Garganey Trust

Wombwell Wetlands

Ground Investigation Factual Report

November 2016

Arndale Court, Otley Road, Headingley, Leeds, West Yorkshire, LS6 2UJ. Tel: + (44) 113 278 7111

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APPENDICES

1.0 Introduction

WYG Environment Planning Transport Limited (WYG) were commissioned by the Garganey Trust to carry out a ground investigation at a site located at Wombwell, Barnsley. The purpose of this investigation was to aid in creating a new wetland habitat. The ground investigation itself was focussed on assessing the ground conditions for creation of a bund and the suitability of the material on site to be used in its creation.

WYG were appointed to undertake the site investigation works, under the on-site direction from the Garganey trust and JBA Consulting.

1.1 Objectives and Report Format

The objectives of this report are to provide factual information pertaining to the site works, including the main phase of intrusive investigation, monitoring rounds and associated laboratory analysis.

Section 2 of the report presents the location and a description of the subject site.

Section 3 of the report includes details of the ground investigation works carried out by WYG and those companies subcontracted for the duration of the required elements of the investigation.

Section 4 of the report includes details of the laboratory analysis completed as part of the commission.

Drawings and factual data are presented as Appendices B to F.

1.2 Terms and Conditions

This report has been prepared for JBA and the Garganey Trust and other agreed parties in accordance with the terms and conditions outlined in the pre tender information.

Attention is drawn to the report conditions, included as Appendix A and the terms and conditions of the engagement.

2.0 Site Details

2.1 Site Location

The site is located within the agricultural land adjacent to Billing Dyke, approximately 800m east of the town of Wombwell, near Barnsley. The National Grid Reference of the approximate centre of the site is (NGR): 441315 403515. The site was accessed from Everill Gate Lane.

A Site Location Plan is presented as Drawing No. A099966-LDS-N-01, within Appendix B.

2.2 Site Description

The site comprises a large farmer's field, bounded to the North by Billings dyke, to the West by a Water Treatment plant and to the South and East by wetlands. At the time of the site works the field had been recently harvested.

Exploratory holes were undertaken on the northern side of the field adjacent to Billings dyke.

The site extents are shown on Exploratory Hole Location Plan as Drawing: A099966-LDS-N-02 within Appendix B.

2.3 Geology

2.3.1 Superficial Geology

The British Geological Survey website indicates the site to be underlain by alluvial deposits of Quaternary Age.

2.3.2 Solid Geology

The British Geological Survey website indicates that the site is underlain by the Middle Coal Measures formation of Carboniferous age.

3.0 Ground Investigation Works

3.1 Site Activities

The ground investigation was carried out on the 3rd October 2016.

The fieldwork was carried out in general accordance with BS 5930 (2015). All Site Investigation operations were completed in accordance with the Specification as provided by the Investigation Supervisor.

The site works are summarised below; exploratory hole locations are presented within Appendix B as WYG Drawing No. A099966/LDS/N/02.

3.2 Site Works

Wombwell

- 2 No. Cable Percussion Boreholes (CP001 and CP002); to depths of 3.5m and 2.5m bgl respectively.
- 5 No. Machine Excavated Trial Pits (TP001 to TP005 inclusive); to depths between 1.7m and 2.8m bgl.

3.2.1 General

- SPT Hammer Energy Test Reports are presented within Appendix C.1. The respective hammer reference is provided on the individual exploratory hole log.
- Full details of the geology encountered, samples taken and insitu testing completed in each exploratory hole are provided on the respective log within Appendix C.
- Photographs of the Machine Excavated trial Pits are presented in Appendix D.
- Upon completion of the intrusive phase of the works, each exploratory hole location was surveyed, with the coordinates recorded to UK OS National Grid and the level to Ordnance Datum; the details of which are provided on the individual exploratory hole logs within Appendix C.

3.2.2 Reinstatement

Cable Percussion boreholes were reinstated with a mix of arisings and bentonite pellets. The Machine Excavated trial pits were reinstated with arisings, with the original topsoil replaced on the top and levelled to the original ground level.

4.0 Laboratory Analysis

4.1 Chemical Laboratory Analysis

Chemical analysis (details of which are provided below) was scheduled by JBA on samples obtained during the site investigation works. Chemical testing was carried out by Jones Environmental at their laboratory in Deeside, in accordance with their UKAS / MCERTS Accreditation.

The testing scheduled is summarised in Table 4.1 below. All chemical analysis results are presented as Appendix E.

Table 4.1: Chemical Analysis Summary Table

Analysis	Total No. Samples Tested
SOILS	
WYG Soil Suite B	1
BRE Suite	1
WAC Testing	1

4.2 Geotechnical Laboratory Analysis

A suite of geotechnical analysis was scheduled by JBA on samples obtained during the site investigation works. Geotechnical testing was carried out by Professional Soils Laboratories Limited (PSL) at their laboratory in Doncaster, in accordance with their UKAS Accreditation. The testing scheduled is summarised in Table 4.2 below. The geotechnical testing results are presented in Appendix F.

Table 4.2: Geotechnical Analysis Summary

Geotechnical Test	Number of Tests
Moisture Content	5
Atterberg Limits	5
Particle Density	2
Particle Size Distribution (Sieve Analysis)	5
2.5 Kg Compaction Test	5
Consolidated Drained (CD) Shearbox Test	3
pH (& SO_4)	4

Appendices

Arndale Court, Otley Road, Headingley, Leeds, West Yorkshire, LS6 2UJ. Tel: + (44) 113 278 7111

Appendix A – Report Conditions

APPENDIX A - REPORT CONDITIONS

GROUND INVESTIGATION

This report is produced solely for the benefit of Garganey Trust and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

This report is based on a visual site inspection, reference to accessible referenced historical records, the physical investigation works as detailed, information supplied by those parties referenced in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research. Where ground contamination is suspected but no physical site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to activities related to the site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, perhaps in higher concentrations, elsewhere on the site cannot be discounted.

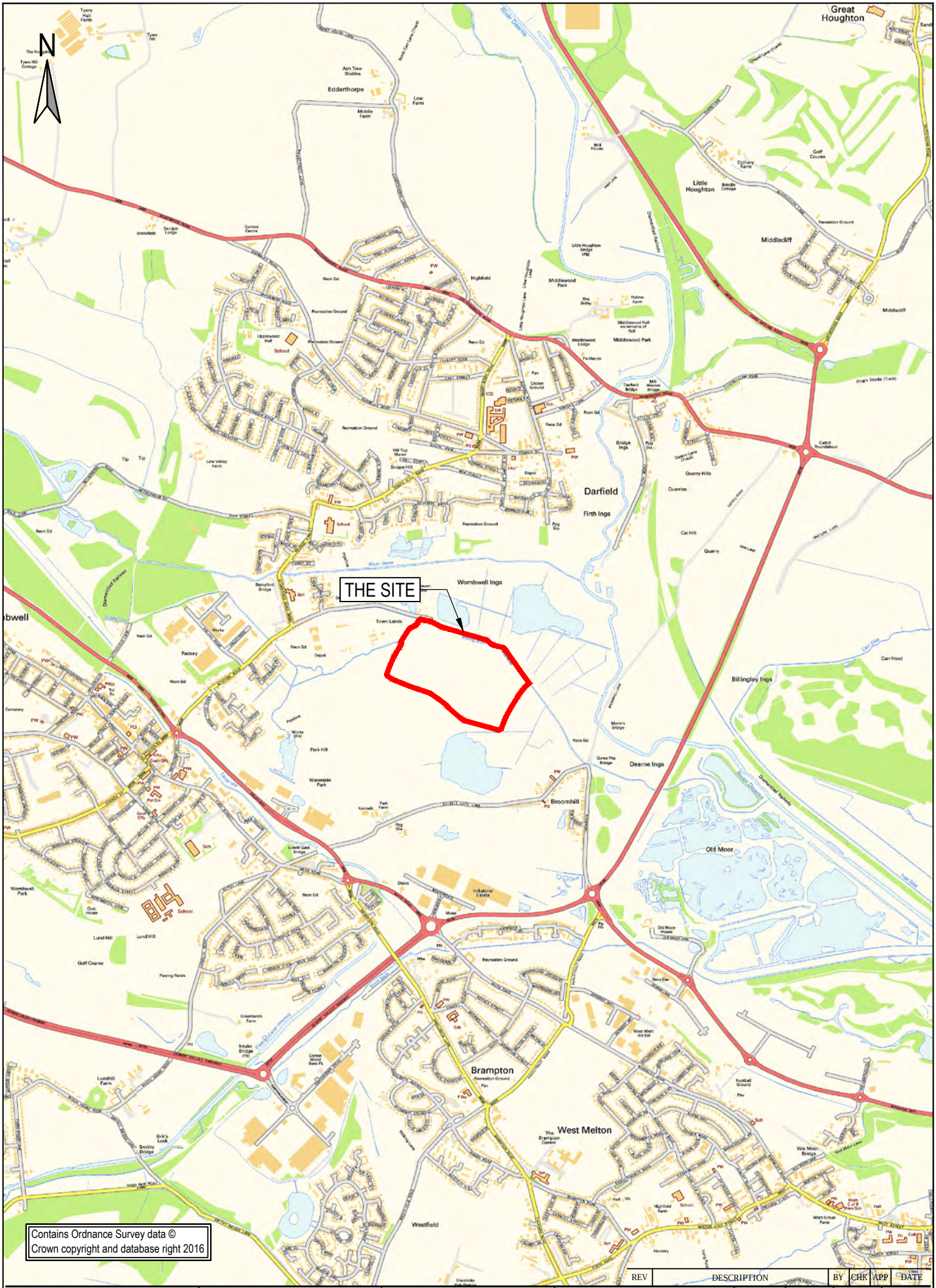
Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question as such bodies often have unpublished, more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices or amended legislation may necessitate a re-assessment.

The assessment of ground conditions within this report is based upon the findings of the study undertaken. We have interpreted the ground conditions in between locations on the assumption that conditions do not vary significantly. However, no investigation can inspect each and every part of the site and therefore changes or variances in the physical and chemical site conditions as described in this report cannot be discounted.

The report is limited to those aspects of land contamination specifically reported on and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contamination (past or present) exists further extensive research will be required before the effects can be better determined.

Appendix B – Figures and Drawings

Arndale Court, Otley Road, Headingley, Leeds, West Yorkshire, LS6 2UJ. Tel: + (44) 113 278 7111



REV	DESCRIPTION	BY	CHK	APP	DATE

ARNDALE COURT
HEADINGLEY
LEEDS
LS6 2UJ

TEL: +44 (0)113 278 7111
FAX: +44 (0)113 278 3487
e-mail: leeds@wyg.com

Client: GARGANEY TRUST

Project: A099966
WOMBWELL WETLANDS

Drawing Title: SITE LOCATION PLAN

Scale @ A4	Drawn	Date	Checked	Date	Approved	Date
1:20,000	PW	14.11.16				

Project No.	Office	Type	Drawing No.	Revision
A099966	LDS	N	01	

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

N

KEY:

BOREHOLE LOCATION

TRIAL PIT LOCATION

0 10 20 30 40 50 m

SCALE 1:2000 @ A3

REV	DESCRIPTION	BY	CHK	APP	DATE

Client:

GARGANEY TRUST

ARNDALE COURT
HEADINGLEY
LEEDS
LS6 2UJ

TEL: +44 (0)113 278 7111
FAX: +44 (0)113 278 3487
e-mail: leeds@wyg.com

Project: A099966

WOMBWELL WETLANDS

Drawing Title:

GROUND INVESTIGATION LOCATION PLAN

Scale @ A3	Drawn Date	Checked Date	Approved Date
1:2000	PW 14.11.16		

Project No.	Office	Type	Drawing No.	Revision
A099966	LDS	N	02	

Appendix C – Exploratory Hole Logs

Appendix C.1 – Cable Percussion Borehole Logs (Including SPT Hammer Energy Test Reports)

Project: **Wombwell Wetlands**

Location: **Wombwell**

Client: **Garganey Trust**

Location Details			
Easting:	441280.37	Northing:	403510.01
Level:	23.77mAOD	Depth:	3.60m
Logger:	JO	Type:	CP
		Inclination:	90°

Status: FINAL

Borehole Number: **CP001**

Sheet 1 of 1

Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time				
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)
0.00	1.20	Inspection Pit	Hand Excavated	M.Clarke	1.20	-	3.60	150					
1.20	3.60	Cable Percussion	Dando 2000	M.Clarke	3.60	150							

Scale: 1:50
Checked By: PS
Approved By: BS
Start Date: 03/10/2016
Finish Date: 03/10/2016

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Dark greyish brown slightly gravelly slightly clayey fine SAND. Gravel is subangular to subrounded fine to medium sandstone.						0.00 - 0.40	B1	
Orangish brown very clayey fine to medium SAND and angular to subangular fine to medium sandstone GRAVEL.		0.40	23.37			0.40 - 1.20	B2	
						1.20	D3	
						1.50 - 1.95	U-NR	Ublows=150 Recovery=0%
						1.50 - 2.00	B4	
Soft light yellowish grey slightly gravelly slightly sandy CLAY. Sand is fine. Gravel is angular to subangular fine to medium sandstone.		2.10	21.67			2.20	D5	
Very dense light yellowish grey gravelly slightly clayey fine to medium SAND. Gravel is angular to subangular fine to medium sandstone.		2.40	21.37			2.50 - 2.95	D6	SPT(S) 2.50m, 50 (10,15/50 for 105mm)
						2.50 - 3.00	B7	
						3.20	D8	
Light yellowish grey fine grained SANDSTONE. Recovered as angular to subangular fine to medium gravel.		3.30	20.47			3.50 - 3.95	D9	SPT(S) 3.50m, 50 (25 for 19mm/50 for 26mm)
EOH at 3.60m - Terminated due to rock obstruction		3.60	20.17					

Observations / Remarks

1. Groundwater not observed.
2. Upon completion exploratory hole backfilled with arisings.

Chiselling

From (m)	To (m)	Time (mins)
2.00	2.50	30
3.50	3.60	30

Water Added

From (m)	To (m)

Hammer Information

Serial No.	Energy Ratio %
JB09	58

Groundwater

Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks

Project Number: **A099966**

Project: **Wombwell Wetlands**

Location: **Wombwell**

Client: **Garganey Trust**

Location Details			
Easting:	441257.49	Northing:	403504.00
Level:	24.17mAOD	Depth:	2.72m
Logger:	JO	Type:	CP
		Inclination:	90°

Status: FINAL

Borehole Number: **CP002**

Sheet 1 of 1

Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time				
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)
0.00	1.20	Inspection Pit	Hand Excavated	M.Clarke	1.20	-	2.50	150					
1.20	2.72	Cable Percussion	Dando 2000	M.Clarke	2.72	150							

Scale:	1:50
Checked By:	PS
Approved By:	BS
Start Date:	03/10/2016
Finish Date:	03/10/2016

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Dark grey slightly gravelly slightly clayey fine to medium SAND. Gravel is subangular to subrounded fine to medium sandstone.						0.00 - 0.40	B1	
		0.40	23.77			0.40 - 0.60	B2	
Medium dense light yellowish brown very clayey fine to medium SAND and angular to subangular fine to medium sandstone and coal GRAVEL.						0.60 - 1.20	B3	
						1.50 - 1.95	D4	SPT(S) 1.50m, N=24 (5,6/7,4,7,6)
						1.50 - 2.00	B5	
		2.20	21.97			2.20	D6	
Very dense light yellowish grey sandy angular to subangular medium to coarse sandstone GRAVEL. Sand is fine to medium.		2.40	21.77					
Light yellowish grey fine grained SANDSTONE.						2.50 - 2.95	D7	SPT(S) 2.50m, 50 (11,14/50 for 65mm)
EOH at 2.72m - Terminated due to rock obstruction		2.72	21.45					

Observations / Remarks

1. Groundwater not observed.
2. Upon completion exploratory hole backfilled with arisings.

Chiselling			Water Added		Hammer Information	
From (m)	To (m)	Time (mins)	From (m)	To (m)	Serial No.	Energy Ratio %
					JB09	58

Groundwater					
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks

Project Number: **A099966**

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

JB Site Investigations Ltd
Windmill Way West
Ramparts Business Park
Berwick-Upon-Tweed
TD15 1TB

SPT Hammer Ref:	JB09
Test Date:	26/08/2016
Report Date:	26/08/2016
File Name:	JB09.spt
Test Operator:	JS

Instrumented Rod Data

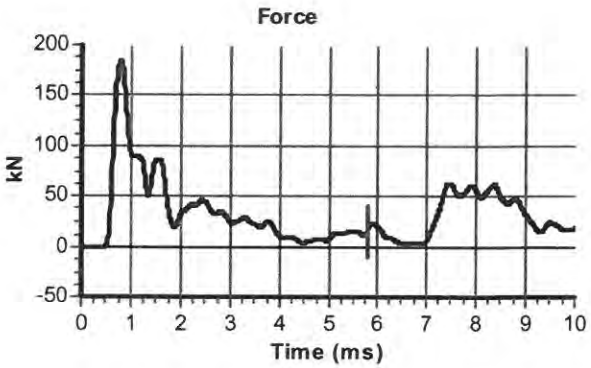
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.3
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	6178
Accelerometer No.2:	5843

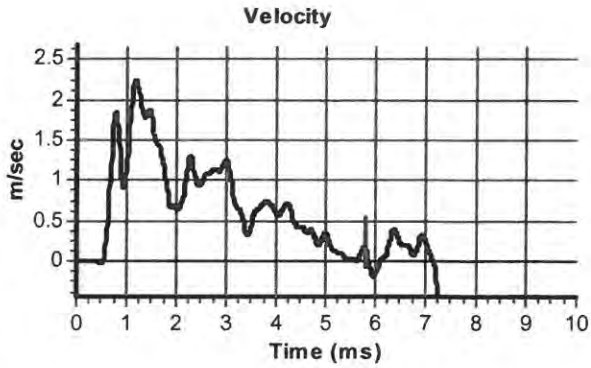
SPT Hammer Information

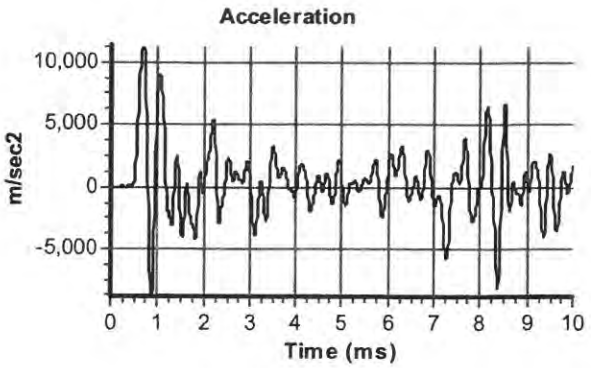
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.0

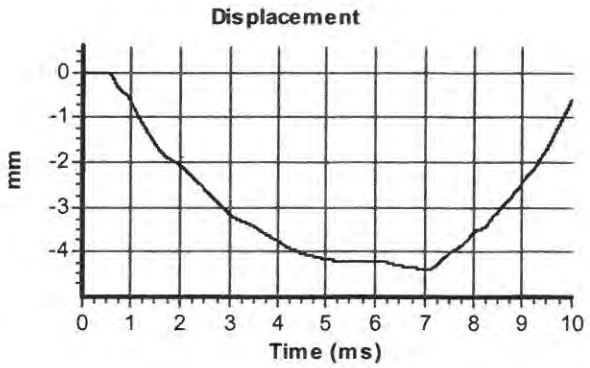
Comments / Location

Hammer Type: Trip
Location: Yard









Calculations

Area of Rod A (mm2):	944
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	274

Energy Ratio E_r (%): **58**

The recommended calibration interval is 6 months

Signed: J Schofield
Title: Project Manager

Appendix C.2 – Machine Excavated Trial Pit Logs

Arndale Court, Otley Road, Headingley, Leeds, West Yorkshire, LS6 2UJ. Tel: + (44) 113 278 7111

Project: **Wombwell Wetlands**	Location Details	Status	Pit Number
Location: **Wombwell**	Easting: 441510.76 Northing: 403455.74	FINAL	**TP001**
Client: **Garganey Trust**	Level: 21.48mAOD Depth: 1.70m		Sheet 1 of 1
	Logger: JO Type: TP		

Hole Information

Pit Dimensions		
0.60m	Orientation:	°
2.20m	Shoring:	None
	Stability:	Stable
	Plant:	Tracked Excavator

Groundwater

Strike (m)	Rose To (m)	After (mins)	Remarks
1.60	1.60	20	

Scale:	1:25
Checked By:	PS
Approved By:	BS
Start Date:	03/10/2016
Finish Date:	03/10/2016

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Light greyish brown slightly gravelly sandy CLAY with occasional fragments of pottery and glass. Sand is fine to coarse. Gravel is angular to subangular fine to medium brick and sandstone.								
MADE GROUND: Dark grey slightly gravelly clayey coarse SAND including ash with occasional fragments of glass, pottery and metal. Gravel is angular to subrounded fine to coarse sandstone and brick.		0.25	21.23			0.40	ES1	
Soft light yellowish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sandstone.		0.60	20.88			0.80	B2	HV 0.80m, (p)=30 kPa (r)=10 kPa
Firm yellowish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to medium fine to medium sandstone and coal.		1.10	20.38					HV 1.10m, (p)=63 kPa (r)=40 kPa
				▼		1.40	B3	
EOH at 1.70m - Achieved target depth		1.70	19.78					

Observations / Remarks

1. Upon completion exploratory hole backfilled with arisings.

Project Number

A099966

Project: **Wombwell Wetlands**	Location Details	Status	Pit Number
Location: **Wombwell**	Easting: 441470.92 Northing: 403479.00	FINAL	**TP002**
Client: **Garganey Trust**	Level: 21.28mAOD Depth: 2.20m		Sheet 1 of 1
	Logger: JO Type: TP		

Hole Information

Pit Dimensions: 2.30m x 0.60m

Orientation: °
Shoring: None
Stability: Stable
Plant: Tracked Excavator

Groundwater

Strike (m)	Rose To (m)	After (mins)	Remarks
2.10	2.05	20	

Scale: 1:25
Checked By: PS
Approved By: BS
Start Date: 03/10/2016
Finish Date: 03/10/2016

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Greyish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to medium brick and sandstone.		0.20	21.08					
Firm light yellowish grey mottled whitish grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium sandstone and coal.						0.70	B1	HV 0.70m, (p)=43 kPa (r)=10 kPa
Firm grey mottled orangish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sandstone.		1.10	20.18			1.30	B2	HV 1.30m, (p)=80 kPa (r)=27 kPa
Light greyish brown very sandy slightly clayey subangular to subrounded fine to medium sandstone and mudstone GRAVEL. Sand is fine to medium.		1.80	19.48			2.00	B3	
EOH at 2.20m - Achieved target depth		2.20	19.08					

Observations / Remarks

1. Upon completion exploratory hole backfilled with arisings.

Project Number
A099966

Project: **Wombwell Wetlands**	Location Details	Status	Pit Number
Location: **Wombwell**	Easting: 441412.03 Northing: 403480.64	FINAL	**TP003**
Client: **Garganey Trust**	Level: 21.72mAOD Depth: 2.80m		Sheet 1 of 1
	Logger: JO Type: TP		

Hole Information		Groundwater				Scale: 1:25
Pit Dimensions	Orientation: °	Strike (m)	Rose To (m)	After (mins)	Remarks	Checked By: PS
0.60m / 2.40m	Shoring: None					Approved By: BS
	Stability: Stable					Start Date: 03/10/2016
	Plant: Tracked Excavator					Finish Date: 03/10/2016

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Dark grey slightly gravelly sandy CLAY. Sand is fine. Gravel is subangular to subrounded fine to medium sandstone and brick.								
Orangish brown slightly gravelly sandy CLAY. Sand is fine. Gravel is subangular to subrounded fine to medium sandstone.		0.40	21.32			0.70	B1	HV 0.70m, (p)=33 kPa (r)=10 kPa
Firm yellowish grey mottled grey slightly gravelly slightly sandy CLAY. Sand is fine. Gravel is subangular to subrounded fine to medium sandstone and coal.		0.90	20.82			1.20	B2	HV 1.20m, (p)=47 kPa (r)=20 kPa
Greyish brown sandy subangular to subrounded fine to medium GRAVEL. Sand is medium to coarse.		1.40	20.32					
Stiff grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sandstone, mudstone and coal.		1.50	20.22					HV 1.80m, (p)=77 kPa (r)=23 kPa
						2.00	B3	HV 2.40m, (p)=103 kPa (r)=47 kPa
EOH at 2.80m - Achieved target depth		2.80	18.92					

Observations / Remarks

1. Groundwater not observed.
2. Upon completion exploratory hole backfilled with arisings.

Project Number

A099966

Project: **Wombwell Wetlands** Location: **Wombwell** Client: **Garganey Trust**	Location Details Easting: 441360.76 Northing: 403478.36 Level: 23.22mAOD Depth: 2.30m Logger: JO Type: TP	Status FINAL	Pit Number **TP004** Sheet 1 of 1

Hole Information		Groundwater				Scale: 1:25
Pit Dimensions	Orientation: °	Strike (m)	Rose To (m)	After (mins)	Remarks	Checked By: PS
0.60m / 2.10m	Shoring: None					Approved By: BS
	Stability: Stable					Start Date: 03/10/2016
	Plant: Wheeled Backhoe Excavator					Finish Date: 03/10/2016

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Light greyish brown slightly gravelly clayey fine SAND. Gravel is subangular to subrounded fine to medium sandstone.								
Orangish brown very clayey fine SAND.		0.30	22.92					
Orangish brown slightly gravelly very clayey fine to medium SAND. Gravel is angular to subangular fine to coarse sandstone. *From 0.65m bgl possible very weathered bedrock.*		0.65	22.58			1.00	B1	
						2.00	B2	
Orangish grey sandy slightly clayey angular to subangular fine to coarse sandstone GRAVEL. Sand is fine to medium. (Possible bedrock).		2.20	21.02					
EOH at 2.30m - Achieved target depth		2.30	20.92					

Observations / Remarks

1. Groundwater not observed.
2. Upon completion exploratory hole backfilled with arisings.

Project Number

A099966

Project: **Wombwell Wetlands**	Location Details		Status	Pit Number
Location: **Wombwell**	Easting: 441473.57	Northing: 403450.82	FINAL	**TP005**
Client: **Garganey Trust**	Level: 21.66mAOD	Depth: 2.40m		Sheet 1 of 1
	Logger: JO	Type: TP		

Hole Information		Groundwater				Scale: 1:25
Pit Dimensions	Orientation: °	Strike (m)	Rose To (m)	After (mins)	Remarks	Checked By: PS
0.60m / 2.30m	Shoring: None	2.10	1.90	20		Approved By: BS
	Stability: Stable					Start Date: 03/10/2016
	Plant: Wheeled Backhoe Excavator					Finish Date: 03/10/2016

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Dark grey slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium sandstone and brick.								
Firm orangish brown slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium sandstone.		0.30	21.36			0.70	B1	HV 0.50m, (p)=37 kPa (r)=10 kPa HV 1.00m, (p)=60 kPa (r)=20 kPa
Firm orangish grey mottled whitish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sandstone and mudstone.		1.10	20.56			1.40	B2	HV 1.50m, (p)=70 kPa (r)=23 kPa HV 1.90m, (p)=73 kPa (r)=43 kPa
Grey sandy subangular to rounded medium to coarse sandstone and mudstone GRAVEL. Sand is medium to coarse.		2.00	19.66					
EOH at 2.40m - Achieved target depth		2.40	19.26					

Observations / Remarks

1. Upon completion exploratory hole backfilled with arisings.

Project Number

A099966

Appendix D – Trial Pit Photographs

Photograph No.1: TP001 Long Face 0.0-1.7m

Photograph No.2: TP001 Short Face 0.0-1.7m

Arndale Court
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Leeds
LS6 2UJ

Tel: 0113 278 7111
Fax: 0113 275 0623
E-mail enviro.leeds@wyg.com

Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No. 3: TP001 Spoil 1

Photograph No.4: TP001 Spoil 2

Arndale Court
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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No.5: TP002 – Long Face 0-2.2m

Photograph No 6: TP002 – Short Face 0-2.2m

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No.7: TP002 Spoil A

Photograph No.8: TP002 Spoil B

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No.9: TP003 Long Face 0.0-2.8m

Photograph No.10:TP003 Short Face 0.0-2.8m

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No.11: TP003 Spoil A

Photograph No.12: TP003 Spoil B

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No.13: TP004 Short Face 0.0-2.3m

Photograph No.14:TP004 Spoil A

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No.15: TP004 Spoil B

Photograph No.16: TP005 Long Face 0.0-2.4m

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No.17: TP005 Short Face 0.0-2.4m

Photograph No.18: TP005 Spoil A

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Photograph No.19: TP005 Spoil B

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Wombwell Wetlands

Client:- Garganey Trust

Project No. :- A099966

Date :- November 2016

Appendix E – Geo-environmental Laboratory Analysis Data

Arndale Court, Otley Road, Headingley, Leeds, West Yorkshire, LS6 2UJ. Tel: + (44) 113 278 7111

Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

WYG
Arndale Court
Arndale Centre
Otley Road
Leeds
LS6 2UJ

Attention :	Joseph Owen
Date :	20th October, 2016
Your reference :	JBA
Our reference :	Test Report 16/15334 Batch 1
Location :	Wombwell A099966
Date samples received :	6th October, 2016
Status :	Final report
Issue :	1

One sample was received for analysis on 6th October, 2016 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: WYG
Reference: JBA
Location: Wombwell A099966
Contact: Joseph Owen
JE Job No.: 16/15334

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3												
Sample ID	E1-TP001												
Depth	0.4												
COC No / misc													
Containers	V J T												
Sample Date	03/10/2016												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	06/10/2016												
												LOD/LOR	Units	Method No.
Arsenic #M	53.3											<0.5	mg/kg	TM30/PM15
Beryllium	2.9											<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1											<0.1	mg/kg	TM30/PM15
Chromium #M	52.6											<0.5	mg/kg	TM30/PM15
Copper #M	95											<1	mg/kg	TM30/PM15
Lead #M	119											<5	mg/kg	TM30/PM15
Mercury #M	0.7											<0.1	mg/kg	TM30/PM15
Nickel #M	46.7											<0.7	mg/kg	TM30/PM15
Selenium #M	2											<1	mg/kg	TM30/PM15
Vanadium	53											<1	mg/kg	TM30/PM15
Water Soluble Boron #M	1.6											<0.1	mg/kg	TM74/PM32
Zinc #M	193											<5	mg/kg	TM30/PM15
PAH MS														
Naphthalene #M	0.22											<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.56											<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05											<0.05	mg/kg	TM4/PM8
Fluorene #M	0.06											<0.04	mg/kg	TM4/PM8
Phenanthrene #M	0.93											<0.03	mg/kg	TM4/PM8
Anthracene #	0.39											<0.04	mg/kg	TM4/PM8
Fluoranthene #M	4.93											<0.03	mg/kg	TM4/PM8
Pyrene #	4.07											<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	3.19											<0.06	mg/kg	TM4/PM8
Chrysene #M	2.98											<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	5.35											<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	3.13											<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	1.75											<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.26											<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	1.36											<0.04	mg/kg	TM4/PM8
Coronene	0.19											<0.04	mg/kg	TM4/PM8
PAH 16 Total	29.2											<0.6	mg/kg	TM4/PM8
PAH 17 Total	29.37											<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	3.85											<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	1.50											<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	110											<0	%	TM4/PM8
EPH (C8-C40) #M	506											<30	mg/kg	TM5/PM8
Mineral Oil (C10-C40)	<30											<30	mg/kg	TM5/PM16
GRO (>C4-C8) #M	159 SV											<100	ug/kg	TM36/PM12
GRO (>C8-C12) #M	1339 SV											<100	ug/kg	TM36/PM12
GRO (>C4-12) #M	1498 SV											<100	ug/kg	TM36/PM12
MTBE #	<5 SV											<5	ug/kg	TM31/PM12
Benzene #	19 SV											<5	ug/kg	TM31/PM12

Client Name: WYG
Reference: JBA
Location: Wombwell A099966
Contact: Joseph Owen
JE Job No.: 16/15334

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3												
Sample ID	E1-TP001												
Depth	0.4												
COC No / misc													
Containers	V J T												
Sample Date	03/10/2016												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	06/10/2016												
												LOD/LOR	Units	Method No.
Toluene #	<5 SV											<5	ug/kg	TM31/PM12
Ethylbenzene #	<5 SV											<5	ug/kg	TM31/PM12
m/p-Xylene #	<5 SV											<5	ug/kg	TM31/PM12
o-Xylene #	<5 SV											<5	ug/kg	TM31/PM12
PCB 28 #	<5											<5	ug/kg	TM17/PM8
PCB 52 #	<5											<5	ug/kg	TM17/PM8
PCB 101 #	<5											<5	ug/kg	TM17/PM8
PCB 118 #	<5											<5	ug/kg	TM17/PM8
PCB 138 #	<5											<5	ug/kg	TM17/PM8
PCB 153 #	<5											<5	ug/kg	TM17/PM8
PCB 180 #	<5											<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35											<35	ug/kg	TM17/PM8
Phenol #M	<0.01											<0.01	mg/kg	TM26/PM21
Natural Moisture Content	27.5											<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3											<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5											<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	33.63											<0.02	%	TM21/PM24
Fraction Organic Carbon	0.336											<0.001	None	TM21/PM24
ANC at pH4	0.67											<0.03	mol/kg	TM77/PM0
ANC at pH7	NDP											<0.03	mol/kg	TM77/PM0
Loss on Ignition #	22.7											<1.0	%	TM22/PM0
pH #M	7.56											<0.01	pH units	TM73/PM11
Sample Type	Clay												None	PM13/PM0
Sample Colour	Dark Brown												None	PM13/PM0
Other Items	Loam, silt, stones												None	PM13/PM0

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	33.9
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	74.7
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**16/15334**			
Sample No	**3**			
Client Sample No	**E1-TP001**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**0.4**			
Sample Date	**03/10/2016**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	33.63	3	5	6
Loss on Ignition (%)	22.7	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 17(mg/kg)	29.37	100	-	-
pH (pH Units)	7.56	-	>6	-
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.67	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	0.0047	0.047	0.5	2	25
Barium	0.028	0.28	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	<0.002	<0.02	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	0.006	0.06	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	0.014	0.14	4	50	200
Chloride	<0.3	<3	800	15000	25000
Fluoride	0.6	6	10	150	500
Sulphate as SO4	11.47	114.6	1000	20000	50000
Total Dissolved Solids	85	850	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	6	60	500	800	1000

Client Name: WYG
Reference: JBA
Location: Wombwell A099966
Contact: Joseph Owen

Note:

Analysis was carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
16/15334	1	E1-TP001	0.4	2	13/10/2016	**General Description (Bulk Analysis)**	soil/stones
					13/10/2016	**Asbestos Fibres**	NAD
					13/10/2016	**Asbestos Fibres (2)**	NAD
					13/10/2016	**Asbestos ACM**	NAD
					13/10/2016	**Asbestos ACM (2)**	NAD
					13/10/2016	**Asbestos Type**	NAD
					13/10/2016	**Asbestos Type (2)**	NAD
					13/10/2016	**Asbestos Level Screen**	NAD

Client Name: WYG **Matrix : Solid**
Reference: JBA
Location: Wombwell A099966
Contact: Joseph Owen

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
16/15334	1	E1-TP001	0.4	1-3	Sample received is below pH7

Client Name: WYG

Matrix : Solid

Reference: JBA

Location: Wombwell A099966

Contact: Joseph Owen

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
16/15334	1	E1-TP001	0.4	1-3	GRO	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 16/15334

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 (UKAS) accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 16/15334

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes

JE Job No: 16/15334

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified USEPA 160.4. Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (450°C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes	Yes	AR	Yes
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7 and 6010B	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7 and 6010B	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7 and 6010B	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

JE Job No: 16/15334

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground samples with deionised water in a 2:1 water to solid ratio for anions. Extraction of as received samples with deionised water in a 2:1 water to solid ratio for ammoniacal nitrogen and hydrazine. Samples are extracted using an orbital shaker.	Yes		AR	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.			AR	
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes
TM77	Modified DDCEN/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No

JE Job No: 16/15334

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Appendix F - Geotechnical Laboratory Analysis Data

LABORATORY REPORT

4043

Contract Number: PSL16/4844

Report Date: 08 November 2016

Client's Reference: A099966

Client Name: WYG Leeds
Arndale Court
Otley Road
Headingley
Leeds
LS6 2UJ

For the attention of: Peter Smith

Contract Title: Wombwell Wetlands, Wombwell

Date Received: 14/10/2016
Date Commenced: 14/10/2016
Date Completed: 8/11/2016

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

D Lambe (Senior Technician)
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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
CP001	4	B	1.50	2.00	Brown very gravelly very sandy very silty CLAY.
CP001	5	D	2.20		Brown slightly gravelly very sandy very silty CLAY.
CP001	7	B	2.50	3.00	Brown slightly gravelly very sandy very silty CLAY.
CP002	3	B	0.60	1.20	Brown very gravelly very sandy very silty CLAY.
CP002	5	B	1.50	2.00	Brown gravelly very sandy very silty CLAY.
TP001	2	B	0.80		Brown slightly gravelly slightly sandy very silty CLAY.
TP001	3	B	1.40		Brown slightly gravelly slightly sandy very silty CLAY.
TP002	1	B	0.70		Brown slightly gravelly sandy very silty CLAY.
TP002	2	B	1.30		Brown slightly gravelly sandy very silty CLAY.
TP003	2	B	1.20		Brown gravelly sandy very silty CLAY.
TP003	3	B	2.00		Brown slightly gravelly sandy very silty CLAY.
TP005	1	B	0.70		Brown slightly gravelly sandy very silty CLAY.
TP005	2	B	1.40		Brown slightly gravelly slightly sandy very silty CLAY.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved	AR	Date	08/11/16	Contract No:
		Wombwell Wetlands				PSL16/4844
						Client Ref:
						A099966

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
CP001	5	D	2.20		23			32	17	15	98	Low plasticity CL.
CP001	7	B	2.50	3.00			2.60					
CP002	5	B	1.50	2.00			2.61					
TP001	3	B	1.40		31			55	27	28	95	High plasticity CH.
TP002	1	B	0.70		25			44	21	23	93	Intermediate plasticity CI.
TP003	3	B	2.00		19			39	20	19	96	Intermediate plasticity CI.
TP005	2	B	1.40		28			60	28	32	97	High plasticity CH.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

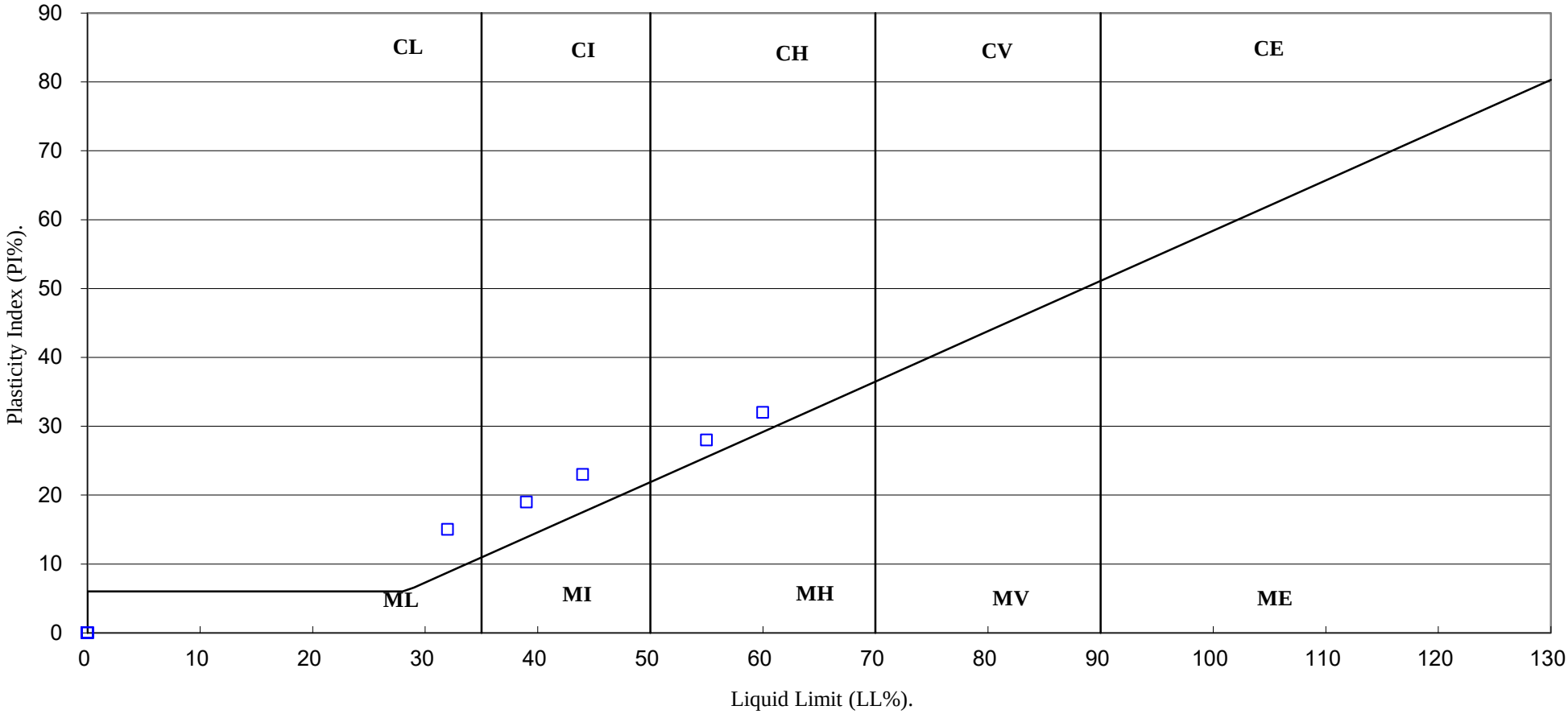
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved		Date	08/11/16	Contract No:
Wombwell Wetlands				PSL16/4844
				Client Ref:
				A099966

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



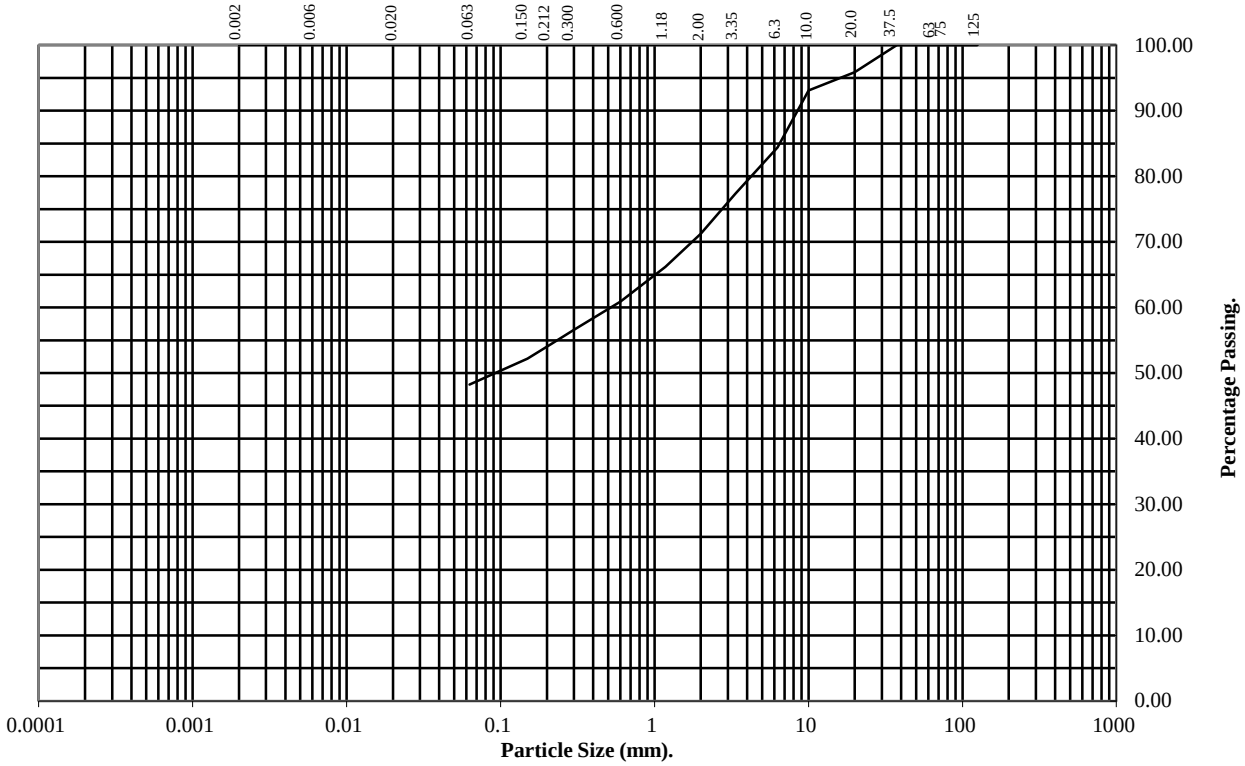
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked /Approved**		**Date**	**08/11/16**	**Contract No:**
		Wombwell Wetlands				**PSL16/4844**
						Client Ref:
						A099966

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**CP001**	**Top Depth (m):**	**1.50**
Sample Number:	**4**	**Base Depth(m):**	**2.00**
Sample Type:	**B**		



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	96
10	93
6.3	84
3.35	77
2	71
1.18	66
0.6	61
0.3	57
0.212	54
0.15	52
0.063	48

Soil Fraction	Total Percentage
Cobbles	0
Gravel	29
Sand	23
Silt/Clay	48

Remarks:

See summary of soil descriptions.

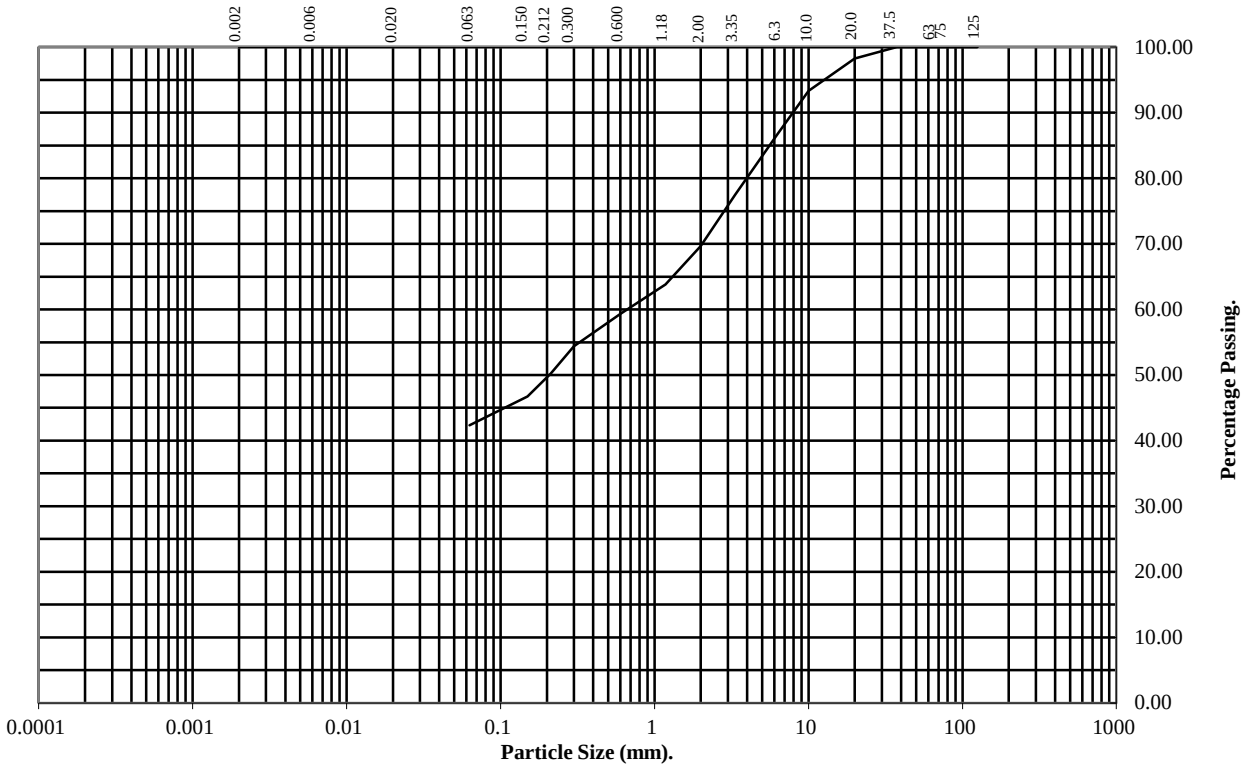
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**		**Date** 08/11/16	**Contract No:** PSL16/4844
		Wombwell Wetlands			**Client Ref:** A099966

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**CP002**	**Top Depth (m):**	**0.60**
Sample Number:	**3**	**Base Depth(m):**	**1.20**
Sample Type:	**B**		



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	98
10	93
6.3	87
3.35	78
2	70
1.18	64
0.6	59
0.3	54
0.212	50
0.15	47
0.063	42

Soil Fraction	Total Percentage
Cobbles	0
Gravel	30
Sand	28
Silt/Clay	42

Remarks:

See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**		**Date**	**08/11/16**	**Contract No:**
		Wombwell Wetlands				**PSL16/4844**
						Client Ref:
						A099966

PARTICLE SIZE DISTRIBUTION TEST

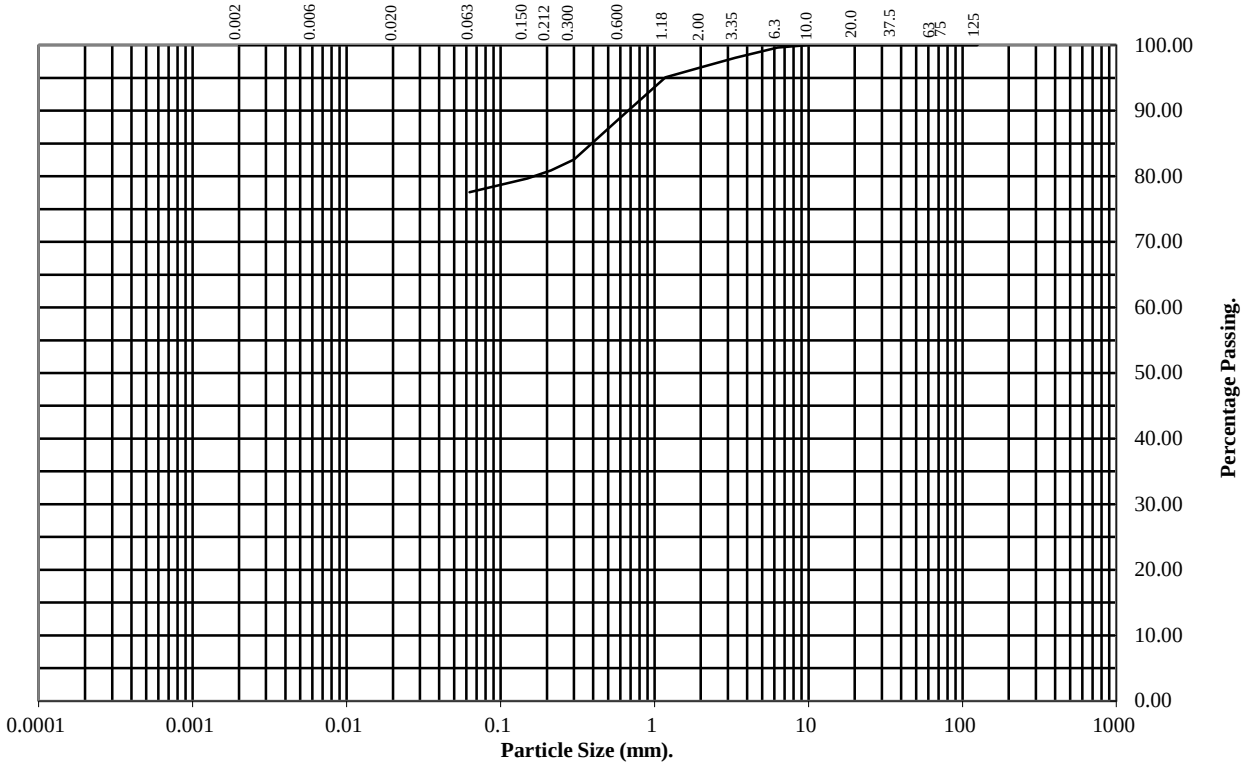
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP002** **Top Depth (m):** **1.30**

Sample Number: **2** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	98
2	97
1.18	95
0.6	89
0.3	83
0.212	81
0.15	80
0.063	78

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	19
Silt/Clay	78

Remarks:

See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**		**Date** **08/11/16**	**Contract No:** **PSL16/4844**
		Wombwell Wetlands			**Client Ref:** **A099966**

PARTICLE SIZE DISTRIBUTION TEST

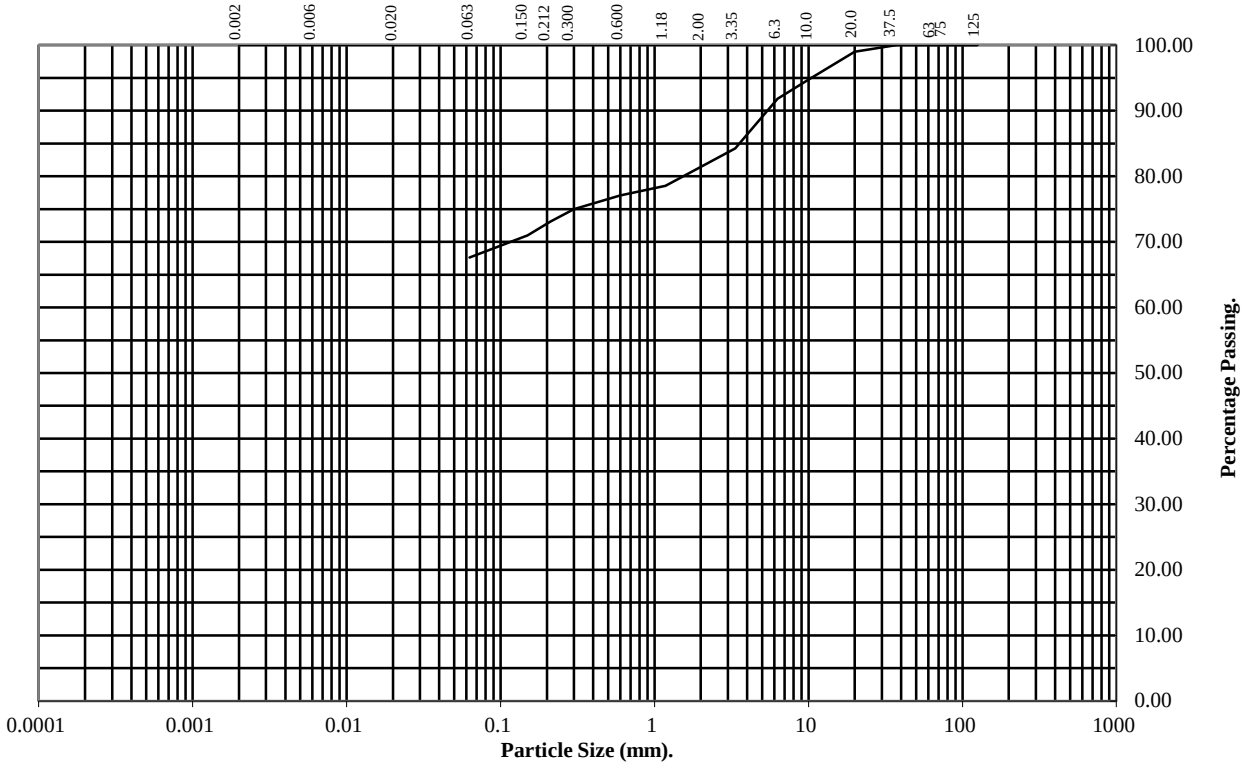
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP003** **Top Depth (m):** **1.20**

Sample Number: **2** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	99
10	95
6.3	92
3.35	84
2	81
1.18	79
0.6	77
0.3	75
0.212	73
0.15	71
0.063	68

Soil Fraction	Total Percentage
Cobbles	0
Gravel	19
Sand	13
Silt/Clay	68

Remarks:

See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**		**Date** **08/11/16**	**Contract No:** **PSL16/4844**
		Wombwell Wetlands			**Client Ref:** **A099966**

PARTICLE SIZE DISTRIBUTION TEST

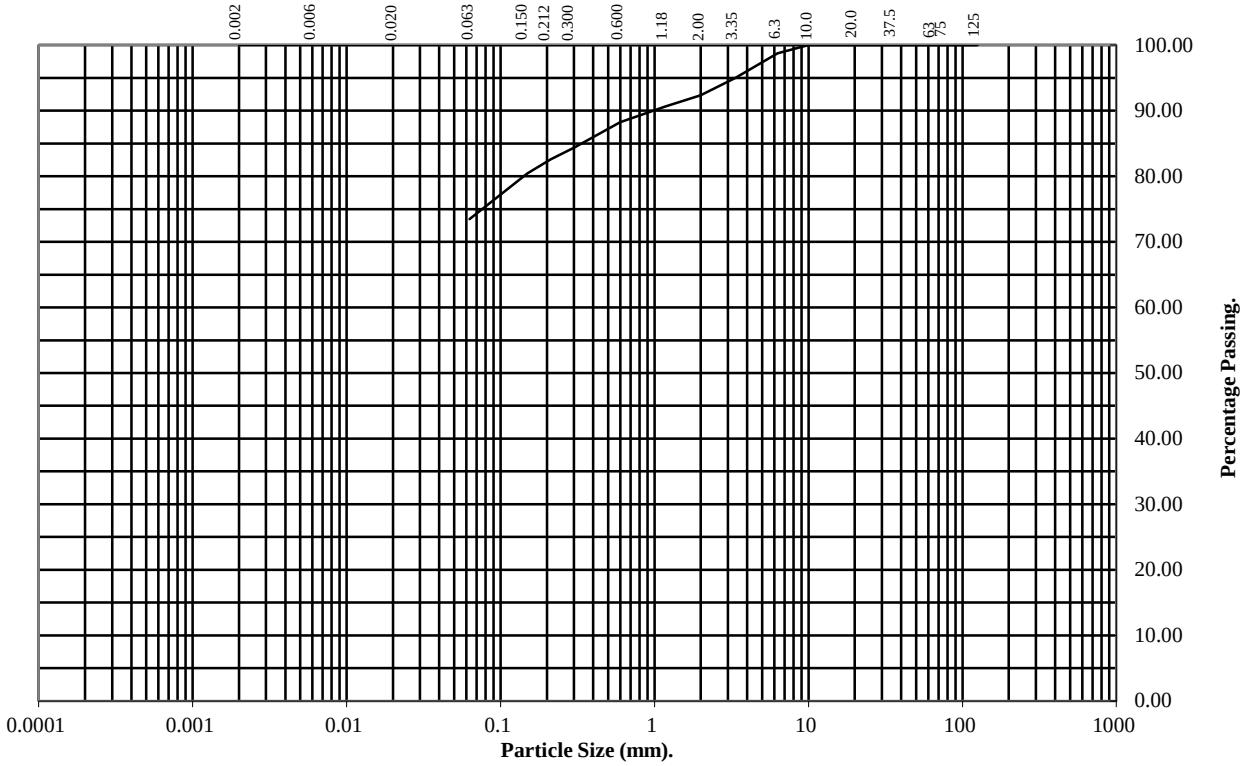
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP005** **Top Depth (m):** **0.70**

Sample Number: **1** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	95
2	92
1.18	91
0.6	88
0.3	84
0.212	83
0.15	80
0.063	73

Soil Fraction	Total Percentage
Cobbles	0
Gravel	8
Sand	19
Silt/Clay	73

Remarks:

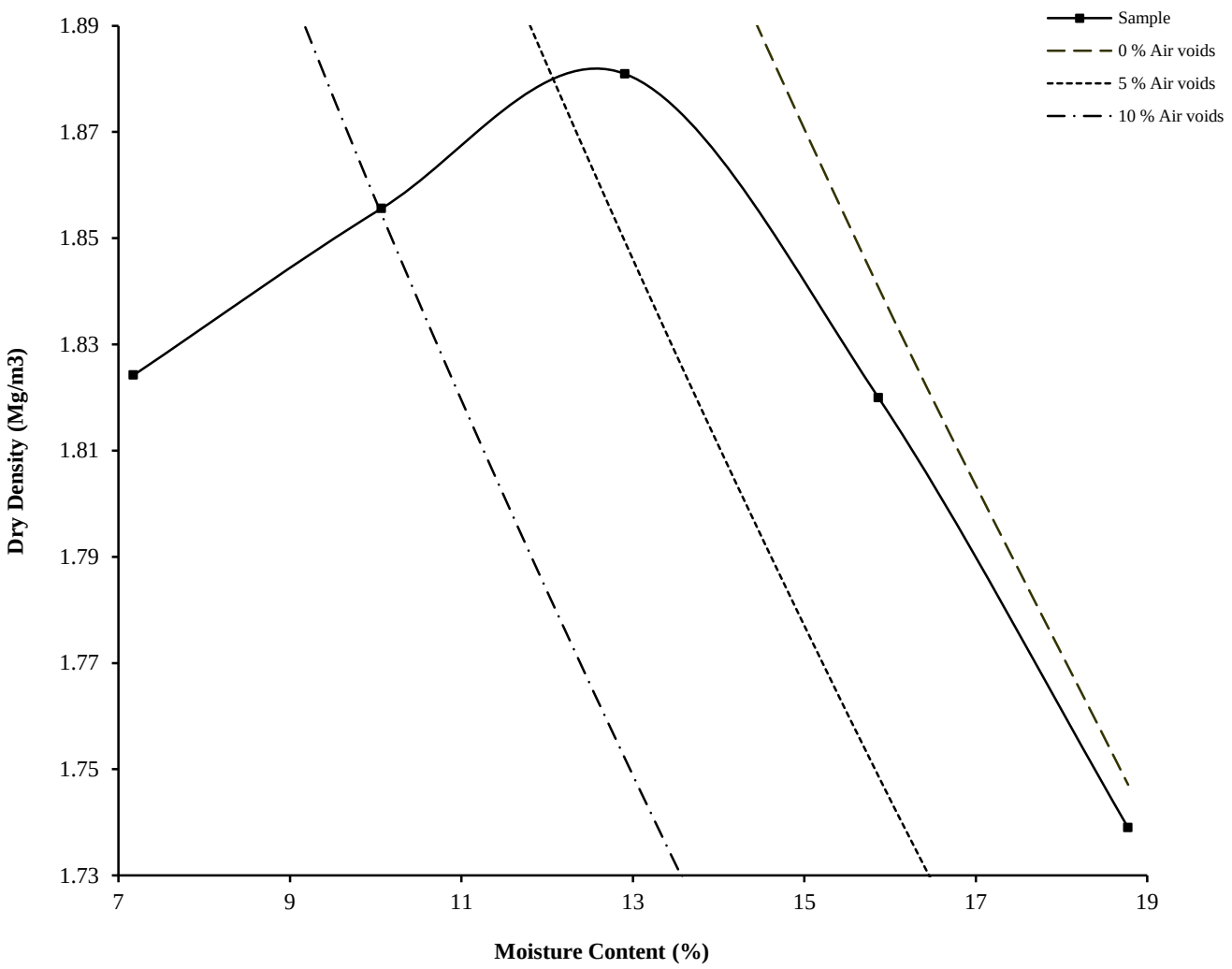
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**		**Date** **08/11/16**	**Contract No:** **PSL16/4844**
		Wombwell Wetlands			**Client Ref:** **A099966**

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**CP001**	**Top Depth (m) :**	**2.50**
Sample Number:	**7**	**Base Depth (m) :**	**3.00**
Sample Type:	**B**		



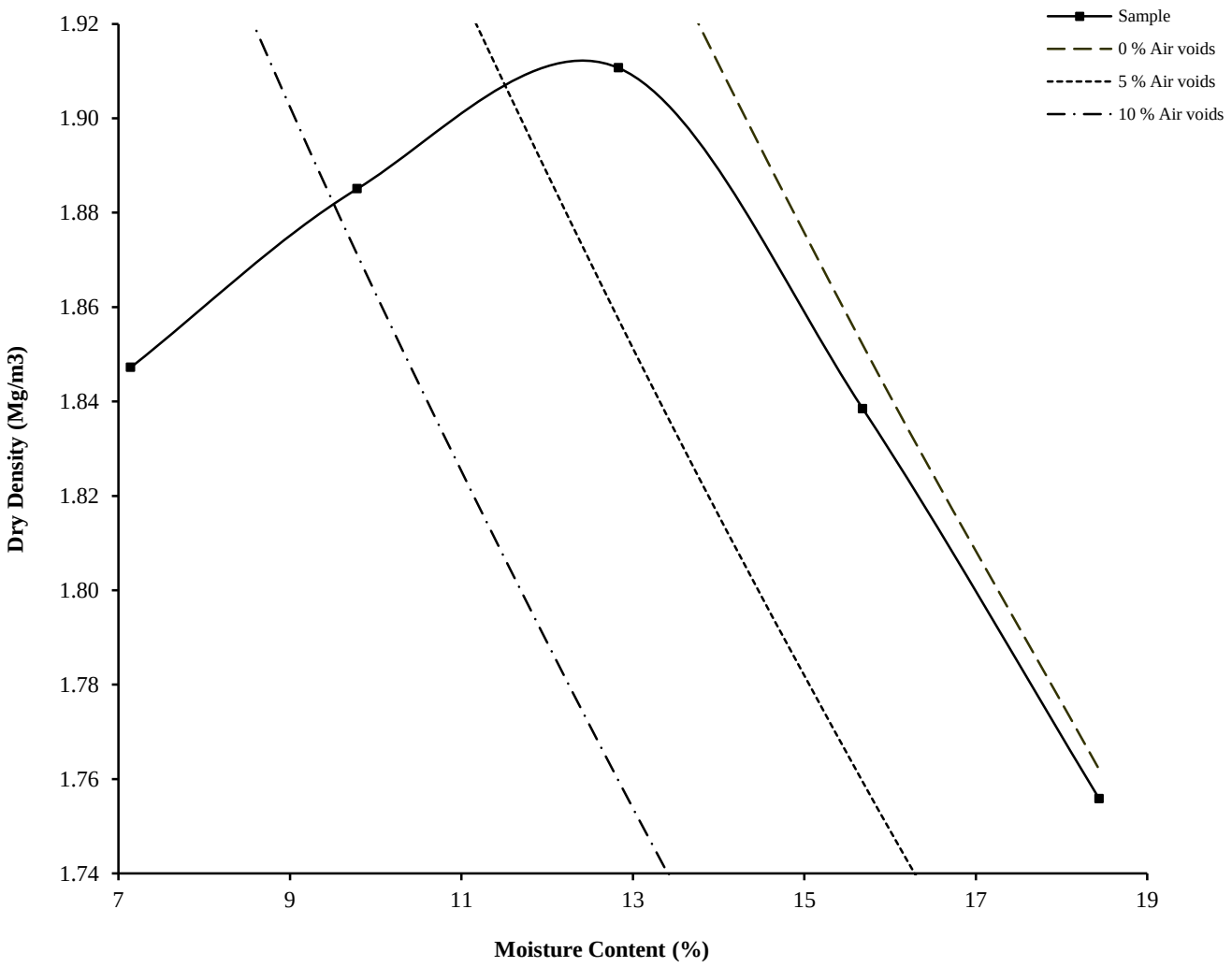
Initial Moisture Content:		13	Method of Compaction:	2.5Kg Rammer	Separate Samples
Particle Density (Mg/m3):	2.6	Actual	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.88	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**	AP	**Date** 08/11/16	**Contract No.**
		Wombwell Wetlands			**PSL16/4844**
					Client Ref
					A099966

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**CP002**	**Top Depth (m) :**	**1.50**
Sample Number:	**5**	**Base Depth (m) :**	**2.00**
Sample Type:	**B**		



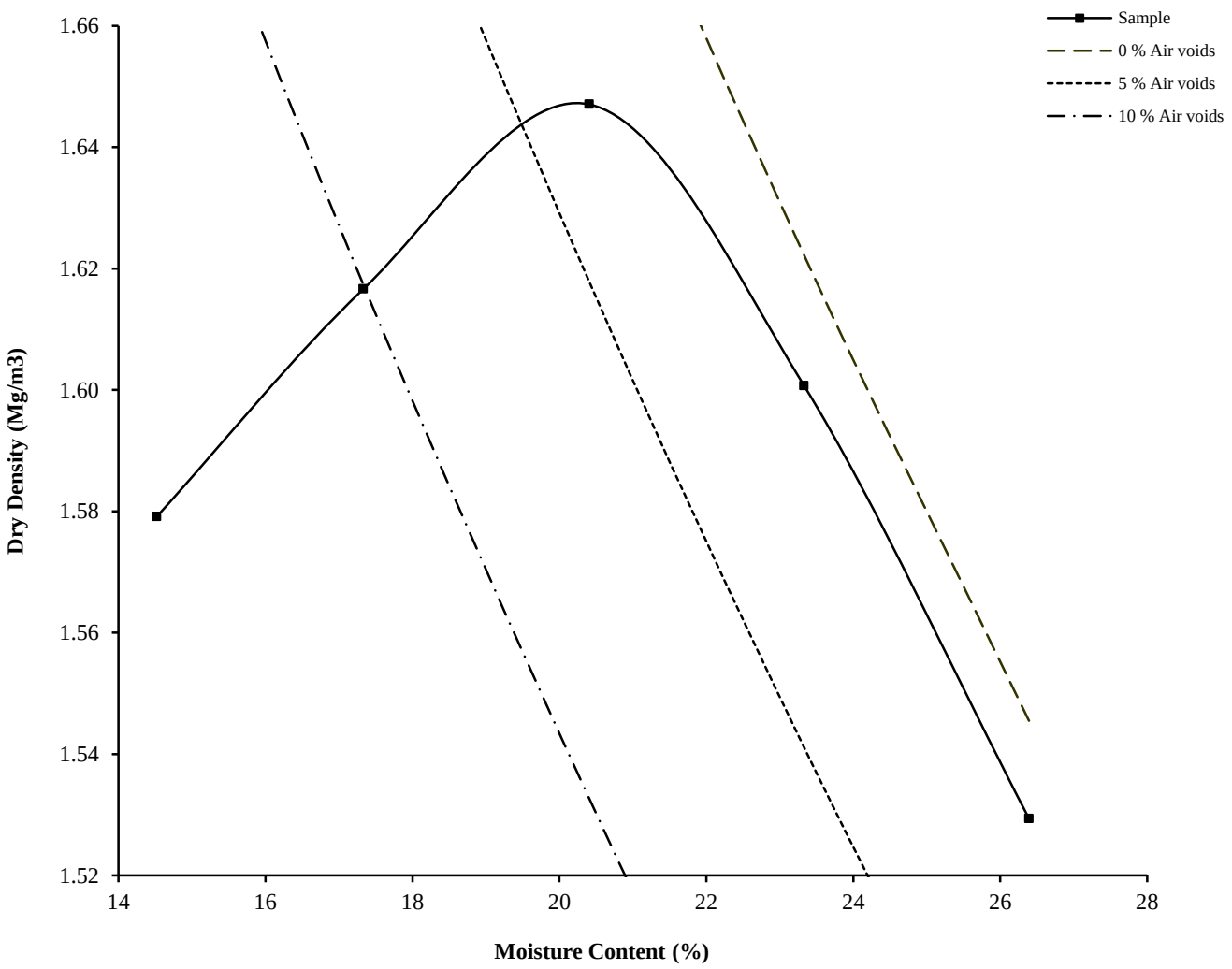
Initial Moisture Content:		13	Method of Compaction:	2.5Kg Rammer	Separate Samples
Particle Density (Mg/m3):	2.61	Actual	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.91	Material Retained on 20.0 mm Test Sieve (%):		2
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**	AR	**Date** 08/11/16	**Contract No.** PSL16/4844
		Wombwell Wetlands			**Client Ref** A099966

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**TP001**	**Top Depth (m) :**	**0.80**
Sample Number:	**2**	**Base Depth (m) :**	
Sample Type:	**B**		



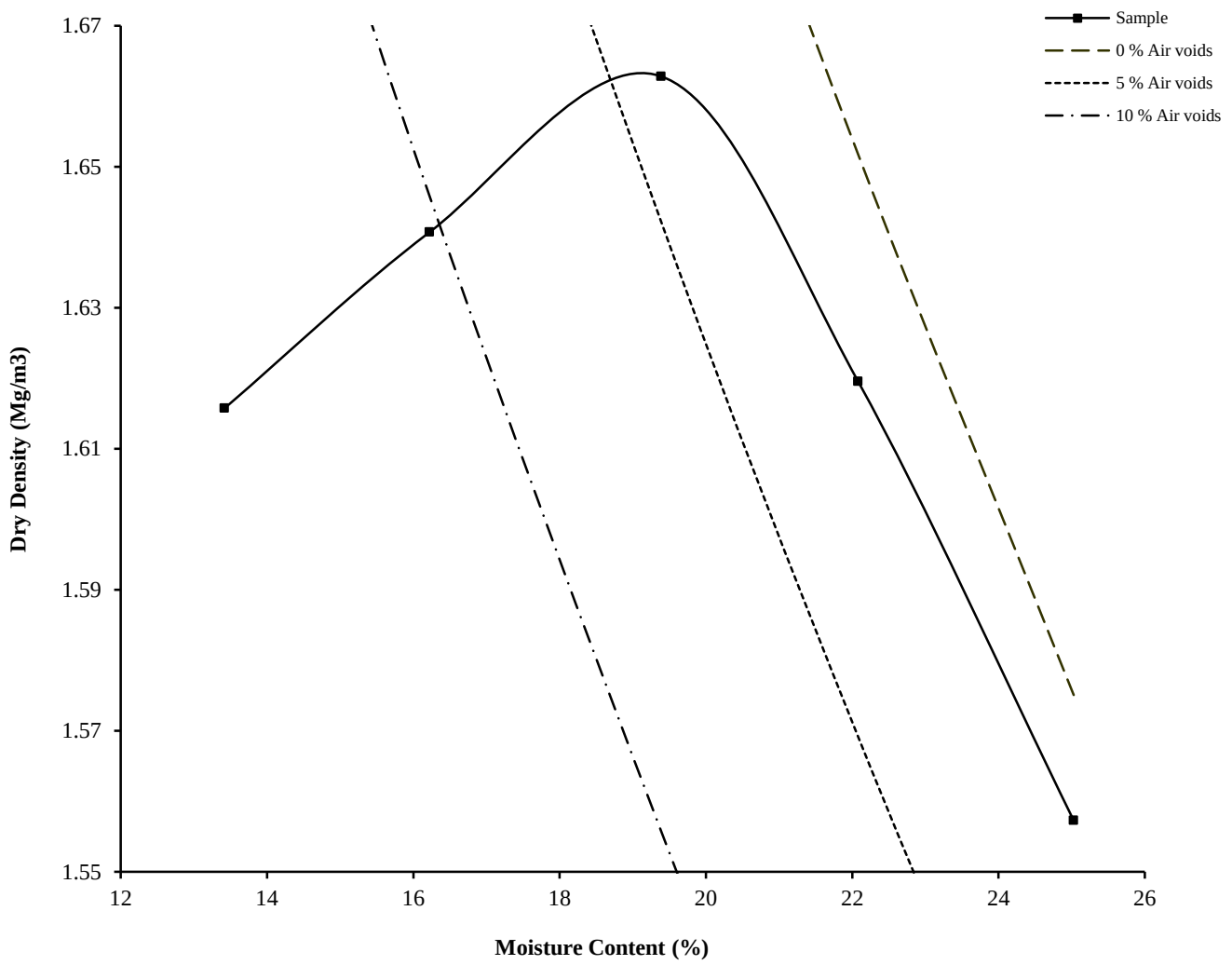
Initial Moisture Content:		26	Method of Compaction:	2.5Kg Rammer	Separate Samples
Particle Density (Mg/m3):	2.61	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.65	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		20			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**		**Date** 08/11/16	**Contract No.**
		Wombwell Wetlands			**PSL16/4844**
					Client Ref
					A099966

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**TP002**	**Top Depth (m) :**	**0.70**
Sample Number:	**1**	**Base Depth (m) :**	
Sample Type:	**B**		



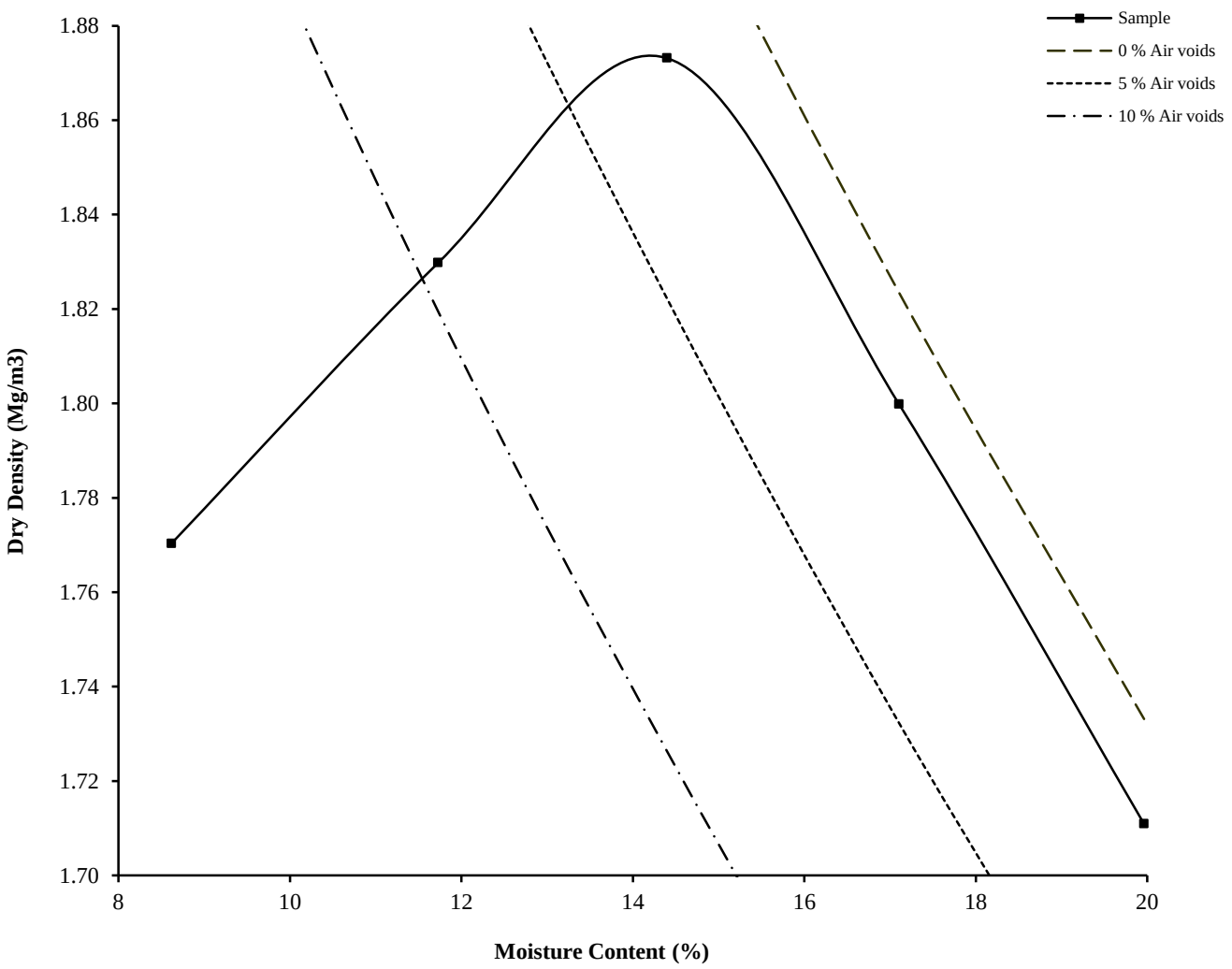
Initial Moisture Content:		25	Method of Compaction:	2.5Kg Rammer	Separate Samples
Particle Density (Mg/m3):	2.6	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.66	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		19			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**	**Date**	**08/11/16**	**Contract No.**
		Wombwell Wetlands			**PSL16/4844**
					Client Ref
					A099966

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**TP003**	**Top Depth (m) :**	**1.20**
Sample Number:	**2**	**Base Depth (m) :**	
Sample Type:	**B**		



Initial Moisture Content:		14	Method of Compaction:	2.5Kg Rammer	Separate Samples
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 (%):		1
Optimum Moisture Content (%):		14			
Remarks See summary of soil descriptions					

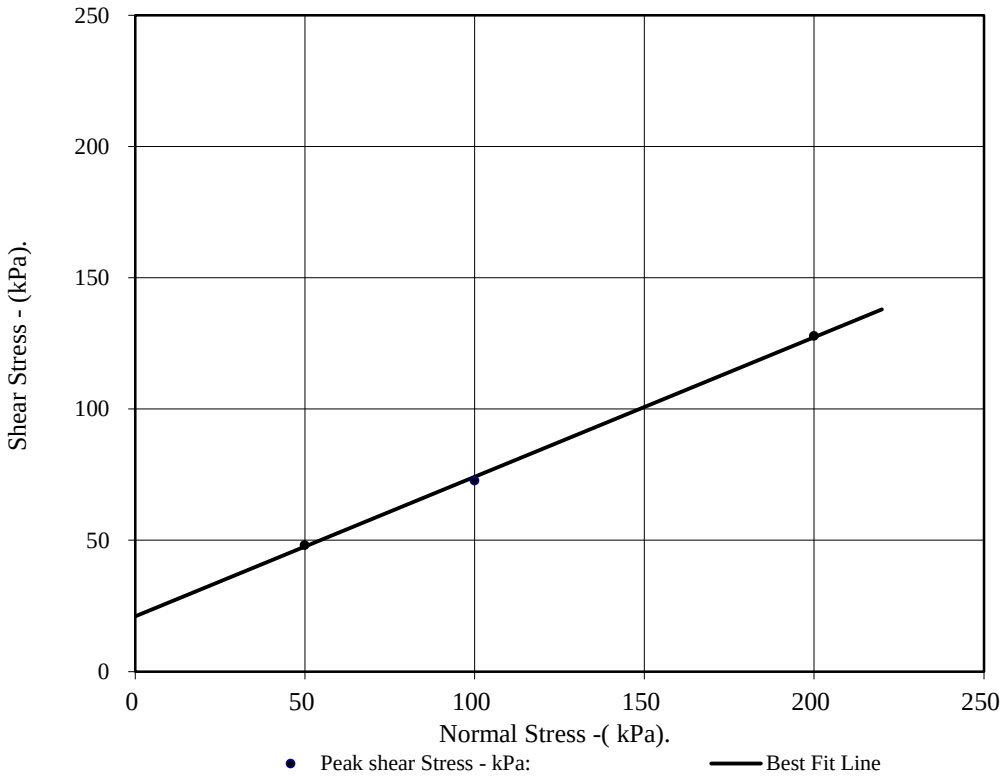
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**	AR	**Date** 08/11/16	**Contract No.** PSL16/4844
		Wombwell Wetlands			**Client Ref** A099966

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4.5.4

Hole Number:	**CP001**		Top Depth:	**3.50**
Sample Number:	**9**		Base Depth:	**3.95**
Sample Conditions:	Submerged		Sample Type	**D**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Remoulded using 2.5kg effort Material tested passing 2mm sieve			
Sample Description:	**Brown slightly gravelly slightly sandy very silty CLAY.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	19.78	19.78	19.78
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	27	27	27
Bulk Density - Mg/m3:	1.95	1.97	1.97
Dry Density - Mg/m3:	1.53	1.54	1.54
Voids Ratio:	0.728	0.717	0.716
Normal Pressure- kPa	50	100	200
Consolidation Stage			
Consolidated Height - mm:	18.99	18.59	18.22
Shearing Stage			
Rate of Strain (mm/min)	0.026	0.026	0.026
Displacement at peak shear stress (mm)	6.00	8.00	8.00
Peak shear Stress - kPa:	48	73	128
Final Consolidated Conditons			
Moisture Content - %:	28	27	26
Bulk Density - Mg/m3:	2.03	2.09	2.14
Dry Density - Mg/m3:	1.58	1.64	1.69
Peak			
Angle of Shearing Resistance:(~~θ~~)	**28**		
Effective Cohesion - kPa:	**21**		

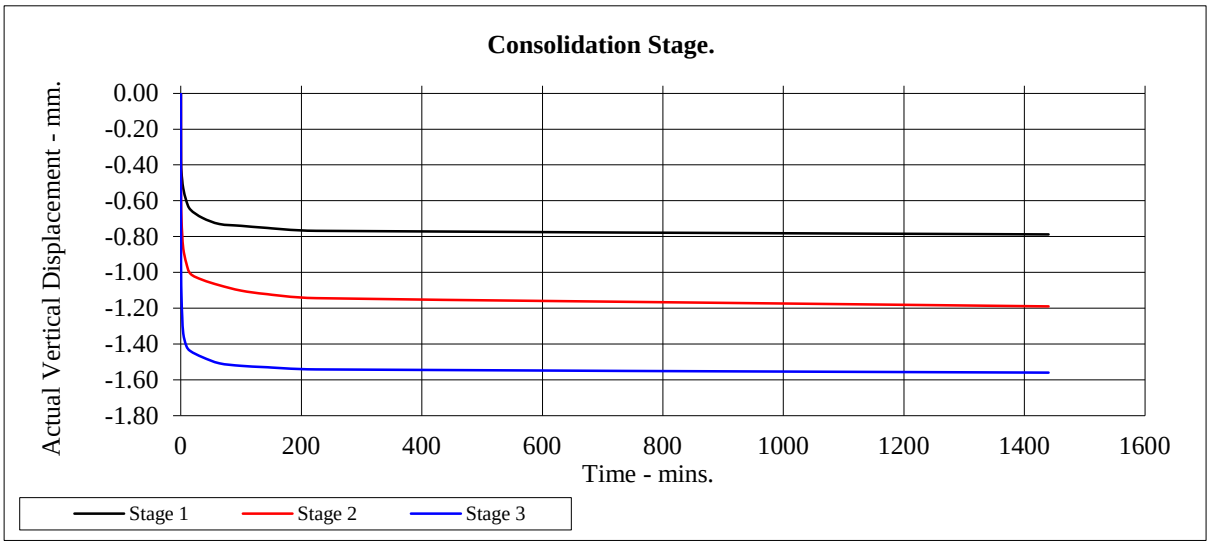


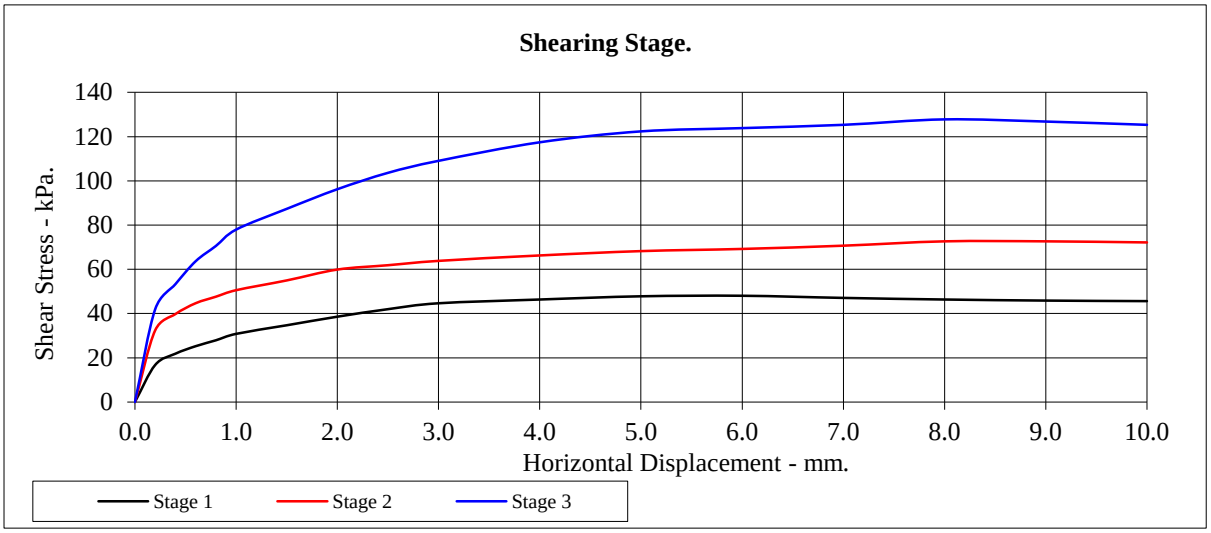
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**	AR	**Date** 08/11/16	Contract No: **PSL16/4844**
		Wombwell Wetlands			Client Ref: **A099966**

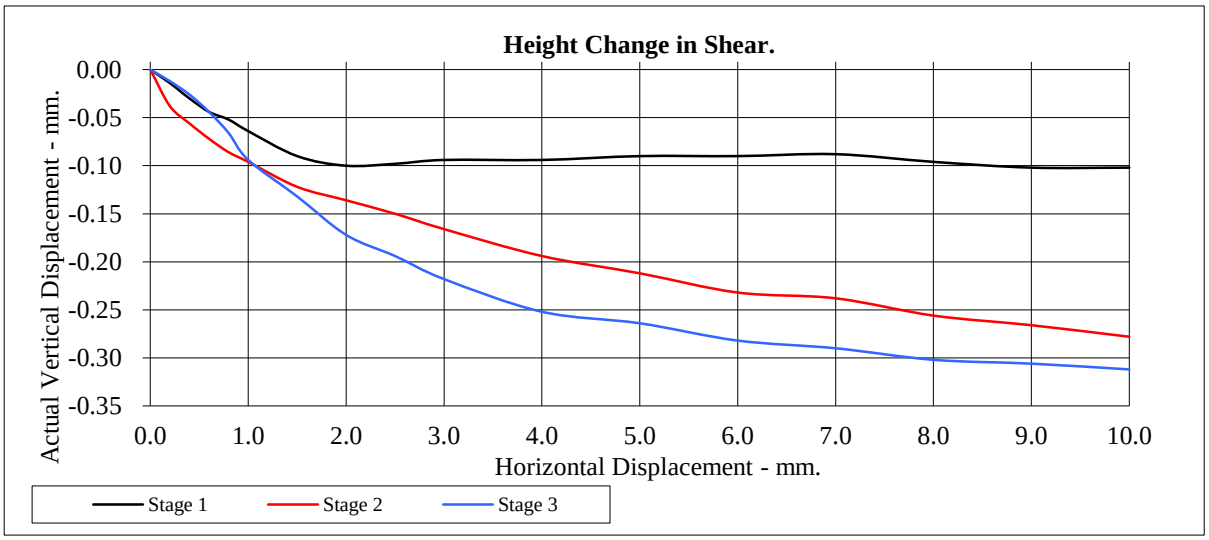
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4.5.4

Hole Number:	**CP001**	Top Depth:	**3.50**
Sample Number:	**9**	Base Depth:	**3.95**







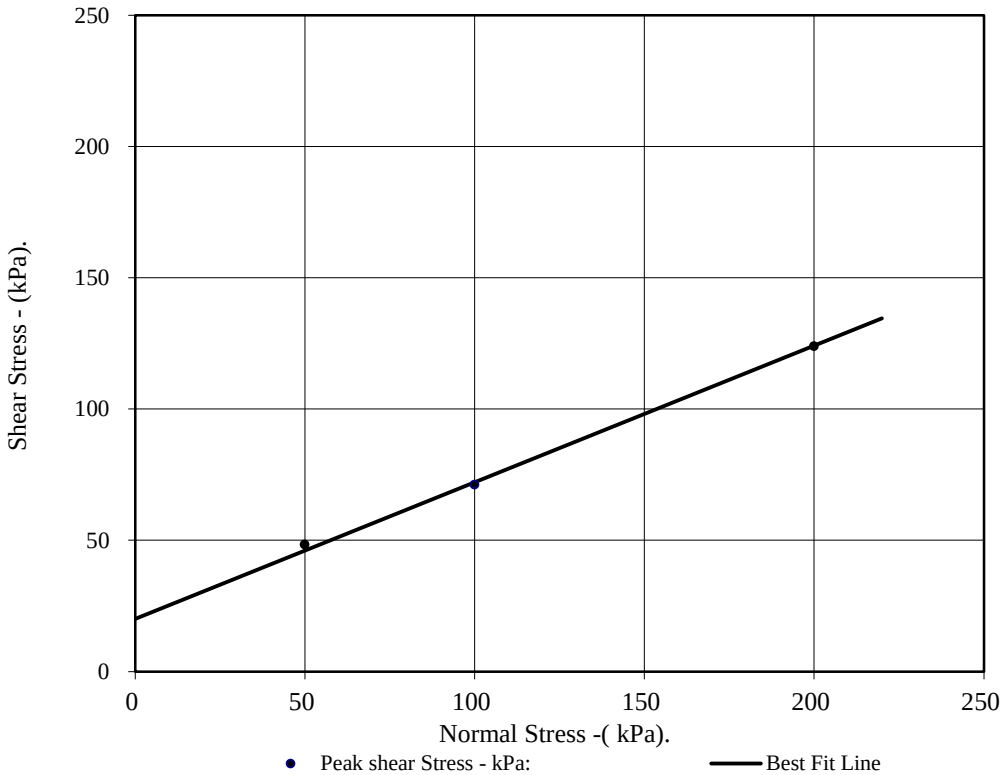
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked/Approved**	AP	**Date** 08/11/16	Contract No: **PSL16/4844**
		Wombwell Wetlands			Client Ref: **A099966**

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4.5.4

Hole Number:	**TP001**		Top Depth:	**0.80**
Sample Number:	**2**		Base Depth:	**-**
Sample Conditions:	Submerged		Sample Type	**B**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Remoulded using 2.5kg effort Material tested passing 2mm sieve			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	26	26	26
Bulk Density - Mg/m3:	1.93	1.93	1.94
Dry Density - Mg/m3:	1.53	1.54	1.54
Voids Ratio:	0.729	0.724	0.719
Normal Pressure- kPa	50	100	200
Consolidation Stage			
Consolidated Height - mm:	23.72	23.42	22.96
Shearing Stage			
Rate of Strain (mm/min)	0.030	0.030	0.030
Displacement at peak shear stress (mm)	6.00	5.00	8.00
Peak shear Stress - kPa:	48	71	124
Final Consolidated Conditons			
Moisture Content - %:	24	23	20
Bulk Density - Mg/m3:	2.03	2.06	2.11
Dry Density - Mg/m3:	1.64	1.68	1.75
Peak			
Angle of Shearing Resistance:(~~θ~~)	**28**		
Effective Cohesion - kPa:	**20**		

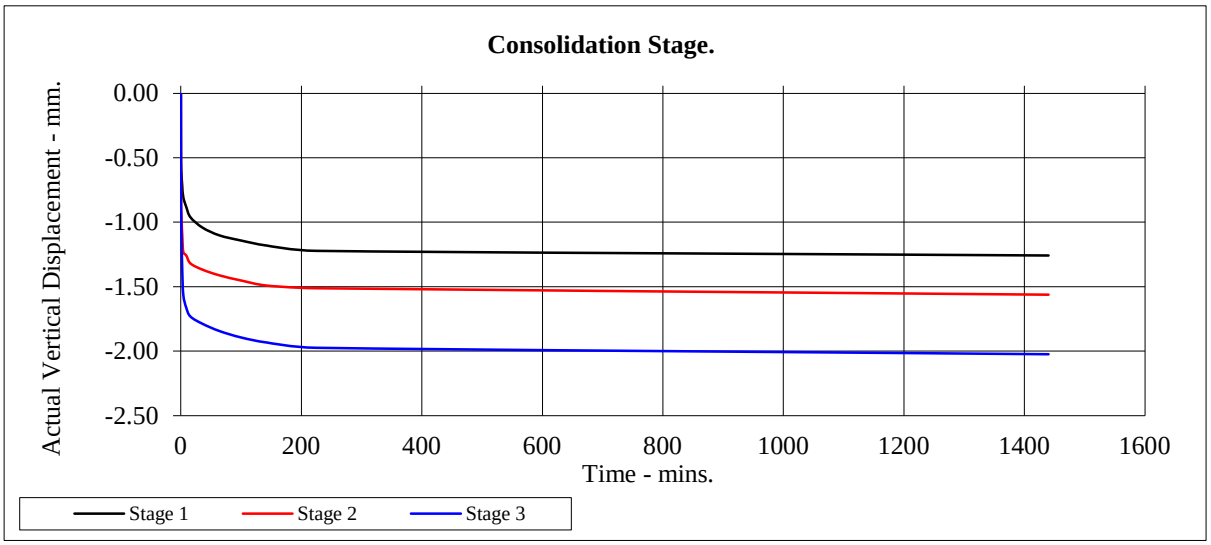


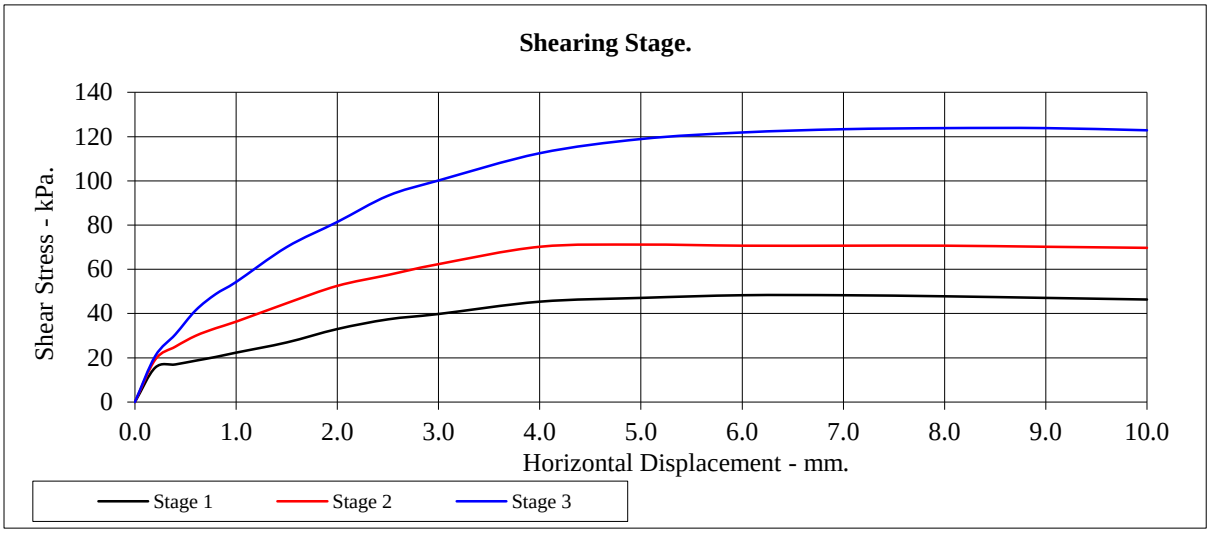
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**	AR	**Date** 08/11/16	Contract No: **PSL16/4844**
		Wombwell Wetlands			Client Ref: **A099966**

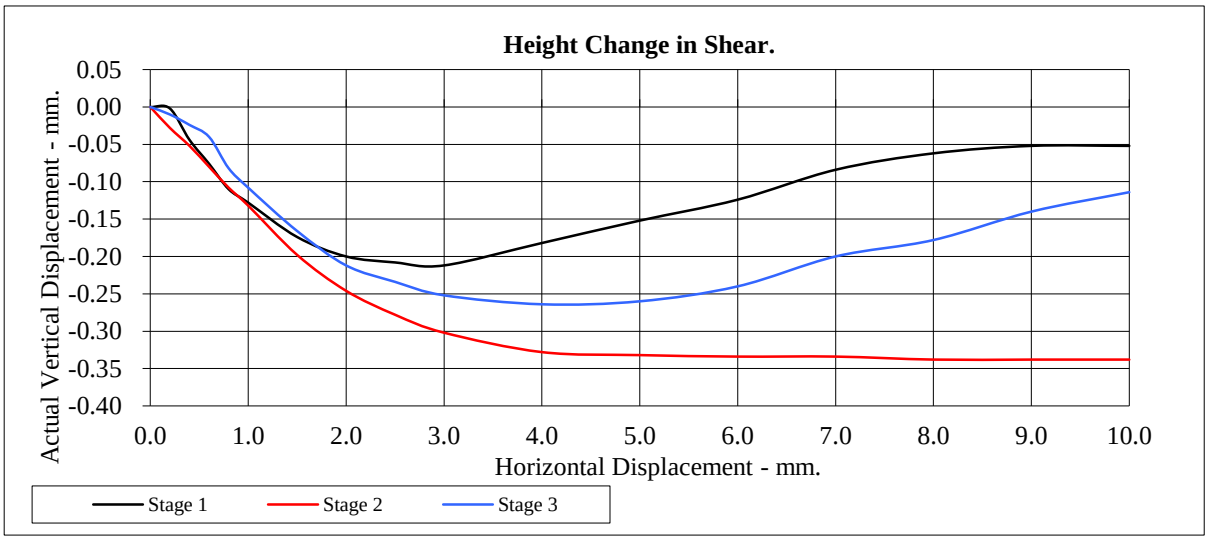
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4.5.4

Hole Number:	**TP001**	Top Depth:	**0.80**
Sample Number:	**2**	Base Depth:	-







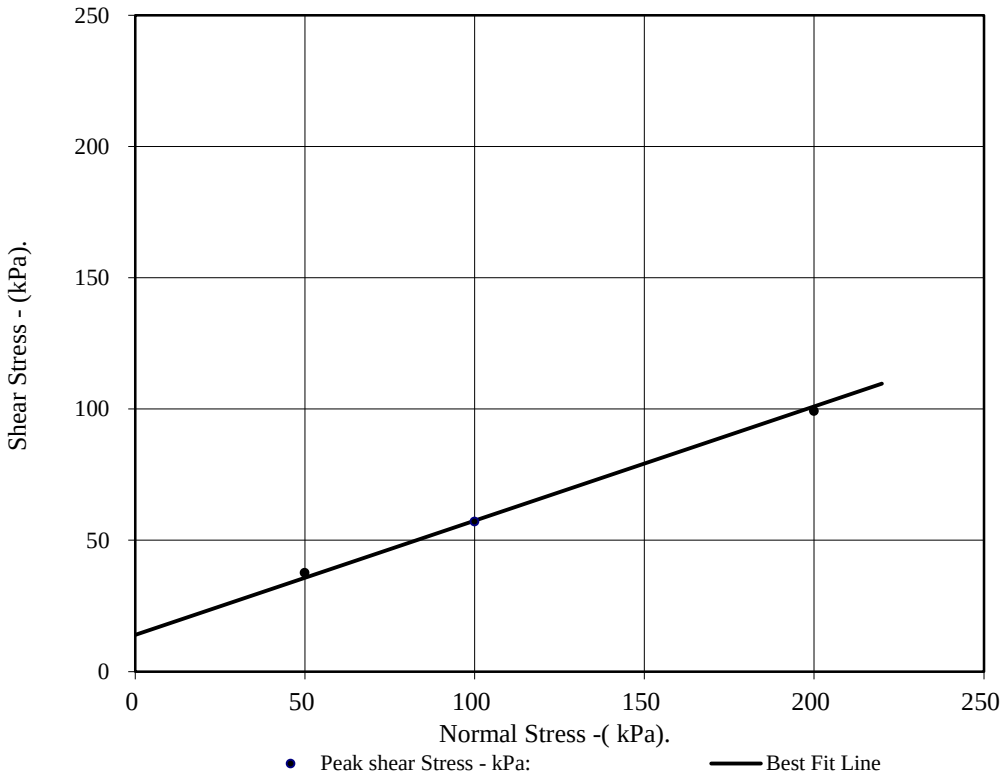
UKAS TESTING 4043 / PSL Professional Soils Laboratory	**Checked/Approved**	AP	**Date**	**08/11/16**	Contract No: **PSL16/4844**
	Wombwell Wetlands				Client Ref: **A099966**

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4.5.4

Hole Number:	**TP005**		Top Depth:	**1.40**
Sample Number:	**2**		Base Depth:	**-**
Sample Conditions:	Submerged		Sample Type	**B**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Remoulded using 2.5kg effort Material tested passing 2mm sieve			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	28	28	28
Bulk Density - Mg/m3:	1.82	1.83	1.83
Dry Density - Mg/m3:	1.43	1.43	1.43
Voids Ratio:	0.859	0.854	0.847
Normal Pressure- kPa	50	100	200
Consolidation Stage			
Consolidated Height - mm:	24.11	23.72	23.22
Shearing Stage			
Rate of Strain (mm/min)	0.020	0.020	0.020
Displacement at peak shear stress (mm)	10.00	10.00	10.00
Peak shear Stress - kPa:	38	57	99
Final Consolidated Conditons			
Moisture Content - %:	30	29	28
Bulk Density - Mg/m3:	1.89	1.92	1.97
Dry Density - Mg/m3:	1.45	1.49	1.55
Peak			
Angle of Shearing Resistance:(~~θ~~)	**24**		
Effective Cohesion - kPa:	**14**		

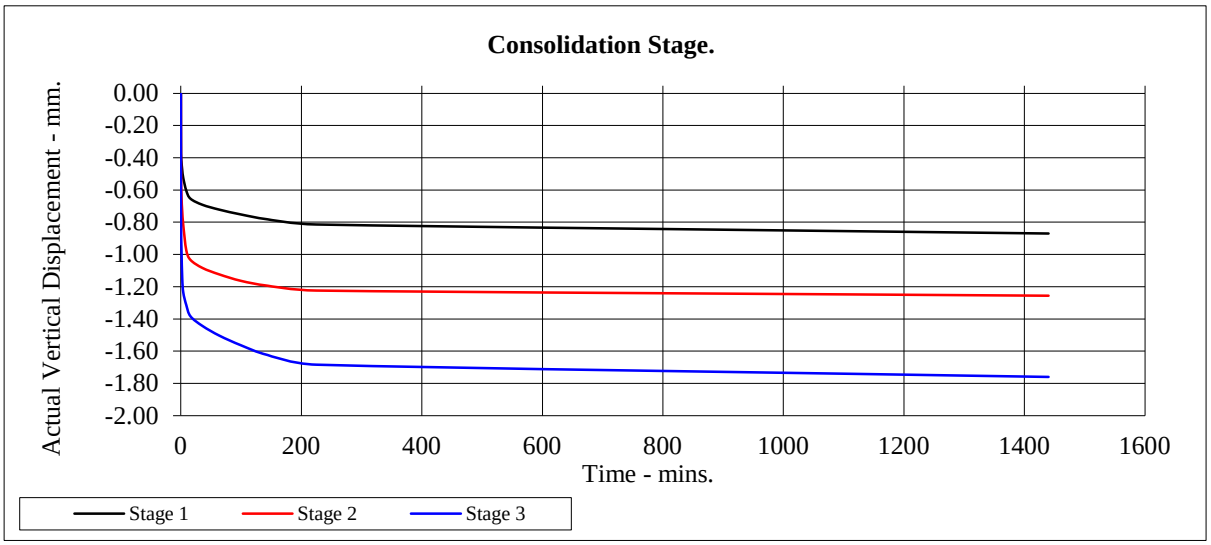


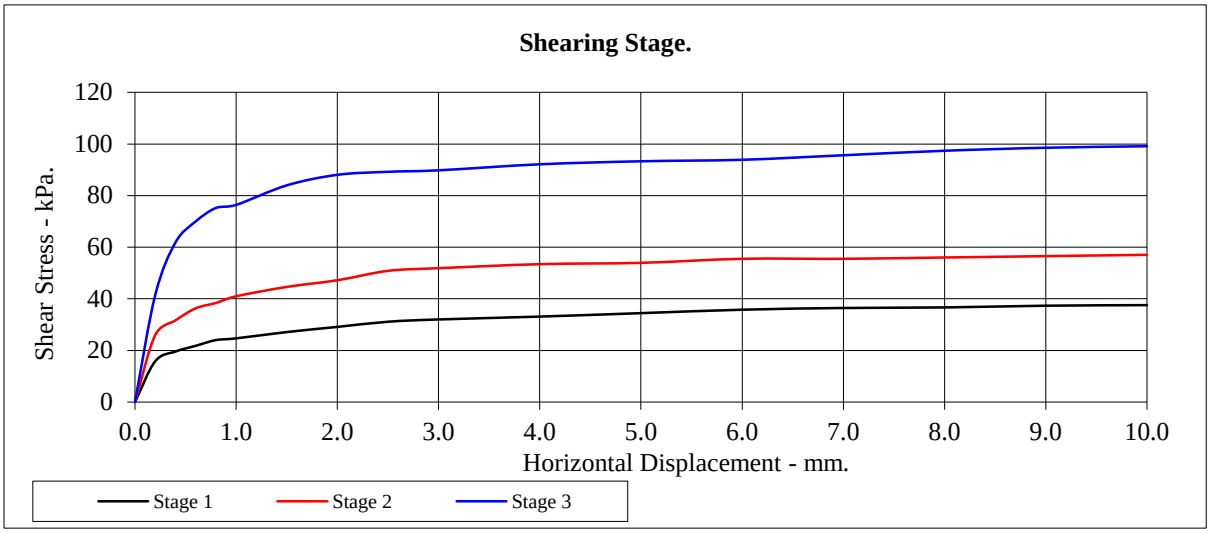
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved**	AR	**Date** 08/11/16	Contract No: **PSL16/4844**
		Wombwell Wetlands			Client Ref: **A099966**

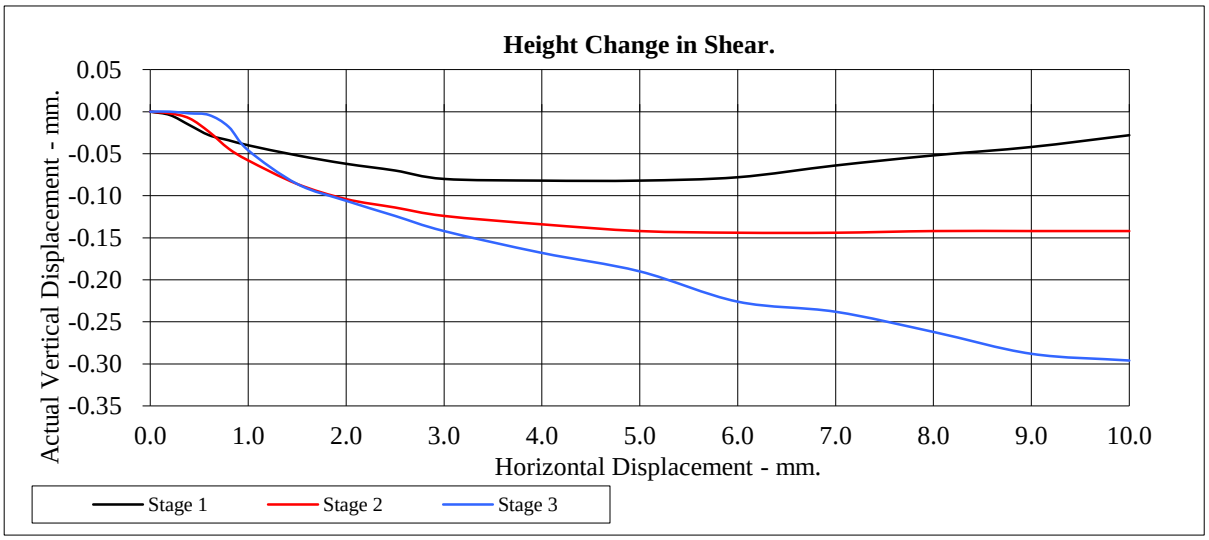
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4.5.4

Hole Number:	**TP005**	Top Depth:	**1.40**
Sample Number:	**2**	Base Depth:	-







UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked/Approved**	AP	**Date**	**08/11/16**
		Wombwell Wetlands			Contract No: **PSL16/4844**
					Client Ref: **A099966**

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 16-82010

27-Oct-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	16-82010
Client Reference	PSL16/4844
Order No	(not supplied)
Contract Title	Wombwell Wetlands
Description	4 Soil samples.
Date Received	24-Oct-16
Date Started	24-Oct-16
Date Completed	27-Oct-16
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Rob Brown
Business Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 16-82010
Client Ref PSL16/4844
Contract Title Wombwell Wetlands

			Lab No	1072812	1072813	1072814	1072815
			Sample ID	CP001	TP001	TP002	TP003
			Depth	2.20	1.40	0.70	2.00
			Other ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sampling Date	n/s	n/s	n/s	n/s
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Inorganics							
pH	DETSC 2008#			7.4	6.6	6.5	6.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	28	46	50	18

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 16-82010
Client Ref PSL16/4844
Contract Wombwell Wetlands

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1072812	CP001 2.20 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), pH + Conductivity (7 days)	
1072813	TP001 1.40 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), pH + Conductivity (7 days)	
1072814	TP002 0.70 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), pH + Conductivity (7 days)	
1072815	TP003 2.00 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months