



CRABTREE FARM, BARWELL (PARCEL 2)

SITE INVESTIGATION FACTUAL REPORT
FOR
JAMES MADISON HOMES LIMITED

Project Ref:
EAL.02.20

Date:
October 2020

Prepared for:
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17 Maybrook Road
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Date:	October 2020	
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1.0 INTRODUCTION

1.1 PREAMBLE

Erda Associates Ltd. (Erda) has been appointed by James Madison Homes Limited (hereafter referred to as 'the client') to undertake a Phase II Site Appraisal.

A previous desk study by BWB Consulting Ltd (Burton Knowles, Crabtree Farm, Barwell, Leicestershire – Phase I Geo-Environmental Assessment, Ref: CTF-BWB-ZZ-XX-RP-YE-0001_DS_P1, dated; February 2018) formed Phase I of the assessment. This previous report encompassed the site within a larger assessment area and allowed the geotechnical and geo-environmental setting of the site to be determined. The ground investigation works were undertaken to assist with the characterisation of the site with regard to ground conditions. A site location plan is included in **Appendix A**, for reference.

This document is intended to provide a factual summary of the ground investigation works and laboratory testing undertaken.

At the time of writing, a proposed development plan is not available for the site. However, it is understood that the Client proposes to develop the site with a burial ground and balancing pond.

1.2 PROJECT BRIEF

The brief for the ground investigation works incorporated:

- A basic ground investigation to determine the geotechnical and contamination hazards that may affect the proposed development.
- Provide a factual report summarising the findings of the ground investigation works and laboratory testing.
- Provide advice on further works required with regard to the proposed development.

The ground investigation works were generally undertaken in accordance with the above brief and also in accordance with BS EN 1997-2 (2007) Part 2: 'Ground Investigation and Testing', BS 5930 (2015) 'Code of Practice for Ground Investigations' and BS 10175 (2011) 'Code of Practice for the Investigation of Potentially Contaminated Sites' where reasonably practical.

Whilst every effort has been made to pre-empt the likely requirements of the Local Authority and the Environment Agency, they may have specific requirements that will need to be discussed and addressed at a later date.

1.3 DATA REFERENCES

- BWB Consulting Ltd., Burton Knowles, Crabtree Farm, Barwell, Leicestershire – Phase I Geo-Environmental Assessment, (Ref: CTF-BWB-ZZ-XX-RP-YE-0001_DS_P1, dated; February 2018).
- British Geological Survey Online Geological Mapping.
- BSI (2015), BS 5930:2015 Code of practice for ground investigations.
- CIRIA (2007), C665 Assessing Risks Posed by Hazardous Ground Gases to Buildings.
- PHE-BGS (2011), Joint Indicative Atlas of Radon in Great Britain.
- EA/DEFRA (2004), CLR11: Model Procedures for the Assessment of Land Contamination.

1.4 LIMITATIONS

This report has been produced in accordance with industry best practice at the time of writing.

In the production of this report, Erda Associates Ltd., have relied upon information provided by third parties. Erda Associates Ltd cannot accept responsibility for the reliability and authenticity of this information. Erda Associates Ltd. will not be responsible for any opinions which it has expressed, or conclusions which it has drawn, in reliance upon information which is subsequently proven to be inaccurate.

All statements and opinions provided in this report have been reported in good faith and are based on the information gained during, and restrictions imposed by, site investigation techniques used at the time. Erda Associates Ltd cannot be held responsible for conditions not revealed by the investigation.

This report has been prepared for the sole use of the client and shall not be relied upon or transferred to third parties without the express written consent of Erda Associates Ltd. Unauthorised third parties rely upon the information contained within this report at their own risk.

2.0 GROUND INVESTIGATION WORKS

2.1 FIELDWORK

The intrusive investigation was undertaken on 8th August 2020, under the supervision of a suitably qualified engineer and in general accordance with the Code of Practice for Site Investigations BS5930: 2015.

The investigation of the proposed burial ground site (Parcel 2 Area) was undertaken concurrently with the investigation of a proposed residential development site (Parcel 1 Area) located to the east. This report will focus solely on the burial ground site (Parcel 2). A separate Phase II Report has been produced for the residential development site (Parcel 1). A site plan showing the extents of Parcel 1 and 2 is included in **Appendix A** for clarity.

The ground investigation works for the burial site incorporated the following:

- The advancing of 15 mechanically excavated trial pits to a maximum depth of 3.20mbgl,
- The analysis of 8 soil samples for a standard 'CLEA' screening suite and selected site specific determinands,
- The analysis of 2 samples for geotechnical design criteria including Plasticity Index (PI) and Particle Size Density (PSD).

The exploratory hole location plan along with all exploratory hole records are contained in **Appendix B**.

2.2 RATIONALE

The investigation works have been designed to facilitate an assessment of the general ground conditions across the site. The investigation has also been designed in consideration of the current site layout and access restrictions, the development proposal and health and safety issues.

2.3 LABORATORY ANALYSIS & TESTING

Selected soil samples were analysed at specialist environmental and geotechnical laboratories as detailed in the following sections.

2.3.1 Chemical Analysis

A total of six samples of topsoil and two samples of the shallow natural strata were sent for analysis at a UKAS/MCERTS accredited laboratory. The samples were screened for heavy metals and PAHs. The soil analysis results are contained within **Appendix C**.

2.3.2 Groundwater Monitoring and Sampling

Two samples of the natural deposits were sent to a UKAS accredited laboratory and subjected to Plasticity Index (PI) and Particle Size Density (PSD). The geotechnical test results are contained in **Appendix C**.

3.0 GROUND CONDITIONS

The intrusive investigation has revealed that topsoil was present across the entire site. The topsoil was predominantly underlain by superficial glacial till deposits (cohesive clay). However, superficial glaciofluvial deposits (granular sands) were encountered in the northern area of the site. The site-specific observations are detailed in the following sections.

3.1 TOPSOIL

Topsoil comprising dark brown slightly gravelly sandy clay was encountered across the majority of the site and generally extended to a maximum depth of 0.40mbgl.

3.2 SUPERFICIAL STRATA

Glacial till deposits were encountered across the majority of the site. These generally comprised stiff reddish brown/dark grey slightly gravelly sandy clay with rare cobbles and boulders.

Glaciofluvial deposits were encountered to the north of the site in TP24, TP25 and TP27 - TP31. These were recorded to comprise medium dense yellowish brown mottled grey sand.

The base of the superficial deposits was not encountered in any exploratory hole, however, they were recorded to extend to a minimum depth of 3.20mbgl.

3.3 SOLID STRATA

The site is recorded to be underlain by a solid geology of the Gunthorpe Member. However, these were not encountered during the ground investigation works.

3.4 FIELD OBSERVATIONS

No significant visual or olfactory evidence of contamination was noted during the ground investigation works.

3.5 GROUNDWATER

Groundwater was encountered at depths of between 2.60mbgl and 2.80mbgl in the glaciofluvial deposits. Groundwater was not encountered within the underlying cohesive glacial till deposits.

3.6 SOAKAWAY TESTING

Soakaway testing was not undertaken during the ground investigation works. However, it is considered that the presence of shallow cohesive deposits across the majority of the site will not be suitable for soakaway infiltration and alternative drainage solutions should be sought in these areas. Soakaway drainage may be suitable in the natural granular glaciofluvial deposits encountered in the northern area of the site. However, soakaway testing is recommended to confirm this.

It is understood that the present redevelopment proposal for the site include a balancing pond situated to the north of the site. Due to the presence of granular deposits in this area, it is considered that the balancing pond would be unlikely to retain water. If the balancing pond is to be retained consideration should be given to relocating this feature so that it is situated within an area of shallow cohesive glacial till deposits which are more likely to retain water.

4.0 GEOTECHNICAL TESTING

4.1. Laboratory Testing

The results contained in **Appendix C** illustrate a PI value of 20% and moisture content of 17%, indicating the cohesive deposits to be of medium volume change potential.

Particle size distribution (PSD) testing has generally confirmed the findings illustrated in the exploratory hole logs.

Water Soluble Sulphate and pH analysis revealed results of <10-83mg/ISO₄ and 6.1-8.9, respectively.

4.2 In-situ Testing

In-situ testing of the natural soils was undertaken during the ground investigation works. Results of the testing are included on the exploratory hole logs in **Appendix B**. In summary, hand shear vane values within the cohesive glacial till deposits ranged from 102kPa to 120kPa indicating a stiff consistency.

5.0 CHEMICAL ANALYSIS

The guidance detailed in section 1.4 has been followed to ensure that the risk posed to identified receptors, as detailed in the conceptual site model, is reported according to accepted compliance criteria.

The Contaminated Land Exposure Assessment (CLEA) guidance and published Soil Guideline Values (SGV) have been incorporated with Generic Assessment Criteria (GAC), for determinands which do not have a published SGV, to provide a competent Tier 1 Assessment. The analysis results were assessed against Tier 1 Assessment Criteria for a residential with produce end use (the most stringent scenario). The GAC and methodology references are contained in **Appendix D**.

5.1 HUMAN HEALTH

An assessment of the analysis results for metals and inorganics contained in **Appendix C**, revealed that all samples do not exceed the respective GAC for residential end use with produce. Therefore, the risk to end users of the site are considered to be negligible.

5.2 CONTROLLED WATERS

No significant source of contamination has been identified, therefore the risk to controlled waters is assessed as being negligible.

6.0 RECCOMENDATIONS

Recommendations for further assessment of the site include:

- Should any signs of contamination be evident during construction activities, a qualified environmental specialist should be consulted to assess the risk posed to end users and the environment.
- Soakaway testing in the granular glaciofluvial soils to demonstrate that soakaway drainage is suitable for the site if desired.
- Revision of the proposed position of the balancing pond so that is situated within an area of shallow cohesive glacial till deposits.

7.0 CONCLUSIONS

The ground investigation works have illustrated that the site is suitable for the proposed reuse as a burial ground.

Appendix A

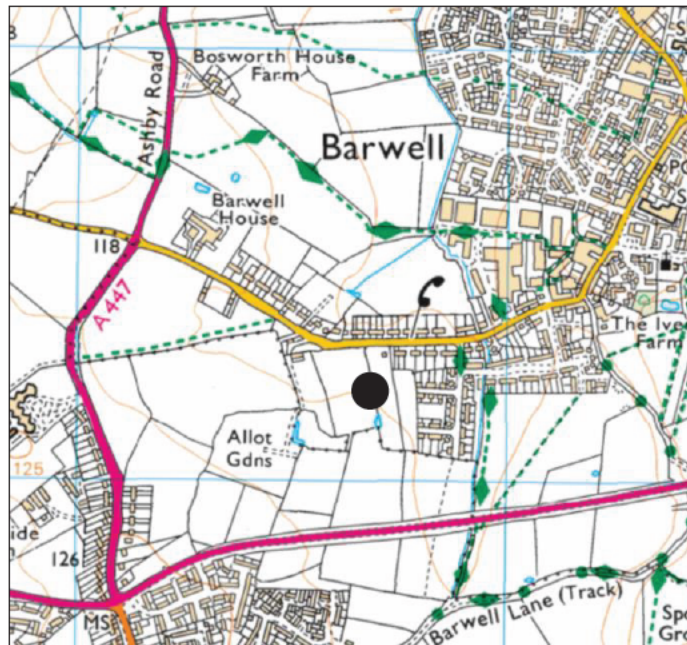




KEY:

● Approximate Site Location

DO NOT SCALE



TITLE:

Site Location Plan

PROJECT:

Crabtree Farm, Barwell

PROJECT No:

EAL.02.20

DATE:

10.2020

SCALE:

NTS

DRAWN:

PD

DWG No:

Figure 1

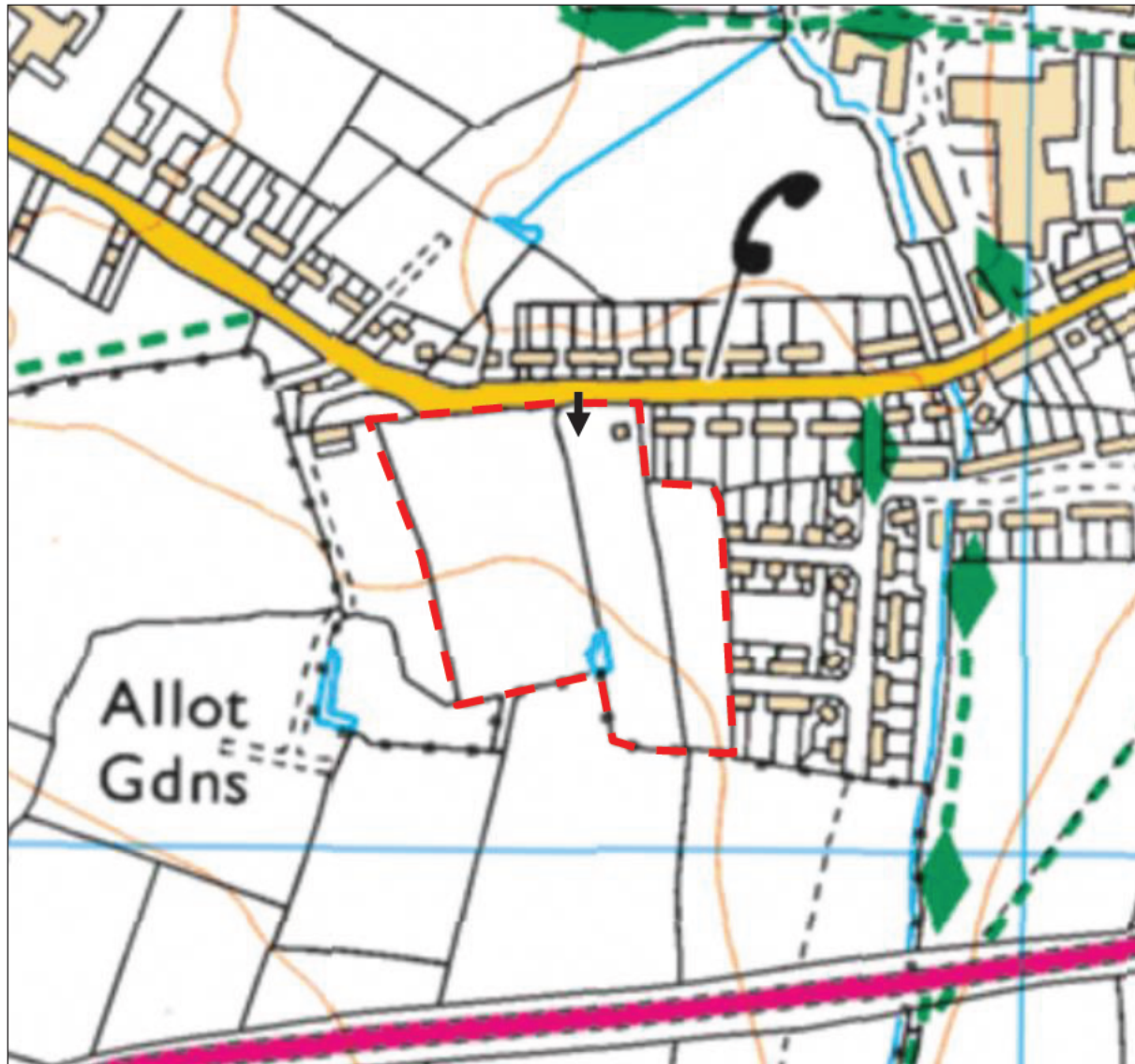


KEY:



Site Boundary

Access



DO NOT SCALE



TITLE:

Site Layout

PROJECT:

Crabtree Farm, Barwell

PROJECT No:

EAL.02.20

DATE:

10.2020

SCALE:

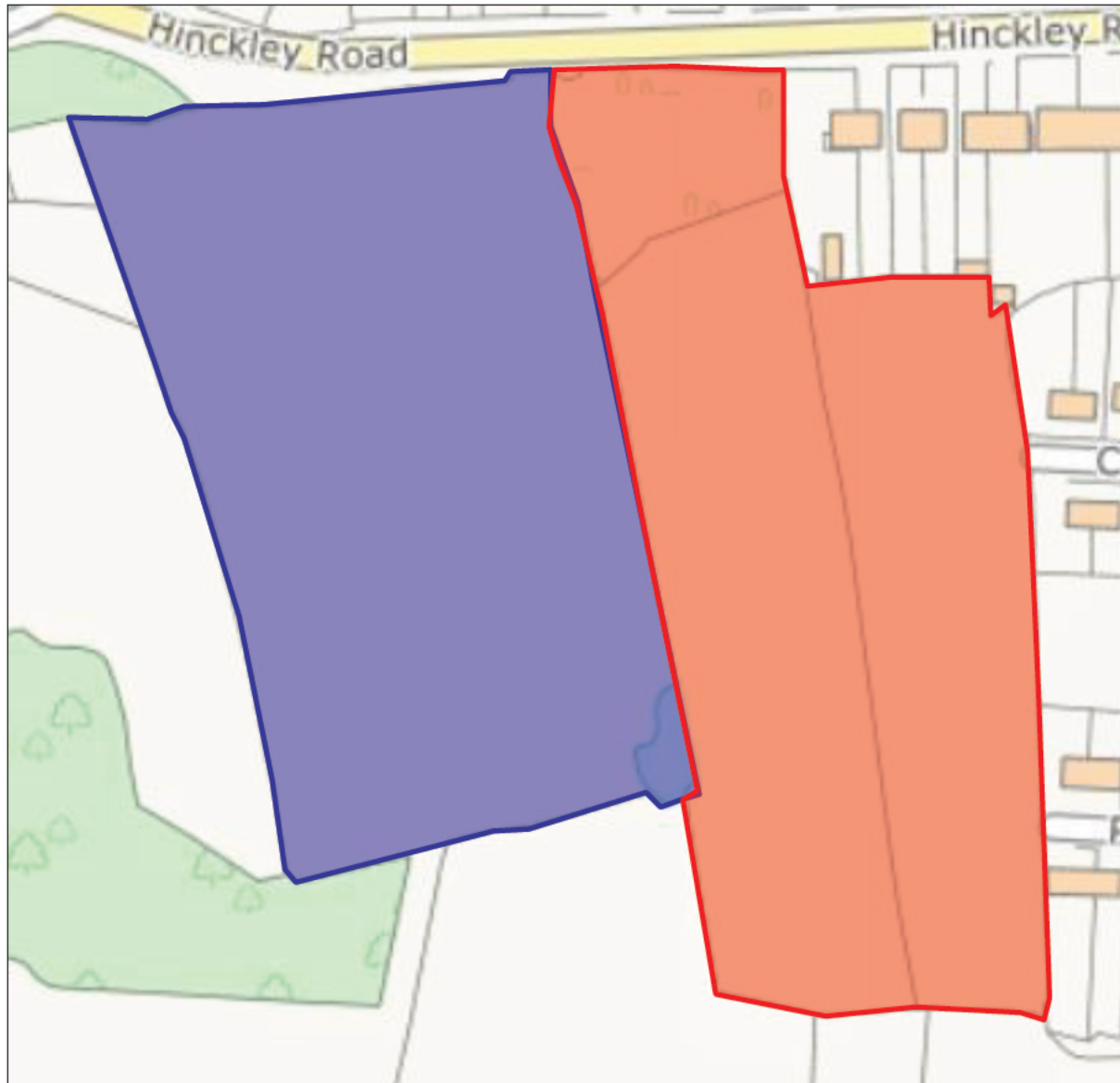
NTS

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Figure 2



KEY:



Parcel 1 - area of proposed residential redevelopment (not included in letter report)



Parcel 2 - area of proposed burial ground (subject of letter report)

DO NOT SCALE



TITLE:

Proposed End Use Plan

PROJECT:

Crabtree Farm, Barwell

PROJECT No:

EAL.02.20

DATE:

10.2020

SCALE:

NTS

DRAWN:

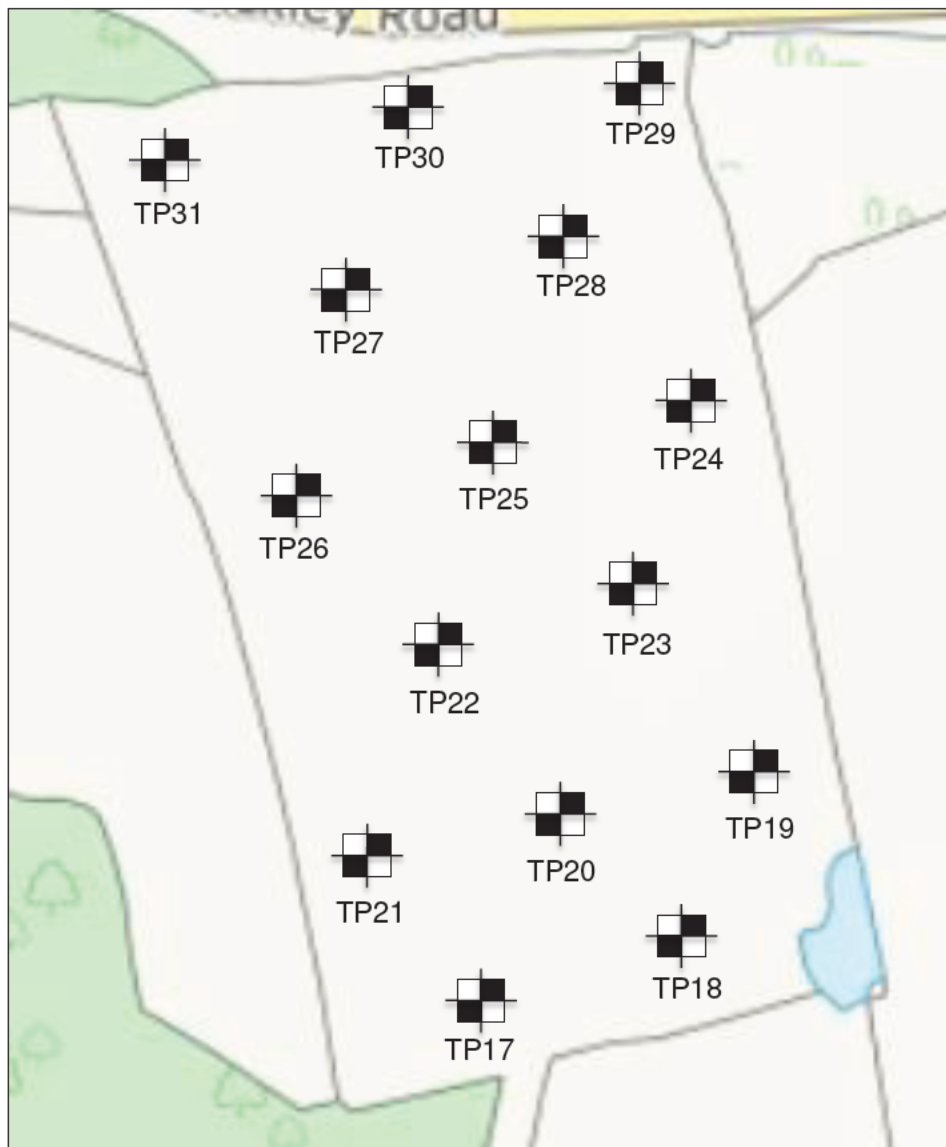
PD

DWG No:

Figure 3

Appendix B





KEY:



Trial Pit

DO NOT SCALE



TITLE:

Exploratory Hole Location Plan

PROJECT:

Crabtree Farm, Barwell

PROJECT No:

EAL.02.20

DATE:

10.2020

SCALE:

NTS

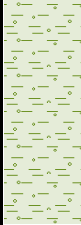
DRAWN:

PD

DWG No:

Figure 4

 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43623 96118 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP17	
				Sheet No. 1 of 1 Job No. EAL.02.20			
SITE LOCATION Crabtree Farm, Barwell							
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			Test Sample Details
				Depth	No	Type	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.10 0.15 0.20 0.25 0.30		0.30 (0.30)	0.20	1	ES	
Stiff yellowish brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70		0.70 (0.40)	0.50		HSV	102, 118, 120+ (Av: 113)
Stiff dark brown mottled grey slightly gravelly silty sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-angular to sub-rounded granite cobbles.	0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40		2.40 (1.70)	1.30		HSV	120+, 120+, 120+ (Av: 120+)
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-rounded to rounded granite and siltstone boulders.	2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80		2.80 (0.40)				
Trial pit terminated at 2.80mbgl.	2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00						
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. No groundwater encountered.				Logged By:	Checked By:	Date:	Scale:
				PD	PD	11.09.20	NTS

 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43666 96134 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP18	
				Sheet No. 1 of 1 Job No. EAL.02.20			
SITE LOCATION Crabtree Farm, Barwell							
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			Test Sample Details
				Depth	No	Type	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40		0.40 (0.40)	0.80	1	D	
Stiff yellowish brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.45 0.50 0.55 0.60 0.65 0.70		0.70 (0.30)				
Stiff dark brown mottled grey slightly gravelly silty sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-angular to sub-rounded granite cobbles.	0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40		1.40 (0.70)				
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-rounded to rounded granite and siltstone boulders.	1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90		2.90 (1.50)	2.00	HSV	120+, 120+, 120+ (Av: 120+)	
Trial pit terminated at 2.90mbgl.	2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00						
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. No groundwater encountered.				Logged By: PD	Checked By: PD	Date: 11.09.20	Scale: NTS

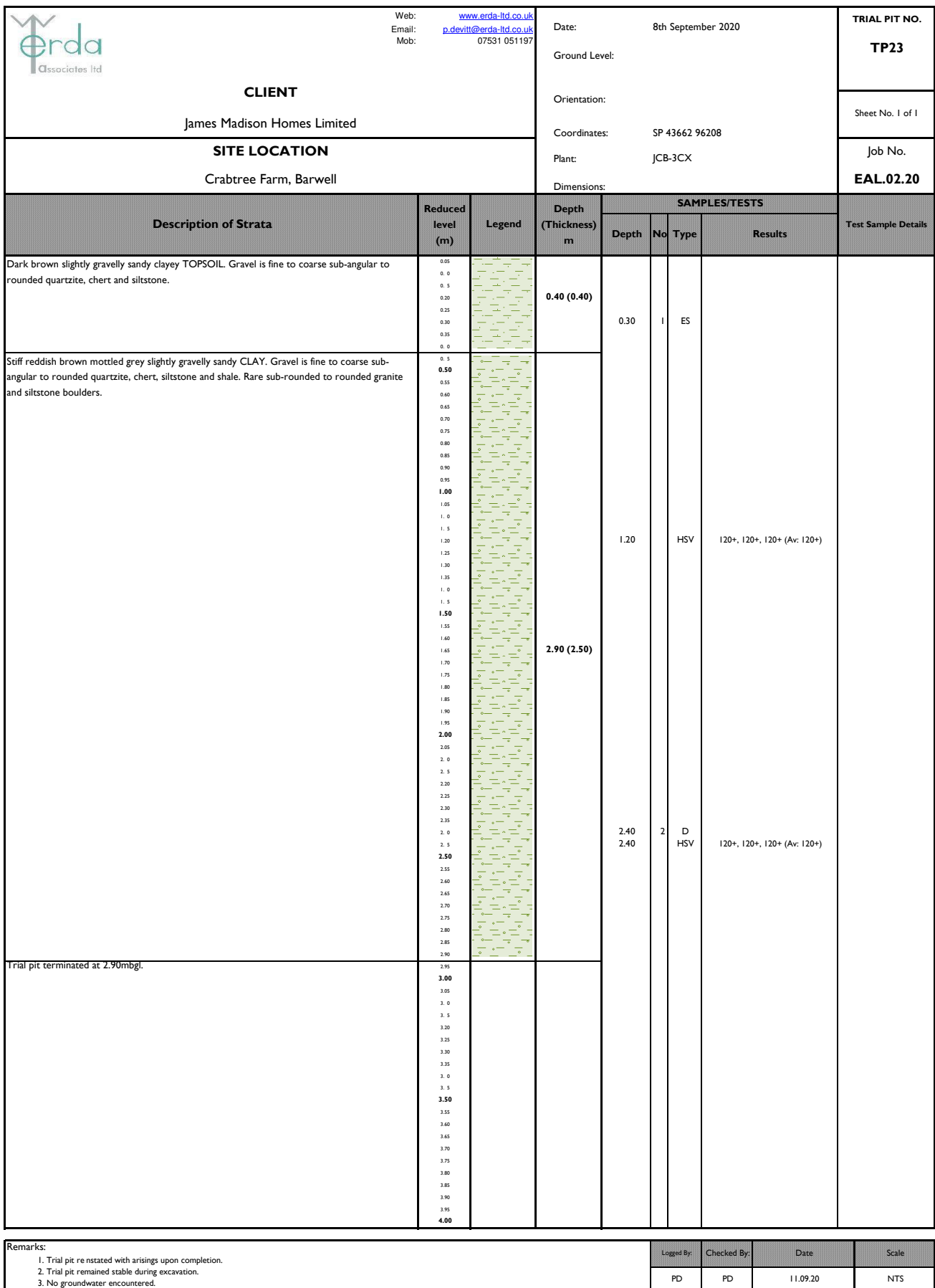
 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43689 96165 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP19		
				Sheet No. 1 of 1 Job No. EAL.02.20				
SITE LOCATION Crabtree Farm, Barwell								
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS				Test Sample Details
				Depth	No	Type	Results	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30		0.30 (0.30)					
Stiff yellowish brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.35 0.0 0.5 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00		1.00 (0.70)	0.70	1	ES		
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-rounded to rounded granite and siltstone boulders.	1.05 1.0 1.5 1.20 1.25 1.30 1.35 1.0 1.5 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.0 2.5 2.20 2.25 2.30 2.35 2.0 2.5 2.50 2.55 2.60 2.65 2.70 2.75 2.80		2.80 (1.80)	1.80		HSV	120+, 120+, 120+ (Av: 120+)	
				2.30	2	D		
Trial pit terminated at 2.80mbgl.	2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00							
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. No groundwater encountered.				Logged By:	Checked By:	Date:	Scale:	
				PD	PD	11.09.20	NTS	

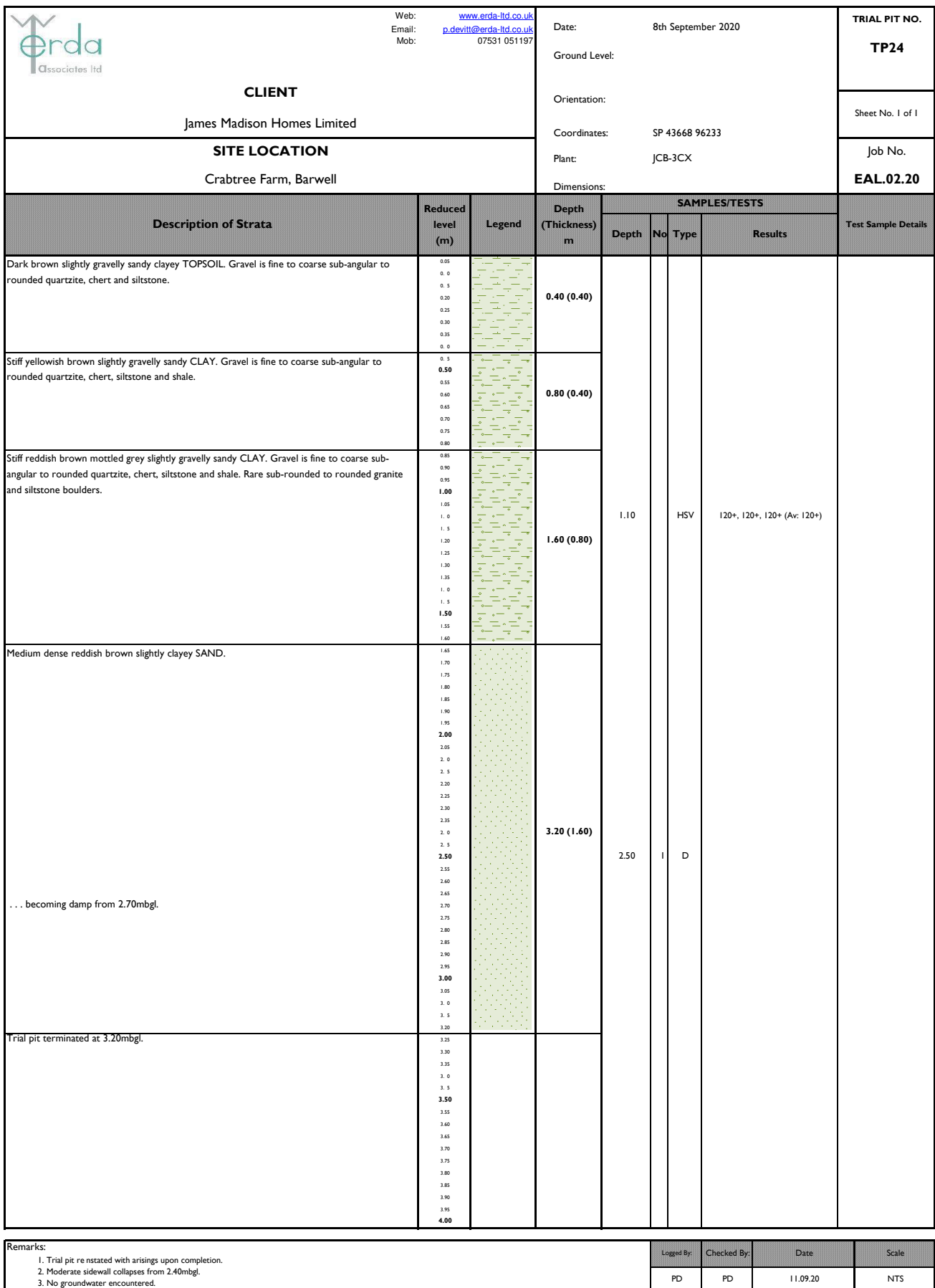
 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43649 96161 Plant: JCB-3CX Dimensions:				TRIAL PIT NO. TP20	
						Sheet No. 1 of 1			
						Job No. EAL.02.20			
SITE LOCATION Crabtree Farm, Barwell									
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS				Test Sample Details	
				Depth	No	Type	Results		
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30		0.30 (0.30)						
Stiff yellowish brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.35 0.0 0.5 0.50		0.50 (0.20)						
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-rounded to rounded granite and siltstone boulders.	0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.0 1.5 1.20 1.25 1.30 1.35 1.0		1.40 (0.90)						
Stiff dark brown mottled grey slightly gravelly silty sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-angular to sub-rounded granite cobbles.	1.5 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.0 2.5 2.20 2.25 2.30 2.35 2.0 2.5 2.50 2.55 2.60 2.65 2.70		2.70 (1.30)	1.50	I	D			
				1.80		HSV	116, 120+, 120+ (Av: 118)		
Trial pit terminated at 2.70mbgl.	2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00								
Remarks: 1. Trial pit re-nstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. No groundwater encountered.				Logged By:	Checked By:	Date:	Scale:		
				PD	PD	11.09.20	NTS		

 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43608 96151 Plant: JCB-3CX Dimensions:				TRIAL PIT NO. TP21	
						Sheet No. 1 of 1			
		SITE LOCATION Crabtree Farm, Barwell				Job No. EAL.02.20			
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS				Test Sample Details	
				Depth	No	Type	Results		
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30		0.30 (0.30)	0.10	I	ES			
Stiff yellowish brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.35 0.0 0.5 0.50 0.55 0.60 0.65 0.70 0.75 0.80		0.80 (0.50)						
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-rounded to rounded granite and siltstone boulders.	0.85 0.90 0.95 1.00 1.05 1.0 1.5 1.20 1.25 1.30 1.35 1.0 1.5 1.50 1.55 1.60		1.60 (0.80)	1.40		HSV	120+, 120+, 120+ (Av: 120+)		
Stiff dark brown mottled grey slightly gravelly silty sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-angular to sub-rounded granite cobbles.	1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.0 2.5 2.20 2.25 2.30		2.30 (0.70)						
Trial pit terminated at 2.30mbgl.	2.35 2.0 2.5 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00			2.30		HSV	120+, 120+, 120+ (Av: 120+)		
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. No groundwater encountered.				Logged By:	Checked By:	Date:	Scale:		
				PD	PD	11.09.20	NTS		

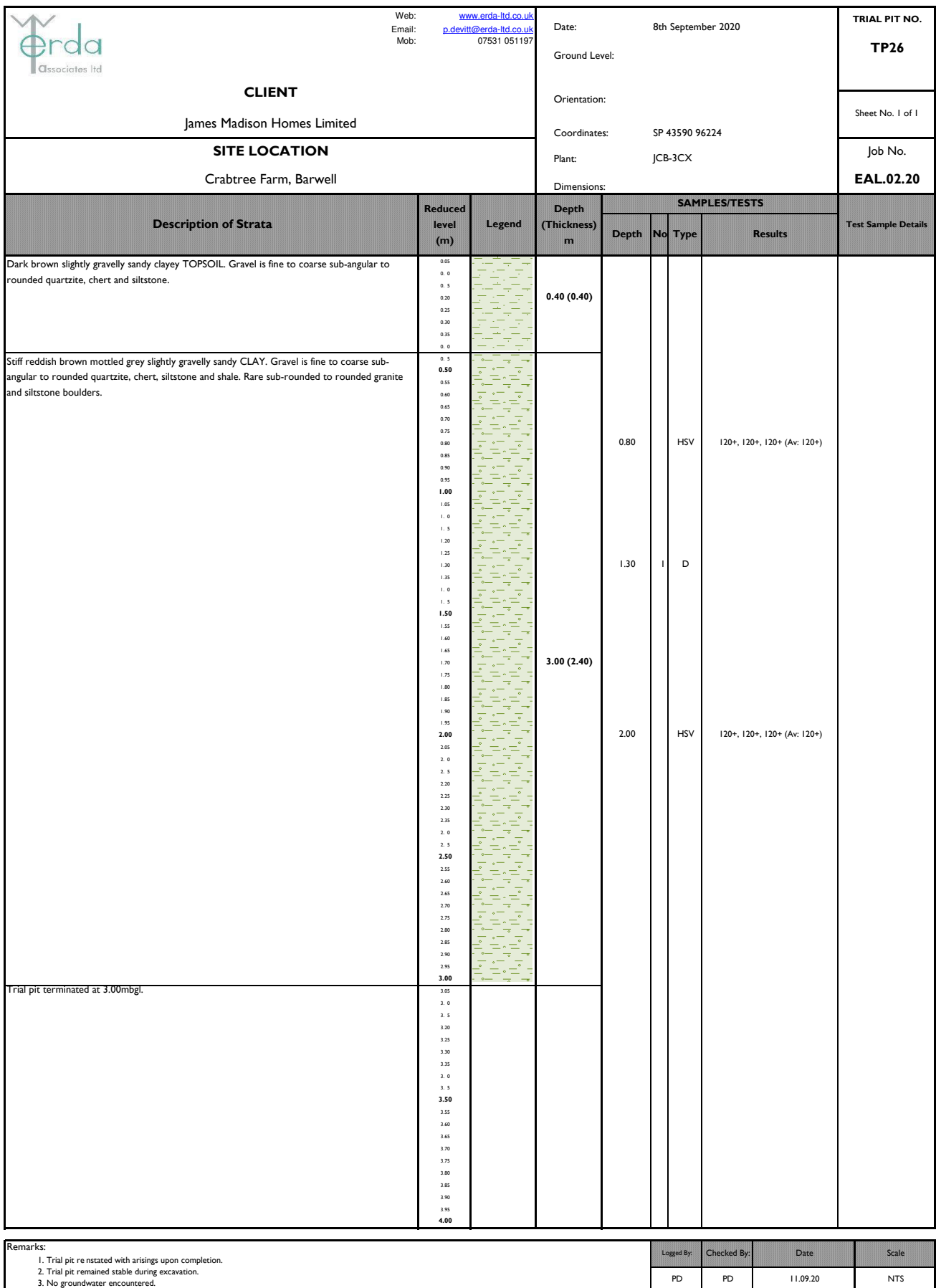
 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43627 96197 Plant: JCB-3CX Dimensions:				TRIAL PIT NO. TP22	
						Sheet No. 1 of 1			
		SITE LOCATION Crabtree Farm, Barwell				Job No. EAL.02.20			
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS				Test Sample Details	
				Depth	No	Type	Results		
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40		0.40 (0.40)	0.70		HSV	I13, I20+, I20+ (Av: I18)		
Stiff yellowish brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.45 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30		1.30 (0.90)						
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-rounded to rounded granite and siltstone boulders.	1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70		2.70 (1.40)	2.10	I	D	I20+, I20+, I20+ (Av: I20+)		
Trial pit terminated at 2.70mbgl.	2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00			2.20		HSV			

Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. No groundwater encountered.	Logged By:	Checked By:	Date:	Scale:
	PD	PD	11.09.20	NTS





 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43629 96231 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP25		
				Sheet No. 1 of 1 Job No. EAL.02.20				
SITE LOCATION Crabtree Farm, Barwell								
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS				Test Sample Details
				Depth	No	Type	Results	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30 0.35 0.0		0.40 (0.40)	0.10	1	ES		
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.5 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.0 1.5 1.20		1.20 (0.80)					
Medium dense reddish brown SAND.	1.25 1.30 1.35 1.0 1.5 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.0 2.5 2.20 2.25 2.30 2.35 2.0 2.5 2.50 2.55 2.60 2.65 2.70 2.75 2.80		2.80 (1.60)					
Trial pit terminated at 2.80mbgl.	2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00							
Remarks:				Logged By: PD Checked By: PD Date: 11.09.20 Scale: NTS				



 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43600 96263 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP27		
				Sheet No. 1 of 1 Job No. EAL.02.20				
SITE LOCATION Crabtree Farm, Barwell								
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS				Test Sample Details
				Depth	No	Type	Results	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30 0.35 0.0		0.40 (0.40)	0.20	I	ES		
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale. Rare sub-rounded to rounded granite and siltstone boulders.	0.5 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.0 1.5 1.20 1.25 1.30 1.35 1.0 1.5 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00		2.00 (1.60)					
Medium dense reddish brown SAND.	2.05 2.0 2.5 2.20 2.25 2.30 2.35 2.0 2.5 2.50 2.55 2.60		2.60 (0.60)					
Trial pit terminated at 2.60mbgl.	2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00							
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Moderate sidewall collapses from 2.00mbgl. 3. No groundwater encountered.				Logged By:	Checked By:	Date:	Scale:	
				PD	PD	11.09.20	NTS	

 Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197			Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43638 96275 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP28		
CLIENT James Madison Homes Limited					Sheet No. 1 of 1		
SITE LOCATION Crabtree Farm, Barwell					Job No. EAL.02.20		
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			Test Sample Details
				Depth	No	Type	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30		0.30 (0.30)	0.70	1	ES	
Stiff yellowish brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.35 0.0 0.5 0.50 0.55 0.60 0.65 0.70 0.75 0.80		0.80 (0.50)				
Medium dense reddish brown SAND.	0.85 0.90 0.95 1.00 1.05 1.0 1.5 1.20 1.25 1.30 1.35 1.0 1.5 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.0 2.5 2.20 2.25 2.30 2.35 2.0 2.5 2.50 2.55 2.60 2.65 2.70 2.75 2.80		2.80 (2.00)	1.50	2	ES	
... becoming damp from 2.60mbgl.							
Trial pit terminated at 2.80mbgl.	2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00						
Remarks: 1. Trial pit re-nstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Minor water ingress at 2.80mbgl.				Logged By:	Checked By:	Date:	Scale:
				PD	PD	11.09.20	NTS

 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43647 96304 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP29	
				Sheet No. 1 of 1 Job No. EAL.02.20			
SITE LOCATION Crabtree Farm, Barwell							
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			Test Sample Details
				Depth	No	Type	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30		0.30 (0.30)	0.90	1	ES	
Medium dense yellowish brown slightly gravelly SAND. Gravel is fine to coarse sub-angular to rounded quartzite.	0.35 0.0 0.5 0.50 0.55 0.60 0.65 0.70 0.75 0.80		0.80 (0.50)				
Medium dense light yellowish orange slightly gravelly SAND. Gravel is fine to coarse sub-rounded to rounded quartzite.	0.85 0.90 0.95 1.00 1.05 1.0 1.5 1.20 1.25 1.30		1.30 (0.50)				
Medium dense reddish brown SAND.	1.35 1.0 1.5 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.0 2.5 2.20 2.25 2.30 2.35 2.0 2.5 2.50 2.55 2.60 2.65 2.70		2.70 (1.40)				
... becoming damp from 2.10mbgl.							
Trial pit terminated at 2.70mbgl.	2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00						
Remarks: 1. Trial pit re-nstated with arisings upon completion. 2. Moderate sidewall collapse from 2.60mbgl. 3. No groundwater encountered.				Logged By: PD	Checked By: PD	Date: 11.09.20	Scale: NTS

 CLIENT James Madison Homes Limited		Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197		Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43610 96299 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP30	
				Sheet No. 1 of 1 Job No. EAL.02.20			
SITE LOCATION Crabtree Farm, Barwell							
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS			Test Sample Details
				Depth	No	Type	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30		0.30 (0.30)	0.30	1	ES	
Medium dense yellowish brown slightly gravelly SAND. Gravel is fine to coarse sub-angular to rounded quartzite.	0.35 0.0 0.5 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.0 1.5 1.20 1.25 1.30 1.35 1.0 1.5 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.0 2.5 2.20 2.25 2.0 2.5 2.50 2.55 2.60		2.60 (2.30)	1.70	2	D	
... becoming damp from 2.50mbgl.							
Trial pit terminated at 2.60mbgl.	2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00						
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Minor sidewall collapse from 2.00mbgl. 3. No groundwater encountered.				Logged By:	Checked By:	Date:	Scale:
				PD	PD	11.09.20	NTS

 Web: www.erda-ltd.co.uk Email: p.devitt@erda-ltd.co.uk Mob: 07531 051197			Date: 8th September 2020 Ground Level: Orientation: Coordinates: SP 43564 96287 Plant: JCB-3CX Dimensions:		TRIAL PIT NO. TP31			
CLIENT James Madison Homes Limited					Sheet No. 1 of 1			
SITE LOCATION Crabtree Farm, Barwell					Job No. EAL.02.20			
Description of Strata	Reduced level (m)	Legend	Depth (Thickness) m	SAMPLES/TESTS				Test Sample Details
				Depth	No	Type	Results	
Dark brown slightly gravelly sandy clayey TOPSOIL. Gravel is fine to coarse sub-angular to rounded quartzite, chert and siltstone.	0.05 0.0 0.5 0.20 0.25 0.30		0.30 (0.30)					
Medium dense yellowish brown slightly gravelly SAND. Gravel is fine to coarse sub-angular to rounded quartzite.	0.35 0.0 0.5 0.50 0.55 0.60 0.65 0.70 0.75 0.80		0.80 (0.50)					
Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to rounded quartzite, chert, siltstone and shale.	0.85 0.90 0.95 1.00 1.05 1.0 1.5 1.20 1.25 1.30 1.35 1.0 1.5 1.50		1.50 (0.70)					
Medium dense yellowish brown mottled grey SAND.	1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.0 2.5 2.20 2.25 2.30 2.35 2.0 2.5 2.50 2.55 2.60		2.60 (1.10)					
Trial pit terminated at 2.60mbgl.	2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.0 3.5 3.20 3.25 3.30 3.35 3.0 3.5 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00							
Remarks: 1. Trial pit reinstated with arisings upon completion. 2. Trial pit remained stable during excavation. 3. Minor water ingress from 2.60mbgl.				Logged By:	Checked By:	Date:	Scale:	
				PD	PD	11.09.20	NTS	

Appendix C





ANALYTICAL TEST REPORT

Contract no: 89254
Contract name: Barwell (Parcel 2 Area)
Client reference: EAL.02.20
Clients name: Erda Associates
Clients address: 102 Scalpcliffe Road
Burton on Trent
Staffordshire
DE15 9AB

Samples received: 14 September 2020

Analysis started: 14 September 2020

Analysis completed: 21 September 2020

Report issued: 21 September 2020

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key: U UKAS accredited test
M MCERTS & UKAS accredited test
\$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing
NAD No Asbestos Detected

Approved by:



Dave Bowerbank
Customer Support Hero

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
89254-1	TP17	0.20	Sandy Clay With Gravel	-	-	18.1
89254-3	TP19	0.70	Clay	-	-	15.5
89254-4	TP21	0.10	Sandy Clay With Gravel	-	-	15.6
89254-5	TP23	0.30	Sandy Clay With Gravel	-	-	17.6
89254-6	TP25	0.10	Sandy Clay With Gravel	-	-	11.7
89254-7	TP27	0.20	Sandy Clay With Gravel	-	-	13.3
89254-8	TP28	0.70	Sandy Clay With Gravel	-	-	14.2
89254-10	TP30	0.30	Sandy Clay With Gravel	-	-	13.6

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SOILS

Lab number Sample id Depth (m) Date sampled			89254-1 TP17 0.20 08/09/2020	89254-3 TP19 0.70 08/09/2020	89254-4 TP21 0.10 08/09/2020	89254-5 TP23 0.30 08/09/2020	89254-6 TP25 0.10 08/09/2020	89254-7 TP27 0.20 08/09/2020
Test	Method	Units						
Arsenic (total)	CE127 ^M	mg/kg As	12	8.0	13	7.7	6.8	5.0
Cadmium (total)	CE127 ^M	mg/kg Cd	0.2	<0.2	0.2	0.2	<0.2	<0.2
Chromium (total)	CE127 ^M	mg/kg Cr	88	78	57	73	81	18
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE127 ^M	mg/kg Cu	16	22	17	17	13	11
Lead (total)	CE127 ^M	mg/kg Pb	31	17	27	37	31	22
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	18	40	22	16	12	11
Selenium (total)	CE127 ^M	mg/kg Se	1.1	1.6	1.4	1.0	0.8	0.7
Vanadium (total)	CE127 ^M	mg/kg V	47	58	46	36	30	24
Zinc (total)	CE127 ^M	mg/kg Zn	64	66	62	55	50	43
pH	CE004 ^M	units	6.8	7.4	7.0	6.5	6.1	6.2
Sulphate (2:1 water soluble)	CE061 ^M	mg/l SO ₄	17	<10	<10	16	14	83
Sulphate (total)	CE062 ^M	mg/kg SO ₄	819	171	420	548	508	336
Organic matter content (OMC)	CE005	% w/w	6.7	4.8	5.8	6.0	4.6	3.4
Estimate of TOC (calculated from OMC)	CE005	% w/w C	3.9	2.8	3.4	3.5	2.7	2.0
PAH								
Naphthalene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	CE087 ^U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Anthracene	CE087 ^U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	CE087 ^M	mg/kg	0.03	<0.02	0.04	0.05	0.05	0.03
Pyrene	CE087 ^M	mg/kg	0.03	<0.02	0.04	0.04	0.05	0.03
Benzo(a)anthracene	CE087 ^U	mg/kg	<0.02	<0.02	<0.02	0.03	0.04	0.03
Chrysene	CE087 ^M	mg/kg	<0.03	<0.03	<0.03	0.03	0.03	<0.03
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.02	<0.02	0.03	0.03	0.03	0.03
Benzo(k)fluoranthene	CE087 ^M	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Benzo(a)pyrene	CE087 ^U	mg/kg	0.02	<0.02	0.03	0.03	0.03	0.02
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.04	<0.02	0.03	0.04	0.03	0.03
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
Subcontracted analysis								
Asbestos (qual tative)	\$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			89254-8	89254-10
Sample id			TP28	TP30
Depth (m)			0.70	0.30
Date sampled			08/09/2020	08/09/2020
Test	Method	Units		
Arsenic (total)	CE127 ^M	mg/kg As	7.3	5.6
Cadmium (total)	CE127 ^M	mg/kg Cd	<0.2	<0.2
Chromium (total)	CE127 ^M	mg/kg Cr	64	73
Chromium (VI)	CE146	mg/kg CrVI	<1	<1
Copper (total)	CE127 ^M	mg/kg Cu	13	9.4
Lead (total)	CE127 ^M	mg/kg Pb	13	23
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	16	10
Selenium (total)	CE127 ^M	mg/kg Se	1.0	0.9
Vanadium (total)	CE127 ^M	mg/kg V	28	26
Zinc (total)	CE127 ^M	mg/kg Zn	37	40
pH	CE004 ^M	units	8.9	6.2
Sulphate (2:1 water soluble)	CE061 ^M	mg/l SO ₄	<10	10
Sulphate (total)	CE062 ^M	mg/kg SO ₄	138	302
Organic matter content (OMC)	CE005	% w/w	2.2	3.8
Estimate of TOC (calculated from OMC)	CE005	% w/w C	1.3	2.2
PAH				
Naphthalene	CE087 ^M	mg/kg	<0.02	<0.02
Acenaphthylene	CE087 ^M	mg/kg	<0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	<0.02	<0.02
Fluorene	CE087 ^U	mg/kg	<0.02	<0.02
Phenanthrene	CE087 ^M	mg/kg	<0.02	0.03
Anthracene	CE087 ^U	mg/kg	<0.02	<0.02
Fluoranthene	CE087 ^M	mg/kg	<0.02	0.09
Pyrene	CE087 ^M	mg/kg	<0.02	0.08
Benzo(a)anthracene	CE087 ^U	mg/kg	<0.02	0.05
Chrysene	CE087 ^M	mg/kg	<0.03	0.05
Benzo(b)fluoranthene	CE087 ^M	mg/kg	<0.02	0.06
Benzo(k)fluoranthene	CE087 ^M	mg/kg	<0.03	<0.03
Benzo(a)pyrene	CE087 ^U	mg/kg	<0.02	0.05
Indeno(123cd)pyrene	CE087 ^M	mg/kg	<0.02	0.06
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	<0.02	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	<0.34	0.47
Subcontracted analysis				
Asbestos (qual tative)	\$	-	NAD	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsen c (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE146	Chromium (VI)	Acid extract on, Colorimetry	Dry		1	mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Vanadium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg V
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	un ts
CE061	Sulphate (2:1 water soluble)	Aqueous extract on, ICP-OES	Dry	M	10	mg/l SO ₄
CE062	Sulphate (total)	Acid extract on, ICP-OES	Dry		100	mg/kg SO ₄
CE005	Organic matter content (OMC)	Based on BS 1377, Colorimetry	Dry		0.1	% w/w
CE005	Estimate of TOC (calculated from OMC)	Calculation from Organic Matter Content	Dry		0.1	% w/w C
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
\$	Asbestos (qual tative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
89254-1	TP17	0.20	N	
89254-3	TP19	0.70	N	
89254-4	TP21	0.10	N	
89254-5	TP23	0.30	N	
89254-6	TP25	0.10	N	
89254-7	TP27	0.20	N	
89254-8	TP28	0.70	N	
89254-10	TP30	0.30	N	



LABORATORY REPORT



4043

Contract Number: PSL20/5074

Report Date: 24 September 2020

Client's Reference: 89254

Client Name: Chemtech Environmental on behalf of Erda Associates Ltd
102 Scalpcliffe Road
Burton on Trent
Staffordshire
DE15 9AB

For the attention of: Phil Devitt

Contract Title: Barwell (Parcel 2 Area)

Date Received: 23/9/2020

Date Commenced: 23/9/2020

Date Completed: 24/9/2020

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)



S Royle
(Laboratory Manager)

S Eyre
(Senior Technician)

L Knight
(Senior Technician)

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Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

4043

PSL
Professional Soils Laboratory

Barwell (Parcel 2 Area)

Contract No:

PSL20/5074

Client Ref:

89254

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



4043

PSL

Professional Soils Laboratory

Barwell (Parcel 2 Area)

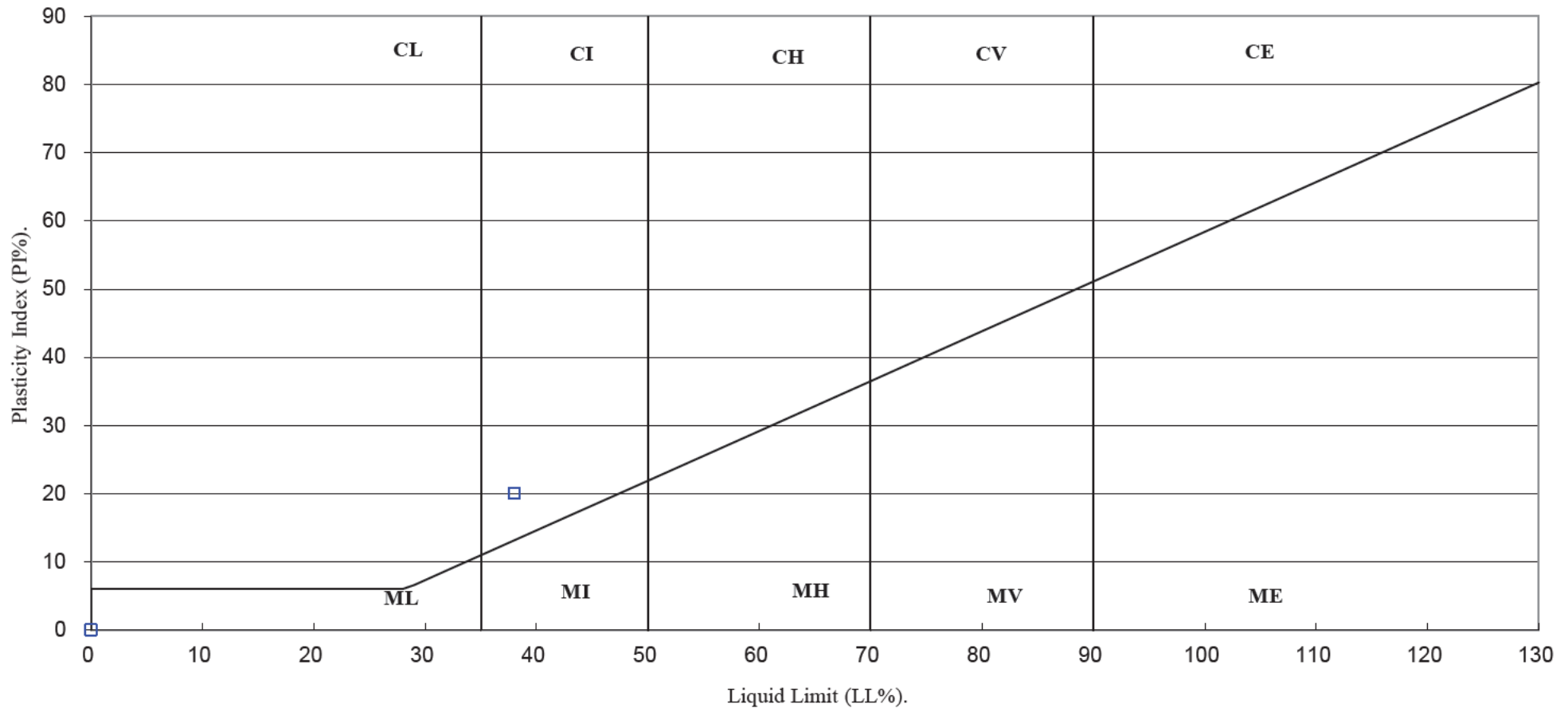
Contract No:

PSL20/5074

Client Ref:

89254

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



4043

PSL

Professional Soils Laboratory

Barwell (Parcel 2 Area)

Contract No:

PSL20/5074

Client Ref:

89254

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

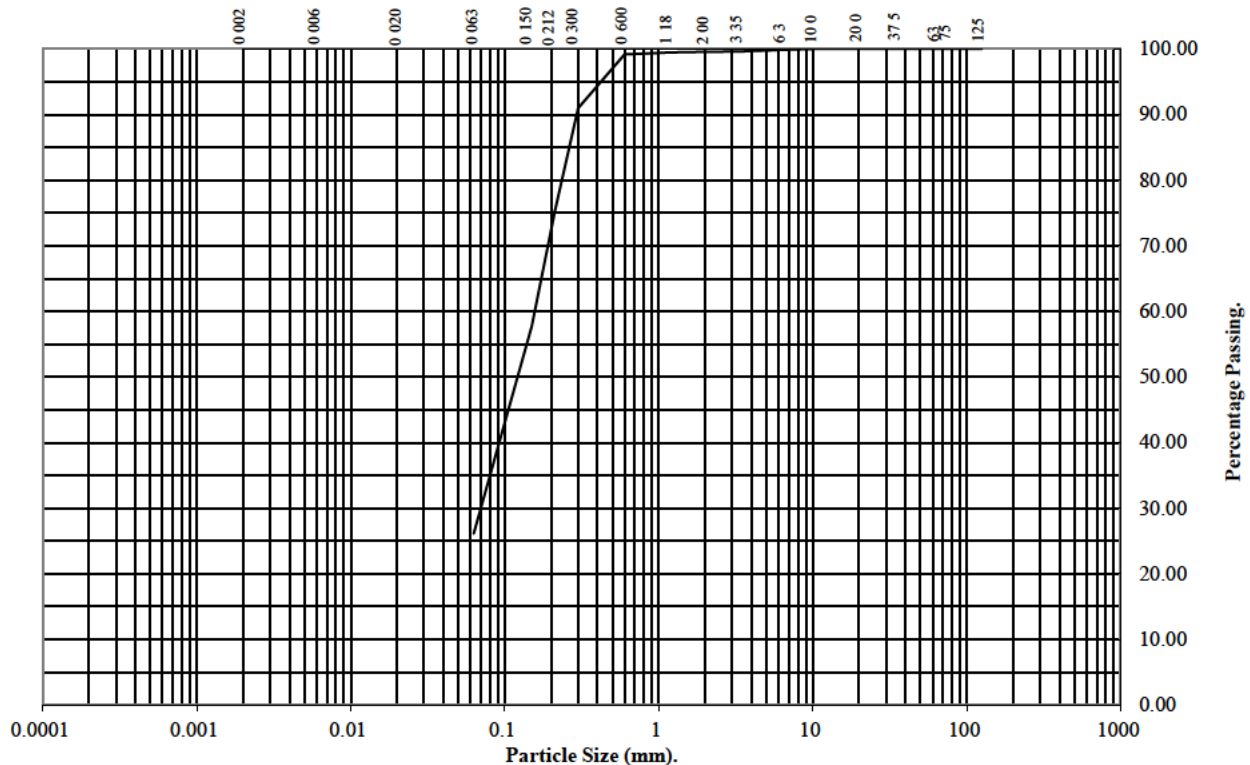
Hole Number: TP28

Top Depth (m): 1.50

Sample Number:

Base Depth(m):

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	91
0.212	75
0.15	58
0.063	26

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	74
Silt/Clay	26

Remarks:

See Summary of Soil Descriptions



PSL
Professional Soils Laboratory

Barwell (Parcel 2 Area)

Contract No:

PSL20/5074

Client Ref:

89254

Appendix D



Tier 1 Assessment Criteria

Determinand	Residential With Produce	Residential Without Produce	Allotments	Commercial (Office)	Commercial (Warehouse)
Arsenic	32.40	35.00	43.00	635.00	635.00
Cadmium	5.17	17.70	1.05	230.00	230.00
Mercury, elemental	1.02	1.02	316.00	109.00	83.40
Mercury, inorganic	169.00	238.00	80.30	3640.00	3640.00
Mercury, methyl	11.40	14.10	7.97	407.00	409.00
Selenium	350.00	595.00	121.00	13000.00	13000.00
Phenol	415.00	519.00	282.00	37600.00	38000.00
Toulene	611.00	2710.00	118.00	189000.00	166000.00
Lead	210.00	210.00	84.00	2300.00	2300.00
Nickel	130.00	130*	180.00	980.00	980.00
Total Cyanide	34.00	34.00			
Benzo(a)pyrene	3.00	3.20	3.50	36.00	14.40
Dibenz(ah)anthracene	0.30	0.32	0.43	3.60	13.00
Acenaphthene	1100.00	6000.00	200.00	100000.00	103000.00
Acenaphthylene	920.00	6000.00	160.00	100000.00	103000.00
Anthracene	11000.00	37000.00	2200.00	540000.00	542000.00
Benzo(a)anthracene	13.00	15.00	13.00	180.00	97.50
Benzo(b)fluoranthene	3.70	4.00	3.90	45.00	103.00
Benzo(ghi)perylene	350.00	360.00	640.00	4000.00	661.00
Benzo(k)fluoranthene	100.00	110.00	130.00	1200.00	144.00
Chrysene	27.00	32.00	19.00	350.00	143.00
Fluoranthene	890.00	1600.00	290.00	23000.00	22700.00
Fluorene	860.00	4500.00	160.00	71000.00	70700.00
Indeno(123cd)pyrene	41.00	46.00	39.00	510.00	61.70
Phenanthrene	440.00	1500.00	90.00	23000.00	22600.00
Pyrene	2000.00	3800.00	620.00	54000.00	54500.00
Naphthalene	13.00	13.00	24.00	1100.00	875.00
Chromium VI	3.38	4.12	2.11	34.20	34.20
Chromium III	627.00	627.00	15300.00	8840.00	8840.00
Copper	2330.00	6200*	524.00	71700.00	71700.00
Vanadium	79.00	226.00	17.90	5590.00	5590.00
Zinc	3750.00	40400*	618.00	665000.00	665000.00

Note:

All figures are in mg/kg

Values calculated using CLEA v1.071

Soil type chosen is sandy loam, pH 7

All organic determinands calculated using 6% SOM

PAH = S4UL (except warehouse model - CLEA v1.071)

* Phytotoxic assessment based on pH range of <6.0 to >7.0, Copper = 100-200mg/kg, Nickel=60-110mg/kg, Zinc = 200-300mg/kg

Tier 1 Assessment Criteria

Determinand	Residential With Produce	Residential Without Produce	Allotments	Commercial (Office)	Commercial (Warehouse)
Benzene	0.33	1.00	0.07	94.70	80.30
Ethylbenzene	354.00	843.00	91.20	65700.00	55600.00
Phenol	415.00	519.00	282.00	37600.00	38000.00
Toulene	611.00	2710.00	118.00	189000.00	166000.00
Xylene, o-	246.00	321.00	159.00	34600.00	27600.00
Xylene, m-	240.00	302.00	175.00	32700.00	26100.00
Xylene, p-	228.00	288.00	164.00	31400.00	25100.00
Aliphatic C5-C6	113.00	113.00	3910.00	12800.00	10800.00
Aliphatic C6-C8	48.10	48.20	13300.00	5470.00	4620.00
Aliphatic C8-C10	108.00	109.00	1710.00	11900.00	10200.00
Aliphatic C10-C12	537.00	538.00	7280.00	49300.00	43700.00
Aliphatic C12-C16	3030.00	3040.00	13400.00	90500.00	89600.00
Aliphatic C16-C35	88400.00	89100.00	281000.00	1910000.00	1910000.00
Aliphatic C35-C44	88400.00	89100.00	281000.00	1910000.00	1910000.00
Aromatic C5-C7	275.00	978.00	57.30	89900.00	76800.00
Aromatic C7-C8	611.00	2710.00	118.00	189000.00	166000.00
Aromatic C8-C10	151.00	189.00	50.50	17800.00	15700.00
Aromatic C10-C12	346.00	866.00	73.80	34500.00	33800.00
Aromatic C12-C16	593.00	1710.00	134.00	37800.00	37800.00
Aromatic C16-C21	770.00	1340.00	260.00	28600.00	28600.00
Aromatic C21-C35	1230.00	1340.00	1550.00	28600.00	28600.00
Aromatic C35-C44	1230.00	1340.00	1550.00	28600.00	28600.00
Combined Aliphatic and Aromatic C44-C70	1300.00	1340.00	2950.00	28600.00	28600.00

Note:

All figures are in mg/kg

Values calculated using CLEA v1.071

Soil type chosen is sandy loam, pH 7

All organic determinands calculated using 6% SOM