S.I. Ltd Contract No: 5752

Client: Cairn Homes PLC
Engineer: Waterman Moylan
Contractor: Site Investigations Ltd

Brennanstown Road – South Site, Cabinteely, Dublin 18 Site Investigation Report

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<u>5752 – Brennanstown Road – South Site</u> <u>Cabinteely, Dublin 18</u>

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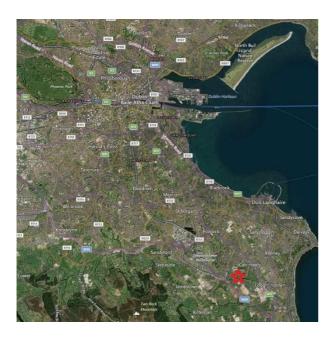
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1. Introduction

On the instructions of Waterman Moylan, Site Investigations Ltd (SIL) was appointed to complete a ground investigation at Brennanstown Road, Cabinteely, Dublin 18. The investigation was for a residential development on the site and was completed on behalf of the Client, Cairn Homes PLC. The site is spread either side of the Brennanstown Road with housing to the North of the road and apartment blocks planned to the South. This report covers the South site and the fieldworks for this part of the site were started in August and completed in November 2020.

2. Site Location

The site is located in Cabinteely in the South East of Dublin. The M50 motorway is to the South of the site as well as the Luas Green line. The first map below shows the location of the site in Dublin and the second map shows the entire site, with the South site shown in green.





3. Fieldwork

The fieldworks on the South site comprised a programme of cable percussive boreholes, rotary coreholes, trial pits, soakaway tests, foundation pits and California Bearing Ratio tests. 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:

- 23 No. cable percussive boreholes
- 12 No. rotary coreholes
- 21 No. trial pits

- 4 No. soakaway tests
- 2 No. foundation pits
- 13 No. California Bearing Ratio tests

3.1. Cable Percussive Boreholes

Cable percussion boring was undertaken at 23 No. locations using a Dando 150 rig and constructed 200mm diameter boreholes. The boreholes generally terminated at shallow depths between 0.30mbgl (BH15S) and 1.90mbgl (BH11S) but BH02S and BH10S did advance to 5.40mbgl and 5.80mbgl respectively. Two attempts were made at the shallow locations to advance the boreholes and the deeper borehole was reported. 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. The report shows the N-Value with the 75mm incremental blows listed in brackets (e.g. BH02S at 1.00mbgl where N=13-(3,3/3,4,3,3)). Where refusal of 50 blows across the test zone was encountered was achieved during testing, the penetration depth is also reported (e.g. BH02S at 5.00mbgl where N=50-(5,4/50 for 125mm)).

The cable percussive logs are presented in Appendix 1.

3.2. Rotary Coreholes

At 12 No. locations, rotary coreholes were completed to investigate the depth and type of bedrock. The rotary drilling was carried out using a Sondeq SS71 top drive rig. Open hole drilling techniques were used to advance through the overburden where encountered and bedrock was recovered from the coreholes from 2.00mbgl to 10.10mbgl. The bedrock was then cored and the corehole terminated when 3m of core was recovered.

Once the coreholes were completed, the rock cores were 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 logs and photographs are presented in Appendix 2.

3.3. Trial Pits

23 No. trial pits were excavated using a wheeled excavator. The strata were logged and photographed by SIL geotechnical engineer and groundwater ingresses and pit wall stability was also recorded. Representative disturbed bulk samples were recovered as the pits were excavated, which were returned to the laboratory for geotechnical testing.

The trial pit logs and photographs are presented in Appendix 3.

3.4. Soakaway Tests

At four locations, soakaway tests were completed with the wheeled excavator. The soakaway test is used to identify possible areas for storm water drainage. The pit will be filled with water and the level of the groundwater recorded over time. As stipulated by BRE Special Digest 365, 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 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 test results and photographs are provided in Appendix 4.

3.5. Foundation Pits

Adjacent to the southern boundary wall, 2 No. foundation pits were excavated to investigate the depths of the wall foundations. This included hand excavating around the foundation to measure the depth to the top, extension out from the wall and the thickness of the foundation. The pit was then photographed, backfilled with arisings and reinstated.

The foundation pit logs with photographs are presented in Appendix 5.

3.6. California Bearing Ratio tests

At thirteen individual locations, undisturbed cylindrical mould samples will be 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 will be presented as part of Appendix 6 with the geotechnical laboratory test data.

3.7. Surveying

Following completion of 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 8.

4. Laboratory Testing

Geotechnical laboratory testing has been completed on representative soil samples in accordance with BS 1377 (1990). Testing includes:

- 3 No. Moisture content
- 3 No. Atterberg limits
- 3 No. Particle size grading
- 3 No. pH, sulphate and chloride content

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

- 3 No. Suite I analysis
- 3 No. loss on ignition tests

The geotechnical laboratory test results are presented in Appendix 6 with the environmental results and waste classification report in Appendix 7.

5. Ground Conditions

5.1. Overburden

MADE GROUND was encountered in one borehole, eight trial pits and three soakaway tests. This consisted of both cohesive clay soils and granular gravel soils although it is generally less than 1.00mbgl, TP02S (1.10mbgl), TP03S (1.50mbgl), SA02 (1.40mbgl) and SA04S (>2.10mbgl) recording fill material below 1.00mbgl.

The site ground conditions in the boreholes recorded consistent results with a shallow layer of cohesive brown and brown grey slightly sandy gravelly silty CLAY before termination generally at depths between 0.30mbgl and 1.90mbgl. As stated in Section 3.1., BH02S and BH10S did advance to 5.40mbgl and 5.80mbgl with the cohesive soils encountered.

The trial pits extended deeper than the boreholes with several pits encountered granular SAND, GRAVEL, COBBLES and BOULDERS. These granular soils are the weathered zone of the granite bedrock in the area and was encountered at 0.20mbgl in TP15S and TP16S.

One of the laboratory tests recorded cohesive soils and this was a CLAY soil with low plasticity index of 14%. The particle size distribution curves were poorly sorted straight-line curves with 29% fines content. The remaining two samples were GRAVEL soils with 12 and 20% fines content.

5.2. Bedrock

Bedrock was recovered from depths ranging from 2.00mbgl to 10.10mbgl and the core recovered shows that bedrock is strong to very strong light grey fine to coarse grained GRANITE. The core showed a fresh to slightly weathered state. The discontinuities are generally rough, planar, tight to open, sub-horizontal to subvertical dip, clean with occasional brown staining.

5.3. Groundwater

Groundwater details in the boreholes and trial pits during the fieldworks are noted on the logs in Appendix 1 and 3. Groundwater ingresses were not recorded in the boreholes with four trial pits recording ingresses. These were in TP08S, TP18S, TP19S and TP21S, were between 1.20mbgl and 2.60mbgl and were recorded as seepages and TP21S was a medium ingress rate.

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.

The southern site for the development is planned to have multi-storey apartment blocks with some underground basements. Therefore, it would be recommended that any foundation is placed on the GRANITE bedrock to ensure that there is no differential settlement of the structures over time.

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.

- Foundations are to be constructed on a level formation of uniform material type (described above).
- The bulk unit weight of the material in this stratum has a minimum density of 19kN/m³
- All bearing capacity calculations allow for a settlement of 25mm.

The trial pits indicate that excavation walls should be stable for a short time, but all excavations should be checked immediately and regular inspection of temporary excavations should be completed during construction to ensure that all slopes are stable. 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, natural groundwater ingresses were recorded four trial pits between 1.20mbgl and 2.60mbgl 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. However, 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 the granular, weathered 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 completed at SA01S and SA02S recorded no infiltration and therefore, failed the specification. The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The test was 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. The unsuitability of the soils for soakaways is further suggested by the soil descriptions of the materials in this area of the site where the soakaway was completed, i.e. well compacted clay/silt soils.

SA03S and SA04S, however, did record infiltration with varying rates. The calculations recorded f-values of 3.42×10^{-5} m/s and 1.05×10^{-3} m/s respectively.

6.4. Pavement Design

The CBR test results in Appendix 6 recorded variable CBR values ranging from 6.2% to 28.5% with the GRAVEL content increasing in the descriptions for the higher value results.

The CBR samples will be recovered from 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 three samples from the investigation and the results are shown in Appendix 7. 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.

Following this analysis of the solid test results, TP18S recorded an elevated Total Organic Carbon value whilst the rest of the results indicate that the soils tested would be able to be treated as Inert Waste.

Three 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 6 indicate a general pH value range of 7.93 to 7.97, 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 126mg/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 151mg/l shows Class 1 conditions and no special precautions are required.

Appendix 1 Cable Percussive Borehole Logs

Contra		Cable Percussio	n Bo	orel	nole	Lo	g			orehole BH01	
Contrac	ct:	Brennanstown Road	Easting	g:	722614	4.287		Date Started:	12/08	3/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	ıg:	724328	8.872		Date Completed:	12/08	12/08/2020	
Client:		Cairn Homes PLC	Elevation	on:	75.89			Drilled By:	T. Tindall		
Engine	er:	Waterman Moylan	Boreho		200mn	n		Status:	FINA	L	
Deptl	h (m)	Stratum Description	Legend		(mOD)	Sai	mples	and Insitu Tes	sts	Water	Backfill
Scale	Depth		Logona	Scale	Depth	Depth	Туре	Result		Strike	Dackiiii
- - - - 0.5 -	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		- - 75.5 —	75.79						
-			× 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0	-							
1.0 —	0.90	Obstruction - possible boulders or weathered bedrock.	*	75.0 —	74.99						
- - -		End of Borehole at 0.90m		-							
1.5 —				74.5 -							
_ _ _				-	-						
2.0 —				74.0 — -							
- -				-	-						
2.5 —				73.5 - - -	- - -						
3.0 —				73.0 — -	-						
- - -				72.5 —	-						
3.5 —				-							
4.0 —				72.0 —							
_				-	-						
4.5 —				71.5 — - -							
- - -				71.0 —							
5.0 —				-							
- - 5.5 —				70.5 —	-						
				- - -							
-				70.0 —	-						
		Chiselling: Water Strikes: Water Details:	Install		_	Backfill:		Remarks:		Legend: B: Bulk	
		From: To: Time: Strike: Rose: Depth sealed Date: Hole Depth: Water Depth: 0.80 0.90 01:00	From: To	o: Pipe		To: Typ 0.90 Arisi	ngs a	Second attempt ma dvance borehole - J.90mbgl.		D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contra	act No: 52	Cable Percussion	on Bo	rel	nole	Lo	g			orehole BH02	
Contra	ct:	Brennanstown Road	Easting	:	722650	0.774		Date Started:	04/08	/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	g:	724289	9.427		Date Completed:	06/08/2020		
Client:		Cairn Homes PLC	Elevation	n:	72.91			Drilled By:	T. Tin	dall	
Engine	er:	Waterman Moylan	Borehol		200mm	า		Status:	FINA	L	
Dept	h (m)	Stratum Description	Legend	Level	(mOD)		mples	and Insitu Tes	sts	Water	Backfil
Scale	Depth	TOPSOIL.	V//SV//S	Scale	Depth	Depth	Туре	Result		Strike	\//X\//
0.5 —	0.10	Brown slightly sandy slightly gravelly silty CLAY.	X - X - X - X - X - X - X - X - X - X -	72.5 —	72.81						
1.0 —		Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content.		72.0 — - - - 71.5 — - -	72.11	1.00	B C	BR01 N=13 (3,3/3,	4,3,3)		
2.0 —				71.0 —		2.00	B C	BR02 N=12 (2,2/3,			
3.0 —				70.0 —		3.00 3.00	B C	BR03 N=15 (3,3/4,	3,4,4)		
4.0 —				69.0 — - - - - 68.5 —		4.00 4.00	B C	BR04 N=17 (3,4/4,	4,5,4)		
5.0 —	F 22			68.0 — - -	07.01	5.00 5.00	B C	BR05 50 (5,4/50 125mm			
5.5 — - - -	5.30 5.40	Obstruction - possible boulders or weathered bedrock. or weathered bedrock. End of Borehole at 5.40m		67.5 —	67.61 67.51	5.40	С	50 (25 fo 5mm/50 for	or 0mm)		
(E		Chiselling: Water Strikes: Water Details: From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: D	Installa From: To		e: From:	Backfill: To: Typ 5.40 Arisi		Remarks:		Legend: B: Bulk D: Disturb U: Undisto ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contract		Cable Percussio	n Bo	orel	nole	Lo	g			rehole 3H03			
Contract	:	Brennanstown Road	Easting	j:	722584	1.313		Date Started:	10/08	/2020			
Location	:	Cabinteely, Dublin 18	Northin	g:	724223	3.868		Date Completed:	10/08/2020		10/08/2020		
Client:		Cairn Homes PLC	Elevation	on:	73.63			Drilled By:	G. Ma	acken			
Engineer	r:	Waterman Moylan	Boreho		200mn	า		Status:	FINAL	_			
Depth		Stratum Description	Legend	Level	(mOD)			and Insitu Tes		Water	Backfill		
Scale [Depth	TOPSOIL.		Scale	Depth	Depth Depth Typ		Result		Strike			
0.5 —	0.30	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		73.5 — 73.0 — -	73.33								
-		Obstruction - possible boulders or weathered bedrock.		72.5 — 	72.33	1.00 1.00	B C	BR06 50 (5,6/50 25mm)					
1.5 —		End of Borehole at 1.30m		72.0 — - - -	-								
2.5				71.5 — - - -									
3.0 —				71.0 —									
3.5 —				70.5 — - - - 70.0 —									
4.0 —				69.5									
4.5 —				69.0	-								
5.0 —				68.5	-								
5.5 — - - -				68.0 —	- - - -								
		Chiselling: Water Strikes: Water Details: From: To: Time: Strike: Rose: Depth Sealed Sealed Sealed O3/09 1.30 Dry 1.20 1.30 01:00 03/09 1.30 Dry	Install From: To		e: From:	Backfill: To: Typ .30 Arisi	ings a	Remarks: second attempt ma dvance borehole - .80mbgl.		Legend: B: Bulk D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT		

Contra		Cable Percussio	n Bo	orel	nole	Lo	g			orehole BH04	
Contra	ct:	Brennanstown Road	Easting	j:	722632	2.246		Date Started:	10/08	3/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	g:	724180	0.947		Date Completed:	10/08/2020		
Client:		Cairn Homes PLC	Elevation	on:	70.42			Drilled By:	T. Tindall		
Engine	er:	Waterman Moylan	Boreho		200mn	n		Status:	FINA	L	
Dept	h (m)	Stratum Description	Legend		(mOD)	Samples and Insitu Tes		ples and Insitu Tes		Water	Backfill
Scale	Depth		\//\&\//\&	Scale	Depth	Depth	Туре	e Result		Strike	×///8×///8
0.5 —	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		70.0 —	70.32						
1.0 —	0.90	Obstruction - possible boulders or weathered	× × ×	69.5 —	69.52						
-		bedrock. End of Borehole at 0.90m		-							
-				69.0 —	_						
1.5 —				-	-						
-				- 68.5 —							
2.0 —				-							
- -				-	-						
2.5 —				68.0 —							
_				-							
- 3.0 —				67.5 —							
<u> </u>				-							
3.5 —				67.0 —	-						
3.5 — - -				-							
=				66.5 —							
4.0 —				-							
_				-	-						
4.5				66.0 — -							
-				-							
5.0 —				65.5 -							
-				-	-						
-				65.0 —	-						
5.5 —				-							
-				- - 64.5. —							
				64.5 —							
		Chiselling: Water Strikes: Water Details: From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Water Depth: 0.20 0.30 01:00 04/09 0.90 Dry	Install From: To		e: From:	Backfill: To: Tyl 0.90 Aris	ings a	Remarks: Second attempt ma advance borehole - 0.90mbgl.	ade to	Legend: B: Bulk D: Disturb U: Undistu ES: Enviro W: Water C: Cone S	urbed onmental

Contra		Cable Percussion	n Bo	orel	nole	Lo	g			orehole BH06	
Contrac	ct:	Brennanstown Road	Easting	g:	722519	9.998		Date Started:	11/08/	/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	ıg:	72420	5.129		Date Completed:	11/08/2020		
Client:		Cairn Homes PLC	Elevati	on:	71.56			Drilled By:	G. Macken		
Engine	er:	Waterman Moylan	Boreho		200mn	n		Status:	FINAL	_	
Deptl		Stratum Description	Legend	Level	(mOD)			s and Insitu Tes		Water	Backfill
Scale	Depth	TOPSOIL.		Scale 71.5 -	Depth	Depth	Туре	e Result		Strike	
-	0.20	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.	× × 0 · ×	- - -	71.36						
0.5 —			0 X 0 F	71.0 —	-						
- -	0.80	Obstruction - possible boulders or weathered	<u> </u>	-	70.76						
1.0 —		bedrock. End of Borehole at 0.80m		70.5 -							
- -				-							
1.5 — –				70.0 —							
<u>-</u>				-							
2.0				69.5 –							
- -				-							
2.5 —				69.0 —							
				-							
3.0 —				-	_						
-				68.5 -							
-				-							
3.5 —				68.0 —							
-				-							
4.0 —				67.5 -							
				-	-						
4.5 —				67.0 —	_						
-				-							
5.0 —				66.5 -							
				-							
5.5 —				-	-						
-				66.0 —							
		Chiselling: Water Strikes: Water Details:	Install	ation:		Backfill:		Remarks:		Legend:	
		Don't Usts Weter	From: To		e: From:	To: Typ 0.80 Aris	ings a	Second attempt ma advance borehole - 0.60mbgl.	ade to	B: Bulk D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental

Contra		Cable Percussio	n Bo	orel	nole	Lo	g		1	orehole BH07	
Contrac	ct:	Brennanstown Road	Easting	j :	722483	3.805		Date Started:	11/08	3/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	g:	724275	5.412		Date Completed:	11/08/2020		
Client:		Cairn Homes PLC	Elevation	on:	77.26			Drilled By:	T. Tin	ıdall	
Engine	er:	Waterman Moylan	Boreho		200mn	n		Status:	FINA	L	
Depth	h (m)	Stratum Description	Legend		(mOD)	Sa	mples	and Insitu Tes	sts	Water	Backfill
Scale	Depth	·	20 3 0110	Scale	Depth	Depth	Туре	Result		Strike	V//AV//A
1.0 —	0.90	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content. Obstruction - possible boulders or weathered bedrock. End of Borehole at 1.00m		77.0 — 76.5 — 76.0 — 75.5 — 75.0 —	77.16 76.36 76.26	1.00	С	50 (25 fc 5mm/50 for	or 0mm)		
3.0 —				74.5 74.0							
4.0 —				-							
				73.0 — -	-						
4.5 —				-							
5.0 —				72.5 - - -	-						
5.5 —				72.0 —							
								_ :			
		Chiselling: Water Strikes: Water Details: From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Dep	Install From: To		e: From:	Backfill: To: Ty 1.00 Aris	ings a	Remarks: second attempt ma dvance borehole - .00mbgl.		Legend: B: Bulk D: Disturb U: Undisto ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contra	act No: 52	Cable Percussio	n Bo	orel	nole	Lo	g			orehole BH08	
Contra	ct:	Brennanstown Road	Easting	j :	722476	6.799		Date Started:	11/08	/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	g:	724330	0.299		Date Completed:	11/08/2020		
Client:		Cairn Homes PLC	Elevation	on:	78.75			Drilled By:	T. Tindall		
Engine	er:	Waterman Moylan	Boreho		200mn	า		Status:	FINAL	L	
Dept		Stratum Description	Legend	Level	(mOD)		mples	and Insitu Tes		Water	Backfill
Scale	Depth 0.10	TOPSOIL.	\(\(\)\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Scale	<u> </u>	Depth	Туре	Result		Strike	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	0.10	Brown slightly sandy slightly gravelly silty CLAY.	X - X	78.5 —	78.65						
0.5 —		Brown slightly sandy slightly gravelly silty CLAY with low cobble content.	× × · · ×	- - -	78.35						
- - -			× × ×	78.0 — -	-						
1.0 —		Obstruction - possible boulders or weathered bedrock.	××	- - 77.5 —	77.65	1.00 1.10	B C	BR07 50 (25 fo 80mm/50	or for		
1.5 —		End of Borehole at 1.10m		-	-			0mm)			
_				77.0 —							
2.0 —				-	_						
_				76.5 —							
2.5 —				- - -							
_ _ _				76.0 	-						
3.0 —				- -							
_ _ _				75.5 —							
3.5 —				-	-						
_ _				75.0 —							
4.0 —				-	-						
_				74.5 -							
4.5 —				-	-						
_ _ _				74.0 —							
5.0 — –				- - -							
- - -				73.5 — -							
5.5 — —				-							
_ _ _				73.0 —	-						
		Chiselling: Water Strikes: Water Details:	Install	ation:		Backfill:		Remarks:		Legend:	
			From: To		e: From:	To: Typ .10 Arisi	ings a	econd attempt ma dvance borehole - .00mbgl.	ide to	B: Bulk D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contra		Cable Percussio	n Bo	orel	nole	Lo	g		1	orehole BH09			
Contrac	ct:	Brennanstown Road	Easting	j :	722605	5.172		Date Started:	11/08	3/2020			
Locatio	n:	Cabinteely, Dublin 18	Northin	g:	724288	3.231		Date Completed:	11/08	11/08/2020			
Client:		Cairn Homes PLC	Elevation	on:	75.75			Drilled By:	T. Tindall				
Engine	er:	Waterman Moylan	Boreho		200mn	n		Status:	FINA	L			
Depth		Stratum Description	Legend	Level	(mOD)			and Insitu Tes		Water	Backfill		
Scale	Depth	TOPSOIL.		Scale	Depth	Depth	Туре	Result		Strike			
0.5 —	0.20	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		75.5 — -	75.55								
- - - -				75.0 —									
1.0 —	1.00	Obstruction - possible boulders or weathered bedrock.	1	-	74.75	1.00	С	50 (25 for 5mm/50 for			Y//>\Y//>\\		
		End of Borehole at 1.00m		74.5 —									
1.5 —				-	-								
- -				74.0 —									
2.0 —				-	-								
				73.5 —									
2.5 —				-									
-				73.0 —									
3.0 —				-									
-				- 72.5 —									
-				-									
3.5 —				-									
_ _				72.0 —									
4.0 —				-									
				71.5 — -									
4.5 — -				-									
-				71.0 —									
5.0 —				-									
- -				70.5 —									
5.5 —				-									
				70.0 —	-								
		Chiselling: Water Strikes: Water Details:	Install			Backfill:		Remarks:		Legend: B: Bulk			
		From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Water Depth: Popth: 0.90 1.00 01:00 11/08 1.00 Dry	From: To	o: Pipe			ings a	Second attempt ma dvance borehole - .00mbgl.		D: Disturb U: Undisto ES: Enviro W: Water C: Cone S	urbed onmental		

	act No: 52	Cable Percussion	n Bo	rel	nole	Lo	g			orehole BH10	
Contra	ct:	Brennanstown Road	Easting	:	722657	7.744		Date Started:	04/08	3/2020	
Locatio	n:	Cabinteely, Dublin 18	Northing	g:	724304	1.402		Date Completed:	04/08	3/2020	
Client:		Cairn Homes PLC	Elevatio	n:	73.23			Drilled By:	T. Tin	dall	
Engine	er:	Waterman Moylan	Borehol Diamete		200mm	า		Status: FIN		L	
Dept	h (m)	Stratum Description	Legend	Level	(mOD)		mples	nples and Insitu Tes		Water	
Scale	Depth	·	V//XV//X	Scale	Depth	Depth	Type Resul			Strike	X//XX//X
- - -		TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY.	<u> </u>	73.0 —	73.13						
0.5 —			X - X	-							
_			XX	72.5 -	_						
1.0 —	0.90	Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content.	X 0 X 0 X 0 X 0 X 0 X 0 X	- - 72.0 —	72.33	1.00 1.00	B C	BR08 N=11 (2,3/3,	2,3,3)		
1.5 —				-							
2.0 —				71.5 —		2.00	В	BR09			
- - - -				71.0 —		2.00	Ċ	N=12 (2,2/3,	3,3,3)		
2.5 — — —				70.5 —							
3.0 —				70.0	-	3.00 3.00	B C	BR10 N=13 (2,3/3,	4,3,3)		
3.5 — - -				- - 69.5 —	-						
4.0 —				- - -	-	4.00 4.00	B C	BR11 N=17 (3,3/4,	4,4,5)		
4.5				69.0 — - -	-						
5.0			X	68.5 —		5.00	B	BD12			
5.0 — - - -			X	68.0 —	-	5.00 5.00	B C	BR12 N=17 (3,3/3,	4,4,6)		
5.5 — —	5.70	Obstruction - possible boulders or weathered		- - 67.5 —	67.53		_				
_	5.80	bedrock. End of Borehole at 5.80m	1	-	67.43	5.80	С	50 (25 for 6	or 0mm)		
		Chiselling: Water Strikes: Water Details:	Installa	ation:	 E	ackfill:		Remarks:		Legend:	
		From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Depth: O4/08 5.80 Dry	From: To		e: From:	To: Typ 5.80 Arisi				B: Bulk D: Disturb U: Undisto ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contra		Cable Percussio	n Bo	orel	nole	Lo	g			orehole BH11	
Contrac	ct:	Brennanstown Road	Easting	g:	722490	0.491		Date Started:	12/08	3/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	ıg:	724255	5.097		Date Completed:	12/08	3/2020	
Client:		Cairn Homes PLC	Elevati	on:	74.26			Drilled By:	T. Tin	dall	
Engine	er:	Waterman Moylan	Boreho		200mm	1		Status:	FINA	L	
Depth		Stratum Description	Legend	Level	(mOD)			and Insitu Tes		Water Strike	Backfill
Scale	Depth 0.10	TOPSOIL.		Scale		Depth	Туре	Result		Strike	X//XX///X
0.5 —	0.10	Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.	× × · · · ×	74.0 — -	74.16						
-			X X C	-	-						
_			× × ×	73.5 – -							
1.0 —			× × ×	-		1.00 1.00	B C	BR13 N=14 (3,3/3,	4,3,4)		
-			× × · · · ×	73.0 —							
1.5 —			× × ×	-							
_	1.80		× × 0 × ×	72.5 -	72.46						
2.0 —	1 00	Obstruction - possible boulders or weathered bedrock.	0.00	-	72.36	1.90	С	50 (25 fo 5mm/50 for			
-		End of Borehole at 1.90m		72.0 —	1				,		
-											
2.5 —				-							
				71.5 –	_						
3.0 —				-							
				71.0 —							
3.5 —				-							
				70.5 –	_						
4.0				-	-						
-				-	-						
-				70.0 — -							
4.5 —				-							
				69.5 -							
5.0				- -	-						
				69.0 —							
5.5 —				-							
-				68.5 -							
				-							
		Chiselling: Water Strikes: Water Details:	Install	ation:	E	Backfill:		Remarks:		Legend:	
		Doub Hale Motor	From: To		e: From:	To: Typ				B: Bulk D: Disturb U: Undisto ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contra	act No: 52	Cable Percussio	n B	orel	nole	Log	3			orehole BH12	
Contra	ct:	Brennanstown Road	Easting	g:	722504	4.969		Date Started:	12/08	3/2020	
Locatio	n:	Cabinteely, Dublin 18	Northir	ng:	724224	4.963		Date Completed:	12/08	3/2020	
Client:		Cairn Homes PLC	Elevati	on:	72.42			Drilled By:	G. M	acken	
Engine	er:	Waterman Moylan	Boreho		200mm	1		Status:	FINA	L	
Dept		Stratum Description	Legend		(mOD)			and Insitu Tes		Water Strike	Backfill
Scale	Depth	TOPSOIL.		Scale	Depth	Depth	Type	Result		Otriko	
0.5 —		Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		- 72.0 — - - -	72.22						
1.0 —	1.10	Obstruction - possible boulders or weathered bedrock. End of Borehole at 1.10m		71.5 —	71.32	1.00 1.10	B C	BR14 50 (25 fo 50mm/50 5mm)	or for		
1.5 —				71.0 — - - - 70.5 —	-						
2.0 — — — — — 2.5 —				70.0							
2.5 — - - - 3.0 —				- - - 69.5 —	-						
3.5 — 3.5 —				69.0 —	-						
4.0 —				68.5 —	-						
4.5 —				68.0							
- - -				67.5							
5.0 — - - - -				- - - 67.0 —							
5.5 — — — —				- - - 66.5 —	-						
		Chiselling: Water Strikes: Water Details:	Instal	lation:		Backfill:		Remarks:		Legend:	
		From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Depth: 1.00 1.10 01:00 Dry		iation: io: Pipe	e: From:	Backtill: To: Type	gs a	econd attempt ma dvance borehole - .00mbgl.	de to	B: Bulk D: Disturb U: Undistr ES: Envir W: Water C: Cone S S: Split sp	urbed onmental SPT

Contract N		Cable Percussion	n Bo	orel	nole	Lo	g			rehole 3H13	
Contract:		Brennanstown Road	Easting	j:	72253	1.447		Date Started:	12/08	/2020	
Location:		Cabinteely, Dublin 18	Northin	g:	724230	0.529		Date Completed:	12/08	/2020	
Client:		Cairn Homes PLC	Elevation	on:	73.59			Drilled By:	G. Ma	icken	
Engineer:		Waterman Moylan	Boreho Diamet		200mm	า		Status:	FINAL	-	
Depth (n		Stratum Description	Legend	Level	(mOD)			s and Insitu Tes		Water Strike	Backfill
Scale De	epth	TOPSOIL.		Scale 73.5 -	Depth	Depth	Тур	e Result		Suike	
_	.20	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.	× · · · · · · · · · · · · · · · · · · ·	-	73.39						
0.5 — — — —			\$\frac{1}{2}\display \times 0.	73.0 —							
1.0 — 0.9		Obstruction - possible boulders or weathered	× × · ·	- - -	72.69						
-		bedrock. End of Borehole at 0.90m		72.5 — -							
-				-							
1.5 —				72.0 —							
-				-							
2.0 —				71.5 —							
				-							
2.5 —				71.0 —							
_				-							
3.0				70.5 —	-						
-				-	-						
3.5				70.0 —							
_				-							
4.0				-							
				69.5 — -							
4.5 —				-							
-				69.0 — –							
5.0				-							
-				68.5 — -	_						
-				-							
5.5 —				68.0 —							
_				-							
		Chiselling: Water Strikes: Water Details:	Install	ation:		Backfill:		Remarks:		Legend:	
		Doub Usta Water	From: To		e: From:	То: Ту	ings	Second attempt ma advance borehole - 0.80mbgl.	ade to	B: Bulk D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	onmental PT

Contra		Cable Percussio	n Bo	orel	nole	Log			orehole BH14	
Contrac	ct:	Brennanstown Road	Easting	j :	722599	9.749	Date Started	d: 06/08	/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	ıg:	724238	3.597	Date Completed:	06/08	/2020	
Client:		Cairn Homes PLC	Elevati	on:	74.12		Drilled By:	T. Tin	dall	
Engine	er:	Waterman Moylan	Boreho		200mm	า	Status:	FINA	L	
Deptl		Stratum Description	Legend	Level	(mOD)		oles and Insitu To		Water Strike	Backfill
Scale		TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.	\$ 0 × 0 E	74.0 —	74.02	Depth 7	Type Resu	ult	Stilke	
0.5 —	0.40	Obstruction - possible boulders or weathered bedrock. End of Borehole at 0.40m		73.5 —	73.72					<i>></i> /^^\
1.0 —				73.0 —						
1.5 — - - -				72.5 —						
2.0 —				72.0 —						
2.5 — - -				71.5 —						
3.0 —				71.0 —						
3.5 — - - -				70.5 —						
4.0 —				70.0 —						
4.5 —				69.5 —						
5.0 — - -				69.0 —						
5.5 — - - - -				- 68.5 — - -						
		Chiselling: Water Strikes: Water Details:	Instal	ation:		Backfill:	Remark	e.	Legend:	
			From: To			To: Type:	Second attempt i	made to	B: Bulk D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

	act No:	Cable Percussion	n Bo	orel	nole	Lo	g			orehole BH15	
Contra	ct:	Brennanstown Road	Easting	g:	722633	3.677		Date Started:	06/08	3/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	ıg:	724236	6.099		Date Completed:	06/08	3/2020	
Client:		Cairn Homes PLC	Elevati	on:	72.76			Drilled By:	T. Tin	ıdall	
Engine	er:	Waterman Moylan	Boreho		200mm	n		Status:	FINA	L	
	h (m)	Stratum Description	Legend	Level	(mOD)			and Insitu Tes		Water Strike	
Scale	Depth	MADE GROUND: grey silty sandy gravel with low		Scale	Depth	Depth	Туре	Result		Strike	
-	0.00	cobble content. Obstruction - possible boulders or weathered		72.5 -	72.46						
0.5 —		bedrock. End of Borehole at 0.30m		-							
_				72.0 —	-						
1.0 —				-	-						
_ _				71.5 —	-						
-				/1.5 - -							
1.5 —				-	_						
_				71.0 —	-						
2.0 —				-	-						
_				70.5							
2.5 —				-							
_				70.0 —	-						
3.0 —				-	-						
-				-	-						
_				69.5 — -							
3.5 —				-							
_				69.0 —	-						
4.0 —				-	-						
-				68.5 –	-						
4.5 —				-							
_				- 68.0 —							
5.0 —				=	-						
-				-							
-				67.5 -							
5.5 —				-							
_				67.0 —	_						
				_							
			Install rom: To		e: From:	Backfill: To: Typ		Remarks: Second attempt ma	ade to	Legend: B: Bulk D: Disturb	
(8	b)	0.20 0.30 01:00 06/08 0.30 Dry				0.30 Arisi	ngs a	dvance borehole - 0.30mbgl.	- also	U: Undisto ES: Enviro W: Water	urbed onmental
0										C: Cone S S: Split sp	

Contra	act No: 52	Cable Percussio	n Bo	orel	nole	Log	3			orehole BH16	
Contra	ct:	Brennanstown Road	Easting	g:	72263	5.535		Date Started:	11/08	/2020	
Locatio	n:	Cabinteely, Dublin 18	Northir	ng:	724206	6.358		Date Completed:	11/08	/2020	
Client:		Cairn Homes PLC	Elevati	on:	71.67			Drilled By:	T. Tin	dall	
Engine	er:	Waterman Moylan	Boreho		200mn	n		Status:	FINA	L	
Dept		Stratum Description	Legend		(mOD)			and Insitu Tes		Water Strike	Backfill
Scale	0.70	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content. Obstruction - possible boulders or weathered bedrock. End of Borehole at 0.70m		Scale	71.57 70.97	Depth	Type	Result			
- - - 1.5 — -				70.5 —							
2.0 — - - - - - 2.5 —				69.5 —							
2.5 — — — 3.0 —				69.0 — - - - - 68.5 —	-						
3.5 —				- - - 68.0 — -	-						
4.0 — - - - 4.5 —				67.5 — 							
5.0 —				67.0	-						
- - 5.5 — - -				66.5 — - - - - 66.0 —							
				-							
		Chiselling: Water Strikes: Water Details: From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Water Details: 0.60 0.70 01:00 11/08 0.70 Dry		lation: o: Pipe		Backfill: To: Type 0.70 Arisin	_{gs} a	Remarks: second attempt ma dvance borehole - .30mbgl.	de to	Legend: B: Bulk D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contra		Cable Percussio	n Bo	orel	nole	Lo	g			orehole BH17	
Contrac	ot:	Brennanstown Road	Easting	j :	722583	3.353		Date Started:	10/08	3/2020	
Location	n:	Cabinteely, Dublin 18	Northin	g:	724180	0.572		Date Completed:	10/08	3/2020	
Client:		Cairn Homes PLC	Elevation	on:	70.58			Drilled By:	G. Ma	acken	
Enginee	er:	Waterman Moylan	Boreho		200mn	า		Status:	FINA	L	
Depth		Stratum Description	Legend	Level	(mOD)			and Insitu Tes		Water	Backfill
Scale	Depth	TOPSOIL.		Scale 70.5 -	Depth	Depth	Туре	Result		Strike	
0.5 —	0.30	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		70.0 —	70.28	1.00	В	BR15			
1.5		Obstruction - possible boulders or weathered bedrock. End of Borehole at 1.10m	××	69.5 — - - - 69.0 —	69.48	1.10	С	50 (25 fo 25mm/50 5mm)	for		
2.0 —				68.5							
3.0 —				67.5 —							
4.0 —				66.5 —	-						
5.0 —				- - - - 65.5 —	-						
5.5 —				65.0 —							
		Chiselling: Water Strikes: Water Details:	Install	ation:		Backfill:		Remarks:		Legend:	
			From: To		e: From:	То: Ту	ings a	second attempt ma dvance borehole - .90mbgl.		B: Bulk D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contract No.	Cable Percussion	n Bo	orel	nole	Lo	g			orehole BH18	
Contract:	Brennanstown Road	Easting	g:	722514	1.910		Date Started:	11/08	/2020	
Location:	Cabinteely, Dublin 18	Northin	ıg:	72418 ²	1.761		Date Completed:	11/08	/2020	
Client:	Cairn Homes PLC	Elevati	on:	69.95			Drilled By:	G. Ma	acken	
Engineer:	Waterman Moylan	Boreho		200mn	า		Status:	FINA	L	
Depth (m)	Stratum Description	Legend	Level	(mOD)			and Insitu Tes		Water Strike	Backfill
Scale Dep	TOPSOIL.		Scale	Depth	Depth	Туре	Result		Strike	X((X)
0.20	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		- - 69.5 —	69.75						
-		× × ×	-							
1.0 —		X - 0 - X	69.0 —		1.00	В	BR16	£		
1.30		× 0 × 0	-	68.65	1.00	C	50 (4,5/50 90mm) 50 (25 fc)		
1.5 —	Obstruction - possible boulders or weathered bedrock. End of Borehole at 1.30m		68.5 —				5mm/50 for			
			-							
2.0 —			68.0 —							
-			-							
2.5 —			67.5 —	_						
			-							
-			67.0 —							
3.0 —			-	_						
-			66.5 —							
3.5 —			-	-						
-			-							
4.0 —			66.0 —							
			-							
4.5 —			65.5 — –	-						
-			-							
5.0			65.0 — -							
_			-							
5.5 —			64.5 —							
			-							
-			64.0 —							
	Chiselling: Water Strikes: Water Details:	Install			Backfill:		Remarks:		Legend: B: Bulk	
	From: To: Time: Strike: Rose: Pepth Sealed Date: Hole Depth: Dept	From: To	o: Pipe		To: Tyl	ings a	econd attempt ma dvance borehole - .90mbgl.		D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

Contra		Cable Percussio	n B	orel	nole	Lo	g			orehole BH19	
Contrac	ct:	Brennanstown Road	Easting	g:	722528	3.853		Date Started:	11/08	/2020	
Locatio	n:	Cabinteely, Dublin 18	Northir	ng:	724167	7.924		Date Completed:	11/08	/2020	
Client:		Cairn Homes PLC	Elevati	ion:	69.08			Drilled By:	G. Ma	acken	
Engine	er:	Waterman Moylan	Boreho		200mn	n		Status:	FINAL	L	
Deptl		Stratum Description	Legend		(mOD)			and Insitu Tes		Water Strike	Backfil
Scale	Depth	TOPSOIL.		Scale 69.0 —	Depth	Depth	Туре	Result		Otriko	
- - 0.5 -	0.20	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.	X X 0.	-	68.88						
- - -	0.60	Obstruction - possible boulders or weathered bedrock. End of Borehole at 0.60m	<u> </u>	68.5 – -	68.48						
1.0				68.0 —							
-				-	-						
- 1.5 —				-	-						
-				67.5 -							
2.0				-	-						
				67.0 —	-						
-				-							
2.5 — -				66.5 -							
-				-							
3.0 —				66.0 —							
-				-							
3.5 —				65.5 -							
				-							
4.0 —				-							
-				65.0 —							
-				-							
4.5 — —				64.5 -							
				-	-						
5.0 —				64.0 —	-						
-				-							
5.5 —				63.5 -							
				-							
-				-							
		Chiselling: Water Strikes: Water Details:	Instal	lation:		Backfill:		Remarks:		Legend:	
		From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Water Depth: 0.50 0.60 01:00	From: T	o: Pipe	9: From: 0.00 0	To: Typ 0.60 Arisi	ngs a	econd attempt ma dvance borehole - .50mbgl.		B: Bulk D: Disturb U: Undistr ES: Envir W: Water C: Cone S S: Split sp	urbed onmental SPT

	act No: 52	Cable Percussio	n Bo	orel	nole	Lo	g			orehole BH20	
Contra	ct:	Brennanstown Road	Easting	j:	722519	9.395		Date Started:	11/08	/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	g:	724096	6.139		Date Completed:	11/08	/2020	
Client:		Cairn Homes PLC	Elevation	on:	63.81			Drilled By:	G. Ma	acken	
Engine	er:	Waterman Moylan	Boreho		200mn	n		Status:	FINA	L	
Dept		Stratum Description	Legend	Level	(mOD)			s and Insitu Tes		Water	Backfill
Scale	Depth	TOPSOIL.		Scale	Depth	Depth	Тур	e Result		Strike	
0.5	0.20	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		63.5 — -	63.61						
- - - 1.0 —	0.80	Obstruction - possible boulders or weathered bedrock.	× · · · · ×	63.0 —	63.01						
_ _ _ _		End of Borehole at 0.80m		62.5 —							
1.5 — - - -				62.0 —	-						
2.0 —				- - -	-						
2.5 —				61.5 — - -	-						
3.0 —				61.0 —							
3.5 —				60.5 — -	-						
4.0				60.0 —							
_ _ _ _				59.5 —	-						
4.5 — — — —				59.0 —	-						
5.0 —				-	-						
5.5 —				58.5 — - - -							
_				58.0 —							
		Chiselling: Water Strikes: Water Details: From: To: Time: Strike: Rose: Depth: Sealed Date: Hole Depth: Depth: Depth: Depth: Depth: Depth	Install From: To		e: From:		ings a	Remarks: Second attempt ma advance borehole	ade to	Legend: B: Bulk D: Disturb U: Undistu	urbed
6								0.80mbgl.		ES: Enviro W: Water C: Cone S	onmental

Contract No: 5752	Cable Percussion	n Bo	orel	nole	Lo	g			orehole BH21	
Contract:	Brennanstown Road	Easting	j:	722542	2.842		Date Started:	11/08	/2020	
Location:	Cabinteely, Dublin 18	Northin	g:	724153	3.164		Date Completed:	11/08	/2020	
Client:	Cairn Homes PLC	Elevation	on:	68.14			Drilled By:	G. Ma	acken	
Engineer:	Waterman Moylan	Boreho		200mn	า		Status:	FINA	L	
Depth (m)	Stratum Description	Legend	Level	(mOD)			s and Insitu Tes		Water Strike	Backfill
Scale Depth	TOPSOIL.		Scale	Depth	Depth	Тур	e Result		Strike	
0.20	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.		68.0 — - -	67.94						
0.5 - 0.50	Obstruction - possible boulders or weathered bedrock.		67.5 —	67.64						
	End of Borehole at 0.50m		-	-						
1.0			-							
_			67.0 — -							
1.5 —			-							
-			66.5 -	-						
2.0			-	-						
-			66.0 —							
-			-							
2.5 —			65.5 —							
			-	-						
3.0 —			- 65.0 —							
-			-							
3.5			-							
			64.5 -	-						
4.0 —			-							
-			64.0 —							
4.5			=	-						
4.5			63.5 —							
-			-							
5.0 —			63.0 —							
			-	-						
5.5 —			-							
			62.5 -							
-										
(As)	Chiselling: Water Strikes: Water Details: From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Dep	Install From: To			L Backfill: To: Ty	pe:	Remarks: Second attempt ma		Legend: B: Bulk	
	O.40 O.50 O1:00 O.50 O1:00 O.50		. i τρε			ings	advance borehole - 0.50mbgl.		D: Disturb U: Undistu ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental

	act No:	Cable Percussion	n Bo	orel	nole	Log	3			orehole BH23	
Contra	ct:	Brennanstown Road	Easting	j:	722579	9.882		Date Started:	07/08	3/2020	
Locatio	n:	Cabinteely, Dublin 18	Northin	ıg:	724124	1.231		Date Completed:	07/08	3/2020	
Client:		Cairn Homes PLC	Elevation	on:	66.57			Drilled By:	T. Tin	dall	
Engine	er:	Waterman Moylan	Boreho Diamet		200mm	า		Status:	FINA	L	
	h (m)	Stratum Description	Legend	Level	(mOD)			and Insitu Tes		Water Strike	Backfill
Scale	Depth 0.10	TOPSOIL.	X//XX//X	Scale 66.5 -	Depth	Depth	Туре	Result		Strike	\\/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
- - -		Brown slightly sandy slightly gravelly silty CLAY with low cobble content.	× × · · · ×	66.5 -	66.47						
0.5 —	0.40	Obstruction - possible boulders or weathered bedrock.	<u>&∞</u> ×	66.0 —	66.17						
=		End of Borehole at 0.40m		-							
1.0 —				-	_						
-				65.5 -							
- 1.5 —				- -							
-				65.0 — -	-						
-				-							
2.0 —				64.5 -	-						
_ _				-	_						
2.5 —				64.0 —							
_				-							
3.0 —				63.5 —	-						
_ _				-	-						
3.5 —				63.0 —							
_				-							
4.0 —				- 62.5 —							
_					-						
4.5 —				-							
-				62.0 — -							
5.0 —				-							
J.0 –				61.5 -							
				-							
5.5 —				61.0 —							
_ _				-	-						
		Chiselling: Water Strikes: Water Details:	Install	ation:	-	Backfill:		Remarks:		Legend:	
		Doubt Hale Webs	From: To		e: From:	To: Type	gs a	Second attempt ma dvance borehole - .40mbgl.		B: Bulk D: Disturb U: Undistu ES: Enviro	urbed onmental
0										C: Cone S S: Split sp	SPT

Contract No: 5752		Cable Percussio	Borehole No: BH24S								
Contract:		Brennanstown Road	Easting	g:	722602.835			Date Started: 10/08		08/2020	
Location:		Cabinteely, Dublin 18	Northing:		724147.271			Date Completed:	10/08/2020		
Client:		Cairn Homes PLC	Elevation:		68.42			Drilled By:			
Engineer:		Waterman Moylan	Borehole Diameter:		200mm			Status: FIN		INAL	
Depth (m)		Stratum Description	Legend		(mOD)	Sai Depth		and Insitu Tes		Water Strike	Backfil
Scale	1.20	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content. Obstruction - possible boulders or weathered bedrock. End of Borehole at 1.20m		68.0 — 67.5 — 67.0 — 66.5 — 66.5 — 66.5 — 66.5 — 66.5 — 66.5 — 66.0 — 66.5 — 66.0 — 66.5 — 66.0 —	Depth 68.32 67.22	1.00 1.00 1.20	B C C	BR17 50 (25 fc 85mm/50 5mm) 50 (25 fc 5mm/50 for	or for		
5.5 — — — —				-							
				62.5 —							
		Chiselling: Water Strikes: Water Details: From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Water Depth: 1.10 1.20 01:00 10/08 1.20 Dry		lation: o: Pipe	e: From:	Backfill: To: Typ .20 Arisi	ngs a	Remarks: econd attempt ma dvance borehole - .20mbgl.		Legend: B: Bulk D: Disturb U: Undisto ES: Enviro W: Water C: Cone S S: Split sp	urbed onmental SPT

575	ct No: 52	Cable Percussio	n Bo	orel	nole	Lo	g			rehole 3H25		
Contract:		Brennanstown Road	Easting	g:	722611.665			Date Started: 10/		0/08/2020		
Location:		Cabinteely, Dublin 18	Northing:		724127.402			Date Completed:	10/08/2020			
Client:		Cairn Homes PLC	Elevation:		67.33			Drilled By:	T. Tino	dall	all	
Engineer:		Waterman Moylan		Borehole Diameter:		200mm		Status:	FINAL			
Depth (m)		Stratum Description	Legend	Level			nples	and Insitu Tes	sts	Water	Backfil	
Scale	Depth	TOPSOIL.	\(\lambda\)	Scale	Depth	Depth	Туре	Result		Strike	X//XX///	
-		Brown slightly sandy slightly gravelly silty CLAY with	** X* 0 **	-	67.23							
-		low cobble content.	× × ·	67.0 —								
0.5			× × ·	-								
-			× × ·	_								
-			× × ·	-								
]	0.90		× × ×	66.5 —	66.43							
1.0 —		Obstruction - possible boulders or weathered bedrock.	1	_								
		End of Borehole at 0.90m		-								
-				66.0 —								
1.5 —				_								
1.5				_								
-				-								
				65.5 —								
2.0 —				_								
				-								
				65.0 —								
-				- 05.0	-							
2.5 —				=								
				_								
-				64.5 —								
3.0				-								
-				_								
-				-								
				64.0 —								
3.5 —				_								
				-	_							
-				63.5 -								
4.0				-								
4.0				-								
-				_								
				63.0 —								
4.5 —				_								
-				-	-							
]				62.5 -								
-				02.5								
5.0				-								
-				_								
-				62.0 —	-							
5.5				_								
-				_	-							
				-								
4				61.5 -]							
		Chiselling: Water Strikes: Water Details:		lation:		Backfill:		Remarks:		Legend: B: Bulk		
		From: To: Time: Strike: Rose: Depth Sealed Date: Hole Depth: Water Depth: 0.80 0.90 01:00	From: T	o: Pipe	9: From: - 0.00 0	To: Typ	ngs a	econd attempt ma dvance borehole - .80mbgl.	ide to	B: Bulk D: Disturb U: Undisto ES: Enviro W: Water C: Cone S	urbed onmental	

Appendix 2 Rotary Corehole Logs and Photographs

Contract No: 5752 Rotary Corehole Log										Corehole No: RC02S		
Contract:		Brennanstown Road	Easting:			722650.774	Date Started:		ed:	02/11/2	2020	
Location:		Cabinteely, Dublin 18	Northing:			724289.427	Date Completed:		l:	02/11/2020		
Client:		Cairn Homes PLC	Elevation:			72.91	Drilled By:			MEDL		
Engineer:		Waterman Moylan	Rig Type:		:	Sondeq	Status:			FINAL		
Depth (m)		Stratum Description		Level		Samples	Roc		Rock	k Indices		Backfill
Scale -	Depth	Cable percussive borehole completed - see CP log.		Scale		oth	Т	CR/%	SCR/9	% RQD/%	FI/m	
0.5		case percassing serious completes cost of logi		72.5								
1.0				72.0								
1.5				71.5								
2.0				71.0 —								
3				70.5								
2.5				70.0								
3.0												
3.5				69.5								
4.0				69.0								
4.5				68.5								
5.0 =				68.0								
5.5	5.40	Core barrell used - no recovery - highly weathered GRANITE.	+ + +	67.5	67.5	51						
6.0			+ + +	67.0								
6.5			+ + +	66.5								
7.0			+++	66.0								
3			+ + +	65.5								
7.5			+ + +	· =								
8.0		Soft light grey fine to coarse grained GRANITE. Highly weathered.	+ + +	65.0	64.9	91						
8.5		weathered.	+ + +	64.5								
9.0			+ + +	64.0		8.00 - 10.00		25	25	19		
9.5			+ + +	63.5								
0.0	10.00	\$trong to very strong light grey fine to coarse grained	+ + +	63.0	62.9	91						
0.5		GRANITE. Fresh to slightly weathered. Discontinuities - rough, planar, tight to open, sub-horizontal to 45°, occasional	+ + +	62.5							10	
1.0		sub-vertical dip, clean.	+ + +	62.0		10.00 - 11.50		87	67	31		
1.5			+ + +	61.5							7	
2.0			+ + +	61.0							10	
2.5			+ + +	60.5		11.50 - 13.00		83	83	48		
∃	10.00		+ + +	60.0		24					2	
3	13.00	End of Corehole at 13.00m		59.5	59.9	71						
3.5												
4.0				59.0								
4.5				58.5								
_ = =				58.0 —								
			Remar			horobolo massis as	h., ac :-:	nla**	4			
(1	From: 10: Pipe Type: From: 10: Type: (0.00 13.00 Bentonite	Jable	percus	SIV	e borehole previous	y com	ipiete	u.			

	ract N 752	o:			F	Rota	ary Cor	ehc	ole	L	O	g					ehole C03	
Contra	act:	Bren	nanstov	vn Road				Eastii	ng:		72	2584.313	Date	e Star	ted:	03/10/2	2020	
Locati	ion:	Cabi	nteely, [Oublin 18				North	ing:		72	4223.868	Date	e nplete	d:	03/10/2	2020	
Client	:	Cairr	n Home:	s PLC				Eleva	ition:		73.	.63	Drill	ed By	:	MEDL		
Engin	eer:	Wate	erman M	loylan				Rig T	уре:		So	ndeq	Stat	us:		FINAL		
Depth				Stratum	Descript	ion		Legend		vel OD)		Samples		TCR/%		Indices	FI/m	Backfill
Ξ		Cable pe	ercussive	borehole cor	mpleted -	- see C	P log.		73.5	De	pui			TCR/%	SCR	/6 KQD//6	FI/III	
0.5									73.0									
1.5	1.30	Open ho	le drilling	g - driller repo	rts returr	ns of gr	avelly sand with	+++	72.5	72.	.33							
2.0		cobbles a	and boul	ders - highly	weathere	ed gran	ite.	+++	72.0 — - - 71.5 —									
2.5								+++	71.0									
3.0	3.20							+++	70.5	70.	43							
3.5		GRANITI	E. Fresh	ong light grey to slightly we	eathered.		grained al to 60°, occasional	+ + +	70.0	10.	.10						15	
4.0		sub-vertic	cal dip, clea	an with occasional	brown stail	ning.	i to oo , occasional	+++	69.5			3.20 - 4.70		91	80	64		
4.5								+ + +	69.0								3	
5.0								+++	68.5			4.70 0.00						
5.5								+ + +	68.0			4.70 - 6.20		77	77	77		
6.0	6.20			End of Core	ehole at 6.	20m		++-	67.5	67.	.43							
7.0									67.0									
7.5									66.5									
8.0									66.0									
8.5									65.5 —									
9.0									64.5									
9.5									64.0									
10.0									63.5									
10.5									63.0									
11.0									62.5									
11.5									62.0									
12.0									61.5									
12.5									61.0									
13.0									60.5									
14.0									60.0									
14.5									59.5									
									59.0 —									
			Instal	lation:		Ba	ıckfill:	_l Remar	ks:									
	(2)	From		Pipe Type:	From:	To:	Type:			ssiv	e b	orehole previous	у со	mplete	ed.			
6)			0.00	6.20	Bentonite											

	ract N 752	Rotary Core	eho	ole	L	og					ehole C06	
Contr	act:	Brennanstown Road	Easti	ng:		722519.998	Date	e Start	ed:	18/11/2	2020	
Locat	ion:	Cabinteely, Dublin 18	North	ning:		724205.129	Date	e npleted	d:	18/11/2	2020	
Client	t:	Cairn Homes PLC	Eleva	ation:		71.56		ed By:		MEDL		
Engin	eer:	Waterman Moylan	Rig T	ype:	;	Sondeq	Stat	us:		FINAL		
Deptl	h (m)	Stratum Description	Legend	Le ^r		Samples			Rock	Indices		Backf
Scale	Depth	Cable percussive borehole completed - see CP log.		Scale		oth		TCR/%	SCR/9	% RQD/%	FI/m	20011
0.5				71.0								
1.0	0.80	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.	+++	70.5	70.7	76						
1.5		cobbies and bodiders - nigrify weathered granite.	+ + +	70.0								
2.0			+ + +	69.5								
2.5			+ + +	69.0								
3.0	3.00	\$trong to very strong light grey fine to coarse grained	+ + + + + +	68.5	68.5	56						
3.5		GRANITE. Fresh to slightly weathered. Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional	+ + +	68.0							14	
4.0		sub-vertical dip, clean with occasional brown staining.	+ + +	67.5		3.00 - 4.50		96	84	68	2	
4.5			+ + + + + + + + +	67.0								
5.0			+ + +	66.5							10	
5.5			+ + +	66.0		4.50 - 6.00		83	67	0	6	
6.0	6.00	End of Corehole at 6.00m	+ + +	65.5	65.5	56					15	
6.5		2.10 0. 00.00.00 0. 00.00.00		65.0								
7.0				64.5								
7.5				64.0								
8.0				63.5								
8.5				63.0								
9.0				62.5								
9.5				62.0								
10.0				61.5								
10.5				61.0								
11.0				60.5								
11.5				60.0								
12.0				59.5								
12.5				59.0								
3.0				58.5								
13.5				58.0								
14.0				57.5								
14.5				57.0								
			Remar			horobala massis and	lv. ==	mplet-				
		From: To: Pipe Type: From: To: Type: (0.00 6.00 Bentonite	Jable	percus	SIV	e borehole previous	iy coi	npiete	a.			

	ract N 752	Rotary Cor	ehc	ole	L	og					ehole C08	
Contra	act:	Brennanstown Road	Easti	ng:		722476.799	Date	e Start	ed:	20/11/2	020	
Locati	ion:	Cabinteely, Dublin 18	North	ing:		724330.299	Date	e npleted	d:	20/11/2	020	
Client	:	Cairn Homes PLC	Eleva	tion:		78.75		ed By:		MEDL		
Engin	eer:	Waterman Moylan	Rig T	ype:	,	Sondeq	Stat	ius:		FINAL		
Depth		Stratum Description	Legend	(m	vel OD)	Samples	,	L		Indices		Backfill
Scale	Depth	Cable percussive borehole completed - see CP log.		Scale 78.5	Dep	oth		TCR/%	SCR/	% RQD/%	FI/m	
0.5				78.0								
1.0	1.10	Open hole drilling - driller reports returns of brown sandy	-0-0	77.5	77.6	65						
1.5		gravelly silty clay with cobbles and boulders.		77.0								
2.0				76.5								
2.5			0,20	76.0								
3.0	3.40		*.0×.0	75.5	75.3	35						
3.5	0.10	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered.	+ + +	75.0								
4.0		Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.	+ + +	74.5		3.40 - 4.90		91	79	79	2	
4.5			+ + +	74.0							Ni	
5.0			+ + +	73.5								
5.5			+ + +	73.0		4.90 - 6.40		100	36	36	6	
6.0	6.40		+ + +	72.5	72.3	35						
6.5	00	End of Corehole at 6.40m		72.0								
7.0				71.5								
7.5				71.0								
8.0				70.5								
8.5				70.0								
9.0				69.5								
9.5				69.0								
10.0				68.5								
10.5				68.0								
11.0				67.5								
11.5				67.0								
12.0				66.5								
12.5				66.0								
13.0				65.5								
13.5				65.0								
14.0				64.5								
14.5				64.0								
				_								
		From: To: Pipe Type: From: To: Type:	Remar Cable _I		ssive	e borehole previousl	ly co	 mplete	ed.			
(0.00 6.40 Bentonite	·			•	-					

Contract N 5752	Rotary Cor	eho	ole	L	og					rehole	
Contract:	Brennanstown Road	Easti	ng:		722657.744	Date	e Start	ted:	02/11/2	2020	
_ocation:	Cabinteely, Dublin 18	North	ning:		724304.402	Date	e nplete	q.	02/11/2	2020	
Client:	Cairn Homes PLC	Eleva	ation:	1	73.23		ed By		MEDL		
Engineer:	Waterman Moylan	Rig T	ype:		Sondeq	Stat	us:		FINAL		
Depth (m)	Stratum Description	Legend		vel OD)	Campleo			Rock	Indices	<u> </u>	Backfi
Scale Depth	Cable percussive borehole completed - see CP log.	Legend	Scale		Samples		TCR/%	SCR/	% RQD/%	FI/m	Dackii
0.5	Cable percussive burefille completed - see of flog.		73.0								
1.0			72.0								
1.5			71.5								
2.0			71.0								
2.5			70.5								
3.0			70.0								
3.5			69.5								
4.0			69.0								
4.5 - 5.0 -			68.5								
5.5			68.0								
7 - 00	Core barrell used - no recovery - highly weathered GRANITE.	+++	67.5	67.4	13						
6.5		+++	67.0								
7.0		+++	66.5								
7.5 7.50	Soft light grey fine to coarse grained GRANITE. Highly	+ + +	66.0	65.7	73						
8.0 =	weathered.	+++	65.5								
8.5		+++	65.0								
9.0		+++	64.5		7.50 - 10.00		60	23	16		
9.5		++++	64.0								
0.0 = 10.10	\$trong to very strong light grey fine to coarse grained	+++	63.0	63.1	13						
0.5	GRANITE. Fresh to slightly weathered. Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional	+ + +	62.5		10.00 - 11.50		100	70	36	12	
1.0	sub-vertical dip, clean with occasional grey staining.	+ + +	62.0							4	
1.5		+++	61.5								
2.0 —		+ + +	61.0		11.50 - 13.00		100	67	37	5	
2.5		***	60.5								
3.0 = 13.00	End of Corehole at 13.00m	***	60.0	60.2	23						
3.5			59.5								
4.5			59.0								
7.0			58.5								
	Installation: Backfill:	 Remar	ks:								
				ssive	e borehole previousl	ly co	mplete	ed.			
	/										

Contract N 5752	Rotary Cor	ehole l	_og		Coreho	
Contract:	Brennanstown Road	Easting:	722490.491	Date Started:	23/11/202	0
Location:	Cabinteely, Dublin 18	Northing:	724255.097	Date Completed:	23/11/2020	0
Client:	Cairn Homes PLC	Elevation:	74.26	Drilled By:	MEDL	
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL	
Depth (m)	Stratum Description	Legend (mO	D) Samples		k Indices	Backfi
Scale Depth	Cable percussive borehole completed - see CP log.	Scale [Depth	TCR/% SCR	1/% RQD/% FI/	m .
0.5 — 1.0 — 1.5 — 1.90 2.5 — 3.00 3.5 — 4.0 — 5.5 — 6.0 — 6.00 6.5 — 7.0 — 7.5 — 8.0 — 8.5	Open hole drilling - driller reports returns of brown sandy gravelly silty clay with cobbles and boulders. Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining. End of Corehole at 6.00m	72.0	71.26 3.00 - 4.50 4.50 - 6.00		4	
9.0 — 9.5 — 10.0 — 11.5 — 11.5 — 12.0 — 13.5 — 14.0 — 14.5	Installation: Backfill:	65.5	sive borehole previou	usly completed.		

	ract N 752	Rotary Core	eho	ole	L	og					ehole C16	
Contr	act:	Brennanstown Road	Easti	ng:		722635.535	Date	Start	ed:	03/10/2	2020	
Locat	ion:	Cabinteely, Dublin 18	North	ning:		724206.358	Date	plete	d:	03/10/2	2020	
Clien	t:	Cairn Homes PLC	Eleva	ation:		71.67		ed By:		MEDL		
Engir	neer:	Waterman Moylan	Rig T	уре:	,	Sondeq	Statu	ıs:		FINAL		
Dept	h (m)	Stratum Description	Legend		vel OD)	Samples			Rock	c Indices		Backfi
Scale	Depth	Cable percussive borehole completed - see CP log.		Scale		oth		TCR/%	SCR/	% RQD/%	FI/m	
0.5	0.70			71.0	70.	27						
1.0	0.70	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.	+ + +] =	70.9	37						
1.5		3,	+ + +	70.5								
2.0 —			+ + +	70.0								
Ξ			+++	69.5								
2.5			+++	69.0								
3.0			+ + +	68.5								
3.5			+ + +	68.0								
4.0			+ + +	67.5								
4.5			+ + +] [
5.0 —			+ + +	67.0								
5.5 -			+ + +	66.5								
Ξ			+ + +	66.0								
6.0			+++	65.5								
6.5			+ + +	65.0								
7.0	7.20		+ + +	64.5	64.4	17						
7.5	1	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered.	+ + +	64.0							11	
8.0		Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.	+ + +	1 =		7.20 - 8.70		93	72	13	"	
8.5			+++	63.5								
9.0 —			+ + +	63.0							6	
Ξ			+ + +	62.5		8.70 - 10.20		87	64	48		
9.5			+ + +	62.0		0.70 - 10.20		01	04	40	Ni	
10.0	10.20	End of Corehole at 10.20m	+ + +	61.5	61.4	17					3	
0.5				61.0								
11.0				60.5								
11.5				60.0								
2.0												
12.5				59.5								
3.0				59.0								
Ξ				58.5								
3.5				58.0								
14.0				57.5								
14.5				57.0								
		From: To: Pipe Type: From: To: Type: (Remai Cable		ssive	e borehole previous	sly con	nplete	ed.			
		From: To: Pipe Type: From: To: Type: (0.00 10.20 Bentonite	Cable	percus	ssive	e borehole previous	sly con	nplete	ed.			

	ract N 752	Rotary Corehole Log										No:
Contra	act:	Brennanstown Road	Easti	ng:	-	722583.353	Date	Start	ed:	17/11/2	020	
Locati	ion:	Cabinteely, Dublin 18	North	ning:	-	724180.572	Date	e npleted	d:	17/11/2	020	
Client	t:	Cairn Homes PLC	Eleva	ation:	-	70.58		ed By:		MEDL		
Engin	eer:	Waterman Moylan	Rig T	ype:	,	Sondeq	Stati	us:		FINAL		
Depth	h (m)	Stratum Description	Legeno		vel OD)	Samples			Rock	Indices		Backf
Scale	Depth	Cable percussive borehole completed - see CP log.		Scale		oth		TCR/%	SCR/9	% RQD/%	FI/m	
0.5				70.0								
1.0	1.10	Open hole drilling - driller reports returns of gravelly sand with	+++	69.5	69.4	18						
1.5		cobbles and boulders - highly weathered granite.	+ + +	1 =								
2.0	2.00	\$trong to very strong light grey fine to coarse grained	+ + +	68.5	68.5	58						
2.5		GRANITE. Fresh to slightly weathered. Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.	+ + +	68.0		2.00 - 3.50		83	72	0	5	
3.0		Sub-vertical dip, clean was occasional brown stanling.	+ + +	67.5		2.00 - 3.30		03	12		10	
3.5			+ + +	67.0								
4.0			+ + +	66.5		3.50 - 5.00		95	95	87	5	
4.5			+ + +	66.0		3.30 - 3.00		33	33	07		
5.0	5.00	End of Corehole at 5.00m	++	65.5	65.5	58						
5.5				65.0								
6.0				64.5								
6.5				64.0								
7.0				63.5								
7.5				63.0								
8.0				62.5								
8.5				62.0								
9.0				61.5								
9.5				61.0								
0.0				60.5								
0.5				60.0								
11.0				59.5								
11.5				59.0								
12.0				58.5								
2.5				58.0								
3.0				57.5								
3.5				57.0								
14.0				56.5								
14.5				56.0								
		Installation: Backfill:	Remar	-ke:								
	17	From: To: Pipe Type: From: To: Type:			ssive	e borehole previous	y cor	nplete	d.			
		0.00 5.00 Bentonite										

	ract N 752	Rotary Core	eho	ole	L	og					rehole	
Contr	act:	Brennanstown Road	Easti	ng:		722514.910	Date	Start	ed:	17/11/2	2020	
Locat	ion:	Cabinteely, Dublin 18	North	ning:	-	724181.761	Date		d:	17/11/2	2020	
Client	t:	Cairn Homes PLC	Eleva	ation:	(69.95	Drille			MEDL		
Engin	eer:	Waterman Moylan	Rig T	ype:		Sondeq	Statu	s:		FINAL		
Dept	h (m)	Stratum Description	Legeno		vel OD)	Samples			Rock	Indices	5	Backfi
Scale	Depth	Cable percussive borehole completed - see CP log.		Scale		oth	Т	CR/%	SCR/	% RQD/%	FI/m	2001111
0.5				69.5								
1.0				69.0								
1.5	1.30	Open hole drilling - driller reports returns of gravelly sand with	+ + +	68.5	68.6	65						
2.0 —		cobbles and boulders - highly weathered granite.	+ + +	68.0								
2.5			+ + + + + + + + +	67.5								
Ξ	2.90		+ + + + + +] .]	67.0	05						
3.0		Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered.	+ + +	<u> </u>							20	
3.5		Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.	+ + + + + + + + +] _		2.90 - 4.40		100	93	21		
4.0			+ + +	66.0							3 17	
4.5			+ + +	65.5								
5.0			+ + +	65.0		4.40 - 6.00		36	36	10	VOID	
5.5			+ + + + + +	64.5		1.10 0.00			00		12	
6.0			+ + +	64.0							12	
6.5			+ + +	63.5		6.00 - 7.00		0	0	0	VOID	
7.0	7.00		+ + +	63.0	62.9	95						
7.5		End of Corehole at 7.00m		62.5								
8.0				62.0								
=				61.5								
8.5												
9.0				61.0								
9.5				60.5								
10.0				60.0								
10.5				59.5								
11.0				59.0								
11.5				58.5								
12.0				58.0								
12.5				57.5								
13.0 —				57.0								
13.5				56.5								
14.0 —				56.0								
14.5				55.5								
5												
		Installation: Backfill: F	20===	·ko:								
(From: To: Pipe Type: From: To: Type: (Remai Cable Core b	percus	ssive	e borehole previous ming in hole on pos	ly com	plete edge	ed. of be	edrock.		

Contract N 5752	Rotary Core	ehc	ole	L	og					ehole C20	
Contract:	Brennanstown Road	Eastii	ng:		722519.395	Date	e Start	ted:	19/11/2	2020	
Location:	Cabinteely, Dublin 18	North	ing:		724096.139	Date	e nplete	d:	19/11/2	2020	
Client:	Cairn Homes PLC	Eleva	tion:		63.81	Drill	led By:	:	MEDL		
Engineer:	Waterman Moylan	Rig T	ype:		Sondeq	Stat	ius:		FINAL		
Depth (m) Scale Depth	Stratum Description	Legend		vel OD) Der	Samples				Indices	FI/m	Backfill
	Cable percussive borehole completed - see CP log.		63.5	Dop	741		101070	0010	70 1100770		
0.5 = 0.80	Open hole drilling - driller reports returns of gravel and fill.		63.0	63.0	01						
1.0 —	3 • • • • • • • • • • • • • • • • • • •		62.5								
2.0			62.0								
2.5			61.5								
3.0 = 3.00	Open hole drilling - driller reports returns of gravelly sand with	F + + ·	61.0	60.8	31						
3.5	cobbles and boulders - highly weathered granite.	+ + +	60.5								
4.0		+ + +	60.0								
4.5		+ + +	59.5								
5.0		+ + +	59.0 — 58.5 —								
5.5		+ + +	58.0								
6.0		+ + +	57.5								
6.5		+ + +	57.0								
7.0		+ + +	56.5								
7.5 7.50	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered.	+ + +	56.0	56.3	31						
8.5	Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.	+ + +	55.5		7.50 - 9.00		100	100	100	4	
9.0		+ + +	55.0								
9.5		+ + +	54.5							<u> </u>	
10.0		+ + +	54.0		9.00 - 10.50		91	42	39	13	
10.50	End of Corehole at 10.50m	+++	53.5	53.3	31						
11.0			53.0								
11.5			52.5 —								
12.0 —			51.5								
12.5			51.0								
13.0			50.5								
13.5			50.0								
14.5			49.5								
-			49.0								
	Installation: Backfill:	 Remar	ks:								
(\$				ssive	e borehole previousl	у сог	mplete	 ∍d.			

	ract N 752	Rotary Core	eho	ole	L	og					ehole C23	
Contr	act:	Brennanstown Road	Easti	ng:		722579.882	Date	Start	ted:	19/11/2	2020	
Locat	ion:	Cabinteely, Dublin 18	North	ning:		724124.231	Date	e plete	d:	19/11/2	2020	
Client	t:	Cairn Homes PLC	Eleva	ation:	(66.57	Drille	ed By	:	MEDL		
Engin	eer:	Waterman Moylan	Rig T	уре:	,	Sondeq	Stati	us:		FINAL		
Deptl	h (m)	Stratum Description	Legend	(m	vel OD)	Samples			Rock	Indices		Backfi
Scale		Cable percussive borehole completed - see CP log.		Scale	Dep	oth		TCR/%	SCR/	% RQD/%	FI/m	
1.0	0.40	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.	+ + + + + + + + + + + + + + + + + +	65.5	66.1	17						
2.5	3.00	Strong to very strong light grey fine to coarse grained	+ + + + + + + + + + + + + + +	64.5	63.5	57					15	-
3.5		GRANITE. Fresh to Slightly weathered. Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.	+ + + + + + + + + + + + + + +	1 3		3.00 - 4.50		93	81	61	5 Ni	
5.0 -			+ + + + + + + + + + + + + + +	61.5		4.50 - 6.00		90	79	57	8	
6.0	6.00	End of Corehole at 6.00m		60.0	60.5	57						
7.0				59.5								
7.5				59.0								
9.0				58.0								
9.5 =				57.0								
10.5				56.0								
11.5				55.0								
12.0 - 12.5 -				54.5								
13.0				54.0								
13.5				53.0								
14.0				52.5								
=												
			Remai Cable		ssive	e borehole previousl	ly cor	nplete	ed.			

	ract N 752	Rotary Core	eho	ole	L	og					ehole C25	
Contr	act:	Brennanstown Road	Easti	ng:		722611.665	Date :	Starte	ed:	18/11/2	2020	
Locat	ion:	Cabinteely, Dublin 18	North	ning:		724127.402	Date Comp	letec	ı:	18/11/2	2020	
Client	t:	Cairn Homes PLC	Eleva	ation:		67.33	Drilled			MEDL		
Engin	eer:	Waterman Moylan	Rig T	ype:		Sondeq	Status	s:		FINAL		
Dept	h (m)	Stratum Description	Legeno		vel OD)	Samples		ı	Rock	Indices		Backfil
Scale	Depth	Cable percussive borehole completed - see CP log.		Scale	Dep	oth .	T	CR/%	SCR/9	% RQD/%	FI/m	
0.5				67.0								
1.0	0.90	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.	+ + + + + +	66.5	66.4	43						
1.5		cobbles and boulders - nignily weathered granite.	+ + +	66.0								
2.0			+ + +	65.5								
2.5			+ + +	65.0								
3.0	3.20	Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.	+++	64.5	64.	13						
3.5		Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered.	+ + +							-	13 5	
4.0		Grant E. Frosin e orgina y modulored.	+++	63.5		3.20 - 4.70		84	30	25	12	
4.5			+ + +	63.0								
5.0			+ + +	62.5							7	
5.5			+ + + + + + + + +	62.0		4.70 - 6.20		100	79	55	10	
6.0	6.20		+ + +	61.5	61.1	13					10	
6.5	0.20	End of Corehole at 6.20m		61.0	01.							
7.0				60.5								
7.5				60.0								
8.0				59.5								
8.5 —				59.0								
9.0 —				58.5								
9.5				58.0								
0.0				57.5								
10.5				57.0								
I1.0 —				56.5								
11.5				56.0								
12.0 —				55.5								
12.5				55.0								
13.0				54.5								
13.5				54.0								
4.0				53.5								
14.0 —				53.0								
				52.5								
		Installation: Backfill:	Remai	·ke·								
					ssive	e borehole previousl	y com	plete	d.			

RC02S Box 1 of 2



RC02S Box 2 of 2



RC03S Box 1 of 1



RC06S Box 1 of 1



RC08S Box 1 of 1



RC10S Box 1 of 2



RC10S Box 2 of 2



RC11S Box 1 of 1



RC16S Box 1 of 1



RC17S Box 1 of 1



RC18S Box 1 of 1



RC23S Box 1 of 1



RC25S Box 1 of 1



Appendix 3 Trial Pit Logs and Photographs

Contract No 5752	D:	-	Trial Pit L	og						Trial P	
Contract:	Brennanstown Roa	ad	Easti	ng:	722498	3.422		Date:		02/09/2020)
Location:	Cabinteely, Dublin	18	North	ing:	724337	7.977		Excavato	r:	JCB 3CX	
Client:	Cairn Homes PLC		Eleva	ition:	78.89			Logged B	y:	M. Kaliski	
Engineer:	Waterman Moylan			nsions xD) (m):	3.80 x	0.70 x	1.40	Status:		FINAL	
Level (mbgl)	Stratum Descripti	1.		Legend	Level	(mOD) Samp	les /	Field Tests	Water
Scale: Depth	TOPSOIL	- Cuatam Becompa				Scale:	Depth	: Depth	Ту	pe Result	Strike
- 0.10 - 0.5 0.70 - 0.90	Firm brown slightly s content. Sand is fine subangular of granite Firm brown slightly s boulder content. San angular to subangular	ack grey brown sandy some plastic fragmen andy slightly gravelly to coarse. Gravel is f e. Cobbles are angula andy gravelly silty CL and is fine to coarse. G ar of granite. Cobbles nite (up to 400mm dia	silty CLAY with low fine to coarse, angular for to subangular of g AY with high cobble ravel is fine to coars and boulders are ar	cobble ar to ranite.		78.5 — 78.0 — -	78.79	0.50	E:		
- - 1.40 1.5 - - -		Pit terminated at 1.40)m			77.5	77.49	3			
2.0 — — — — — — — — — — — — — — — — — — —						- - - 76.5 — - -					
	Termination: Obstruction - possible boulders or bedrock.	Pit Wall Stability: Pit walls stable.	Groundwater Rate	: Remar	·ks:	76.0 — 	-		Sma Un=	c disturbed all disturbed disturbed CB ronmental	R

	act No: 5752		•	Trial Pit	Log							Pit No: 02S
Contr	act:	Brennanstown Roa	d	E	asting:	72245	7.205		Date:		02/09/202	0
Locat	tion:	Cabinteely, Dublin	18	N	lorthing:	72429	7.219		Excavato	r:	JCB 3CX	
Clien	t:	Cairn Homes PLC		E	levation:	77.82			Logged E	By:	M. Kaliski	
Engir	neer:	Waterman Moylan			Dimensions _xWxD) (m)	. 4.40 x	0.70 x	1.50	Status:		FINAL	
Leve	l (mbgl)		Stratum Descripti	1.		Legend	Level (mOD) Samp	oles /	Field Tests	
Scale:	Depth	TOPSOIL	Otratum Descripti			Legend	Scale:	Depth	n: Depth	Тур	pe Resu	lt Strike
	1.10	MADE GROUND: brocobble and low bould concrete fragments. MADE GROUND: groboulder content and store content and store content. Sand is fine subangular of grantee subangular to subangular to subangular to subangular of grantee content. Sand is fire subangular to subangular to subangular to subangular of grantee content. Sand is fire subangular to subangular of grantee content. Sand is fire subangular to subangular of grantee content.	andy gravelly silty CL to coarse. Gravel is fee. Cobbles are angula andy gravelly silty CL d is fine to coarse. Gar of granite. Cobbles	AY with low cobine to coarse, a rate to subangular. AY with high coravel is fine to cand boulders and meter).	bble ngular to of granite. bble and oarse,		77.5 —	77.62 77.52 76.72 76.32	1.00	В	MK22	2
2.5 -							75.0 —					
		Termination:	Pit Wall Stability:	Groundwater F	Rate: Rema	arks:			Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry	TAGING				B = D = CBR	Bulk Sma	disturbed all disturbed disturbed Clonmental	

	act No: 752		٦	rial Pit Lo	og							Trial Pit I	
Contr	act:	Brennanstown Road	d	Eastin	g: 7	722495	5.741		Date:		01/	/09/2020	
Locat	ion:	Cabinteely, Dublin 1	18	Northi	ng: 7	724275	5.695		Excavato	r:	JCI	в зсх	
Client	t:	Cairn Homes PLC		Elevat	ion: 7	77.07			Logged E	Зу:	M.	Kaliski	
Engin	neer:	Waterman Moylan		Dimer	sions (D) (m):	3.60 x	0.70 x	1.50	Status:		FIN	NAL	
	(mbgl)		Stratum Descripti	•		egend.	Level			oles /	Fie	ld Tests	Water
Scale:	Depth	TOPSOIL					Scale:	Depth	n: Depth	Ту	ре	Result	Strike
0.5 —	0.20	MADE GROUND: browith medium cobble a	own slightly silty sligh and some concrete fr	tly sandy gravelly sil agments.	ty clay		77.0 —	76.87	1.00	E	3	MK24	
1.5 — — — — — — — — — — — — — — — — — — —	1.50		Pit terminated at 1.50	m			75.5	75.57	7				
2.5 —		Termination:	Pit Wall Stability:	Groundwater Rate:	Remark	e.	74.5 - - - -		Key:				
		Obstruction -	Pit walls stable.	Dry	remark				B =		(dis	turbed	
6		possible boulders or bedrock.	THE WAILS STADIC.	Jiy					D = CBR	Sma = Una	all di distu	isturbed urbed CBR nental	

	act No: 752		-	Trial Pit Lo	og						Trial Pit	
Contr	act:	Brennanstown Roa	d	Eastin	g:	722473	3.013		Date:		02/09/2020	
Locat	ion:	Cabinteely, Dublin	18	Northi	ng:	724256	5.820		Excavato	r:	JCB 3CX	
Clien	t:	Cairn Homes PLC		Elevat	ion:	74.96			Logged E	By:	M. Kaliski	
Engir	neer:	Waterman Moylan		Dimer	sions D) (m):	4.60 x	0.70 x	0.90	Status:		FINAL	
Level	(mbgl)		Stratum Descripti	•		Legend	Level	(mOD) Samp	oles /	Field Tests	Water
Scale:	Depth	TOPSOIL	Stratum Descripti			zegenu	Scale:	Depth	: Depth	Тур	e Result	Strike
	0.20	Soft becoming firm b medium cobble and I Gravel is fine to coar and boulders are and diameter).	rown slightly sandy g low boulder content. Se, angular to subang gular to subangular of dy gravelly angular C Pit terminated at 0.90	Sand is fine to coarse gular of granite. Cobb granite (up to 400m) OBBLES and BOULI	e. olles m		74.5 —	74.76 74.16 74.06		В	MK23	
2.5		Termination:	Pit Wall Stability:	Groundwater Rate:	Rema	rks:	72.5 —		Key:			
	§)	Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry						Sma = Und	disturbed all disturbed disturbed CBF onmental	₹

Contract No 5752): 	٦	rial Pi	t Log						Trial Pit	
Contract:	Brennanstown Road	d		Easting:	72251	8.233		Date:	0	1/09/2020	
Location:	Cabinteely, Dublin 1	8		Northing:	72423	3.150		Excavator	r: J	CB 3CX	
Client:	Cairn Homes PLC			Elevation:	73.68			Logged B	y: N	/l. Kaliski	
Engineer:	Waterman Moylan			Dimensions (LxWxD) (n		x 0.70	¢ 1.80	Status:	F	INAL	
Level (mbg		Stratum Description	on		Legeno		(mOD			ield Tests	Water Strike
Scale: Depth	TOPSOIL					Scale:	Depth	: Depth	Туре	Result	Otrito
-						73.5 -					
0.20	Light brown silty sand with high cobble conto					70.0	73.48	3			
	angular to subangular	r of granite.			''''						
0.5 —					× ^						
_					'M' X 'M'						
_					* × * *	73.0 —					
_					* × * * * * * * * * * * * * * * * * * *						
-					* × * *						
1.0 —					**************************************			1.00	В	MK09	
1.10	Light brown silly sand				**************************************		72.58	3			
-	with high cobble and coarse. Cobbles and	boulders are angular			** * *** 0	72.5 -					
	(up to 600mm diameter	er).			**************************************						
-					** * *** 0						
1.5 —					**************************************						
					* × * * * * * * * * * * * * * * * * * *	72.0 —					
1.80		Pit terminated at 1.80			**************************************		71.88	3			
		Fit terminated at 1.60	···								
2.0 —											
_						71.5 -					
-											
-											
2.5 —											
						71.0 —					
						71.0					
	Termination:	Pit Wall Stability:	Groundwater	Rate: Rer	narks:			Key:			
	Obstruction -	Pit walls stable.	Dry					B =		listurbed disturbed	
	possible boulders or bedrock.								= Undis	sturbed CBR nmental	

Contract No: 5752		•	Trial Pit Lo	og						Trial Pit	
Contract:	Brennanstown Roa	d	Eastir	ng:	722505	5.171		Date:		01/09/2020	
Location:	Cabinteely, Dublin	18	North	ing:	724211	.221		Excavato	r:	JCB 3CX	
Client:	Cairn Homes PLC		Eleva	tion:	70.99			Logged E	By:	M. Kaliski	
Engineer:	Waterman Moylan			nsions (D) (m):	4.30 x	0.70 >	2.50	Status:		FINAL	
Level (mbgl)		Stratum Descript	1.		Legend	Level	(mOD) Samp	oles /	Field Tests	Water
Scale: Depth	TOPSOIL					Scale:	Depth	n: Depth	Ту	pe Result	Strike
0.5 0.80	Light brown slightly s granite. Sand is fine standard standard subtantial standard sub	ilty sandy fine to coa	rse, angular GRAVE	Lof		70.5 - 70.0 - 69.5 - 69.0	70.19		E	3 MK10	
2.5 - 2.50		Pit terminated at 2.5	0m	0		68.5 -	68.49	9			
	Termination: Obstruction - possible boulders or bedrock.	Pit Wall Stability: Pit walls stable.	Groundwater Rate:	Rema	rks:	- - - -		Key: B = D = CBR	Bull Sma	< disturbed all disturbed disturbed CBF ronmental	3

Contract No: 5752		٦	Γrial Pi	t Log	J						Trial Pit TP07	
Contract:	Brennanstown Road	j		Easting:	72	22531	.396		Date:	0	1/09/2020	
Location:	Cabinteely, Dublin 1	8		Northing:	72	24189	.511		Excavato	r: J	СВ 3СХ	
Client:	Cairn Homes PLC			Elevation:	70	0.90			Logged B	y: N	/l. Kaliski	
Engineer:	Waterman Moylan			Dimension (LxWxD) (3.90 x	0.70 x	1.70	Status:	F	INAL	
Level (mbgl)		Stratum Descripti	on		Leç	gend	Level				ield Tests	Water Strike
Scale: Depth	TOPSOIL						Scale:	Depth	Depth	Туре	Result	
0.20	Soft becoming firm lig medium cobble conte to coarse. Gravel is fii Cobbles are angular t	nt interbeded with cla ne to coarse, angula	ayey gravel. S r to subangula	and is fine			70.5 —	70.70	1.00	В	MK11	
1.10	Light brown grey sligh of granite with mediur to coarse. Cobbles an granite (up to 400mm	n cobble and low boo nd boulders are angu	ulder content.	Sand is fir			69.5 —	69.80		D	WIKTT	
1.70		Pit terminated at 1.70	im				69.0 —	69.20				
2.5 —							68.5 —					
	Termination:	Pit Wall Stability:	Groundwater	Rate: Re	emarks	s:			Key:			
	Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry							Small Undis	listurbed disturbed sturbed CBR nmental	

	act No: 752		•	Trial Pit Lo	g							nl Pit No: P08S
Contr	act:	Brennanstown Roa	ıd	Easting	g:	722511	1.270		Date:		01/09/2	020
Locat	ion:	Cabinteely, Dublin	18	Northir	ng:	724168	3.780		Excavato	r:	JCB 3C	X
Client	t:	Cairn Homes PLC		Elevati	on:	68.32			Logged E	By:	M. Kalis	ski
Engin	neer:	Waterman Moylan		Dimen		4.10 x	0.70 x	2.10	Status:		FINAL	
	(mbgl)		0	(LxWx			Level	(mOD) Samp	oles /	Field Te	sts Water
	Depth		Stratum Descript	ion		Legend	Scale:					sult Strike
1.5 —	0.50	with low cobble conte to subangular of grar Light grey brown silty granite with medium are angular to suban	ent. Sand is fine to conite. y sandy fine to coarse cobble content. Sand gular of granite.	gular GRAVEL of gran parse. Cobbles are an e, angular GRAVEL of d is fine to coarse. Co	bbles	Side S. Ale Side S	68.0 — 68.0 — 67.5 — 67.0 — - - - - - - - - - - - - -	68.12				
2.0 —		Light brown silty sand of granite.	dy gravelly angular C	COBBLES and BOULE	DERS		66.5 —	00.32				
- - -	2.10		Pit terminated at 2.10	0m		. <u>X o 3 * 4</u> 70 ° X x o 3 * 4 70 ° X x o 1 ° 4 % ¢ °	66.0 —	66.22	2			
2.5 —		Termination:	Pit Wall Stability:	Groundwater Rate:	Remar	rks:	- - - 65.5 —		Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	1.80 Seepage	Sindi				B = D = CBR	Bulk Sma	disturbe all disturb disturbed onmenta	ed CBR

	act No: 752		7	rial Pi	t Log						Trial Pit TP09	
Contra	act:	Brennanstown Road	i		Easting:	72254	7.432		Date:	0	2/09/2020	
Locati	on:	Cabinteely, Dublin 1	8		Northing:	72412	6.240		Excavato	r: J	СВ 3СХ	
Client:	:	Cairn Homes PLC			Elevation:	66.22			Logged B	y: N	/l. Kaliski	
Engine	eer:	Waterman Moylan			Dimensions (LxWxD) (m		0.70 x	2.60	Status:	F	INAL	
	(mbgl) Depth		Stratum Description	on		Legend	Level Scale:	(mOD		les / Fi	ield Tests Result	Water Strike
Scale.	1	MADE GROUND: gre	y silty sandy gravel.				Scale.			турс	resuit	
-		MADE GROUND: gre various lithologies with			oles of		- 66.0 — -	66.12	2			
0.5 —		Soft becoming firm broobble and low boulde				1 20 8 -	- 65.5 —	65.52	2			
1.0 —	f k	ine to coarse, angula poulders are angular that is a significant t	r to subangular of gra	anite. Cobbles	and		-		1.00	В	MK16	
-							65.0 —					
1.5 —	g	ight grey brown silty granite with medium c are angular to subang	cobble content. Sand				64.5 —	64.72				
2.0 —							- 64.0 —					
2.5 —							-					
-	2.60		Pit terminated at 2.60	m		Tike Andrews	63.5 -	63.62	2			
		Termination:	Pit Wall Stability:	Groundwater	Rate: Rem	arks:			Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry					B = D = CBR :	Small Undis=	disturbed disturbed sturbed CBR nmental	

	act No: 752		1	rial Pi	t Lo	g						Trial Pit I	
Contra	act:	Brennanstown Road	l		Easting:		722557	7.871		Date:	0	1/09/2020	
Locati	on:	Cabinteely, Dublin 1	8		Northing	:	724231	1.090		Excavator	: J	CB 3CX	
Client	:	Cairn Homes PLC			Elevation	n:	74.19			Logged B	y: N	Л. Kaliski	
Engine	eer:	Waterman Moylan			Dimension (LxWxD)		4.50 x	0.70 x	1.60	Status:	F	INAL	
	(mbgl)		Stratum Description	on			Legend	Level				ield Tests	Water Strike
Scale:	Depth	TOPSOIL						Scale:	Depth	: Depth	Туре	Result	Ou mo
0.5 —	0.90	Firm brown slightly sa nedium boulder conte togars, angular to subangular of granite.	is fine to coarse. Gra of granite. Cobbles and of gravelly silty CL, and some to copangular of granite. Copangular	AY with high coarse. Gravel cobbles and b	cobble an is fine to coulders a	ular আমান আমান আমান আমান আমান আমান আমান আমান	생산 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등	74.0 —	73.29		В	MK08	
1.5 —	1.60 -		Pit terminated at 1.60			शतस्य स्थातस्य स्यास्य स्थास		73.0 — - - -	72.59				
2.0 —								72.5 — - - -					
- - 2.5 —								72.0 — - -					
_ _ _ _								71.5 — - -					
		Termination:	Pit Wall Stability:	Groundwater	r Rate.	Remar	·ks·			Key:			
			Pit walls stable.	Dry	Nate.	Contal	N.S.			B = D = CBR =	Small Undis	disturbed disturbed sturbed CBR nmental	

	act No: 752		-	Trial Pit L	_og							rial Pit I	
Contr	act:	Brennanstown Roa	d	Eas	ting:	722590).516		Date:		01/09	/2020	
Locat	tion:	Cabinteely, Dublin	18	Nor	thing:	724120	0.860		Excavato	r:	JCB 3	BCX	
Clien	t:	Cairn Homes PLC		Elev	/ation:	66.56			Logged E	Ву:	M. Ka	ıliski	
Engir	neer:	Waterman Moylan			ensions	4.80 x	0.70 >	1.00	Status:		FINA	<u> </u>	
	l (mbgl)		Ctratum Deceriati	'	//xD) (m):		I	(mOD	<u> </u>	oles /	Field [*]	Tests	Water
Scale:	Depth	TOPSOIL	Stratum Descripti	ion		Legend		Depth		Ту	pe F	Result	Strike
	0.90	Light brown silty sand with high cobble and Cobbles and boulder 400mm diameter). Light brown silty sand of granite.	low boulder content.	Sand is fine to coangular of granite (arse. up to		66.0 — 65.5 — 65.0 — 64.5 — 64.0 —	65.66	3	E	3 N	ИК15	
		Termination:	Pit Wall Stability:	Groundwater Rat	e: Rema	rks.	-		Key:				
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry	.c. Ivellid	ii No.			B = D = CBR	Bull Sma	disturiall distudisturber	ırbed ed CBR	

Contract No: 5752		1	rial Pi	t Log						Trial Pit I	
Contract:	Brennanstown Road	d		Easting:	722557	7.099		Date:	0	1/09/2020	
Location:	Cabinteely, Dublin 1	8		Northing:	72416	5.230		Excavator	: Ј	CB 3CX	
Client:	Cairn Homes PLC			Elevation:	69.43			Logged B	y: N	/l. Kaliski	
Engineer:	Waterman Moylan			Dimensions (LxWxD) (m): 4.40 x	0.70 >	2.10	Status:	F	INAL	
Level (mbgl)		Stratum Description	on		Legend		(mOD			ield Tests	Water Strike
Scale: Depth	TOPSOIL					Scale:	Depth	: Depth	Туре	Result	Otrito
	Light brown silty sand					-	69.23	i			
	with medium cobble a Cobbles and boulders 400mm diameter).				a X a X a X	_	-				
0.5 —	,				**************************************	69.0 —	-				
_					a X	_	-				
					a× , a× , , , , , , , , , , , , , , , ,	-	-				
_					a × , a × 0 ×	68.5 -	_				
	Light grey brown silty granite with medium of	cobble and boulder co	ontent. Sand i	s fine to	4 X 4 X X X X X X X X X X X X X X X X X	-	68.43	1.00	В	MK12	
_	coarse. Cobbles and l (up to 500mm diamete	boulders are angular er).	to subangula	r of granite	**************************************	_					
					**************************************	-	_				
1.5 —					4 × 4 × 1 × 1 × 1 × 1 × 1 × 1 × 1 × 1 ×	68.0 —					
					**************************************	_	-				
					a X , a X) X	-					
					4 × 4 × 1 × 1 × 1 × 1 × 1 × 1 × 1 × 1 ×	67.5 –	-				
2.0 —					a X , a X 1 , o	-	67.33				
_		Pit terminated at 2.10	m			-	-				
_						-	-				
2.5 —						67.0 —					
						_					
						_					
						66.5 -	-				
(In	Termination:	Pit Wall Stability:	Groundwater	Rate: Rem	arks:			Key:			
	Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry						Small Undis	listurbed disturbed sturbed CBR nmental	

	act No: 752		7	Γrial Pit L	og							rial Pit I TP13	
Contr	act:	Brennanstown Roa	d	Easti	ng:	722600	0.711		Date:		01/09	/2020	
Locat	ion:	Cabinteely, Dublin	18	North	ing:	724248	3.482		Excavato	r:	JCB 3	BCX	
Client	t:	Cairn Homes PLC		Eleva	ition:	74.49			Logged E	Ву:	M. Ka	liski	
Engir	neer:	Waterman Moylan			nsions xD) (m):	4.00 x	1.00 >	1.00	Status:		FINAL	_	
Level	(mbgl)		Stratum Descripti	,		Legend	Level	(mOD) Samı	oles /	Field ⁻	Tests	Water
Scale:	Depth	TOPSOIL	Stratum Descripti	011		Legend	Scale:	Depth	n: Depth	Тур	pe F	Result	Strike
0.5 —	0.20	Soft becoming firm ligmedium cobble and light of the coar are angular to subantifirm brown slightly suboulder content. San	ght brown slightly san ow boulder content. See, angular of granite (up to andy gravelly silty CL d is fine to coarse. Gobbles and boulders amm diameter).	Sand is fine to coars Cobbles and bould A00mm diameter). AY with high cobble ravel is fine to coars are angular to subar	e. ders and e,		74.0 —	73.49	9	В	3 N	/IK03	
1.5 —							73.0 —						
2.0 —							72.5 -						
2.5 —							72.0 —						
		Termination:	Pit Wall Stability:	Groundwater Rate	: Rema	rks:			Key:				
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry						Sma = Una	disturl all distu disturbe onmen	rbed ed CBR	

Contract No: 5752		1	Trial Pit	Log						Trial Pit I	
Contract:	Brennanstown Road	l	I	Easting:	722612	2.554		Date:	C	1/09/2020	
Location:	Cabinteely, Dublin 1	8	ı	Northing:	724200	0.576		Excavator	r: J	ICB 3CX	
Client:	Cairn Homes PLC		ı	Elevation:	71.69			Logged B	y: N	Л. Kaliski	
Engineer:	Waterman Moylan			Dimensions (LxWxD) (m): 4.30 x	0.70 x	1.10	Status:	F	INAL	
Level (mbgl) Scale: Depth		Stratum Description	on		Legend	Level Scale:	(mOD		les / F	ield Tests	Water Strike
- 0.20	TOPSOIL Light grey brown silty granite with high cohe	sandy fine to coarse	, angular GRA	VEL of		71.5 -	71.49		Турс	, ixesuit	
	granite with high cobble and medium boulder concoarse. Cobbles and boulders are angular to sub- (up to 500mm diameter).					- - - 71.0 —					
1.0 —		Pit terminated at 1.10	m			70.5 -	70.59	1.00	В	MK07	
1.5 —						- - 70.0 —					
2.0 —						- - -					
2.5 —						69.5 -	-				
-						- 69.0 — -					
						_					
	Termination:	Pit Wall Stability:	Groundwater	Rate: Rem	arks:	1		Key:			
(\$)	Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry						Small Undi:	disturbed disturbed sturbed CBR nmental	

	act No: 752		-	Trial Pit	Log						Trial F		
Contr	act:	Brennanstown Roa	d	E	asting:	722629	9.097		Date:		01/09/202)	
Locat	ion:	Cabinteely, Dublin	18	N	orthing:	724140	0.710		Excavato	r:	JCB 3CX		
Clien	t:	Cairn Homes PLC		E	levation:	68.55			Logged E	By:	M. Kaliski		
Engir	neer:	Waterman Moylan			imensions xWxD) (m):	5.40 x	0.70 x	1.30	Status:		FINAL		
Level	(mbgl)		Olastana Bassisti	1,	, , , <u>,</u>	1	Level	(mOD			Field Tests	Wate	
	Depth		Stratum Descripti	ion		Legend	Scale:			Тур			
0.5	0.40	boulder content. Gra and boulders are and diameter). Light brown silty sand with high cobble and Cobbles and boulder 600mm diameter).	lly fine to coarse SAN vel is fine to coarse, a gular to subangular of dy fine to coarse, ang low boulder content. rs are angular to suba dy gravelly angular C Pit terminated at 1.30	angular of granite f granite (up to 3 gular GRAVEL of Sand is fine to cangular of granite OBBLES and BO	granite coarse.		68.5 — - - 68.0 — - 67.5 — -	68.35 68.15 67.35 67.25	1.00	В	MK14		
1.5 —							67.0 — - - - 66.5 — -						
2.5 —							 66.0 - -						
		Termination:	Pit Wall Stability:	Groundwater R	ate: Rema	rks:	1		Key:	1	1	1	
	()	Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry						Sma = Und	disturbed all disturbed disturbed CE onmental	BR	

	act No: 752		-	Trial Pit I	rial Pit Log								No:	
Contr	act:	Brennanstown Roa	ıd	Ea	sting:	722648	3.454		Date:		01/09	/2020		
Locat	ion:	Cabinteely, Dublin	18	No	rthing:	724169	9.350		Excavato	r:	JCB 3CX			
Client	t:	Cairn Homes PLC		Ele	vation:	68.95			Logged E	Ву:	M. Kaliski			
Engin	neer:	Waterman Moylan			nensions WxD) (m):	4.20 x	0.70 x	1.00	Status:		FINA	FINAL		
Level	(mbgl)		Stratum Descripti	Į,	(III).	Legend	Level	(mOD) Samp	oles /	/ Field Tests		Water	
Scale:	Depth	TORSOIL	Otratum Descripti				Scale: Depth		n: Depth	Ту	pe F	Result	Strike	
0.5 —	0.20	high cobble and boul and boulders are and diameter).	e to coarse, angular (lder content. Sand is gular to subangular of dy gravelly angular C	fine to coarse. Co f granite (up to 50 OBBLES and BO	bbles 0mm		68.5 —	68.75 68.15	5	E	3 1	ИК13		
1.5 —							67.5							
2.5 —							66.5 -							
		To wood of the state of	Dit Well Otal 19	Crown down to a D	40. D:	wl.o.			12					
		Termination: Obstruction - possible boulders or bedrock.	Pit Wall Stability: Pit walls stable.	Groundwater Ra	te: Rema	irks:			Key: B = D = CBR ES =	Bull Sma	k distur all distu disturbe ronmen	ırbed ed CBR		

Contract No: 5752		٦	rial Pi	t Log						Trial Pit TP17	
Contract:	Brennanstown Road	d		Easting:	722	2645.75)	Date:		01/09/2020	
Location:	Cabinteely, Dublin 1	8		Northing:	724	724211.221 I			or:	JCB 3CX	
Client:	Cairn Homes PLC	Cairn Homes PLC Elevation: 71.73		.73	73 Log		Зу:	M. Kaliski			
Engineer:	Waterman Moylan			Dimension: (LxWxD) (r		10 x 0.7	x 1.70	Status:		FINAL	
Level (mbgl)		Stratum Description	on		Lege	ena	el (mOE	·		Field Tests	Water Strike
0.10	MADE GROUND: tarm MADE GROUND: gre Soft to firm grey brow cobble and boulder co fine to coarse. Gravel and boulders are angi diameter). Light brown silty very GRAVEL of granite wi Sand is fine to coarse subangular of granite	macadam. by silty sandy gravel. In slightly sandy gravel ontent interbeded with is fine to coarse, and ular to subangular of sandy fine to coarse, ith high cobble and me cobbles and boulde	elly silty CLAY h clayey grave gular of granite granite (up to the sample of the granite (up to the sampular to su the sampular to su	el. Sand is e. Cobbles 500mm ubangular er content.		70.	71.6	3 1.00	В	MK06	Strike
2.0 —						69.	-				
13	Termination:	Pit Wall Stability:	Groundwater	Rate: Rer	narks:			Key:			
	Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry						Sma = Und	disturbed Il disturbed listurbed CBR onmental	

	act No: 752		•	Trial Pit	Log							Trial Pit	
Contr	act:	Brennanstown Roa	d	Ea	sting:	722675	5.078		Date:		01/09	9/2020	
Locat	ion:	Cabinteely, Dublin	18	No	orthing:	724286	5.117		Excavato	r:	JCB 3CX		
Client	t:	Cairn Homes PLC		El	evation:	71.16			Logged E	Зу:	M. Kaliski		
Engir	neer:	Waterman Moylan			mensions «WxD) (m):	3.90 x	0.70 >	3.00	Status:		FINAL		
Level	(mbgl)		Stratum Descript	1,		Legend	Level	(mOD) Samp	oles /	/ Field Tests		Water
Scale:	Depth -	TOPSOIL with cobbles and plastic fragments.					Scale:	Depth	n: Depth	Ту	rpe Result		Strike
0.5 —	0.10	MADE GROUND: da silty clay with mediur bricks fragments.		71.0 —	71.06	0.50	E	S	MK01				
1.0 —	1.20	cobble and frequent fine to coarse, angulate from fight grey brown cobble and boulder a coarse. Gravel is fine	n slightly sandy grave gravel laminas. Sand ar of granite. Cobbles n slightly sandy grave and frequent gravel la e to coarse, angular of to subangular of gra	I is fine to coarse, are angular to selly silty CLAY with aminas. Sand is fine of granite. Cobble	Gravel is ubangular n high ne to s and		- - 70.0 — - -	70.26 69.96	1.00	В	3	MK02	•
1.5 —							69.5						
2.5 —		Light brown silty san of granite.	dy gravelly angular C	COBBLES and BC	OULDERS		- - - 68.5 – -	68.76	3				
	3.00		Pit terminated at 3.0	0m		<u> </u>	_	68.16	3				
		Termination:	Pit Wall Stability:	Groundwater R	ate: Rema	rks:		1	Key:		1		1
		Scheduled depth	Pit walls stable.	1.20 Seepage						Sma = Un	k distu all dist disturb ronme	urbed ed CBR	l

	act No: 752	Trial Pit Log										Trial Pit No: TP19S		
Contr	act:	Brennanstown Roa	d	E	Easting:	722640	0.048		Date:		01/	09/2020		
Locat	ion:	Cabinteely, Dublin	18	ı	Northing:	724299	9.367		Excavato	r:	JCI	B 3CX		
Client	t:	Cairn Homes PLC		E	Elevation:	73.35			Logged E	By:	M. Kaliski			
Engin	neer:	Waterman Moylan Dimensions (LxWxD) (m)					0.70 x	1.20	Status:		FIN	FINAL		
Level	(mbgl)		Stratum Descript	1.	EXTEND) (III)	Legend	Level (mOD) Samples		Field Tests		Water	
Scale:	Depth	MADE GROUND: gre	·		e content.		Scale:	Depth	: Depth	Ту	ре	Result	Strike	
_	040	TOPSOIL		_	73.25	5								
0.5	0.20	Soft becoming firm light brown sandy slightly gravelly silty CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles are angular to subangular of granite.					73.0 — -	73.15	5					
		Firm light grey slightl and boulder content.	Sand is fine to coars	to coarse,		72.5 —	72.45	1.00	B	3	MK04			
_		angular to subangula to subangular of grar		ameter).	re angular		-	72.15					•	
_			Pit terminated at 1.2	um			_							
_							72.0 —							
1.5 —							_							
-							_							
_							71.5 —							
2.0 —							- - -							
							71.0 —							
2.5 —							_ _ _							
_							70.5 —							
	And the same of th	Termination:	Pit Wall Stability:	Groundwater I		arks:			Key:					
		Obstruction - possible boulders or bedrock.	Pit walls stable.	1.20 Seepage	Э				B = D = CBR ES =	Sma Un	all di distu	turbed sturbed irbed CBR iental		

	act No: 752	Trial Pit Log									Trial Pit No: TP20S		
Contra	act:	Brennanstown Road Easting:					722689	.220		Date:	C	01/09/2020	
Locati	ion:	Cabinteely, Dublin 1	8		Northing:		724318.952		Excavator:		JCB 3CX		
Client	Client: Cairn Homes PLC Elevation:			73.37 Lo		Logged By:		M. Kaliski					
Engin	eer:	Waterman Moylan			Dimension (LxWxD) (4.60 x	0.70 x	1.90	Status: FINAL		INAL	
Level Scale:	(mbgl) Depth		Stratum Description	on		L	_egend	Level Scale:	(mOD Depth	· .	les / F	ield Tests Result	Water Strike
0.5 — 1.0 — 1.5 —	0.20	FOPSOIL Soft brown slightly sail content. Sand is fine to subangular of granite. Firm light grey brown cobble content. Sand angular of granite. Comparished to a coarse. Cobbles and large to 400mm diameter to 400mm diameter.	slightly sandy gravell is fine to coarse. Grabbles are angular to ball sandy fine to coarse. Grabbles are angular to cobble and low boulders are angular er).	y silty CLAY vivel is fine to subangular of angular of to subangular of to subangular of to subangular	angular to ar of granit with low coarse, f granite.	te. Resident to the second sec		73.0 — 72.5 — 71.5 — 71.5 —	73.17 72.77 71.57 71.47	1.00	В	MK05	
2.0 —	1.30		Pit terminated at 1.90		· Rata: Re	pmar	ke:	71.0 —	71.47				
			Pit Wall Stability: Pit walls stable.	Groundwater Dry	r Kate: Re	emar	KS:			Key:	Bulk o	disturbed	
6		possible boulders or bedrock.		21,9						D = CBR :	Small Undi:	l disturbed sturbed CBR nmental	

	act No: 752			Trial Pit	Log							Pit No: 215
Contr	act:	Brennanstown Roa	d	I	Easting:	722627	722627.173 Date:				02/09/2020	
Location:		Cabinteely, Dublin	18	I	Northing:	72435	724355.530 Excavator:		r:	JCB 3CX		
Client	t:	Cairn Homes PLC Elevation: 76.60 Logge		Logged E	ged By: M. Kaliski		(i					
Engin	ieer:	Waterman Moylan			Dimensions (LxWxD) (n		0.70 >	2.80	Status:		FINAL	
Level	(mbgl)		Stratum Descript		(=	Legend	Level	(mOD			Field Tes	
Scale:	Depth 0.05	MADE GROUND: tai	·				Scale:			Тур	pe Res	ult Strike
0.5 — 1.0 — 1.5 —	0.30	Soft becoming firm y with high cobble and Gravel is fine to coar and boulders are and diameter).	ellow brown slightly s low boulder content. se, angular to suban	sandy gravelly s . Sand is fine to gular of granite.	coarse. Cobbles	스페스페스페스페스페스페스페스페스페스페스페스페스페스페스페스페스페스페스페	76.5 - 76.0 - 75.5 - 75.0 -	76.55		ES		
2.0 —		Firm yellow brown sl and medium boulder coarse, angular to su angular to subangula	content. Sand is fine bangular of granite.	e to coarse. Gra Cobbles and bo 00mm diameter)	vel is fine to oulders are		74.5 —	74.00		В	MK1	1 9
		Termination:	Pit Wall Stability:	Groundwater	Rate: Rer	narks:			Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	2.60 Medium					B = D = CBR	Bulk Sma	disturbed all disturbe disturbed (onmental	d

TP01S Sidewall



TP01S Spoil



TP02S Sidewall



TP02S Spoil



TP03S Sidewall



TP03S Spoil



TP04S Sidewall



TP04S Spoil



TP05S Sidewall



TP05S Spoil



TP06S Sidewall



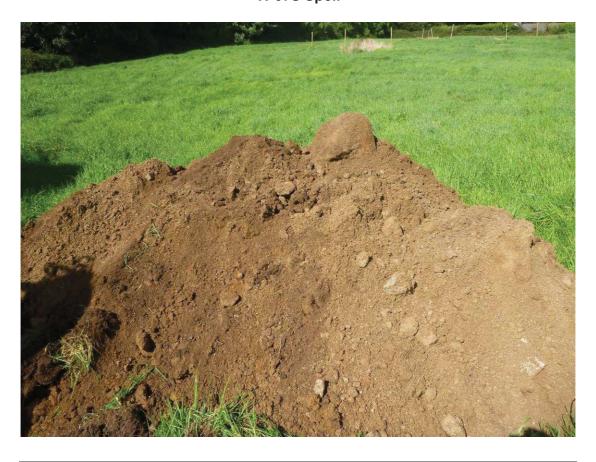
TP06S Spoil



TP07S Sidewall



TP07S Spoil



TP08S Sidewall



TP08S Spoil



P09S Sidewall



TP09S Spoil



TP010S Sidewall



TP10S Spoil



TP11S Sidewall



TP11S Spoil



TP12S Sidewall



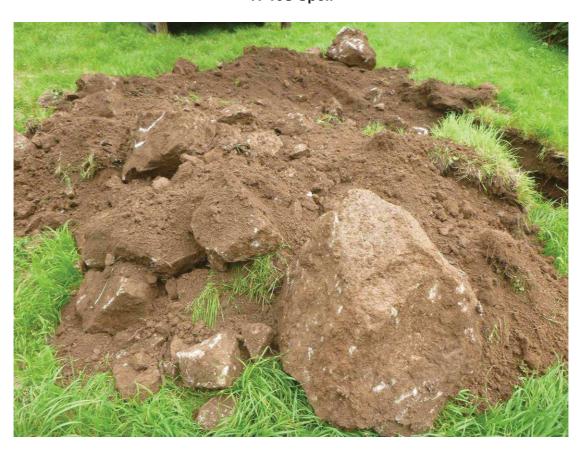
TP12S Spoil



TP13S Sidewall



TP13S Spoil



TP14S Sidewall



TP14S Spoil



TP15S Sidewall



TP15S Spoil



TP16S Sidewall



TP16S Spoil



TP17S Sidewall



TP17S Spoil



TP18S Sidewall



TP18S Spoil



TP19S Sidewall



TP19S Spoil



TP20S Sidewall



TP20S Spoil



TP21S Sidewall



TP21S Spoil



Appendix 4 Soakaway Test Results and Photographs

Project Reference:	5752
Contract name:	Brennanstown Road
Location:	Cabinteely, Dublin 18
Test No:	SA01S

02/09/2020



Ground Conditions

Ground Condi	แบบร	
From	То	
0.00	0.05	MADE GROUND: grey silty sandy gravel.
0.05	0.30	MADE GROUND: grey silty sandy gravel with high cobble content.
0.30	0.90	MADE GROUND: brown black mottled sandy gravelly silty CLAY with high
		cobble content and some plastic, red brick and concrete fragments.
0.90	1.10	Firm brown grey slightly sandy gravelly silty CLAY with high cobble content.
		•

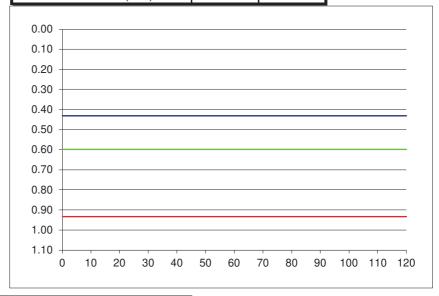
Remarks:

Date:

Obstruction at 1.10mbgl.

Elapsed Time	Fall of Water
(mins)	(m)
0	0.43
0.5	0.43
1	0.43
1.5	0.43
2	0.43
2.5	0.43
3	0.43
3.5	0.43
4	0.43
4.5	0.43
5	0.43
6	0.43
7	0.43
8	0.43
9	0.43
10	0.43
12	0.43
14	0.43
16	0.43
18	0.43
20	0.43
25	0.43
30	0.43
40	0.43
50	0.43
60	0.43
75	0.43
90	0.43
120	0.43

Pit Dimensions (m)		
Length (m)	2.10	m
Width (m)	0.70	m
Depth	1.10	m
Water		
Start Depth of Water	0.43	m
Depth of Water	0.67	m
75% Full	0.60	m
25% Full	0.93	m
75%-25%	0.34	m
Volume of water (75%-25%)	0.49	m3
Area of Drainage	6.16	m2
Area of Drainage (75%-25%)	3.35	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 or Fail m/min

Project Reference:	5752
Contract name:	Brennanstown Road
Location:	Cabinteely, Dublin 18
Test No:	SA02S
Date:	02/09/2020



Date:

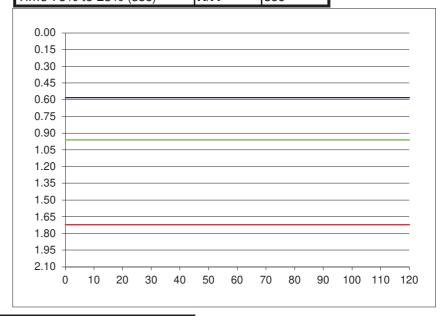
Ground Conditions					
From	То				
0.00	0.20	TOPSOIL.			
0.20		MADE GROUND: brown grey mottled sandy gravelly silty CLAY with low			
		cobble content and some plastic, timber and concrete fragments.			
1.40	2.10	Firm brown grey slightly sandy gravelly silty CLAY with medium cobble content.			

Remarks:

-

-	
Elapsed Time	Fall of Water
(mins)	(m)
0	0.58
0.5	0.58
1	0.58
1.5	0.58
2	0.58
2.5	0.58
3	0.58
3.5	0.58
4	0.58
4.5	0.58
5	0.58
6	0.58
7	0.58
8	0.58
9	0.58
10	0.58
12	0.58
14	0.58
16	0.58
18	0.58
20	0.58
25	0.58
30	0.58
40	0.58
50	0.58
60	0.58
75	0.58
90	0.58
120	0.58

Pit Dimensions (m)		
Length (m)	2.20	m
Width (m)	0.70	m
Depth	2.10	m
Water		
Start Depth of Water	0.58	m
Depth of Water	1.52	m
75% Full	0.96	m
25% Full	1.72	m
75%-25%	0.76	m
Volume of water (75%-25%)	1.17	m3
Area of Drainage	12.18	m2
Area of Drainage (75%-25%)	5.95	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



<u>Fail</u> Fail f = or m/s m/min

Project Reference: 5752

Contract name: Brennanstown Road

Location: Cabinteely, Dublin 18



 Test No:
 SA03S

 Date:
 02/09/2020

Ground Conditions

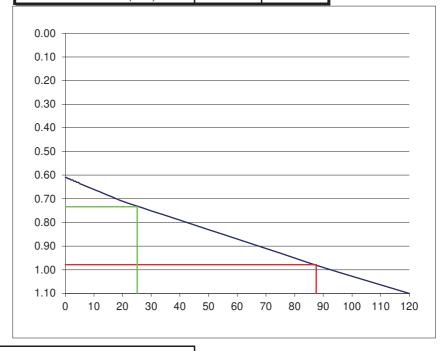
From	То	
0.00	0.20	TOPSOIL.
0.20	1.10	Brown silty sandy GRAVEL with high cobble and medium boulder content.

Remarks:

Obstruction at 1.10mbgl.

Obstruction at 1	
Elapsed Time	Fall of Water
(mins)	(m)
0	0.61
0.5	0.61
1	0.62
1.5	0.62
2	0.62
2.5	0.62
3	0.63
3.5	0.63
4	0.63
4.5	0.63
5	0.64
6	0.64
7	0.65
8	0.65
9	0.66
10	0.66
12	0.67
14	0.68
16	0.69
18	0.70
20	0.71
25	0.73
30	0.75
40	0.79
50	0.83
60	0.87
75	0.93
90	0.99
120	1.10

Pit Dimensions (m)		
Length (m)	2.30	m
Width (m)	0.70	m
Depth	1.10	m
Water		
Start Depth of Water	0.61	m
Depth of Water	0.49	m
75% Full	0.73	m
25% Full	0.98	m
75%-25%	0.25	m
Volume of water (75%-25%)	0.39	m3
Area of Drainage	6.60	m2
Area of Drainage (75%-25%)	3.08	m2
Time		
75% Full	25	min
25% Full	87.5	min
Time 75% to 25%	62.5	min
Time 75% to 25% (sec)	3750	sec



f = 0.00205 or m/min

3.42E-05 m/s

Project Reference:	5752
Contract name:	Brennanstown Road
Location:	Cabinteely, Dublin 18
Test No:	SA04S

02/09/2020



Ground Conditions

arouna conan	lions	
From	То	
0.00	0.05	MADE GROUND: grey silty sandy gravel.
0.05		MADE GROUND:grey silty sandy gravel with high cobble content and
		occasional plastic fragments.

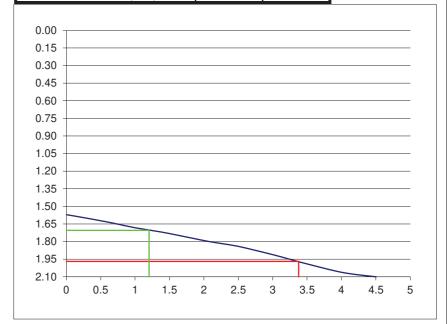
Remarks:

Date:

Water level only rose to 1.57mbgl with 1000l added.

Elapsed Time	Fall of Water
(mins)	(m)
0	1.57
0.5	1.62
1	1.68
1.5	1.73
2	1.79
2.5	1.84
3	1.91
3.5	1.99
4	2.06
4.5	2.10

Pit Dimensions (m)		
Length (m)	2.90	m
Width (m)	0.70	m
Depth	2.10	m
Water		
Start Depth of Water	1.57	m
Depth of Water	0.53	m
75% Full	1.70	m
25% Full	1.97	m
75%-25%	0.27	m
Volume of water (75%-25%)	0.54	m3
Area of Drainage	15.12	m2
Area of Drainage (75%-25%)	3.94	m2
Time		
75% Full	1.20	min
25% Full	3.38	min
Time 75% to 25%	2.18	min
Time 75% to 25% (sec)	130.5	sec



 $f = \underbrace{0.06281}_{m/min} \text{ or }$

1.05E-03 m/s

SA01S Sidewall



SA01S Spoil



SA02S Sidewall



SA02S Spoil



SA03S Sidewall



SA03S Spoil



SA04S Sidewall



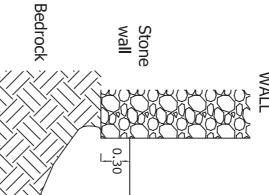
SA04S Spoil



Appendix 5 Foundation Pit Logs

FP01

Cross Section



9

Ground Conditions:

Depth:	Depth: Description:
0.00m	0.00m TOPSOIL.
0.20m	Light brown silty gravelly SAND with low cobble content.
0.95m	0.95m Obstruction - possible boulders or weathered bedrock.

Trench Dimensions

Point:	Easting:	Northing:	Level
Start	722587.165	724111.382	65.57

Length: 3.60m

0.80m Width:

0.95m Depth:

Photograph:





Client: Project: Cairn Homes PLC Brennanstown Road

Scale:
NOT TO SCALE, ALL DISTANCES IN m M. Kaliski Excavation Started: 03/09/2020

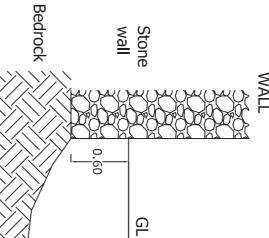
DEPTH ARE TO THE TOP OF SERVICES

Excavation Finished: CONTRACT 03/09/2020 NUMBER

5752

FP02

Cross Section



Ground Conditions:

0	0	0	ō
90m	0.20m	.00m	epth:
0.90m Obstruction - possible boulders or weathered bedrock.	Brown silty gravelly SAND with high cobble and low boulder content.	0.00m TOPSOIL.	Depth: Description:

Trench Dimensions

2.60m	Length:	
0.80m	Width:	
0.90m	Depth:	
		1

Start	Point:	
722626.478	Easting:	
724122.940	Northing:	
67.80	Level:	

Photograph:





Brennanstown Road Cairn Homes PLC

M. Kaliski

Scale: NOT TO SCALE, ALL DISTANCES IN m Excavation Started: 03/09/2020 Excavation Finished: 03/09/2020

DEPTH ARE TO THE TOP OF SERVICES

CONTRACT NUMBER

5752

Appendix 6 Geotechnical Laboratory Test Results

Classification Tests in accordance with BS1377: Part 4

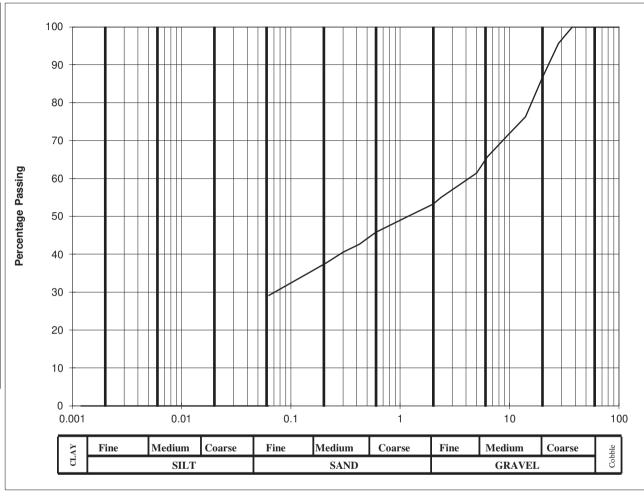
Client	Cairn Homes PLC
Site	Brennanstown Road - South Site
S.I. File No	5752 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	29th September 2020

Hole ID	Depth	Sample	Lab Ref	Sample	Natural	Liquid	Plastic	Plastic	Min. Dry	Particle	%	Comments	Remarks C=Clay;
		No	No.	Type	Moisture	Limit	Limit	Index	Density	Density	passing		M=Silt Plasticity:
					Content	%	%	%	Mg/m^3	Mg/m^3	425um		L=Low; I=Intermediate;
					%				C	C			H =High; V =Very High;
													E=Extremely High
TP01S	0.90	MK21	20/852	В	21.3	34	20	14			68.3		CL
TP07S	1.00	MK11	20/853	В	13.8	23	NP				40.2		
TP21S	1.00	MK18	20/854	В	11.3	21	NP				23.2		

Printed 26/11/2020 _____Paddy McGonagle Sheet 1 of 1 ______Site Investigations Ltd

BS Sieve	Percent	Hydrometer	analysis
size, mm	passing	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	95.6		
20	86.7		
14	76.3		
10	71.9		
6.3	65.7		
5.0	61.4		
2.36	55		
2.00	53.2		
1.18	50		
0.600	45.8		
0.425	42.6		
0.300	40.5		
0.212	37.7		
0.150	35.3		
0.063	29		

Cobbles, %	0
Gravel, %	47
Sand, %	24
Clay / Silt, %	29



Client:	Cairn Homes PLC	
Project :	Brennanstown Road, Cabinteely	

Lab. No:	20/852
Sample No:	MK21

Hole ID:	TP 01S
Depth, m:	0.90

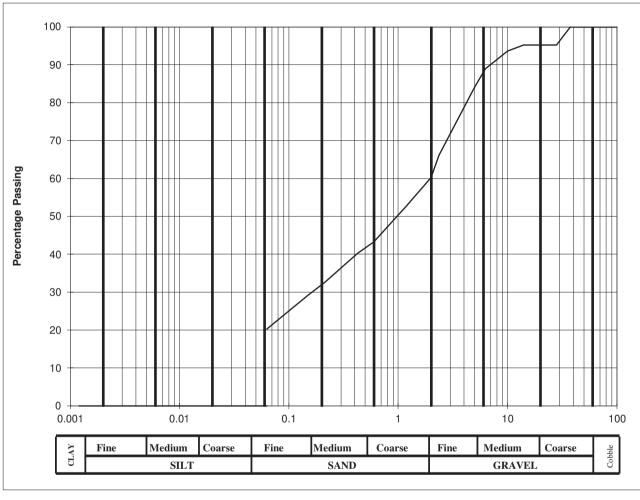
Remarks:

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

BS Sieve	Percent	Hydrometer	analysis
size, mm	passing	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	95.2		
20	95.2		
14	95.2		
10	93.6		
6.3	88.9		
5.0	84		
2.36	66.1		
2.00	60.2		
1.18	52.6		
0.600	43.2		
0.425	40.2		
0.300	36.4		
0.212	32.5		
0.150	29.2		
0.063	20		

Cobbles, %	0
Gravel, %	40
Sand, %	40
Clay / Silt, %	20



Client:	Cairn Homes PLC	
Project:	Brennanstown Road, Cabinteely	

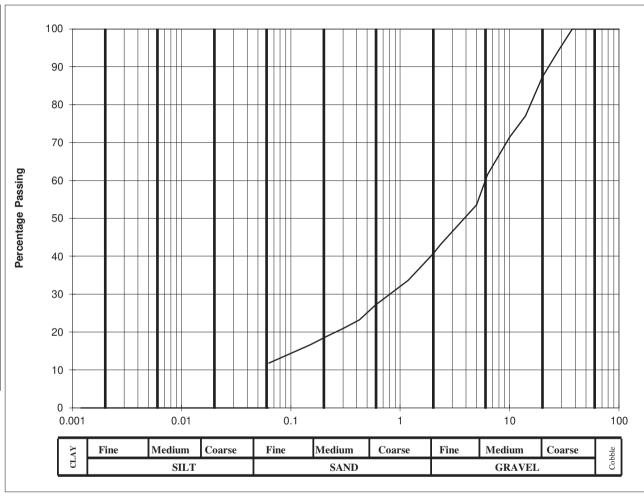
Lab. No:	20/853
Sample No:	MK11

Hole ID :	TP 07S
Depth, m:	1.00

Material description:	silty very sandy GRAVEL
Damanisa	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.
Remarks:	Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve	Percent	Hydrometer	analysis
size, mm	passing	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	94.3		
20	87.3		
14	77		
10	71.4		
6.3	61.5		
5.0	53.5		
2.36	43.2		
2.00	40.6		
1.18	33.6		
0.600	27.2		
0.425	23.2		
0.300	20.9		
0.212	18.8		
0.150	16.6		
0.063	12		

Cobbles, %	0
Gravel, %	59
Sand, %	29
Clay / Silt, %	12



Client:	Cairn Homes PLC	
Project:	Brennanstown Road, Cabinteely	

Lab. No:	20/854
Sample No:	MK18

Hole ID :	TP 21S
Depth, m:	1.00

Material description:	silty very sandy GRAVEL
Damanka	Soils with clay or silt content between 15% - 35% can be clas

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.

Remarks: Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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

Client	Cairn Homes PLC
Site	Brennanstown Road - South Site
S.I. File No	5752 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	28th September 2020

CBR No	Depth (mBGL)	Sample No	Sample Type	Lab Ref	Moisture Content (%)	CBR Value (%)	Location / Remarks / Soil Description
	()		- 71		(/-/		
01S	0.50	MK52	CBR	20/857	11.8	20.6	brown silty sandy GRAVEL
02S	0.50	MK53	CBR	20/858	19.2	6.2	brown slightly sandy slightly gravelly silty CLAY
03S	0.50	MK54	CBR	20/859	22.0	10.7	brown slightly sandy slightly gravelly silty CLAY
04S	0.50	MK55	CBR	20/860	11.5	17.5	brown slightly sandy gravelly silty CLAY
05S	0.50	MK56	CBR	20/861	15.2	15.8	brown slightly sandy gravelly silty CLAY
06S	0.50	MK57	CBR	20/862	21.9	8.5	brown slightly sandy slightly gravelly silty CLAY
07S	0.50	MK58	CBR	20/863	10.6	28.5	brown silty sandy GRAVEL
08S	0.50	MK59	CBR	20/864	15.1	10.9	brown slightly sandy slightly gravelly silty CLAY
09S	0.50	MK60	CBR	20/865	14.5	13.0	brown slightly sandy slightly gravelly silty CLAY
10S	0.50	MK61	CBR	20/866	20.9	8.5	brown slightly sandy slightly gravelly silty CLAY
11S	0.50	MK62	CBR	20/867	18.8	10.7	brown slightly sandy slightly gravelly silty CLAY
12S	0.50	MK63	CBR	20/866	15.2	24.4	brown silty sandy GRAVEL
13S	0.50	MK64	CBR	20/867	17.8	14.3	brown slightly sandy gravelly silty CLAY

Chemical Testing In accordance with BS 1377: Part 3

Client	Cairn Homes PLC
Site	Brennanstown Road - South Site
S.I. File No	5752 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	29th September 2020

Hole Id	Depth	Sample	Lab Ref	рН	Water Soluble	Water Soluble	Loss on	Chloride	% passing	Remarks
	(mBGL)	No		Value	Sulphate Content	Sulphate Content	Ignition	ion	2mm	
					(2:1 Water-soil	(2:1 Water-soil	(Organic	Content		
					extract) (SO ₃)	extract) (SO ₃)	Content)	(water:soil		
					g/L	%	%	ratio 2:1)		
								%		
TP01S	1.50	MK21	20/852	7.93	0.123	0.104		0.31	84.4	
TP07S	1.50	MK11	20/853	7.97	0.123	0.081		0.28	66.1	
TP21S	1.50	MK18	20/854	7.95	0.126	0.051		0.25	40.6	

Paddy McGonagle
Site Investigations Ltd.

Appendix 7 Environmental Laboratory Test Results



Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

> Tel: (01244) 528700 Fax: (01244) 528701

email: haward encustomers ervices@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:08 October 2020Customer:Site Investigations Ltd

Sample Delivery Group (SDG): 200925-152 Your Reference: 5752

Location: Brennanstown Road, Cabinteely

Report No: 570403

We received 7 samples on Friday September 25, 2020 and 7 of these samples were scheduled for analysis which was completed on Thursday October 08, 2020. 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 (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

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.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager







Validated



CERTIFICATE OF ANALYSIS

SDG: 200925-152 Client Reference: 5752 Report Number: 570403
Location: Brennanstown Road, Cabint Order Number: 92/A/20 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22903249	TP01 N		0.50 - 0.50	22/09/2020
22903250	TP01 S		0.50 - 0.50	22/09/2020
22903252	TP01 S		0.90 - 0.90	22/09/2020
22903253	TP07 S		1.00 - 1.00	22/09/2020
22903254	TP18 S		0.50 - 0.50	22/09/2020
22903255	TP21 S		0.50 - 0.50	22/09/2020
22903256	TP21 S		1.00 - 1.00	22/09/2020

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

570403

Report Number:

CERTIFICATE OF ANALYSIS

Client Reference:

ALS	

SDG:

200925-152

Brennanstown Road, Cabint@rder Number: 92/A/20 Location: Results Legend 22903249 22903255 22903256 22903250 22903252 Lab Sample No(s) X Test No Determination **Possible** Customer TP01 N TP21 S TP01 S TP01S TP07 S TP21 S Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.50 -0.50 - 0.500.50 - 0.500.50 - 0.50.00 .00 - 1.00 SA - Saline Water Depth (m) - 0.50 - 1.00 TE - Trade Effluent - 0.90 TS - Treated Sewage US - Untreated Sewage 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) RE - Recreational Water 60g VOC (ALE215) 60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 60g VOC (ALE215) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type S S S Anions by Kone (w) All NDPs: 0 Tests: 4 X X Χ X CEN Readings All NDPs: 0 Tests: 4 X X Х Chromium III All NDPs: 0 Tests: 4 X X Χ X Coronene All NDPs: 0 Tests: 4 Х Х Х Х Dissolved Metals by ICP-MS ΑII NDPs: 0 Tests: 4 X X X X Dissolved Organic/Inorganic Carbon All NDPs: 0 Tests: 4 Χ X X Х EPH by GCxGC-FID All NDPs: 0 Tests: 4 Χ Х Х Х EPH CWG GC (S) All NDPs: 0 Tests: 4 Χ Χ Χ Χ Fluoride All NDPs: 0 Tests: 4 X Χ X X GRO by GC-FID (S) All NDPs: 0 Tests: 4 X X X Χ Hexavalent Chromium (s) All NDPs: 0 Tests: 4 X Х Х X Loss on Ignition in soils All NDPs: 0 Tests: 7 Х Χ Х X Х Х Χ Mercury Dissolved All NDPs: 0 Tests: 4 Χ Χ Х All Metals in solid samples by OES NDPs: 0 Tests: 4 Χ X Χ X PAH by GCMS All NDPs: 0 Tests: 4 X X X Χ

Validated

CERTIFICATE OF ANALYSIS

(ALS)	

SDG: 200925-152 Client Reference: Report Number: 570403 Brennanstown Road, Cabintonder Number: Location: 92/A/20 Results Legend 22903249 22903250 22903255 22903256 22903252 Lab Sample No(s) X Test No Determination Possible Customer TP01 N TP01 S TP01S TP07 S TP21 S TP21 S Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.50 - 0.500.50 - 0.500.50 - 0.500.50 - 0.501.00 - 1.00 1.00 - 1.00 SA - Saline Water Depth (m) - 0.90 TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 60g VOC (ALE215) 250g Amber Jar (ALE210) 60g VOC (ALE215) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type ഗ S S S S S S S S S S S S S PCBs by GCMS All NDPs: 0 Tests: 4 X X Х Х Phenols by HPLC (W) All NDPs: 0 Tests: 4 Χ X X All Sample description NDPs: 0 Tests: 7 Χ X Χ X X X Total Dissolved Solids on Leachates ΑII NDPs: 0 Tests: 4 X Х Х Χ Total Organic Carbon All NDPs: 0 Tests: 4 Χ X X Χ TPH CWG GC (S) All NDPs: 0 Tests: 4 Χ X X X VOC MS (S) All NDPs: 0 Tests: 4 Χ Χ X Χ



SDG: 200925-152 Client Reference: Location: Brennanstown Road, Cabint@rder Number:

5752 92/A/20 Report Number: Superseded Report: 570403

Sample Descriptions

Grain Sizes

very fine	<0.0	63mm	fine	0.06	63mm - 0.1mm	me	edium	0.1mm	1 - 2mm	coarse	2mm -	10mm	very coars	e >1
Lab Sample	No(s)	Custom	ner Sample I	Ref.	Depth (m)	1	Co	lour	Descrip	tion	Inclusions	Inclu	usions 2	
2290324	.9		TP01 N		0.50 - 0.50		Dark	Brown	Sandy L	oam	Stones	1	None	
2290325	60		TP01 S		0.50 - 0.50		Dark	Brown	Sandy L	oam	Stones	Veç	getation	
2290325	52		TP01 S		0.90 - 0.90		Dark	Brown	Sandy L	oam	Stones	Veç	getation	
2290325	i3		TP07 S		1.00 - 1.00		Dark	Brown	Sandy L	oam	Stones	Veç	getation	
2290325	i4		TP18 S		0.50 - 0.50		Dark	Brown	Sand	d	Stones	Veç	getation	
2290325	55		TP21 S		0.50 - 0.50		Dark	Brown	Loamy S	Sand	Stones	1	None	
2290325	6		TP21 S		1.00 - 1.00		Light	t Brown	Loamy S	Sand	Stones	1	None	

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.

200925-152 Client Referenc Brennanstown Road, CabintiOrder Number: 5752 92/A/20 SDG: Client Reference: Location:

Report Number: Superseded Report:

570403

Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	TP01 N	TP01 S	TP01 S	TP07 S	TP18 S	TP21 S
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report	t for	Depth (m) Sample Type	0.50 - 0.50 Soil/Solid (S)	0.50 - 0.50 Soil/Solid (S)	0.90 - 0.90 Soil/Solid (S)	1.00 - 1.00 Soil/Solid (S)	0.50 - 0.50 Soil/Solid (S)	0.50 - 0.50 Soil/Solid (S)
accreditation status. ** % recovery of the surrogate standard to chec		Date Sampled Sample Time	22/09/2020	22/09/2020 00:00:00	22/09/2020	22/09/2020	22/09/2020	22/09/2020
efficiency of the method. The results of indivi compounds within samples aren't corrected to	idual	Date Received SDG Ref	25/09/2020 200925-152	25/09/2020 200925-152	25/09/2020 200925-152	25/09/2020 200925-152	25/09/2020 200925-152	25/09/2020 200925-152
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	22903249	22903250	22903252	22903253	22903254	22903255
1-3+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method						
Moisture Content Ratio (% of as received sample)	%	PM024	15	14	19	14	23	9.2
Loss on ignition	<0.7 %	TM018	3.55 M	3.32 M	4.25 M	1.4 M	9.51 M	2.01 M
Organic Carbon, Total	<0.2 %	TM132	0.462 M	0.416 M	W	III.	4.98 M	0.226 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	<21 µg/kg	TM168	<21	<21			<21	<21
Chromium, Trivalent	<0.9 mg/kg	TM181	15.9	14.2			19.3	9.13
Antimony	<0.6 mg/kg	TM181	1.25	0.871			1.71	<0.6
Arsenic	<0.6 mg/kg	TM181	15.7 M	15.5 M			18.2 M	13 M
Barium	<0.6 mg/kg	TM181	25.5	22.2			107 #	29.7
Cadmium	<0.02 mg/kg	TM181	0.375 M	0.337 M			2.19 M	0.95 M
Chromium	<0.9 mg/kg	TM181	15.9 M	14.2			19.3 M	9.13
Copper	<1.4 mg/kg	TM181	13.5 M	12.6			47.8 M	17.8 M
Lead	<0.7 mg/kg	TM181	28.2 M	24.7			134 M	12.1 M
Mercury	<0.14 mg/kg	TM181	<0.14 M	<0.14			<0.14 M	<0.14 M
Molybdenum	<0.1 mg/kg	TM181	2.23	2.33			3.72 #	1.09 #
Nickel	<0.2 mg/kg	TM181	21.9 M	19.1			48.7 M	22.3 M
Selenium	<1 mg/kg	TM181	1.99	1.69			1.57 #	<1 #
Zinc	<1.9 mg/kg	TM181	66.1 M	60.2			141 M	48.3 M
Coronene	<200 µg/kg	TM410	<200	<200			<200	<200
Mineral Oil >C10-C40	<5 mg/kg	TM415	<5	<5			<5	<5
I								

ALS

SDG: 200925-152 Client Reference: 5752 Report Number: 570403
Location: Brennanstown Road, Cabintorder Number: 92/A/20 Superseded Report:

But the board				+		
Results Legend # ISO17025 accredited.		Customer Sample Ref.	TP21 S			
M mCERTS accredited. aq Aqueous / settled sample.						
diss.filt Dissolved / filtered sample.		Depth (m)				
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report	t for	Sample Type	Soil/Solid (S)			
accreditation status.		Date Sampled Sample Time	22/09/2020			
efficiency of the method. The results of indiv	idual	Date Received	25/09/2020			
compounds within samples aren't corrected recovery	for the	SDG Ref	200925-152			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22903256			
Component	LOD/Units	Method				
Moisture Content Ratio (% of as	%	PM024	11			
received sample)	/*	1	'''			
Loss on ignition	<0.7 %	TM018	0.741			
Loss on ignition	10.7 70	11010	0.741 M			
	_		IVI			
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		1				
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200925-152 Client Referenc Brennanstown Road, CabintiOrder Number: 5752 92/A/20 Report Number: Superseded Report: SDG: Client Reference:

Location:

570403

PAH	OV GCMS Results Legend		Customer Sample Bof	T20414	T201.0	T0/0.0	7704.0		
# M	ISO17025 accredited. mCERTS accredited.	(Customer Sample Ref.	TP01 N	TP01 S	TP18 S	TP21 S		
aq diss.filt	Aqueous / settled sample. Dissolved / filtered sample.		Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
tot.unfilt	Total / unfiltered sample. Subcontracted - refer to subcontractor report	for	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
**	accreditation status. % recovery of the surrogate standard to check		Date Sampled Sample Time	22/09/2020	22/09/2020 00:00:00	22/09/2020	22/09/2020		
	efficiency of the method. The results of individ compounds within samples aren't corrected for	lual	Date Received	25/09/2020	25/09/2020	25/09/2020	25/09/2020		
(F)	recovery Trigger breach confirmed	n tile	SDG Ref Lab Sample No.(s)	200925-152 22903249	200925-152 22903250	200925-152 22903254	200925-152 22903255		
1-3+§@	Sample deviation (see appendix)		AGS Reference						
Compo Naphth		LOD/Units <9 µg/kg	Method TM218	<9	<9	<9	<9		-
INapilui	alelle	≺9 μg/kg	TIVIZ TO	\sqrt{9} M	1	\ \ \ M	\ \ \ M		
Acenar	hthylene	<12 µg/kg	TM218	<12	<12	<12	<12		
	,			M	1	M	M		
Acenar	hthene	<8 µg/kg	TM218	<8	<8	<8	<8		
				M	M	М	М		
Fluorer	ne	<10 µg/kg	TM218	<10	<10	<10	<10		
		45 "	711010	M		M	M		
Phenar	ntnrene	<15 µg/kg	TM218	<15 M	<15 M	20.2 M	<15 M		
Anthra	rene	<16 µg/kg	TM218	<16	<16	<16	<16		
7 414.11 44		10 µg///g	2.10	M	1	M	M		
Fluorar	thene	<17 µg/kg	TM218	<17	<17	56	<17		
				М	M	М	М		
Pyrene		<15 µg/kg	TM218	<15	<15	45.1	<15		
				M	M	М	М		
Benz(a)anthracene	<14 µg/kg	TM218	<14	<14	31.9	<14		
Chryso	no	<10 ug/kg	TM218	<10	<10 M	28.8	M <10		
Chryse	ne	<10 µg/kg	1M218	<10 M	1	28.8 M	<10 M		
Benzo(b)fluoranthene	<15 µg/kg	TM218	<15	<15	28.9	<15		
201.20(2)	10 µg///g	2.10	M	1	M	M		
Benzo(k)fluoranthene	<14 µg/kg	TM218	<14	<14	<14	<14		
				М	M	М	М		
Benzo(a)pyrene	<15 µg/kg	TM218	<15	<15	26.4	<15		
				M		M	M		
Indeno	(1,2,3-cd)pyrene	<18 µg/kg	TM218	<18	<18	<18	<18		
Dihenz	o(a,h)anthracene	<23 µg/kg	TM218	<23	<23	<23	<23		
DIDGITZ	o(a,ii)aiitiiiaceile	-20 μg/kg	TIVIZIO	_23	1	\\ \frac{125}{M}	\23 M		
Benzo(g,h,i)perylene	<24 µg/kg	TM218	<24	<24	<24	<24		
				М	M	М	М		
PAH, T	otal Detected USEPA 16	<118 µg/kg	TM218	<118	<118	237	<118		
			+						
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TPH CWG (S)

SDG: Client Reference:

200925-152 Client Referenc Brennanstown Road, CabintiOrder Number: 5752 92/A/20 Report Number: Superseded Report: 570403 Location:

	Results Legend	C	ustomer Sample Ref.	TP01 N	TP01 S	TP18 S	TP21 S		
# M	ISO17025 accredited. mCERTS accredited.								
aq	Aqueous / settled sample.		- 443						
diss.filt tot.unfilt	Dissolved / filtered sample. Total / unfiltered sample.		Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
*	Subcontracted - refer to subcontractor report f	or	Sample Type Date Sampled	Soil/Solid (S) 22/09/2020	Soil/Solid (S) 22/09/2020	Soil/Solid (S) 22/09/2020	Soil/Solid (S) 22/09/2020		
	accreditation status. % recovery of the surrogate standard to check	the	Sample Time	22/09/2020	00:00:00		22/09/2020		
	efficiency of the method. The results of individ	ual	Date Received	25/09/2020	25/09/2020	25/09/2020	25/09/2020		
	compounds within samples aren't corrected for recovery	r the	SDG Ref	200925-152	200925-152	200925-152	200925-152		
(F)	Trigger breach confirmed		Lab Sample No.(s)	22903249	22903250	22903254	22903255		
1-3+§@	Sample deviation (see appendix)		AGS Reference						
Compo		LOD/Units	Method						
GRO St	ırrogate % recovery**	%	TM089	102	96.1	113	107		
Alinhatic	os >C5-C6	<10 µg/kg	TM089	<10	<10	<10	<10		
Alipilatio	.5 >03-00	-10 μg/kg	110000	\10	\10	\10	\10		
Aliphatio	cs >C6-C8	<10 µg/kg	TM089	<10	<10	<10	<10		
1		, , ,							
Alimbotic	> C0 C10	410	TM089	z10	<10	<10	<10		
Aliphalic	cs >C8-C10	<10 µg/kg	1 101009	<10	<10	<10	<10		
Aliphatio	cs >C10-C12	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
,									
Aliphotic	os >C12-C16	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Alipitatio	S 2012-010	∼1000 μg/kg	1101414	\1000	<1000	<1000	\1000		
Aliphatio	cs >C16-C21	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
l								1	
Alinhatia	cs >C21-C35	<1000 µg/kg	TM414	1860	2130	4350	<1000		
Ailbiigil	00 - OZ I-OOO	- 1000 µg/kg	1 IVI+ 14	1000	2130	4000	1000	1	
<u> </u>									
Aliphatio	cs >C35-C44	<1000 µg/kg	TM414	<1000	<1000	<1000	2120	1	
l .								1	
Total Ali	phatics >C10-C44	<5000 µg/kg	TM414	<5000	<5000	<5000	<5000		
I Oldi All	priatios - 0 10 -044	-Jooo pg/kg	1 IVI+ 14	\J 000	\JUUU	\JUUU	\JUUU	1	
Total Ali	phatics & Aromatics	<10000	TM414	<10000	<10000	10400	<10000		
>C10-C	44	μg/kg							
Aromati	cs >EC5-EC7	<10 µg/kg	TM089	<10	<10	<10	<10		
Alomati	CS > LOS-LO1	10 µg/kg	110000	110	110	110	110		
Aromati	cs >EC7-EC8	<10 µg/kg	TM089	<10	<10	<10	<10		
Aromati	cs >EC8-EC10	<10 µg/kg	TM089	<10	<10	<10	<10		
7 0111.01.	55 25 25 15		1111000						
		"							
Aromati	cs > EC10-EC12	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromati	cs > EC12-EC16	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
		1 1 1 3 3							
	5040 5004	4000 "		4000	4000	4000	4000		
Aromati	cs > EC16-EC21	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromati	cs > EC21-EC35	<1000 µg/kg	TM414	1280	1180	4510	<1000		
A 4:	> 5005 5044	44000	TN4444	44000	44000	44000	44000		
Aromati	cs >EC35-EC44	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromati	cs > EC40-EC44	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
l .								1	1
Total A-	omatics > EC10-EC44	<5000 µg/kg	TM414	<5000	<5000	5590	<5000		
i otal Ar	umatics > EUTU-EU44	<э∪∪∪ µg/кg	1 IVI4 14	<5000	\0000	5590	<5000	1	
Total Ali	phatics & Aromatics	<10000	TM414	<10000	<10000	<10000	<10000	1	1
>C5-C4	4	µg/kg						1	
GRO >0		<20 µg/kg	TM089	<20	<20	<20	<20		
1		_~ Mg/Ng	. 111000		1			1	
075	20.07	.00 "	THOSE			22			
GRO >0	J0-U/	<20 µg/kg	TM089	<20	<20	<20	<20	1	
GRO >0	C7-C8	<20 µg/kg	TM089	<20	<20	<20	<20		
		.5.5						1	
CDC+C	20 040	Z20//	TMACCO	-200	-00	-200	-200		
GR0 >0	0-0 IU	<20 µg/kg	TM089	<20	<20	<20	<20	1	
GRO >0	C10-C12	<20 µg/kg	TM089	<20	<20	<20	<20	1	
l .								1	
Total Ali	phatics >C5-C10	<50 µg/kg	TM089	<50	<50	<50	<50		
I Oldi All	priatios - 00-010	-50 µg/kg	I IVIUUS	\00	\ 00	\ 00	\ 00	1	
		_							
Total Ar	omatics >EC5-EC10	<50 µg/kg	TM089	<50	<50	<50	<50	1	
GRO >0	C5-C10	<20 µg/kg	TM089	<20	<20	<20	<20		
		_~ mg/\\g	550	_ - -	I			1	
			 						
I									

Validated

CERTIFICATE OF ANALYSIS

VOC MS (S)

SDG: 570403 Client Reference:

200925-152 Client Referenc Brennanstown Road, CabintiOrder Number: 5752 92/A/20 Report Number: Superseded Report: Location:

Results Legend		Customer Sample Ref.	TD04 N	TD04.C	TD40 C	TD04 C		
# ISO17025 accredited.		Customer Sample Rei.	TP01 N	TP01 S	TP18 S	TP21 S		
M mCERTS accredited. aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample.		Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
tot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
 Subcontracted - refer to subcontractor report accreditation status. 	for	Date Sampled	22/09/2020	22/09/2020	22/09/2020	22/09/2020		
* % recovery of the surrogate standard to chec	k the	Sample Time		00:00:00				
efficiency of the method. The results of indivi	dual	Date Received	25/09/2020	25/09/2020	25/09/2020	25/09/2020		
compounds within samples aren't corrected in recovery	for the	SDG Ref	200925-152	200925-152	200925-152	200925-152		
(F) Trigger breach confirmed		Lab Sample No.(s)	22903249	22903250	22903254	22903255		
1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference						
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	98.3	101	108	97.6		
Toluene-d8**	%	TM116	98.8	93.3	91	101		
Toluelle-uo	70	TIVITIO	90.0	93.3	91	101		
4-Bromofluorobenzene**	%	TM116	83.4	77.9	77.3	97.8		
Marit e Dille	.40 //	T14440	.40	.40	.40	:40		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	<10	<10	<10		
			M	M	M	M		
Benzene	<9 µg/kg	TM116	<9	<9	<9	<9		
20.120.10	0 µg/1.9		М			M		
				M	M			
Toluene	<7 µg/kg	TM116	<7	<7	<7	<7		
1		1	M	M	M	M		
Ethylbenzene	<4 µg/kg	TM116	<4	<4	<4	<4		
Laryborizone	~ - μg/κg	TIVITIO						
	-	1	М	M	M	M		
p/m-Xylene	<10 µg/kg	TM116	<10	<10	<10	<10		
	1	1	#	#	#	#		
o Yylono	<10	TM446	<10	<10	<10	<10		
o-Xylene	<10 µg/kg	TM116						
			M	M	M	M		
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SDG: 200925-152 Location: Brennanstown Road, Cabintorder Number:

Client Reference: 5752 92/A/20 Report Number: Superseded Report:

570403

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESU	JLTS					REF: BS	EN 12457/2
Client Reference			Site Location		Brenn	anstown Road,	Cabinteely
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)			17		
Mass of dry sample (kg)	0.090		Dry Matter Cont		85.5		
Particle Size <4mm	>95%			(70)			
Case					Landi	ill Waste Acce	otance
SDG	200925-152					Criteria Limits	
Lab Sample Number(s)	22903249						
Sampled Date	22-Sep-2020					Stable	
-	TP01 N				Inert Waste	Non-reactive Hazardous Waste	Hazardous
Customer Sample Ref.					Landfill	in Non-	Waste Landfill
Depth (m)	0.50 - 0.50					Hazardous Landfill	
Solid Waste Analysis	Result						
Total Organic Carbon (%)	0.462				3	5	6
Loss on Ignition (%)	3.55				-	-	10
Sum of BTEX (mg/kg)	-				-	-	-
Sum of 7 PCBs (mg/kg)	<0.021				1	-	-
Mineral Oil (mg/kg)	<5				500 -	-	-
PAH Sum of 17 (mg/kg) pH (pH Units)	-					-	
ANC to pH 6 (mol/kg)	-				-	-	-
ANC to pH 4 (mol/kg)	-				-	-	-
Eluate Analysis	C ₂ Conc ⁿ in :	Conc ⁿ in 10:1 eluate (mg/l)			Limit values for compliance leaching test		
Liudie Alidiysis	Result	Limit of Detection	Result	Limit of Detection	using E	SS EN 12457-3 at L/S	10 l/kg
Arsenic	0.00106	<0.0005	0.0106	<0.005	0.5	2	25
Barium	0.00119	<0.0002	0.0119	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00118	<0.001	0.0118	<0.01	0.5	10	70
Copper	0.0049	<0.0003	0.049	< 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	0.00144	<0.0004	0.0144	<0.004	0.4	10	40
Lead	0.000848	<0.0002	0.00848	<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	0.00322	<0.001	0.0322	<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	18.8	<10	188	<100	4000	60000	100000

Leach Test Information

Total Monohydric Phenols (W)

Dissolved Organic Carbon

Date Prepared	29-Sep-2020
pH (pH Units)	8.05
Conductivity (µS/cm)	17.50
Temperature (°C)	20.10
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 Mcerts Certification does not apply to leachates 08/10/2020 13:55:48

<0.016

6.43

<0.016

<3

<0.16

64.3

<0.16

<30

500

800

1000

REF: BS EN 12457/2

Hazardous

Waste Landfill

CERTIFICATE OF ANALYSIS

SDG: 200925-152 Client Reference: Location: Brennanstown Road, Cabint@rder Number:

92/A/20

Report Number: Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

Client Reference	
Mass Sample taken (kg)	0.107
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location Brennanstown Road, Cabinteely **Natural Moisture Content (%)** 18.5 **Dry Matter Content (%)** 84.4

Inert Waste

Landfill

Case SDG 200925-152 22903250 Lab Sample Number(s) **Sampled Date** 22-Sep-2020 **Customer Sample Ref.** TP01 S 0.50 - 0.50Depth (m)

Landfill Waste Acceptance Criteria Limits Stable

Non-reactive

Hazardous Waste

in Non-

570403

Solid Waste Analysis	Result
	0.440
Total Organic Carbon (%)	0.416
Loss on Ignition (%)	3.32
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<5
PAH Sum of 17 (mg/kg)	-
pH (pH Units)	-
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

	Landfill	
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Eluate Analysis	C ₂ Conc ⁿ in	10:1 eluate (mg/l)	A ₂ 10:1 con	c ⁿ leached (mg/kg)	Limit values for compliance using BS EN 12457-3 at L		-	
	Result	Limit of Detection	Result	Limit of Detection				
Arsenic	0.000789	<0.0005	0.00789	<0.005	0.5	2	25	
Barium	0.000932	<0.0002	0.00932	<0.002	20	100	300	
Cadmium	0.000168	<0.00008	0.00168	<0.0008	0.04	1	5	
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70	
Copper	0.0048	<0.0003	0.048	<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	0.00142	<0.0004	0.0142	<0.004	0.4	10	40	
Lead	0.0407	<0.0002	0.407	<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	0.023	<0.001	0.23	<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	21.1	<10	211	<100	4000	60000	10000	
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-	
Dissolved Organic Carbon	6.23	<3	62.3	<30	500	800	1000	

Leach Test Information

Date Prepared	29-Sep-2020
pH (pH Units)	7.83
Conductivity (µS/cm)	26.10
Temperature (°C)	20.40
Volume Leachant (Litres)	0.883

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 Mcerts Certification does not apply to leachates 08/10/2020 13:55:48

13:55:34 08/10/2020

Case

SDG

ANC to pH 6 (mol/kg)

SDG: 200925-152 Location: Brennanstown Road, Cabint@rder Number:

200925-152

Client Reference:

Report Number: 92/A/20 Superseded Report:

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Landfill Waste Acceptance Criteria Limits

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS **REF: BS EN 12457/2 Client Reference** Brennanstown Road, Cabinteely Site Location Mass Sample taken (kg) 0.118 **Natural Moisture Content (%)** 31.2 Mass of dry sample (kg) 0.090 **Dry Matter Content (%)** 76.2 Particle Size <4mm >95%

Lab Sample Number(s) 22903254 Stable 22-Sep-2020 **Sampled Date** Non-reactive Inert Waste Hazardous **Customer Sample Ref.** TP18 S Hazardous Waste Landfill Waste Landfill in Non-Depth (m) 0.50 - 0.50Hazardous Landfill Result **Solid Waste Analysis** 4.98 3 Total Organic Carbon (%) Loss on Ignition (%) 9.51 Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) <0.021 Mineral Oil (mg/kg) <5 500 PAH Sum of 17 (mg/kg) pH (pH Units)

ANC to pH 4 (mol/kg)					-	-	-	
Eluate Analysis	C ₂ Conc ⁿ in 1	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ 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	0.000636	<0.0005	0.00636	<0.005	0.5	2	25	
Barium	0.00429	<0.0002	0.0429	<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	0.0072	<0.0003	0.072	<0.003	2	50	100	
Mercury Dissolved (CVAF)	0.0000321	<0.00001	0.000321	<0.0001	0.01	0.2	2	
Molybdenum	<0.003	< 0.003	<0.03	<0.03	0.5	10	30	
Nickel	0.00158	<0.0004	0.0158	<0.004	0.4	10	40	
Lead	0.0015	<0.0002	0.015	<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	0.00522	<0.001	0.0522	<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	46.5	<10	465	<100	4000	60000	100000	
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-	
Dissolved Organic Carbon	6.7	<3	67	<30	500	800	1000	

Leach Test Information

Date Prepared	29-Sep-2020
pH (pH Units)	8.41
Conductivity (µS/cm)	60.30
Temperature (°C)	20.50
Volume Leachant (Litres)	0.872

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 Mcerts Certification does not apply to leachates 08/10/2020 13:55:48

ALS

Case

SDG: 200925-152 Client Reference: Location: Brennanstown Road, Cabint Order Number:

5752 92/A/20 Report Number: Superseded Report: 570403

Landfill Waste Acceptance

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RES	ULTS		REF : BS EN 124
Client Reference		Site Location	Brennanstown Road, Cabintee
Mass Sample taken (kg)	0.101	Natural Moisture Content (%)	12.7
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.8
Particle Size <4mm	>95%		

200925-152 **Criteria Limits SDG** 22903255 Lab Sample Number(s) Stable **Sampled Date** 22-Sep-2020 Non-reactive Inert Waste Hazardous **Customer Sample Ref.** Hazardous Waste TP21 S Landfill Waste Landfill in Non-0.50 - 0.50Depth (m) Hazardous Landfill Solid Waste Analysis Result

Solid Waste Analysis	Result
T++0 : 0 + (0)	0.226
Total Organic Carbon (%)	0.220
Loss on Ignition (%)	2.01
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<5
PAH Sum of 17 (mg/kg)	-
pH (pH Units)	-
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 1	C ₂ Conc ⁿ in 10:1 eluate (mg/l) A ₂ 10:1 conc ⁿ leached (mg/kg)				es for compliance le S EN 12457-3 at L/S	-	
	Result	Limit of Detection	Result	Limit of Detection				
Arsenic	0.00184	<0.0005	0.0184	<0.005	0.5	2	25	
Barium	0.00534	<0.0002	0.0534	<0.002	20	100	300	
Cadmium	0.000103	<0.00008	0.00103	<0.0008	0.04	1	5	
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70	
Copper	0.00631	<0.0003	0.0631	<0.003	2	50	100	
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2	
Molybdenum	0.00364	<0.003	0.0364	<0.03	0.5	10	30	
Nickel	0.00199	<0.0004	0.0199	<0.004	0.4	10	40	
Lead	0.000267	<0.0002	0.00267	<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	0.00318	<0.001	0.0318	<0.01	4	50	200	
Chloride	<2	<2	<20	<20	800	15000	25000	
Fluoride	0.596	<0.5	5.96	<5	10	150	500	
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000	
Total Dissolved Solids	84.7	<10	847	<100	4000	60000	10000	
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-	
Dissolved Organic Carbon	8.27	<3	82.7	<30	500	800	1000	

Leach Test Information

Date Prepared	29-Sep-2020
pH (pH Units)	8.31
Conductivity (µS/cm)	108.00
Temperature (°C)	20.30
Volume Leachant (Litres)	0.889

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
Mcerts Certification does not apply to leachates
08/10/2020 13:55:48

Validated



CERTIFICATE OF ANALYSIS

SDG: 200925-152 Client Reference: 5752 Report Number: 570403
Location: Brennanstown Road, Cabint Order Number: 92/A/20 Superseded Report:

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 & 10:11 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
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	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) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Validated

CERTIFICATE OF ANALYSIS

200925-152 Client Referenc Brennanstown Road, Cabint@rder Number: SDG: Location:

5752 Client Reference:

Report Number: Superseded Report: 92/A/20

570403

Test Completion Dates

Lab Sample No(s)	22903249	22903250	22903252	22903253	22903254	22903255	22903256	22903250
Customer Sample Ref.	TP01 N	TP01 S	TP01 S	TP07 S	TP18 S	TP21 S	TP21 S	TP01 S.
AGS Ref.								
Depth	0.50 - 0.50	0.50 - 0.50	0.90 - 0.90	1.00 - 1.00	0.50 - 0.50	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50
Туре	Soil/Solid (S)							
Anions by Kone (w)	06-Oct-2020	05-Oct-2020			06-Oct-2020	06-Oct-2020		
CEN 10:1 Leachate (1 Stage)	30-Sep-2020	30-Sep-2020			30-Sep-2020	30-Sep-2020		
CEN Readings	02-Oct-2020	02-Oct-2020			02-Oct-2020	02-Oct-2020		
Chromium III	05-Oct-2020	05-Oct-2020			05-Oct-2020	02-Oct-2020		
Coronene	01-Oct-2020	01-Oct-2020			01-Oct-2020	01-Oct-2020		
Dissolved Metals by ICP-MS	06-Oct-2020	06-Oct-2020			06-Oct-2020	06-Oct-2020		
Dissolved Organic/Inorganic Carbon	07-Oct-2020	07-Oct-2020			07-Oct-2020	07-Oct-2020		
EPH by GCxGC-FID	02-Oct-2020	02-Oct-2020			02-Oct-2020	02-Oct-2020		
EPH CWG GC (S)	01-Oct-2020	01-Oct-2020			01-Oct-2020	01-Oct-2020		
Fluoride	06-Oct-2020	06-Oct-2020			06-Oct-2020	06-Oct-2020		
GRO by GC-FID (S)	05-Oct-2020				05-Oct-2020	05-Oct-2020		06-Oct-2020
Hexavalent Chromium (s)	01-Oct-2020	01-Oct-2020			30-Sep-2020	01-Oct-2020		
Loss on Ignition in soils	01-Oct-2020	01-Oct-2020	02-Oct-2020	02-Oct-2020	02-Oct-2020	01-Oct-2020	06-Oct-2020	
Mercury Dissolved	07-Oct-2020	08-Oct-2020			08-Oct-2020	08-Oct-2020		
Metals in solid samples by OES	06-Oct-2020	06-Oct-2020			06-Oct-2020	01-Oct-2020		
Moisture at 105C	29-Sep-2020				29-Sep-2020	29-Sep-2020		29-Sep-2020
PAH by GCMS	01-Oct-2020	01-Oct-2020			01-Oct-2020	01-Oct-2020		
PCBs by GCMS	01-Oct-2020	01-Oct-2020			01-Oct-2020	01-Oct-2020		
Phenols by HPLC (W)	06-Oct-2020	05-Oct-2020			06-Oct-2020	05-Oct-2020		
Sample description	29-Sep-2020							
Total Dissolved Solids on Leachates	06-Oct-2020	06-Oct-2020			06-Oct-2020	06-Oct-2020		
Total Organic Carbon	05-Oct-2020	05-Oct-2020			05-Oct-2020	02-Oct-2020		
TPH CWG GC (S)	05-Oct-2020	06-Oct-2020			05-Oct-2020	05-Oct-2020		
VOC MS (S)	02-Oct-2020				02-Oct-2020	02-Oct-2020		02-Oct-2020



SDG: Location:

200925-152 Brennanstown Road, Cabinteely Order Number:

Client Reference:

5752 92/A/20

Report Number: Superseded Report: 570403

Appendix

General

- Results are expressed on a dry weight basis (dried at 35°C) 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
- 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
- 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 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. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss
- 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. 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.

18. 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
§	Sampled on date not provided
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or
w	samples

19. 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 (2005), 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

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials 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 (2005).

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, based on HSG 248 (2005).

Asbe stos Type	Common Name
Chrysofile	White Asbesbs
Amosite	Brown Asbestos
Cro d dolite	Blue Asbe stos
Fibrous Actinolite	-
Fib to us Anthop hyll ite	-
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

Standing Committee of Analysts, The Quantification of Asbestos in Soil (2017)

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.



Waste Classification Report



Job name

5752S

Description/Comments

Client: Cairn Homes PLC Engineer: Waterman Moylan

Project

Brennanstown Road - South Site

Site

Cabinteely, Dublin 18

Related Documents

# Name	Description
1 200925-152.hwol	.hwol file used to create the Job

Waste Stream Template

Rilta Suite NEW

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.

Classified by

Name: Company: Stephen Letch

Site Investigations Ltd

Date: 26 Nov 2020 15:56 GMT

Telephone: 00353 86817 9449 HazWasteOnline™ Training Record:

Date Course 09 Apr 2019 Hazardous Waste Classification Advanced Hazardous Waste Classification 09 Oct 2019

Report

Created by: Stephen Letch

Created date: 26 Nov 2020 15:56 GMT

Job summary

#	Sample Name	Denth [m]	Classification Result Hazard properties	WAC F	_ Page	
π	Sample Name	Deptil [iii]	Classification Nesult Trazard properties	Inert	Non Haz	-ı aye
1	TP01 S-220920-0.50-0.50		Non Hazardous	Pass	Pass	3
2	TP18 S-220920-0.50-0.50		Non Hazardous	Fail	Pass	7



HazWasteOnline[™] Report created by Stephen Letch on 26 Nov 2020

# Sample Name	Donth [m]	Classification Result Hazard properties	WAC	Dogo		
# Sample Name Depth	Depth [m]	Classification Result Hazard properties	Inert	Non Haz	— Page	
3 TP21 S-220920-0.50-0.50		Non Hazardous	Pass	Pass	11	
ppendices					Page	
• •	non CLP determ	inands			Page 15	
ppendices ppendix A: Classifier defined and n ppendix B: Rationale for selection o						

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Classification of sample: TP01 S-220920-0.50-0.50

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

Sample details

Sample Name: LoW Code: TP01 S-220920-0.50-0.50 Chapter:

Moisture content:

14% (wet weight correction)

Entry:

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

17 05 04 (Soil and stones other than those mentioned in 17 05

Hazard properties

None identified

Determinands

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

#		Determinand CLP index number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	0	TPH (C6 to C40) petroleum group		<10 mg/kg	1	<10 mg/kg	<0.001 %		<lod< td=""></lod<>
2	0	confirm TPH has NOT arisen from diesel or petrol		✓					
3	4	antimony { antimony trioxide }		0.871 mg/kg	1.197	0.897 mg/kg	0.0000897 %	√	
4	4	arsenic { arsenic pentoxide } 033-004-00-6		15.5 mg/kg	1.534	20.447 mg/kg	0.00204 %	✓	
5		barium { • barium sulphide } 016-002-00-X		22.2 mg/kg	1.233	23.55 mg/kg	0.00235 %	✓	
6	4	cadmium { cadmium sulfate } 048-009-00-9		0.337 mg/kg	1.855	0.537 mg/kg	0.0000537 %	√	
7	_	copper { dicopper oxide; copper (I) oxide } 029-002-00-X		12.6 mg/kg	1.126	12.2 mg/kg	0.00122 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	1	24.7 mg/kg	1	21.242 mg/kg	0.00212 %	√	
9		082-001-00-6 mercury { mercury dichloride } 080-010-00-X 231-299-8 7487-94-7		<0.14 mg/kg	1.353	<0.189 mg/kg	<0.0000189 %		<lod< td=""></lod<>
10	æ å	molybdenum { molybdenum(VI) oxide } 042-001-00-9		2.33 mg/kg	1.5	3.006 mg/kg	0.000301 %	✓	
11	4	nickel { nickel sulfate } 028-009-00-5 232-104-9 7786-81-4		19.1 mg/kg	2.637	43.31 mg/kg	0.00433 %	√	
12		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		1.69 mg/kg	1.405	2.042 mg/kg	0.000204 %	✓	
13	_	zinc { zinc sulphate } 030-006-00-9		60.2 mg/kg	2.469	127.84 mg/kg	0.0128 %	√	
14	4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) } 215-160-9 1308-38-9		14.2 mg/kg	1.462	17.849 mg/kg	0.00178 %	✓	



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# Determinand 2 2	% <lod %="" <="" <lod="" br=""> % <lod< p=""> <lod< p=""> <lod< p=""> <lod< p=""> <lod< p=""> <lod< p=""></lod<></lod<></lod<></lod<></lod<></lod<></lod>
Chromium in chromium(VI) compounds { chromium(VI) oxide } chromium (VI) oxide 0.24-001-00-0 215-607-8 1333-82-0 chromium in chromium(VI) cxide 0.0000 mg/kg cxide 0.0000009 mg/kg cxide 0.0000009 mg/kg cxide c	<pre><lod %<="" td=""></lod></pre>
naphthalene	% <lod %="" <lod="" <lod<="" td=""></lod>
17	% <lod %="" <lod="" <lod<="" td=""></lod>
17 acenaphthylene 205-917-1 208-96-8	% <lod <lod="" <lod<="" td=""></lod>
18	% <lod <lod="" <lod<="" td=""></lod>
18	<lod< td=""></lod<>
19 fluorene	% <lod <lod<="" td=""></lod>
19	% <lod <lod<="" td=""></lod>
20 Phenanthrene 201-581-5 85-01-8 35	% <lod< td=""></lod<>
201-581-5 85-01-8 35	% <lod< td=""></lod<>
21	
Comparison of the color of th	6 <lod< td=""></lod<>
20	% <lod< td=""></lod<>
204-927-3 129-00-0 200-0000015 200-0000015 200-0000014 200-0000014 200-0000014 200-0000014 200-0000015 200-00000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-0000015 200-00000015 200-00000015 200-000000000000000000000000000000000	
204-927-3 129-00-0 204-927-3 129-00-0 205-923-4 218-01-9 20.015 mg/kg <0.0000014 205-911-9 205-99-2 207-08-9 207-08-9 208-028-5 50-32-8 205-893-2 193-39-5 205-93-2 200-028-5 50-32-8 205-93-2 200-028-5 50-32-8 201-041-00-2 200-181-8 53-70-3 30-0000023 200-028-5 50-70-3 200-0181-8 53-70-3 200-023 mg/kg <0.0000023 30-0000023 200-028-5 30-70-3 30-0000023 200-0181-8 53-70-3 30-0000023 200-0181-8 53-70-3 30-0000023 200-028-5 30-70-3 30-0000023 200-181-8 53-70-3 30-00000023 200-181-8 53-70-3 30-00000023 200-028-5 30-70-3 30-00000023 200-181-8 30-70-3 30-00000023 200-181-8 30-70-3 30-00000000000000000000000000000	% <lod td="" <=""></lod>
24	1200
Chrysene	% <lod< td=""></lod<>
25	
26 benzo[b]fluoranthene <0.015	<lod< td=""></lod<>
Column	% <lod< td=""></lod<>
27	LOD
28	% <lod< td=""></lod<>
29 indeno[123-cd]pyrene	
29 indeno[123-cd]pyrene	% <lod< td=""></lod<>
29 205-893-2 193-39-5 20.0000018 205-893-2 193-39-5 20.0000018 205-893-2 193-39-5 20.0000018 205-893-2 205-800-800-800-2 205-800-2 205-800-2 205-800-2 205-800-2 205-800-2 205-8	
30 <0.023 mg/kg <0.0000023 601-041-00-2 200-181-8 53-70-3	% <lod< td=""></lod<>
601-041-00-2 200-181-8 53-70-3	% <lod< td=""></lod<>
honzolahilnonylono	
31 Substituting Su	% <lod< td=""></lod<>
205-883-8 191-24-2 20 204	
32 Operation of prienty is, PCB Condition of prienty is, P	% <lod< td=""></lod<>
tert-butyl methyl ether; MTBE;	
2-methoxy-2-methylpropane	<lod< td=""></lod<>
hanzana	
34 601-020-00-8 200-753-7 71-43-2 < 0.009 mg/kg < 0.0000009	% <lod< td=""></lod<>
35 toluene <0.007 mg/kg <0.007 mg/kg <0.0000007	% <lod< td=""></lod<>
35 601-021-00-3 203-625-9 108-88-3	\LOD
36 ethylbenzene < 0.004 mg/kg < 0.000004	% <lod< td=""></lod<>
601-023-00-4 202-849-4 100-41-4	
37 coronene 	
o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	<lod< td=""></lod<>
38	<lod< td=""></lod<>
Total: 0.0285 %	

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Report created by Stephen Letch on 26 Nov 2020

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 Determinand - 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 S-220920-0.50-0.50

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

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)	%	0.416	3	5	
2	LOI (loss on ignition) % 3.32		3.32	-	-	
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	<0.118	100	-	
7	рН	рН	7.83	-	>6	
8	ANC (acid neutralisation capacity)	mol/kg		-	-	
	Eluate Analysis 10:1					
9	arsenic	mg/kg	0.0078	0.5	2	
10	barium	mg/kg	0.0093	20	100	
11	cadmium	mg/kg	0.0016	0.04	1	
12	chromium	mg/kg	<0.01	0.5	10	
13	copper	mg/kg	0.048	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	0.0142	0.4	10	
17	lead	mg/kg	0.407	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	0.23	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	62.3	500	800	
26	TDS (total dissolved solids)	mg/kg	211	4,000	60,000	

Key

User supplied data

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Classification of sample: TP18 S-220920-0.50-0.50

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

Sample details

Sample Name: LoW Code:

TP18 S-220920-0.50-0.50 Chapter: Moisture content:

Entry: 23%

(wet weight correction)

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

17 05 04 (Soil and stones other than those mentioned in 17 05

Hazard properties

None identified

Determinands

Moisture content: 23% Wet Weight Moisture Correction applied (MC)

#		Determinand CLP index number	CLP Note	User entered	data	Conv. Factor	Compound c	onc.	Classification value	MC Applied	Conc. Not Used
1	0	TPH (C6 to C40) petroleum group		<10	mg/kg		<10	mg/kg	<0.001 %		<lod< td=""></lod<>
		TPH	\perp								
2	0	confirm TPH has NOT arisen from diesel or petrol	_	☑							
			\perp	_							
3	_	antimony { antimony trioxide }		1.71	mg/kg	1.197	1.576	mg/kg	0.000158 %	✓	
		051-005-00-X 215-175-0 1309-64-4	+								
4	-			18.2	mg/kg	1.534	21.496	mg/kg	0.00215 %	✓	
		033-004-00-6 215-116-9 1303-28-2	+								
5	4	barium { • barium sulphide }		107	ma/ka	1.233	101.628	mg/kg	0.0102 %	1	
	Ì	016-002-00-X 244-214-4 21109-95-5			J J			3 3			
6	æ	cadmium { cadmium sulfate }		2.19	ma/ka	1.855	3.127	mg/kg	0.000313 %	1	
Ľ		048-009-00-9 233-331-6 10124-36-4		2.10	9/119	1.000	0.127	mg/ng		~	
7	4	copper { dicopper oxide; copper (I) oxide }		47.8	ma/ka	1.126	41.439	mg/kg	0.00414 %	√	
Ĺ		029-002-00-X 215-270-7 1317-39-1	1					33		*	
8	4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	1	134	mg/kg		103.18	mg/kg	0.0103 %	✓	
	Ì	082-001-00-6									
9	æ	mercury { mercury dichloride }		<0.14	ma/ka	1.353	<0.189	mg/kg	<0.000189 %		<lod< td=""></lod<>
Ľ		080-010-00-X 231-299-8 7487-94-7		-0.11	9/119	1.000	-0.100	mg/kg			-205
10	æ	molybdenum { molybdenum(VI) oxide }		3.72	mg/kg	1.5	4.297	mg/kg	0.00043 %	1	
		042-001-00-9 215-204-7 1313-27-5		0.72	9/119	1.0	1.207	mg/ng		*	
11	4	nickel { nickel sulfate }		48.7	ma/ka	2.637	98.873	mg/kg	0.00989 %	√	
Ľ.		028-009-00-5 232-104-9 7786-81-4	1			2.00.		9,9		*	
12	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		1.57	mg/kg	1.405	1.699	mg/kg	0.00017 %	✓	
		034-002-00-8									
	-	zinc { zinc sulphate }						.			
13		030-006-00-9 231-793-3 [1] 7446-19-7 [1] 231-793-3 [2] 7733-02-0 [2]		141	mg/kg	2.469	268.092	mg/kg	0.0268 %	√	
14	4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		19.3	mg/kg	1.462	21.72	mg/kg	0.00217 %	✓	
		215-160-9 1308-38-9									



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#		Γ	Determinand		CLP Note	User entered	data	Conv.	Compound of	conc.	Classification value	Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number	J.L.P			. acto.			74.45	MC /	0000
15	***	chromium in chromium oxide }				<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %	_	<lod< td=""></lod<>
		024-001-00-0 215- naphthalene	6-607-8	1333-82-0	H	<u>'</u>						Н	
16		·	-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<lod< td=""></lod<>
	0	acenaphthylene	. 010 0	01 20 0	Н								
17			i-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<lod< td=""></lod<>
18	0	acenaphthene				<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<lod< td=""></lod<>
			-469-6	83-32-9	L					J J		Ш	
19	Θ	fluorene	60F F	06 70 7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<lod< td=""></lod<>
		phenanthrene	-695-5	86-73-7									
20	0	ļ.	-581-5	85-01-8		0.0202	mg/kg		0.0156	mg/kg	0.00000156 %	√	
21	0	anthracene	,			<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<lod< td=""></lod<>
		204-	-371-1	120-12-7		-0.010			\0.010	mg/kg	VO.0000010 70		LOD
22	0	fluoranthene				0.056	mg/kg		0.0431	mg/kg	0.00000431 %	1	
			-912-4	206-44-0		<u>'</u>							
23	0	pyrene	-927-3	129-00-0		0.0451	mg/kg		0.0347	mg/kg	0.00000347 %	✓	
		benzo[a]anthracene	129-00-0										
24			-280-6	56-55-3		0.0319	mg/kg		0.0246	mg/kg	0.00000246 %	✓	
25		chrysene			Г	0.0000			0.0000		0.00000000.0/	,	
25		601-048-00-0 205-	i-923-4	218-01-9		0.0288	mg/kg		0.0222	mg/kg	0.00000222 %	✓	
26		benzo[b]fluoranthene				0.0289	mg/kg		0.0223	mg/kg	0.00000223 %	√	
			-911-9	205-99-2								•	
27		benzo[k]fluoranthene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<lod< td=""></lod<>
		601-036-00-5 205- benzo[a]pyrene; benzo		207-08-9									
28				50-32-8		0.0264	mg/kg		0.0203	mg/kg	0.00000203 %	✓	
	0	indeno[123-cd]pyrene	020 0	00 02 0									
29	_		-893-2	193-39-5		<0.018	mg/kg	g	<0.018	mg/kg	<0.0000018 %		<lod< td=""></lod<>
30		dibenz[a,h]anthracene				<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<lod< td=""></lod<>
		ļ	-181-8	53-70-3		-0.020			-0.020	mg/kg	-0.0000020 /0	Ш	
31	0	benzo[ghi]perylene				<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<lod< td=""></lod<>
-		1		191-24-2								Н	
32	0	polychlorobiphenyls; P0 602-039-00-4 215-		1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<lod< td=""></lod<>
		tert-butyl methyl ether;		1000-00-0	Н							H	
33		2-methoxy-2-methylpro				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<lod< td=""></lod<>
			i-653-1	1634-04-4	Ц							Ш	
34		benzene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<lod< td=""></lod<>
			-753-7	71-43-2									
35		toluene 601-021-00-3 203-	-625-9	108-88-3		<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<lod< td=""></lod<>
	6	ethylbenzene	-UZJ-3	100-00-3	\vdash							H	
36	9		!-849-4	100-41-4		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<lod< td=""></lod<>
37	0	coronene			П	<0.2	mg/kg		<0.2	ma/ka	<0.00002 %		<lod< td=""></lod<>
51		205-	i-881-7	191-07-1		~ 0.2	mg/kg		VU.Z	mg/kg	-0.00002 76		-FOD
		o-xylene; [1] p-xylene;											
38		203- 203-	-396-5 [2] -576-3 [3]	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< td=""></lod<>
		<u>¥</u> 13-	[F] 1 000 F	.000 20 7 [4]	ш					Total:	0.0679 %	Н	
	_						-			,			

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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 Determinand - 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: TP18 S-220920-0.50-0.50

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

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

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

WAC Determinands

	Solid Waste Analysis	Landfill Waste Acceptance Criteria Limits				
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill	
1	TOC (total organic carbon)	%	4.98	3	5	
2	LOI (loss on ignition)	%	9.51	-	-	
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	0.237	100	-	
7	рН	рН	8.41	-	>6	
8	ANC (acid neutralisation capacity)	mol/kg		-	-	
	Eluate Analysis 10:1					
9	arsenic	mg/kg	0.0063	0.5	2	
10	barium	mg/kg	0.0429	20	100	
11	cadmium	mg/kg	<0.0008	0.04	1	
12	chromium	mg/kg	<0.01	0.5	10	
13	copper	mg/kg	0.072	2	50	
14	mercury	mg/kg	0.0003	0.01	0.2	
15	molybdenum	mg/kg	<0.03	0.5	10	
16	nickel	mg/kg	0.0158	0.4	10	
17	lead	mg/kg	0.015	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	0.0522	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	67	500	800	
26	TDS (total dissolved solids)	mg/kg	465	4,000	60,000	

User supplied data Inert WAC criteria fail

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Classification of sample: TP21 S-220920-0.50-0.50

Non Hazardous Waste Classified as 17 05 04

in the List of Waste

Sample details

Sample Name: LoW Code:

TP21 S-220920-0.50-0.50 Chapter: Moisture content:

9.2% Entry:

(wet weight correction)

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

17 05 04 (Soil and stones other than those mentioned in 17 05

Hazard properties

None identified

Determinands

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

#		Determinand CLP index number	Number	CLP Note	User entered o	lata	Conv. Factor	Compound o	conc.	Classification value	MC Applied	Conc. Not Used
1	0	TPH (C6 to C40) petroleum group			<10 r	ng/kg		<10	mg/kg	<0.001 %		<lod< td=""></lod<>
2	0	confirm TPH has NOT arisen from diesel or petr	rol		☑							
3	4	antimony { antimony trioxide } 051-005-00-X	-4		<0.6 r	ng/kg	1.197	<0.718	mg/kg	<0.0000718 %		<lod< td=""></lod<>
4	4	arsenic { arsenic pentoxide } 033-004-00-6 215-116-9 1303-28-	-2		13 r	ng/kg	1.534	18.106	mg/kg	0.00181 %	✓	
5	æ	barium {	5-5		29.7 r	ng/kg	1.233	33.264	mg/kg	0.00333 %	✓	
6	4	cadmium { cadmium sulfate } 048-009-00-9	6-4		0.95 r	ng/kg	1.855	1.6	mg/kg	0.00016 %	✓	
7	4	copper { dicopper oxide; copper (I) oxide } 029-002-00-X 215-270-7 1317-39-	-1		17.8 r	ng/kg	1.126	18.197	mg/kg	0.00182 %	✓	
8	4	specified elsewhere in this Annex (worst case) }		1	12.1 r	ng/kg		10.987	mg/kg	0.0011 %	✓	
9	æ.		7		<0.14 r	ng/kg	1.353	<0.189	mg/kg	<0.0000189 %		<lod< td=""></lod<>
10	4	080-010-00-X 231-299-8 7487-94- molybdenum { molybdenum(VI) oxide } 042-001-00-9 215-204-7 1313-27-			1.09 r	ng/kg	1.5	1.485	mg/kg	0.000148 %	✓	
11	4				22.3 r	ng/kg	2.637	53.389	mg/kg	0.00534 %	✓	
12	4	selenium { selenium compounds with the excep cadmium sulphoselenide and those specified elin this Annex }			<1 r	ng/kg	1.405	<1.405	mg/kg	<0.000141 %		<lod< td=""></lod<>
13	-	zinc { zinc sulphate } 030-006-00-9			48.3 r	ng/kg	2.469	108.294	mg/kg	0.0108 %	✓	
14	æ	chromium in chromium(III) compounds { chromium in chromium(III) compounds { chromium (III) compounds { 10 chromium in chromium (III) compounds { 10 chromium (III) compounds { 10 chromium (III) chromium (IIII) chromiu			9.13 r	ng/kg	1.462	12.116	mg/kg	0.00121 %	✓	



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#		Determinand		CLP Note	User entered data	Cor		Classification value	Applied	Conc. Not Used
		CLP index number	r CAS Number	_ - -					MC /	0000
15	4	oxide }			<0.6 mg/l	g 1.92	23 <1.154 mg/kg		_	<lod< td=""></lod<>
-		024-001-00-0 215-607-8 naphthalene	1333-82-0	+						
16		601-052-00-2 202-049-5	91-20-3	-	<0.009 mg/l	g	<0.009 mg/kg	<0.0000009 %		<lod< td=""></lod<>
. _	0	acenaphthylene	01200							
17		205-917-1	208-96-8		<0.012 mg/l	g	<0.012 mg/kg	<0.0000012 %		<lod< td=""></lod<>
18	0	acenaphthene	100.00		<0.008 mg/l	g	<0.008 mg/kg	<0.0000008 %		<lod< td=""></lod<>
	_	201-469-6 fluorene	83-32-9	+						
19	0	201-695-5	86-73-7	\dashv	<0.01 mg/l	g	<0.01 mg/kg	<0.000001 %		<lod< td=""></lod<>
20	0	phenanthrene			<0.015 mg/l	a	<0.015 mg/kg	<0.0000015 %		<lod< td=""></lod<>
20		201-581-5	85-01-8		40.015 High	9	-0.015 Hig/kg	10.0000013 /6		LOD
21	0	anthracene	400 40 7		<0.016 mg/l	g	<0.016 mg/kg	<0.0000016 %		<lod< td=""></lod<>
22		204-371-1 fluoranthene	120-12-7	+						
	0	205-912-4	206-44-0	-	<0.017 mg/l	g	<0.017 mg/kg	<0.0000017 %		<lod< td=""></lod<>
23	0	pyrene			<0.015 mg/l	a	<0.015 mg/kg	<0.0000015 %		<lod< td=""></lod<>
		204-927-3	129-00-0		10.010 mg/1	9	10.010 1119/119	10.0000010 70		
24		benzo[a]anthracene			<0.014 mg/l	g	<0.014 mg/kg	<0.0000014 %		<lod< td=""></lod<>
-		601-033-00-9 200-280-6 chrysene	56-55-3	+						
25		601-048-00-0 205-923-4	218-01-9	-	<0.01 mg/l	g	<0.01 mg/kg	<0.000001 %		<lod< td=""></lod<>
26		benzo[b]fluoranthene		\top	.0.045 #	_	<0.01E mailion	<0.000001E 9/		<lod< td=""></lod<>
20		601-034-00-4 205-911-9 205-99-2			<0.015 mg/l	g	<0.015 mg/kg	<0.0000015 %		\LUD
27		benzo[k]fluoranthene			<0.014 mg/l	g	<0.014 mg/kg	<0.0000014 %		<lod< td=""></lod<>
		601-036-00-5 205-916-6	207-08-9	-						
28		benzo[a]pyrene; benzo[def]chrysel 601-032-00-3 200-028-5	50-32-8	-	<0.015 mg/l	g	<0.015 mg/kg	<0.0000015 %		<lod< td=""></lod<>
29	0	indeno[123-cd]pyrene	00 02 0		40.040		40.040	-0.0000040.0/		4LOD
29	9	205-893-2	193-39-5		<0.018 mg/l	g	<0.018 mg/kg	<0.0000018 %		<lod< td=""></lod<>
30		dibenz[a,h]anthracene			<0.023 mg/l	a	<0.023 mg/kg	<0.0000023 %		<lod< td=""></lod<>
		601-041-00-2 200-181-8	53-70-3							
31	0		nzo[ghi]perylene		<0.024 mg/	g	<0.024 mg/kg	<0.0000024 %		<lod< td=""></lod<>
-		205-883-8 191-24-2 polychlorobiphenyls; PCB								
32	Ĭ	602-039-00-4 215-648-1	1336-36-3	-	<0.021 mg/l	g	<0.021 mg/kg	<0.0000021 %		<lod< td=""></lod<>
		tert-butyl methyl ether; MTBE;			<0.01 mg/kg		.0.04	<0.000001 %		.1.00
33		2-methoxy-2-methylpropane 603-181-00-X 216-653-1 1634-04-4		_		g	<0.01 mg/kg			<lod< td=""></lod<>
		benzene	100-10		.0.000		.0.000 "	.0.00000000	H	.1.65
34		601-020-00-8 200-753-7	71-43-2		<0.009 mg/l	g	<0.009 mg/kg	<0.0000009 %		<lod< td=""></lod<>
35		toluene			<0.007 mg/l	a	<0.007 mg/kg	<0.0000007 %		<lod< td=""></lod<>
36	0	601-021-00-3 203-625-9	108-88-3	4		3				
		ethylbenzene 601-023-00-4 202-849-4	100 41 4		<0.004 mg/l	g	<0.004 mg/kg	<0.0000004 %		<lod< td=""></lod<>
-	0	601-023-00-4 202-849-4 coronene	100-41-4	+					H	
37	9	205-881-7	191-07-1	-	<0.2 mg/l	g	<0.2 mg/kg	<0.00002 %		<lod< td=""></lod<>
38	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/l	g	<0.02 mg/kg	<0.000002 %		<lod< td=""></lod<>
	F10 000 / [4] [1000 20-7 [4]						Total:	0.0271 %	Н	

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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 Determinand - 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: TP21 S-220920-0.50-0.50

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

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)		0.226	3	5	
2	LOI (loss on ignition)	%	2.01	-	-	
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	<0.118	100	-	
7	рН	рН	8.31	-	>6	
8	ANC (acid neutralisation capacity)	mol/kg		-	-	
	Eluate Analysis 10:1					
9	arsenic	mg/kg	0.0184	0.5	2	
10	barium	mg/kg	0.0534	20	100	
11	cadmium	mg/kg	0.001	0.04	1	
12	chromium	mg/kg	<0.01	0.5	10	
13	copper	mg/kg	0.0631	2	50	
14	mercury	mg/kg	<0.0001	0.01	0.2	
15	molybdenum	mg/kg	0.0364	0.5	10	
16	nickel	mg/kg	0.0199	0.4	10	
17	lead	mg/kg	0.0026	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	0.0318	4	50	
21	chloride	mg/kg	<20	800	15,000	
22	fluoride	mg/kg	5.96	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	82.7	500	800	
26	TDS (total dissolved solids)	mg/kg	847	4,000	60,000	

User supplied data

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Appendix A: Classifier defined and non 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)

CLP index number: 016-002-00-X

Description/Comments:

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

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)

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

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

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)

Conversion factor: 1.462

Description/Comments: Data from C&L Inventory Database

Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332, Acute Tox. 4 H302, Eye Irrit. 2 H319, STOT SE 3 H335, Skin Irrit. 2 H315, Resp. Sens. 1

H334, Skin Sens. 1 H317, Repr. 1B H360FD, Aquatic Acute 1 H400, Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database

Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302, Acute Tox. 1 H330, Acute Tox. 1 H310, Eye Irrit. 2 H319, STOT SE 3 H335, Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database

Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319, STOT SE 3 H335, Skin Irrit. 2 H315, Aquatic Acute 1 H400, Aquatic Chronic 1 H410, Aquatic Chronic 2 H411

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

Description/Comments: Data from C&L Inventory Database

Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400, Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database

Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302, Eye Irrit. 2 H319, STOT SE 3 H335, Carc. 2 H351, Skin Sens. 1 H317, Aquatic Acute 1 H400

, Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database

Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319, STOT SE 3 H335, Skin Irrit. 2 H315, Skin Sens. 1 H317, Aquatic Acute 1 H400, Aquatic

Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database

Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302, Aquatic Acute 1 H400, Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: http://echa.europa.eu/web/quest/information-on-chemicals/cl-inventory-database

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315, Eye Irrit. 2 H319, STOT SE 3 H335, Aquatic Acute 1 H400, Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database

Data source: http://echa.europa.eu/web/quest/information-on-chemicals/cl-inventory-database

Data source date: 06 Aug 2015 Hazard Statements: Carc. 2 H351

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400, Aquatic Chronic 1 H410

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

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.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

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)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 - 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008.

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:

http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en

Data source date: 16 Jun 2014 Hazard Statements: STOT SE 2 H371

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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 VII 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 VII 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 VII 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 VII 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, May 2018

HazWasteOnline Classification Engine Version: 2020.329.4545.8812 (24 Nov 2020)

HazWasteOnline Database: 2020.329.4545.8812 (24 Nov 2020)

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Report created by Stephen Letch on 26 Nov 2020

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

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

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

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Appendix 8
Survey Data

Survey Data

Location	Irish Transverse Mercator		Floretion	Irish National Grid				
Location	Easting Northing		Elevation	Easting	Northing			
Boreholes								
BH01S	722614.287	724328.872	75.89	322690.213	224300.510			
BH02S			72.91	322726.708	224261.057			
BH03S	722584.313	724223.868	73.63	322660.234	224195.483			
BH04S	722632.246	724180.947	70.42	322708.177	224152.553			
BH06S	722519.998	724205.129	71.56	322595.905	224176.740			
BH07S	722483.805	724275.412	77.26	322559.704	224247.038			
BH08S	722476.799	724330.299	78.75	322552.696	224301.937			
BH09S	722605.172	724288.231	75.75	322681.096	224259.860			
BH10S	722657.744	724304.402	73.23	322733.680	224276.035			
BH11S	722490.491	724255.097	74.26	322566.391	224226.718			
BH12S	722504.969	724224.963	72.42	322580.873	224196.578			
BH13S	722531.447	724230.529	73.59	322607.356	224202.145			
BH14S	722599.749	724238.597	74.12	322675.673	224210.215			
BH15S	722633.677	724236.099	72.76	322709.608	224207.717			
BH16S	722635.535	724206.358	71.67	322711.467	224177.970			
BH17S	722583.353	724180.572	70.58	322659.274	224152.178			
BH18S	722514.910	724181.761	69.95	322590.816	224153.367			
BH19S	722528.853	724167.924	69.08	322604.762	224139.527			
BH20S	722519.395	724096.139	63.81	322595.303	224067.726			
BH21S	722542.842	724153.164	68.14	322618.754	224124.763			
BH23S	722579.882	724124.231	66.57	322655.803	224095.824			
BH24S	722602.835	724147.271	68.42	322678.760	224118.870			
BH25S	722611.665	724127.402	67.33	322687.592	224098.996			
Trial Pits								
TP01S	722498.422	724337.977	78.89	322574.323	224309.616			
TP02S	722457.205	724297.219	77.82	322533.098	224268.849			
TP03S	722495.741	724275.695	77.07	322571.642	224247.321			
TP04S	722473.013	724256.820	74.96	322548.909	224228.442			
TP05S			73.68	322594.139	224204.767			
TP06S	722505.171	724211.221	70.99	322581.075	224182.833			
TP07S	722531.396	724189.511	70.90	322607.306	224161.118			
TP08S	722511.270	724168.780	68.32	322587.175	224140.383			
TP09S	722547.432	724126.240	66.22	322623.346	224097.834			
TP10S	722557.871	724231.090	74.19	322633.786	224202.707			
TP11S	722590.516	724120.860	66.56	322666.439	224092.453			
TP12S	722557.099	724165.230	69.43	322633.014	224136.832			
TP13S	722600.711	724248.482	74.49	322676.635	224220.103			
TP14S	722612.554	724200.576	71.69	322688.481	224172.186			
TP15S	722629.097	724140.710	68.55	322705.028	224112.307			
TP16S	722648.454	724169.350	68.95	322724.389	224140.954			
TP17S	722645.750	724211.221	71.73	322721.684	224182.834			
TP18S	722675.078	724286.117	71.16	322751.018	224257.746			
TP19S			73.35	322715.980	224270.999			
TP20S	TP20S 722689.220 724318.952		73.37	322765.162	224290.589			
TP21S	722627.173	724355.530	76.60	322703.102	224327.174			
Foundation Pits								
FP01	722587.165	724111.382	65.57	322663.087	224082.973			
FP02	722626.478	724122.940	67.80	322702.409	224094.533			

Survey Data

Location	Irish Transve	erse Mercator	Elevation	Irish National Grid				
Location	Easting	ing Northing		Easting	Northing			
Soakaway Tests								
SK01S	722498.439	724326.126	78.43	322574.340	224297.763			
SK02S	722636.694	724346.526	76.70	322712.625	224318.168			
SK03S	722546.853	724213.454	72.50	322622.766	224185.067			
SK04S	722524.358	724106.284	64.39	322600.267	224077.873			
		sts						
CBR01S	722519.572	724112.282	64.60	322595.480	224083.872			
CBR02S	722570.241	724121.419	66.11	322646.160	224093.012			
CBR03S	722603.398	724116.213	66.16	322679.324	224087.805			
CBR04S	722506.885	724174.900	68.68	322582.789	224146.504			
CBR05S	722549.852	724161.148	69.18	322625.766	224132.749			
CBR06S	722642.957	724160.156	68.62	322718.891	224131.758			
CBR07S	722501.717	724218.204	71.72	322577.620	224189.817			
CBR08S	722561.333	724213.689	72.91	322637.249	224185.302			
CBR09S	722615.996	724199.547	71.60	322691.924	224171.157			
CBR10S	722480.965	724263.063	74.98	322556.863	224234.686			
CBR11S	722575.709	724254.198	75.24	322651.628	224225.820			
CBR12S	722636.320	724261.103	74.54	322712.251	224232.727			
CBR13S	722682.288	724292.124	71.89	322758.229	224263.755			

