



**CAUSEWAY**  
— GEOTECH

## **Dan Breen House – Ground Investigation**

**Client:** Tipperary County Council

**Report No.:** 23-0766

**Date:** July 2023

**Status:** Final for Issue



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Document Control Sheet

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## Document Control Sheet

<b>Report No.:</b>		23-0766			
<b>Project Title:</b>		Dan Breen House			
<b>Client:</b>		Tipperary County Council			
<b>Revision:</b>	A00	<b>Status:</b>	Final for Issue	<b>Issue Date:</b>	11 <sup>th</sup> July 2023
<b>Prepared by:</b>		<b>Reviewed by:</b>		<b>Approved by:</b>	
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The works were conducted in accordance with:

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 $N \times 5 = C_u$ 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.

## **Dan Breen House**

### **1 AUTHORITY**

On the instructions of Tipperary 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 extension to the current building.

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 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, foundation inspection 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 the site of the existing Dan Breen House site located in Tipperary Town, Co. Tipperary. The site is bounded by Davis Street to the east, James Street to the south, a private dwelling to the west and Tipperary Road to the north. Works were conducted on the hardstanding areas around the existing house.

## 4 SITE OPERATIONS

### 4.1 Summary of site works

Site operations, which were conducted between the 8<sup>th</sup> and 13<sup>th</sup> June 2023, comprised:

- two boreholes by dynamic (windowless) sampling
- one machine dug trial pit
- nine machine and hand dug foundation inspection pits

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

### 4.2 Boreholes

Two boreholes (BH01-BH02) were put down to completion by light percussion boring techniques using a Dando Terrier 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 2.90m and 3.30m where they were terminated on encountering virtual refusal.

Disturbed (bulk and small bag) samples were taken within the encountered strata. Environmental samples were taken at standard intervals, as directed by the Client Representative. Undisturbed samples were not taken due to the granular nature of the strata.

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<sub>(s)</sub>) or solid cone attachment (SPT<sub>(c)</sub>). 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 J.

Groundwater was not encountered during drilling any either borehole location. Details of the water strikes are presented on the individual borehole logs.

Appendix B presents the borehole logs.

### 4.3 Trial Pit

One trial pit (TP09) was excavated using a 3t tracked excavator fitted with a 300mm wide bucket, to a depth of 2.50m.

Environmental samples were taken at depths of 0.50 and 1.00m in the trial pit.

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

Groundwater was not encountered during excavation of the pit. 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 Foundation inspection pits

Nine foundation inspection pits (TP01-TP08 and TP10) were excavated using a 3t tracked excavator fitted with a 300mm wide bucket, to a maximum depth of 2.00m, in order to determine the depths, dimensions and conditions of any existing foundations.

Environmental samples were taken at depths of 0.50 and 1.00m in each trial pit.

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

Groundwater was not encountered during excavation of the pit. The stability of the trial pit walls was noted on completion.

Drawings of the pits showing the depths and dimensions of any foundations encountered during excavation are shown along with the pit logs in Appendix E, with photographs presented in Appendix F.

## 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 and particle size distribution analysis.
- **soil chemistry:** pH and water soluble sulphate content

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 SUEZ (DETS North) at its laboratory in Consett, Durham.

Rilta suite of analysis was carried out on several 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
- Volatile Organic Compounds (VOCs)
- Semi-Volatile Organic Compounds (SVOCs)
- Polychlorinated biphenyls (PCBs)
- Phenols
- Organic matter
- Total Organic Carbon (TOC)
- Cyanides
- Asbestos screen
- Sulphate and sulphide
- Sulphur
- Phosphate
- Calcium
- pH
- Waste acceptance criteria (WAC)

Results of environmental laboratory testing are presented in Appendix H.

A waste classification report was compiled analysing results of the above testing. The report is presented in Appendix J.

## 6 GROUND CONDITIONS

### 6.1 General geology of the area

Published geological mapping indicate the superficial deposits underlying the site comprise made ground and fluvioglacial deposits. These deposits are underlain by shaley cherty limestone of the Athassel 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:

- **Paved surface:** TP05 and BH01 encountered 50-150mm of bitmac surfacing
- **Made Ground (sub-base):** approximately 100-550mm of aggregate fill beneath the paved surface in TP05 and BH01.
- **Made Ground (fill):** reworked gravelly clayey/silty sand, sandy silty gravel and sandy gravelly clay encountered across the site to a maximum depth of 1.25m in TP10. Varying amounts of concrete, steel, red brick and slate fragments and cloth in TP01, TP04, TP07, TP08 and BH02
- **Fluvioglacial deposits:** typically medium dense sands and gravels encountered across the site beneath made ground.

### 6.3 Groundwater

Groundwater was not noted during drilling at any of the borehole locations. However, it should be noted that the casing used in supporting the borehole walls during drilling may have sealed out any groundwater strikes and the possibility of encountering groundwater during excavation works should not be ruled out.

Groundwater was not noted during excavation of any of the trial pits.

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

## 7 DISCUSSION

### 7.1 Proposed construction

It is proposed to construct an extension to the current building with associated infrastructure.

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 medium dense granular deposits 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,  $\phi$ , 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	100	Medium dense SAND	Strip & pad	Ground bearing**	Not encountered
BH02	1.20m	110	Medium dense SAND	Strip & pad	Ground bearing**	Not encountered

\*Existing Ground Level

\*\*Providing made ground present is excavated and replaced with suitable engineered fill

Based on the findings of the ground investigation, spread foundations (strip/pad) are considered suitable with estimated allowable bearing pressures between 100kPa and 110kPa at depths of 1.20m on medium dense granular deposits.

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

Given the predominance of granular strata, and the findings of the trial pit excavations (most of which were found to be unstable), excavations for foundations are not likely to be stable. Where space allows, 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 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 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 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.

### 7.3 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 the site are suitable for disposal as Inert waste to an appropriate licenced facility with the exception of the below samples shown in Table 2, below.

**Table 2 Samples where Non-Haz WAC are exceeded**

GI Ref	Determinant Failure	Comment
TP05 0.40m	-Chromium (1.2mg/kg) exceeds Inert WAC (0.5mg/kg)	Exceeds Inert WAC, suitable for disposal as non-hazardous waste.

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 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 (2005) BRE Special Digest 1, Concrete in aggressive ground.

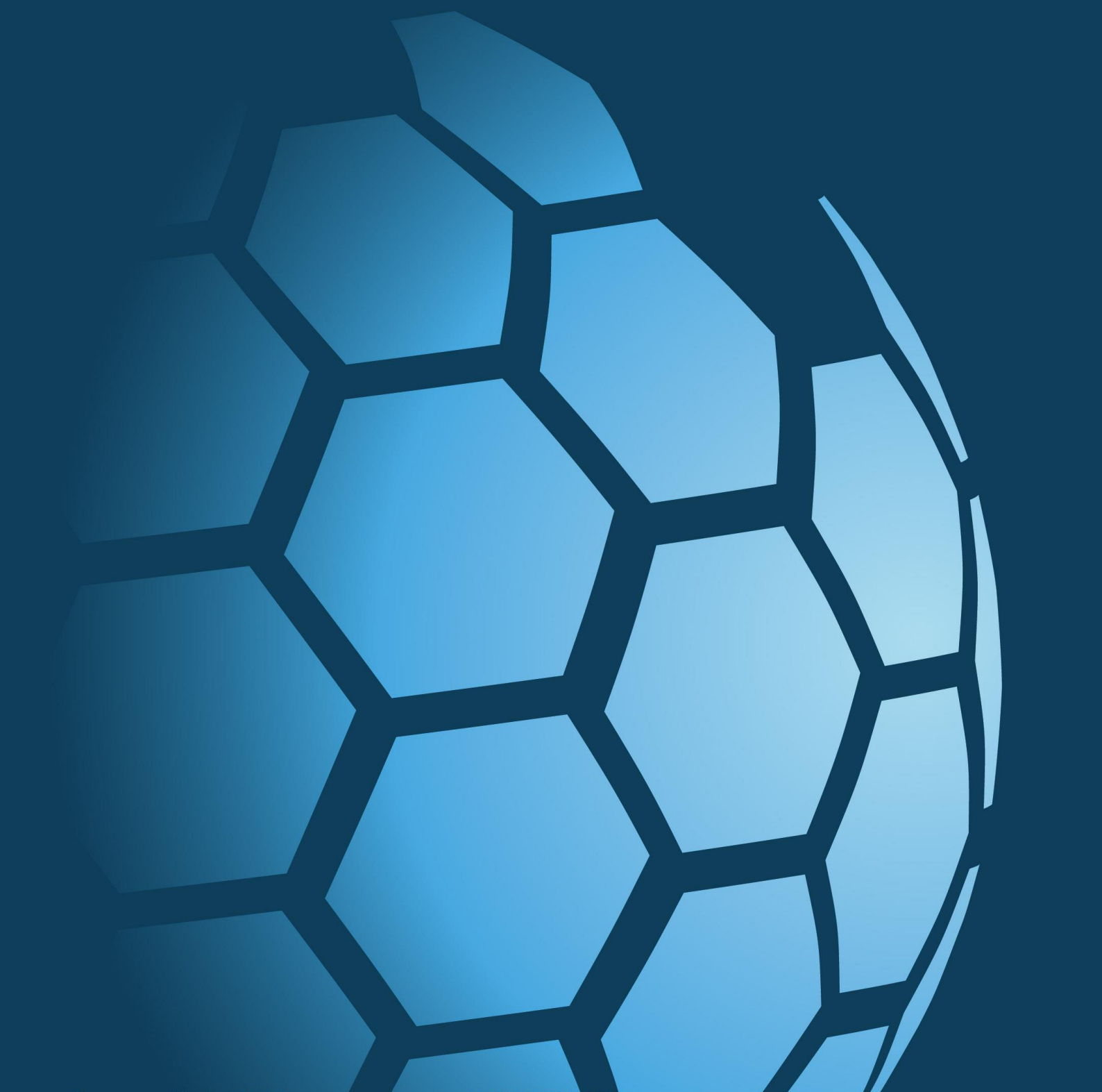
Building Research Establishment (2007), BRE Digest 365: Soakaways.

Land contamination risk management (LCRM), (2020) Environment Agency.



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**APPENDIX A**  
**SITE AND EXPLORATORY HOLE LOCATION PLANS**





**Project No.:** 23-0766

**Client:** Tipperary County Council

**Project Name:** Dan Breen House Project

**Client's Representative:**

Legend Key



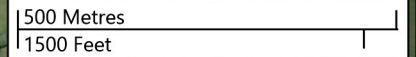
**Title:**  
Site Location Plan

**Last Revised:**  
11/07/2023

**Scale:**  
1:10000



Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation





**Project No.:** 23-0766

**Client:** Tipperary County Council

**Project Name:** Dan Breen House Project

**Client's Representative:**

**Legend Key**

- Locations By Type - DS
- Locations By Type - TP



**Title:**  
Exploratory Hole Location Plan

**Last Revised:**  
11/07/2023

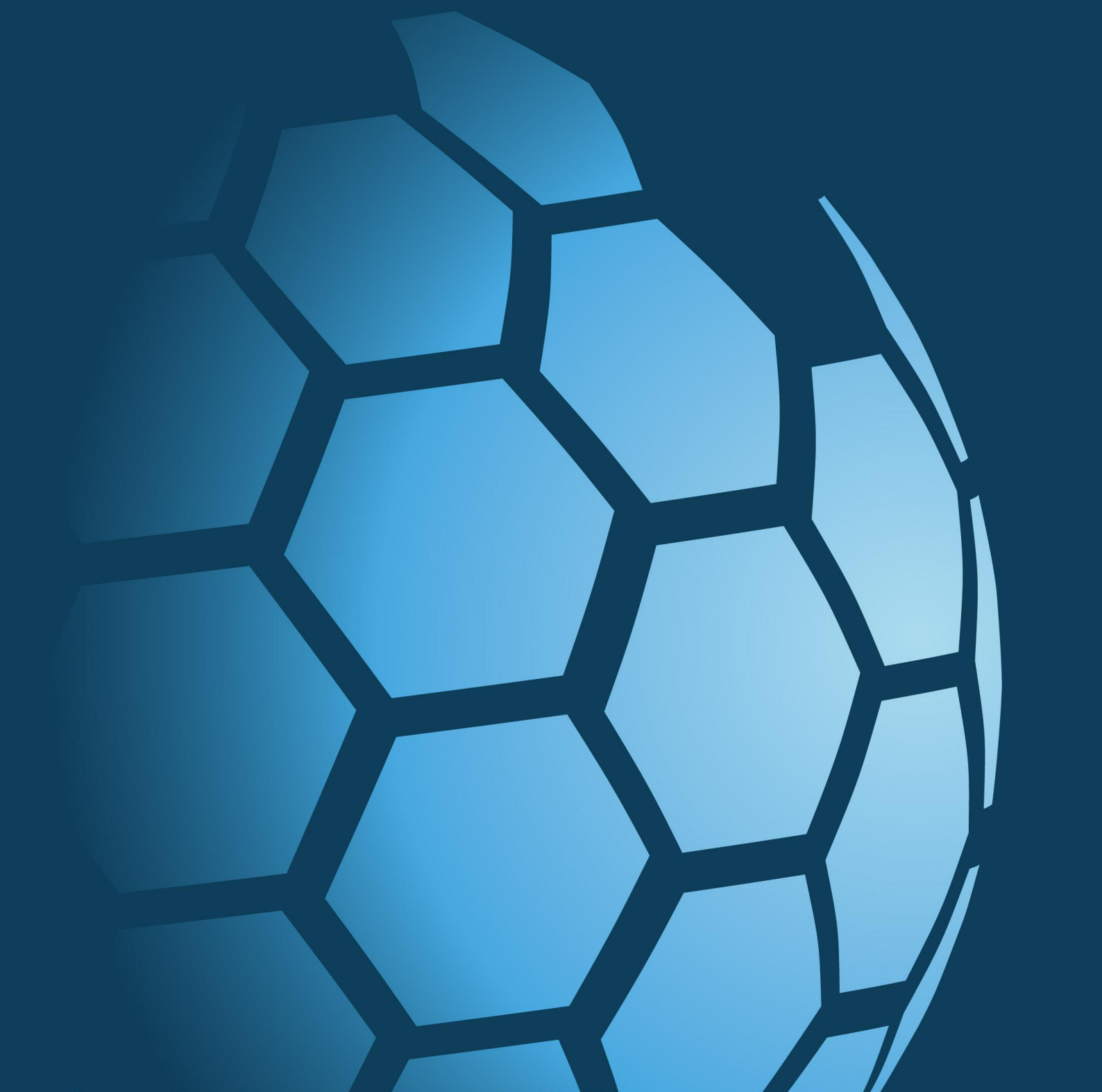
**Scale:**  
1:500

20 Metres  
80 Feet



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**APPENDIX B**  
**BOREHOLE LOGS**





<b>Method</b> Dynamic Sampling	<b>Plant Used</b> Premier 110	<b>Top (m)</b> 0.00	<b>Base (m)</b> 2.90	<b>Coordinates</b> 588861.44 E 636058.27 N	<b>Final Depth:</b> 2.90 m	<b>Start Date:</b> 13/06/2023	<b>Driller:</b> JD	Sheet 1 of 1 Scale: 1:50
					<b>Elevation:</b> mOD	<b>End Date:</b> 13/06/2023	<b>Logger:</b> SR	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
0.15						0.15		BITMAC		
0.50	B3					0.50		MADE GROUND: Dense brown sandy subangular to subrounded fine to coarse. SAND is fine to coarse.		
0.50	D7					0.70		Brown gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.		
0.50	ES1					1.20		Medium dense brown very gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to medium.		
1.00	B4									
1.00	D8									
1.00	ES2									
1.20 - 2.00	B5	N=10 (1,1/2,3,2,3)								
1.20 - 1.65	SPT (S)									
2.00 - 2.90	B6	N=13 (1,1/5,6,2,0)								
2.00 - 2.45	SPT (S)									
2.90 - 2.98	SPT (S)	50 (25 for 75mm/50 for 0mm)				2.90		End of Borehole at 2.90m		

Water Strikes				Casing Details		Remarks
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	To (m)	Diameter	
						Hand dug inspection pit excavated to 1.20m. No groundwater encountered.
<b>Termination Reason</b>						<b>Last Updated</b>
Terminated on refusal.						11/07/2023





**Project No.**  
**23-0766**

**Project Name:** Dan Breen House Project

**Client:** Tipperary County Council

**Client's Rep:**

**Borehole ID**  
**BH02**

<b>Method</b> Dynamic Sampling	<b>Plant Used</b> Premier 110	<b>Top (m)</b> 0.00	<b>Base (m)</b> 3.30	<b>Coordinates</b> 588833.23 E 636069.78 N	<b>Final Depth:</b> 3.30 m	<b>Start Date:</b> 13/06/2023	<b>Driller:</b> JD	Sheet 1 of 1 Scale: 1:50
					<b>Elevation:</b> mOD	<b>End Date:</b> 13/06/2023	<b>Logger:</b> SR	FINAL

Depth (m)	Sample / Tests	Field Records	Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
0.20						0.20		MADE GROUND: Grey sandy silty angular fine to medium GRAVEL. Sand is fine to coarse.		
0.50	B3					0.50		MADE GROUND: Brown gravelly fine to coarse SAND with fragments of brick and slate. Gravel is subangular to subrounded fine to coarse.		
0.50	D7							Brown gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.		
0.50	ES1									
1.00	B4					1.20		Medium dense brown gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.		
1.00	D8									
1.00	ES2									
1.20 - 2.20	B5	N=11 (1,3/2,2,3,4)								
1.20 - 1.65	SPT (S)									
2.00 - 2.45	SPT (S)	N=10 (1,0/1,2,3,4)	2.00							
2.20 - 3.00	B6									
3.00 - 3.45	SPT (S)	N=50 (5,5/7,12,31,0)	2.00			2.70		Medium dense becoming dense brown slightly gravelly slightly silty fine to coarse SAND. Gravel is subrounded fine to medium.		
						3.30		End of Borehole at 3.30m		

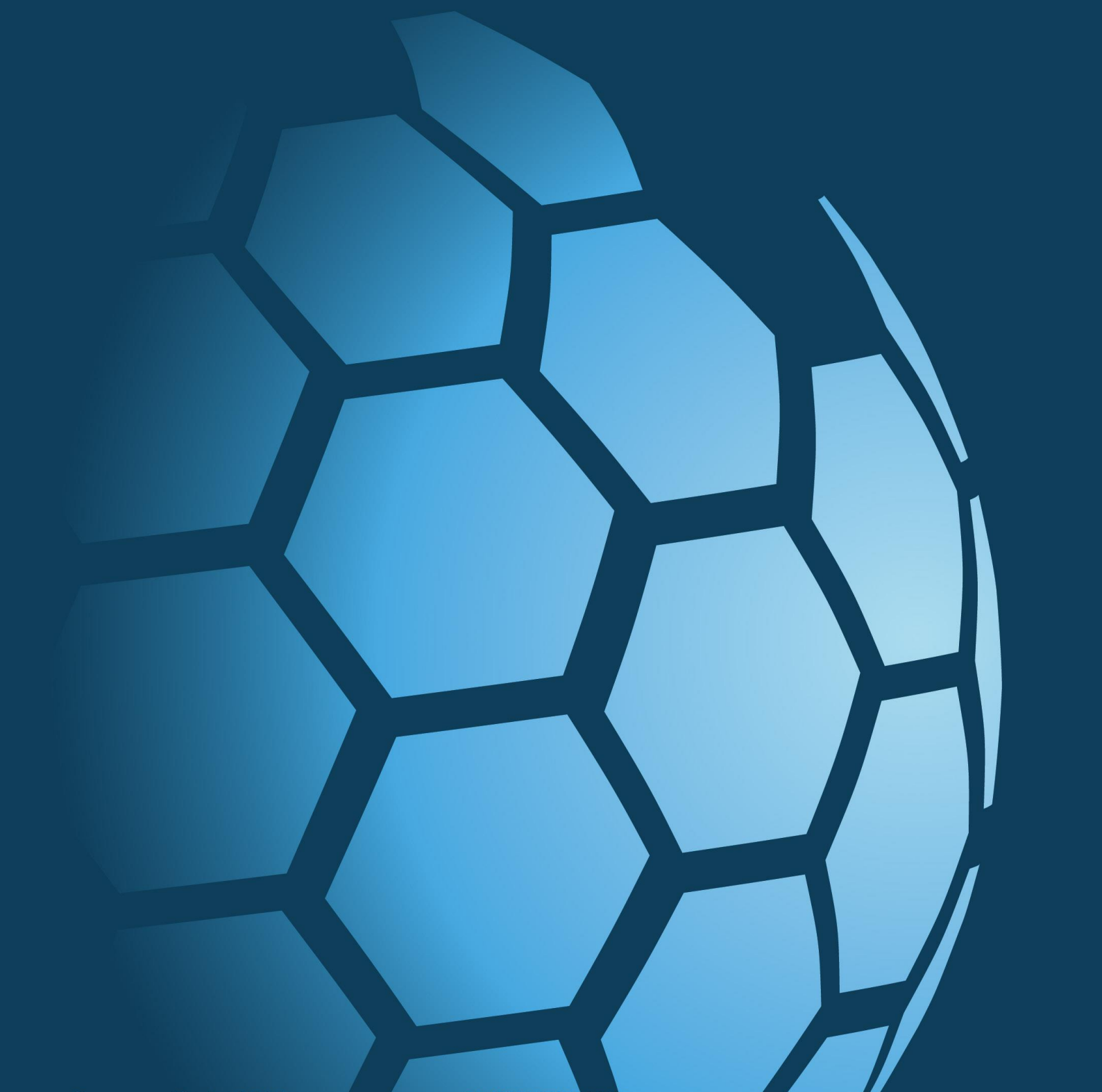
Water Strikes				Casing Details		Remarks
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	To (m)	Diameter	
						Hand dug inspection pit excavated to 1.20m. No groundwater encountered.
<b>Termination Reason</b>						<b>Last Updated</b>
Terminated on refusal.						11/07/2023





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**APPENDIX C**  
**TRIAL PIT LOGS**





<b>Project No.</b> 23-0766	<b>Project Name:</b> Dan Breen House Project	<b>Trial Pit ID</b>  <b>TP09</b>
<b>Coordinates</b> 588834.52 E 636076.87 N	<b>Client:</b> Tipperary County Council	
<b>Method:</b> Trial Pitting	<b>Client's Representative:</b>	Sheet 1 of 1 Scale: 1:25
<b>Plant:</b> 3t Tracked Excavator	<b>Elevation</b> mOD	<b>Date:</b> 08/06/2023
		<b>Logger:</b> RS
		<b>FINAL</b>

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1			0.05		MADE GROUND: Grey sandy silty angular fine to medium GRAVEL. Sand is fine to coarse.	
				0.35		MADE GROUND: Dark brown sandy very clayey subrounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are subrounded.	
1.00 1.00	B3 ES2			0.90		MADE GROUND: Brown very gravelly very silty fine to coarse SAND with low cobble content. and rare brick fragments. Gravel is rounded fine to coarse. Cobbles are rounded.	
2.00	B4			2.50		Brown very sandy silty subrounded fine to medium GRAVEL with low cobble content. Sand is fine to coarse fine to coarse. Cobbles are rounded.	
						End of trial pit at 2.50m	

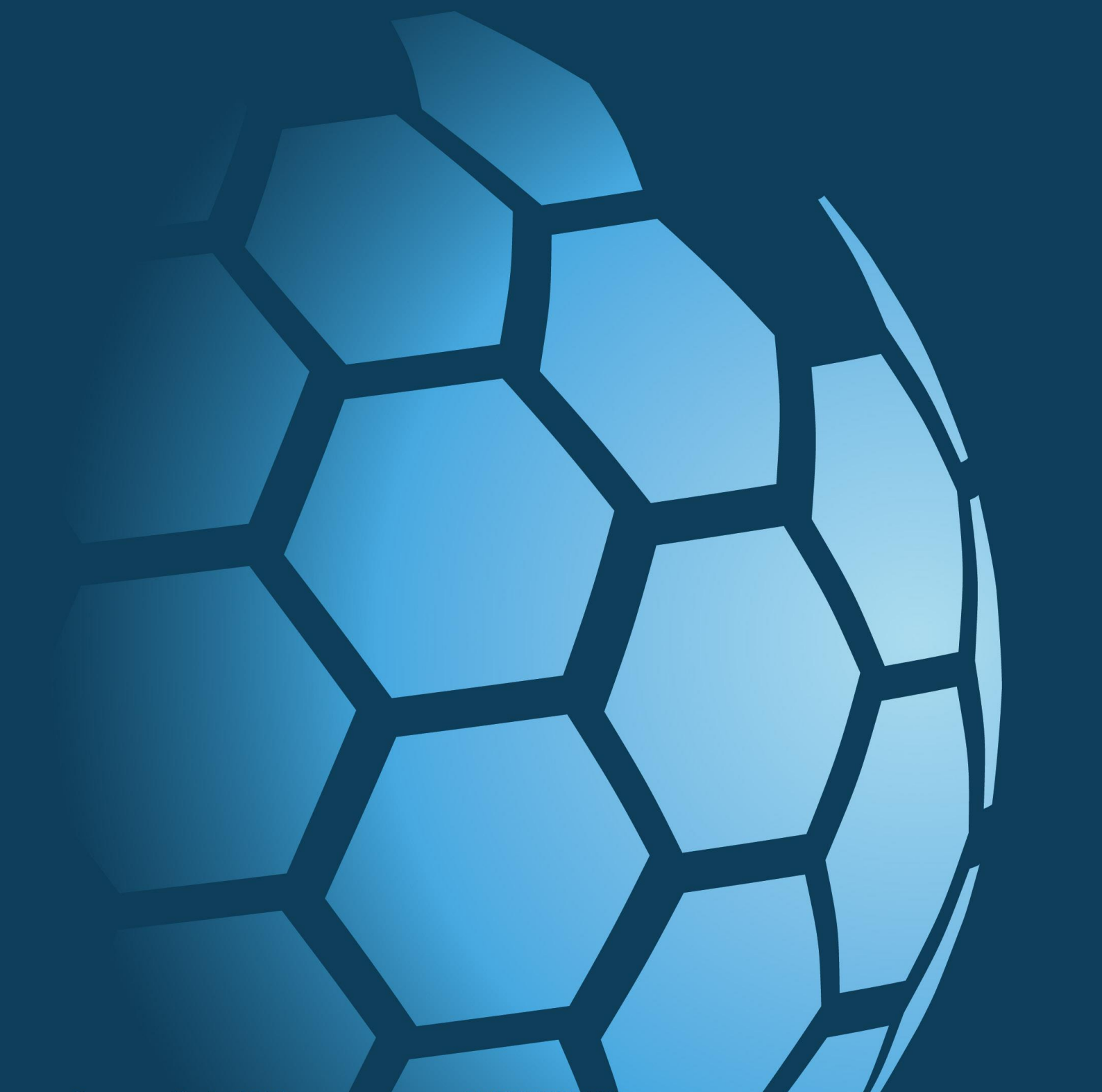
<b>Water Strikes</b>		<b>Depth:</b> 2.50 <b>Width:</b> 2.50 <b>Length:</b> 2.00	<b>Remarks:</b> No groundwater encountered.
Struck at (m)	Remarks		
		<b>Stability:</b> Unstable	<b>Termination Reason</b> Terminated at scheduled depth.
		<b>Last Updated</b> 11/07/2023	



**CAUSEWAY**  
— GEOTECH

**APPENDIX D**

**TRIAL PIT PHOTOGRAPHS**





TP09



TP09



TP09



TP09



TP09



**TP09**



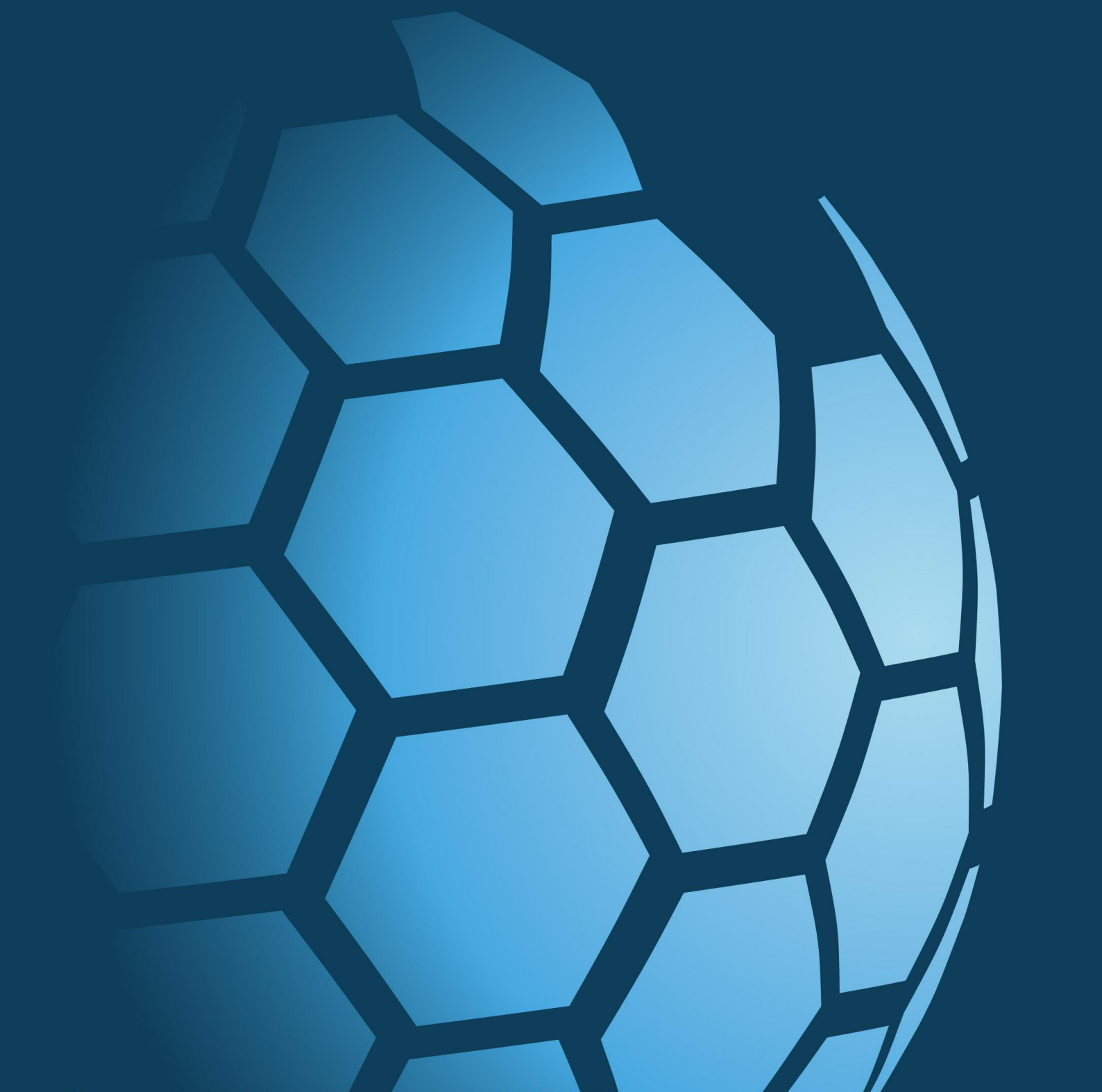
**TP09**



**CAUSEWAY**  
— GEOTECH

**APPENDIX E**

**FOUNDATION INSPECTION PIT SKETCHES AND LOGS**





**Project No.**  
23-0766

**Project Name:**  
Dan Breen House Project

**Trial Pit ID**

**Coordinates**

**Client:**  
Tipperary County Council

**TP01**

588858.85 E  
636040.46 N

**Client's Representative:**

Sheet 1 of 1  
Scale: 1:25

**Method:**

Foundation Inspection Pit

**Plant:**

3t Tracked Excavator

**Elevation**

mOD

**Date:**

09/06/2023

**Logger:**

RS

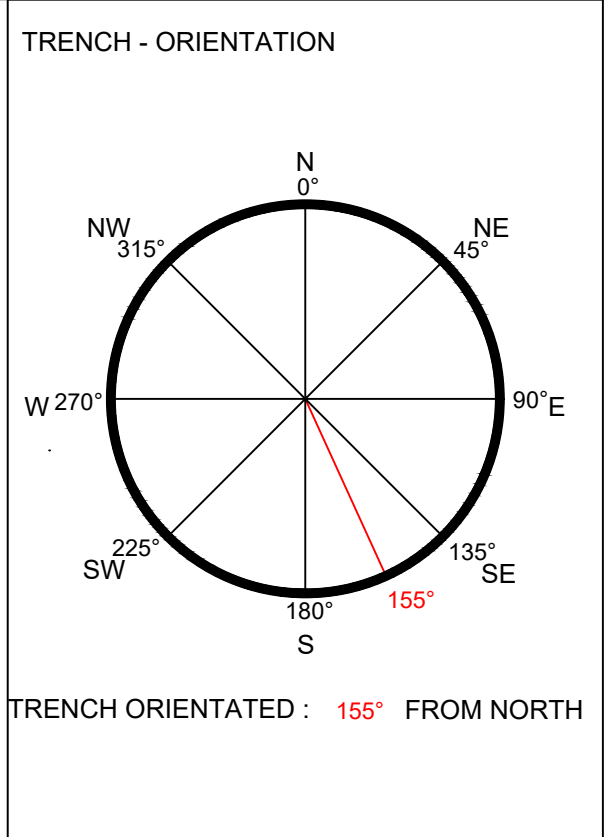
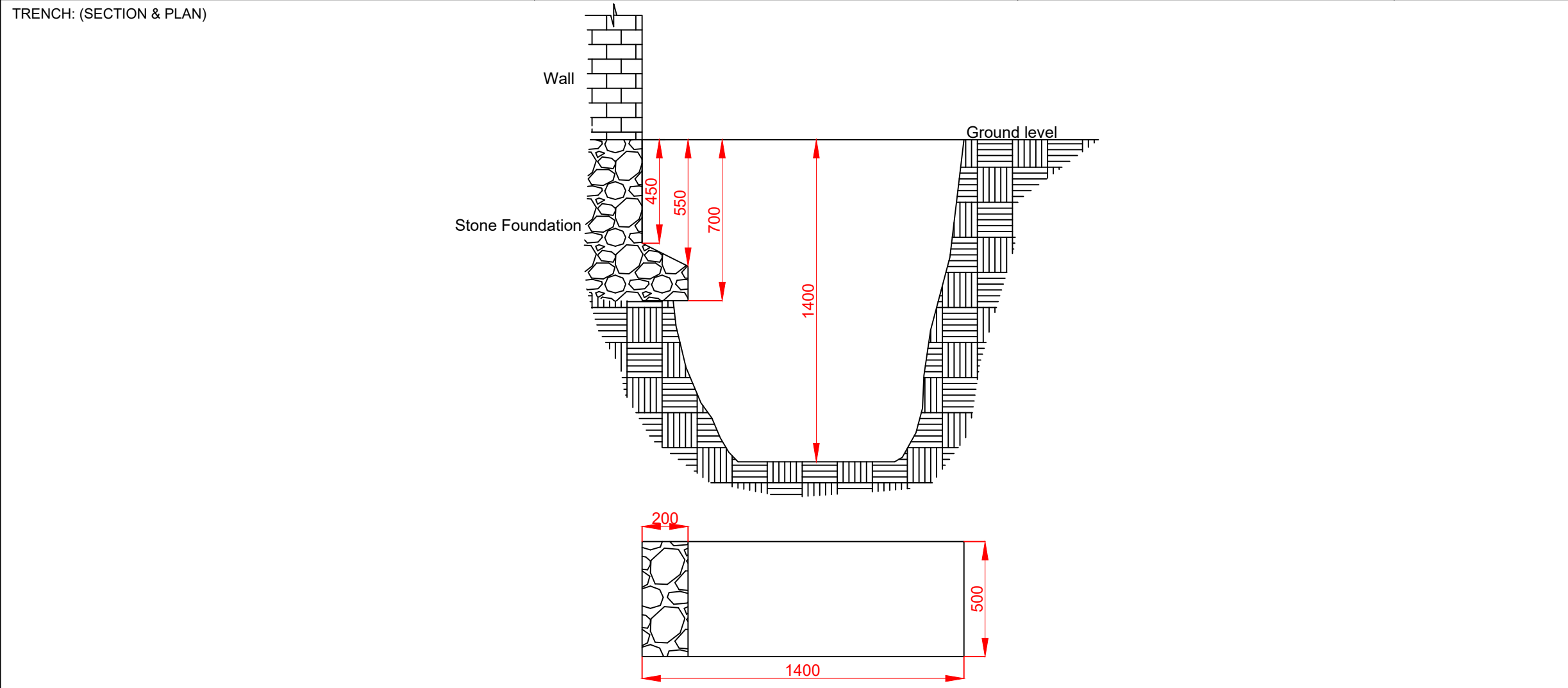
**FINAL**

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1					MADE GROUND: Brown slightly gravelly very clayey fine to coarse SAND. Gravel is subangular fine to coarse.	
1.00 1.00	B3 ES2					0.40-0.60m MADE GROUND: Light grey gravelly silty fine to coarse SAND with abundant concrete fragments. Gravel is angular fine to coarse.	
				1.20			
1.40	B4			1.40		Orangish brown silty fine to coarse SAND.	
				1.40		End of trial pit at 1.40m	

<b>Water Strikes</b>		<b>Depth:</b> 1.40 <b>Width:</b> 0.45 <b>Length:</b> 1.40	<b>Remarks:</b> No groundwater encountered.
Struck at (m)	Remarks		
		<b>Stability:</b> Moderately stable	<b>Termination Reason</b> Foundation exposed.
		<b>Last Updated</b> 11/07/2023	

JOB NUMBER: 23-0766      JOB NAME: Dan Breen House Project      LOCATION: TP01

CLIENT: Tipperary County Council      CLIENTS REPRESENTATIVE: Tipperary County Council      CREW: RS      PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools



COORDINATES: DATUM

EASTING: -  
 NORTHING: 787983.01  
 ELEVATION: 46.56

TRENCH LENGTH (m) : 1.40  
 TRENCH DEPTH (m) : 1.40  
 TRENCH WIDTH (m) : 0.50

STABILITY:  
 GROUNDWATER:

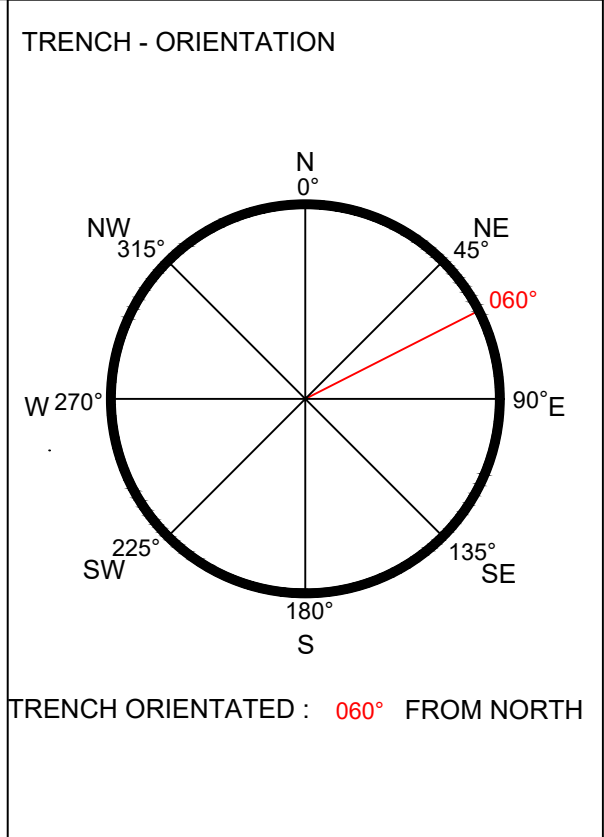
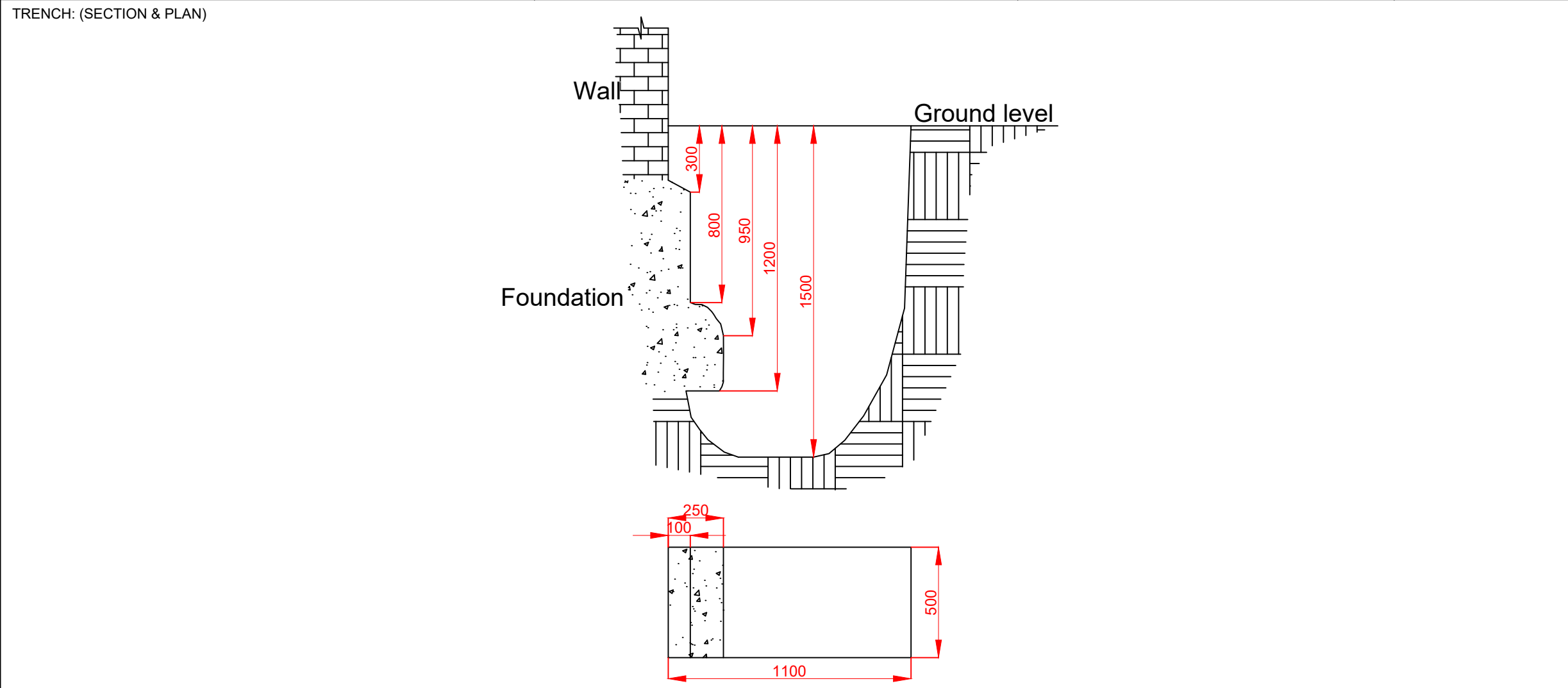
SCALE: NTS@A3  
 DRAWN: BS  
 CHECKED: SR  
 DATE EXCAVATED: 08/06/2023

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01					No services found
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					





JOB NUMBER: 23-0766	JOB NAME: Dan Breen House Project	LOCATION: TP02
CLIENT: Tipperary County Council	CLIENTS REPRESENTATIVE: Tipperary County Council	CREW: RS
		PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools



COORDINATES: DATUM

EASTING: -  
 NORTHING: -  
 ELEVATION: -

TRENCH LENGTH (m) : 1.10  
 TRENCH DEPTH (m) : 1.40  
 TRENCH WIDTH (m) : 0.50

STABILITY:  
 GROUNDWATER:

SCALE: NTS@A3  
 DRAWN: BS  
 CHECKED: SR  
 DATE EXCAVATED: 08/06/2023

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01					No services found
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					





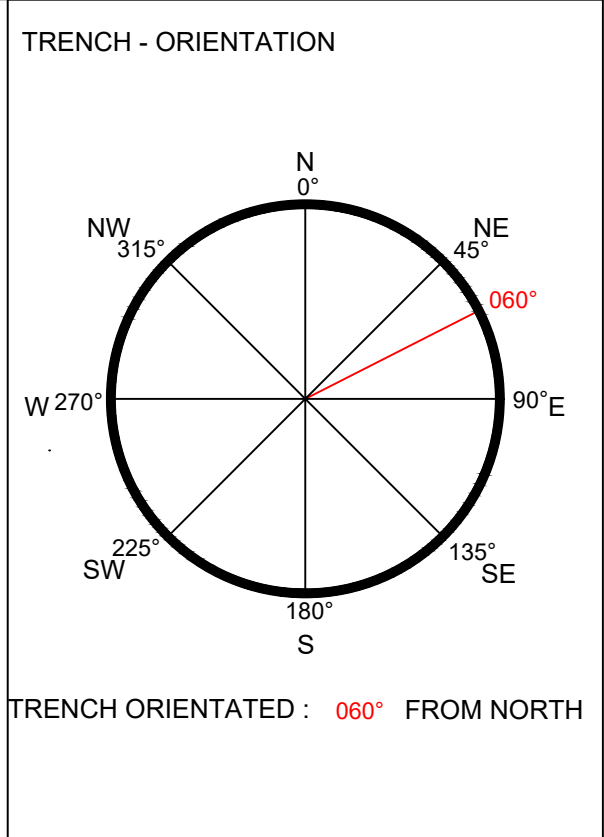
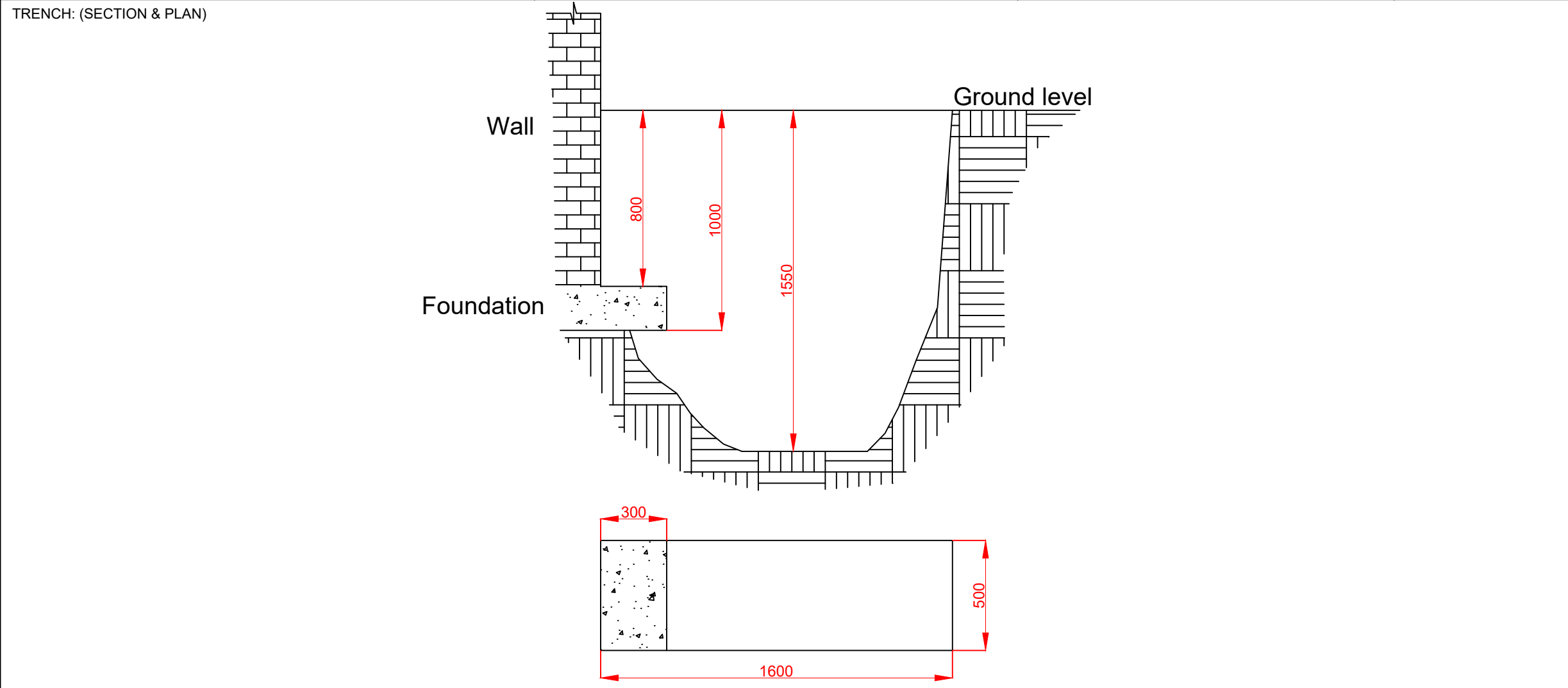
<b>Project No.</b> 23-0766	<b>Project Name:</b> Dan Breen House Project	<b>Trial Pit ID</b>  <b>TP03</b>
<b>Coordinates</b> 588852.71 E 636064.28 N	<b>Client:</b> Tipperary County Council	
<b>Method:</b> Foundation Inspection Pit	<b>Client's Representative:</b>	Sheet 1 of 1 Scale: 1:25
<b>Plant:</b> 3t Tracked Excavator	<b>Elevation</b> mOD	<b>Date:</b> 09/06/2023
		<b>Logger:</b> RS
		<b>FINAL</b>

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1			0.30		MADE GROUND: Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine to coarse.	
				0.90		MADE GROUND: Light brown slightly gravelly silty fine to coarse SAND with low boulder content. Gravel is subangular fine to coarse.	
1.00 1.00	B3 ES2			1.55		Light brown silty fine to coarse SAND.	
						End of trial pit at 1.55m	

<b>Water Strikes</b>		<b>Depth:</b> 1.55 <b>Width:</b> 0.30 <b>Length:</b> 1.60	<b>Remarks:</b> No groundwater encountered.
Struck at (m)	Remarks		
		<b>Stability:</b> Stable	<b>Termination Reason</b> Foundation exposed.
			<b>Last Updated</b> 11/07/2023



JOB NUMBER: 23-0766	JOB NAME: Dan Breen House Project	LOCATION: TP03
CLIENT: Tipperary County Council	CLIENTS REPRESENTATIVE: Tipperary County Council	CREW: RS
		PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools



COORDINATES: DATUM

EASTING: -  
 NORTHING: -  
 ELEVATION: -

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01					No services found
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					

TRENCH LENGTH (m) : 1.60  
 TRENCH DEPTH (m) : 1.55  
 TRENCH WIDTH (m) : 0.50

STABILITY:  
 GROUNDWATER:

SCALE: NTS@A3  
 DRAWN: BS  
 CHECKED: SR  
 DATE EXCAVATED: 08/06/2023





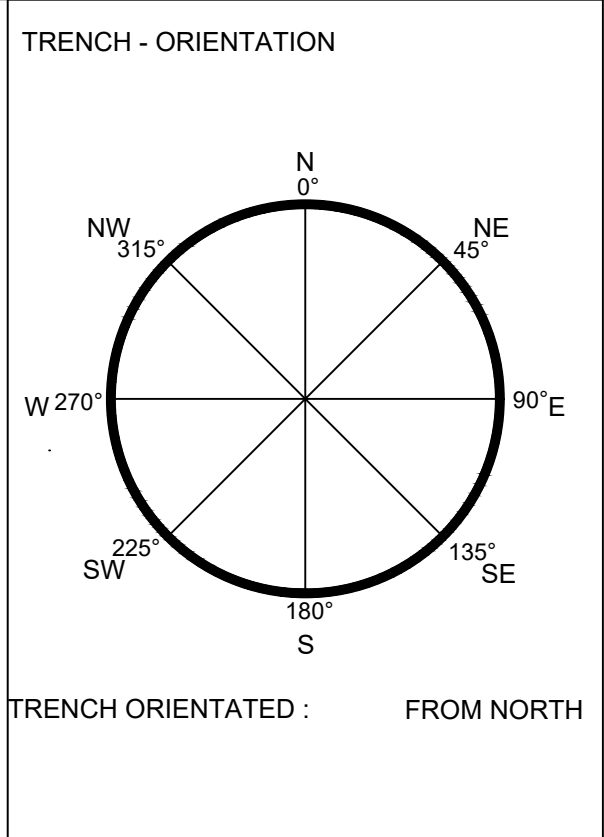
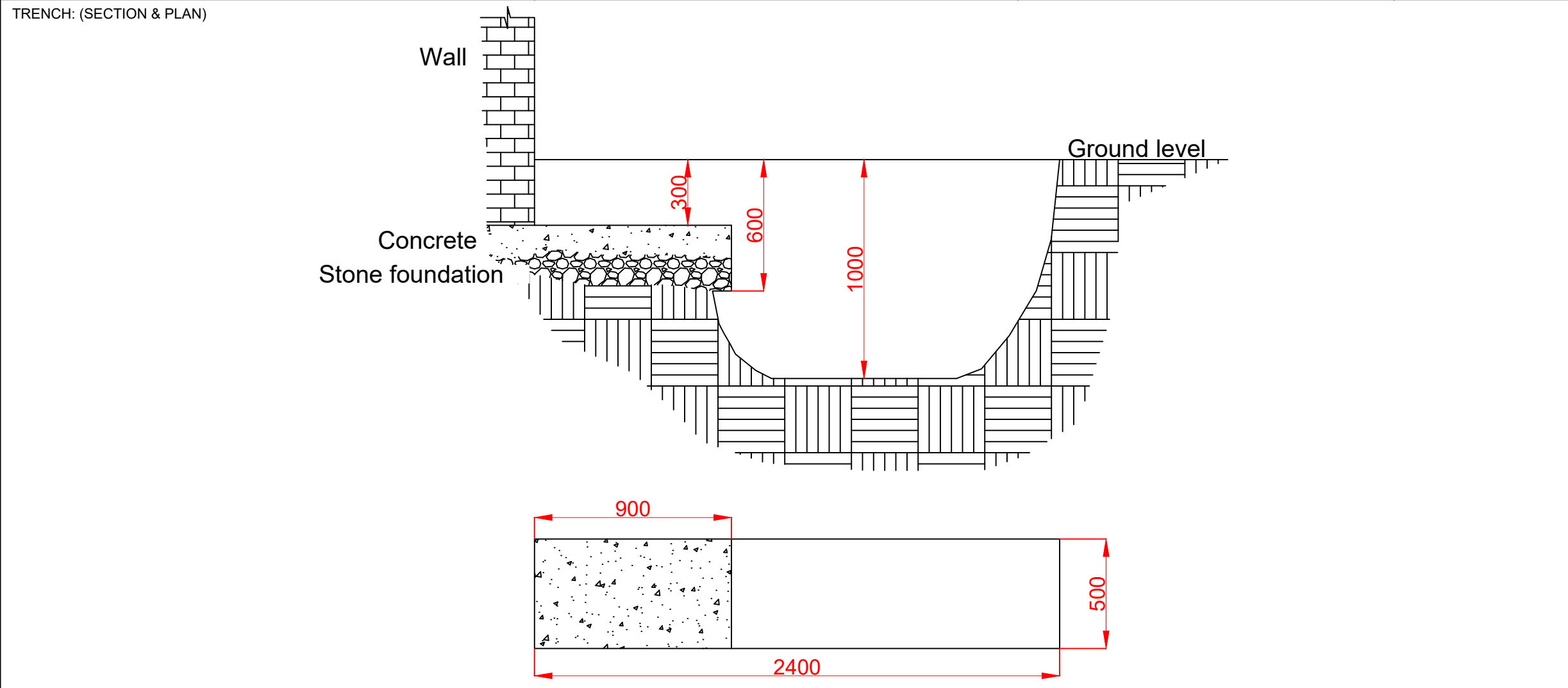
<b>Project No.</b> 23-0766	<b>Project Name:</b> Dan Breen House Project	<b>Trial Pit ID</b>  <b>TP04</b>
<b>Coordinates</b> 588857.76 E 636039.73 N	<b>Client:</b> Tipperary County Council	
<b>Method:</b> Foundation Inspection Pit	<b>Client's Representative:</b>	Sheet 1 of 1 Scale: 1:25
<b>Plant:</b> 3t Tracked Excavator	<b>Elevation</b> mOD	<b>Date:</b> 08/06/2023
		<b>Logger:</b> RS
		<b>FINAL</b>

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1			0.60		MADE GROUND: Stiff brown slightly sandy gravelly CLAY with low cobble content, rare steel fragments, sheets of cloth and concrete. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are angular.	
1.00	B3			1.00		Brown very gravelly very clayey fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subangular.	
1.00	ES2					End of trial pit at 1.00m	

<b>Water Strikes</b>		<b>Depth:</b> 1.00 <b>Width:</b> 0.50 <b>Length:</b> 2.40	<b>Remarks:</b> No groundwater encountered.
Struck at (m)	Remarks		
		<b>Stability:</b> Unstable	<b>Termination Reason</b> Foundation exposed.
		<b>Last Updated</b> 11/07/2023	

JOB NUMBER: 23-0766      JOB NAME: Dan Breen House Project      LOCATION: TP04

CLIENT: Tipperary County Council      CLIENTS REPRESENTATIVE: Tipperary County Council      CREW: RS      PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools



COORDINATES: DATUM

EASTING: -  
NORTHING: -  
ELEVATION: -

TRENCH LENGTH (m) : 2.40  
TRENCH DEPTH (m) : 1.00  
TRENCH WIDTH (m) : 0.50

STABILITY:  
GROUNDWATER:

SCALE: NTS@A3  
DRAWN: BS  
CHECKED: SR  
DATE EXCAVATED: 08/06/2023

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01					No services found
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					





<b>Project No.</b> 23-0766	<b>Project Name:</b> Dan Breen House Project	<b>Trial Pit ID</b>  <b>TP05</b>
<b>Coordinates</b> 588841.80 E 636075.76 N	<b>Client:</b> Tipperary County Council	
<b>Method:</b> Foundation Inspection Pit	<b>Client's Representative:</b>	Sheet 1 of 1 Scale: 1:25
<b>Plant:</b> 3t Tracked Excavator	<b>Elevation</b> mOD	<b>Date:</b> 08/06/2023
		<b>Logger:</b> RS
		<b>FINAL</b>

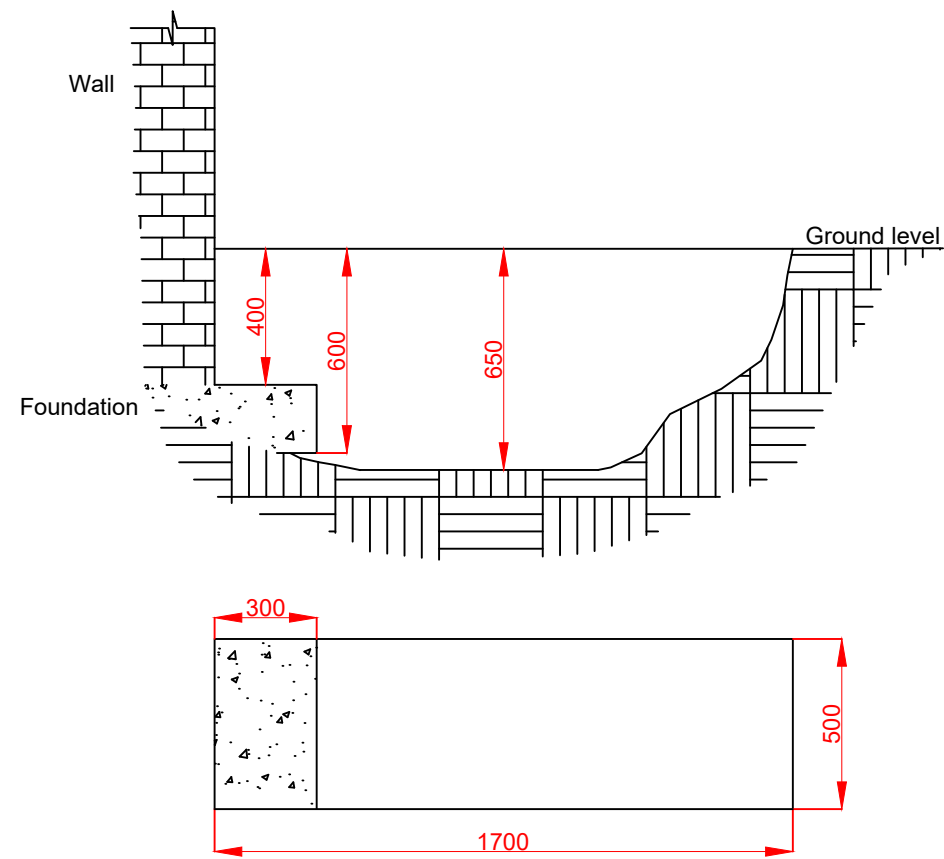
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1			0.05	TARMAC		
				0.15	MADE GROUND: Light grey sandy very silty angular fine to medium GRAVEL. Sand is fine to coarse.		
					MADE GROUND: Dark brown very gravelly very silty fine to coarse SAND. Gravel is subrounded fine to coarse.		
0.65	B2			0.60	Brown very gravelly silty fine to coarse SAND. Gravel is subrounded fine to medium.		
				1.70		End of trial pit at 1.70m	

<b>Water Strikes</b>		<b>Depth:</b> 1.70 <b>Width:</b> 0.50 <b>Length:</b> 1.50	<b>Remarks:</b> No groundwater encountered. 10mm steel cable encountered in pit.
Struck at (m)	Remarks		
		<b>Stability:</b> Unstable	<b>Termination Reason</b> Foundation exposed.
		<b>Last Updated</b> 11/07/2023	

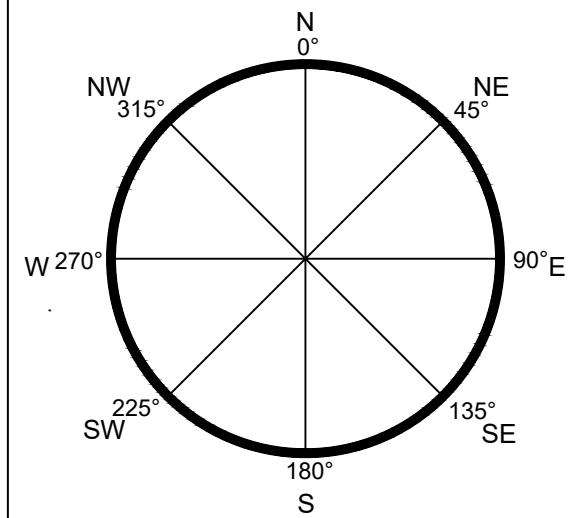
JOB NUMBER: 23-0766      JOB NAME: Dan Breen House Project      LOCATION: TP05

CLIENT: Tipperary County Council      CLIENTS REPRESENTATIVE: Tipperary County Council      CREW: RS      PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools

TRENCH: (SECTION & PLAN)



TRENCH - ORIENTATION



TRENCH ORIENTATED : FROM NORTH

COORDINATES: DATUM

EASTING: -  
NORTHING: -  
ELEVATION: -

TRENCH LENGTH (m) : 1.70  
TRENCH DEPTH (m) : 0.65  
TRENCH WIDTH (m) : 0.50

STABILITY:  
GROUNDWATER:

SCALE: NTS@A3  
DRAWN: BS  
CHECKED: SR  
DATE EXCAVATED: 08/06/2023

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01					No services found
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					





<b>Project No.</b> 23-0766	<b>Project Name:</b> Dan Breen House Project	<b>Trial Pit ID</b>  <b>TP06</b>
<b>Coordinates</b> 588829.57 E 636065.24 N	<b>Client:</b> Tipperary County Council	
<b>Method:</b> Foundation Inspection Pit	<b>Client's Representative:</b>	Sheet 1 of 1 Scale: 1:25
<b>Plant:</b> 3t Tracked Excavator	<b>Elevation</b> mOD	<b>Date:</b> 08/06/2023
		<b>Logger:</b> RS
		<b>FINAL</b>

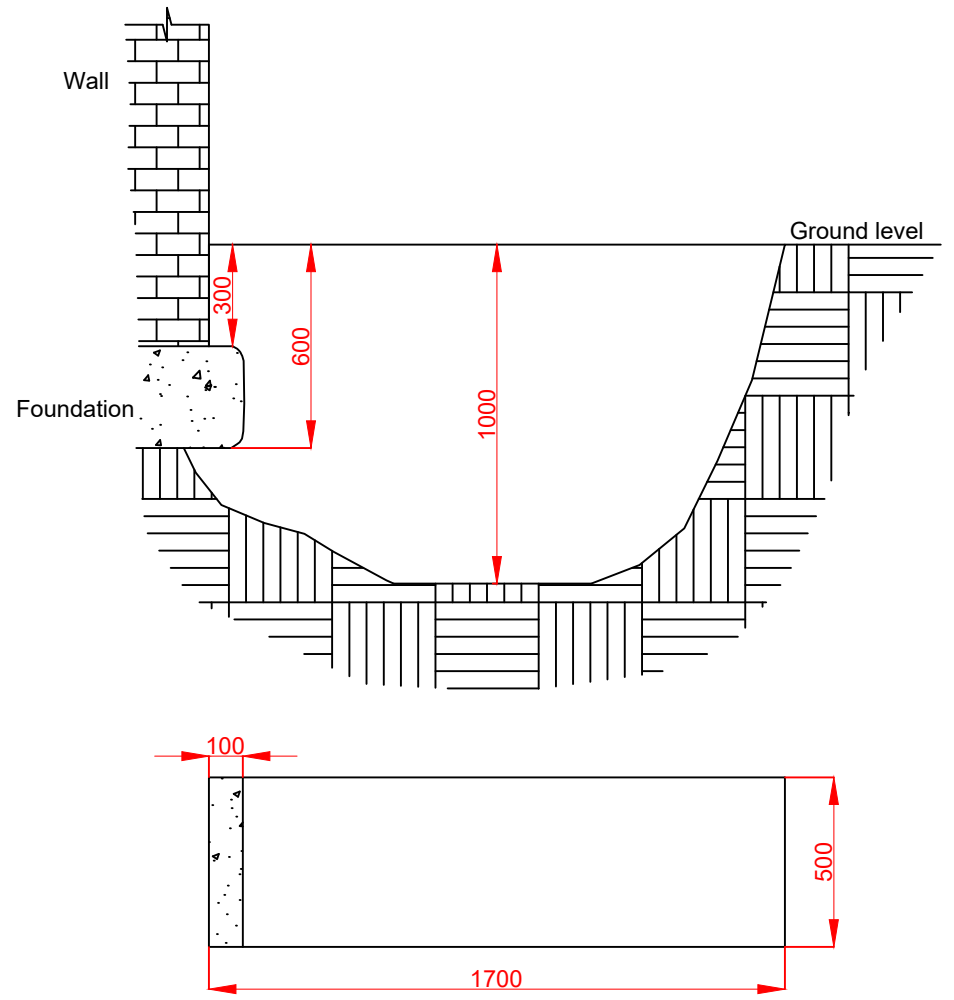
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1			0.20		MADE GROUND: Brown sandy very clayey subrounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are rounded.	
				0.70		Orangish brown slightly gravelly very clayey fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded.	
1.00	B3			1.00		Light brown very sandy silty rounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are rounded.	
1.00	ES2					End of trial pit at 1.00m	

<b>Water Strikes</b>		<b>Depth:</b> 1.00 <b>Width:</b> 0.50 <b>Length:</b> 1.70	<b>Remarks:</b> No groundwater encountered.
Struck at (m)	Remarks		
		<b>Stability:</b> Unstable below	<b>Termination Reason</b> Foundation exposed.
		<b>Last Updated</b> 11/07/2023	

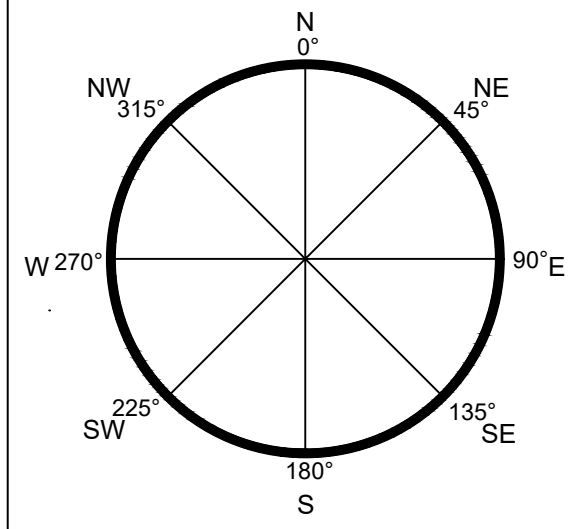
JOB NUMBER: 23-0766      JOB NAME: Dan Breen House Project      LOCATION: TP06

CLIENT: Tipperary County Council      CLIENTS REPRESENTATIVE: Tipperary County Council      CREW: RS      PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools

TRENCH: (SECTION & PLAN)



TRENCH - ORIENTATION



TRENCH ORIENTATED : FROM NORTH

COORDINATES: DATUM

EASTING: -  
NORTHING: -  
ELEVATION: -

TRENCH LENGTH (m) : 1.70  
TRENCH DEPTH (m) : 1.00  
TRENCH WIDTH (m) : 0.50

STABILITY:

GROUNDWATER:

SCALE: NTS@A3  
DRAWN: BS  
CHECKED: SR  
DATE EXCAVATED: 08/06/2023

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01					No services found
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					





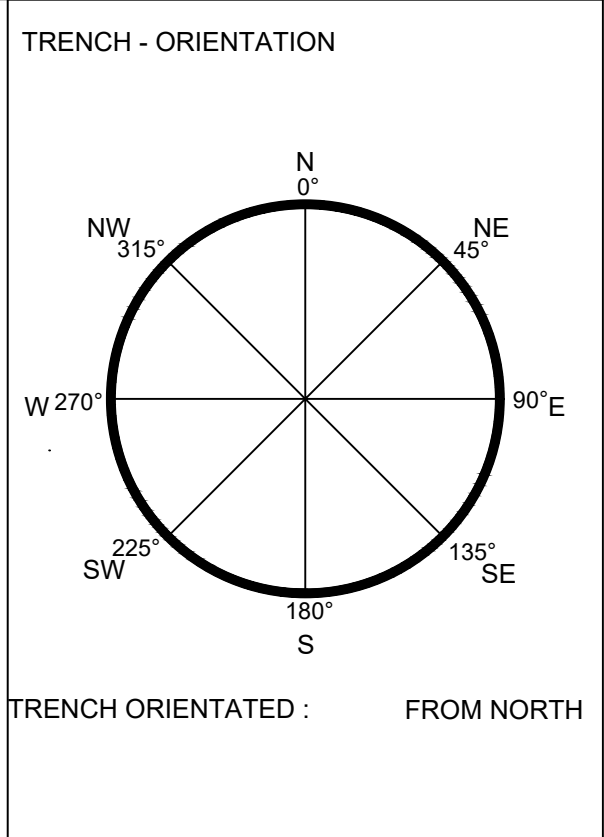
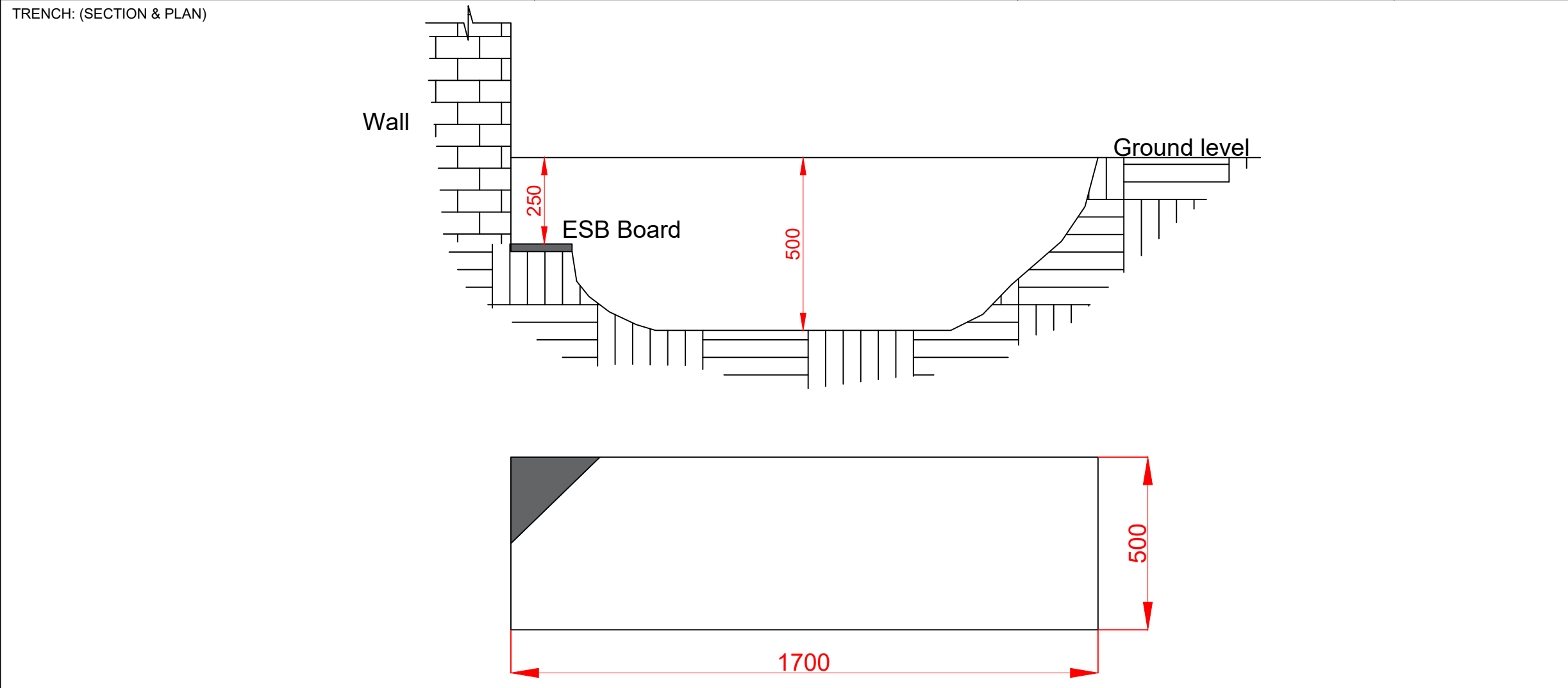
<b>Project No.</b> 23-0766	<b>Project Name:</b> Dan Breen House Project	<b>Trial Pit ID</b>  <b>TP07</b>
<b>Coordinates</b> 588838.12 E 636059.77 N	<b>Client:</b> Tipperary County Council	
<b>Method:</b> Foundation Inspection Pit	<b>Client's Representative:</b>	Sheet 1 of 1 Scale: 1:25
<b>Plant:</b> 3t Tracked Excavator	<b>Elevation</b> mOD	<b>Date:</b> 08/06/2023
		<b>Logger:</b> RS
		<b>FINAL</b>

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1			0.50		MADE GROUND: Grey sandy very silty angular fine to coarse GRAVEL with frequent concrete fragments. Sand is fine to coarse.	
						End of trial pit at 0.50m	

<b>Water Strikes</b>		<b>Depth:</b> 0.50 <b>Width:</b> 0.50 <b>Length:</b> 1.70	<b>Remarks:</b> No groundwater encountered. ESB boards encountered at 0.25m.
Struck at (m)	Remarks		
		<b>Stability:</b> Unstable	<b>Termination Reason</b> Terminated on Client's instruction.
		<b>Last Updated</b> 11/07/2023	

JOB NUMBER: 23-0766      JOB NAME: Dan Breen House Project      LOCATION: TP07

CLIENT: Tipperary County Council      CLIENTS REPRESENTATIVE: Tipperary County Council      CREW: RS      PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools



COORDINATES: DATUM

EASTING: -  
NORTHING: -  
ELEVATION: -

TRENCH LENGTH (m) : 1.70  
TRENCH DEPTH (m) : 1.00  
TRENCH WIDTH (m) : 0.50

STABILITY:  
GROUNDWATER:

SCALE: NTS@A3  
DRAWN: BS  
CHECKED: SR  
DATE EXCAVATED: 08/06/2023

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01	ESB	Unknown	0.25	Unknown	ESB Board
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					





<b>Project No.</b> 23-0766	<b>Project Name:</b> Dan Breen House Project	<b>Trial Pit ID</b>  <b>TP08</b>
<b>Coordinates</b> 588854.84 E 636040.10 N	<b>Client:</b> Tipperary County Council	
<b>Method:</b> Foundation Inspection Pit	<b>Client's Representative:</b>	Sheet 1 of 1 Scale: 1:25
<b>Plant:</b> 3t Tracked Excavator	<b>Elevation</b> mOD	<b>Date:</b> 08/06/2023
		<b>Logger:</b> RS
		<b>FINAL</b>

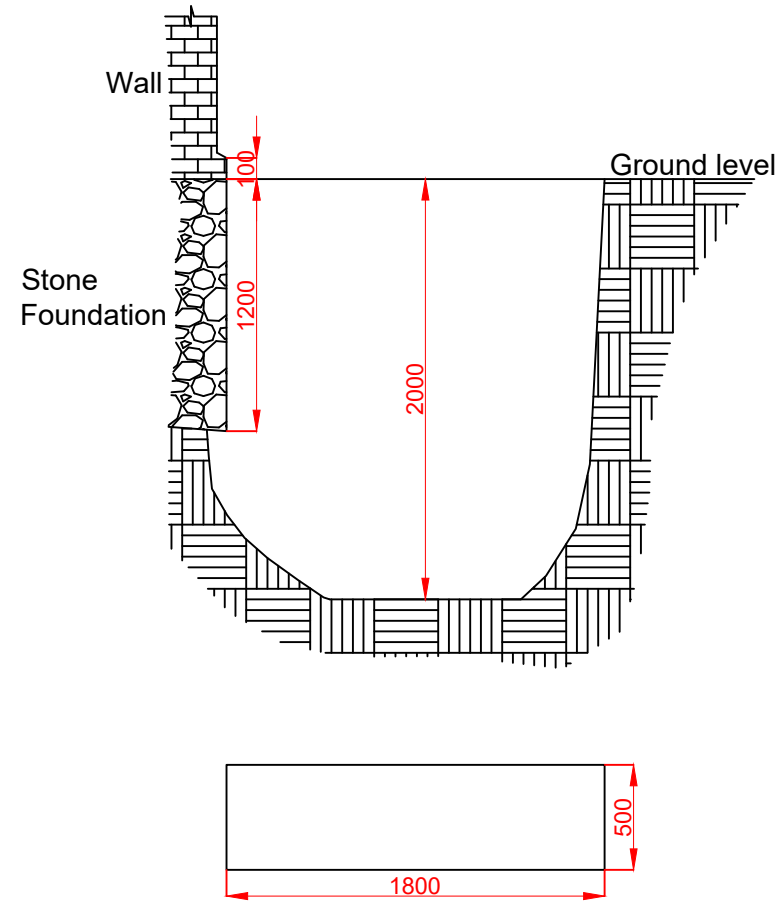
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1					MADE GROUND: Stiff brown slightly sandy slightly gravelly CLAY with low cobble content and rare rare rootlets. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are subrounded.	
1.00 1.00	B3 ES2			1.20		0.35-0.55m MADE GROUND: Grey gravelly very silty fine to coarse SAND with high cobble content. Gravel is angular fine to coarse. Cobbles are angular.	
						Brown very sandy clayey rounded fine to medium GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are rounded.	
2.00	B4			2.00		End of trial pit at 2.00m	

<b>Water Strikes</b>		<b>Depth:</b> 2.00 <b>Width:</b> 0.30 <b>Length:</b> 1.80	<b>Remarks:</b> No groundwater encountered.
Struck at (m)	Remarks		
		<b>Stability:</b> Stable	<b>Termination Reason</b> Foundation exposed.
		<b>Last Updated</b> 11/07/2023	

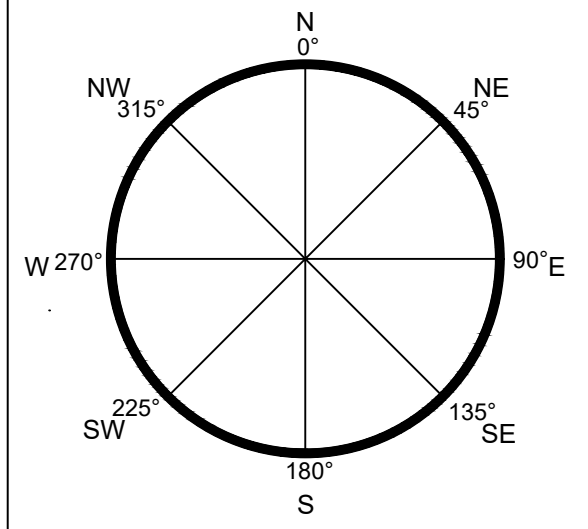
JOB NUMBER: 23-0766      JOB NAME: Dan Breen House Project      LOCATION: TP08

CLIENT: Tipperary County Council      CLIENTS REPRESENTATIVE: Tipperary County Council      CREW: RS      PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools

TRENCH: (SECTION & PLAN)



TRENCH - ORIENTATION



TRENCH ORIENTATED : FROM NORTH

COORDINATES: DATUM

EASTING: -  
NORTHING: -  
ELEVATION: -

TRENCH LENGTH (m) : 1.80  
TRENCH DEPTH (m) : 2.00  
TRENCH WIDTH (m) : 0.50

STABILITY:  
GROUNDWATER:

SCALE: NTS@A3  
DRAWN: BS  
CHECKED: SR  
DATE EXCAVATED: 08/06/2023

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01					No services found
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					





<b>Project No.</b> 23-0766	<b>Project Name:</b> Dan Breen House Project	<b>Trial Pit ID</b>  <b>TP10</b>
<b>Coordinates</b> 588851.63 E 636068.10 N	<b>Client:</b> Tipperary County Council	
<b>Method:</b> Foundation Inspection Pit	<b>Client's Representative:</b>	Sheet 1 of 1 Scale: 1:25
<b>Plant:</b> 3t Tracked Excavator	<b>Elevation</b> mOD	<b>Date:</b> 08/06/2023
		<b>Logger:</b> RS
		<b>FINAL</b>

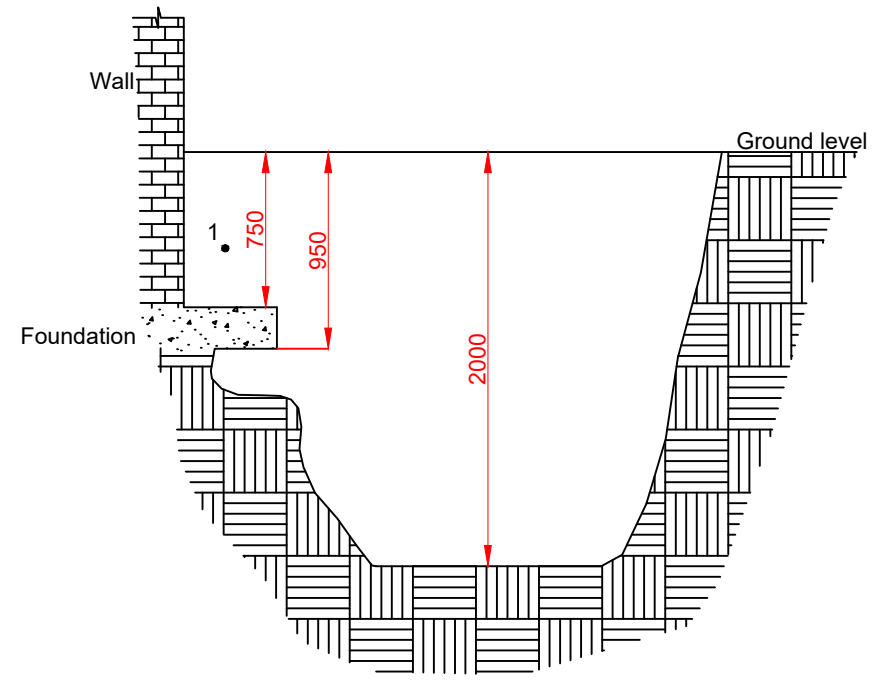
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	ES1			0.35		MADE GROUND: Stiff brown slightly sandy slightly gravelly CLAY with frequent rootlets. Sand is fine to coarse. Gravel is subrounded fine to coarse.	
				0.55		MADE GROUND: Brown slightly gravelly silty fine to coarse SAND. Gravel is subrounded fine to medium.	
1.00 1.00	B3 ES2			1.25		MADE GROUND: Light brown slightly gravelly silty fine to coarse SAND. Gravel is subrounded fine to medium.	
						Light brown very gravelly silty fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded.	
2.00	B4			2.00		End of trial pit at 2.00m	

<b>Water Strikes</b>		<b>Depth:</b> 2.00 <b>Width:</b> 0.50 <b>Length:</b> 2.60	<b>Remarks:</b> No groundwater encountered. 30mm black PVC encountered at 0.45m.
Struck at (m)	Remarks		
		<b>Stability:</b> Unstable	<b>Termination Reason</b> Foundation exposed.
		<b>Last Updated</b> 11/07/2023	

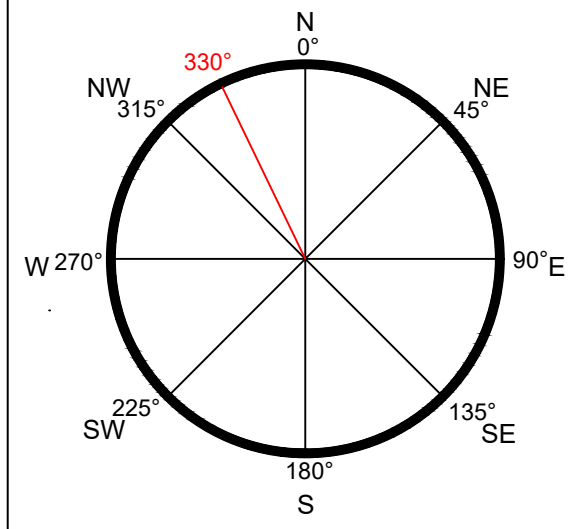
JOB NUMBER: 23-0766      JOB NAME: Dan Breen House Project      LOCATION: TP10

CLIENT: Tipperary County Council      CLIENTS REPRESENTATIVE: Tipperary County Council      CREW: RS      PLANT & EQUIPMENT: 3 Tonne Excavator & Hand Tools

TRENCH: (SECTION & PLAN)



TRENCH - ORIENTATION



TRENCH ORIENTATED : 330° FROM NORTH

COORDINATES: DATUM

EASTING: -  
NORTHING: -  
ELEVATION: -

TRENCH LENGTH (m) : 2.60  
TRENCH DEPTH (m) : 2.00  
TRENCH WIDTH (m) : 0.50

STABILITY:

GROUNDWATER:

SCALE: NTS@A3  
DRAWN: BS  
CHECKED: SR  
DATE EXCAVATED: 08/06/2023

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01	Unknown	30	0.45	0.20	30mm Black PVC Pipe
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					

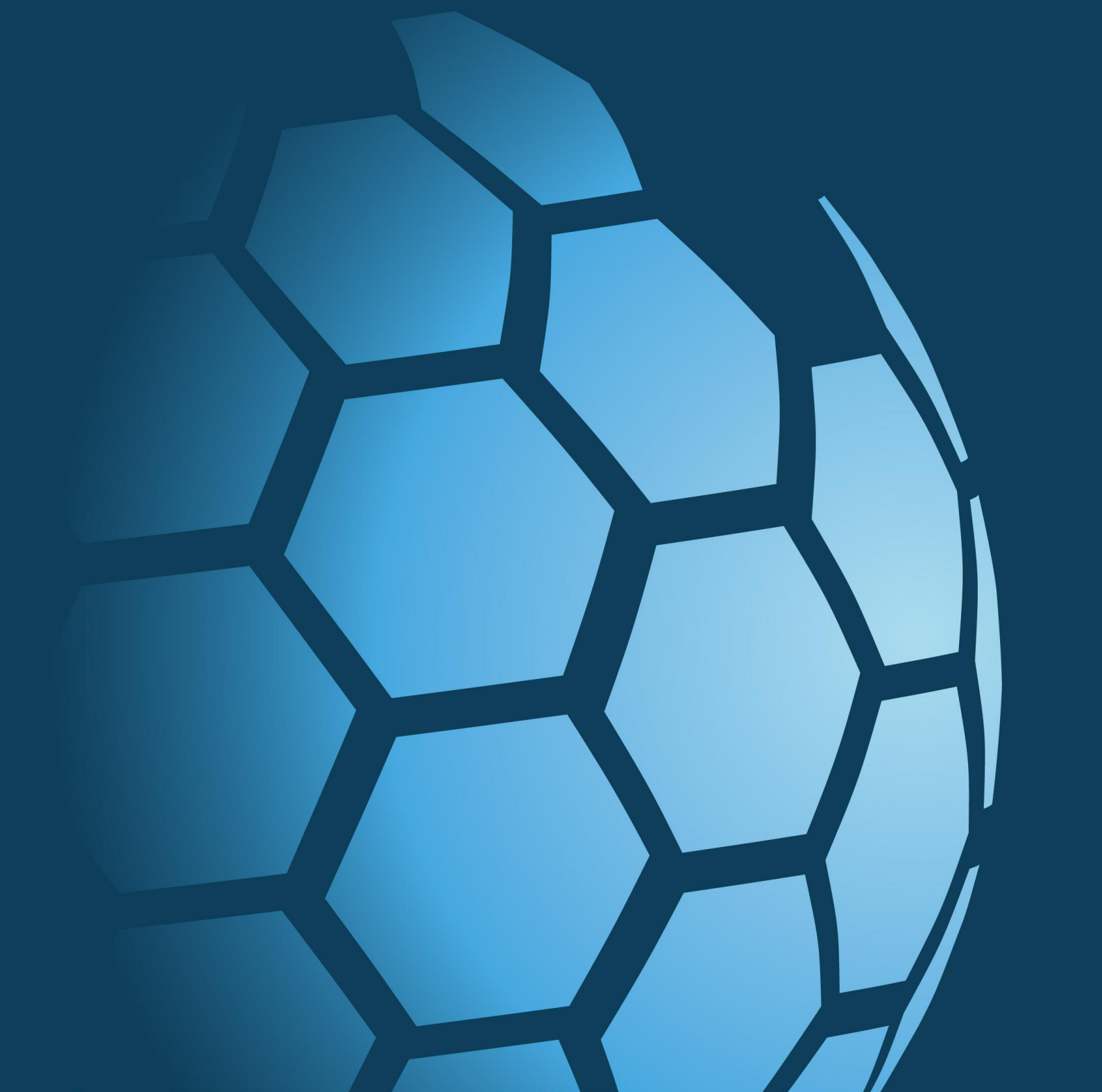




**CAUSEWAY**  
— GEOTECH

**APPENDIX F**

**FOUNDATION INSPECTION PIT PHOTOS**





TP01



TP01



TP01



TP01



**TP01**



**TP01**



**TP01**



TP02



TP02



TP02



TP02



**TP02**



TP02



**TP02**



TP03



TP03



TP03



TP03



**TP03**



**TP03**



**TP03**



**TP03**



TP04



TP04



TP04



TP04



**TP04**



**TP04**



**TP04**



TP05



TP05



TP05



TP05



**TP05**



**TP05**



TP05



TP06



TP06



TP06



TP06



**TP06**



TP06



TP07



TP07



TP07



TP07



TP07



TP07



**TP07**



TP08



TP08



TP08



TP08



**TP08**



**TP08**



**TP08**



TP10



TP10



TP10



TP10



**TP10**



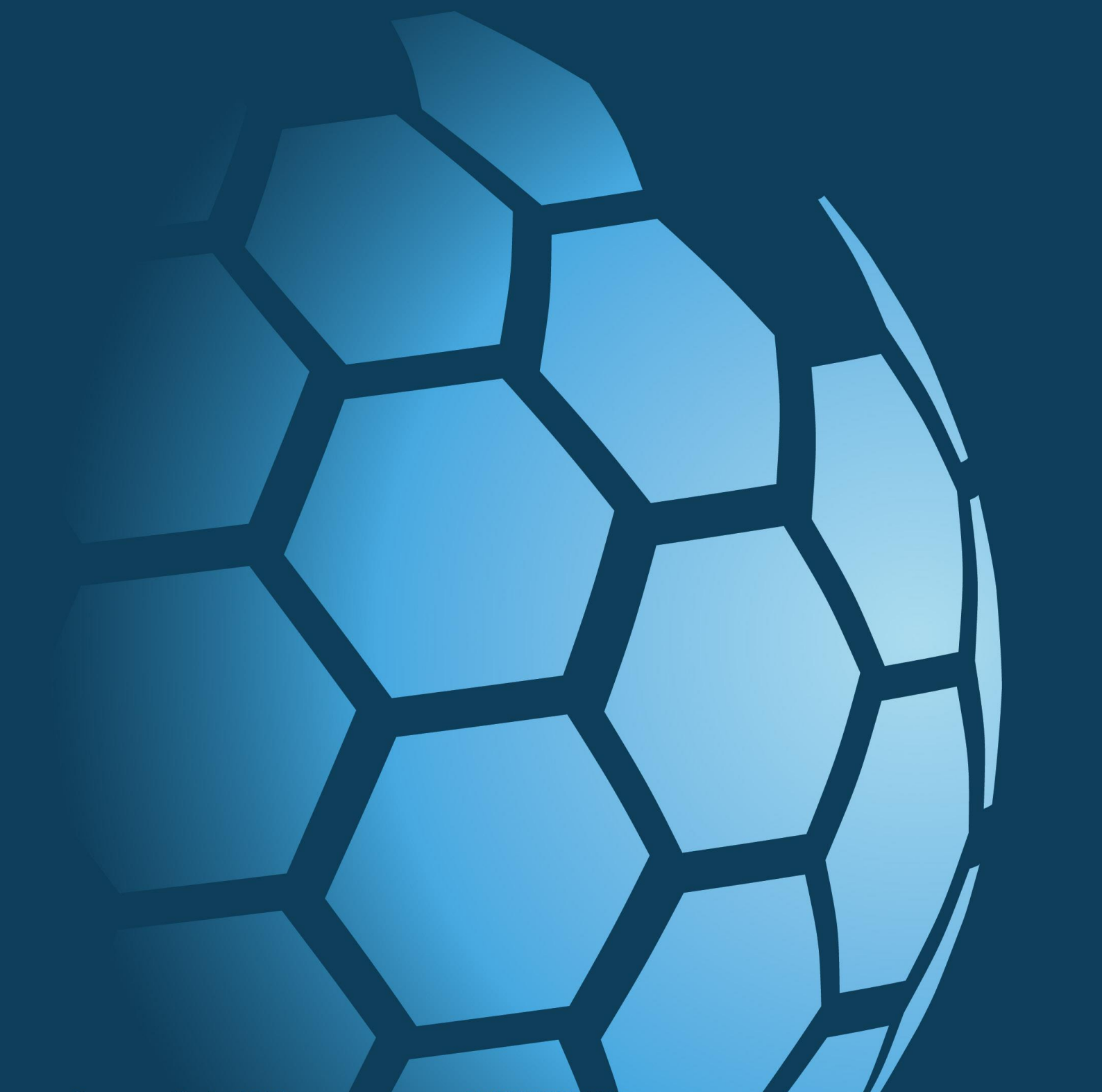
**TP10**



**CAUSEWAY**  
— GEOTECH

**APPENDIX G**

**GEOTECHNICAL LABORATORY TEST RESULTS**





**SOIL AND ROCK SAMPLE ANALYSIS  
LABORATORY TEST REPORT**

30 June 2023

<b>Project Name:</b>	Dan Breen House Project
<b>Project No.:</b>	23-0766
<b>Client:</b>	Tipperary County Council

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 15/06/2023 and 30/06/2023.

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:** Dan Breen House Project

**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.

<b>Material tested</b>	<b>Type of test/Properties measured/Range of measurement</b>	<b>Standard specifications</b>	<b>No. of results included in the report</b>
SOIL	Moisture Content of Soil	BS 1377-2: 1990: Cl 3.2	5
SOIL	Particle size distribution - wet sieving	BS 1377-2: 1990: Cl 9.2	5

#### **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.

<b>Material tested</b>	<b>Type of test/Properties measured/Range of measurement</b>	<b>Standard specifications</b>	<b>No. of results included in the report</b>
SOIL - Subcontracted to Derwentside Environmental Testing Ltd ( <i>UKAS 2139</i> )	pH Value of Soil		5
SOIL - Subcontracted to Derwentside Environmental Testing Ltd ( <i>UKAS 2139</i> )	Sulphate Content water extract		5

## Summary of Classification Test Results

Project No. 23-0766		Project Name Dan Breen House Project												
Hole No.	Sample				Specimen Description	Density		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Casagrande Classification
	Ref	Top	Base	Type		bulk Mg/m3	dry							
BH01	5	1.20	2.00	B	Brown slightly gravelly slightly silty fine to coarse SAND.			5.3						
BH02	6	2.20	3.00	B	Brownish grey slightly gravelly slightly silty fine to coarse SAND.			4.1						
TP05	2	0.65		B	Brown slightly gravelly slightly silty fine to coarse SAND.			15						
TP08	4	2.00		B	Brownish grey slightly gravelly slightly silty fine to coarse SAND.			11						
TP09	4	2.00		B	Brownish grey slightly gravelly slightly silty fine to coarse SAND.			8.6						

All tests performed in accordance with BS1377:1990 unless specified otherwise LAB 01R Version 6

<b>Key</b>  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  <p style="text-align: center;">30/06/2023</p>	Approved By  <p style="text-align: center;">Stephen Watson</p>	 10122
---	---	--	--



## PARTICLE SIZE DISTRIBUTION

Job Ref **23-0766**

Borehole/Pit No. **BH01**

Site Name **Dan Breen House Project**

Sample No. **5**

Specimen Description **Brown slightly gravelly slightly silty fine to coarse SAND.**

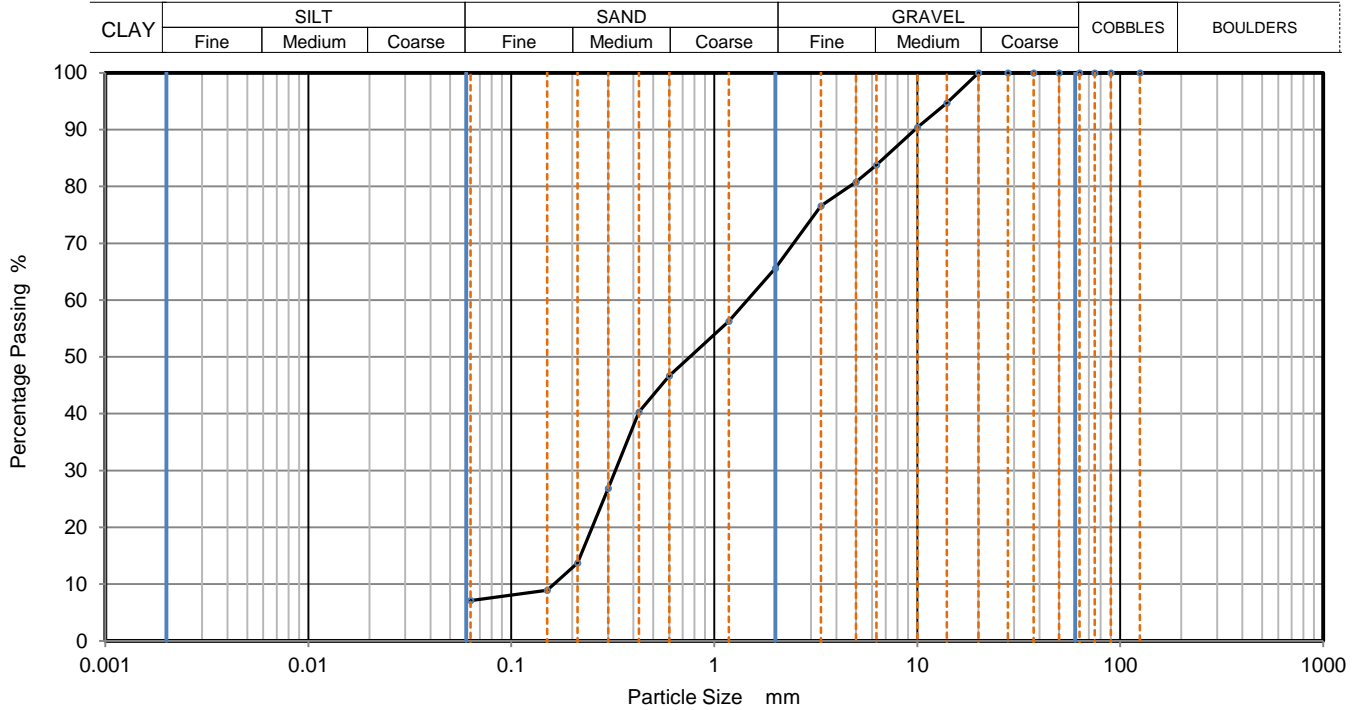
Sample Depth (m)	Top	1.20
	Base	2.00

Specimen Reference	4	Specimen Depth	1.2	m
--------------------	---	----------------	-----	---

Sample Type **B**

Test Method **BS1377:Part 2:1990, clause 9.2**

KeyLAB ID **Caus202306150**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	95		
10	90		
6.3	84		
5	81		
3.35	77		
2	66		
1.18	56		
0.6	47		
0.425	40		
0.3	27		
0.212	14		
0.15	9		
0.063	7		

Dry Mass of sample, g **536**

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	34.4
Sand	58.5
Fines <0.063mm	7.0

Grading Analysis	
D100	mm
D60	mm 1.45
D30	mm 0.325
D10	mm 0.163
Uniformity Coefficient	8.9
Curvature Coefficient	0.45

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

Approved
Stephen Watson

LAB 05R - Version 6



10122



## PARTICLE SIZE DISTRIBUTION

Job Ref **23-0766**

Borehole/Pit No. **BH02**

Site Name **Dan Breen House Project**

Sample No. **6**

Specimen Description **Brownish grey slightly gravelly slightly silty fine to coarse SAND.**

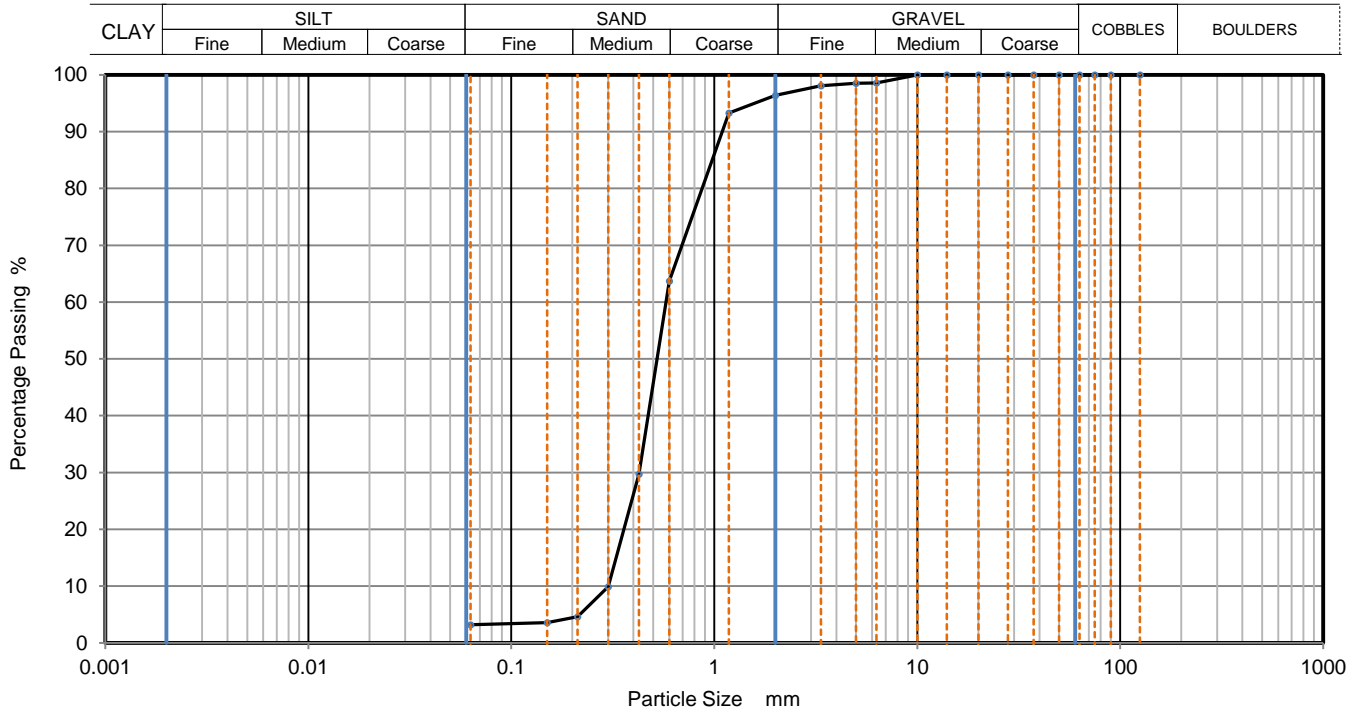
Sample Depth (m)	Top	2.20
	Base	3.00

Specimen Reference	4	Specimen Depth	2.2	m
--------------------	---	----------------	-----	---

Sample Type **B**

Test Method **BS1377:Part 2:1990, clause 9.2**

KeyLAB ID **Caus202306152**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	96		
1.18	93		
0.6	64		
0.425	30		
0.3	10		
0.212	5		
0.15	4		
0.063	3		

Dry Mass of sample, g

319

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	3.6
Sand	93.2
Fines <0.063mm	3.0

Grading Analysis	
D100	mm
D60	mm 0.578
D30	mm 0.426
D10	mm 0.301
Uniformity Coefficient	1.9
Curvature Coefficient	1

Remarks

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



Approved

Stephen Watson

LAB 05R - Version 6

10122



## PARTICLE SIZE DISTRIBUTION

Job Ref **23-0766**

Borehole/Pit No. **TP05**

Site Name **Dan Breen House Project**

Sample No. **2**

Specimen Description **Brown slightly gravelly slightly silty fine to coarse SAND.**

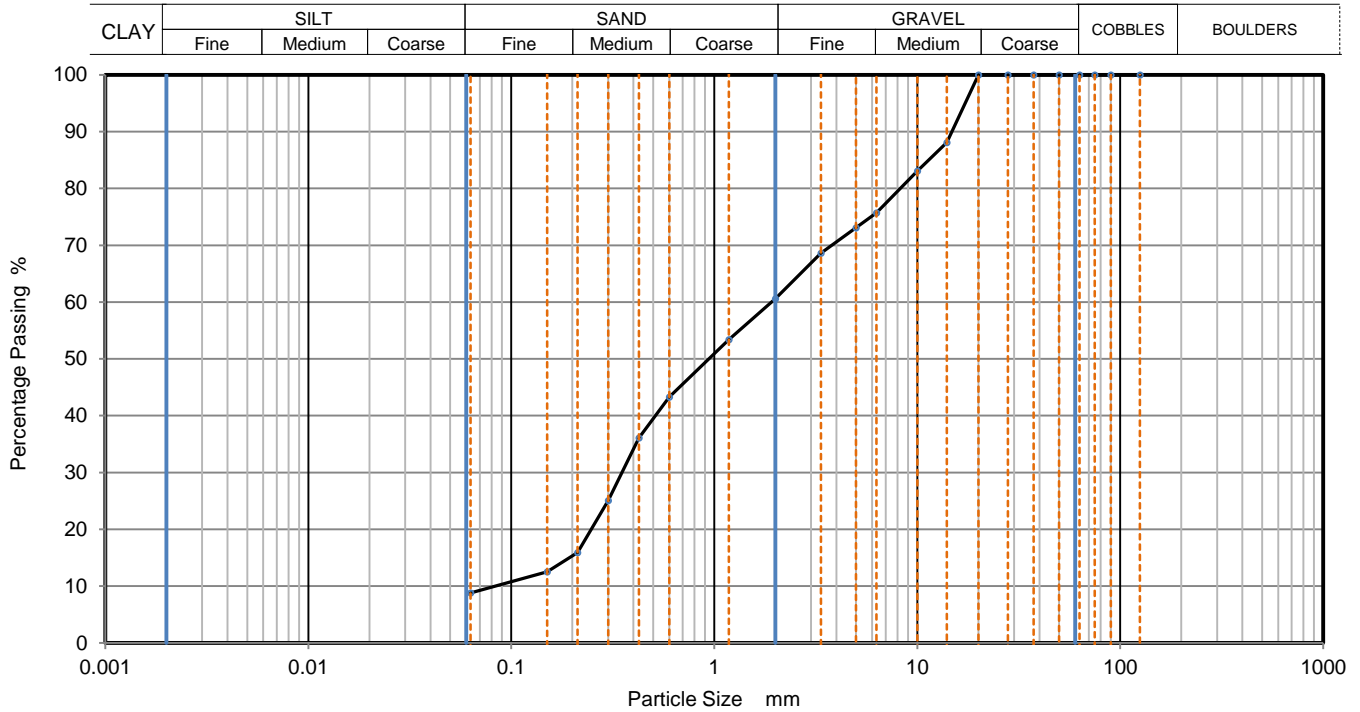
Sample Depth (m)	Top	0.65
	Base	

Specimen Reference	4	Specimen Depth	0.65	m
--------------------	---	----------------	------	---

Sample Type **B**

Test Method **BS1377:Part 2:1990, clause 9.2**

KeyLAB ID **Caus202306153**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	88		
10	83		
6.3	76		
5	73		
3.35	69		
2	61		
1.18	53		
0.6	43		
0.425	36		
0.3	25		
0.212	16		
0.15	13		
0.063	9		

Dry Mass of sample, g **507**

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	39.4
Sand	51.8
Fines <0.063mm	9.0

Grading Analysis	
D100	mm
D60	mm 1.91
D30	mm 0.35
D10	mm 0.0837
Uniformity Coefficient	23
Curvature Coefficient	0.77

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



Approved

Stephen Watson



## PARTICLE SIZE DISTRIBUTION

Job Ref **23-0766**

Borehole/Pit No. **TP08**

Site Name **Dan Breen House Project**

Sample No. **4**

Specimen Description **Brownish grey slightly gravelly slightly silty fine to coarse SAND.**

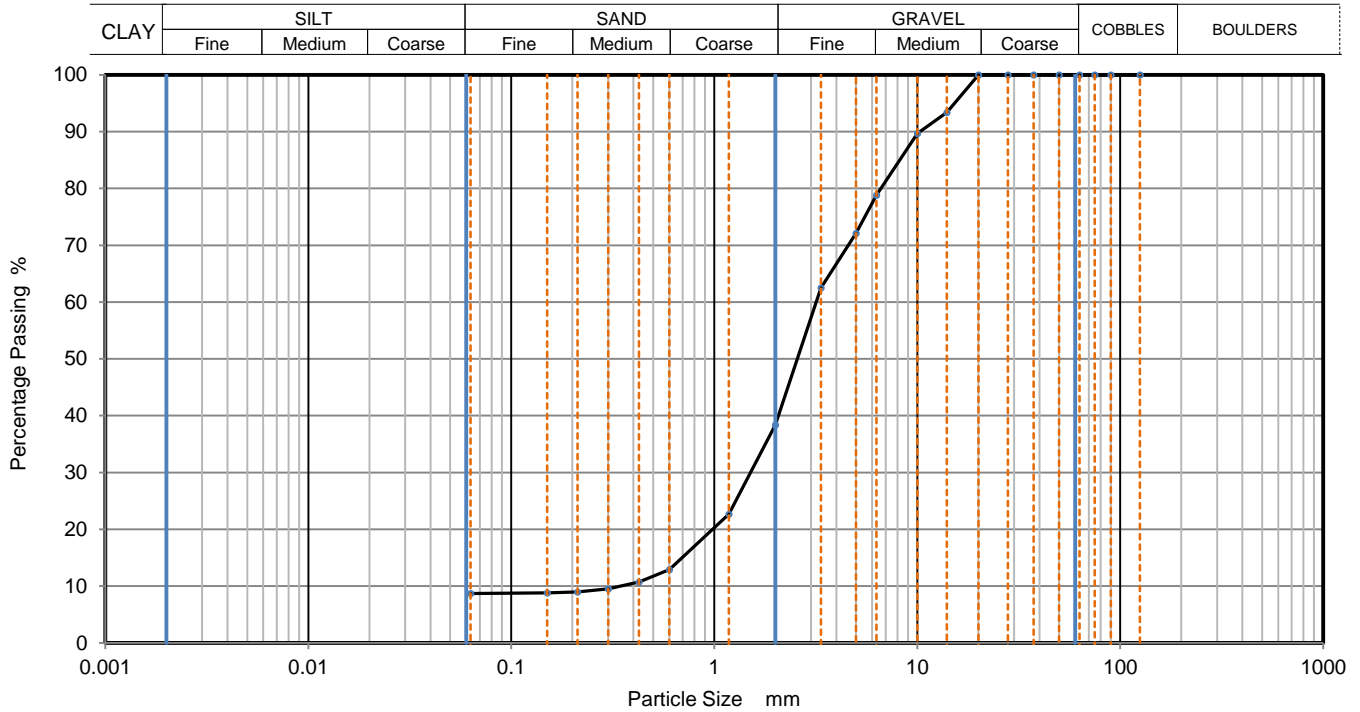
Sample Depth (m)	Top	2.00
	Base	

Specimen Reference	4	Specimen Depth	2	m
--------------------	---	----------------	---	---

Sample Type **B**

Test Method **BS1377:Part 2:1990, clause 9.2**

KeyLAB ID **Caus202306154**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	93		
10	90		
6.3	79		
5	72		
3.35	63		
2	38		
1.18	23		
0.6	13		
0.425	11		
0.3	10		
0.212	9		
0.15	9		
0.063	9		

Dry Mass of sample, g **525**

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	61.6
Sand	29.8
Fines <0.063mm	9.0

Grading Analysis	
D100	mm
D60	mm 3.18
D30	mm 1.51
D10	mm 0.347
Uniformity Coefficient	9.2
Curvature Coefficient	2.1

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



LAB 05R - Version 6

10122

Approved

Stephen Watson



## PARTICLE SIZE DISTRIBUTION

Job Ref **23-0766**

Borehole/Pit No. **TP09**

Site Name **Dan Breen House Project**

Sample No. **4**

Specimen Description **Brownish grey slightly gravelly slightly silty fine to coarse SAND.**

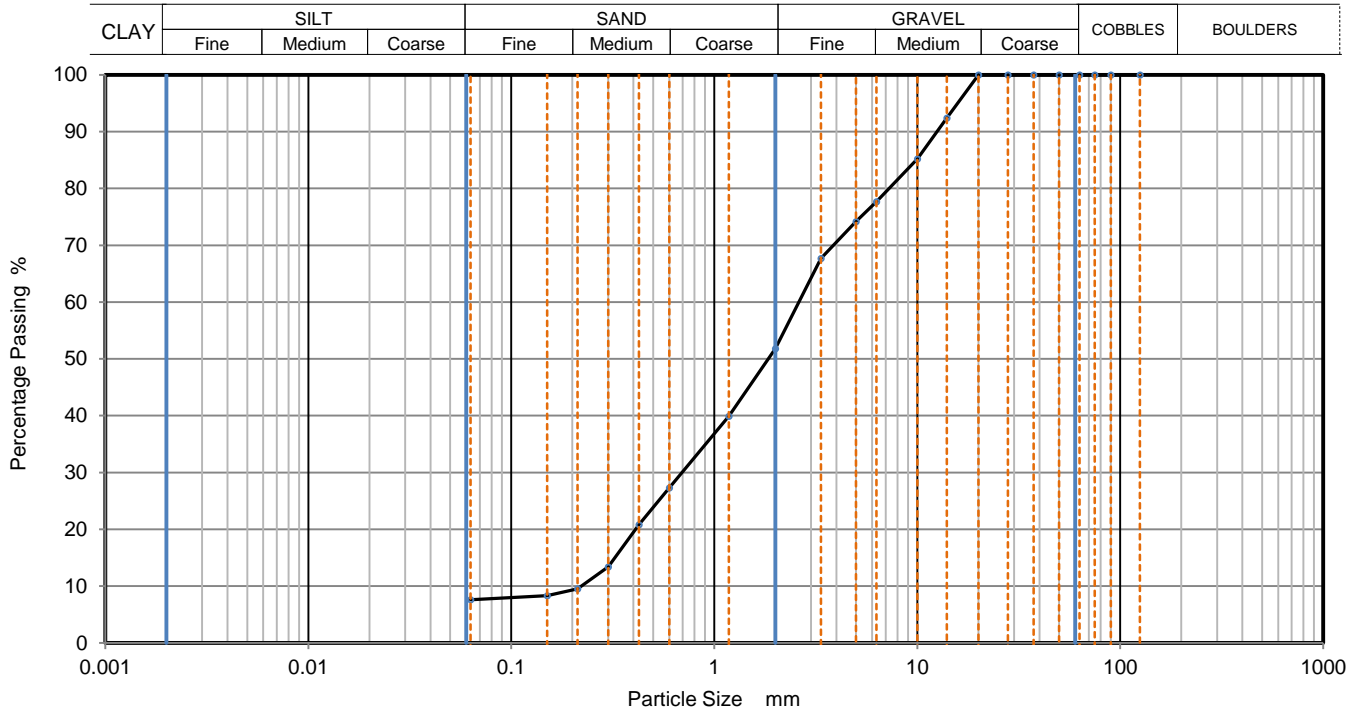
Sample Depth (m)	Top	2.00
	Base	

Specimen Reference	4	Specimen Depth	2	m
--------------------	---	----------------	---	---

Sample Type **B**

Test Method **BS1377:Part 2:1990, clause 9.2**

KeyLAB ID **Caus202306155**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	92		
10	85		
6.3	78		
5	74		
3.35	68		
2	52		
1.18	40		
0.6	27		
0.425	21		
0.3	13		
0.212	10		
0.15	8		
0.063	8		

Dry Mass of sample, g

517

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	48.2
Sand	44.2
Fines <0.063mm	8.0

Grading Analysis	
D100	mm
D60	mm 2.61
D30	mm 0.693
D10	mm 0.221
Uniformity Coefficient	12
Curvature Coefficient	0.83

**Remarks**

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

Approved
Stephen Watson





# DETS

## Certificate of Analysis

*Certificate Number* 23-15568

*Issued:* 06-Jul-23

*Client* Causeway Geotech  
8 Drumahiskey Road  
Ballymoney  
County Antrim  
BT53 7QL

*Our Reference* 23-15568

*Client Reference* 23-0766

*Order No* (not supplied)

*Contract Title* Dan Breen House Project

*Description* 5 Soil samples.

*Date Received* 28-Jun-23

*Date Started* 30-Jun-23

*Date Completed* 06-Jul-23

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*



Kirk Bridgewood  
General Manager



2139

## Summary of Chemical Analysis Soil Samples

Our Ref 23-15568

Client Ref 23-0766

Contract Title Dan Breen House Project

<b>Lab No</b>	2195382	2195383	2195384	2195385	2195386
<b>Sample ID</b>	BH01	BH02	TP05	TP08	TP09
<b>Depth</b>	1.20	1.00	0.65	2.00	2.00
<b>Other ID</b>	5	4	2	4	4
<b>Sample Type</b>	B	B	B	B	B
<b>Sampling Date</b>	27/06/2023	27/06/2023	27/06/2023	27/06/2023	27/06/2023
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>Inorganics</b>								
pH	DETSC 2008#		pH	8.8	8.7	8.5	8.1	8.9
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	20	15	14	< 10	49

## Information in Support of the Analytical Results

Our Ref 23-15568  
 Client Ref 23-0766  
 Contract Dan Breen House Project

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2195382	BH01 1.20 SOIL	27/06/23	PT 500ml		
2195383	BH02 1.00 SOIL	27/06/23	PT 500ml		
2195384	TP05 0.65 SOIL	27/06/23	PT 500ml		
2195385	TP08 2.00 SOIL	27/06/23	PT 500ml		
2195386	TP09 2.00 SOIL	27/06/23	PT 500ml		

Key: P-Plastic T-Tub

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

### Soil Analysis Notes

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

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

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

### Disposal

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

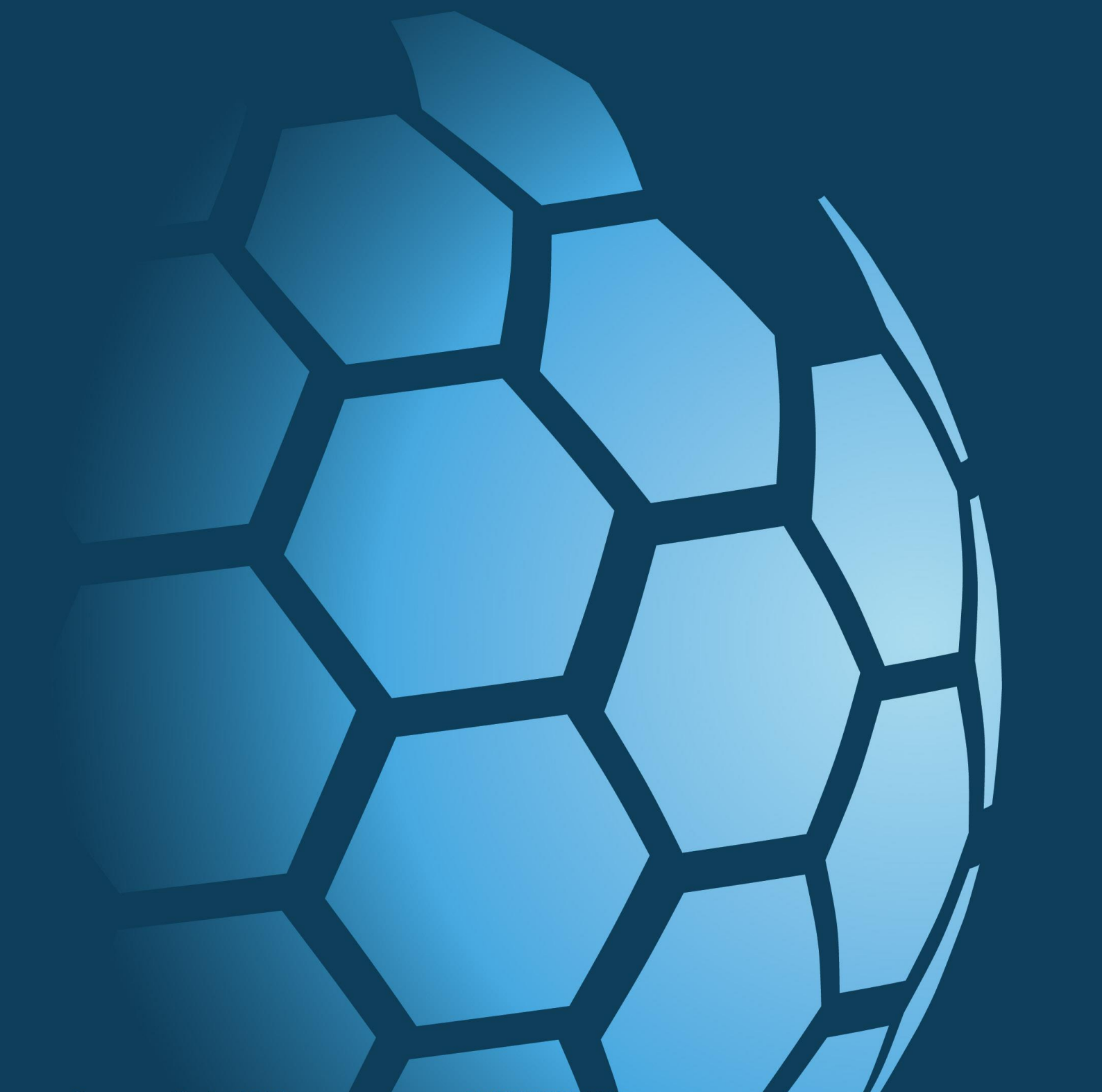
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



**CAUSEWAY**  
— GEOTECH

**APPENDIX H**  
**ENVIRONMENTAL LABORATORY TEST RESULTS**





# DETS

## Certificate of Analysis

*Certificate Number* 23-14140

*Issued:* 28-Jun-23

*Client* Causeway Geotech  
Unit 1 Fingal House  
Stephenstown Industrial Estate  
Balbriggan  
Co. Dublin  
K32 VR66

*Our Reference* 23-14140

*Client Reference* 23-0766

*Order No* (not supplied)

*Contract Title* Dan Breen House Project

*Description* 3 Soil samples, 3 Leachate samples.

*Date Received* 15-Jun-23

*Date Started* 15-Jun-23

*Date Completed* 28-Jun-23

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*



Kirk Bridgewood  
General Manager



2139

# Summary of Chemical Analysis

## Soil Samples

Our Ref 23-14140

Client Ref 23-0766

Contract Title Dan Breen House Project

Lab No	2187456	2187457	2187458
Sample ID	TP03	TP05	TP09
Depth	0.50	0.40	0.50
Other ID			
Sample Type	ES	ES	ES
Sampling Date	09/06/2023	08/06/2023	08/06/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
<b>Preparation</b>						
Moisture Content	DETSC 1004	0.1	%	4.6	11	9.6
<b>Metals</b>						
Antimony	DETSC 2301*	1	mg/kg	< 1.0	< 1.0	1.0
Arsenic	DETSC 2301#	0.2	mg/kg	7.9	7.5	11
Barium	DETSC 2301#	1.5	mg/kg	53	110	73
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	0.4	0.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.4	0.5
Chromium	DETSC 2301#	0.15	mg/kg	8.4	9.7	11
Chromium III	DETSC 2301*	0.15	mg/kg	8.4	9.7	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	15	15	19
Lead	DETSC 2301#	0.3	mg/kg	31	96	33
Mercury	DETSC 2325#	0.05	mg/kg	0.13	0.23	0.18
Molybdenum	DETSC 2301#	0.4	mg/kg	< 0.4	0.5	0.6
Nickel	DETSC 2301#	1	mg/kg	18	16	19
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	78	77	77
<b>Inorganics</b>						
pH	DETSC 2008#		pH	8.2	8.6	8.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	0.2	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	0.5	1.5	1.2
Sulphide	DETSC 2024*	10	mg/kg	< 10	23	12
Sulphur (free)	DETSC 3049#	0.75	mg/kg	< 0.75	< 0.75	< 0.75
Sulphate as SO <sub>4</sub> , Total	DETSC 2321#	0.01	%	0.03	0.04	0.04
<b>Petroleum Hydrocarbons</b>						
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	19	< 1.4

# Summary of Chemical Analysis

## Soil Samples

Our Ref 23-14140

Client Ref 23-0766

Contract Title Dan Breen House Project

<b>Lab No</b>	2187456	2187457	2187458
<b>Sample ID</b>	TP03	TP05	TP09
<b>Depth</b>	0.50	0.40	0.50
<b>Other ID</b>			
<b>Sample Type</b>	ES	ES	ES
<b>Sampling Date</b>	09/06/2023	08/06/2023	08/06/2023
<b>Sampling Time</b>	n/s	n/s	n/s

Test	Method	LOD	Units			
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4	28	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10	47	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10	47	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETSC 3311#	10	mg/kg	< 10	< 10	< 10
<b>PAHs</b>						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.2
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.2
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Coronene	DETSC 3301*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
<b>PCBs</b>						
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
<b>Phenols</b>						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	0.3

## Summary of Chemical Analysis

### Leachate Samples

Our Ref 23-14140

Client Ref 23-0766

Contract Title Dan Breen House Project

<b>Lab No</b>	2187459	2187460	2187461
<b>Sample ID</b>	TP03	TP05	TP09
<b>Depth</b>	0.50	0.40	0.50
<b>Other ID</b>			
<b>Sample Type</b>	ES	ES	ES
<b>Sampling Date</b>	09/06/2023	08/06/2023	08/06/2023
<b>Sampling Time</b>	n/s	n/s	n/s

Test	Method	LOD	Units			
<b>Preparation</b>						
BS EN 12457 10:1	DETSC 1009*			Y	Y	Y
<b>Inorganics</b>						
Un-Ionised Ammonia	*	0.02	mg/l	< 0.02	< 0.02	< 0.02
Ammoniacal Nitrogen as NH <sub>4</sub>	DETSC 2207	0.015	mg/l	0.03	0.06	0.10

# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14140

Client Ref 23-0766

Contract Title Dan Breen House Project

Sample Id TP03 0.50

Sample Numbers 2187456 2187459

Date Analysed 28/06/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	0.5	3	5	6
DETSC 2003# Loss On Ignition	%	2.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.2	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.2	0.012	0.5	2	25
DETSC 2306 Barium as Ba	4.1	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.4	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.011	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.45	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.27	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.43	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	11	0.11	4	50	200
DETSC 2055 Chloride as Cl	890	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	1600	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	29000	290	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	8900	89	500	800	1000

Additional Information	
DETSC 2008 pH	6.7
DETSC 2009 Conductivity uS/cm	41.3
* Temperature*	19.0
Mass of Sample Kg*	0.100
Mass of dry Sample Kg*	0.095
Stage 1	
Volume of Leachant L2*	0.949
Volume of Eluate VE1*	0.9

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

\* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14140

Client Ref 23-0766

Contract Title Dan Breen House Project

Sample Id TP05 0.40

Sample Numbers 2187457 2187460

Date Analysed 28/06/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.5	3	5	6
DETSC 2003# Loss On Ignition	%	0.63	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.6	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	2.9	0.029	0.5	2	25
DETSC 2306 Barium as Ba	23	0.23	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	120	1.2	0.5	10	70
DETSC 2306 Copper as Cu	1.7	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.048	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	4.6	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	4.4	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.4	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.54	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	7.7	0.077	4	50	200
DETSC 2055 Chloride as Cl	5300	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	160	1.6	10	150	500
DETSC 2055 Sulphate as SO4	2600	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	60000	600	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	12000	120	500	800	1000

Additional Information	
DETSC 2008 pH	6.7
DETSC 2009 Conductivity uS/cm	85.6
* Temperature*	19.0
Mass of Sample Kg*	0.110
Mass of dry Sample Kg*	0.098
Stage 1	
Volume of Leachant L2*	0.967
Volume of Eluate VE1*	0.91

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

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# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14140

Client Ref 23-0766

Contract Title Dan Breen House Project

Sample Id TP09 0.50

Sample Numbers 2187458 2187461

Date Analysed 28/06/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.2	3	5	6
DETSC 2003# Loss On Ignition	%	2.8	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.8	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	8.4	0.084	0.5	2	25
DETSC 2306 Barium as Ba	3.5	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.66	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2.9	0.029	2	50	100
DETSC 2306 Mercury as Hg	0.025	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	1.5	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.83	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1.1	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.62	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.47	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3.4	0.034	4	50	200
DETSC 2055 Chloride as Cl	59000	590	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	5300	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	190000	1900	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	15000	150	500	800	1000

Additional Information	
DETSC 2008 pH	6.9
DETSC 2009 Conductivity uS/cm	274.0
* Temperature*	19.0
Mass of Sample Kg*	0.110
Mass of dry Sample Kg*	0.099
Stage 1	
Volume of Leachant L2*	0.983
Volume of Eluate VE1*	0.93

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

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## Summary of Asbestos Analysis

### Soil Samples

*Our Ref* 23-14140

*Client Ref* 23-0766

*Contract Title* Dan Breen House Project

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2187456	TP03 0.50	SOIL	NAD	none	D Wilkinson
2187457	TP05 0.40	SOIL	NAD	none	D Wilkinson
2187458	TP09 0.50	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* - not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 23-14140  
 Client Ref 23-0766  
 Contract Dan Breen House Project

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2187456	TP03 0.50 SOIL	09/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		
2187457	TP05 0.40 SOIL	08/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		
2187458	TP09 0.50 SOIL	08/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		
2187459	TP03 0.50 LEACHATE	09/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		
2187460	TP05 0.40 LEACHATE	08/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		
2187461	TP09 0.50 LEACHATE	08/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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

### Soil Analysis Notes

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

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

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

### Disposal

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

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

## Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total
C24-C40 Lube Oil Range Organics (LO)	EH_1D_Total

End of Report



# DETS

## Certificate of Analysis

*Certificate Number* 23-14399

*Issued:* 30-Jun-23

*Client* Causeway Geotech  
Unit 1 Fingal House  
Stephenstown Industrial Estate  
Balbriggan  
Co. Dublin  
K32 VR66

*Our Reference* 23-14399

*Client Reference* 23-0766

*Order No* (not supplied)

*Contract Title* Dan Breen House Project

*Description* 2 Soil samples, 2 Leachate samples.

*Date Received* 17-Jun-23

*Date Started* 19-Jun-23

*Date Completed* 30-Jun-23

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*



Kirk Bridgewood  
General Manager



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# Summary of Chemical Analysis

## Soil Samples

Our Ref 23-14399

Client Ref 23-0766

Contract Title Dan Breen House Project

Lab No	2188973	2188974
Sample ID	BH01	BH02
Depth	0.50	0.50
Other ID	1	1
Sample Type	ES	ES
Sampling Date	12/06/2023	12/06/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Preparation</b>					
Moisture Content	DETSC 1004	0.1	%	8.0	9.2
<b>Metals</b>					
Antimony	DETSC 2301*	1	mg/kg	1.5	1.1
Arsenic	DETSC 2301#	0.2	mg/kg	10	17
Barium	DETSC 2301#	1.5	mg/kg	62	52
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.5
Chromium	DETSC 2301#	0.15	mg/kg	12	11
Chromium III	DETSC 2301*	0.15	mg/kg	12	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	14	15
Lead	DETSC 2301#	0.3	mg/kg	24	40
Mercury	DETSC 2325#	0.05	mg/kg	0.13	0.08
Molybdenum	DETSC 2301#	0.4	mg/kg	< 0.4	< 0.4
Nickel	DETSC 2301#	1	mg/kg	19	19
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	68	65
<b>Inorganics</b>					
pH	DETSC 2008#		pH	8.3	8.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	< 0.5	< 0.5
Sulphide	DETSC 2024*	10	mg/kg	44	16
Sulphur (free)	DETSC 3049#	0.75	mg/kg	< 0.75	< 0.75
Sulphate as SO <sub>4</sub> , Total	DETSC 2321#	0.01	%	0.03	0.02
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg	1.33	< 1.20
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg	< 3.40	< 3.40
Aliphatic >EC35-EC40: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40	< 3.40
Aliphatic >EC40-EC44: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40	< 3.40
Aliphatic C5-C44: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg	< 10.00	< 10.00
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg	< 0.60	< 0.60

# Summary of Chemical Analysis

## Soil Samples

Our Ref 23-14399

Client Ref 23-0766

Contract Title Dan Breen House Project

Lab No	2188973	2188974
Sample ID	BH01	BH02
Depth	0.50	0.50
Other ID	1	1
Sample Type	ES	ES
Sampling Date	12/06/2023	12/06/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg	< 1.40	< 1.40
Aromatic >EC35-EC40: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40	< 1.40
Aromatic >EC40-EC44: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40	< 1.40
Aromatic C5-C44: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg	< 10.00	< 10.00
TPH Ali/Aro C5-C44: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg	< 10.00	< 10.00
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETSC 3311#	10	mg/kg	< 10	< 10
<b>PAHs</b>					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Coronene	DETSC 3301*	0.1	mg/kg	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6
<b>PCBs</b>					
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

## Summary of Chemical Analysis

### Leachate Samples

Our Ref 23-14399

Client Ref 23-0766

Contract Title Dan Breen House Project

Lab No	2188975	2188976
Sample ID	BH01	BH02
Depth	0.50	0.50
Other ID	1	1
Sample Type	ES	ES
Sampling Date	12/06/2023	12/06/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Preparation</b>					
BS EN 12457 10:1	DETSC 1009*			Y	Y
<b>Inorganics</b>					
Un-Ionised Ammonia	*	0.02	mg/l	< 0.02	< 0.02
Ammoniacal Nitrogen as NH <sub>4</sub>	DETSC 2207	0.015	mg/l	0.10	0.09

# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14399

Client Ref 23-0766

Contract Title Dan Breen House Project

Sample Id BH01 1 0.50

Sample Numbers 2188973 2188975

Date Analysed 30/06/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	< 0.5	3	5	6
DETSC 2003# Loss On Ignition	%	1.6	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.3	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.6	0.016	0.5	2	25
DETSC 2306 Barium as Ba	4	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	3.2	0.032	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.3	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.22	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.28	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	11000	110	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	3200	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	79000	790	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	3500	< 50	500	800	1000

### Additional Information

DETSC 2008 pH	7.4
DETSC 2009 Conductivity uS/cm	113.0
* Temperature*	20.0
Mass of Sample Kg*	0.100
Mass of dry Sample Kg*	0.092
Stage 1	
Volume of Leachant L2*	0.912
Volume of Eluate VE1*	0.86

TBE - To Be Evaluated  
SNRHW - Stable Non-Reactive  
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

\* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-14399

Client Ref 23-0766

Contract Title Dan Breen House Project

Sample Id BH02 1 0.50

Sample Numbers 2188974 2188976

Date Analysed 30/06/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	< 0.5	3	5	6
DETSC 2003# Loss On Ignition	%	1.2	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.9	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	46	0.46	0.5	2	25
DETSC 2306 Barium as Ba	2.1	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.61	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	3.8	0.038	2	50	100
DETSC 2306 Mercury as Hg	0.025	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	2.4	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.43	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.8	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.39	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	1.5	0.015	4	50	200
DETSC 2055 Chloride as Cl	4800	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	4500	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	62000	620	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	3300	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	7.6
DETSC 2009 Conductivity uS/cm	88.1
* Temperature*	20.0
Mass of Sample Kg*	0.110
Mass of dry Sample Kg*	0.100
Stage 1	
Volume of Leachant L2*	0.989
Volume of Eluate VE1*	0.93

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

\* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

## Summary of Asbestos Analysis

### Soil Samples

*Our Ref* 23-14399

*Client Ref* 23-0766

*Contract Title* Dan Breen House Project

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2188973	BH01 1 0.50	SOIL	NAD	none	Keith Wilson
2188974	BH02 1 0.50	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* - not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 23-14399  
 Client Ref 23-0766  
 Contract Dan Breen House Project

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2188973	BH01 0.50 SOIL	12/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		
2188974	BH02 0.50 SOIL	12/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		
2188975	BH01 0.50 LEACHATE	12/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		
2188976	BH02 0.50 LEACHATE	12/06/23	GJ 250ml, GJ 60ml, PT 500ml x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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

### Soil Analysis Notes

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

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

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

### Disposal

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

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

## Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic >EC10-EC12	EH_2D_AL
Aliphatic >EC12-EC16	EH_2D_AL
Aliphatic >EC16-EC21	EH_2D_AL
Aliphatic >EC21-EC35	EH_2D_AL
Aliphatic >EC35-EC40	EH_2D_AL
Aliphatic >EC40-EC44	EH_2D_AL
Aliphatic C5-C44	EH_2D+HS_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic >EC10-EC12	EH_2D_AR
Aromatic >EC12-EC16	EH_2D_AR
Aromatic >EC16-EC21	EH_2D_AR
Aromatic >EC21-EC35	EH_2D_AR
Aromatic >EC35-EC40	EH_2D_AR
Aromatic >EC40-EC44	EH_2D_AR
Aromatic C5-C44	EH_2D+HS_1D_AR
TPH Ali/Aro C5-C44	EH_2D+HS_1D_Total
TPH (C10-C40)	EH_1D_Total
C24-C40 Lube Oil Range Organics (LO)	EH_1D_Total

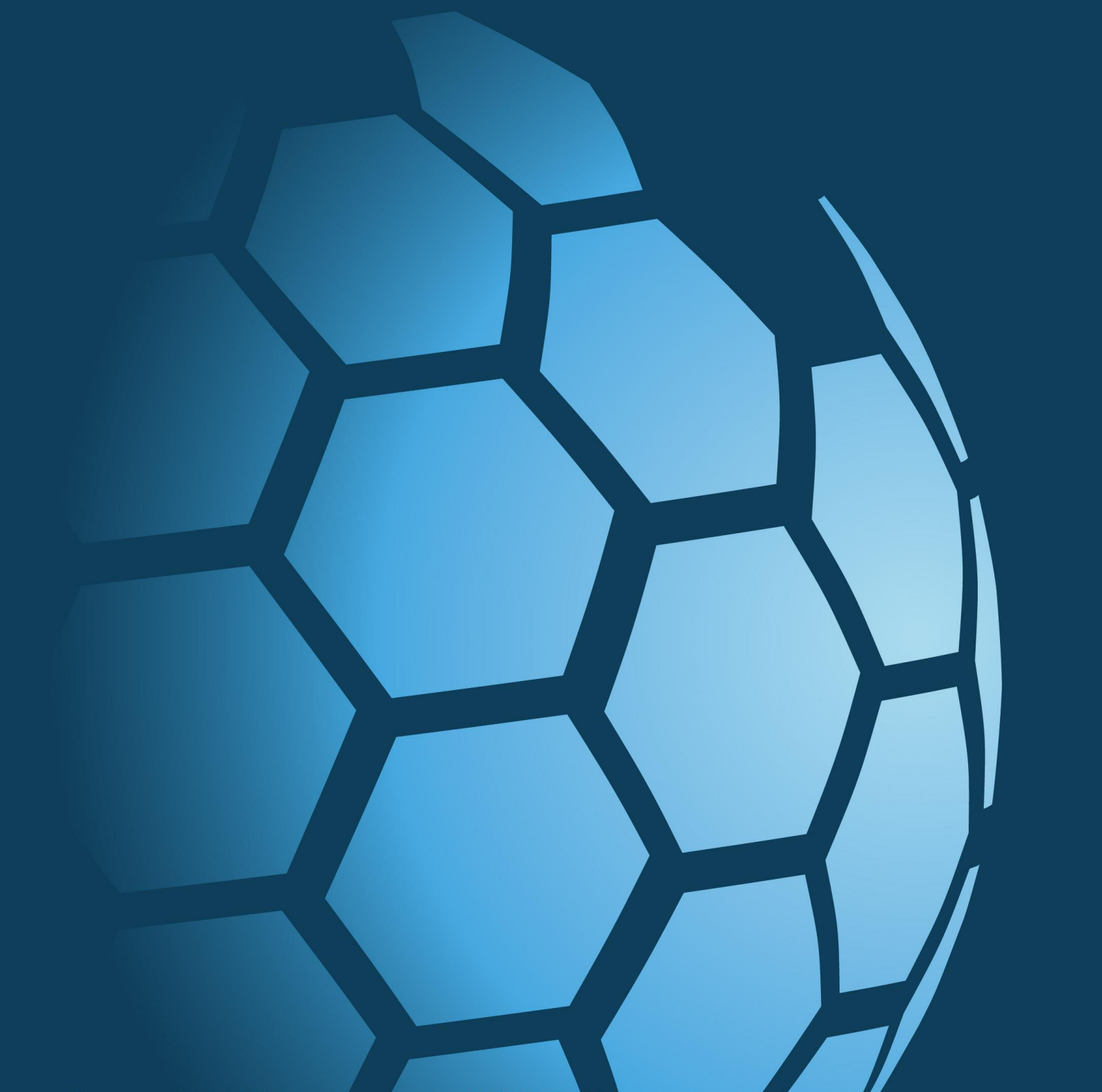
End of Report



**CAUSEWAY**  
— GEOTECH

**APPENDIX I**

**SPT HAMMER ENERGY MEASUREMENT REPORT**



# SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Southern Testing  
Unit 11  
Charlwoods Road  
East Grinstead  
West Sussex  
RH19 2HU

SPT Hammer Ref: T7.  
Test Date: 18/02/2023  
Report Date: 20/02/2023  
File Name: T7..spt  
Test Operator: RWS

## Instrumented Rod Data

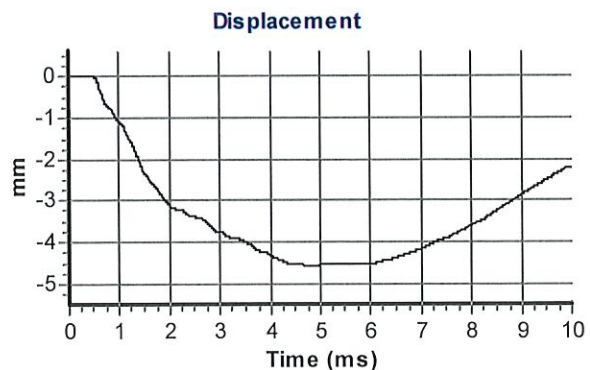
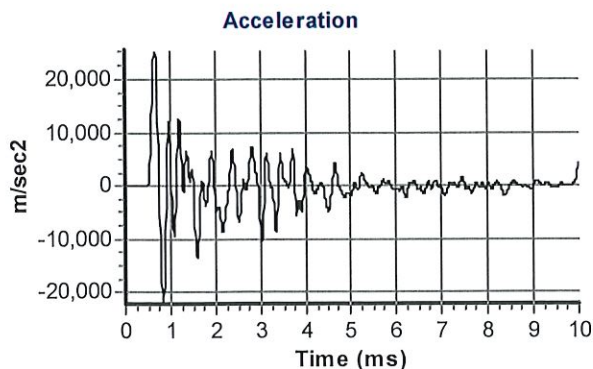
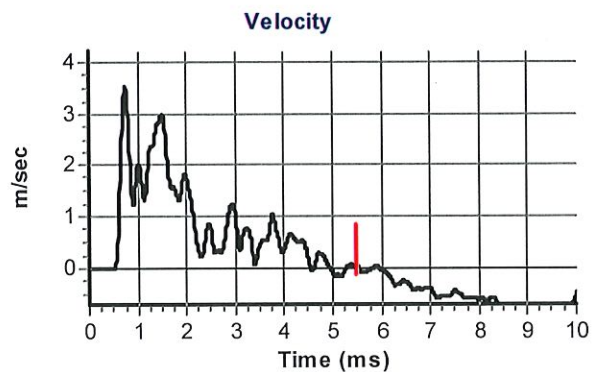
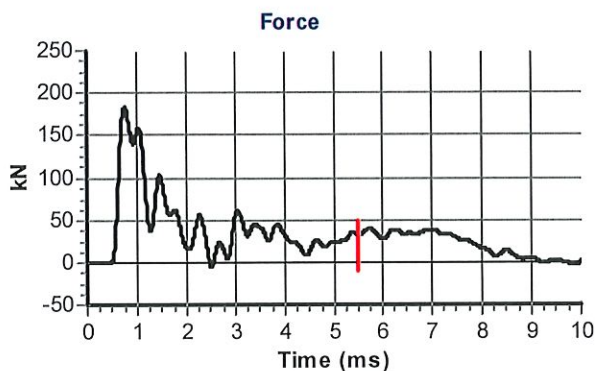
Diameter  $d_r$  (mm): 54  
Wall Thickness  $t_r$  (mm): 6.7  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 64786  
Accelerometer No.2: 64789

## SPT Hammer Information

Hammer Mass  $m$  (kg): 63.5  
Falling Height  $h$  (mm): 760  
SPT String Length  $L$  (m): 10.0

## Comments / Location

CAUSEWAY



## Calculations

Area of Rod A (mm<sup>2</sup>): 996  
Theoretical Energy  $E_{theor}$  (J): 473  
Measured Energy  $E_{meas}$  (J): 354

**Energy Ratio  $E_r$  (%):** 75

  
Signed: Bob Stewart  
Title: Technician

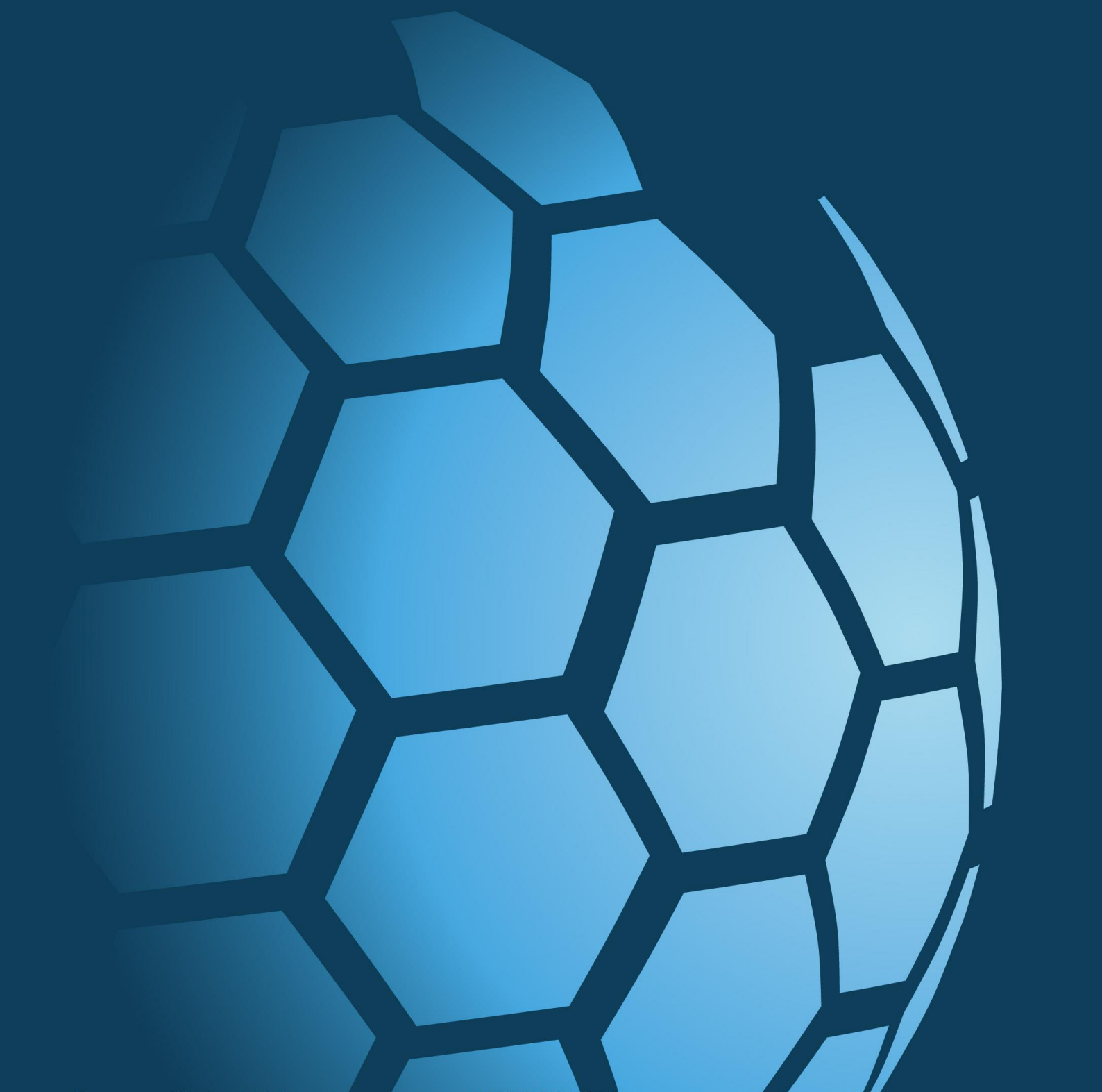
The recommended calibration interval is 12 months



**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)



HC536-B6IWM-5F65Y

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

### Job name

23-0766 Dan Breen House

### Description/Comments

Waste classification on samples recovered from site in June 2023.

### Project

23-0766

### Site

Dan Breen House

### Classified by

<b>Name:</b> <b>Sean Ross</b> <b>Date:</b> <b>11 Jul 2023 09:29 GMT</b> <b>Telephone:</b>	<b>Company:</b> <b>Causeway Geotech Ltd</b> <b>Unit 1 Fingal House, Stephenstown</b> <b>Industrial Estate,</b> <b>Balbriggan</b> <b>K32 VR66</b>
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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:

**Course**  
 Hazardous Waste Classification

**Date**  
 50% complete

### Purpose of classification

2 - Material Characterisation

### Address of the waste

Dan Breen House, Tipperary Town, Co. Tipperary

**Post Code** NA

### Description of industry/producer giving rise to the waste

Redevelopment of site

### Description of the specific process, sub-process and/or activity that created the waste

Waste created during redevelopment of site

### Description of the waste

Mainly made ground comprising reworked sand, gravel and clay occasionally with fragments of concrete, steel, cloth.

**Job summary**

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	TP03/0.50/2023-06-09		Non Hazardous		Pass	Pass	3
2	TP05/0.40/2023-06-08		Non Hazardous		Fail	Pass	7
3	TP09/0.50/2023-06-08		Non Hazardous		Pass	Pass	11
4	BH01 1/0.50/2023-06-12		Non Hazardous		Pass	Pass	15
5	BH02 1/0.50/2023-06-12		Non Hazardous		Pass	Pass	19

**Related documents**

#	Name	Description
1	23-0766 Dan Breen House.BATCH	DETS North .batch file used to populate the Job
2	23-14140.hwol	DETS North .hwol file used to populate the Job
3	23-14399.hwol	DETS North .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 do not 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: Sean Ross

Created date: 11 Jul 2023 09:29 GMT

Appendices	Page
<a href="#">Appendix A: Classifier defined and non EU CLP determinands</a>	23
<a href="#">Appendix B: Rationale for selection of metal species</a>	24
<a href="#">Appendix C: Version</a>	25

Classification of sample: TP03/0.50/2023-06-09

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

### Sample details

Sample name:	LoW Code:	
<b>TP03/0.50/2023-06-09</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>4.6%</b> (wet weight correction)		

### Hazard properties

None identified

### Determinands





Moisture content: 4.6% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				<1 mg/kg	1.197	<1.197 mg/kg	<0.00012 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				7.9 mg/kg	1.32	9.951 mg/kg	0.000995 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	boron { diboron trioxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.545 mg/kg	0.0000545 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				8.4 mg/kg	1.462	11.712 mg/kg	0.00117 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				15 mg/kg	1.126	16.111 mg/kg	0.00161 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	31 mg/kg	1.56	46.13 mg/kg	0.00296 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.13 mg/kg	1.353	0.168 mg/kg	0.0000168 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				<0.4 mg/kg	1.5	<0.6 mg/kg	<0.00006 %		<LOD
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel chromate }				18 mg/kg	2.976	51.108 mg/kg	0.00511 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
12	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
13	zinc { zinc chromate }				78 mg/kg	2.774	206.43 mg/kg	0.0206 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
14	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
16	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
17	toluene 601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
18	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	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]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	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				0.1 mg/kg	1.884	0.18 mg/kg	0.000018 %	✓	
21	pH PH				8.2 pH		8.2 pH	8.2 pH		
22	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	acenaphthylene 205-917-1	208-96-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	acenaphthene 201-469-6	83-32-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	fluorene 201-695-5	86-73-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	phenanthrene 201-581-5	85-01-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	anthracene 204-371-1	120-12-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	fluoranthene 205-912-4	206-44-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
29	pyrene 204-927-3	129-00-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
30	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
31	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
32	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
33	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
34	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
35	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
36	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
37	benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
39	monohydric phenols P1186				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
40	coronene 205-881-7	191-07-1			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
41	sulfur { sulfur } 016-094-00-1	231-722-6	7704-34-9		<0.75 mg/kg		<0.75 mg/kg	<0.000075 %		<LOD
42	barium { barium sulphide } 016-002-00-X	244-214-4	21109-95-5		53 mg/kg	1.233	62.368 mg/kg	0.00624 %	✓	
Total:								0.0407 %		

Key

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	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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<b>&lt;LOD</b>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

**WAC results for sample: TP03/0.50/2023-06-09**

WAC Settings: samples in this Job do not 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)	%	0.5	3
2	LOI (loss on ignition)	%	2	5
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.04	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.01	-
5	Mineral oil (C10 to C40)	mg/kg	<10	1
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<1.6	500
7	pH	pH	8.2	100
8	ANC (acid neutralisation capacity)	mol/kg	<1	-
Eluate Analysis 10:1				
9	arsenic	mg/kg	0.012	0.5
10	barium	mg/kg	<0.1	20
11	cadmium	mg/kg	<0.02	0.04
12	chromium	mg/kg	<0.1	0.5
13	copper	mg/kg	<0.02	2
14	mercury	mg/kg	<0.002	0.01
15	molybdenum	mg/kg	<0.1	0.5
16	nickel	mg/kg	<0.1	0.4
17	lead	mg/kg	<0.05	0.5
18	antimony	mg/kg	<0.05	0.06
19	selenium	mg/kg	<0.03	0.1
20	zinc	mg/kg	0.11	4
21	chloride	mg/kg	<100	800
22	fluoride	mg/kg	<0.1	10
23	sulphate	mg/kg	<100	1,000
24	phenol index	mg/kg	<1	1
25	DOC (dissolved organic carbon)	mg/kg	89	500
26	TDS (total dissolved solids)	mg/kg	290	4,000

**Key**

User supplied data

Classification of sample: TP05/0.40/2023-06-08

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

### Sample details

Sample name:	LoW Code:	
<b>TP05/0.40/2023-06-08</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>11%</b> (wet weight correction)		

### Hazard properties

None identified

### Determinands

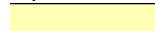



Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				<1 mg/kg	1.197	<1.197 mg/kg	<0.00012 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				7.5 mg/kg	1.32	8.813 mg/kg	0.000881 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	boron { diboron trioxide }				0.4 mg/kg	3.22	1.146 mg/kg	0.000115 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.407 mg/kg	0.0000407 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.7 mg/kg	1.462	12.618 mg/kg	0.00126 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				15 mg/kg	1.126	15.031 mg/kg	0.0015 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	96 mg/kg	1.56	133.271 mg/kg	0.00854 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.23 mg/kg	1.353	0.277 mg/kg	0.0000277 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				0.5 mg/kg	1.5	0.668 mg/kg	0.0000668 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel chromate }				16 mg/kg	2.976	42.382 mg/kg	0.00424 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
12	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
13	zinc { zinc chromate }				77 mg/kg	2.774	190.112 mg/kg	0.019 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
14	TPH (C6 to C40) petroleum group				47 mg/kg		41.83 mg/kg	0.00418 %	✓	
			TPH							
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
16	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
17	toluene 601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
18	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	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]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	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				0.2 mg/kg	1.884	0.335 mg/kg	0.0000335 %	✓	
21	pH PH				8.6 pH		8.6 pH	8.6 pH		
22	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	acenaphthylene 205-917-1	208-96-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	acenaphthene 201-469-6	83-32-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	fluorene 201-695-5	86-73-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	phenanthrene 201-581-5	85-01-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	anthracene 204-371-1	120-12-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	fluoranthene 205-912-4	206-44-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
29	pyrene 204-927-3	129-00-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
30	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
31	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
32	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
33	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
34	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
35	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
36	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
37	benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
39	monohydric phenols P1186				0.4 mg/kg		0.356 mg/kg	0.0000356 %	✓	
40	coronene 205-881-7	191-07-1			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
41	sulfur { sulfur } 016-094-00-1	231-722-6	7704-34-9		<0.75 mg/kg		<0.75 mg/kg	<0.000075 %		<LOD
42	barium { barium sulphide } 016-002-00-X	244-214-4	21109-95-5		110 mg/kg	1.233	120.759 mg/kg	0.0121 %	✓	
Total:								0.0527 %		

Key

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	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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<b>&lt;LOD</b>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

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### Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because **No free product noted in the sample**

Hazard Statements hit:

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**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

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TPH (C6 to C40) petroleum group: (conc.: 0.00418%)

**WAC results for sample: TP05/0.40/2023-06-08**

WAC Settings: samples in this Job do not 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)	% 1.5	3	5
2	LOI (loss on ignition)	% 0.63	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.04	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.01	1	-
5	Mineral oil (C10 to C40)	mg/kg <10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg <1.6	100	-
7	pH	pH 8.6	-	>6
8	ANC (acid neutralisation capacity)	mol/kg <1	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg 0.029	0.5	2
10	barium	mg/kg 0.23	20	100
11	cadmium	mg/kg <0.02	0.04	1
12	chromium	mg/kg 1.2	0.5	10
13	copper	mg/kg <0.02	2	50
14	mercury	mg/kg <0.002	0.01	0.2
15	molybdenum	mg/kg <0.1	0.5	10
16	nickel	mg/kg <0.1	0.4	10
17	lead	mg/kg <0.05	0.5	10
18	antimony	mg/kg <0.05	0.06	0.7
19	selenium	mg/kg <0.03	0.1	0.5
20	zinc	mg/kg 0.077	4	50
21	chloride	mg/kg <100	800	15,000
22	fluoride	mg/kg 1.6	10	150
23	sulphate	mg/kg <100	1,000	20,000
24	phenol index	mg/kg <1	1	-
25	DOC (dissolved organic carbon)	mg/kg 120	500	800
26	TDS (total dissolved solids)	mg/kg 600	4,000	60,000

**Key**

<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	User supplied data
<span style="background-color: cyan; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Inert WAC criteria fail

Classification of sample: TP09/0.50/2023-06-08

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

### Sample details

Sample name:	LoW Code:	
<b>TP09/0.50/2023-06-08</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>9.6%</b> (wet weight correction)		

### Hazard properties

None identified

### Determinands

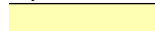



Moisture content: 9.6% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	antimony { antimony trioxide }				1	mg/kg	1.197	1.082	mg/kg	0.000108 %	✓	
	051-005-00-X	215-175-0	1309-64-4									
2	arsenic { arsenic trioxide }				11	mg/kg	1.32	13.129	mg/kg	0.00131 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	boron { diboron trioxide }				0.4	mg/kg	3.22	1.164	mg/kg	0.000116 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.5	mg/kg	1.142	0.516	mg/kg	0.0000516 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11	mg/kg	1.462	14.534	mg/kg	0.00145 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				19	mg/kg	1.126	19.338	mg/kg	0.00193 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead chromate }			1	33	mg/kg	1.56	46.532	mg/kg	0.00298 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
9	mercury { mercury dichloride }				0.18	mg/kg	1.353	0.22	mg/kg	0.000022 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
10	molybdenum { molybdenum(VI) oxide }				0.6	mg/kg	1.5	0.814	mg/kg	0.0000814 %	✓	
	042-001-00-9	215-204-7	1313-27-5									
11	nickel { nickel chromate }				19	mg/kg	2.976	51.12	mg/kg	0.00511 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
12	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
13	zinc { zinc chromate }				77	mg/kg	2.774	193.103	mg/kg	0.0193 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
14	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
16	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
17	toluene 601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
18	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	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]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	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				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
21	pH PH				8.8 pH		8.8 pH	8.8 pH		
22	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	acenaphthylene 205-917-1	208-96-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	acenaphthene 201-469-6	83-32-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	fluorene 201-695-5	86-73-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	phenanthrene 201-581-5	85-01-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	anthracene 204-371-1	120-12-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	fluoranthene 205-912-4	206-44-0			0.2 mg/kg		0.181 mg/kg	0.0000181 %	✓	
29	pyrene 204-927-3	129-00-0			0.2 mg/kg		0.181 mg/kg	0.0000181 %	✓	
30	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
31	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
32	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
33	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
34	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
35	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
36	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
37	benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
39	monohydric phenols P1186				0.3 mg/kg		0.271 mg/kg	0.0000271 %	✓	
40	coronene 205-881-7	191-07-1			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
41	sulfur { sulfur } 016-094-00-1	231-722-6	7704-34-9		<0.75 mg/kg		<0.75 mg/kg	<0.000075 %		<LOD
42	barium { barium sulphide } 016-002-00-X	244-214-4	21109-95-5		73 mg/kg	1.233	81.401 mg/kg	0.00814 %	✓	
Total:								0.0423 %		

Key

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	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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<b>&lt;LOD</b>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

**WAC results for sample: TP09/0.50/2023-06-08**

WAC Settings: samples in this Job do not 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)	% 1.2	3	5
2	LOI (loss on ignition)	% 2.8	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.04	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.01	1	-
5	Mineral oil (C10 to C40)	mg/kg <10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg <1.6	100	-
7	pH	pH 8.8	-	>6
8	ANC (acid neutralisation capacity)	mol/kg <1	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg 0.084	0.5	2
10	barium	mg/kg <0.1	20	100
11	cadmium	mg/kg <0.02	0.04	1
12	chromium	mg/kg <0.1	0.5	10
13	copper	mg/kg 0.029	2	50
14	mercury	mg/kg <0.002	0.01	0.2
15	molybdenum	mg/kg <0.1	0.5	10
16	nickel	mg/kg <0.1	0.4	10
17	lead	mg/kg <0.05	0.5	10
18	antimony	mg/kg <0.05	0.06	0.7
19	selenium	mg/kg <0.03	0.1	0.5
20	zinc	mg/kg 0.034	4	50
21	chloride	mg/kg 590	800	15,000
22	fluoride	mg/kg <0.1	10	150
23	sulphate	mg/kg <100	1,000	20,000
24	phenol index	mg/kg <1	1	-
25	DOC (dissolved organic carbon)	mg/kg 150	500	800
26	TDS (total dissolved solids)	mg/kg 1900	4,000	60,000

**Key**

User supplied data

Classification of sample: BH01 1/0.50/2023-06-12

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

### Sample details

Sample name:	LoW Code:	
<b>BH01 1/0.50/2023-06-12</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>8%</b> (wet weight correction)		

### Hazard properties

None identified

### Determinands





Moisture content: 8% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				1.5 mg/kg	1.197	1.652 mg/kg	0.000165 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				10 mg/kg	1.32	12.147 mg/kg	0.00121 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	boron { diboron trioxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.42 mg/kg	0.000042 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	16.136 mg/kg	0.00161 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				14 mg/kg	1.126	14.501 mg/kg	0.00145 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	24 mg/kg	1.56	34.441 mg/kg	0.00221 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.13 mg/kg	1.353	0.162 mg/kg	0.0000162 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				<0.4 mg/kg	1.5	<0.6 mg/kg	<0.00006 %		<LOD
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel chromate }				19 mg/kg	2.976	52.025 mg/kg	0.0052 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
12	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
13	zinc { zinc chromate }				68 mg/kg	2.774	173.551 mg/kg	0.0174 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
14	TPH (C6 to C40) petroleum group				<1.4 mg/kg		<1.4 mg/kg	<0.00014 %		<LOD
			TPH							
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
16	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
17	toluene 601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
18	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	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]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	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				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
21	pH PH				8.3 pH		8.3 pH	8.3 pH		
22	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	acenaphthylene 205-917-1	208-96-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	acenaphthene 201-469-6	83-32-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	fluorene 201-695-5	86-73-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	phenanthrene 201-581-5	85-01-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	anthracene 204-371-1	120-12-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	fluoranthene 205-912-4	206-44-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
29	pyrene 204-927-3	129-00-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
30	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
31	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
32	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
33	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
34	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
35	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
36	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
37	benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
39	monohydric phenols P1186				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
40	coronene 205-881-7	191-07-1			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
41	sulfur { sulfur } 016-094-00-1	231-722-6	7704-34-9		<0.75 mg/kg		<0.75 mg/kg	<0.000075 %		<LOD
42	barium { barium sulphide } 016-002-00-X	244-214-4	21109-95-5		62 mg/kg	1.233	70.358 mg/kg	0.00704 %	✓	
Total:								0.0372 %		

Key

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	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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<b>&lt;LOD</b>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

**WAC results for sample: BH01 1/0.50/2023-06-12**

WAC Settings: samples in this Job do not 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)	%	<0.5	3
2	LOI (loss on ignition)	%	1.6	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.04	6
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.01	1
5	Mineral oil (C10 to C40)	mg/kg	<10	500
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<1.6	100
7	pH	pH	8.3	-
8	ANC (acid neutralisation capacity)	mol/kg	<1	>6
Eluate Analysis 10:1				
9	arsenic	mg/kg	0.016	0.5
10	barium	mg/kg	<0.1	20
11	cadmium	mg/kg	<0.02	0.04
12	chromium	mg/kg	<0.1	0.5
13	copper	mg/kg	0.032	2
14	mercury	mg/kg	<0.002	0.01
15	molybdenum	mg/kg	<0.1	0.5
16	nickel	mg/kg	<0.1	0.4
17	lead	mg/kg	<0.05	0.5
18	antimony	mg/kg	<0.05	0.06
19	selenium	mg/kg	<0.03	0.1
20	zinc	mg/kg	<0.01	4
21	chloride	mg/kg	110	800
22	fluoride	mg/kg	<0.1	10
23	sulphate	mg/kg	<100	1,000
24	phenol index	mg/kg	<1	1
25	DOC (dissolved organic carbon)	mg/kg	<50	500
26	TDS (total dissolved solids)	mg/kg	790	4,000

**Key**

User supplied data

Classification of sample: BH02 1/0.50/2023-06-12

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

**Sample details**

Sample name:	LoW Code:	
<b>BH02 1/0.50/2023-06-12</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>9.2%</b> (wet weight correction)		

**Hazard properties**

None identified

**Determinands**





Moisture content: 9.2% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				1.1 mg/kg	1.197	1.196 mg/kg	0.00012 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				17 mg/kg	1.32	20.381 mg/kg	0.00204 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	boron { diboron trioxide }				0.2 mg/kg	3.22	0.585 mg/kg	0.0000585 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.519 mg/kg	0.0000519 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11 mg/kg	1.462	14.598 mg/kg	0.00146 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				15 mg/kg	1.126	15.335 mg/kg	0.00153 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	40 mg/kg	1.56	56.652 mg/kg	0.00363 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.08 mg/kg	1.353	0.0983 mg/kg	0.0000983 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				<0.4 mg/kg	1.5	<0.6 mg/kg	<0.00006 %		<LOD
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel chromate }				19 mg/kg	2.976	51.347 mg/kg	0.00513 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
12	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
13	zinc { zinc chromate }				65 mg/kg	2.774	163.73 mg/kg	0.0164 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
14	TPH (C6 to C40) petroleum group				<1.4 mg/kg		<1.4 mg/kg	<0.00014 %		<LOD
			TPH							
15	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
16	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
17	toluene 601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
18	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	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]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	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				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
21	pH PH				8.9 pH		8.9 pH	8.9 pH		
22	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	acenaphthylene 205-917-1	208-96-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	acenaphthene 201-469-6	83-32-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	fluorene 201-695-5	86-73-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	phenanthrene 201-581-5	85-01-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	anthracene 204-371-1	120-12-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	fluoranthene 205-912-4	206-44-0			0.1 mg/kg		0.0908 mg/kg	0.00000908 %	✓	
29	pyrene 204-927-3	129-00-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
30	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
31	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
32	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
33	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
34	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
35	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
36	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
37	benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
39	monohydric phenols P1186				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
40	coronene 205-881-7	191-07-1			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
41	sulfur { sulfur } 016-094-00-1	231-722-6	7704-34-9		<0.75 mg/kg		<0.75 mg/kg	<0.000075 %		<LOD
42	barium { barium sulphide } 016-002-00-X	244-214-4	21109-95-5		52 mg/kg	1.233	58.241 mg/kg	0.00582 %	✓	
Total:								0.0371 %		

Key

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	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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<b>&lt;LOD</b>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

**WAC results for sample: BH02 1/0.50/2023-06-12**

WAC Settings: samples in this Job do not 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)	% <0.5	3	5
2	LOI (loss on ignition)	% 1.2	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.04	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.01	1	-
5	Mineral oil (C10 to C40)	mg/kg <10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg <1.6	100	-
7	pH	pH 8.9	-	>6
8	ANC (acid neutralisation capacity)	mol/kg <1	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg 0.46	0.5	2
10	barium	mg/kg <0.1	20	100
11	cadmium	mg/kg <0.02	0.04	1
12	chromium	mg/kg <0.1	0.5	10
13	copper	mg/kg 0.038	2	50
14	mercury	mg/kg <0.002	0.01	0.2
15	molybdenum	mg/kg <0.1	0.5	10
16	nickel	mg/kg <0.1	0.4	10
17	lead	mg/kg <0.05	0.5	10
18	antimony	mg/kg <0.05	0.06	0.7
19	selenium	mg/kg <0.03	0.1	0.5
20	zinc	mg/kg 0.015	4	50
21	chloride	mg/kg <100	800	15,000
22	fluoride	mg/kg <0.1	10	150
23	sulphate	mg/kg <100	1,000	20,000
24	phenol index	mg/kg <1	1	-
25	DOC (dissolved organic carbon)	mg/kg <50	500	800
26	TDS (total dissolved solids)	mg/kg 620	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

### • TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

### • 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

▪ **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

▪ **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

▪ **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

## 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

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**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 (edit as required)

**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

**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}**

Reasonable case scenario CLP

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**Appendix C: Version**

HazWasteOnline Classification Engine: EU WM3 1st Edition v1.1.NI using the EU LoW

HazWasteOnline Classification Engine Version: 2023.186.5664.10433 (05 Jul 2023)

HazWasteOnline Database: 2023.186.5664.10433 (05 Jul 2023)

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