

Test Report:

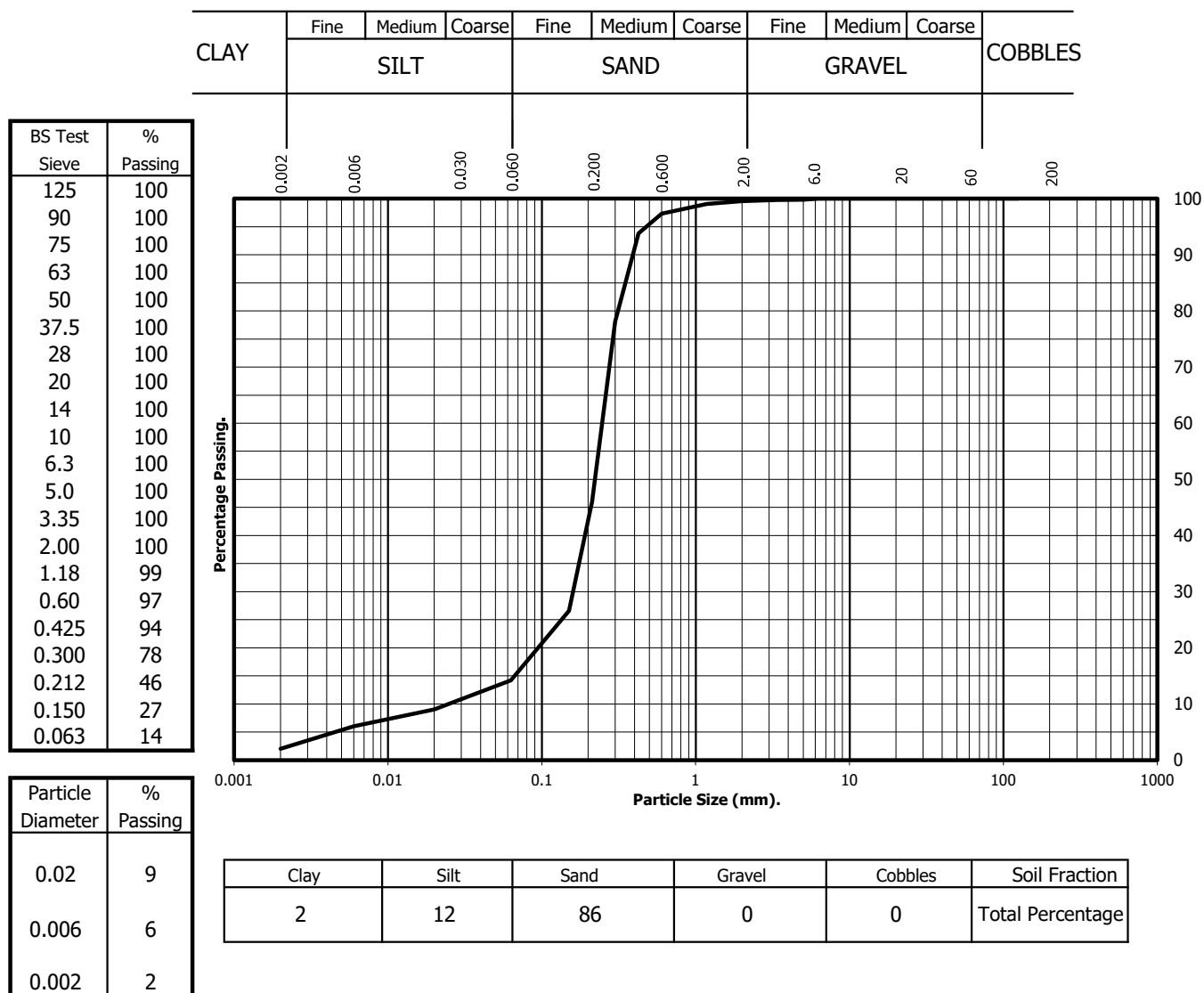
Particle Size Distribution Test BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref: 34529100
Contract Number: 31699
Hole Number: WS09

Sample Number:
Depth from (m): 3.40
Depth to (m): 5.00
Sample Type: B

Location: Castlebrook
Description: Brown slightly clayey silty fine to coarse SAND.


Remarks:

CI 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Ben Sharp (Contracts Manager)

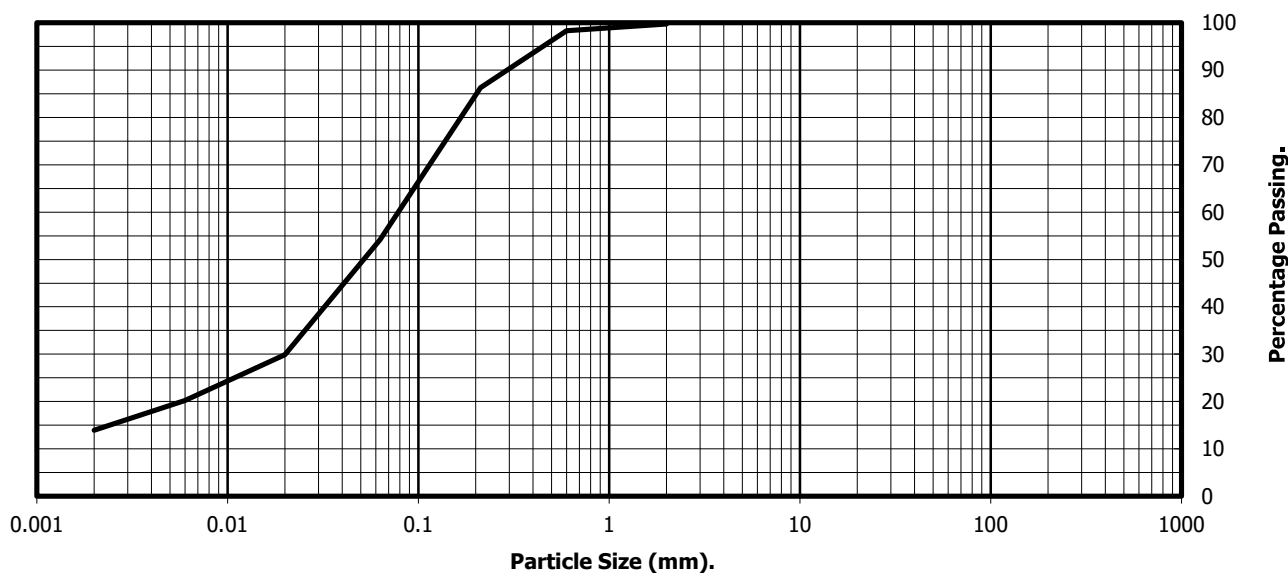
Date: 5.9.16

Particle Size Distribution Test

BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Hole Number: BH04
Sample Number: 8
Depth from (m) : 4.50
Depth to (m) : 4.80
Description : Brown clayey silty SAND.
Sample Type: D



BS Test Sieve	Percentage Passing
2.00	100
0.60	98
0.212	86
0.063	54

Particle Diameter	Percentage Passing
0.02	30
0.006	20
0.002	14

Soil Fraction	Total Percentage
Gravel	0
Sand	46
Silt	40
Clay	14

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:

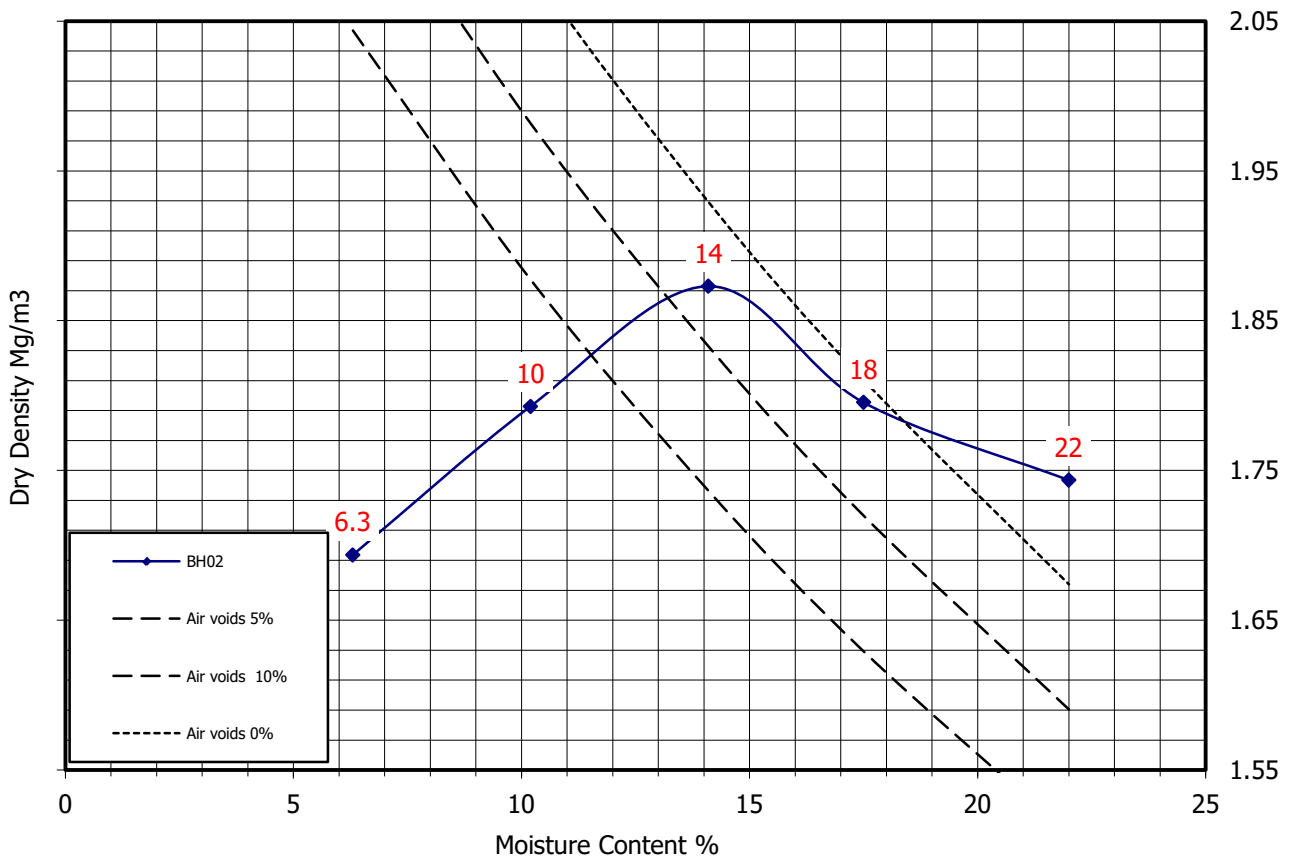
Ben Sharp (Contracts Manager)

Date: 13.10.16

Dry Density/Moisture Content Relationship

BS 1377:Part 4:1990

Client ref: **34529110**
 Location: **Casltebrook**
 Contract Number: **31699**
 Hole Number: **BH02**
 Sample Number: **5**
 Depth (m): **2.00 - 2.90**
 Sample Type: **B**



Compaction Point:	1	2	3	4	5
Moisture Content:	6.3	10	14	17.5	22.0
Bulk Density (Mg/m³):	1.80	1.98	2.14	2.11	2.13
Dry Density (Mg/m³):	1.69	1.79	1.87	1.80	1.74

Initial Moisture Content: **18** Method of Compaction: **2.5kg Rammer**
 Particle Density (Mg/m³): **2.65 Assumed** Material Retained on 37.5 mm Test Sieve (%): **0**
 Maximum Dry Density (mg/m³): **1.87** Material Retained on 20.0 mm Test Sieve (%): **0**
 Optimum Moisture Content (%): **14** Sample Preparation Clause: **3.2.4.1**

Remarks:



Checked By:
Ben Sharp

Date Approved:

Approved By:
Paul Evans

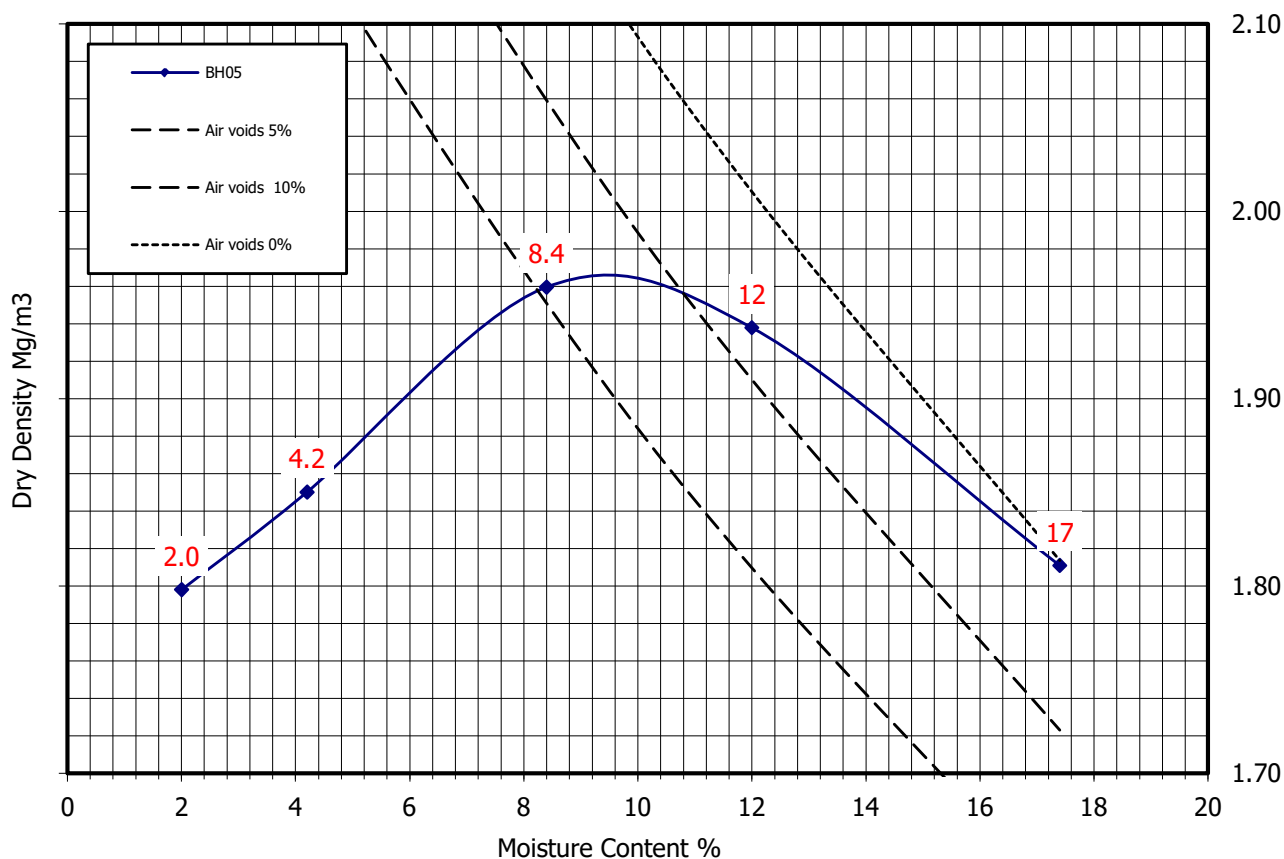
13.10.16



Dry Density/Moisture Content Relationship

BS 1377:Part 4:1990

Client ref: 34529100
 Location: Castlebrook
 Contract Number: 31699
 Hole Number: BH05
 Sample Number: 6
 Depth (m): 3.50 - 3.75
 Sample Type: B



Compaction Point:	1	2	3	4	5
Moisture Content:	2.0	4.2	8.4	12.0	17.4
Bulk Density (Mg/m³):	1.83	1.93	2.12	2.17	2.13
Dry Density (Mg/m³):	1.80	1.85	1.96	1.94	1.81

Initial Moisture Content: 17 Method of Compaction: 2.5kg Rammer
 Particle Density (Mg/m³): 2.65 Assumed Material Retained on 37.5 mm Test Sieve (%): 0
 Maximum Dry Density (mg/m³): 1.96 Material Retained on 20.0 mm Test Sieve (%): 0
 Optimum Moisture Content (%): 8.4 Sample Preparation Clause: 3.2.4.1

Remarks:

Checked By:
Ben Sharp

[Signature]

Date Approved:

Approved By:
Paul Evans

[Signature]

5.9.16



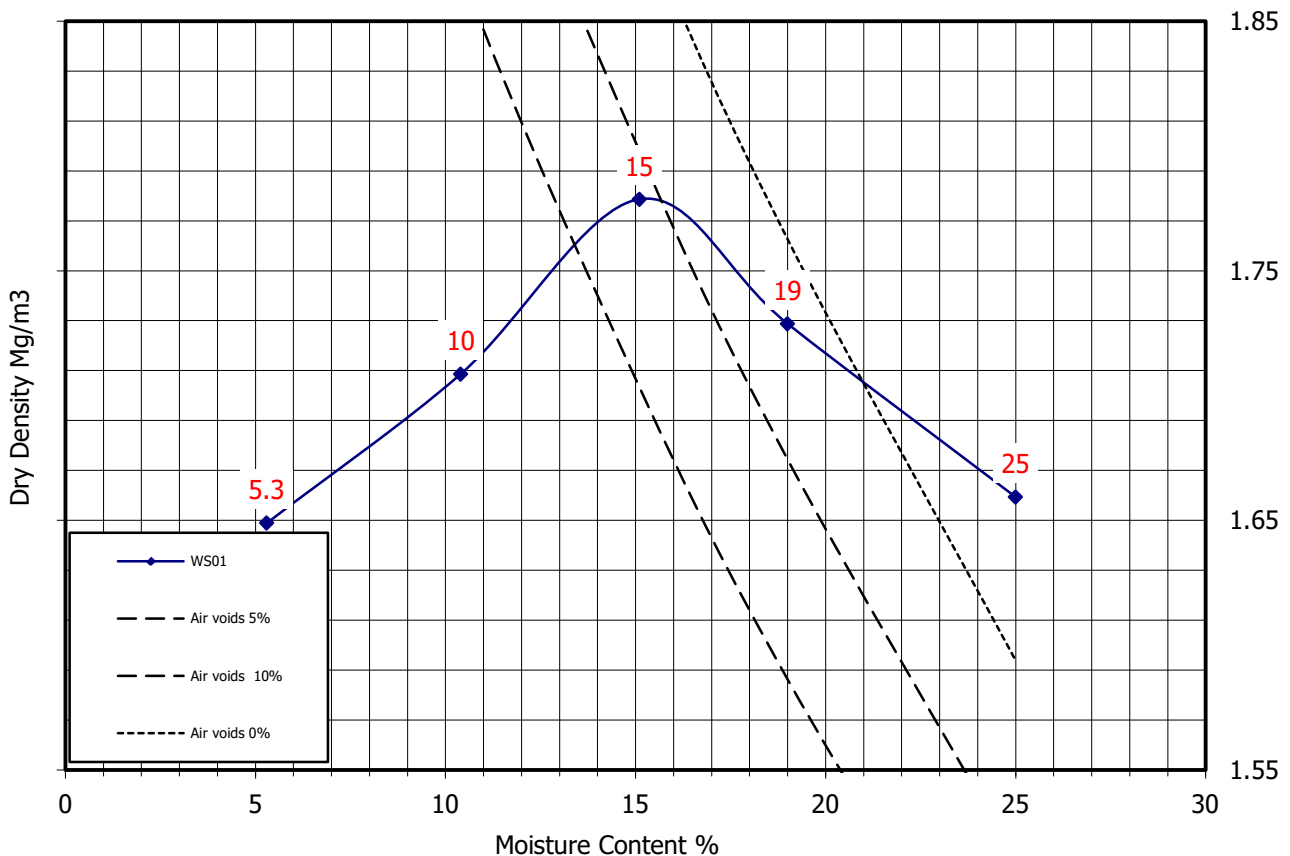
2788



Dry Density/Moisture Content Relationship

BS 1377:Part 4:1990

Client ref: **34529110**
 Location: **Casltebrook**
 Contract Number: **31699**
 Hole Number: **WS01**
 Sample Number: **3**
 Depth (m): **1.20 - 2.00**
 Sample Type: **B**



Compaction Point:	1	2	3	4	5
Moisture Content:	5.3	10	15	19.0	25.0
Bulk Density (Mg/m³):	1.74	1.89	2.05	2.06	2.07
Dry Density (Mg/m³):	1.65	1.71	1.78	1.73	1.66

Initial Moisture Content:	19	Method of Compaction:	2.5kg Rammer
Particle Density (Mg/m³):	2.65 Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m³):	1.78	Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	15	Sample Preparation Clause:	3.2.4.1

Remarks:

Checked By:
Ben Sharp

Date Approved:

Approved By:
Paul Evans

13.10.16

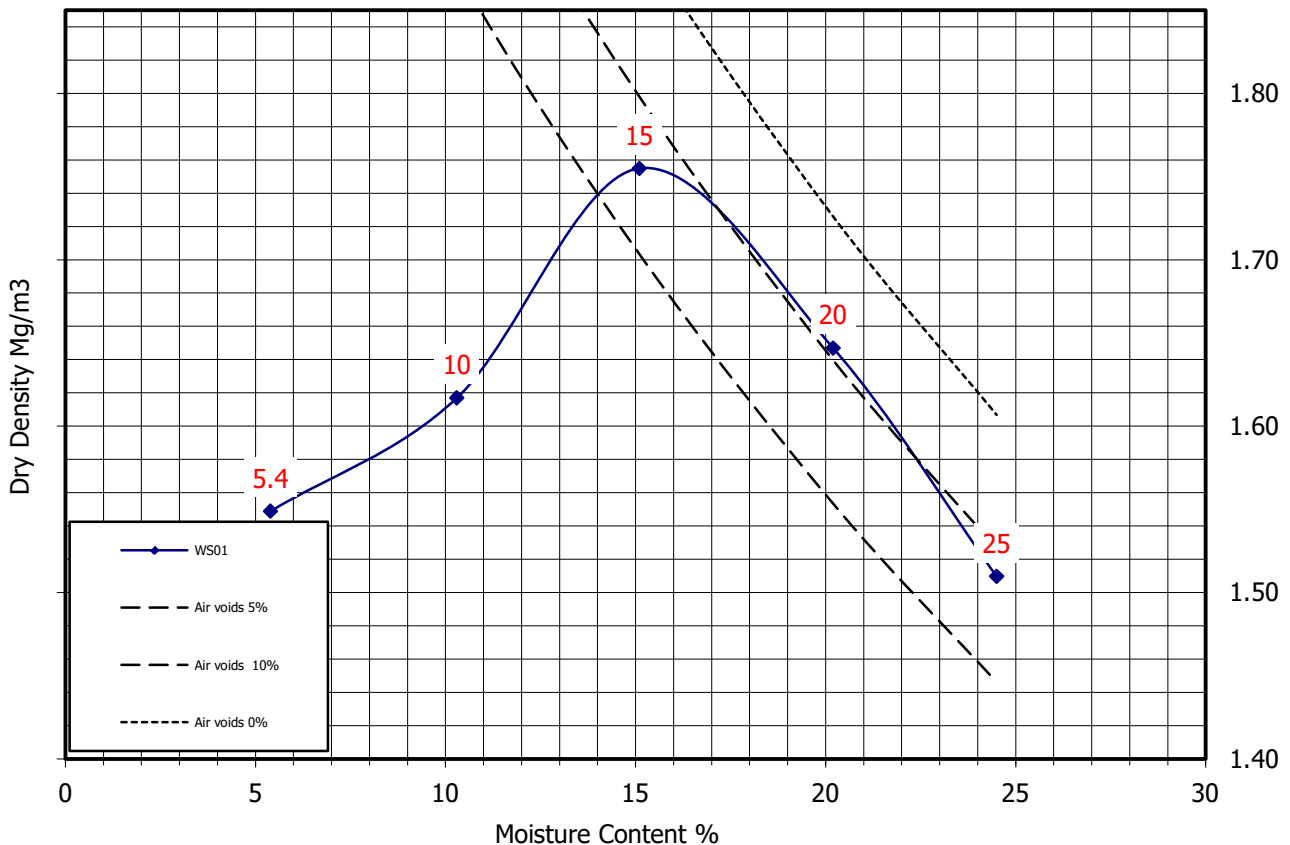


2788

Dry Density/Moisture Content Relationship

BS 1377:Part 4:1990

Client ref: **34529110**
 Location: **Casltebrook**
 Contract Number: **31699**
 Hole Number: **WS01**
 Sample Number: **4**
 Depth (m): **1.90 - 2.70**
 Sample Type: **B**



Compaction Point:	1	2	3	4	5
Moisture Content:	5.4	10	15	20.2	24.5
Bulk Density (Mg/m ³):	1.63	1.78	2.02	1.98	1.88
Dry Density (Mg/m ³):	1.55	1.62	1.75	1.65	1.51

Initial Moisture Content:	25	Method of Compaction:	2.5kg Rammer
Particle Density (Mg/m ³):	2.65 Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m ³):	1.75	Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	15	Sample Preparation Clause:	3.2.4.1

Remarks:



Checked By:
Ben Sharp

Date Approved:

Approved By:
Paul Evans

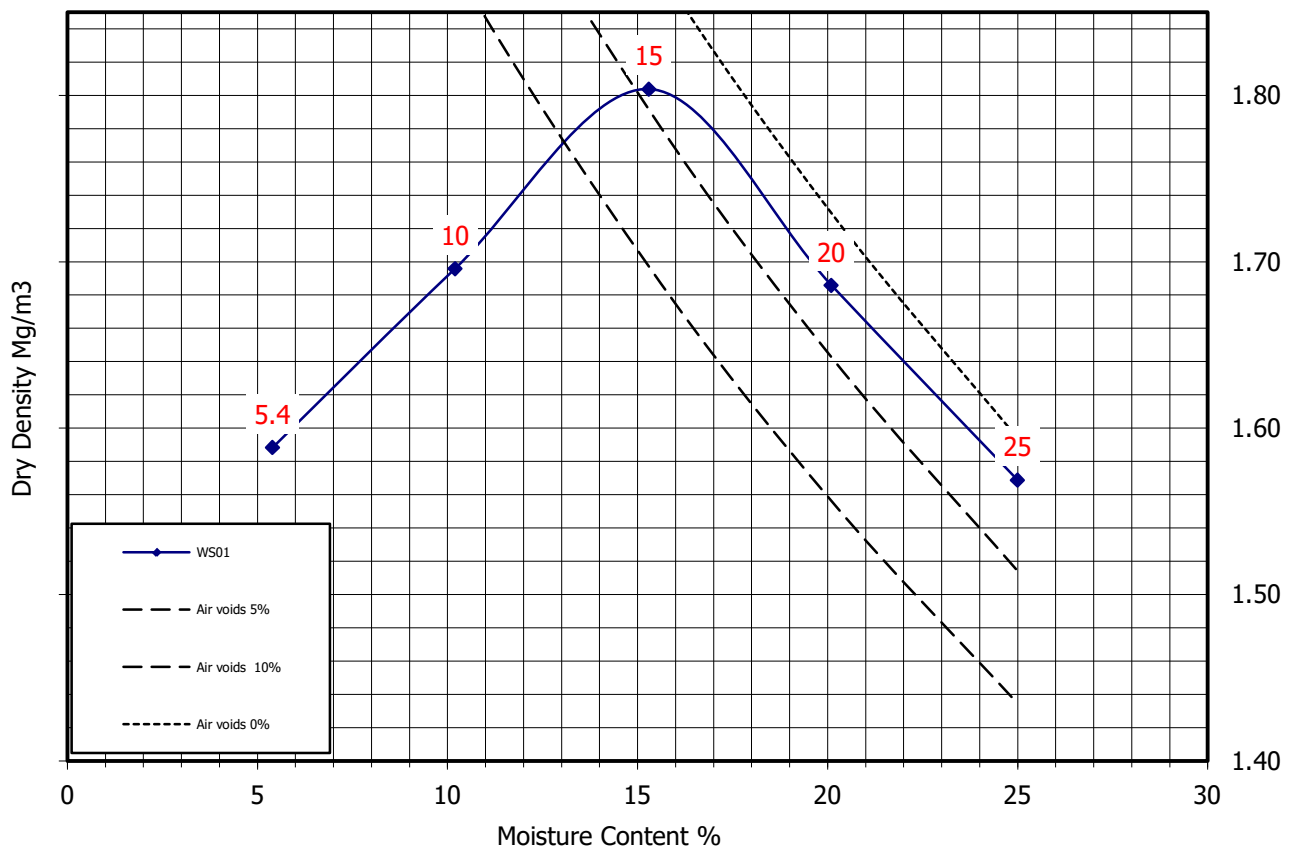
13.10.16



Dry Density/Moisture Content Relationship

BS 1377:Part 4:1990

Client ref: **34529110**
 Location: **Casltebrook**
 Contract Number: **31699**
 Hole Number: **WS01**
 Sample Number: **3**
 Depth (m): **1.20 - 2.00**
 Sample Type: **B**



Compaction Point:	1	2	3	4	5
Moisture Content:	5.4	10	15	20.1	25.0
Bulk Density (Mg/m ³):	1.67	1.87	2.08	2.02	1.96
Dry Density (Mg/m ³):	1.59	1.70	1.80	1.69	1.57

Initial Moisture Content:	15	Method of Compaction:	2.5kg Rammer
Particle Density (Mg/m ³):	2.65 Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (mg/m ³):	1.80	Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	15	Sample Preparation Clause:	3.2.4.1

Remarks:

Checked By:
Ben Sharp

Date Approved:

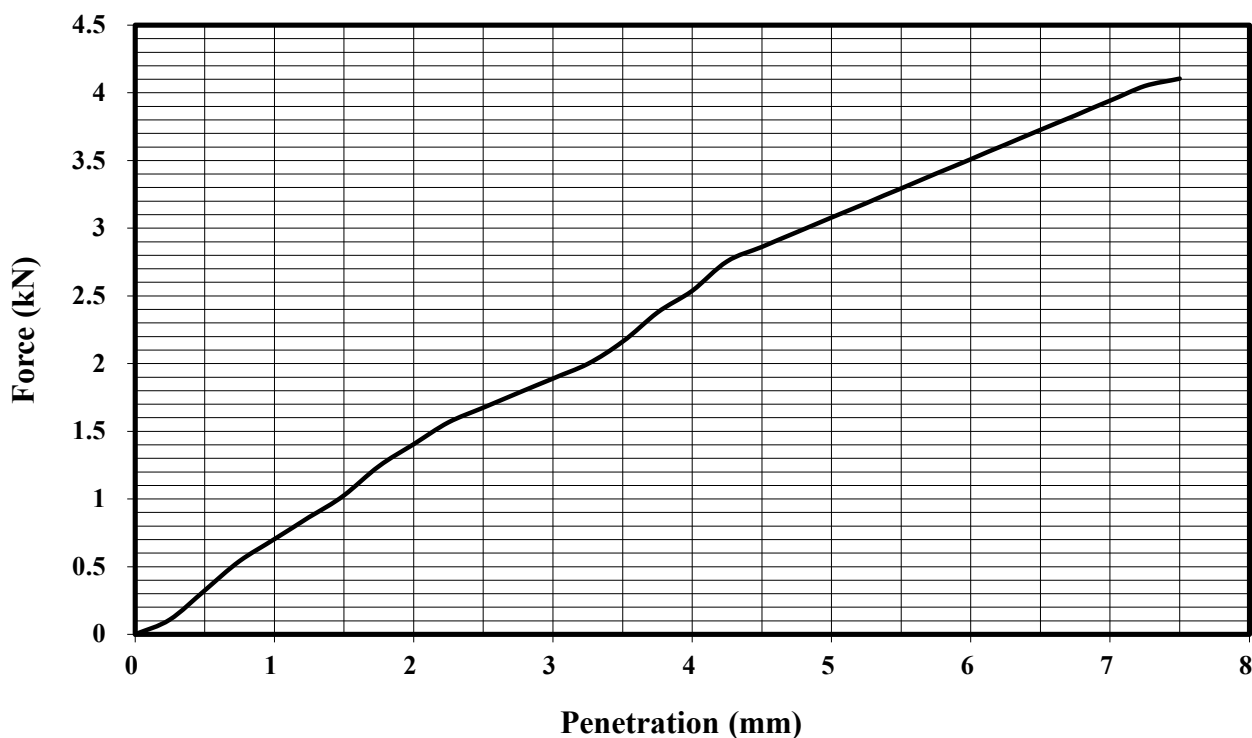
Approved By:
Paul Evans

13.10.16



Test Report: Determination of the California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Sample Type: B
Hole Number: WS01
Sample Number: 3
Depth (m): 1.20 - 2.00



Initial Sample Conditions

Moisture Content: **19.0**
Bulk Density Mg/m³: **2.06**
Dry Density Mg/m³: **1.73**
C.B.R. Value % Sample Top **15.39**
Percentage retained on 20mm BS test sieve: **0**

Test Conditions

Surcharge Kg: **2.0**
Soaking Time (hrs): **N/A**
Swelling mm: **N/A**

Method of Compaction:
2.5 Kg Rammer

Remarks:



[Signature]

Checked By **Ben Sharp (Contracts Manager)**
Date Approved: **13.10.16**

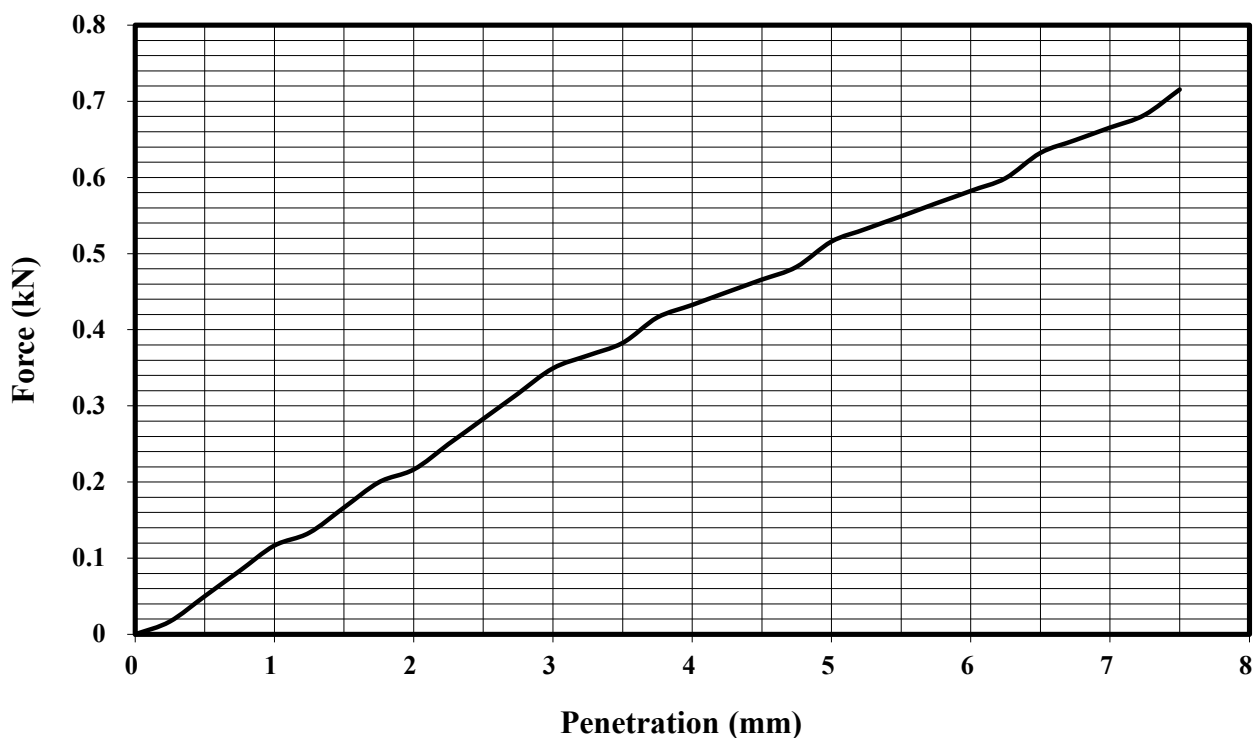
[Signature]

Approved By: **Paul Evans (Quality Manager)**



Test Report: Determination of the California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Sample Type: B
Hole Number: WS03
Sample Number: 3
Depth (m): 1.20 - 2.00



Initial Sample Conditions

Moisture Content: **15.0**
Bulk Density Mg/m³: **2.15**
Dry Density Mg/m³: **1.87**
C.B.R. Value % Sample Top **2.58**
Percentage retained on 20mm BS test sieve: **0**

Test Conditions

Surcharge Kg: **2.0**
Soaking Time (hrs): **N/A**
Swelling mm: **N/A**

Method of Compaction:
2.5 Kg Rammer

Remarks:



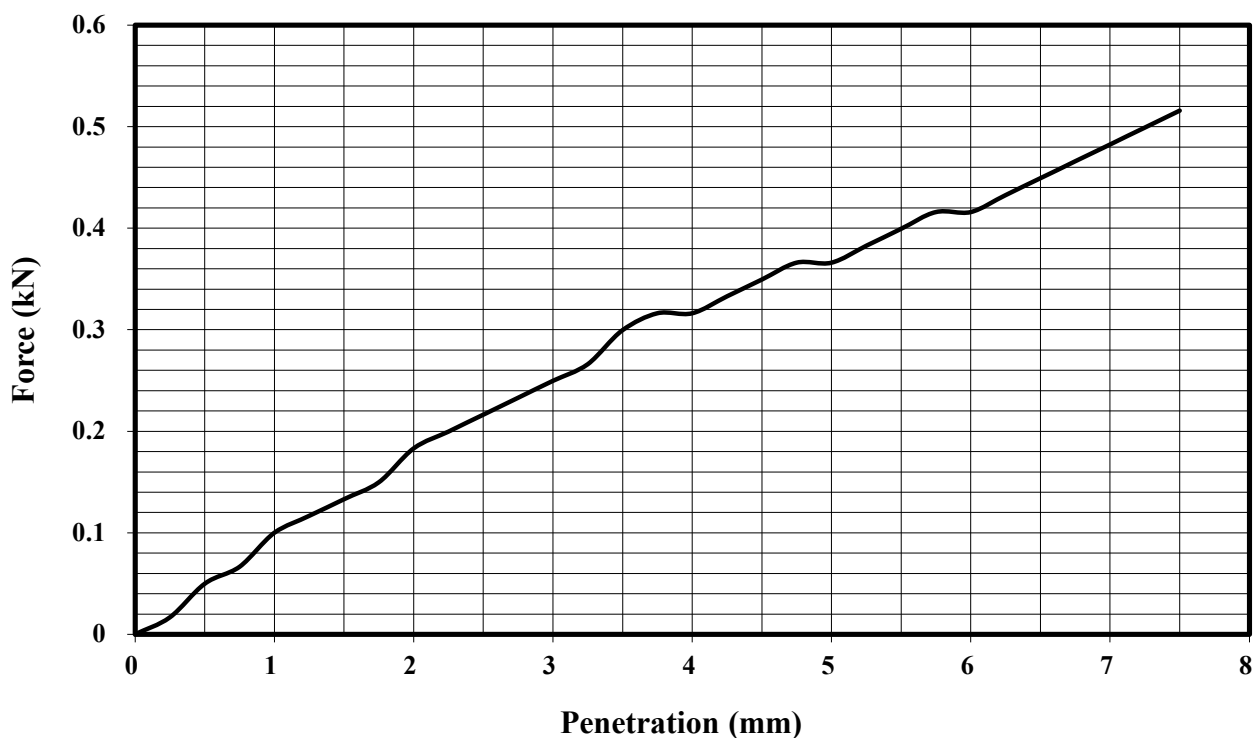
Checked By **Ben Sharp (Contracts Manager)**
Date Approved: **13.10.16**

Approved By: **Paul Evans (Quality Manager)**



Test Report: Determination of the California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Sample Type: B
Hole Number: WS06
Sample Number: 3
Depth (m): 1.20 - 2.00



Initial Sample Conditions

Test Conditions

Method of Compaction:
2.5 Kg Rammer

Moisture Content: **18.5**

Surcharge Kg: **2.0**

Bulk Density Mg/m³: **2.07**

Soaking Time (hrs): **N/A**

Dry Density Mg/m³: **1.75**

Swelling mm: **N/A**

C.B.R. Value % Sample Top

1.83

Percentage retained on 20mm BS test sieve: **0**

Remarks:



Checked By

Ben Sharp (Contracts Manager)

Date Approved:

Approved By:

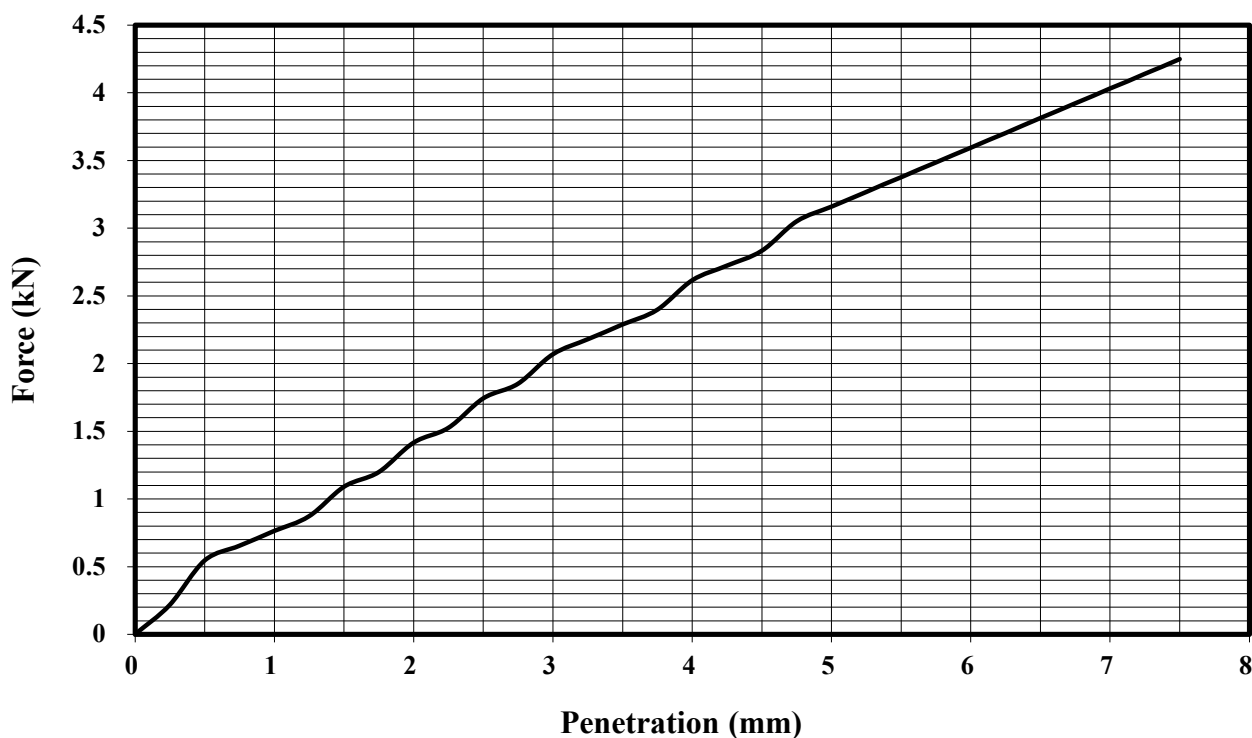
Paul Evans (Quality Manager)

13.10.16



Test Report: Determination of the California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Sample Type: B
Hole Number: WS07
Sample Number: 2
Depth (m): 1.50 - 1.90



Initial Sample Conditions

Test Conditions

Method of Compaction:
2.5 Kg Rammer

Moisture Content: **21.6**
Bulk Density Mg/m³: **1.98**
Dry Density Mg/m³: **1.63**
C.B.R. Value % Sample Top **15.80**
Percentage retained on 20mm BS test sieve: **0**

Surcharge Kg: **2.0**
Soaking Time (hrs): **N/A**
Swelling mm: **N/A**

Remarks:



Checked By

Ben Sharp (Contracts Manager)

Date Approved:

Approved By:

Paul Evans (Quality Manager)

13.10.16

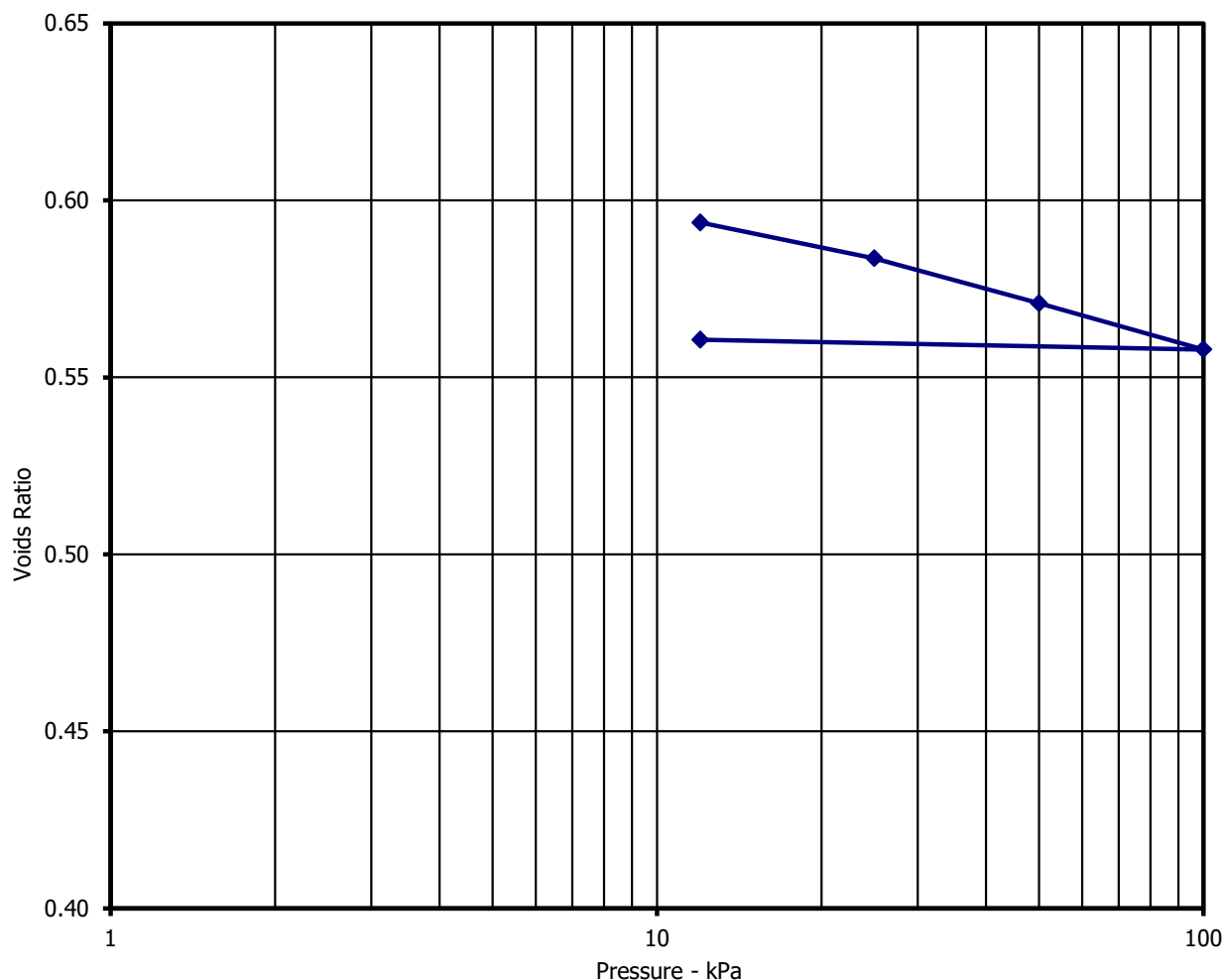


Test Report: ONE DIMENSIONAL CONSOLIDATION

BS1377: Part 5: 1990

Client ref: **34529110**
 Location: **Castlebrook**
 Contract Number: **31699**
 Hole/Sample Number: **BH01 / 2**
 Depth (m) : **1.20 - 1.65**
 Sample Type: **U**

Initial Conditions		Pressure Range	Mv	Cv	Method of time fitting used
Moisture Content (%):	23	kPa	m2/MN	m2/yr	Cv Calculated using t90
Bulk Density (Mg/m3):	2.01	0 - 12	1.2	0.73	Nominal Laboratory Temperature
Dry Density (Mg/m3):	1.64	12 - 25	0.49	4	
Voids Ratio:	0.6172	25 - 50	0.32	4.9	Location of specimen with sample
Degree of saturation:	98.6	50 - 100	0.17	15.00	top
Height (mm):	19.22	100 - 12	0.02	9.6	Remarks:
Diameter (mm)	75.07				
Particle Density (Mg/m3)	2.65				
Assumed					



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Ben Sharp
Checked by
 Ben Sharp (Contracts Manager)
Date approved:

Paul Evans
Approved by
 Paul Evans (Quality Manager)
 13/10/16

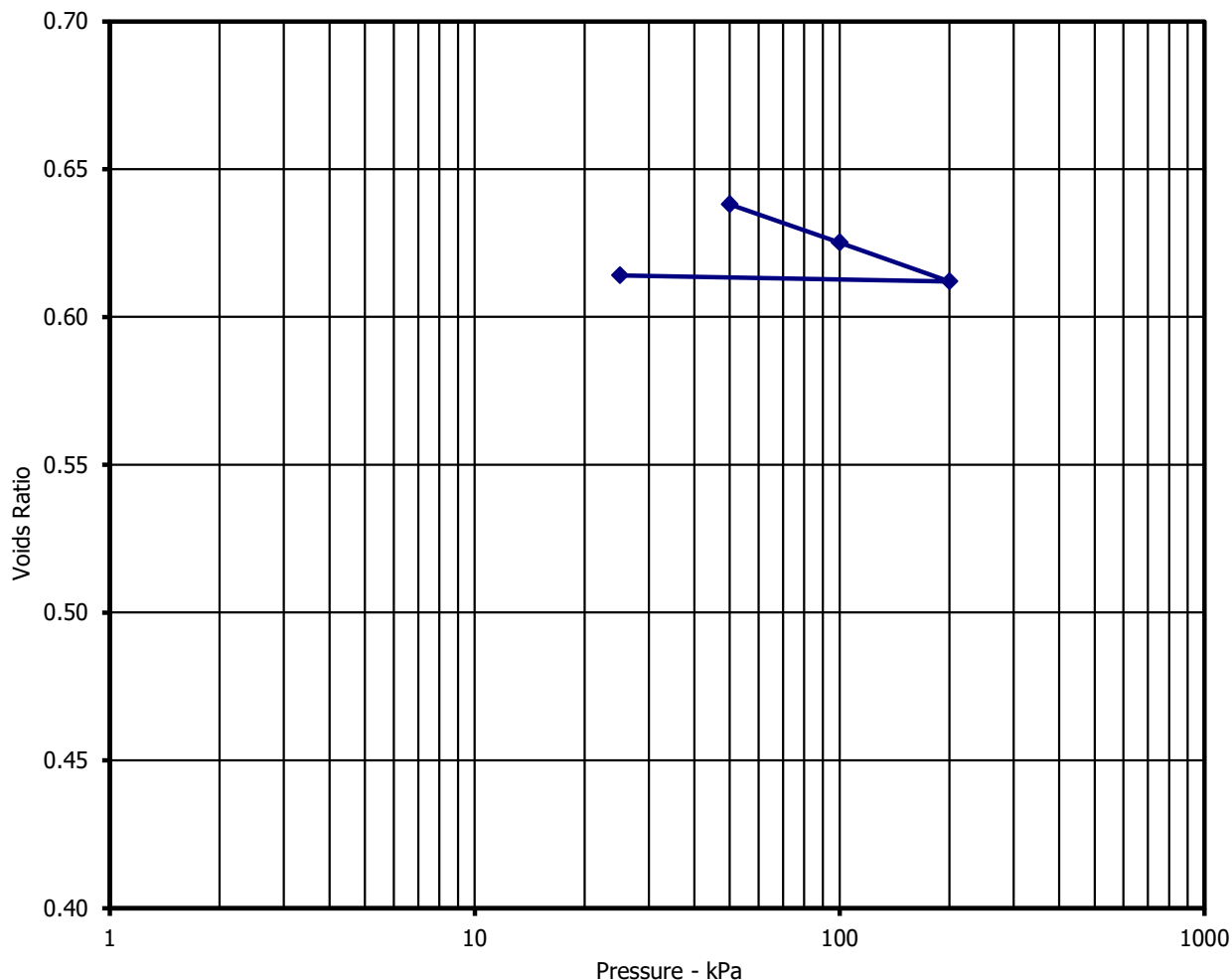


Test Report: ONE DIMENSIONAL CONSOLIDATION

BS1377: Part 5: 1990

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Hole/Sample Number: BH02 / 3
Depth (m) : 2.00 - 2.45
Sample Type: U

Initial Conditions		Pressure Range	Mv	Cv	Method of time fitting used
Moisture Content (%):	25	kPa	m2/MN	m2/yr	Cv Calculated using t90
Bulk Density (Mg/m3):	2.02	0 - 25	Sample	Swelled	Nominal Laboratory Temperature
Dry Density (Mg/m3):	1.62	25 - 50	0.0021	5.9	
Voids Ratio:	0.6381	50 - 100	0.16	9.8	Location of specimen with sample
Degree of saturation:	102.7	100 - 200	0.081	14.00	top
Height (mm):	19.27	200 - 25	0.0072	14	Remarks:
Diameter (mm)	74.94				
Particle Density (Mg/m3)	2.65				
Assumed					



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 Ben Sharp (Contracts Manager)
Date approved:

Approved by
 Paul Evans (Quality Manager)
 13/10/16

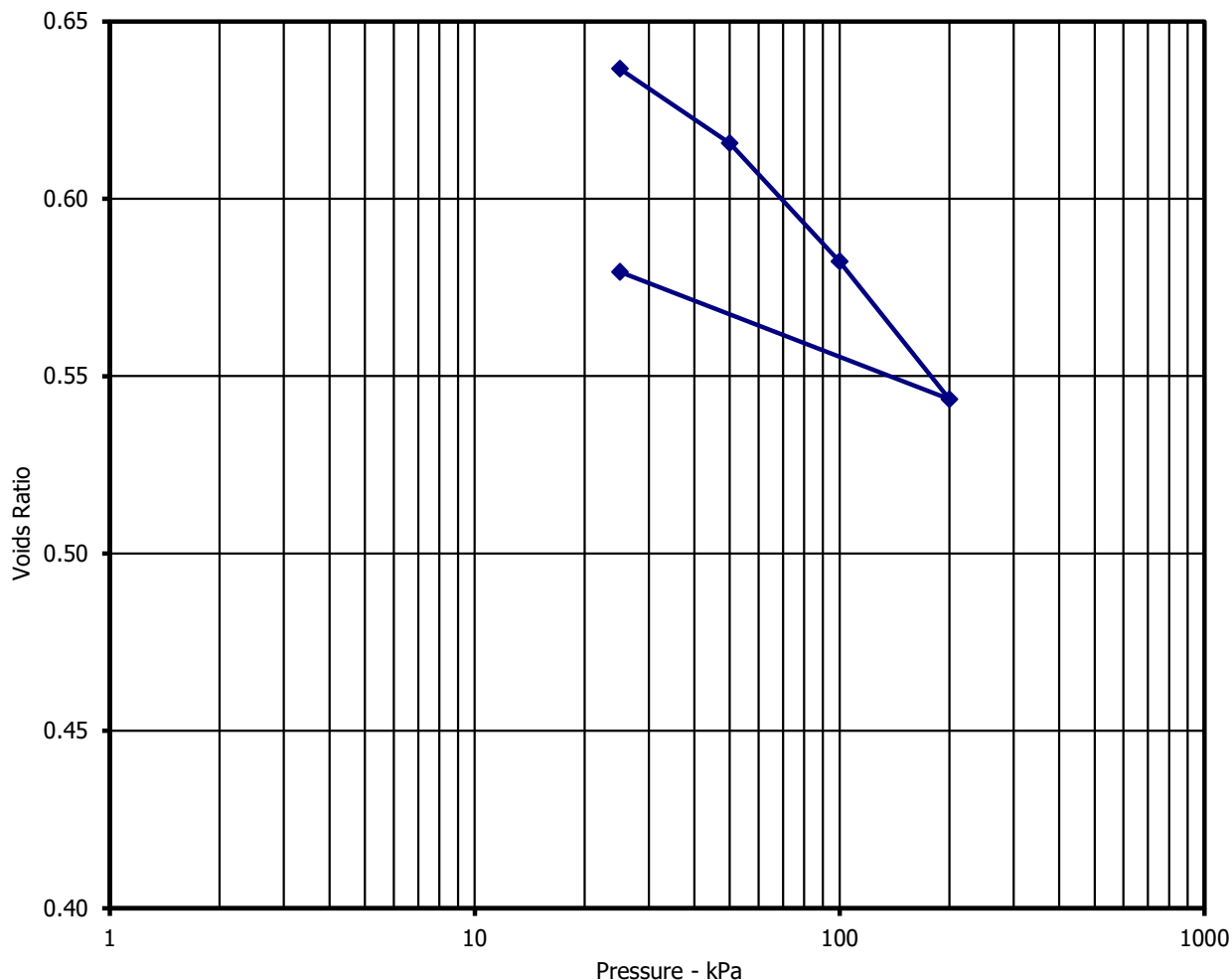


Test Report: ONE DIMENSIONAL CONSOLIDATION

BS1377: Part 5: 1990

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Hole/Sample Number: BH03 / 3
Depth (m) : 2.00 - 2.45
Sample Type: U

Initial Conditions		Pressure Range	Mv	Cv	Method of time fitting used
Moisture Content (%):	29	kPa	m2/MN	m2/yr	Cv Calculated using t90
Bulk Density (Mg/m3):	2.06	0 - 25	0.55	5.9	Nominal Laboratory Temperature
Dry Density (Mg/m3):	1.60	25 - 50	0.51	0.36	
Void Ratio:	0.6595	50 - 100	0.41	0.43	Location of specimen with sample
Degree of saturation:	117.7	100 - 200	0.25	0.43	top
Height (mm):	18.21	200 - 25	0.13	0.33	Remarks:
Diameter (mm)	74.98				
Particle Density (Mg/m3)	2.65				
Assumed					



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 Ben Sharp (Contracts Manager)
Date approved:

Approved by
 Paul Evans (Quality Manager)
 13/10/16

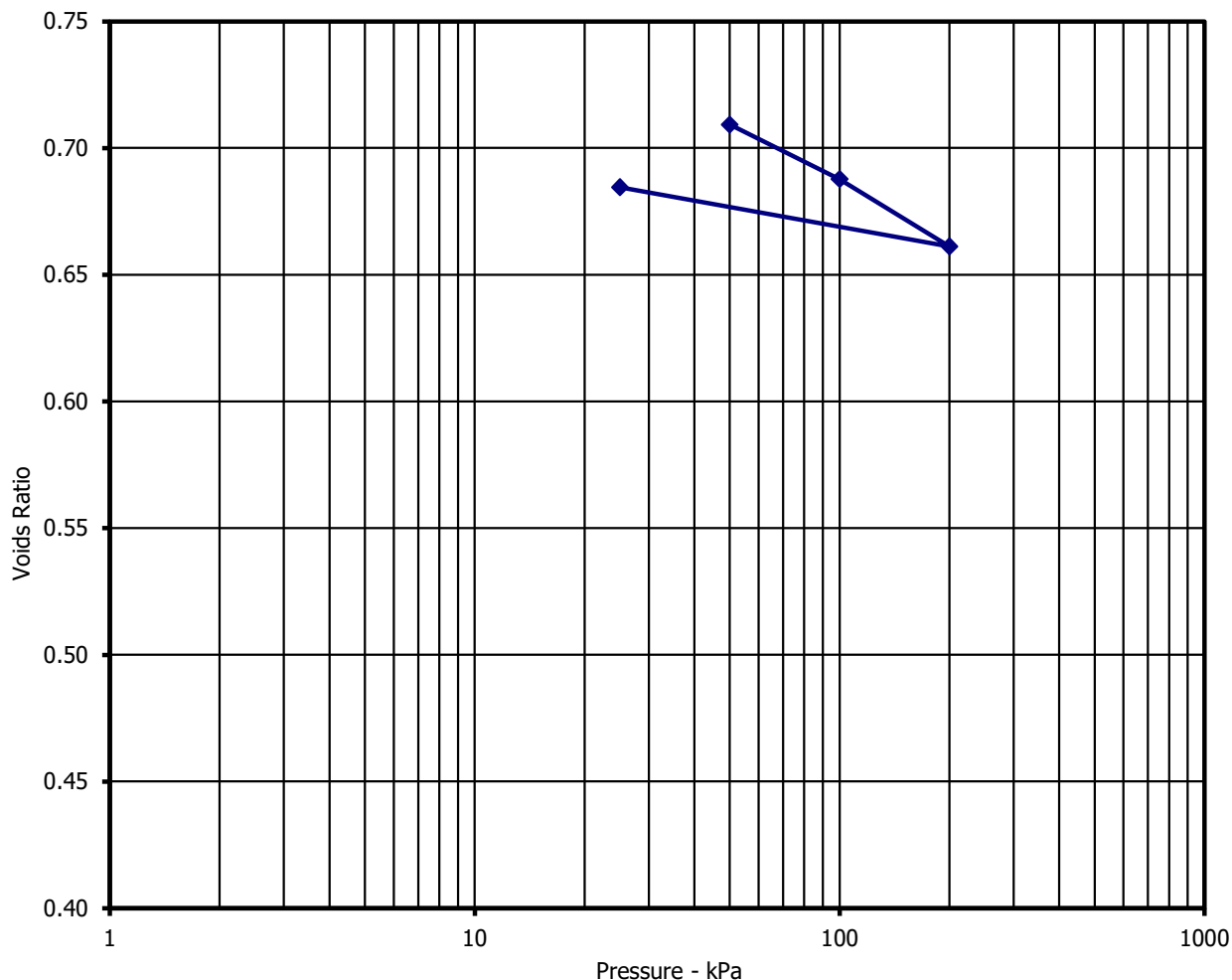


Test Report: ONE DIMENSIONAL CONSOLIDATION

BS1377: Part 5: 1990

Client ref: **34529110**
 Location: **Castlebrook**
 Contract Number: **31699**
 Hole/Sample Number: **BH04 / 2**
 Depth (m) : **2.00 - 2.45**
 Sample Type: **U**

Initial Conditions		Pressure Range	Mv	Cv	Method of time fitting used
Moisture Content (%):	25	kPa	m2/MN	m2/yr	Cv Calculated using t90
Bulk Density (Mg/m3):	1.94	0 - 25	Sample	Swelled	Nominal Laboratory Temperature
Dry Density (Mg/m3):	1.55	25 - 50	0.07	28	
Void Ratio:	0.7121	50 - 100	0.25	1.1	Location of specimen with sample
Degree of saturation:	93.6	100 - 200	0.16	0.53	top
Height (mm):	18.94	200 - 25	0.081	0.61	Remarks:
Diameter (mm)	74.91				
Particle Density (Mg/m3)	2.65				
Assumed					



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Checked by
 Ben Sharp (Contracts Manager)
Date approved:

Approved by
 Paul Evans (Quality Manager)
 13/10/16



QUICK SHEARBOX TEST.

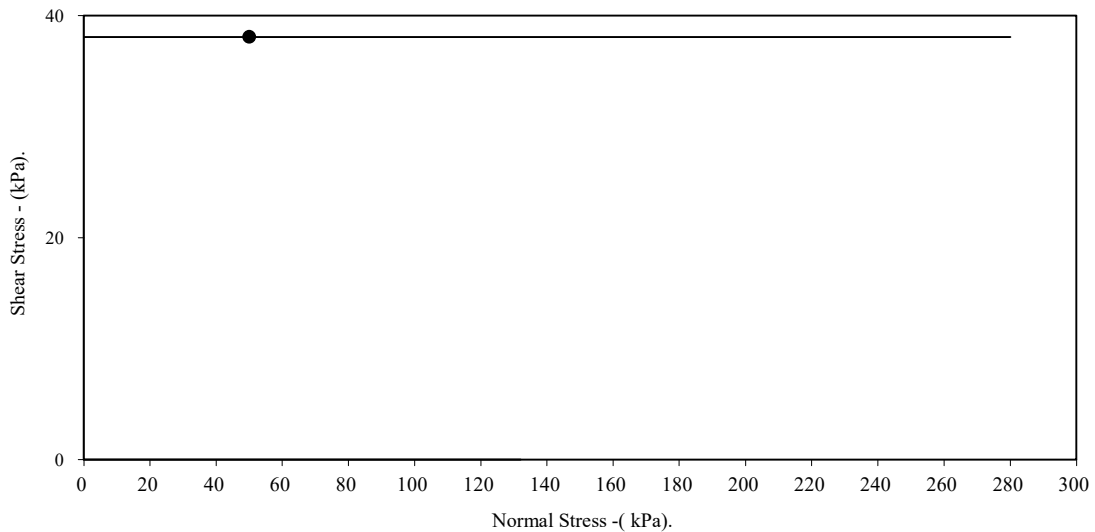
BS1377:Part 7:4.5 :1990.

Borehole/Sample Number: BH05 Depth (m): 2.00

Sample Type:	Undisturbed
Particle Density - Mg/m3:	2.14
Specimen Tested:	Submerged
Sample Description: Greyish brown gravelly (fine-coarse) slightly silty sandy CLAY	
STAGE	1
Initial Conditions	
Height - mm:	24.27
Length - mm:	59.97
Moisture Content - %:	14
Bulk Density - Mg/m3:	2.14
Dry Density - Mg/m3:	1.87
Voids Ratio:	0.1448
Normal Pressure- kPa	50
Consolidation	
Consolidated Height - mm:	23.88
Shear	
Rate of Strain (mm/min)	0.125
Strain at peak shear stress (mm)	10.30
Peak shear Stress - kPa:	38

PEAK	
Angle of Shearing Resistance:(θ)	n/a
Effective Cohesion - kPa:	38
RESIDUAL	
Angle of Shearing Resistance:(θ)	n/a
Effective Cohesion - kPa:	n/a

FAILURE CONDITIONS



● Peak shear Stress - kPa: — Best Fit Line

DP Gans 18/08/16
Checked by Date

DP Gans 18/08/16
Approved by Date



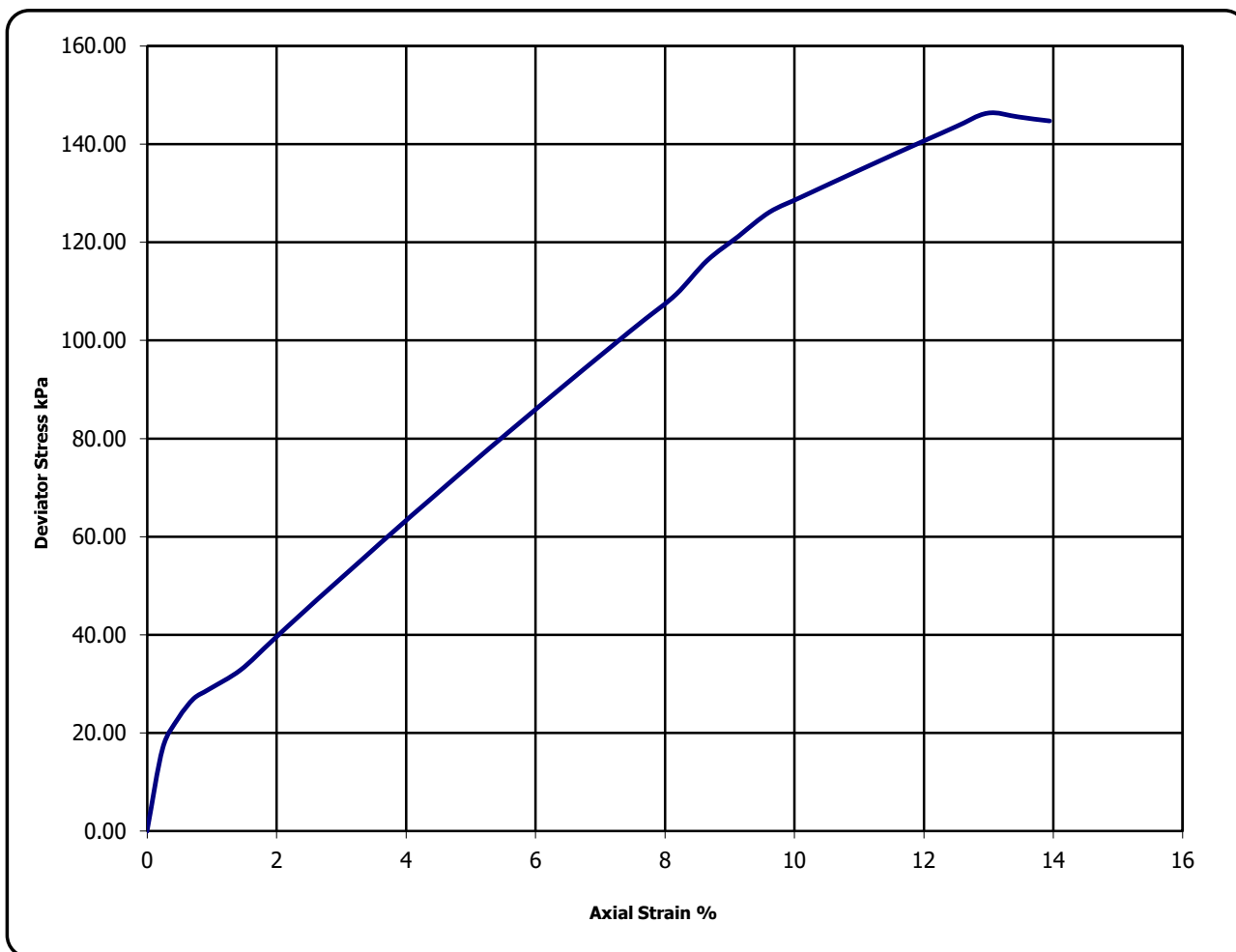
Castlebrook

Contract No.:
31699

Client Ref Number:
34529100

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

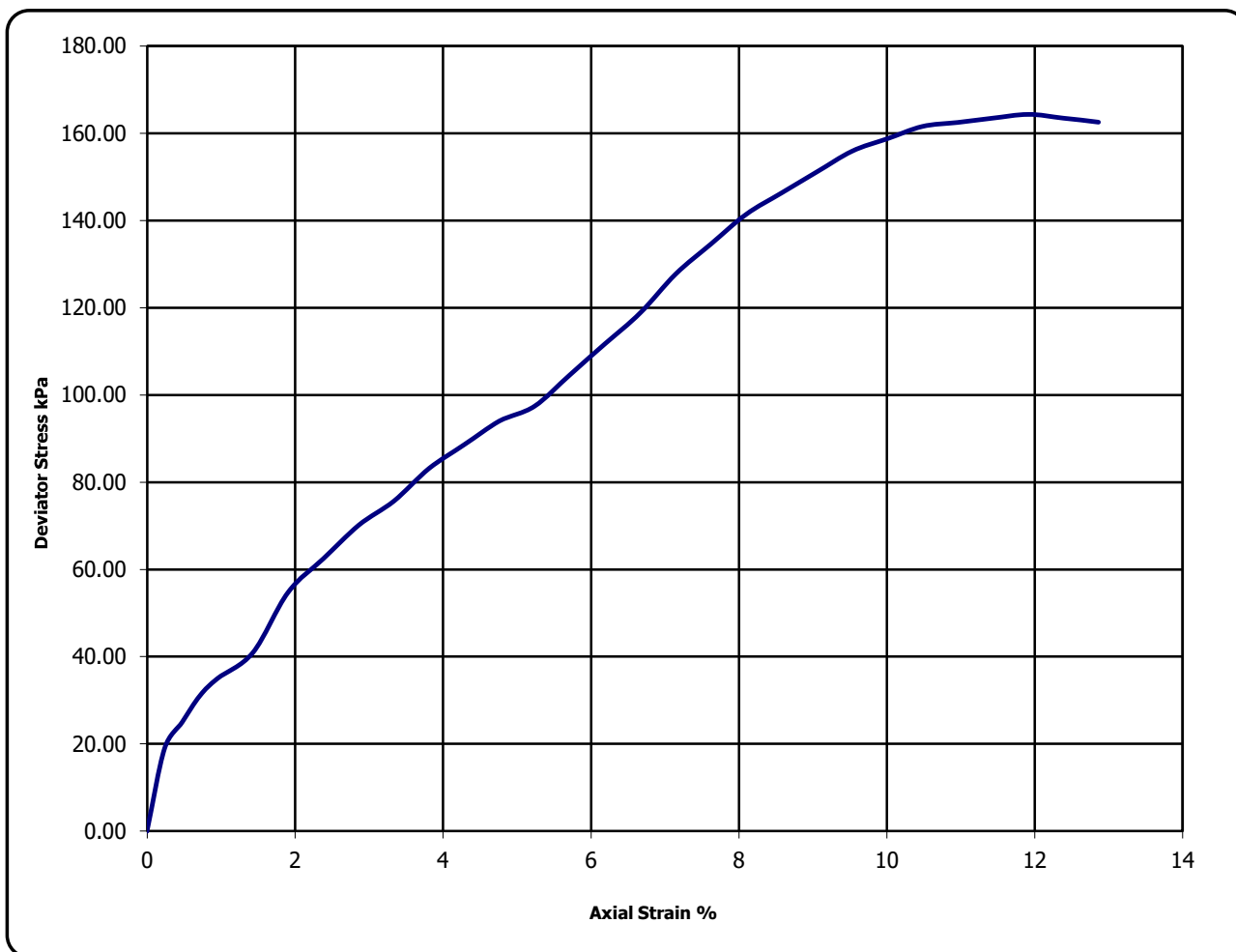
Client ref: 34529100
Location: Castlebrook
Contract Number: 31699
Hole Number: BH05
Sample Number: 12
Depth (m) : 6.00 - 6.45
Sample Type : U



Diameter (mm):		102	Height (mm):		208	Test:		U 102 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
									Sample taken from Top-middle of tube Rate of strain = 2 %/min	
A	21.1	2.29	1.89	125	146	73	13.0	Compound	Latex Membrane used 0.2 mm thickness	

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

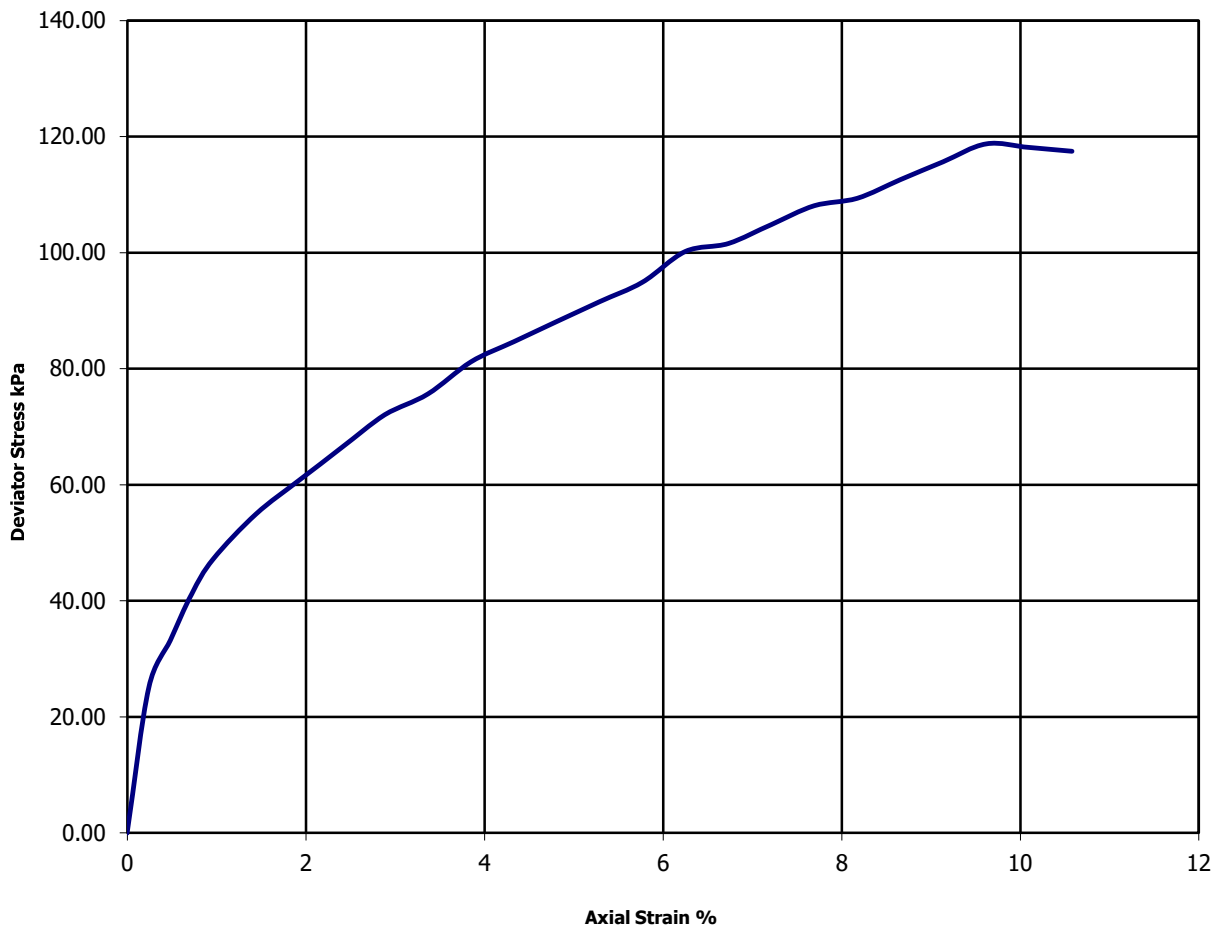
Client ref: 34529100
Location: Castlebrook
Contract Number: 31699
Hole Number: BH05
Sample Number: 16
Depth (m) : 8.00 - 8.45
Sample Type : U



Diameter (mm):		102	Height (mm):		210	Test:		U 102 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
									Sample taken from Top-middle of tube Rate of strain = 2 %/min	
A	18.0	2.24	1.90	175	164	82	11.9	Compound	Latex Membrane used 0.2 mm thickness	

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

Client ref: 34529100
Location: Castlebrook
Contract Number: 31699
Hole Number: BH05
Sample Number: 21
Depth (m) : 10.00 - 10.45
Sample Type : U



Diameter (mm):		102	Height (mm):		208	Test: U 102 mm Single Stage.			
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks
	A	14.7	2.32	2.02	200	119	59	9.6	Compound
									Sample taken from Top-middle of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thickness



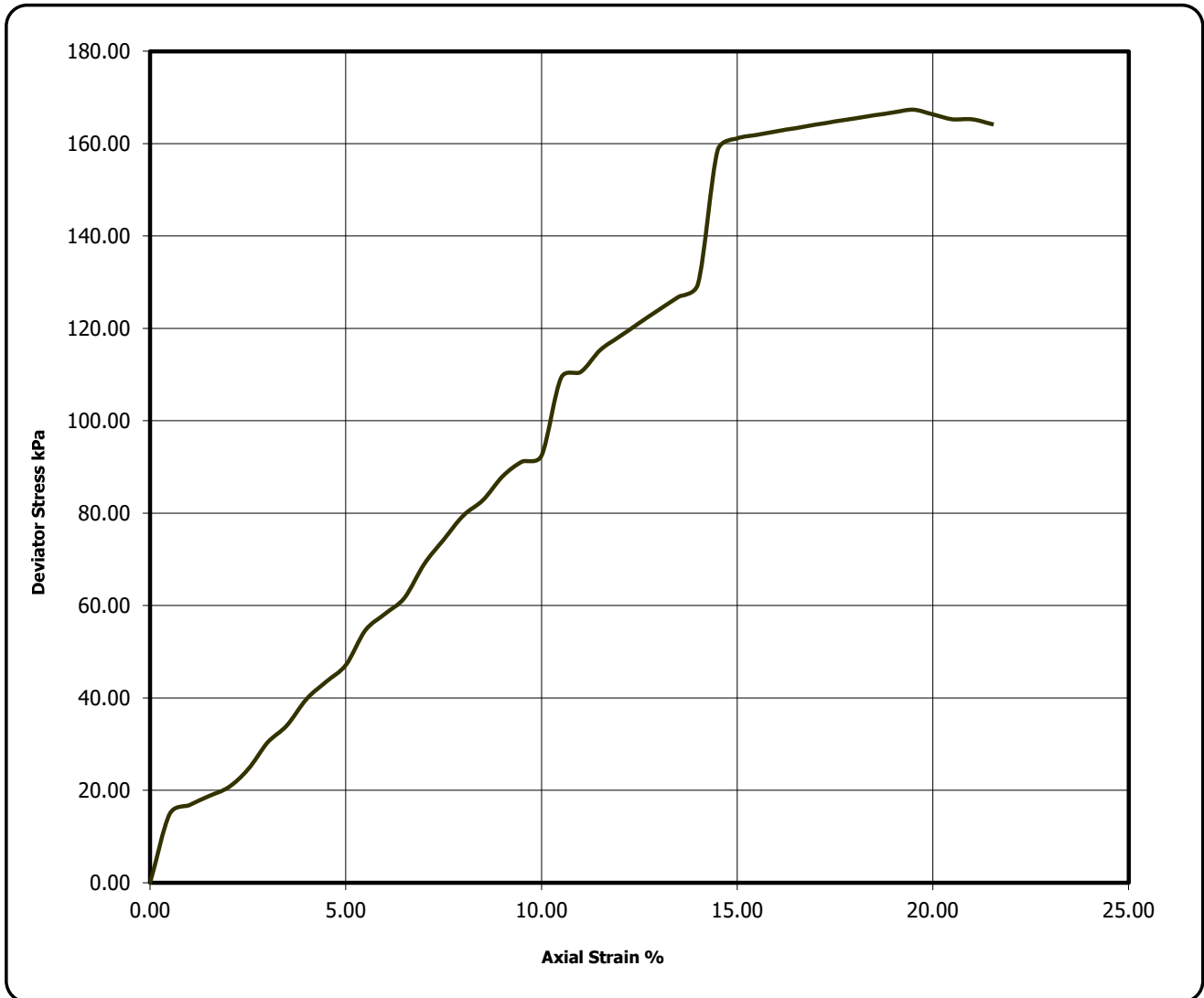
Checked By
Ben Sharp (Contracts Manager)
Date Approved:

Approved By:
Paul Evans (Quality Manager)
5.9.16



Test Report: Undrained Shear Strength in Triaxial Compression
BS 1377 : Part7 : Clause 8 : 1990 Multistage Test
without measurement of Pore Pressure

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Hole Number BH01
Sample Number: 13
Depth (m) : 7.00 - 7.45



Diameter (mm): 103		Height (mm): 200		Test: 100mm Multistage					
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Shear Strength (kPa)	Failure Strain (%)	Mode of Failure	Remarks
A	12.8	2.27	2.01	65	92	46	10.0	Compound	Sample taken from Top-middle of tube
				125	130	65	14.0		Rate of strain = 2 %/min Latex Membrane used mm thickness
				250	167	84	19.5		



[Signature]

Checked By

[Signature]

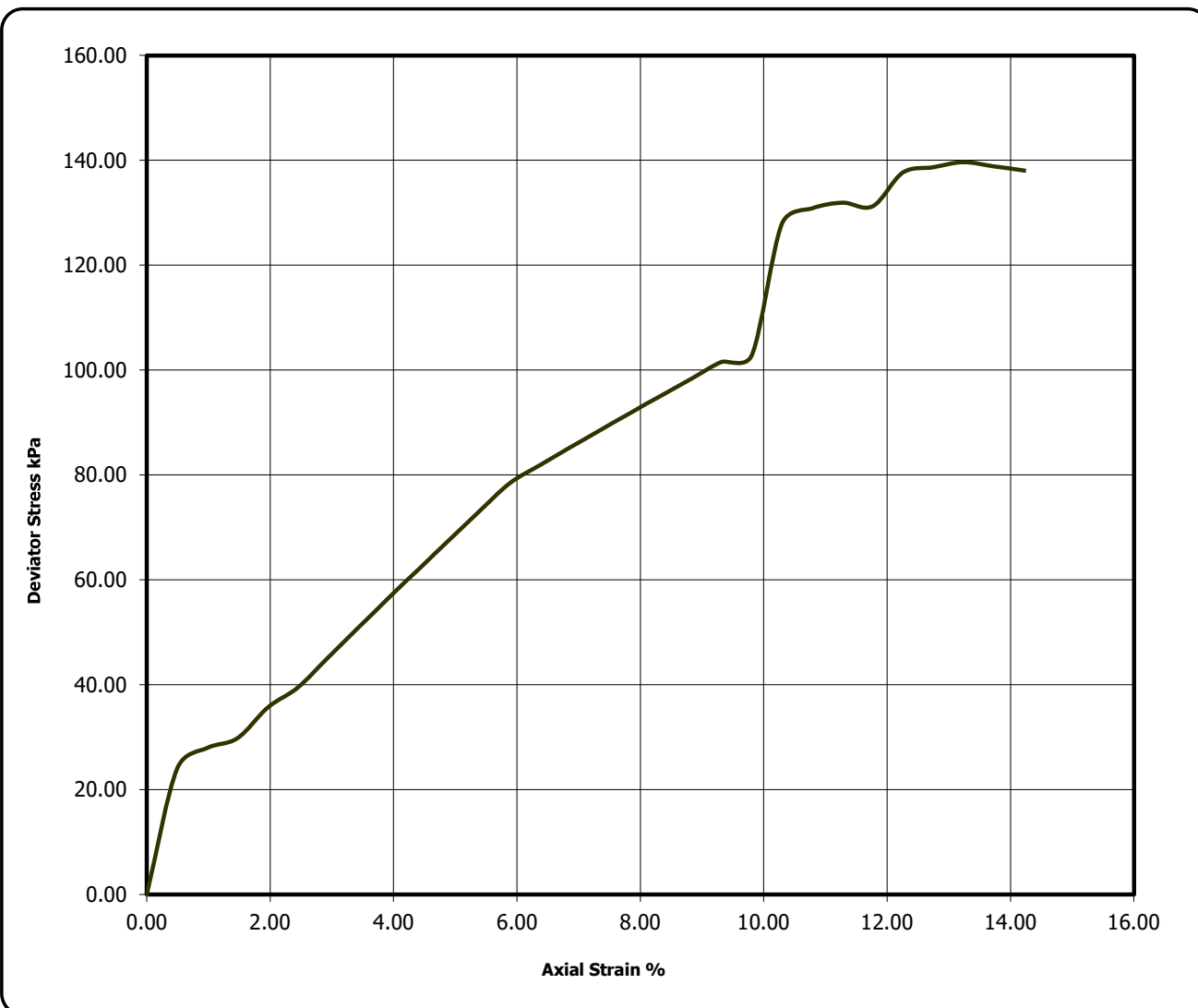
Approved By:



Date Approved: 13.10.16

Test Report: Undrained Shear Strength in Triaxial Compression
BS 1377 : Part7 : Clause 8 : 1990 Multistage Test
without measurement of Pore Pressure

Client ref: 34529110
Location: Castlebrook
Contract Number: 31699
Hole Number BH01
Sample Number: 16
Depth (m) : 8.50 - 8.95



Diameter (mm): 103		Height (mm): 200		Test: 100mm Multistage					
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Shear Strength (kPa)	Failure Strain (%)	Mode of Failure	Remarks
A	14.6	2.21	1.93	75	103	51	9.8	Compound	Sample taken from Top-middle of tube Rate of strain = 2 %/min Latex Membrane used mm thickness
				150	132	66	11.3		
				300	140	70	13.2		



[Signature]

Checked By

[Signature]

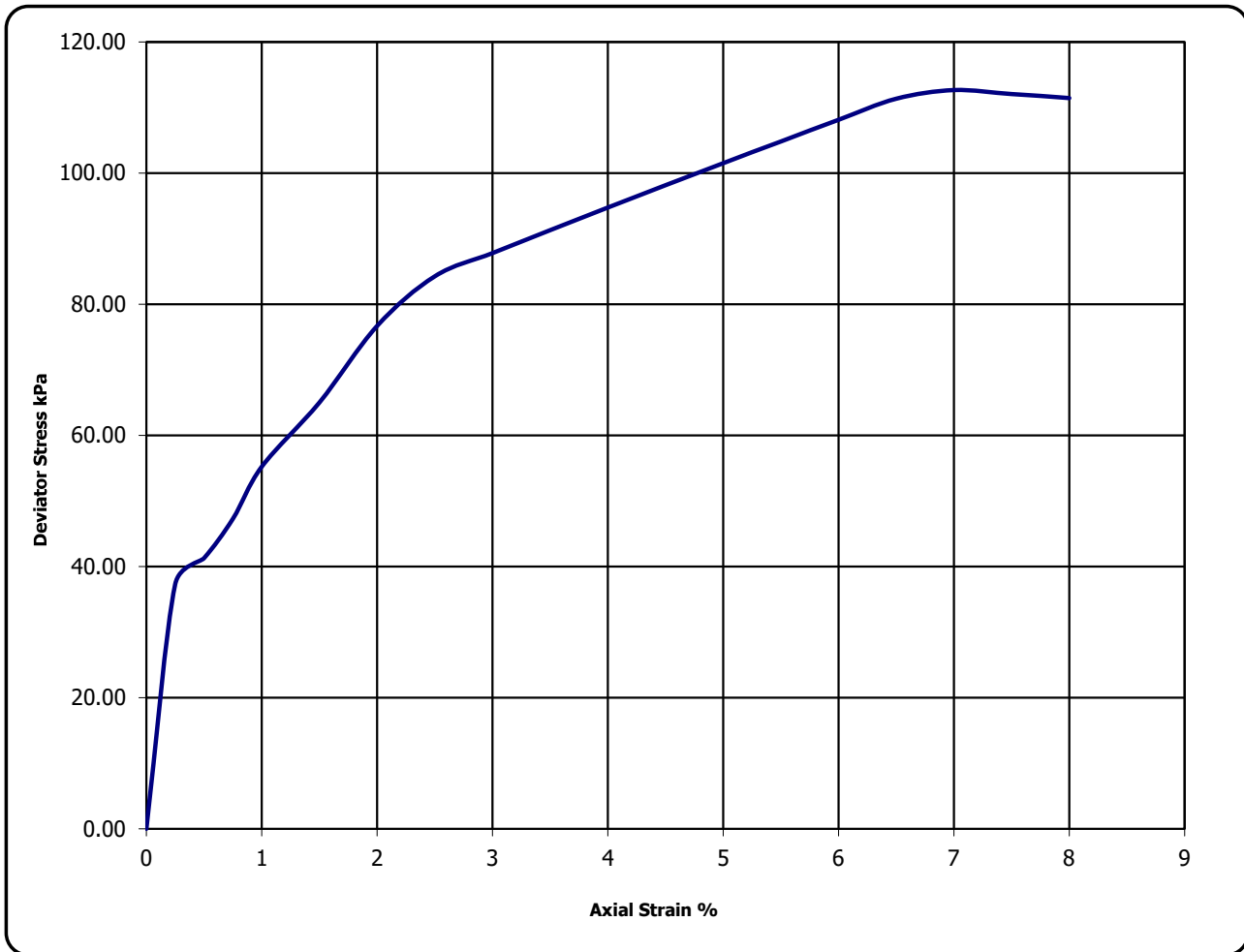
Approved By:



Date Approved: 13.10.16

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

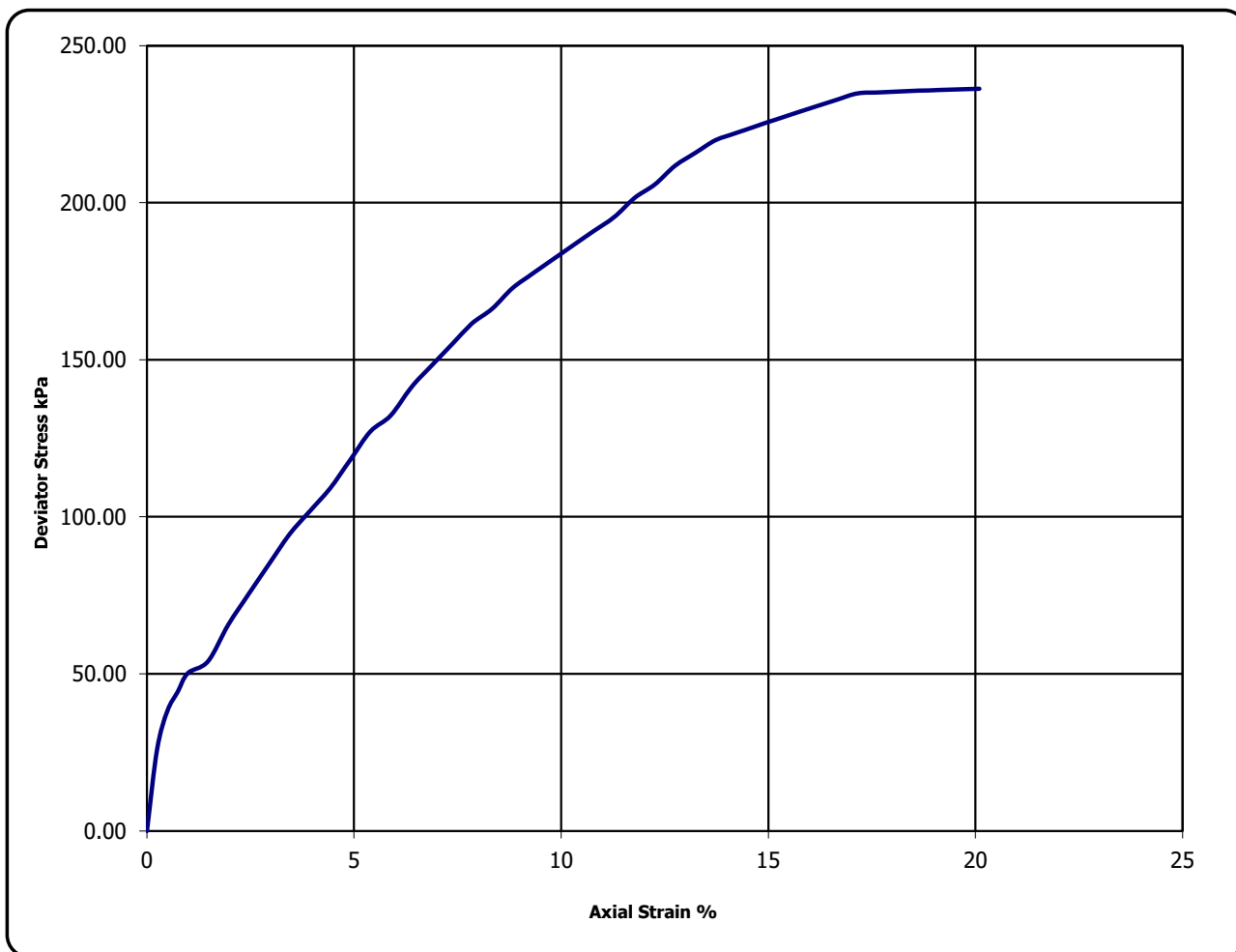
Client ref: 34529110
Location: Castlebrook
Contract Number: 32148
Hole Number: BH02
Sample Number: 3
Depth (m) : 2.00 - 2.45
Sample Type : U
Sample Description : Brown sandy silty CLAY.



Diameter (mm):		102	Height (mm):		200	Test:		U 102 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
									Sample taken from Top-middle of tube Rate of strain = 2 %/min	
A	22.4	2.11	1.72	50	113	56	7.0	Plastic	Latex Membrane used 0.2 mm thickness	

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

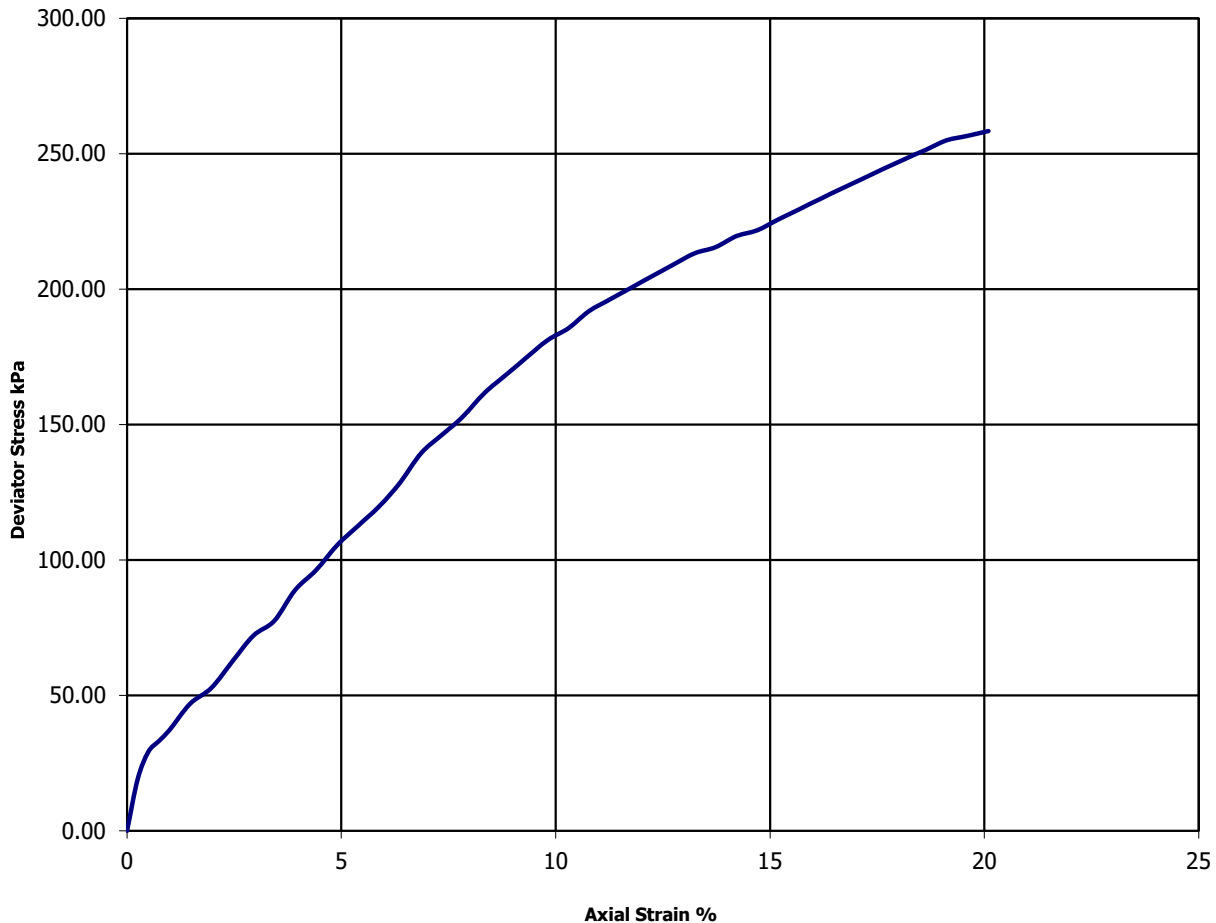
Client ref: 34529110
Location: Castlebrook
Contract Number: 32148
Hole Number: BH02
Sample Number: 10
Depth (m) : 5.00 - 5.45
Sample Type : U
Sample Description : Brown sandy silty CLAY.



Diameter (mm):		102	Height (mm):		204	Test:	U 102 mm Single Stage.			
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
									Sample taken from Top-middle of tube Rate of strain = 2 %/min	
A	15.0	2.30	2.00	100	236	118	20.1	Plastic	Latex Membrane used 0.2 mm thickness	

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

Client ref: 34529110
Location: Castlebrook
Contract Number: 32148
Hole Number: BH02
Sample Number: 15
Depth (m) : 8.00 - 8.45
Sample Type : U
Sample Description : Brown sandy silty CLAY.



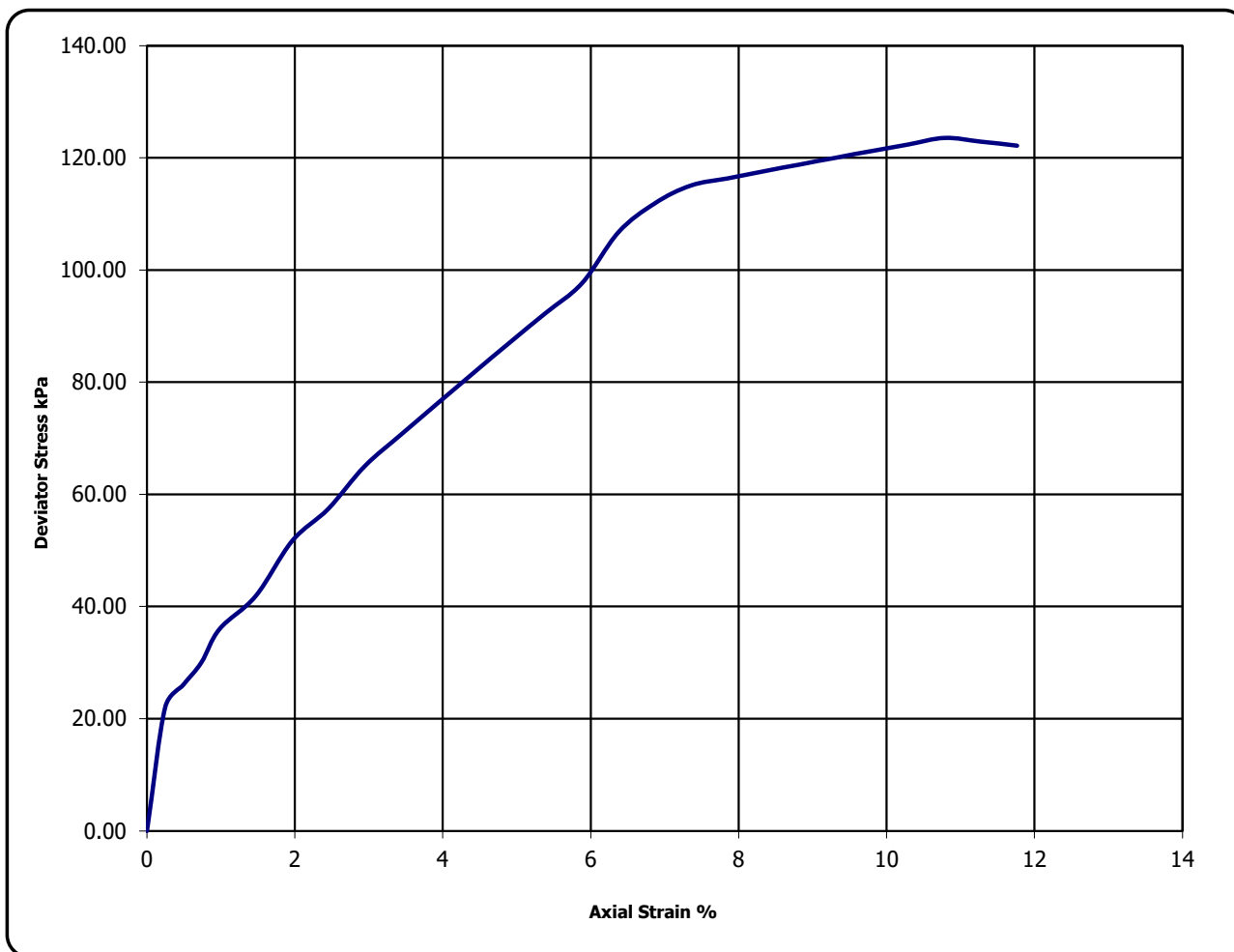
Diameter (mm):		102	Height (mm):		204	Test:		U 102 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
	A	14.1	2.03	1.78	150	258	129	20.1	Compound	Sample taken from Top-middle of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thickness

Checked By
Ben Sharp (Contracts Manager)
Date Approved:

Approved By:
Paul Evans (Quality Manager)
13.10.16

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

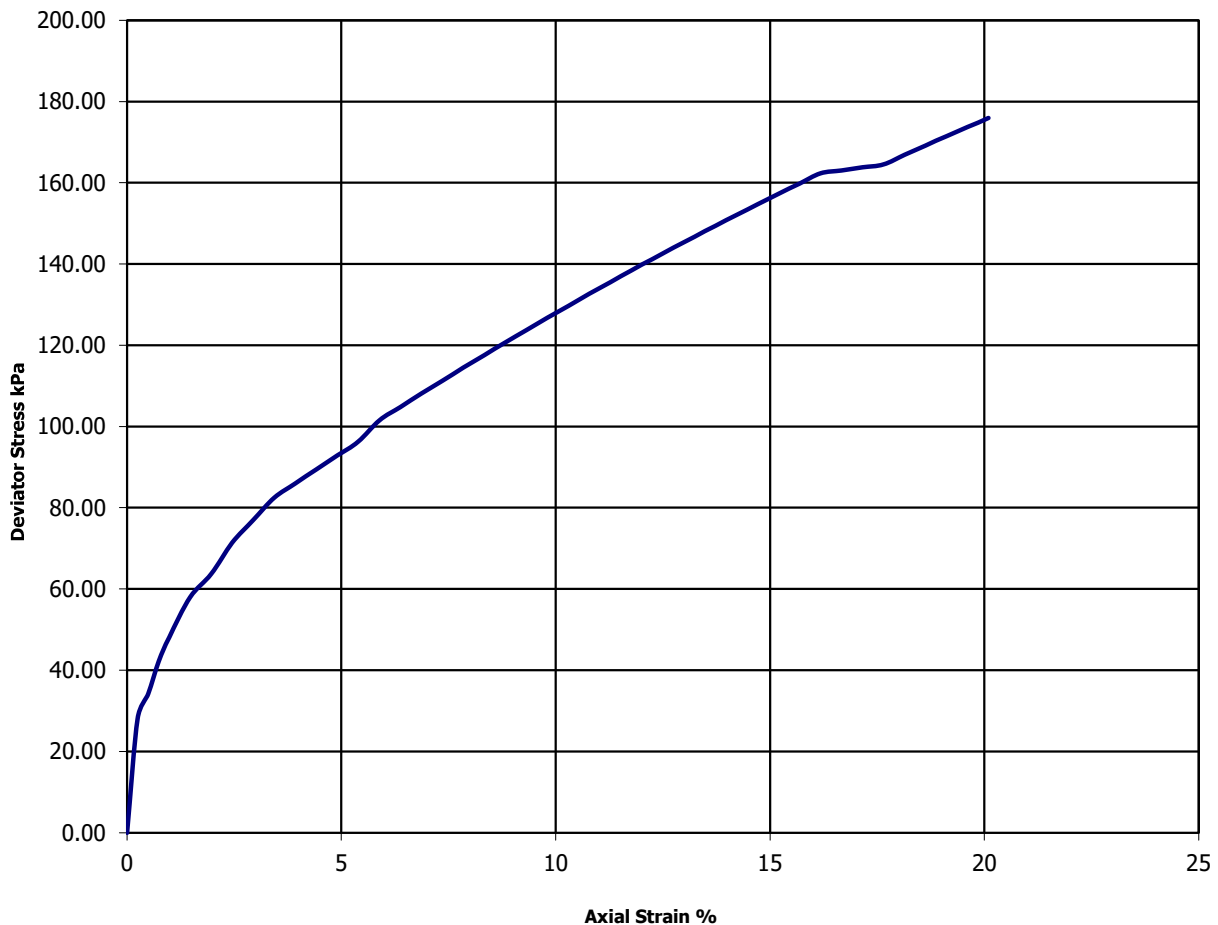
Client ref: 34529110
Location: Castlebrook
Contract Number: 32148
Hole Number: BH03
Sample Number: 3
Depth (m) : 2.00 - 2.45
Sample Type : U
Sample Description : Brown sandy silty CLAY.



Diameter (mm):		102	Height (mm):		204	Test:		U 102 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
	A	31.3	2.10	1.60	50	124	62	10.8	Compound	Sample taken from Top-middle of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thickness

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

Client ref: 34529110
Location: Castlebrook
Contract Number: 32148
Hole Number: BH03
Sample Number: 18
Depth (m) : 10.00 - 10.45
Sample Type : U
Sample Description : Brown sandy silty CLAY.



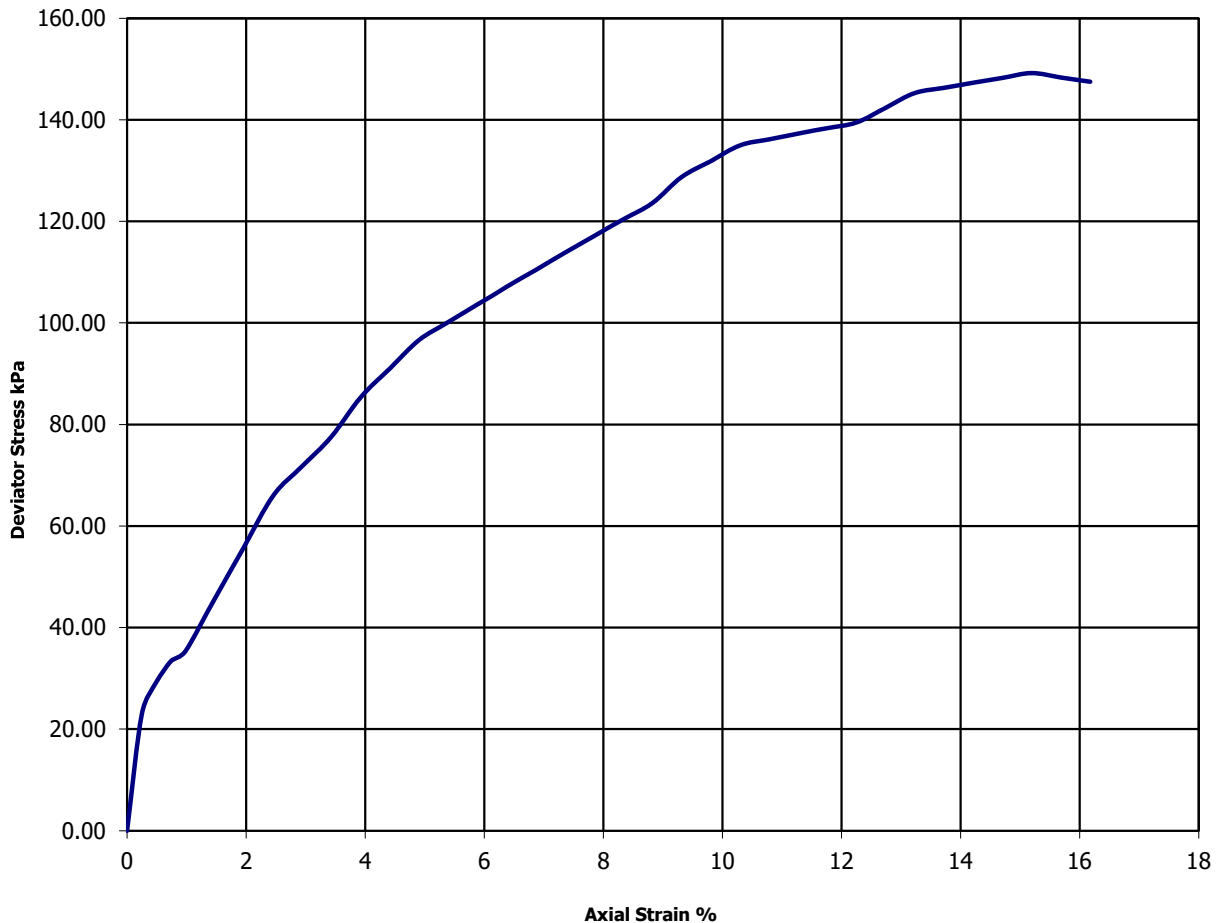
Diameter (mm):		102	Height (mm):		204	Test:	U 102 mm Single Stage.			
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
									Sample taken from Top-middle of tube Rate of strain = 2 %/min	
A	8.0	2.35	2.17	200	176	88	20.1	Compound	Latex Membrane used 0.2 mm thickness	

Checked By
Ben Sharp (Contracts Manager)
Date Approved:

Approved By:
Paul Evans (Quality Manager)
13.10.16

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

Client ref: 34529110
Location: Castlebrook
Contract Number: 32148
Hole Number: BH04
Sample Number: 2
Depth (m) : 2.00 - 2.45
Sample Type : U
Sample Description : Brown sandy silty CLAY.



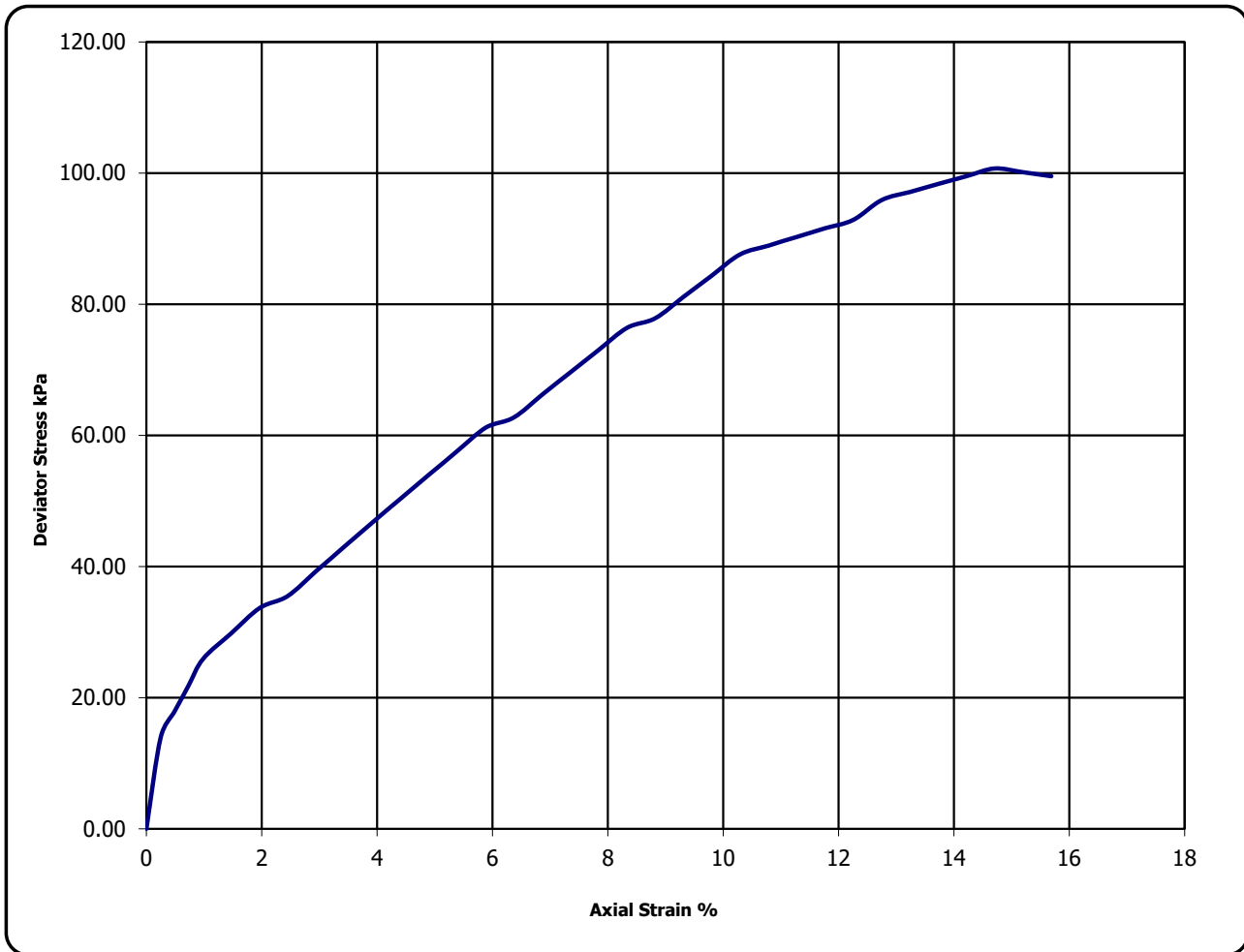
Diameter (mm):		100	Height (mm):		204	Test:		U 100 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
	A	26.9	2.22	1.75	45	149	75	15.2	Compound	Sample taken from Top-middle of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thickness

Checked By
Ben Sharp (Contracts Manager)
Date Approved:

Approved By:
Paul Evans (Quality Manager)
13.10.16

Test Report:**Undrained Shear Strength in Triaxial Compression
BS 1377 : Part 7 : Clause 8 : 1990 Single Stage Test
without measurement of Pore Pressure**

Client ref: 34529110
Location: Castlebrook
Contract Number: 32148
Hole Number: BH04
Sample Number: 19
Depth (m) : 10.00 - 10.45
Sample Type : U
Sample Description : Brown sandy silty CLAY.



Diameter (mm):		102	Height (mm):		204	Test:		U 102 mm Single Stage.		
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Cohesion (kPa)	Failure Strain (%)	Mode of Failure	Remarks	
									Sample taken from Top-middle of tube Rate of strain = 2 %/min	
A	30.0	2.08	1.60	200	101	50	14.7	Plastic	Latex Membrane used 0.2 mm thickness	



Checked By
Ben Sharp (Contracts Manager)
Date Approved:

Approved By:
Paul Evans (Quality Manager)
13.10.16



APPENDIX G

ENVIRONMENTAL LABORATORY RESULTS



ARCADIS UK Ltd
2 Craven Court
Willie Snaith Road
Newmarket
Suffolk
CB8 7FA

Attention: Jonathan Harris

CERTIFICATE OF ANALYSIS

Date: 20 July 2016
Customer: H_ARCADIS_NMK
Sample Delivery Group (SDG): 160707-87
Your Reference: 34529110
Location: Castlebrook High
Report No: 369841

We received 7 samples on Thursday July 07, 2016 and 6 of these samples were scheduled for analysis which was completed on Wednesday July 20, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





SDG:	160707-87	Location:	Castlebrook High	Order Number:	34529110
Job:	H_ARCADIS_NMK-1336	Customer:	ARCADIS UK Ltd	Report Number:	369841
Client Reference:	34529110	Attention:	Jonathan Harris	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13727307	BH01.		0.40 - 0.80	04/07/2016
13727306	BH01.		7.50	04/07/2016
13727310	BH02		0.20 - 0.50	06/07/2016
13727308	BH04		0.40 - 0.80	04/07/2016
13727313	BH04		10.00	04/07/2016
13727609	BH04		5.00	04/07/2016
13727311	BH04		8.00	04/07/2016

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG: 160707-87
Job: H_ARCADIS_NMK-1336
Client Reference: 34529110

Location: Castlebrook High
Customer: ARCADIS UK Ltd
Attention: Jonathan Harris

Order Number: 34529110
Report Number: 369841
Superseded Report:

SOLID Results Legend X Test N No Determination Possible	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container	
	13727609		BH04				5.00		250g Amber Jar (AL	
	13727313		BH04				10.00		250g Amber Jar (AL	
	13727308		BH04				0.40 - 0.80		60g VOC (ALE215)	
	13727310		BH02				0.20 - 0.50		250g Amber Jar (AL	
	13727306		BH01				7.50		60g VOC (ALE215)	
	13727307		BH01				0.40 - 0.80		400g Tub (ALE214)	
									250g Amber Jar (AL	
									1kg TUB	
									60g VOC (ALE215)	
Anions by Kone (soil)	All	NDPs: 0 Tests: 4								
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2								
Chromium III	All	NDPs: 0 Tests: 3								
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 3								
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 3								
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3								
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3								
Metals in solid samples by OES	All	NDPs: 0 Tests: 3								
pH	All	NDPs: 0 Tests: 3								
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3								
Sample description	All	NDPs: 0 Tests: 5								
Total Sulphate	All	NDPs: 0 Tests: 3								
TPH CWG GC (S)	All	NDPs: 0 Tests: 3								
VOC MS (S)	All	NDPs: 0 Tests: 3								



SDG:	160707-87	Location:	Castlebrook High	Order Number:	34529110
Job:	H_ARCADIS_NMK-1336	Customer:	ARCADIS UK Ltd	Report Number:	369841
Client Reference:	34529110	Attention:	Jonathan Harris	Superseded Report:	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
13727310	BH02	0.20 - 0.50	Dark Brown	Sandy Loam	0.063 - 2.00 mm	Stones	Vegetation
13727308	BH04	0.40 - 0.80	Dark Brown	Sandy Clay Loam	0.063 - 2.00 mm	Stones	None
13727313	BH04	10.00	Dark Brown	Silty Clay	0.002 - 0.063 mm	None	None
13727609	BH04	5.00	Dark Brown	Sand	0.063 - 2.00 mm	None	None
13727306	BH01.	7.50	Dark Brown	Silty Clay	0.002 - 0.063 mm	None	None
13727307	BH01.	0.40 - 0.80	Light Brown	Sandy Clay Loam	0.063 - 2.00 mm	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	160707-87
Job:	H_ARCADIS_NMK-1336
Client Reference:	34529110

Location: Castlebrook High
Customer: ARCADIS UK Ltd
Attention: Jonathan Harris

Order Number: 34529110
Report Number: 369841
Superseded Report:

[illegible]



CERTIFICATE OF ANALYSIS

SDG: 160707-87
Job: H_ARCADIS_NMK-1336
Client Reference: 34529110

Location: Castlebrook High
Customer: ARCADIS UK Ltd
Attention: Jonathan Harris

Order Number: 34529110
Report Number: 369841
Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample R	BH01.	BH02	BH04			
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.40 - 0.80 Soil/Solid 04/07/2016 . 07/07/2016 160707-87 13727307	0.20 - 0.50 Soil/Solid 06/07/2016 . 07/07/2016 160707-87 13727310	0.40 - 0.80 Soil/Solid 04/07/2016 . 07/07/2016 160707-87 13727308			
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-5	@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	95	67	44			
GRO TOT (Moisture Corrected)	<0.044 mg/kg	TM089	<0.044 M	<0.044 M	<0.044 M			
Methyl tertiary butyl ether (MTBE)	<0.005 mg/kg	TM089	<0.005 #	<0.005 #	<0.005 #			
Benzene	<0.01 mg/kg	TM089	<0.01 M	<0.01 M	<0.01 M			
Toluene	<0.002 mg/kg	TM089	<0.002 M	<0.002 M	<0.002 M			
Ethylbenzene	<0.003 mg/kg	TM089	<0.003 M	<0.003 M	<0.003 M			
m,p-Xylene	<0.006 mg/kg	TM089	<0.006 M	<0.006 M	<0.006 M			
o-Xylene	<0.003 mg/kg	TM089	<0.003 M	<0.003 M	<0.003 M			
sum of detected mpo xylene by GC	<0.009 mg/kg	TM089	<0.009	<0.009	<0.009			
sum of detected BTEX by GC	<0.024 mg/kg	TM089	<0.024	<0.024	<0.024			
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01			
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01			
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01	<0.01	0.0106			
Aliphatics >C10-C12	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01			
Aliphatics >C12-C16	<0.1 mg/kg	TM173	<0.1	5.21	<0.1			
Aliphatics >C16-C21	<0.1 mg/kg	TM173	<0.1	16.7	<0.1			
Aliphatics >C21-C35	<0.1 mg/kg	TM173	<0.1	41.5	20.1			
Aliphatics >C35-C44	<0.1 mg/kg	TM173	<0.1	3.86	11.4			
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173	<0.1	67.3	31.4			
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01			
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01			
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01			
Aromatics >EC10-EC12	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01			
Aromatics >EC12-EC16	<0.1 mg/kg	TM173	<0.1	<0.1	<0.1			
Aromatics >EC16-EC21	<0.1 mg/kg	TM173	<0.1	2.26	0.487			
Aromatics >EC21-EC35	<0.1 mg/kg	TM173	2.05	16.1	36.6			
Aromatics >EC35-EC44	<0.1 mg/kg	TM173	<0.1	4.01	18.2			
Aromatics >EC40-EC44	<0.1 mg/kg	TM173	<0.1	0.855	7.72			
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173	2.05	22.4	55.3			
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173	2.05	89.7	86.7			



CERTIFICATE OF ANALYSIS

SDG: 160707-87
Job: H_ARCADIS_NMK-1336
Client Reference: 34529110

Location: Castlebrook High
Customer: ARCADIS UK Ltd
Attention: Jonathan Harris

Order Number: 34529110
Report Number: 369841
Superseded Report:

VOC MS (S)

Results Legend		Customer Sample R	BH01.	BH02	BH04			
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.40 - 0.80 Soil/Solid 04/07/2016 . 07/07/2016 160707-87 13727307	0.20 - 0.50 Soil/Solid 06/07/2016 . 07/07/2016 160707-87 13727310	0.40 - 0.80 Soil/Solid 04/07/2016 . 07/07/2016 160707-87 13727308			
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-5&*\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	104	110	106			
Toluene-d8**	%	TM116	98.8	101	99.9			
4-Bromofluorobenzene**	%	TM116	85.5	89.4	87			
Dichlorodifluoromethane	<0.006 mg/kg	TM116	<0.006 M	<0.06 M	<0.06 M			
Chloromethane	<0.007 mg/kg	TM116	<0.007 #	<0.07 #	<0.07 #			
Vinyl Chloride	<0.006 mg/kg	TM116	<0.006 M	<0.06 M	<0.06 M			
Bromomethane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Chloroethane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Trichlorofluoromethane	<0.006 mg/kg	TM116	<0.006 M	<0.06 M	<0.06 M			
1,1-Dichloroethene	<0.01 mg/kg	TM116	<0.01 #	<0.1 #	<0.1 #			
Carbon Disulphide	<0.007 mg/kg	TM116	<0.007 M	<0.07 M	<0.07 M			
Dichloromethane	<0.01 mg/kg	TM116	<0.01 #	<0.1 #	<0.1 #			
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
trans-1,2-Dichloroethene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
1,1-Dichloroethane	<0.008 mg/kg	TM116	<0.008 M	<0.08 M	<0.08 M			
cis-1,2-Dichloroethene	<0.006 mg/kg	TM116	<0.006 M	<0.06 M	<0.06 M			
2,2-Dichloropropane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Bromochloromethane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Chloroform	<0.008 mg/kg	TM116	<0.008 M	<0.08 M	<0.08 M			
1,1,1-Trichloroethane	<0.007 mg/kg	TM116	<0.007 M	<0.07 M	<0.07 M			
1,1-Dichloropropene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Carbontetrachloride	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
1,2-Dichloroethane	<0.005 mg/kg	TM116	<0.005 M	<0.05 M	<0.05 M			
Benzene	<0.009 mg/kg	TM116	<0.009 M	<0.09 M	<0.09 M			
Trichloroethene	<0.009 mg/kg	TM116	<0.009 #	<0.09 #	<0.09 #			
1,2-Dichloropropane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Dibromomethane	<0.009 mg/kg	TM116	<0.009 M	<0.09 M	<0.09 M			
Bromodichloromethane	<0.007 mg/kg	TM116	<0.007 M	<0.07 M	<0.07 M			
cis-1,3-Dichloropropene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Toluene	<0.007 mg/kg	TM116	<0.007 M	<0.07 M	<0.07 M			
trans-1,3-Dichloropropene	<0.01 mg/kg	TM116	<0.01	<0.1	<0.1			
1,1,2-Trichloroethane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			



CERTIFICATE OF ANALYSIS

SDG: 160707-87
Job: H_ARCADIS_NMK-1336
Client Reference: 34529110

Location: Castlebrook High
Customer: ARCADIS UK Ltd
Attention: Jonathan Harris

Order Number: 34529110
Report Number: 369841
Superseded Report:

VOC MS (S)

Results Legend		Customer Sample R	BH01.	BH02	BH04			
#	ISO17025 accredited. mCERTS accredited.							
M	Aqueous / settled sample.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.40 - 0.80 Soil/Solid 04/07/2016 07/07/2016 160707-87 13727307	0.20 - 0.50 Soil/Solid 06/07/2016 07/07/2016 160707-87 13727310	0.40 - 0.80 Soil/Solid 04/07/2016 07/07/2016 160707-87 13727308			
aq	Dissolved / filtered sample.							
diss.filt	Total / unfiltered sample.							
tot.unfilt	Subcontracted test.							
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
**	Trigger breach confirmed							
(F)	Sample deviation (see appendix)							
1-5&+§@								
Component	LOD/Units	Method						
1,3-Dichloropropane	<0.007 mg/kg	TM116	<0.007 M	<0.07 M	<0.07 M			
Tetrachloroethene	<0.005 mg/kg	TM116	<0.005 M	<0.05 M	<0.05 M			
Dibromochloromethane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
1,2-Dibromoethane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Chlorobenzene	<0.005 mg/kg	TM116	<0.005 M	<0.05 M	<0.05 M			
1,1,1,2-Tetrachloroethane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Ethylbenzene	<0.004 mg/kg	TM116	<0.004 M	<0.04 M	<0.04 M			
p/m-Xylene	<0.01 mg/kg	TM116	<0.01 #	<0.1 #	<0.1 #			
o-Xylene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Styrene	<0.01 mg/kg	TM116	<0.01 #	<0.1 #	<0.1 #			
Bromoform	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Isopropylbenzene	<0.005 mg/kg	TM116	<0.005 #	<0.05 #	<0.05 #			
1,1,2,2-Tetrachloroethane	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
1,2,3-Trichloropropane	<0.016 mg/kg	TM116	<0.016 M	<0.16 M	<0.16 M			
Bromobenzene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
Propylbenzene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
2-Chlorotoluene	<0.009 mg/kg	TM116	<0.009 M	<0.09 M	<0.09 M			
1,3,5-Trimethylbenzene	<0.008 mg/kg	TM116	<0.008 M	<0.08 M	<0.08 M			
4-Chlorotoluene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
tert-Butylbenzene	<0.014 mg/kg	TM116	<0.014 M	<0.14 M	<0.14 M			
1,2,4-Trimethylbenzene	<0.009 mg/kg	TM116	<0.009 #	<0.09 #	<0.09 #			
sec-Butylbenzene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
4-Isopropyltoluene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
1,3-Dichlorobenzene	<0.008 mg/kg	TM116	<0.008 M	<0.08 M	<0.08 M			
1,4-Dichlorobenzene	<0.005 mg/kg	TM116	<0.005 M	<0.05 M	<0.05 M			
n-Butylbenzene	<0.011 mg/kg	TM116	<0.011	<0.11	<0.11			
1,2-Dichlorobenzene	<0.01 mg/kg	TM116	<0.01 M	<0.1 M	<0.1 M			
1,2-Dibromo-3-chloroprop ane	<0.014 mg/kg	TM116	<0.014 M	<0.14 M	<0.14 M			
Tert-amyl methyl ether	<0.01 mg/kg	TM116	<0.01 #	<0.1 #	<0.1 #			
1,2,4-Trichlorobenzene	<0.02 mg/kg	TM116	<0.02	<0.2	<0.2			
Hexachlorobutadiene	<0.02 mg/kg	TM116	<0.02	<0.2	<0.2			
Naphthalene	<0.013 mg/kg	TM116	<0.013 M	<0.13 M	<0.13 M			

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VOC MS (S)

[illegible]



SDG:	160707-87	Location:	Castlebrook High	Order Number:	34529110
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Asbestos Identification - Soil

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref.	BH01. 0.40 - 0.80 SOLID	20/07/16	Simon Postlewhite	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	04/07/2016										
Sample Type	00:00:00										
Date Sampled	14/07/2016										
Date Receieved	18:10:30										
SDG	160707-87										
Original Sample	13727307										
Method Number	TM048										
Cust. Sample Ref.	BH02. 0.20 - 0.50 SOLID	20/07/16	Simon Postlewhite	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	06/07/2016										
Sample Type	00:00:00										
Date Sampled	15/07/2016										
Date Receieved	07:51:47										
SDG	160707-87										
Original Sample	13727310										
Method Number	TM048										



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Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
TM243		Mixed Anions In Soils By Kone		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



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Test Completion Dates

Lab Sample No(s)	13727310	13727308	13727313	13727609	13727306	13727307
Customer Sample Ref.	BH02	BH04	BH04	BH04	BH01.	BH01.
AGS Ref.						
Depth	0.20 - 0.50	0.40 - 0.80	10.00	5.00	7.50	0.40 - 0.80
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID

Anions by Kone (soil)			18-Jul-2016	18-Jul-2016	18-Jul-2016	18-Jul-2016
Asbestos ID in Solid Samples	20-Jul-2016					20-Jul-2016
Chromium III	19-Jul-2016	19-Jul-2016				19-Jul-2016
EPH CWG (Aliphatic) GC (S)	18-Jul-2016	16-Jul-2016				18-Jul-2016
EPH CWG (Aromatic) GC (S)	18-Jul-2016	16-Jul-2016				18-Jul-2016
GRO by GC-FID (S)	18-Jul-2016	18-Jul-2016				18-Jul-2016
Hexavalent Chromium (s)	18-Jul-2016	18-Jul-2016				18-Jul-2016
Metals in solid samples by OES	19-Jul-2016	19-Jul-2016				19-Jul-2016
pH	18-Jul-2016	15-Jul-2016				15-Jul-2016
Phenols by HPLC (S)	18-Jul-2016	16-Jul-2016				18-Jul-2016
Sample description	15-Jul-2016	14-Jul-2016	14-Jul-2016	14-Jul-2016	14-Jul-2016	14-Jul-2016
Total Sulphate	20-Jul-2016	18-Jul-2016				20-Jul-2016
TPH CWG GC (S)	18-Jul-2016	18-Jul-2016				18-Jul-2016
VOC MS (S)	18-Jul-2016	18-Jul-2016				18-Jul-2016



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ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 1344	QC 1302
Chloride (soluble)	TM243	89.13 : 109.51	94.76 89.13 : 109.51
Water Soluble Sulphate as SO4 2:1 Extract	TM243	91.99 : 109.79	88.64 91.99 : 109.79

EPH CWG (Aliphatic) GC (S)

Component	Method Code	QC 1328	QC 1303	QC 1344
Total Aliphatics >C12-C35	TM173	90.21 69.19 : 111.75	90.83 69.19 : 111.75	91.67 70.80 : 111.51

EPH CWG (Aromatic) GC (S)

Component	Method Code	QC 1328	QC 1303	QC 1344
Total Aromatics >EC12-EC35	TM173	84.0 65.82 : 105.00	86.67 65.82 : 105.00	84.67 65.21 : 121.32

GRO by GC-FID (S)

Component	Method Code	QC 1389
Benzene by GC (Moisture Corrected)	TM089	95.5 76.23 : 120.71
Ethylbenzene by GC (Moisture Corrected)	TM089	90.0 73.32 : 122.02
m & p Xylene by GC (Moisture Corrected)	TM089	88.75 72.90 : 122.64
MTBE GC-FID (Moisture Corrected)	TM089	97.5 72.17 : 124.81
o Xylene by GC (Moisture Corrected)	TM089	88.5 71.65 : 124.40
QC	TM089	92.91 68.82 : 125.04
Toluene by GC (Moisture Corrected)	TM089	93.0 74.60 : 120.38

Hexavalent Chromium (s)

Component	Method Code	QC 1349	QC 1324
Hexavalent Chromium	TM151	94.0 92.20 : 106.60	100.0 92.20 : 106.60



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Metals in solid samples by OES

Component	Method Code	QC 1323	QC 1387	QC 1349
Aluminium	TM181	97.69 80.01 : 119.99	100.77 80.01 : 119.99	91.54 80.01 : 119.99
Antimony	TM181	93.55 77.50 : 122.50	93.55 77.50 : 122.50	96.42 77.50 : 122.50
Arsenic	TM181	348.67 82.63 : 117.37	343.36 82.63 : 117.37	339.82 82.63 : 117.37
Barium	TM181	96.99 79.45 : 120.55	96.24 79.45 : 120.55	91.73 79.45 : 120.55
Beryllium	TM181	480.62 82.93 : 117.07	454.26 82.93 : 117.07	443.41 82.93 : 117.07
Boron	TM181	252.67 69.98 : 130.02	257.25 69.98 : 130.02	245.04 69.98 : 130.02
Cadmium	TM181	321.01 81.95 : 118.05	321.01 81.95 : 118.05	322.69 81.95 : 118.05
Chromium	TM181	187.45 81.29 : 118.71	189.8 81.29 : 118.71	188.63 81.29 : 118.71
Cobalt	TM181	550.0 83.86 : 116.14	536.67 83.86 : 116.14	530.0 83.86 : 116.14
Copper	TM181	91.22 78.57 : 121.43	92.03 78.57 : 121.43	92.7 78.57 : 121.43
Iron	TM181	97.24 83.21 : 116.79	98.62 83.21 : 116.79	91.72 83.21 : 116.79
Lead	TM181	193.31 77.50 : 122.50	185.83 77.50 : 122.50	181.1 77.50 : 122.50
Manganese	TM181	99.4 82.91 : 117.09	97.8 82.91 : 117.09	93.8 82.91 : 117.09
Mercury	TM181	427.14 81.99 : 118.01	417.09 81.99 : 118.01	423.79 81.99 : 118.01
Molybdenum	TM181	415.61 81.45 : 118.55	404.46 81.45 : 118.55	402.87 81.45 : 118.55
Nickel	TM181	252.33 79.64 : 120.36	252.33 79.64 : 120.36	251.16 79.64 : 120.36
Phosphorus	TM181	99.55 81.03 : 118.97	97.76 81.03 : 118.97	93.0 81.03 : 118.97
Selenium	TM181	558.97 83.31 : 116.69	560.68 83.31 : 116.69	562.39 83.31 : 116.69
Strontium	TM181	175.1 83.64 : 116.36	180.84 83.64 : 116.36	183.91 83.64 : 116.36
Thallium	TM181	399.67 81.18 : 118.82	407.96 81.18 : 118.82	417.91 81.18 : 118.82
Tin	TM181	93.69 81.44 : 118.56	92.36 81.44 : 118.56	91.69 81.44 : 118.56
Titanium	TM181	96.09 71.02 : 128.98	96.09 71.02 : 128.98	90.63 71.02 : 128.98
Vanadium	TM181	93.82 86.61 : 113.39	93.82 86.61 : 113.39	93.24 86.61 : 113.39
Zinc	TM181	90.1 87.90 : 112.10	91.56 87.90 : 112.10	92.05 87.90 : 112.10

pH



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pH

Component	Method Code	QC 1326	QC 1371	QC 1365
pH	TM133	99.24 97.98 : 101.77	99.87 98.36 : 102.14	99.37 98.36 : 102.14

Phenols by HPLC (S)

Component	Method Code	QC 1345	QC 1316	QC 1320
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	106.49 85.25 : 114.75	101.95 87.96 : 112.04	104.55 87.96 : 112.04
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	107.02 75.71 : 124.29	93.57 82.86 : 105.46	92.98 81.61 : 100.44
Catechol by HPLC (S)	TM062 (S)	101.9 64.10 : 135.90	96.19 76.28 : 137.67	100.0 76.28 : 137.67
Cresols by HPLC (S)	TM062 (S)	102.51 85.72 : 114.28	99.37 90.51 : 112.71	96.45 90.51 : 112.71
Napthol by HPLC (S)	TM062 (S)	106.43 75.62 : 124.38	103.57 89.39 : 128.63	110.0 89.39 : 128.63
Phenol by HPLC (S)	TM062 (S)	108.61 79.53 : 120.47	101.99 87.45 : 106.46	96.03 87.45 : 106.46
Resorcinol HPLC (S)	TM062 (S)	96.86 85.90 : 114.10	100.0 87.76 : 112.24	97.48 87.76 : 112.24
Xylenols by HPLC (S)	TM062 (S)	101.77 88.01 : 111.99	100.31 93.06 : 114.56	100.42 93.06 : 114.56

Total Sulphate

Component	Method Code	QC 1320
Total Sulphate	TM221	90.15 70.57 : 128.43

VOC MS (S)

Component	Method Code	QC 1303	QC 1333
1,1,1,2-tetrachloroethane	TM116	85.2 76.60 : 121.00	95.8 76.60 : 121.00
1,1,1-Trichloroethane	TM116	88.4 77.80 : 123.40	99.6 77.80 : 123.40
1,1,2-Trichloroethane	TM116	83.8 75.40 : 119.80	95.0 75.40 : 119.80
1,1-Dichloroethane	TM116	90.2 74.46 : 129.15	103.6 74.46 : 129.15
1,2-Dichloroethane	TM116	97.4 86.62 : 136.90	107.2 86.62 : 136.90
1,4-Dichlorobenzene	TM116	91.6 72.76 : 126.34	96.0 72.76 : 126.34
2-Chlorotoluene	TM116	83.2 74.00 : 117.20	90.0 74.00 : 117.20



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VOC MS (S)

		QC 1303	QC 1333
4-Chlorotoluene	TM116	87.6 71.20 : 113.20	93.8 71.20 : 113.20
Benzene	TM116	88.0 79.60 : 125.20	99.2 79.60 : 125.20
Carbon Disulphide	TM116	84.0 74.91 : 122.14	96.2 74.91 : 122.14
Carbontetrachloride	TM116	100.0 87.07 : 120.37	108.8 87.07 : 120.37
Chlorobenzene	TM116	83.0 75.00 : 115.53	91.8 75.00 : 115.53
Chloroform	TM116	91.8 82.00 : 128.80	103.0 82.00 : 128.80
Chloromethane	TM116	92.4 68.36 : 154.01	105.6 68.36 : 154.01
Cis-1,2-Dichloroethene	TM116	83.0 57.23 : 143.96	94.8 57.23 : 143.96
Dibromomethane	TM116	88.8 73.40 : 116.60	95.0 73.40 : 116.60
Dichloromethane	TM116	93.4 86.60 : 137.00	104.6 86.60 : 137.00
Ethylbenzene	TM116	82.4 73.60 : 115.60	89.2 73.60 : 115.60
Hexachlorobutadiene	TM116	93.0 42.69 : 142.65	83.0 42.69 : 142.65
Isopropylbenzene	TM116	73.6 64.24 : 119.40	78.8 64.24 : 119.40
Naphthalene	TM116	93.4 79.04 : 135.59	103.4 79.04 : 135.59
o-Xylene	TM116	69.0 51.65 : 118.61	78.4 51.65 : 118.61
p/m-Xylene	TM116	78.2 71.30 : 112.70	84.4 71.30 : 112.70
Sec-Butylbenzene	TM116	87.6 54.99 : 144.98	78.4 54.99 : 144.98
Tetrachloroethene	TM116	89.6 85.92 : 127.92	97.8 85.92 : 127.92
Toluene	TM116	81.0 76.08 : 110.17	89.2 76.08 : 110.17
Trichloroethene	TM116	85.8 78.17 : 121.37	93.8 78.17 : 121.37
Trichlorofluoromethane	TM116	90.8 75.01 : 124.99	98.2 75.01 : 124.99
Vinyl Chloride	TM116	92.6 66.81 : 138.46	107.2 66.81 : 138.46

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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Chromatogram

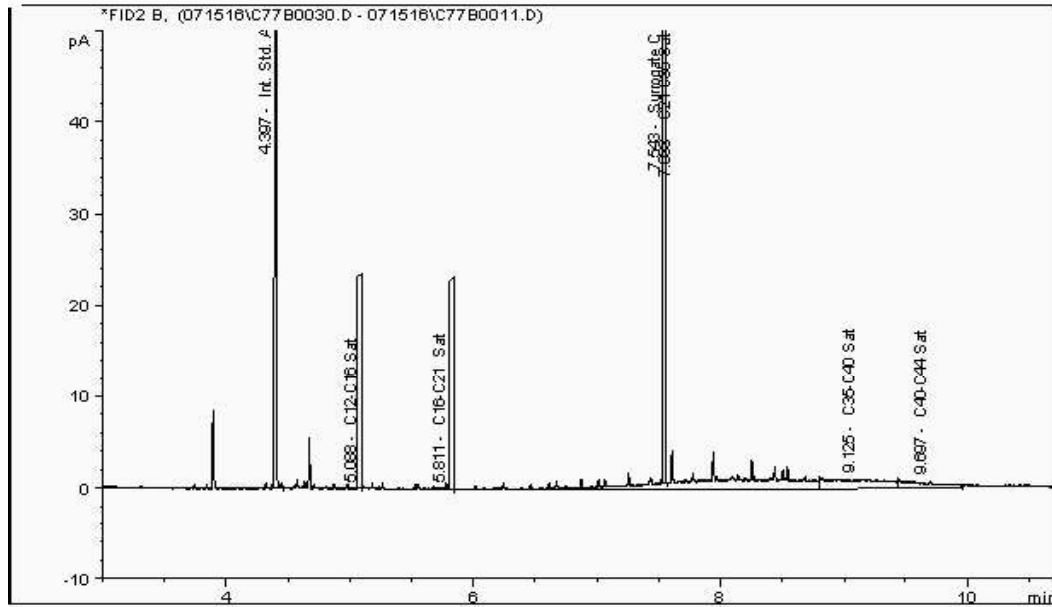
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 13773162
Sample ID : BH04

Depth : 0.40 - 0.80

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 12915435-
Date Acquired : 15/07/2016 18:59:14 PM
Units : ppb
Dilution:





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Superseded Report:

Chromatogram

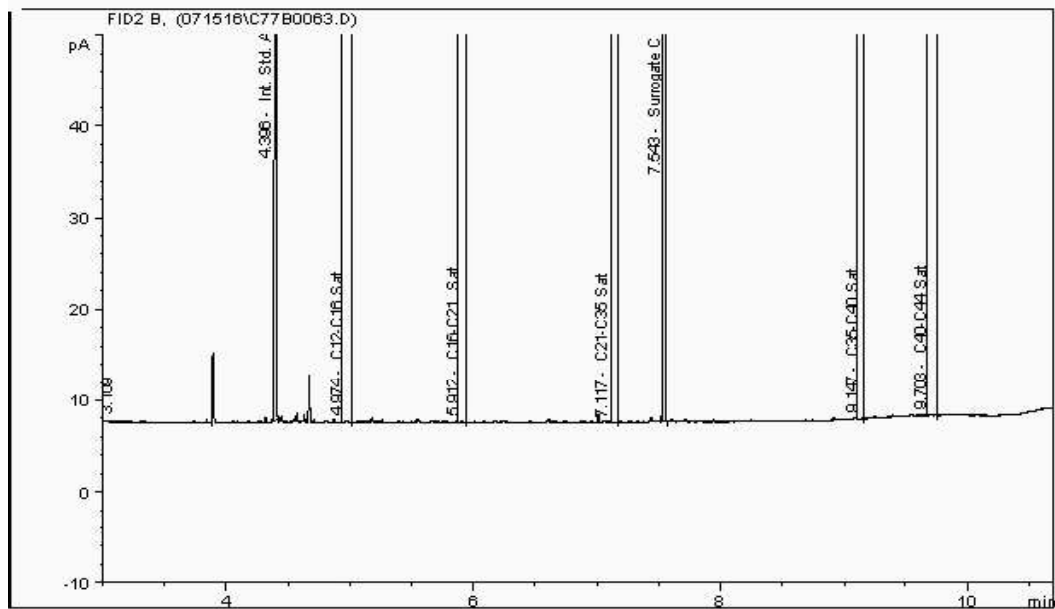
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 13776488
Sample ID : BH01.

Depth : 0.40 - 0.80

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 12915395-
Date Acquired : 16/07/2016 15:17:28 PM
Units : ppb
Dilution:





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Chromatogram

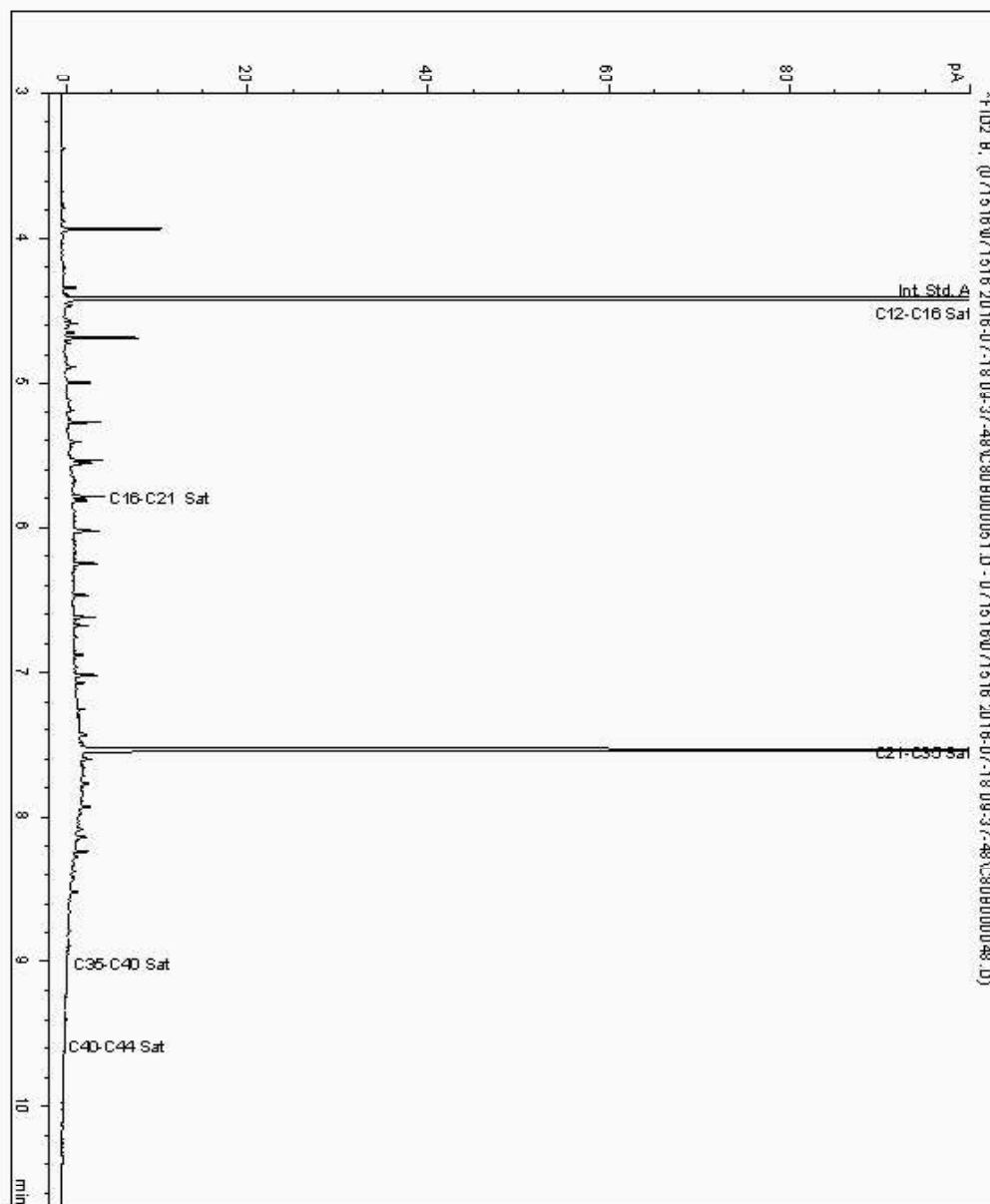
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 13777288
Sample ID : BH02

Depth : 0.20 - 0.50

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 12915452-
Date Acquired : 18/07/16 10:00:53
Units : ppb
Dilution :
CF : 1
Multiplier : 1.010





SDG: 160707-87
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Customer: ARCADIS UK Ltd
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Superseded Report:

Chromatogram

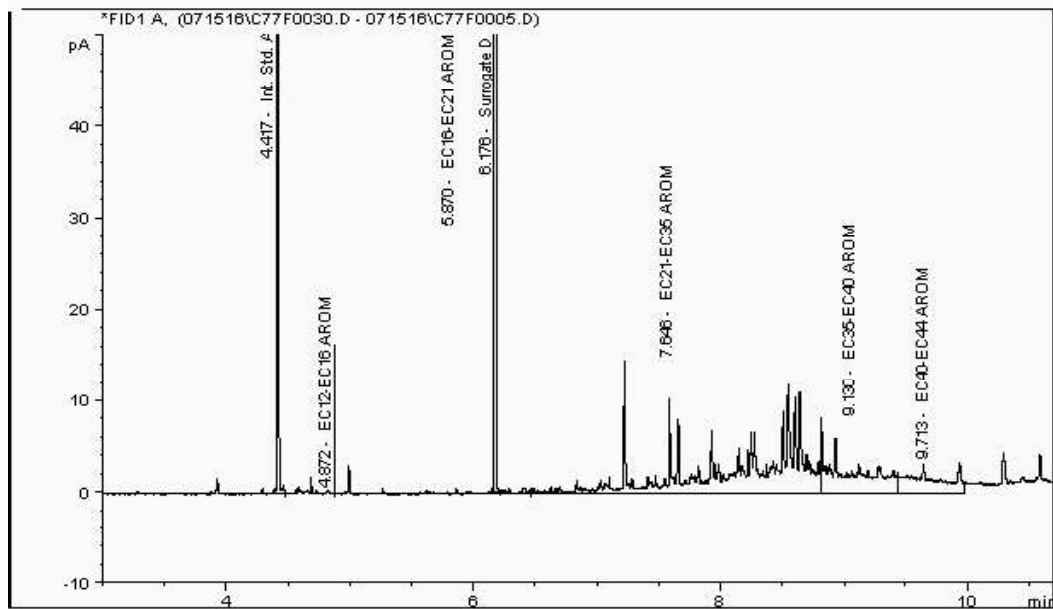
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 13773162
Sample ID : BH04

Depth : 0.40 - 0.80

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 12915436-
Date Acquired : 15/07/2016 18:59:14 PM
Units : ppb
Dilution:





SDG: 160707-87
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Client Reference: 34529110

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Chromatogram

Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 13776488
Sample ID : BH01.

Depth : 0.40 - 0.80

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 12915396-
Date Acquired : 16/07/2016 15:17:28 PM
Units : ppb
Dilution:

