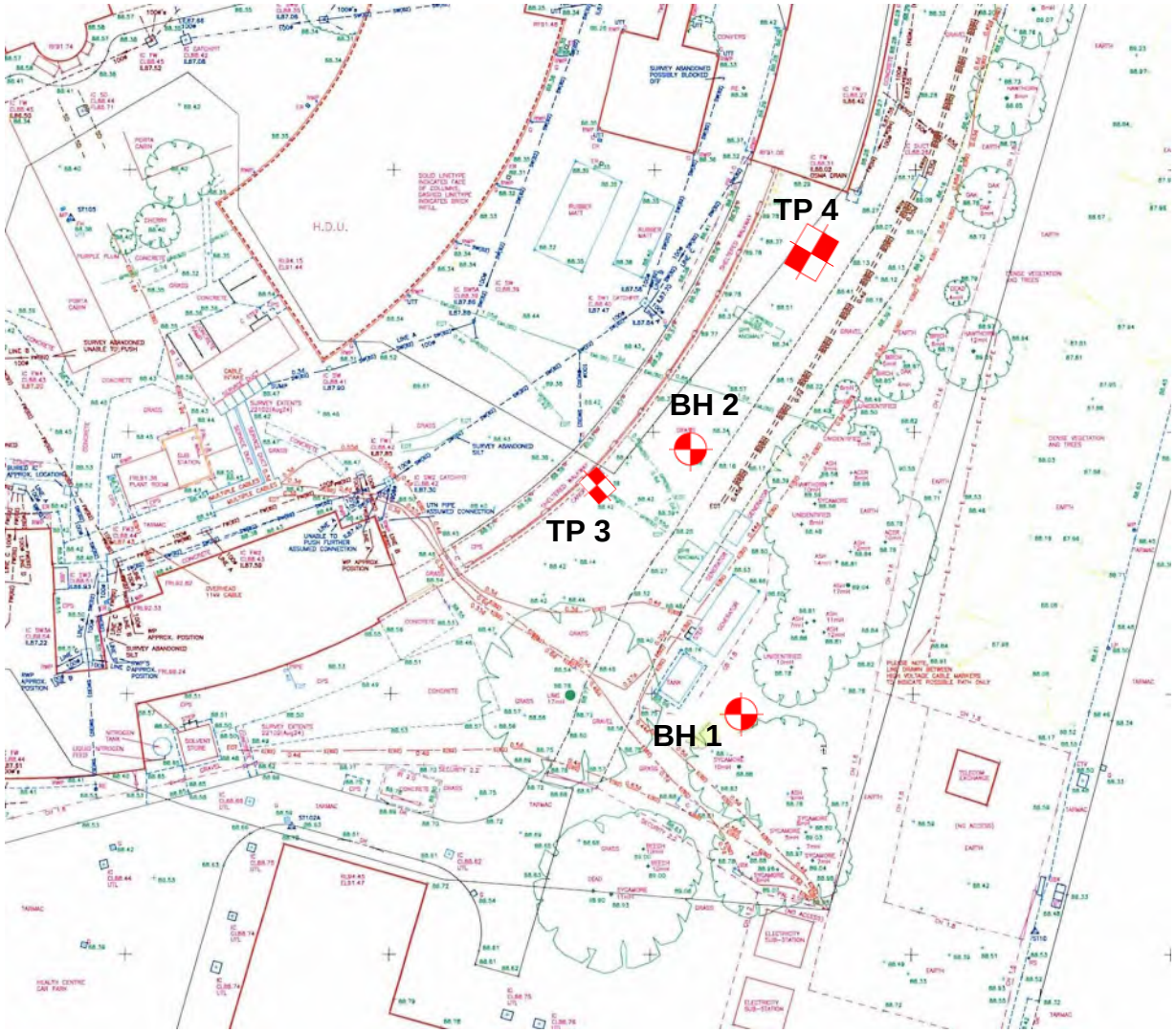
Exploratory Hole Location Plan – East of Heart Science Centre

Reproduced from a topographical plan provided by the client (Not to scale)



Key –

Borehole

Trial Pit

Project : Harefield Hospital – Stage 3 Surveys

Client : CAM & Co. Consulting Limited

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Protecting people and planet

LUCION GROUND ENGINEERING LIMITED
Peterborough Tel : 01733 566566

Project No.
118858

GROUND ENGINEERING LIMITED

Tel: 01733-566566
www.groundengineering.co.uk

Site: HAREFIELD HOSPITAL - STAGE 3 SURVEYS

Date: 02/10/24

Hole Size: 150mm dia to 15.00m

BOREHOLE BH1

Ground Level: 88.70m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
0.00-0.40	B1			MADE GROUND - Brown and orange brown, slightly clayey SAND AND GRAVEL. Gravel of brick, concrete, flint, quartz and ceramics.		0.40	88.30
0.40-0.60	B2						
0.60-0.80	B3			MADE GROUND - Dark brown and brown, silty, gravelly SAND topsoil with occasional fibrous roots. Gravel of flint and quartzite.		0.60	88.10
0.80-1.20	B4			MADE GROUND - Dark brown, clayey SAND AND GRAVEL with occasional fibrous roots. Gravel of flint, quartz, ironstone, chalk and ash.		0.80	87.90
1.20-1.70	B5						
1.35-1.65	C	N54		Very dense, orange brown, initially clayey, silty SAND AND GRAVEL. Gravel of angular to rounded flint, quartz and quartzite.			
1.70-2.00	B6						
2.00-2.50	B7		c▼w				
2.15-2.32	C	50*		(GERRARDS CROSS GRAVEL MEMBER)			
2.50-3.20	B8						
			1 ▼				
3.20-3.70	B9					3.20	85.50
3.35-3.50	C	50*	3.00	Very dense, orange brown, slightly silty, very sandy GRAVEL. Gravel of angular to rounded flint, quartz and quartzite. (GERRARDS CROSS GRAVEL MEMBER)			
4.00-4.50	B10					4.00	84.70
4.00	W1			Medium dense, orange brown, slightly silty SAND AND GRAVEL. Gravel of angular to rounded flint, quartz and quartzite.			
4.15-4.45	C	N14	4.00				
5.00-5.50	B11			(GERRARDS CROSS GRAVEL MEMBER)			
5.15-5.45	C	N12	5.00				
5.60-6.00	B12					5.60	83.10
5.60	W2			Firm, brown, orange brown and grey mottled, silty CLAY. (WEATHERED LONDON CLAY FORMATION)			
6.00-6.40	U1	40	6.00			6.00	82.70
6.40	D1			Firm, becoming stiff, closely fissured, grey brown, silty CLAY.			
7.00-7.45	U2	40	6.00				
7.45	D2						
8.00	D3			(LONDON CLAY FORMATION)			
8.50-8.95	U3	40	6.00				
8.95	D4						
9.50	D5					10.00	78.70

REMARKS 1. Excavating a pit from 0.00m to 1.20m for 1.25 hours
2. Water added from 3.20m to 5.00m
3. Borehole cased to 6.00m depth

Project No 118858

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KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/*- SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▼c Level on completion
c▼w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
1	3.00	2.90	slow	2.70	6.00	02/10/24	15.00	6.00	dry
						02/10/24	15.00	0.00	2.00

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Site: HAREFIELD HOSPITAL - STAGE 3 SURVEYS

BOREHOLE
BH1

Date: 02/10/24

Hole Size: 150mm dia to 15.00m

Ground Level: 88.70m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
10.10-10.55	U4	55	6.00	Very stiff, closely fissured, grey brown, silty CLAY with occasional silt partings.		10.00	78.70
10.65	D6						
11.00	D7						
11.50-11.95	U5	55	6.00				
11.95	D8						
12.50	D9						
				(LONDON CLAY FORMATION)			
13.00-13.45	U6	53	6.00				
13.45	D10						
14.00	D11						
14.60-15.00	U7	60	6.00				
15.00	D12					15.00	73.70
				Borehole completed at 15.00m depth			

REMARKS

Project No
118858

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▼c Level on completion
c▼w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water

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Site: HAREFIELD HOSPITAL - STAGE 3 SURVEYS

Date: 03/10/24

Hole Size: 150mm dia to 15.00m

BOREHOLE BH2

Ground Level: 88.40m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
0.00-0.10	B1			MADE GROUND - Soft, brown and orange brown mottled, slightly sandy, slightly gravelly, silty CLAY with occasional fibrous roots. Gravel of flint, glass and concrete.		0.10	88.30
0.10-0.40	B2					0.40	88.00
0.40-0.60	B3			MADE GROUND - Dark brown and brown, silty, gravelly SAND topsoil. Gravel of flint and quartzite.		0.80	87.60
0.60-0.80	B4						
0.80-1.20	B5			MADE GROUND - Brown and dark brown, clayey, sandy GRAVEL. Gravel of brick, flint and quartzite.			
1.20-1.70	B6						
1.35-1.58	C	52*		Very dense, orange brown, clayey, becoming silty SAND AND GRAVEL. Gravel of angular to rounded flint, quartz and quartzite.			
2.00-2.50	B7		c▼w				
2.15-2.45	C	N56					
				(GERRARDS CROSS GRAVEL MEMBER)			
3.00-3.40	B8		1 ▼				
3.15-3.37	C	50*					
3.40-4.00	B9		1 ▽				
						4.00	84.40
4.10-4.60	B10			Medium dense, orange brown, slightly silty SAND AND GRAVEL with occasional flint cobbles. Gravel of angular to rounded flint, quartz and quartzite.			
4.25-4.55	C	N13	4.00				
5.00-5.40	B11			(GERRARDS CROSS GRAVEL MEMBER)			
5.00	W1						
5.15-5.45	C	N10	5.00				
						5.40	83.00
5.40-5.70	B12			Firm, brown, orange brown and grey mottled, silty CLAY. (WEATHERED LONDON CLAY FORMATION)		5.70	82.70
5.80-6.25	U1	40	5.80	Stiff, closely fissured, grey brown, silty CLAY with a cobble size nodule of medium strong, grey, concretionary limestone at 7.40m depth.			
6.25	D1						
6.80-7.20	U2	40	6.00				
7.40-7.70	B13		2 ▽				
8.50-8.95	U3	45	6.00	(LONDON CLAY FORMATION)			
8.95	D2						
9.50	D3						
10.00-10.45	U4	50	6.00			10.00	78.40

REMARKS
1. Excavating a pit from 0.00m to 1.20m for 1.25 hours
2. Water added from 4.00m to 4.50m
3. Borehole cased to 6.00m depth
4. Chiselling from 7.40m to 7.60m for 0.50 hours

Project No 118858

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▼c Level on completion
c▼w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed
1	3.40	3.10	steady	3.00	6.00
2	7.40		slow	6.00	not

Groundwater Observations

Date	Depth m Hole	Casing	Water
03/10/24	15.00	6.00	damp
03/10/24	15.00	0.00	2.10

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BOREHOLE
BH2

Date: 03/10/24

Hole Size: 150mm dia to 15.00m

Ground Level: 88.40m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
				Very stiff, closely fissured, locally to stiff, grey brown, silty CLAY with occasional silt partings.		10.00	78.40
10.45	D4						
11.00	D5						
11.50-11.95	U5	50	6.00				
11.95	D6						
12.50	D7						
				(LONDON CLAY FORMATION)			
13.00-13.45	U6	50	6.00				
13.45	D8						
14.00	D9						
14.50-14.95	U7	56	6.00				
15.00	D10					15.00	73.40
				Borehole completed at 15.00m depth			

REMARKS

Project No 118858

Scale 1:50

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Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water

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Results of Standard Penetration Tests

118858 - Harefield Hospital - Stage 3 Surveys

BH.No.	Depth (m)	Casing Depth (m)	Depth to Water (m)	Type of Test *	Seating Drive Blows /Penetration (mm)	Test Drive: 300mm. Blows for each successive 75mm penetration				N Value	Extra-polated N Value
BH1	1.20-1.65			C	25 / 150	15	14	12	13	54	
	2.00-2.32			C	22 / 150	20	25	5/15			
	3.20-3.50	3.00	2.90	C	35 / 150	25	25				
	4.00-4.45	4.00	3.30	C	3 / 150	3	3	4	4	14	
	5.00-5.45	5.00	4.00	C	3 / 150	2	3	3	4	12	
BH2	1.20-1.58			C	25 / 150	18	20	14			
	2.00-2.45			C	12 / 150	11	16	14	15	56	
	3.00-3.37			C	21 / 150	18	16	16/70			
	4.10-4.55	4.00	3.20	C	6 / 150	4	3	3	3	13	
	5.00-5.45	5.00	4.00	C	4 / 150	3	2	2	3	10	

*** C denotes test using a solid cone**
S denotes test using a split barrel sampler

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Site: HAREFIELD HOSPITAL - STAGE 3 SURVEYS

TRIAL PIT
TP1

Date: 30/09/24

Pit Size: 0.50m L x 0.43m W x 1.05m D.

Ground Level: 83.80m. O.D.

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
				MADE GROUND - ASPHALT.		0.07	83.73
				MADE GROUND - Reinforced CONCRETE.		0.23	83.57
0.30	D1			MADE GROUND - Dark brown SAND AND GRAVEL. Gravel of flint and concrete.			
0.30	ES1					0.45	83.35
0.45-0.70	B1			Orange brown and brown, slightly clayey, very gravelly SAND. Gravel of angular to rounded flint and quartzite. (GERRARDS CROSS GRAVEL MEMBER)		0.70	83.10
0.50	D2						
0.80	D3			Orange brown and brown, slightly silty SAND AND GRAVEL. Gravel of angular to rounded flint and quartzite. (GERRARDS CROSS GRAVEL MEMBER)			
1.00	D4		▽ 1			1.05	82.75
				Pit completed at 1.05m depth			

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- ▼ Water Rise
- ▼c Level on completion
- MP - Mackintosh Probe
- P( ) - Hand Penetrometer Cohesion ( ) kPa
- V - Vane Shear Test Cohesion ( ) kPa

REMARKS
1. No live roots observed
2. Water seepage at 1.05m depth
3. Pit sides stable

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118858	
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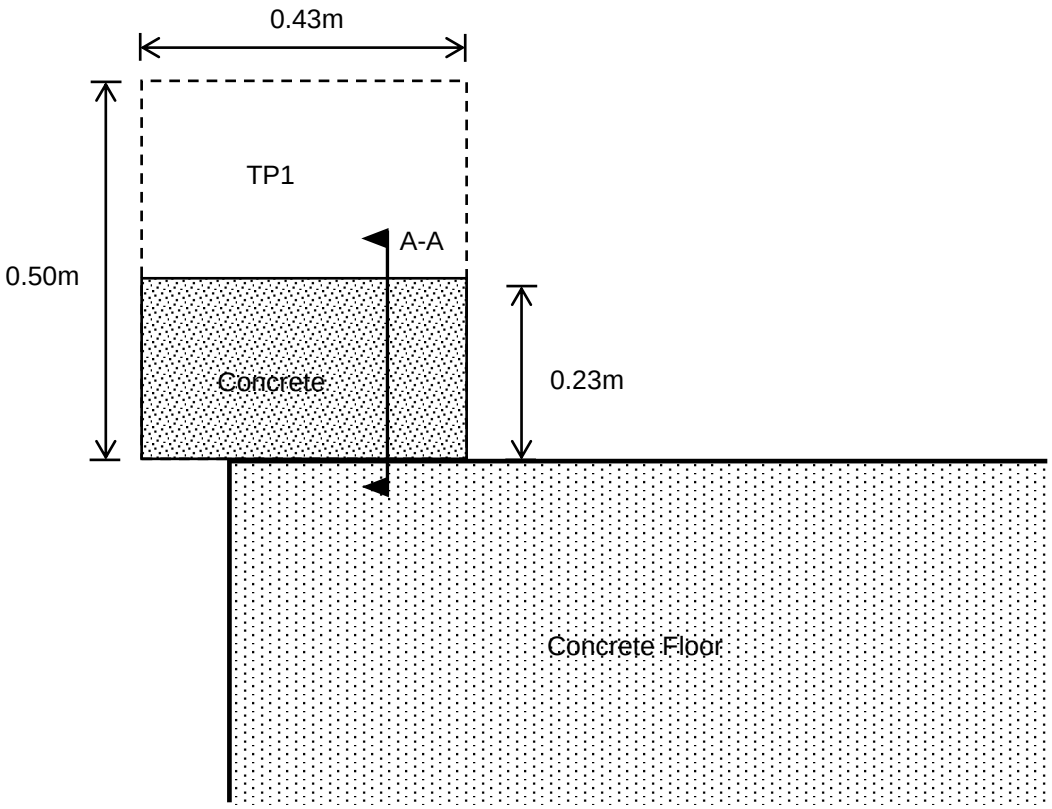
Trial Pit TP1
Plan View



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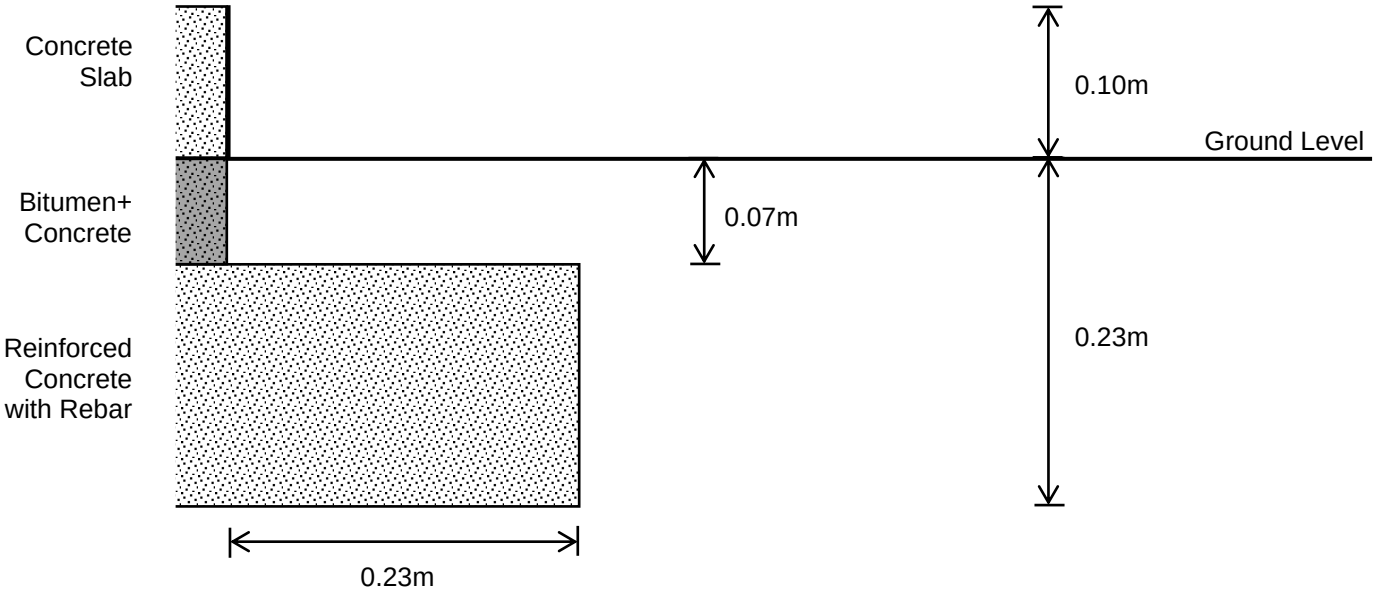
Trial Pit TP1
Cross Section A-A



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Trial Pit TP1
Photographs

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Site: HAREFIELD HOSPITAL - STAGE 3 SURVEYS

TRIAL PIT
TP2

Date: 30/09/24

Pit Size: 4.50m L x 4.50m W x 3.25m D.

Ground Level: 83.80m. O.D.

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
				MADE GROUND - ASPHALT.		0.09	83.71
				MADE GROUND - Extremely weak CONCRETE.		0.20	83.60
0.20-0.35	B1			MADE GROUND - Brown SAND AND GRAVEL. Gravel of flint and concrete.		0.35	83.45
0.30	D1			MADE GROUND - Dark brown and black SAND AND GRAVEL. Gravel of flint and concrete.		0.50	83.30
0.30	ES1						
0.35-0.50	B2						
0.40	D2						
0.40	ES2						
0.50-0.80	B3			MADE GROUND - Firm, brown and orange brown mottled, slightly gravelly, silty CLAY. Gravel of flint and concrete.			
0.80	D3						
0.80	ES3						
						1.30	82.50
1.40	D4			MADE GROUND - Firm, brown and light brown mottled, slightly gravelly, silty CLAY. Gravel of flint and ash.			
1.40	ES4						
1.70	D5						
2.00	D6						
2.30	D7						
						2.40	81.40
2.60	D8			MADE GROUND - Firm, brown and grey mottled, slightly gravelly, silty CLAY. Gravel of flint and ash.			
						2.80	81.00
2.90	D9			MADE GROUND - Firm becoming soft, brown grey and dark brown mottled, slightly sandy, silty CLAY with occasional ash fragments.			
3.20	D10					3.25	80.55
				Pit completed at 3.25m depth			

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- ▼ Water Rise
- ▼c Level on completion
- MP - Mackintosh Probe
- P( ) - Hand Penetrometer Cohesion ( ) kPa
- V - Vane Shear Test Cohesion ( ) kPa

REMARKS
1. No live roots observed
2. Pit dry
3. Pit sides stable

Project No 118858

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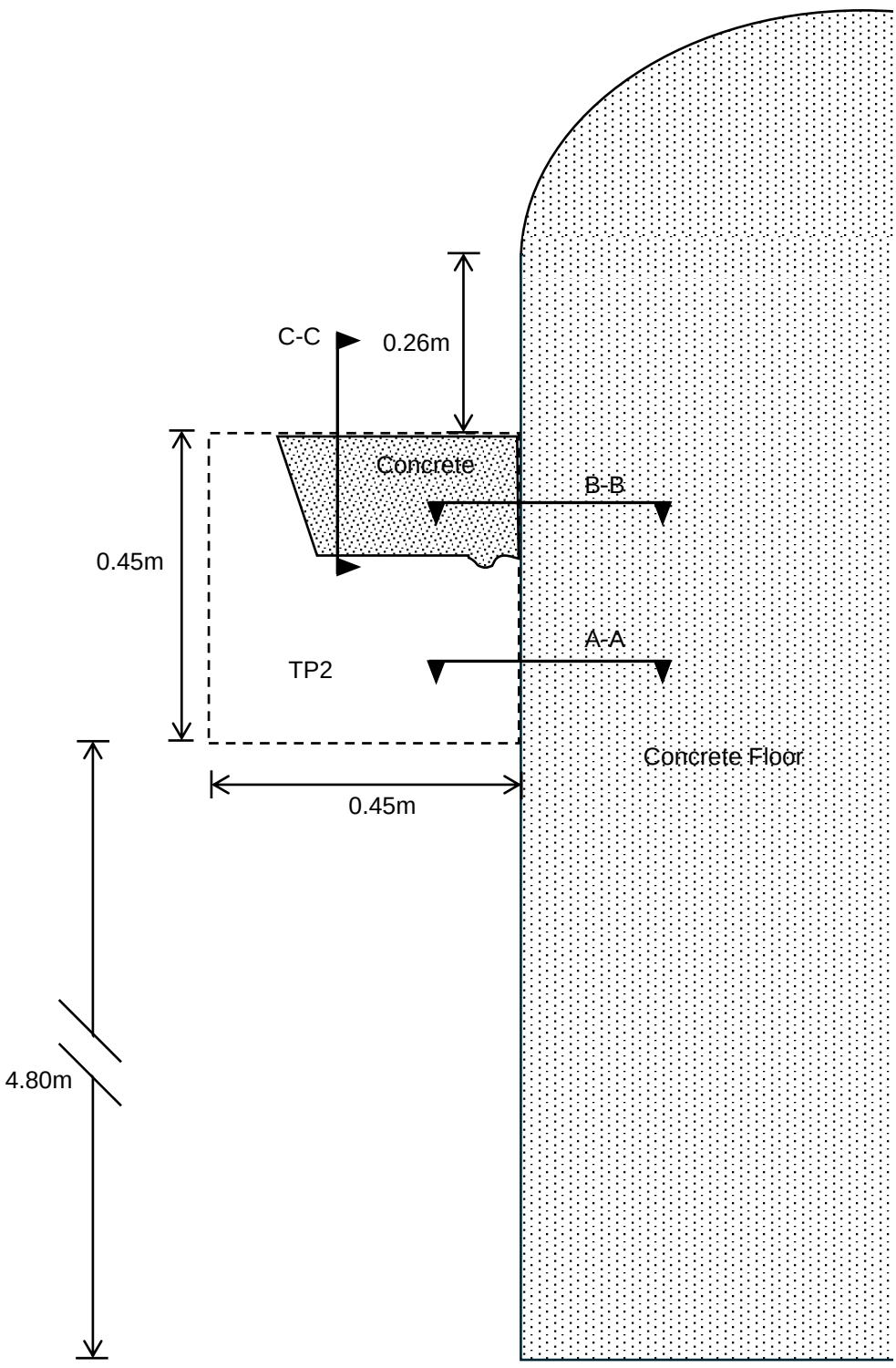
Trial Pit TP2
Plan View



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Trial Pit TP2
Cross Section A-A

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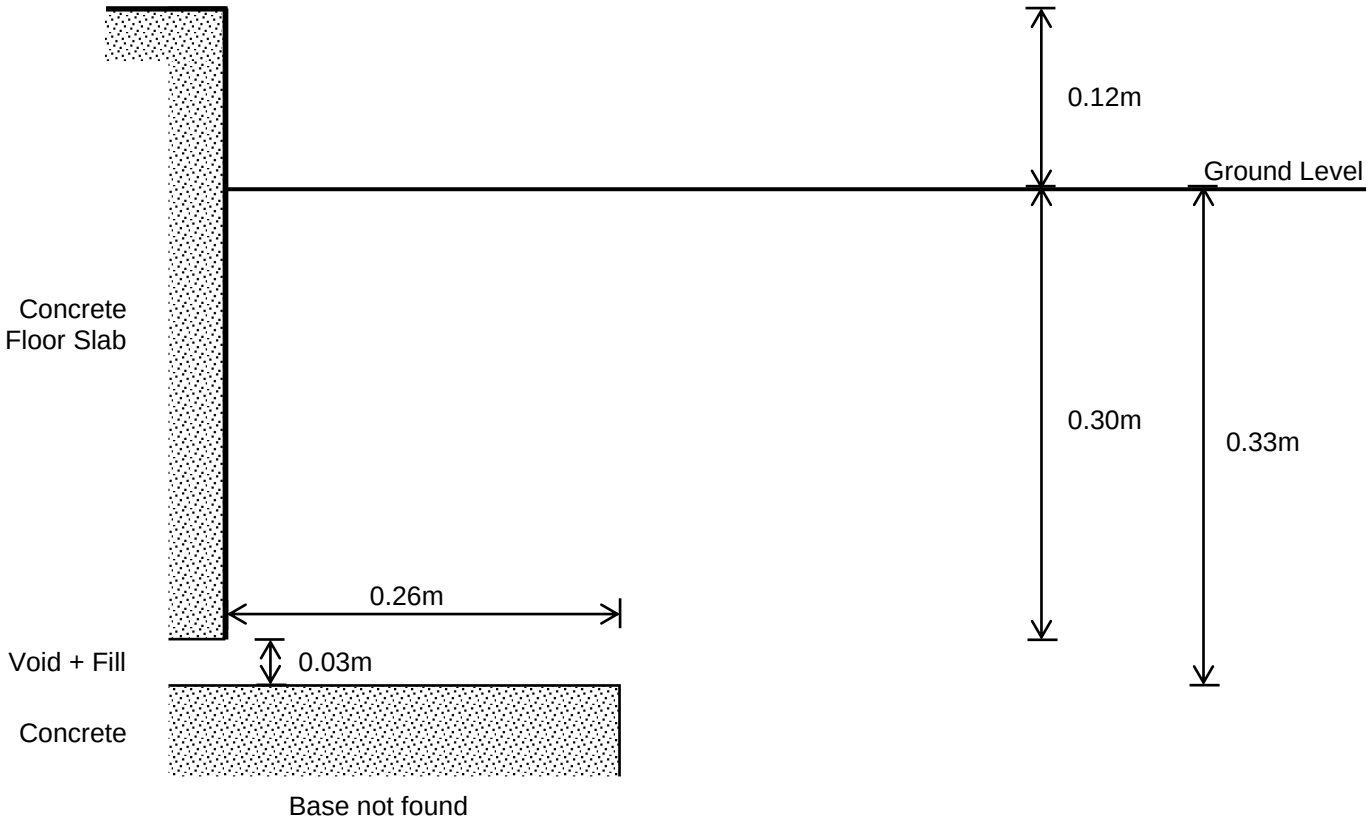
Trial Pit TP2
Cross Section B-B



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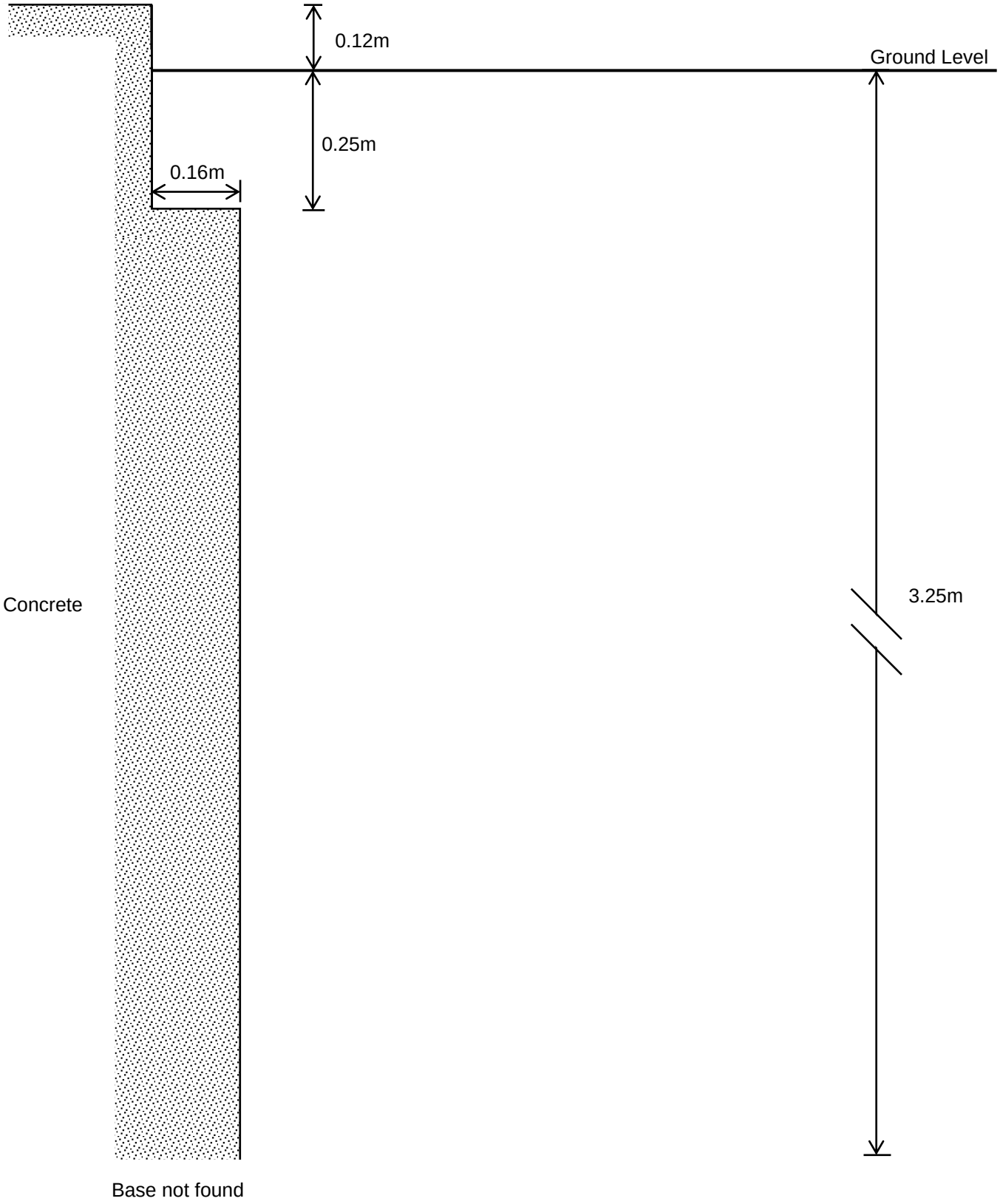
Trial Pit TP2
Cross Section C-C



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Trial Pit TP2
Photographs

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Site: HAREFIELD HOSPITAL - STAGE 3 SURVEYS

TRIAL PIT
TP3

Date: 30/09/24

Pit Size: 0.60m L x 0.60m W x 0.95m D.

Ground Level: 88.40m. O.D.

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.10	D1			MADE GROUND - Dark brown, slightly silty, slightly gravelly SAND topsoil. Gravel of flint.		0.20	88.20
0.10	ES1						
0.40	D2			MADE GROUND - Brown and dark brown, slightly clayey, silty, very gravelly SAND. Gravel of flint, quartzite and brick.		0.45	87.95
0.40	ES2						
0.60	D3			Brown and light brown, slightly clayey, very sandy GRAVEL. Gravel of angular to rounded flint and quartzite. (GERRARDS CROSS GRAVEL MEMBER)		0.70	87.70
0.80	D4			Orange brown and brown, slightly clayey, very sandy GRAVEL. Gravel of angular to rounded quartz and quartzite. (GERRARDS CROSS GRAVEL MEMBER)		0.85	87.55
0.90	D5			Brown and orange brown, slightly silty SAND AND GRAVEL. Gravel of angular to rounded flint, quartz and quartzite. (GERRARDS CROSS GRAVEL MEMBER)		0.95	87.45
				Pit completed at 0.95m depth			

KEY

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- ES - Environmental Sample
- ▽ Water Strike
- ▼ Water Rise
- ▼c Level on completion
- MP - Mackintosh Probe
- P( ) - Hand Penetrometer Cohesion ( ) kPa
- V - Vane Shear Test Cohesion ( ) kPa

REMARKS
1. Live roots observed to 0.45m depth
2. Pit dry
3. Pit sides stable

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118858	
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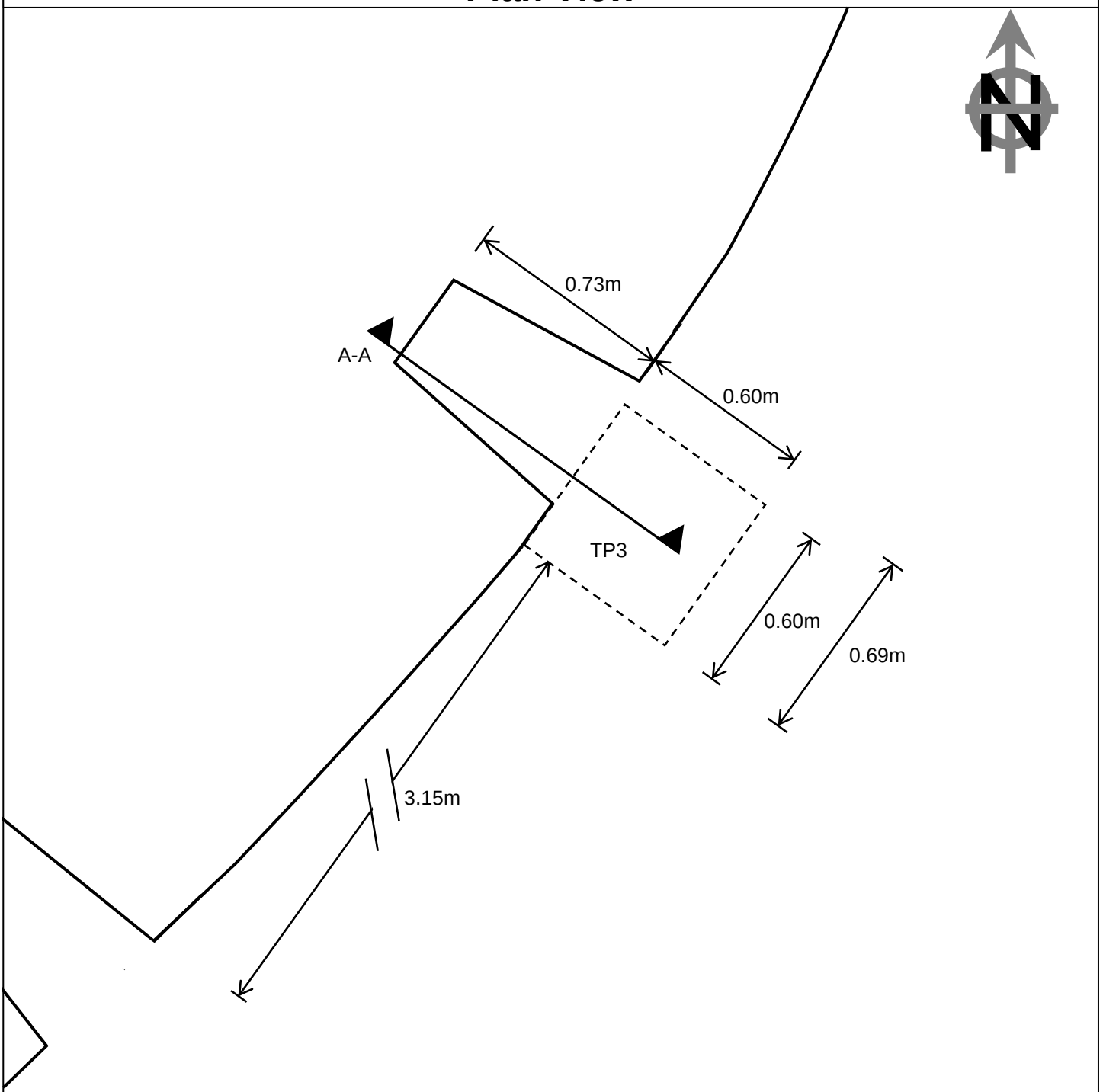
Trial Pit TP3
Plan View



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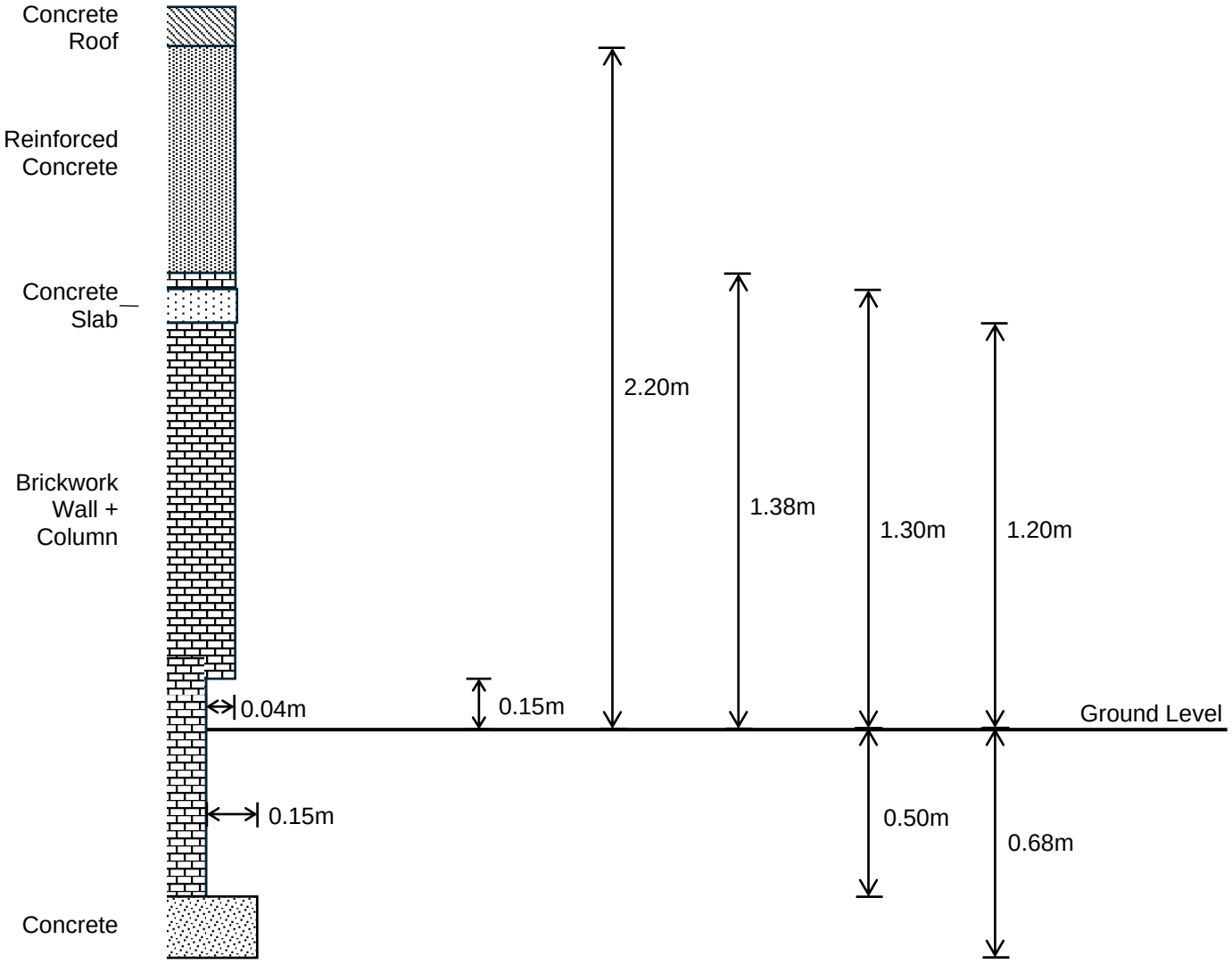
Trial Pit TP3
Cross Section A-A



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Trial Pit TP3
Photographs

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GROUND ENGINEERING LIMITED

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Site: HAREFIELD HOSPITAL - STAGE 3 SURVEYS

TRIAL PIT
TP4

Date: 07/10/24

Pit Size: 1.90m L x 0.50m W x 2.00m D.

Ground Level: 88.50m. O.D.

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.10	D1			MADE GROUND - Brown, light brown, orange brown and grey, slightly clayey, sandy GRAVEL. Gravel of chalk, flint, quartzite and brick.		0.15	88.35
0.10	ES1						
0.20	D2			MADE GROUND - Dark grey, slightly gravelly SAND. Gravel of ash and quartz.		0.30	88.20
0.20	ES2						
0.40	D3			MADE GROUND - Grey, clayey SAND AND GRAVEL with occasional cobbles of brick. Gravel of brick, limestone, flint and quartz.		0.60	87.90
0.40	ES3						
0.70	D4			MADE GROUND - Grey and light brown, sandy GRAVEL. Gravel of chalk, flint and quartzite.		0.75	87.75
0.75-1.00	B1			Firm, orange brown and grey mottled, slightly sandy, gravelly, silty CLAY. Gravel of angular to sub-rounded flint and chalk. (GERRARDS CROSS GRAVEL MEMBER)		1.05	87.45
0.80	D5						
1.15	D6			Orange brown, clayey SAND AND GRAVEL with rare pockets of firm, orange brown clay. Gravel of sub-angular to sub-rounded chalk and flint.			
1.40-1.70	B2						
1.50	D7						
				(GERRARDS CROSS GRAVEL MEMBER)			
2.00	D8					2.00	86.50
				Pit completed at 2.00m depth			

KEY

- D - Disturbed Sample
- B - Bulk Sample
- U - Undisturbed Sample
- R - Root Sample
- W - Water Sample
- ES - Environmental Sample
- ▽ Water Strike
- ▼ Water Rise
- ▼c Level on completion
- MP - Mackintosh Probe
- P( ) - Hand Penetrometer Cohesion ( ) kPa
- V - Vane Shear Test Cohesion ( ) kPa

REMARKS
1. Live roots observed to 0.30m depth
2. Pit dry
3. Pit sides stable

Project No	
118858	
Scale	Page
1:25	1/1

SOAKAWAY TEST RESULTS

BRE DIGEST 365 - SOIL INFILTRATION RATE

Project: Harefield Hospital - Stage 3 Surveys
Client: CAM & Co. Consulting Limited

Project No: 118858
Sheet No: 1\1

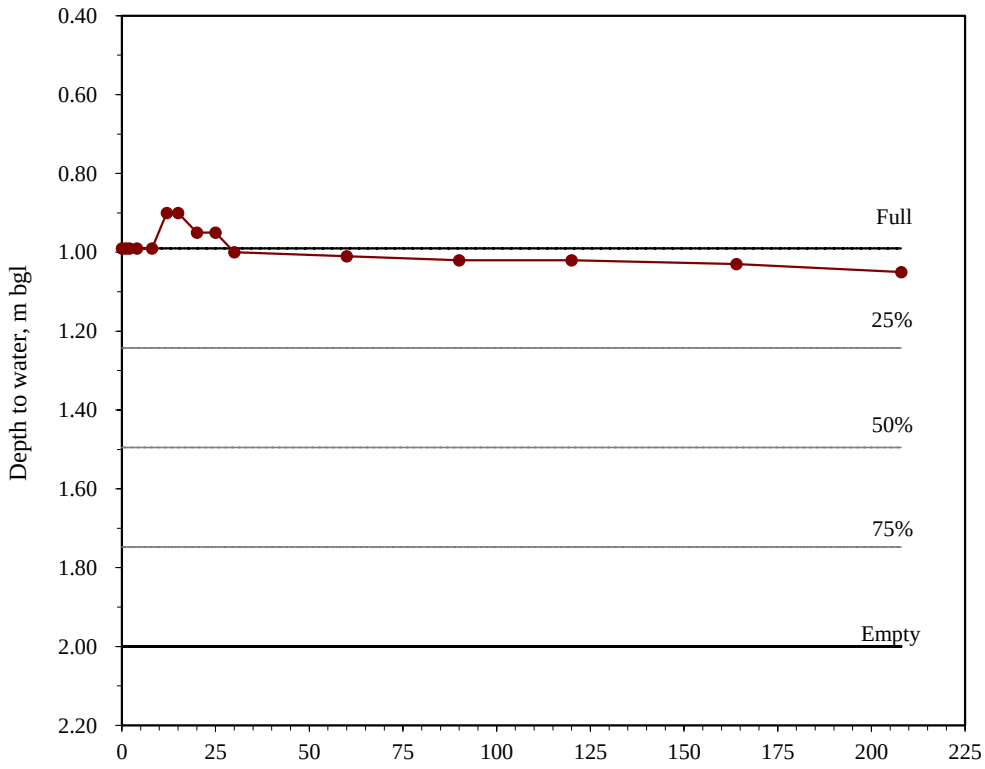
Trial Pit: TP 4
Depth: 2.00
Length: 1.90
Width: 0.50

Description of Stratum under test: Clayey SAND and GRAVEL

Depth to water prior to test: Dry
(below ground level)

Elapsed Time min	Depth to Water m
0	0.99
1	0.99
2	0.99
4	0.99
8	0.99
12	0.90
15	0.90
20	0.95
25	0.95
30	1.00
60	1.01
90	1.02
120	1.02
164	1.03
208	1.05

DEPTH TO WATER vs ELAPSED TIME



All dimensions given in metres

f = (V75-V25)/A50(T75-T25)

V75-V25 = 0.480
A50 = 3.374
T75-T25 = 1513 extrapolated

Extrapolated Soil Infiltration Rate **f = 9.40E-05 m/s**

Slight sidewall spalling 12 minutes after start of test resulted in higher water level until 30 minutes

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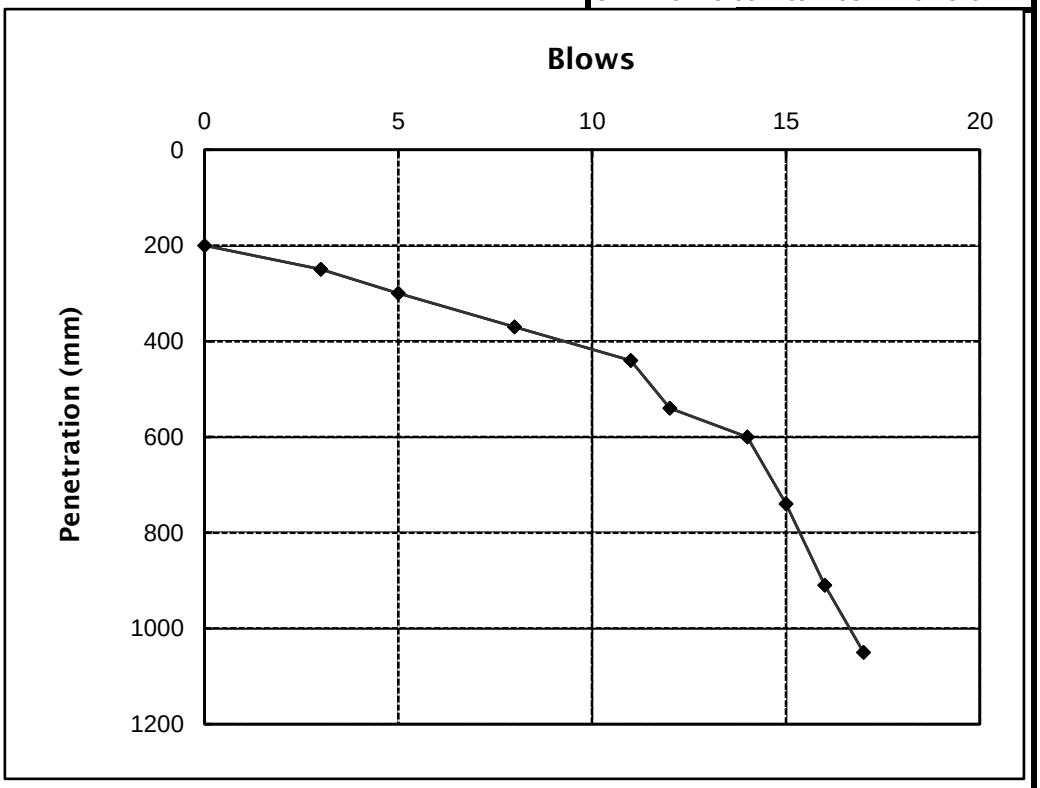
DYNAMIC CONE PENETROMETER (DCP) RESULTS

Project: Harefield Hospital - Stage 3 Surveys | **Project Ref: 118858**

DCP No: TP1 **Depth of test: 0.20m**

CBR from 0.20m to 0.44m = 8.3%
CBR from 0.44m to 0.60m = 2.6%
CBR from 0.60m to 1.05m = 0.70%

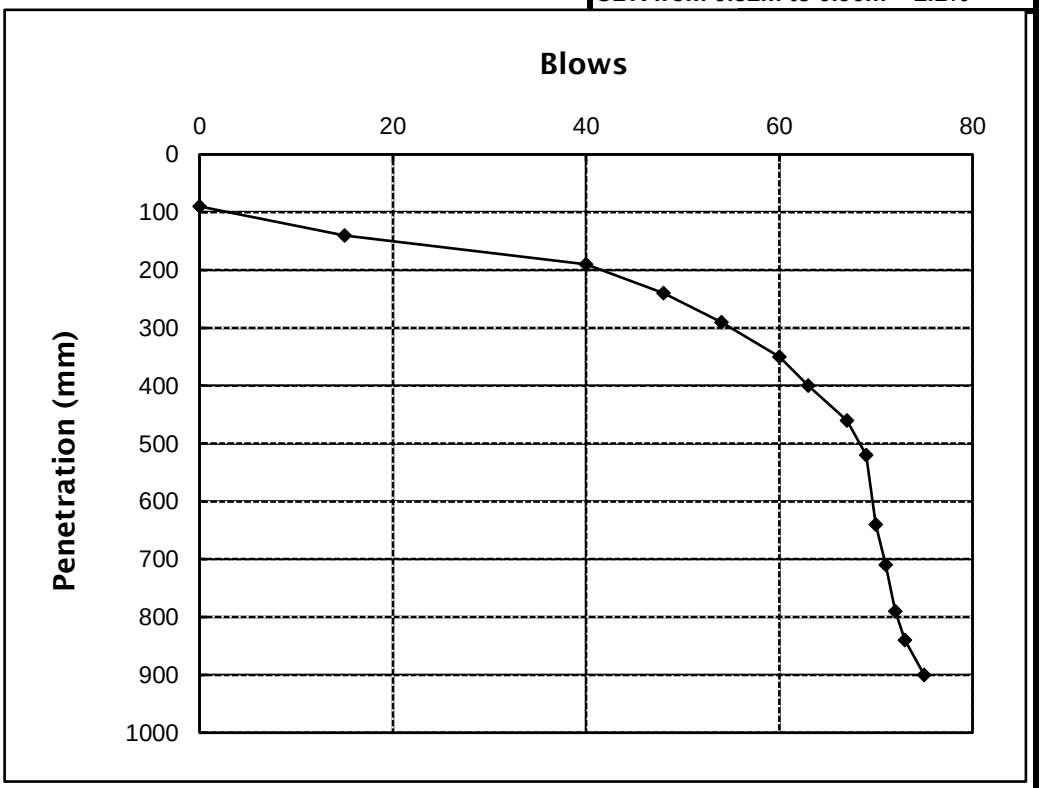
Blows	Pen.
0	200
3	250
5	300
8	370
11	440
12	540
14	600
15	740
16	910
17	1050



DCP No: TP2 **Depth of test: 0.09m**

CBR from 0.09m to 0.24m = 100%
CBR from 0.24m to 0.52m = 16%
CBR from 0.52m to 0.90m = 2.1%

Blows	Pen.
0	90
15	140
40	190
48	240
54	290
60	350
63	400
67	460
69	520
70	640
71	710
72	790
73	840
75	900



LABORATORY TEST RESULTS

CONTRACT HAREFIELD HOSPITAL - STAGE 3 SURVEYS

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO_4)				C.B.R.		Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m^3	Dry Mg/m^3	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l	pH	Top %	Base %	
BH1	B3	0.60 - 0.80				10	2.15	1.96							148		6.2	15	15	15% retained on 20mm sieve
	B4	0.80 - 1.20	44	19	25	13														SOIL CLASSIFICATION = CI 64% retained on 425μm sieve
	B5	1.20 - 1.70													236		6.0			
	W1	4.00														272	7.3			
	U1	6.00 - 6.40				32	2.01	1.53	Q	136	130	68	0		347		7.6			
	U3	8.50 - 8.95				28	1.90	1.48	Q	157	180	79	0							
	U5	11.50 - 11.95				23	2.07	1.68	Q	331	240	166	0							
	U7	14.60 - 15.00				27	2.05	1.62	Q	319	300	160	0							
BH2	B4	0.60 - 0.80	53	18	35	15	2.15	1.88										5.4	6.8	SOIL CLASSIFICATION = CH 61% retained on 425μm sieve 10% retained on 20mm sieve

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

C.B.R. - CALIFORNIA BEARING RATIO

118858

GROUND ENGINEERING LIMITED
Tel: 01733-566566
www.groundengineering.co.uk

LABORATORY TEST RESULTS

CONTRACT HAREFIELD HOSPITAL - STAGE 3 SURVEYS

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO_4)				C.B.R.		Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m^3	Dry Mg/m^3	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l	pH	Top %	Base %	
BH2	B5	0.80 - 1.20													22		7.5			
	B7	2.00 - 2.50													69		7.4			
	W1	5.00														115	7.5			
	U2	6.80 - 7.20				27	1.96	1.54	Q	160	140	80	0							
	U4	10.00 - 10.45				27	2.11	1.66	Q	234	210	117	0							
	U6	13.00 - 13.45				26	1.91	1.51	Q	189	270	94	0							

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

C.B.R. - CALIFORNIA BEARING RATIO

118858

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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

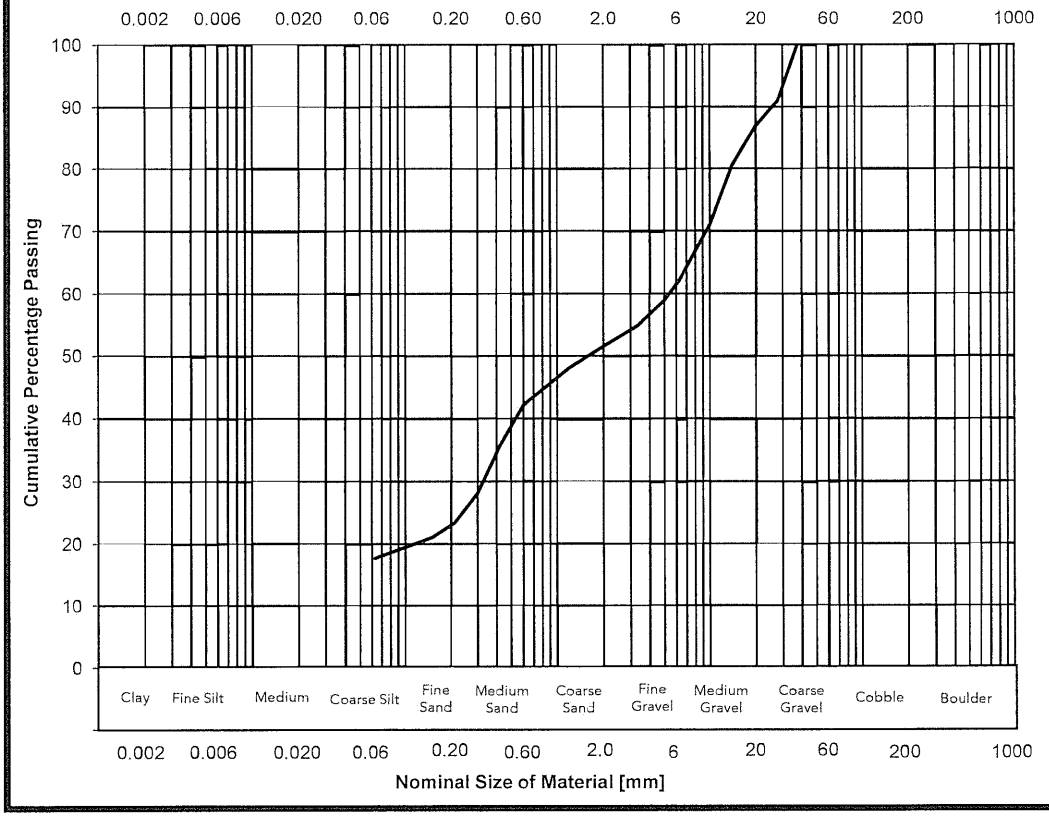
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/2/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	14/11/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/2
Client Reference: B4
Pre-treatment for organic material: N/A

Sample Description: Brown orange-brown dark-brown clayey silty SAND and GRAVEL. Gravel consists of angular to sub-rounded flint quartz ironstone chalk and ash.

Material Specification: Not Required
Location: BH1
Depth Top: 0.80
Depth Base: 1.20



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	91
20	87
14	81
10	71
6.3	62
5.0	59
3.35	55
2.00	52
1.18	48
0.600	42
0.425	36
0.300	28
0.212	23
0.150	21
0.063	18
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

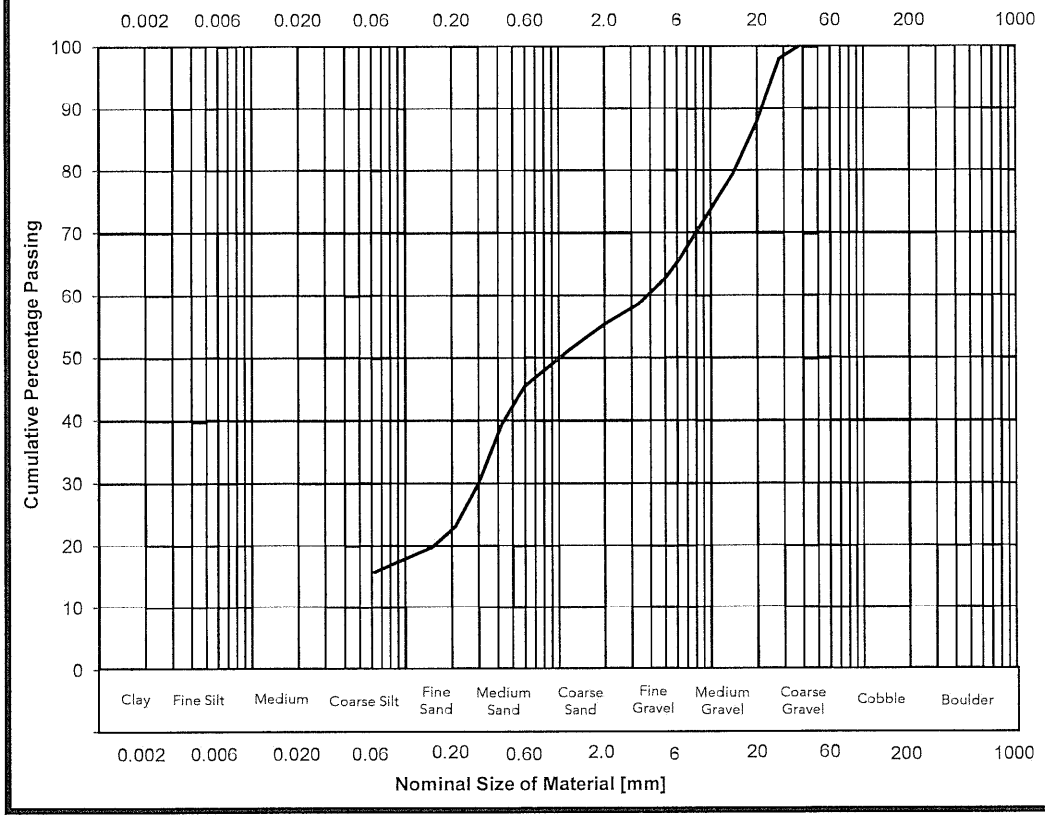
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/3/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	13/11/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/3
Client Reference: B5
Pre-treatment for organic material: N/A

Sample Description: Orange-brown slightly clayey slightly silty SAND and GRAVEL. Gravel consists of fine to coarse angular to sub-rounded flint quartzite and chalk.

Material Specification: Not Required
Location: BH1
Depth Top: 1.20
Depth Base: 1.70



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	98
20	88
14	80
10	74
6.3	66
5.0	63
3.35	59
2.00	55
1.18	51
0.600	46
0.425	39
0.300	30
0.212	23
0.150	20
0.063	16
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

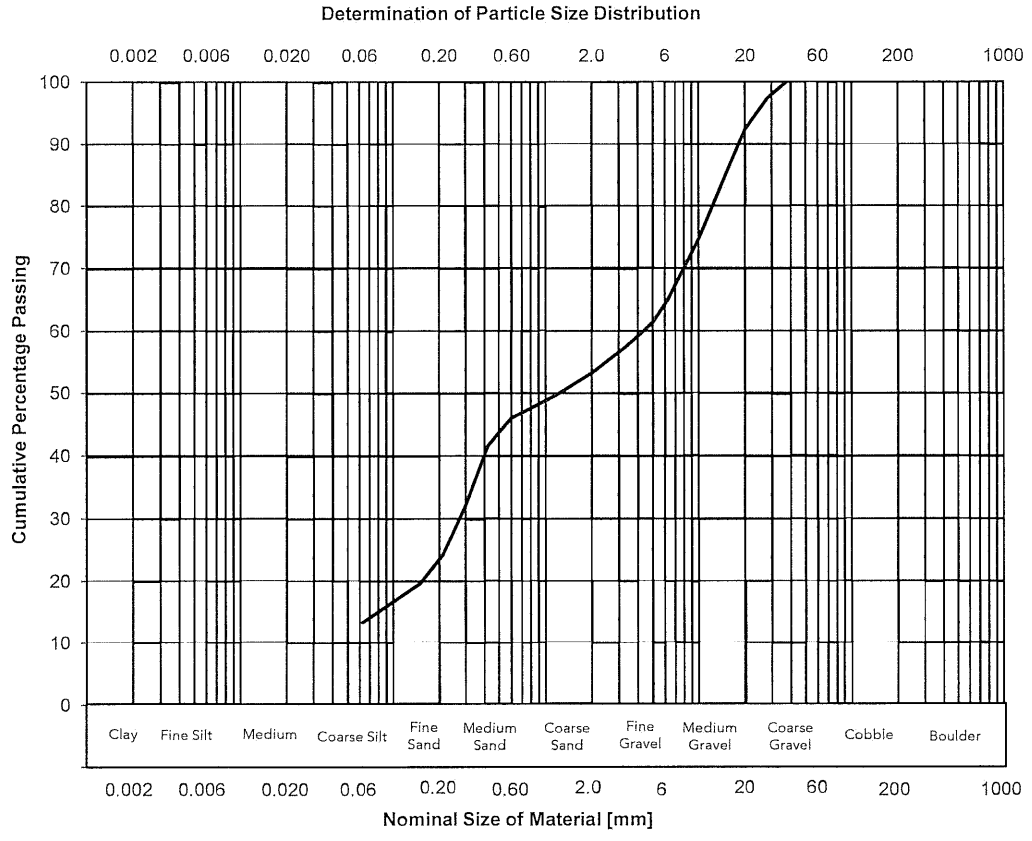
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/4/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	13/11/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/4
Client Reference: B6
Pre-treatment for organic material: N/A

Sample Description: Orange-brown slightly clayey slightly silty SAND and GRAVEL. Gravel consists of fine to coarse angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH1
Depth Top: 1.70
Depth Base: 2.00



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	97
20	92
14	83
10	75
6.3	65
5.0	61
3.35	57
2.00	53
1.18	50
0.600	46
0.425	42
0.300	32
0.212	24
0.150	20
0.063	13
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

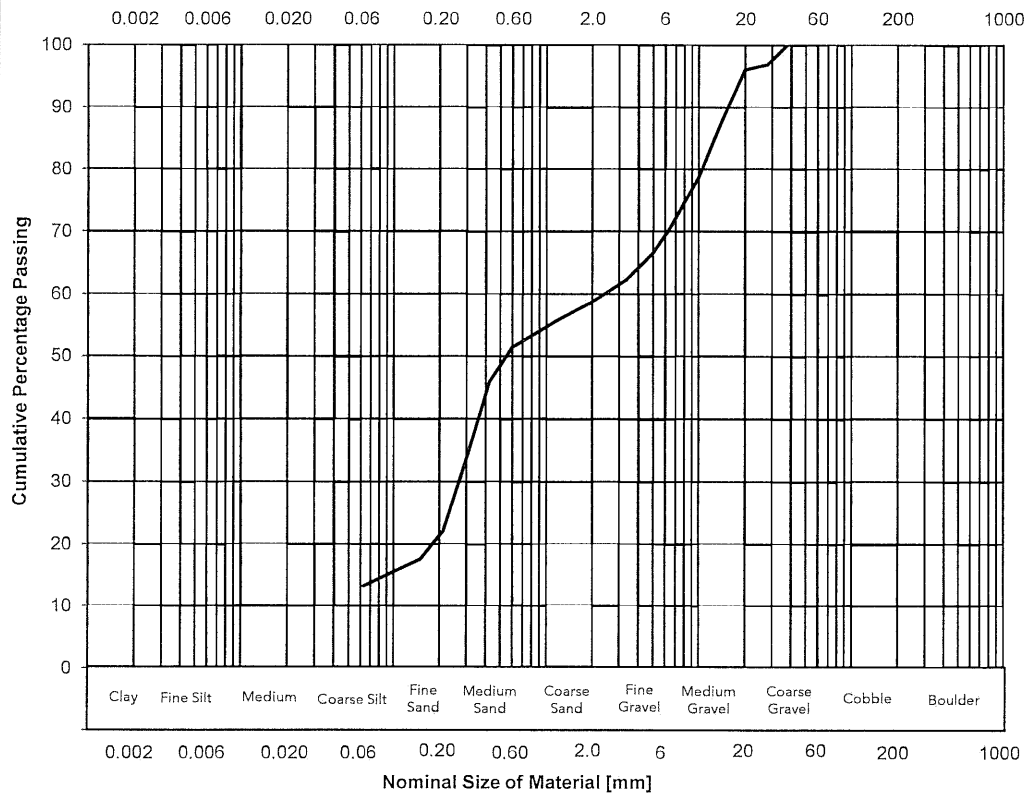
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/5/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	30/10/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/5
Client Reference: B7
Pre-treatment for organic material:

Sample Description: Brown slightly clayey slightly silty SAND and GRAVEL. Gravel consists of angular to sub-rounded flint.

Material Specification: Not Required
Location: BH1
Depth Top: 2.00
Depth Base: 2.50



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	97
20	96
14	88
10	79
6.3	70
5.0	67
3.35	62
2.00	59
1.18	56
0.600	51
0.425	46
0.300	34
0.212	22
0.150	18
0.063	13
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

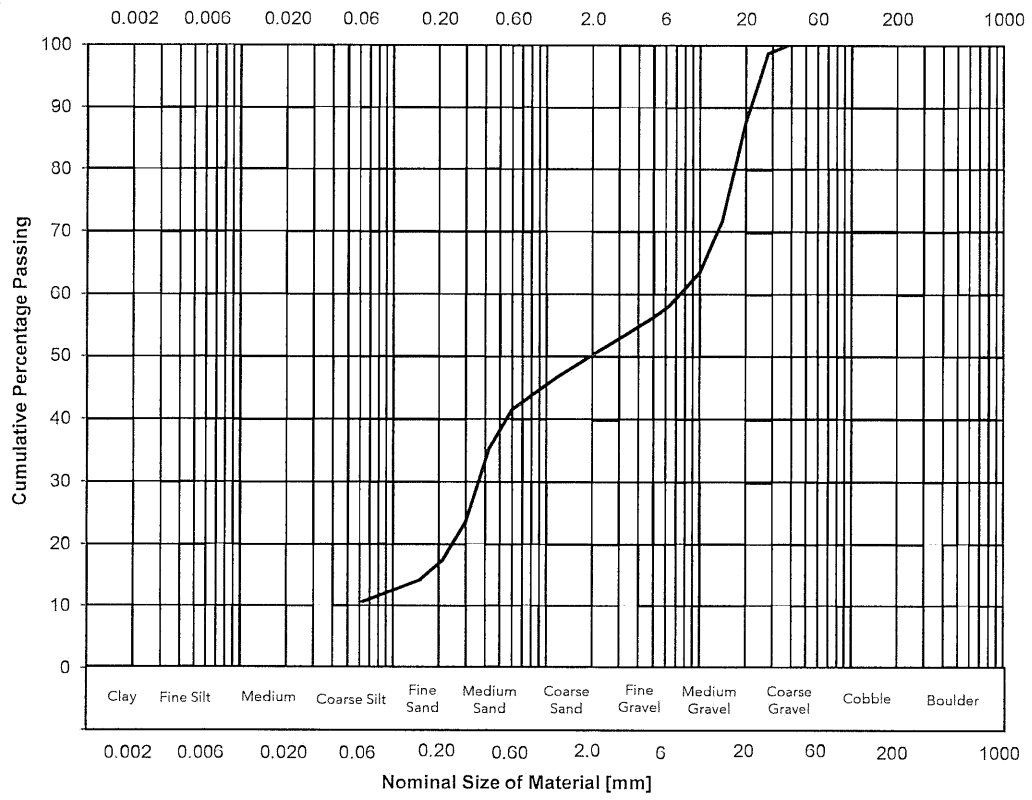
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/6/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	14/11/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/6
Client Reference: B8
Pre-treatment for organic material: N/A

Sample Description: Brown orange-brown slightly clayey slightly silty SAND and GRAVEL. Gravel consists of fine to coarse angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH1
Depth Top: 2.50
Depth Base: 3.00



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	99
20	88
14	72
10	64
6.3	58
5.0	56
3.35	54
2.00	50
1.18	47
0.600	42
0.425	35
0.300	24
0.212	17
0.150	14
0.063	11
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

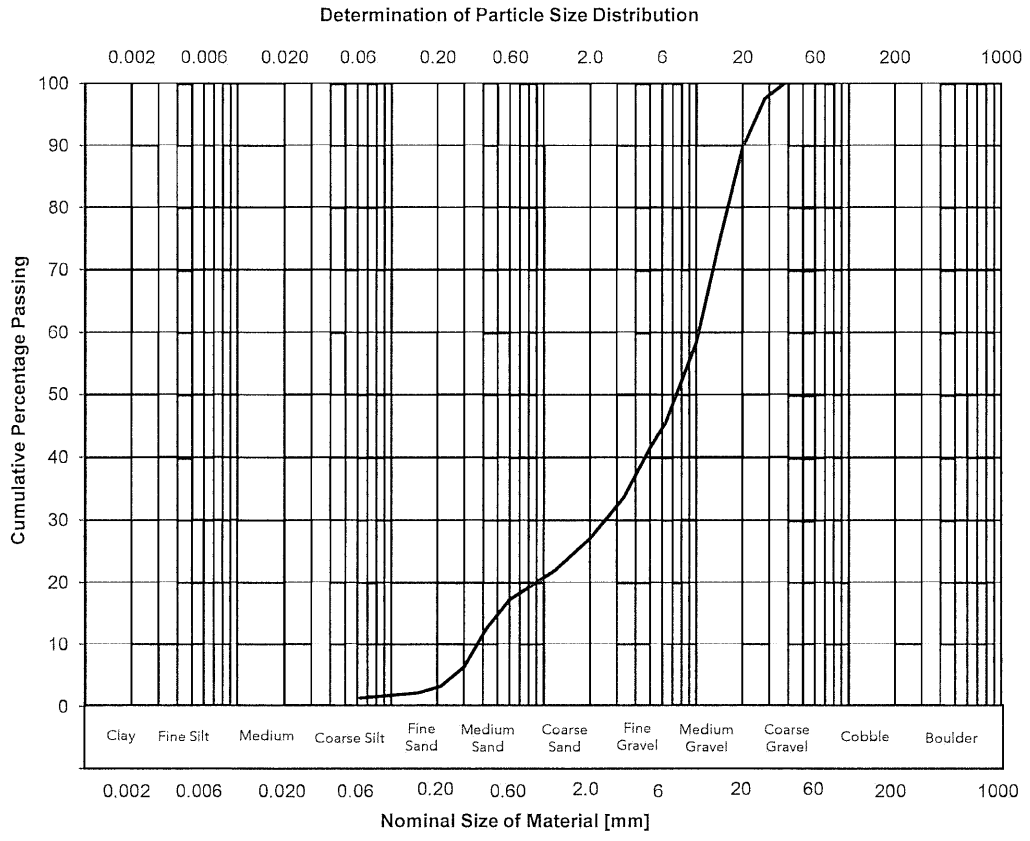
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/7/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	30/10/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/7
Client Reference: B9
Pre-treatment for organic material:

Sample Description: Brown slightly silty sandy GRAVEL. Gravel consists of angular to sub-rounded flint and quartz.

Material Specification: Not Required
Location: BH1
Depth Top: 3.20
Depth Base: 3.70



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	98
20	90
14	74
10	58
6.3	45
5.0	42
3.35	34
2.00	27
1.18	22
0.600	17
0.425	13
0.300	6
0.212	3
0.150	2
0.063	1
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

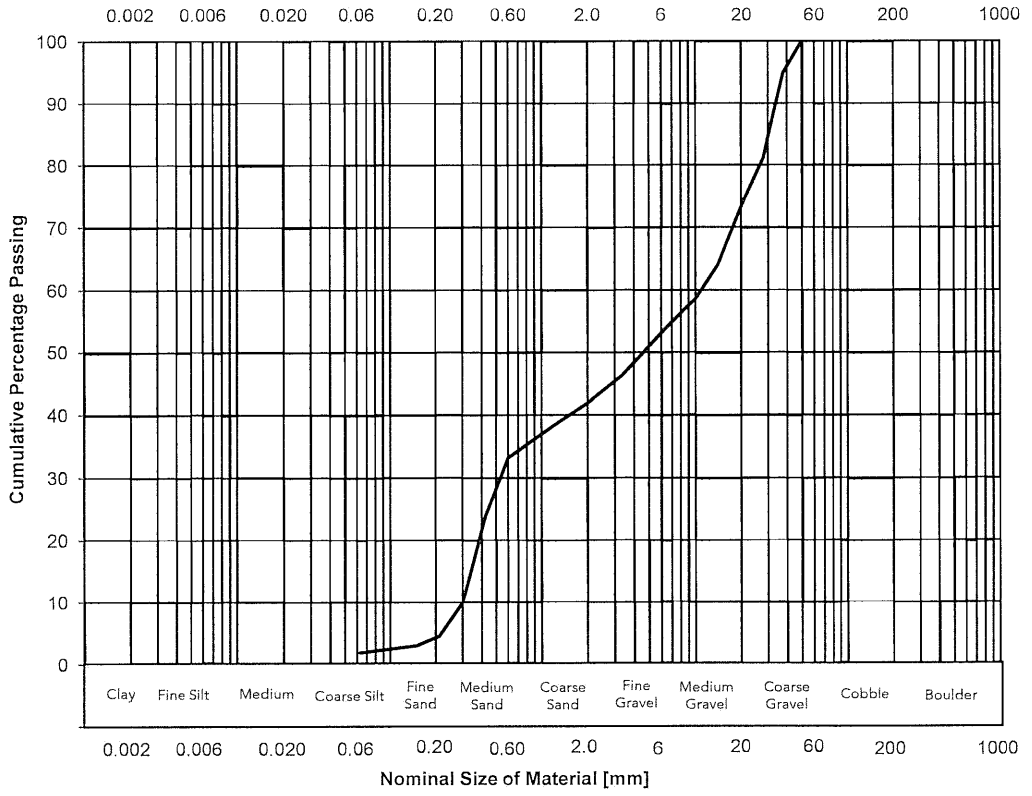
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/8/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	14/11/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/8
Client Reference: B10
Pre-treatment for organic material: N/A

Sample Description: Brown slightly silty SAND and GRAVEL. Gravel consists of fine to coarse angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH1
Depth Top: 4.00
Depth Base: 4.50



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	95
28	81
20	73
14	64
10	59
6.3	54
5.0	51
3.35	46
2.00	42
1.18	38
0.600	33
0.425	24
0.300	10
0.212	5
0.150	3
0.063	2
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1

Form Number: GELab/C/709-3 Version 11

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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

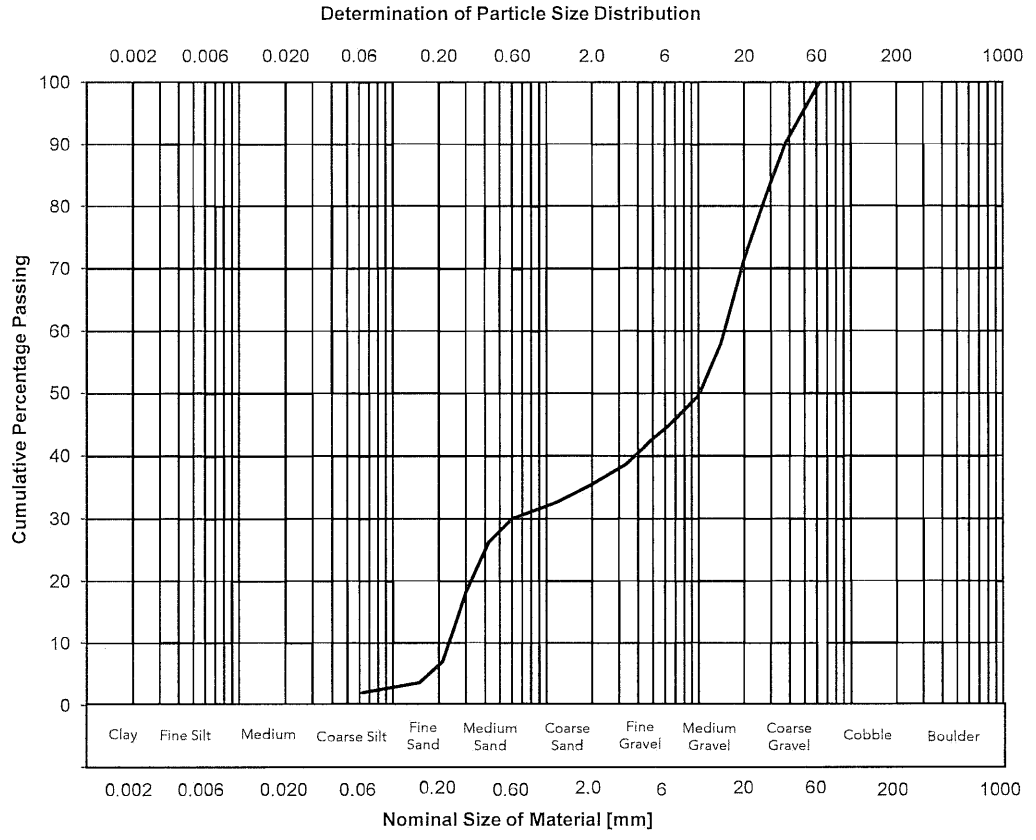
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/10/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	13/11/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/10
Client Reference: B11
Pre-treatment for organic material: N/A

Sample Description: Brown silty SAND and GRAVEL. Gravel consists of fine to coarse angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH1
Depth Top: 5.00
Depth Base: 5.50



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	96
37.5	90
28	82
20	71
14	58
10	50
6.3	45
5.0	43
3.35	39
2.00	36
1.18	33
0.600	30
0.425	26
0.300	18
0.212	7
0.150	4
0.063	2
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

Registered in England & Wales
Registration Number: 6929574
Reg Office: Lucion Ground Engineering Ltd
Newark Road, Peterborough PE1 5UA

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Ground Engineering Ltd

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Newark Road, Peterborough
t: 01733 566566
e: geadmin@luciongroup.com

TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

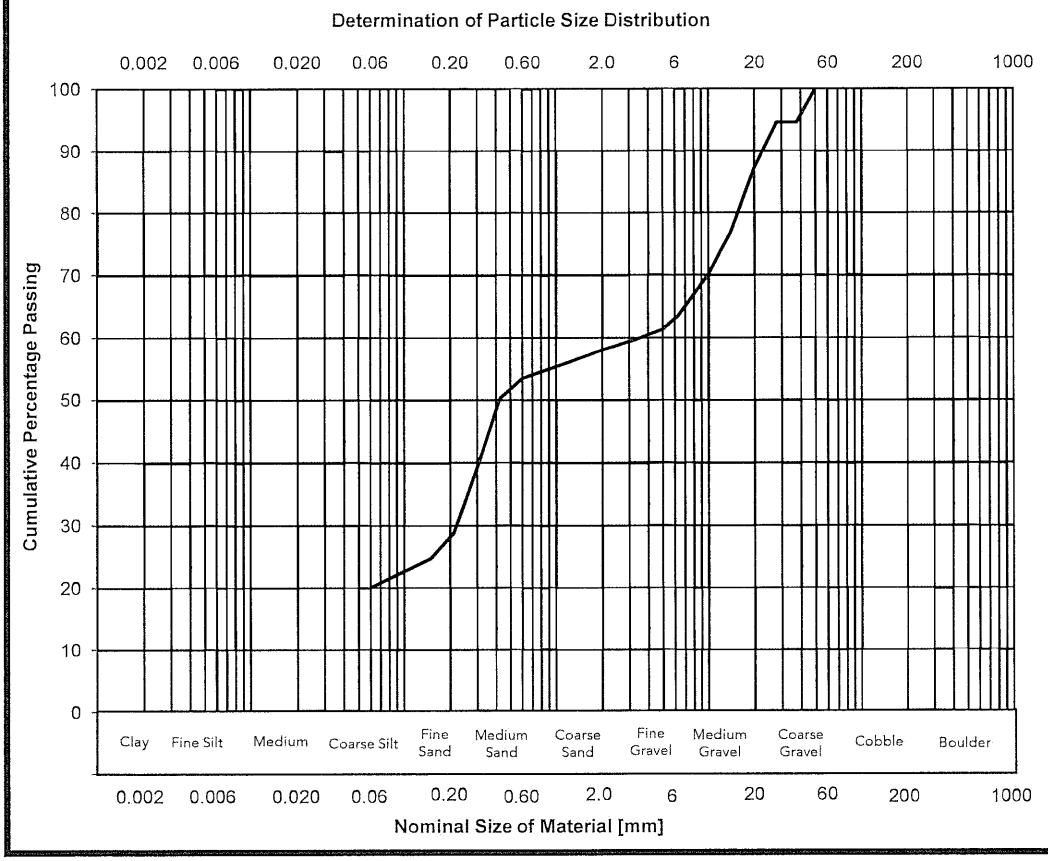
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/16/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	30/10/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/16
Client Reference: B5
Pre-treatment for organic material: N/A

Sample Description: Brown orange-brown grey slightly clayey slightly silty SAND and GRAVEL. Gravel consists of angular to sub-rounded flint chalk and quartzite.

Material Specification: Not Required
Location: BH2
Depth Top: 0.80
Depth Base: 1.20



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	95
28	95
20	87
14	77
10	70
6.3	63
5.0	61
3.35	60
2.00	58
1.18	56
0.600	53
0.425	50
0.300	39
0.212	29
0.150	25
0.063	20
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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e: geadmin@luciongroup.com

TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

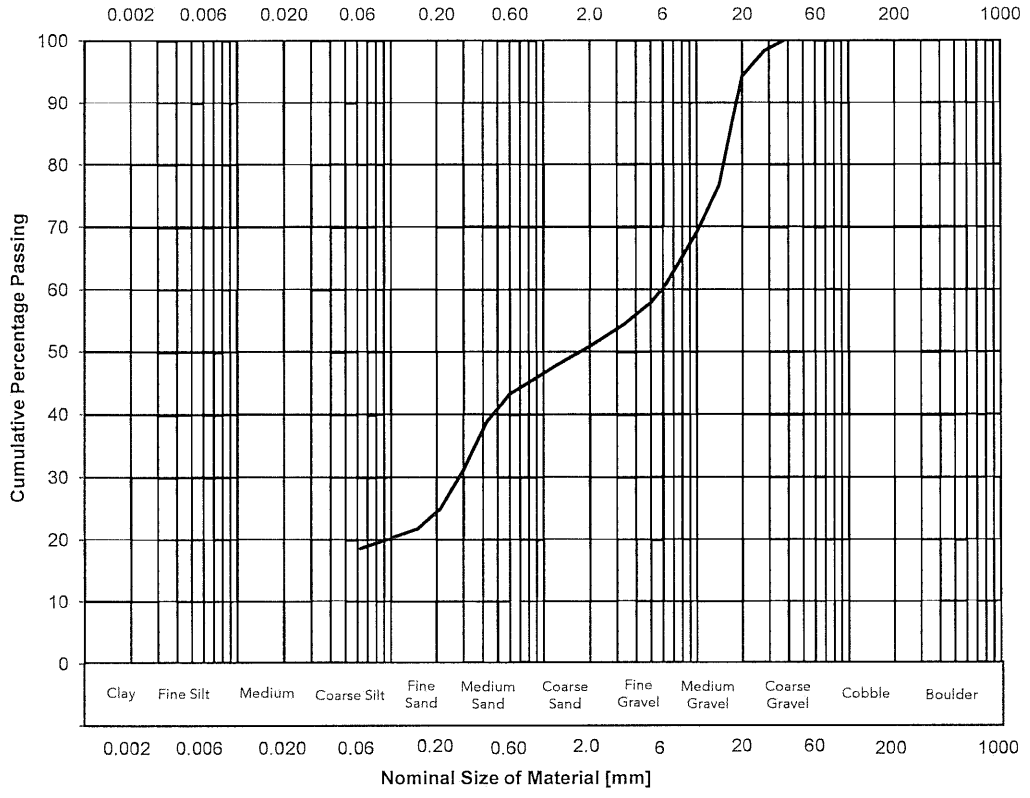
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/17/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	30/10/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/17
Client Reference: B6
Pre-treatment for organic material: N/A

Sample Description: Brown slightly clayey slightly silty sandy GRAVEL. Gravel consists of angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH2
Depth Top: 1.20
Depth Base: 1.70



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	98
20	94
14	77
10	69
6.3	61
5.0	58
3.35	54
2.00	51
1.18	48
0.600	43
0.425	39
0.300	31
0.212	25
0.150	22
0.063	19
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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TEST CERTIFICATE

Determination of Particle Size Distribution

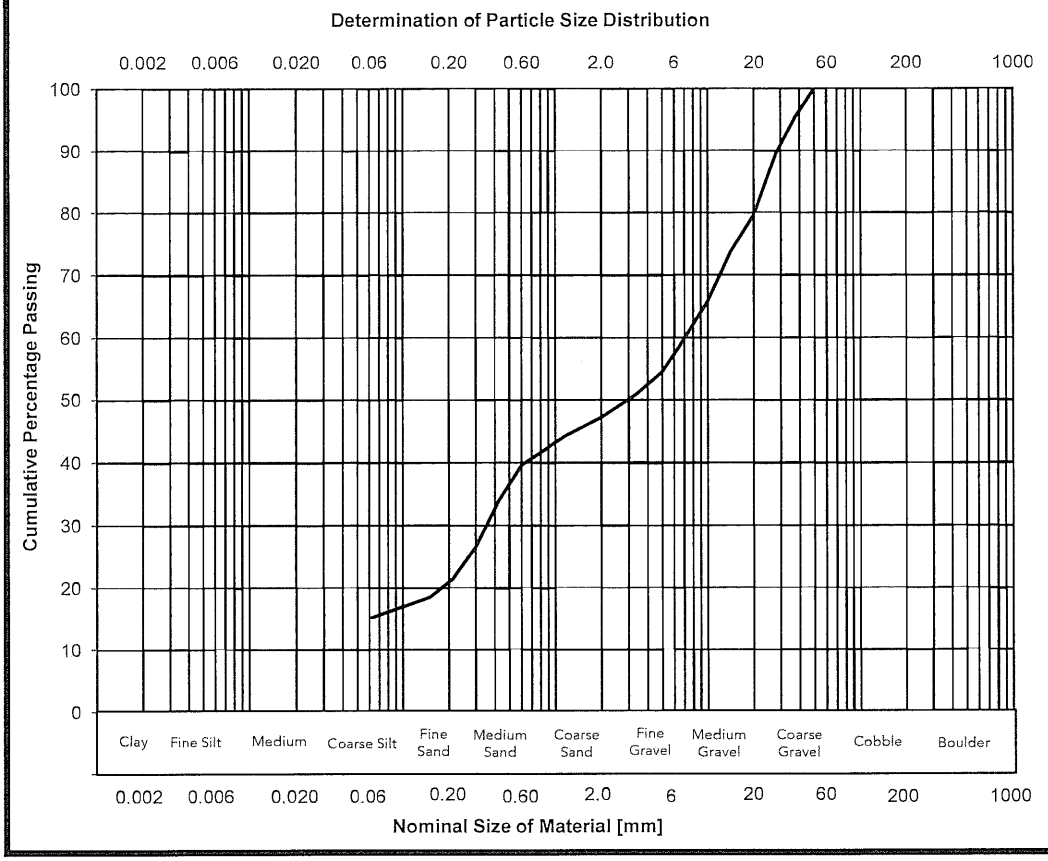
BS1377:Part 2:1990, clause 9.2

Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/18/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	11/11/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS **Laboratory Reference:** PL8780-1/18 **Pre-treatment for organic material:** N/A
Client Reference: B7

Sample Description: Orange-brown slightly clayey slightly silty very sandy GRAVEL. Gravel consists of angular to sub-rounded flint and quartzite.

Material Specification: Not Required **Depth Top:** 2.00
Location: BH2 **Depth Base:** 2.50



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	96
28	90
20	80
14	74
10	66
6.3	58
5.0	54
3.35	51
2.00	47
1.18	44
0.600	40
0.425	34
0.300	27
0.212	21
0.150	19
0.063	15
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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Registration Number: 6929574
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e: geadmin@luciongroup.com

TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

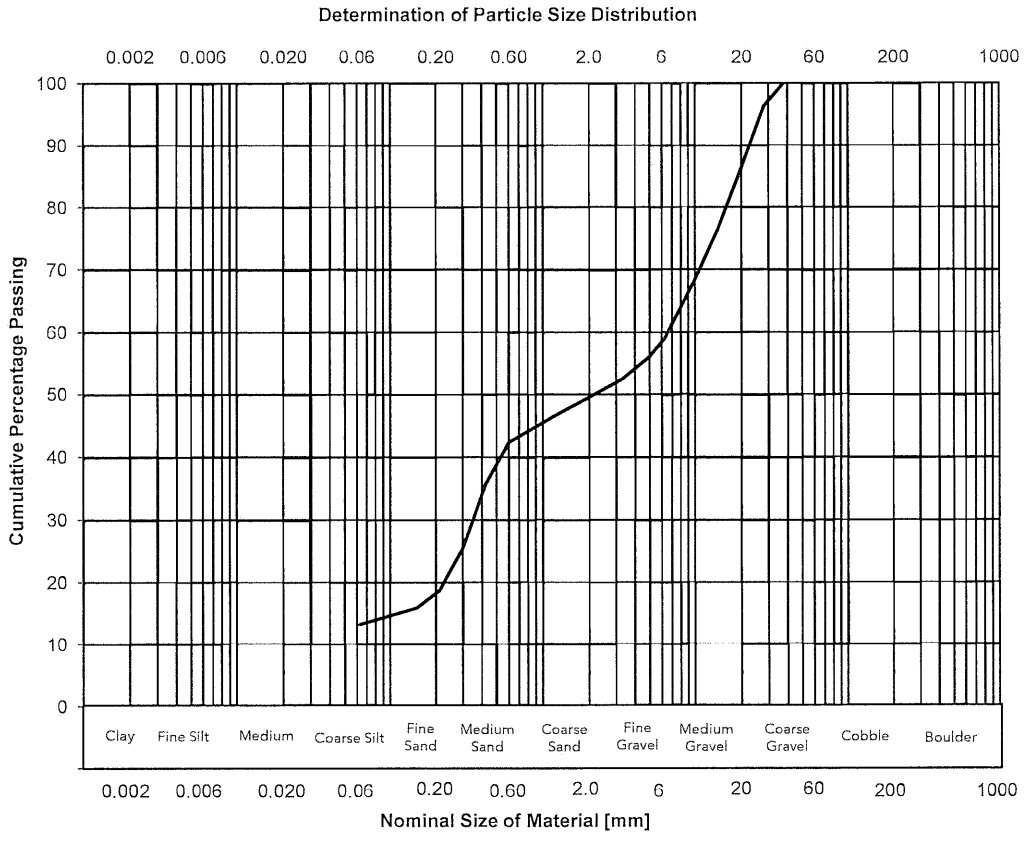
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/19/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	30/10/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/19
Client Reference: B8
Pre-treatment for organic material: N/A

Sample Description: Brown clayey silty SAND and GRAVEL. Gravel consists of fine to coarse angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH2
Depth Top: 3.00
Depth Base: 3.40



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	96
20	86
14	76
10	68
6.3	59
5.0	56
3.35	53
2.00	50
1.18	47
0.600	42
0.425	36
0.300	25
0.212	19
0.150	16
0.063	13
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

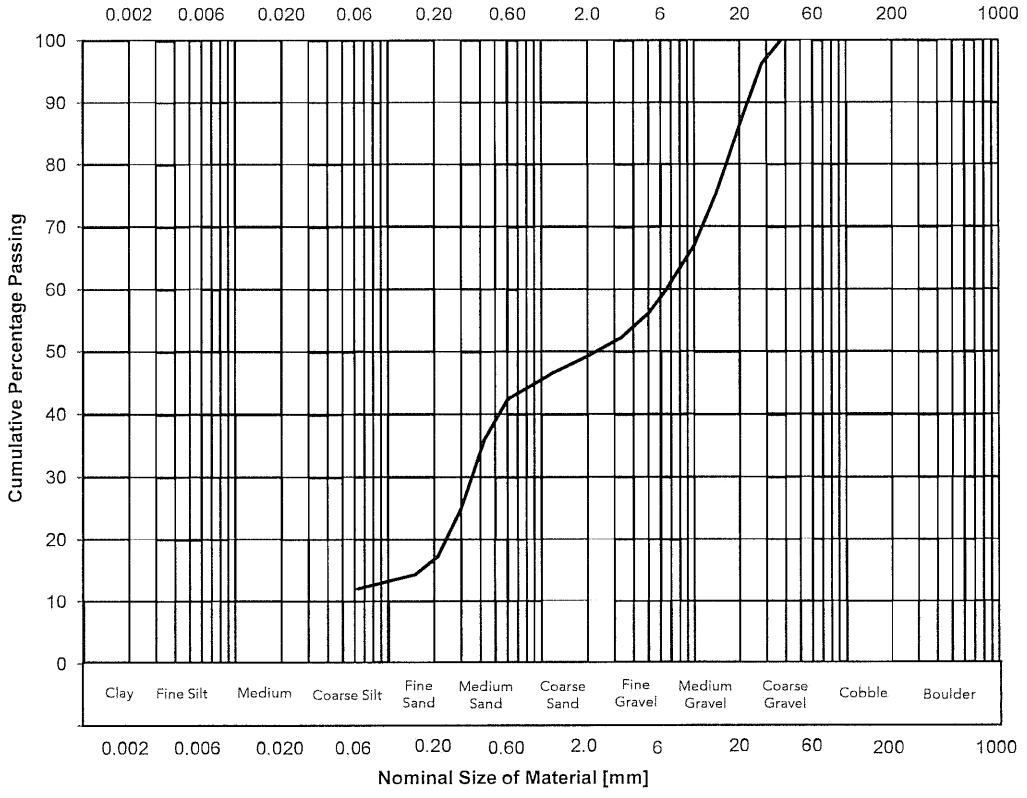
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/20/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	30/10/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/20
Client Reference: B9
Pre-treatment for organic material: N/A

Sample Description: Brown clayey silty SAND and GRAVEL. Gravel consists of fine to coarse angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH2
Depth Top: 3.40
Depth Base: 4.00



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	96
20	86
14	75
10	67
6.3	59
5.0	56
3.35	52
2.00	49
1.18	47
0.600	42
0.425	36
0.300	25
0.212	17
0.150	14
0.063	12
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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e: geadmin@luciongroup.com

TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

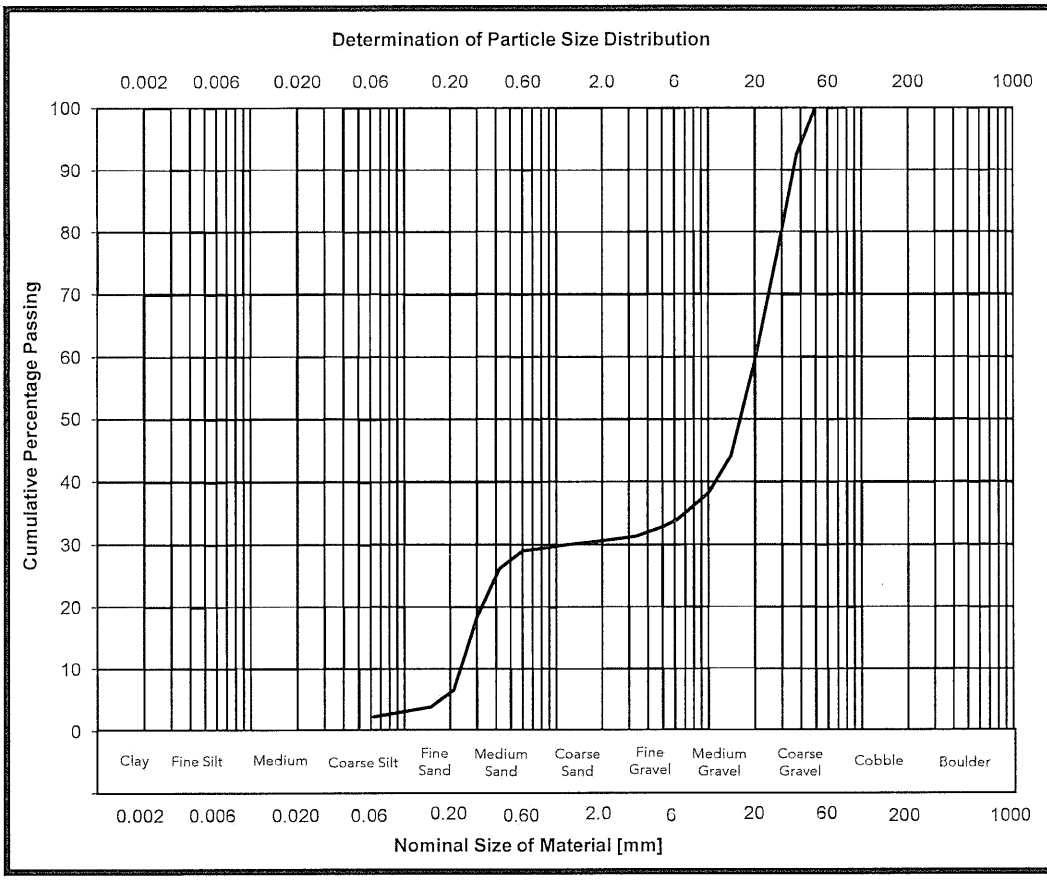
Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/21/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	30/10/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

TEST RESULTS

Laboratory Reference: PL8780-1/21
Client Reference: B10
Pre-treatment for organic material:

Sample Description: Brown silty sandy GRAVEL. Gravel consists of angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH2
Depth Top: 4.10
Depth Base: 4.60



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	93
28	77
20	59
14	44
10	38
6.3	34
5.0	33
3.35	31
2.00	31
1.18	30
0.600	29
0.425	26
0.300	18
0.212	7
0.150	4
0.063	2
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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e: geadmin@luciongroup.com

TEST CERTIFICATE

Determination of Particle Size Distribution

BS1377:Part 2:1990, clause 9.2

Client:	Lucion Ground Engineering Ltd	Certificate Number:	PL8780-1/22/709
Client Address:	Newark Road	Client Reference:	118858
	Peterborough	Lab Job Number:	PL8780-1
	PE1 5UA	Date Sampled:	Unknown
		Date Received:	15/10/2024
Contact:	Steve Fleming	Date Tested:	30/10/2024
		Certificate of Sampling:	N/A
Site Name:	Harefield Hospital - Stage 3 Surveys	Sampling Certificate No.:	N/A
		Sampled By:	Client

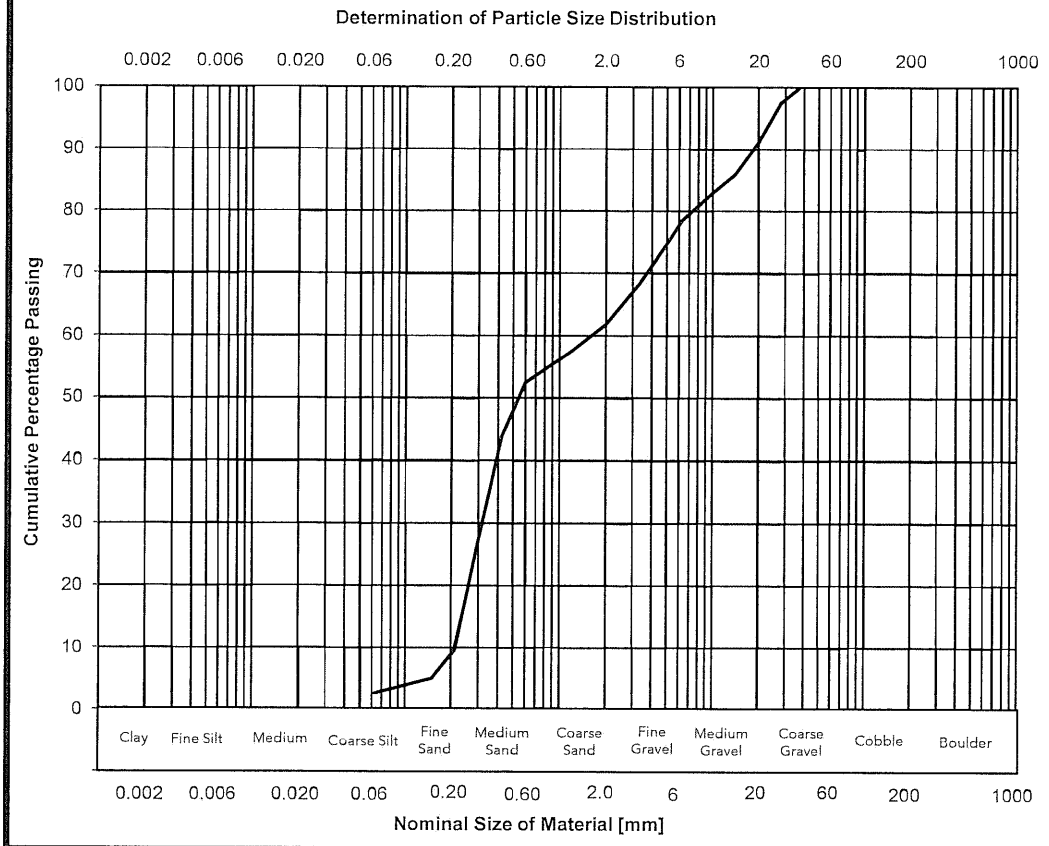
TEST RESULTS

Laboratory Reference: PL8780-1/22
Client Reference: B11
Pre-treatment for organic material: N/A

Sample Description: Brown silty SAND and GRAVEL. Gravel consists of fine to coarse angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH2

Depth Top: 5.00
Depth Base: 5.40



Sieve Analysis

Sieve mm	%Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	98
20	91
14	86
10	83
6.3	79
5.0	75
3.35	68
2.00	62
1.18	57
0.600	52
0.425	44
0.300	27
0.212	10
0.150	5
0.063	3
0.020	
0.006	
0.002	

Comments:

Approved Signatory: Matt Hartnup - Laboratory Manager

Signed:

for and on behalf of Lucion Ground Engineering Ltd

Date Reported: 18/11/2024 Page 1 of 1
Form Number: GELab/C/709-3 Version 11

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Reg Office: Lucion Ground Engineering Ltd
Newark Road, Peterborough PE1 5UA

APPENDIX 1

PRELIMINARY UXO THREAT ASESSMENT

Harefield Hospital

Lucion Ground Engineering

Preliminary Unexploded Ordnance (UXO) Threat Assessment

Meeting the requirements of the UK's
Construction Industry Research and Information Association's UXO Risk Management Framework
"Unexploded Ordnance (UXO) – A Guide for the Construction Industry" (C681)

6 Alpha Associates Ltd

Project No.: 11685

20th January 2025

V1.0

Using This Report

This Preliminary Threat Assessment is designed to inform the reader whether military related Unexploded Ordnance (UXO) is likely to pose a hazard at the Study Site. The assessment is intended as a site-screening tool to meet with the requirement of Stage 1 of the *Health and Safety Executive* endorsed *CIRIA C681 UXO Risk Management Framework* – for which *6 Alpha* were the lead technical author. Whilst the term "Risk" can be justifiably used at this stage, the reader should note that the "Consequence" function of "Risk" is not considered.

There are two prospective outcomes of this report; either the threat level requires a Detailed Threat and Risk Assessment with Risk Mitigation Strategy (Stages 2 and 3 of the *CIRIA C681* framework); or no further action is required. In the former instance *6 Alpha* can advise and support further, as required.

Two figures accompany the report, the first is the Site Boundary which clearly depicts the area covered by this assessment and the second is the Probability of UXO Encounter at the Study Site. The latter will illustrate any variance in the probability of encountering UXO throughout the Study Site.

Document Control

Version	Author(s)	Reviewed By	Recipient
1.0	Beth Skoulding	Laurence Gregory	Lucion Ground Engineering

6 Alpha Associates Limited

2A Woolpit Business Park

Woolpit, Bury St. Edmunds, Suffolk

IP30 9UP

Tel: +44(0) 203 371 3900

Web: www.6alpha.com

Document Scope

6 Alpha Associates Limited (6 Alpha) has been commissioned to provide a UXO Threat Assessment for the Site described as "Harefield Hospital, Middlesex, UB9 6JH", which is centred on *National Grid Reference* 505121, 190830.

Key Findings

During WWII, the Study Site was situated within *Uxbridge Urban District*, which recorded five HE bomb strikes per 100 hectares; categorised as a "very low" level of bombing.

Luftwaffe aerial reconnaissance photography did not identify any primary bombing targets on-site nor within a 1,000m radius of the Study Site boundary.

Air Raid Precaution (ARP) records identified 13 HE bomb strikes within a 1,000m radius of the Study Site, the closest of which was located 495m to the north-east of the Study Site. Nonetheless, extensive archival research did not identify any evidence of WWII-era bomb strikes located within a closer proximity to the Study Site.

Official bomb damage mapping associated with the Study Site was not available. Nonetheless, extensive archival research did not identify any evidence of WWII-era bomb damage on-site nor within the vicinity of the Study Site. However, an analysis of post-wartime mapping identified a *'Ruin'* located approximately 105m to the east, of which may have been indicative of bomb damage; though this could not be corroborated.

An analysis of pertinent historical records supplemented with further *6 Alpha* research noted that the *Harefield Hospital* (located on-site) was initially established as a military hospital for *Australian* and *New Zealand* soldiers during WWI and later treated other *Allied* personnel and prisoners of war during WWII. Nonetheless, it is unlikely that munitions would previously have been stored on-site or nearby as a result of this activity.

Recommendations

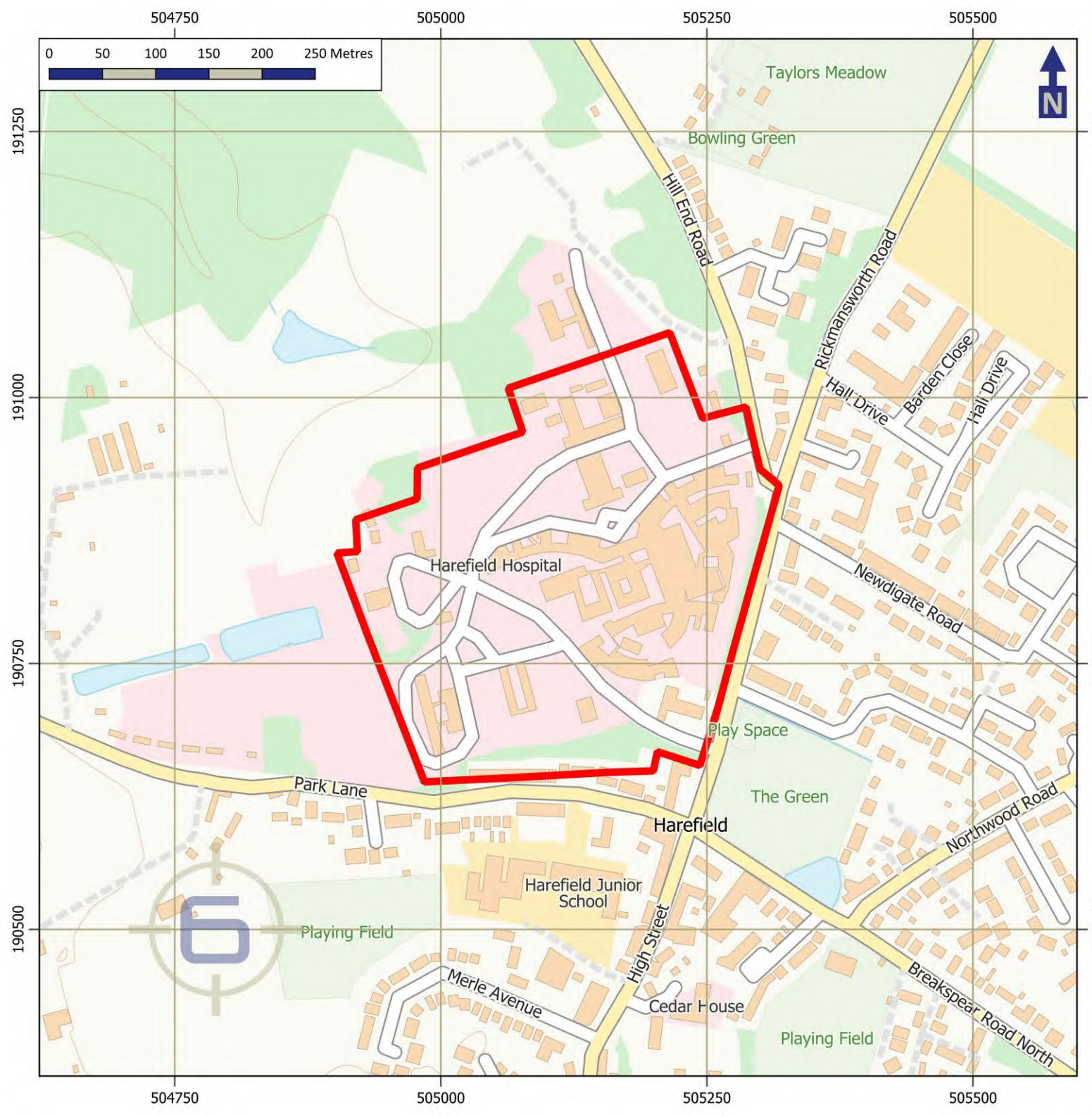
Although WWII bombing, potential bomb damage and *Allied* military activity were recorded in the wider area, as there was no bombing, bomb damage or other military activity recorded in the Study Site's immediate vicinity, *6 Alpha* do not consider that any further investigation into UXO is warranted. Therefore:

NO FURTHER ACTION IS REQUIRED

Constraints

The report is also constrained by the following factors:

1. The assessment levels have been generated from historical data and third-party sources. Where possible *6 Alpha* have sought to verify the accuracy of such data, but cannot be held accountable for inherent errors that may be in third-party data sets (e.g. *National Archives* or library sources);
    a. Nonetheless, *6 Alpha* have exercised all reasonable care, skill and due diligence in producing this report;
2. Whilst every effort has been used to identify all potential UXO/explosive threats, there were a number of private facilities which may not have released privately recorded information concerning UXO/explosive threats into the public domain;
3. This report is accurate and up to date at the time of writing but cannot account for the release of new information, nor for new evidence concerning the potential for a UXO hazard to exist at this Study Site, which is disclosed after the date of the report's release. Should further evidence of UXO sources be found, or if UXO is found at the Site or nearby in the future, then this assessment for the Study Site is to be reassessed and updated by *6 Alpha*.



Site Boundary

BOMB SEARCH

LEGEND

Site Boundary

British National Grid

Address

HAREFIELD HOSPITAL. MIDDLESEX. UB9 6JH

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE
11685	1	BS	LG	17/01/2025

alpha ASSOCIATES
special risks consultancy

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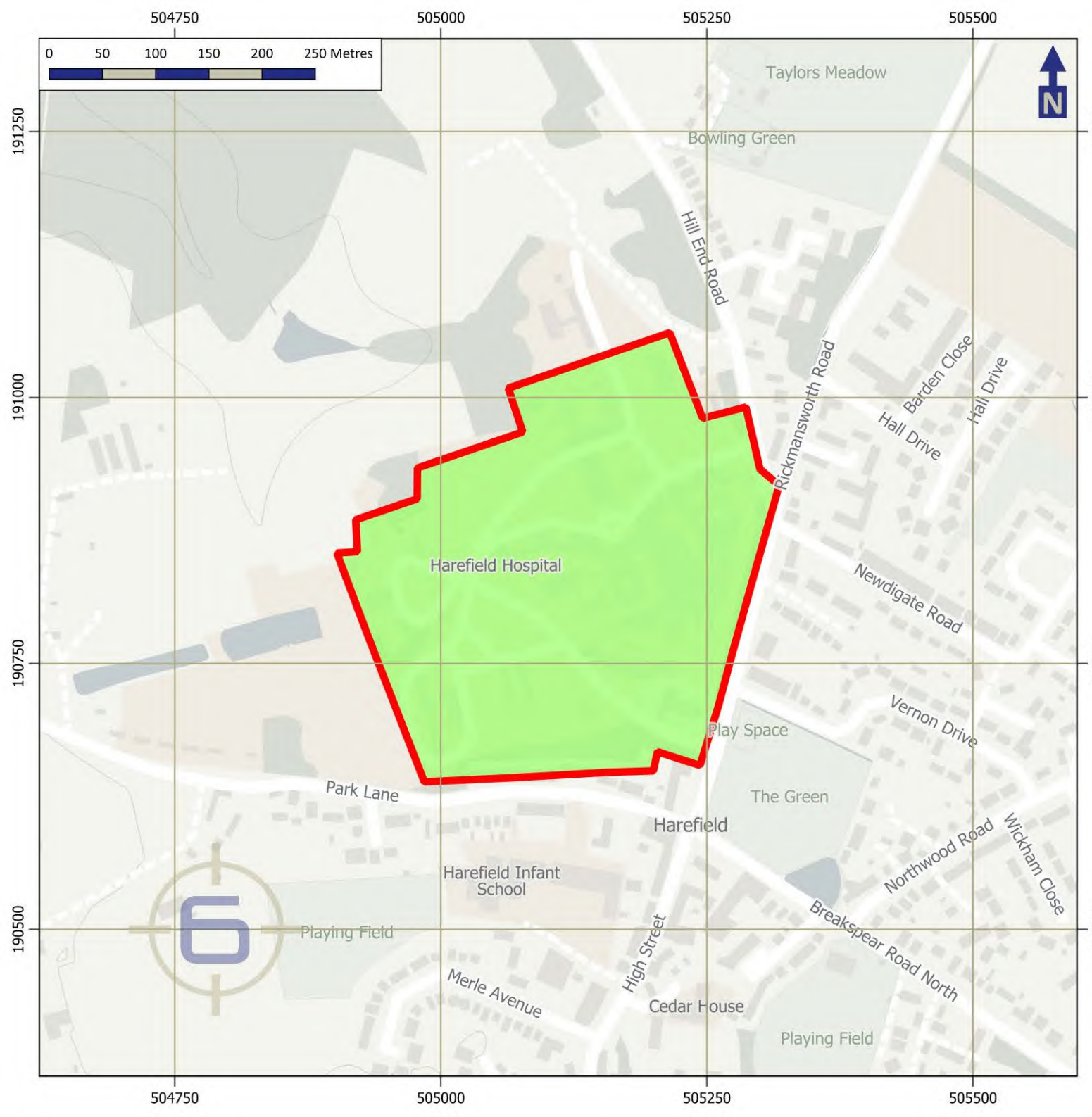

Probability of UXO Encounter

BOMB SEARCH

LEGEND

Site Boundary

Probability of UXO Encounter

Likely

Unlikely

British National Grid

Address

HAREFIELD HOSPITAL. MIDDLESEX. UB9 6JH

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE
11685	2	BS	LG	17/01/2025

alpha ASSOCIATES
special risks consultancy

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APPENDIX 2

CHEMICAL LABORATORY TEST RESULTS

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	24-33406-1
Initial Date of Issue:	22-Oct-2024
Re-Issue Details:	
Client	Lucion Ground Engineering Limited
Client Address:	Newark Road Peterborough Cambridgeshire PE1 5UA
Contact(s):	Steve Fleming
Project	118858 Harefield Hospital - Stage 3 Surveys

Quotation No.:	Q24-35007	**Date Received:**	16-Oct-2024
Order No.:	17694	**Date Instructed:**	16-Oct-2024
No. of Samples:	9		
Turnaround (Wkdays):	5	**Results Due:**	22-Oct-2024
Date Approved:	22-Oct-2024		

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: 118858 Harefield Hospital - Stage 3 Surveys

Client: Lucion Ground Engineering Limited				**Chemtest Job No.:**		24-33406	24-33406	24-33406	24-33406	24-33406	24-33406	24-33406
Quotation No.: Q24-35007				**Chemtest Sample ID.:**		1881061	1881062	1881063	1881064	1881065	1881066	1881067
Order No.: 17694				Client Sample Ref.:		B1	B2	B1	B2	D1/ES1	D3/ES3	D2/ES2
				Sample Location:		BH1	BH1	BH2	BH2	TP2	TP2	TP3
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.00	0.40	0.00	0.10	0.30	0.80	0.40
				Bottom Depth (m):		0.40	0.60	0.10	0.40			
				Date Sampled:		02-Oct-2024	02-Oct-2024	03-Oct-2024	03-Oct-2024	30-Sep-2024	30-Sep-2024	30-Sep-2024
				Asbestos Lab:			DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
pH at 20C		M	2010		4.0		6.9		7.8	8.9	8.4	8.1
Moisture		N	2030	%	0.020	9.8	12	5.2	13	9.2	22	12
Stones and Removed Materials		N	2030	%	0.020		< 0.020		< 0.020	< 0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40		0.60		0.70	< 0.40	0.43	0.82
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010		< 0.010		< 0.010	0.037	< 0.010	< 0.010
Cyanide (Free)		M	2300	mg/kg	0.50		0.80		< 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Cyanide (Total)		M	2300	mg/kg	0.50		1.0		< 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50		3.2		2.5	3.6	2.5	2.9
Arsenic		M	2455	mg/kg	0.5		7.2		11	12	22	22
Cadmium		M	2455	mg/kg	0.10		0.20		0.42	0.71	0.50	0.41
Chromium		M	2455	mg/kg	0.5		14		16	18	46	35
Copper		M	2455	mg/kg	0.50		14		28	35	110	27
Mercury		M	2455	mg/kg	0.05		0.21		0.34	< 0.05	0.08	0.32
Nickel		M	2455	mg/kg	0.50		8.6		11	27	59	21
Lead		M	2455	mg/kg	0.50		58		91	18	190	88
Selenium		M	2455	mg/kg	0.25		0.72		0.78	0.55	2.3	1.0
Zinc		M	2455	mg/kg	0.50		51		84	88	260	120
Chromium (Hexavalent)		N	2490	mg/kg	0.50		< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40		5.0		4.0	3.1	1.2	2.2
Acenaphthene		M	2700	mg/kg	0.10		< 0.10		< 0.10	0.36	< 0.10	0.13
Acenaphthylene		M	2700	mg/kg	0.10		0.27		0.34	0.37	< 0.10	0.44
Anthracene		M	2700	mg/kg	0.10		< 0.10		< 0.10	0.80	< 0.10	0.34
Benzo[a]anthracene		M	2700	mg/kg	0.10		0.24		0.43	0.75	< 0.10	1.1
Benzo[a]pyrene		M	2700	mg/kg	0.10		0.38		0.71	0.71	< 0.10	1.2
Benzo[b]fluoranthene		M	2700	mg/kg	0.10		0.53		0.94	0.92	< 0.10	1.8
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10		3.1		1.9	0.85	< 0.10	1.0
Benzo[k]fluoranthene		M	2700	mg/kg	0.10		3.1		1.0	0.45	< 0.10	0.94
Chrysene		M	2700	mg/kg	0.10		1.3		1.8	0.80	< 0.10	1.5
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10		0.35		< 0.10	0.22	< 0.10	0.25
Fluoranthene		M	2700	mg/kg	0.10		0.77		1.2	2.5	0.33	2.9
Fluorene		M	2700	mg/kg	0.10		< 0.10		0.10	0.44	< 0.10	0.11
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10		0.54		0.54	0.57	< 0.10	0.80
Naphthalene		M	2700	mg/kg	0.10		0.81		0.67	0.49	< 0.10	0.58
Phenanthrene		M	2700	mg/kg	0.10		0.37		0.58	1.9	0.24	1.3
Pyrene		M	2700	mg/kg	0.10		0.80		1.2	2.3	0.24	3.0
Total Of 16 PAH's		M	2700	mg/kg	2.0		13		11	14	< 2.0	17

Results - Soil

Project: 118858 Harefield Hospital - Stage 3 Surveys

Client: Lucion Ground Engineering Limited				**Chemtest Job No.:**		24-33406	24-33406	24-33406	24-33406	24-33406	24-33406	24-33406
Quotation No.: Q24-35007				**Chemtest Sample ID.:**		1881061	1881062	1881063	1881064	1881065	1881066	1881067
Order No.: 17694				Client Sample Ref.:		B1	B2	B1	B2	D1/ES1	D3/ES3	D2/ES2
				Sample Location:		BH1	BH1	BH2	BH2	TP2	TP2	TP3
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.00	0.40	0.00	0.10	0.30	0.80	0.40
				Bottom Depth (m):		0.40	0.60	0.10	0.40			
				Date Sampled:		02-Oct-2024	02-Oct-2024	03-Oct-2024	03-Oct-2024	30-Sep-2024	30-Sep-2024	30-Sep-2024
				Asbestos Lab:			DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
Total Phenols		M	2920	mg/kg	0.10		< 0.10		< 0.10	< 0.10	< 0.10	< 0.10
ACM Type		U	2192		N/A		-		-	-	-	-
Asbestos Identification		U	2192		N/A		No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones and grass	Stones and Roots	Stones and Roots	Stones	Stones	Stones	Stones
Soil Texture		N	2040		N/A	Clay	Sand	Clay	Sand	Sand	Clay	Sand
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05		< 0.05	[B] < 0.05	[B] < 0.05	[B] < 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05		< 0.05	[B] < 0.05	[B] < 0.05	[B] < 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05		< 0.05	[B] < 0.05	[B] < 0.05	[B] < 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10		< 0.10		< 0.10	[B] < 0.10	[B] < 0.10	[B] < 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05		< 0.05	[B] < 0.05	[B] < 0.05	[B] < 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25		< 0.25		< 0.25	[B] < 0.25	[B] < 0.25	[B] < 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00		2.7		2.7	[B] < 2.0	[B] 18	[B] 16
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00		2.3		4.7	[B] 1.2	[B] 2.7	[B] < 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00		< 2.0		6.0	[B] 13	[B] 2.4	[B] < 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00		12		17	[B] 10	[B] 6.9	[B] 18
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00		< 10		< 10	[B] < 10	[B] < 10	[B] < 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00		19		30	[B] 26	[B] 30	[B] 34
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00		19		30	[B] 26	[B] 30	[B] 34
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05		< 0.05	[B] < 0.05	[B] < 0.05	[B] < 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05		< 0.05	[B] < 0.05	[B] < 0.05	[B] < 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05		< 0.05	[B] < 0.05	[B] < 0.05	[B] < 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25		< 0.25		< 0.25	[B] < 0.25	[B] < 0.25	[B] < 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00		< 1.0		< 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00		< 1.0		< 1.0	[B] 7.1	[B] < 1.0	[B] < 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00		5.9		16	[B] 60	[B] 58	[B] 19
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00		23		42	[B] 5.1	[B] 74	[B] 66
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00		9.5		19	[B] 77	[B] 28	[B] 27
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00		30		59	[B] 73	[B] 130	[B] 85
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00		40		77	[B] 150	[B] 160	[B] 110
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50		< 0.50		< 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00		49		89	[B] 99	[B] 160	[B] 120
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00		58		110	[B] 180	[B] 190	[B] 150

Results - Soil

Project: 118858 Harefield Hospital - Stage 3 Surveys

Client: Lucion Ground Engineering Limited				**Chemtest Job No.:**		24-33406	24-33406
Quotation No.: Q24-35007				**Chemtest Sample ID.:**		1881068	1881069
Order No.: 17694				Client Sample Ref.:		D2/ES2	D3/ES3
				Sample Location:		TP4	TP4
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.20	0.40
				Bottom Depth (m):			
				Date Sampled:		07-Oct-2024	07-Oct-2024
				Asbestos Lab:		DURHAM	
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**		
pH at 20C		M	2010		4.0	8.0	
Moisture		N	2030	%	0.020	19	11
Stones and Removed Materials		N	2030	%	0.020	< 0.020	
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.6	
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	< 0.010	
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	2.9	
Arsenic		M	2455	mg/kg	0.5	11	
Cadmium		M	2455	mg/kg	0.10	0.17	
Chromium		M	2455	mg/kg	0.5	19	
Copper		M	2455	mg/kg	0.50	16	
Mercury		M	2455	mg/kg	0.05	0.25	
Nickel		M	2455	mg/kg	0.50	12	
Lead		M	2455	mg/kg	0.50	61	
Selenium		M	2455	mg/kg	0.25	0.56	
Zinc		M	2455	mg/kg	0.50	77	
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	
Organic Matter		M	2625	%	0.40	4.8	
Acenaphthene		M	2700	mg/kg	0.10	< 0.10	
Acenaphthylene		M	2700	mg/kg	0.10	< 0.10	
Anthracene		M	2700	mg/kg	0.10	< 0.10	
Benzo[a]anthracene		M	2700	mg/kg	0.10	0.23	
Benzo[a]pyrene		M	2700	mg/kg	0.10	< 0.10	
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	< 0.10	
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	< 0.10	
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	< 0.10	
Chrysene		M	2700	mg/kg	0.10	1.8	
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	< 0.10	
Fluoranthene		M	2700	mg/kg	0.10	0.69	
Fluorene		M	2700	mg/kg	0.10	< 0.10	
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	< 0.10	
Naphthalene		M	2700	mg/kg	0.10	< 0.10	
Phenanthrene		M	2700	mg/kg	0.10	0.36	
Pyrene		M	2700	mg/kg	0.10	0.66	
Total Of 16 PAH's		M	2700	mg/kg	2.0	3.7	

Results - Soil

Project: 118858 Harefield Hospital - Stage 3 Surveys

Client: Lucion Ground Engineering Limited				**Chemtest Job No.:**		24-33406	24-33406
Quotation No.: Q24-35007				**Chemtest Sample ID.:**		1881068	1881069
Order No.: 17694				Client Sample Ref.:		D2/ES2	D3/ES3
				Sample Location:		TP4	TP4
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.20	0.40
				Bottom Depth (m):			
				Date Sampled:		07-Oct-2024	07-Oct-2024
				Asbestos Lab:		DURHAM	
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**		
Total Phenols		M	2920	mg/kg	0.10	< 0.10	
ACM Type		U	2192		N/A	-	
Asbestos Identification		U	2192		N/A	No Asbestos Detected	
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones, Roots and brick
Soil Texture		N	2040		N/A	Sand	Sand
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	18	
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	21	
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	41	
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	41	
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	8.0	
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	33	
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	15	
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	41	
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	57	
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	82	
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	98	

Results - Single Stage WAC

Project: 118858 Harefield Hospital - Stage 3 Surveys

Chemtest Job No:	24-33406					**Landfill Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1881061							
Sample Ref:	B1							
Sample ID:								
Sample Location:	BH1							
Top Depth(m):	0.00							
Bottom Depth(m):	0.40							
Sampling Date:	02-Oct-2024					**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**				
Total Organic Carbon	2625		M	%	1.3	3	5	6
Loss On Ignition	2610		M	%	2.6	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	88	500	--	--
Total (Of 17) PAH's	2800		N	mg/kg	14	100	--	--
pH at 20C	2010		M		8.9	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.014	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0021	0.021	0.5	2	25
Barium	1455		U	0.009	0.088	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	0.0014	0.014	0.5	10	70
Copper	1455		U	0.0036	0.036	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.0007	0.0066	0.5	10	30
Nickel	1455		U	0.0006	0.0062	0.4	10	40
Lead	1455		U	0.0022	0.022	0.5	10	50
Antimony	1455		U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455		U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455		U	0.010	0.099	4	50	200
Chloride	1220		U	< 1.0	< 10	800	15000	25000
Fluoride	1220		U	0.14	1.4	10	150	500
Sulphate	1220		U	3.8	38	1000	20000	50000
Total Dissolved Solids	1020		N	46	460	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	5.7	57	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	9.8

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 118858 Harefield Hospital - Stage 3 Surveys

Chemtest Job No:	24-33406					**Landfill Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1881062							
Sample Ref:	B2							
Sample ID:								
Sample Location:	BH1							
Top Depth(m):	0.40							
Bottom Depth(m):	0.60							
Sampling Date:	02-Oct-2024					**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**				
Total Organic Carbon	2625		M	%	2.9	3	5	6
Loss On Ignition	2610		M	%	7.8	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	92	500	--	--
Total (Of 17) PAH's	2800		N	mg/kg	6.3	100	--	--
pH at 20C	2010		M		6.9	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.0050	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0014	0.014	0.5	2	25
Barium	1455		U	0.014	0.14	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	0.0018	0.018	0.5	10	70
Copper	1455		U	0.0061	0.061	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.0010	0.010	0.5	10	30
Nickel	1455		U	0.0008	0.0082	0.4	10	40
Lead	1455		U	0.0017	0.017	0.5	10	50
Antimony	1455		U	0.0007	0.0075	0.06	0.7	5
Selenium	1455		U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455		U	0.009	0.090	4	50	200
Chloride	1220		U	< 1.0	< 10	800	15000	25000
Fluoride	1220		U	0.20	2.0	10	150	500
Sulphate	1220		U	13	130	1000	20000	50000
Total Dissolved Solids	1020		N	100	1000	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	13	130	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 118858 Harefield Hospital - Stage 3 Surveys

Chemtest Job No:	24-33406					**Landfill Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1881063							
Sample Ref:	B1							
Sample ID:								
Sample Location:	BH2							
Top Depth(m):	0.00							
Bottom Depth(m):	0.10							
Sampling Date:	03-Oct-2024							
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625		M	%	0.48	3	5	6
Loss On Ignition	2610		M	%	3.3	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	67	500	--	--
Total (Of 17) PAH's	2800		N	mg/kg	2.2	100	--	--
pH at 20C	2010		M		8.3	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0048	0.048	0.5	2	25
Barium	1455		U	0.017	0.17	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	0.0058	0.058	0.5	10	70
Copper	1455		U	0.0039	0.039	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.0018	0.018	0.5	10	30
Nickel	1455		U	0.0021	0.021	0.4	10	40
Lead	1455		U	0.0031	0.031	0.5	10	50
Antimony	1455		U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455		U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455		U	0.008	0.083	4	50	200
Chloride	1220		U	1.9	19	800	15000	25000
Fluoride	1220		U	0.42	4.2	10	150	500
Sulphate	1220		U	6.3	63	1000	20000	50000
Total Dissolved Solids	1020		N	75	750	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	6.0	60	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	5.2

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 118858 Harefield Hospital - Stage 3 Surveys

						Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-33406							
Chemtest Sample ID:	1881064							
Sample Ref:	B2							
Sample ID:								
Sample Location:	BH2							
Top Depth(m):	0.10							
Bottom Depth(m):	0.40							
Sampling Date:	03-Oct-2024							
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625		M	%	2.3	3	5	6
Loss On Ignition	2610		M	%	7.1	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800		N	mg/kg	7.8	100	--	--
pH at 20C	2010		M		7.8	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.011	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0023	0.023	0.5	2	25
Barium	1455		U	0.030	0.30	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	0.0023	0.023	0.5	10	70
Copper	1455		U	0.0045	0.045	2	50	100
Mercury	1455		U	0.00006	0.00064	0.01	0.2	2
Molybdenum	1455		U	0.0013	0.013	0.5	10	30
Nickel	1455		U	0.0014	0.014	0.4	10	40
Lead	1455		U	0.012	0.12	0.5	10	50
Antimony	1455		U	0.0008	0.0078	0.06	0.7	5
Selenium	1455		U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455		U	0.008	0.075	4	50	200
Chloride	1220		U	1.2	12	800	15000	25000
Fluoride	1220		U	0.40	4.0	10	150	500
Sulphate	1220		U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020		N	56	560	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	6.6	66	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	13

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 118858 Harefield Hospital - Stage 3 Surveys

Chemtest Job No:	24-33406					**Landfill Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1881068							
Sample Ref:	D2/ES2							
Sample ID:								
Sample Location:	TP4							
Top Depth(m):	0.20							
Bottom Depth(m):								
Sampling Date:	07-Oct-2024							
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625		M	%	2.8	3	5	6
Loss On Ignition	2610		M	%	7.0	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800		N	mg/kg	4.5	100	--	--
pH at 20C	2010		M		8.0	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.012	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0037	0.037	0.5	2	25
Barium	1455		U	0.022	0.22	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	0.0040	0.040	0.5	10	70
Copper	1455		U	0.0045	0.045	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.0010	0.010	0.5	10	30
Nickel	1455		U	0.0024	0.024	0.4	10	40
Lead	1455		U	0.0075	0.075	0.5	10	50
Antimony	1455		U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455		U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455		U	0.011	0.11	4	50	200
Chloride	1220		U	1.3	13	800	15000	25000
Fluoride	1220		U	0.41	4.1	10	150	500
Sulphate	1220		U	1.4	14	1000	20000	50000
Total Dissolved Solids	1020		N	63	630	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	8.1	81	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	19

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 118858 Harefield Hospital - Stage 3 Surveys

Chemtest Job No:	24-33406					**Landfill Waste Acceptance Criteria Limits**		
Chemtest Sample ID:	1881069							
Sample Ref:	D3/ES3							
Sample ID:								
Sample Location:	TP4							
Top Depth(m):	0.40							
Bottom Depth(m):								
Sampling Date:	07-Oct-2024							
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625		M	%	1.2	3	5	6
Loss On Ignition	2610		M	%	3.8	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800		N	mg/kg	7.0	100	--	--
pH at 20C	2010		M		8.2	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.010	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0027	0.027	0.5	2	25
Barium	1455		U	0.022	0.22	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	0.0042	0.042	0.5	10	70
Copper	1455		U	0.0032	0.033	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.0011	0.011	0.5	10	30
Nickel	1455		U	0.0023	0.023	0.4	10	40
Lead	1455		U	0.0073	0.073	0.5	10	50
Antimony	1455		U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455		U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455		U	0.011	0.11	4	50	200
Chloride	1220		U	1.5	15	800	15000	25000
Fluoride	1220		U	0.36	3.6	10	150	500
Sulphate	1220		U	2.4	24	1000	20000	50000
Total Dissolved Solids	1020		N	45	450	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	7.3	73	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	11

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1881065	D1/ES1		TP2	30-Sep-2024	B	Amber Glass 250ml
1881065	D1/ES1		TP2	30-Sep-2024	B	Plastic Tub 500g
1881066	D3/ES3		TP2	30-Sep-2024	B	Amber Glass 250ml
1881066	D3/ES3		TP2	30-Sep-2024	B	Plastic Tub 500g
1881067	D2/ES2		TP3	30-Sep-2024	B	Amber Glass 250ml
1881067	D2/ES2		TP3	30-Sep-2024	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	RE PW PL LE DW FW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW FW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW FW
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2015	Acid Neutralisation Capacity	Acid Reserve	Titration	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.
Any comments or interpretations are outside the scope of UKAS accreditation.
The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.
Uncertainty of measurement for the determinands tested are available upon request .
None of the results in this report have been recovery corrected.
All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at ≤ 30°C prior to analysis.
All Asbestos testing is performed at the indicated laboratory .
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.
All water samples will be retained for 14 days from the date of receipt.
Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

APPENDIX 3

CLASSIFICATION OF AGGRESSIVE CHEMICAL ENVIRONMENT FOR BURIED CONCRETE

TABLE C2 – AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) CLASSIFICATION FOR BROWNFIELD LOCATIONS[a]

Table C2 Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield locations[a]

Sulfate and magnesium						Groundwater		ACEC
Design Sulfate Class for location	2:1 water/soil extract[b]		Groundwater		Total potential sulfate[c]	Static water	Mobile water	Class for location
1	2 (SO_4 mg/l)	3 (Mg mg/l)	4 (SO_4 mg/l)	5 (Mg mg/l)	6 (SO_4 %)	7 (pH)[d]	8 (pH)[d]	9
DS-1	< 500		< 400		< 0.24	≥ 2.5		AC-1s
							> 6.5[d]	AC-1
							5.5–6.5	AC-2z
							4.5–5.5	AC-3z
							2.5–4.5	AC-4z
DS-2	500–1500		400–1400		0.24–0.6	> 5.5		AC-1s
							> 6.5	AC-2
						2.5–5.5		AC-2s
							5.5–6.5	AC-3z
							4.5–5.5	AC-4z
							2.5–5.5	AC-5z
DS-3	1600–3000		1500–3000		0.7–1.2	> 5.5		AC-2s
							> 6.5	AC-3
						2.5–5.5		AC-3s
							5.5–6.5	AC-4
							2.5–5.5	AC-5
DS-4	3100–6000	≤ 1200	3100–6000	≤ 1000	1.3–2.4	> 5.5		AC-3s
							> 6.5	AC-4
						2.5–5.5		AC-4s
							2.5–6.5	AC-5
DS-4m	3100–6000	> 1200[e]	3100–6000	> 1000[e]	1.3–2.4	> 5.5		AC-3s
							> 6.5	AC-4m
						2.5–5.5		AC-4ms
							2.5–6.5	AC-5m
DS-5	> 6000	≤ 1200	> 6000	≤ 1000	> 2.4	> 5.5		AC-4s
						2.5–5.5	≥ 2.5	AC-5
DS-5m	> 6000	> 1200[e]	> 6000	> 1000[e]	> 2.4	> 5.5		AC-4ms
						2.5–5.5	≥ 2.5	AC-5m

Notes

a Brownfield locations are those sites, or parts of sites, that might contain chemical residues produced by or associated with industrial production (Section C5.1.3).

b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered from previous Digests (Box C7).

c Applies only to locations where concrete will be exposed to sulfate ions (SO_4), which may result from the oxidation of sulfides such as pyrite, following ground disturbance (Appendix A1 and Box C8).

d An additional account is taken of hydrochloric and nitric acids by adjustment to sulfate content (Section C5.1.3).

e The limit on water-soluble magnesium does not apply to brackish groundwater (chloride content between 12 000 mg/l and 17 000 mg/l). This allows 'm' to be omitted from the relevant ACEC classification. Seawater (chloride content about 18 000 mg/l) and stronger brines are not covered by this table.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that include the suffix 'z' have primarily to resist acid conditions and may be made with any of the cements in Table D2 on page 42.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.