Remount (Phase 2), Rathmore Road, Lusk Co. Dublin – Ground Investigation

Client:	Fingal County Council
Client's Representative:	McMahon Associates
Report No.:	22-1165
Date:	October 2022
Status:	Final for Issue

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CONTENTS

APPENDICES

Document Control Sheet

Report No.:		22-1165			
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Revision:	A00	**Status:**	Final for issue	**Issue Date:**	27th Oct 2022
Prepared by:		**Reviewed and approved by:**			
 Lucy Newland BSc (Hons)		 Stephen Franey BSc MSc MIEnvSc CEnv			

The works were conducted in accordance with:

UK Specification for Ground Investigation 2nd Edition, published by ICE Publishing (2012)

British Standards Institute (2015) BS 5930:2015+A1:2020, Code of practice for ground investigations.

BS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing.

Geotechnical Society of Ireland (2016), Specification & Related Documents for Ground Investigation in Ireland

Laboratory testing was conducted in accordance with:

British Standards Institute BS 1377:1990 parts 2, 4, 5, 7 and 9

METHODS OF DESCRIBING SOILS AND ROCKS

Soil and rock descriptions are based on the guidance in BS5930:2015+A1:2020, The Code of Practice for Ground Investigation.

Abbreviations used on exploratory hole logs	
U	Nominal 100mm diameter undisturbed open tube sample (thick walled sampler).
UT	Nominal 100mm diameter undisturbed open tube sample (thin walled sampler).
P	Nominal 100mm diameter undisturbed piston sample.
B	Bulk disturbed sample.
LB	Large bulk disturbed sample.
D	Small disturbed sample.
C	Core sub-sample (displayed in the Field Records column on the logs).
L	Liner sample from dynamic sampled borehole.
W	Water sample.
ES / EW	Soil sample for environmental testing / Water sample for environmental testing.
SPT (s)	Standard penetration test using a split spoon sampler (small disturbed sample obtained).
SPT (c)	Standard penetration test using 60 degree solid cone.
(x,x/x,x,x,x)	Blows per increment during the standard penetration test. The initial two values relate to the seating drive (150mm) and the remaining four to the 75mm increments of the test length.
(Y for Z/ Y for Z)	Incomplete standard penetration test where the full test length was not achieved. The blows 'X' represent the total blows for the given seating or test length 'Z' (mm).
N=X	SPT blow count 'N' given by the summation of the blows 'X' required to drive the full test length (300mm).
HVP / HVR	In situ hand vane test result (HVP) and vane test residual result (HVR). Results presented in kPa.
V VR	Shear vane test (borehole). Shear strength stated in kPa. V: undisturbed vane shear strength VR: remoulded vane shear strength
Soil consistency description	In cohesive soils, where samples are disturbed and there are no suitable laboratory tests, N values may be used to indicate consistency on borehole logs – a median relationship of Nx5=Cu is used (as set out in Stroud & Butler 1975).
dd-mm-yyyy	Date at the end and start of shifts, shown at the relevant borehole depth. Corresponding casing and water depths shown in the adjacent columns.
▽	Water strike: initial depth of strike.
▼	Water strike: depth water rose to.
Abbreviations relating to rock core – reference Clause 36.4.4 of BS 5930: 2015+A1:2020	
TCR (%)	Total Core Recovery: Ratio of rock/soil core recovered (both solid and non-intact) to the total length of core run.
SCR (%)	Solid Core Recovery: Ratio of solid core to the total length of core run. Solid core has a full diameter, uninterrupted by natural discontinuities, but not necessarily a full circumference and is measured along the core axis between natural fractures.
RQD (%)	Rock Quality Designation: Ratio of total length of solid core pieces greater than 100mm to the total length of core run.
FI	Fracture Index: Number of natural discontinuities per metre over an indicated length of core of similar intensity of fracturing.
NI	Non Intact: Used where the rock material was recovered fragmented, for example as fine to coarse gravel size particles.
AZCL	Assessed zone of core loss: The estimated depth range where core was not recovered.
DIF	Drilling induced fracture: A fracture of non-geological origin brought about by the rock coring.
(xxx/xxx/xxx)	Spacing between discontinuities (minimum/average/maximum) measured in millimetres.

Remount (Phase 2), Rathmore Road, Lusk Co. Dublin

1 AUTHORITY

On the instructions of McMahon Associates Consulting Engineers, ("the Client's Representative"), acting on the behalf of Fingal County Council ("the Client"), a ground investigation was undertaken at the above location to provide geotechnical and environmental information for input to the design and construction of a proposed residential development.

This report details the work carried out both on site and in the geotechnical and chemical testing laboratories; it contains a description of the site and the works undertaken, the exploratory hole logs and the laboratory test results. A discussion on the recommendations for construction is also provided.

All information given in this report is based upon the ground conditions encountered during the ground investigation works, and on the results of the laboratory and field tests performed. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes. It should be noted that groundwater levels usually vary due to seasonal and/or other effects and may at times differ to those recorded during the investigation. No responsibility can be taken for conditions not encountered through the scope of work commissioned, for example between exploratory hole points, or beneath the termination depths achieved.

This report was prepared by Causeway Geotech Ltd for the use of the Client and the Client's Representative in response to a particular set of instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded.

2 SCOPE

The extent of the investigation, as instructed by the Client's Representative, included boreholes, trial pits, soil sampling, environmental sampling, in-situ and laboratory testing, and the preparation of a report on the findings including recommendations for construction.

3 DESCRIPTION OF SITE

As shown on the site location plan in Appendix A, the works were conducted on an open green area off the Rathmore Road in the southern area of Lusk, Co. Dublin. The site is bordered by Rathmore Road to the south, residential estates to the east and west and open grasslands with playing fields to the north. The site slopes down gently from north-west to south-east.

4 SITE OPERATIONS

4.1 Summary of site works

Site operations, which were conducted between 7th and 9th September 2022, comprised:

- six boreholes by dynamic (windowless) sampling
- six machine dug trial pits
- an infiltration test performed in two trial pits
- indirect CBR tests at two locations.

The exploratory holes and in-situ tests were located as instructed by the Client's Representative, as shown on the exploratory hole location plan in Appendix A.

4.2 Boreholes

Six boreholes (BH01-BH06) were put down to completion by light percussion boring techniques using a Premier 110 dynamic sampling rig. The boreholes were put down initially in 150mm diameter, reducing in diameter with depth as required, down to 50mm by use of the smallest sampler.

Hand dug inspection pits were carried out between ground level and 1.20m depth to ensure boreholes were put down clear of services or subsurface obstructions. The boreholes were taken to depths ranging between 2.65m and 4.50m where they were terminated on encountering virtual refusal.

Standard penetration tests were carried out in accordance with BS EN 22476-3:2005+A1:2011 at standard depth intervals using the split spoon sampler ($SPT_{(s)}$) or solid cone attachment ($SPT_{(c)}$). The penetrations are stated for those tests for which the full 150mm seating drive or 300mm test drive was not possible. The *N*-values provided on the borehole logs are uncorrected and no allowance has been made for energy ratio corrections. The SPT hammer energy measurement report is provided in Appendix I.

Disturbed (bulk and small bag) samples were taken within the encountered strata. Environmental samples were taken at standard intervals, as directed by the Client's Representative.

No groundwater was encountered during drilling.

Appendix B presents the borehole logs.

4.3 Trial Pits

Six trial pits (ST01, ST02 and TH01 to TH04) were excavated using a 3t tracked excavator fitted with a 400mm wide bucket, to depths ranging between 1.50m and 2.50m. Selected trial pits were excavated to allow completion of infiltration test.

Environmental samples were taken at depths select depths in trial pits TH01-TH04.

Disturbed (bulk bag) samples were taken at standard depth intervals and at change of strata.

No groundwater was encountered during excavations. The stability of the trial pit walls was noted on completion.

Appendix C presents the trial pit logs with photographs of the pits and arising provided in Appendix D.

4.4 Infiltration tests

An infiltration/soakaway test was carried out at two locations (ST01 and ST02) in accordance with BRE Digest 365 - Soakaways (BRE, 2016).

Appendix E presents the results and analysis of the infiltration test. The absence of the outflow from the pits precluded calculation of infiltration coefficients.

4.5 Indirect CBR tests (DCP)

An indirect CBR test was conducted at two locations (TH01 and TH04) using a Dynamic Cone Penetrometer (DCP). The equipment was developed in conjunction with the UK Transport Research Laboratory, is used widely throughout the world, and is referred to in the UK Highway Agency Interim Advice Note 73/06.

The test results are presented in Appendix F in the form of plots of the variation with depth of the penetration per blow. Straight lines have been fitted to the plots and the CBR for each depth range estimated using the following relationship, which is derived from Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.48 - 1.057 \text{ Log (mm/blow)}$$

5 LABORATORY WORK

Upon their receipt in the laboratory, all disturbed samples were carefully examined and accurately described, and their descriptions incorporated into the borehole logs.

5.1 Geotechnical laboratory testing of soils

Laboratory testing of soils comprised:

- **soil classification:** moisture content measurement, Atterberg Limit tests and particle size distribution analysis.
- **compaction related:** dry density/moisture content relationship, Moisture Condition Value, California bearing ratio tests
- **soil chemistry:** pH, water soluble sulphate content and sulphate 2:1 Extract.

Laboratory testing of soils samples was carried out in accordance with British Standards Institute: *BS 1377, Methods of test for soils for civil engineering purposes; Part 1 (2016), and Parts 2-9 (1990).*

The test results are presented in Appendix G.

5.2 Environmental laboratory testing of soils

Environmental testing was conducted on selected environmental soil samples by Chemtest at its laboratory in Newmarket, Suffolk.

Rilta suite of analysis was carried out on two samples for landfill disposal criteria. This included testing for a range of determinants, including:

- Metals
- Speciated total petroleum hydrocarbons (TPH)
- Speciated polycyclic aromatic hydrocarbons (PAH)
- BTEX compounds
- Polychlorinated biphenyls (PCBs)
- Phenols
- Total Organic Carbon (TOC)
- Cyanides
- Asbestos screen
- Sulphate and sulphide
- Sulphur
- pH
- Waste acceptance criteria (WAC)

Results of environmental laboratory testing are presented in Appendix H.

6 GROUND CONDITIONS

6.1 General geology of the area

Published geological mapping indicate the superficial deposits underlying the site comprise glacial till. These deposits are underlain by dark limestone and shale of the Lucan Limestone Formation.

6.2 Ground types encountered during investigation of the site

A summary of the ground types encountered in the exploratory holes is listed below, in approximate stratigraphic order:

- **Topsoil:** encountered typically in 100-300mm thickness across the site.
- **Made Ground (fill):** reworked sandy gravelly clay fill with fragments of metal and type 1 extending to a depth of 1.90m in borehole BH04.
- **Glacial Till:** sandy gravelly clay, frequently with low cobble content, typically firm or stiff in upper horizons, becoming very stiff with increasing depth.

6.3 Groundwater

Groundwater was not noted during drilling at any of the borehole locations.

Seasonal variation in groundwater levels should also be factored into design considerations.

7 DISCUSSION

7.1 Proposed construction

It is proposed to construct new residential properties on the site.

No further details were available to Causeway Geotech at the time of preparing this report and any designs based on the recommendations or conclusions within this report should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory holes. Causeway Geotech were commissioned to provide a geotechnical report, and it is outwith our remit to advise on structure design.

7.2 Recommendations for construction

7.2.1 Summary

Based on the presence of stiff glacial till at relatively shallow depths across the footprint of the proposed building, the implementation of traditional shallow (spread) foundations (strip/pad and trench fill) are considered suitable.

7.2.2 Soil strength parameters

When estimating the shear strength of fine soils (silt/clay), reference is made to the results of Standard Penetration Tests (SPT's) carried out within the boreholes. The undrained shear strength of fine soils can be estimated using the correlation developed by Stroud & Butler:

$$C_u = f_1 \times N$$

where f_1 is typically in the range 4 to 6. A median f_1 value of 5 is adopted for this report.

For granular soils (sand/gravel), a graphical relationship between SPT "N" value and angle of shearing resistance, φ, has been developed by Peck, Hanson and Thorburn. This is published in *Foundation Design and Construction* (Tomlinson, 2001) and is referenced in this report when deriving angles of shearing resistance for the gravel soils.

7.2.3 Foundations and ground floor construction

Foundations should transfer loading to below any Made Ground or subsoil. The recommended foundation construction and allowable bearing pressure (ABP) at the borehole locations are presented in Table 1.

Table 1: Construction recommendations

Borehole	Depth below EGL* to suitable bearing stratum	Estimated ABP (kPa)	Strata description	Foundation type	Ground floor construction	Groundwater
BH01	1.20m	130	Firm Glacial Till	Strip & pad	Ground bearing	Not encountered
BH02	1.20m	120	Firm Glacial Till	Strip & pad	Ground bearing	Not encountered
BH03	1.20m	140	Firm Glacial Till	Strip & pad	Ground bearing	Not encountered
BH04	2.00m	200	Stiff Glacial Till	Trench fill	Suspended	Not encountered

Borehole	Depth below EGL* to suitable bearing stratum	Estimated ABP (kPa)	Strata description	Foundation type	Ground floor construction	Groundwater
BH05	1.20m	120	Firm Glacial Till	Strip & pad	Ground bearing	Not encountered
BH06	1.20m	120	Firm Glacial Till	Strip & pad	Ground bearing	Not encountered

*Existing Ground Level

Based on the findings of the ground investigation, spread foundations (strip/pad and trench fill) are considered suitable with estimated allowable bearing pressures between 120kPa and 200kPa at depths between 1.20m and 2.00m on firm to stiff glacial till.

The base of foundation excavations should be thoroughly inspected in accordance with the Earthworks Specification; any soft soils should be removed with the resultant void backfilled with ST1 concrete. A consistent bearing stratum should be provided for any building unit to limit differential settlements.

Given the generally fine grained/cohesive nature of the soils throughout the proposed formation levels, excavations for foundations are likely to be relatively stable. However, any instability can be minimised by battering the side slopes at 2 vertical to 1 horizontal and by limiting the duration that the excavation is open. Groundwater control, where required, will be possible by pumping from sumps formed in the base of excavations.

7.2.4 Floor slabs

Floor slabs should not bear directly onto Made Ground or soft soils. Consequently, the use of ground bearing floor slabs is considered appropriate following the removal of any surface Made Ground and soft clay layers and their replacement using well-graded well-compacted granular fill. However, a suspended floor slab should be adopted where the difference in levels of the proposed floor and the base of Made Ground/soft soils is greater than 600mm.

7.2.5 Excavations for services

For the installation of services ducts/trenches, it is suggested that open trenching will be the most practicable construction method. Generally speaking, the ground conditions should render the use of open trenching by backhoe excavator possible.

Where working in open trenches, it is thought that trench support systems, by way of a trench box (or possibly sheet piles), will be required to maintain trench stability and safe working conditions. Groundwater control at these locations should be possible by means of sump pumping.

To preclude the eventuality of differential settlements in pipes, they should be laid on a consistent stratum of appropriate allowable bearing capacity and protected with appropriate fill cover.

Where ducts and chambers must be installed in areas where localised soft spots are encountered, the use of geogrid reinforcement along the base of the excavation is recommended. This will stiffen the base of the trench and help control longitudinal differential settlement.

Backfilling of trenches may be completed by using compacted Cl 804 granular fill and reinstated as appropriate.

7.2.6 Soil aggressivity

An assessment of the Aggressive Chemical Environment for Concrete (ACEC) was undertaken through reference to the Building Research Establishment (BRE) Special Digest 1 (2017).

As noted by BRE Special Digest 1, sulphates in the soil and groundwater are the chemical agents most likely to attack concrete. The extent to which sulphates affect concrete is linked to their concentrations, the type of ground, the presence of groundwater, the type of concrete and the form of construction in which concrete is used.

BRE Special Digest 1 identifies four different categories of site which require specific procedures for investigation for aggressive ground conditions:

- Sites not subjected to previous industrial development and not perceived as containing pyrite;
- Sites not subjected to previous industrial development and perceived as containing pyrite;
- Brownfield sites not perceived as containing pyrite;
- Brownfield sites perceived as containing pyrite.

For the purposes of this report the site was classified as not having been subject to previous industrial development and not perceived as containing pyrite.

The results of chemical tests (pH and water soluble sulphate contents) on soil samples indicate Design Sulphate Class DS-1 and ACEC Class AC-1s – reference Table C1 of BRE Special Digest 1 (Building Research Establishment, 2005). The Special Digest does not require any measures to protect underground concrete elements greater than 140mm thick.

7.2.7 Access roads, car parks and hard standing

Based on a summary of the CBR test undertaken at the site, it is envisaged that the upper glacial till layers at the site would be suitable for the placement of road make up layers. The area tested on site has a CBR value in excess of 15%.

Table 2.1 of volume 7 section 2 of the Design Manual for Roads and Bridges (below), gives guidance on the average thickness of the pavement layers in relation to the CBR results. As can be seen, a CBR in excess of 15% does not require any capping layers, however a sub-base thickness of 200mm is suggested.

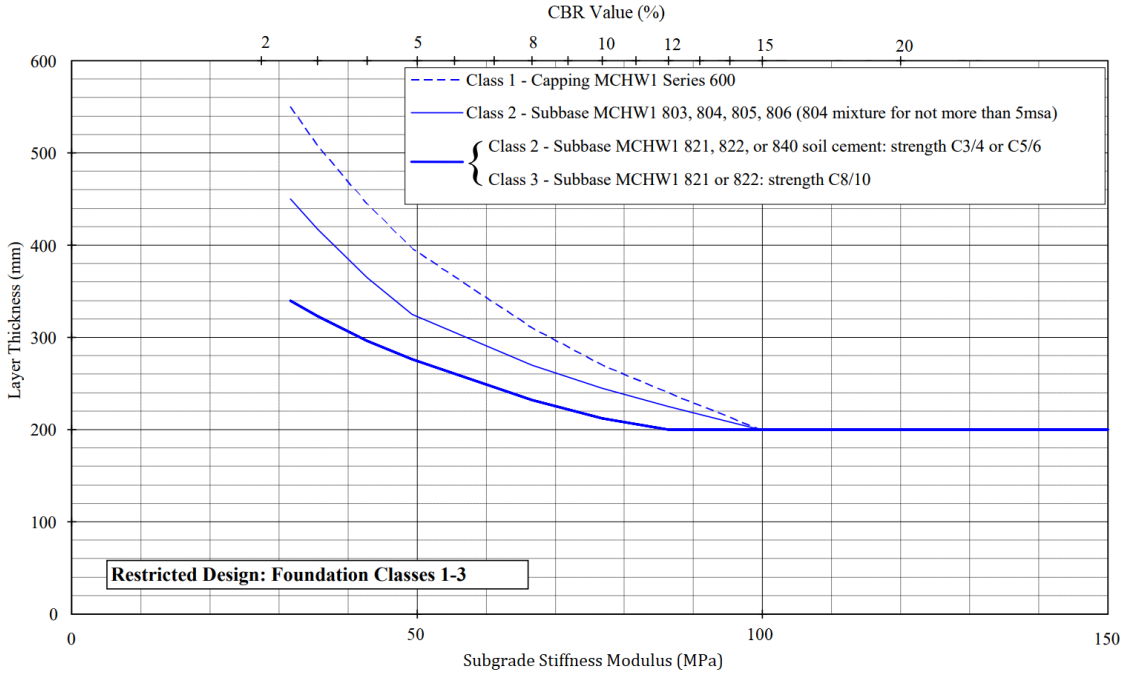


Table 2.1 (DMRB Vol.7 Sec2) 2009

The above plot should be used to determine the thicknesses of any capping or sub-base layers that may need to be placed in these areas.

It is recommended that further testing be undertaken during the course of construction works at intervals as set out in the Earthworks Specification, and should any areas indicate lower than expected value, the above plot should be used to determine the thicknesses of any capping or sub-base layers that may need to be placed in these areas.

The use of geosynthetics in the construction of paved areas, will be beneficial, particularly in areas of Made Ground. These could include a geosynthetic (e.g., a geogrid) at subgrade level with further benefit gained by incorporating further layer(s) within the capping/sub-base layer. Road design should be undertaken by a specialist earthworks contractor/designer.

7.3 Infiltration drainage

Due to the absence of any significant outflow from the infiltration tests the low-permeability fine-grained soils are considered to be poor infiltration media and would be deemed unsuitable for the implementation of infiltration drainage systems.

7.4 Waste classification

For consideration of material to be removed from site, a waste classification of the solid soil laboratory results was completed using HazWasteOnline™ software. A copy of the Waste Classification report is included at Appendix J. The Waste Classification report shows that the material tested can be classified as non-hazardous material considering the List of Wastes (LoW) code 17 for Construction and Demolition Wastes (including soils excavated from contaminated sites), specifically 17 05 03* and 17 05 04.

Following completion of the waste classification, and to determine a suitable disposal route for the soil, assessment of the WAC analysis of the samples was completed. The laboratory results of the WAC testing indicate that the soils from BH02 and BH04 may be suitable for disposal as inert waste to an appropriate licenced facility although there was a very slight exceedance of the inert waste criteria for antimony in the soil sample in BH04 at 2.0m. The Total Dissolved Solids (TDS) result for BH01 at 0.40m indicated that the soil from this location is not suitable for disposal as inert waste. It is recommended that these results are presented to appropriate licenced facilities to see if this material can be received at their facility.

It is noted that this waste classification assessment has been based solely on the available samples results and corresponding investigation findings. In making this assessment all due care and attention to available and relevant legislative and guidance frameworks has been taken in arriving at the conclusions.

Also, potential areas of localised contamination outside the areas of the investigation cannot be discounted. Any potential contamination identified during site development work by visual or olfactory means should be investigated, including further laboratory testing, and appropriate health & safety, waste disposal and remediation measures adopted. Additional testing of the soils to be disposed from site may also be requested by the individual landfill before acceptance at their facility.

8 REFERENCES

Geotechnical Society of Ireland (2016), Specification & Related Documents for Ground Investigation in Ireland.

IS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. National Standards Authority of Ireland.

BS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. British Standards Institution.

BS 5930: 2015+A1:2020: Code of practice for ground investigations. British Standards Institution.

BS EN ISO 14688-1:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 1 Identification and description.

BS EN ISO 14688-2:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 2 Principles for a classification.

BS 1377: 1990: Methods of test for soils for civil engineering purposes. British Standards Institution.

BS EN ISO 22476-3:2005+A1:2011: Geotechnical investigation and testing. Field testing. Standard penetration test.

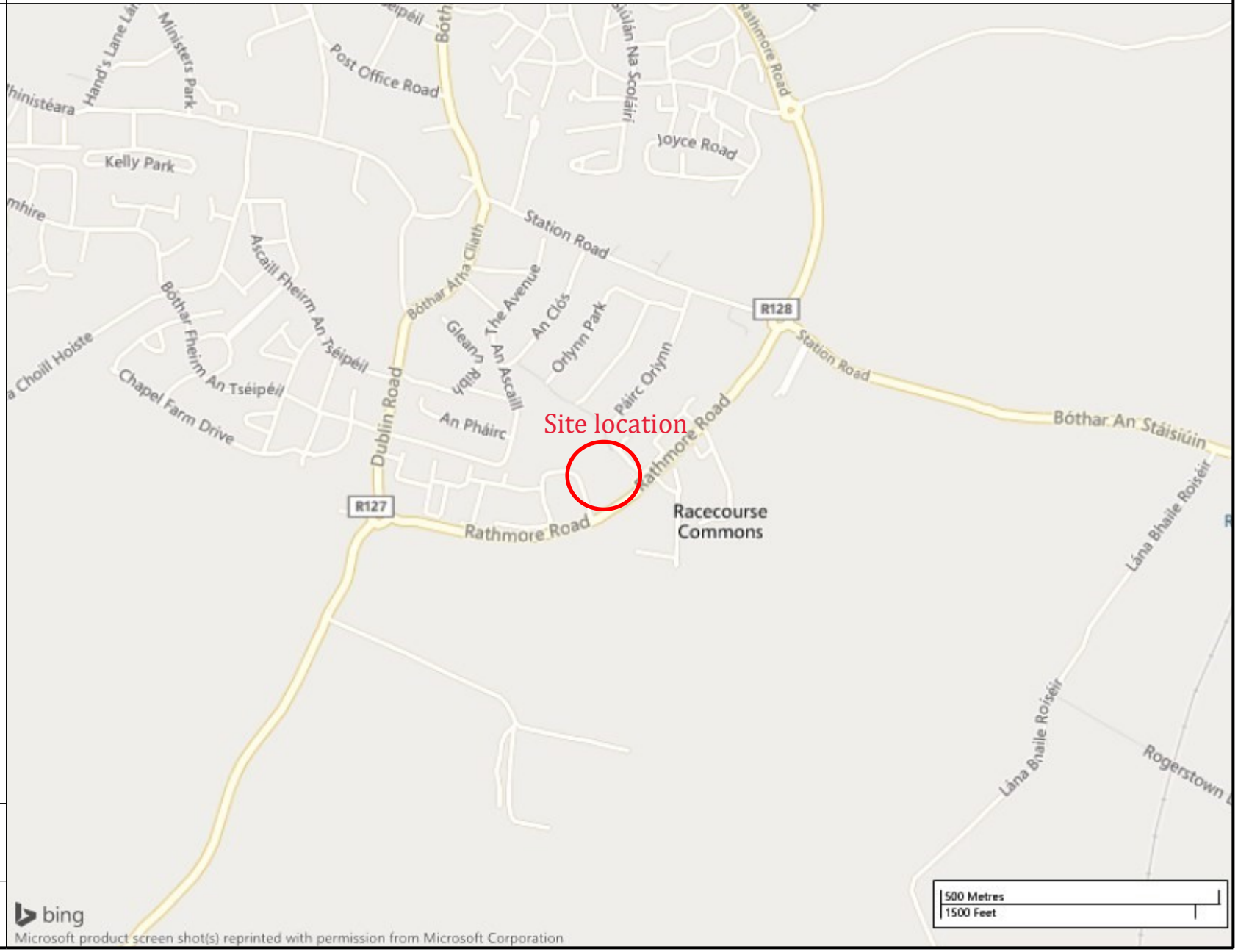
Building Research Establishment (2007), BRE Digest 365: Soakaways.

CAUSEWAY GEOTECH

APPENDIX A

EXPLORATORY HOLE LOCATION PLAN

Project No.:	22-1165	**Client:**	Fingal County Council
Project Name:	Remount (Phase 2), Rathmore Road	**Client's Representative:**	McMahon Associates



Title:
Site Location Plan

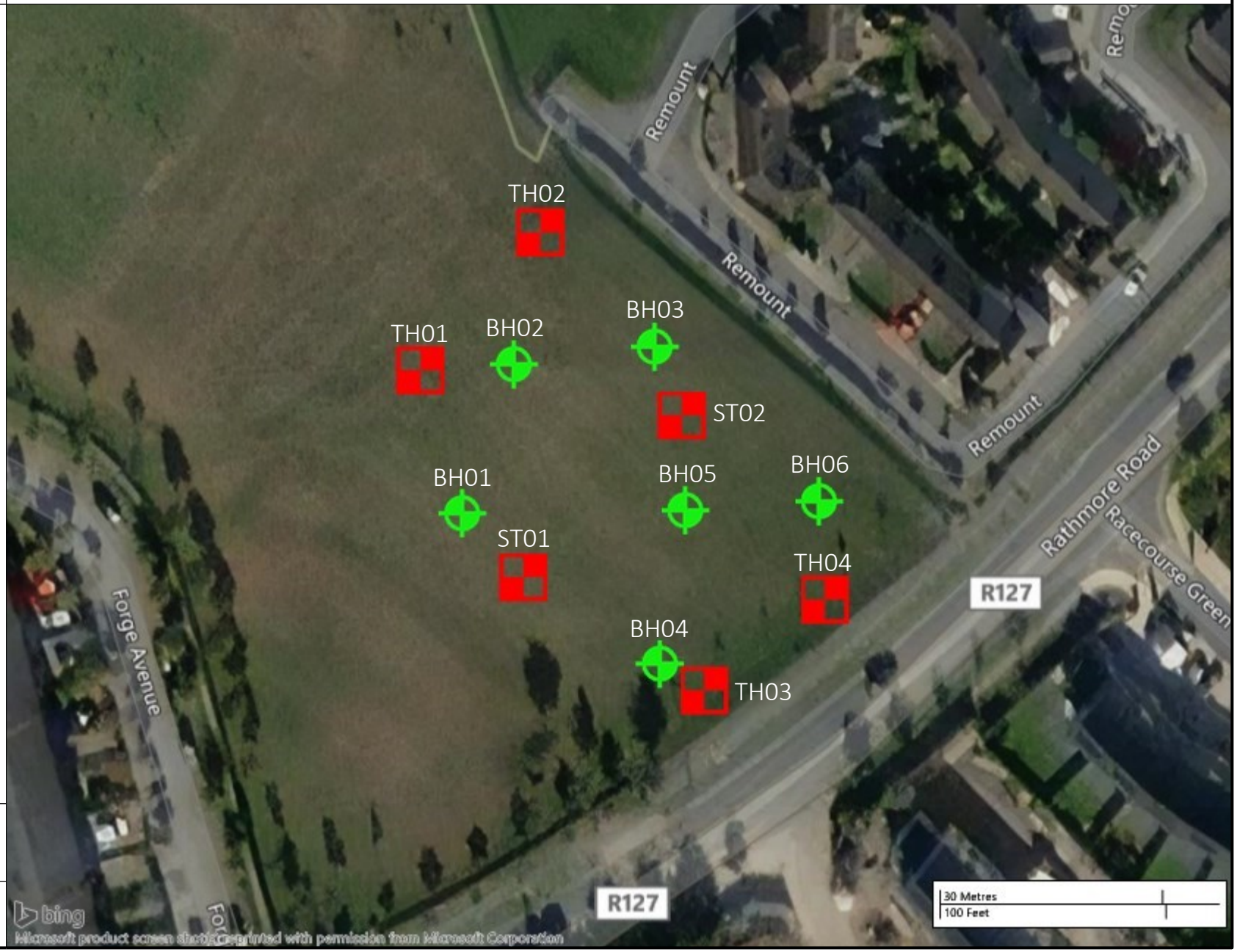
Last Revised:	**Scale:**
18/10/2022	1:10000

CAUSEWAY GEOTECH

Project No.:	22-1165	**Client:**	Fingal County Council
Project Name:	Remount (Phase 2), Rathmore Road	**Client's Representative:**	McMahon Associates

Legend Key

- Borehole location
- Trial pit location



Title:
Exploratory Hole Location Plan

Last Revised:	**Scale:**
18/10/2022	1:750

CAUSEWAY GEOTECH

APPENDIX B

BOREHOLE LOGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-1165	Remount (Phase 2), Rathmore Road	BH01
	Client: Fingal County Council	
	Client's Rep: McMahon Associates	

Method	Plant Used	Top (m)	Base (m)	Coordinates	Final Depth:	Start Date:	Driller:	Sheet 1 of 1
Dynamic Sampling	Premier 110	0.00	3.10	721865.60 E	3.10 m	08/09/2022	JD	Scale: 1:50
				753917.95 N	**Elevation:** 20.90 mOD	**End Date:** 08/09/2022	**Logger:** SF	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
					20.80	0.10		TOPSOIL		
0.40	ES1							Firm brownish grey slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium.		
0.50	B2									
0.50	D4									
1.20	B3									
1.20 - 1.65	SPT (S)	N=13 (5,4/3,3,3,4) Hammer SN = AI2	0.00	Dry						
					19.20	1.70		Stiff greyish black slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
2.00 - 2.45	SPT (S)	N=24 (4,6/5,7,5,7) Hammer SN = AI2	0.00	Dry						
2.80 - 3.10	SPT (C)	N=50 (10,10/50 for 150mm) Hammer SN = AI2	0.00	0.00						
					17.80	3.10		End of Borehole at 3.10m		

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Casing Details

To (m)	Diameter

Remarks

Hand dug inspection pit excavated to 1.20m

Termination Reason

Terminated on refusal

Last Updated

24/10/2022

AGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-1165	Remount (Phase 2), Rathmore Road	BH02
	Client: Fingal County Council	
	Client's Rep: McMahon Associates	

Method	Plant Used	Top (m)	Base (m)	Coordinates
Dynamic Sampling	Premier 110	0.00	2.85	721873.16 E 753935.37 N

Final Depth:	2.85 m	**Start Date:** 08/09/2022	**Driller:** JD	Sheet 1 of 1 Scale: 1:50
Elevation:	21.36 mOD	**End Date:** 08/09/2022	**Logger:** SF	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
					21.26	0.10		TOPSOIL		
0.30	ES1							Firm brownish grey slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
0.50	B2									
0.50	D5									
0.50	D6									
1.20	B3									
1.20 - 1.65	SPT (S)	N=12 (2,2/3,3,3,3) Hammer SN = AI2	0.00	0.00						
					19.46	1.90				
2.00	B4							Stiff greyish black slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
2.00 - 2.45	SPT (S)	N=23 (4,4/5,6,5,7) Hammer SN = AI2	0.00	Dry						
2.70 - 2.85	SPT (C)	N=50 (20,5/50 for 0mm) Hammer SN = AI2	0.00	Dry						
					18.51	2.85		End of Borehole at 2.85m		

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Casing Details

To (m)	Diameter

Remarks

Hand dug inspection pit excavated to 1.20m

Termination Reason

Terminated on refusal

Last Updated

24/10/2022

AGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-1165	Remount (Phase 2), Rathmore Road	BH03
	Client: Fingal County Council	
	Client's Rep: McMahon Associates	

Method	Plant Used	Top (m)	Base (m)	Coordinates
Dynamic Sampling	Premier 110	0.00	2.65	721892.16 E 753941.44 N

Final Depth: 2.65 m	**Start Date:** 09/09/2022	**Driller:** JD	Sheet 1 of 1	
Elevation: 21.40 mOD	**End Date:** 09/09/2022	**Logger:** SF	Scale: 1:50	
			FINAL	

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
					21.30	0.10		TOPSOIL		
0.30	ES1							Firm brown Slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
0.50	B3									
0.50	D2									
					20.40	1.00		Firm greyish black slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium		
1.20	B4									
1.20 - 1.65	SPT (S)	N=14 (3,3/3,3,4,4) Hammer SN = AI2	0.00	Dry						
2.00	B5				19.40	2.00		Very stiff greyish black slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
2.00 - 2.45	SPT (S)	N=35 (6,5/7,8,10,10) Hammer SN = AI2	0.00	Dry						
2.50 - 2.65	SPT (C)	N=50 (20,5/50 for 0mm) Hammer SN = AI2	0.00	0.00	18.75	2.65		End of Borehole at 2.65m		

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Casing Details

To (m)	Diameter

Remarks

Hand dug inspection pit excavated to 1.20m

Termination Reason

Terminated on refusal

Last Updated

24/10/2022

AGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-1165	Remount (Phase 2), Rathmore Road	BH04
	Client: Fingal County Council	
	Client's Rep: McMahon Associates	

Method	Plant Used	Top (m)	Base (m)	Coordinates
Dynamic Sampling	Premier 110	0.00	3.90	721894.07 E 753898.76 N

Final Depth:	Start Date:	Driller:	Sheet 1 of 1
3.90 m	07/09/2022	JD	Scale: 1:50
Elevation: 20.85 mOD	**End Date:** 07/09/2022	**Logger:** SF	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
					20.75	0.10		TOPSOIL		
0.40	ES3							MADE GROUND: Soft greyish brown slightly sandy slightly gravelly CLAY with low cobble content and fragments of metal and type 1. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
0.50	B1									
0.50	D2									
1.20	B4									
1.20	D5									
1.20 - 1.65	SPT (S)	N=6 (1,1/2,1,1,2) Hammer SN = AI2	0.00	Dry						
					18.95	1.90		Stiff greyish black slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium		
2.00	B6									
2.00	D7									
2.00 - 2.45	SPT (S)	N=20 (2,3/4,5,5,6) Hammer SN = AI2	0.00	Dry						
3.00	B8									
3.00	D9									
3.00 - 3.45	SPT (S)	N=23 (6,4/5,5,6,7) Hammer SN = AI2	0.00	Dry						
3.60 - 3.90	SPT (S)	N=50 (10,10/50 for 150mm) Hammer SN = AI2	0.00	Dry						
					16.95	3.90		End of Borehole at 3.90m		

Water Strikes				Casing Details	
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	To (m)	Diameter

Remarks

Hand dug pit excavated from 0.0 to 1.20m

Termination Reason

Terminated on refusal

Last Updated

24/10/2022

AGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-1165	Remount (Phase 2), Rathmore Road	BH05
	Client: Fingal County Council	
	Client's Rep: McMahon Associates	

Method	Plant Used	Top (m)	Base (m)	Coordinates
Dynamic Sampling	Premier 110	0.00	4.50	721897.25 E 753914.98 N

Final Depth:	Start Date:	Driller:	Sheet 1 of 1
4.50 m	07/09/2022	JD	Scale: 1:50
Elevation: 20.98 mOD	**End Date:** 07/09/2022	**Logger:** SF	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
					20.88	0.10		TOPSOIL		
0.30	ES1							Firm brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
0.50	B2									
0.50	D3									
1.20	B4									
1.20	D5				19.68	1.30				
1.20 - 1.65	SPT (S)	N=12 (3,2/2,3,3,4) Hammer SN = AI2	0.00	Dry				Firm greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
2.00	B6									
2.00	D7				18.88	2.10				
2.00 - 2.45	SPT (S)	N=21 (2,2/3,6,5,7) Hammer SN = AI2	0.00	Dry				Stiff greyish black slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
3.00	B8									
3.00	D9									
3.00 - 3.45	SPT (S)	N=17 (4,3/3,4,5,5) Hammer SN = AI2	0.00	Dry						
4.00	D10									
4.00 - 4.22	SPT (S)	N=50 (7,8/50 for 75mm) Hammer SN = AI2	0.00	Dry	16.88	4.10		Possible weathered BEDROCK		
4.15 - 4.53	SPT (C)	N=50 (8,9/50 for 225mm) Hammer SN = AI2	0.00	Dry	16.48	4.50		End of Borehole at 4.50m		

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Casing Details

To (m)	Diameter

Remarks

Hand dug pit excavated from 0.0 to 1.20m

Termination Reason

Terminated on refusal

Last Updated

24/10/2022

AGS

CAUSEWAY GEOTECH

Project No.	Project Name:	Borehole ID
22-1165	Remount (Phase 2), Rathmore Road	BH06
	Client: Fingal County Council	
	Client's Rep: McMahon Associates	

Method	Plant Used	Top (m)	Base (m)	Coordinates
Dynamic Sampling	Premier 110	0.00	3.28	721912.19 E 753919.32 N

Final Depth:	3.28 m	**Start Date:**	07/09/2022	**Driller:**	JD	Sheet 1 of 1 Scale: 1:50
Elevation:	21.14 mOD	**End Date:**	07/09/2022	**Logger:**	SF	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
					21.04	0.10		TOPSOIL		
0.30	ES1							Firm dark greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
0.50	B2									
0.50	D3									
1.20	B4									
1.20	D5									
1.20 - 1.65	SPT (S)	N=12 (3,2/3,3,3,3) Hammer SN = AI2	0.00	Dry						
					19.24	1.90		Stiff greyish black slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium		
2.00	B6									
2.00	D7									
2.00 - 2.45	SPT (S)	N=22 (5,4/4,5,7,6) Hammer SN = AI2	0.00	Dry						
2.90 - 3.28	SPT (C)	N=50 (9,9/50 for 225mm) Hammer SN = AI2	0.00	Dry						
					17.87	3.28		End of Borehole at 3.28m		

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Casing Details

To (m)	Diameter

Remarks

Hand dug pit excavated from 0.0 to 1.20m

Termination Reason

Terminated on refusal

Last Updated

24/10/2022

AGS

CAUSEWAY GEOTECH

APPENDIX C

TRIAL PIT LOGS

CAUSEWAY GEOTECH

Project No. 22-1165	**Project Name:** Remount (Phase 2), Rathmore Road		**Trial Pit ID** ST01
Coordinates 721868.77 E 753910.38 N	**Client:** Fingal County Council		
Method: Trial Pitting	**Client's Representative:** McMahon Associates		Sheet 1 of 1 Scale: 1:25
Plant: 3t Tracked Excavator	**Elevation** 20.84 mOD	**Date:** 09/09/2022	**Logger:** DM	FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
			20.54	0.30		TOPSOIL	
						Orangish brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.	
			20.04	0.80		Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
			19.34	1.50		End of trial pit at 1.50m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Water Strikes	
Struck at (m)	Remarks

Depth: 1.50
Width: 0.50
Length: 2.40

Remarks:

Stability: Stable

Termination Reason: Terminated at scheduled depth.

Last Updated: 24/10/2022

AGS

CAUSEWAY GEOTECH

Project No. 22-1165	**Project Name:** Remount (Phase 2), Rathmore Road		**Trial Pit ID** ST02
Coordinates 721895.71 E 753933.69 N	**Client:** Fingal County Council		
Method: Trial Pitting	**Client's Representative:** McMahon Associates		Sheet 1 of 1 Scale: 1:25
Plant: 3t Tracked Excavator	**Elevation** 21.47 mOD	**Date:** 09/09/2022	**Logger:** DC	FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
						TOPSOIL	
			21.27	0.20		Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse	
			20.57	0.90		Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse	
			19.97	1.50		End of trial pit at 1.50m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Water Strikes	
Struck at (m)	Remarks

Depth: 1.50
Width: 0.50
Length: 2.30

Remarks:

Stability:	Termination Reason	Last Updated
Stable	Terminated at scheduled depth	24/10/2022

AGS

CAUSEWAY GEOTECH

Project No. 22-1165	**Project Name:** Remount (Phase 2), Rathmore Road		**Trial Pit ID** TH01
Coordinates 721852.65 E 753940.93 N	**Client:** Fingal County Council		
Method: Trial Pitting	**Client's Representative:** McMahon Associates		Sheet 1 of 1 Scale: 1:25
Plant: 3t Tracked Excavator	**Elevation** 21.84 mOD	**Date:** 09/09/2022	**Logger:** DM	FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.20	ES1		21.59	0.25		TOPSOIL	
0.50	B2					Orangish light brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.	
			20.64	1.20		Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
1.50	B3						
2.00	B4		19.84	2.00		Stiff dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
			19.34	2.50		End of trial pit at 2.50m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Water Strikes	
Struck at (m)	Remarks

Depth: 2.50
Width: 0.50
Length: 2.50

Remarks:

Stability: Stable

Termination Reason: Terminated at maximum reach of excavator.

Last Updated: 24/10/2022

AGS

CAUSEWAY GEOTECH

Project No. 22-1165	**Project Name:** Remount (Phase 2), Rathmore Road		**Trial Pit ID** TH02
Coordinates 721870.93 E 753959.44 N	**Client:** Fingal County Council		
Method: Trial Pitting	**Client's Representative:** McMahon Associates		Sheet 1 of 1 Scale: 1:25
Plant: 3t Tracked Excavator	**Elevation** 21.79 mOD	**Date:** 09/09/2022	**Logger:** DM	FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.20	ES5		21.49	0.30		TOPSOIL	
0.50	B1					Light orangish brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.	
0.50	B2						
1.00	B3						
1.00	B4		20.59	1.20		Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
			19.39	2.40		End of trial pit at 2.40m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Water Strikes	
Struck at (m)	Remarks

Depth: 2.40
Width: 0.50
Length: 2.50

Remarks:

Stability: Stable

Termination Reason: Terminated at maximum reach of excavator.

Last Updated: 24/10/2022

AGS

CAUSEWAY GEOTECH

Project No. 22-1165	**Project Name:** Remount (Phase 2), Rathmore Road		**Trial Pit ID** TH03
Coordinates 721897.67 E 753896.81 N	**Client:** Fingal County Council		
Method: Trial Pitting	**Client's Representative:** McMahon Associates		Sheet 1 of 1 Scale: 1:25
Plant: 3t Tracked Excavator	**Elevation** 21.15 mOD	**Date:** 09/09/2022	**Logger:** DM	FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.20 - 0.20	ES5		20.85	0.30		TOPSOIL with occasional fragments of rebar	
0.50 - 0.50	B1					Orangish brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.	
0.50 - 0.50	B2		20.35	0.80		Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
1.00 - 1.00	B3						
1.00 - 1.00	B4		19.85	1.30		Stiff dark brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
			18.65	2.50		End of trial pit at 2.50m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Water Strikes	
Struck at (m)	Remarks

Depth: 2.50
Width: 0.50
Length: 2.40

Remarks:

Stability: Stable

Termination Reason: Terminated at maximum reach of excavator.

Last Updated: 24/10/2022

AGS

CAUSEWAY GEOTECH

Project No. 22-1165	**Project Name:** Remount (Phase 2), Rathmore Road		**Trial Pit ID** TH04
Coordinates 721909.14 E 753907.30 N	**Client:** Fingal County Council		
Method: Trial Pitting	**Client's Representative:** McMahon Associates		Sheet 1 of 1 Scale: 1:25
Plant: 3t Tracked Excavator	**Elevation** 21.27 mOD	**Date:** 09/09/2022	**Logger:** DM	FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.20	ES4		20.97	0.30		TOPSOIL	
0.50 - 0.50	B1		20.52	0.75		Light orangish brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.	
1.00 - 1.00	B2					Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
1.50 - 1.50	B3		19.77	1.50		Stiff dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
			18.77	2.50		End of trial pit at 2.50m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Water Strikes	
Struck at (m)	Remarks

Depth: 2.50
Width: 0.50
Length: 2.40

Remarks:

Stability: Stable

Termination Reason: Terminated at maximum reach of excavator.

Last Updated: 24/10/2022

AGS

CAUSEWAY GEOTECH

APPENDIX D

TRIAL PIT PHOTOGRAPHS


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
GI Number
TH01
(m) 0.1 0.2 0.3 0.4 0.5

TH01


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH01
(m) 0.1 0.2 0.3 0.4 0.5

TH01


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH01
(m) 0.1 0.2 0.3 0.4 0.5

TH01


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH01
(m) 0.1 0.2 0.3 0.4 0.5

TH01


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH01
(m) 0.1 0.2 0.3 0.4 0.5

TH01


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
BH Number
TH01
(m) 0.1 0.2 0.3 0.4 0.5

TH01


CAUSEWAY
GEOTECH
Remount P2
22-1165
09/09/2022
TH02
(m) 0.1 0.2 0.3 0.4 0.5

TH02


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH02
(m) 0.1 0.2 0.3 0.4 0.5

TH02


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH02
(m)
0.1
0.2
0.3
0.4

TH02


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH02
(m) 0.1 0.2 0.3 0.4 0.5

TH02


U36-4
CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
Fill Number
TH02
(m) 0.1 0.2 0.3 0.4 0.5

TH02


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH02
(m) 0.1 0.2 0.3 0.4 0.5

TH02


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH03
(m) 0.1 0.2 0.3 0.4 0.5

TH03


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH03
(m) 0.1 0.2 0.3 0.4 0.5

TH03


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH03
(m) 0.1 0.2 0.3 0.4 0.5

TH03


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
EH Number
TH03
Date
09/09/2022
0.5

TH03


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
LH Number
TH03

TH03


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Pit Number
TH03
Date
09/09/2022
(m)
0.1
0.2
0.3
0.4
0.5

TH03


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
BH Number
TH04
(m)
0.1
0.2
0.3
0.4
0.5

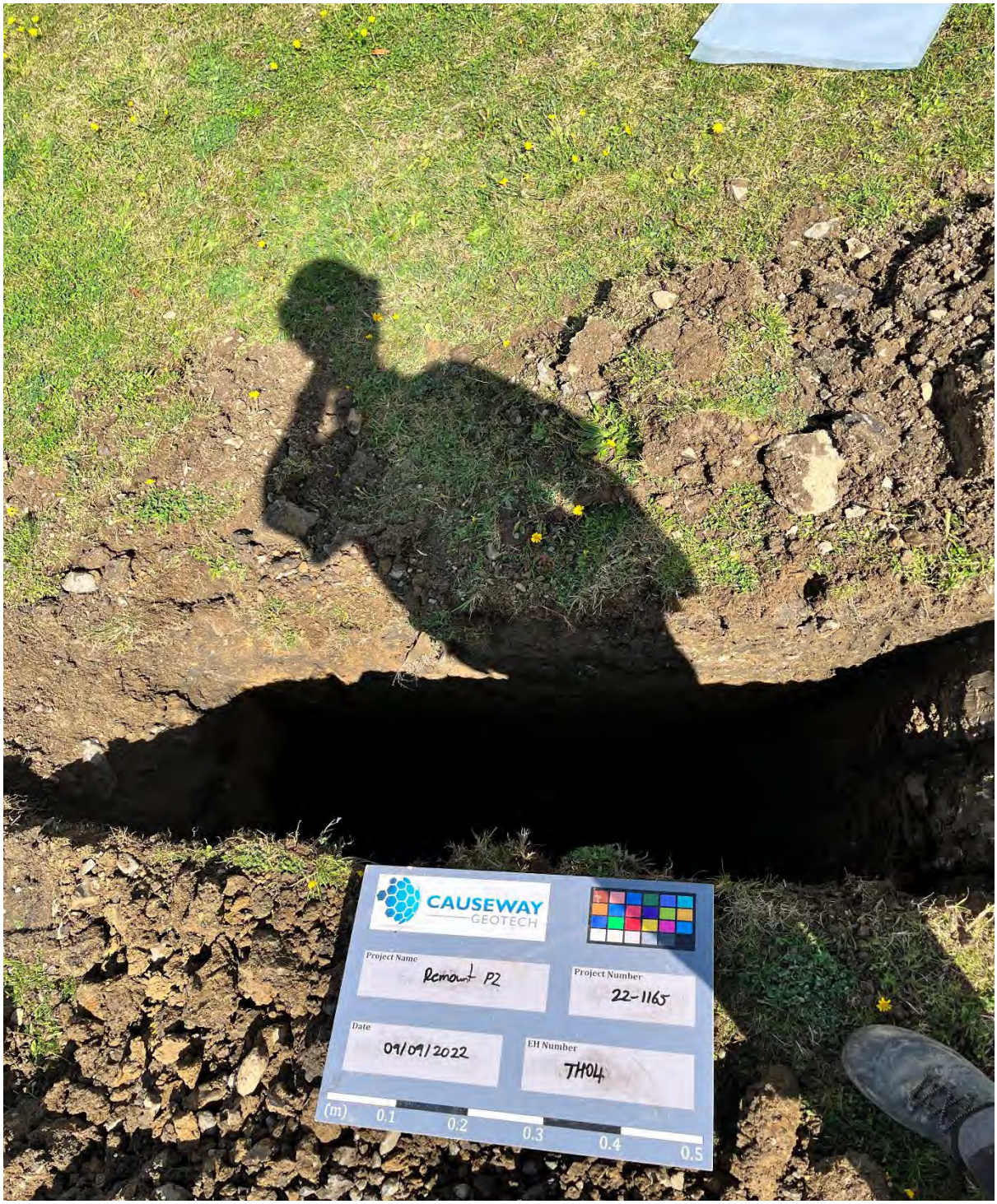
TH04


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
ER Number
TH04
(m)
0.1
0.2
0.3
0.4
0.5

TH04


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH04
(m) 0.1 0.2 0.3 0.4 0.5

TH04


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH04
(m)
0.1
0.2
0.3
0.4
0.5

TH04


CAUSEWAY
GEOTECH
Project Number
22-1165
Project Name
Remount P2
TH Number
TH04
Date
09/09/2022

TH04


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
TH04
(m) 0.1 0.2 0.3 0.4 0.5

TH04


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
ST01
(m) 0.1 0.2 0.3 0.4 0.5

ST01


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
EH Number
ST01
(m)
0.1
0.2
0.3
0.4
0.5

ST01


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
EH Number
ST01
Date
09/09/2022
(m)
0.1
0.2
0.3
0.4
0.5

ST01

ST01


CAUSEWAY
GEOTECH
Project Name
Remount P2
Project Number
22-1165
Date
09/09/2022
ER Number
ST01
(m) 0.1 0.2 0.3 0.4 0.5

ST01

CAUSEWAY GEOTECH

APPENDIX E

SOAKAWAY TEST RESULTS

Soakaway Infiltration Test

Project No.: 22-1165
Site: Remount Phase 2
Test Location: ST01
Test Date: 09 September 2022

	width (m)	length (m)
test pit top dimensions	0.50	1.80
test pit base dimensions	0.50	1.00
test pit depth (m)	1.50	

Analysis using method as described in BRE Digest 365 and CIRIA Report C697-The SUDS Manual

depth to groundwater before adding water (m) = Dry

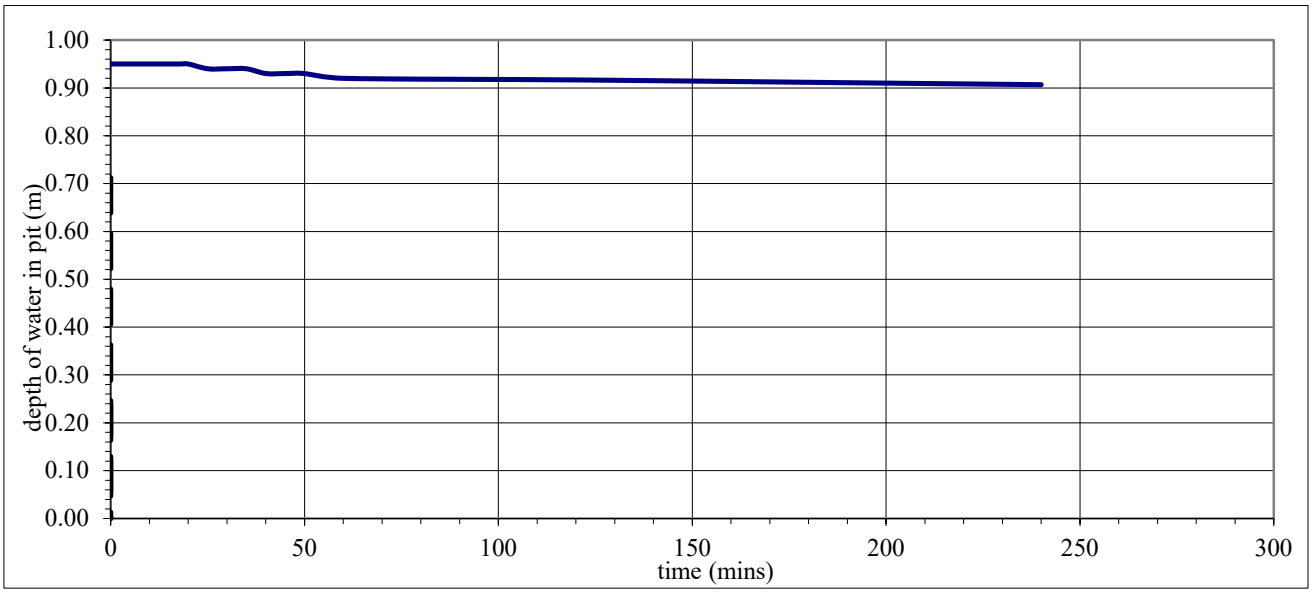
time (mins)	depth to water surface (m)	depth of water in pit (m)
0	0.55	0.95
1	0.55	0.95
2	0.55	0.95
4	0.55	0.95
6	0.55	0.95
8	0.55	0.95
10	0.55	0.95
12	0.55	0.95
14	0.55	0.95
16	0.55	0.95
18	0.55	0.95
20	0.55	0.95
25	0.56	0.94
30	0.56	0.94
35	0.56	0.94
40	0.57	0.93
45	0.57	0.93
50	0.57	0.93
60	0.58	0.92
120	0.58	0.92
180	0.59	0.91
240	0.59	0.91

From graph below:
test start - 75% depth at
0.7125 m water depth
time is not determined

test end - 25% depth at
0.2375 m water depth
time is not determined

infiltration rate (q) is very low

time (mins)	depth to water (m)	depth of water in pit (m)	time elapsed (mins)	volume of water lost (m^3)	Area of walls and base at 50% drop (m^2)	q (m/min)	q (m/h)
	0.79	0.7125		0.30	2.08		
	1.26	0.2375					



Soakaway Infiltration Test

Project No.: 22-1165
Site: Remount Phase 2
Test Location: ST02
Test Date: 09 September 2022

Analysis using method as described in BRE Digest 365 and CIRIA Report C697-The SUDS Manual

	width (m)	length (m)
test pit top dimensions	0.50	2.30
test pit base dimensions	0.50	1.80
test pit depth (m)	1.50	

depth to groundwater before adding water (m) = Dry

time (mins)	depth to water surface (m)	depth of water in pit (m)
0	0.60	0.90
1	0.60	0.90
2	0.60	0.90
4	0.60	0.90
6	0.60	0.90
8	0.61	0.89
10	0.61	0.89
12	0.61	0.89
14	0.61	0.89
16	0.62	0.88
18	0.62	0.88
20	0.62	0.88
25	0.62	0.88
30	0.63	0.87
35	0.63	0.87
40	0.63	0.87
45	0.64	0.86
50	0.64	0.86
60	0.64	0.86
120	0.68	0.82
180	0.70	0.80
240	0.73	0.77

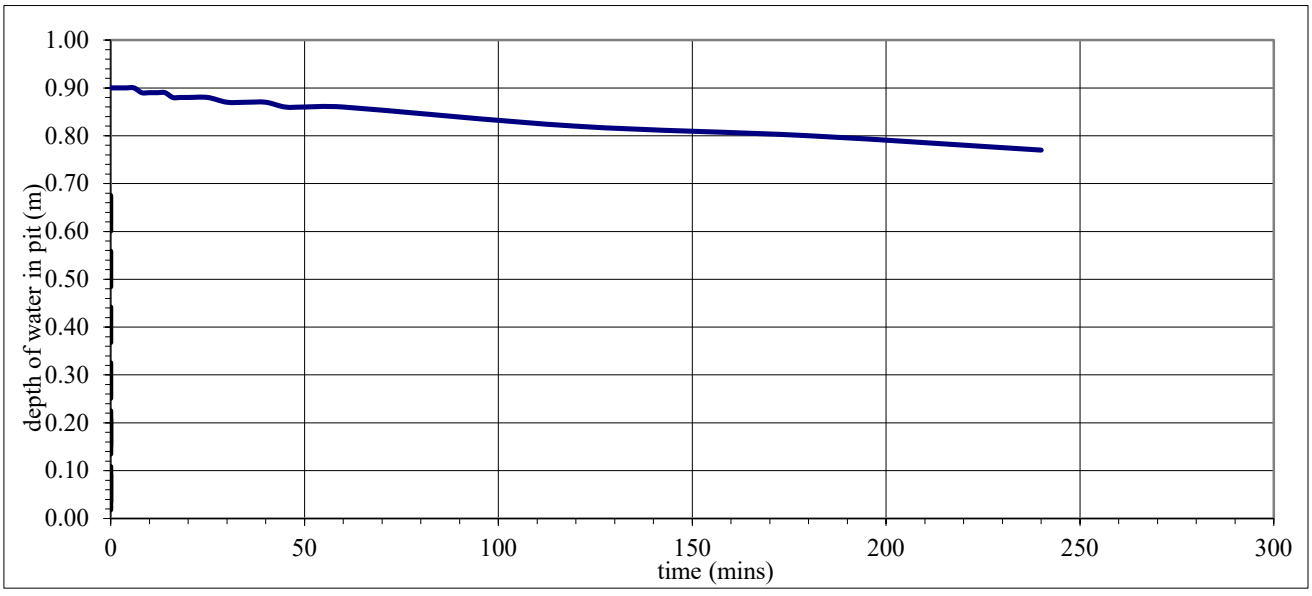
From graph below:

test start - 75% depth at
0.675 m water depth
time is not determined

test end - 25% depth at
0.225 m water depth
time is not determined

infiltration rate (q) is very low

time (mins)	depth to water (m)	depth of water in pit (m)	time elapsed (mins)	volume of water lost (m^3)	Area of walls and base at 50% drop (m^2)	q (m/min)	q (m/h)
	0.83	0.675		0.44	3.05		
	1.28	0.225					



CAUSEWAY GEOTECH

APPENDIX F

INDIRECT IN-SITU CBR TEST RESULTS

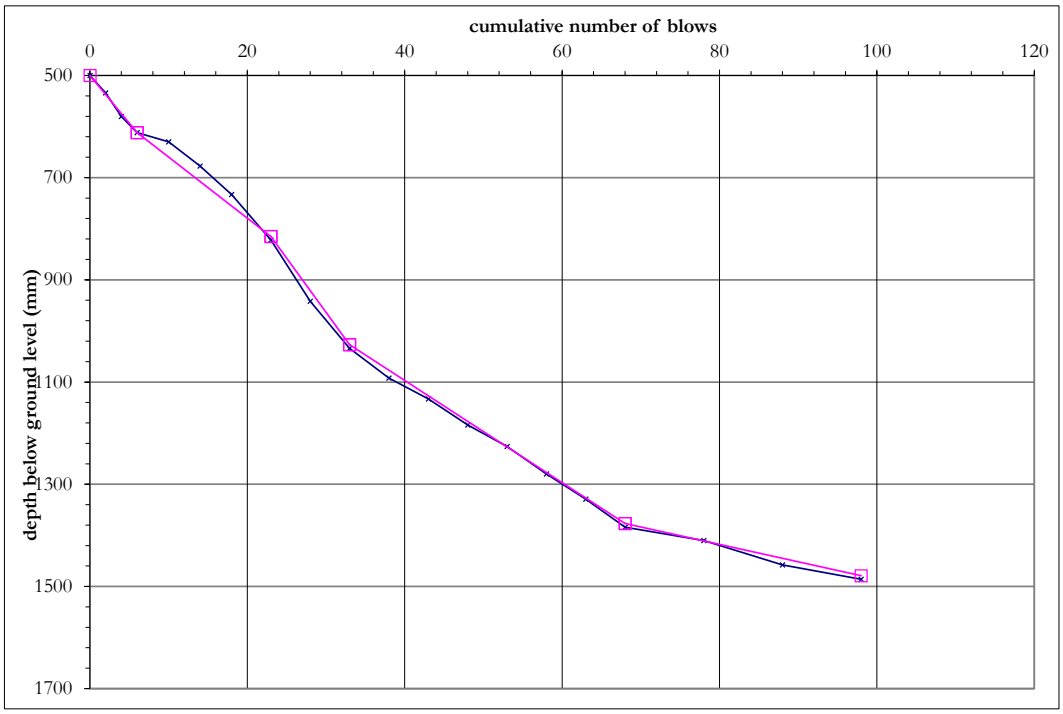
Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project Number	22-1165
Project Name	Remount Phase 2
Site Location	Lusk, Co. Dublin

Test Number	TH01	**Date Tested**	09/09/2022
Depth bgl (m)	0.50	**Weather**	Sunny

Test conducted in accordance with Documented In-House Technical Procedure IMS TP7-4.
CBR calculated using the TRL equation: log10(CBR) = 2.48 - 1.057 x log10(mm/blow) iaw IAN 73/06 Rev 1 2009.

Surface preparation	Description of surface material at test depth
None	Clayey gravelly sand



top / base of layer (mm)	mm/ blow	CBR (%)
500	19	14
612		
612	12	22
815		
815	21	12
1027		
1027	10	26
1377		
1377	3.4	83
1479		

CBR Range	Min: 12 Max: 83	The selection of layers is based on visual interpretation of the data. The insitu DCP reading (mm/blow) and CBR values are valid at the time of testing; variation in moisture content or other factors may affect the insitu value.

Deviation(s) from standard procedure	None

Observations and comments	

Approved Name and Appointment		
Darren O'Mahony Director		October 2022

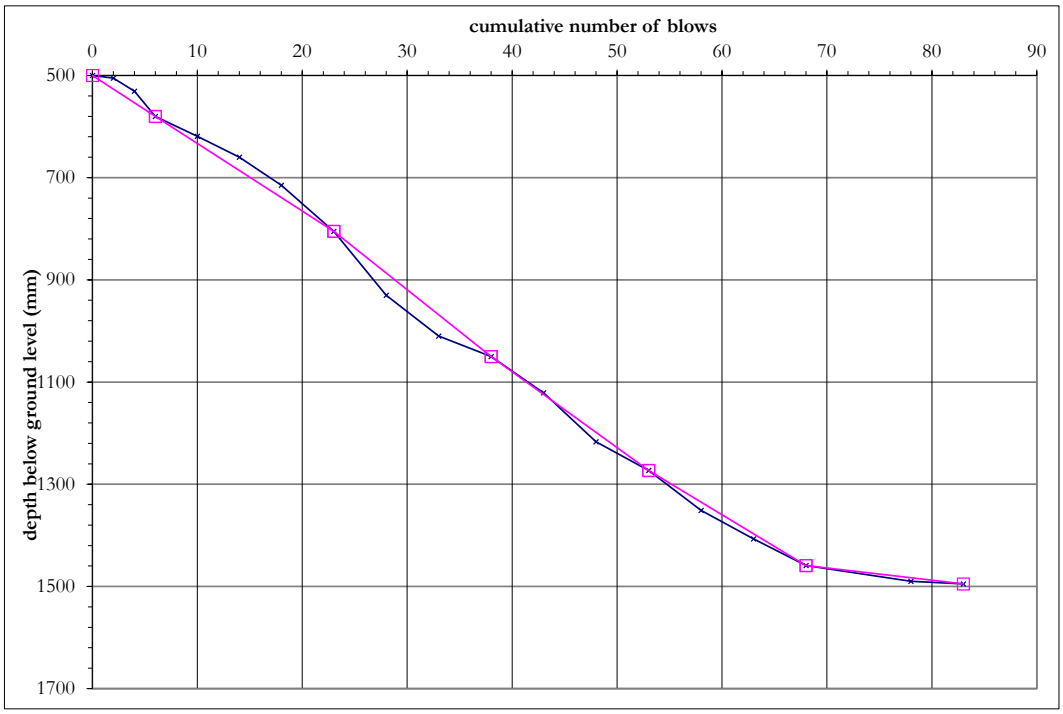
Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project Number	22-1165
Project Name	Remount Phase 2
Site Location	Lusk, Co. Dublin

Test Number	TH04	**Date Tested**	09/09/2022
Depth bgl (m)	0.50	**Weather**	Sunny

Test conducted in accordance with Documented In-House Technical Procedure IMS TP7-4.
CBR calculated using the TRL equation: log10(CBR) = 2.48 - 1.057 x log10(mm/blow) iaw IAN 73/06 Rev 1 2009.

Surface preparation	**Description of surface material at test depth**
None	Clayey gravelly sand



top / base of layer (mm)	mm/ blow	CBR (%)
500	13	20
580		
580	13	20
805		
805	16	16
1050		
1050	15	17
1273		
1273	12	21
1459		
1459	2.4	>100
1495		

CBR Range	Min: 16 Max: >100	The selection of layers is based on visual interpretation of the data. The insitu DCP reading (mm/blow) and CBR values are valid at the time of testing; variation in moisture content or other factors may affect the insitu value.

Deviation(s) from standard procedure	None

Observations and comments	

Approved Name and Appointment		
Darren O'Mahony Director		October 2022

CAUSEWAY GEOTECH

APPENDIX G

GEOTECHNICAL LABORATORY TEST RESULTS

CAUSEWAY GEOTECH

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Registered in Ireland.
Company Number: 633786

www.causewaygeotech.com

SOIL AND ROCK SAMPLE ANALYSIS
LABORATORY TEST REPORT

6 October 2022

Project Name:	Remount (Phase 2), Rathmore Road, Lusk, Co. Dublin
Project No.:	22-1165
Client:	Fingal County Council
Engineer:	McMAhon Associated

We are pleased to attach the results of laboratory testing carried out for the above project. This memo and its attachments constitute a report of the results of tests as detailed in the Contents page(s). This testing was performed between 13/09/2022 and 06/10/2022.

The attached results complete the testing requested and we would therefore wish to confirm that samples will be retained without charge for a period of 28 days from the above date after which they will be appropriately disposed of unless we receive written instructions to the contrary prior to that date.

We trust our report meets with your approval but if you have any queries or require additional information, please do not hesitate to contact the undersigned.

Stephen Watson

Laboratory Manager

Signed for and on behalf of Causeway Geotech Ltd

Project Name: Remount (Phase 2), Rathmore Road, Lusk, Co. Dublin

Report Reference: Schedule 1

The table below details the tests carried out, the specifications used, and the number of tests included in this report. The results contained in this report relate to the sample(s) as received

Tests marked with* in this report are not United Kingdom Accreditation Service (UKAS) accredited and are not included in Causeway Geotech Limited's scope of UKAS Accreditation Schedule of Tests. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Material tested	Type of test/Properties measured/Range of measurement	Standard specifications	No. of results included in the report
SOIL	Moisture Content of Soil	BS 1377-2: 1990: Cl 3.2	6
SOIL	Liquid and Plastic Limits of soil-1 point cone penetrometer method	BS 1377-2: 1990: Cl 4.4, 5.3 & 5.4	6
SOIL	Particle size distribution - wet sieving	BS 1377-2: 1990: Cl 9.2	6
SOIL	Particle size distribution - sedimentation hydrometer method	BS 1377-2: 1990: Cl 9.5	6
SOIL	Dry density/moisture content relationship (2.5 kg rammer)	BS 1377-4: 1990: Cl 3.3 & 3.4	4
SOIL	Moisture Condition Value at natural moisture content	BS 1377-4: 1990: Cl 5.4	4
SOIL	California Bearing Ratio (CBR)	BS 1377-4: 1990: Cl 7	4

SUB-CONTRACTED TESTS

In agreement with Client, the following tests were conducted by an approved sub-contractor. All sub-contracting laboratories used are UKAS accredited.

Material tested	Type of test/Properties measured/Range of measurement	Standard specifications	No. of results included in the report
SOIL – Subcontracted to Eurofins Chemtest Ltd *(UKAS 2183)*	pH Value of Soil		6
SOIL – Subcontracted to Eurofins Chemtest Ltd *(UKAS 2183)*	Sulphate Content water extract		6

Summary of Classification Test Results

Project No.	Project Name
22-1165	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin

Hole No.	Sample				Specimen Description	Density bulk Mg/m3	Density dry Mg/m3	*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Casagrande Classification
	Ref	Top	Base	Type										
BH01	3	1.20		B	Brown sandy slightly gravelly silty CLAY.			12.0	67	35 -1pt	17	18		CL/CI
BH02	4	2.00		B	Greyish brown sandy slightly gravelly silty CLAY.			11.0	69	34 -1pt	17	17		CL
BH03	4	1.20		B	Brown sandy slightly gravelly silty CLAY.			11.0	69	38 -1pt	19	19		CI
BH04	8	3.00		B	Brown sandy slightly gravelly silty CLAY.			12.0	64	34 -1pt	17	17		CL
BH05	4	1.20		B	Greyish brown sandy slightly gravelly silty CLAY.			12.0	67	37 -1pt	18	19		CI
BH06	6	2.00		B	Dark grey sandy slightly gravelly silty CLAY.			12.0	66	36 -1pt	18	18		CI

All tests performed in accordance with BS1377:1990 unless specified otherwise

LAB 01R Version 6

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed

10/06/2022 00:00

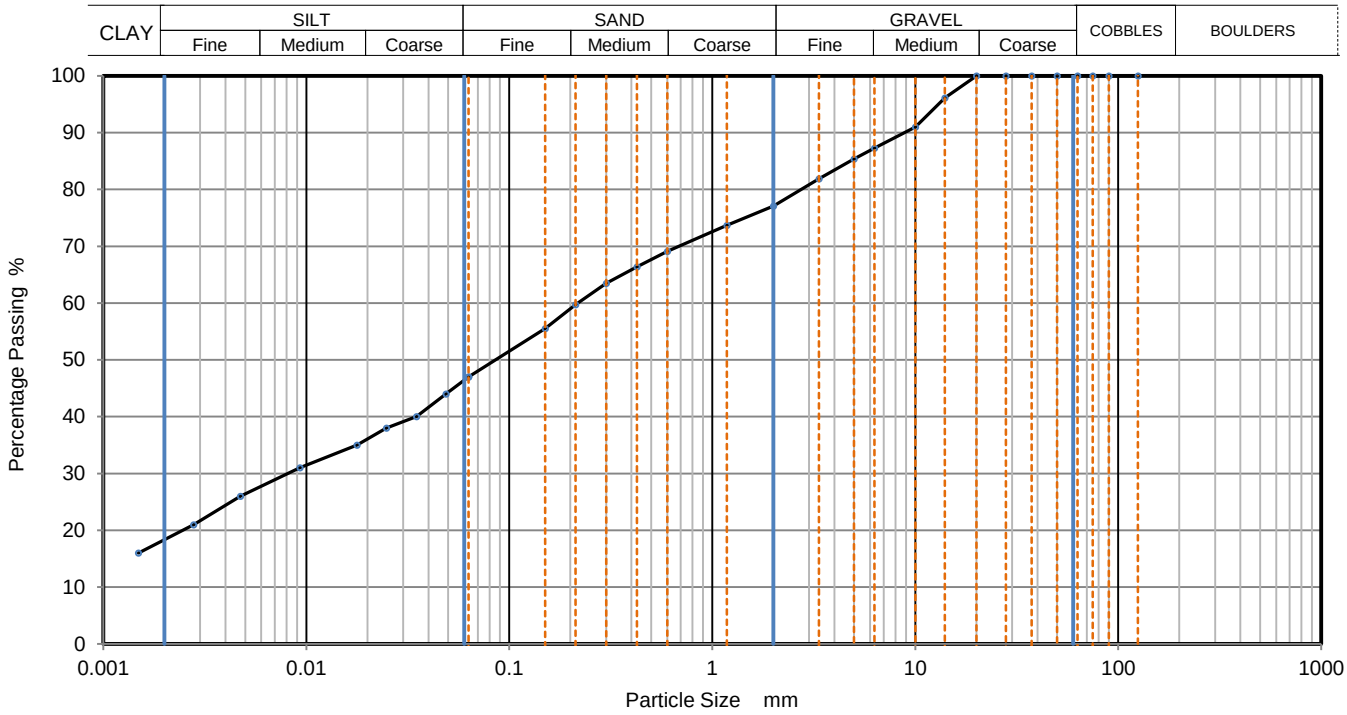
Approved By

Stephen.Watson

UKAS TESTING

10122

CAUSEWAY GEOTECH	PARTICLE SIZE DISTRIBUTION				Job Ref		22-1165
					Borehole/Pit No.		BH01
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin				Sample No.		3
Specimen Description	Brown sandy slightly gravelly silty CLAY.				Sample Depth (m)	Top	1.20
						Base	
Specimen Reference	6	Specimen Depth	1.2	m	Sample Type		B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5				KeyLAB ID		Caus2022091373



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	47
90	100	0.04869	44
75	100	0.03490	40
63	100	0.02484	38
50	100	0.01779	35
37.5	100	0.00930	31
28	100	0.00474	26
20	100	0.00278	21
14	96	0.00149	16
10	91		
6.3	87		
5	85		
3.35	82		
2	77		
1.18	74		
0.6	69	Particle density	(assumed)
0.425	66	2.65	Mg/m3
0.3	64		
0.212	60		
0.15	56		
0.063	47		

Dry Mass of sample, g: 614

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	22.9
Sand	30.0
Silt	29.0
Clay	18.1

Grading Analysis		
D100	mm	
D60	mm	0.217
D30	mm	0.00783
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

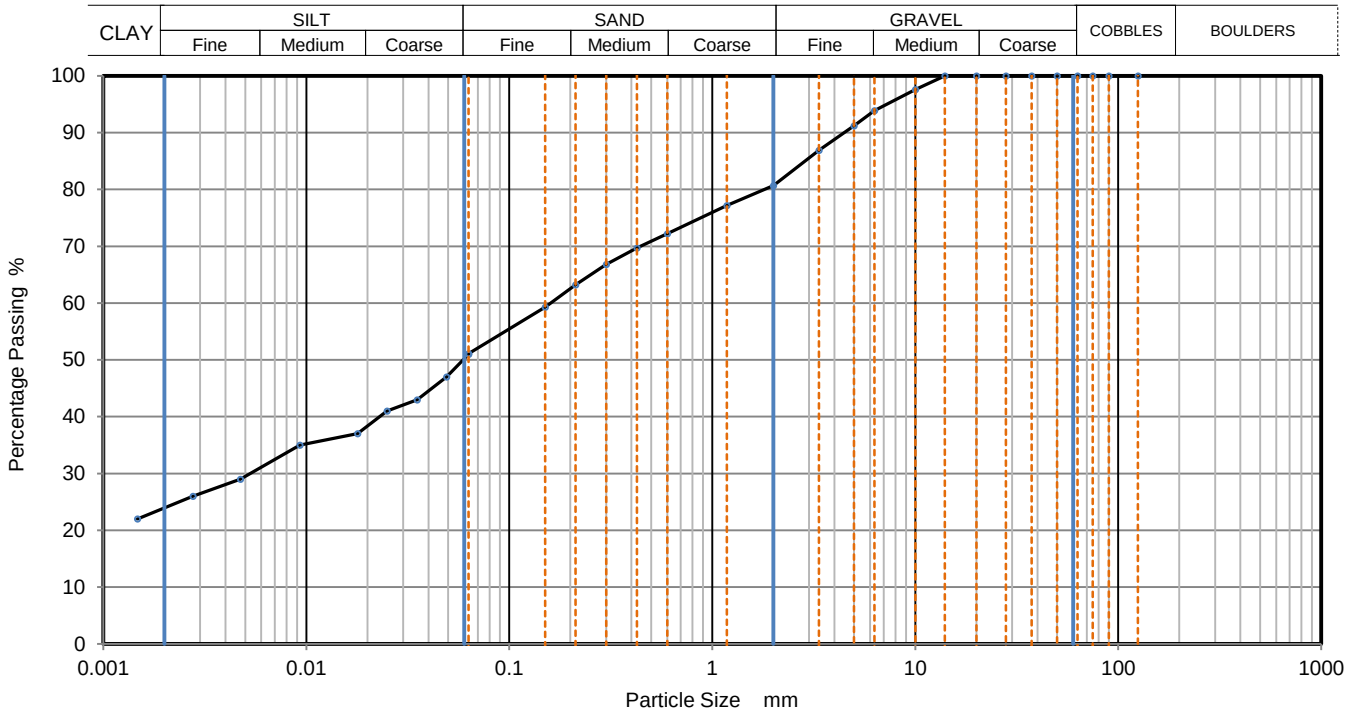
Preparation and testing in accordance with BS1377-2 :1990 unless noted below

Approved
Stephen.Watson

LAB 05R - Version 6

UKAS TESTING 10122

CAUSEWAY GEOTECH	PARTICLE SIZE DISTRIBUTION			Job Ref		22-1165
				Borehole/Pit No.		BH02
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin			Sample No.		4
Specimen Description	Greyish brown sandy slightly gravelly silty CLAY.			Sample Depth (m)	Top	2.00
					Base	
Specimen Reference	6	Specimen Depth	2 m	Sample Type		B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5			KeyLAB ID		Caus2022091374



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	51
90	100	0.04902	47
75	100	0.03513	43
63	100	0.02500	41
50	100	0.01791	37
37.5	100	0.00930	35
28	100	0.00474	29
20	100	0.00277	26
14	100	0.00147	22
10	98		
6.3	94		
5	91		
3.35	87		
2	81		
1.18	77		
0.6	72	Particle density	(assumed)
0.425	70	2.65	Mg/m3
0.3	67		
0.212	63		
0.15	59		
0.063	51		

Dry Mass of sample, g	568

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	19.3
Sand	29.6
Silt	27.6
Clay	23.5

Grading Analysis		
D100	mm	
D60	mm	0.16
D30	mm	0.00503
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377-2 :1990 unless noted below

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Stephen.Watson

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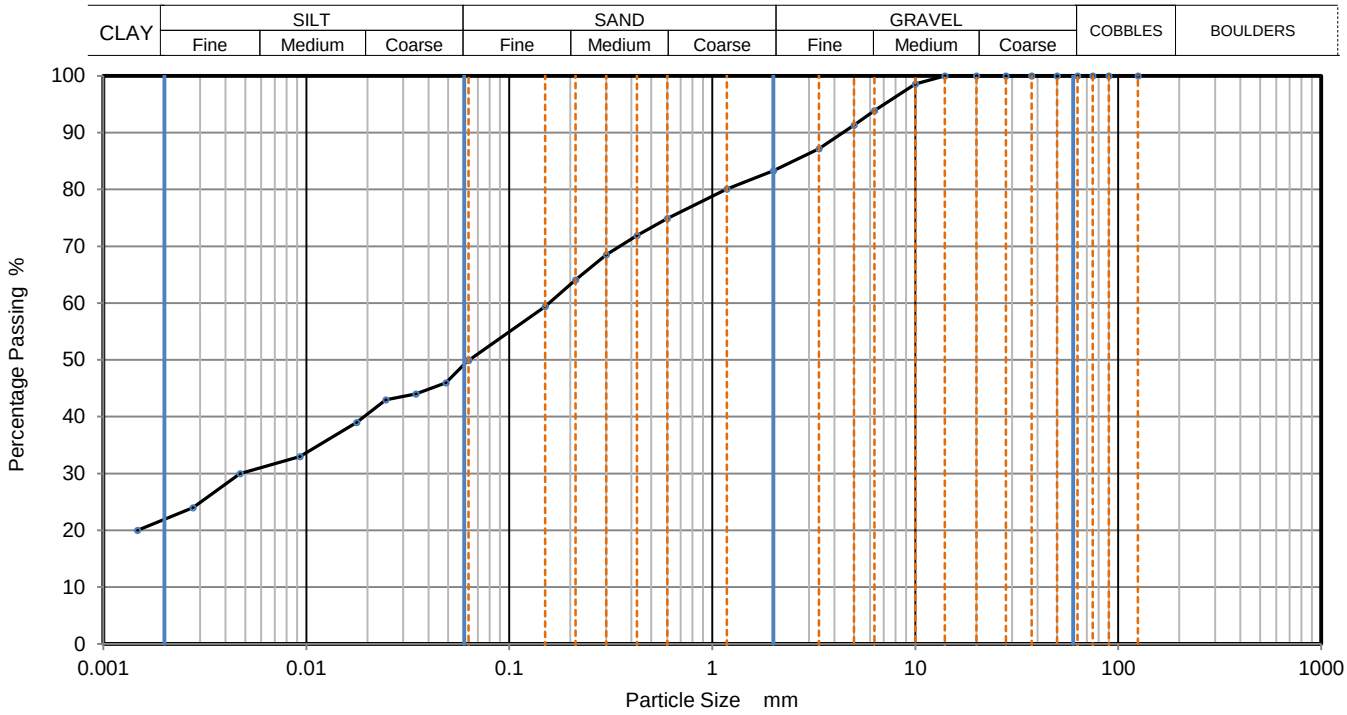
UKAS TESTING

10122

CAUSEWAY GEOTECH	PARTICLE SIZE DISTRIBUTION				Job Ref		22-1165
					Borehole/Pit No.		BH03
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin				Sample No.		4
Specimen Description	Brown sandy slightly gravelly silty CLAY.				Sample Depth (m)	Top	1.20
						Base	
Specimen Reference	6	Specimen Depth	1.2	m	Sample Type		B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5				KeyLAB ID		Caus2022091375



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	50
90	100	0.04869	46
75	100	0.03467	44
63	100	0.02468	43
50	100	0.01768	39
37.5	100	0.00930	33
28	100	0.00471	30
20	100	0.00277	24
14	100	0.00147	20
10	99		
6.3	94		
5	91		
3.35	87		
2	83		
1.18	80		
0.6	75	Particle density	(assumed)
0.425	72	2.65	Mg/m3
0.3	69		
0.212	64		
0.15	59		
0.063	50		

Dry Mass of sample, g	565

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	16.7
Sand	33.4
Silt	27.8
Clay	22.1

Grading Analysis		
D100	mm	
D60	mm	0.157
D30	mm	0.0051
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377-2 :1990 unless noted below

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Stephen.Watson

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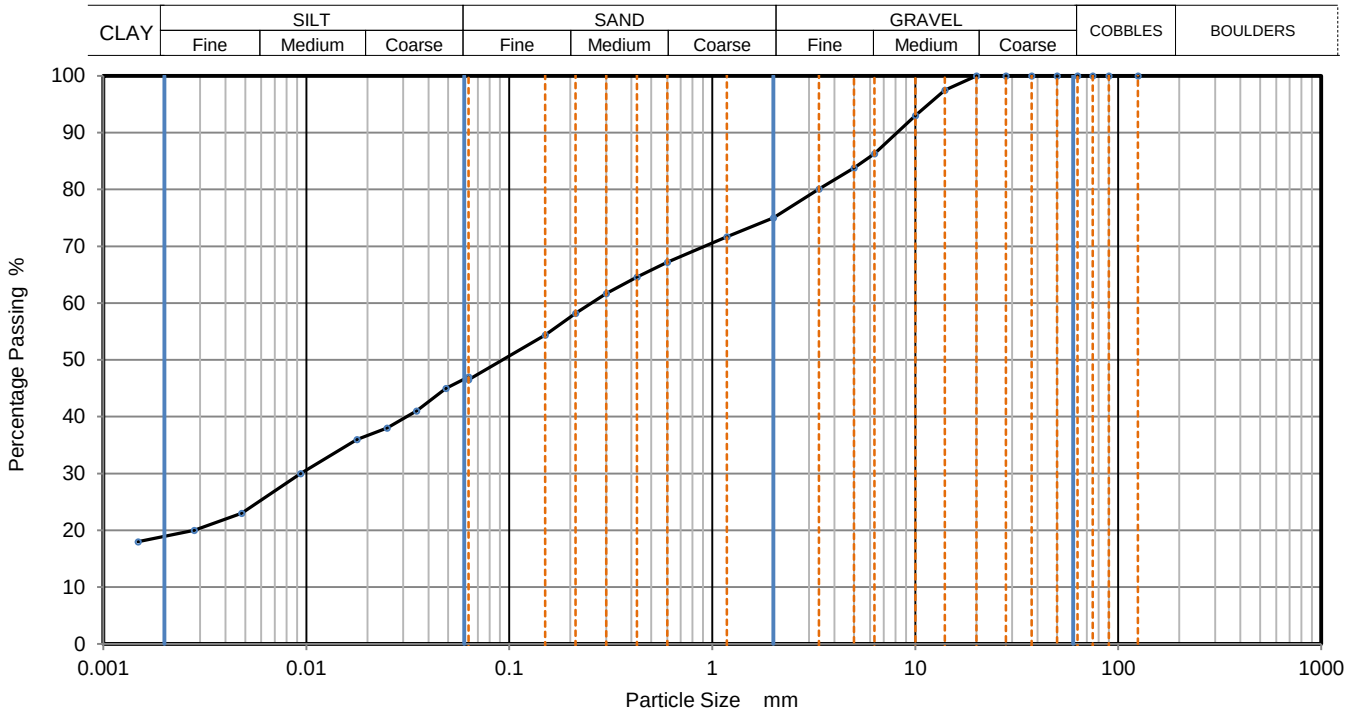
UKAS TESTING

10122

CAUSEWAY GEOTECH	PARTICLE SIZE DISTRIBUTION			Job Ref		22-1165
				Borehole/Pit No.		BH04
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin			Sample No.		8
Specimen Description	Brown sandy slightly gravelly silty CLAY.			Sample Depth (m)	Top	3.00
					Base	
Specimen Reference	6	Specimen Depth	3 m	Sample Type		B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5			KeyLAB ID		Caus2022091376



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	47
90	100	0.04869	45
75	100	0.03490	41
63	100	0.02500	38
50	100	0.01779	36
37.5	100	0.00936	30
28	100	0.00479	23
20	100	0.00280	20
14	98	0.00148	18
10	93		
6.3	86		
5	84		
3.35	80		
2	75		
1.18	72		
0.6	67	Particle density	(assumed)
0.425	65	2.65	Mg/m3
0.3	62		
0.212	58		
0.15	54		
0.063	47		

Dry Mass of sample, g	558

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	25.0
Sand	28.4
Silt	27.9
Clay	18.7

Grading Analysis		
D100	mm	
D60	mm	0.254
D30	mm	0.00902
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377-2 :1990 unless noted below

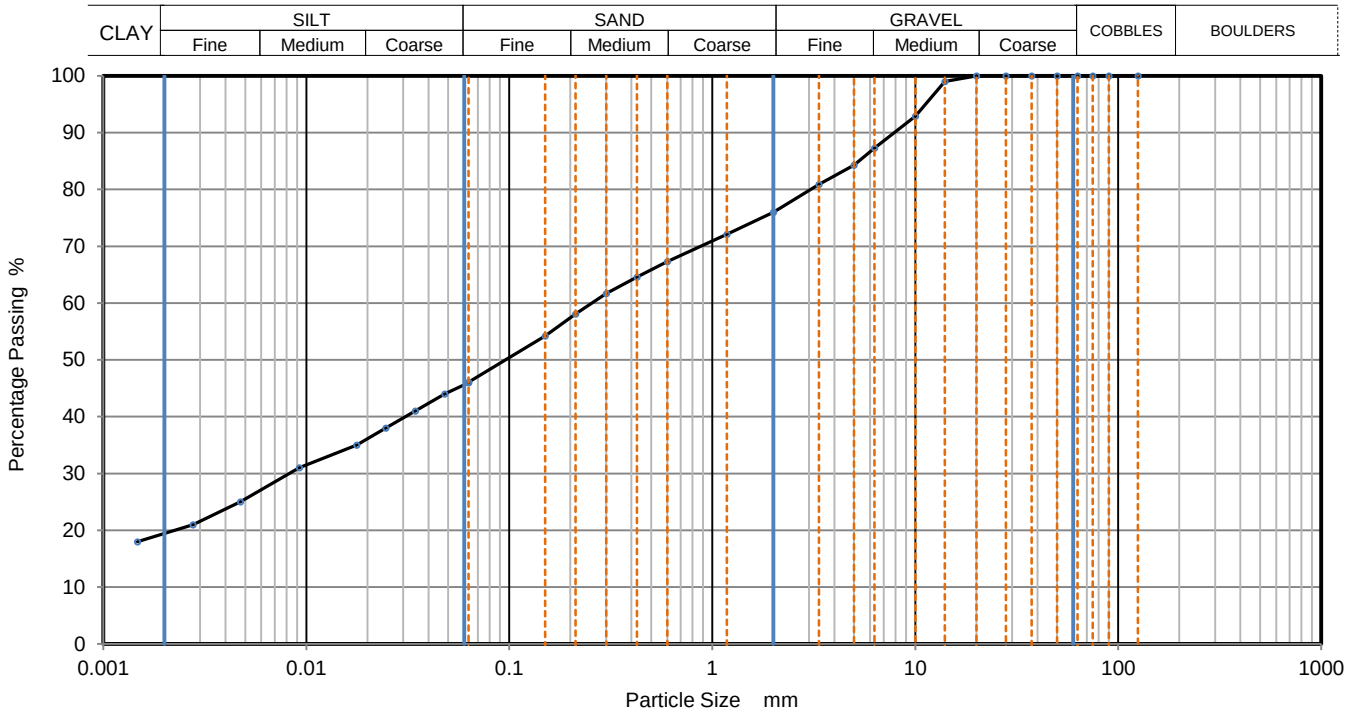
Approved
Stephen.Watson

LAB 05R - Version 6

UKAS TESTING

10122

CAUSEWAY GEOTECH	PARTICLE SIZE DISTRIBUTION				Job Ref		22-1165
					Borehole/Pit No.		BH05
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin				Sample No.		4
Specimen Description	Greyish brown sandy slightly gravelly silty CLAY.				Sample Depth (m)	Top	1.20
						Base	
Specimen Reference	6	Specimen Depth	1.2	m	Sample Type		B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5				KeyLAB ID		Caus2022091377



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	46
90	100	0.04803	44
75	100	0.03443	41
63	100	0.02468	38
50	100	0.01768	35
37.5	100	0.00925	31
28	100	0.00474	25
20	100	0.00277	21
14	99	0.00147	18
10	93		
6.3	87		
5	84		
3.35	81		
2	76		
1.18	72		
0.6	67	Particle density	(assumed)
0.425	65	2.65	Mg/m3
0.3	62		
0.212	58		
0.15	54		
0.063	46		

Dry Mass of sample, g	520

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	24.0
Sand	29.9
Silt	26.4
Clay	19.7

Grading Analysis		
D100	mm	
D60	mm	0.255
D30	mm	0.00812
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377-2 :1990 unless noted below

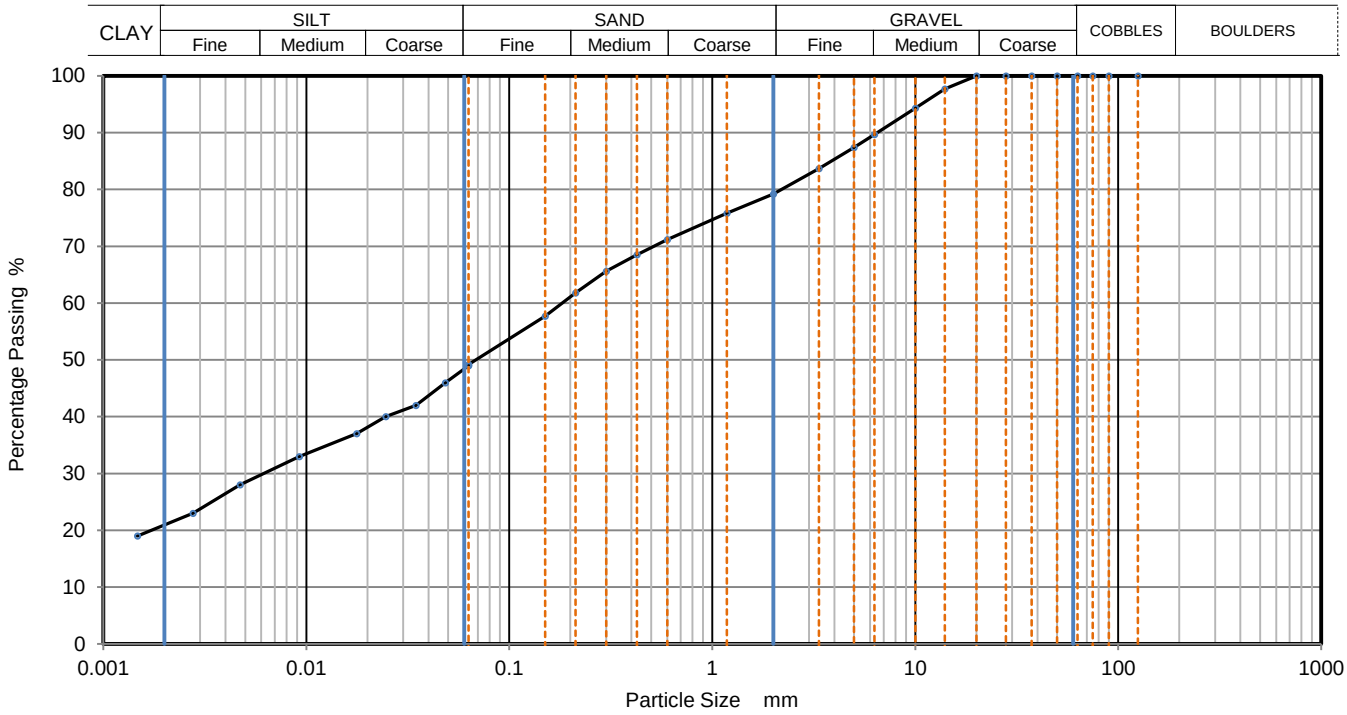
Approved
Stephen.Watson

LAB 05R - Version 6

UKAS TESTING

10122

CAUSEWAY GEOTECH	**PARTICLE SIZE DISTRIBUTION**			Job Ref	**22-1165**
				Borehole/Pit No.	BH06
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin			Sample No.	6
Specimen Description	Dark grey sandy slightly gravelly silty CLAY.			Sample Depth (m) Top	2.00
				Sample Depth (m) Base	
Specimen Reference	6	Specimen Depth	2 m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5			KeyLAB ID	Caus2022091378



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	49
90	100	0.04836	46
75	100	0.03467	42
63	100	0.02468	40
50	100	0.01768	37
37.5	100	0.00925	33
28	100	0.00471	28
20	100	0.00277	23
14	98	0.00147	19
10	94		
6.3	90		
5	87		
3.35	84		
2	79		
1.18	76		
0.6	71	Particle density	(assumed)
0.425	69	2.65	Mg/m3
0.3	66		
0.212	62		
0.15	58		
0.063	49		

Dry Mass of sample, g: 513

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	20.8
Sand	30.1
Silt	28.1
Clay	21.0

Grading Analysis		
D100	mm	
D60	mm	0.182
D30	mm	0.006
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377-2 :1990 unless noted below

Approved
Stephen.Watson

LAB 05R - Version 6

UKAS TESTING 10122

Moisture Condition Value at Natural Moisture Content
Summary of Results

Project No.	Project Name
22-1165	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin

Hole No.	Sample				Specimen Description	Retained on 20mm sieve %	Moisture Content <20mm %	Moisture Condition Value	Method of Interpretation	Remarks
	Ref	Top	Base	Type						
TH02	2	0.50		B	Brown sandy slightly gravelly silty CLAY.	6	11	17.9	Best fit line	
TH02	4	1.00		B	Brown sandy slightly gravelly silty CLAY.	9	10	16.7	Best fit line	
TH03	4	1.00	1.00	B	Brown sandy slightly gravelly silty CLAY.	7	12	11.9	Best fit line	
TH04	3	1.50	1.50	B	Brown sandy slightly gravelly silty CLAY.	2	14	9.4	Best fit line	

LAB 10R - Version 7

Key

Test performed in accordance with BS1377:Part4:1990, clause 5.4 unless annotated otherwise

Date Printed

10/06/2022 00:00

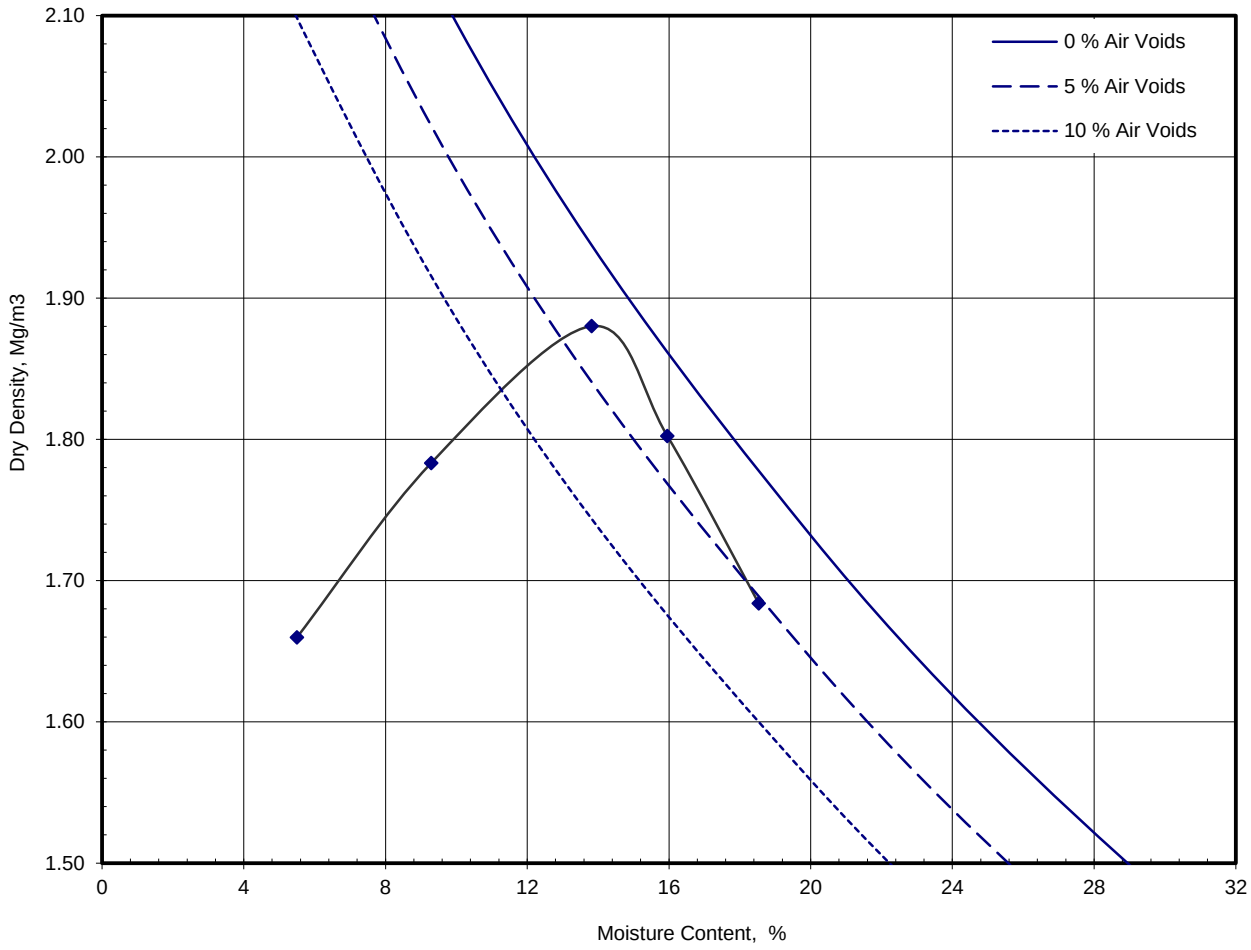
Approved By

Stephen.Watson

UKAS TESTING

10122

CAUSEWAY GEOTECH	**Dry Density / Moisture Content Relationship Light Compaction**			Job Ref	**22-1165**
				Borehole / Pit No	TH01
Site Name	**Remount (Phase 2), Rathmore Road, Lusk Co. Dublin**			Sample No	4
Specimen Description	Brown sandy slightly gravelly silty CLAY.			Sample Depth (m) Top	2.00
				Sample Depth (m) Base	
Specimen Ref.	2	Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.3, 2.5kg rammer			Keylab ID	Caus2022091381

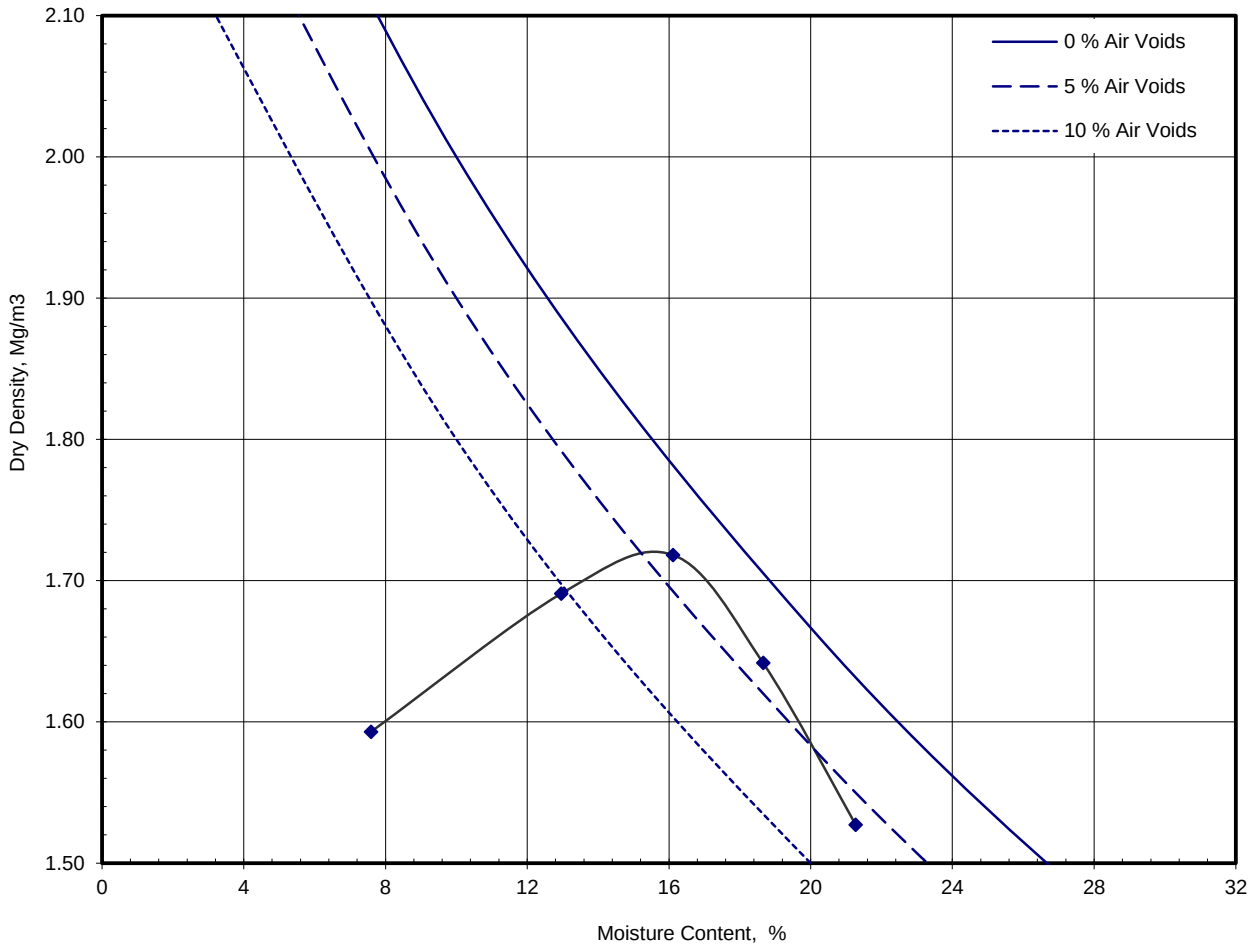


Preparation		Material used was air dried
Mould Type		1 LITRE
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	5
Particle Density - Assumed	Mg/m³	2.65

Maximum Dry Density	Mg/m³	**1.88**
Optimum Moisture Content	%	**14**

Approved	Remarks	UKAS TESTING 10122
Stephen.Watson	LAB 08R - Version 6	

CAUSEWAY GEOTECH	**Dry Density / Moisture Content Relationship Light Compaction**			Job Ref	**22-1165**
				Borehole / Pit No	TH02
Site Name	**Remount (Phase 2), Rathmore Road, Lusk Co. Dublin**			Sample No	1
Specimen Description	Brown sandy slightly gravelly silty CLAY.			Sample Depth (m) Top	0.50
				Sample Depth (m) Base	
Specimen Ref.	2	Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.3, 2.5kg rammer			Keylab ID	Caus2022091382

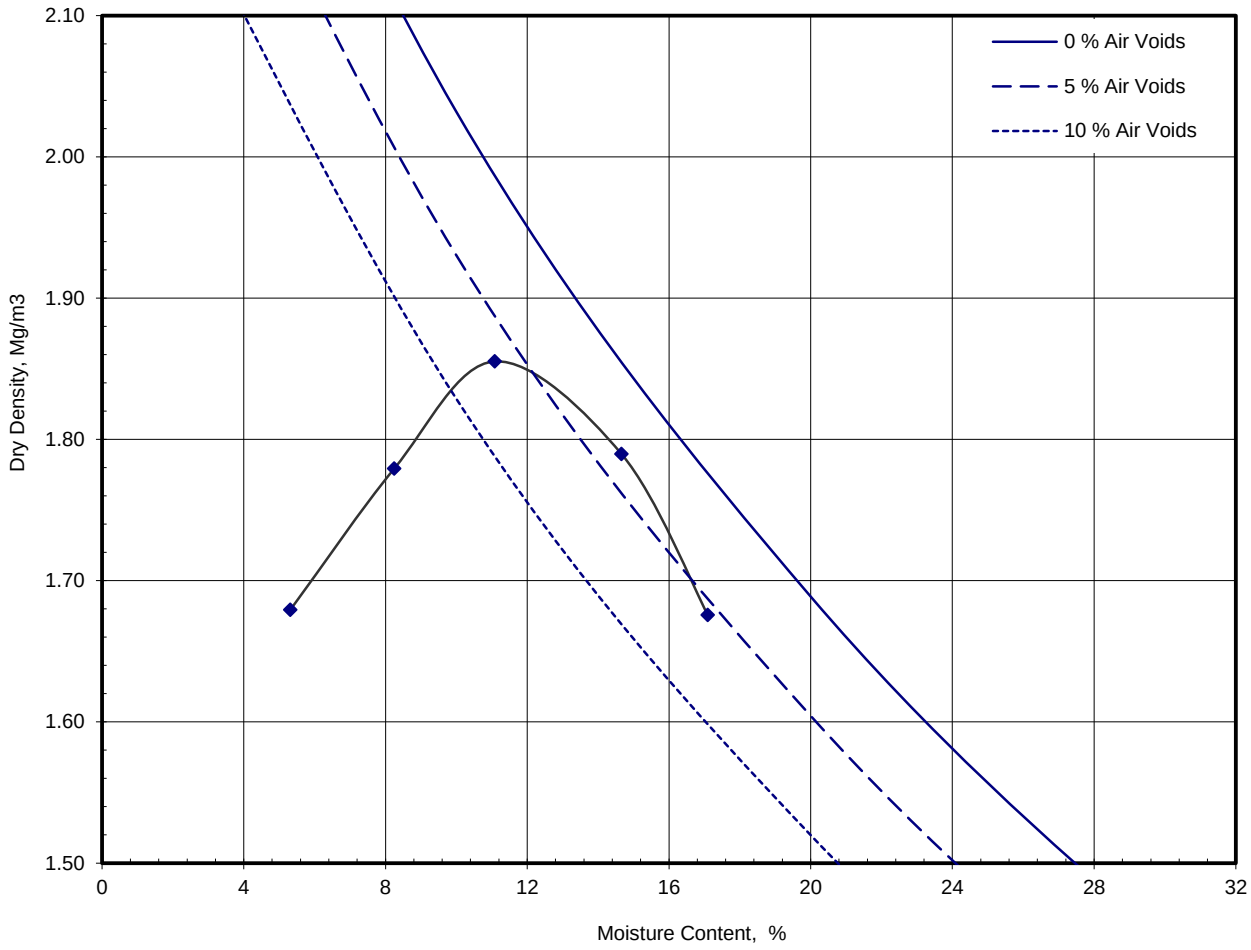


Preparation		Material used was air dried
Mould Type		1 LITRE
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	4
Particle Density - Assumed	Mg/m³	2.50

Maximum Dry Density	Mg/m³	**1.72**
Optimum Moisture Content	%	**16**

Approved	Remarks	UKAS TESTING 10122
Stephen.Watson	LAB 08R - Version 6	

CAUSEWAY GEOTECH	**Dry Density / Moisture Content Relationship Light Compaction**			Job Ref	**22-1165**
				Borehole / Pit No	TH02
Site Name	**Remount (Phase 2), Rathmore Road, Lusk Co. Dublin**			Sample No	3
Specimen Description	Brown sandy slightly gravelly silty CLAY.			Sample Depth (m) Top	1.00
				Sample Depth (m) Base	
Specimen Ref.	2	Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer			Keylab ID	Caus2022091384



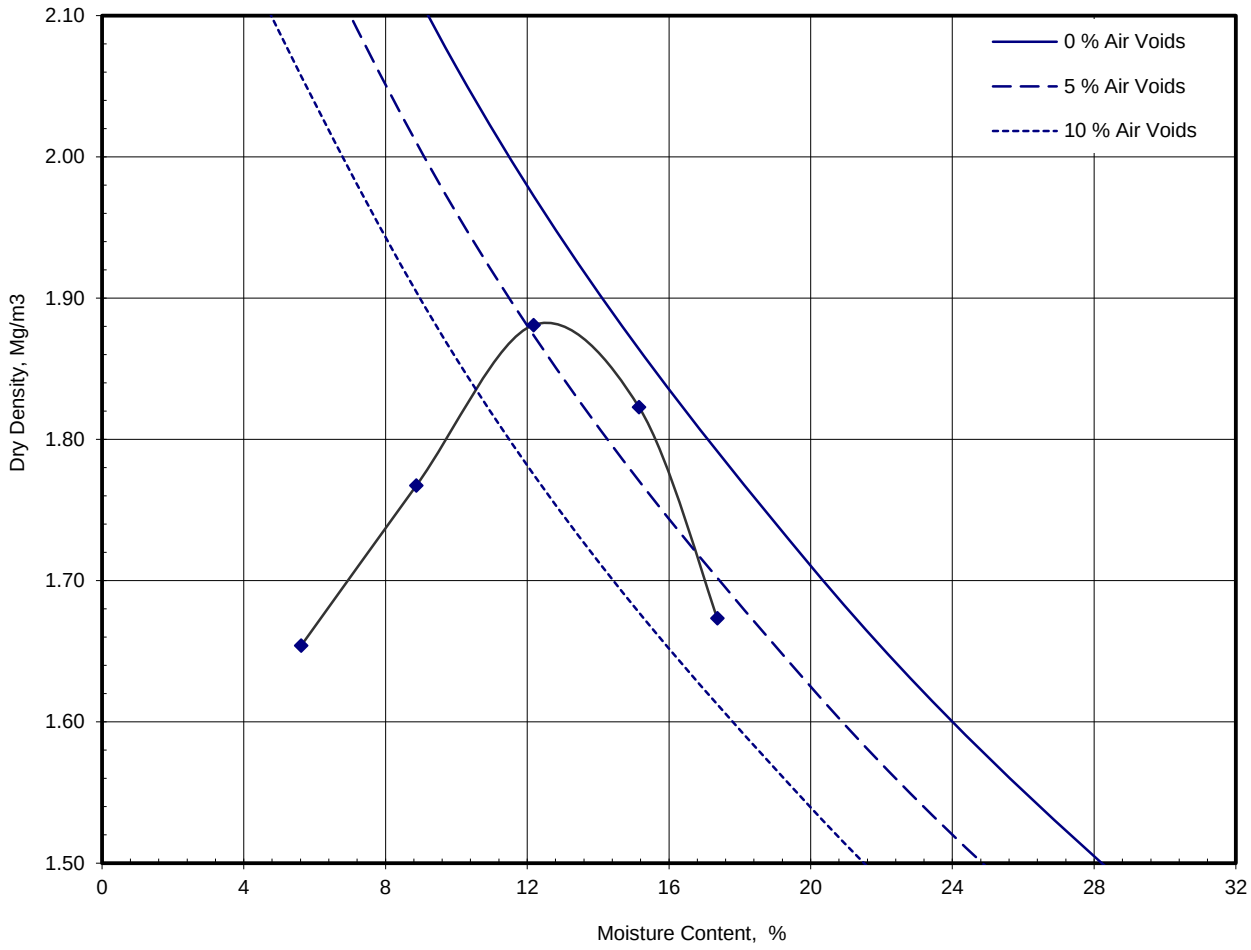
Preparation		Material used was air dried
Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	12
Particle Density - Assumed	Mg/m³	2.55

Maximum Dry Density	Mg/m³	**1.86**

Optimum Moisture Content	%	**11**

Approved	Remarks	UKAS TESTING 10122
Stephen.Watson	LAB 08R - Version 6	

CAUSEWAY GEOTECH	Dry Density / Moisture Content Relationship Light Compaction			Job Ref		22-1165
				Borehole / Pit No		TH03
Site Name	**Remount (Phase 2), Rathmore Road, Lusk Co. Dublin**			Sample No		3
Specimen Description	Brown sandy slightly gravelly silty CLAY.			Sample Depth (m)	Top	1.00
					Base	1.00
Specimen Ref.	2	Specimen Depth	m	Sample Type		B
Test Method	BS1377:Part 4:1990, clause 3.3, 2.5kg rammer			Keylab ID		Caus2022091386



Preparation		Material used was air dried
Mould Type		1 LITRE
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	4
Particle Density - Assumed	Mg/m³	2.60

Maximum Dry Density	Mg/m³	**1.88**

Optimum Moisture Content	%	**12**

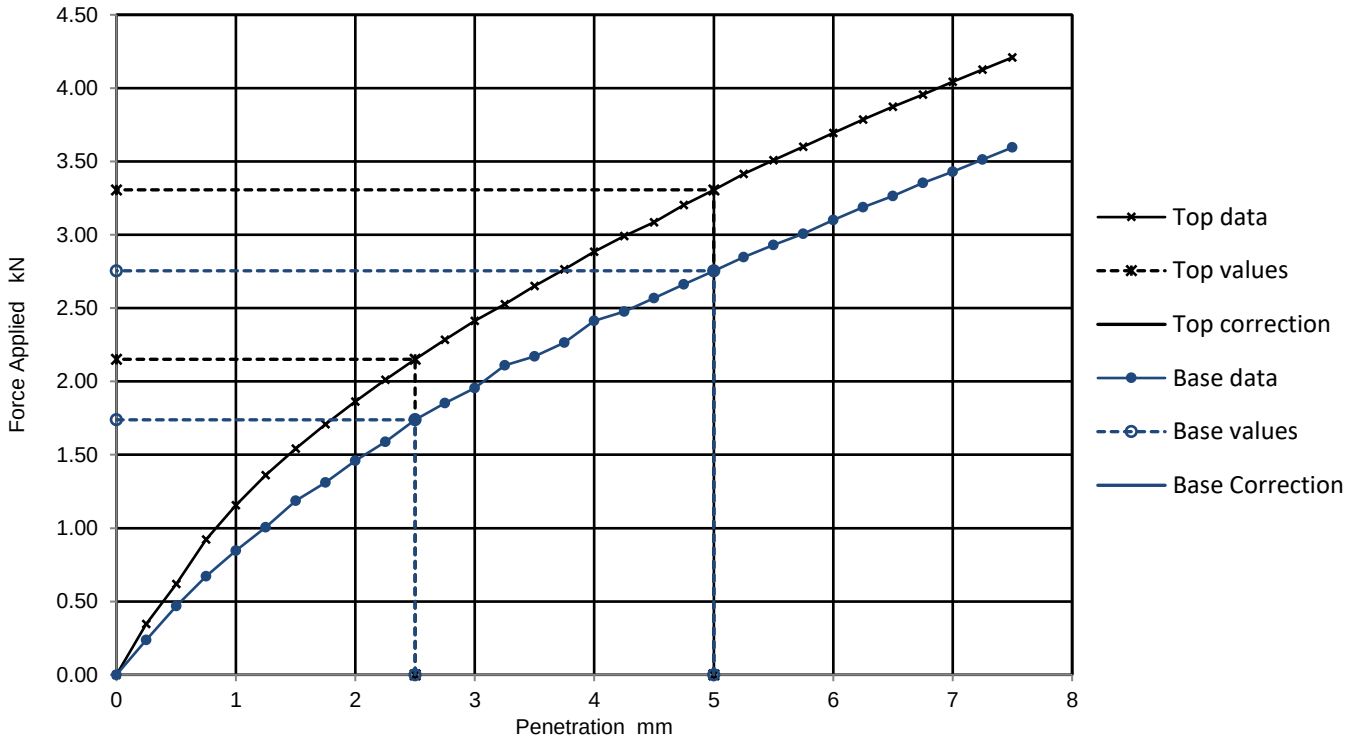
Approved	Remarks	UKAS TESTING 10122
Stephen.Watson	LAB 08R - Version 6	

CAUSEWAY GEOTECH	**California Bearing Ratio (CBR)**			Job Ref	22-1165
				Borehole/Pit No.	TH02
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin			Sample No.	1
Soil Description	Brown sandy slightly gravelly silty CLAY.			Depth m	0.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Brown sandy slightly gravelly silty CLAY.			KeyLAB ID	Caus2022091379
Test Method	BS1377 : Part 4 : 1990, clause 7			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		4	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.90	Mg/m3	Surcharge applied	4.5	kg
	Dry density	1.68	Mg/m3		3	kPa
	Moisture content	13	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	16.0	17.0	17.0	15.0	13
BASE	No	13.0	14.0	14.0		13

General remarks	Test specific remarks	Approved
Tested at natural moisture content.	Average result may be reported if within 10% of the mean CBR value of top and base.	Stephen.Watson

UKAS TESTING

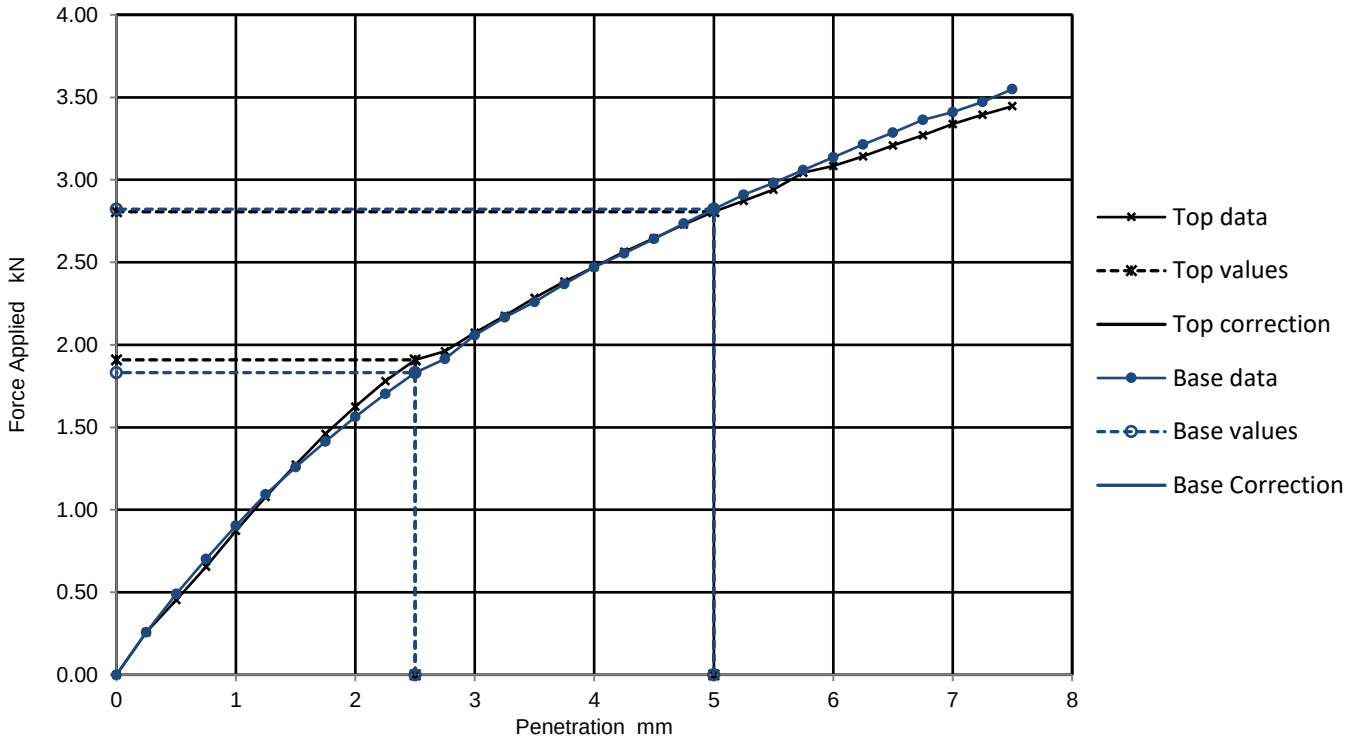
10122

CAUSEWAY GEOTECH	**California Bearing Ratio (CBR)**			Job Ref	22-1165
				Borehole/Pit No.	TH02
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin			Sample No.	3
Soil Description	Brown sandy slightly gravelly silty CLAY.			Depth m	1.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Brown sandy slightly gravelly silty CLAY.			KeyLAB ID	Caus2022091380
Test Method	BS1377 : Part 4 : 1990, clause 7			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		3	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.12	Mg/m3	Surcharge applied	4.5	kg
	Dry density	1.86	Mg/m3		3	kPa
	Moisture content	14	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	14.0	14.0	14.0	14.0	14
BASE	No	14.0	14.0	14.0		13

General remarks	Test specific remarks	Approved
Tested at natural moisture content.	Average result may be reported if within 10% of the mean CBR value of top and base.	Stephen.Watson

UKAS TESTING

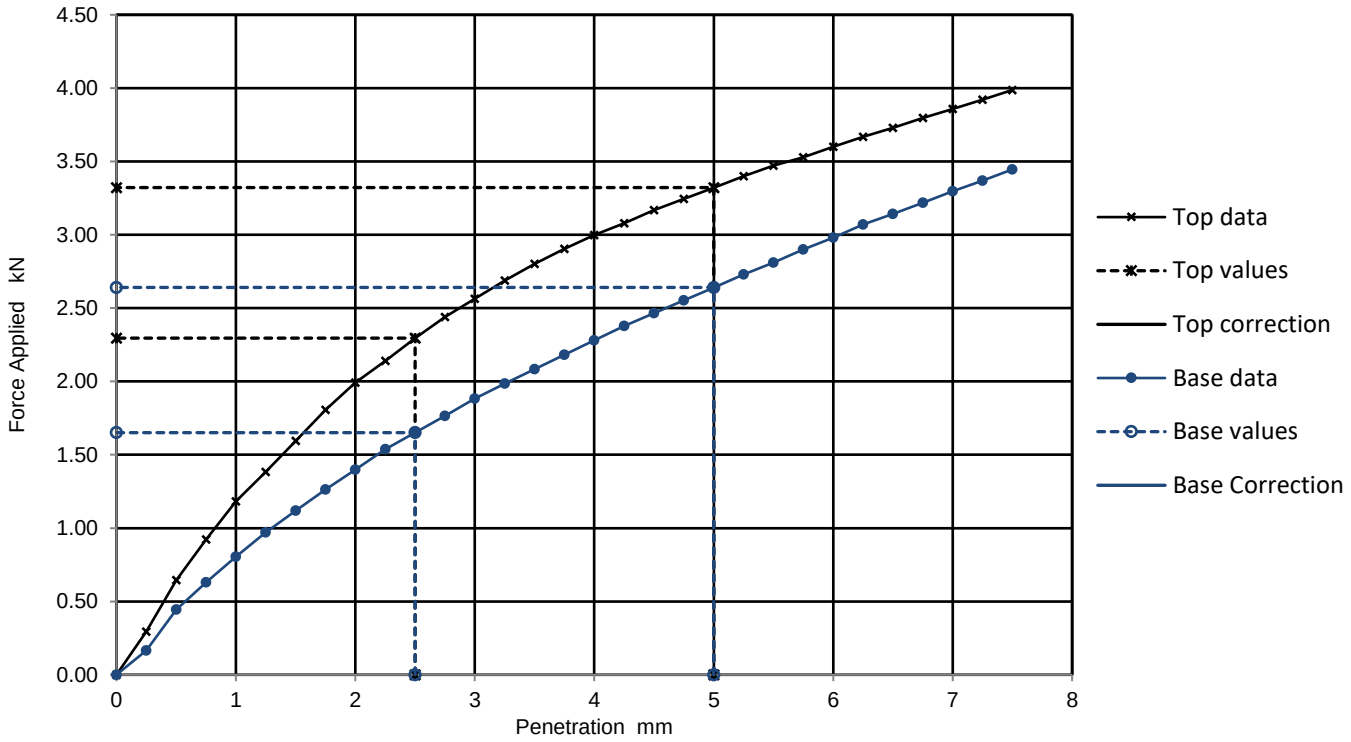
10122

CAUSEWAY GEOTECH	**California Bearing Ratio (CBR)**			Job Ref	22-1165
				Borehole/Pit No.	TH03
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin			Sample No.	1
Soil Description	Brown sandy slightly gravelly silty CLAY.			Depth m	0.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Brown sandy slightly gravelly silty CLAY.			KeyLAB ID	Caus2022091388
Test Method	BS1377 : Part 4 : 1990, clause 7			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		5	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.07	Mg/m3	Surcharge applied	4.5	kg
	Dry density	1.84	Mg/m3		3	kPa
	Moisture content	13	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	17.0	17.0	17.0		13
BASE	No	13.0	13.0	13.0		12

General remarks	Test specific remarks	Approved
Tested at natural moisture content.	Average result may be reported if within 10% of the mean CBR value of top and base.	Stephen.Watson

UKAS TESTING

10122

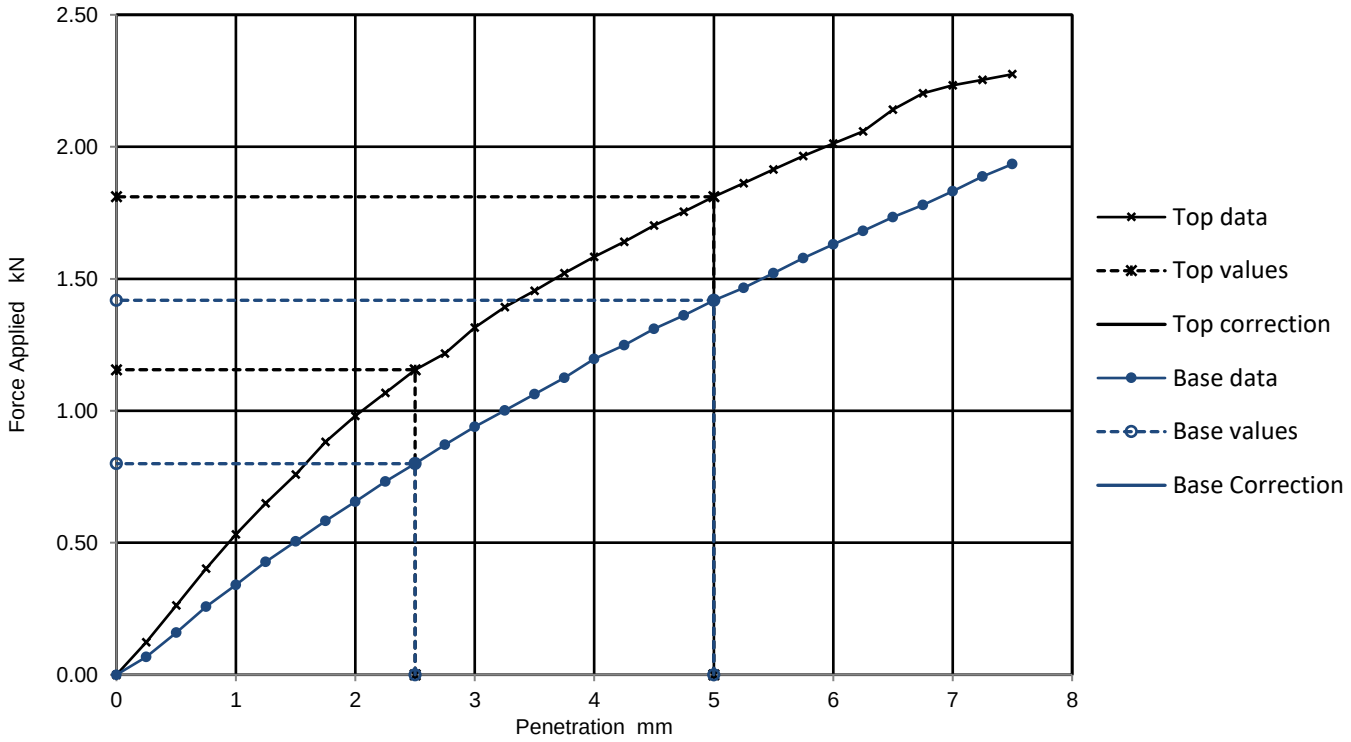
California Bearing Ratio (CBR)

				Job Ref	22-1165
				Borehole/Pit No.	TH03
Site Name	Remount (Phase 2), Rathmore Road, Lusk Co. Dublin			Sample No.	4
Soil Description	Brown sandy slightly gravelly silty CLAY.			Depth m	1.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Brown sandy slightly gravelly silty CLAY.			KeyLAB ID	Caus2022091389
Test Method	BS1377 : Part 4 : 1990, clause 7			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		8	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.05	Mg/m3	Surcharge applied	4.5	kg
	Dry density	1.76	Mg/m3		3	kPa
	Moisture content	16	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	8.8	9.1	9.1		16
BASE	No	6.1	7.1	7.1		18

General remarks	Test specific remarks	Approved
Tested at natural moisture content.	Average result may be reported if within 10% of the mean CBR value of top and base.	Stephen.Watson

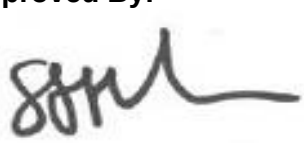
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-36210-1
Initial Date of Issue:	26-Sep-2022
Client	Causeway Geotech Ltd
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL
Contact(s):	Alistair McQuat Colm Hurley Darren O'Mahony Gabriella Horan Joe Gervin John Cameron Lucy Newland Martin Gardiner Matthew Gilbert Neil Haggan Paul Dunlop Sean Ross Stephen Franey Stephen McCracken Stephen Watson Stuart Abraham Thomas McAlli
Project	22-1165 Remount Phase 2

Quotation No.:		**Date Received:**	22-Sep-2022
Order No.:		**Date Instructed:**	22-Sep-2022
No. of Samples:	6		
Turnaround (Wkdays):	7	**Results Due:**	30-Sep-2022
Date Approved:	26-Sep-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Results - Soil

Project: 22-1165 Remount Phase 2

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		22-36210	22-36210	22-36210	22-36210	22-36210	22-36210
Quotation No.:			**Chemtest Sample ID.:**		1510906	1510907	1510908	1510909	1510910	1510911
Order No.:			Client Sample Ref.:		3	4	4	8	4	6
			Sample Location:		BH01	BH02	BH03	BH04	BH05	BH06
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.2	2	1.2	3	1.2	2
			Date Sampled:		21-Sep-2022	21-Sep-2022	21-Sep-2022	21-Sep-2022	21-Sep-2022	21-Sep-2022
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Moisture	N	2030	%	0.020	8.6	9.4	8.4	7.9	8.0	9.4
pH	U	2010		4.0	9.3	9.3	9.1	9.2	9.3	9.0
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

CAUSEWAY GEOTECH

APPENDIX H

ENVIRONMENTAL LABORATORY TEST RESULTS

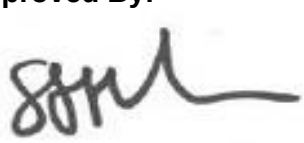
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-34542-1
Initial Date of Issue:	26-Sep-2022
Client	Causeway Geotech Ltd
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL
Contact(s):	Alistair McQuat Colm Hurley Darren O'Mahony Gabriella Horan Joe Gervin John Cameron Lucy Newland Martin Gardiner Matthew Gilbert Neil Haggan Paul Dunlop Sean Ross Stephen Franey Stephen Watson Stuart Abraham Thomas McAllister Ciaran Dohert
Project	22-1165 Remount Phase 2

Quotation No.:		**Date Received:**	09-Sep-2022
Order No.:		**Date Instructed:**	14-Sep-2022
No. of Samples:	2		
Turnaround (Wkdays):	7	**Results Due:**	23-Sep-2022
Date Approved:	26-Sep-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Results - Leachate

Project: 22-1165 Remount Phase 2

Client: Causeway Geotech Ltd				**Chemtest Job No.:**		22-34542	22-34542
Quotation No.:				**Chemtest Sample ID.:**		1503594	1503595
				Sample Location:		BH04	BH04
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.4	2.0
				Date Sampled:		07-Sep-2022	07-Sep-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**		
Ammonium	U	1220	10:1	mg/l	0.050	< 0.050	< 0.050
Ammonium	N	1220	10:1	mg/kg	0.10	0.24	0.26

Results - Soil

Project: 22-1165 Remount Phase 2

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		22-34542	22-34542
Quotation No.:			**Chemtest Sample ID.:**		1503594	1503595
			Sample Location:		BH04	BH04
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.4	2.0
			Date Sampled:		07-Sep-2022	07-Sep-2022
			Asbestos Lab:		NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	14
pH	U	2010		4.0	8.4	8.6
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.97	0.67
Sulphur (Elemental)	U	2180	mg/kg	1.0	< 1.0	1.2
Cyanide (Total)	U	2300	mg/kg	0.50	0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	1.2	1.3
Sulphate (Total)	U	2430	%	0.010	0.12	0.069
Arsenic	U	2455	mg/kg	0.5	16	12
Barium	U	2455	mg/kg	0	88	73
Cadmium	U	2455	mg/kg	0.10	0.38	0.68
Chromium	U	2455	mg/kg	0.5	22	28
Molybdenum	U	2455	mg/kg	0.5	5.0	1.8
Antimony	N	2455	mg/kg	2.0	< 2.0	< 2.0
Copper	U	2455	mg/kg	0.50	1400	28
Mercury	U	2455	mg/kg	0.05	0.08	< 0.05
Nickel	U	2455	mg/kg	0.50	23	39
Lead	U	2455	mg/kg	0.50	120	27
Selenium	U	2455	mg/kg	0.25	1.4	0.90
Zinc	U	2455	mg/kg	0.50	50	52
Chromium (Trivalent)	N	2490	mg/kg	1.0	22	28
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Total Organic Carbon	U	2625	%	0.20	1.4	1.2
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: 22-1165 Remount Phase 2

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		22-34542	22-34542
Quotation No.:			**Chemtest Sample ID.:**		1503594	1503595
			Sample Location:		BH04	BH04
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.4	2.0
			Date Sampled:		07-Sep-2022	07-Sep-2022
			Asbestos Lab:		NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Coronene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10	< 0.10
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Results - Single Stage WAC

Project: 22-1165 Remount Phase 2

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-34542						
Chemtest Sample ID:	1503594						
Sample Ref:							
Sample ID:							
Sample Location:	BH04						
Top Depth(m):	0.4						
Bottom Depth(m):							
Sampling Date:	07-Sep-2022						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	1.4	3	5	6
Loss On Ignition	2610	U	%	10	--	--	10
Total BTEX	2760	U	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	U		8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.013	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0008	0.0079	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	0.0016	0.016	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0045	0.045	0.5	10	30
Nickel	1455	U	0.0009	0.0093	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	0.0005	0.0052	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.025	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.24	2.4	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	130	1200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	13

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 22-1165 Remount Phase 2

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-34542						
Chemtest Sample ID:	1503595						
Sample Ref:							
Sample ID:							
Sample Location:	BH04						
Top Depth(m):	2.0						
Bottom Depth(m):							
Sampling Date:	07-Sep-2022						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	1.2	3	5	6
Loss On Ignition	2610	U	%	3.4	--	--	10
Total BTEX	2760	U	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	U		8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0033	0.033	0.5	2	25
Barium	1455	U	0.006	0.059	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	0.0033	0.033	0.5	10	70
Copper	1455	U	0.0063	0.063	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0017	0.017	0.5	10	30
Nickel	1455	U	0.0038	0.038	0.4	10	40
Lead	1455	U	0.010	0.10	0.5	10	50
Antimony	1455	U	0.0067	0.067	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.025	4	50	200
Chloride	1220	U	1.3	13	800	15000	25000
Fluoride	1220	U	0.34	3.4	10	150	500
Sulphate	1220	U	1.1	11	1000	20000	50000
Total Dissolved Solids	1020	N	67	670	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	3.1	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	14

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Test Methods

SOP	Title	Parameters included	Method summary
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-34771-4		
Initial Date of Issue:	04-Oct-2022	**Date of Re-Issue:**	27-Oct-2022
Client	Causeway Geotech Ltd		
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL		
Contact(s):	Alistair McQuat Colm Hurley Darren O'Mahony Gabriella Horan Joe Gervin John Cameron Lucy Newland Martin Gardiner Matthew Gilbert Neil Haggan Paul Dunlop Sean Ross Stephen Franey Stephen Watson Stuart Abraham Thomas McAllister Ciaran Dohert		
Project	22-1165 Remount Phase 2		
Quotation No.:		**Date Received:**	12-Sep-2022
Order No.:	STEPHEN FRANEY	**Date Instructed:**	12-Sep-2022
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	21-Oct-2022
Date Approved:	26-Oct-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Results - Leachate

Project: 22-1165 Remount Phase 2

Client: Causeway Geotech Ltd				**Chemtest Job No.:**		22-34771	22-34771
Quotation No.:				**Chemtest Sample ID.:**		1504717	1504718
				Sample Location:		BH01	BH02
				Sample Type:		SOIL	SOIL
				Top Depth (m):		0.40	0.30
				Date Sampled:		08-Sep-2022	08-Sep-2022
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**		
Ammonium	U	1220	10:1	mg/l	0.050	< 0.050	< 0.050
Ammonium	N	1220	10:1	mg/kg	0.10	0.23	0.21

Results - Soil

Project: 22-1165 Remount Phase 2

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		22-34771	22-34771
Quotation No.:			**Chemtest Sample ID.:**		1504717	1504718
			Sample Location:		BH01	BH02
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.40	0.30
			Date Sampled:		08-Sep-2022	08-Sep-2022
			Asbestos Lab:		NEW-ASB	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	11	12
pH	M	2010		4.0	8.7	8.6
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.87	< 0.40
Sulphur (Elemental)	M	2180	mg/kg	1.0	< 1.0	< 1.0
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.5	12
Sulphate (Total)	U	2430	%	0.010	0.026	0.022
Arsenic	M	2455	mg/kg	0.5	18	17
Barium	M	2455	mg/kg	0	76	82
Cadmium	M	2455	mg/kg	0.10	1.0	0.85
Chromium	M	2455	mg/kg	0.5	29	33
Molybdenum	M	2455	mg/kg	0.5	2.9	2.9
Antimony	N	2455	mg/kg	2.0	< 2.0	< 2.0
Copper	M	2455	mg/kg	0.50	32	33
Mercury	M	2455	mg/kg	0.05	0.08	0.09
Nickel	M	2455	mg/kg	0.50	40	42
Lead	M	2455	mg/kg	0.50	24	19
Selenium	M	2455	mg/kg	0.25	1.7	1.7
Zinc	M	2455	mg/kg	0.50	49	53
Chromium (Trivalent)	N	2490	mg/kg	1.0	29	33
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	0.49	1.0
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: 22-1165 Remount Phase 2

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		22-34771	22-34771
Quotation No.:			**Chemtest Sample ID.:**		1504717	1504718
			Sample Location:		BH01	BH02
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.40	0.30
			Date Sampled:		08-Sep-2022	08-Sep-2022
			Asbestos Lab:		NEW-ASB	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.15	< 0.10
Anthracene	M	2800	mg/kg	0.10	0.37	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	0.28	< 0.10
Pyrene	M	2800	mg/kg	0.10	0.50	< 0.10
Benzo[a]anthracene	M	2800	mg/kg	0.10	1.6	< 0.10
Chrysene	M	2800	mg/kg	0.10	1.9	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	1.7	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	1.6	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	1.6	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	1.6	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	2.0	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	1.7	< 0.10
Coronene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	2800	mg/kg	2.0	15	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10	< 0.10
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10

Results - Single Stage WAC

Project: 22-1165 Remount Phase 2

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-34771						
Chemtest Sample ID:	1504717						
Sample Ref:							
Sample ID:							
Sample Location:	BH01						
Top Depth(m):	0.40						
Bottom Depth(m):							
Sampling Date:	08-Sep-2022						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	0.49	3	5	6
Loss On Ignition	2610	M	%	8.3	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	15	100	--	--
pH	2010	M		8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.025	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	< 0.0002	< 0.0020	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0050	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0023	0.023	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0050	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.025	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.11	1.1	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	1200	12000	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.4	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	11

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 22-1165 Remount Phase 2

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-34771						
Chemtest Sample ID:	1504718						
Sample Ref:							
Sample ID:							
Sample Location:	BH02						
Top Depth(m):	0.30						
Bottom Depth(m):							
Sampling Date:	08-Sep-2022						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	1.0	3	5	6
Loss On Ignition	2610	M	%	6.6	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0014	0.014	0.5	2	25
Barium	1455	U	0.008	0.080	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	0.0013	0.013	0.5	10	70
Copper	1455	U	0.0032	0.032	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0016	0.016	0.5	10	30
Nickel	1455	U	0.0012	0.012	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	0.0006	0.0063	0.1	0.5	7
Zinc	1455	U	0.004	0.038	4	50	200
Chloride	1220	U	4.4	44	800	15000	25000
Fluoride	1220	U	0.44	4.4	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	85	840	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	7.2	72	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

CAUSEWAY GEOTECH

APPENDIX I

SPT HAMMER ENERGY MEASUREMENT REPORT

SPT Hammer Energy Report

BAM Ritchies
Glasgow Road
Kilsyth
G65 9BL

SPT Hammer Ref:	AI2
Test Date:	20/12/2021 10:41
Report Date:	21/12/2021
File Name:	AI2.spt
Test Operator:	PH

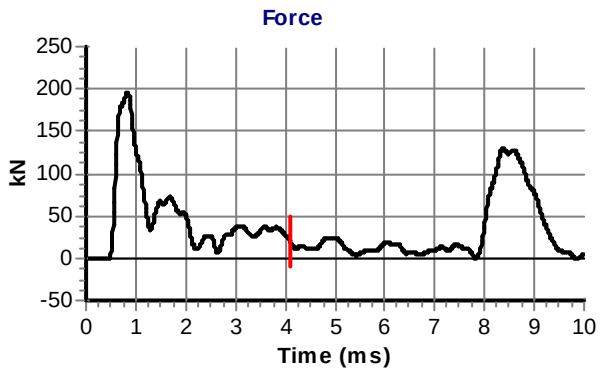
Instrumented Rod Data

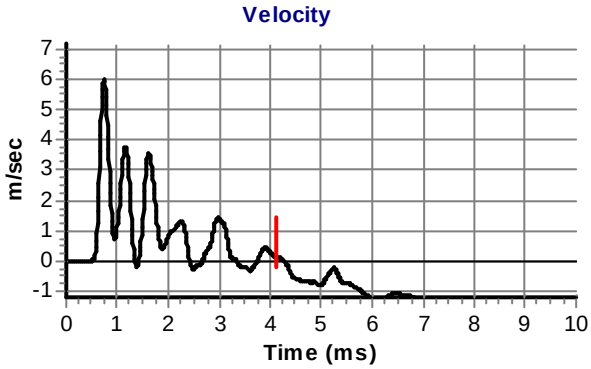
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.7
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	5844
Accelerometer No.2:	5845

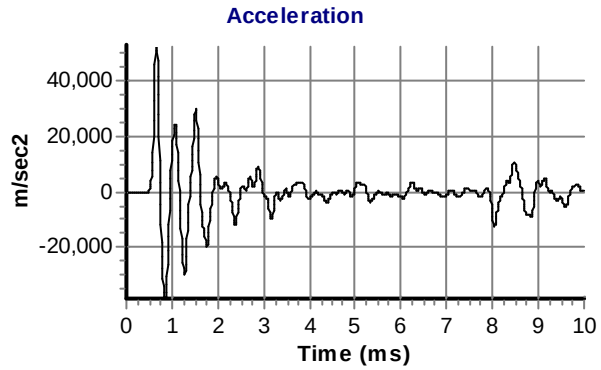
SPT Hammer Information

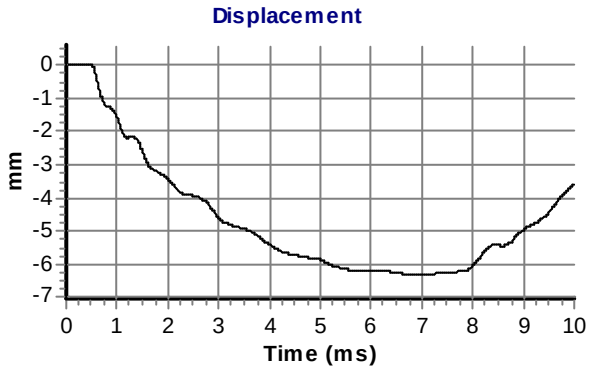
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	17.0

Comments / Location









Calculations

Area of Rod A (mm2):	996
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	390

Energy Ratio E_r (%): **82**

Signed: Calum Bissett

Title: Geotechnical Engineer

CAUSEWAY GEOTECH

APPENDIX J

WASTE CLASSIFICATION REPORT

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

F1NFF-JKFE7-5FV4A

Job name

22-1165 Remount Phase2

Description/Comments

Assessment of soil samples collected during September 2022 GI

Project

22-1165

Site

Remount Phase 2

Classified by

Name:
Stephen Franey
Date:
27 Oct 2022 10:33 GMT
Telephone:
028 2766 6640

Company:
Causeway Geotech Ltd
8 Drumahiskey Road
Ballymoney
BT53 7QL

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	06 Aug 2020

Next 3 year Refresher due by Aug 2023

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	BH04-07/09/2022-0.4	0.4	Non Hazardous		Pass	Pass	2
2	BH04-07/09/2022-2.0	2.0	Non Hazardous		Fail	Pass	6
3	BH01-08/09/2022-0.40	0.40	Non Hazardous		Fail	Pass	10
4	BH02-08/09/2022-0.30	0.30	Non Hazardous		Pass	Pass	14

Related documents

#	Name	Description
1	22-1165_RemountPhase2_Env.batch	Eurofins Chemtest .batch file used to populate the Job
2	HWOL_22-34542-20220926 151748.hwol	Eurofins Chemtest .hwol file used to populate the Job
3	HWOL_22-34771-20221027 110918.hwol	Eurofins Chemtest .hwol file used to populate the Job
4	Example waste stream template for contaminated soils	waste stream template used to create this Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Stephen Franey

Created date: 27 Oct 2022 10:33 GMT

Classification of sample: BH04-07/09/2022-0.4

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH04-07/09/2022-0.4
Sample Depth:
0.4 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16 mg/kg	1.32	18.379 mg/kg	0.00184 %	✓	
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.97 mg/kg	3.22	2.717 mg/kg	0.000272 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.38 mg/kg	1.142	0.378 mg/kg	0.0000378 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	27.974 mg/kg	0.0028 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		1400 mg/kg	1.126	1371.332 mg/kg	0.137 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	120 mg/kg	1.56	162.845 mg/kg	0.0104 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.08 mg/kg	1.353	0.0942 mg/kg	0.00000942 %	✓	
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		5 mg/kg	1.5	6.526 mg/kg	0.000653 %	✓	
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23 mg/kg	2.976	59.555 mg/kg	0.00596 %	✓	
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1.4 mg/kg	2.554	3.111 mg/kg	0.000311 %	✓	
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		50 mg/kg	2.774	120.675 mg/kg	0.0121 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number											
16		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.5	mg/kg	1.884	0.82	mg/kg	0.000082 %	✓	
		006-007-00-5											
20		pH				8.4	pH		8.4	pH	8.4 pH		
				PH									
21		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
28		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
37		polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
38		sulfur { sulfur }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		016-094-00-1	231-722-6	7704-34-9									
39		barium { barium sulphide }				88	mg/kg	1.233	94.436	mg/kg	0.00944 %	✓	
		016-002-00-X	244-214-4	21109-95-5									
40		coronene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-881-7	191-07-1									
41		monohydric phenols				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
				P1186									
										Total:	0.182 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: BH04-07/09/2022-0.4

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.4	3	5
2	LOI (loss on ignition)	%	10	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	8.4	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	0.013	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.0079	0.5	2
10	barium	mg/kg	<0.05	20	100
11	cadmium	mg/kg	<0.0011	0.04	1
12	chromium	mg/kg	<0.005	0.5	10
13	copper	mg/kg	0.016	2	50
14	mercury	mg/kg	<0.0005	0.01	0.2
15	molybdenum	mg/kg	0.045	0.5	10
16	nickel	mg/kg	0.0093	0.4	10
17	lead	mg/kg	<0.005	0.5	10
18	antimony	mg/kg	0.0052	0.06	0.7
19	selenium	mg/kg	<0.005	0.1	0.5
20	zinc	mg/kg	<0.025	4	50
21	chloride	mg/kg	<10	800	15,000
22	fluoride	mg/kg	2.4	10	150
23	sulphate	mg/kg	<10	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	1200	4,000	60,000

Key

User supplied data

Classification of sample: BH04-07/09/2022-2.0

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH04-07/09/2022-2.0
Sample Depth:
2.0 m
Moisture content:
14%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	13.626 mg/kg	0.00136 %	✓	
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.67 mg/kg	3.22	1.855 mg/kg	0.000186 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.68 mg/kg	1.142	0.668 mg/kg	0.0000668 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		28 mg/kg	1.462	35.194 mg/kg	0.00352 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28 mg/kg	1.126	27.111 mg/kg	0.00271 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	27 mg/kg	1.56	36.219 mg/kg	0.00232 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		1.8 mg/kg	1.5	2.322 mg/kg	0.000232 %	✓	
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39 mg/kg	2.976	99.824 mg/kg	0.00998 %	✓	
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		0.9 mg/kg	2.554	1.977 mg/kg	0.000198 %	✓	
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		52 mg/kg	2.774	124.06 mg/kg	0.0124 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
20		pH			PH		8.6	pH		8.6	pH	8.6 pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
26		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
27		fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
28		pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
30		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
34		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
36		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
37		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38		sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		1.2	mg/kg		1.032	mg/kg	0.000103 %	✓	
39		barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		73	mg/kg	1.233	77.439	mg/kg	0.00774 %	✓	
40		coronene		205-881-7	191-07-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
41		monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
											Total:	0.0415 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: BH04-07/09/2022-2.0

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample FAILS the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.2	3	5
2	LOI (loss on ignition)	%	3.4	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	8.6	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	0.009	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.033	0.5	2
10	barium	mg/kg	0.059	20	100
11	cadmium	mg/kg	<0.0011	0.04	1
12	chromium	mg/kg	0.033	0.5	10
13	copper	mg/kg	0.063	2	50
14	mercury	mg/kg	<0.0005	0.01	0.2
15	molybdenum	mg/kg	0.017	0.5	10
16	nickel	mg/kg	0.038	0.4	10
17	lead	mg/kg	0.1	0.5	10
18	antimony	mg/kg	0.067	0.06	0.7
19	selenium	mg/kg	<0.005	0.1	0.5
20	zinc	mg/kg	<0.025	4	50
21	chloride	mg/kg	13	800	15,000
22	fluoride	mg/kg	3.4	10	150
23	sulphate	mg/kg	11	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	670	4,000	60,000

Key

	User supplied data
	Inert WAC criteria fail

Classification of sample: BH01-08/09/2022-0.40

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH01-08/09/2022-0.40
Sample Depth:
0.40 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18 mg/kg	1.32	21.152 mg/kg	0.00212 %	✓	
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.87 mg/kg	3.22	2.493 mg/kg	0.000249 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1 mg/kg	1.142	1.017 mg/kg	0.000102 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29 mg/kg	1.462	37.723 mg/kg	0.00377 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		32 mg/kg	1.126	32.065 mg/kg	0.00321 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	24 mg/kg	1.56	33.318 mg/kg	0.00214 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.08 mg/kg	1.353	0.0964 mg/kg	0.00000964 %	✓	
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.9 mg/kg	1.5	3.872 mg/kg	0.000387 %	✓	
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		40 mg/kg	2.976	105.955 mg/kg	0.0106 %	✓	
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1.7 mg/kg	2.554	3.864 mg/kg	0.000386 %	✓	
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		49 mg/kg	2.774	120.981 mg/kg	0.0121 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
20		pH			PH		8.7	pH		8.7	pH	8.7 pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		0.15	mg/kg		0.134	mg/kg	0.0000134 %	✓	
26		anthracene		204-371-1	120-12-7		0.37	mg/kg		0.329	mg/kg	0.0000329 %	✓	
27		fluoranthene		205-912-4	206-44-0		0.28	mg/kg		0.249	mg/kg	0.0000249 %	✓	
28		pyrene		204-927-3	129-00-0		0.5	mg/kg		0.445	mg/kg	0.0000445 %	✓	
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.6	mg/kg		1.424	mg/kg	0.000142 %	✓	
30		chrysene	601-048-00-0	205-923-4	218-01-9		1.9	mg/kg		1.691	mg/kg	0.000169 %	✓	
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.7	mg/kg		1.513	mg/kg	0.000151 %	✓	
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.6	mg/kg		1.424	mg/kg	0.000142 %	✓	
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.6	mg/kg		1.424	mg/kg	0.000142 %	✓	
34		indeno[123-cd]pyrene		205-893-2	193-39-5		1.6	mg/kg		1.424	mg/kg	0.000142 %	✓	
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		2	mg/kg		1.78	mg/kg	0.000178 %	✓	
36		benzo[ghi]perylene		205-883-8	191-24-2		1.7	mg/kg		1.513	mg/kg	0.000151 %	✓	
37		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38		sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
39		barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		76	mg/kg	1.233	83.434	mg/kg	0.00834 %	✓	
40		coronene		205-881-7	191-07-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
41		monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
											Total:	0.0454 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: BH01-08/09/2022-0.40

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample FAILS the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.49	3	5
2	LOI (loss on ignition)	%	8.3	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	15	100	-
7	pH	pH	8.7	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	0.025	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.002	0.5	2
10	barium	mg/kg	<0.05	20	100
11	cadmium	mg/kg	<0.0011	0.04	1
12	chromium	mg/kg	<0.005	0.5	10
13	copper	mg/kg	<0.005	2	50
14	mercury	mg/kg	<0.0005	0.01	0.2
15	molybdenum	mg/kg	0.023	0.5	10
16	nickel	mg/kg	<0.005	0.4	10
17	lead	mg/kg	<0.005	0.5	10
18	antimony	mg/kg	<0.005	0.06	0.7
19	selenium	mg/kg	<0.005	0.1	0.5
20	zinc	mg/kg	<0.025	4	50
21	chloride	mg/kg	<10	800	15,000
22	fluoride	mg/kg	1.1	10	150
23	sulphate	mg/kg	<10	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	12000	4,000	60,000

Key

	User supplied data
	Inert WAC criteria fail

Classification of sample: BH02-08/09/2022-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH02-08/09/2022-0.30
Sample Depth:
0.30 m
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2 mg/kg	1.197	<2.394 mg/kg	<0.000239 %		<**LOD**
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17 mg/kg	1.32	19.752 mg/kg	0.00198 %	✓	
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.85 mg/kg	1.142	0.854 mg/kg	0.0000854 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		33 mg/kg	1.462	42.444 mg/kg	0.00424 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		33 mg/kg	1.126	32.696 mg/kg	0.00327 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	19 mg/kg	1.56	26.08 mg/kg	0.00167 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.09 mg/kg	1.353	0.107 mg/kg	0.0000107 %	✓	
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.9 mg/kg	1.5	3.828 mg/kg	0.000383 %	✓	
11	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		42 mg/kg	2.976	110.003 mg/kg	0.011 %	✓	
12	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1.7 mg/kg	2.554	3.821 mg/kg	0.000382 %	✓	
13	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		53 mg/kg	2.774	129.386 mg/kg	0.0129 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
20		pH			PH		8.6	pH		8.6	pH	8.6 pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
26		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
27		fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
28		pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
30		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
34		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
36		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
37		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38		sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
39		barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		82	mg/kg	1.233	89.009	mg/kg	0.0089 %	✓	
40		coronene		205-881-7	191-07-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
41		monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
											Total:	0.0457 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: BH02-08/09/2022-0.30

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1	3	5
2	LOI (loss on ignition)	%	6.6	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	8.6	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.014	0.5	2
10	barium	mg/kg	0.08	20	100
11	cadmium	mg/kg	<0.0011	0.04	1
12	chromium	mg/kg	0.013	0.5	10
13	copper	mg/kg	0.032	2	50
14	mercury	mg/kg	<0.0005	0.01	0.2
15	molybdenum	mg/kg	0.016	0.5	10
16	nickel	mg/kg	0.012	0.4	10
17	lead	mg/kg	<0.005	0.5	10
18	antimony	mg/kg	<0.005	0.06	0.7
19	selenium	mg/kg	0.0063	0.1	0.5
20	zinc	mg/kg	0.038	4	50
21	chloride	mg/kg	44	800	15,000
22	fluoride	mg/kg	4.4	10	150
23	sulphate	mg/kg	<10	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	72	500	800
26	TDS (total dissolved solids)	mg/kg	840	4,000	60,000

Key

User supplied data

Appendix A: Classifier defined and non EU CLP determinands

- **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

EU CLP index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

EU CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

EU CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
29 Sep 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

barium sulphide (EC Number: 244-214-4, CAS Number: 21109-95-5)

EU CLP index number: 016-002-00-X
Description/Comments:
Additional Hazard Statement(s): EUH031 >= 0.8 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source: http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2; H371

monohydric phenols (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides.

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide.

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide]

sulfur {sulfur}

chemtest reports Elemental sulfur using this CAS

barium {barium sulphide}

No Cr VI in samples therefore worst case scenario not applicable.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1.NI - Jan 2021
HazWasteOnline Classification Engine Version: 2022.263.5340.9974 (20 Sep 2022)
HazWasteOnline Database: 2022.273.5362.10003 (03 Oct 2022)

This classification utilises the following guidance and legislation:
WM3 v1.1.NI - Waste Classification - 1st Edition v1.1.NI - Jan 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
17th ATP - Regulation (EU) 2021/849 of 11 March 2021
18th ATP - Regulation (EU) 2022/692 of 16 February 2022