S.I. Ltd Contract No: 5994

Client:	Kildare County Council
Engineer:	Tobin Consulting Engineers
Contractor:	Site Investigations Ltd

Maynooth Fire Station,
Maynooth, Co. Kildare
Site Investigation Report

Prepared by:

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Issue Date:	24/06/2022
Status	Final
Revision	1

Contents:

Appendices:

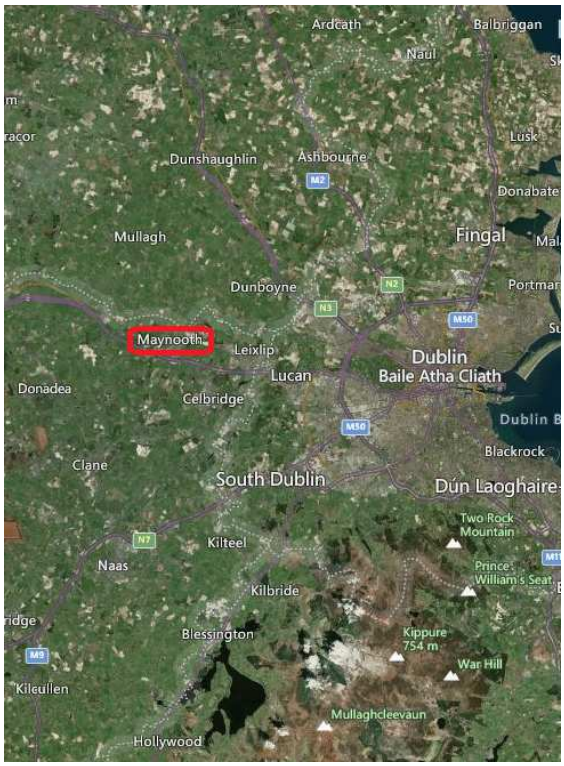
1. Introduction

On the instructions of Tobin Consulting Engineers, Site Investigations Ltd (SIL) was appointed to complete a ground investigation at Maynooth, Co. Kildare. The investigation was for a fire station on the site and was completed on behalf of Kildare County Council.

This report presents the factual geotechnical data obtained from the field and laboratory testing with interpretation of the ground conditions discussed.

2. Site Location

The site is located in Maynooth in north county Kildare to the west of Dublin as shown by the map on the left. The map on the right shows the location of the site to the south of the town centre close to Junction 7 of the M4.



3. Fieldwork

The fieldworks were started in May and completed in June 2022 and comprised a programme of cable percussive boreholes, a rotary corehole, trial pits with soakaway tests, California Bearing Ratio tests and dynamic probes. All fieldwork was carried out in accordance with BS 5930:2015, Engineers Ireland GI Specification and Related Document 2nd Edition 2016 and Eurocode 7: Geotechnical Design.

The fieldworks comprised of the following:

- 4 No. cable percussive boreholes
- 1 No. rotary corehole
- 4 No. trial pits with 2 No. soakaway tests
- 4 No. California Bearing Ratio tests
- 8 No. dynamic probes

3.1. Cable Percussive Boreholes

Cable percussion boring was undertaken at 4 No. locations using a Dando 150 rig and constructed 200mm diameter boreholes. The boreholes terminated at shallow depths ranging from 0.90mbgl (BH03) to 1.35mbgl (BH01 and BH02) after an hour and a half chiselling was completed and no further progress was made. It was not possible to collect undisturbed samples due to the granular soils encountered so bulk disturbed samples were recovered at regular intervals.

To test the strength of the stratum, Standard Penetration Tests (SPT's) were performed at 1.00m intervals in accordance with BS 1377 (1990). In soils with high gravel and cobble content it is appropriate to use a solid cone (60°) (CPT) instead of the split spoon and this was used throughout the testing. The test is completed over 450mm and the cone is driven 150mm into the stratum to ensure that the test is conducted over an undisturbed zone. The cone is then driven the remaining 300mm and the blows recorded to report the N-Value. Where refusal of 50 blows across the test zone was encountered was achieved during testing, the penetration depth is also reported (e.g., BH01 at 1.00mbgl where N=50-(3,18/50 for 105mm)).

The cable percussive borehole logs are presented in Appendix 1

3.2. Rotary Corehole

Following completion of the cable percussive boreholes, a rotary corehole was completed at BH02 to investigate the depth of bedrock. The rotary drilling was carried out using a Sondeq SS71 top drive rig and open hole drilling techniques were used to advance through the overburden to the bedrock. The coreholes were then terminated when 3m of core was recovered and returned to SIL, where they were logged and photographed by a SIL geotechnical engineer.

Provided on the logs are engineering geological descriptions of the rock cores with details of the bedding/discontinuities and mechanical indices for each core run, i.e., TCR, SCR, RQD and Fracture Index.

The rotary corehole log and photograph is presented in Appendix 2.

3.3. Trial Pits with Soakaway Tests

4 No. trial pits were excavated using a wheeled excavator. The pits were logged and photographed by SIL geotechnical engineer and representative disturbed bulk samples were recovered as the pits were excavated, which were returned to the laboratory for geotechnical testing.

At TP02 and TP04, soakaway tests were completed and logged by SIL geotechnical engineer. BRE Special Digest 365 stipulates that the pit should be filled three times and that the final cycle is used to provide the infiltration rate. The time taken for the water level to fall from 75% volume to 25% volume is required to calculate the rate of infiltration. However, if water ingresses into the pits or if the water level does not fall at a steady rate, then the test is deemed to have failed and the area is unsuitable for storm water drainage.

The trial pit logs and photographs are presented in Appendix 3 with the soakaway test results in Appendix 4.

3.4. California Bearing Ratio Tests

At 4 No. locations, undisturbed cylindrical mould samples were recovered to complete California Bearing Ratio tests in the laboratory. The results facilitate the designing of the access roads and associated areas and are completed to BS1377: 1990: Part 4, Clause 7 ‘Determination of California Bearing Ratio’. The results are presented in Appendix 5.

3.5. Dynamic Probes

After completion of the initial fieldworks, dynamic probes were scheduled adjacent to the boreholes and trial pits to attempt to get quantitative data for foundation design. The probes were completed using a track mounted Competitor 130 machine. The testing complies with the requirements of BS1377: Part 9 (1990) and Eurocode 7: Part 3. The configuration utilised standard DPH (Heavy) probing method comprising a 50kg weight, 500mm drop height and a 50mm diameter (90°) cone. The number of blows required to drive the cone each 100mm increment into the sub soil is recorded in accordance with the standards. The dynamic probe provides no information regarding soil type or groundwater conditions.

The dynamic probe results can be used to analyse the strength of the soil strata encountered by the probe. 'Proceedings of the Trinity College Dublin Symposium of Field and Laboratory Testing of Soils for Foundations and Embankments' presents a paper by Foirbart that is most relevant to Irish soil conditions and within this paper the following equations were included:

Granular Soils: DPH N_{100} x 2.5 = SPT N value

Cohesive Soils: C_u = 15 x DPH N_{100} + 30 kN/m^2

These equations present a relationship between the probe N_{100} value and the SPT N value for granular soils and the undrained shear strength of cohesive soils.

The dynamic probe logs are presented in Appendix 6.

3.6. Surveying

Following completion of all the fieldworks, a survey of the exploratory hole locations was completed using a GeoMax GPS Rover. The data is supplied on each individual log and along with a site plan in Appendix 10.

4. Laboratory Testing

Geotechnical laboratory testing was completed on representative soil samples in accordance with BS 1377 (1990). Testing included:

- 8 No. Moisture contents
- 8 No. Atterberg limits
- 8 No. Particle size gradings
- 4 No. pH and sulphate content

Environmental testing was completed by ALS Environmental Ltd. and consists of the following:

- 4 No. Suite I analysis

The geotechnical laboratory test results are presented in Appendix 7 with the environmental tests reported in Appendix 8 and a Waste Classification Report in Appendix 9.

5. Ground Conditions

5.1. MADE GROUND

MADE GROUND was identified at each borehole and trial pit location between 0.60mbgl and 0.70mbgl. This consisted of grey brown sandy gravelly silty clay with medium cobble content with some timber, plastic, concrete, plastic pipe and telecom cable fragments identified across the site.

5.2. Overburden

The natural ground conditions recorded brown (slightly) sandy (slightly) gravelly silty CLAY until the locations terminated on possible boulder or bedrock obstructions. All the borehole SPT tests recorded 50 blows before the 450mm penetration was achieved so the dynamic probes were

completed. These recorded high N_{100} values throughout the profile with DPTP01 recording the lowest value of 7 at 1.00mbgl.

Laboratory tests of the shallow soils confirm that the soils are dominated by cohesive CLAY soils with low to intermediate plasticity indexes of 14% to 18% recorded by the Atterberg Limits. The particle size distribution curves show poorly sorted curves with 16% to 46% fines content within the samples tested.

5.3. Bedrock

The bedrock was recorded at 2.30mbgl at RC02 and 3m of core was recovered. This is a moderately strong, light grey, massive LIMESTONE with occasional calcite veins and a fresh to slightly weathered state. The discontinuities are rough, undulating, tight to open, sub-horizontal, occasionally sub-vertical dip and the surfaces are clean with occasional brown staining.

5.4. Groundwater

Groundwater details in the boreholes and trial pits during the fieldworks are noted on the logs in Appendices 1 and 3. No groundwater ingresses were recorded during the fieldworks period.

6. Recommendations and Conclusions

Please note the following caveats:

The recommendations given, and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between the exploratory hole locations or below the final level of excavation, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for adjacent unexpected conditions that have not been revealed by the exploratory holes. It is further recommended that all bearing surfaces when excavated should be inspected by a suitably qualified Engineer to verify the information given in this report.

Excavated surfaces in clay strata should be kept dry to avoid softening prior to foundation placement. Foundations should always be taken to a minimum depth of 0.50mBGL to avoid the effects of frost action and possible seasonal shrinkage/swelling.

If it is intended that on-site materials are to be used as fill, then the necessary laboratory testing should be specified by the Client to confirm the suitability. Also, relevant lab testing should be specified where stability of side slopes to excavations is a concern, or where contamination may be an issue.

6.1. Shallow Foundations

Due to the unknown depth of foundation and no longer-term groundwater information, this analysis assumes the groundwater will not influence the construction or performance of these foundations.

As stated previously, man-made soils were recorded across the site to between 0.60mbgl and 0.70mbgl. SIL do not recommend that narrow shallow foundations are placed on fill material due to the unknown compaction methods used during laying of man-made material. This unknown could result in softer spots and differential settlement once construction is completed. If shallow foundations are to be used and man-made soils are encountered below foundation level, then the soil should be removed and replaced with engineered fill which is compacted to the required standard.

The borehole SPT tests refused before the 450mm penetration was achieved to provide quantitative data for allowable bearing capacity analysis. Therefore, the dynamic probes were scheduled and these terminated at shallow depths but they do provide values for analysis. In cohesive soils, the undrained shear strength (C_u) is calculated using the N_{100} value as per the equation in Section 3.5. This can then be used in calculations to work out the ultimate bearing capacity (ULS) and when a factor of safety of 3 is applied, the allowable bearing capacity (ABC) can be provided.

In granular soils, the N_{100} value is used to correlate the SPT N-value. The SPT N-value can then be used to calculate the allowable bearing capacity, as per Terzaghi and Peck, using the correlation of SPT N-value x 10 = ABC.

The table below shows the allowable bearing capacities for N_{100} values 1 to 10 at 1.00mbgl and these can be used provide the allowable bearing capacity at each probe location.

N_{100} Value	Cohesive Soils			Granular Soils	
	C_u	ULS	ABC	SPT N-value	ABC
1	45	245	82	2.5	25
2	60	324	110	5	50
3	75	400	135	7.5	75
4	90	480	160	10	100
5	105	555	185	12.5	125
6	120	630	210	15	150
7	135	705	235	17.5	175
8	150	780	260	20	200
9	165	855	285	22.5	225
10	180	930	310	250	250

The probes at 1.00mbgl recorded high N_{100} values with DPTP01 recording the lowest value of 7. Using the table above, this indicates an allowable bearing capacity of 235kN/m^2 in cohesive soils or 175kN/m^2 in granular soils.

It would therefore, be highly recommended that all foundations are inspected by a suitably qualified Engineer prior to pouring and confirm that the soils are suitable for the foundation design.

The following assumptions were made as part of these analyses. If any of these assumptions are not in accordance with detailed design or observations made during construction these recommendations should be re-evaluated.

- The foundation is to be 1m wide.
- Foundations are to be constructed on a level formation of uniform material type (described above).
- All man-made or filled material is to be removed prior to construction.
- The bulk unit weight of the material in this stratum has a minimum density of 19kN/m^3.
- Based on groundwater observations this analysis assumes the groundwater will not influence the construction or performance of these foundations.
- All founding strata to be inspected by a suitably qualified Engineer prior to pouring the foundations.

The trial pits indicate that excavations should be stable for a short while at least. Inspection of temporary slopes should be completed immediately upon excavation and at regular intervals whilst left open to ensure that all slopes are stable and they should be battered back if required. Temporary support should be used on any excavation that will be left open for an extended period.

6.2. Groundwater

The caveats below relating to interpretation of groundwater levels should be noted:
There is always considerable uncertainty as to the likely rates of water ingress into excavations in clayey soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water.

Furthermore, water levels noted on the borehole and trial pit logs do not generally give an accurate indication of the actual groundwater conditions as the borehole or trial pit is rarely left open for sufficient time for the water level to reach equilibrium.

Also, during boring procedures, a permeable stratum may have been sealed off by the borehole casing, or water may have been added to aid drilling. Therefore, an extended period of

groundwater monitoring using any constructed standpipes is required to provide more accurate information regarding groundwater conditions. Finally, groundwater levels vary with time of year, rainfall, nearby construction and tides.

Pumping tests would be required to determine likely seepage rates and persistence into excavations taken below the groundwater level. Deep trial pits also aid estimation of seepage rates.

As discussed previously, groundwater was not recorded in the boreholes or trial pits during the fieldworks period. There is always considerable uncertainty as to the likely rates of water ingress into excavations in cohesive soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water. Based on this information at the exploratory hole locations to date, it is considered likely that any shallow ingress into excavations of the CLAY will be slow. If granular soils are encountered in shallow excavations, then the possibility of water ingressing into an excavation increase.

If groundwater is encountered during excavations then mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

6.3. Soakaway Test

The soakaway tests at TP02 and TP04 failed the soakaway test specification as the water level did not fall sufficiently enough to complete the tests. The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The tests were terminated at the end of the first (of a possible three) fill/empty cycle since further testing would give even slower fall rates due to increased soil saturation.

6.4. Pavement Design

The CBR test results in Appendix 5 indicate CBR values ranging from 4.8% to 7.7%.

The CBR samples were recovered between 0.50mbgl and inspection of the formation strata should be completed prior to construction of the pavement. Once the exact formation levels are finalised then additional in-situ testing could be completed to assist with the detailed pavement design.

6.5. Contamination

Environmental testing was carried out on four samples from the investigation and the results are shown in Appendix 8. For material to be removed from site, Suite I testing was carried out to determine if the material is hazardous or non-hazardous and then the leachate results were

compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill.

The Waste Classification report created using HazWasteOnline™ software shows that the material tested can be classified as non-hazardous material. The sample from TP04 did record a Total Petroleum Hydrocarbon value above the limits of detection but it is low and in the non-liquid phase so HP3 can be discounted.

Following this analysis of the solid test results, the leachate disposal suite results indicate that the soils tested would generally be able to be treated as Inert Waste.

Four samples were tested for analysis but it cannot be discounted that any localised contamination may have been missed. Any MADE GROUND excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils. Additional testing of these soils may be requested by the individual landfill before acceptance and a testing regime designed by an environmental engineer would be recommended to satisfy the landfill.

6.6. Aggressive Ground Conditions

The chemical test results in Appendix 7 indicate a general pH value between 8.11 and 8.23, which is close to neutral and below the level of 9, therefore no special precautions are required.

The maximum value obtained for water soluble sulphate was 122mg/l as SO_3. The BRE Special Digest 1:2005 – '*Concrete in Aggressive Ground*' guidelines require SO_4 values and after conversion ($SO_4 = SO_3 \times 1.2$), the maximum value of 146mg/l shows Class 1 conditions and no special precautions are required.

Appendix 1

Cable Percussive Borehole Logs

Contract No: 5994	**Cable Percussion Borehole Log**	Borehole No: **BH01**

Contract:	Maynooth Fire Station	Easting:	693991.954	Date Started:	31/05/2022
Location:	Maynooth, Co. Kildare	Northing:	736387.194	Date Completed:	02/03/2021
Client:	Kildare County Council	Elevation:	63.34	Drilled By:	J. O'Toole
Engineer:	Tobin Consulting Engineers	Borehole Diameter:	200mm	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
		TOPSOIL.			63.14					
	0.20	MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic, timber and concrete fragments.		63.0						
0.5						0.50	B	JOT02		
	0.70	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.			62.64					
				62.5						
1.0						1.00	B	JOT03		
						1.00	C	50 (3,18/50 for 105mm)		
	1.25	Obstruction - possible boulders.			62.09					
	1.35	End of Borehole at 1.35m		62.0	61.99	1.35	C	50 (25 for 5mm/50 for 5mm)		
1.5										
				61.5						
2.0										
				61.0						
2.5										
				60.5						
3.0										
				60.0						
3.5										
				59.5						
4.0										
				59.0						
4.5										
				58.5						

Chiselling: From:	To:	Time:	Water Strikes: Strike:	Rose:	Depth Sealed	Water Details: Date:	Hole Depth:	Water Depth:	Installation: From:	To:	Pipe:	Backfill: From:	To:	Type:	Remarks:
1.25	1.35	01:30				31/05	1.35	Dry				0.00	1.35	Arisings	Borehole terminated due to obstruction.

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 5994	**Cable Percussion Borehole Log**				Borehole No: **BH02**
Contract:	Maynooth Fire Station	Easting:	693986.702	Date Started:	31/05/2022
Location:	Maynooth, Co. Kildare	Northing:	736374.180	Date Completed:	03/03/2021
Client:	Kildare County Council	Elevation:	63.38	Drilled By:	J. O'Toole
Engineer:	Tobin Consulting Engineers	Borehole Diameter:	200mm	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
		TOPSOIL.			63.18					
	0.20	MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic, timber and concrete fragments.		63.0		0.50	B	JOT04		
0.5	0.60	Brown slightly sandy gravelly silty CLAY with low cobble content.			62.78					
				62.5		1.00	B	JOT05		
1.0						1.00	C	50 (9,15/50 for 90mm)		
	1.25	Obstruction - boulders.			62.13					
	1.35	End of Borehole at 1.35m		62.0	62.03	1.35	C	50 (25 for 5mm/50 for 5mm)		
1.5										
				61.5						
2.0										
				61.0						
2.5										
				60.5						
3.0										
				60.0						
3.5										
				59.5						
4.0										
				59.0						
4.5										
				58.5						

Chiselling: From:	To:	Time:	Water Strikes: Strike:	Rose:	Depth Sealed	Water Details: Date:	Hole Depth:	Water Depth:	Installation: From:	To:	Pipe:	Backfill: From:	To:	Type:	Remarks:
1.25	1.35	01:30				31/05	1.35	Dry				0.00	1.35	Arisings	Borehole terminated due to obstruction.

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 5994	**Cable Percussion Borehole Log**	Borehole No: **BH03**

Contract:	Maynooth Fire Station	Easting:	694017.345	Date Started:	30/05/2022
Location:	Maynooth, Co. Kildare	Northing:	736374.408	Date Completed:	04/03/2021
Client:	Kildare County Council	Elevation:	63.33	Drilled By:	J. O'Toole
Engineer:	Tobin Consulting Engineers	Borehole Diameter:	200mm	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
0.5	0.20	TOPSOIL.		63.0	63.13					
	0.60	MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic, timber and concrete fragments.			62.73	0.70	B	JOT01		
	0.80	Brown slightly sandy gravelly silty CLAY with low cobble content.		62.5	62.53					
1.0	0.90	Obstruction - possible boulders.			62.43	0.90	C	50 (25 for 5mm/50 for 10mm)		
1.5		End of Borehole at 0.90m		62.0						
2.0				61.5						
2.5				61.0						
3.0				60.5						
3.5				60.0						
4.0				59.5						
4.5				59.0						
				58.5						

Chiselling: From:	To:	Time:	Water Strikes: Strike:	Rose:	Depth Sealed	Water Details: Date:	Hole Depth:	Water Depth:	Installation: From:	To:	Pipe:	Backfill: From:	To:	Type:	Remarks:
0.80	0.90	01:30				30/05	0.90	Dry				0.00	0.90	Arisings	Borehole terminated due to obstruction.

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 5994	**Cable Percussion Borehole Log**	Borehole No: **BH04**

Contract:	Maynooth Fire Station	Easting:	694008.037	Date Started:	01/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736356.332	Date Completed:	01/06/2022
Client:	Kildare County Council	Elevation:	63.44	Drilled By:	J. O'Toole
Engineer:	Tobin Consulting Engineers	Borehole Diameter:	200mm	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
		TOPSOIL.			63.24					
	0.20	MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic, timber and concrete fragments.		63.0		0.50	B	JOT06		
0.5	0.60	Brown slightly sandy gravelly silty CLAY with low cobble content.			62.84					
				62.5		1.00	B	JOT07		
1.0						1.00	C	50 (6,14/50 for 40mm)		
	1.20	Obstruction - possible boulders.			62.24					
	1.30	End of Borehole at 1.30m			62.14	1.30	C	50 (25 for 5mm/50 for 5mm)		
1.5				62.0						
2.0				61.5						
2.5				61.0						
3.0				60.5						
3.5				60.0						
4.0				59.5						
4.5				59.0						
				58.5						

Chiselling: From:	To:	Time:	Water Strikes: Strike:	Rose:	Depth Sealed	Water Details: Date:	Hole Depth:	Water Depth:	Installation: From:	To:	Pipe:	Backfill: From:	To:	Type:	Remarks:
1.20	1.30	01:30				01/06	1.30	Dry				0.00	1.30	Arisings	Borehole terminated due to obstruction.

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Appendix 2

Rotary Corehole Log and Photograph

Contract No: 5994	**Rotary Corehole Log**				Corehole No: **RC02**
Contract:	Maynooth Fire Station	Easting:	693986.702	Date Started:	08/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736374.180	Date Completed:	08/06/2022
Client:	Kildare County Council	Elevation:	63.38	Drilled By:	MEDL
Engineer:	Tobin Consulting Engineers	Rig Type:	Sondeq	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples	Rock Indices TCR/%	SCR/%	RQD/%	FI/m	Backfill
0.5		Cable percussive borehole completed - see CP log.		63.0							
1.0				62.5							
1.5	1.35	Open hole drilling - driller reports returns of sandy gravelly CLAY with cobbles and boulders.		62.0	62.03						
2.0				61.5							
2.5	2.30	Moderately strong light grey massive LIMESTONE with occasional calcite veins. Fresh to slightly weathered. *Discontinuities - rough, undulating, tight to open, sub-horizontal, occasionally sub-vertical dip, clean with occasional brown staining.*		61.0	61.08	2.30 - 3.30	96	82	51	7	
3.0				60.5							
3.5				60.0		3.30 - 4.30	95	77	46		
4.0				59.5						11	
4.5				59.0		4.30 - 5.30	93	84	32		
5.0				58.5							
5.5	5.30	End of Corehole at 5.30m		58.0	58.08						
				57.5							

Installation:			Backfill:			Remarks:
From:	To:	Pipe Type:	From:	To:	Type:	Cable percussive borehole previously completed. Corehole completed adjacent to borehole.
			0.00	5.30	Bentonite	

RC02 Box 1 of 1

Appendix 3

Trial Pit Logs and Photographs

Contract No: 5994	**Trial Pit Log**				Trial Pit No: **TP01**
Contract:	Maynooth Fire Station	Easting:	693983.942	Date:	25/05/2022
Location:	Maynooth, Co. Kildare	Northing:	736366.956	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	63.29	Logged By:	M. Kaliski
Engineer:	Tobin Consulting Engineers	Dimensions (LxWxD) (m):	6.50 x 0.60 x 1.70	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
	0.10	TOPSOIL.			63.19				
		MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic pipe and timber fragments.		63.0					
0.5						0.50	ES	MK05	
	0.60	Stiff brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.			62.69				
				62.5					
1.0						1.00	B	MK06	
				62.0					
1.5									
	1.70	Obstruction - possible boulders.			61.59				
		Pit terminated at 1.70m		61.5					
2.0									
				61.0					
2.5									
				60.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5994	**Trial Pit Log**				Trial Pit No: **TP02**
Contract:	Maynooth Fire Station	Easting:	694007.291	Date:	25/05/2022
Location:	Maynooth, Co. Kildare	Northing:	736395.659	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	63.24	Logged By:	M. Kaliski
Engineer:	Tobin Consulting Engineers	Dimensions (LxWxD) (m):	5.10 x 0.60 x 1.80	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
	0.10	TOPSOIL.			63.14				
		MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic fragments.		63.0					
0.5						0.50	ES	MK03	
	0.70	Stiff brown slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		62.5	62.54				
1.0						1.00	B	MK04	
				62.0					
1.5									
	1.80	Obstruction - possible boulders.		61.5	61.44				
		Pit terminated at 1.80m							
2.0									
				61.0					
2.5									
				60.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5994	**Trial Pit Log**				Trial Pit No: **TP03**
Contract:	Maynooth Fire Station	Easting:	694032.944	Date:	25/05/2022
Location:	Maynooth, Co. Kildare	Northing:	736371.616	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	63.34	Logged By:	M. Kaliski
Engineer:	Tobin Consulting Engineers	Dimensions (LxWxD) (m):	4.40 x 0.60 x 1.50	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
	0.10	TOPSOIL.			63.24				
		MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some concrete fragments.		63.0					
0.5						0.50	ES	MK01	
	0.60	Stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).			62.74				
				62.5					
1.0						1.00	B	MK02	
				62.0					
1.5	1.50	Obstruction - possible boulders.			61.84				
		Pit terminated at 1.50m							
				61.5					
2.0									
				61.0					
2.5									
				60.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5994	**Trial Pit Log**				Trial Pit No: **TP04**
Contract:	Maynooth Fire Station	Easting:	694021.704	Date:	25/05/2022
Location:	Maynooth, Co. Kildare	Northing:	736347.331	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	63.27	Logged By:	M. Kaliski
Engineer:	Tobin Consulting Engineers	Dimensions (LxWxD) (m):	4.50 x 0.60 x 1.20	Status:	FINAL

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
	0.10	TOPSOIL.			63.17				
		MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic pipe and telecom cable fragments.		63.0					
0.5						0.50	ES	MK07	
	0.70				62.57				
		Stiff brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		62.5					
1.0						1.00	B	MK08	
	1.20	Obstruction - possible boulders.			62.07				
		Pit terminated at 1.20m		62.0					
1.5									
				61.5					
2.0									
				61.0					
2.5									
				60.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

TP01 Sidewall

TP01 Spoil

TP02 Sidewall

TP02 Spoil

TP03 Sidewall

TP03 Spoil

TP04 Sidewall

TP04 Spoil

Appendix 4

Soakaway Test Results

SOAKAWAY TEST

Project Reference:	5994
Contract name:	Maynooth Fire Station
Location:	Maynooth, Co. Kildare
Test No:	TP02
Date:	25/05/2022

Ground Conditions

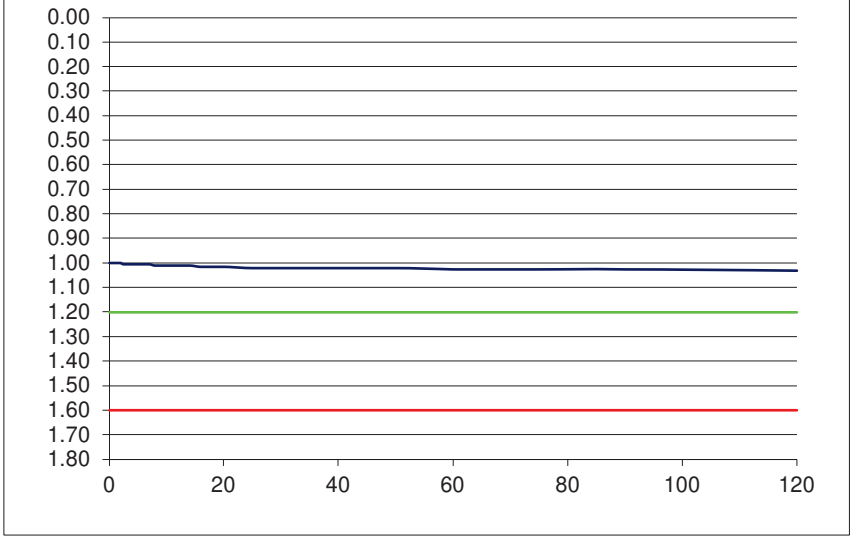
From	To	
0.00	0.10	TOPSOIL.
0.10	0.70	MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic fragments.
0.70	1.80	Firm brown slightly sandy slightly gravelly silty CLAY with medium cobble content.

Remarks:

Obstruction at 1.80mbgl - pit terminated and test completed.

Elapsed Time (mins)	Fall of Water (m)
0	1.00
0.5	1.00
1	1.00
1.5	1.00
2	1.00
2.5	1.01
3	1.01
3.5	1.01
4	1.01
4.5	1.01
5	1.01
6	1.01
7	1.01
8	1.01
9	1.01
10	1.01
12	1.01
14	1.01
16	1.02
18	1.02
20	1.02
25	1.02
30	1.02
40	1.02
50	1.02
60	1.03
75	1.03
90	1.03
120	1.03

Pit Dimensions (m)		
Length (m)	5.10	m
Width (m)	0.60	m
Depth	1.80	m
Water		
Start Depth of Water	1.00	m
Depth of Water	0.80	m
75% Full	1.20	m
25% Full	1.60	m
75%-25%	0.40	m
Volume of water (75%-25%)	**1.22**	m3
Area of Drainage	**20.52**	m2
Area of Drainage (75%-25%)	**7.62**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** **m/min** or **Fail** **m/s**

SOAKAWAY TEST

Project Reference:	5994
Contract name:	Maynooth Fire Station
Location:	Maynooth, Co. Kildare
Test No:	TP04
Date:	25/05/2022

Ground Conditions

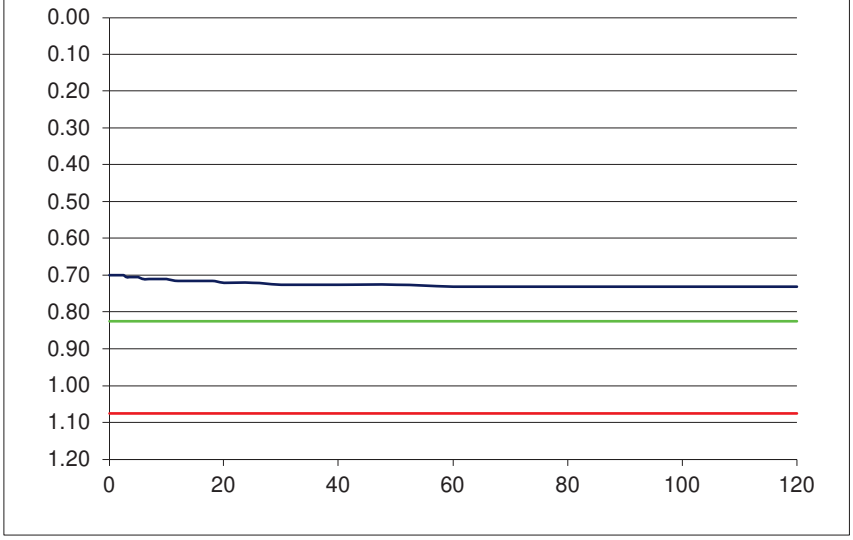
From	To	
0.00	0.10	TOPSOIL.
0.10	0.70	MADE GROUND: grey brown sandy gravelly silty clay with medium cobble content and some plastic pipe and telecom cable fragments.
0.70	1.20	Firm brown slightly sandy slightly gravelly silty CLAY with medium cobble content.

Remarks:

Obstruction at 1.20mbgl - pit terminated and test completed.

Elapsed Time (mins)	Fall of Water (m)
0	0.70
0.5	0.70
1	0.70
1.5	0.70
2	0.70
2.5	0.70
3	0.71
3.5	0.71
4	0.71
4.5	0.71
5	0.71
6	0.71
7	0.71
8	0.71
9	0.71
10	0.71
12	0.72
14	0.72
16	0.72
18	0.72
20	0.72
25	0.72
30	0.73
40	0.73
50	0.73
60	0.73
75	0.73
90	0.73
120	0.73

Pit Dimensions (m)		
Length (m)	4.50	m
Width (m)	0.60	m
Depth	1.20	m
Water		
Start Depth of Water	0.70	m
Depth of Water	0.50	m
75% Full	0.83	m
25% Full	1.08	m
75%-25%	0.25	m
Volume of water (75%-25%)	**0.68**	m3
Area of Drainage	**12.24**	m2
Area of Drainage (75%-25%)	**5.25**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** **m/min** or **Fail** **m/s**

Appendix 5

California Bearing Ratio Tests

California Bearing Ratio (CBR) In accordance with BS1377: Part 4: Method 7

Client	Kildare County Council
Site	Maynooth Fire Station
S.I. File No	5994 / 22
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	17th June 2022

CBR No	Depth (mBGL)	Sample No	Sample Type	Lab Ref	Moisture Content (%)	CBR Value (%)	Location / Remarks
CBR01	0.50	MK20	CBR	22/784	12.3	7.7	
CBR02	0.50	MK21	CBR	22/785	14.1	6.3	
CBR03	0.50	MK22	CBR	22/786	13.6	5.5	
CBR04	0.50	MK23	CBR	22/787	16.0	4.8	

Printed 24/06/2022

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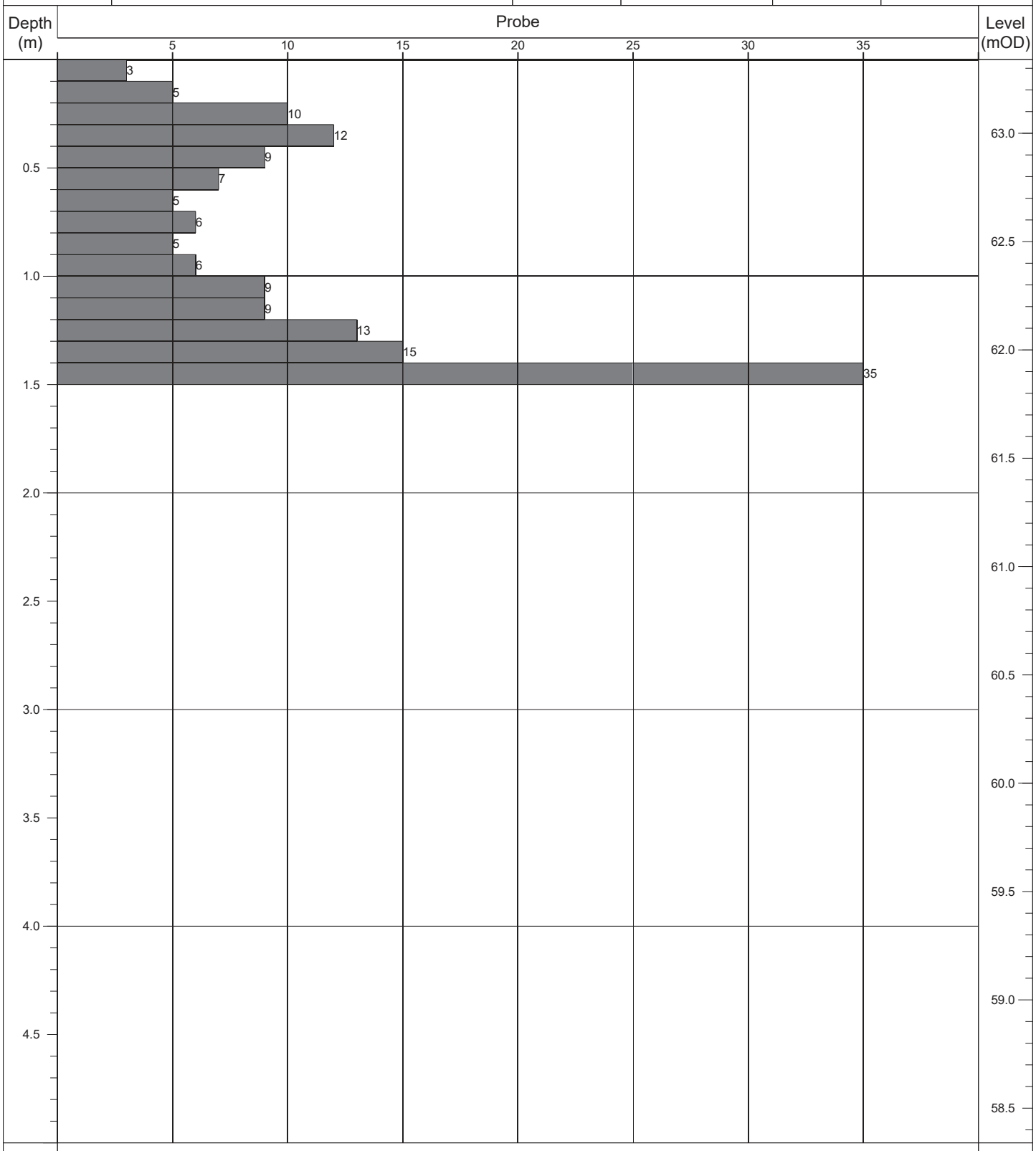
Appendix 6

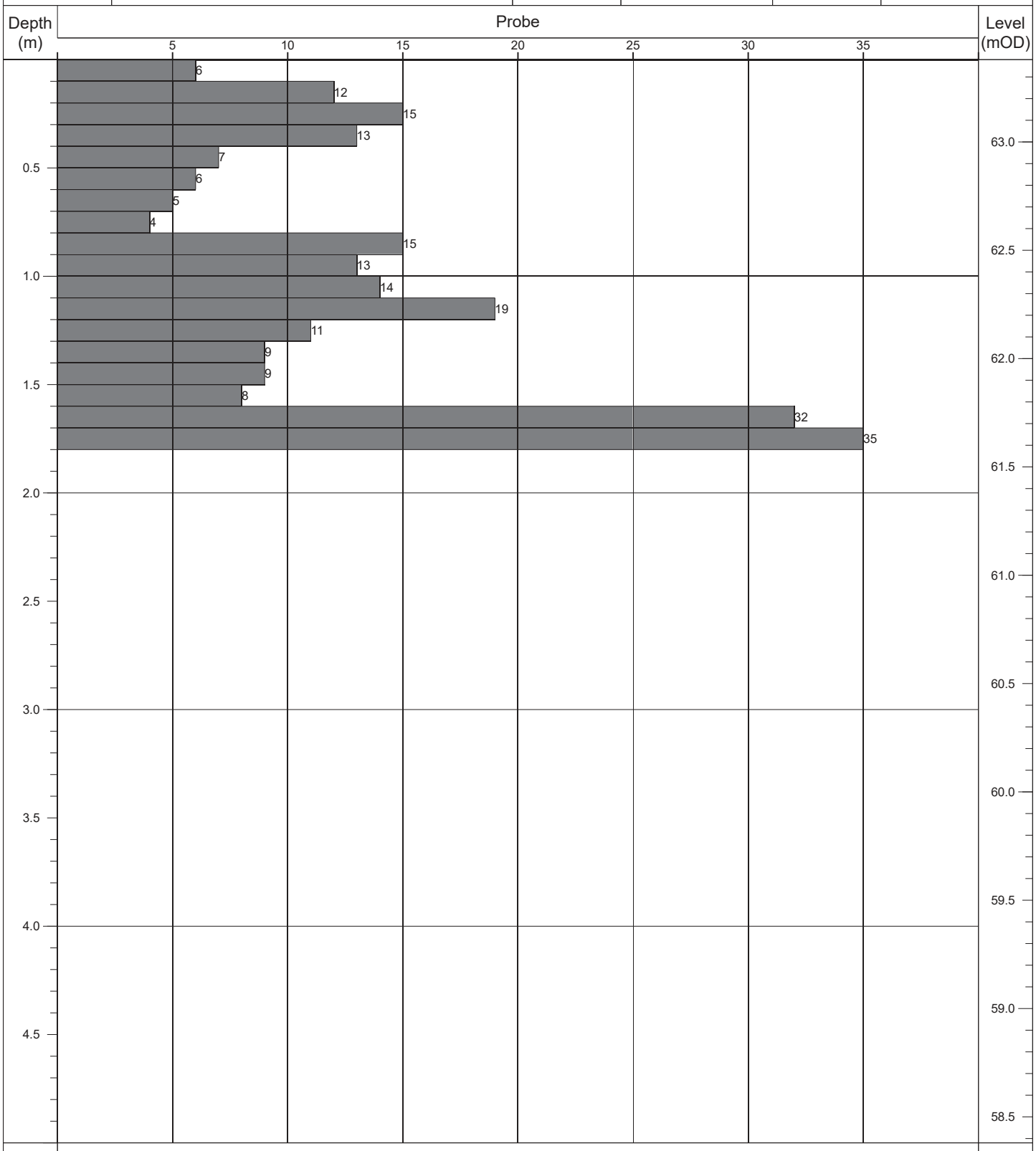
Dynamic Probe Logs

Contract No: 5994	Dynamic Probe Log				Probe No: **DPBH01**
Contract:	Maynooth Fire Station	Easting:	693991.954	Date Started:	24/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736387.194	Logged By:	D. Clarke
Client:	Kildare County Council	Elevation:	63.34	Scale:	1:25
Engineer:	Tobin Consulting Engineers	Rig Type:	Competitor 130	Sheet No:	Sheet 1 of 1



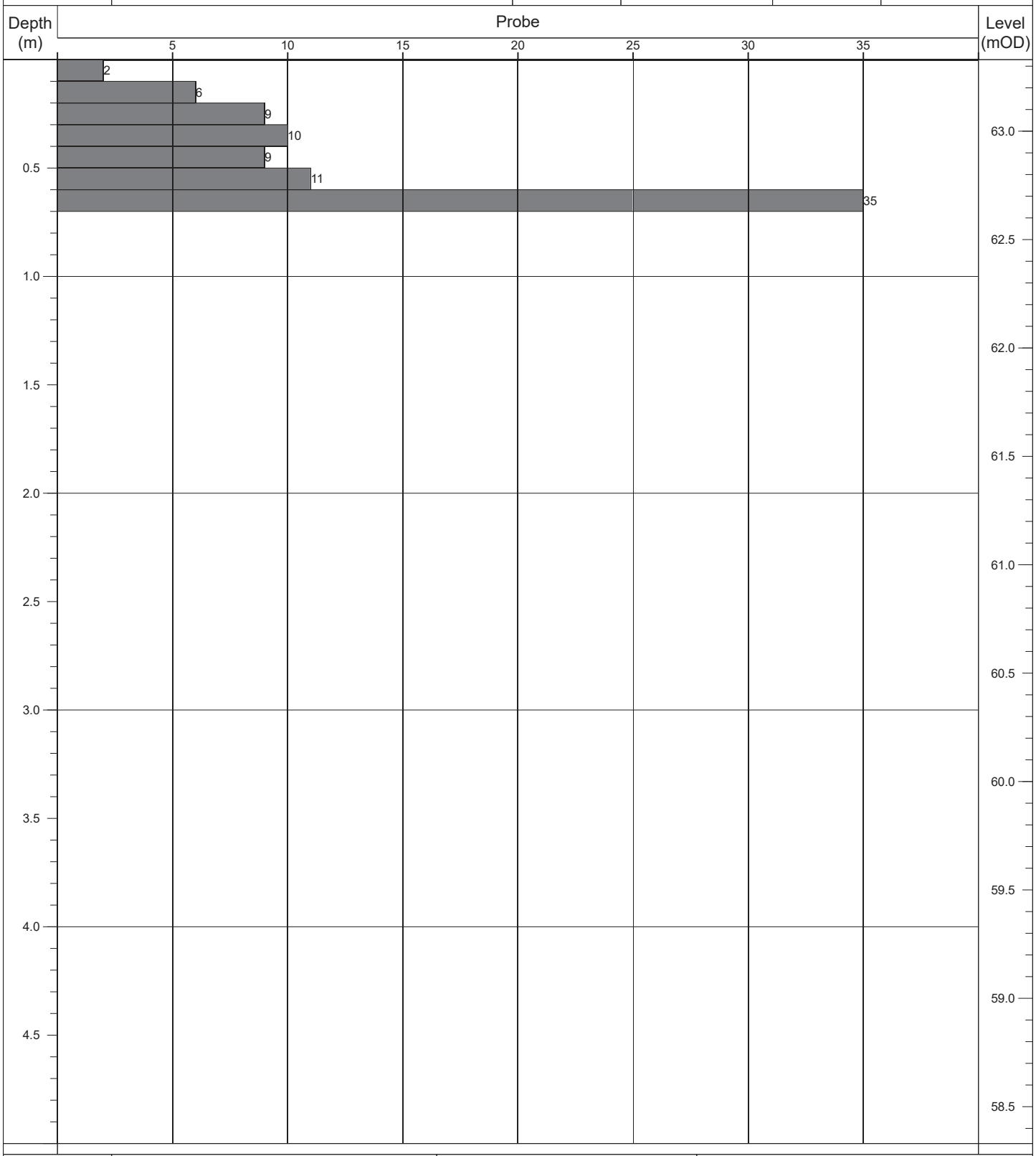
Termination:		Probe Details:			Remarks:
Depth:	Reason:	Type:	Mass	Drop:	Completed adjacent to BH01.
1.50m	Obstruction - possible boulders or weathered bedrock.	DPH	50kg	500mm	

Contract No: 5994	Dynamic Probe Log				Probe No: **DPBH02**
Contract:	Maynooth Fire Station	Easting:	693986.702	Date Started:	24/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736374.180	Logged By:	D. Clarke
Client:	Kildare County Council	Elevation:	63.38	Scale:	1:25
Engineer:	Tobin Consulting Engineers	Rig Type:	Competitor 130	Sheet No:	Sheet 1 of 1



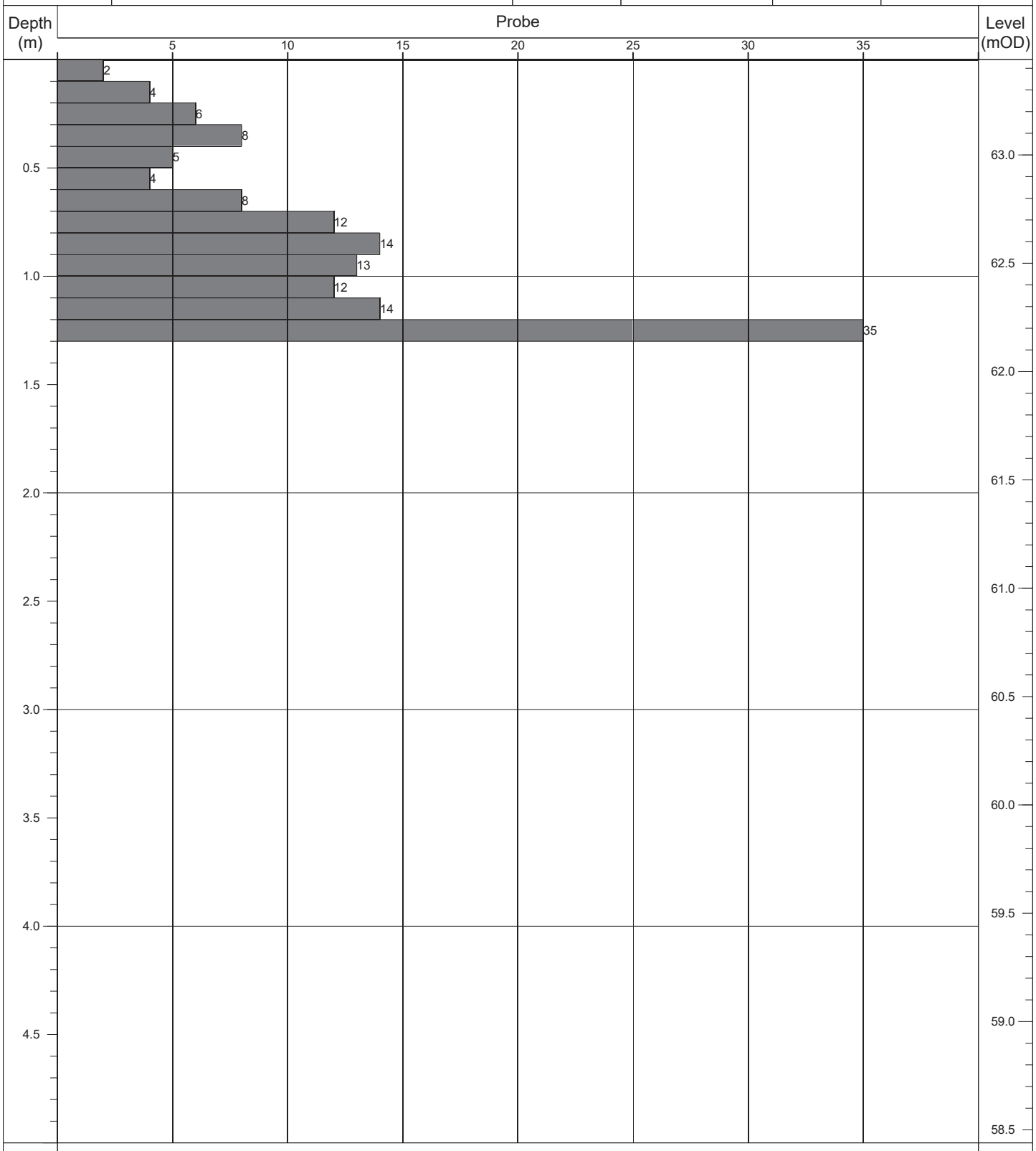
Termination:		Probe Details:			Remarks:
Depth:	Reason:	Type:	Mass	Drop:	Completed adjacent to BH02.
1.80m	Obstruction - possible boulders or weathered bedrock.	DPH	50kg	500mm	

Contract No: 5994	Dynamic Probe Log				Probe No: **DPBH03**
Contract:	Maynooth Fire Station	Easting:	694017.345	Date Started:	24/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736374.408	Logged By:	D. Clarke
Client:	Kildare County Council	Elevation:	63.33	Scale:	1:25
Engineer:	Tobin Consulting Engineers	Rig Type:	Competitor 130	Sheet No:	Sheet 1 of 1



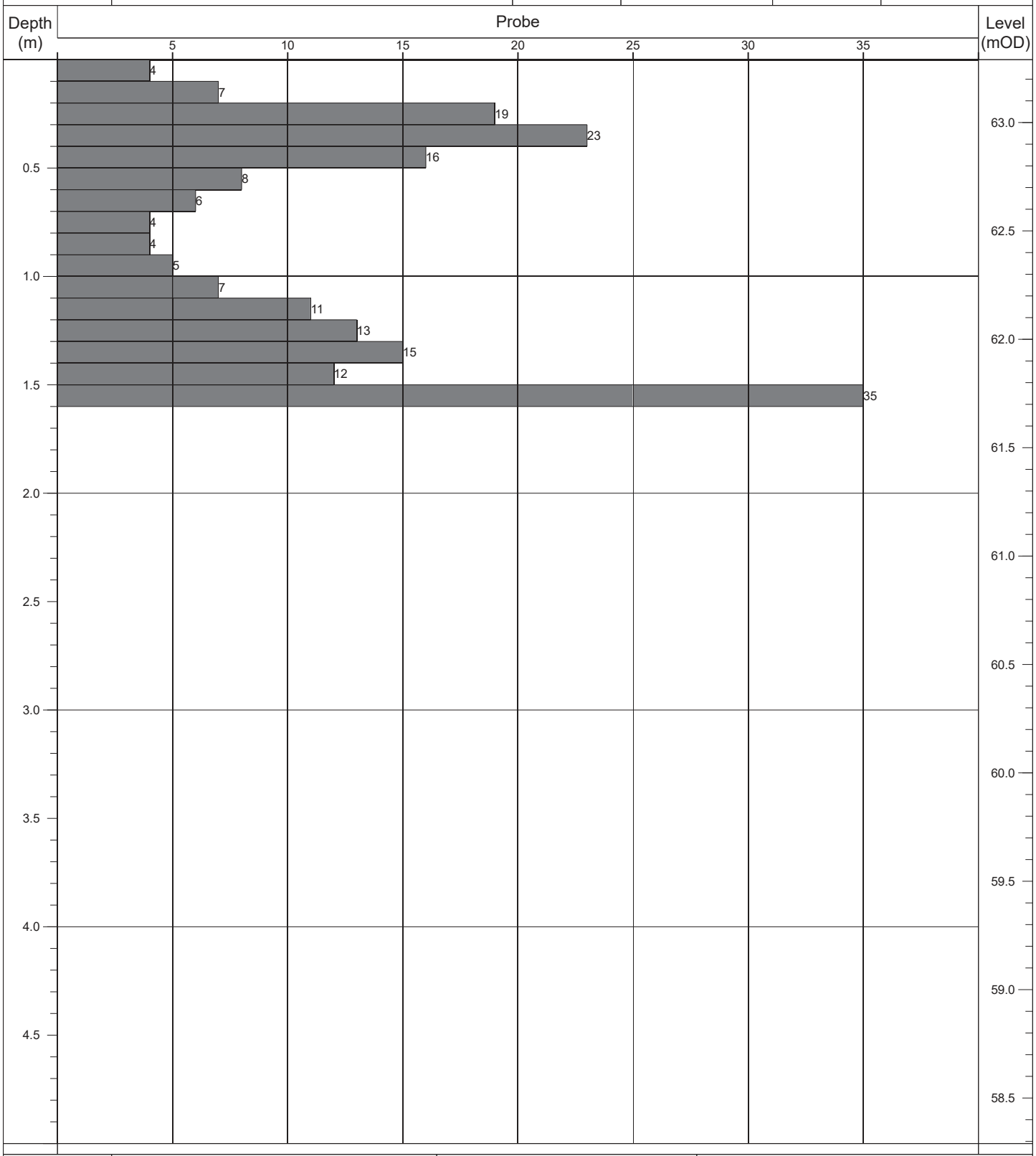
Termination:		Probe Details:			Remarks:
Depth:	Reason:	Type:	Mass	Drop:	Completed adjacent to BH03.
0.70m	Obstruction - possible boulders or weathered bedrock.	DPH	50kg	500mm	

Contract No: 5994	Dynamic Probe Log				Probe No: **DPBH04**
Contract:	Maynooth Fire Station	Easting:	694008.037	Date Started:	24/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736356.332	Logged By:	D. Clarke
Client:	Kildare County Council	Elevation:	63.44	Scale:	1:25
Engineer:	Tobin Consulting Engineers	Rig Type:	Competitor 130	Sheet No:	Sheet 1 of 1



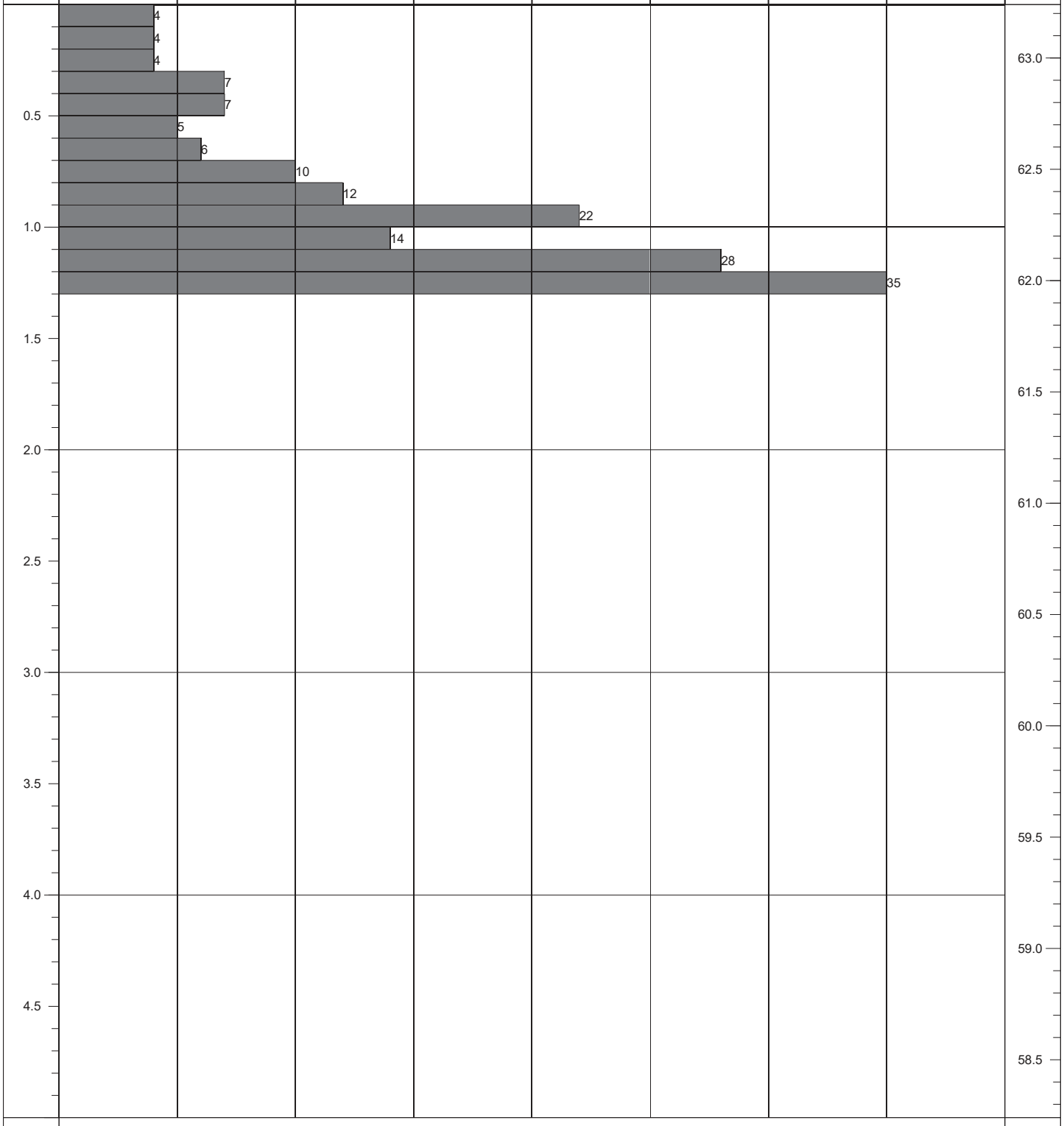
Termination:		Probe Details:			Remarks:
Depth:	Reason:	Type:	Mass	Drop:	Completed adjacent to BH04.
1.30m	Obstruction - possible boulders or weathered bedrock.	DPH	50kg	500mm	

Contract No: 5994	Dynamic Probe Log				Probe No: DPTP01
Contract:	Maynooth Fire Station	Easting:	693983.942	Date Started:	24/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736366.956	Logged By:	D. Clarke
Client:	Kildare County Council	Elevation:	63.29	Scale:	1:25
Engineer:	Tobin Consulting Engineers	Rig Type:	Competitor 130	Sheet No:	Sheet 1 of 1



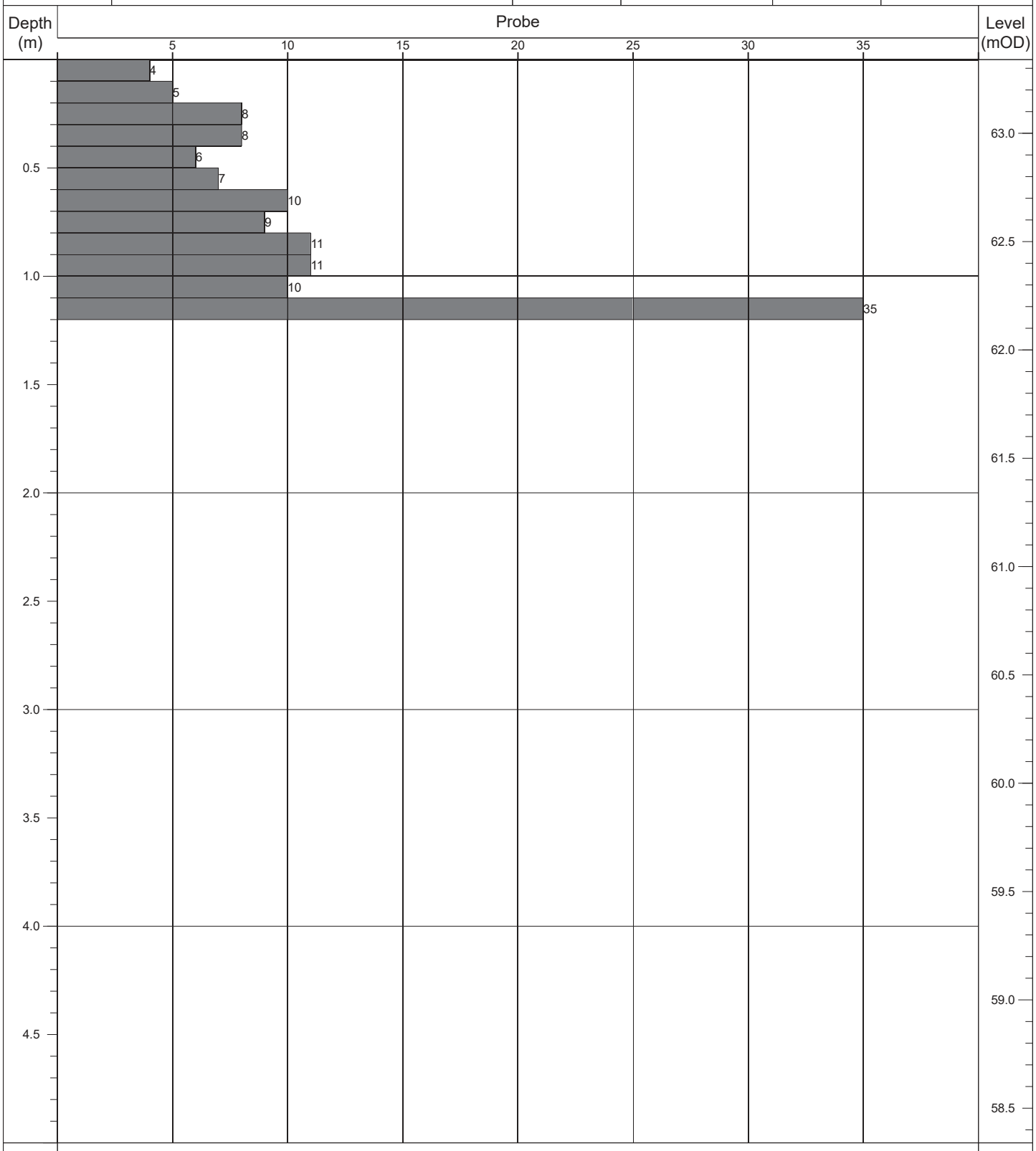
Termination:		Probe Details:			Remarks:
Depth:	Reason:	Type:	Mass	Drop:	Completed adjacent to TP01.
1.60m	Obstruction - possible boulders or weathered bedrock.	DPH	50kg	500mm	

Contract No: 5994	Dynamic Probe Log				Probe No: DPTP02
Contract:	Maynooth Fire Station	Easting:	694007.291	Date Started:	24/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736395.659	Logged By:	D. Clarke
Client:	Kildare County Council	Elevation:	63.24	Scale:	1:25
Engineer:	Tobin Consulting Engineers	Rig Type:	Competitor 130	Sheet No:	Sheet 1 of 1



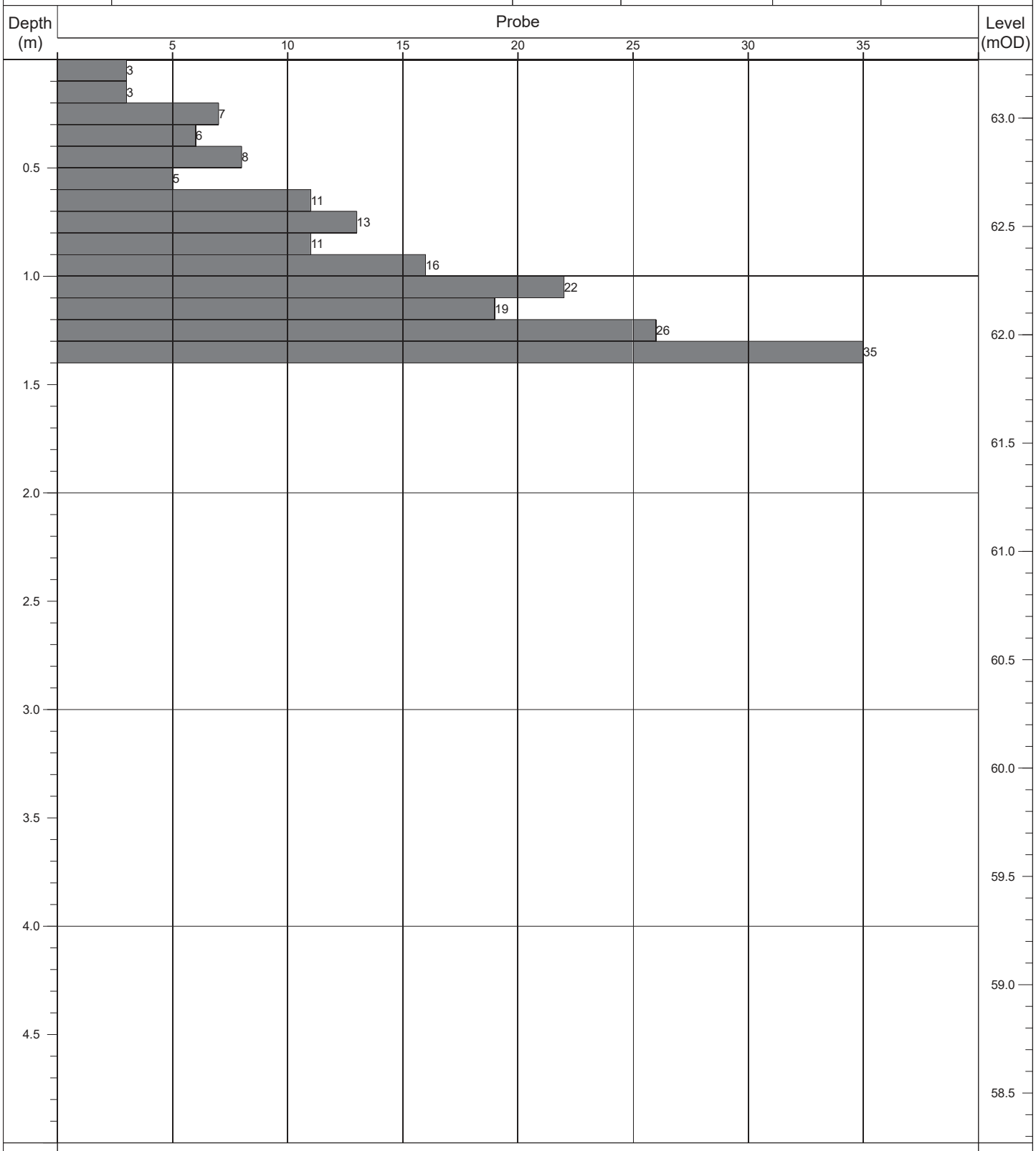
Termination:		Probe Details:			Remarks:
Depth:	Reason:	Type:	Mass	Drop:	Completed adjacent to TP02.
1.30m	Obstruction - possible boulders or weathered bedrock.	DPH	50kg	500mm	

Contract No: 5994	Dynamic Probe Log				Probe No: DPTP03
Contract:	Maynooth Fire Station	Easting:	694032.944	Date Started:	24/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736371.616	Logged By:	D. Clarke
Client:	Kildare County Council	Elevation:	63.34	Scale:	1:25
Engineer:	Tobin Consulting Engineers	Rig Type:	Competitor 130	Sheet No:	Sheet 1 of 1



Termination:		Probe Details:			Remarks:
Depth:	Reason:	Type:	Mass	Drop:	Completed adjacent to TP03.
1.20m	Obstruction - possible boulders or weathered bedrock.	DPH	50kg	500mm	

Contract No: 5994	Dynamic Probe Log				Probe No: DPTP04
Contract:	Maynooth Fire Station	Easting:	694021.704	Date Started:	24/06/2022
Location:	Maynooth, Co. Kildare	Northing:	736347.331	Logged By:	D. Clarke
Client:	Kildare County Council	Elevation:	63.27	Scale:	1:25
Engineer:	Tobin Consulting Engineers	Rig Type:	Competitor 130	Sheet No:	Sheet 1 of 1



Termination:		Probe Details:			Remarks:
Depth:	Reason:	Type:	Mass	Drop:	Completed adjacent to TP04.
1.40m	Obstruction - possible boulders or weathered bedrock.	DPH	50kg	500mm	

Appendix 7

Geotechnical Laboratory Test Results

Classification Tests
In accordance with BS 1377: Part 2

Client	Kildare County Council
Site	Maynooth Fire Station
S.I. File No	5994 / 22
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	17th June 2022

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Min. Dry Density Mg/m^3	Bulk Density Mg/m^3	% passing 425um	Comments	**Remarks** **C**=Clay; **M**=Silt **Plasticity**: **L**=Low; **I**=Intermediate; **H**=High; **V**=Very High; **E**=Extremely High
BH01	1.00	JOT03	22/776	B	16.2	36	20	16			50.0		CL
BH02	1.00	JOT05	22/777	B	17.1	32	18	14			27.1		CL
BH03	0.70	JOT01	22/778	B	18.6	38	20	18			44.5		CI
BH04	1.00	JOT07	22/779	B	11.9	36	20	16			48.7		CI
TP01	1.00	MK06	22/780	B	16.5	33	18	15			45.3		CL
TP02	1.00	MK04	22/781	B	16.1	37	21	16			63.8		CI
TP03	1.00	MK02	22/782	B	9.7	34	19	15			56.5		CL
TP04	1.00	MK08	22/783	B	11.3	37	21	16			46.0		CL

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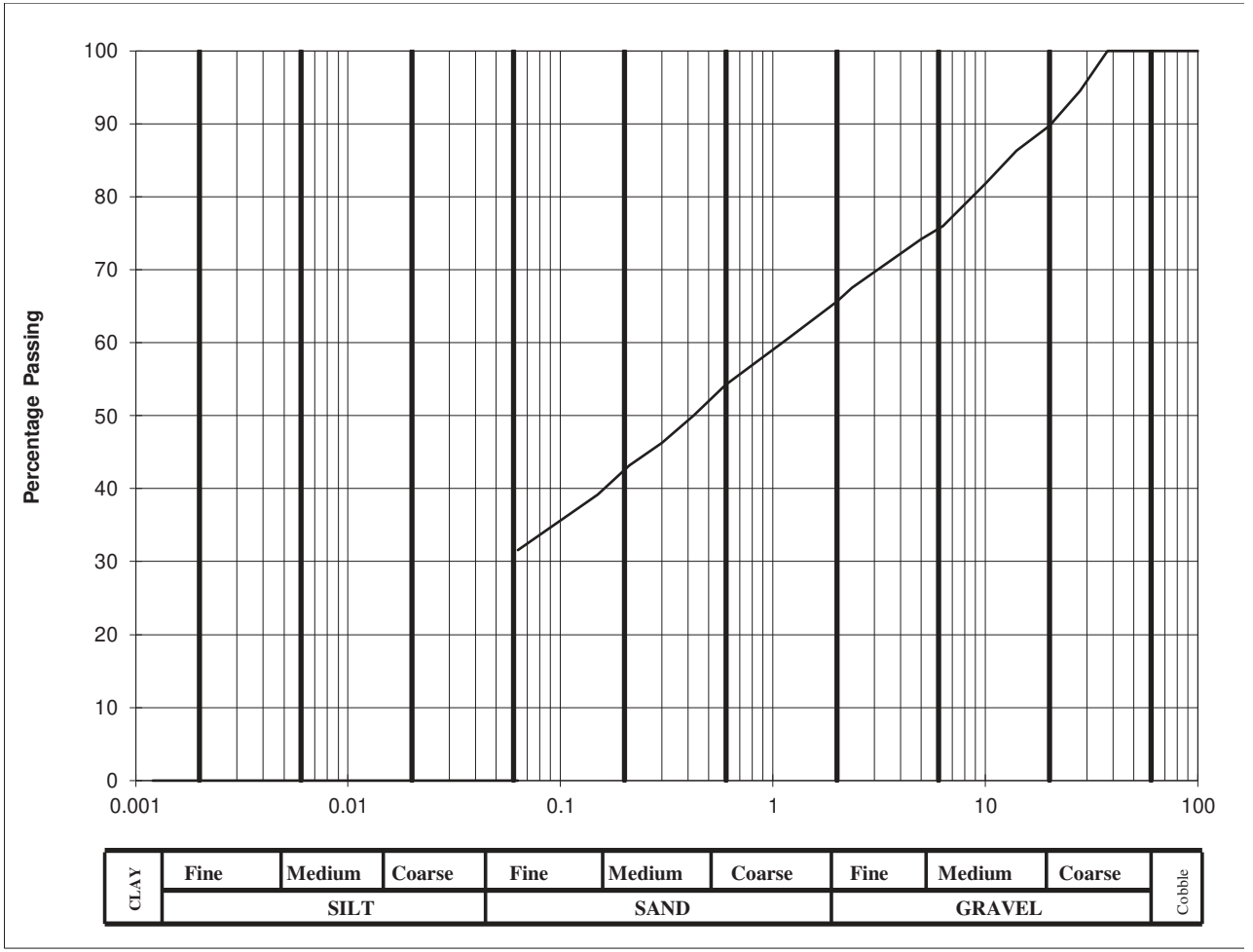
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	94.5		
20	89.7		
14	86.3		
10	81.8		
6.3	76		
5.0	74.2		
2.36	67.5		
2.00	65.6		
1.18	60.6		
0.600	54.2		
0.425	50		
0.300	46.3		
0.212	43.2		
0.150	39.2		
0.063	32		

Cobbles, %	0
Gravel, %	34
Sand, %	34
Clay / Silt, %	32



Client :	Kildare County Council
Project :	Maynooth Fire Station

Lab. No :	22/776
Sample No :	JOT03

Hole ID :	BH 01
Depth, m :	1.00

Material description :	slightly sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

File No: 5502
Printed 24/06/2022

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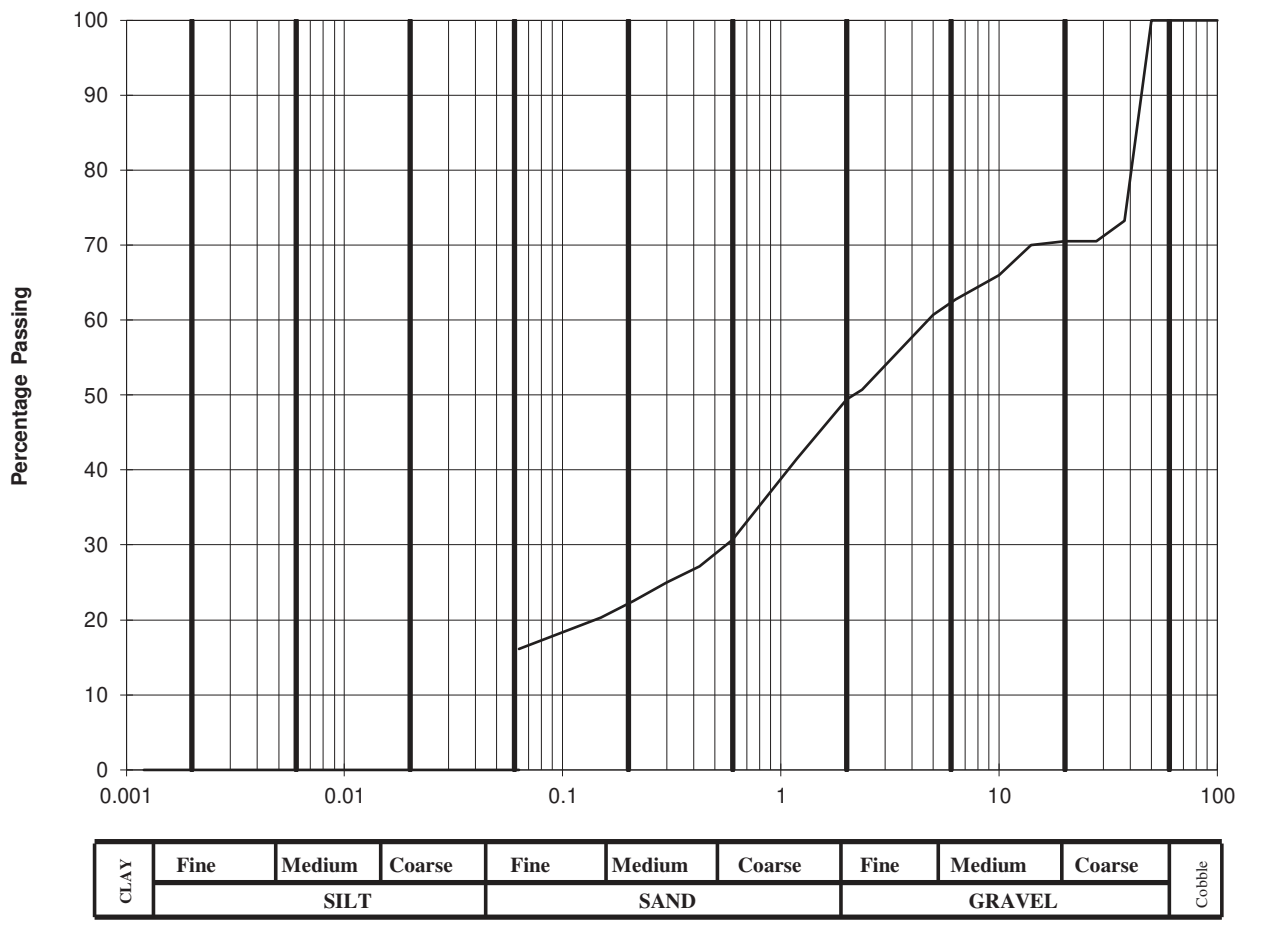
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	73.2		
28	70.5		
20	70.5		
14	70		
10	66		
6.3	62.7		
5.0	60.7		
2.36	50.7		
2.00	49.4		
1.18	41.5		
0.600	30.6		
0.425	27.1		
0.300	25		
0.212	22.5		
0.150	20.3		
0.063	16		

Cobbles, %	0
Gravel, %	51
Sand, %	33
Clay / Silt, %	16



Client :	Kildare County Council
Project :	Maynooth Fire Station

Lab. No :	22/777
Sample No :	JOT05

Hole ID :	BH 02
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

File No: 5502
Printed 24/06/2022

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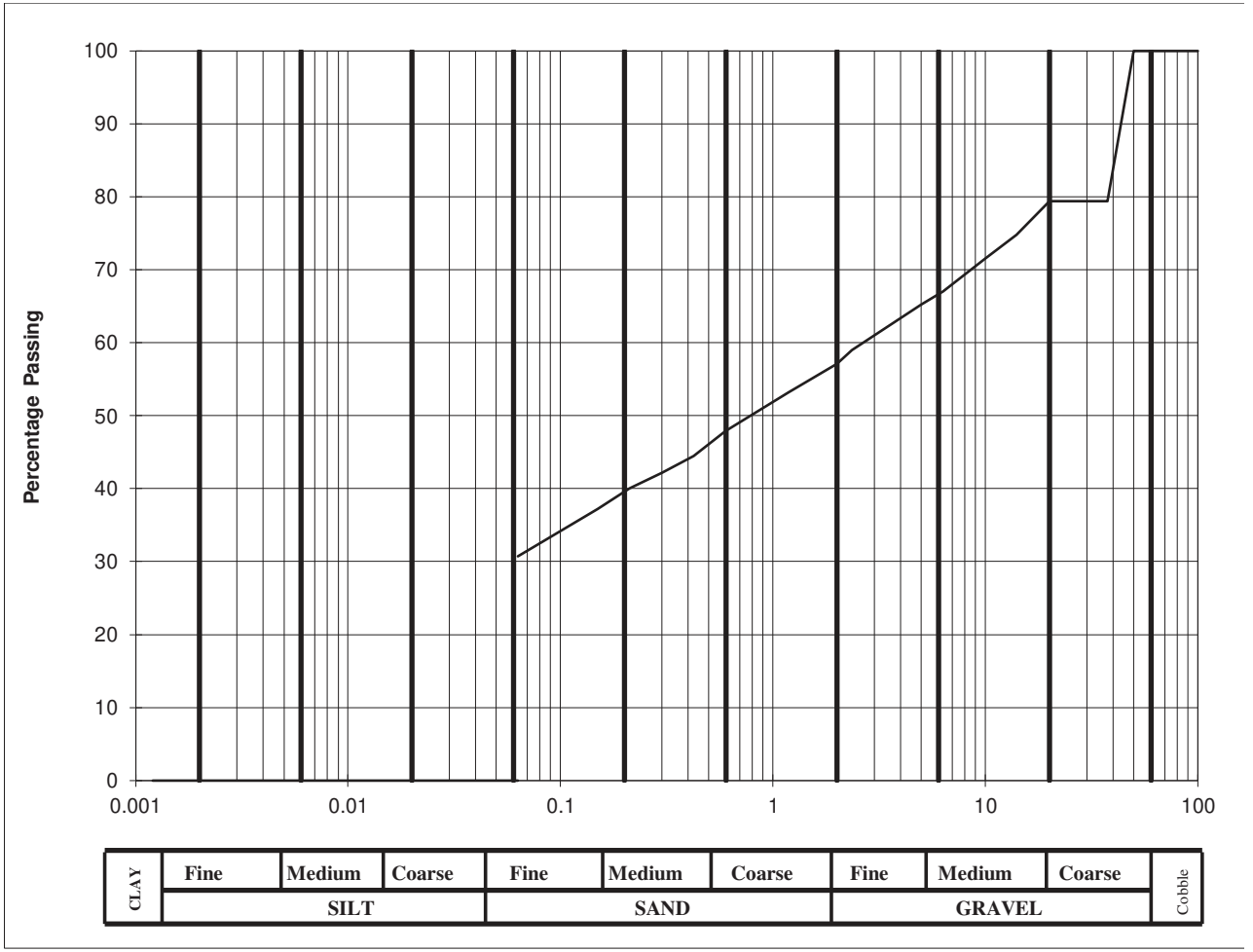
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	79.4		
28	79.4		
20	79.4		
14	74.8		
10	71.5		
6.3	67		
5.0	65.2		
2.36	59		
2.00	57.1		
1.18	53.2		
0.600	47.9		
0.425	44.5		
0.300	42.2		
0.212	40		
0.150	37.2		
0.063	31		

Cobbles, %	0
Gravel, %	43
Sand, %	26
Clay / Silt, %	31



Client :	Kildare County Council
Project :	Maynooth Fire Station

Lab. No :	22/778
Sample No :	JOT01

Hole ID :	BH 03
Depth, m :	0.70

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

File No: 5502
Printed 24/06/2022

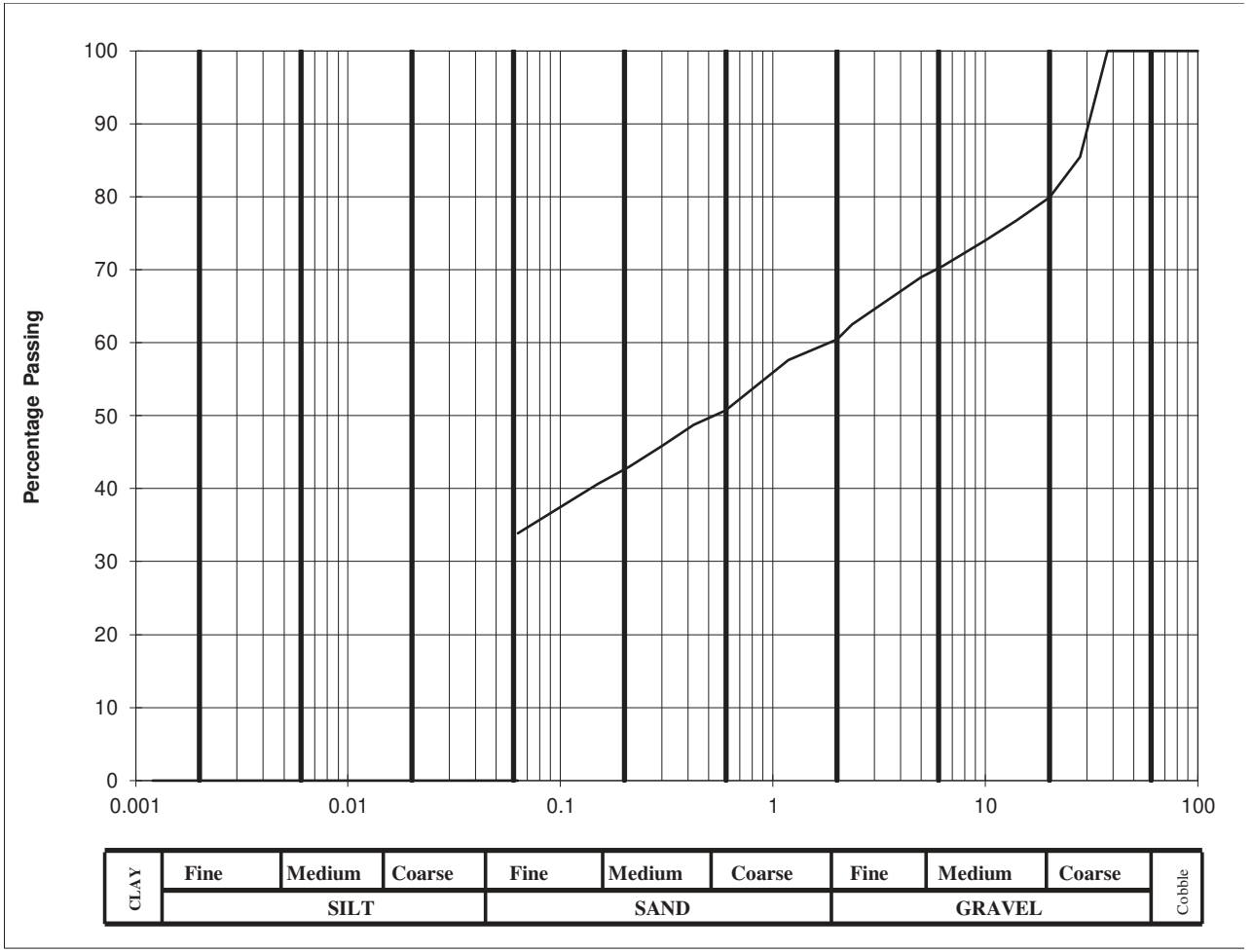
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	85.4		
20	79.9		
14	76.7		
10	74		
6.3	70.5		
5.0	69		
2.36	62.5		
2.00	60.4		
1.18	57.6		
0.600	50.7		
0.425	48.7		
0.300	45.8		
0.212	43		
0.150	40.6		
0.063	34		

Cobbles, %	0
Gravel, %	40
Sand, %	26
Clay / Silt, %	34



Client :	Kildare County Council
Project :	Maynooth Fire Station

Lab. No :	22/779
Sample No :	JOT07

Hole ID :	BH 04
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

File No: 5502
Printed 24/06/2022

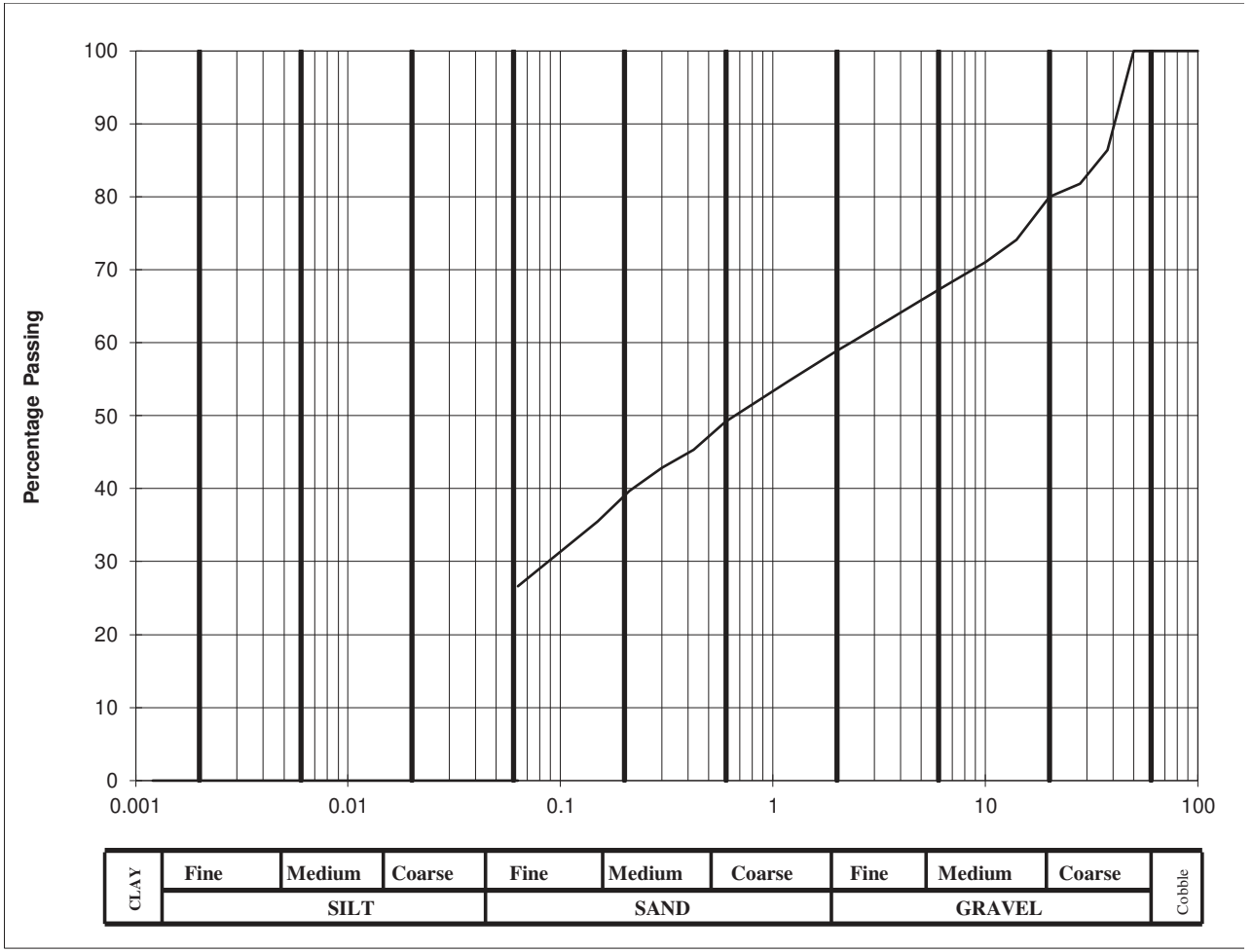
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	86.4		
28	81.8		
20	80		
14	74.1		
10	71		
6.3	67.6		
5.0	65.8		
2.36	60.1		
2.00	58.9		
1.18	54.7		
0.600	49.2		
0.425	45.3		
0.300	42.8		
0.212	39.7		
0.150	35.5		
0.063	27		

Cobbles, %	0
Gravel, %	41
Sand, %	32
Clay / Silt, %	27



Client :	Kildare County Council	Lab. No :	22/780	Hole ID :	TP 01
Project :	Maynooth Fire Station	Sample No :	MK06	Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

File No: 5502
Printed 24/06/2022

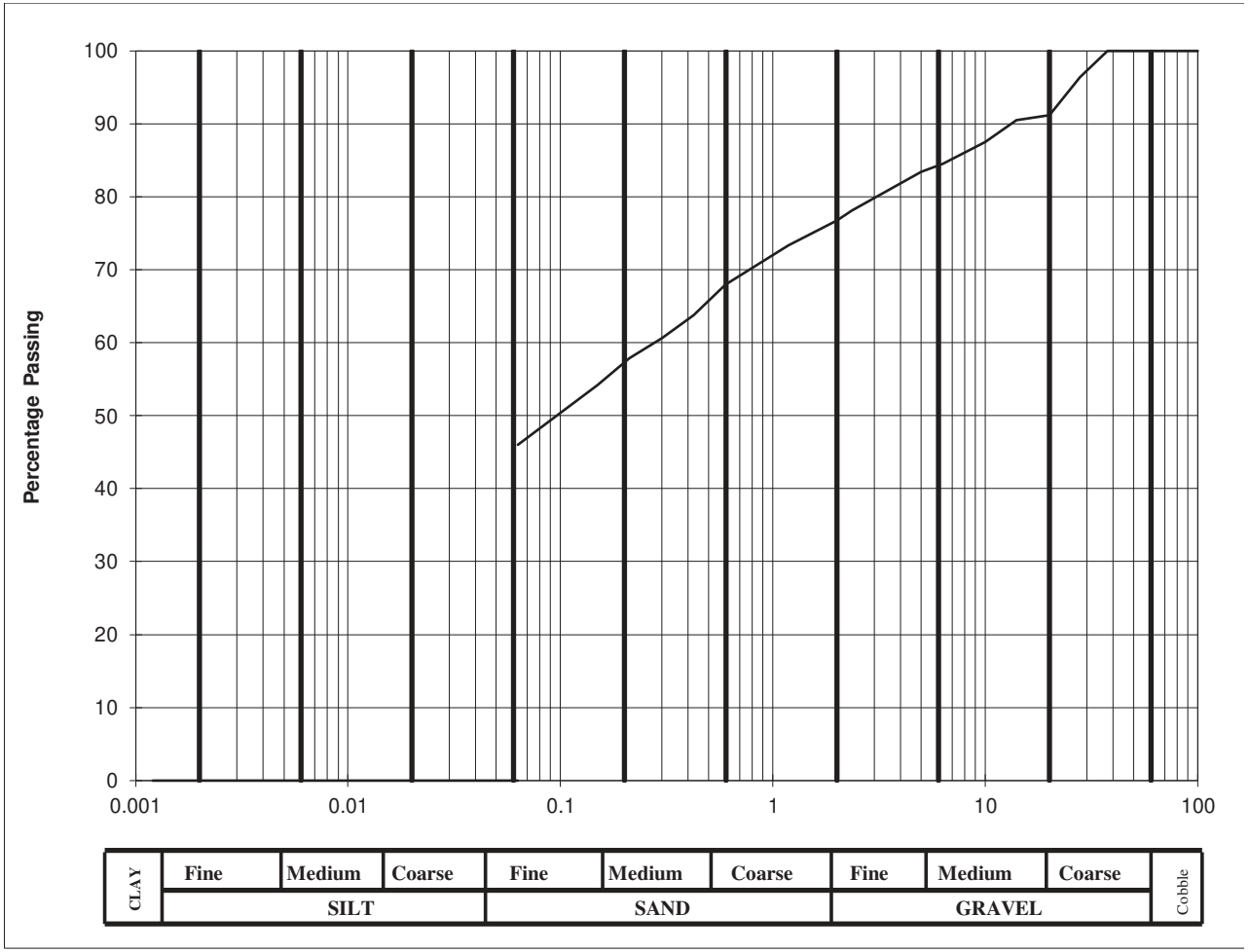
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	96.4		
20	91.2		
14	90.5		
10	87.5		
6.3	84.5		
5.0	83.4		
2.36	78.1		
2.00	76.7		
1.18	73.3		
0.600	67.9		
0.425	63.8		
0.300	60.6		
0.212	57.9		
0.150	54.2		
0.063	46		

Cobbles, %	0
Gravel, %	23
Sand, %	31
Clay / Silt, %	46



Client :	Kildare County Council
Project :	Maynooth Fire Station

Lab. No :	22/781
Sample No :	MK04

Hole ID :	TP 02
Depth, m :	1.00

Material description :	slightly sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

File No: 5502
Printed 24/06/2022

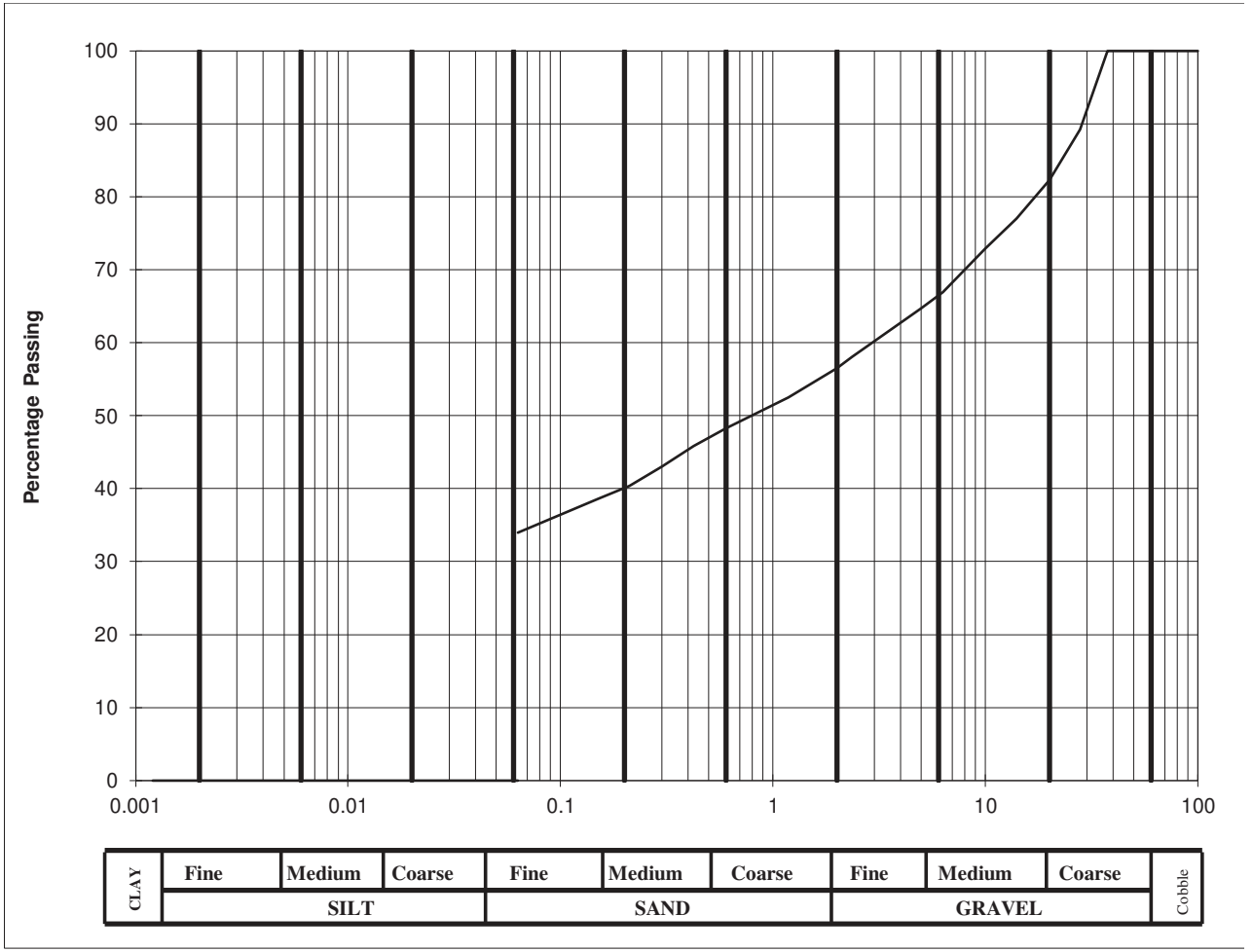
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	89.2		
20	82.3		
14	77		
10	72.9		
6.3	66.9		
5.0	64.7		
2.36	58		
2.00	56.5		
1.18	52.5		
0.600	48.2		
0.425	45.8		
0.300	43		
0.212	40.4		
0.150	38.6		
0.063	34		

Cobbles, %	0
Gravel, %	44
Sand, %	23
Clay / Silt, %	34



Client :	Kildare County Council
Project :	Maynooth Fire Station

Lab. No :	22/782
Sample No :	MK02

Hole ID :	TP 03
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

File No: 5502
Printed 24/06/2022

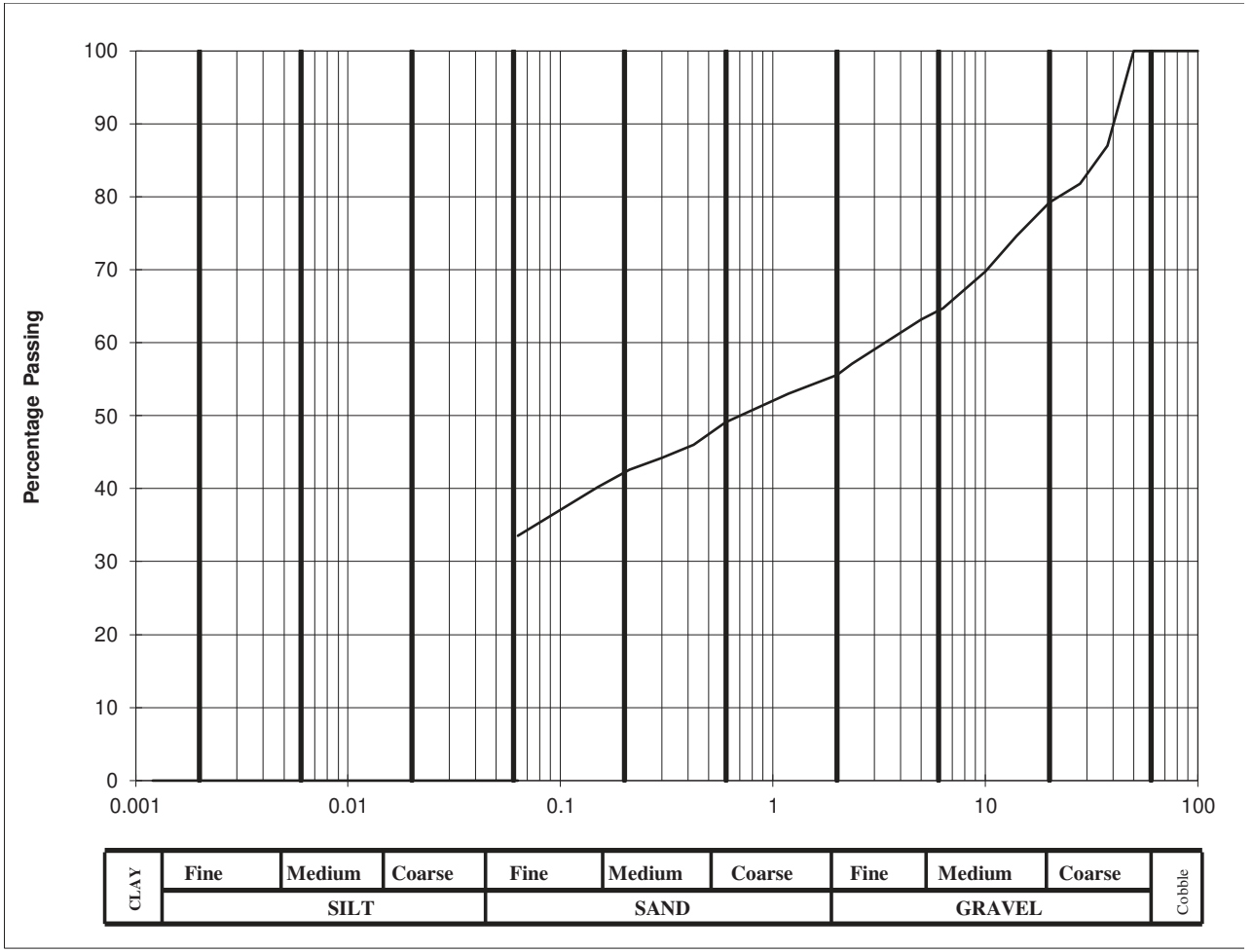
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	87		
28	81.8		
20	79.2		
14	74.6		
10	69.7		
6.3	64.7		
5.0	63.2		
2.36	57.1		
2.00	55.6		
1.18	53		
0.600	49.1		
0.425	46		
0.300	44.2		
0.212	42.6		
0.150	40.2		
0.063	34		

Cobbles, %	0
Gravel, %	44
Sand, %	22
Clay / Silt, %	34



Client :	Kildare County Council
Project :	Maynooth Fire Station

Lab. No :	22/783
Sample No :	MK08

Hole ID :	TP 04
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

File No: 5502
Printed 24/06/2022

_____Paddy McGonagle
Site Investigations Ltd

Chemical Testing
In accordance with BS 1377: Part 3

Client	Kildare County Council
Site	Maynooth Fire Station
S.I. File No	5994 / 22
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	17th June 2022

Hole Id	Depth (mBGL)	Sample No	Lab Ref	pH Value	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO_3) g/L	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO_3) %	Loss on Ignition (Organic Content) %	Chloride ion Content (water:soil ratio 2:1) %	% passing 2mm	Remarks
BH01	1.00	JOT03	22/776	8.23	0.122	0.080			65.6	
BH02	1.00	JOT05	22/777	8.11	0.119	0.059			49.4	
BH03	0.70	JOT01	22/778	8.22	0.122	0.069			57.1	
BH04	1.00	JOT07	22/779	8.19	0.122	0.073			60.4	

Printed 24/06/2022

_____Paddy McGonagle
Site Investigations Ltd.

Appendix 8

Environmental Laboratory Test Results

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Site Investigations Ltd
The Grange
Carhugar
12th Lock Road
Lucan
Co. Dublin

Attention: Stephen Letch

CERTIFICATE OF ANALYSIS

Date of report Generation:	21 June 2022
Customer:	Site Investigations Ltd
Sample Delivery Group (SDG):	220614-16
Your Reference:	5994
Location:	Maynooth Fire Station
Report No:	651507
Order Number:	33/A/22

We received 4 samples on Monday June 13, 2022 and 4 of these samples were scheduled for analysis which was completed on Tuesday June 21, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.

Approved By:

Sonia McWhan

Operations Manager

1291

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26423777	TP1		0.50 - 0.50	09/06/2022
26423776	TP2		0.50 - 0.50	09/06/2022
26423778	TP3		0.50 - 0.50	09/06/2022
26423779	TP4		0.50 - 0.50	09/06/2022

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)											
			26423777			26423776			26423778			26423779		
			Customer Sample Reference											
			TP1			TP2			TP3			TP4		
			AGS Reference											
			Depth (m)											
			0.50 - 0.50			0.50 - 0.50			0.50 - 0.50			0.50 - 0.50		
			Container											
			1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type											
			S	S	S	S	S	S	S	S	S	S	S	S
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X			X			X			X		
CEN Readings	All	NDPs: 0 Tests: 4	X			X			X			X		
Chromium III	All	NDPs: 0 Tests: 4		X			X			X			X	
Coronene	All	NDPs: 0 Tests: 4		X			X			X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4	X			X			X			X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 4	X			X			X			X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 4		X			X			X			X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 4		X			X			X			X	
Fluoride	All	NDPs: 0 Tests: 4	X			X			X			X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4			X			X			X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4		X			X			X			X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 4		X			X			X			X	
Mercury Dissolved	All	NDPs: 0 Tests: 4	X			X			X			X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 4		X			X			X			X	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 4		X			X			X			X	

Validated

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)											
			26423777			26423776			26423778			26423779		
			Customer Sample Reference			TP1			TP2			TP3			TP4		
			AGS Reference														
			Depth (m)			0.50 - 0.50			0.50 - 0.50			0.50 - 0.50			0.50 - 0.50		
			Container	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S
PAH by GCMS	All	NDPs: 0 Tests: 4			X			X			X			X	
PCBs by GCMS	All	NDPs: 0 Tests: 4			X			X			X			X	
pH	All	NDPs: 0 Tests: 4			X			X			X			X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 4		X			X			X			X		
Sample description	All	NDPs: 0 Tests: 4			X			X			X			X	
Total Dissolved Solids on Leachates	All	NDPs: 0 Tests: 4		X			X			X			X		
Total Organic Carbon	All	NDPs: 0 Tests: 4			X			X			X			X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 4			X			X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 4				X			X			X			X

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26423777	TP1	0.50 - 0.50	Dark Brown	Sand	None	Stones
26423776	TP2	0.50 - 0.50	Dark Brown	Loamy Sand	Vegetation	Stones
26423778	TP3	0.50 - 0.50	Dark Brown	Loamy Sand	Vegetation	Stones
26423779	TP4	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones

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

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

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	TP2	TP3	TP4		
			Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	09/06/2022	09/06/2022	09/06/2022	09/06/2022		
			Sample Time	-	-	-	-		
			Date Received	13/06/2022	13/06/2022	13/06/2022	13/06/2022		
			SDG Ref	220614-16	220614-16	220614-16	220614-16		
			Lab Sample No.(s)	26423777	26423776	26423778	26423779		
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		13	17	11	16		
Loss on ignition	<0.7 %	TM018		4.14 M	5.26 M	2.78 M	4.71 M		
Organic Carbon, Total	<0.2 %	TM132		1.05 M	1.06 M	0.482 M	0.901 M		
pH	1 pH Units	TM133		8.15 M	8.1 M	8.55 M	8.13 M		
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<0.6 #		
PCB congener 28	<3 µg/kg	TM168		<3 M	<3 M	<3 M	<3 M		
PCB congener 52	<3 µg/kg	TM168		<3 M	<3 M	<3 M	<3 M		
PCB congener 101	<3 µg/kg	TM168		<3 M	<3 M	<3 M	<3 M		
PCB congener 118	<3 µg/kg	TM168		<3 M	<3 M	<3 M	<3 M		
PCB congener 138	<3 µg/kg	TM168		<3 M	<3 M	<3 M	<3 M		
PCB congener 153	<3 µg/kg	TM168		<3 M	<3 M	<3 M	<3 M		
PCB congener 180	<3 µg/kg	TM168		<3 M	<3 M	<3 M	<3 M		
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<21	<21	<21	<21		
Chromium, Trivalent	<0.9 mg/kg	TM181		11.7	9.12	4.52	7.05		
Antimony	<0.6 mg/kg	TM181		<0.6 #	1.26 #	0.688 #	0.932 #		
Arsenic	<0.6 mg/kg	TM181		16.4 M	18.1 M	13.4 M	14.3 M		
Barium	<0.6 mg/kg	TM181		68.2 #	90.5 #	53.9 #	89.9 #		
Cadmium	<0.02 mg/kg	TM181		1.21 M	1.78 M	2.06 M	2.1 M		
Chromium	<0.9 mg/kg	TM181		11.7 M	9.12 M	4.52 M	7.05 M		
Copper	<1.4 mg/kg	TM181		23.2 M	36.5 M	28.7 M	27.7 M		
Lead	<0.7 mg/kg	TM181		19 M	27.3 M	15.4 M	20.3 M		
Mercury	<0.1 mg/kg	TM181		<0.1 M	<0.1 M	<0.1 M	<0.1 M		
Molybdenum	<0.1 mg/kg	TM181		2.08 #	2.96 #	2.28 #	2.4 #		
Nickel	<0.2 mg/kg	TM181		30.1 M	39.7 M	40.7 M	41.6 M		
Selenium	<1 mg/kg	TM181		2.25 #	3.64 #	2.6 #	2.59 #		
Zinc	<1.9 mg/kg	TM181		95.9 M	134 M	99.5 M	110 M		
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410		<10	<10	<10	<10		
Coronene	<200 µg/kg	TM410		<200	<200	<200	<200		
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415		<5	<5	<5	14.9		

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	TP2	TP3	TP4		
			Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	09/06/2022	09/06/2022	09/06/2022	09/06/2022		
			Sample Time	-	-	-	-		
			Date Received	13/06/2022	13/06/2022	13/06/2022	13/06/2022		
			SDG Ref	220614-16	220614-16	220614-16	220614-16		
			Lab Sample No.(s)	26423777	26423776	26423778	26423779		
			AGS Reference						
Naphthalene	<9 µg/kg	TM218		<9 M	<9 M	<9 M	<9 M		
Acenaphthylene	<12 µg/kg	TM218		<12 M	<12 M	<12 M	<12 M		
Acenaphthene	<8 µg/kg	TM218		<8 M	<8 M	<8 M	<8 M		
Fluorene	<10 µg/kg	TM218		<10 M	<10 M	<10 M	<10 M		
Phenanthrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M		
Anthracene	<16 µg/kg	TM218		<16 M	<16 M	<16 M	<16 M		
Fluoranthene	<17 µg/kg	TM218		<17 M	<17 M	<17 M	<17 M		
Pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M		
Benz(a)anthracene	<14 µg/kg	TM218		<14 M	<14 M	<14 M	<14 M		
Chrysene	<10 µg/kg	TM218		<10 M	<10 M	<10 M	<10 M		
Benzo(b)fluoranthene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M		
Benzo(k)fluoranthene	<14 µg/kg	TM218		<14 M	<14 M	<14 M	<14 M		
Benzo(a)pyrene	<15 µg/kg	TM218		<15 M	<15 M	<15 M	<15 M		
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18 M	<18 M	<18 M	<18 M		
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 M	<23 M	<23 M	<23 M		
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24 M	<24 M	<24 M	<24 M		
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		<118	<118	<118	<118		

Validated

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

TPH CWG (S)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	TP2	TP3	TP4		
			Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	09/06/2022	09/06/2022	09/06/2022	09/06/2022		
			Sample Time	-	-	-	-		
			Date Received	13/06/2022	13/06/2022	13/06/2022	13/06/2022		
			SDG Ref	220614-16	220614-16	220614-16	220614-16		
			Lab Sample No.(s)	26423777	26423776	26423778	26423779		
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		94.9	75.2	97.6	92		
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/kg	TM089		<10	<10	<10	<10		
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/kg	TM089		<10	<10	<10	<10		
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/kg	TM089		<10	<10	<10	<10		
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #	<1000 #	<1000 #		
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #	<1000 #	<1000 #		
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #	<1000 #	<1000 #		
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1000 µg/kg	TM414		4560 #	3350 #	<1000 #	13500 #		
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000	<1000	<1000	1530		
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5000 µg/kg	TM414		5090	<5000	<5000	15200		
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10000 µg/kg	TM414		<10000	<10000	<10000	22300		
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/kg	TM089		<10	<10	<10	<10		
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/kg	TM089		<10	<10	<10	<10		
Aromatics >EC8-EC10 (HS_1D_AR)	<10 µg/kg	TM089		<10	<10	<10	<10		
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #	<1000 #	<1000 #		
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #	<1000 #	<1000 #		
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 #	<1000 #	<1000 #	<1000 #		
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1000 µg/kg	TM414		3210 #	2230 #	<1000 #	5740 #		
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000	<1000	<1000	1300		
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000		
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5000 µg/kg	TM414		<5000	<5000	<5000	7100		
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10000 µg/kg	TM414		<10000	<10000	<10000	22300		
GRO >C5-C6 (HS_1D)	<20 µg/kg	TM089		<20	<20	<20	<20		
GRO >C6-C7 (HS_1D)	<20 µg/kg	TM089		<20	<20	<20	<20		
GRO >C7-C8 (HS_1D)	<20 µg/kg	TM089		<20	<20	<20	<20		
GRO >C8-C10 (HS_1D)	<20 µg/kg	TM089		<20	<20	<20	<20		
GRO >C10-C12 (HS_1D)	<20 µg/kg	TM089		<20	<20	<20	<20		
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<50 µg/kg	TM089		<50	<50	<50	<50		
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<50 µg/kg	TM089		<50	<50	<50	<50		
GRO >C5-C10 (HS_1D_TOTAL)	<20 µg/kg	TM089		<20	<20	<20	<20		

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	TP2	TP3	TP4		
			Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	09/06/2022	09/06/2022	09/06/2022	09/06/2022		
			Sample Time	-	-	-	-		
			Date Received	13/06/2022	13/06/2022	13/06/2022	13/06/2022		
			SDG Ref	220614-16	220614-16	220614-16	220614-16		
			Lab Sample No.(s)	26423777	26423776	26423778	26423779		
			AGS Reference						
Dibromofluoromethane**	%	TM116		117	109	118	111		
Toluene-d8**	%	TM116		98.8	97.9	99.9	100		
4-Bromofluorobenzene**	%	TM116		75.9	87.6	83.6	95		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<100 M		
Benzene	<9 µg/kg	TM116		<9 M	<9 M	<9 M	<90 M		
Toluene	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<70 M		
Ethylbenzene	<4 µg/kg	TM116		<4 M	<4 M	<4 M	<40 M		
p/m-Xylene	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<100 #		
o-Xylene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<100 M		

Validated

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Maynooth Fire Station
Mass Sample taken (kg)	0.108	**Natural Moisture Content (%)**	19.9
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	83.4
Particle Size <4mm	>95%		

Case	
SDG	220614-16
Lab Sample Number(s)	26423776
Sampled Date	09-Jun-2022
Customer Sample Ref.	TP2
Depth (m)	0.50 - 0.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	1.06	3	5	6
Loss on Ignition (%)	5.26	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.1	-	>6	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00137	<0.0002	0.0137	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00122	<0.0003	0.0122	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000654	<0.0004	0.00654	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00172	<0.001	0.0172	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	43.5	<10	435	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.26	<3	42.6	<30	500	800	1000

Leach Test Information

Date Prepared	14-Jun-2022
pH (pH Units)	7.82
Conductivity (µS/cm)	53.60
Temperature (°C)	18.30
Volume Leachant (Litres)	0.882

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

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Validated

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Maynooth Fire Station
Mass Sample taken (kg)	0.104	**Natural Moisture Content (%)**	14.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	87.2
Particle Size <4mm	>95%		

Case	
SDG	220614-16
Lab Sample Number(s)	26423777
Sampled Date	09-Jun-2022
Customer Sample Ref.	TP1
Depth (m)	0.50 - 0.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	1.05	3	5	6
Loss on Ignition (%)	4.14	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.15	-	>6	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00322	<0.0002	0.0322	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00189	<0.0003	0.0189	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00338	<0.003	0.0338	<0.03	0.5	10	30
Nickel	0.000605	<0.0004	0.00605	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0011	<0.001	0.011	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	101	<10	1010	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	7.6	<3	76	<30	500	800	1000

Leach Test Information

Date Prepared	14-Jun-2022
pH (pH Units)	8.03
Conductivity (µS/cm)	132.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.887

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

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Validated

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Maynooth Fire Station
Mass Sample taken (kg)	0.103	**Natural Moisture Content (%)**	14.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	87.4
Particle Size <4mm	>95%		

Case	
SDG	220614-16
Lab Sample Number(s)	26423778
Sampled Date	09-Jun-2022
Customer Sample Ref.	TP3
Depth (m)	0.50 - 0.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	0.482	3	5	6
Loss on Ignition (%)	2.78	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.55	-	>6	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.000515	<0.0005	0.00515	<0.005	0.5	2	25
Barium	0.00499	<0.0002	0.0499	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00245	<0.0003	0.0245	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00583	<0.003	0.0583	<0.03	0.5	10	30
Nickel	0.00102	<0.0004	0.0102	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00116	<0.001	0.0116	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	103	<10	1030	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	5.4	<3	54	<30	500	800	1000

Leach Test Information

Date Prepared	14-Jun-2022
pH (pH Units)	8.53
Conductivity (µS/cm)	130.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.887

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

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15:31:50 21/06/2022

Validated

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Maynooth Fire Station
Mass Sample taken (kg)	0.106	**Natural Moisture Content (%)**	18.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	84.6
Particle Size <4mm	>95%		

Case	
SDG	220614-16
Lab Sample Number(s)	26423779
Sampled Date	09-Jun-2022
Customer Sample Ref.	TP4
Depth (m)	0.50 - 0.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	0.901	3	5	6
Loss on Ignition (%)	4.71	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	14.9	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.13	-	>6	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00262	<0.0002	0.0262	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.000849	<0.0003	0.00849	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	92.7	<10	927	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.63	<3	36.3	<30	500	800	1000

Leach Test Information

Date Prepared	14-Jun-2022
pH (pH Units)	7.77
Conductivity (µS/cm)	119.00
Temperature (°C)	19.40
Volume Leachant (Litres)	0.884

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

21/06/2022 15:32:14

15:31:50 21/06/2022

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 220614-16 **Report Number:** 651507 **Superseded Report:**
Client Ref.: 5994 **Location:** Maynooth Fire Station

Test Completion Dates

Lab Sample No(s)	26423777	26423776	26423778	26423779
Customer Sample Ref.	TP1	TP2	TP3	TP4
AGS Ref.				
Depth	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (w)	17-Jun-2022	17-Jun-2022	17-Jun-2022	17-Jun-2022
CEN 10:1 Leachate (1 Stage)	20-Jun-2022	20-Jun-2022	20-Jun-2022	20-Jun-2022
CEN Readings	21-Jun-2022	21-Jun-2022	21-Jun-2022	21-Jun-2022
Chromium III	17-Jun-2022	16-Jun-2022	17-Jun-2022	17-Jun-2022
Coronene	16-Jun-2022	16-Jun-2022	16-Jun-2022	16-Jun-2022
Dissolved Metals by ICP-MS	17-Jun-2022	17-Jun-2022	17-Jun-2022	17-Jun-2022
Dissolved Organic/Inorganic Carbon	21-Jun-2022	21-Jun-2022	21-Jun-2022	21-Jun-2022
EPH by GCxGC-FID	16-Jun-2022	16-Jun-2022	16-Jun-2022	16-Jun-2022
EPH CWG GC (S)	17-Jun-2022	17-Jun-2022	17-Jun-2022	17-Jun-2022
Fluoride	17-Jun-2022	17-Jun-2022	17-Jun-2022	17-Jun-2022
GRO by GC-FID (S)	17-Jun-2022	17-Jun-2022	17-Jun-2022	17-Jun-2022
Hexavalent Chromium (s)	16-Jun-2022	16-Jun-2022	16-Jun-2022	16-Jun-2022
Loss on Ignition in soils	17-Jun-2022	17-Jun-2022	17-Jun-2022	17-Jun-2022
Mercury Dissolved	20-Jun-2022	20-Jun-2022	20-Jun-2022	20-Jun-2022
Metals in solid samples by OES	16-Jun-2022	16-Jun-2022	16-Jun-2022	17-Jun-2022
Moisture at 105C	14-Jun-2022	14-Jun-2022	14-Jun-2022	14-Jun-2022
PAH 16 & 17 Calc	16-Jun-2022	16-Jun-2022	16-Jun-2022	16-Jun-2022
PAH by GCMS	16-Jun-2022	15-Jun-2022	15-Jun-2022	16-Jun-2022
PCBs by GCMS	16-Jun-2022	16-Jun-2022	16-Jun-2022	16-Jun-2022
pH	15-Jun-2022	15-Jun-2022	15-Jun-2022	15-Jun-2022
Phenols by HPLC (W)	20-Jun-2022	17-Jun-2022	20-Jun-2022	20-Jun-2022
Sample description	14-Jun-2022	14-Jun-2022	14-Jun-2022	14-Jun-2022
Total Dissolved Solids on Leachates	16-Jun-2022	16-Jun-2022	16-Jun-2022	16-Jun-2022
Total Organic Carbon	17-Jun-2022	17-Jun-2022	17-Jun-2022	20-Jun-2022
TPH CWG GC (S)	17-Jun-2022	17-Jun-2022	17-Jun-2022	17-Jun-2022
VOC MS (S)	17-Jun-2022	20-Jun-2022	17-Jun-2022	20-Jun-2022

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix 9

Waste Classification Report

HazWasteOnline™

Waste Classification Report

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

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

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

MJOHZ-92TGP-1GE93

Job name

5994

Description/Comments

Client: Kildare County Council
Engineer: Tobin Consulting Engineers

Project

5994

Site

Maynooth Fire Station

Classified by

Name:
Stephen Letch
Company:
Site Investigations Ltd
Date:
24 Jun 2022 11:17 GMT
Telephone:
00353 86817 9449

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

HazWasteOnline™ Certification: CERTIFIED

Course	Date
Hazardous Waste Classification	09 Oct 2019

Next 3 year Refresher due by Oct 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	TP01-0.50	0.50	Non Hazardous		Pass	Pass	2
2	TP02-0.50	0.50	Non Hazardous		Pass	Pass	6
3	TP03-0.50	0.50	Non Hazardous		Pass	Pass	10
4	TP04-0.50	0.50	Non Hazardous		Pass	Pass	14

Related documents

#	Name	Description
1	220614-16.hwol	.hwol file used to create the Job
2	Rilta Suite NEW	waste stream template used to create this Job

WAC results

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

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

Report

Created by: Stephen Letch
Created date: 24 Jun 2022 11:17 GMT

Classification of sample: TP01-0.50

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

Sample details

Sample name:
TP01-0.50
Sample Depth:
0.50 m
Moisture content:
13%
(wet weight correction)

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

Hazard properties

None identified

Determinands

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

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol					☑					
3	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		16.4 mg/kg	1.534	21.885 mg/kg	0.00219 %	✓	
5	barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		68.2 mg/kg	1.233	73.188 mg/kg	0.00732 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		1.21 mg/kg	1.855	1.952 mg/kg	0.000195 %	✓	
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		23.2 mg/kg	1.126	22.725 mg/kg	0.00227 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	19 mg/kg		16.53 mg/kg	0.00165 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.08 mg/kg	1.5	2.715 mg/kg	0.000271 %	✓	
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		30.1 mg/kg	2.637	69.047 mg/kg	0.0069 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2.25 mg/kg	1.405	2.75 mg/kg	0.000275 %	✓	
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		95.9 mg/kg	2.469	206.021 mg/kg	0.0206 %	✓	
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		11.7 mg/kg	1.462	14.877 mg/kg	0.00149 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17		acenaphthylene		205-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18		acenaphthene		201-469-6	83-32-9		<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20		phenanthrene		201-581-5	85-01-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21		anthracene		204-371-1	120-12-7		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22		fluoranthene		205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23		pyrene		204-927-3	129-00-0		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31		benzo[ghi]perylene		205-883-8	191-24-2		<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34		benzene	601-020-00-8	200-753-7	71-43-2		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
35		toluene	601-021-00-3	203-625-9	108-88-3		<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<LOD
36		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
37		coronene		205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		pH			PH		8.15	pH		8.15	pH	8.15 pH		
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
											Total:	0.0444 %		

Key

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

WAC results for sample: TP01-0.50

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

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

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

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

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.05	3	5
2	LOI (loss on ignition)	%	4.14	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.04	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	8.15	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.0322	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0189	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.0338	0.5	10
16	nickel	mg/kg	0.006	0.4	10
17	lead	mg/kg	<0.002	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.011	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	76	500	800
26	TDS (total dissolved solids)	mg/kg	1010	4,000	60,000

Key

User supplied data

Classification of sample: TP02-0.50

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

Sample details

Sample name:
TP02-0.50
Sample Depth:
0.50 m
Moisture content:
17%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		**<LOD**
2	confirm TPH has NOT arisen from diesel or petrol					☑					
3	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		1.26 mg/kg	1.197	1.252 mg/kg	0.000125 %	✓	
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		18.1 mg/kg	1.534	23.043 mg/kg	0.0023 %	✓	
5	barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		90.5 mg/kg	1.233	92.654 mg/kg	0.00927 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		1.78 mg/kg	1.855	2.74 mg/kg	0.000274 %	✓	
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		36.5 mg/kg	1.126	34.109 mg/kg	0.00341 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	27.3 mg/kg		22.659 mg/kg	0.00227 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		**<LOD**
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.96 mg/kg	1.5	3.686 mg/kg	0.000369 %	✓	
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		39.7 mg/kg	2.637	86.881 mg/kg	0.00869 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				3.64 mg/kg	1.405	4.245 mg/kg	0.000424 %	✓	
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		134 mg/kg	2.469	274.635 mg/kg	0.0275 %	✓	
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		9.12 mg/kg	1.462	11.063 mg/kg	0.00111 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17		acenaphthylene		205-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18		acenaphthene		201-469-6	83-32-9		<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20		phenanthrene		201-581-5	85-01-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21		anthracene		204-371-1	120-12-7		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22		fluoranthene		205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23		pyrene		204-927-3	129-00-0		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31		benzo[ghi]perylene		205-883-8	191-24-2		<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34		benzene	601-020-00-8	200-753-7	71-43-2		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
35		toluene	601-021-00-3	203-625-9	108-88-3		<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<LOD
36		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
37		coronene		205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		pH			PH		8.1	pH		8.1	pH	8.1 pH		
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
											Total:	0.0569 %		

Key

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

WAC results for sample: TP02-0.50

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

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

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

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

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.06	3	5
2	LOI (loss on ignition)	%	5.26	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.04	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	8.1	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.0137	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0122	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	0.0065	0.4	10
17	lead	mg/kg	<0.002	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.0172	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	42.6	500	800
26	TDS (total dissolved solids)	mg/kg	435	4,000	60,000

Key

User supplied data

Classification of sample: TP03-0.50

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

Sample details

Sample name:
TP03-0.50
Sample Depth:
0.50 m
Moisture content:
11%
(wet weight correction)

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

Hazard properties

None identified

Determinands

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

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol					☑					
3	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		0.688 mg/kg	1.197	0.733 mg/kg	0.0000733 %	✓	
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		13.4 mg/kg	1.534	18.293 mg/kg	0.00183 %	✓	
5	barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		53.9 mg/kg	1.233	59.172 mg/kg	0.00592 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		2.06 mg/kg	1.855	3.4 mg/kg	0.00034 %	✓	
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28.7 mg/kg	1.126	28.759 mg/kg	0.00288 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	15.4 mg/kg		13.706 mg/kg	0.00137 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.28 mg/kg	1.5	3.044 mg/kg	0.000304 %	✓	
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		40.7 mg/kg	2.637	95.509 mg/kg	0.00955 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2.6 mg/kg	1.405	3.251 mg/kg	0.000325 %	✓	
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		99.5 mg/kg	2.469	218.669 mg/kg	0.0219 %	✓	
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		4.52 mg/kg	1.462	5.88 mg/kg	0.000588 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17		acenaphthylene		205-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18		acenaphthene		201-469-6	83-32-9		<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20		phenanthrene		201-581-5	85-01-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21		anthracene		204-371-1	120-12-7		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22		fluoranthene		205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23		pyrene		204-927-3	129-00-0		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31		benzo[ghi]perylene		205-883-8	191-24-2		<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34		benzene	601-020-00-8	200-753-7	71-43-2		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
35		toluene	601-021-00-3	203-625-9	108-88-3		<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<LOD
36		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
37		coronene		205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		pH			PH		8.55	pH		8.55	pH	8.55 pH		
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
											Total:	0.0462 %		

Key

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

WAC results for sample: TP03-0.50

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

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

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

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

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.482	3	5
2	LOI (loss on ignition)	%	2.78	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.04	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	8.55	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.0051	0.5	2
10	barium	mg/kg	0.0499	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0245	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	0.0583	0.5	10
16	nickel	mg/kg	0.0102	0.4	10
17	lead	mg/kg	<0.002	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.0116	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	54	500	800
26	TDS (total dissolved solids)	mg/kg	1030	4,000	60,000

Key

User supplied data

Classification of sample: TP04-0.50

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

Sample details

Sample name:
TP04-0.50
Sample Depth:
0.50 m
Moisture content:
16%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	TPH (C6 to C40) petroleum group			TPH		22.3 mg/kg		18.732 mg/kg	0.00187 %	✓	
2	confirm TPH has NOT arisen from diesel or petrol					☑					
3	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		0.932 mg/kg	1.197	0.937 mg/kg	0.0000937 %	✓	
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		14.3 mg/kg	1.534	18.425 mg/kg	0.00184 %	✓	
5	barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		89.9 mg/kg	1.233	93.149 mg/kg	0.00931 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		2.1 mg/kg	1.855	3.271 mg/kg	0.000327 %	✓	
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27.7 mg/kg	1.126	26.197 mg/kg	0.00262 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	20.3 mg/kg		17.052 mg/kg	0.00171 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		**<LOD**
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.4 mg/kg	1.5	3.024 mg/kg	0.000302 %	✓	
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		41.6 mg/kg	2.637	92.136 mg/kg	0.00921 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2.59 mg/kg	1.405	3.057 mg/kg	0.000306 %	✓	
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		110 mg/kg	2.469	228.163 mg/kg	0.0228 %	✓	
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		7.05 mg/kg	1.462	8.655 mg/kg	0.000866 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17		acenaphthylene		205-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18		acenaphthene		201-469-6	83-32-9		<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20		phenanthrene		201-581-5	85-01-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21		anthracene		204-371-1	120-12-7		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22		fluoranthene		205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23		pyrene		204-927-3	129-00-0		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31		benzo[ghi]perylene		205-883-8	191-24-2		<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
34		benzene	601-020-00-8	200-753-7	71-43-2		<0.09	mg/kg		<0.09	mg/kg	<0.000009 %		<LOD
35		toluene	601-021-00-3	203-625-9	108-88-3		<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
36		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
37		coronene		205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		pH			PH		8.13	pH		8.13	pH	8.13 pH		
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
											Total:	0.0515 %		

Key

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

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 HP 3 can be discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00187%)

WAC results for sample: TP04-0.50

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

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

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

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

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.901	3	5
2	LOI (loss on ignition)	%	4.71	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.4	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	14.9	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	8.13	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.0262	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0084	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	<0.004	0.4	10
17	lead	mg/kg	<0.002	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	<0.01	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	36.3	500	800
26	TDS (total dissolved solids)	mg/kg	927	4,000	60,000

Key

User supplied data

Appendix A: Classifier defined and non EU CLP determinands

- **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

- **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **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

- **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

EU CLP index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

- **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: hiips://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

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

Description/Comments: Data from C&L Inventory Database
Data source: hiip://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: hiip://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: hiip://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: hiip://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: hiip://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: hiip://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: hiip://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: hiip://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: hiip://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

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

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: hiip://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

pH (CAS Number: PH)

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

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case scenario.

arsenic {arsenic pentoxide}

Arsenic pentoxide used as most hazardous species.

barium {barium sulphide}

Chromium VI at limits of detection. Barium sulphide used as the next most hazardous species. No chromate present.

cadmium {cadmium sulfate}

Cadmium sulphate used as the most hazardous species.

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromium VI at limits of detection. Lead compounds used as the next most hazardous species. No chromate present.

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 sulfate}

Chromium VI at limits of detection. Nickel sulphate used as the next most hazardous species. No chromate present.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

zinc {zinc sulphate}

Chromium VI at limits of detection. Zinc sulphate used as the next most hazardous species. No chromate present.

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

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

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1.NI - Jan 2021
HazWasteOnline Classification Engine Version: 2022.168.5189.9766 (18 Jun 2022)
HazWasteOnline Database: 2022.168.5189.9766 (18 Jun 2022)

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

Appendix 10

Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Boreholes					
BH01	693991.954	736387.194	63.34	294061.622	236361.271
BH02	693986.702	736374.18	63.38	294056.369	236348.254
BH03	694017.345	736374.408	63.33	294087.018	236348.482
BH04	694008.037	736356.332	63.44	294077.709	236330.402
Trial Pits					
TP01	693983.942	736366.956	63.29	294053.608	236341.029
TP02	694007.291	736395.659	63.24	294076.962	236369.738
TP03	694032.944	736371.616	63.34	294102.621	236345.69
TP04	694021.704	736347.331	63.27	294091.379	236321.4
California Bearing Ratio Tests					
CBR1	693993.596	736378.131	63.32	294063.264	236352.206
CBR2	693986.927	736354.906	63.32	294056.594	236328.976
CBR3	694010.074	736381.136	63.29	294079.746	236355.212
CBR4	694006.616	736346.556	63.37	294076.287	236320.624

Legend Key

- Locations By Type - CP
- Locations By Type - ICBR
- Locations By Type - TP

Contract No:	5994
Contract Name:	Maynooth Fire Station
Location:	Maynooth, Co. Kildare
Client:	Kildare County Council
Engineer:	Tobin Consulting Engineers
Title:	Site Plan
Scale:	1:750
Drawn By:	SL

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