



TEST CERTIFICATE

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



Environmental Science

Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 16/10/2018
Sampled By: Not Given

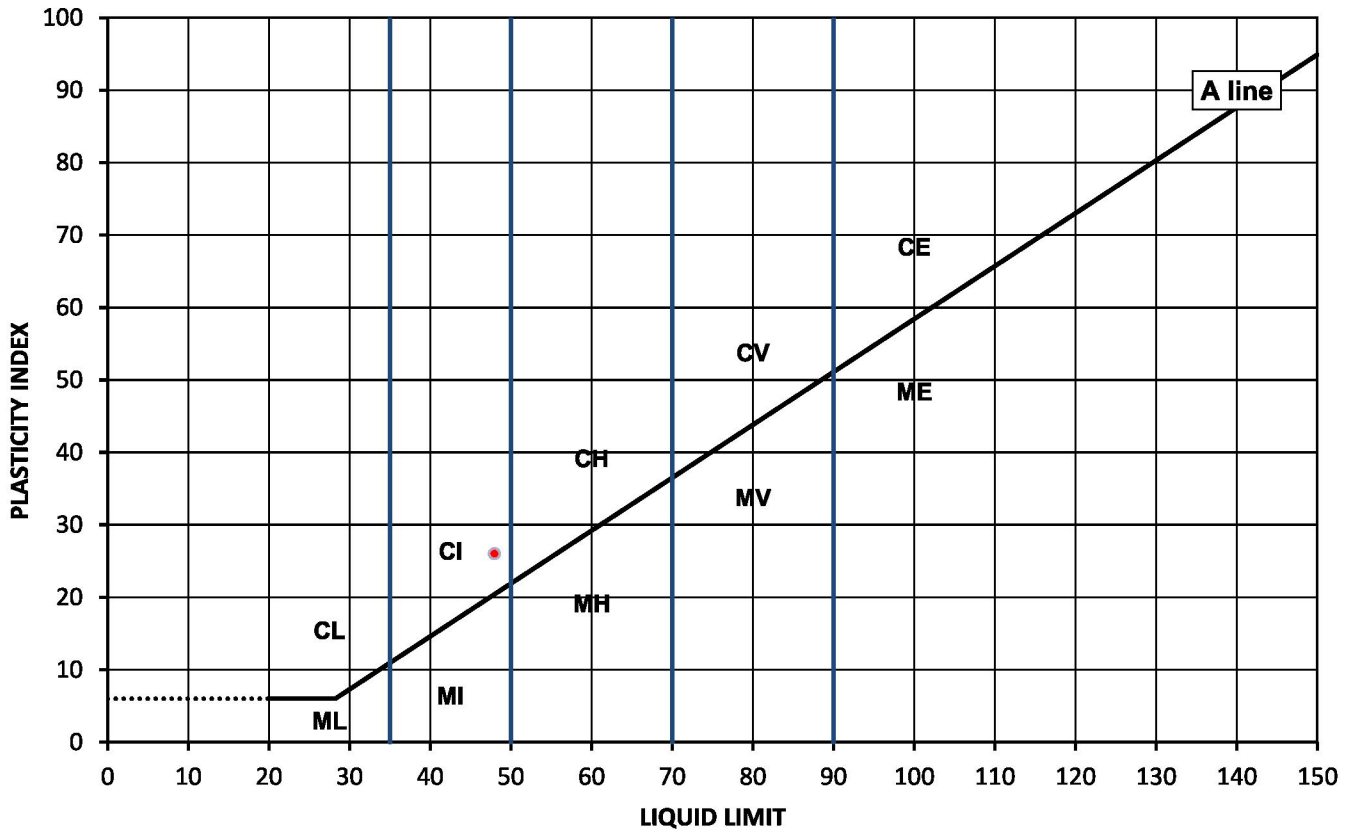
Test Results

Laboratory Reference: 1063631
Hole No.: TP15
Sample Reference: Not Given
Soil Description: Light brown gravelly sandy CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
14	48	22	26	89



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

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

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

*Opinions and Interpretations expressed here in are outside of the scope of the UKAS Accreditation.
This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.*



TEST CERTIFICATE

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



Environmental Science

Liquid and Plastic Limits

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 16/10/2018
Sampled By: Not Given

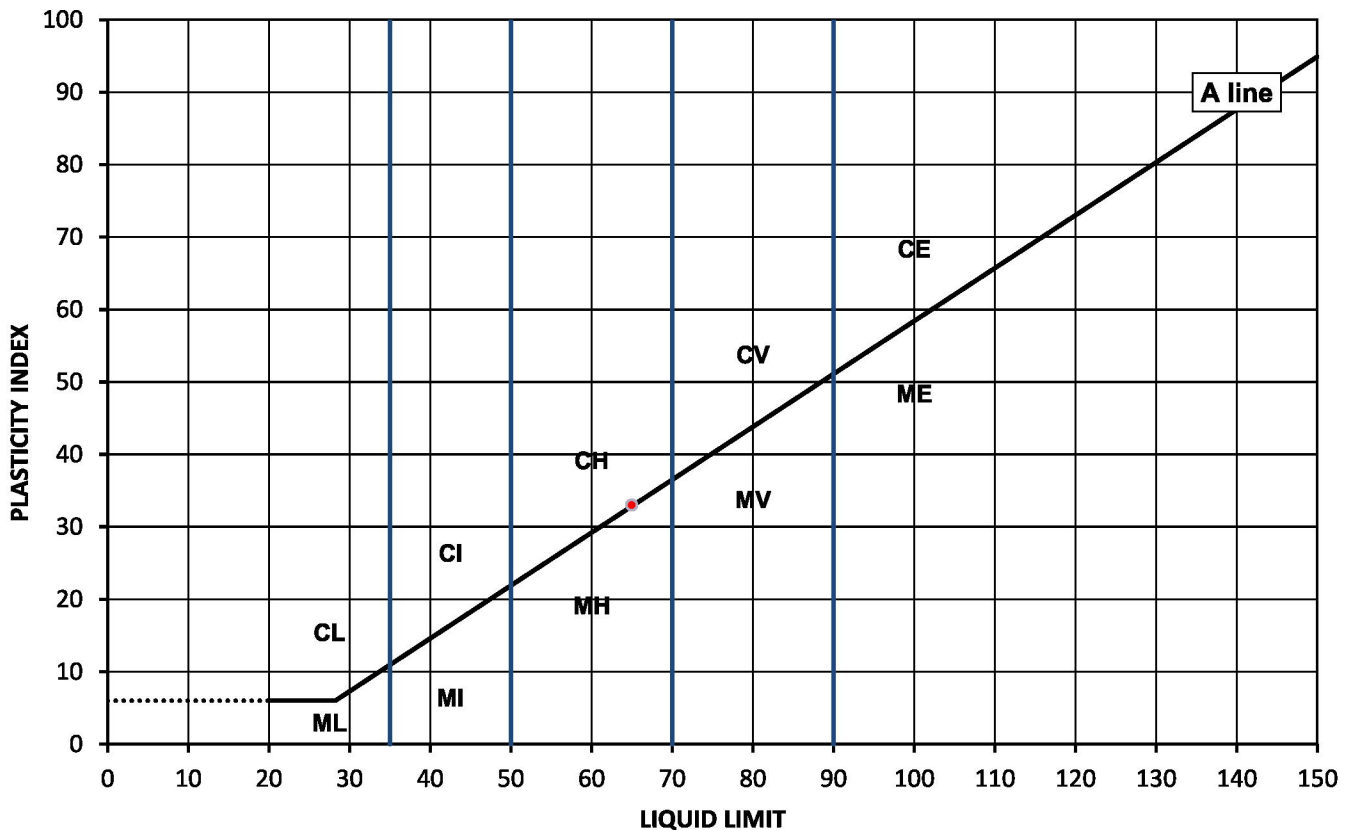
Test Results

Laboratory Reference: 1063632
Hole No.: TP19
Sample Reference: Not Given
Soil Description: Light brown slightly sandy slightly gravelly CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
20	65	32	33	60



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

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

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

*Opinions and Interpretations expressed here in are outside of the scope of the UKAS Accreditation.
This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Rudzka Staska, Poland.*



TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 16/10/2018
Sampled By: Not Given

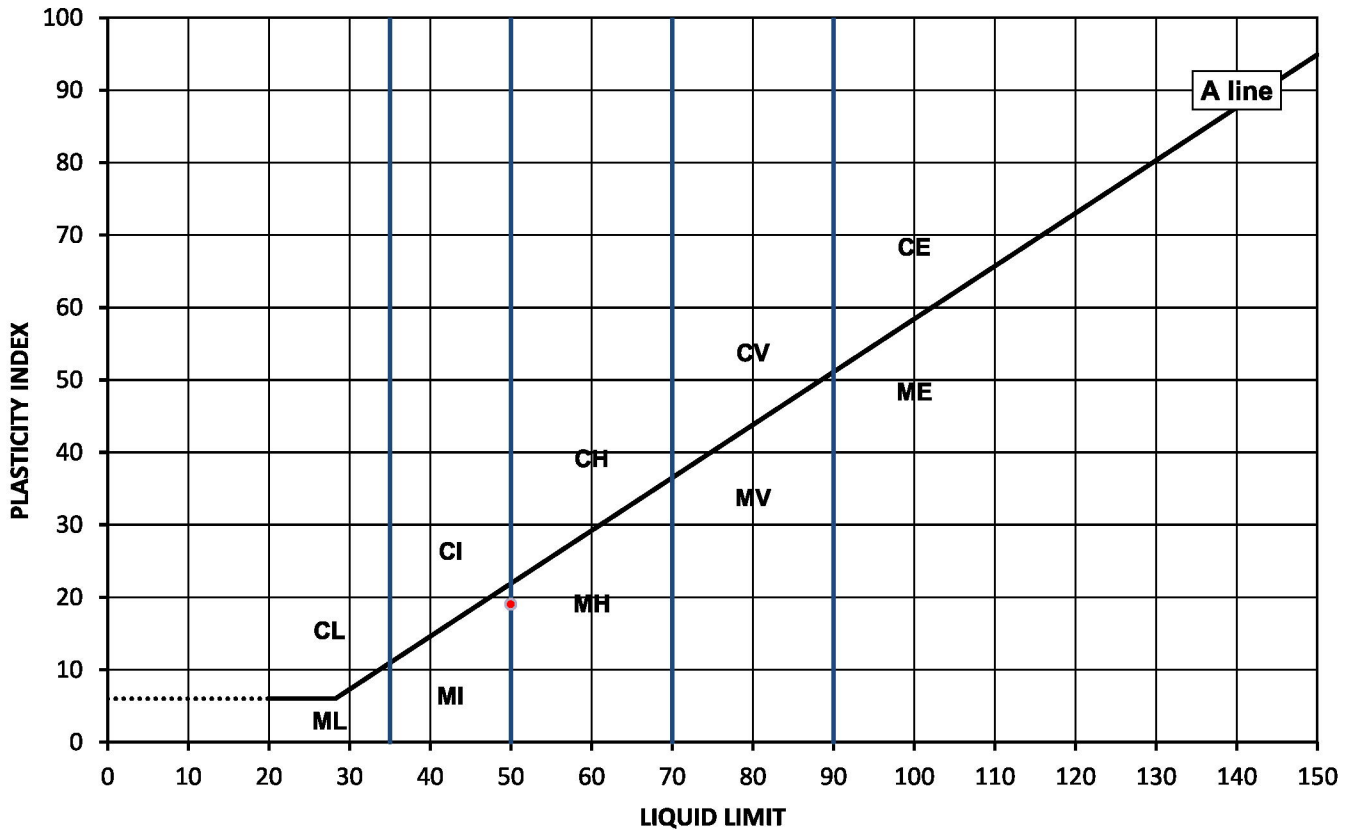
Test Results

Laboratory Reference: 1063633
Hole No.: TP22
Sample Reference: Not Given
Soil Description: Light brown gravelly very sandy CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
14	50	31	19	80



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

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

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

*Opinions and Interpretations expressed here in are outside of the scope of the UKAS Accreditation.
This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Rudzka Staska, Poland.*



4041

Client: Applied Geology Ltd
 Client Address: Unit 23
 Abbey Park, Stareton, Kenilworth,
 Warwickshire, CV8 2LY
 Contact: Sarah Treacy
 Site Name: Howes Lane, Bicester AG2373-18
 Site Address: Not Given

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

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



Environmental Science

Client Reference: 18-13497
 Job Number: 18-13497
 Date Sampled: 27/09/2018
 Date Received: 01/10/2018
 Date Tested: 16/10/2018
 Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC#	Atterberg#				Density		Total Porosity				
		Reference	Depth Top m	Depth Base m	Type				% Passing 425um %	LL %	PL %	PI %	bulk Mg/m3	PD Mg/m3					
1063630	TP14	Not Given	0.70	Not Given	B	Grey slightly gravelly sandy CLAY	Atterberg 1 Point	15	98	41	24	17		2.54					
1063631	TP15	Not Given	0.70	Not Given	B	Light brown gravelly sandy CLAY	Atterberg 1 Point	14	89	48	22	26		2.69					
1063632	TP19	Not Given	0.50	Not Given	B	Light brown slightly sandy slightly gravelly CLAY	Atterberg 1 Point	20	60	65	32	33		2.67					
1063633	TP22	Not Given	0.50	Not Given	B	Light brown gravelly very sandy CLAY	Atterberg 1 Point	14	80	50	31	19		2.59					
1063629	TP8	Not Given	0.50	Not Given	B	Light brown sandy very clayey GRAVEL	Atterberg 1 Point	18	42	61	34	27		2.57					

Note: # UKAS accredited; NP - Non plastic

Comments:

Approved: Dariusz Piotrowski
 PL Laboratory Manager Geotechnical Section
 Date Reported: 23/10/2018

Signed:

Darren Berrill
 Geotechnical General Manager

GF 234.4

"Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
 This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
 The results included within the report are representative of the samples submitted for analysis.
 The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



TEST CERTIFICATE

Particle Size Distribution

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



Environmental Science

Tested in Accordance with: BS 1377-2: 1990

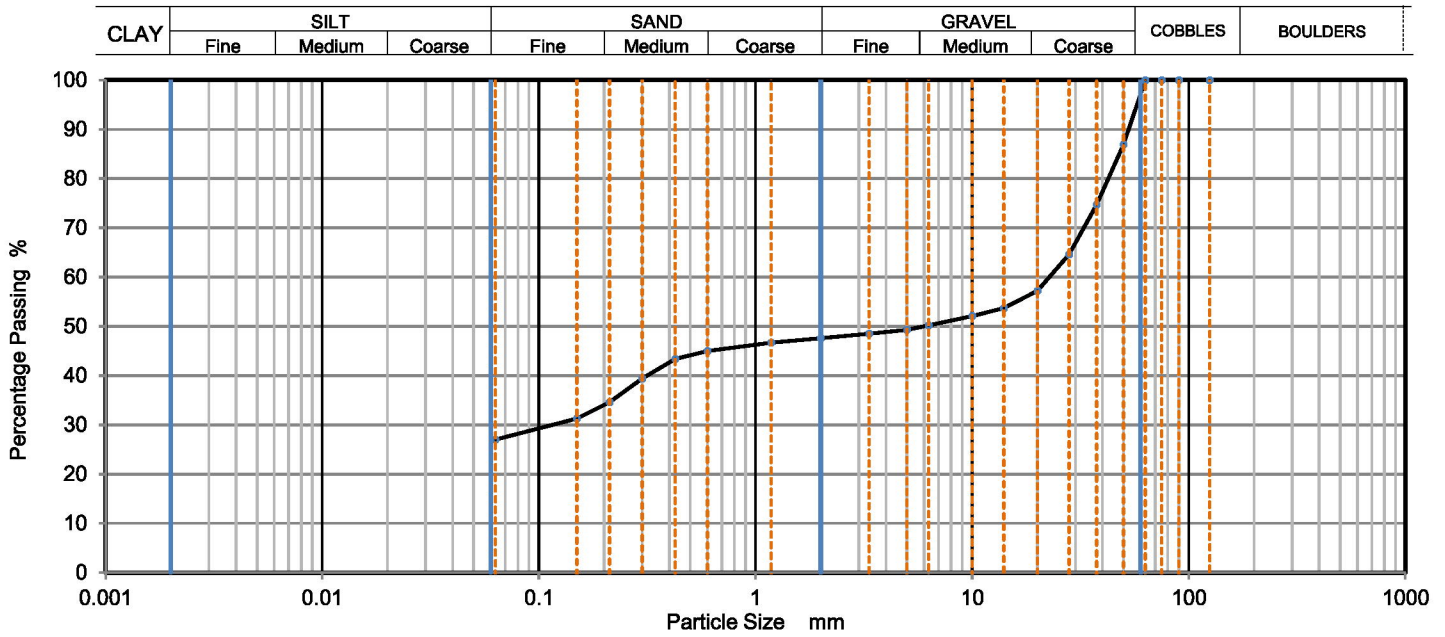
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 16/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063629
Hole No.: TP8
Sample Reference: Not Given
Sample Description: Light brown sandy very clayey GRAVEL

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	87		
37.5	75		
28	65		
20	57		
14	54		
10	52		
6.3	50		
5	49		
3.35	49		
2	48		
1.18	47		
0.6	45		
0.425	43		
0.3	39		
0.212	35		
0.15	31		
0.063	28		

Dry Mass of sample [g]: 9007

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	52.40
Sand	20.10
Fines <0.063mm	27.50

Grading Analysis		
D100	mm	63
D60	mm	22.7
D30	mm	0.112
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



TEST CERTIFICATE

Particle Size Distribution

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



Environmental Science

Tested in Accordance with: BS 1377-2: 1990

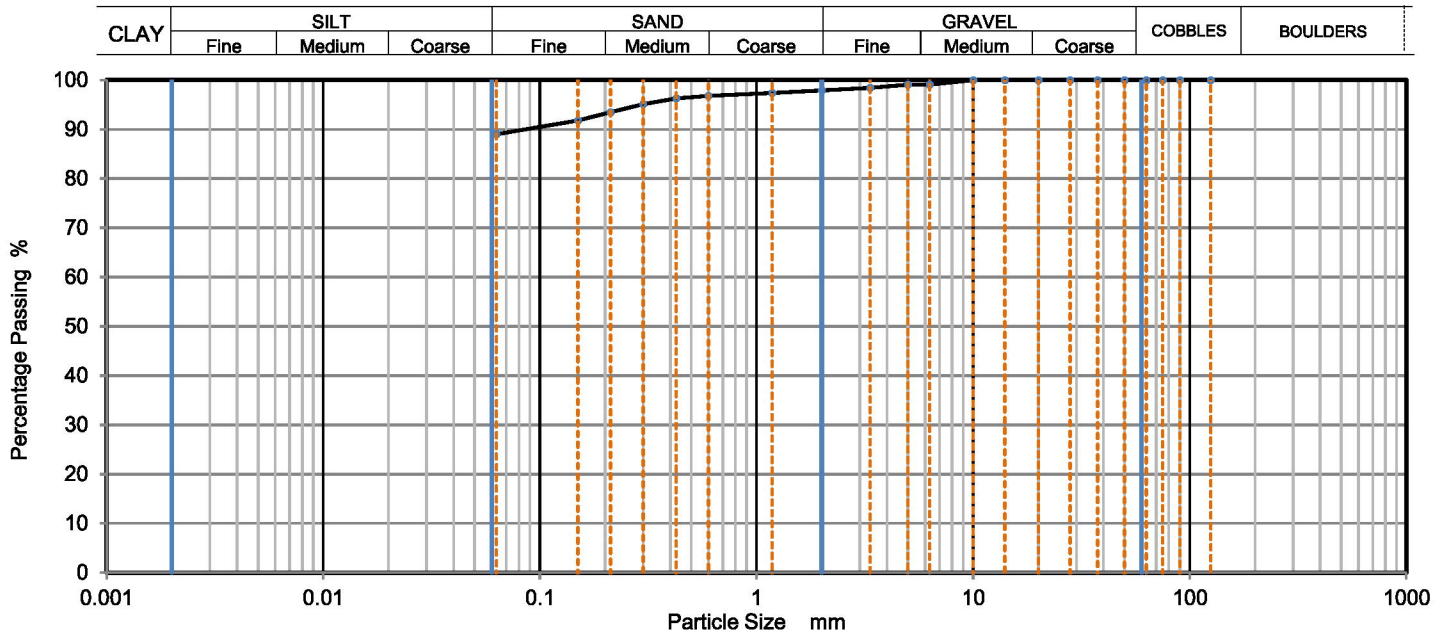
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 16/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063630
Hole No.: TP14
Sample Reference: Not Given
Sample Description: Grey slightly gravelly sandy CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	98		
1.18	97		
0.6	97		
0.425	96		
0.3	95		
0.212	94		
0.15	92		
0.063	90		

Dry Mass of sample [g]: 180

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	2.10
Sand	8.10
Fines <0.063mm	89.80

Grading Analysis		
D100	mm	10
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



TEST CERTIFICATE

Particle Size Distribution

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



Tested in Accordance with: BS 1377-2: 1990

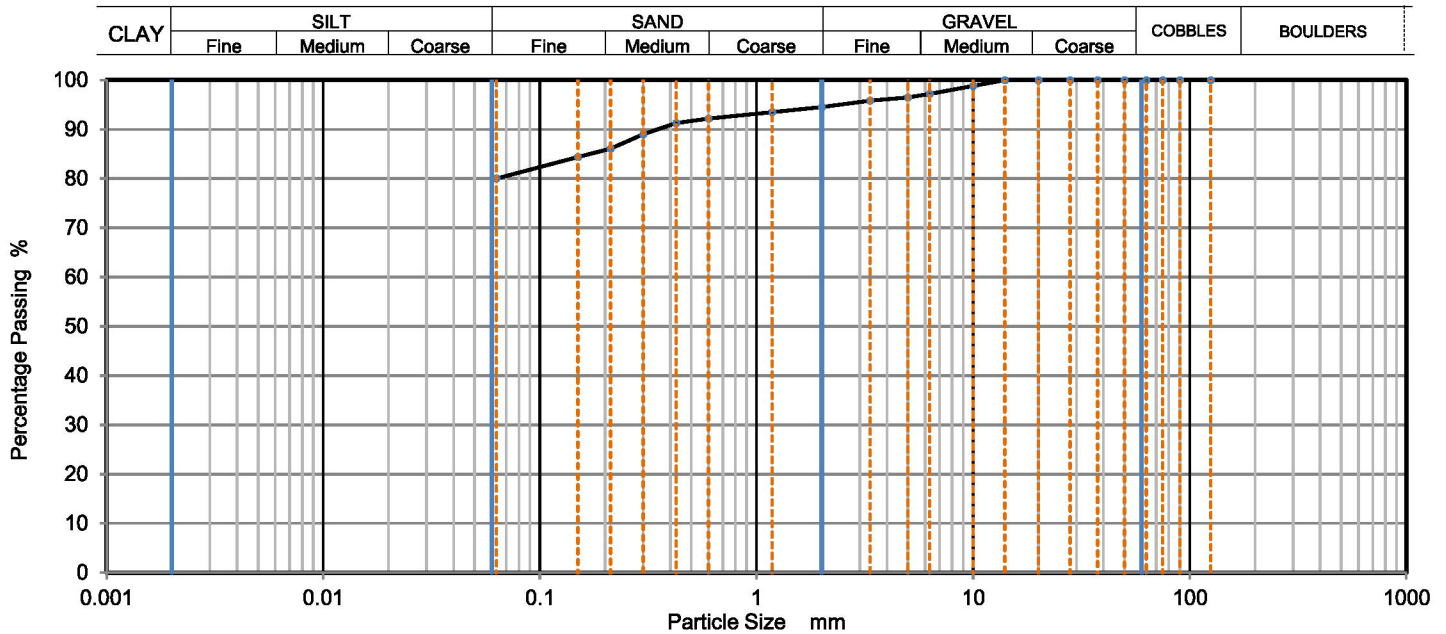
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 16/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063631
Hole No.: TP15
Sample Reference: Not Given
Sample Description: Light brown gravelly sandy CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	97		
5	97		
3.35	96		
2	95		
1.18	94		
0.6	92		
0.425	91		
0.3	89		
0.212	86		
0.15	84		
0.063	81		

Dry Mass of sample [g]: 167

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	5.50
Sand	13.60
Fines <0.063mm	80.90

Grading Analysis		
D100	mm	14
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



TEST CERTIFICATE

Particle Size Distribution

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



Environmental Science

Tested in Accordance with: BS 1377-2: 1990

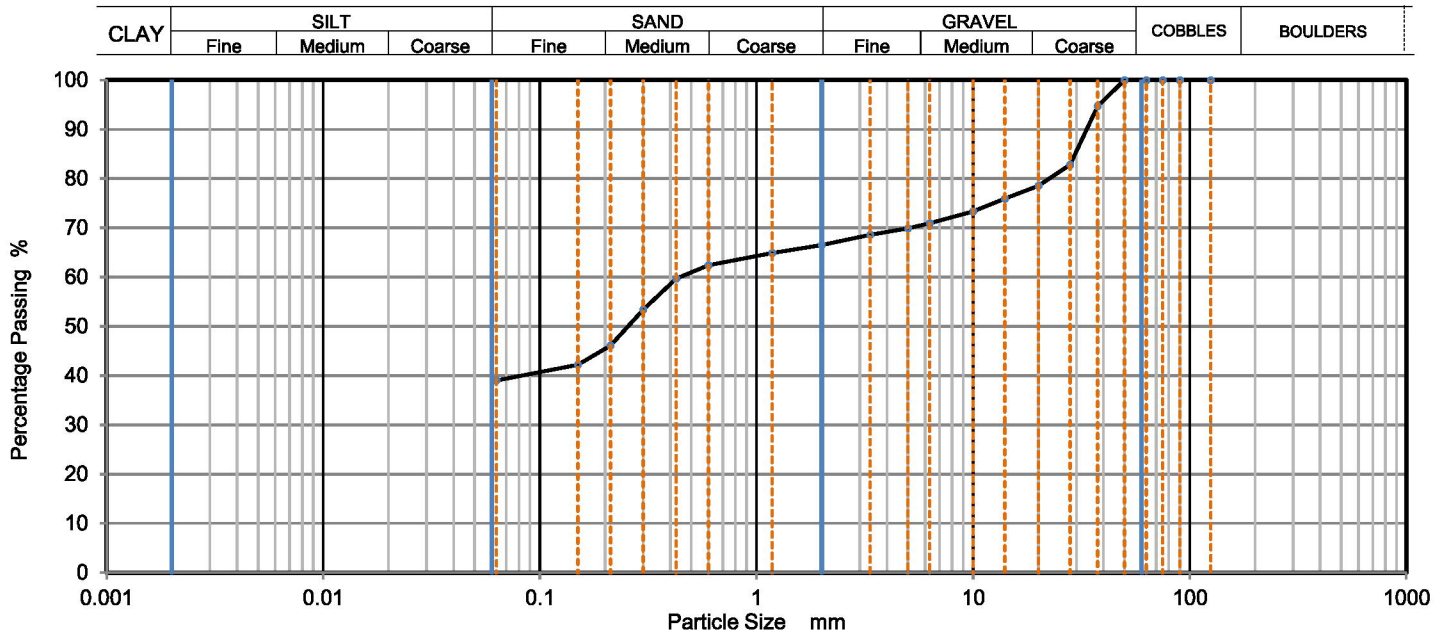
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 16/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063632
Hole No.: TP19
Sample Reference: Not Given
Sample Description: Light brown slightly sandy slightly gravelly CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	83		
20	79		
14	76		
10	73		
6.3	71		
5	70		
3.35	69		
2	67		
1.18	65		
0.6	62		
0.425	60		
0.3	53		
0.212	46		
0.15	42		
0.063	39		

Dry Mass of sample [g]: 5228

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	33.50
Sand	27.10
Fines <0.063mm	39.40

Grading Analysis		
D100	mm	50
D60	mm	0.442
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



TEST CERTIFICATE

Particle Size Distribution

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



Environmental Science

Tested in Accordance with: BS 1377-2: 1990

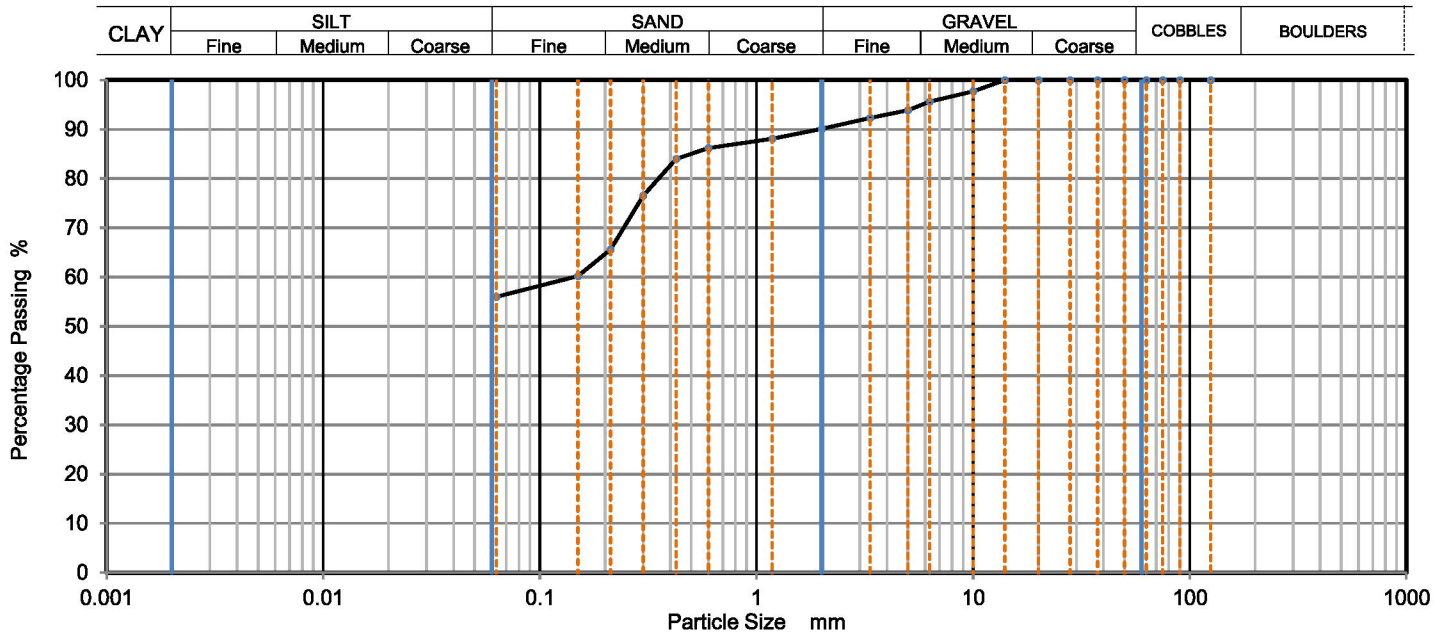
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 16/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063633
Hole No.: TP22
Sample Reference: Not Given
Sample Description: Light brown gravelly very sandy CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	98		
6.3	96		
5	94		
3.35	92		
2	90		
1.18	88		
0.6	86		
0.425	84		
0.3	77		
0.212	66		
0.15	60		
0.063	57		

Dry Mass of sample [g]: 631

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	9.90
Sand	33.30
Fines <0.063mm	56.90

Grading Analysis		
D100	mm	14
D60	mm	0.144
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



4041

Client: Applied Geology Ltd
 Client Address: Unit 23
 Abbey Park, Stareton, Kenilworth,
 Warwickshire, CV8 2LY

Contact: Sarah Treacy
 Site Name: Howes Lane, Bicester AG2373-18
 Site Address: Not Given

SUMMARY REPORT

Summary of Particle Density by Gas Jar Test Results

Tested in Accordance with: BS 1377-2: 1990: Clause 8.2

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



Environmental Science

Client Reference: 18-13497
 Job Number: 18-13497
 Date Sampled: 27/09/2018
 Date Received: 01/10/2018
 Date Tested: 19/10/2018
 Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	PD													
		Reference	Depth Top m	Depth Base m	Type																
1063630	TP14	Not Given	0.70	Not Given	B	Grey slightly gravelly sandy CLAY		2.54													
1063631	TP15	Not Given	0.70	Not Given	B	Light brown gravelly sandy CLAY		2.69													
1063632	TP19	Not Given	0.50	Not Given	B	Light brown slightly sandy slightly gravelly CLAY		2.67													
1063633	TP22	Not Given	0.50	Not Given	B	Light brown gravelly very sandy CLAY		2.59													
1063629	TP8	Not Given	0.50	Not Given	B	Light brown sandy very clayey GRAVEL		2.57													

Note: PD - Particle Density

Comments:

Approved: Dariusz Piotrowski
 PL Laboratory Manager Geotechnical Section
 Date Reported: 23/10/2018

Signed: Darren Berrill
 Geotechnical General Manager

GF 104.9

*Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
 This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
 The results included within the report are representative of the samples submitted for analysis.
 The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.*



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

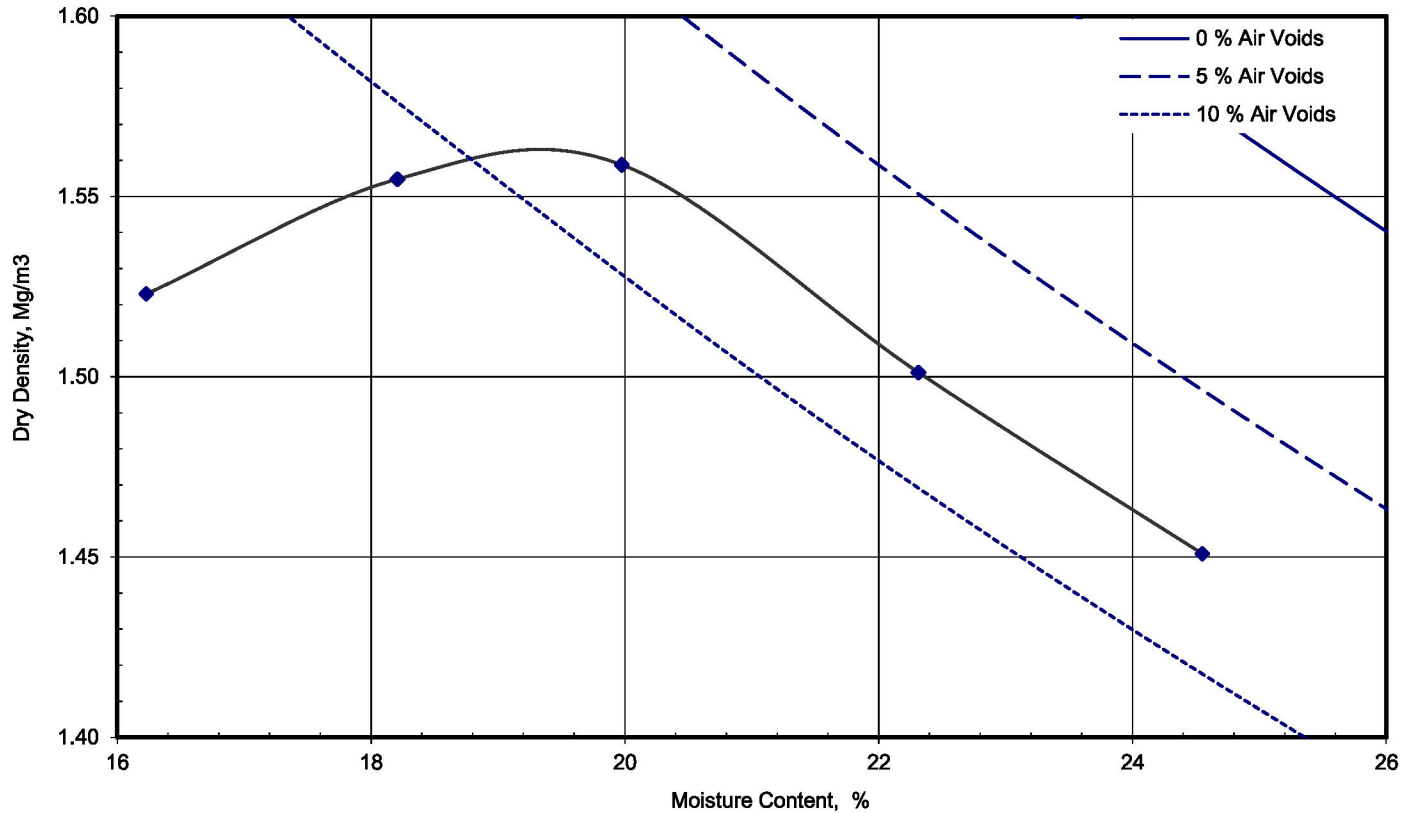
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 19/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063629
Hole No.: TP8
Sample Reference: Not Given
Sample Description: Light brown sandy very clayey GRAVEL

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	20	%
Material Retained on 20.0 mm Sieve	39	%
Particle Density - Measured using gas jar	2.57	Mg/m³
As received Moisture Content	18	%
Maximum Dry Density	1.56	Mg/m³
Optimum Moisture Content	20	%

Note: Tested in Accordance with: BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks: Insufficient amount of material - compacted in proctor mould; Zone X - test carried out as per client request

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 109.12

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

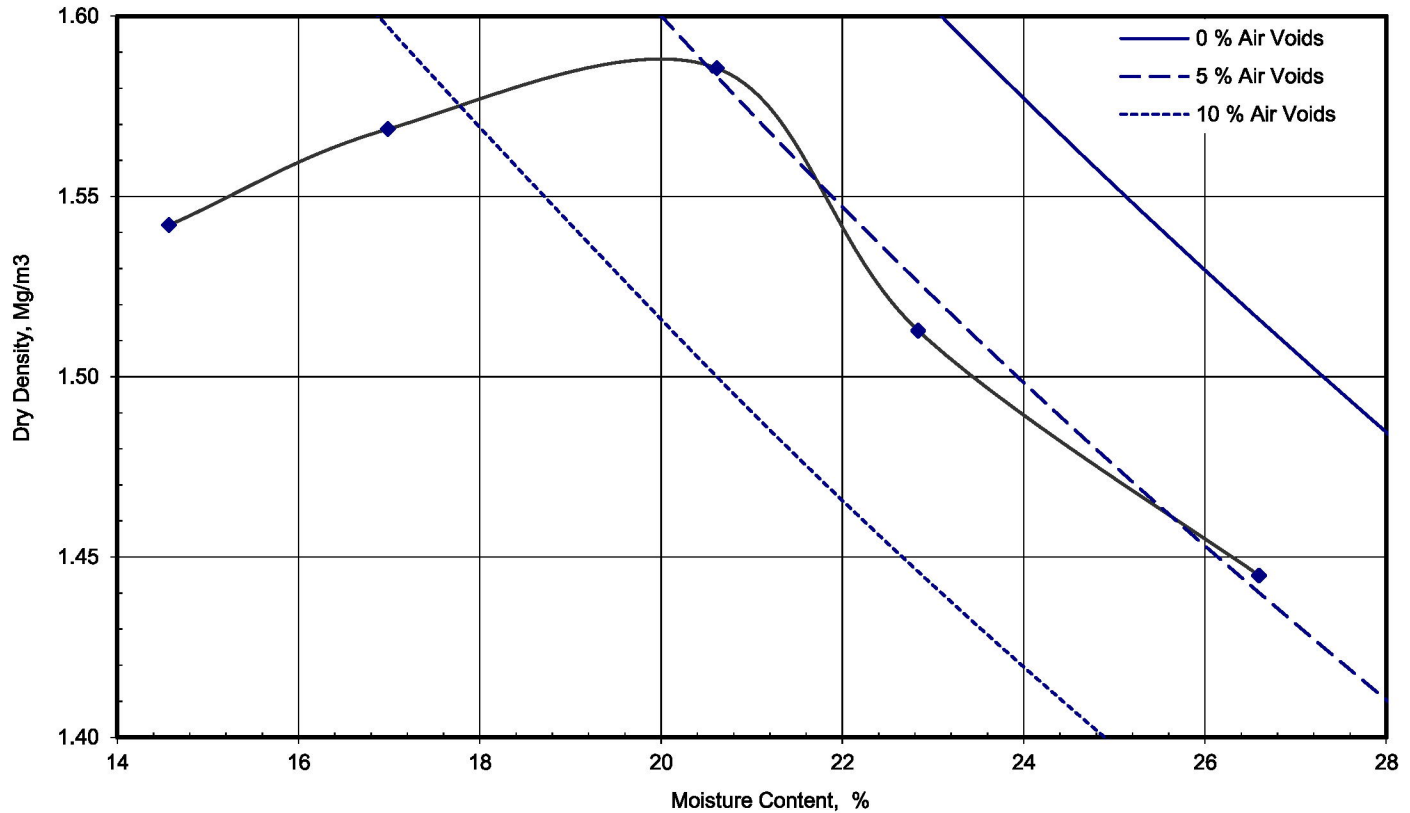
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 18/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063630
Hole No.: TP14
Sample Reference: Not Given
Sample Description: Grey slightly gravelly sandy CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	0	%
Material Retained on 20.0 mm Sieve	0	%
Particle Density - Measured using gas jar	2.54	Mg/m³
As received Moisture Content	15	%
Maximum Dry Density	1.59	Mg/m³
Optimum Moisture Content	21	%

Note: Tested in Accordance with: BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 109.12

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

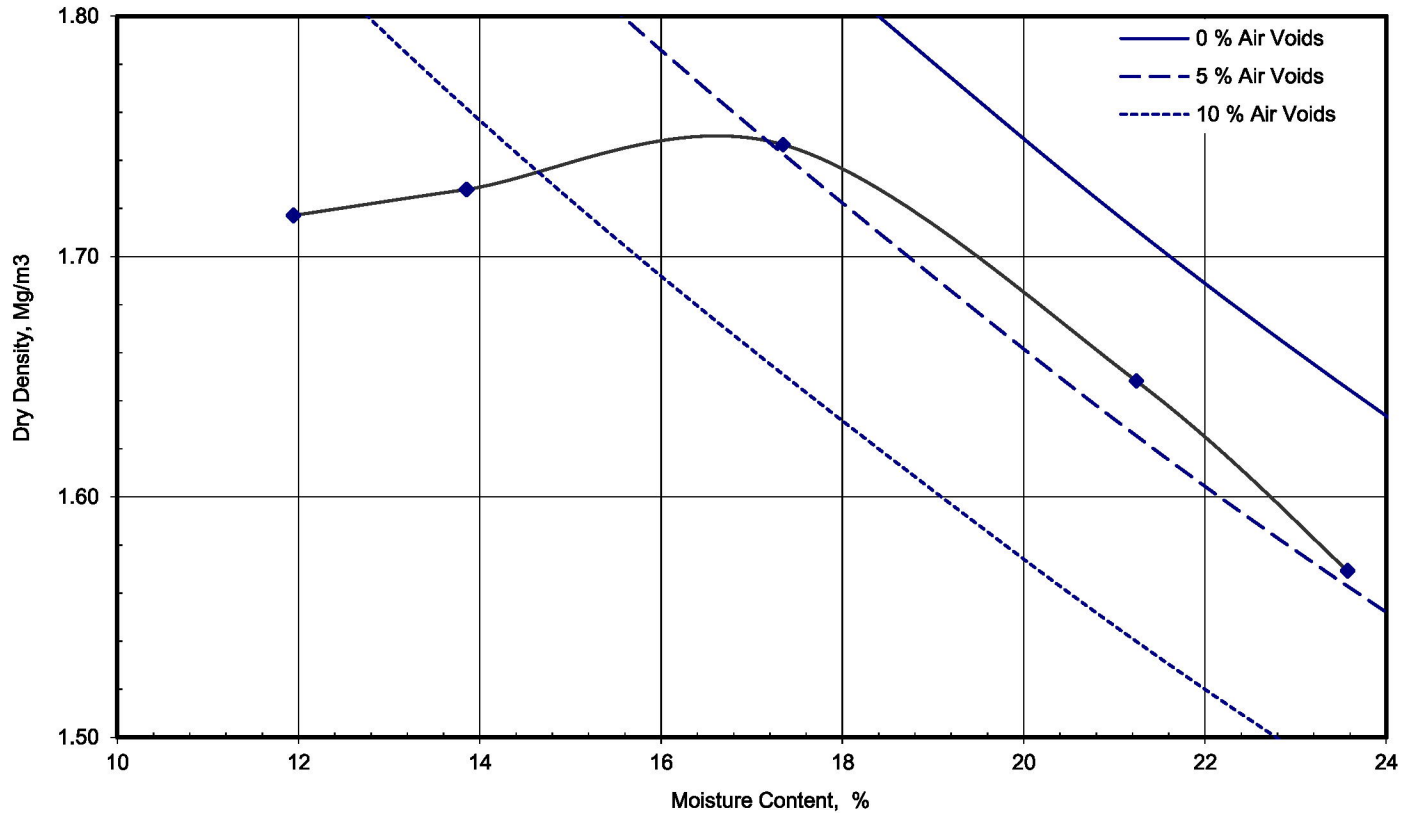
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 18/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063631
Hole No.: TP15
Sample Reference: Not Given
Sample Description: Light brown gravelly sandy CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	0	%
Material Retained on 20.0 mm Sieve	0	%
Particle Density - Measured using gas jar	2.69	Mg/m³
As received Moisture Content	14	%
Maximum Dry Density	1.75	Mg/m³
Optimum Moisture Content	17	%

Note: Tested in Accordance with: BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 109.12

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

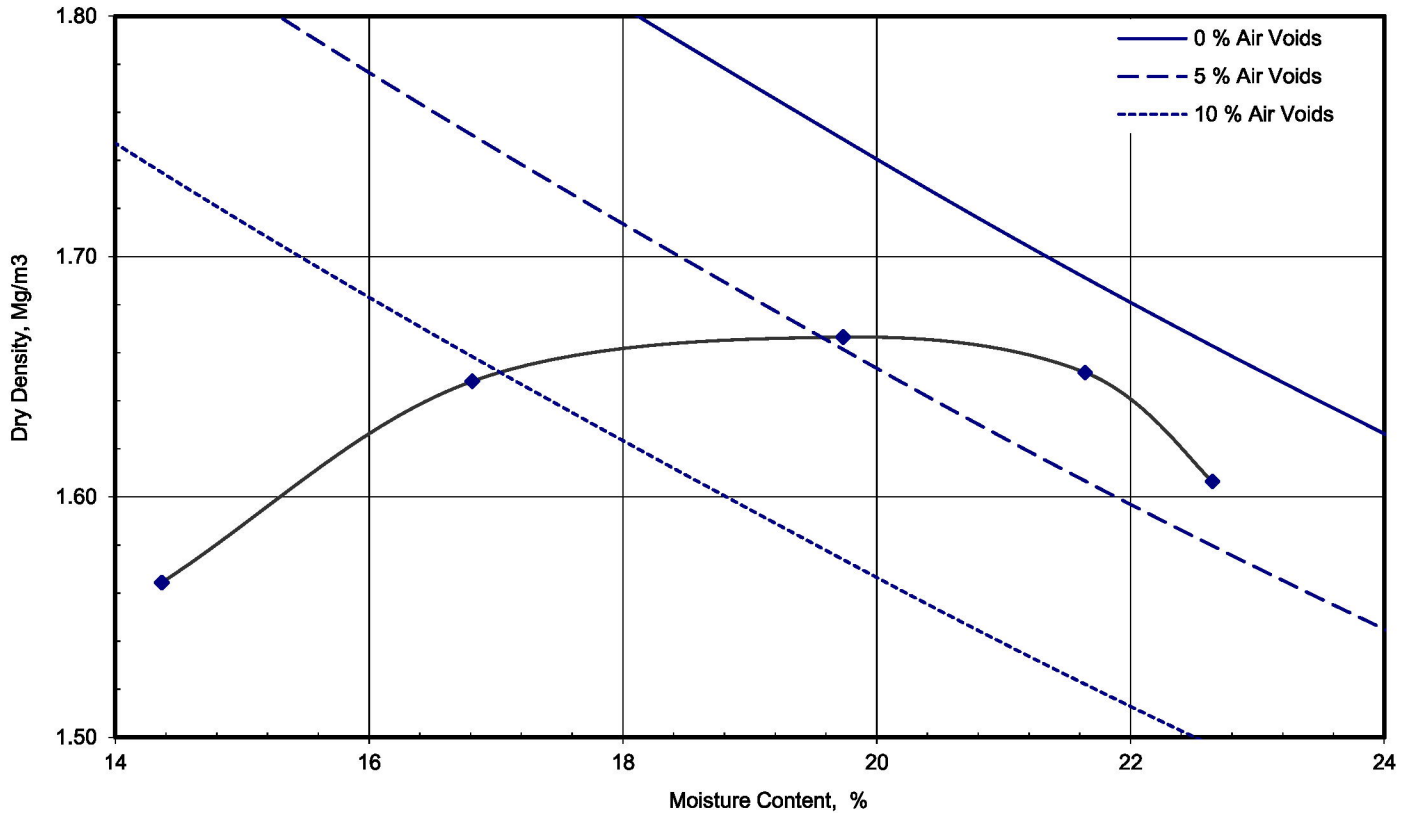
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 19/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063632
Hole No.: TP19
Sample Reference: Not Given
Sample Description: Light brown slightly sandy slightly gravelly CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	5	%
Material Retained on 20.0 mm Sieve	21	%
Particle Density - Measured using gas jar	2.67	Mg/m³
As received Moisture Content	20	%
Maximum Dry Density	1.67	Mg/m³
Optimum Moisture Content	20	%

Note: Tested in Accordance with: BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks: insufficient amount of material – compacted in proctor mould

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 109.12

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

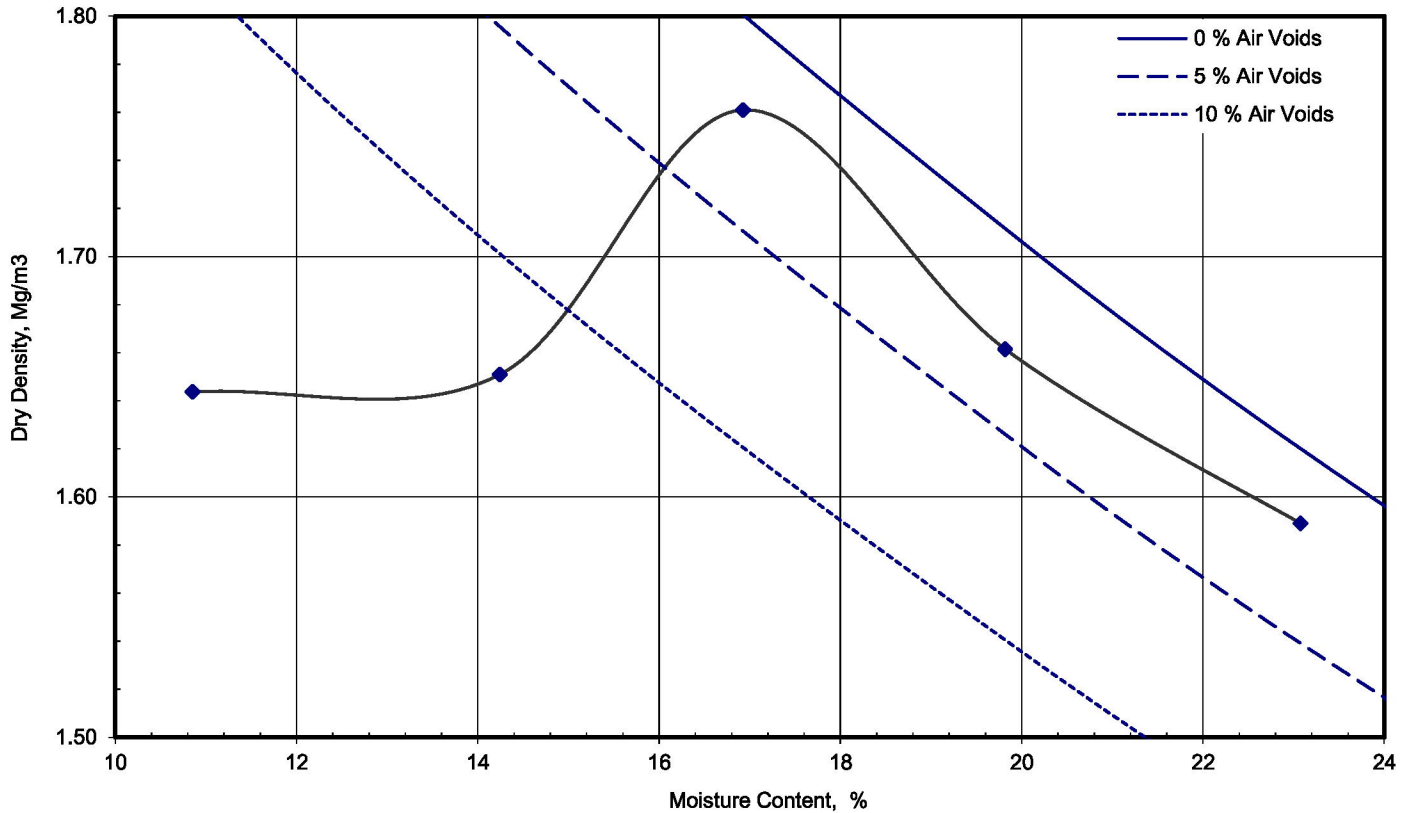
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 19/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063633
Hole No.: TP22
Sample Reference: Not Given
Sample Description: Light brown gravelly very sandy CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	0	%
Material Retained on 20.0 mm Sieve	0	%
Particle Density - Measured using gas jar	2.59	Mg/m³
As received Moisture Content	14	%
Maximum Dry Density	1.76	Mg/m³
Optimum Moisture Content	17	%

Note: Tested in Accordance with: BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 109.12

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

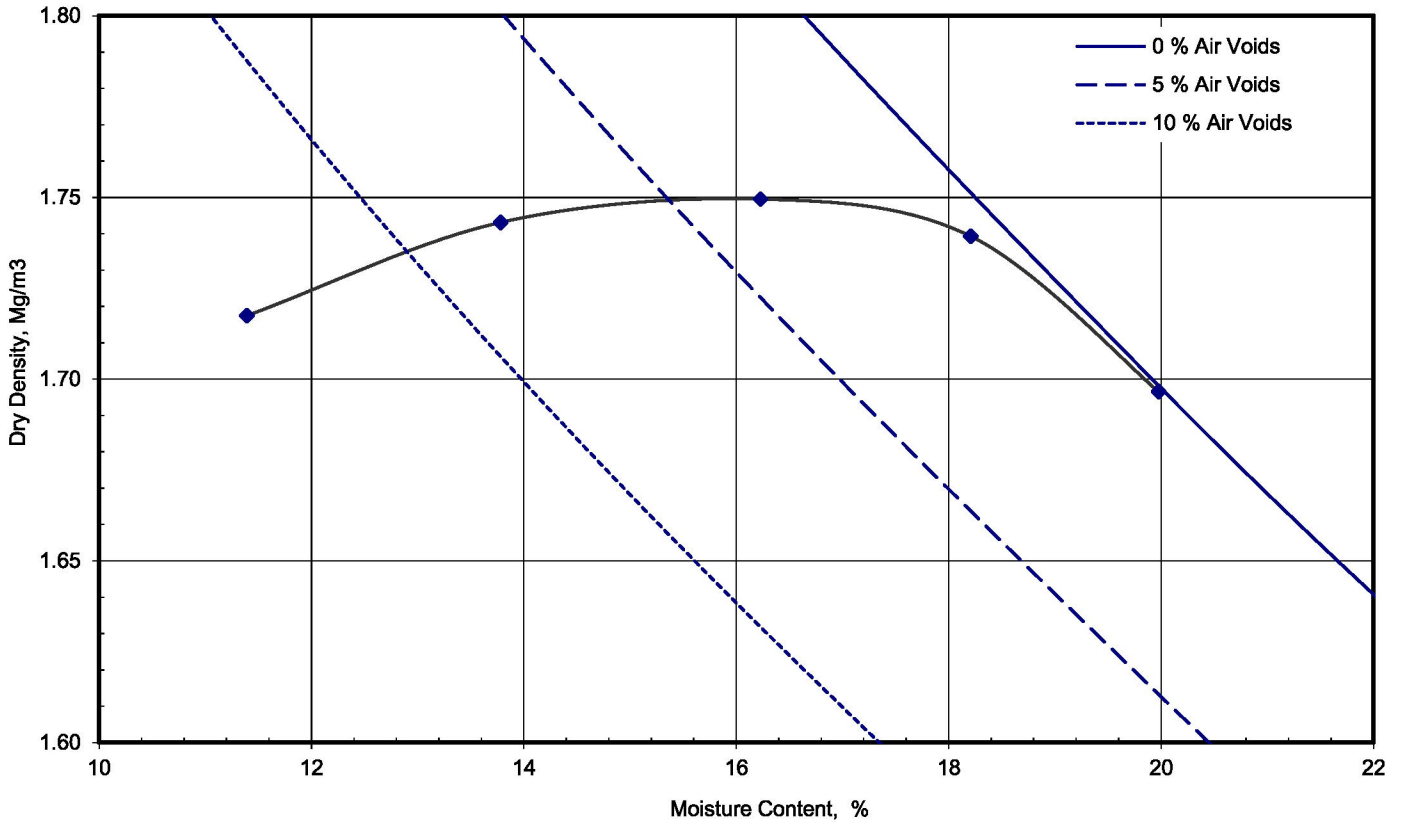
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 19/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063629
Hole No.: TP8
Sample Reference: Not Given
Sample Description: Light brown sandy very clayey GRAVEL

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	20	%
Material Retained on 20.0 mm Sieve	39	%
Particle Density - Measured using gas jar	2.57	Mg/m ³
As received Moisture Content	18	%
Maximum Dry Density	1.75	Mg/m ³
Optimum Moisture Content	16	%

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Insufficient amount of material - compacted in proctor mould; Zone X -test carried out as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 110.12

Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

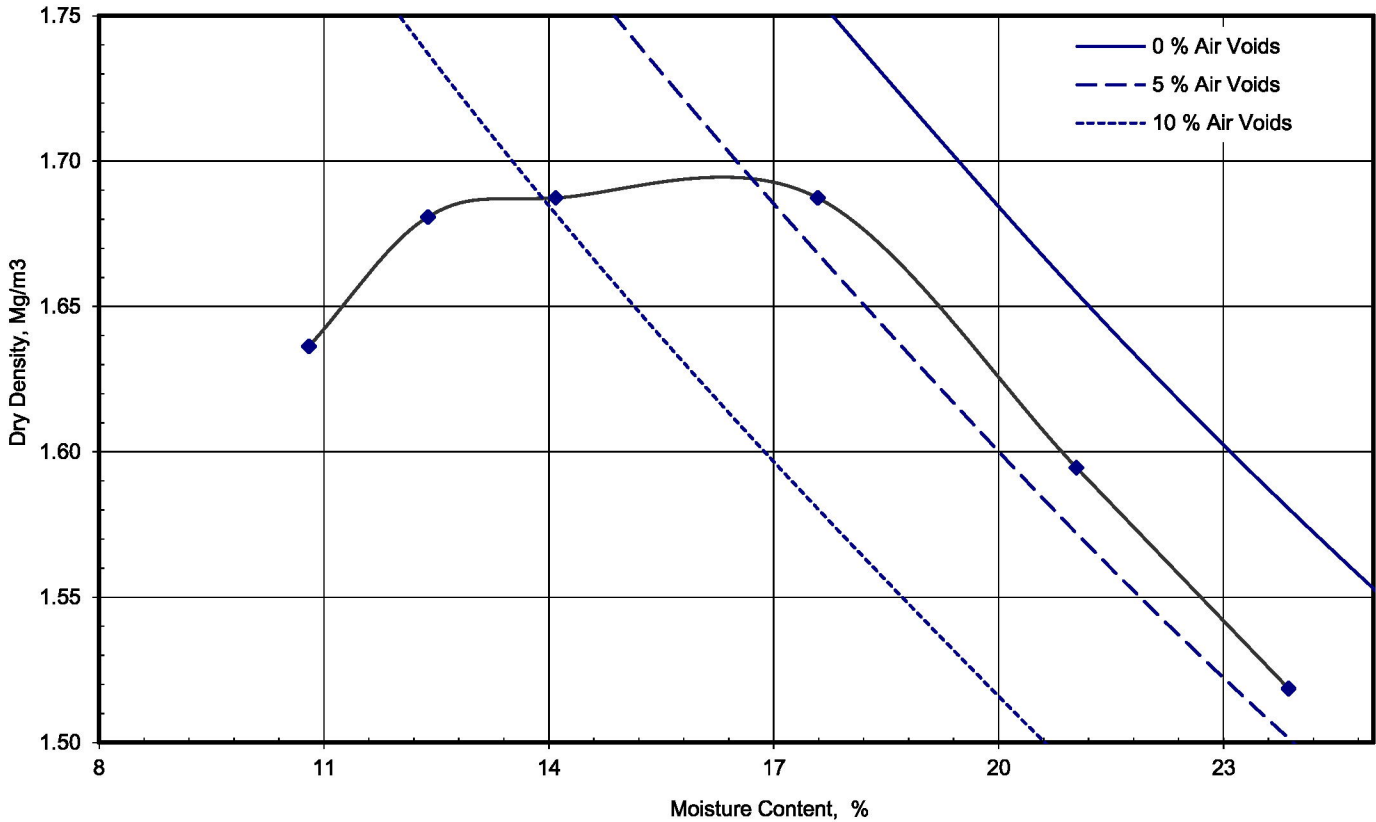
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 18/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063630
Hole No.: TP14
Sample Reference: Not Given
Sample Description: Grey slightly gravelly sandy CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	0	%
Material Retained on 20.0 mm Sieve	0	%
Particle Density - Measured using gas jar	2.54	Mg/m³
As received Moisture Content	14	%
Maximum Dry Density	1.70	Mg/m³
Optimum Moisture Content	17	%

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 110.12

*Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation.
This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.*



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

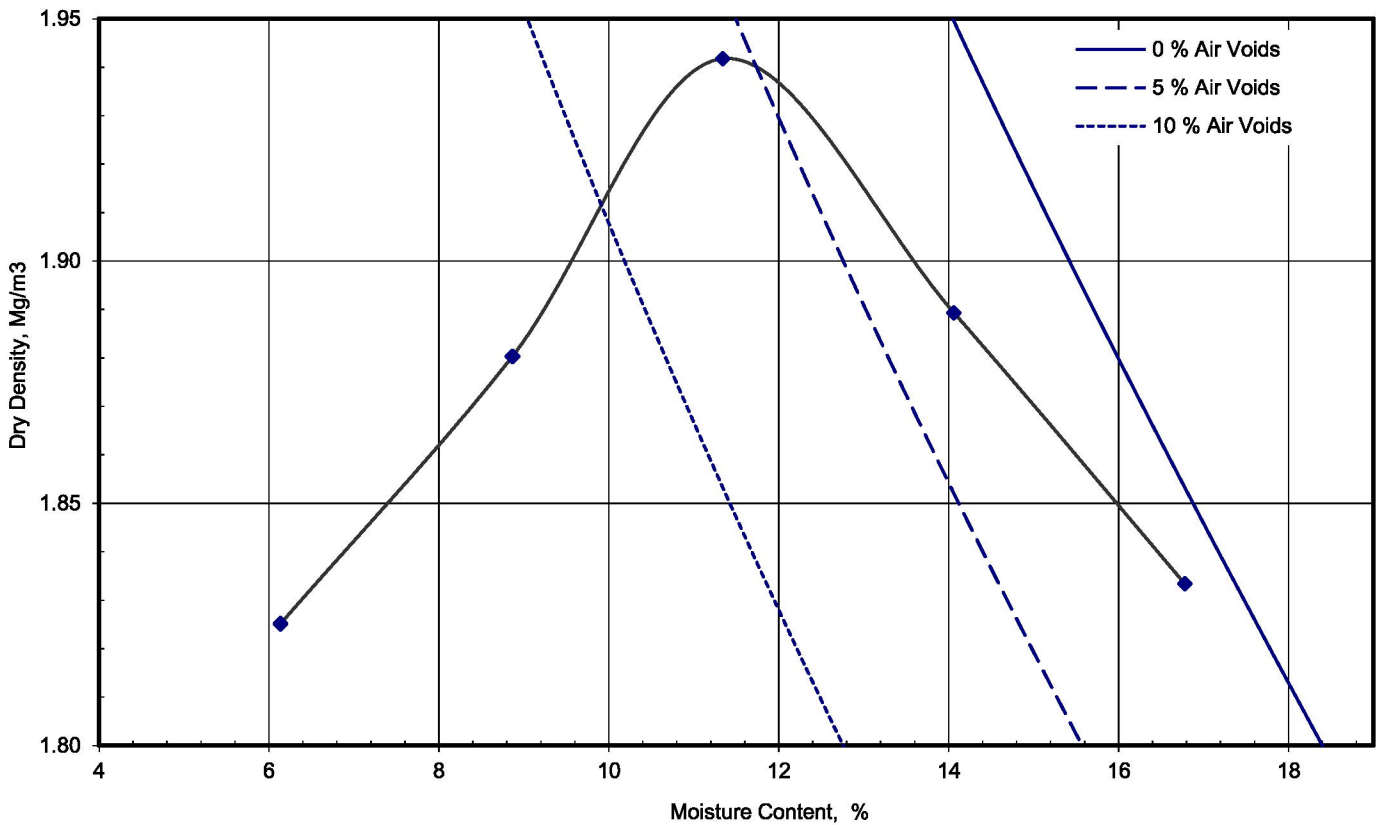
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 18/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063631
Hole No.: TP15
Sample Reference: Not Given
Sample Description: Light brown gravelly sandy CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	0	%
Material Retained on 20.0 mm Sieve	0	%
Particle Density - Measured using gas jar	2.69	Mg/m ³
As received Moisture Content	14	%
Maximum Dry Density	1.94	Mg/m ³
Optimum Moisture Content	11	%

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 110.12

Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis. The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

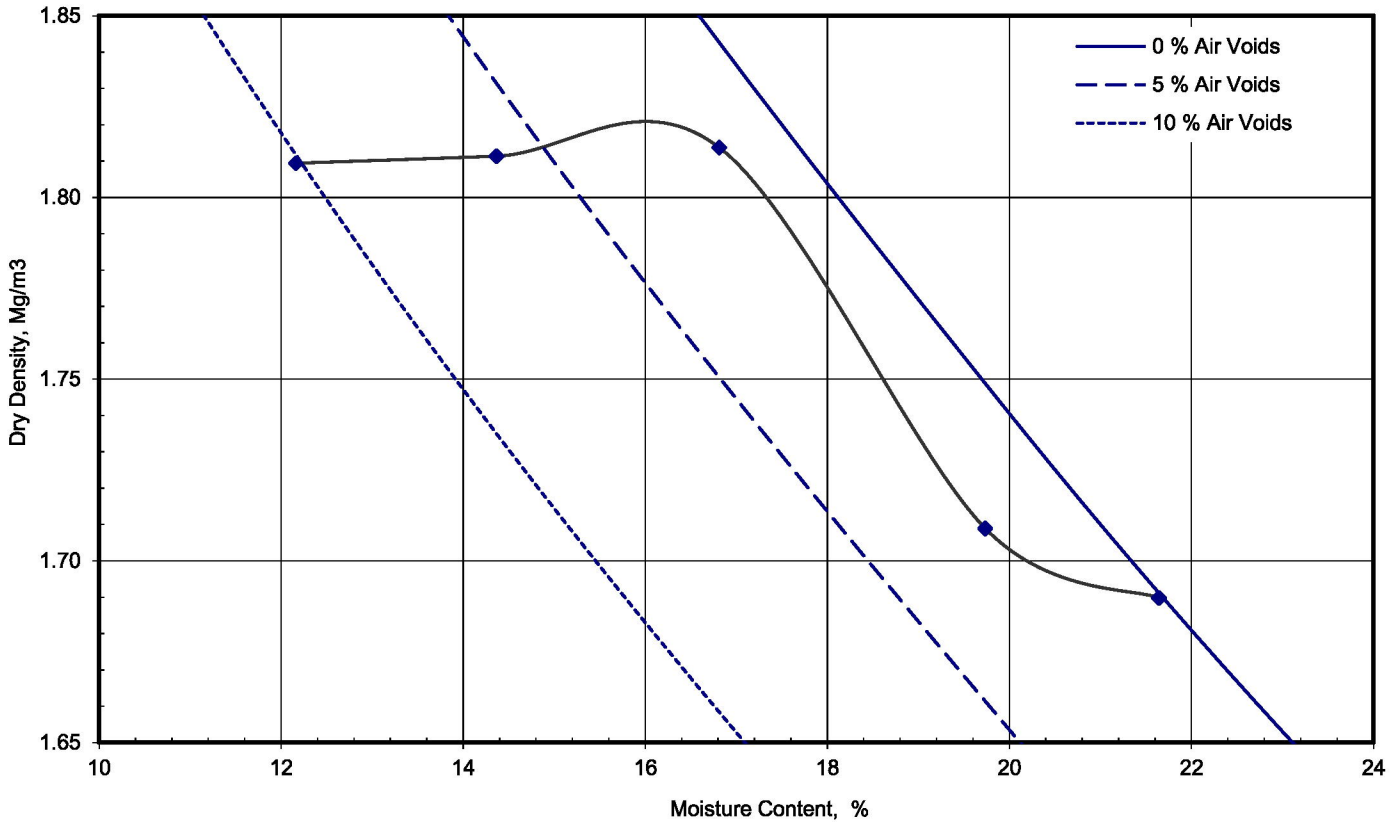
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 19/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063632
Hole No.: TP19
Sample Reference: Not Given
Sample Description: Light brown slightly sandy slightly gravelly CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	5	%
Material Retained on 20.0 mm Sieve	21	%
Particle Density - Measured using gas jar	2.67	Mg/m ³
As received Moisture Content	20	%
Maximum Dry Density	1.82	Mg/m ³
Optimum Moisture Content	16	%

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: insufficient amount of material – compacted in proctor mould

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 110.12

*Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation.
This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.*



4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



Environmental Science

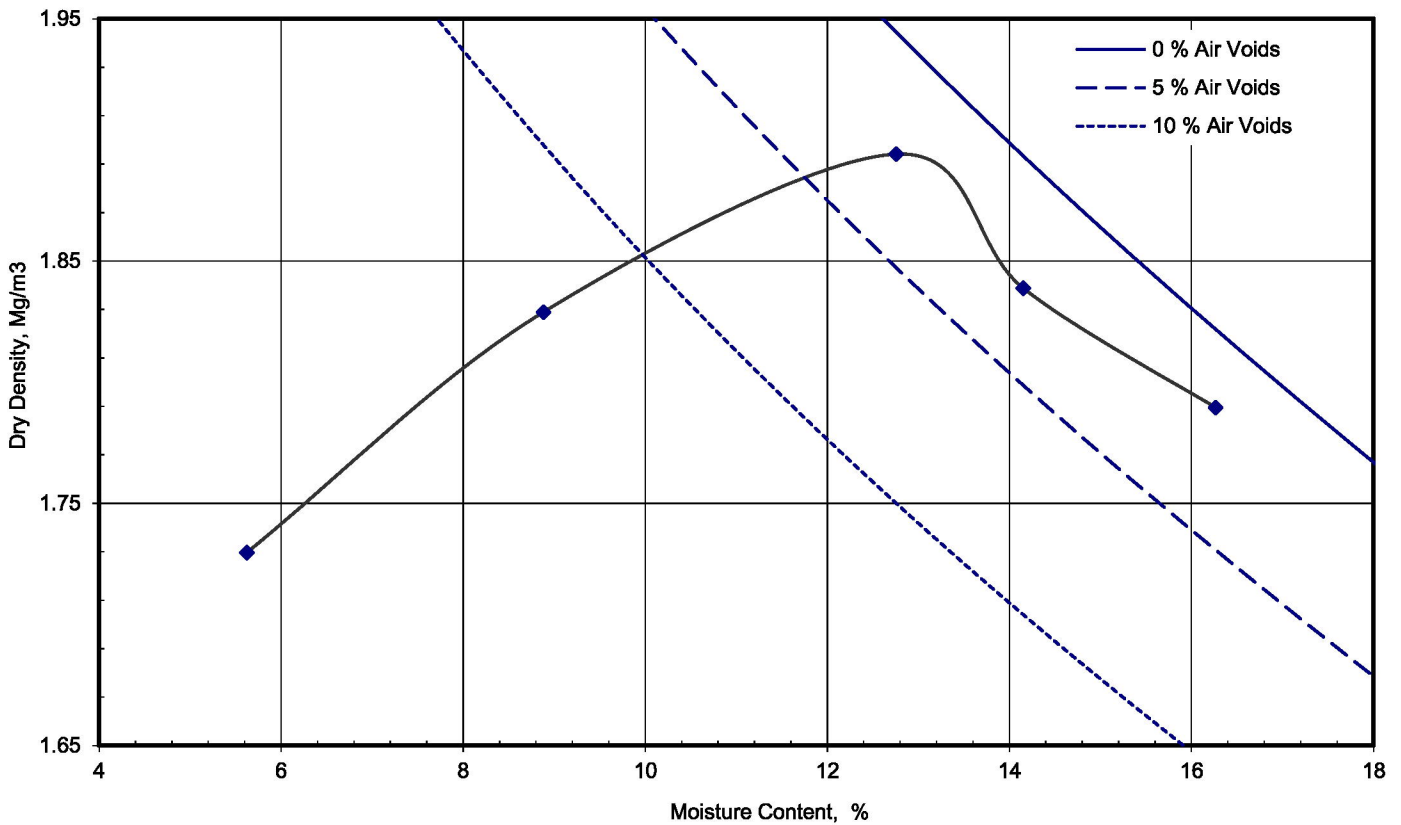
Client: Applied Geology Ltd
Client Address: Unit 23
Abbey Park
Stareton, Kenilworth, Warwickshire, CV8 2LY
Contact: Sarah Treacy
Site Name: Howes Lane, Bicester AG2373-18
Site Address: Not Given

Client Reference: 18-13497
Job Number: 18-13497
Date Sampled: 27/09/2018
Date Received: 01/10/2018
Date Tested: 18/10/2018
Sampled By: Not Given

Test Results:

Laboratory Reference: 1063633
Hole No.: TP22
Sample Reference: Not Given
Sample Description: Light brown gravelly very sandy CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	0	%
Material Retained on 20.0 mm Sieve	0	%
Particle Density - Measured using gas jar	2.59	Mg/m ³
As received Moisture Content	14	%
Maximum Dry Density	1.89	Mg/m ³
Optimum Moisture Content	13	%

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

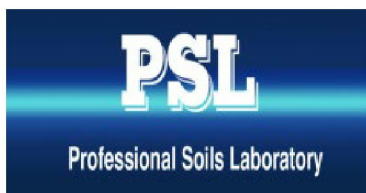
Remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 23/10/2018

Signed: Darren Berrill
Geotechnical General Manager

GF 110.12

*Opinions and Interpretations expressed herein are outside of the scope of the UKAS Accreditation.
This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.*



LABORATORY REPORT



4043

Contract Number: PSL18/5065

Report Date: 17 October 2018
Client's Reference: 13454
Client Name: Applied Geology Limited
Centrix House,
Crow Lane East,
Newton-le-Willows
WA12 9UY.

For the attention of: Sarah Treacy

Contract Title: AG2873-18 Howes lane, Bicester
Date Received: 3/10/2018
Date Commenced: 3/10/2018
Date Completed: 17/10/2018

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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


Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)

R Berriman
(Quality Manager)

L Knight
(Senior Technician)


L Pavey
(Senior/Quality Technician)

A Fry
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

Page 1 of

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure (kN)	UCS (MPa)	Failure Mode	Date Tested	Remarks
R1		C	5.66	5.94	85	172	2.0	2413	2.47	2.4	2.41	26.0	4.6	Brittle	16/10/18	
R1		C	9.47	9.82	85	173	2.0	2439	2.48	5.8	2.35	29.1	5.1	Brittle	16/10/18	
R2		C	3.43	3.67	85	172	2.0	2643	2.71	1.9	2.66	183.3	32.3	Brittle	16/10/18	
R2		C	5.69	6.11	85	174	2.0	2608	2.64	2.5	2.58	109.7	19.3	Brittle	16/10/18	
R3		C	5.01	5.22	85	171	2.0	2558	2.64	2.2	2.58	96.9	17.1	Brittle	16/10/18	
R3		C	11.05	11.32	85	177	2.1	2474	2.46	7.8	2.28	19.5	3.4	Brittle	16/10/18	
R4		C	10.00	10.46	85	152	1.8	2214	2.57	1.7	2.52	83.1	14.6	Brittle	16/10/18	
R5		C	5.61	5.83	85	182	2.1	2763	2.68	1.0	2.65	290.4	51.2	Brittle	16/10/18	
R5		C	9.38	9.81	85	162	1.9	2305	2.51	1.4	2.47	80.8	14.2	Brittle	16/10/18	



Howes Lane, Bicester

Contract No:
PSL18/5065
Client Ref:
AG2873-18

POINT LOAD INDEX TEST RESULTS

Date Cored/Sampled	21/8/18 - 28/8/18
Date Tested	04/10/2018

Tested By	KH
Approved By	

BH No.	Sample No.	Depth (m bgl)	Test Type ³	Orientation ⁴	Failure Valid (Y/N)	W (mm)	D (mm)	De ² (mm ²)	De (mm)	P (kN)	Is (MPa)	F	Is(50) (MPa)
R1	2	6.00	D	Parallel	Y	90.00	85.00	7225.00	85.00	0.38	0.05	1.27	0.07
R1	3	7.65	D	Parallel	Y	55.00	85.00	7225.00	85.00	0.52	0.07	1.27	0.09
R1	5	10.35	D	Parallel	Y	140.00	85.00	7225.00	85.00	5.66	0.78	1.27	1.00
R2	1	3.08	D	Parallel	Y	141.00	85.00	7225.00	85.00	19.10	2.64	1.27	3.36
R2	4	9.69	D	Parallel	Y	83.00	60.00	3600.00	60.00	6.29	1.75	1.09	1.90
R2	5	9.89	D	Parallel	Y	115.00	85.00	7225.00	85.00	4.82	0.67	1.27	0.85
R2	6	10.46	D	Parallel	Y	104.00	85.00	7225.00	85.00	4.34	0.60	1.27	0.76
R2	7	11.27	D	Parallel	Y	50.00	85.00	7225.00	85.00	3.02	0.42	1.27	0.53
R3	2	4.56	D	Parallel	Y	116.00	85.00	7225.00	85.00	15.61	2.16	1.27	2.74
R3	4	5.23	D	Parallel	Y	117.00	85.00	7225.00	85.00	7.96	1.10	1.27	1.40
R3	5	9.61	D	Parallel	Y	123.00	43.00	1849.00	43.00	3.40	1.84	0.93	1.72
R4	1	4.00	D	Parallel	Y	85.00	85.00	7225.00	85.00	4.49	0.62	1.27	0.79
R4	2	4.14	D	Parallel	Y	124.00	85.00	7225.00	85.00	13.39	1.85	1.27	2.35
R4	3	5.82	D	Parallel	Y	90.00	85.00	7225.00	85.00	2.08	0.29	1.27	0.36
R4	4	9.75	D	Parallel	Y	42.00	85.00	7225.00	85.00	0.22	0.03	1.27	0.04
R4	5	9.87	D	Parallel	Y	147.00	85.00	7225.00	85.00	7.80	1.08	1.27	1.37
R5	1	2.72	D	Parallel	Y	66.00	85.00	7225.00	85.00	14.19	1.96	1.27	2.49
R5	2	3.33	D	Parallel	Y	65.00	85.00	7225.00	85.00	5.06	0.70	1.27	0.89
R5	3	3.53	D	Parallel	Y	94.00	85.00	7225.00	85.00	16.95	2.35	1.27	2.98
R5	5	6.88	D	Parallel	Y	162.00	85.00	7225.00	85.00	10.89	1.51	1.27	1.91
R5	7	10.43	D	Parallel	Y	140	64	4096.00	64.00	8.11	1.98	1.12	2.21

Notes:

1. Testing undertaken in accordance with ISRM Suggested Methods 1985
2. All samples tested at as-received moisture content unless otherwise stated.
3. A = Axial, D = Diametral, I = Irregular Lump
4. Par = parallel, Per = perpendicular (to planes of weakness)

Comments:

--

Client:	Albion Land Two Limited	APPLIED GEOLOGY Unit 23 Abbey Park, Stareton, Kenilworth, Warwickshire. CV8 2LY Tel. 02476 511822 email: admin@appliedgeology.co.uk www.appliedgeology.co.uk
Project:	Howes Lane, Bicester	
Project No:	AG2873-18	

POINT LOAD INDEX TEST RESULTS

Date Cored/Sampled	21/8/18 - 28/8/18
Date Tested	04/10/2018

Tested By	KH
Approved By	

BH No.	Sample No.	Depth (m bgl)	Test Type ³	Orientation ⁴	Failure Valid (Y/N)	W (mm)	D (mm)	De ² (mm ²)	De (mm)	P (kN)	Is (MPa)	F	Is(50) (MPa)
R6	1	3.32	D	Parallel	Y	67.00	85.00	7225.00	85.00	9.07	1.26	1.27	1.59
R6	2	3.73	D	Parallel	Y	78.00	85.00	7225.00	85.00	6.56	0.91	1.27	1.15
R6	3	4.10	D	Parallel	Y	63.00	85.00	7225.00	85.00	3.49	0.48	1.27	0.61
R6	4	5.34	D	Parallel	Y	173.00	85.00	7225.00	85.00	7.75	1.07	1.27	1.36
R6	5	5.74	D	Parallel	Y	110.00	85.00	7225.00	85.00	8.13	1.13	1.27	1.43
R6	6	5.84	D	Parallel	Y	65.00	85.00	7225.00	85.00	5.12	0.71	1.27	0.90
R1	2	6.00	A	Perpendicular	Y	85.00	60.00	6492.68	80.58	3.14	0.48	1.24	0.60
R1	3	7.65	A	Perpendicular	Y	85.00	42.00	4544.88	67.42	4.43	0.97	1.14	1.12
R1	5	10.35	A	Perpendicular	Y	85.00	61.00	6600.89	81.25	0.24	0.04	1.24	0.05
R2	1	3.08	A	Perpendicular	Y	85.00	74.00	8007.64	89.49	19.36	2.42	1.30	3.14
R2	4	9.69	A	Perpendicular	Y	60.00	38.00	2902.61	53.88	3.37	1.16	1.03	1.20
R2	5	9.89	A	Perpendicular	Y	85.00	56.00	6059.83	77.84	4.18	0.69	1.22	0.84
R2	6	10.46	A	Perpendicular	Y	85.00	78.00	8440.48	91.87	6.46	0.76	1.31	1.01
R2	7	11.27	A	Perpendicular	Y	85.00	50.00	5410.57	73.56	6.46	1.19	1.19	1.42
R3	2	4.56	A	Perpendicular	Y	85.00	69.00	7466.58	86.41	24.09	3.23	1.28	4.13
R3	4	5.23	A	Perpendicular	Y	85.00	61.00	6600.89	81.25	3.53	0.53	1.24	0.67
R3	5	9.61	A	Perpendicular	Y	43.00	43.00	2353.91	48.52	0.77	0.33	0.99	0.32
R4	1	4.00	A	Perpendicular	Y	85.00	57.00	6168.05	78.54	14.08	2.28	1.23	2.80
R4	2	4.14	A	Perpendicular	Y	85.00	104.00	11253.98	106.08	8.20	0.73	1.40	1.02
R4	3	5.82	A	Perpendicular	Y	85.00	43.00	4653.09	68.21	1.75	0.38	1.15	0.43
R4	4	9.75	A	Perpendicular	Y	85	38	4112.03	64.13	0.79	0.19	1.12	0.21

- Notes:
1. Testing undertaken in accordance with ISRM Suggested Methods 1985
 2. All samples tested at as-received moisture content unless otherwise stated.
 3. A = Axial, D = Diametral, I = Irregular Lump
 4. Par = parallel, Per = perpendicular (to planes of weakness)

Comments:

Client:	Albion Land Two Limited	APPLIED GEOLOGY Unit 23 Abbey Park, Stareton, Kenilworth, Warwickshire. CV8 2LY Tel. 02476 511822 email: admin@appliedgeology.co.uk www.appliedgeology.co.uk
Project:	Howes Lane, Bicester	
Project No:	AG2873-18	

POINT LOAD INDEX TEST RESULTS

Date Cored/Sampled	21/8/18 - 28/8/18
Date Tested	04/10/2018

Tested By	KH
Approved By	

BH No.	Sample No.	Depth (m bgl)	Test Type ³	Orientation ⁴	Failure Valid (Y/N)	W (mm)	D (mm)	De ² (mm ²)	De (mm)	P (kN)	Is (MPa)	F	Is(50) (MPa)
R4	5	9.87	A	Perpendicular	Y	85.00	84.00	9089.75	95.34	7.22	0.79	1.34	1.06
R5	1	2.72	A	Perpendicular	Y	85.00	43.00	4653.09	68.21	17.78	3.82	1.15	4.39
R5	2	3.33	A	Perpendicular	Y	85.00	59.00	6384.47	79.90	3.79	0.59	1.23	0.73
R5	3	3.53	A	Perpendicular	Y	85.00	84.00	9089.75	95.34	21.98	2.42	1.34	3.23
R5	5	6.88	A	Perpendicular	Y	85.00	76.00	8224.06	90.69	6.33	0.77	1.31	1.01
R5	7	10.43	A	Perpendicular	Y	64.00	58.00	4725.65	68.74	3.60	0.76	1.15	0.88
R6	1	3.32	A	Perpendicular	Y	65.00	63.00	5213.24	72.20	17.25	3.31	1.18	3.90
R6	2	3.73	A	Perpendicular	Y	85.00	68.00	7358.37	85.78	7.20	0.98	1.27	1.25
R6	3	4.10	A	Perpendicular	Y	85.00	38.00	4112.03	64.13	4.20	1.02	1.12	1.14
R6	4	5.34	A	Perpendicular	Y	85.00	77.00	8332.27	91.28	7.38	0.89	1.31	1.16
R6	5	5.74	A	Perpendicular	Y	85.00	60.00	6492.68	80.58	9.89	1.52	1.24	1.89
R6	6	5.84	A	Perpendicular	Y	85.00	42.00	4544.88	67.42	5.23	1.15	1.14	1.32

- Notes:
1. Testing undertaken in accordance with ISRM Suggested Methods 1985
 2. All samples tested at as-received moisture content unless otherwise stated.
 3. A = Axial, D = Diametral, I = Irregular Lump
 4. Par = parallel, Per = perpendicular (to planes of weakness)

Comments:

Client:	Albion Land Two Limited	APPLIED GEOLOGY Unit 23 Abbey Park, Stareton, Kenilworth, Warwickshire. CV8 2LY Tel. 02476 511822 email: admin@appliedgeology.co.uk www.appliedgeology.co.uk
Project:	Howes Lane, Bicester	
Project No:	AG2873-18	

APPENDIX F

APPENDIX F

STANDARD FIELDWORK AND ASSESSMENT PROCEDURES

Scope of Work

The scope of work undertaken is defined in Section 1 of the Report. It should be noted that Applied Geology Limited does not provide arboricultural surveys, specialist surveys for the detection of invasive plant species (such as Japanese Knotweed) or protected species of wildlife. Information from environmental and ecological datasets is included from a review of the MAGIC (Multi-Agency Geographic Information for the Countryside) website, however, if a full assessment of Environmental or Ecological aspects is required, it is recommended that other specialists are consulted. Similarly, information on flood risk is included; obtained from the Environment Agency Web site and the GroundSure report; but this is not intended to be a full hydrological study and, if a flood risk assessment is needed, additional analysis by others is recommended to confirm this aspect of the development. Also, whilst our field staff have undergone asbestos awareness training, Applied Geology does not undertake asbestos surveys or provide specific advice relating to asbestos-containing materials. Any suspected asbestos-containing materials observed by our field staff will be mentioned in the report but further assessment by others may be required.

Fieldwork

Fieldwork is generally carried out in accordance with BS5930 (2015) "Code of Practice for Site Investigations" and BS10175 (2011) Investigation of Potentially Contaminated Sites, unless otherwise stated.

Prior to commencement on site, statutory services plans are generally obtained and verbal enquiries are also made regarding the positions of private or statutory services on site. Prior to excavation or drilling, locations are scanned with a cable avoidance tool (CAT) and service pits are generally excavated at borehole positions, where possible.

Descriptions and depths of the various strata recovered are presented on the exploratory hole records, reproduced in the report appendices, together with sample depths, the results of in-situ testing, comments on groundwater inflows, and any other pertinent information. The strata descriptions are in general accordance with BS5930:2015. Disturbed plastic pot and glass amber jar samples are recovered from the various strata and stored and transported in cool boxes, where relevant, for possible future laboratory testing.

Light cable percussion boreholes are generally drilled using a Pilcon Wayfarer or Dando rig and are advanced using equipment to bore 200/150mm diameter boreholes. Disturbed plastic pot samples are recovered from all deposits encountered to allow examination and laboratory testing. Certain strata are cased off due to their tendency to collapse, particularly in the presence of groundwater inflows and/or to reduce the risk of cross contamination. In situ Standard Penetration Tests, using Split Spoon (SPT) and Cone (CPT) are undertaken in the boreholes to provide a measure of the relative density of the granular (coarse grained) deposits or shear strength of the clay/chalk/ weathered rock deposits using industry recognised correlation guidelines of shear strength against SPT "N" value results. Within the fine grained (cohesive) deposits, "undisturbed" 100mm driven open tube samples were recovered from the various deposits to provide samples for examination and laboratory testing. On encountering groundwater, boring is usually suspended for 20 minutes while any rise in water level is recorded. Full details of the groundwater observations and monitoring results during boring operations are included on the borehole records. All boreholes without monitoring wells installed are usually backfilled with arisings upon completion, unless otherwise stated on the individual logs.

Unless otherwise stated on the relevant logs, trial pits are excavated using a wheeled backhoe excavator, usually with a 0.6m wide bucket. The excavations are logged from the ground surface by an Engineering Geologist / Geo-environmental Engineer and relevant field testing, appropriate to the soils encountered, is carried out on samples brought to the surface. Representative disturbed soil

samples are collected from selected horizons for subsequent laboratory testing. The trial pits are usually unshored and where reasonable, left open for a period of time to allow observations of pit stability and depth and inflow rate of any groundwater ingress. The excavations are backfilled with arisings prior to moving on to the next position. Any trial pits carried out as part of this or previous investigations may represent soft spots and conduits/sumps for groundwater or surface water. In excavations, such materials may also be loose and unstable.

Driven Continuous Sampling (DCS) boreholes are drilled using a track mounted Global mini-rig or similar using sampling tubes of varying diameter (decreasing with depth). Samples of the deposits encountered are recovered in 1m long clear plastic liners, which are logged and sub-sampled on site by an Engineering Geologist. Generally for geotechnical investigations, during the drilling process in-situ Standard Penetration Tests (SPTs) are undertaken at selected depths to provide a measure of the relative density of the granular (coarse grained) deposits or shear strength of the clay/chalk/ weathered rock deposits using industry recognised correlation guidelines of shear strength against SPT "N" value results. Groundwater seepages are noted during drilling if encountered. All boreholes without monitoring wells installed are usually backfilled with arisings upon completion.

Unless specifically stated in the report, exploratory hole locations should be regarded as approximate. Consideration should be given to accurate location of the exploratory holes where it is considered they may impact on proposed development.

It should be noted that groundwater levels at any particular site may fluctuate due to rainfall, seasonal variations etc and, therefore, levels may be different to those measured during the course of the fieldwork and monitoring period.

Laboratory Testing

The geotechnical testing was carried out in accordance with BS 1377:1990 Method of Tests for Soils for Civil Engineering Purposes and was undertaken by a UKAS accredited specialist laboratory. Chemical testing was undertaken by a UKAS accredited specialist chemical testing laboratory and MCERTS accredited methods, in accordance with Environment Agency recommendations, were specified where available.

Contamination Assessment – Human Health

Applied Geology Limited has followed the guidance given in the CLR 11 publication and other available guidance to assess the contaminant concentrations. Details of the methodology followed are briefly outlined below.

The available chemical data is sorted into appropriate datasets depending on sampling regime and ground conditions. An initial generic quantitative risk assessment is undertaken on this data using statistical tests, where appropriate, and relevant screening values. Risk to human health has been initially assessed by comparing soil results against various published screening criteria. These have been sourced from the following, in order of preference:

- DEFRA. Category 4 Screening Levels (C4SL), March 2014;
- LQM/CIEH S4UL for Human Health Risk Assessment (S4UL), 2015*;
- Environment Agency/DEFRA, Soil Guideline Values (SGV) published in 2009;
- EIC/AGS/CL:AIRE Soil Generic Assessment Criteria (GAC), 2010.

*- © Land Quality Management Limited reproduced with permission; Publication Number S4UL3159. All rights reserved

Except for lead and benzo(a)pyrene, the assessments will be carried out by comparing results against the LQM/CIEH S4UL in the first instance, where these values are exceeded, then reference will be made to the C4SLs where such exist. Lead will only be compared to the C4SL because no S4UL exists for lead. For Benzo(a)pyrene, Applied Geology has chosen to adopt the approach presented by the C4SL committee rather than the approach proposed by LQM/CIEH. Further discussion on this is presented below.

It is our view, and the view of others in the industry, that the C4SL were derived for use in both the Part IIA system and through the planning system, as they allow identification of those sites that fall within Category 4 (not contaminated) and are therefore able to be developed with no further remedial action. The C4SLs are considered to represent a contamination level that is 'low' from a toxicological view point, which we therefore consider to be 'acceptable' under planning.

Historically, the level of contamination has been assessed with reference to SGV values which were derived to represent a 'minimal' level of contamination. The SGVs are still valid and can be used alongside C4SL, however both screening values are only intended to provide guidance as to the level of contamination and, where concentrations fall below these screening values, the site is not contaminated (and is within Category 4). Exceedance of a SGV/S4UL/C4SL does not automatically indicate that an 'unacceptable' risk exists at a site; simply that further consideration of that particular contaminant is required.

At this time, there are two toxicological methodologies that can be used in the derivation of screening criteria for PAHs; Relative Potency Factor (RPFs) or the Surrogate Marker approach. Applied Geology has chosen (based on the latest guidance from the Health Protection Agency (HPA) to use the surrogate marker approach proposed in the C4SL methodology, whereby benzo(a)pyrene can be used as a surrogate marker for all 'genotoxic' (gene damaging) PAHs. The surrogate marker approach estimates the toxicity of a mixture of PAHs in an environmental matrix by using data from toxicity studies in which a PAH mixture of known composition was tested. Exposure to the surrogate marker benzo(a)pyrene is assumed to represent exposure to all the PAHs in the environmental matrix. Thus, the level of toxicity ascribed to the surrogate represents the toxicity of the PAH mixture. This allows an assessment of the combined carcinogenic risk associated with genotoxic PAHs using only benzo(a)pyrene. In order to confirm that the mixture of genotoxic PAH in the soil is similar to the coal tar mixture used in the toxicological study, various PAH ratios are plotted and checked to see that they fall within the limits set in HPA, 2010.

Contamination Assessment – Water Quality

Risks to water quality has been assessed by following the Environment Agency guidance on groundwater protection (previously known as GP3), updated on their website in March 2017, see <https://www.gov.uk/government/policies/water-quality> and 'The Environment Agency's approach to groundwater protection' (March 2017 Version 1.0).

For hazardous substances, which should be prevented from entering groundwater, the screening criteria are initially set as the limit of detection, however, if groundwater has already been impacted, an appropriate environmental standard will then be used. For hazardous substances, background quality may also be taken into account.

For non-hazardous compounds, their release should not result in any pollution or significant risk of pollution in the future, as such comparison with UK DWS or EQS standards will allow determination of whether pollution could occur. Typically screening criteria will be sourced from the following:

- Environmental Standards (ES), which are defined in European legislation such as the Water Framework Directive (WFD) (2000/60/EC) and the Priority Substances Directive (PSD) (2008/105/EC) a daughter directive of the WFD.
- The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Direction, 2010.
- UK Water Supply (Water Quality) Regulations, 2010.
- UK quality standards for water to be used for direct abstraction to potable supply e.g. Surface Water (Abstraction for Drinking Water) (Classification) Regulations, 1996.
- World Health Organisation (WHO) Guidelines for Drinking Water Quality.

Re-use of Soils and Waste Soil Disposal

It is noted that if any excavated material is to be reused on site, a Waste Management Plan (WMP) and / or a Materials Management Plan (MMP) will probably be required. Any such materials must be suitable for re-use without further treatment, and only the quantity necessary for the specified works should be used. Any materials not within these definitions may need to be considered as waste whereby a Waste Management Licence Exemption may also be required.

A specific categorisation and assessment of potential waste soils arising from the proposed development has not been undertaken as part of the investigation, unless otherwise detailed in the report text. However, generic comments and advice are made below for the reader.

All waste soils should be sorted to prevent mixtures of waste types. Where possible, any waste soil should be recycled and the volume of soil to be disposed of should be minimised. Any excavated soil material and excess spoil disposed of off-site should be treated as Waste and classified as Inert, Non-hazardous or Hazardous, prior to removal from site, as required by the "Duty of Care" (Environmental Protection Act, 1990) legislation together with Annex II of Directive 1999/31/EC ("Landfill Directive"). Initially, Basic Characterisation of the waste is required whereby the material should be described and its source of origin recorded (a site plan, exploratory hole records and the certificates of chemical analysis in this report should be included). This should also include data on its composition and leaching behaviour, its European Waste Catalogue (EWC) code, and where relevant any hazardous properties according to Annex III of Directive 91/689/EEC. This information should be provided to the licensed waste contractor.

Soils excavated on many sites would generally fall under the EWC description "Soil and Stones", EWC code 17 05 04. Waste Acceptance Criteria (WAC) testing is required for many Inert wastes and generally for all Hazardous Waste but not for non-hazardous waste. There are certain restrictions for inert wastes regarding topsoil and peat. Any asbestos must be disposed of by suitably licensed contractors to a suitably licensed facility.

Health & Safety Aspects

As outlined within the HSE publication 'Successful Health and Safety Management - HSG65', this report should inform your development of safe systems of work and information as an input into the safety management system.

When developing risk control systems we suggest making reference to the CIRIA report 132 "A guide for safe working on contaminated sites" and the HSE document "Protection of workers and the general public during the development of contaminated land – HSG66". All risk control measures should be in accordance with the guidelines laid down within the Management of Health and Safety at Work Regulations 1999.

The contents of this report may be used to supplement the contents of the Health and Safety File as required under the Construction Design and Management (CDM) Regulations.

Where excavations are undertaken on site, trench support or the angle of batter should be designed by an appropriately qualified engineer or competent person to suit the required depth and the ground and groundwater conditions. Care should be taken when digging excavations to prevent undermining or causing loss of support to the foundations of the nearby adjoining structures. Surcharging such as from spoil or vehicle movements close to excavation sides should be avoided. Practical guidance on trench excavation is given in CIRIA Report 97 Trenching Practice. Guidance on groundwater control is given in CIRIA Report 113 Control of groundwater for temporary works. Temporary works should be designed by a suitably qualified engineer or a competent person particularly where personnel access is necessary, in accordance with the requirements of the Construction (Design and Management) (CDM) Regulations.