

Trial Pit TP6 Photographs



Project: Begbroke Science Park, Kidlington

Client: Oxford University Development

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C15387

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: BEGBROKE SCIENCE PARK, KIDLINGTON		TRIAL PIT TP7		
			Date: 16/06/21	Pit Size: 1.70m L x 0.60m W x 2.00m D.		447797 mE 213515 mN Ground Level: 68.25m. 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 - Grey, slightly sandy GRAVEL. Gravel of angular granite, flint, concrete and asphalt.		0.20	68.05
0.40	D2			MADE GROUND - Brown, silty, gravelly SAND. Gravel of brick, granite, ironstone, flint and ash.		0.65	67.60
0.80	D3			Brown and orange brown, clayey, very gravelly SAND. Gravel of angular to sub-angular flint, limestone, quartzite and ironstone. (SUMMERTOWN - RADLEY SAND AND GRAVEL FORMATION)		1.20	67.05
1.20	D4			Orange brown and yellow brown, silty SAND AND GRAVEL. Gravel of angular to rounded limestone, ironstone, flint, quartz and quartzite.			
1.60-1.90	B1			(SUMMERTOWN - RADLEY SAND AND GRAVEL FORMATION)			
2.00	D5			Pit completed at 2.00m depth		2.00	66.25

- 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 1.00m depth
 2. Pit dry
 3. Pit sides stable
 4. Soakaway testing undertaken at 2.00m depth

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SOAKAWAY TEST RESULTS

BRE DIGEST 365 - SOIL INFILTRATION RATE

Project: Begbroke Science Park, Kidlington

Project No: C15387

Date of Test : 16/06/2021

Sheet No: 1/3

Trial Pit: TP7 (FIRST FILLING)

Depth: 2.00

Length: 1.70

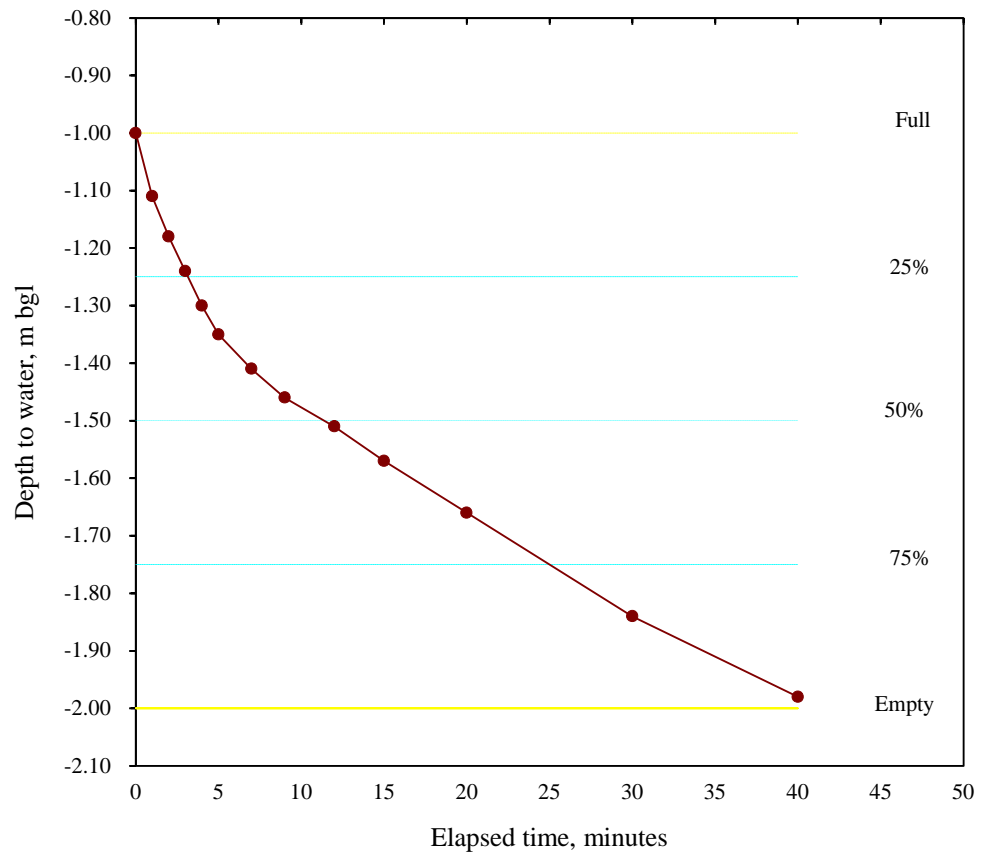
Width: 0.60

Description of Stratum under test: Brown and Yellow Brown, slightly silty SAND AND GRAVEL

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

DEPTH TO WATER vs ELAPSED TIME

Elapsed Time min	Depth to Water m
0.00	1.00
1.00	1.11
2.00	1.18
3.00	1.24
4.00	1.30
5.00	1.35
7.00	1.41
9.00	1.46
12.00	1.51
15.00	1.57
20.00	1.66
30.00	1.84
40.00	1.98



All dimensions given in metres

$$f = \frac{(V_{75} - V_{25})}{A_{50}(T_{75} - T_{25})}$$

$V_{75} - V_{25} = 0.51$
 $A_{50} = 3.32$
 $T_{75} - T_{25} = 22$
 $f = \underline{1.16E-04} \text{ m/s}$

Soil Infiltration Rate

SOAKAWAY TEST RESULTS

BRE DIGEST 365 - SOIL INFILTRATION RATE

Project: Begbroke Science Park, Kidlington

Project No: C15387

Date of Test : 16/06/2021

Sheet No: 2/3

Trial Pit: TP7 (SECOND FILLING)

Depth: 2.00

Length: 1.70

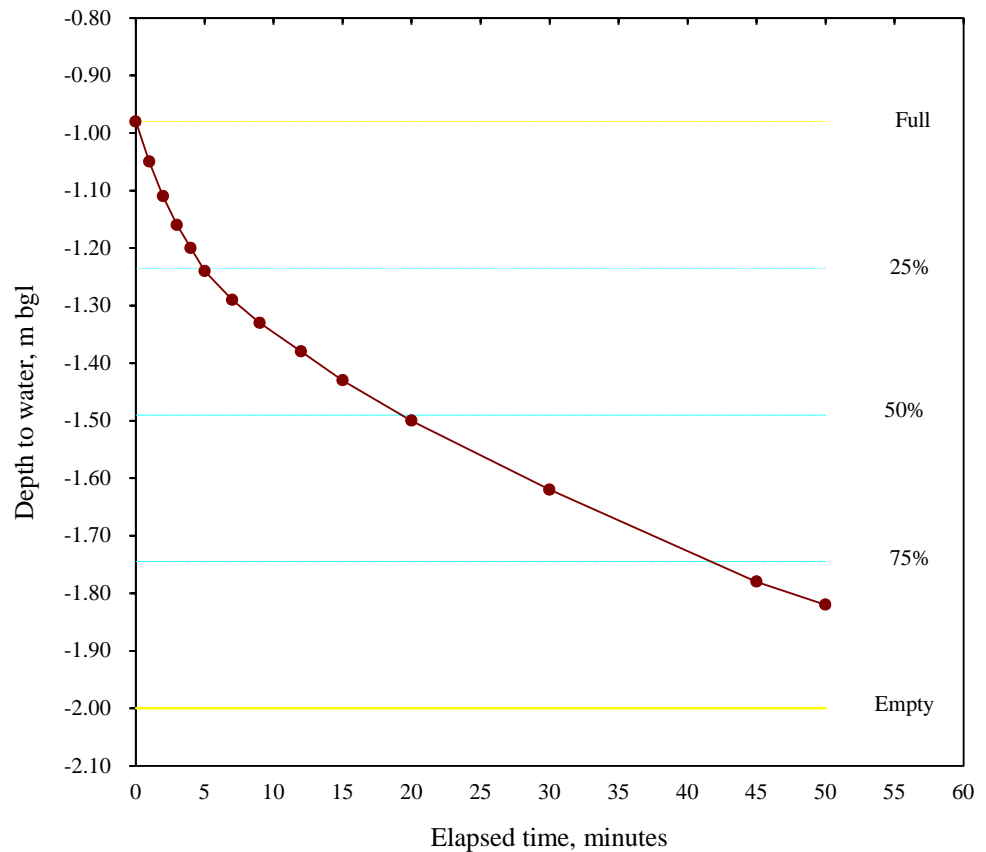
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Description of Stratum under test: Brown and Yellow Brown, slightly silty SAND AND GRAVEL

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

DEPTH TO WATER vs ELAPSED TIME

Elapsed Time min	Depth to Water m
0.00	0.98
1.00	1.05
2.00	1.11
3.00	1.16
4.00	1.20
5.00	1.24
7.00	1.29
9.00	1.33
12.00	1.38
15.00	1.43
20.00	1.50
30.00	1.62
45.00	1.78
50.00	1.82



All dimensions given in metres

$$f = \frac{(V_{75} - V_{25})}{A_{50}(T_{75} - T_{25})}$$

$V_{75} - V_{25} = 0.52$
 $A_{50} = 3.37$
 $T_{75} - T_{25} = 36$
 $f = \underline{7.15E-05} \text{ m/s}$

Soil Infiltration Rate

SOAKAWAY TEST RESULTS

BRE DIGEST 365 - SOIL INFILTRATION RATE

Project: Begbroke Science Park, Kidlington

Project No: C15387

Date of Test : 16/06/2021

Sheet No: 3/3

Trial Pit: TP7 (THIRD FILLING)

Depth: 2.00

Length: 1.70

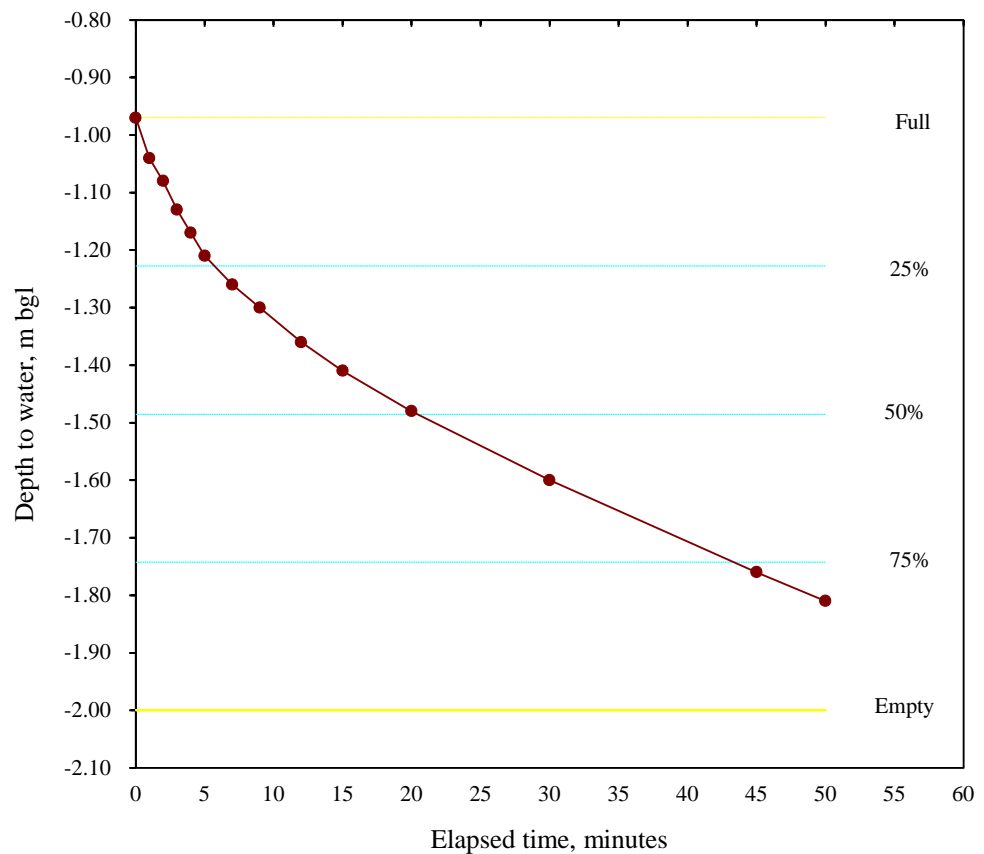
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Description of Stratum under test: Brown and Yellow Brown, slightly silty SAND AND GRAVEL

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

DEPTH TO WATER vs ELAPSED TIME

Elapsed Time min	Depth to Water m
0.00	0.97
1.00	1.04
2.00	1.08
3.00	1.13
4.00	1.17
5.00	1.21
7.00	1.26
9.00	1.30
12.00	1.36
15.00	1.41
20.00	1.48
30.00	1.60
45.00	1.76
50.00	1.81



All dimensions given in metres

$$f = \frac{(V_{75} - V_{25})}{A_{50}(T_{75} - T_{25})}$$

$V_{75} - V_{25} = 0.53$
 $A_{50} = 3.39$
 $T_{75} - T_{25} = 38$
 $f = \underline{\underline{6.80E-05}} \text{ m/s}$

Soil Infiltration Rate

Trial Pit TP7 Photographs



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

Site: BEGBROKE SCIENCE PARK, KIDLINGTON

TRIAL PIT CBR1

Date: 14/06/21

Pit Size: 0.30m L x 0.30m W x 1.00m D.

447976 mE 213609 mN
Ground Level: 68.95m. O.D.

Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O. D. Level m
Depth m	Type	Result	Water				
0.10	D1			MADE GROUND - Grey, slightly sandy GRAVEL of granite, brick, flint, asphalt and limestone.		0.15	68.80
0.40 0.50-0.80	D2 B1			MADE GROUND - Brown, slightly gravelly, silty SAND. Gravel of brick, granite, limestone and flint.		0.65	68.30
0.70	D3			MADE GROUND - Firm, friable, green grey and orange brown mottled, slightly gravelly, sandy, silty, slightly organic CLAY. Gravel of brick, ironstone and flint.		0.85	68.10
0.90	D4			Orange brown and brown, clayey, gravelly SAND. Gravel of angular to rounded limestone, ironstone, flint, quartz and quartzite. (SUMMERTOWN - RADLEY SAND AND GRAVEL MEMBER)		1.00	67.95
Pit completed at 1.00m 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. No live roots observed
 2. Pit dry
 3. Pit sides stable

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Trial Pit CBR1 Photographs



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Site: BEGBROKE SCIENCE PARK, KIDLINGTON

TRIAL PIT
CBR2

Date: 14/06/21

Pit Size: 0.30m L x 0.30m W x 1.00m D.

447997 mE 213635 mN
Ground Level: 68.65m. O.D.

Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
0.10	D1			MADE GROUND - Grey, slightly sandy GRAVEL. Gravel of granite, concrete, flint, ironstone, clinker and ash. Geotextile at base. MADE GROUND - Brown, grey and orange brown, silty SAND AND GRAVEL. Gravel of limestone, flint, quartz, quartzite, ironstone, concrete, brick and ash. ...Gravelly, silty SAND below 0.40m depth		0.15	68.50
0.20	D2						
0.35	D3						
0.50-0.80	B1						
0.60	D4						
0.90	D5			Brown and orange brown, clayey, gravelly SAND. Gravel of angular to rounded limestone, flint, quartz, quartzite and ironstone. (SUMMERTOWN - RADLEY SAND AND GRAVEL MEMBER)		0.70	67.95
				Pit completed at 1.00m depth		1.00	67.65

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

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Trial Pit CBR2 Photographs



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
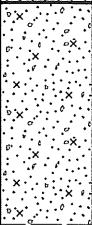
Site: BEGBROKE SCIENCE PARK, KIDLINGTON

TRIAL PIT
CBR3

Date: 14/06/21

Pit Size: 0.30m L x 0.30m W x 1.00m D.

447761 mE 213565 mN
Ground Level: 68.50m. O.D.

Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O. D. Level m
Depth m	Type	Result	Water				
0.10	D1			MADE GROUND - Grey and brown, silty, very gravelly SAND. Gravel of granite, limestone, flint and ash.		0.25	68.25
0.40 0.50-0.70	D2 B1			Brown and orange, silty, gravelly SAND. Gravel of angular to rounded flint, quartz, quartzite, limestone and ironstone.			
0.70	D3			(SUMMERTOWN - RADLEY SAND AND GRAVEL MEMBER)			
0.90	D4					1.00	67.50
				Pit completed at 1.00m 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 0.80m depth
 2. Pit dry
 3. Pit sides stable

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Trial Pit CBR3 Photographs



Project: Begbroke Science Park, Kidlington




Client: Oxford University Development




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Project No.

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GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: BEGBROKE SCIENCE PARK, KIDLINGTON			TRIAL PIT CBR4	
			Date: 14/06/21	Pit Size: 0.30m L x 0.30m W x 1.00m D.		447759 mE 213511 mN Ground Level: 68.40m. O.D.	
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
0.10	D1			MADE GROUND - Grey, slightly silty sand and gravel. Gravel of brick, concrete, limestone, glass and rare fragments of string.		0.30	68.10
0.30	D2			Brown and orange brown, clayey, gravelly SAND. Gravel of angular to rounded flint, quartz, quartzite, ironstone and limestone. (SUMMERTOWN - RADLEY SAND AND GRAVEL MEMBER)		0.55	67.85
0.50-0.70 0.50	B1 D3				Orange brown, silty SAND AND GRAVEL. Gravel of angular to rounded ironstone, limestone, flint, quartz and quartzite. (SUMMERTOWN - RADLEY SAND AND GRAVEL MEMBER)		1.00
0.70	D4						
0.95	D5						
				Pit completed at 1.00m depth			

KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample R - Root Sample W - Water Sample ES - Environmental Sample  Water Strike  Water Rise  Level on completion MP - Mackintosh Probe P() - Hand Penetrometer Cohesion () kPa V - Vane Shear Test Cohesion () kPa	REMARKS 1. Live roots observed to 0.70m depth 2. Pit dry 3. Pit sides stable	Project No 15387	
			Scale 1:25

Trial Pit CBR4 Photographs



Project: Begbroke Science Park, Kidlington

Client: Oxford University Development

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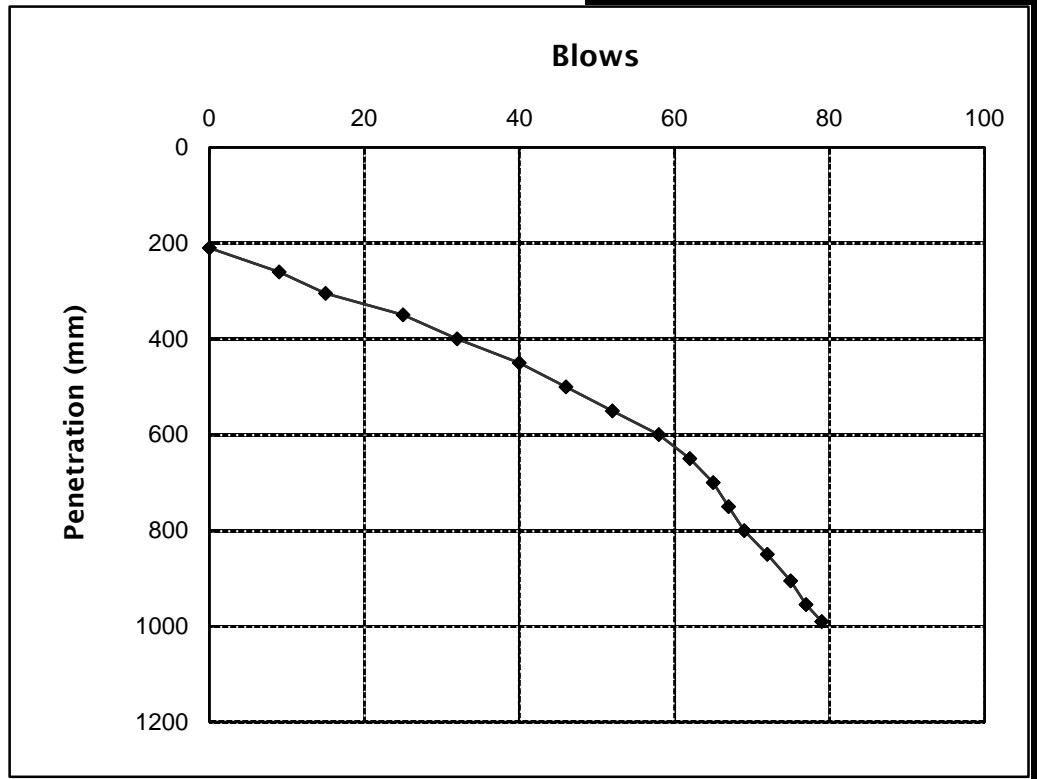
C15387

DYNAMIC CONE PENETROMETER (DCP) RESULTS

Project: Begbroke Science Park, Kidlington **Project Ref: C15387**

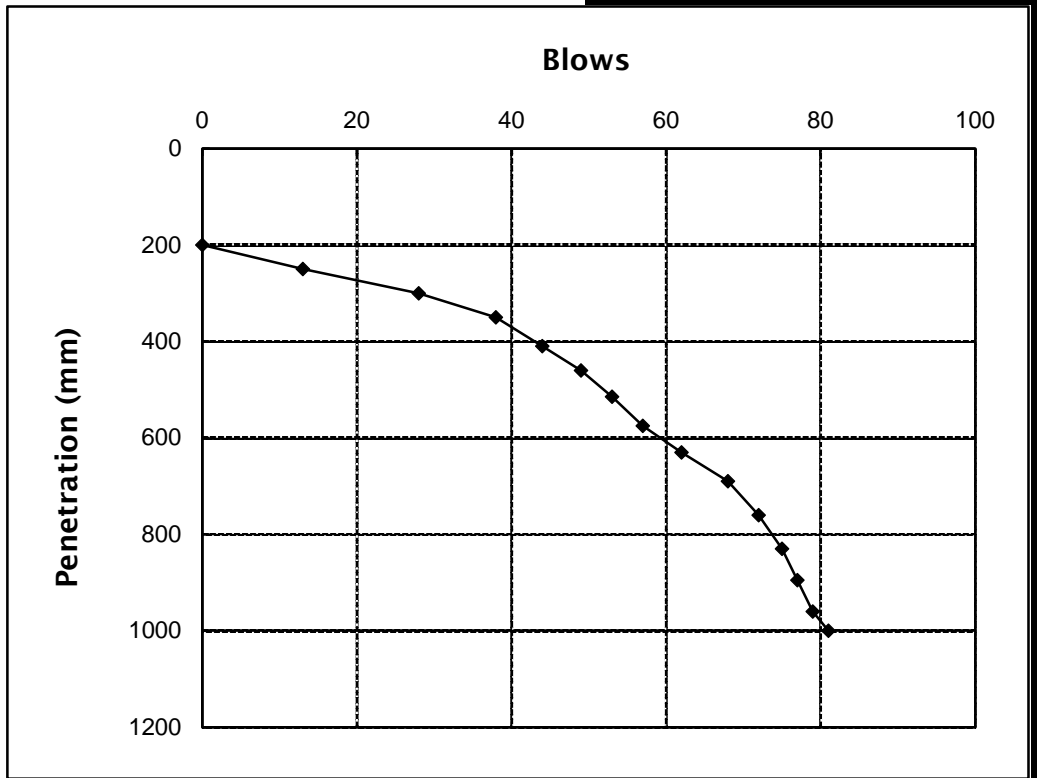
DCP No: CBR1 **Depth of test: 0.21m**
CBR from 0.21m to 0.50m = 41%
CBR from 0.50m to 0.70m = 21%
CBR from 0.70m to 0.99m = 8.9%

Blows	Pen.
0	210
9	260
15	305
25	350
32	400
40	450
46	500
52	550
58	600
62	650
65	700
67	750
69	800
72	850
75	905
77	955
79	990



DCP No: CBR2 **Depth of test: 0.20m**
CBR from 0.20m to 0.35m = 74%
CBR from 0.41m to 0.69m = 18%
CBR from 0.69m to 1.00m = 7.4%

Blows	Pen.
0	200
13	250
28	300
38	350
44	410
49	460
53	515
57	575
62	630
68	690
72	760
75	830
77	895
79	960
81	1000

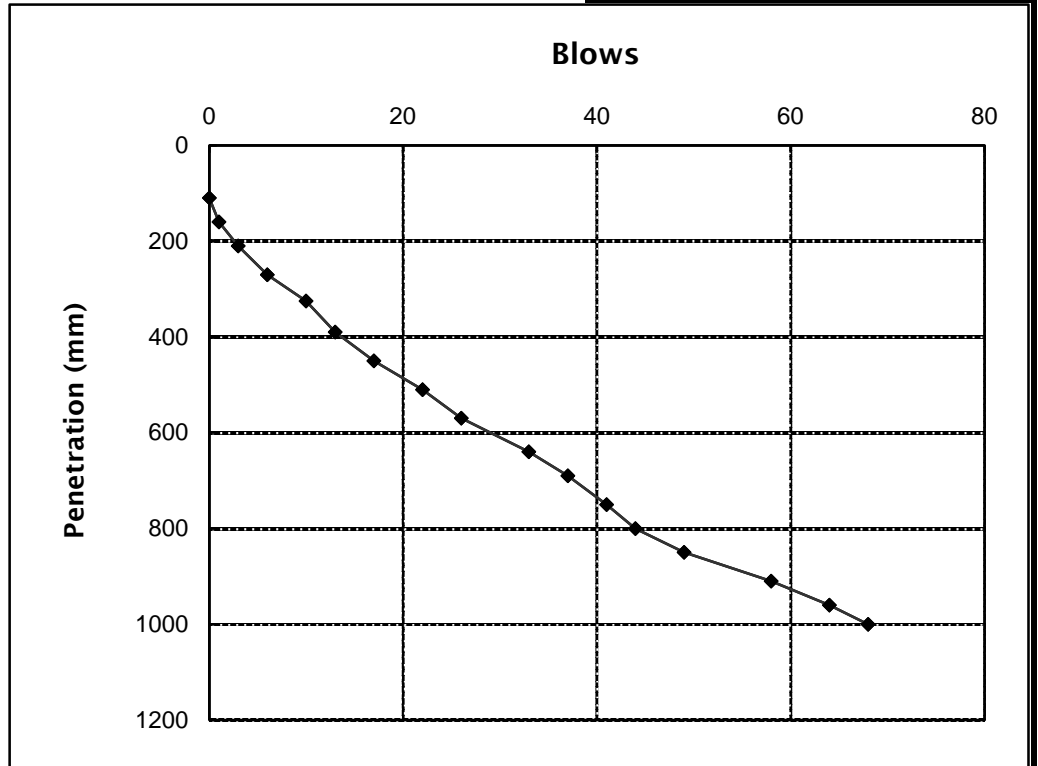


DYNAMIC CONE PENETROMETER (DCP) RESULTS

Project: Begbroke Science Park, Kidlington **Project Ref: C15387**

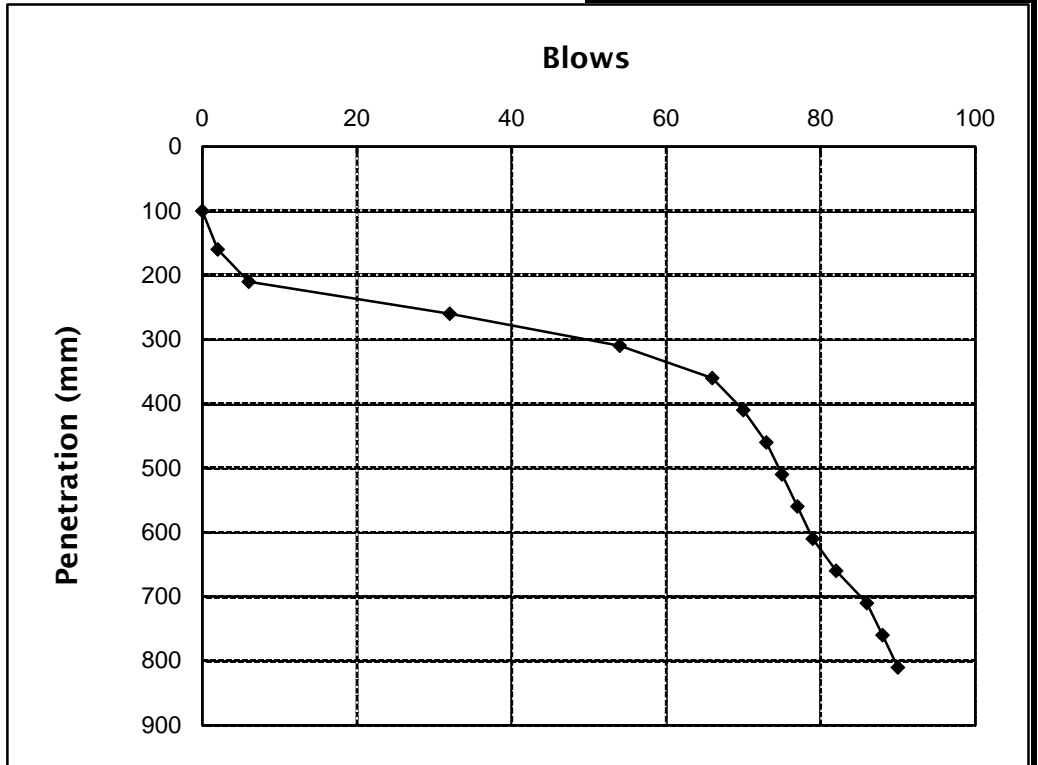
DCP No: CBR3 **Depth of test: 0.11m** **CBR from 0.11m to 0.51m = 10%**
CBR from 0.51m to 0.80m = 16%
CBR from 0.80m to 1.00m = 28%

Blows	Pen.
0	110
1	160
3	210
6	270
10	325
13	390
17	450
22	510
26	570
33	640
37	690
41	750
44	800
49	850
58	910
64	960
68	1000



DCP No: CBR4 **Depth of test: 0.10m** **CBR from 0.10m to 0.21m = 10%**
CBR from 0.21m to 0.36m = 133%
CBR from 0.36m to 0.81m = 10%

Blows	Pen.
0	100
2	160
6	210
32	260
54	310
66	360
70	410
73	460
75	510
77	560
79	610
82	660
86	710
88	760
90	810
93	860
95	910
97	960
99	990



Gas & Groundwater Monitoring Record

Site: Begbroke Science Park, Kidlington

Report Ref: C15387

Date	Borehole No.	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Flow Rate (l/hr)	Atmosph. Pressure (mb)	Depth of Well (mbgl)	Depth to Groundwater (mbgl)
		Peak	Steady	Peak	Steady	Max	Min				
30-06-21	BH1	<0.1	<0.1	1.5	1.5	0.6	0.6	<0.1	1011	5.00	3.61*
30-06-21	BH3	<0.1	<0.1	1.5	1.5	9.2	9.2	<0.1	1011	5.00	3.27*
07-07-21	BH1	<0.1	<0.1	1.9	1.9	0.5	0.5	<0.1	1005	5.00	3.67
07-07-21	BH3	<0.1	<0.1	2.2	2.2	10.0	10.0	<0.1	1005	5.00	3.30
14-07-21	BH1	<0.1	<0.1	2.3	2.3	0.3	0.2	<0.1	1012	5.00	3.70
14-07-21	BH3	<0.1	<0.1	3.0	3.0	10.7	10.7	<0.1	1012	5.00	3.32

Note- *Water Samples taken in 1 litre glass and plastic bottles and 15ml glass vials
Instrumentation= GasData GA5000 soil gas monitor and dip meter

Appendix 3

Geotechnical Test Results

Figure 1 - SPT 'N' Value vs. Depth Plot

Figure 2 - Apparent Cohesion vs. Depth Plot

Figure 3 - Soil Profile - Zone B

Figure 3.1 - Soil Profile - Zone C

LABORATORY TEST RESULTS

CONTRACT BEGBROOKE SCIENCE PARK, KIDLINGTON

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				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	Total Dry Wt. %	Soil Aqueous Extract mg/l	Water mg/l	pH	
BH1	U2	4.60 - 5.00	60	22	38	24	2.07	1.66	Q	193	100	97	0					SOIL CLASSIFICATION = CH 0% retained on 425µm sieve
	U3	5.70 - 6.10			25	2.02	1.62	Q	158	120	79	0						
	U4	6.70 - 7.10			30	1.96	1.51	Q	164	140	82	0	1065				7.2	
	C4	11.30 - 11.60			24	2.03	1.63	Q	205	230	103	0						
BH2	C4.	12.35 - 12.65			14	2.27	1.99	Q	269	230	134	0						SOIL CLASSIFICATION = CI 50% retained on 425µm sieve
	C5	13.90 - 14.10			20	2.17	1.81	Q	650	280	325	0	1174				8.8	
	C6	14.90 - 15.10			17	2.20	1.88	Q	566	300	283	0						
BH2	C7	16.10 - 16.50			19	2.24	1.88	Q	717	330	359	0						SOIL CLASSIFICATION = CI 50% retained on 425µm sieve
	U1	2.00 - 2.20	37	18	19													
	U3	4.60 - 5.00			22	2.04	1.67	Q	149	100	74	0	895				7.2	

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

15387

LABORATORY TEST RESULTS

CONTRACT BEGBROOKE SCIENCE PARK, KIDLINGTON

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression						Sulphates (SO ₄)			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	Total Dry Wt. %	Soil Aqueous Extract mg/l	Water mg/l	pH	
BH2	U4	5.70 - 6.10				23	2.09	1.70	Q	187	120	94	0					
	U5	6.80 - 7.10			24	2.09	1.68	Q	241	140	121	0						
BH3	U1	1.30 - 1.40	62	19	43	21									354		6.8	
	U2	4.60 - 5.00			24	2.03	1.64	Q	179	100	90	0						
	U3	5.70 - 6.10			25	2.00	1.61	Q	198	120	99	0						
	U4	6.70 - 7.10			26	1.99	1.58	Q	158	140	79	0						
	C3	10.35 - 10.70			22	2.08	1.71	Q	261	210	131	0		837			8.2	
	C5	13.50 - 13.90			17	2.12	1.82	Q	321	275	161	0						
	C5.	14.20 - 14.60			18	2.15	1.83	Q	596	290	298	0						
C7	16.50 - 16.80			13	2.21	1.96	Q	358	335	179	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

15387

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L I M I T E D

Tel: 01793-566566
www.groundengineering.co.uk

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LABORATORY TEST RESULTS

CONTRACT BEGBROOKE SCIENCE PARK, KIDLINGTON

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				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	Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l	pH	
BH4	U2	4.50 - 5.00	57	20	37	23	2.07	1.68	Q	198	90	99	0					SOIL CLASSIFICATION = CH 0% retained on 425µm sieve
	U3	5.55 - 5.90				25	2.02	1.61	Q	164	115	82	0					
	C2	7.20 - 7.60				21	1.96	1.61	Q	187	150	93	0		920		7.5	

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

15387

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Tel: 01793-566566
www.groundengineering.co.uk



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GROUND ENGINEERING

Newark Road Peterborough
t: 01733 566566
e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Wet Sieving Method

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL7512-1/1/710-2
Client Reference: C15387
Lab Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 14.07.2021

Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

TEST RESULTS

Laboratory Reference: PL7512-1/1
Client Reference: U1

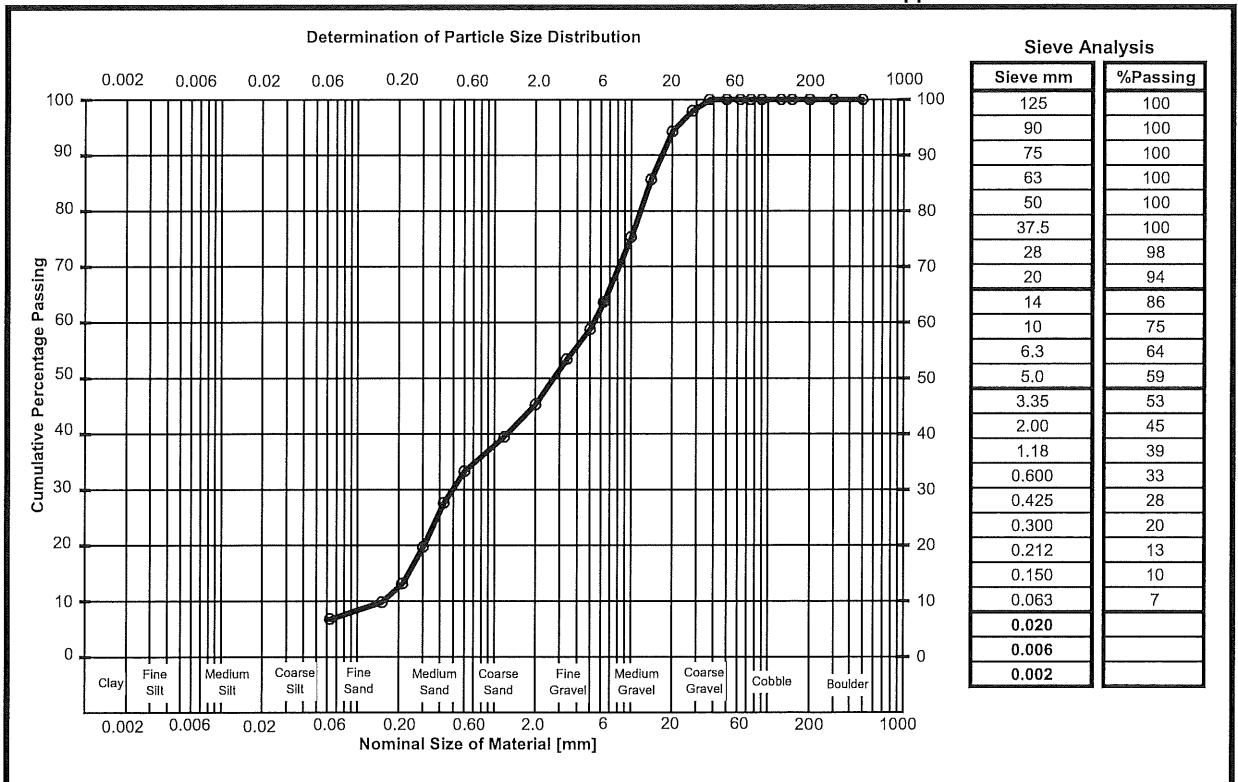
Pre-treatment for organic material: N/A

Sample Description:

Orange-brown grey slightly clayey SAND and GRAVEL. Gravel consists of angular to sub-rounded flint quartzite limestone clinker and sandstone.

Material Specification: Not Required
Location: BH1
Source:

Depth Top: 1.20m
Depth Base: 1.60m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 19.07.2021 Page 1 of 1
Form Number: GELab/C/709-2 Version 56

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



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Newark Road Peterborough
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e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Wet Sieving Method

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL7512-1/27/710-2
Client Reference: C15387
Lab Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 14.07.2021

Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

TEST RESULTS

Laboratory Reference: PL7512-1/27
Client Reference: U1

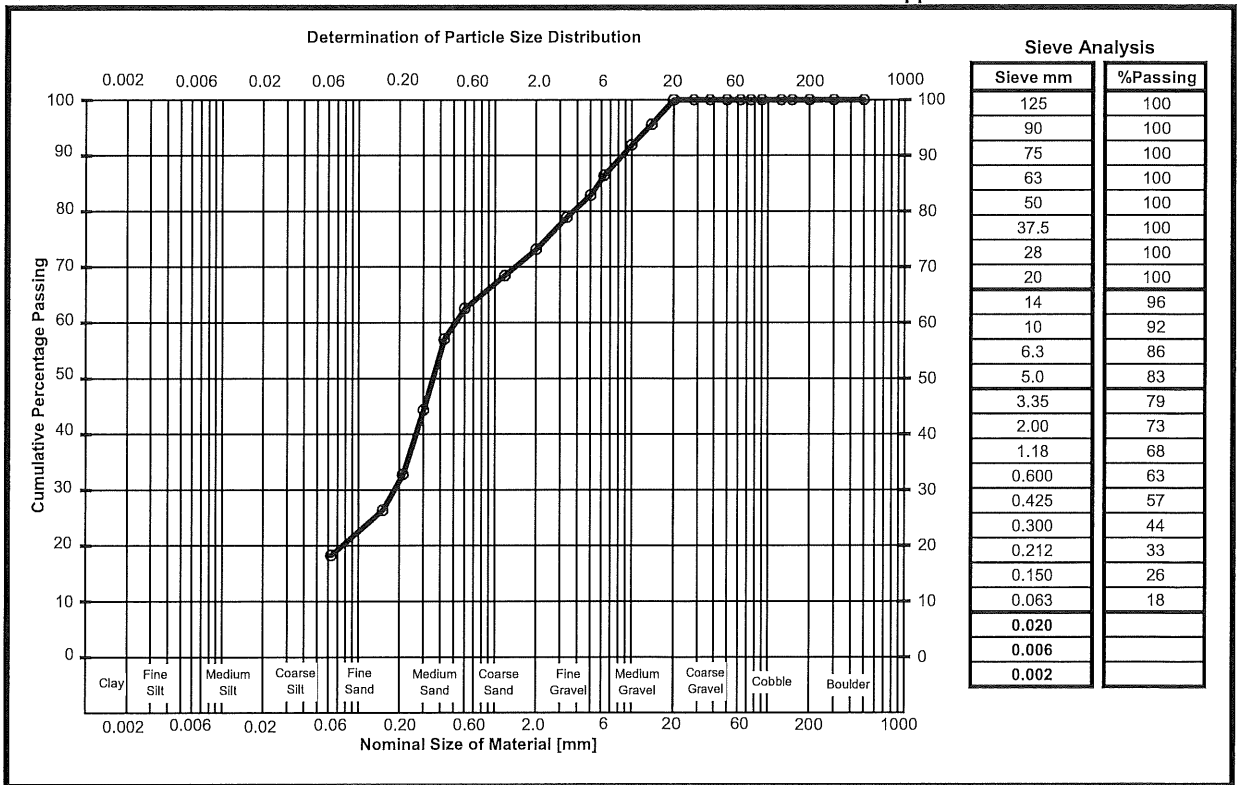
Pre-treatment for organic material: N/A

Sample Description:

Orange-brown slightly clayey slightly silty gravelly SAND with occasional roots <3mm in diameter. Gravel consists of sub-angular to rounded flint sandstone and ironstone.

Material Specification: Not Required
Location: BH3
Source:

Depth Top: 1.70m
Depth Base: 1.90m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 19.07.2021 Page 1 of 1
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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Wet Sieving Method

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL7512-1/46/710-2
Client Reference: C15387
Lab Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 14.07.2021

Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

TEST RESULTS

Laboratory Reference: PL7512-1/46
Client Reference: U1

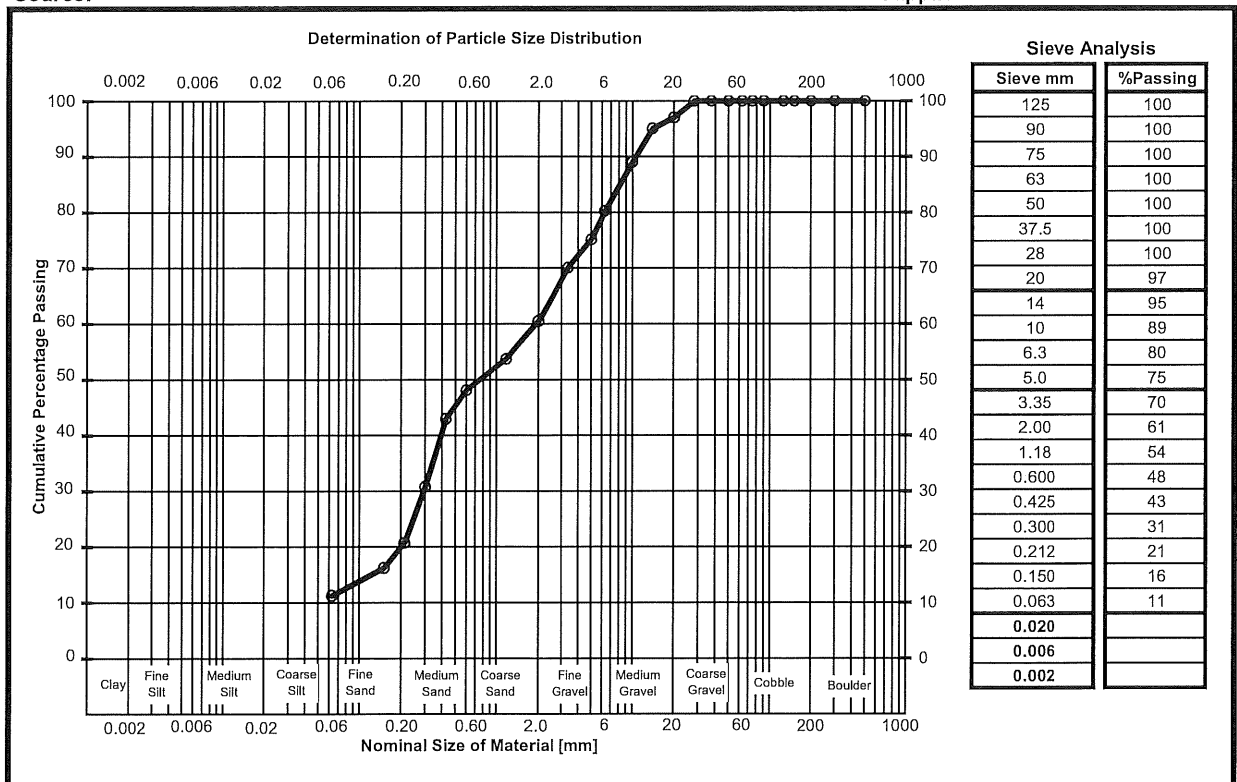
Pre-treatment for organic material: N/A

Sample Description:

Brown light brown slightly clayey slightly silty SAND and GRAVEL with occasional roots <2mm in diameter. Gravel consists of angular to rounded flint siltstone sandstone and ironstone.

Material Specification: Not Required
Location: BH4
Source:

Depth Top: 1.20m
Depth Base: 2.20m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 19.07.2021 Page 1 of 1
Form Number: GELab/C/709-2 Version 56

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Newark Rd, Peterborough PE1 5UA



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GROUND ENGINEERING

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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Wet Sieving Method

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL7512-1/54/710-2
Client Reference: C15387
Lab Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 14.07.2021

Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

TEST RESULTS

Laboratory Reference: PL7512-1/54
Client Reference: B5

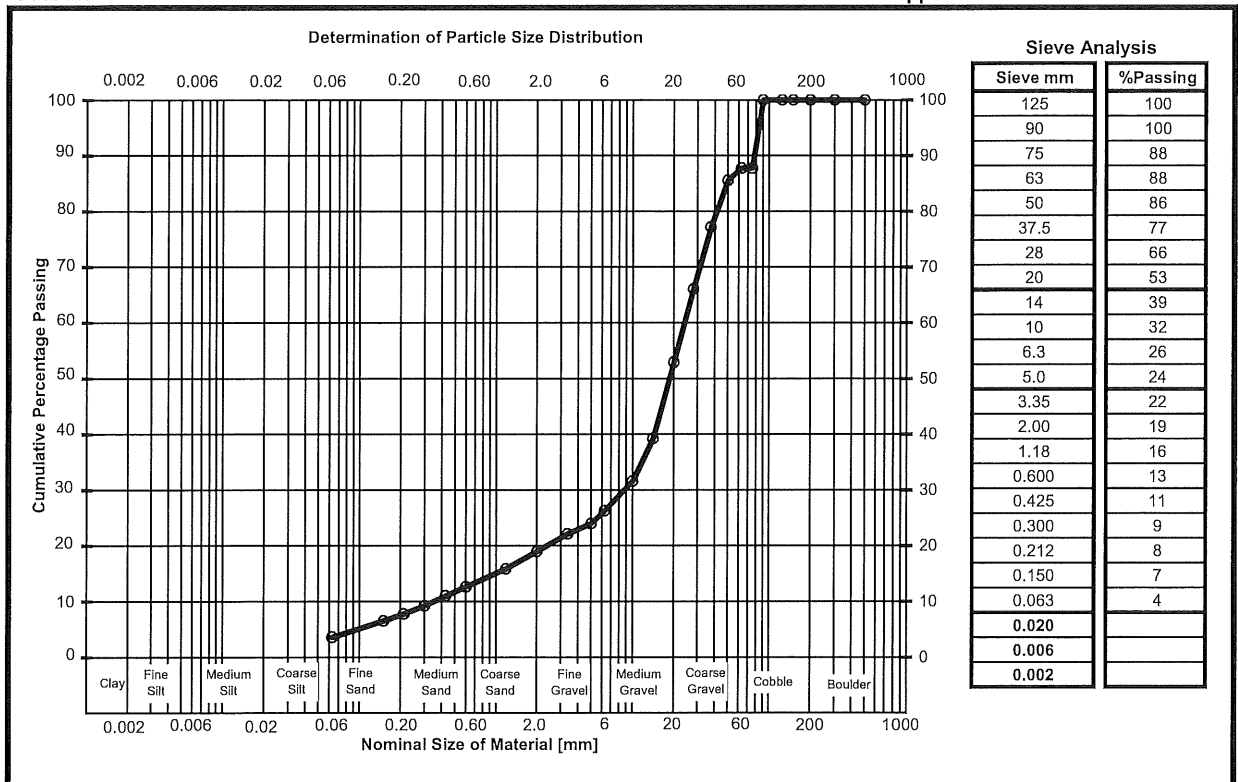
Pre-treatment for organic material: N/A

Sample Description:

Orange-brown slightly clayey slightly silty sandy Gravel. Gravel consists of sub-angular to sub-rounded limestone sandstone and flint.

Material Specification: Not Required
Location: TP1
Source:

Depth Top: 3.50m
Depth Base: 3.70m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 19.07.2021 Page 1 of 1
Form Number: GELab/C/709-2 Version 56

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Newark Rd, Peterborough PE1 5UA



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Newark Road Peterborough
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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Wet Sieving Method

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL7512-1/55/710-2
Client Reference: C15387
Lab Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 14.07.2021

Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

TEST RESULTS

Laboratory Reference: PL7512-1/55

Pre-treatment for organic material: N/A

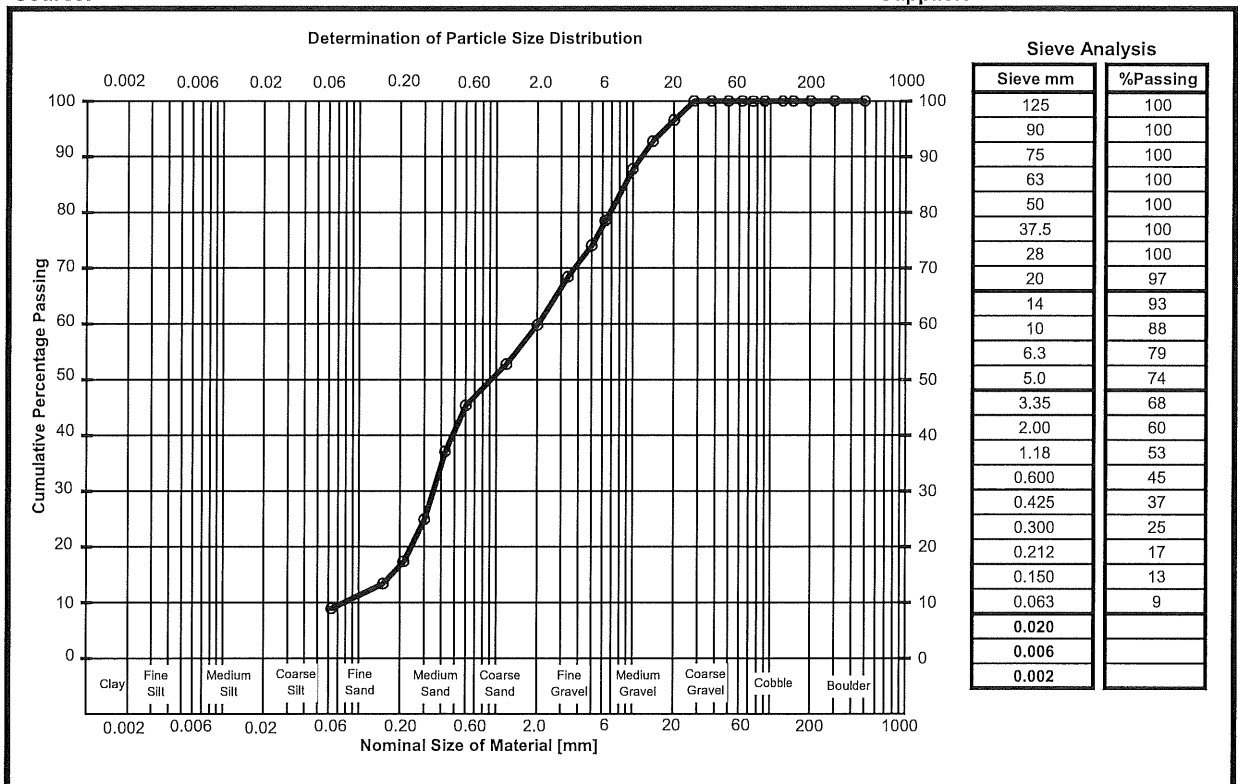
Client Reference: B4

Brown clayey silty SAND and GRAVEL. Gravel consists of angular to sub-rounded flint and sandstone.

Sample Description:

Material Specification: Not Required
Location: TP2
Source:

Depth Top: 2.10m
Depth Base: 2.30m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 19.07.2021 Page 1 of 1
Form Number: GELab/C/709-2 Version 56

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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Wet Sieving Method

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL7512-1/56/710-2
Client Reference: C15387
Lab Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 14.07.2021

Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

TEST RESULTS

Laboratory Reference: PL7512-1/56

Pre-treatment for organic material: N/A

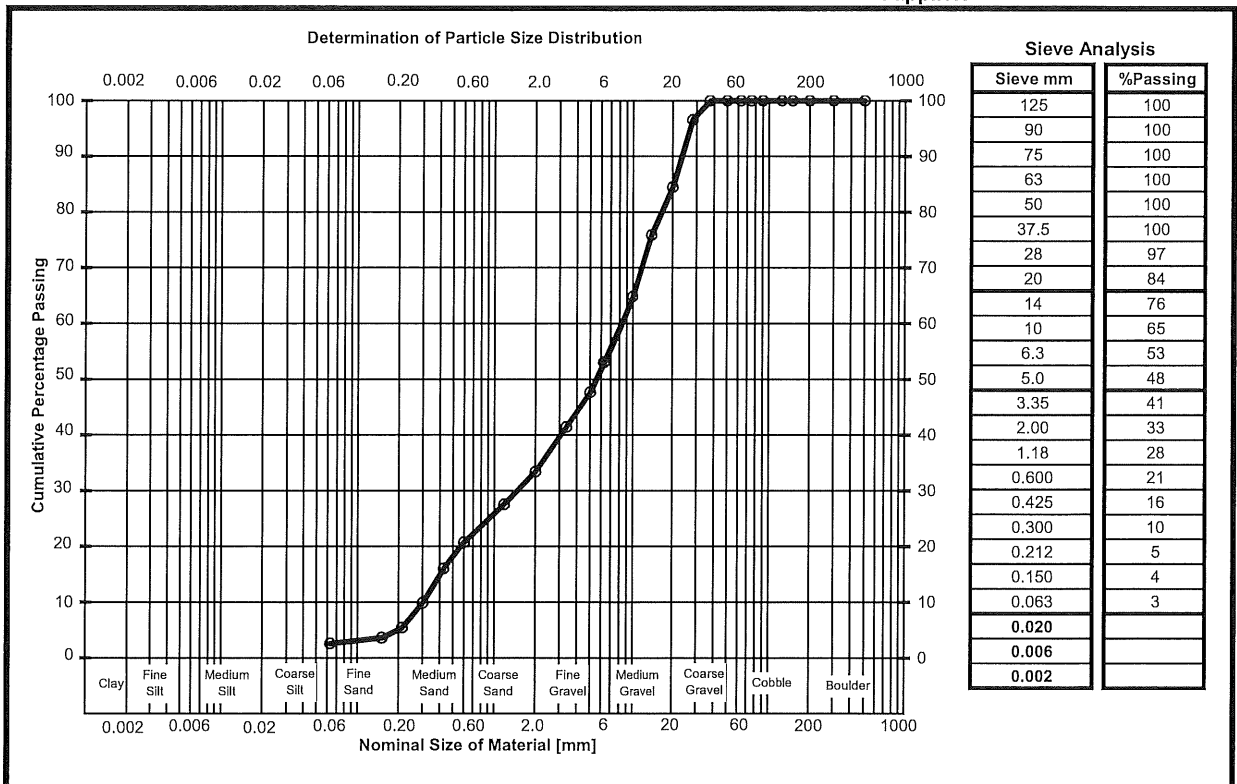
Client Reference: B4

Sample Description:

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

Material Specification: Not Required
Location: TP5
Source:

Depth Top: 3.70m
Depth Base: 4.00m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 19.07.2021 Page 1 of 1
Form Number: GELab/C/709-2 Version 56

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TEST CERTIFICATE

Newark Road Peterborough
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Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Wet Sieving Method

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL7512-1/57/710-2
Client Reference: C15387
Lab Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 14.07.2021

Contact: James Davies

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: Begbroke Science Park
Site Address: Kidlington

TEST RESULTS

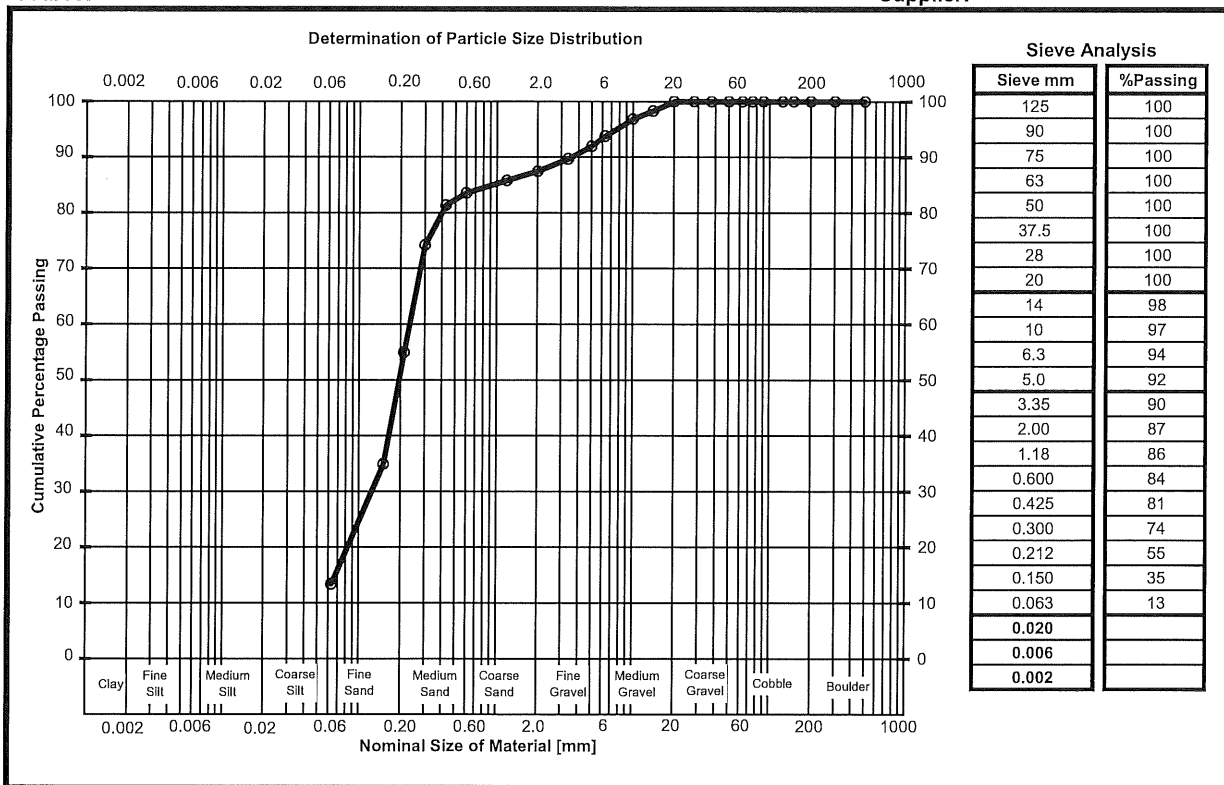
Laboratory Reference: PL7512-1/57
Client Reference: B2
Pre-treatment for organic material: N/A

Sample Description:

Orange-brown silty gravelly SAND with rare roots <1mm in diameter. Gravel consists of sub-angular to rounded flint and sandstone.

Material Specification: Not Required
Location: TP6
Source:

Depth Top: 1.70m
Depth Base: 2.00m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed: *[Signature]*

for and on behalf of Ground Engineering Ltd

Date Reported: 19.07.2021 Page 1 of 1
Form Number: GELab/C/709-2 Version 56

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Newark Rd, Peterborough PE1 5UA



TEST CERTIFICATE

Newark Road Peterborough
t: 01733 566566
e: admin@groundengineering.co.uk

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Wet Sieving Method

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL7512-1/58/710-2
Client Reference: C15387
Lab Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 14.07.2021

Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

TEST RESULTS

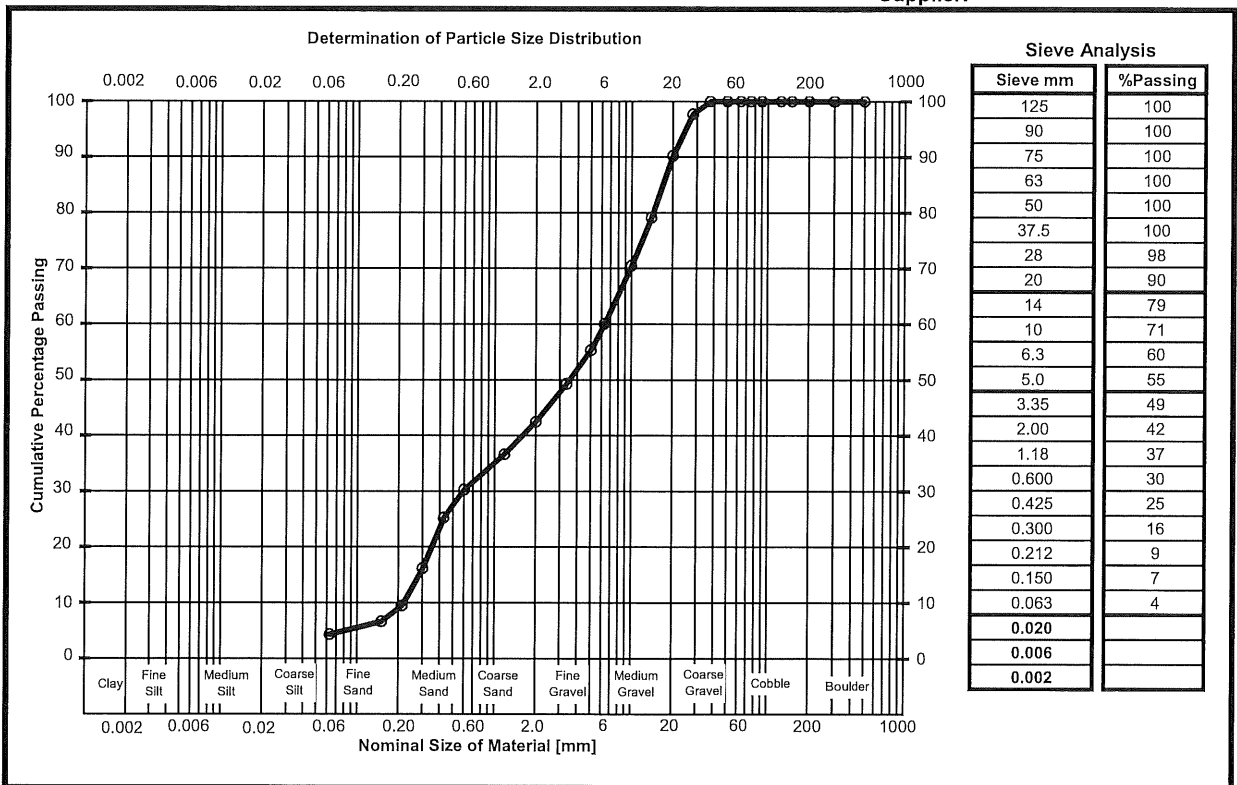
Laboratory Reference: PL7512-1/58
Client Reference: B4
Pre-treatment for organic material: N/A

Sample Description:

Brown slightly clayey slightly silty SAND and GRAVEL with rare fossils and roots <1mm in diameter. Gravel consists of sub-angular to rounded sandstone and flint.

Material Specification: Not Required
Location: TP6
Source:

Depth Top: 3.40m
Depth Base: 3.60m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 19.07.2021 Page 1 of 1
Form Number: GELab/C/709-2 Version 56

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

TEST CERTIFICATE**Determination of Uniaxial Compression Strength**

I.S.R.M. Suggested Methods 1981

Newark Road Peterborough

t: 01733 566566

e: admin@groundengineering.co.uk

Client: Ground Engineering Ltd
Client Newark Road
Address: Peterborough
Cambs
Postcode: PE1 5UA
Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate Number: PL7512-1/5/408
Client Reference Number: **C15387**
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 21.07.2021
Sampling Certificate No.: N/A
Certificate of Sampling: N/A
Sampled By: Client

Test Results:

Lab Reference PL7512-1/5
Location: **BH1**
Sample Light grey dark grey LIMESTONE.
Description:

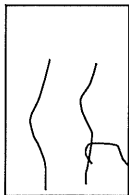
Sample Reference: **C1**
Depth (m): **8.20 - 8.60**

Laboratory Temperature (°C): 22.0
Testing Equipment: ELE AQR 2000

Specimen Details

Height (mm): 169.5
Diameter (mm): 86.3
Method of Preparation : I.S.R.M. Suggested Methods 1981

Applied Rate of Stress (kN/sec): **4.0**
Bulk Density (Mg/m³): **2.48**
Moisture Content (%): **N/A**
Dry Density (Mg/m³): **N/A**

Failure Sketch

Mode of Failure: Axial

Variations from Standard: Specimen with length and diameter ratio outside 2.5-3.0 recommendation.

Stress Rate	4.0	kN/sec
Failure Time	0.48	Min/Sec
Uniaxial Compressive Strength	18.38	MN/m ²

Approved Signatory: M.Hartnup - Laboratory Manager
 L.Petch - Team Leader

Signed:

Date Reported: 21/07/2021

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for and on behalf of
Ground Engineering Ltd

Registered in England and Wales
Reg No. 6929574
Reg Office: Ground Engineering Ltd
Newark Rd, Peterborough
PE1 5UA

TEST CERTIFICATE**Determination of Uniaxial Compression Strength**

I.S.R.M. Suggested Methods 1981

Newark Road Peterborough

t: 01733 566566

e: admin@groundengineering.co.uk

Client: Ground Engineering Ltd
 Client Newark Road
 Address: Peterborough
 Cambs
 Postcode: PE1 5UA
 Contact: James Davies
 Site Name: Begbroke Science Park
 Site Address: Kidlington

Certificate Number: PL7512-1/17/408
 Client Reference Number: **C15387**
 Date Sampled: Unknown
 Date Received: 23.06.2021
 Date Tested: 21.07.2021
 Sampling Certificate No.: N/A
 Certificate of Sampling: N/A
 Sampled By: Client

Test Results:

Lab Reference PL7512-1/17
 Location: **BH1**
 Sample Light grey dark grey LIMESTONE.
 Description:

Sample Reference: **C9**
 Depth (m): **19.80 - 20.20**

Laboratory Temperature (°C): 22.0
 Testing Equipment: ELE AQR 2000

Specimen Details

Height (mm): 177.6
 Diameter (mm): 86.5
 Method of Preparation : I.S.R.M. Suggested Methods 1981

Applied Rate of Stress (kN/sec): **4.0**
 Bulk Density (Mg/m³): **2.39**
 Moisture Content (%): **N/A**
 Dry Density (Mg/m³): **N/A**

Failure Sketch

Mode of Failure: Axial

Variations from Standard: Specimen with length and diameter ratio outside 2.5-3.0 recommendation.

Stress Rate	4.0	kN/sec
Failure Time	0.58	Min/Sec
Uniaxial Compressive Strength	25.49	MN/m ²

Approved Signatory: M.Hartnup - Laboratory Manager
 L.Petch - Team Leader

Signed: 

Date Reported: 21/07/2021

for and on behalf of
 Ground Engineering Ltd

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 Reg No. 6929574
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 PE1 5UA

TEST CERTIFICATE**Determination of Uniaxial Compression Strength**

I.S.R.M. Suggested Methods 1981

Newark Road Peterborough

t: 01733 566566

e: admin@groundengineering.co.uk

Client: Ground Engineering Ltd
 Client Newark Road
 Address: Peterborough
 Cambs
 Postcode: PE1 5UA
 Contact: James Davies
 Site Name: Begbroke Science Park
 Site Address: Kidlington

Certificate Number: PL7512-1/33/408
 Client Reference Number: **C15387**
 Date Sampled: Unknown
 Date Received: 23.06.2021
 Date Tested: 21.07.2021
 Sampling Certificate No.: N/A
 Certificate of Sampling: N/A
 Sampled By: Client

Test Results:

Lab Reference PL7512-1/33
 Location: **BH3**
 Sample Grey dark grey LIMESTONE.
 Description:

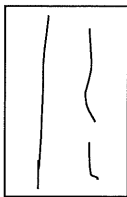
Sample Reference: **C2**
 Depth (m): **9.00 - 9.40**

Laboratory Temperature (°C): 22.0
 Testing Equipment: ELE AQR 2000

Specimen Details

Height (mm): 188.4
 Diameter (mm): 86.4
 Method of Preparation : I.S.R.M. Suggested Methods 1981

Applied Rate of Stress (kN/sec): **4.0**
 Bulk Density (Mg/m³): **2.41**
 Moisture Content (%): **N/A**
 Dry Density (Mg/m³): **N/A**

Failure Sketch

Mode of Failure: Axial

Variations from Standard: Specimen with length and diameter ratio outside 2.5-3.0 recommendation.

Stress Rate	4.0	kN/sec
Failure Time	0.47	Min/Sec
Uniaxial Compressive Strength	17.31	MN/m ²

Approved M.Hartnup - Laboratory Manager
 Signatory: L.Petch - Team Leader

Signed: 

Date Reported: 21/07/2021

for and on behalf of
 Ground Engineering Ltd

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 Newark Rd, Peterborough
 PE1 5UA

TEST CERTIFICATE

Newark Road Peterborough

t: 01733 566566

e: admin@groundengineering.co.uk

Determination of Uniaxial Compression Strength

I.S.R.M. Suggested Methods 1981

Client: Ground Engineering Ltd
 Client Newark Road
 Address: Peterborough
 Cambs
 Postcode: PE1 5UA
 Contact: James Davies
 Site Name: Begbroke Science Park
 Site Address: Kidlington

Certificate Number: PL7512-1/42/408
 Client Reference Number: **C15387**
 Date Sampled: Unknown
 Date Received: 23.06.2021
 Date Tested: 21.07.2021
 Sampling Certificate No.: N/A
 Certificate of Sampling: N/A
 Sampled By: Client

Test Results:

Lab Reference PL7512-1/42
 Location: **BH3**
 Sample Light grey LIMESTONE.
 Description:

Sample Reference: **C7**
 Depth (m): **17.10 - 17.50**

Laboratory Temperature (°C): 22.0
 Testing Equipment: ELE AQR 2000

Specimen Details

Height (mm): 190.7
 Diameter (mm): 86.5
 Method of Preparation : I.S.R.M. Suggested Methods 1981

Applied Rate of Stress (kN/sec): **4.0**
 Bulk Density (Mg/m³): **2.52**
 Moisture Content (%): **N/A**
 Dry Density (Mg/m³): **N/A**


Failure Sketch

Mode of Failure: Axial

Variations from Standard: Specimen with length and diameter ratio outside 2.5-3.0 recommendation.

Stress Rate	4.0	kN/sec
Failure Time	1.14	Min/Sec
Uniaxial Compressive Strength	44.02	MN/m ²

Approved M.Hartnup - Laboratory Manager
 Signatory: L.Petch - Team Leader

Signed: 

Date Reported: 21/07/2021

for and on behalf of
Ground Engineering Ltd

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Registered in England and Wales
 Reg No. 6929574
 Reg Office: Ground Engineering Ltd
 Newark Rd, Peterborough
 PE1 5UA

TEST CERTIFICATE

Determination of Point Load Test Index

Newark Road, Peterborough,
PE1 5UA
Tel:01733 566566
admin@groundengineering.co.uk

Tested in Accordance with Broch & Franklin (1972) & ISRM (1985) Methodology

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
Cambs
PE1 5UA
Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate Number: PL7512-1/1/400
Client Reference: C15387
Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 16.07.2021
Certificate of Sampling: N/A
Sampled By: Client

Test Results: Laboratory Reference:

Lab Reference	Sample Reference	Depth (m)	Description	Test Type	Is(50)	UCS (MN/m ²)
PL7512-1/6	BH1 C2	8.75 - 9.25	Dark grey shelly LIMESTONE.	Axial	0.69	10
PL7512-1/6	BH1 C2	8.75 - 9.25	Light grey LIMESTONE.	Irregular	2.34	35
PL7512-1/7	BH1 C3	10.80 - 11.20	Grey dark grey light grey LIMESTONE.	Axial	0.87	13
PL7512-1/9	BH1 C4	11.90 - 12.30	Grey light grey LIMESTONE.	Axial	3.76	56
PL7512-1/15	BH1 C8	18.30 - 18.70	Light grey light brown LIMESTONE.	Axial	3.61	54
PL7512-1/16	BH1 C9	18.70 - 19.40	Light grey light brown LIMESTONE.	Axial	1.23	18
PL7512-1/22	BH2 C1	8.20 - 8.40	Grey dark grey slightly shelly LIMESTONE.	Axial	4.16	62
PL7512-1/23	BH2 C2	8.70 - 9.00	Grey dark grey LIMESTONE.	Axial	4.37	66
PL7512-1/24	BH2 C2	9.40 - 9.70	Grey light grey LIMESTONE.	Axial	1.12	17
PL7512-1/25	BH2 C2	10.00 - 10.20	Light grey dark grey LIMESTONE.	Axial	3.61	54
PL7512-1/31	BH3 C1	7.50 - 8.00	Grey dark grey LIMESTONE.	Axial	2.35	35
PL7512-1/32	BH3 C1	8.30 - 8.70	Grey shelly LIMESTONE.	Axial	1.78	27
PL7512-1/34	BH3 C2	9.60 - 10.20	Grey dark grey light grey LIMESTONE.	Axial	0.52	7.8
PL7512-1/36	BH3 C3	11.10 - 11.20	Grey light grey LIMESTONE.	Axial	3.95	59
PL7512-1/37	BH3 C4	12.00 - 12.10	Grey dark grey light grey LIMESTONE>	Axial	0.91	14

Comments: U C S (MN/m²) value has been calculated using a K factor, = 15

Approved Signatory: M. Hartnup Laboratory Manager
 L. Petch Team Leader

Signed: 

for and on behalf of Ground Engineering Ltd

Date Reported: 19 July 2021 Page 1 of 2
Form Number: Form Number GELab/C/401 Issue 2

Registered in England & Wales
Registration Number 692574
Reg Office Ground Engineering Ltd
Newark Rd Peterborough PE1 5UA

TEST CERTIFICATE

Determination of Point Load Test Index

Newark Road, Peterborough,
PE1 5UA
Tel:01733 566566
admin@groundengineering.co.uk

Tested in Accordance with Broch & Franklin (1972) & ISRM (1985) Methodology

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
Cams
PE1 5UA
Contact: James Davies
Site Name: Begbroke Science Park
Site Address: Kidlington

Certificate Number: PL7512-1/1/400
Client Reference: C15387
Job Number: PL7512-1
Date Sampled: Unknown
Date Received: 23.06.2021
Date Tested: 16.07.2021
Certificate of Sampling: N/A
Sampled By: Client

Test Results: Laboratory Reference:

Lab Reference	Sample Reference	Depth (m)	Description	Test Type	Is(50)	UCS (MN/m ²)
PL7512-1/40	BH3 C6	15.50 - 15.80	Grey light grey LIMESTONE.	Axial	3.46	52
PL7512-1/43	BH3 C8	17.70 - 18.10	Grey light grey LIMESTONE.	Axial	2.18	33
PL7512-1/44	BH3 C8	18.10 - 18.60	Light brown grey LIMESTONE.	Axial	0.77	11
PL7512-1/50	BH4 C2	8.20 - 8.50	Light grey LIMESTONE.	Axial	6.17	92
PL7512-1/51	BH1 C8	8.70 - 9.00	Grey dark grey shelly LIMESTONE.	Axial	3.20	48
PL7512-1/52	BH1 C9	9.00 - 9.50	Grey light grey LIMESTONE.	Axial	1.03	15
PL7512-1/53	BH2 C1	9.75 - 10.00	Grey dark grey light grey LIMESTONE.	Axial	0.57	8.6
PL7512-1/45	BH2 C2	18.90 - 19.10	Dark grey LIMESTONE.	Diametral	1.68	25
PL7512-1/45	BH2 C2	18.90 - 19.10	Dark grey LIMESTONE.	Irregular	1.55	23

Comments: U C S (MN/m²) value has been calculated using a K factor, = 15

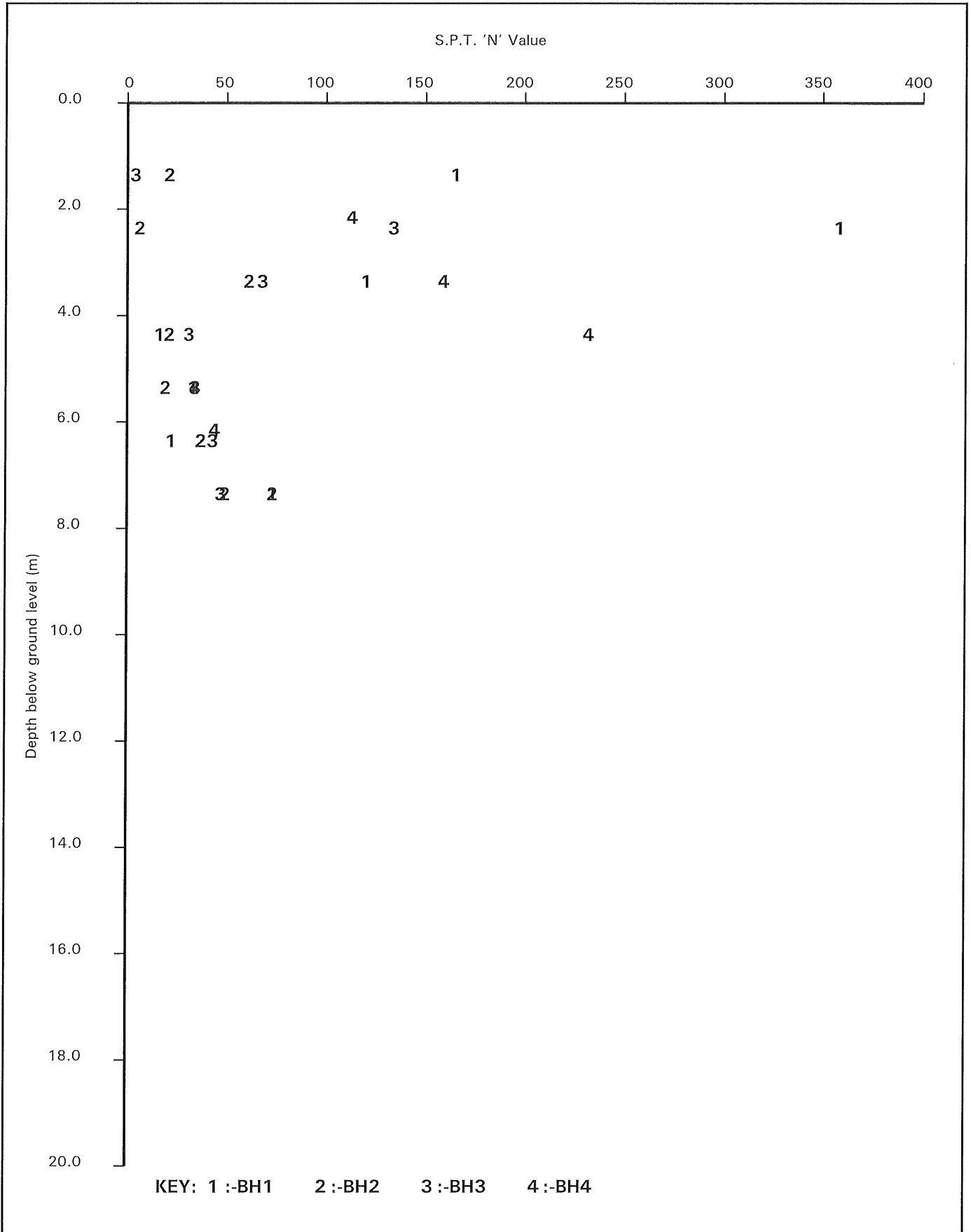
Approved Signatory: M. Hartnup Laboratory Manager
 L. Petch Team Leader

Signed: 

for and on behalf of Ground Engineering Ltd

Date Reported: 19 July 2021 Page 2 of 2
Form Number: Form Number GELab/C/401 Issue 2

Registered in England & Wales
Registration Number 692574
Reg Office Ground Engineering Ltd
Newark Rd Peterborough PE1 5UA

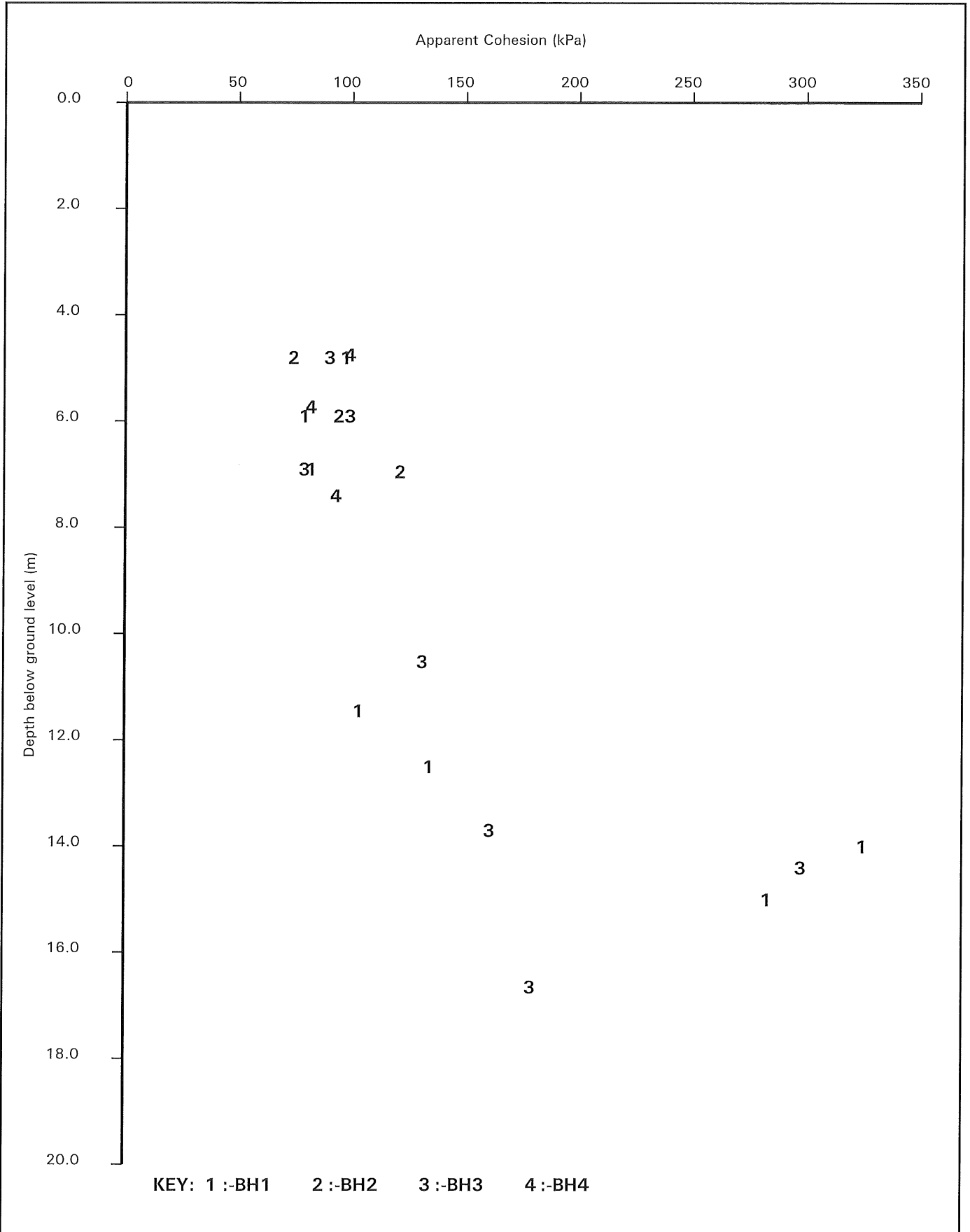


S.P.T. 'N' Value vs Depth below ground level (m).

SITE BEGBROKE SCIENCE PARK, KIDLINGTON

CLIENT OXFORD UNIVERSITY DEVELOPMENT Contract Number 15387

GROUND ENGINEERING Date 20/07/21 Figure 1
L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk

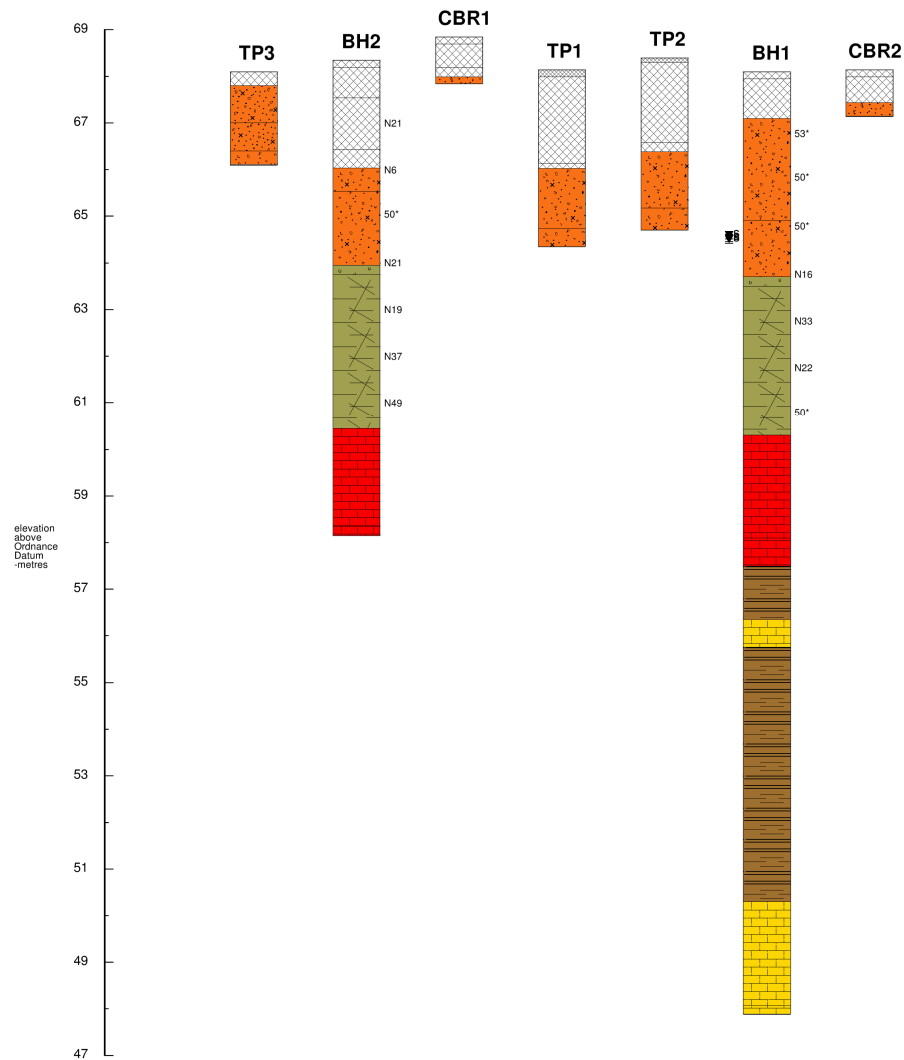


Apparent Cohesion (kPa) vs Depth below ground level (m).













SITE		BEGBROKE SCIENCE PARK, KIDLINGTON	
CLIENT	OXFORD UNIVERSITY DEVELOPMENT	Contract Number	15387
GROUND ENGINEERING L I M I T E D		Tel: 01733-566566 www.groundengineering.co.uk	Date 19/07/21
		Figure	2

SOUTH-WEST

NORTH-EAST



KEY TO LEGENDS

-  MADE GROUND
-  Localised clay layer of SUMMERTOWN - RADLEY SAND AND GRAVEL MEMBER
-  Coarse-grained SUMMERTOWN - RADLEY SAND AND GRAVEL MEMBER
-  KELLAWAYS CLAY MEMBER
-  CORNBRAsh FORMATION
-  Clay layers of FOREST MARBLE FORMATION
-  Limestone layers of FOREST MARBLE FORMATION
-  Groundwater Encountered
-  Groundwater Rise
-  Level on Completion
-  Level Casing Withdrawn
-  Standpipe Level

Project : Begbroke Science Park, Kidlington

Client : Oxford University Development

GROUND ENGINEERING LIMITED
Tel: 01733 566566

SOIL PROFILE

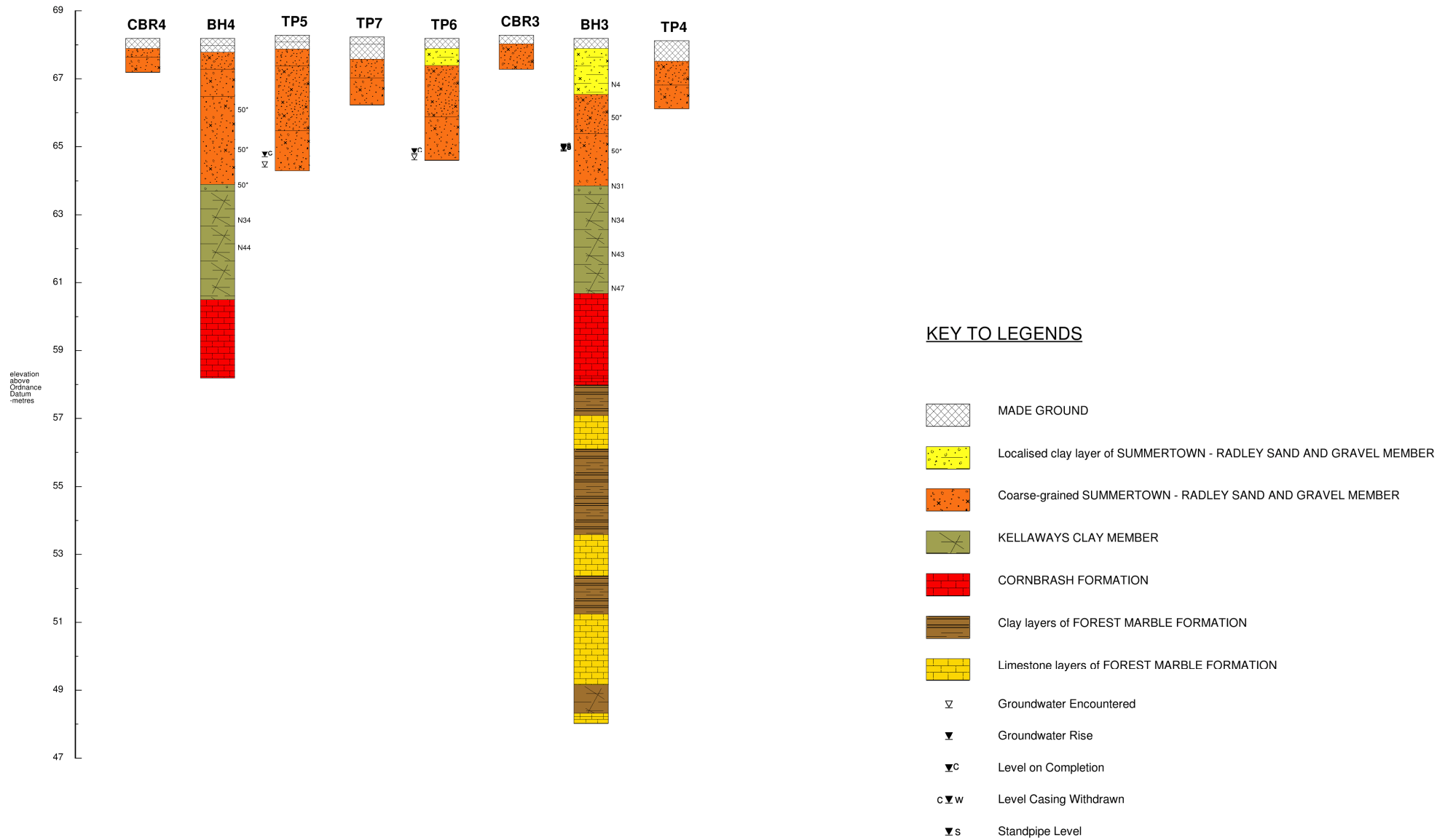
Fig No. 3

Project No C15387

Vertical Scale 1:100

SOUTH-WEST

NORTH-EAST



Project : Begbroke Science Park, Kidlington

Client : Oxford University Development

**GROUND
ENGINEERING
LIMITED**

Tel: 01733 566566

SOIL PROFILE

Fig No. 3.1

**Project No
C15387**

Vertical Scale 1:100

Appendix 4

Chemical Test Results



Amended Report

Report No.:	21-21947-2	Date of Re-Issue:	16-Jul-2021
Initial Date of Issue:	05-Jul-2021		
Client	Ground Engineering Limited		
Client Address:	Newark Road Peterborough Cambridgeshire PE1 5UA		
Contact(s):	James Davies		
Project	C15387 Begbroke Science Park, Kidlington		
Quotation No.:	Q20-22175	Date Received:	28-Jun-2021
Order No.:	C15387	Date Instructed:	28-Jun-2021
No. of Samples:	17		
Turnaround (Wkdays):	15	Results Due:	16-Jul-2021
Date Approved:	16-Jul-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Bulk Identification Certificate

Client: Ground Engineering Limited

Site Address:

Date Sampled: 22-Jun-2021

Date Received: 28-Jun-2021

Your Ref.:

Project: C15387 Begbroke Science
Park, Kidlington

Job Number: 21-21947

No Samples:

Date Reported: 05-Jul-2021

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
1229473	ACM		TP5	0.20	0.40	2185	U	DURHAM	Cement	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248).

The results relate only to items tested as supplied by the client.

Comments and interpretations are beyond the scope of UKAS accreditation.

Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)

Results - Soil

Project: C15387 Begbroke Science Park, Kidlington

Client: Ground Engineering Limited		Chemtest Job No.:		21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947
Quotation No.: Q20-22175		Chemtest Sample ID.:		1229459	1229460	1229461	1229462	1229463	1229464	1229465	1229466	
		Client Sample ID.:		D2/ES2	D1/ES1	U1/ES1	D2/ES2	D1/ES1	D2/ES2	D4/ES4	D1/ES1	
		Sample Location:		BH1	BH2	BH2	BH3	BH4	CBR1	CBR2	CBR3	
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
		Top Depth (m):		0.20	0.10	1.20	0.70	0.10	0.40	0.60	0.10	
		Bottom Depth (m):				1.50						
		Date Sampled:		22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021
		Asbestos Lab:		DURHAM		DURHAM		DURHAM		DURHAM		
Determinand	Accred.	SOP	Units	LOD								
pH	M	2010		4.0	10.0	9.8		8.2	8.9	8.3	8.4	8.2
Moisture	N	2030	%	0.020	7.9	2.5		12	1.1	11	10	8.9
Stones and Removed Materials	N	2030	%	0.020	< 0.020	< 0.020		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.55	0.52		< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.26	0.086		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	13	9.5		6.1	2.6	1.7	1.4	0.95
Arsenic	M	2450	mg/kg	1.0	17	18		23	25	30	40	52
Cadmium	M	2450	mg/kg	0.10	0.13	1.2		< 0.10	1.4	0.16	0.18	0.31
Chromium	M	2450	mg/kg	1.0	10	8.9		21	3.4	32	32	40
Copper	M	2450	mg/kg	0.50	5.8	6.1		5.6	3.5	10	10	16
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10		< 0.10	0.21	< 0.10	< 0.10	0.10
Nickel	M	2450	mg/kg	0.50	9.3	9.0		16	4.7	25	23	28
Lead	M	2450	mg/kg	0.50	13	17		7.1	26	11	13	35
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20		0.34	< 0.20	0.31	0.32	0.35
Zinc	M	2450	mg/kg	0.50	26	30		30	210	50	49	84
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	2.2	7.8		0.64	< 0.40	0.83	1.0	4.1
Acenaphthene	M	2700	mg/kg	0.10	0.44	0.14		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	0.27	0.31		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	0.95	0.37		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	4.4	1.5		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	5.5	4.4		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	8.0	3.0		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	5.0	2.1		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	3.3	1.6		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	5.6	0.82		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	1.8	1.8		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	9.3	3.2		< 0.10	< 0.10	0.16	0.12	< 0.10
Fluorene	M	2700	mg/kg	0.10	0.61	0.15		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	5.0	3.5		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Naphthalene	M	2700	mg/kg	0.10	0.15	0.12		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	4.2	0.93		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	M	2700	mg/kg	0.10	8.8	3.9		< 0.10	< 0.10	0.29	0.20	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	63	28		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: C15387 Begbroke Science Park, Kidlington

Client: Ground Engineering Limited		Chemtest Job No.:		21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947
Quotation No.: Q20-22175		Chemtest Sample ID.:		1229459	1229460	1229461	1229462	1229463	1229464	1229465	1229466	
		Client Sample ID.:		D2/ES2	D1/ES1	U1/ES1	D2/ES2	D1/ES1	D2/ES2	D4/ES4	D1/ES1	
		Sample Location:		BH1	BH2	BH2	BH3	BH4	CBR1	CBR2	CBR3	
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
		Top Depth (m):		0.20	0.10	1.20	0.70	0.10	0.40	0.60	0.10	
		Bottom Depth (m):				1.50						
		Date Sampled:		22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	
		Asbestos Lab:		DURHAM		DURHAM		DURHAM		DURHAM		
Determinand	Accred.	SOP	Units	LOD								
ACM Type	U	2192		N/A	-		-		-		-	
Asbestos Identification	U	2192		N/A	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected	
Soil Colour	N	2040		N/A	Brown	Brown		Other	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones		Stones and Roots	Stones	Stones and Roots	Stones and Roots	Stones, Roots and Wood
Soil Texture	N	2040		N/A	Sand	Sand		Sand	Gravel	Sand	Sand	Sand
Total TPH >C6-C40	M	2670	mg/kg	10	< 10	2700		< 10	< 10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0						
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0						
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0						
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0						
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0						
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0		< 1.0						
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0		41						
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0						
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		41						
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0						
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0						
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0						
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0						
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0						
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		99						
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0		2000						
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0						
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		2100						
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		2100						

Results - Soil

Project: C15387 Begbroke Science Park, Kidlington

Client: Ground Engineering Limited		Chemtest Job No.:		21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947
Quotation No.: Q20-22175		Chemtest Sample ID.:		1229467	1229468	1229469	1229470	1229471	1229472	1229474	1229475	1229475
		Client Sample ID.:		D1/ES1	D1/ES1	D2/ES2	D1/ES1	D1/ES1	D2/ES2	D1/ES1	D2/ES2	D2/ES2
		Sample Location:		CBR4	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP7
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.10	0.40	0.60	0.10	0.30	0.30	0.20	0.40	0.40
		Bottom Depth (m):										
		Date Sampled:		22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021
		Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM			DURHAM
Determinand	Accred.	SOP	Units	LOD								
pH	M	2010		4.0	8.3	8.7	9.4	7.6	8.0	10.2	7.7	8.6
Moisture	N	2030	%	0.020	9.0	7.1	7.6	8.8	8.8	6.2	8.9	6.3
Stones and Removed Materials	N	2030	%	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.63	< 0.40	0.55	0.57	0.49	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	0.27	< 0.010	< 0.010	0.21	< 0.010	< 0.010
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	0.70	0.83	12	0.76	1.4	1.0	0.55	1.2
Arsenic	M	2450	mg/kg	1.0	46	31	15	23	22	15	36	25
Cadmium	M	2450	mg/kg	0.10	0.26	< 0.10	0.17	0.19	0.17	0.12	0.19	0.18
Chromium	M	2450	mg/kg	1.0	40	22	6.8	20	18	6.7	28	11
Copper	M	2450	mg/kg	0.50	13	4.6	8.9	10	9.5	2.8	11	5.6
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	33	16	6.4	15	14	5.6	20	8.8
Lead	M	2450	mg/kg	0.50	20	6.1	22	24	16	5.6	22	39
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20	0.29	0.28	< 0.20	0.36	< 0.20
Zinc	M	2450	mg/kg	0.50	62	30	31	45	41	17	51	43
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	0.91	< 0.40	2.8	2.8	1.4	< 0.40	1.7	< 0.40
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.40	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.55	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	1.8	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	8.1	0.11	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	14	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	8.6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	5.7	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10	10	0.12	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	2.7	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	16	0.36	< 0.10	< 0.10	< 0.10	0.16
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.62	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	8.9	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	0.18	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	6.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	16	0.29	< 0.10	< 0.10	< 0.10	0.13
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0	110	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: C15387 Begbroke Science Park, Kidlington

Client: Ground Engineering Limited		Chemtest Job No.:		21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947	21-21947
Quotation No.: Q20-22175		Chemtest Sample ID.:		1229467	1229468	1229469	1229470	1229471	1229472	1229474	1229475	1229475
		Client Sample ID.:		D1/ES1	D1/ES1	D2/ES2	D1/ES1	D1/ES1	D2/ES2	D1/ES1	D2/ES2	D2/ES2
		Sample Location:		CBR4	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP7
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.10	0.40	0.60	0.10	0.30	0.30	0.20	0.40	0.40
		Bottom Depth (m):										
		Date Sampled:		22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021	22-Jun-2021
		Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM			DURHAM
Determinand	Accred.	SOP	Units	LOD								
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		No Asbestos Detected
Soil Colour	N	2040		N/A	Brown	Other	Brown	Brown	Brown	Other	Brown	Other
Other Material	N	2040		N/A	Stones, Roots and Wood	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots	Stones	Stones and Roots	Stones and Roots
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Total TPH >C6-C40	M	2670	mg/kg	10	50	260	850	46	40	25	26	51
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0	< 1.0					
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0					
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	< 1.0					
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	< 1.0					
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	< 1.0					
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0		< 1.0	< 1.0					
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0		20	< 1.0					
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0					
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		20	< 5.0					
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0	< 1.0					
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0					
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	< 1.0					
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	< 1.0					
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	< 1.0					
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		39	9.9					
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0		510	220					
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0					
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		550	230					
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		570	230					