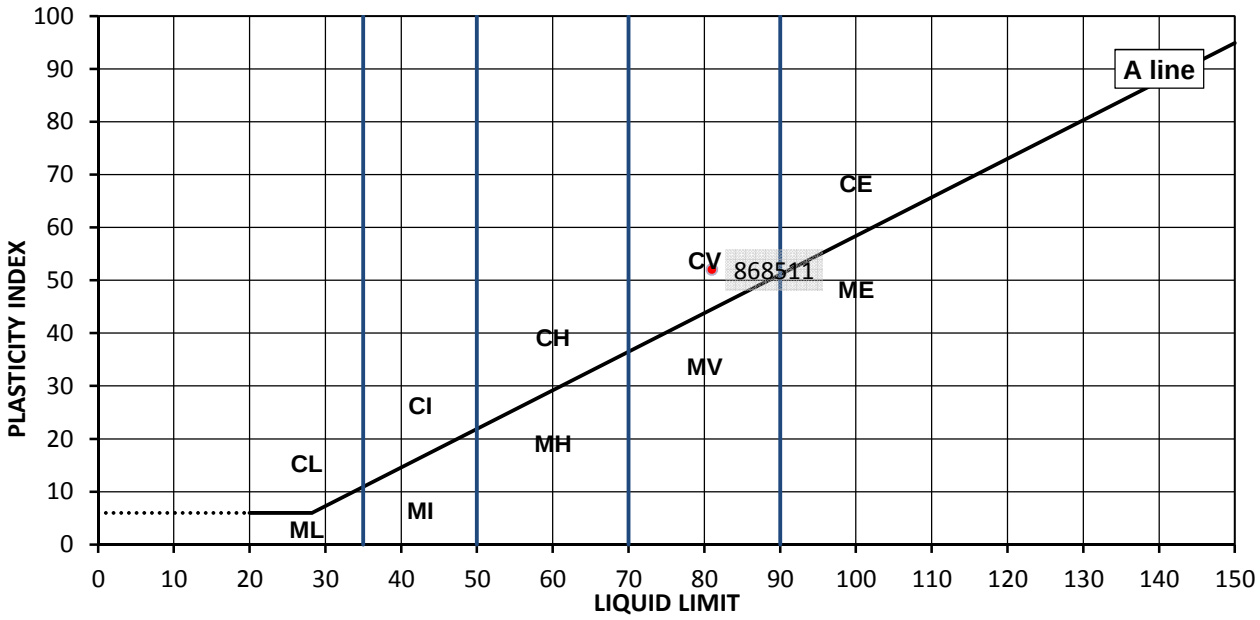
Client:	LMB Geosolutions Ltd	Client Reference:	17-69490
Client Address:	28 Dresden Road London N19 3BD	Job Number:	17-69490
		Date Sampled:	29/11/2017
		Date Received:	29/11/2017
Contact:	Philip Lewis	Date Tested:	12/12/2017
Site Name:	35 Pilgrim's Lane	Sampled By:	PIL/LIS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 868511
Sample Reference: Not Given

Description:	Brown CLAY	Sample Type:	D
Location:	BH1	Depth Top [m]:	3.50
Sample Preparation:	Tested in natural condition	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
30	81	29	52	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 18/12/2017

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

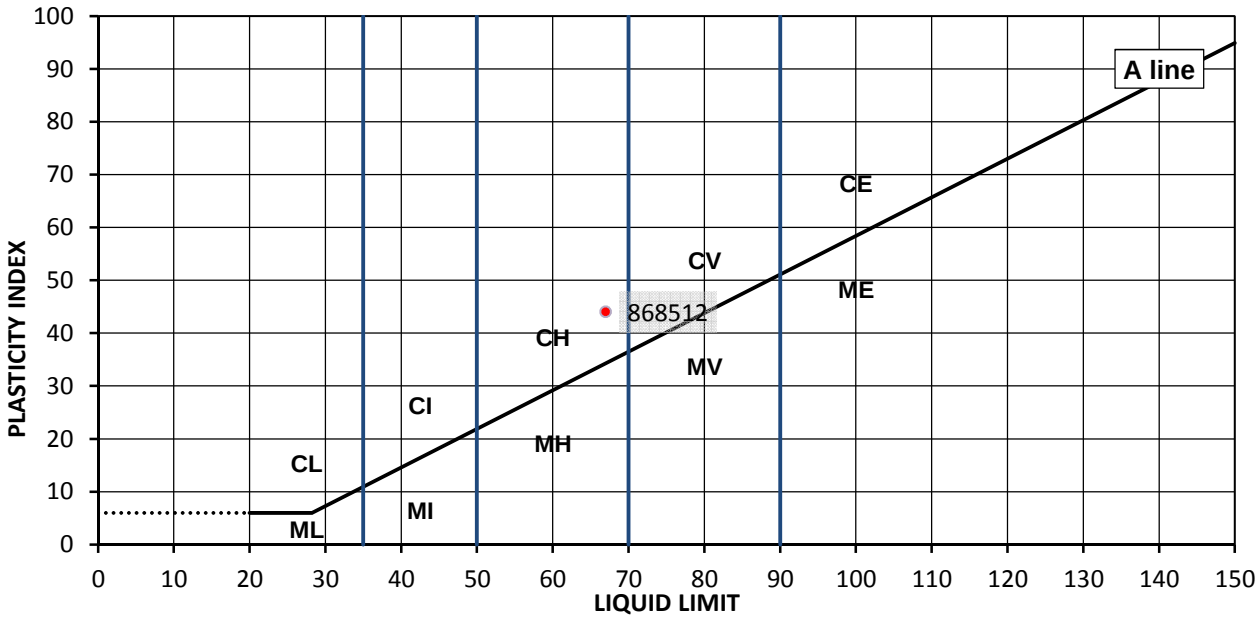
Client:	LMB Geosolutions Ltd	Client Reference:	17-69490
Client Address:	28 Dresden Road London N19 3BD	Job Number:	17-69490
		Date Sampled:	29/11/2017
		Date Received:	29/11/2017
Contact:	Philip Lewis	Date Tested:	12/12/2017
Site Name:	35 Pilgrim's Lane	Sampled By:	PIL/LIS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 868512
Sample Reference: Not Given

Description:	Brown CLAY	Sample Type:	D
Location:	BH1	Depth Top [m]:	5.50
Sample Preparation:	Tested in natural condition	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
32	67	23	44	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 18/12/2017

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Summary of Classification Test Results

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Client: LMB Geosolutions Ltd
Client Address: 28 Dresden Road
London
N19 3BD

Contact: Philip Lewis
Site Name: 35 Pilgrim's Lane
Site Address: Not Given

Client Reference: 17-69490
Job Number: 17-69490
Date Sampled: 29/11/2017
Date Received: 29/11/2017
Date Tested: 12/12/2017
Sampled By: PIL/LIS

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Atterberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk Mg/m3	dry Mg/m3	%	% Passing 425um %	LL %	PL %	PI %	Mg/m3
868511	BH1	Not Given	3.50	Not Given	D	Brown CLAY			30	100	81	29	52	
868512	BH1	Not Given	5.50	Not Given	D	Brown CLAY			32	100	67	23	44	

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 18/12/2017

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

APPENDICES

APPENDIX G CHEMICAL LABORATORY TESTING RESULTS

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28 Dresden Road
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N19 3BD

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WD18 8YS

t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 17-69392

Project / Site name:	35 Pilgrim's Lane	**Samples received on:**	29/11/2017
Your job number:		**Samples instructed on:**	01/12/2017
Your order number:		**Analysis completed by:**	13/12/2017
Report Issue Number:	1	**Report issued on:**	13/12/2017
Samples Analysed:	4 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 17-69392

Project / Site name: 35 Pilgrim's Lane

Lab Sample Number				868029	868030	868031	868032	
Sample Reference				BH1	BH1	BH1	TP2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				1.00	2.90	5.50	0.60	
Date Sampled				29/11/2017	29/11/2017	29/11/2017	29/11/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	-	17	20	18	
Total mass of sample received	kg	0.001	NONE	-	1.1	0.33	1.3	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	7.3	7.2	-	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.052	2.4	-	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	< 0.80	-	< 0.80	

Analytical Report Number: 17-69392

Project / Site name: 35 Pilgrim's Lane

Lab Sample Number				868029	868030	868031	868032	
Sample Reference				BH1	BH1	BH1	TP2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				1.00	2.90	5.50	0.60	
Date Sampled				29/11/2017	29/11/2017	29/11/2017	29/11/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	15	-	10	
Boron (water soluble)	mg/kg	0.2	MCERTS	-	2.6	-	1.7	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	46	-	24	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	21	-	26	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	56	-	77	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	26	-	13	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	-	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	57	-	43	
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	-	150	-	-	

Analytical Report Number : 17-69392

Project / Site name: 35 Pilgrim's Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
868029	BH1	None Supplied	1.00	-
868030	BH1	None Supplied	2.90	Light brown clay and sand with gravel.
868031	BH1	None Supplied	5.50	Light brown clay.
868032	TP2	None Supplied	0.60	Light brown clay with gravel.

Analytical Report Number : 17-69392

Project / Site name: 35 Pilgrim's Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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N19 3BD

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WD18 8YS

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e: reception@i2analytical.com

Analytical Report Number : 17-69393

Project / Site name:	35 Pilgrim's Lane	**Samples received on:**	29/11/2017
Your job number:		**Samples instructed on:**	01/12/2017
Your order number:		**Analysis completed by:**	13/12/2017
Report Issue Number:	1	**Report issued on:**	13/12/2017
Samples Analysed:	1 10:1 WAC sample.		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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7 Woodshots Meadow
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Watford, WD18 8YS

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email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**17-69393**						
					Client:	**LMBGEOSOL**	
Location	**35 Pilgrim's Lane**						
Lab Reference (Sample Number)	868033 / 868034				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	29/11/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH1						
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	0.4				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	-				6000	--	--
Sum of PCBs (mg/kg) **	-				1	--	--
Mineral Oil (mg/kg)	-				500	--	--
Total PAH (WAC-17) (mg/kg)	-				100	--	--
pH (units)**	8.2				--	>6	--
Acid Neutralisation Capacity (mol / kg)	5.7				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0049			0.0357	0.5	2	25
Barium *	0.0135			0.0985	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0041			0.030	0.5	10	70
Copper *	0.0031			0.023	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0098			0.0717	0.5	10	30
Nickel *	0.0025			0.019	0.4	10	40
Lead *	0.0076			0.055	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0061			0.045	4	50	200
Chloride *	1.9			14	800	4000	25000
Fluoride	0.91			6.6	10	150	500
Sulphate *	4.0			29	1000	20000	50000
TDS	76			560	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.99			43.7	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.1						
Dry Matter (%)	85						
Moisture (%)	15						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation
** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Analytical Report Number : 17-69393

Project / Site name: 35 Pilgrim's Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
868033	BH1	None Supplied	1.00	Brown clay and sand with gravel and brick.

Analytical Report Number : 17-69393

Project / Site name: 35 Pilgrim's Lane

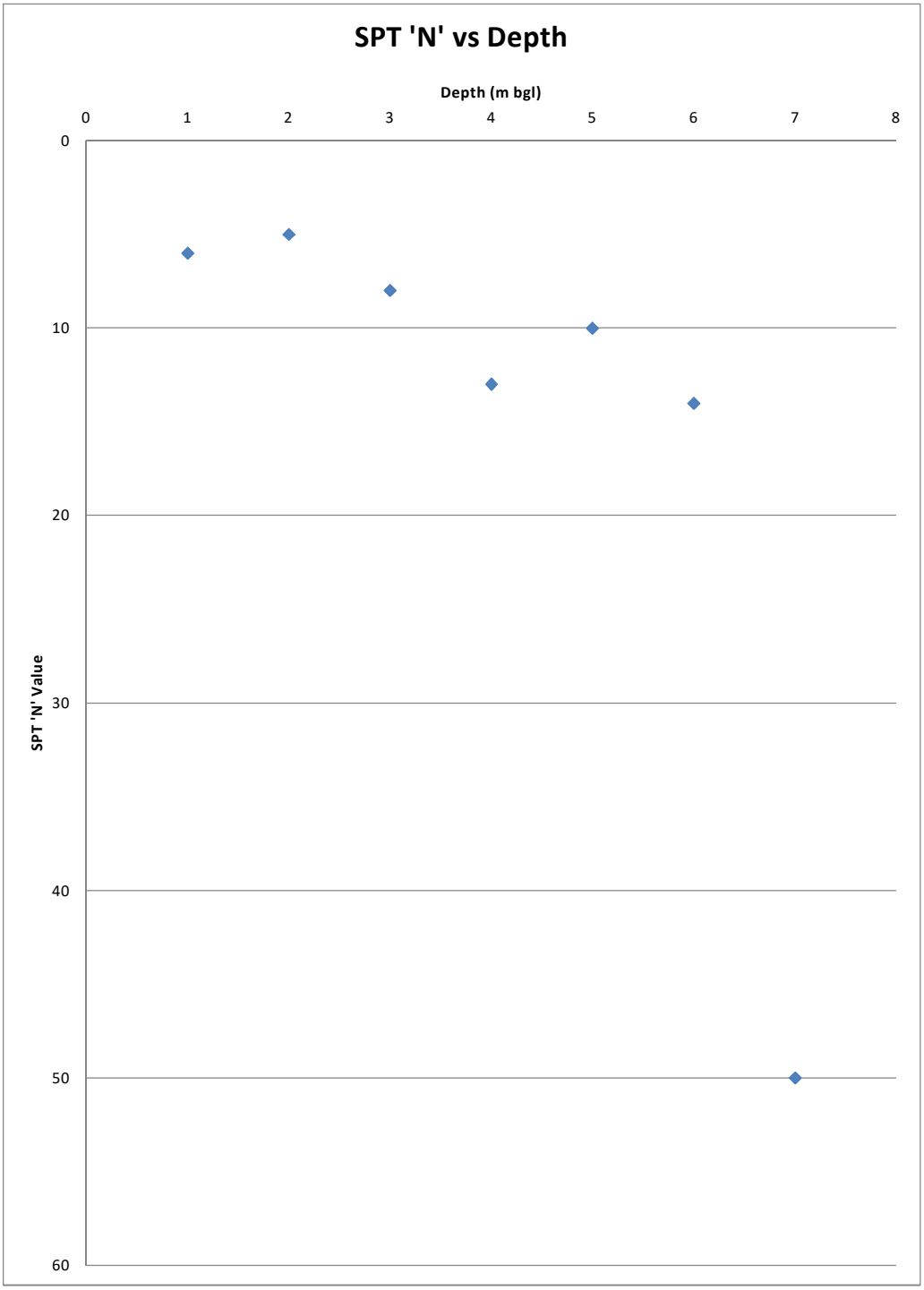
Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDICES

APPENDIX H PLOT OF SPT ‘N’ VLAUE VS DEPTH



LMB GEOSOLUTIONS LTD

SPT N DEPTH PLOT

Project: 35 Pilgrims Lane, London NW3
Client: Nori Bali
Logged By: PIL

Depth	SPT N BH1	Geol
1	6	MG
2	5	MG
3	8	MG
4	13	LC
5	10	LC
6	14	LC
7	50	LC

APPENDICES

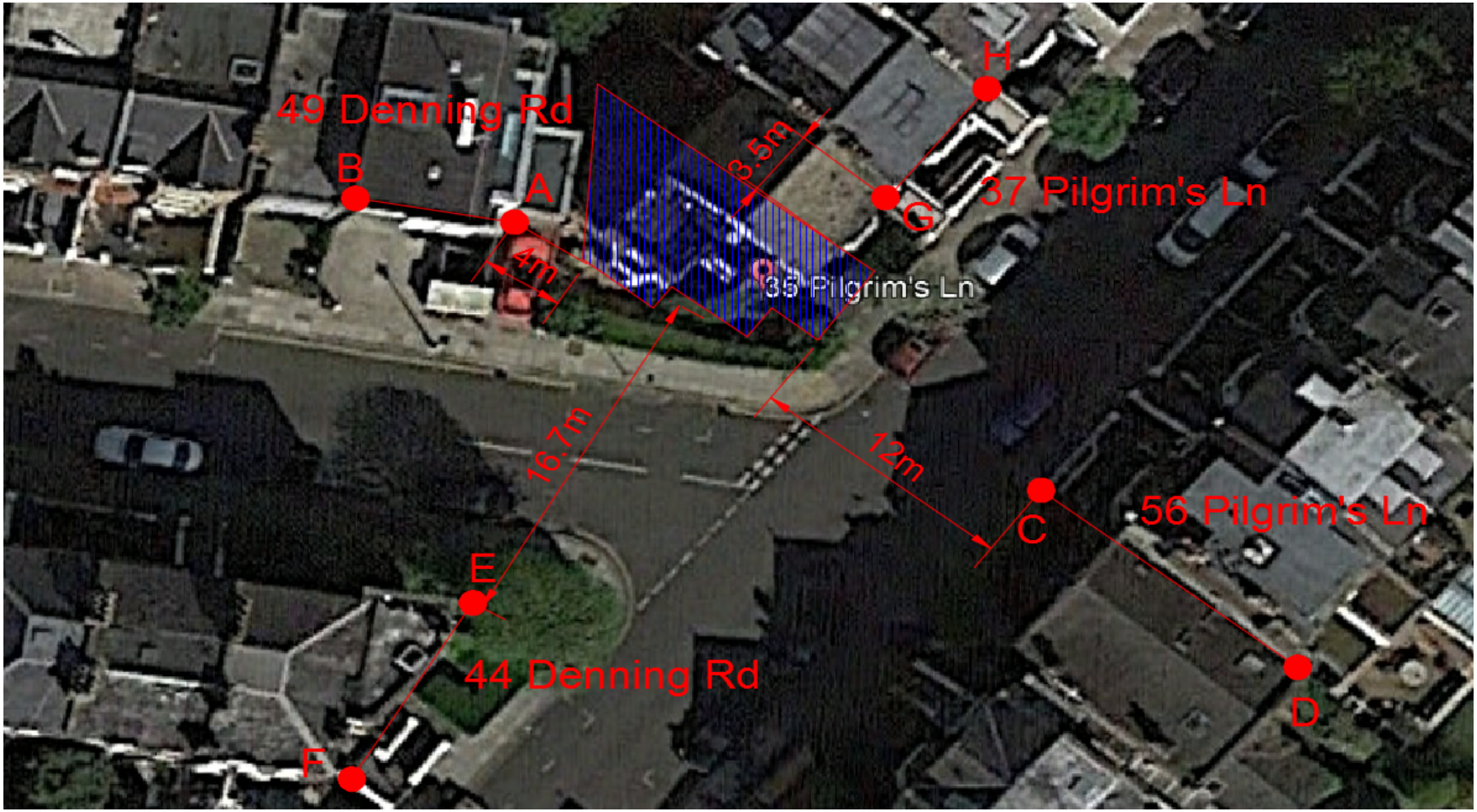
APPENDIX I GMA CALCULATION WORKSHEETS

Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Calc No.	Sheet No.	Rev
	1	A

Calculation Sheet

Project	Ground Movement Assessment	Made by	CC
Location	35 Pilgrim's Lane - London NW3 1SS	Date	27.02.18



Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Calc No.	Sheet No.	Rev
	2	A

Calculation Sheet

Project	Ground Movement Assessment	Made by	CC
Location	35 Pilgrim's Lane - London NW3 1SS	Date	27.02.18

Assumptions

Underpins
Propping System will be utilised

Max Excavation Depth 3.30 m
Wall Depth 3.30 m

Nearby Structure	Note	Point	Distance from wall (m)	Ground movements arising from wall installation					Ground movements arising from excavation in front of wall				
				Distance from wall / wall depth	Horizontal movement / wall depth (%) Fig. 6.9a	Horizontal movement (mm)	Settlement / wall depth (%) Fig. 6.9b	Vertical movement (mm)	Distance from wall / max excavation depth	Horizontal movement / max excavation depth (%)	Horizontal movement (mm)	Settlement / max excavation depth (%)	Vertical movement (mm)
49 Denning Road	Existing Basement	A	4.0	1.2	0.01	0.3	0.00	0.00	1.2	0.13	4.3	0.18	5.9
		B	8.0	2.4	0.00	0.0	0.00	0.00	2.4	0.08	2.6	0.06	2.0
56 Pilgrim's Lane	-	C	12.0	3.6	0.00	0.0	0.00	0.00	3.6	0.01	0.3	0.00	0.0
		D	27.0	8.2	0.00	0	0.00	0.00	8.2	0.00	0.0	0.00	0.0
44 Denning Road	-	E	16.7	5.1	0.00	0.0	0.00	0.00	5.1	0.00	0.0	0.00	0.0
		F	27.7	8.4	0.00	0	0.00	0.00	8.4	0.00	0.0	0.00	0.0
37 Pilgrim's Lane	-	G	3.5	1.1	0.018	0.6	0.00	0.00	1.1	0.14	4.6	0.19	6.3
		H	11.0	3.3	0.00	0	0.00	0.00	3.3	0.04	1.3	0.00	0.0

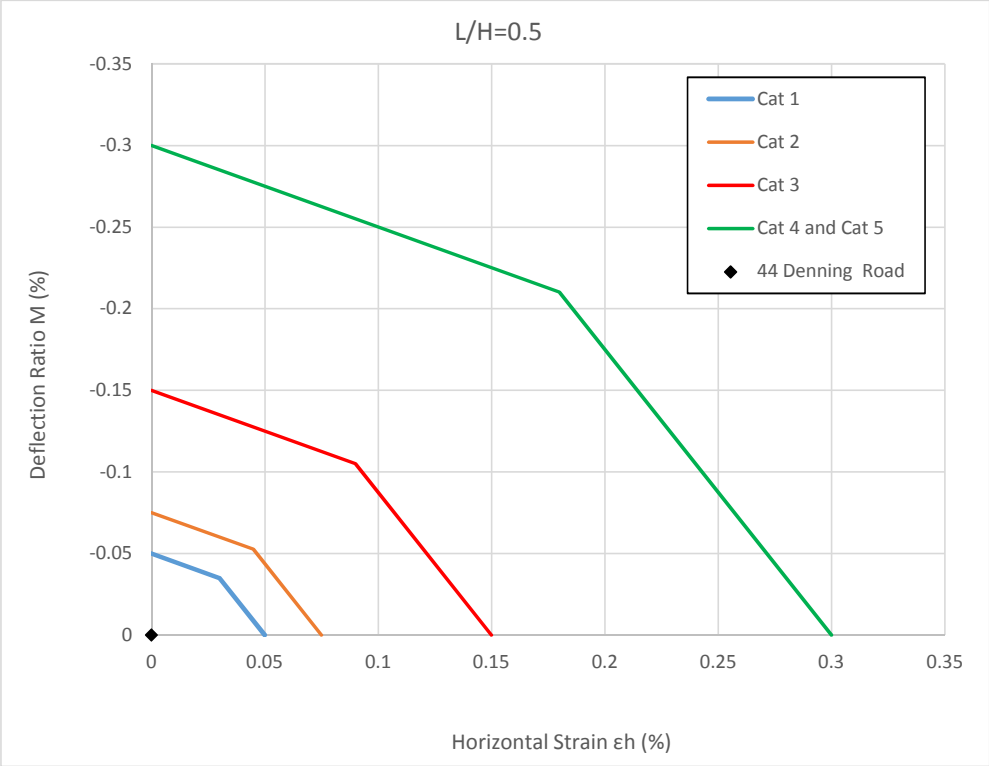
Nearby Structure	Total Movements										
	Corner Effect	Total horizontal movement (mm)	Total vertical movement (mm)	L (m)	H (m)	L/H	Δ (mm)	Tilt (1/x)	M=Δ/L (%)	δh (mm)	εh=δh/L (%)
49 Denning Road	N	4.6	5.9	10.0	13.0	0.8	0.0	-	0.000	2.0	0.020
		2.6	2.0								
56 Pilgrim's Lane	N	0.3	0.0	15.0	13.0	1.2	0.0	-	0.000	0.3	0.002
		0.0	0.0								
44 Denning Road	N	0.0	0.0	11.0	15.0	0.7	0.0	-	0.000	0.0	0.000
		0.0	0.0								
37 Pilgrim's Lane	N	5.2	6.3	7.5	10.0	0.8	0.1	75000	0.001	3.9	0.052
		1.3	0.0								

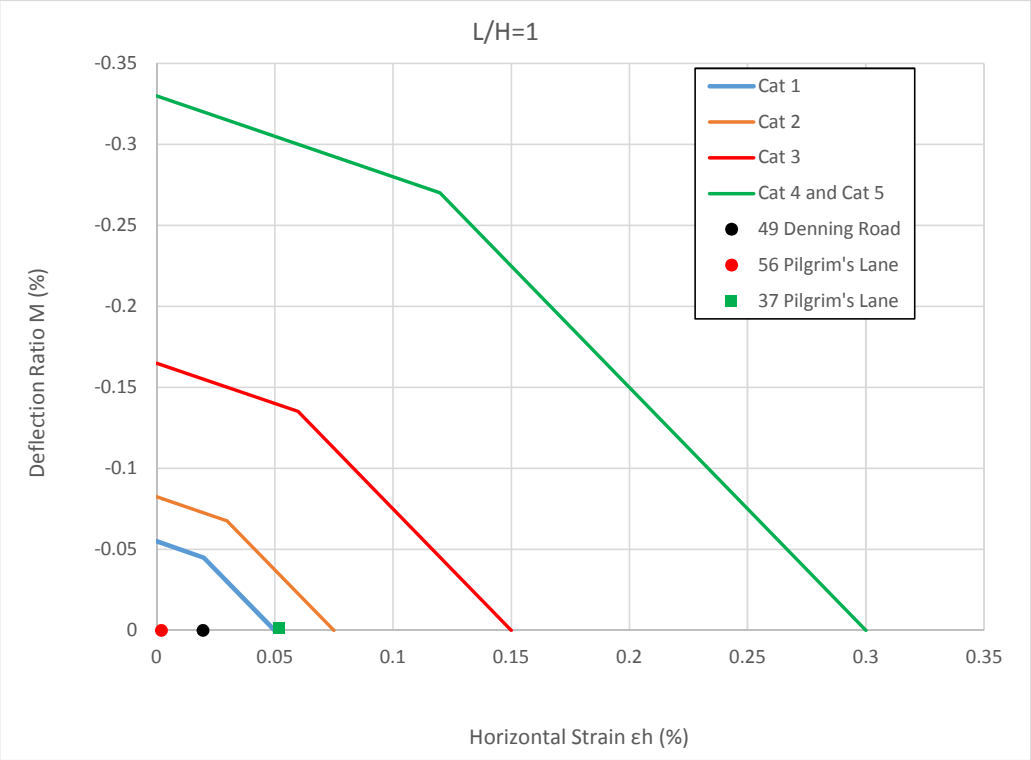
Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Calc No.	Sheet No.	Rev
	3	A

Calculation Sheet

Project	Ground Movement Assessment	Made by	CC
Location	35 Pilgrim's Lane - London NW3 1SS	Date	27.02.18



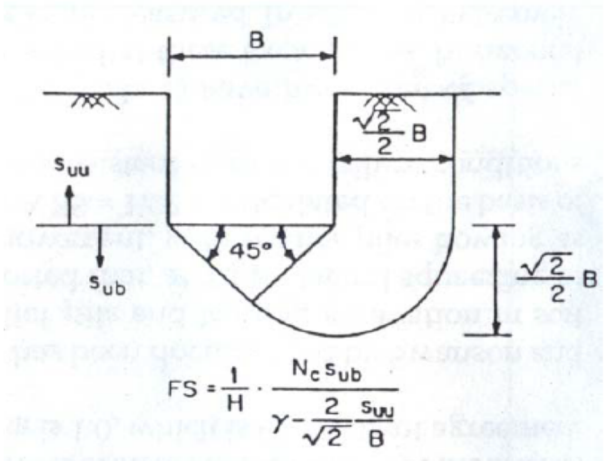


Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Calc No.	Sheet No.	Rev
	4	A

Calculation Sheet

Project	Ground Movement Assessment	Made by	CC
Location	35 Pilgrim's Lane - London NW3 1SS	Date	27.02.18



Terzaghi's Method to assess Factor of Safety against Bottom Heave (Fig. 6.2 in CIRIA C760).

B	5.5 m	Excavation Width
H	3.3 m	Excavation Depth
Nc	5.7	
Sub	65 kPa	Undrained Shear Strength (Firm Clay)
Suu	36 kPa	Undrained Shear Strength (Soft Clay N=8)
γ_s	19 kN/m³	Bulk Unit Weight of Soil
FoS	11.5	Factor of Safety against Bottom Heave (after Terzaghi, 1943)

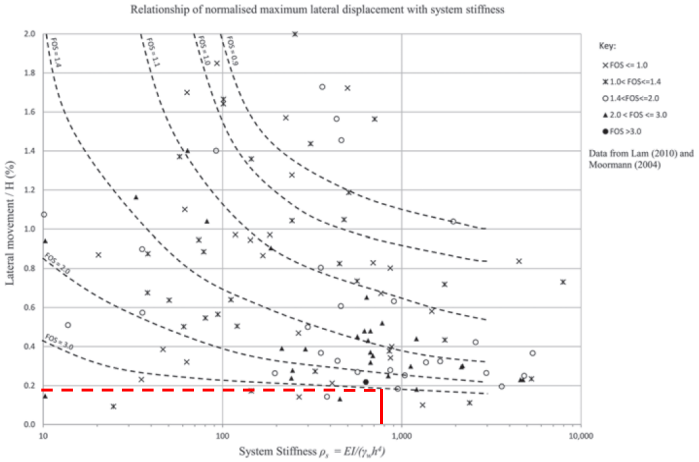


Figure 6.12 Relationship of normalised maximum lateral displacement with system stiffness

E	1.70E+07	kPa	Wall Stiffness (Long Term)
b	0.3	m	Wall Width
I	0.00225	m^4/m	Moment of Inertia
γ_w	10	kN/m³	Bulk Unit Weigth of Water
h	1.5	m	Props Vertical Spacing
ρ_s	756		System Stiffness (after Clough et al, 1989)

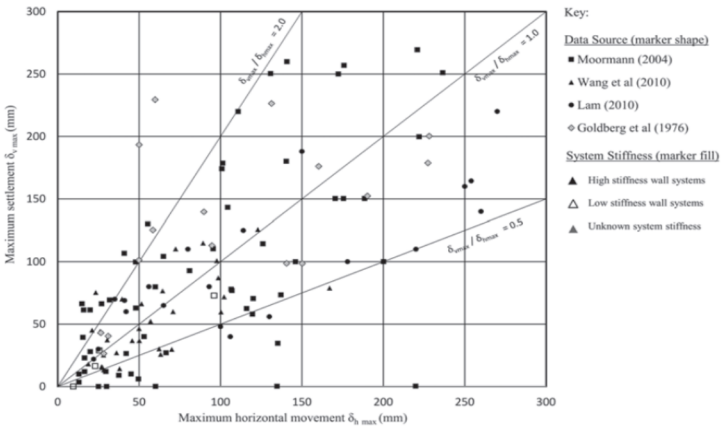
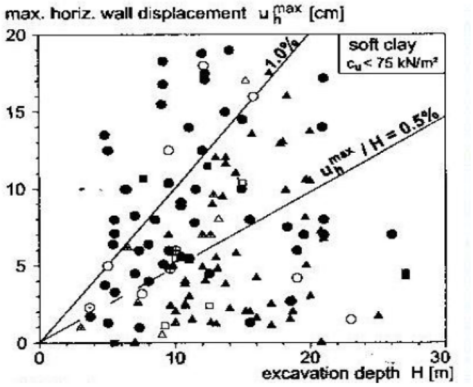
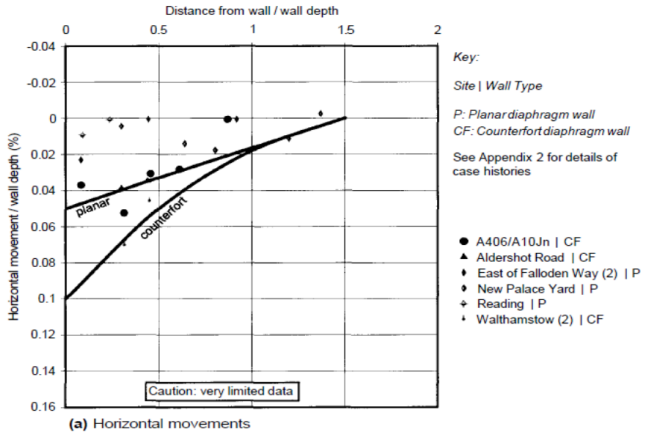


Figure 6.13 Relationship between maximum lateral and vertical ground movements

Variation of maximum horizontal displacement with excavation depth following Moormann (2004).





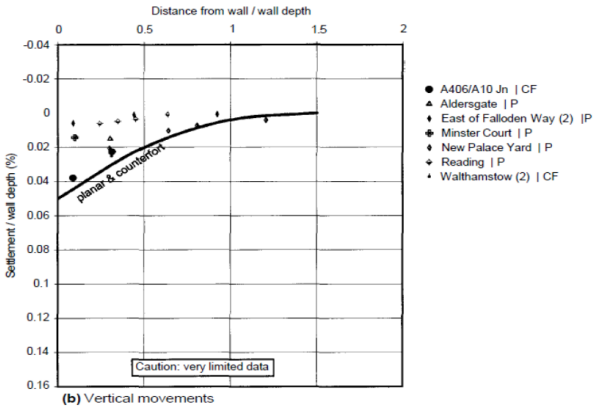
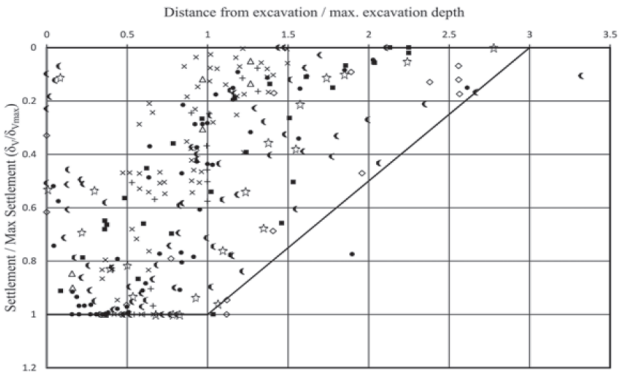


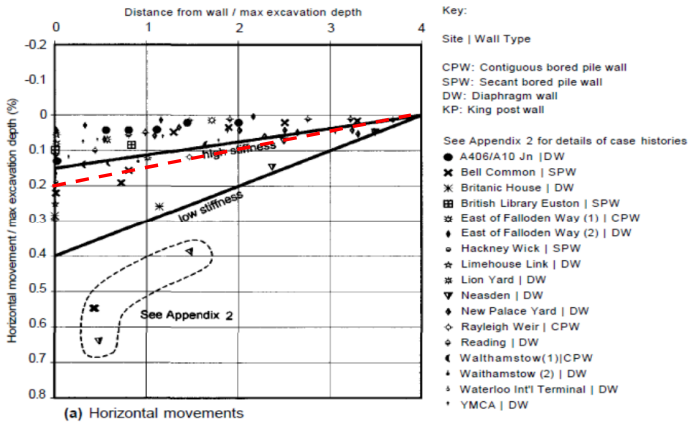
Fig. 6.9 *Ground surface movements due to diaphragm wall installation in stiff clay*



b Normalised ground settlements in soft to firm clay

Figure 6.11 Normalised ground surface settlements due to excavation in soft and firm clay and settlements behind the wall based on the same data

Soft to Firm Clay



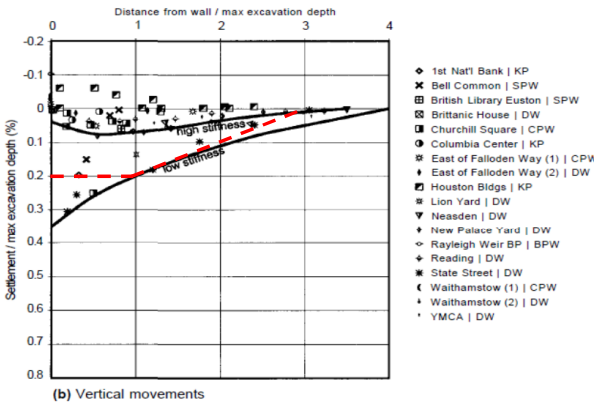


Fig. 6.15 *Ground surface movements due to excavation in front of wall in stiff clay*