

PARTICLE SIZE DISTRIBUTION TEST

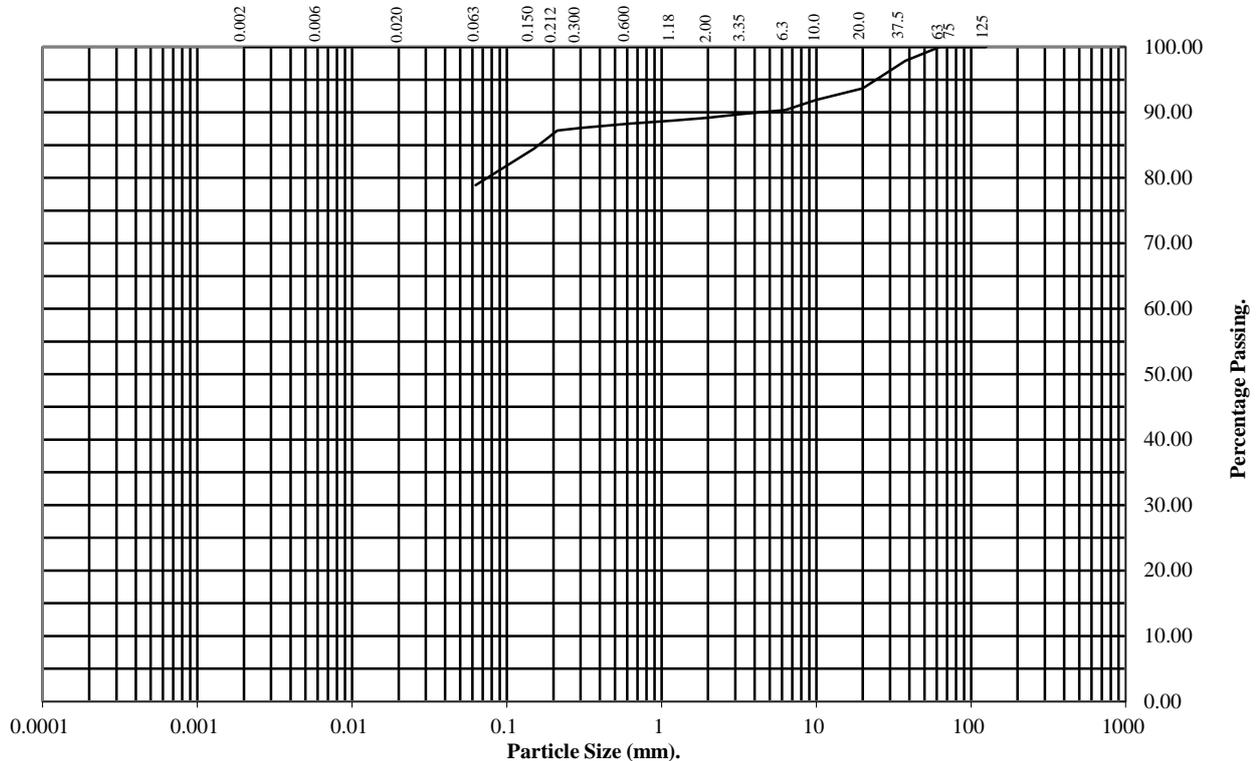
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1414 **Top Depth (m):** 2.20

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	98
20	94
10	92
6.3	90
3.35	90
2	89
1.18	89
0.6	88
0.3	88
0.212	87
0.15	84
0.063	79

Soil Fraction	Total Percentage
Cobbles	0
Gravel	11
Sand	10
Silt/Clay	79

Remarks:
See Summary of Soil Descriptions



Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

PARTICLE SIZE DISTRIBUTION TEST

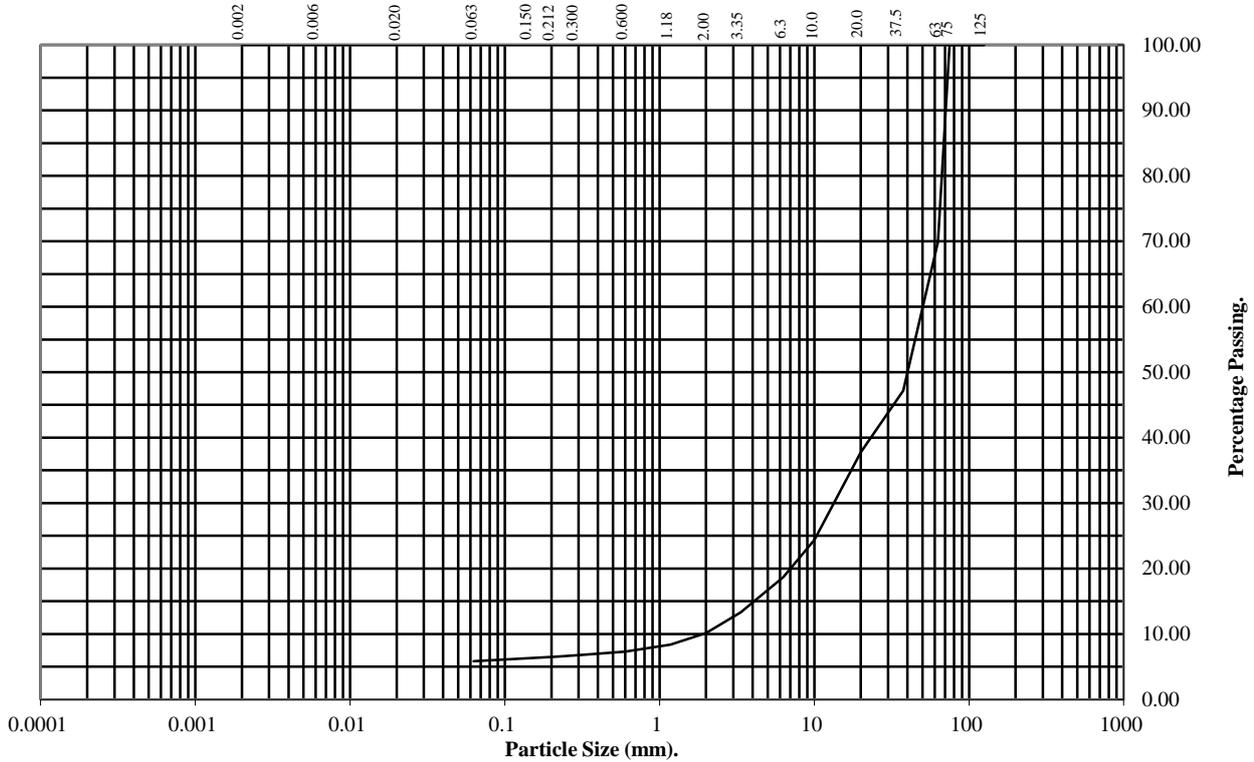
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TT2107A** Top Depth (m): **0.50**

Sample Number: Base Depth(m):

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	70
37.5	47
20	38
10	24
6.3	19
3.35	13
2	10
1.18	8
0.6	7
0.3	7
0.212	7
0.15	6
0.063	6

Soil Fraction	Total Percentage
Cobbles	30
Gravel	60
Sand	4
Silt/Clay	6

Remarks:
See Summary of Soil Descriptions



Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

PARTICLE SIZE DISTRIBUTION TEST

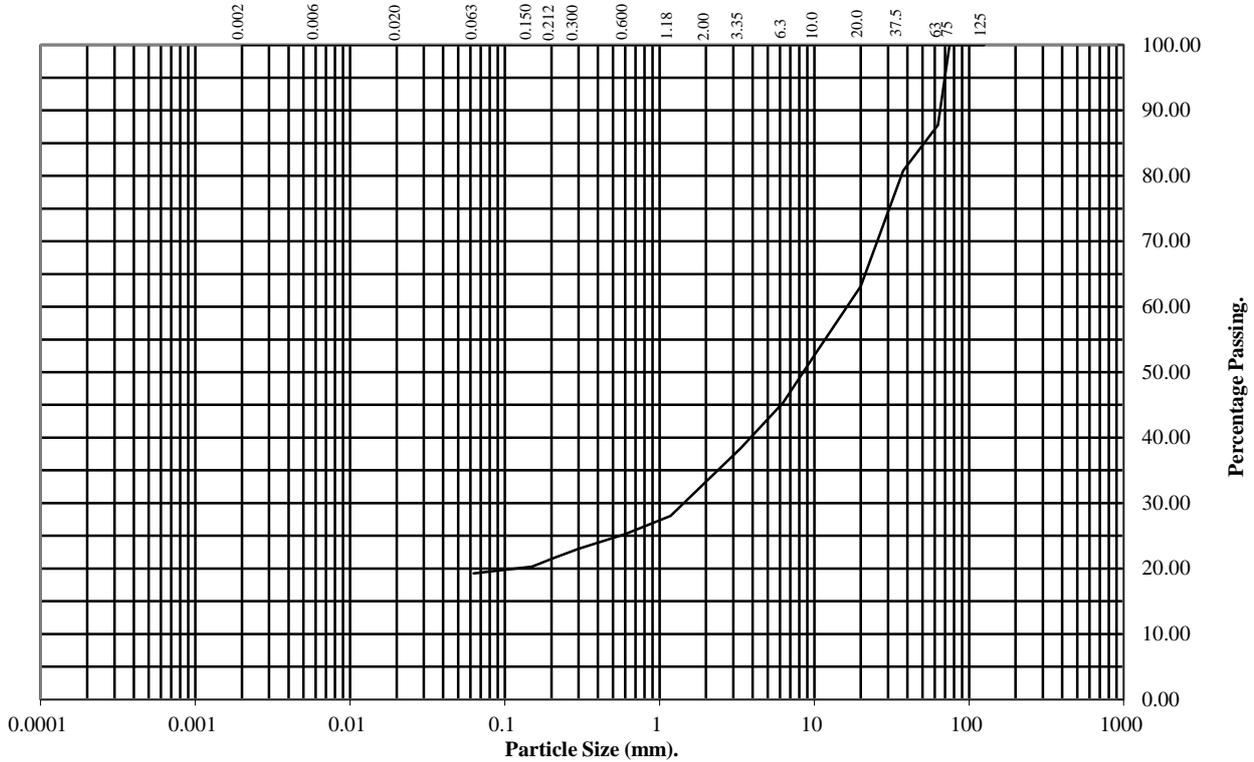
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TT2103A** Top Depth (m): **1.00**

Sample Number: Base Depth(m):

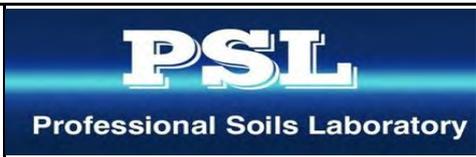
Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	88
37.5	81
20	63
10	53
6.3	45
3.35	38
2	33
1.18	28
0.6	25
0.3	23
0.212	22
0.15	20
0.063	19

Soil Fraction	Total Percentage
Cobbles	12
Gravel	55
Sand	14
Silt/Clay	19

Remarks:
See Summary of Soil Descriptions



Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

PARTICLE SIZE DISTRIBUTION TEST

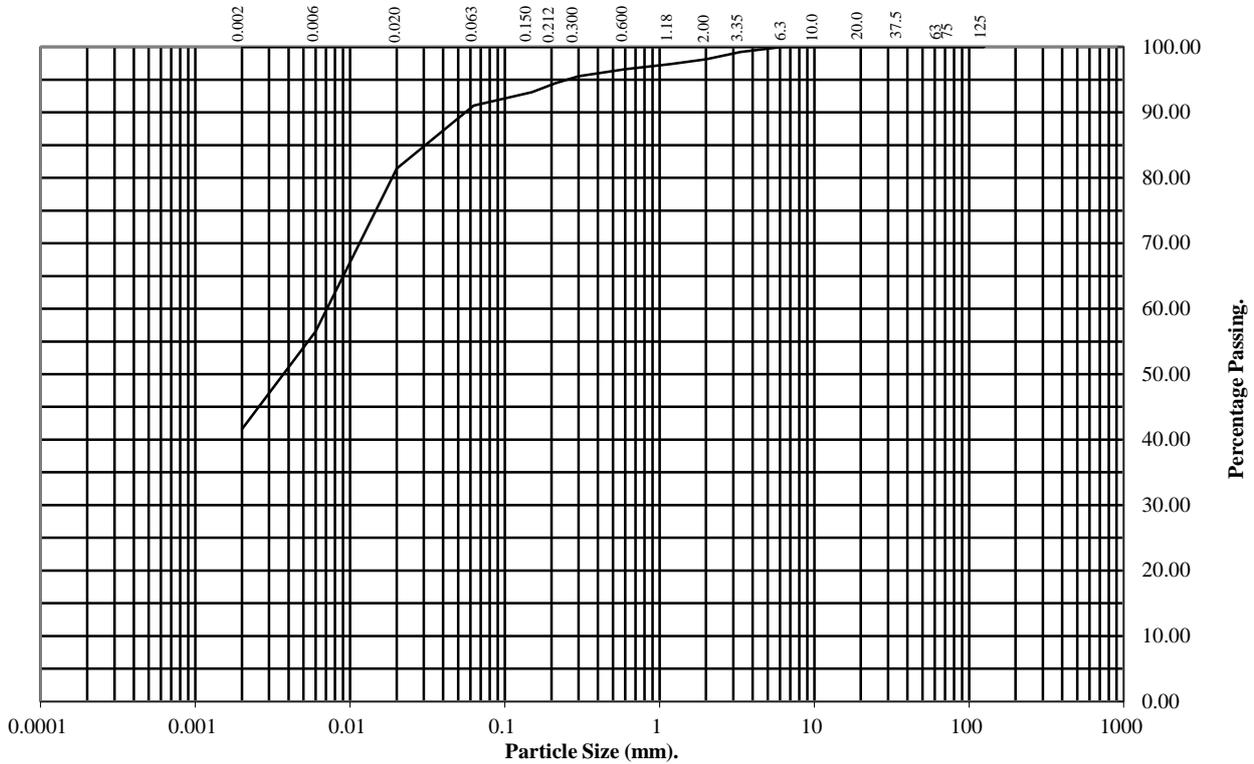
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TT2104** **Top Depth (m):** **1.10**

Sample Number: **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	98
1.18	97
0.6	97
0.3	96
0.212	94
0.15	93
0.063	91

Particle Diameter	Percentage Passing
0.02	81
0.006	57
0.002	42

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	7
Silt	49
Clay	42

Remarks:
See Summary of Soil Descriptions



Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

PARTICLE SIZE DISTRIBUTION TEST

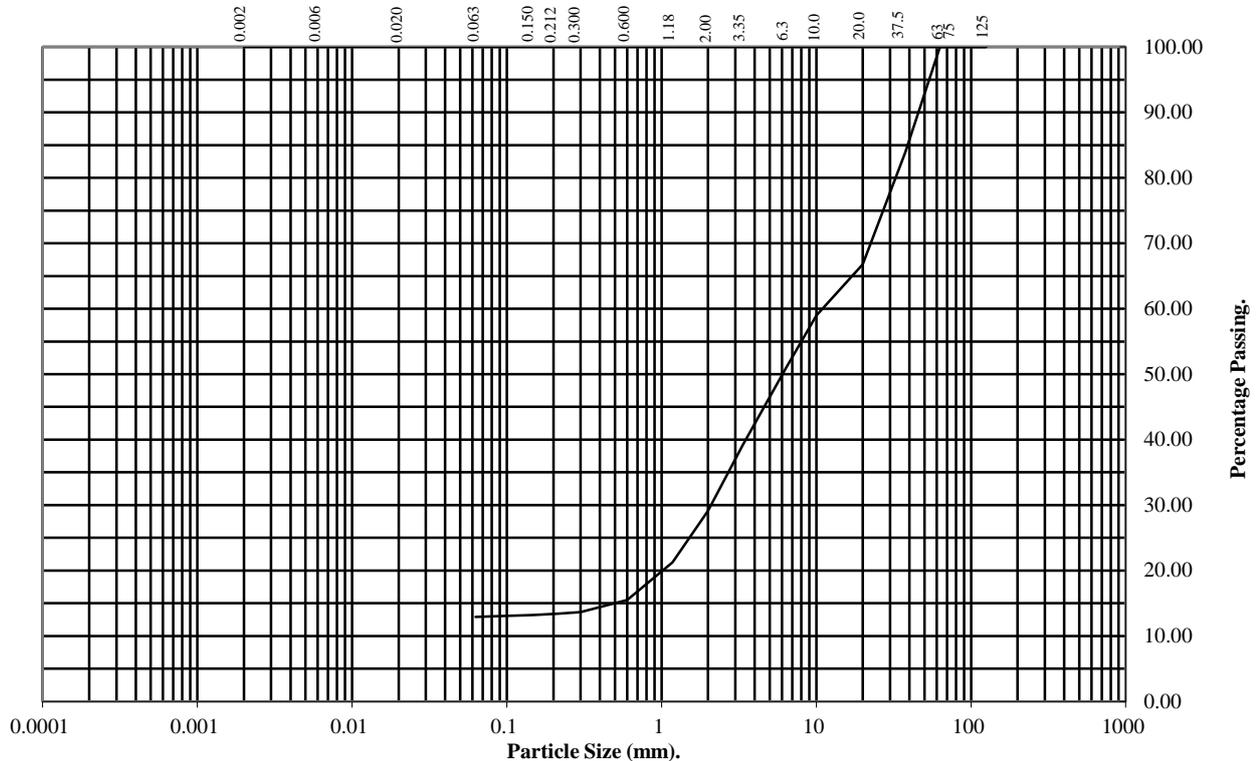
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TT2105B **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	84
20	67
10	59
6.3	51
3.35	39
2	29
1.18	21
0.6	15
0.3	14
0.212	13
0.15	13
0.063	13

Soil Fraction	Total Percentage
Cobbles	0
Gravel	71
Sand	16
Silt/Clay	13

Remarks:
See Summary of Soil Descriptions



Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

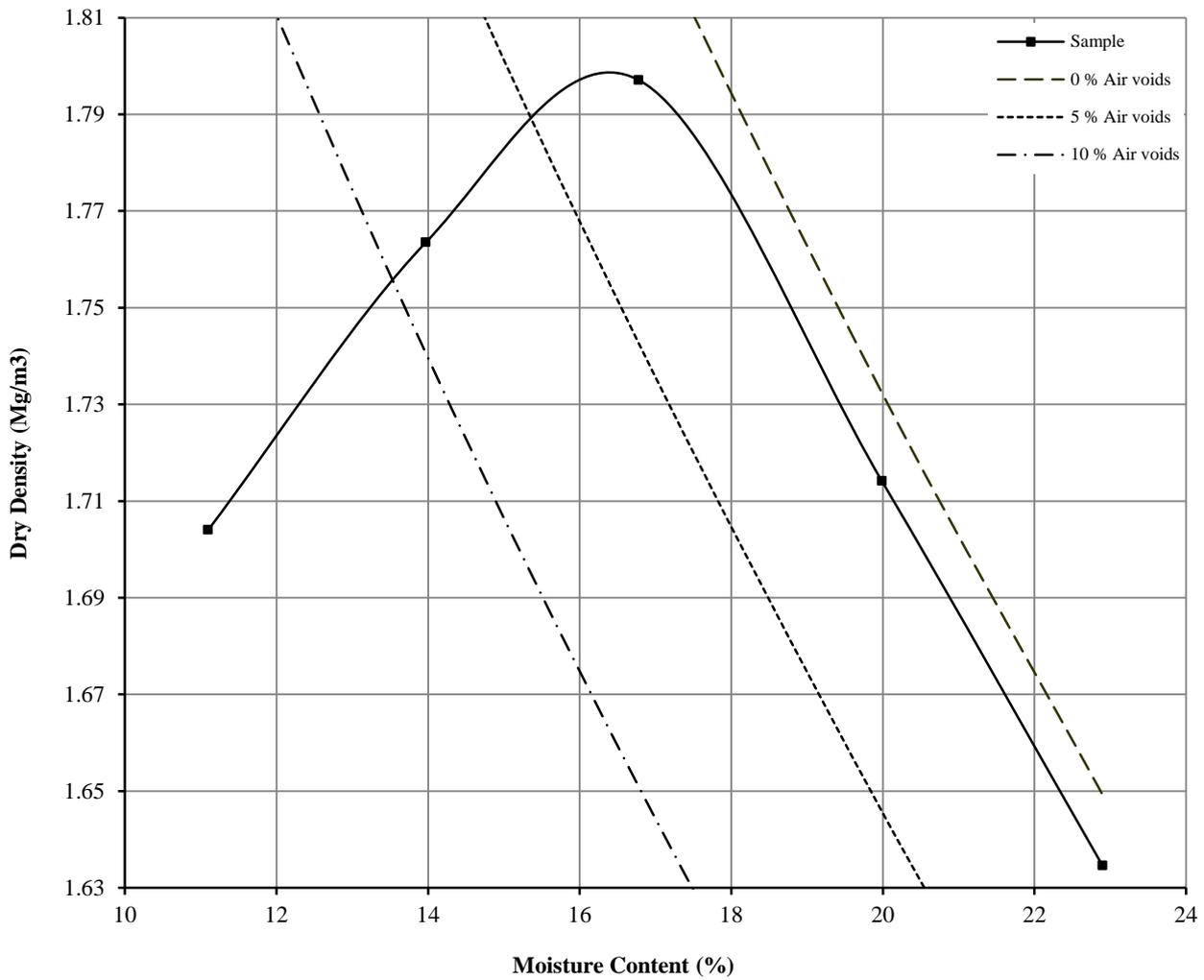
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.4 : 1990

Hole Number: TP1414 Top Depth (m) : 2.20

Sample Number: Base Depth (m) :

Sample Type: B



Initial Moisture Content:	14	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m ³):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):	2
Maximum Dry Density (Mg/m ³):	1.80		Material Retained on 20.0 mm Test Sieve (%):	4
Optimum Moisture Content (%):	17			
Remarks See summary of soil descriptions.				



Parkside, Hoyland Common

Contract
PSL20/5161
Client Ref
AG3080D-20

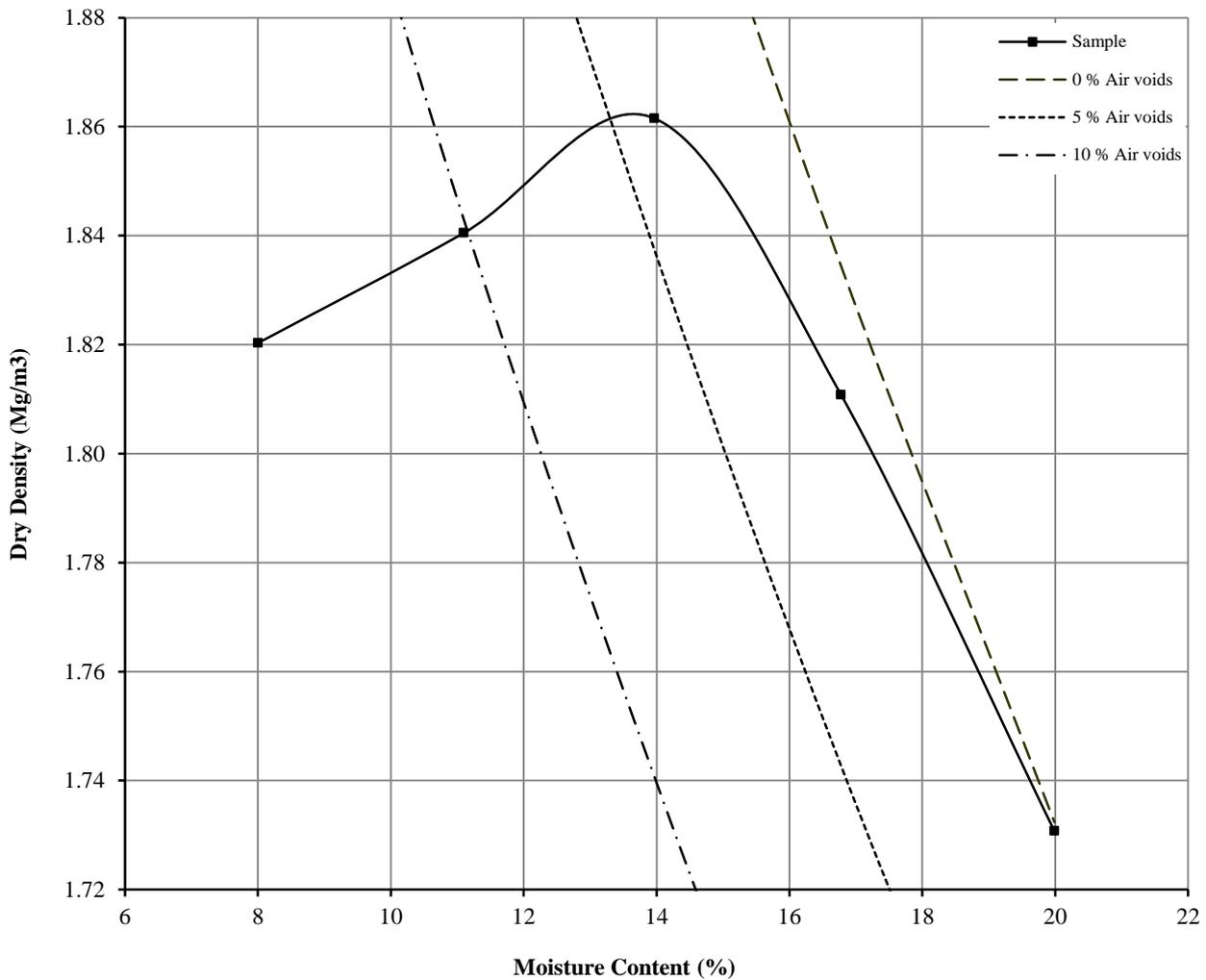
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: TP1414 Top Depth (m) : 2.20

Sample Number: Base Depth (m) :

Sample Type: B



Initial Moisture Content:	14	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):	2
Maximum Dry Density (Mg/m ³):	1.86		Material Retained on 20.0 mm Test Sieve (%):	4
Optimum Moisture Content (%):	14			
Remarks				
See summary of soil descriptions.				



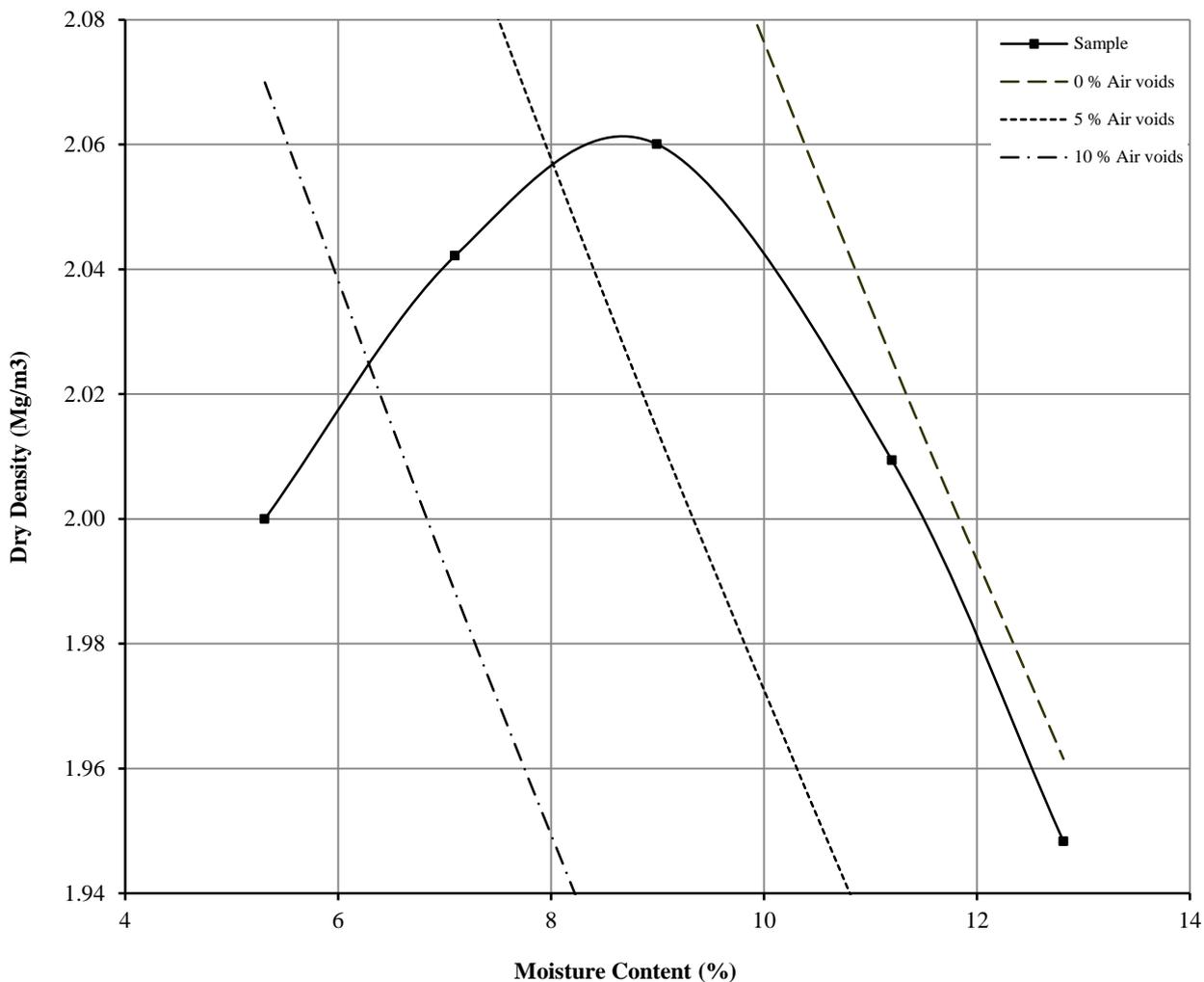
Parkside, Hoyland Common

Contract
PSL20/5161
Client Ref
AG3080D-20

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: **TT2107A** Top Depth (m) : **0.50**
 Sample Number: Base Depth (m) :
 Sample Type: **B**



Initial Moisture Content:	9.0	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.62	Measured	Material Retained on 37.5 mm Test Sieve (%):	53
Maximum Dry Density (Mg/m ³):	2.06		Material Retained on 20.0 mm Test Sieve (%):	9
Optimum Moisture Content (%):	9			
Remarks See summary of soil descriptions.				



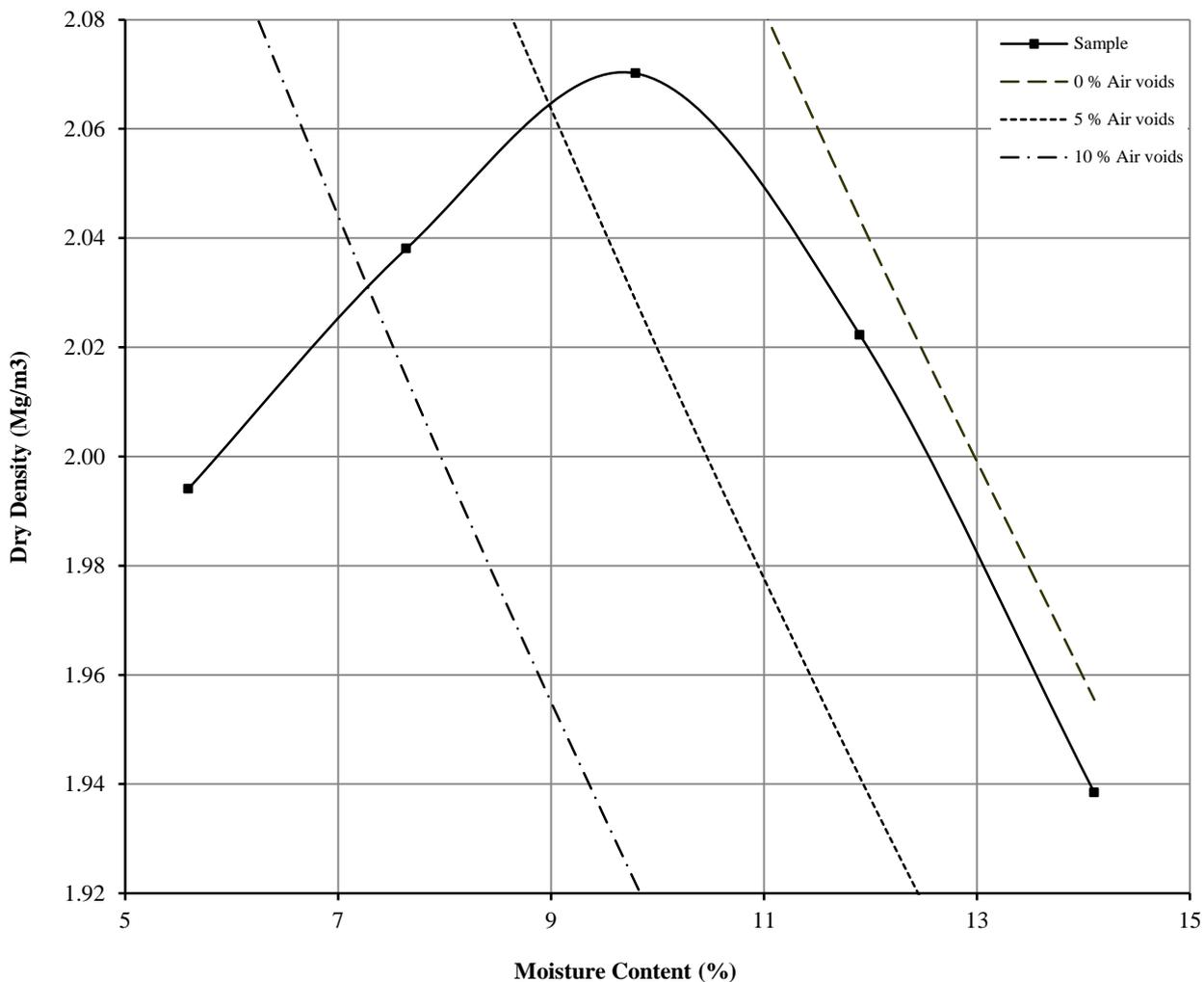
Parkside, Hoyland Common

Contract
PSL20/5161
 Client Ref
AG3080D-20

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: **TT2107B** Top Depth (m) : **1.00**
 Sample Number: Base Depth (m) :
 Sample Type: **B**



Initial Moisture Content:	12	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.70	Measured	Material Retained on 37.5 mm Test Sieve (%):	3
Maximum Dry Density (Mg/m ³):	2.07		Material Retained on 20.0 mm Test Sieve (%):	12
Optimum Moisture Content (%):	10			
Remarks See summary of soil descriptions.				



Parkside, Hoyland Common

Contract
PSL20/5161
 Client Ref
AG3080D-20

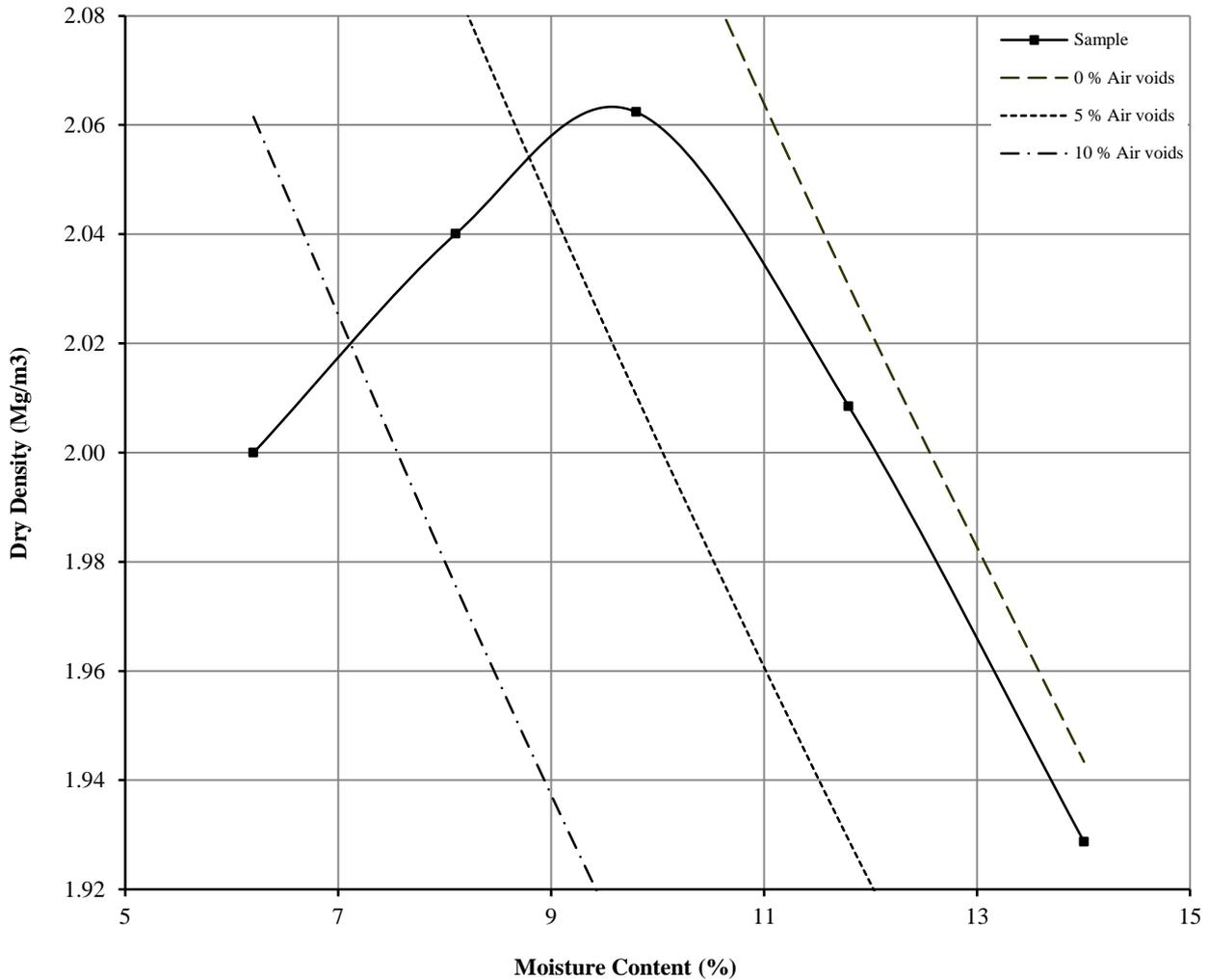
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: **TT2103A** Top Depth (m) : **1.00**

Sample Number: Base Depth (m) :

Sample Type: **B**



Initial Moisture Content:	12	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.67	Measured	Material Retained on 37.5 mm Test Sieve (%):	19
Maximum Dry Density (Mg/m ³):	2.06		Material Retained on 20.0 mm Test Sieve (%):	18
Optimum Moisture Content (%):	10			
Remarks See summary of soil descriptions.				



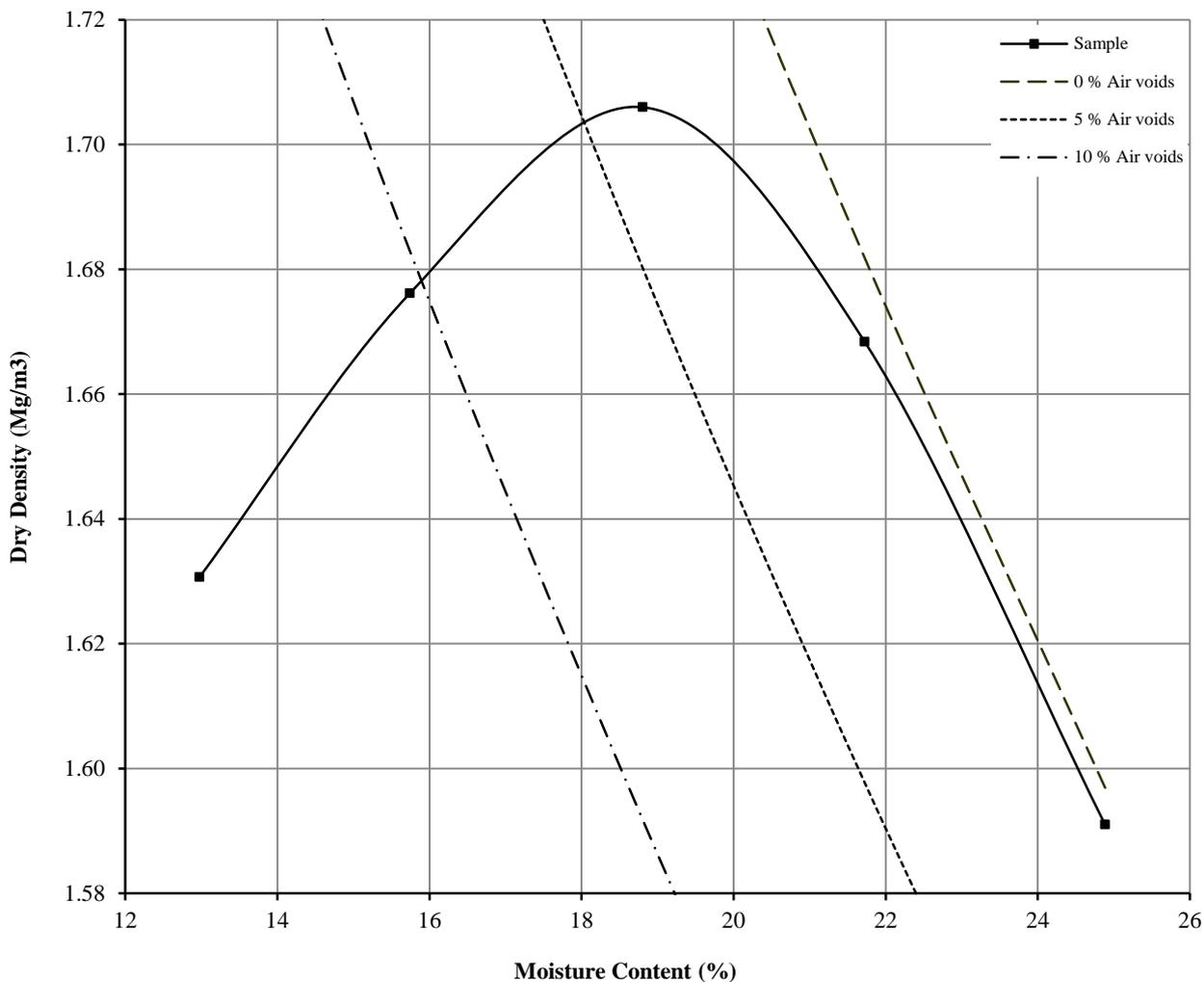
Parkside, Hoyland Common

Contract
PSL20/5161
Client Ref
AG3080D-20

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

Hole Number: **TT2104** Top Depth (m) : **1.10**
 Sample Number: Base Depth (m) :
 Sample Type: **B**



Initial Moisture Content:	22	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m ³):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m ³):	1.71	Material Retained on 20.0 mm Test Sieve (%):	0	
Optimum Moisture Content (%):	19			
Remarks				
See summary of soil descriptions.				



Parkside, Hoyland Common

Contract
PSL20/5161
 Client Ref
AG3080D-20

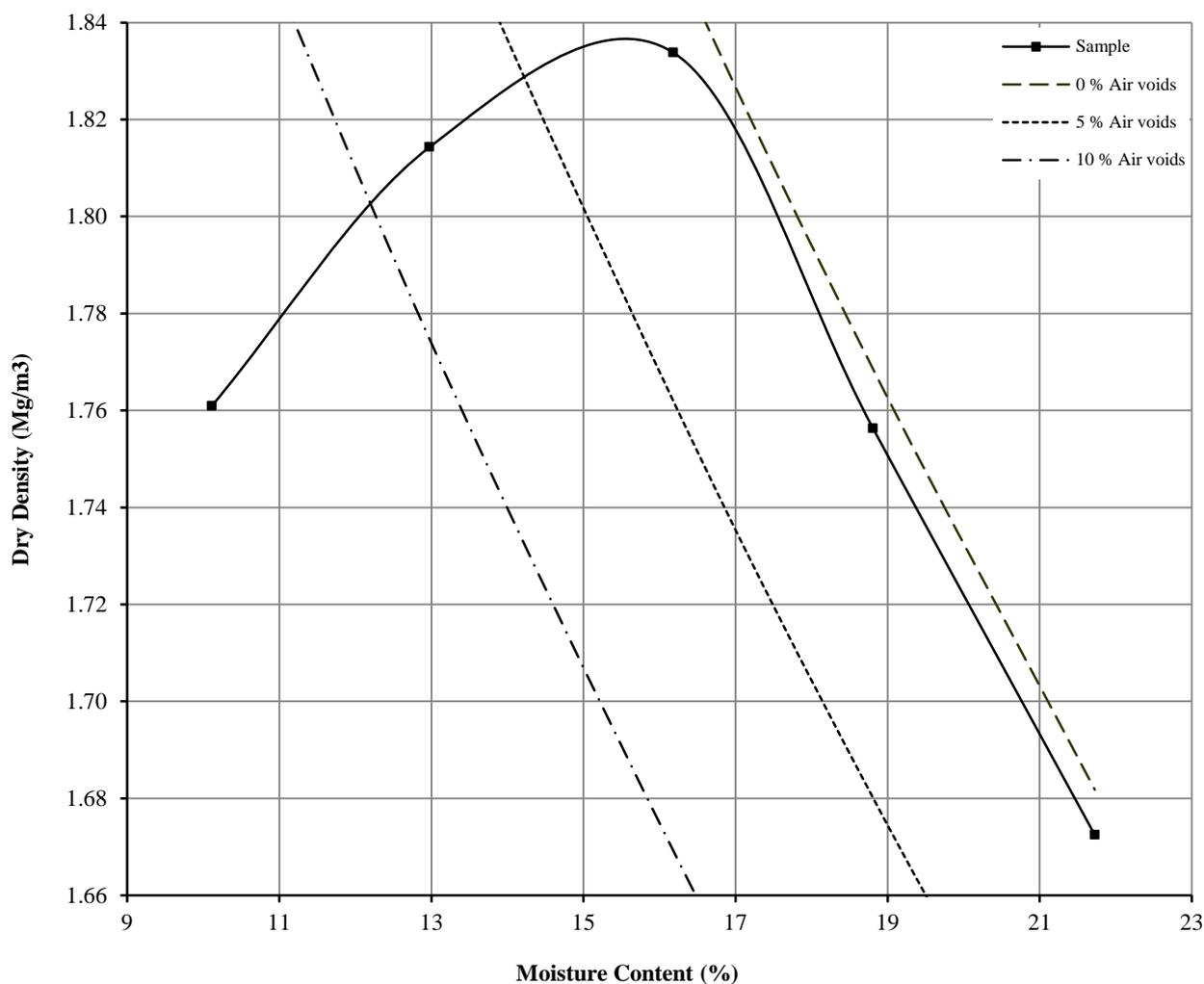
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.5 : 1990

Hole Number: **TT2104** Top Depth (m) : **1.10**

Sample Number: Base Depth (m) :

Sample Type: **B**



Initial Moisture Content:	22	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m ³):	1.83		Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	16			
Remarks See summary of soil descriptions.				



Parkside, Hoyland Common

Contract
PSL20/5161
Client Ref
AG3080D-20

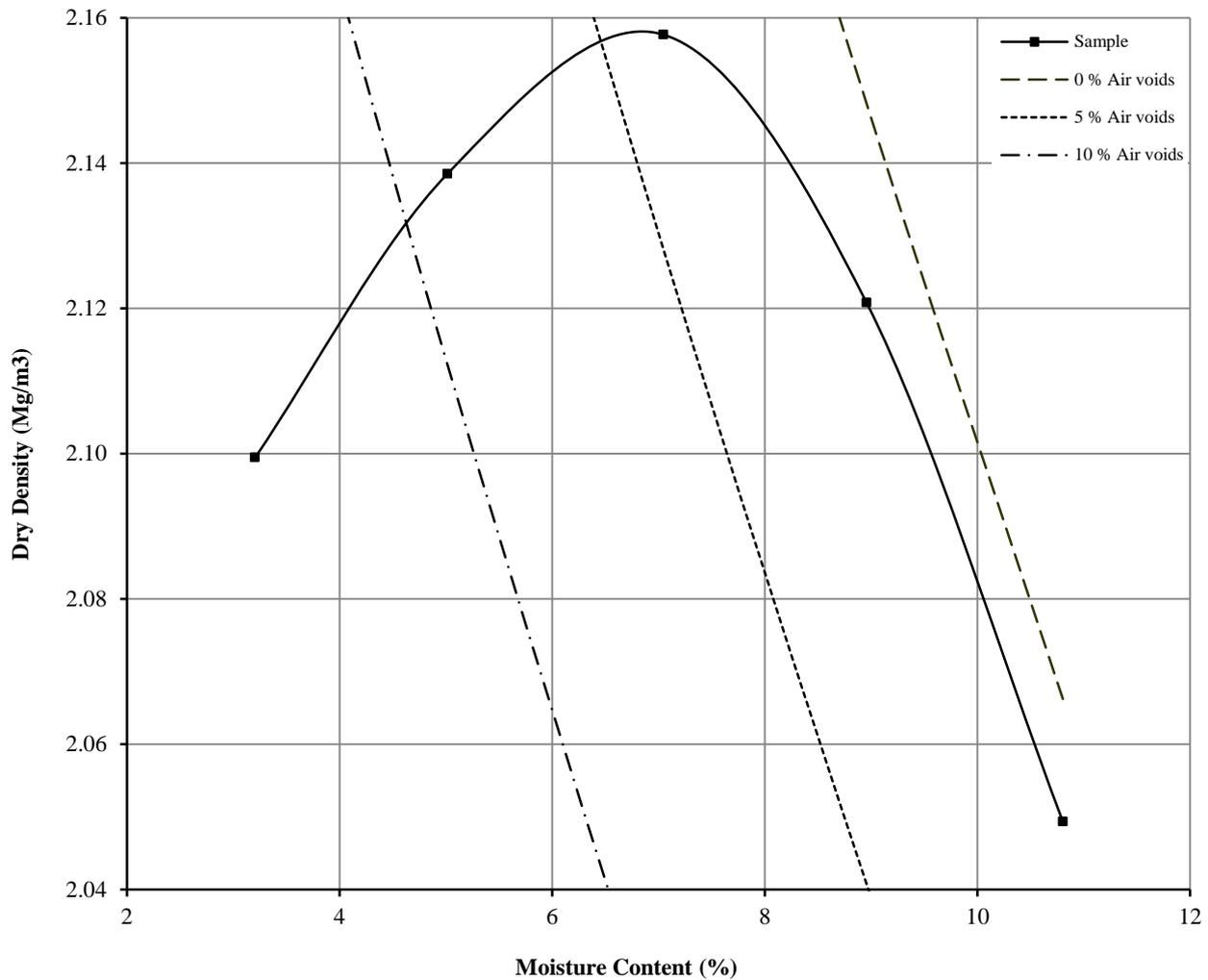
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: **TT2105B** Top Depth (m) : **1.00**

Sample Number: Base Depth (m) :

Sample Type: **B**



Initial Moisture Content:	9.0	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.66	Measured	Material Retained on 37.5 mm Test Sieve (%):	16
Maximum Dry Density (Mg/m ³):	2.16		Material Retained on 20.0 mm Test Sieve (%):	17
Optimum Moisture Content (%):	7			
Remarks See summary of soil descriptions.				



Parkside, Hoyland Common

Contract
PSL20/5161
Client Ref
AG3080D-20

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

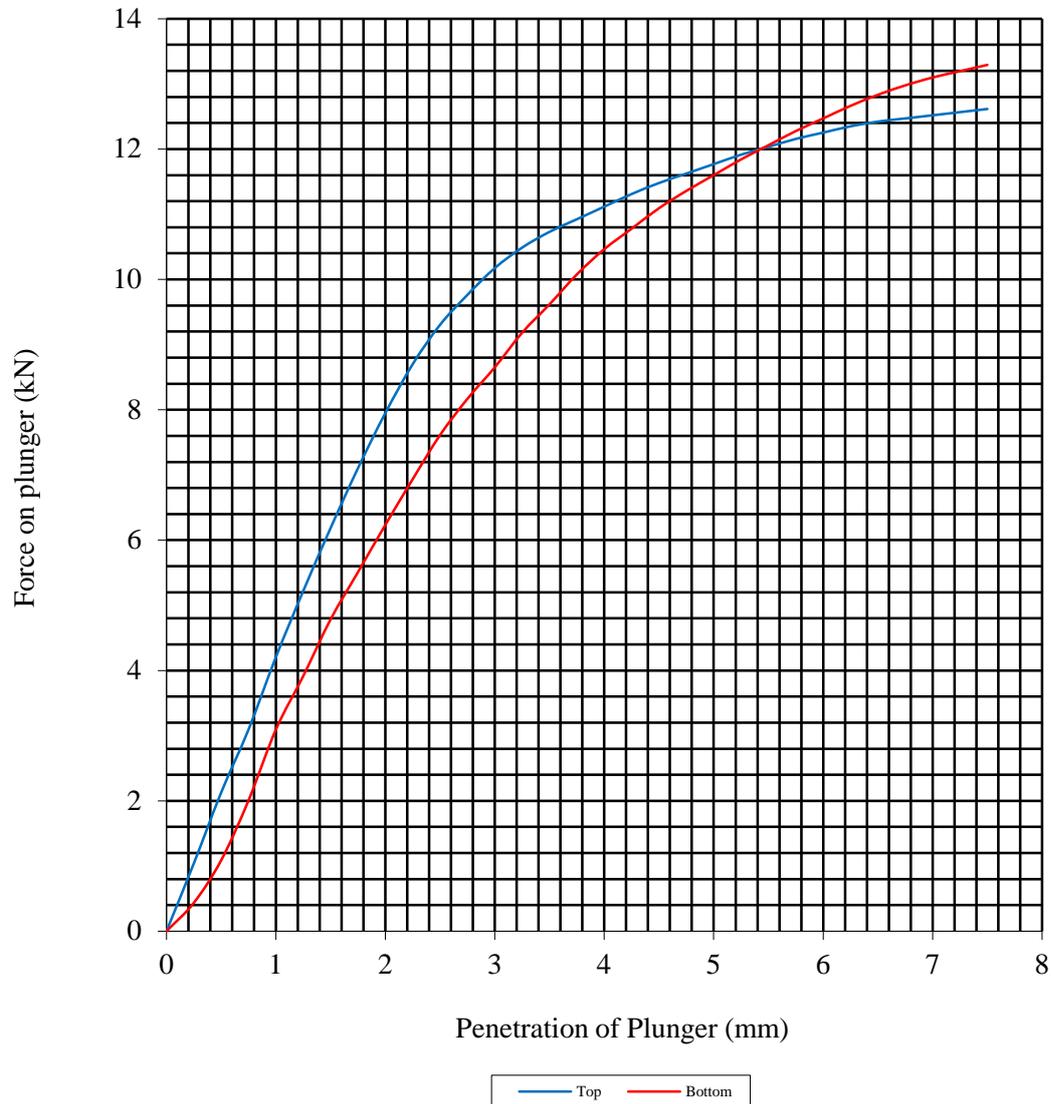
Hole Number: TT2107B

Top Depth (m): 1.00

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	10	Surcharge Kg:	4.20	Sample Top	9.6	Sample Top	70.5
Bulk Density Mg/m ³ :	2.29	Soaking Time hrs	0	Sample Bottom	10	Sample Bottom	58.0
Dry Density Mg/m ³ :	2.07	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:		15					
Compaction Conditions		4.5kg					



PSL
Professional Soils Laboratory

Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

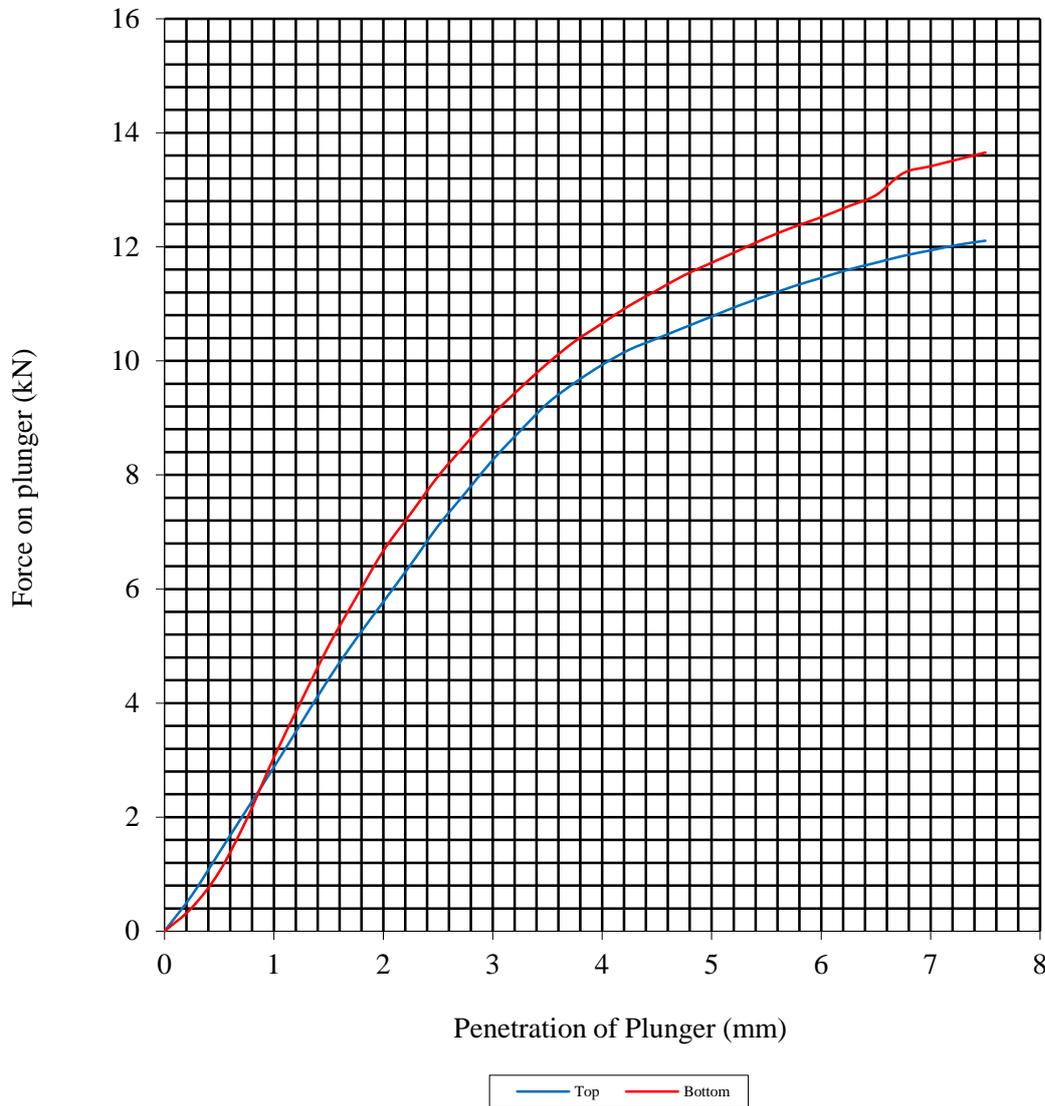
Hole Number: TT2103A

Top Depth (m): 1.00

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	10	Surcharge Kg:	4.20	Sample Top	9.7	Sample Top	53.9
Bulk Density Mg/m ³ :	2.26	Soaking Time hrs	0	Sample Bottom	10	Sample Bottom	60.4
Dry Density Mg/m ³ :	2.06	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			37				
Compaction Conditions		4.5kg					



PSL
Professional Soils Laboratory

Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

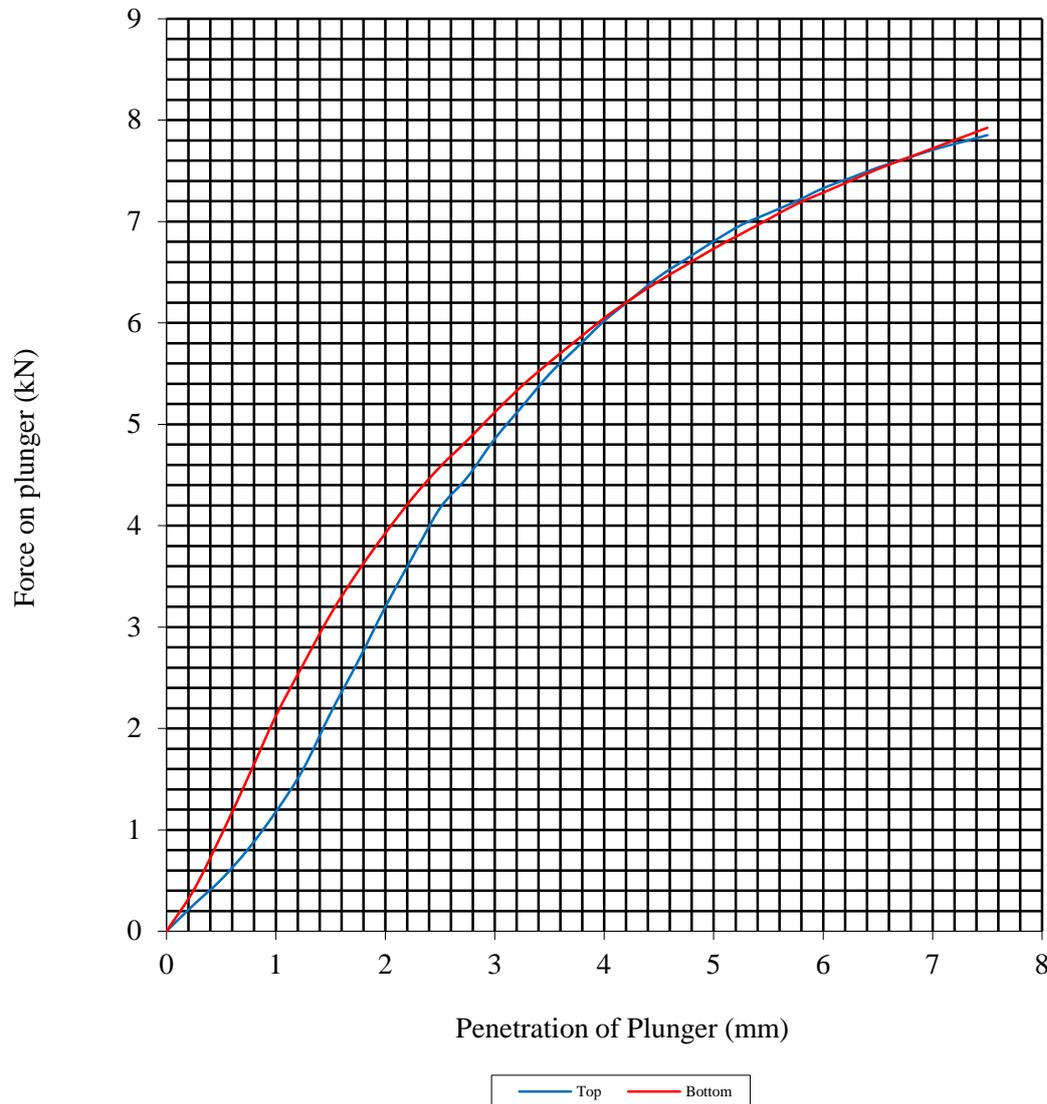
Hole Number: TT2104

Top Depth (m): 1.10

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	16	Surcharge Kg:	4.20	Sample Top	16	Sample Top	34.0
Bulk Density Mg/m ³ :	2.12	Soaking Time hrs	0	Sample Bottom	16	Sample Bottom	34.7
Dry Density Mg/m ³ :	1.83	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:	0						
Compaction Conditions	4.5kg						



PSL
Professional Soils Laboratory

Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

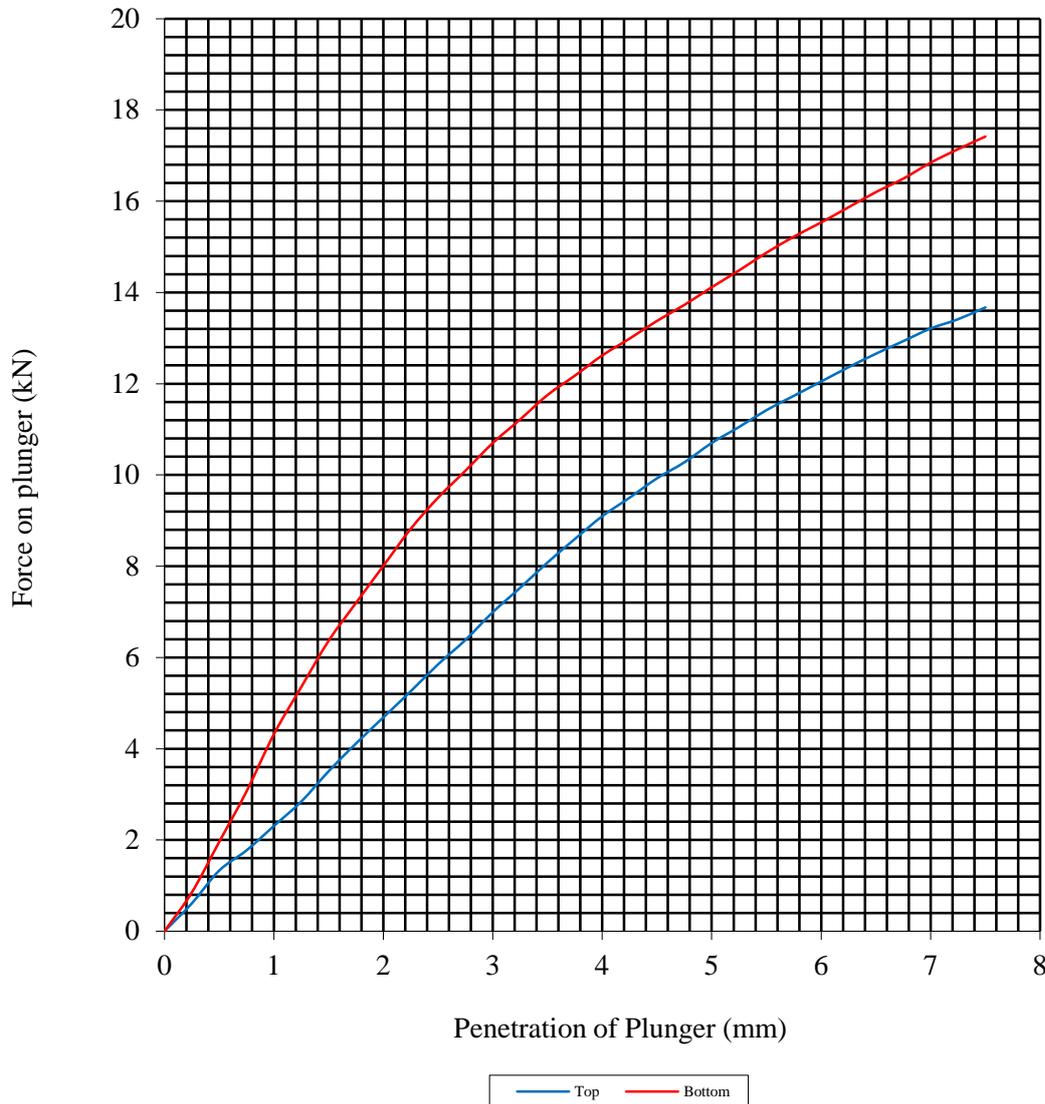
Hole Number: TT2105B

Top Depth (m): 1.00

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	6.8	Surcharge Kg:	4.20	Sample Top	7.0	Sample Top	53.5
Bulk Density Mg/m ³ :	2.31	Soaking Time hrs	0	Sample Bottom	6.6	Sample Bottom	72.0
Dry Density Mg/m ³ :	2.16	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:		33					
Compaction Conditions		4.5kg					



PSL
Professional Soils Laboratory

Parkside, Hoyland Common

Contract No:
PSL20/5161
Client Ref:
AG3080D-20

GEOLABS Limited
Bucknalls Lane
Garston
Watford
Hertfordshire
WD25 9XX
Tel: +44(0) 1923 891 190
Fax: +44(0) 1923 891 191
email: admin@geolabs.co.uk
web: www.geolabs.co.uk

Applied Geology

Unit 23
Abbey Park
Stareton
Kenilworth
Warwickshire
CV8 2LY

For the attention of Mr A Perks / Ms F Connor

23 October 2020

Report No : GEO/31824/01

Page 1 of 1

Dear Sirs

Our ref **GEO / 31824**

Your Ref **AG3080D-20**

Project **PARKSIDE HOYLAND**

Date samples received 24/09/2020
Date written instructions received 24/09/2020
Date testing commenced 25/09/2020
Date of sample disposal 20/11/2020

Further to your instructions we have pleasure in enclosing the results of the tests you requested in the attached figures.

LABORATORY TEST REPORT

Item No	Test Quantity	Description
1	~	Geotechnical Test Summary
~	6	Water Content
2	6	Liquid & Plastic Limits Summary
3	2	One Dimensional Consolidation
4	2	Unconsolidated Undrained Triaxial Compression
5	2	Shear Strength by Direct Shear - Small Shearbox

Any opinions or interpretations expressed herein are outside the scope of UKAS accreditation. All results contained in this report are provisional unless signed by an approved signatory. The results contained in this report relate only to samples received in the laboratory. This report should not be reproduced except in full without the written permission of the laboratory.

All the necessary data required by the documented test procedures has been recorded and will be stored for a period of no less than 6 years. This data will be issued to yourselves at your request. All samples will be disposed of after the date shown above. Written confirmation will be required to retain the samples beyond this period and a storage charge may be applied.

We trust that the above meets your requirements and should you require any further information or assistance, please do not hesitate to contact us.

Yours faithfully
on behalf of **GEOLABS Limited**



J A Reynolds
Laboratory Manager



SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC %	LL %	PL %	PI %	<425 µm %	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 g/L	W/S Mg mg/L	
DCS6102	1.00-1.45	CM	UT	Dark brownish grey slightly gravelly silty CLAY.	15.0	49	26	23	99										Direct Shear
DCS6103	0.55-1.00	OC	UT	Stiff brown mottled orange sandy silty CLAY with rare fine gravel. Becoming more gravelly with depth.	17.0	42	20	22	57	2.22	1.89	Undisturbed	25	137	68				
DCS6104	1.00-1.45	OC	UT	Stiff friable brown slightly mottled light brown gravelly sandy CLAY.	12.2	38	21	17	50										One Dimensional Consolidation
DCS6105	0.55-1.00	OC	UT	Stiff brown very gravelly silty CLAY. Gravel is fine to medium.	8.6	41	21	20	34										
DCS6106	1.00-1.45	OC	UT	Stiff friable brown sandy very gravelly CLAY. Gravel is fine to medium and includes brick fragments.	13.1	40	26	14	55										One Dimensional Consolidation Direct Shear
DCS6110	1.00-1.45	OC	UT	Stiff brown mottled grey silty CLAY with rare organic matter.	22.7	46	27	19	90	2.20	1.79	Undisturbed	25	119	59				

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by  J Sturges - Operations Manager 22/10/2020	Project Number: <p style="text-align: center;">GEO / 31824</p> Project Name: <p style="text-align: center;">PARKSIDE HOYLAND AG3080D-20</p>	
--	---	---

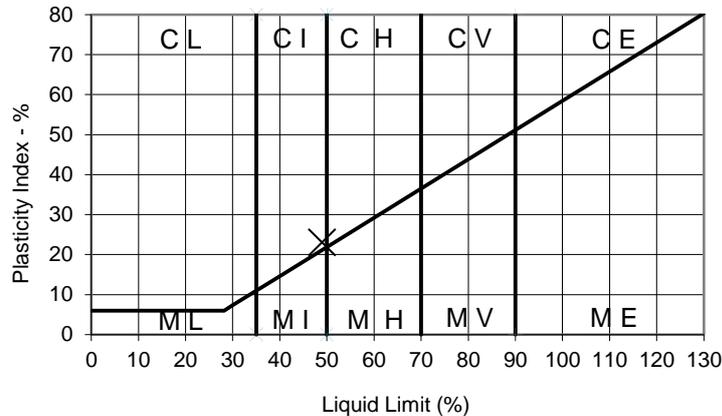
LIQUID AND PLASTIC LIMITS

Location	DCS6102
Sample Ref	CM
Depth (m)	1.00
Sample Type	UT

Description:
Dark brownish grey slightly gravelly silty CLAY.

Preparation : Sample as received with discrete coarse particles removed by hand.

Water Content : (BS EN ISO 17892-1:2014)	15.0 %
Estimated percentage passing 425µm sieve :	99 %
*Liquid Limit - Fall Cone 1 point Method (cone angle 30°) :	49 %
Plastic Limit :	26 %
Plasticity Index :	23 %
Equivalent Water Content of material passing 425µm sieve :	15.2 %
Liquidity Index :	-0.47



***One point liquid limit test readings**

Cone penetration	18.8 mm
Water content	48.0 %
One point method correlation factor	1.024

Clayton and Jukes Géotechnique Volume 28 Issue 4 December 1978

Processed by CC
Checked and Approved by

J A Reynolds - Laboratory Manager
23/10/2020

Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
AG3080D-20**



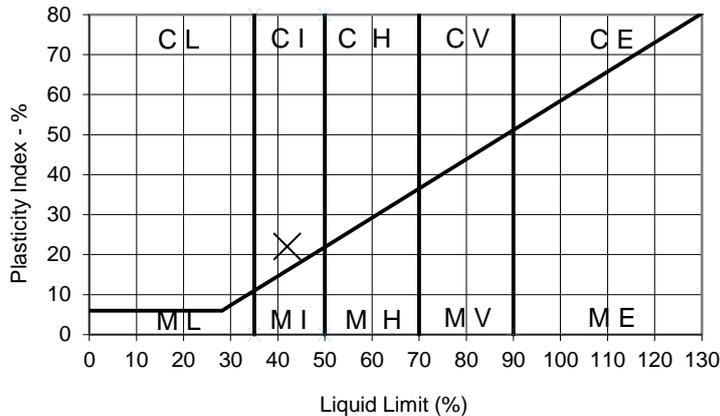
LIQUID AND PLASTIC LIMITS

Location	DCS6103
Sample Ref	OC
Depth (m)	0.55
Sample Type	UT

Description:
Stiff brown mottled orange gravelly sandy silty CLAY.

Preparation : Particles >425µm removed by wet sieving and air drying.

Water Content : (BS EN ISO 17892-1:2014)	14.9 %
Measured percentage passing 425µm sieve :	57 %
*Liquid Limit - Fall Cone 1 point Method (cone angle 30°) :	42 %
Plastic Limit :	20 %
Plasticity Index :	22 %
Equivalent Water Content of material passing 425µm sieve :	26.3 %
Liquidity Index :	0.29



***One point liquid limit test readings**

Cone penetration	20.1 mm
Water content	42.4 %
One point method correlation factor	0.999
<i>Clayton and Jukes Géotechnique Volume 28 Issue 4 December 1978</i>	

Processed by CC
Checked and Approved by

J A Reynolds - Laboratory Manager
23/10/2020

Project Number: **GEO / 31824**

Project Name: **PARKSIDE HOYLAND
AG3080D-20**



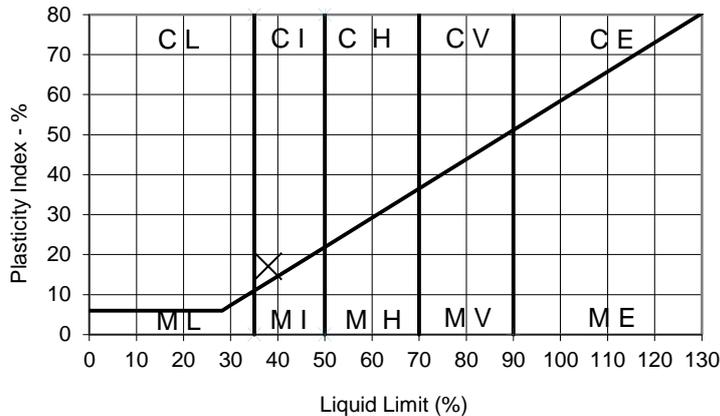
BS EN ISO 17892-12 : 2018 : Clause 5.3 & 5.5
LIQUID AND PLASTIC LIMITS

Location	DCS6104
Sample Ref	OC
Depth (m)	1.00
Sample Type	UT

Description:
 Stiff friable brown slightly mottled light brown gravelly sandy CLAY.

Preparation : Particles >425µm removed by wet sieving and air drying.

Water Content : (BS EN ISO 17892-1:2014)	12.2 %
Measured percentage passing 425µm sieve :	50 %
*Liquid Limit - Fall Cone 1 point Method (cone angle 30°) :	38 %
Plastic Limit :	21 %
Plasticity Index :	17 %
Equivalent Water Content of material passing 425µm sieve :	24.3 %
Liquidity Index :	0.19



***One point liquid limit test readings**

Cone penetration	20.1 mm
Water content	38.0 %
One point method correlation factor	1.000
<i>Clayton and Jukes Géotechnique Volume 28 Issue 4 December 1978</i>	

Processed by CC
 Checked and Approved by

 J A Reynolds - Laboratory Manager
 23/10/2020

Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
 AG3080D-20**



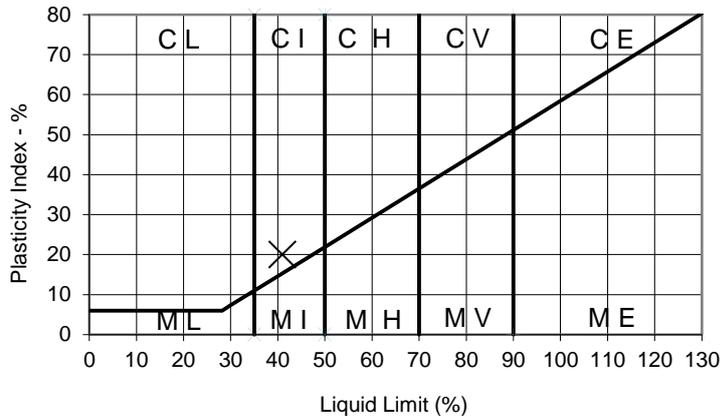
BS EN ISO 17892-12 : 2018 : Clause 5.3 & 5.5
LIQUID AND PLASTIC LIMITS

Location	DCS6105
Sample Ref	OC
Depth (m)	0.55
Sample Type	UT

Description:
 Stiff brown very gravelly silty CLAY. Gravel is fine to medium.

Preparation : Particles >425µm removed by wet sieving and air drying.

Water Content : (BS EN ISO 17892-1:2014)	8.6 %
Measured percentage passing 425µm sieve :	34 %
*Liquid Limit - Fall Cone 1 point Method (cone angle 30°) :	41 %
Plastic Limit :	21 %
Plasticity Index :	20 %
Equivalent Water Content of material passing 425µm sieve :	25.1 %
Liquidity Index :	0.21



***One point liquid limit test readings**

Cone penetration	20.9 mm
Water content	41.4 %
One point method correlation factor	0.985
<i>Clayton and Jukes Géotechnique Volume 28 Issue 4 December 1978</i>	

Processed by CC
 Checked and Approved by

 J A Reynolds - Laboratory Manager
 23/10/2020

Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
 AG3080D-20**



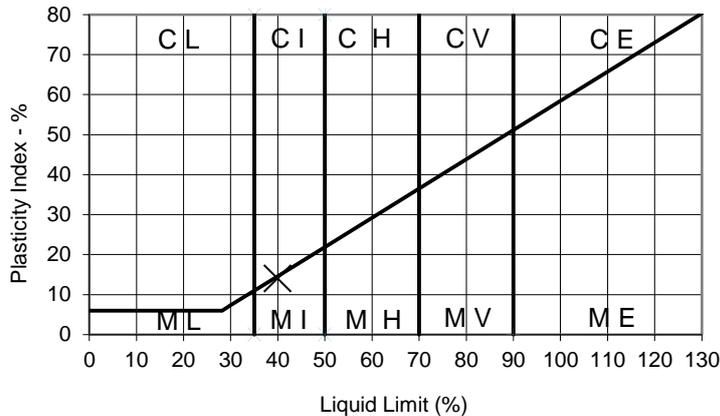
LIQUID AND PLASTIC LIMITS

Location	DCS6106
Sample Ref	OC
Depth (m)	1.00
Sample Type	UT

Description:
Stiff friable brown sandy very gravelly CLAY. Gravel is fine to medium and includes brick fragments.

Preparation : Particles >425µm removed by wet sieving and air drying.

Water Content : (BS EN ISO 17892-1:2014)	13.1 %
Measured percentage passing 425µm sieve :	55 %
*Liquid Limit - Fall Cone 1 point Method (cone angle 30°) :	40 %
Plastic Limit :	26 %
Plasticity Index :	14 %
Equivalent Water Content of material passing 425µm sieve :	23.9 %
Liquidity Index :	-0.15



***One point liquid limit test readings**

Cone penetration	21.4 mm
Water content	40.7 %
One point method correlation factor	0.978
<i>Clayton and Jukes Géotechnique Volume 28 Issue 4 December 1978</i>	

Processed by CC
Checked and Approved by

J A Reynolds - Laboratory Manager
23/10/2020

Project Number: **GEO / 31824**
Project Name: **PARKSIDE HOYLAND
AG3080D-20**



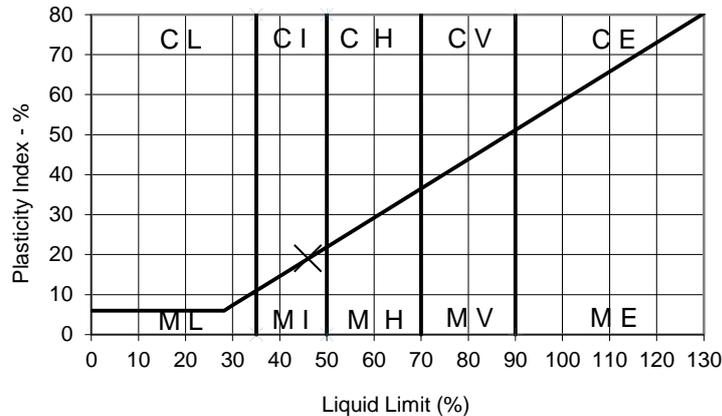
LIQUID AND PLASTIC LIMITS

Location	DCS6110
Sample Ref	OC
Depth (m)	1.00
Sample Type	UT

Description:
Stiff brown mottled grey silty CLAY with rare organic matter.

Preparation : Particles >425µm removed by wet sieving and air drying.

Water Content : (BS EN ISO 17892-1:2014)	22.7 %
Measured percentage passing 425µm sieve :	90 %
*Liquid Limit - Fall Cone 1 point Method (cone angle 30°) :	46 %
Plastic Limit :	27 %
Plasticity Index :	19 %
Equivalent Water Content of material passing 425µm sieve :	25.4 %
Liquidity Index :	-0.08



***One point liquid limit test readings**

Cone penetration	15.2 mm
Water content	42.0 %
One point method correlation factor	1.091

Clayton and Jukes Géotechnique Volume 28 Issue 4 December 1978

Processed by CC
Checked and Approved by

J A Reynolds - Laboratory Manager
23/10/2020

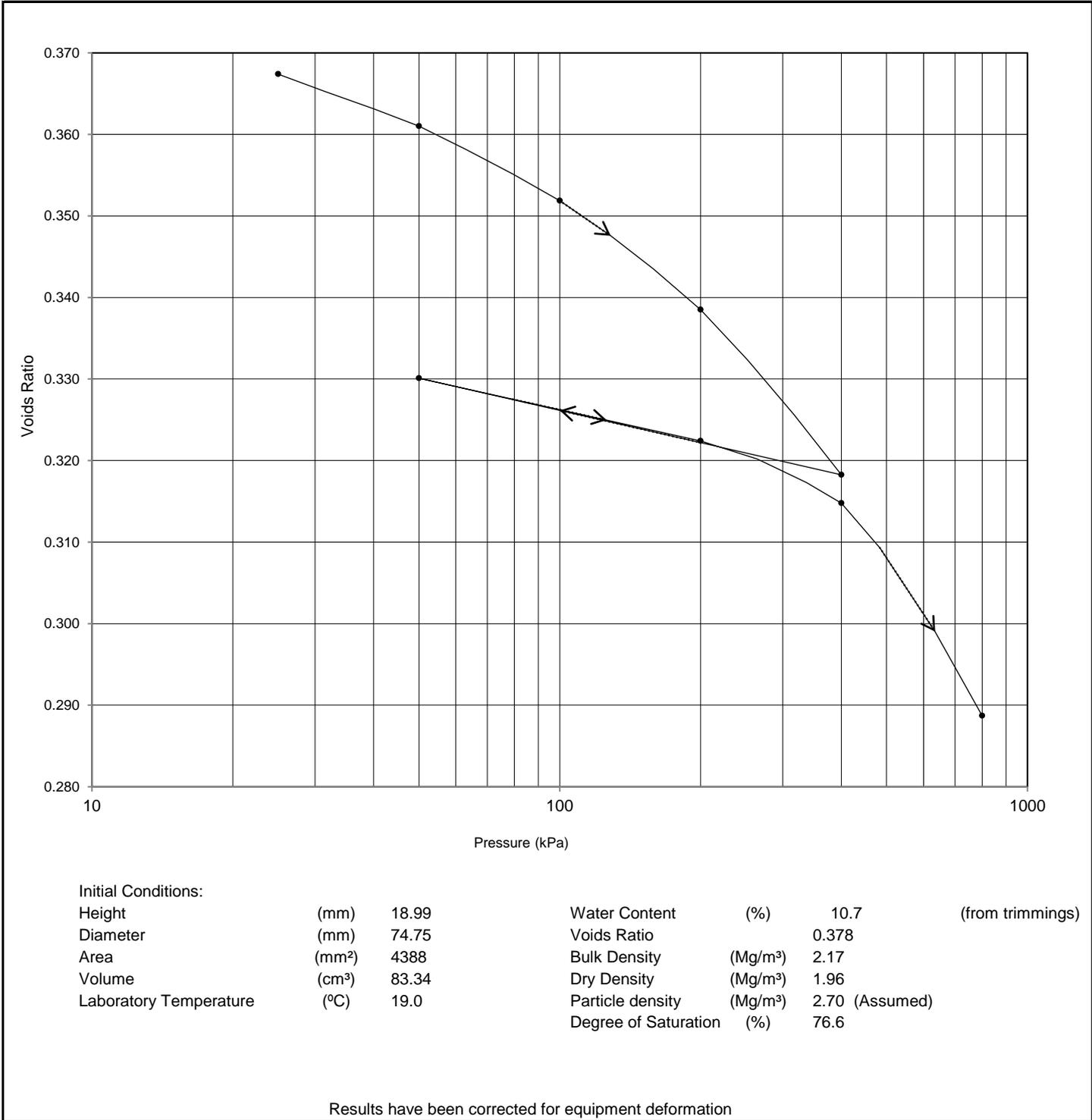
Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
AG3080D-20**



INCREMENTAL LOADING OEDOMETER TEST

Location	DCS6104	Description: Stiff friable brown slightly mottled light brown gravelly sandy CLAY. Note: Some patching required due to removal of gravel.
Sample Ref.	OC	
Depth (m)	1.00-1.45	
Sample Type	UT	
Depth within original (mm)	10	
Orientation within original	Vertical	
Specimen preparation	Undisturbed	



Initial Conditions:

Height	(mm)	18.99	Water Content	(%)	10.7	(from trimmings)
Diameter	(mm)	74.75	Voids Ratio		0.378	
Area	(mm ²)	4388	Bulk Density	(Mg/m ³)	2.17	
Volume	(cm ³)	83.34	Dry Density	(Mg/m ³)	1.96	
Laboratory Temperature	(°C)	19.0	Particle density	(Mg/m ³)	2.70 (Assumed)	
			Degree of Saturation	(%)	76.6	

Results have been corrected for equipment deformation

Checked and Approved by  J Sturges - Operations Manager 22/10/2020	Project Number:	GEO / 31824	 
	Project Name:	PARKSIDE HOYLAND AG3080D-20	

INCREMENTAL LOADING OEDOMETER TEST

Location	DCS6104	Description: Stiff friable brown slightly mottled light brown gravelly sandy CLAY. Note: Some patching required due to removal of gravel.
Sample Ref.	OC	
Depth (m)	1.00-1.45	
Sample Type	UT	
Depth within original (mm)	10	
Orientation within original	Vertical	
Specimen preparation	Undisturbed	

Pressure Range (kPa)	m_v (m ² /MN)	c_v (m ² /year)	Time Fitting		Voids Ratio
			Method	minutes	
0 - 25	0.31	44	t90	0.909	0.367
25 - 50	0.19	10	t90	3.76	0.361
50 - 100	0.13	17	t90	2.34	0.352
100 - 200	0.099	14	t90	2.77	0.339
200 - 400	0.076	15	t90	2.47	0.318
400 - 50	0.026	13 (Sv)	t90	2.74	0.330
50 - 200	0.039	15	t90	2.49	0.322
200 - 400	0.029	15	t90	2.40	0.315
400 - 800	0.050	20	t90	1.80	0.289

Checked and Approved by


J Sturges - Operations Manager
22/10/2020

Project Number:

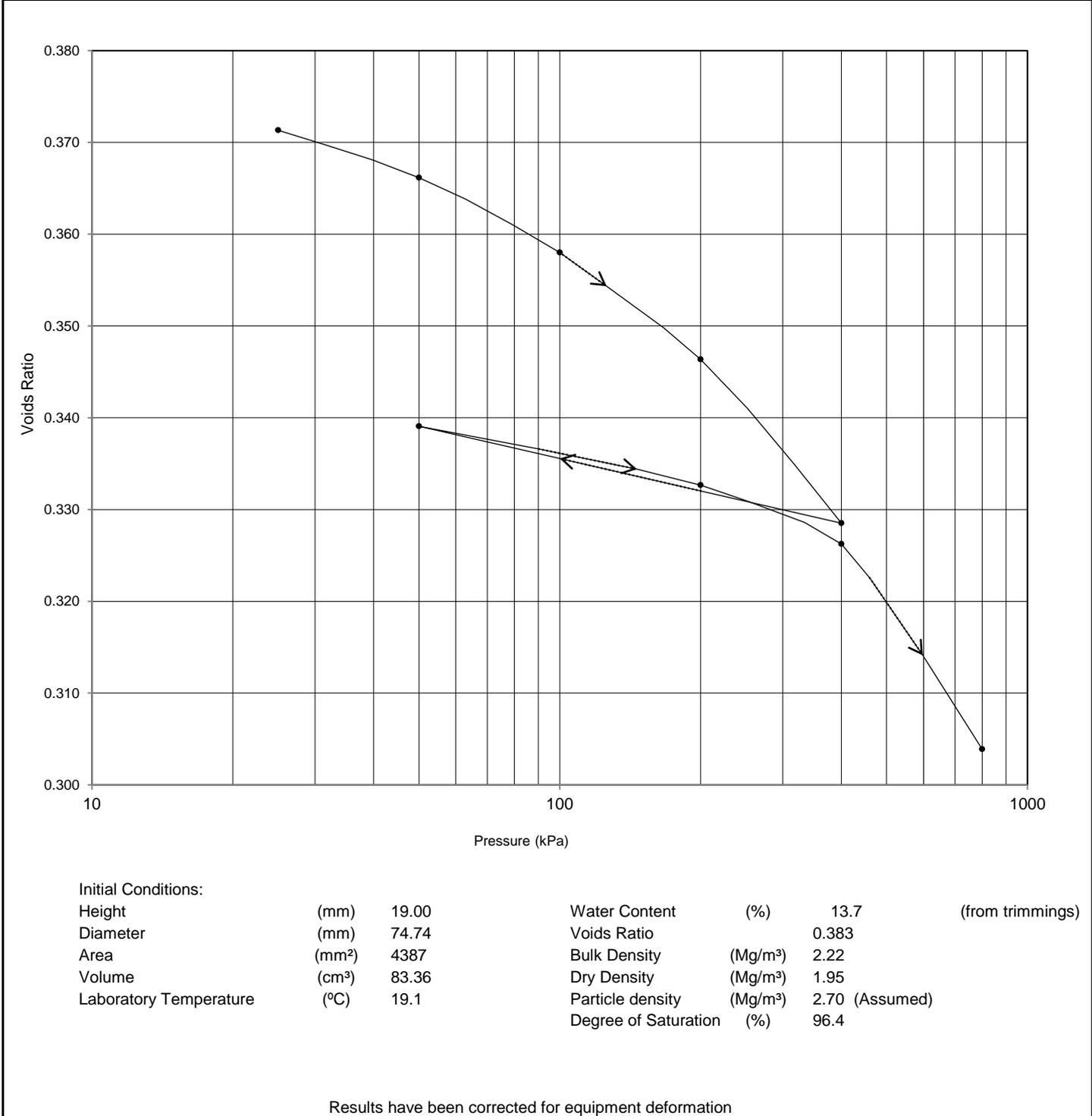
GEO / 31824

Project Name:

**PARKSIDE HOYLAND
AG3080D-20****GEOLABS**®

INCREMENTAL LOADING OEDOMETER TEST

Location	DCS6106	Description: Stiff friable brown sandy very gravelly CLAY. Gravel is fine to medium and includes brick fragments. Note: Some patching required due to removal of gravel.
Sample Ref.	OC	
Depth (m)	1.00-1.45	
Sample Type	UT	
Depth within original (mm)	30	
Orientation within original	Vertical	
Specimen preparation	Undisturbed	



Initial Conditions:

Height	(mm)	19.00	Water Content	(%)	13.7	(from trimmings)
Diameter	(mm)	74.74	Voids Ratio		0.383	
Area	(mm ²)	4387	Bulk Density	(Mg/m ³)	2.22	
Volume	(cm ³)	83.36	Dry Density	(Mg/m ³)	1.95	
Laboratory Temperature	(°C)	19.1	Particle density	(Mg/m ³)	2.70 (Assumed)	
			Degree of Saturation	(%)	96.4	

Results have been corrected for equipment deformation

Checked and Approved by  J Sturges - Operations Manager 22/10/2020	Project Number:	GEO / 31824	
	Project Name:	PARKSIDE HOYLAND AG3080D-20	

INCREMENTAL LOADING OEDOMETER TEST

Location DCS6106
 Sample Ref. OC
 Depth (m) 1.00-1.45
 Sample Type UT
 Depth within original (mm) 30
 Orientation within original Vertical
 Specimen preparation Undisturbed

Description:

Stiff friable brown sandy very gravelly CLAY. Gravel is fine to medium and includes brick fragments.

Note: Some patching required due to removal of gravel.

Pressure Range (kPa)	m_v (m ² /MN)	c_v (m ² /year)	Time Fitting		Voids Ratio
			Method	minutes	
0 - 25	0.35	71	t90	0.560	0.371
25 - 50	0.15	14	t90	2.72	0.366
50 - 100	0.12	14	t90	2.76	0.358
100 - 200	0.086	16	t90	2.33	0.346
200 - 400	0.066	14	t90	2.69	0.329
400 - 50	0.023	12 (Sv)	t90	3.02	0.339
50 - 200	0.032	19	t90	1.96	0.333
200 - 400	0.024	21	t90	1.74	0.326
400 - 800	0.042	21	t90	1.73	0.304

Checked and Approved by



J Sturges - Operations Manager
22/10/2020

Project Number:

GEO / 31824

Project Name:

PARKSIDE HOYLAND
AG3080D-20

GEOLABS®

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

Location DCS6103
 Sample Ref OC
 Depth (m) 0.55-1.00
 Sample Type UT

Description:

Stiff brown mottled orange sandy silty CLAY with rare fine gravel.
 Becoming more gravelly with depth.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	201.2
Diameter	(mm)	103.1
Moisture content	(%)	17.0
Bulk density	(Mg/m ³)	2.22
Dry density	(Mg/m ³)	1.89
Test Details		
Latex membrane thickness	(mm)	0.3
Specimen height prior to shearing	(mm)	201.2
Membrane correction	(kPa)	1.1
Mean rate of shear	(%/min)	2.0
Cell pressure	(kPa)	25
Strain at failure	(%)	19.9
Maximum deviator stress	(kPa)	137
Shear Stress Cu	(kPa)	68

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	20

Processed by SB
 Checked and Approved by

J Sturges - Operations Manager
 22/10/2020

Project Number:

GEO / 31824

Project Name:

PARKSIDE HOYLAND
AG3080D-20

GEOLABS

1731 - UUTXL DCS6110.01.00 OC UT Test.01 - 31824-220306.XLSM

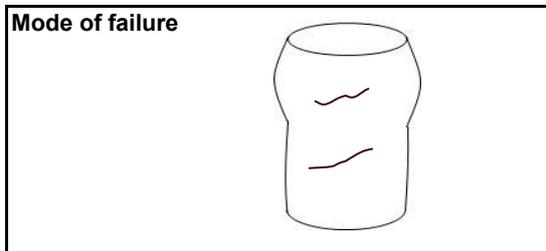
UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Location</td> <td>DCS6110</td> </tr> <tr> <td>Sample Ref</td> <td>OC</td> </tr> <tr> <td>Depth (m)</td> <td>1.00-1.45</td> </tr> <tr> <td>Sample Type</td> <td>UT</td> </tr> </table>	Location	DCS6110	Sample Ref	OC	Depth (m)	1.00-1.45	Sample Type	UT	<p>Description:</p> <p>Stiff brown mottled grey silty CLAY with rare organic matter.</p>
Location	DCS6110								
Sample Ref	OC								
Depth (m)	1.00-1.45								
Sample Type	UT								

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.0
Diameter	(mm)	102.5
Moisture content	(%)	15.9
Bulk density	(Mg/m ³)	2.20
Dry density	(Mg/m ³)	1.90
Test Details		
Latex membrane thickness	(mm)	0.3
Specimen height prior to shearing	(mm)	202.0
Membrane correction	(kPa)	0.8
Mean rate of shear	(%/min)	2.0
Cell pressure	(kPa)	25
Strain at failure	(%)	13.4
Maximum deviator stress	(kPa)	119
Shear Stress Cu	(kPa)	59

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	80

Version 82.200602

Processed by SB
Checked and Approved by

J Sturges - Operations Manager
22/10/2020

Project Number: **GEO / 31824**

Project Name: **PARKSIDE HOYLAND
AG3080D-20**



SHEAR STRENGTH BY DIRECT SHEAR

(small shearbox apparatus)

Borehole No DCS6102
 Sample No CM
 Depth (m) 1.00-1.45
 Sample Type UT

Description:

Dark brownish grey slightly gravelly silty CLAY.

Specimen Details

Depth within original sample *mm* n/a
 Orientation within original sample n/a
 Test condition Submerged
 Preparation Undisturbed

Particle density *Mg/m³* 2.70 (assumed)

Specimen Number		1	2	3
Length	<i>mm</i>	59.94	60.79	61.18
Width	<i>mm</i>	60.04	60.85	61.07
Height	<i>mm</i>	20.00	24.36	19.44
Initial water content	%	15.0	15.0	15.0
Initial wet density	<i>Mg/m³</i>	2.06	2.03	2.04
Initial dry density	<i>Mg/m³</i>	1.79	1.76	1.77
Initial voids ratio		0.507	0.532	0.523

Consolidation Stage

	<i>kPa</i>	50	100	200
Normal stress				
Duration	<i>day(s)</i>	1	1	1

Shearing Stage

	<i>kPa</i>	50	100	200
Normal stress				

Peak Conditions:

	<i>mm/min</i>	0.00192	0.00192	0.00192
Rate of horizontal displacement				
Maximum shear stress	<i>kPa</i>	33.1	58.7	84.1
Horizontal displacement at MSS	<i>mm</i>	0.8	4.8	4.3
Vertical Displacement at Peak	<i>mm</i>	-0.01	0.93	0.65

Residual Conditions:

	<i>mm/min</i>	0.0072	0.0072	0.0072
Rate of horizontal displacement				
Residual shear stress	<i>kPa</i>	25.2	37.2	48.7
Final cumulative displacement	<i>mm</i>	21.4	23.8	23.4
Vertical Displacement at Residual	<i>mm</i>	0.52	4.29	4.21
Total traverses		13	13	13
Method of reversal		Rapid multi-reversals by hand (5 traverses), to Clause 4.5.5.5(c)		

	%	18.9	19.0	18.8
Final water content				
Duration	<i>day(s)</i>	5	5	5

Shear Strength Parameters

	<i>kPa</i>	Peak Condition	Residual Condition
Apparent Cohesion		20	19
Angle of Shearing Resistance	<i>degrees</i>	18.0	8.5

Notes:

Processed by TG
 Checked and Approved by



S Allen - Senior Technician
 16/10/2020

Project Number:

GEO / 31824

Project Name:

**PARKSIDE HOYLAND
 AG3080D-20**

GEOLABS®

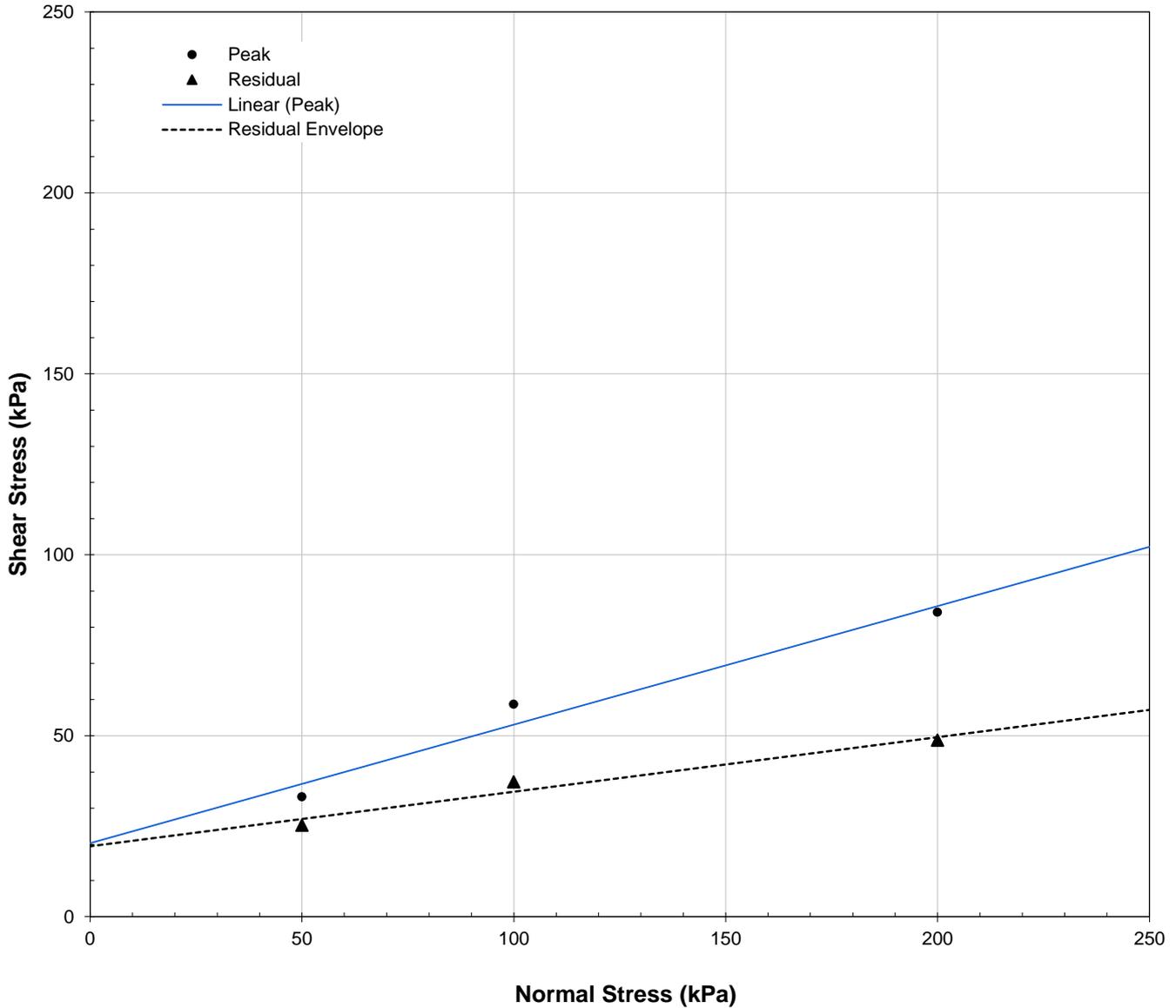
SHEAR STRENGTH BY DIRECT SHEAR

(small shearbox apparatus)

Borehole No	DCS6102
Sample No	CM
Depth (m)	1.00-1.45
Sample Type	UT

Description:
Dark brownish grey slightly gravelly silty CLAY.

Shear Stress v Normal Stress



Peak: $c' = 20$
 $\Phi' = 18.0$

Residual: $c'_r = 19$
 $\Phi'_r = 8.5$

Processed by TG
Checked and Approved by
S Allen
S Allen - Senior Technician
16/10/2020

Project Number:
GEO / 31824
Project Name:
**PARKSIDE HOYLAND
AG3080D-20**



SHEAR STRENGTH BY DIRECT SHEAR

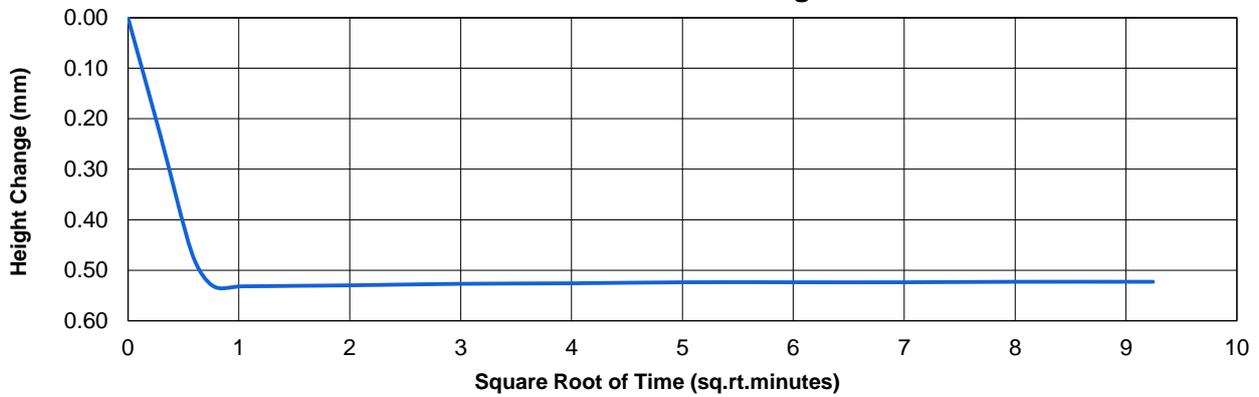
(small shearbox apparatus)

Borehole No	DCS6102
Sample No	CM
Depth (m)	1.00-1.45
Sample Type	UT

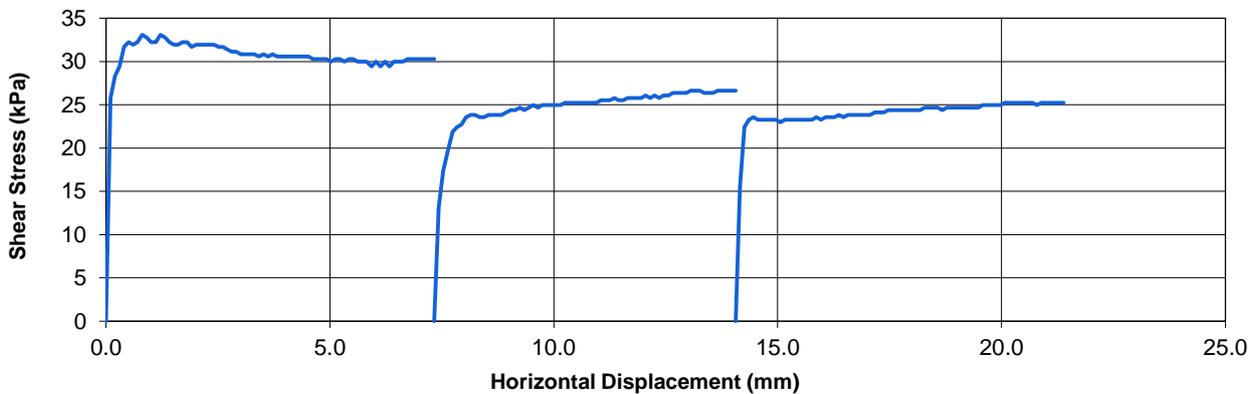
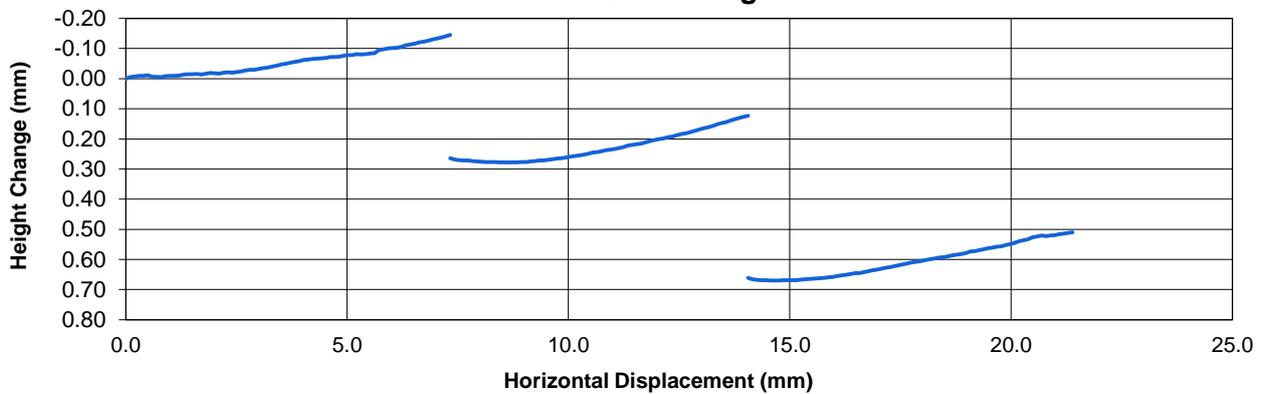
Description:
Dark brownish grey slightly gravelly silty CLAY.

Specimen: 1

Consolidation Stage



Shear Stage



Processed by TG
Checked and Approved by
S Allen
S Allen - Senior Technician
16/10/2020

Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
AG3080D-20**



SHEAR STRENGTH BY DIRECT SHEAR

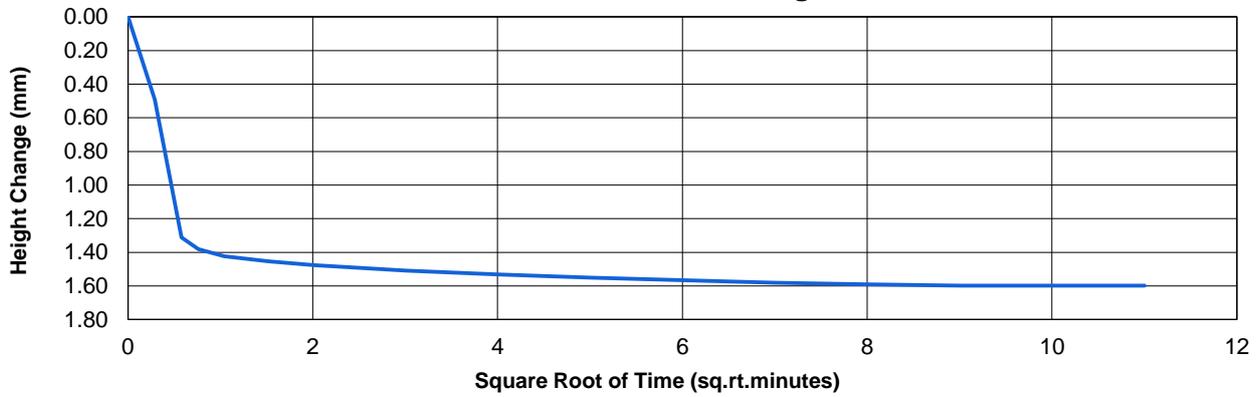
(small shearbox apparatus)

Borehole No	DCS6102
Sample No	CM
Depth (m)	1.00-1.45
Sample Type	UT

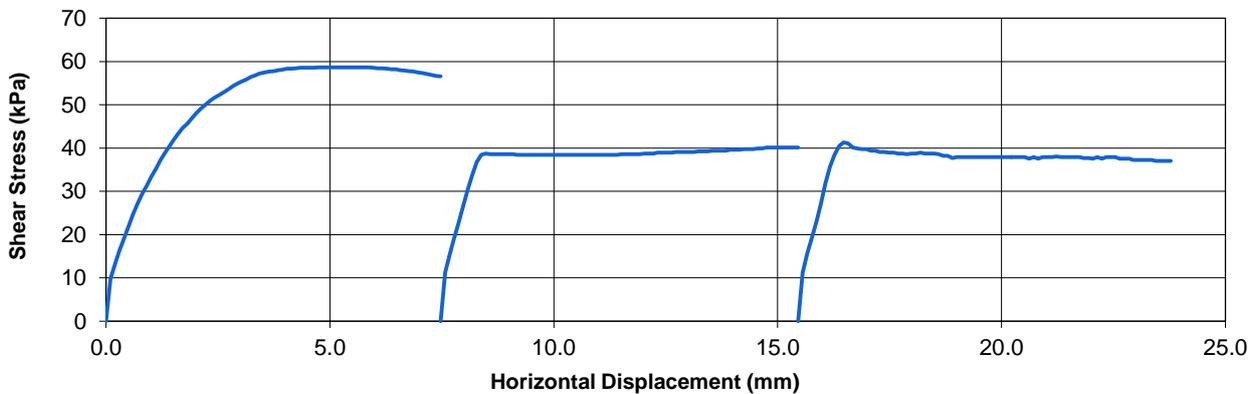
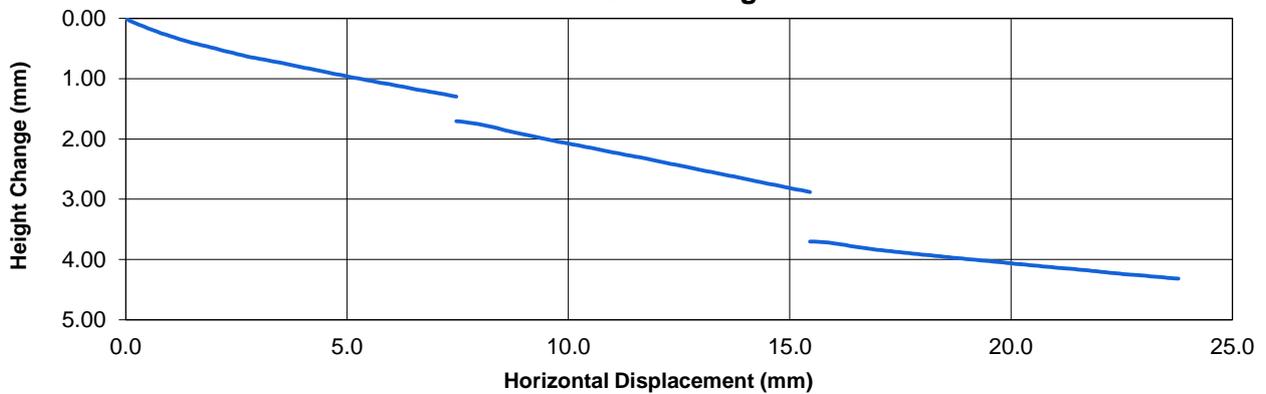
Description:
Dark brownish grey slightly gravelly silty CLAY.

Specimen: 2

Consolidation Stage



Shear Stage



Processed by TG
Checked and Approved by
S Allen
S Allen - Senior Technician
16/10/2020

Project Number:
GEO / 31824
Project Name:
**PARKSIDE HOYLAND
AG3080D-20**



SHEAR STRENGTH BY DIRECT SHEAR

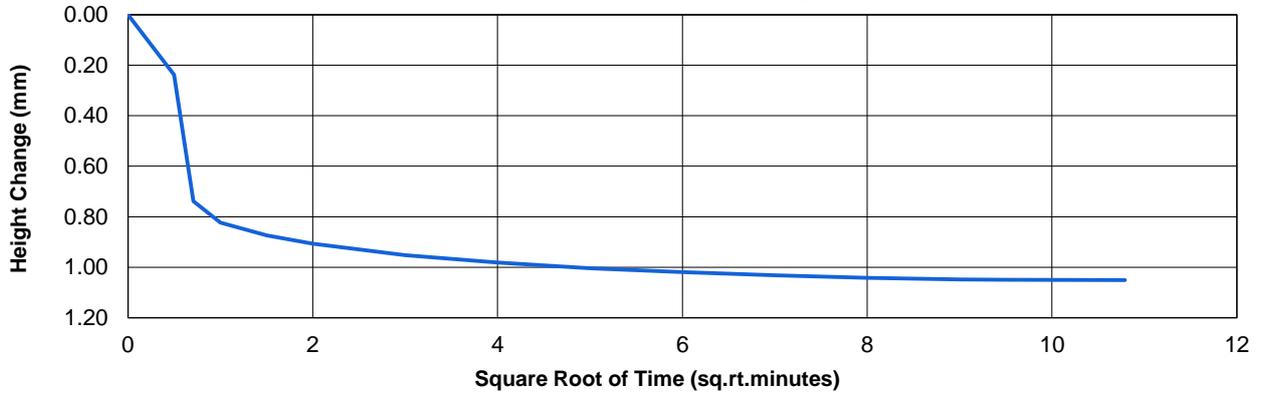
(small shearbox apparatus)

Borehole No DCS6102
 Sample No CM
 Depth (m) 1.00-1.45
 Sample Type UT

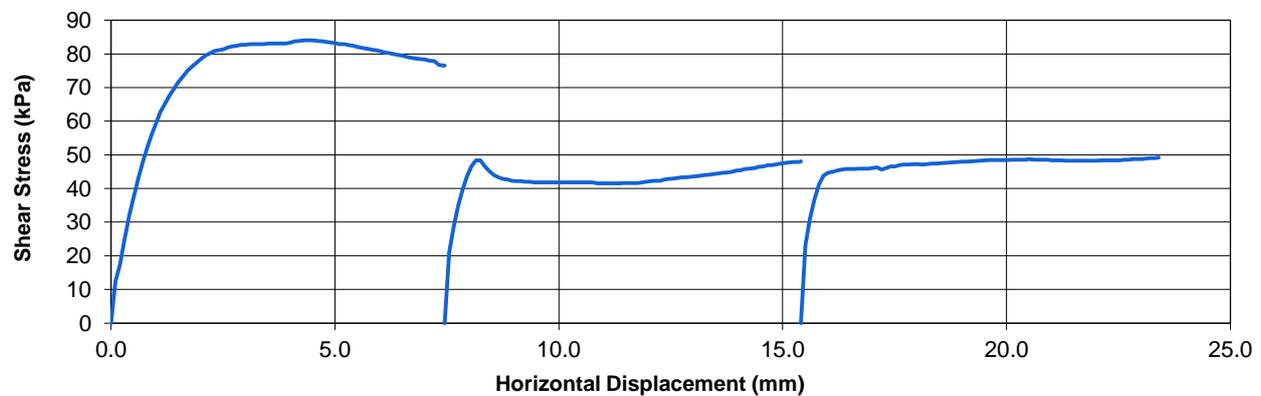
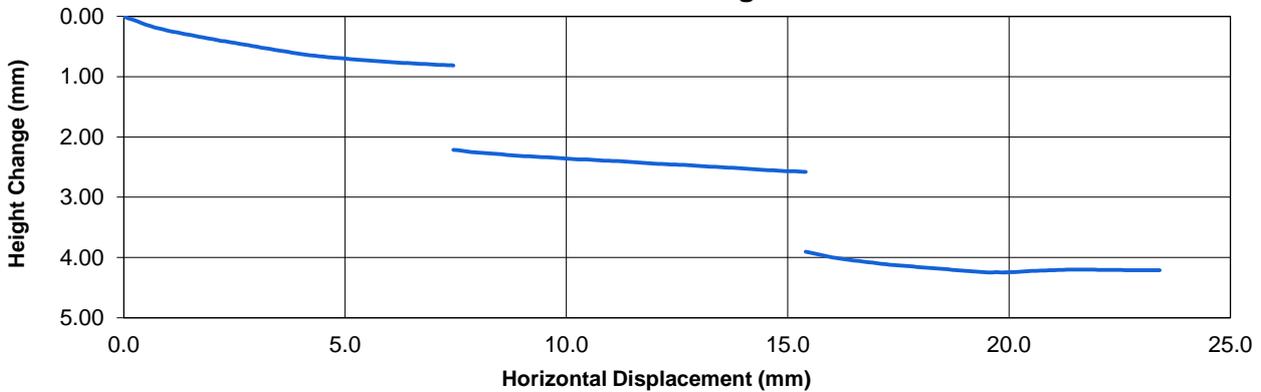
Description:
 Dark brownish grey slightly gravelly silty CLAY.

Specimen: 3

Consolidation Stage



Shear Stage



Processed by TG
 Checked and Approved by

 S Allen - Senior Technician
 16/10/2020

Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
 AG3080D-20**



SHEAR STRENGTH BY DIRECT SHEAR

(small shearbox apparatus)

Borehole No DCS6106
 Sample No OC
 Depth (m) 1.00-1.45
 Sample Type UT

Description:

Brown slightly gravelly slightly sandy silty CLAY.

Specimen Details

Depth within original sample *mm* n/a
 Orientation within original sample n/a
 Test condition Submerged
 Preparation Undisturbed

Particle density *Mg/m³* 2.70 (assumed)

Specimen Number	1	2	3
Length <i>mm</i>	59.85	60.00	60.06
Width <i>mm</i>	59.80	59.98	59.99
Height <i>mm</i>	19.20	19.20	19.90
Initial water content %	13.5	13.5	13.5
Initial wet density <i>Mg/m³</i>	2.09	2.05	2.09
Initial dry density <i>Mg/m³</i>	1.84	1.81	1.85
Initial voids ratio	0.468	0.492	0.463

Consolidation Stage

	50	100	200
Normal stress <i>kPa</i>	50	100	200
Duration <i>day(s)</i>	1	1	1

Shearing Stage

	50	100	200
Normal stress <i>kPa</i>	50	100	200

Peak Conditions:

	0.00192	0.00192	0.00192
Rate of horizontal displacement <i>mm/min</i>	0.00192	0.00192	0.00192
Maximum shear stress <i>kPa</i>	42.3	66.4	115.5
Horizontal displacement at MSS <i>mm</i>	5.7	4.3	7.5
Vertical Displacement at Peak <i>mm</i>	0.27	0.10	-0.24

Residual Conditions:

	0.0072	0.0072	0.0072
Rate of horizontal displacement <i>mm/min</i>	0.0072	0.0072	0.0072
Residual shear stress <i>kPa</i>	32.2	60.6	93.2
Final cumulative displacement <i>mm</i>	24.6	25.7	24.0
Vertical Displacement at Residual <i>mm</i>	3.25	1.52	5.65
Total traverses	13	13	13
Method of reversal	Rapid multi-reversals by hand (5 traverses), to Clause 4.5.5.5(c)		

	18.0	18.2	19.4
Final water content %	18.0	18.2	19.4
Duration <i>day(s)</i>	5	5	5

Shear Strength Parameters

	Peak Condition	Residual Condition
Apparent Cohesion <i>kPa</i>	18	16
Angle of Shearing Resistance <i>degrees</i>	26.0	21.5

Notes:

Processed by TG
 Checked and Approved by



S Allen - Senior Technician
 16/10/2020

Project Number:

GEO / 31824

Project Name:

**PARKSIDE HOYLAND
 AG3080D-20**

GEOLABS®

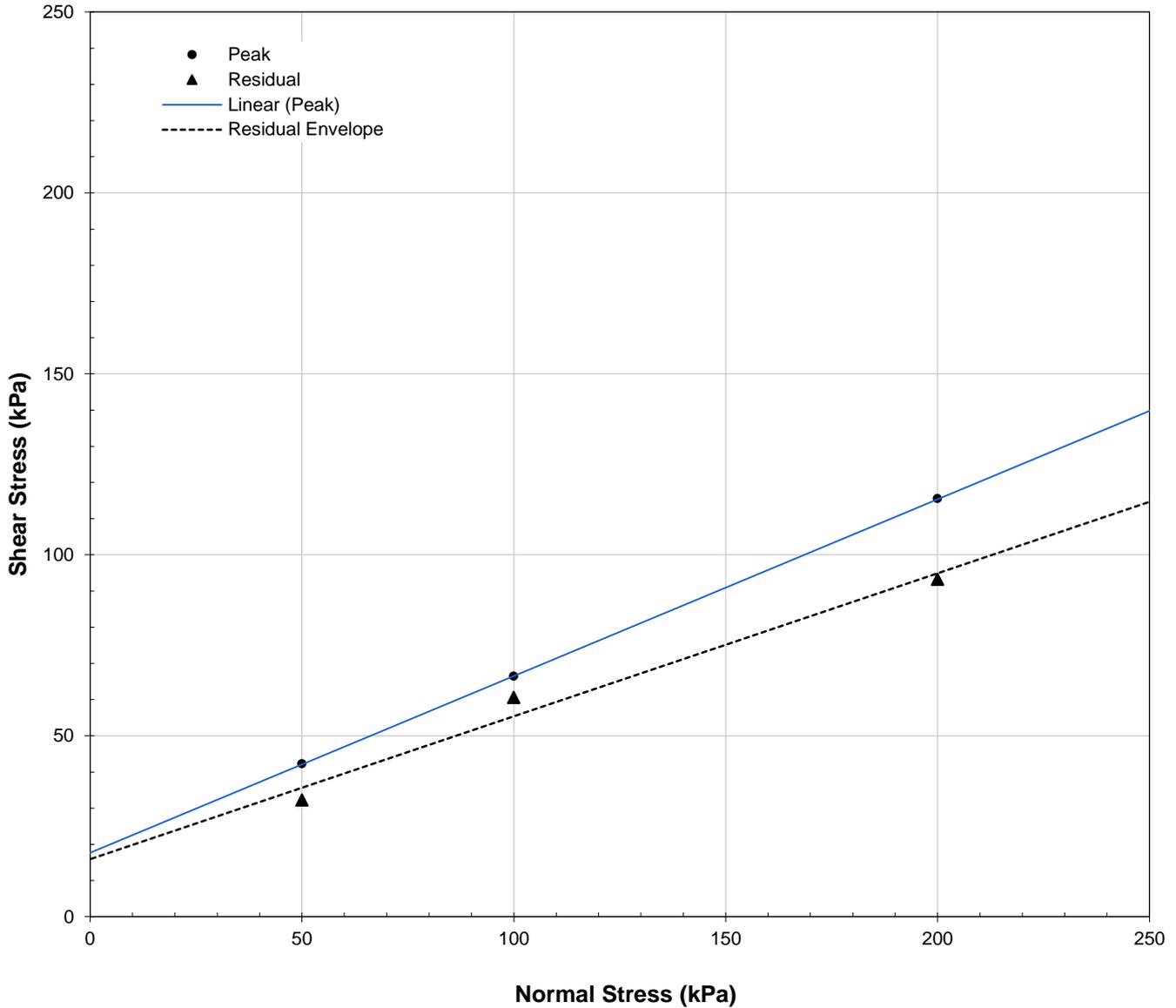
SHEAR STRENGTH BY DIRECT SHEAR

(small shearbox apparatus)

Borehole No	DCS6106
Sample No	OC
Depth (m)	1.00-1.45
Sample Type	UT

Description:
Brown slightly gravelly slightly sandy silty CLAY.

Shear Stress v Normal Stress



Peak: $c' = 18$
 $\Phi' = 26.0$

Residual: $c'_r = 16$
 $\Phi'_r = 21.5$

Processed by TG
Checked and Approved by
S Allen
S Allen - Senior Technician
16/10/2020

Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
AG3080D-20**



SHEAR STRENGTH BY DIRECT SHEAR

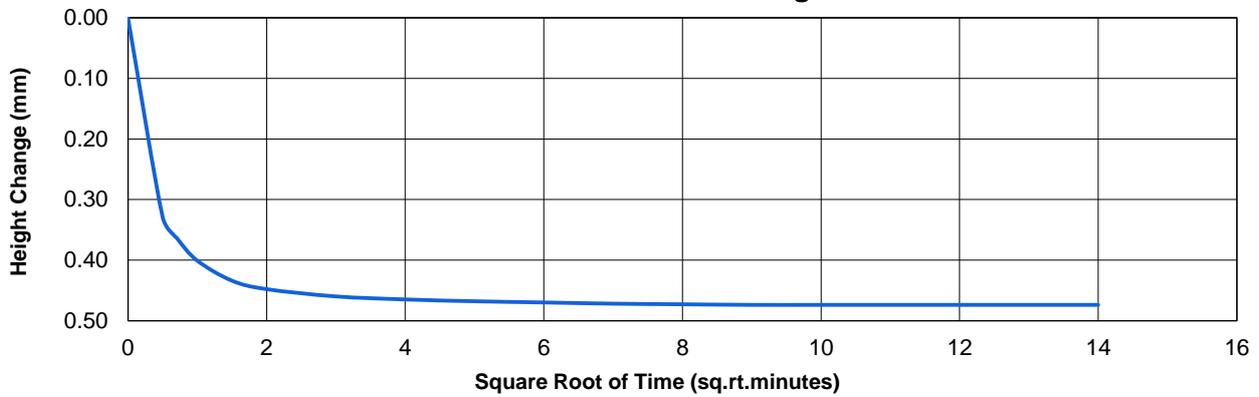
(small shearbox apparatus)

Borehole No DCS6106
 Sample No OC
 Depth (m) 1.00-1.45
 Sample Type UT

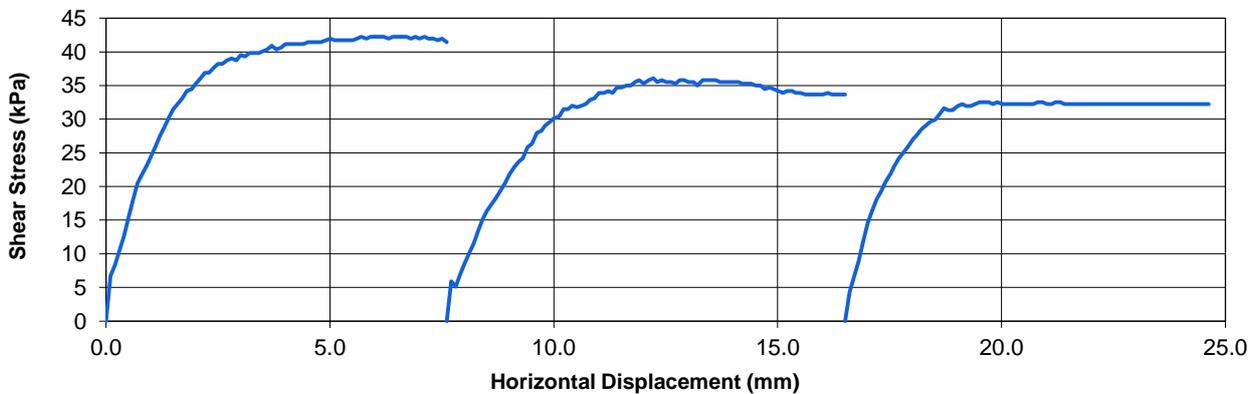
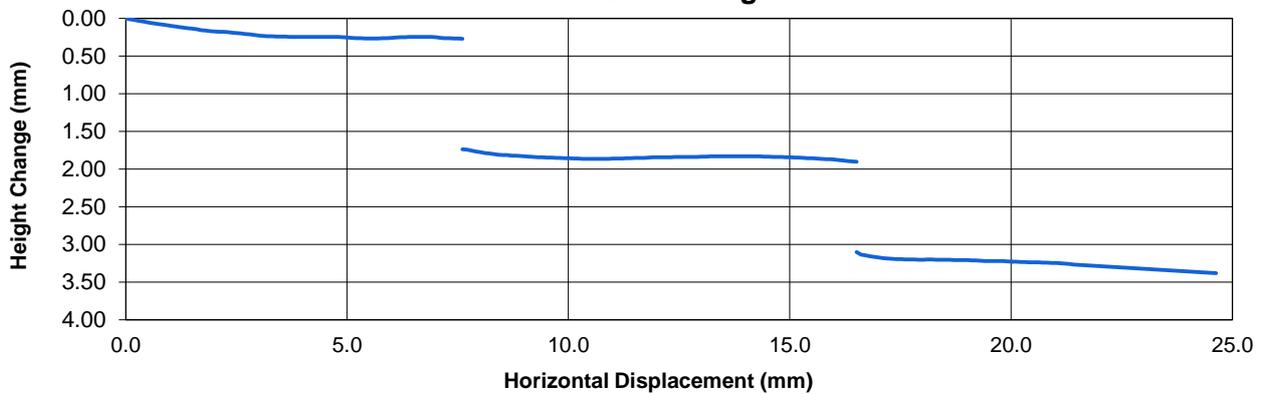
Description:
 Brown slightly gravelly slightly sandy silty CLAY.

Specimen: 1

Consolidation Stage



Shear Stage



Processed by TG
 Checked and Approved by

 S Allen - Senior Technician
 16/10/2020

Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
 AG3080D-20**



SHEAR STRENGTH BY DIRECT SHEAR

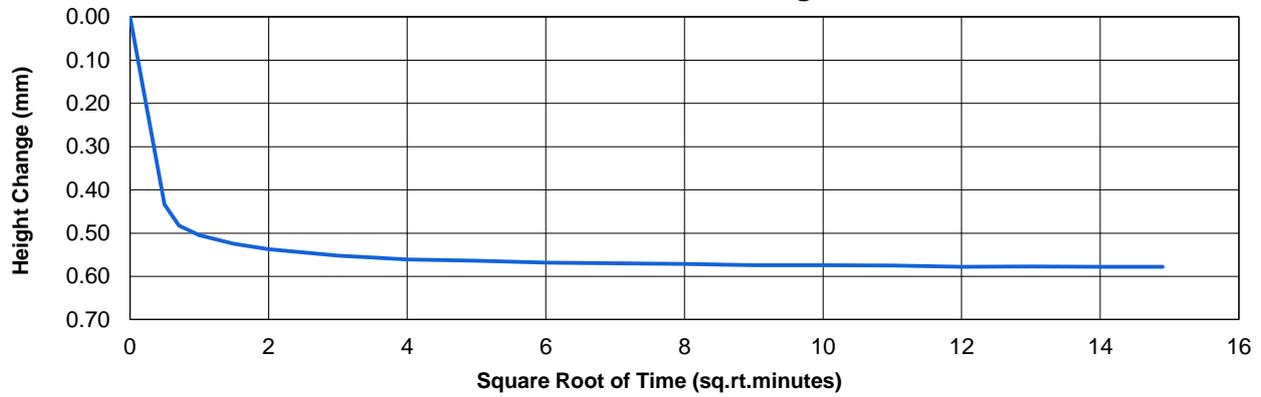
(small shearbox apparatus)

Borehole No	DCS6106
Sample No	OC
Depth (m)	1.00-1.45
Sample Type	UT

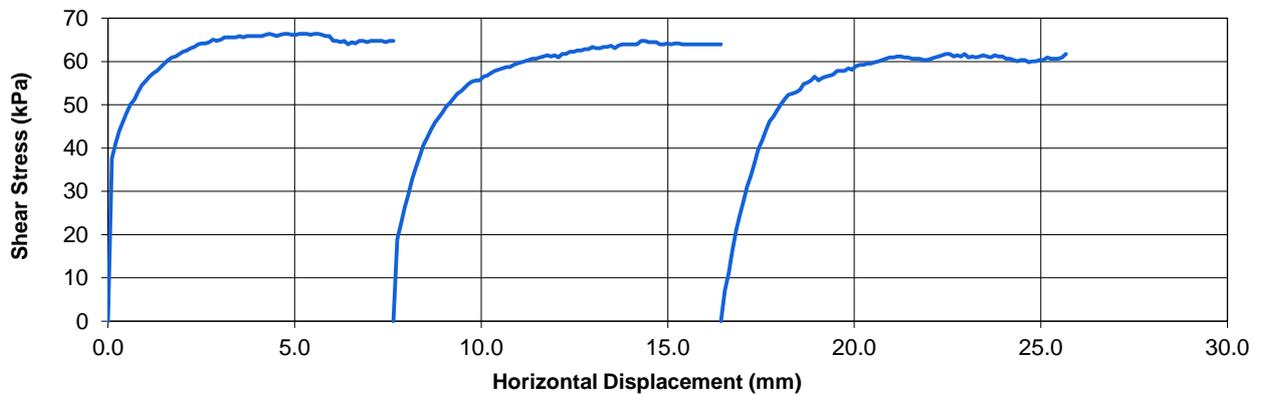
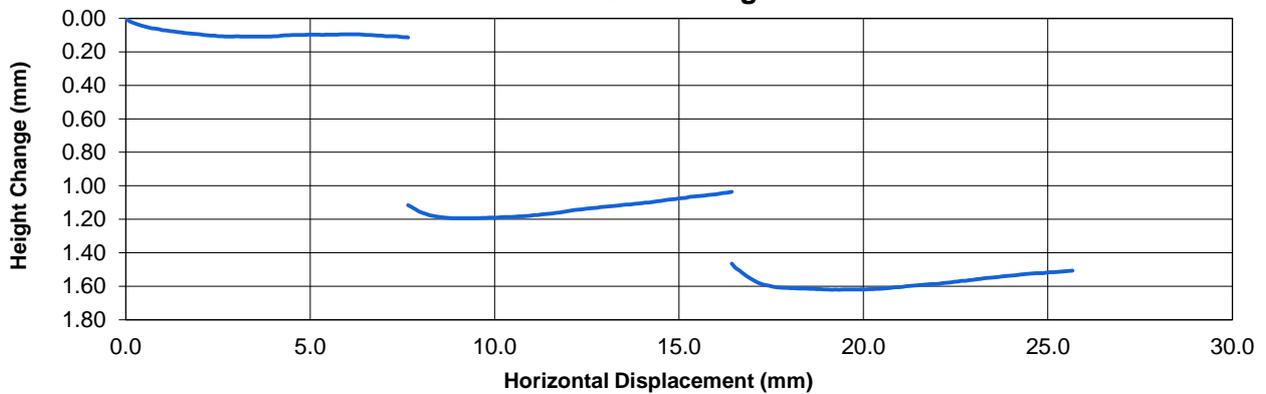
Description:
Brown slightly gravelly slightly sandy silty CLAY.

Specimen: 2

Consolidation Stage



Shear Stage



Processed by TG
Checked and Approved by
S Allen
S Allen - Senior Technician
16/10/2020

Project Number:
GEO / 31824
Project Name:
**PARKSIDE HOYLAND
AG3080D-20**



SHEAR STRENGTH BY DIRECT SHEAR

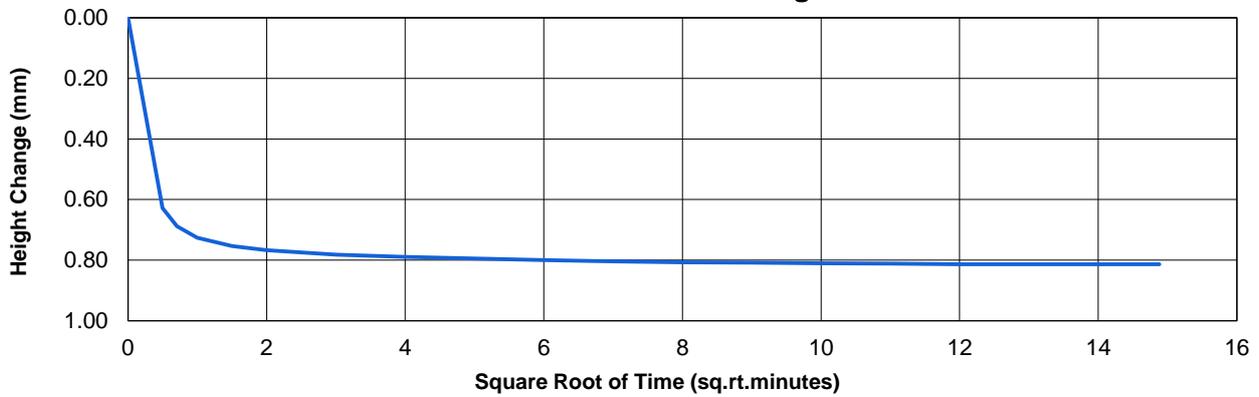
(small shearbox apparatus)

Borehole No	DCS6106
Sample No	OC
Depth (m)	1.00-1.45
Sample Type	UT

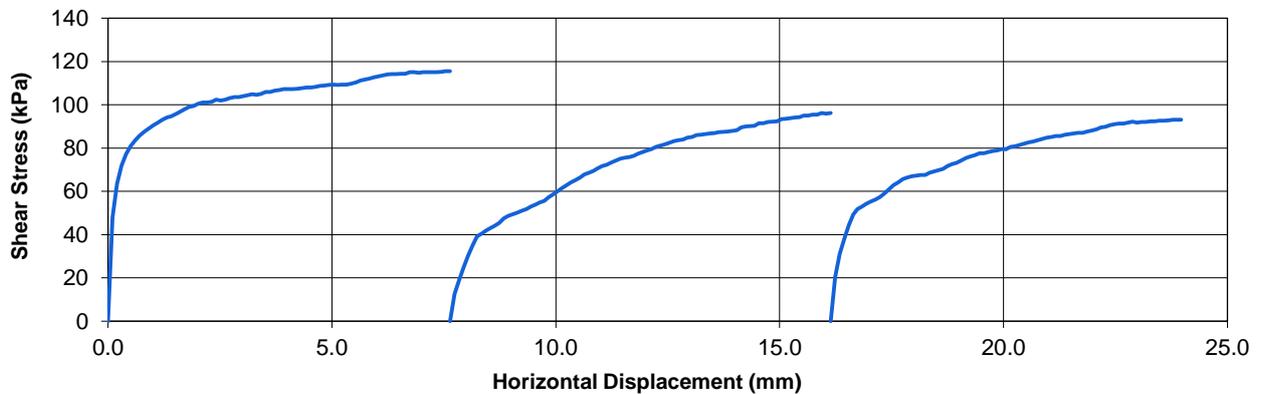
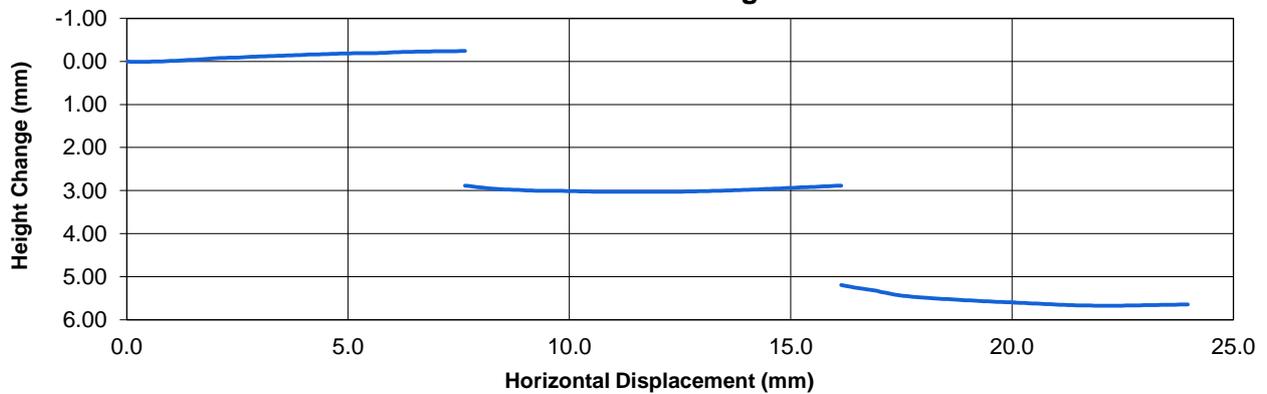
Description:
Brown slightly gravelly slightly sandy silty CLAY.

Specimen: 3

Consolidation Stage



Shear Stage



Processed by TG
Checked and Approved by
S Allen
S Allen - Senior Technician
16/10/2020

Project Number:
GEO / 31824

Project Name:
**PARKSIDE HOYLAND
AG3080D-20**





4041

**Adam Perks**

Applied Geology Ltd
Unit 23
Abbey Park
Stareton
Kenilworth
Warwickshire
CV8 2LY

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

t: 01923 225404**f:** 01923 237404**e:** reception@i2analytical.com**e:** Appliedgeology cc engineer**Analytical Report Number : 20-35149**

Project / Site name:	Parkside, Hoyland Common	Samples received on:	29/09/2020
Your job number:	AG3080D-20	Samples instructed on/ Analysis started on:	14/10/2020
Your order number:	16018	Analysis completed by:	20/10/2020
Report Issue Number:	1	Report issued on:	20/10/2020
Samples Analysed:	11 soil samples		

Signed:

Joanna Wawrzeczek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 20-35149

Project / Site name: Parkside, Hoyland Common

Your Order No: 16018

Lab Sample Number				1648092	1648093	1648094	1648095
Sample Reference				TT2101	TT2107A	TT2107B	DCS6102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60-0.60	0.50-0.50	0.50-0.50	0.70-0.70
Date Sampled				21/09/2020	21/09/2020	21/09/2020	22/09/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	3.9	8.6	9.9
Total mass of sample received	kg	0.001	NONE	1.1	1.1	1.1	1.1

General Inorganics

	pH Units	N/A	MCERTS	7.6	7.7	7.9	6.9
pH - Automated							
Total Sulphate as SO4	%	0.005	MCERTS	0.049	0.03	0.037	0.069
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	200	50	74	50
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.099	0.025	0.037	0.025
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	98.5	24.8	36.9	25.2
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	9.5	3.4	4.8	4
Total Sulphur	%	0.005	MCERTS	0.016	0.009	0.026	0.031
Water Soluble Nitrate (2:1) as NO3	mg/kg	2	NONE	7	20	17	6.9
Water Soluble Nitrate (2:1) as NO3 (leachate equivalent)	mg/l	5	NONE	< 5.0	9.7	8.5	< 5.0

Heavy Metals / Metalloids

	mg/kg	5	NONE	33	11	44	13
Magnesium (water soluble)							
Magnesium (leachate equivalent)	mg/l	2.5	NONE	16	5.3	22	6.5

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-35149

Project / Site name: Parkside, Hoyland Common

Your Order No: 16018

Lab Sample Number				1648096	1648097	1648098	1648099
Sample Reference				DCS6101	TT2104	TT2104	TP1414
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.20-2.20	1.20-1.20	1.00-1.00	0.40-0.40
Date Sampled				22/09/2020	22/09/2020	22/09/2020	21/09/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.6	14	10	6
Total mass of sample received	kg	0.001	NONE	1.1	1.1	1.1	1.1

General Inorganics

	pH Units	N/A	MCERTS	8.2	7.5	8.2	7.9
pH - Automated							
Total Sulphate as SO4	%	0.005	MCERTS	0.037	0.1	0.029	0.067
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	100	480	46	460
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.051	0.24	0.023	0.23
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	51	239	23	231
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.9	4.9	1.5	4.8
Total Sulphur	%	0.005	MCERTS	0.053	0.028	0.023	0.024
Water Soluble Nitrate (2:1) as NO3	mg/kg	2	NONE	< 2.0	< 2.0	2.6	< 2.0
Water Soluble Nitrate (2:1) as NO3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0

Heavy Metals / Metalloids

	mg/kg	5	NONE	22	79	17	76
Magnesium (water soluble)							
Magnesium (leachate equivalent)	mg/l	2.5	NONE	11	40	8.2	38

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-35149

Project / Site name: Parkside, Hoyland Common

Your Order No: 16018

Lab Sample Number				1648100	1648101	1648102
Sample Reference				TP1401	TP1410	TT2105
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				1.50-1.50	0.80-0.80	0.70-0.70
Date Sampled				23/09/2020	24/03/2020	22/09/2020
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	6.9	7.2	15
Total mass of sample received	kg	0.001	NONE	1.1	1.1	1.1

General Inorganics

	pH Units	N/A	MCERTS	7.5	7.8	6.7
pH - Automated	%	0.005	MCERTS	0.553	1.59	0.056
Total Sulphate as SO4	mg/kg	2.5	MCERTS	690	1500	360
Water Soluble Sulphate as SO4 16hr extraction (2:1)	g/l	0.00125	MCERTS	0.35	0.77	0.18
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	345	770	179
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	5.3	3.5	6.7
Total Sulphur	%	0.005	MCERTS	0.195	0.6	0.026
Water Soluble Nitrate (2:1) as NO3	mg/kg	2	NONE	< 2.0	17	< 2.0
Water Soluble Nitrate (2:1) as NO3 (leachate equivalent)	mg/l	5	NONE	< 5.0	8.4	< 5.0

Heavy Metals / Metalloids

	mg/kg	5	NONE	110	290	52
Magnesium (water soluble)	mg/l	2.5	NONE	55	150	26
Magnesium (leachate equivalent)						

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 20-35149

Project / Site name: Parkside, Hoyland Common

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1648092	TT2101	None Supplied	0.60-0.60	Brown sandy clay.
1648093	TT2107A	None Supplied	0.50-0.50	Brown sandy clay.
1648094	TT2107B	None Supplied	0.50-0.50	Brown clay and loam with vegetation and gravel
1648095	DCS6102	None Supplied	0.70-0.70	Brown clay and loam with gravel and vegetation.
1648096	DCS6101	None Supplied	2.20-2.20	Grey clay and loam.
1648097	TT2104	None Supplied	1.20-1.20	Brown clay and sand.
1648098	TT2104	None Supplied	1.00-1.00	Grey clay and sand with gravel.
1648099	TP1414	None Supplied	0.40-0.40	Brown sandy clay with gravel.
1648100	TP1401	None Supplied	1.50-1.50	Brown clay and loam with vegetation.
1648101	TP1410	None Supplied	0.80-0.80	Brown clay and loam with gravel.
1648102	TT2105	None Supplied	0.70-0.70	Light grey clay and sand.



Analytical Report Number : 20-35149

Project / Site name: Parkside, Hoyland Common

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample Deviation Report



Analytical Report Number : 20-35149

Project / Site name: Parkside, Hoyland Common

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP1410	None Supplied	S	1648101	c	Chloride, water soluble, in soil	L082-PL	c
TP1410	None Supplied	S	1648101	c	Nitrate, water soluble, in soil	L078-PL	c
TP1410	None Supplied	S	1648101	c	Water Soluble Nitrate (2:1) as N in soil	L078-PL	c
TP1410	None Supplied	S	1648101	c	Water Soluble Nitrate (leachate equivalent)	L078-PL	c
TP1410	None Supplied	S	1648101	c	pH in soil (automated)	L099-PL	c

APPENDIX F

CONTAMINATION ASSESSMENT PROCEDURES

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.

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.



4041

**Adam Perks**

Applied Geology Ltd
Unit 23
Abbey Park
Stareton
Kenilworth
Warwickshire
CV8 2LY

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

t: 01923 225404**f:** 01923 237404**e:** reception@i2analytical.com**e:** Appliedgeology cc engineer**Analytical Report Number : 20-33372**

Project / Site name:	Parkside, Hoyland Common	Samples received on:	29/09/2020
Your job number:	AG3080D-20	Samples instructed on/ Analysis started on:	01/10/2020
Your order number:	16021	Analysis completed by:	08/10/2020
Report Issue Number:	1	Report issued on:	08/10/2020
Samples Analysed:	5 leachate samples - 18 soil samples		

Signed:

Joanna Wawrzeczek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number	1637925	1637926	1637927	1637928
Sample Reference	TP1404	TP1405	TP1414	TP1415
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1.20	0.70	0.90	0.10
Date Sampled	22/09/2020	23/09/2020	21/09/2020	21/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	Accreditation

General Inorganics

Parameter	Units	Limit of detection	Accreditation Status	1637925	1637926	1637927	1637928
pH	pH Units	N/A	ISO 17025	7.1	7.2	7.5	7.3
Sulphate as SO4	mg/l	0.1	ISO 17025	48.1	8.3	57.3	11.4

Speciated PAHs

Parameter	Units	Limit of detection	Accreditation Status	1637925	1637926	1637927	1637928
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Parameter	Units	Limit of detection	Accreditation Status	1637925	1637926	1637927	1637928
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2

Heavy Metals / Metalloids

Parameter	Units	Limit of detection	Accreditation Status	1637925	1637926	1637927	1637928
Arsenic (dissolved)	µg/l	1.1	ISO 17025	2.4	< 1.1	< 1.1	< 1.1
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.3	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	23	31	22	42
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	1.2	< 0.4	1.9
Copper (dissolved)	µg/l	0.7	ISO 17025	7.4	7	2.5	8.8
Lead (dissolved)	µg/l	1	ISO 17025	2.2	4.7	< 1.0	2.3
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.6	3.7	2.7	3.7
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	9.7	8.9	5.5	11

Magnesium (dissolved)	mg/l	0.005	ISO 17025	8.2	3.3	14	3.9
-----------------------	------	-------	-----------	-----	-----	----	-----

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number					1637929
Sample Reference					TT2103A
Sample Number					None Supplied
Depth (m)					0.20
Date Sampled					22/09/2020
Time Taken					None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	Accreditation Station	

General Inorganics

pH	pH Units	N/A	ISO 17025	7.1
Sulphate as SO4	mg/l	0.1	ISO 17025	8.8

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2
-------------------	------	-----	------	-------

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	57
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.8
Copper (dissolved)	µg/l	0.7	ISO 17025	11
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	4
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	2.4
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.3

Magnesium (dissolved)	mg/l	0.005	ISO 17025	2.7
-----------------------	------	-------	-----------	-----

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number	1637907	1637908	1637909	1637910
Sample Reference	DCS6101	DCS6101	DCS6102	DCS6105
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.15	2.20	0.70	0.20
Date Sampled	22/09/2020	22/09/2020	22/09/2020	22/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	7.4	14	18
Total mass of sample received	kg	0.001	NONE	1.2	1.4	1.4	1

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	8.2	5.8	6.5
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	20	130	170	39
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0099	0.064	0.084	0.02
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	9.9	64.4	84.4	19.7
Organic Matter	%	0.1	MCERTS	3	0.8	0.2	4.5

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.34	< 0.05	< 0.05	0.41
Pyrene	mg/kg	0.05	MCERTS	0.34	< 0.05	< 0.05	0.43
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.27
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.29
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.34
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.16
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	2.11
-----------------------------	-------	-----	--------	--------	--------	--------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	8.8	7.2	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1	1.2	1.4	1.4
Boron (total)	mg/kg	1	MCERTS	3.7	5	2.1	4.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2	< 0.2	0.4
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	22	19	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	36	35	34
Lead (aqua regia extractable)	mg/kg	1	MCERTS	32	21	21	61
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	59	39	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.1	< 1.0	< 1.0	1.6
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	27	23	17	39
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	90	110	95	98

Magnesium (water soluble)	mg/kg	5	NONE	9.8	40	42	21
---------------------------	-------	---	------	-----	----	----	----

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-



Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number					1637907	1637908	1637909	1637910
Sample Reference					DCS6101	DCS6101	DCS6102	DCS6105
Sample Number					None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)					0.15	2.20	0.70	0.20
Date Sampled					22/09/2020	22/09/2020	22/09/2020	22/09/2020
Time Taken					None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number	1637911	1637912	1637913	1637914
Sample Reference	DCS6107	DCS6108	DCS6109	TP1401
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20	0.20	1.80	1.50
Date Sampled	21/09/2020	21/09/2020	21/09/2020	23/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	20	18	13	17
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.6	6.5	6.1	5.4
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	86	49	370	610
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.043	0.025	0.19	0.3
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	43	24.7	185	304
Organic Matter	%	0.1	MCERTS	5.1	4.9	1.9	1.1

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.45	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.43	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	0.88	< 0.80	< 0.80	< 0.80
-----------------------------	-------	-----	--------	------	--------	--------	--------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	16	9.5	5.6
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.2	1.1	1.1
Boron (total)	mg/kg	1	MCERTS	3.9	3.4	2.6	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.5	0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	25	20	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	29	31	40
Lead (aqua regia extractable)	mg/kg	1	MCERTS	53	45	18	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	24	43	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	1.5	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	44	41	24	23
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	96	110	92	87

Magnesium (water soluble)	mg/kg	5	NONE	52	28	62	98
---------------------------	-------	---	------	----	----	----	----

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-



Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number				1637911	1637912	1637913	1637914
Sample Reference				DCS6107	DCS6108	DCS6109	TP1401
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	1.80	1.50
Date Sampled				21/09/2020	21/09/2020	21/09/2020	23/09/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	-	ND	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number	1637915	1637916	1637917	1637918
Sample Reference	TP1401	TP1403	TP1404	TP1405
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	3.00	1.20	1.20	0.70
Date Sampled	23/09/2020	24/09/2020	22/09/2020	23/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	17	13	13
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.7	5.4	7.3	7.5
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130	250	350	39
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.063	0.12	0.17	0.02
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	63	123	174	19.6
Organic Matter	%	0.1	MCERTS	1.5	1	2.2	1.5

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80
-----------------------------	-------	-----	--------	--------	--------	--------	--------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.2	12	8.6	7.2
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.75	1.2	1.2	1.1
Boron (total)	mg/kg	1	MCERTS	3.1	2.7	4.6	3.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	28	22	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	48	31	32	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	20	23	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	26	46	36
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	18	38	24	24
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	63	95	78

Magnesium (water soluble)	mg/kg	5	NONE	37	34	60	17
---------------------------	-------	---	------	----	----	----	----

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-



Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number				1637915	1637916	1637917	1637918
Sample Reference				TP1401	TP1403	TP1404	TP1405
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	1.20	1.20	0.70
Date Sampled				23/09/2020	24/09/2020	22/09/2020	23/09/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-33372
 Project / Site name: Parkside, Hoyland Common
 Your Order No: 16021

Lab Sample Number	1637919	1637920	1637921	1637922
Sample Reference	TP1414	TP1415	TT2101	TT2103A
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.90	0.10	0.10	0.20
Date Sampled	21/09/2020	21/09/2020	21/09/2020	22/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.9	15	15	17
Total mass of sample received	kg	0.001	NONE	1	1	1	1

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	6.8	7	6.6
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	430	45	72	35
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.22	0.022	0.036	0.018
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	215	22.4	35.9	17.6
Organic Matter	%	0.1	MCERTS	1.8	3.5	4	3.7

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.25
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.44	0.56
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.42	0.55
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27	0.31
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28	0.34
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.4
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.15
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	1.41	2.77
-----------------------------	-------	-----	--------	--------	--------	------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	13	15	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.1	1.3	1.2
Boron (total)	mg/kg	1	MCERTS	4.5	4.2	4.9	4.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.3	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	24	26	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	28	34	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	37	49	44
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	42	24	31	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	27	36	37	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	95	95	110	95

Magnesium (water soluble)	mg/kg	5	NONE	83	26	40	43
---------------------------	-------	---	------	----	----	----	----

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-



Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number				1637919	1637920	1637921	1637922
Sample Reference				TP1414	TP1415	TT2101	TT2103A
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.10	0.10	0.20
Date Sampled				21/09/2020	21/09/2020	21/09/2020	22/09/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	-	ND	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number				1637923	1637924
Sample Reference				TT2105B	TT2107B
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.10
Date Sampled				22/09/2020	21/09/2020
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.1	16
Total mass of sample received	kg	0.001	NONE	0.5	1

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	6.9
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	190	34
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.097	0.017
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	97.4	17
Organic Matter	%	0.1	MCERTS	1.2	4

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80
-----------------------------	-------	-----	--------	--------	--------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1	1.1
Boron (total)	mg/kg	1	MCERTS	4.7	4.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	30
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	36
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	45	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	110

Magnesium (water soluble)	mg/kg	5	NONE	65	55
---------------------------	-------	---	------	----	----

SVOCs

Aniline	mg/kg	0.1	NONE	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-



Analytical Report Number: 20-33372

Project / Site name: Parkside, Hoyland Common

Your Order No: 16021

Lab Sample Number				1637923	1637924
Sample Reference				TT2105B	TT2107B
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.10
Date Sampled				22/09/2020	21/09/2020
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	-	-
SVOC % Match	%	N/A	NONE	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 20-33372

Project / Site name: Parkside, Hoyland Common

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1637907	DCS6101	None Supplied	0.15	Brown clay and sand with vegetation.
1637908	DCS6101	None Supplied	2.2	Grey clay with gravel.
1637909	DCS6102	None Supplied	0.7	Light brown clay.
1637910	DCS6105	None Supplied	0.2	Brown clay and loam with vegetation and gravel
1637911	DCS6107	None Supplied	0.2	Brown clay and loam with vegetation and gravel
1637912	DCS6108	None Supplied	0.2	Brown clay and loam with vegetation and gravel
1637913	DCS6109	None Supplied	1.8	Brown clay with gravel.
1637914	TP1401	None Supplied	1.5	Light grey clay and sand with vegetation.
1637915	TP1401	None Supplied	3	Grey clay with vegetation.
1637916	TP1403	None Supplied	1.2	Light brown clay with gravel.
1637917	TP1404	None Supplied	1.2	Grey clay and sand with vegetation.
1637918	TP1405	None Supplied	0.7	Light brown clay with gravel.
1637919	TP1414	None Supplied	0.9	Brown clay and sand with vegetation and gravel
1637920	TP1415	None Supplied	0.1	Brown clay and loam with vegetation and gravel
1637921	TT2101	None Supplied	0.1	Brown clay and loam with vegetation and gravel
1637922	TT2103A	None Supplied	0.2	Brown clay and loam with vegetation and gravel
1637923	TT2105B	None Supplied	0.5	Grey clay and sand with vegetation.
1637924	TT2107B	None Supplied	0.1	Brown clay and loam with vegetation and gravel

Analytical Report Number : 20-33372

Project / Site name: Parkside, Hoyland Common

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In house method.	L005-PL	W	ISO 17025
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Tentatively identified compounds (SVOC) in soil	Determination of semi-volatile organic compounds total ion count in soil by extraction with dichloromethane and hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L064-PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS



Analytical Report Number : 20-33372

Project / Site name: Parkside, Hoyland Common

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
----------------------	-------------------------------	-----------------------------	---------------	--------------------	----------------------

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

SOIL CHEMICAL RESULTS COMPARED AGAINST SCREENING VALUES FOR HUMAN HEALTH

Site: Parkside, Hoyland Common, Barnsley
 Job No: AG3080D-20
 Land Use: Public Open Space (Parks)
 Dataset: All materials
 Soil Organic Matter (%): 2.5 %

Exploratory Hole Reference		DCS6101	DCS6105	DCS6107	DCS6108	TT2101	TT2103A	TT2107B	DCS6101	DCS6109	TP1404	TP1405	TP1414	TT2105B	TP1415	DCS6102	TP1401	TP1401	TP1403	No. of samples (n)	Public Open Space (Parks)	Source/Justification
Depth (m)		0.15	0.20	0.20	0.20	0.10	0.20	0.10	2.20	1.80	1.20	0.70	0.90	0.50	0.10	0.70	1.50	3.00	1.20			
Strata		TS/MG	TS/MG	TS/MG	TS/MG	TS/MG	TS/MG	TS/MG	MG-OC	MG-OC	MG-OC	MG-OC	MG-OC	MG-OC	TS	PMCMF	PMCMF	PMCMF	PMCMF			
	Units																					
Organic Matter (%)	%	3.0	4.5	5.1	4.9	4.0	3.7	4.0	0.8	1.9	2.2	1.5	1.8	1.2	3.5	0.2	1.1	1.5	1.0	18		
pH		7.5	6.5	6.6	6.5	7.0	6.6	6.9	8.2	6.1	7.3	7.5	7.3	7.5	6.8	5.8	5.4	6.7	5.4	18		
Arsenic	mg/kg	12.0	18.0	17.0	16.0	15.0	15.0	12.0	8.8	9.5	8.6	7.2	10.0	7.0	13.0	7.2	5.6	6.2	12.0	18	170	LQM/CIEH S4UL (2015)
Beryllium	mg/kg	1.0	1.4	1.2	1.2	1.3	1.2	1.1	1.2	1.1	1.2	1.1	1.1	1.0	1.1	1.4	1.1	0.8	1.2	18	63	LQM/CIEH S4UL (2015)
Boron	mg/kg	3.7	4.1	3.9	3.4	4.9	4.4	4.4	5.0	2.6	4.6	3.7	4.5	4.7	4.2	2.1	2.3	3.1	2.7	18	46000	LQM/CIEH S4UL (2015)
Cadmium	mg/kg	0.3	0.4	0.4	0.5	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	18	560	LQM/CIEH S4UL (2015)
Chromium	mg/kg	20	21	25	25	26	24	28	22	20	22	21	22	22	24	19	22	20	28	18	33000	LQM/CIEH S4UL (2015)
Copper	mg/kg	28	34	34	29	34	27	30	36	31	32	27	31	34	28	35	40	48	31	18	44000	LQM/CIEH S4UL (2015)
Lead	mg/kg	32	61	53	45	49	44	36	21	18	23	17	20	18	37	21	17	20	20	18	1300	C4SL (2014)
Mercury	mg/kg	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	18	240	LQM/CIEH S4UL (2015)
Nickel	mg/kg	28	21	23	24	31	23	32	59	43	46	36	42	45	24	39	34	19	26	18	800	LQM/CIEH S4UL (2015)
Selenium	mg/kg	1.1	1.6	1.6	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	18	1800	LQM/CIEH S4UL (2015)
Vanadium	mg/kg	27	39	44	41	37	36	40	23	24	24	24	27	20	36	17	23	18	38	18	5000	LQM/CIEH S4UL (2015)
Zinc	mg/kg	90	98	96	110	110	95	110	110	92	95	78	95	110	95	95	87	51	63	18	170000	LQM/CIEH S4UL (2015)
Naphthalene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	1900	LQM/CIEH S4UL (2015)
Acenaphthylene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	30000	LQM/CIEH S4UL (2015)
Acenaphthene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	30000	LQM/CIEH S4UL (2015)
Fluorene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	20000	LQM/CIEH S4UL (2015)
Phenanthrene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.25	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	6200	LQM/CIEH S4UL (2015)
Anthracene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	150000	LQM/CIEH S4UL (2015)
Fluoranthene	mg/kg	0.34	0.41	0.45	0.05	0.44	0.56	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	6300	LQM/CIEH S4UL (2015)
Pyrene	mg/kg	0.34	0.43	0.43	0.05	0.42	0.55	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	15000	LQM/CIEH S4UL (2015)
Benzo[a]anthracene	mg/kg	0.05	0.27	0.05	0.05	0.27	0.31	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	56	LQM/CIEH S4UL (2015)
Chrysene	mg/kg	0.05	0.29	0.05	0.05	0.28	0.34	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	110	LQM/CIEH S4UL (2015)
Benzo[b]fluoranthene	mg/kg	0.05	0.34	0.05	0.05	0.05	0.4	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	15	LQM/CIEH S4UL (2015)
Benzo[k]fluoranthene	mg/kg	0.05	0.16	0.05	0.05	0.05	0.15	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	410	LQM/CIEH S4UL (2015)
Benzo[a]pyrene	mg/kg	0.05	0.21	0.05	0.05	0.05	0.21	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	12	LQM/CIEH S4UL (2015)
Dibenzo[a,h]anthracene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	1.3	LQM/CIEH S4UL (2015)
Indeno[1,2,3-cd]pyrene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	170	LQM/CIEH S4UL (2015)
Benzo[g,h,i]perylene	mg/kg	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	18	1500	LQM/CIEH S4UL (2015)
Total of 16 PAHs	mg/kg	0.80	2.11	0.88	0.80	1.41	2.77	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	18		
Pesticides suite	mg/kg	-	-	-	*	-	-	-	-	-	-	-	-	-	*	-	-	-	-	0	690	LQM/CIEH S4UL (2015)

Key -
 Value within sample set exceeds screening value
 * All SVOCs + TICs (pesticide suite) were below detection limits.
 LQM/CIEH S4UL Reference No. S4UL3159 (2015)
 Values in bold are reported at the laboratory limit of detection

SUMMARY OF LEACHATE RESULTS

Site Parkside, Hoyland Common, Barnsley
 Job Number AG3080D-20
 Type of Water Leachate

Determinand	Limit of Detection	Hazardous or Non-Hazardous [^]	Sample Identity Depth Sampled Date	TP1404 1.20 MG-OC	TP1405 0.70 MG-OC	TP1414 0.90 MG-OC	TP1415 0.10 TS	TT2103A 0.20 TS/MG	No. of samples (n)	Waters Screening Value	Source & Justification
pH		-	-	7.1	7.2	7.5	7.3	7.1	5	-	-
Arsenic		Haz	µg l ⁻¹	2.4	1.1	1.1	1.1	1.1	5	50	WFD Environmental Standard, 2010
Cadmium		Non Haz	µg l ⁻¹	0.08	0.08	0.08	0.08	0.08	5	1.5	WFD Environmental Standard, 2010
Chromium (Total)		Non Haz	µg l ⁻¹	0.4	1.2	0.4	1.9	0.8	5	50	UK Drinking Water Standards (2010)
Copper		Non Haz	µg l ⁻¹	7.4	7	2.5	8.8	11	5	28	WFD Environmental Standard, 2010
Lead		Haz	µg l ⁻¹	2.2	4.7	1.0	2.3	1.0	5	7.2	WFD Environmental Standard, 2010
Mercury		Haz	µg l ⁻¹	0.5	0.5	0.5	0.5	0.5	5	0.07	WFD Environmental Standard, 2010
Nickel		Non Haz	µg l ⁻¹	2.6	3.7	2.7	3.7	4.0	5	20	WFD Environmental Standard, 2010
Selenium		Non Haz	µg l ⁻¹	4.0	4.0	4.0	4.0	4.0	5	10	UK Drinking Water Standards (2010)
Zinc		Non Haz	µg l ⁻¹	9.7	8.9	5.5	11	5.3	5	125	WFD Environmental Standard, 2010
Boron		Non Haz	µg l ⁻¹	23	31	22	42	57	5	1000	UK Drinking Water Standards (2010)
Beryllium		Non Haz	µg l ⁻¹	0.2	0.3	0.2	0.2	0.2	5	12	UK Drinking Water Standards (2010)
Vanadium		Non Haz	µg l ⁻¹	1.7	1.7	1.7	1.7	2.4	5	60	EQS
Magnesium		Non Haz	mg l ⁻¹	8.2	3.3	14	3.9	2.7	5	-	
Sulphate		Non Haz	mg l ⁻¹	48.1	8.3	57.3	11.4	8.8	5	250	UK Drinking Water Standards (2010)
Naphthalene		Non Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	2.4	WFD Environmental Standard, 2010
Acenaphthylene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.01	Detection limit
Acenaphthene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.01	Detection limit
Fluorene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.01	Detection limit
Phenanthrene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.01	Detection limit
Anthracene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.4	WFD Environmental Standard, 2010
Fluoranthene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	1	WFD Environmental Standard, 2010
Pyrene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.01	Detection limit
Benzo[a]anthracene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.01	Detection limit
Chrysene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.01	Detection limit
Benzo[b]fluoranthene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.03	WFD Environmental Standard, 2010
Benzo[k]fluoranthene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.03	WFD Environmental Standard, 2010
Benzo[a]pyrene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.1	WFD Environmental Standard, 2010
Dibenz(a,h)Anthracene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.01	Detection limit
Indeno(1,2,3-c,d)Pyrene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.002	WFD Environmental Standard, 2010
Benzo[g,h,i]perylene		Haz	µg l ⁻¹	0.01	0.01	0.01	0.01	0.01	5	0.002	WFD Environmental Standard, 2010

Key-
 Result exceeds test Detection Limit (for Haz determinands)
 Result exceeds Screening Value (for Non Haz determinands)
 Values in bold at the limit of detection

[^] Note: Hazardous and non-hazardous substances determined by JAGDAG (Jan 2017) and published at <http://www.wfd.uk.org/sites/default/files/Media/170116%20Substance%20Determinationsfinal.pdf>. These are marked in bold.

For substances not assessed by JAGDAG, Applied Geology has assumed a determination based on our understanding of the behaviour of the chemical. These determinations are highlighted in yellow.

APPENDIX G

Risk ID	Hazard	Consequences	Qualitative Risk Level (High /Medium/Low/ Negligible)	Comments & Possible Mitigation Measures
1	Uncertain or variable thickness of Made Ground – relating to the opencast backfilling	<ul style="list-style-type: none"> • Increased construction costs • Programme delays • Construction difficulties <p>All due to effects of excessive total and differential settlements (applies to sports pitches, car parking, roads and services)</p>	Medium/High	<p>SI shows depth of opencast backfill to at least 11m. However, abandonment plans indicate opencast depths could extend as deep as 26m bgl in some locations. There was some variation in high wall locations, but they were largely as indicated by the abandonment plans. The proposed engineered fill above the opencast backfill will induce some settlement. All design including roads and services (especially drainage) to be designed to accommodate some movements.</p>
2	Possible unrecorded coal and/or ironstone workings	Increased construction costs and programme delays due to need to drill and grout to stabilise old workings	Low	<p>SI evidence does not suggest coal mined at shallow depth (other than by opencast). Given the date, depth and extent of the opencast mine in this area, there are not anticipated to be any unrecorded underground shallow coal mine working present at the site. However, the Dunsil (Harley) Seam is shown to outcrop in the north-western corner of the site just outside the opencast boundary and therefore potential old shallow workings (probably via bell pits) could theoretically exist here. Several trial pits were undertaken in this area as part of the ground investigation works no evidence of shallow workings or shafts was identified. Low sensitivity end-use – no occupied buildings proposed. Maintain vigilance during siteworks and report unexpected features to a competent person.</p>
3	Possible presence of unrecorded mine shafts	<p>Increased construction costs and programme delays due to:</p> <ul style="list-style-type: none"> • Risk of sudden collapse of ground; • Need to drill and grout and/or cap – increased construction costs. 	Low	<p>No mine shafts recorded on site. Given the date, depth and extent of the opencast mine in this area, there are not anticipated to be any unrecorded underground shallow coal mine working present at the site. See comments above re. Harley Seam and Ground Investigation findings. Maintain vigilance during siteworks and report unexpected features to a competent person.</p>
4	Location and extent of geological faulting (variation in weathering profile and strength as a result of faulting and other geological factors)	Increased construction costs and programme delays due to possible implications for reduced slope stability if fault intersected in cut slope.	Low	<p>Minor faulting was noted in the opencast mine (also shown on the underground mine plan) and another fault is mapped immediately west of the site, however, these are not considered likely to affect the proposed development.</p>

5	Unexpected or high groundwater conditions, including water ingress from land drains and un-mapped surface drainage	Increased construction costs and programme delays due to: <ul style="list-style-type: none"> • Water ingress during cut operation • Softening of strata being excavated • Reduced stability of slopes in areas of cut 	Medium	SI suggests a consistent shallow groundwater profile is absent levels, however pockets of perched groundwater and a seasonally raised groundwater table has been experienced on the main Hoyland site, especially within opencast backfill materials. Some degree of moisture modification to be assumed during earthworks. Temporary and permanent drainage measures to be incorporated, especially at cut slopes.
6	Sulphate-rich, potentially pyritic ground and acidic conditions	<ul style="list-style-type: none"> • Increased costs for buried concrete • Increased costs and construction difficulties (earthworks) if strata unsuitable for lime modification? 	Medium/High	SI suggests DS-2 and AC-3z conditions. Buried concrete to be specified for these conditions. Significant number of tests undertaken - sulphates generally low enough for use of lime. Contractor to do lime suitability testing/lab trials.
7	Unsuitable soils for re-use as engineered fill (for geotechnical reasons)	Increased construction costs and programme delays due to: <ul style="list-style-type: none"> • Additional measures needed to render cut materials suitable for use as engineered fill • Disposal costs if unsuitable (e.g. too organic, coal) • Possible double handling of materials 	Medium	A proportion of the soils to be excavated are wetter/drier than optimum, so moisture modification will be required. Earthworks Contractor to do lime suitability testing/lab trials. Oversize materials are present in the opencast backfill (including large boulders) and areas of excavation in bedrock may generate further quantities of further over size materials. As this will include siltstones and sandstones, some crushing and screening may be required to render the materials suitable for use as engineered fill.
8	Variability of suitable soils for re-use as engineered fill	Increased construction costs and programme delays due to: <ul style="list-style-type: none"> • Variability in geotechnical properties may mean different compaction techniques and/or different compaction plant • Possible double handling of materials 	Medium	SI shows variable geotechnical properties of both opencast backfill and in situ coal measures strata, particular significant variation in maximum dry density, optimum moisture content, liquid limit and grading. Careful excavation of cut materials and segregation of suitable materials into different classes of material will be required. Appropriate selection of compaction plant. Appropriate earthworks specification to be prepared with suitable testing criteria and acceptance criteria.
9	Difficult excavation of rock strength materials in areas of cut	Increased construction costs, construction difficulties and programme delays due to: <ul style="list-style-type: none"> • Reduced rate of excavation • Additional plant needed • Increase in oversize materials for re-use 	Medium	SI indicates locally excavation of rock strength material might be required. Crusher and screen may be needed on site to process some more competent materials.

10	Slope stability, particularly where placing engineered fill over uncontrolled opencast backfill materials.	Increased construction costs, construction difficulties and programme delays due to collapse of engineered fill slope during construction.	Medium	Slopes to be designed on conservative parameters for highly variable opencast backfill material. Amend slope angles or use of measures such as shear keys, ground improvement where marginal stability at preferred slope angles. Adequate drainage will be required for toes of slopes and, for some slopes, possibly also along the crests. Detailed slope stability assessments being undertaken to steer appropriate measures.
11	Contamination within opencast backfill materials	Increased construction costs and programme delays due to materials being unsuitable for re-use on site and need to either dispose off-site or on-site remediation and need for double handling.	Low	SI suggests no contamination present. Include procedures on measures to deal with unexpected contamination in earthworks specification and/or contract documents.
12	Inability for balancing pond to retain sufficient water - water drains out of pond through permeable materials (sandstones/siltstones), voids within material	<ul style="list-style-type: none"> Increased construction costs Programme delays Construction difficulties <p>Water not retained leading to ingress of water into backfill materials causes inundation settlement and collapse of materials/excessive settlement.</p>	High	Ground investigation identified some natural materials to be relatively permeable. Mitigate this hazard by designing the balancing pond to include a suitably impermeable liner.
13	Slope instability – cut slopes of balancing pond.	<ul style="list-style-type: none"> Increased construction costs Programme delays Construction difficulties <p>Collapse of pond sides leading to lack of function of pond and water loss.</p>	Medium	Ground investigation identified opencast materials as likely to be unstable on cut slopes at steep angles. Ensure safe slope angle for cut faces, consider re-engineering of cut slope where composed of opencast materials. Consider suitable engineered fill placement so as not to create artificial slip surfaces between re-engineered layers. Ensure impermeable liner functions to prevent weakening of materials from saturation.

Risk categories:

- Negligible: Geohazards that might have unacceptable impact on the development, are unlikely to be present, or, have been proven to be too far from or too deep beneath the site to have a significant influence.
- Low Risk: Geohazards may be present but are unlikely to have an unacceptable impact on the development.
- Medium Risk: Geohazards are probably present and might have an unacceptable impact on the development. Therefore, remedial measures or appropriate design may be necessary to reduce the risks.
- High Risk: Geohazards probably or certainly present and likely to have an unacceptable impact on the development. Remedial measures or appropriate design are likely to be necessary to reduce the risks to acceptable levels.