
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

Prepared by:

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Stephen Letch

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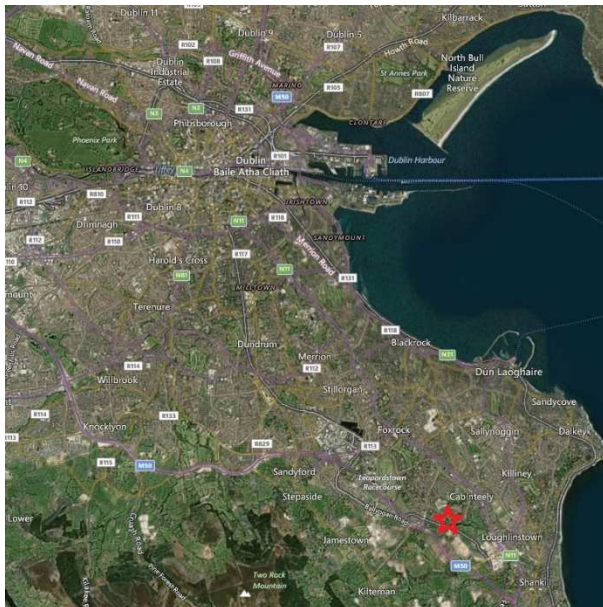
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1. Introduction

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 $3.42 \times 10^{-5} \text{m/s}$ and $1.05 \times 10^{-3} \text{m/s}$ 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 SO₃. The BRE Special Digest 1:2005 – *‘Concrete in Aggressive Ground’* guidelines require SO₄ values and after conversion (SO₄ = SO₃ x 1.2), the maximum value of 151mg/l shows Class 1 conditions and no special precautions are required.

Appendix 1
Cable Percussive Borehole Logs








Contract No: 5752		Cable Percussion Borehole Log										Borehole No: BH01S							
Contract:		Brennanstown Road				Easting:		722614.287		Date Started:		12/08/2020							
Location:		Cabinteely, Dublin 18				Northing:		724328.872		Date Completed:		12/08/2020							
Client:		Cairn Homes PLC				Elevation:		75.89		Drilled By:		T. Tindall							
Engineer:		Waterman Moylan				Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth						Scale	Depth	Depth	Type	Result								
	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.						75.79											
	0.90	Obstruction - possible boulders or weathered bedrock. End of Borehole at 0.90m						74.99											
	0.5							75.5											
	1.0							75.0											
	1.5							74.5											
	2.0							74.0											
	2.5							73.5											
	3.0							73.0											
	3.5							72.5											
	4.0							72.0											
	4.5							71.5											
	5.0							71.0											
	5.5							70.5											
								70.0											
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - also 0.90mbgl.		
		0.80	0.90	01:00				12/08	0.90	Dry				0.00	0.90	Arisings			






Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH02S					
Contract:		Brennanstown Road			Easting:		722650.774		Date Started:		04/08/2020			
Location:		Cabinteely, Dublin 18			Northing:		724289.427		Date Completed:		06/08/2020			
Client:		Cairn Homes PLC			Elevation:		72.91		Drilled By:		T. Tindall			
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL			
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill	
Scale	Depth					Scale	Depth	Depth	Type	Result				
	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY.					72.81							
0.5							72.5							
	0.80	Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content.					72.11							
1.0							72.0	1.00	B	BR01 N=13 (3,3/3,4,3,3)				
								1.00	C					
1.5							71.5							
2.0							71.0	2.00	B	BR02 N=12 (2,2/3,3,3,3)				
								2.00	C					
2.5							70.5							
3.0							70.0	3.00	B	BR03 N=15 (3,3/4,3,4,4)				
								3.00	C					
3.5							69.5							
4.0							69.0	4.00	B	BR04 N=17 (3,4/4,4,5,4)				
								4.00	C					
4.5							68.5							
5.0							68.0	5.00	B	BR05 50 (5,4/50 for 125mm)				
								5.00	C					
5.30							67.5	5.40	C	50 (25 for 5mm/50 for 0mm)				
5.40		Obstruction - possible boulders or weathered bedrock. or weathered bedrock. End of Borehole at 5.40m					67.61 67.51							
							67.0							






	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:	Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	-	
	5.30	5.40	01:00				04/08 06/08 06/08	3.00 3.00 5.40	Dry Dry Dry				0.00	5.40	Arisings		

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH03S										
Contract:		Brennanstown Road			Easting:		722584.313		Date Started:		10/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724223.868		Date Completed:		10/08/2020								
Client:		Cairn Homes PLC			Elevation:		73.63		Drilled By:		G. Macken								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill							
Scale	Depth					Scale	Depth	Depth	Type	Result									
	0.30	TOPSOIL.				73.5													
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.				73.33													
	1.0	Obstruction - possible boulders or weathered bedrock. End of Borehole at 1.30m				73.0													
	1.30					72.5	1.00	B	BR06										
	1.5					72.33	1.00	C	50 (5,6/50 for 25mm)										
	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													
						68.0													
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 0.80mbgl.		
		1.20	1.30	01:00				03/09	1.30	Dry				0.00	1.30	Arisings			

Contract No: 5752		Cable Percussion Borehole Log										Borehole No: BH04S							
Contract:		Brennanstown Road					Easting:		722632.246		Date Started:		10/08/2020						
Location:		Cabinteely, Dublin 18					Northing:		724180.947		Date Completed:		10/08/2020						
Client:		Cairn Homes PLC					Elevation:		70.42		Drilled By:		T. Tindall						
Engineer:		Waterman Moylan					Borehole Diameter:		200mm		Status:		FINAL						
Depth (m)		Stratum Description					Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill					
Scale	Depth							Scale	Depth	Depth	Type	Result							
	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.							70.32										
	0.90	Obstruction - possible boulders or weathered bedrock. End of Borehole at 0.90m							69.52										
	0.5								70.0										
	1.0								69.5										
	1.5								69.0										
	2.0								68.5										
	2.5								68.0										
	3.0								67.5										
	3.5								67.0										
	4.0								66.5										
	4.5								66.0										
	5.0								65.5										
	5.5								65.0										
									64.5										
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - also 0.90mbgl.		
		0.20	0.30	01:00				04/09	0.90	Dry				0.00	0.90	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH06S										
Contract:		Brennanstown Road			Easting:		722519.998		Date Started:		11/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724205.129		Date Completed:		11/08/2020								
Client:		Cairn Homes PLC			Elevation:		71.56		Drilled By:		G. Macken								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill							
Scale	Depth					Scale	Depth	Depth	Type	Result									
	0.20	TOPSOIL.				71.5													
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.				71.36													
	0.80	Obstruction - possible boulders or weathered bedrock.				71.0													
	1.0	End of Borehole at 0.80m				70.76													
	1.5					70.5													
	2.0					70.0													
	2.5					69.5													
	3.0					69.0													
	3.5					68.5													
	4.0					68.0													
	4.5					67.5													
	5.0					67.0													
	5.5					66.5													
						66.0													
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 0.60mbgl.		
		0.70	0.80	01:00				11/08	0.80	Dry				0.00	0.80	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH08S										
Contract:		Brennanstown Road			Easting:		722476.799		Date Started:		11/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724330.299		Date Completed:		11/08/2020								
Client:		Cairn Homes PLC			Elevation:		78.75		Drilled By:		T. Tindall								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill							
Scale	Depth					Scale	Depth	Depth	Type	Result									
	0.10	TOPSOIL.					78.65												
		Brown slightly sandy slightly gravelly silty CLAY.					78.5												
	0.40	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.					78.35												
	0.5						78.0												
	1.0	Obstruction - possible boulders or weathered bedrock.					77.65	1.00	B	BR07									
	1.10	End of Borehole at 1.10m					77.5	1.10	C	50 (25 for 80mm/50 for 0mm)									
	1.5						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:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 1.00mbgl.		
		1.00	1.10	01:00				11/08	1.10	Dry				0.00	1.10	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH09S										
Contract:		Brennanstown Road			Easting:		722605.172		Date Started:		11/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724288.231		Date Completed:		11/08/2020								
Client:		Cairn Homes PLC			Elevation:		75.75		Drilled By:		T. Tindall								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill							
Scale	Depth					Scale	Depth	Depth	Type	Result									
	0.20	TOPSOIL.																	
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.				75.5	75.55												
	1.00	Obstruction - possible boulders or weathered bedrock. End of Borehole at 1.00m					74.75	1.00	C	50 (25 for 5mm/50 for 0mm)									
	1.5																		
	2.0																		
	2.5																		
	3.0																		
	3.5																		
	4.0																		
	4.5																		
	5.0																		
	5.5																		
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 1.00mbgl.		
		0.90	1.00	01:00				11/08	1.00	Dry				0.00	1.00	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH10S								
Contract:		Brennanstown Road			Easting:		722657.744		Date Started:		04/08/2020						
Location:		Cabinteely, Dublin 18			Northing:		724304.402		Date Completed:		04/08/2020						
Client:		Cairn Homes PLC			Elevation:		73.23		Drilled By:		T. Tindall						
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL						
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill					
Scale	Depth					Scale	Depth	Depth	Type	Result							
	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY.				73.13											
0.5						73.0											
	0.90	Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content.				72.33											
1.0						72.0	1.00	B	BR08 N=11 (2,3/3,2,3,3)								
1.5						72.0	1.00	C									
2.0						71.5											
2.5						71.0	2.00	B	BR09 N=12 (2,2/3,3,3,3)								
3.0						71.0	2.00	C									
3.5						70.5											
4.0						70.0	3.00	B	BR10 N=13 (2,3/3,4,3,3)								
4.5						70.0	3.00	C									
5.0						69.5											
5.5						69.0	4.00	B	BR11 N=17 (3,3/4,4,4,5)								
5.70						69.0	4.00	C									
5.80		Obstruction - possible boulders or weathered bedrock. End of Borehole at 5.80m				67.53 67.43	5.80	C	50 (25 for 5mm/50 for 0mm)								
		Chiselling:		Water Strikes:		Water Details:			Installation:			Backfill:		Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT	
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:		Type:
		5.70	5.80	01:00				04/08	5.80	Dry				0.00	5.80		Arisings







Contract No: 5752	Cable Percussion Borehole Log				Borehole No: BH11S
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Contract:	Brennanstown Road	Easting:	722490.491	Date Started:	12/08/2020
Location:	Cabinteely, Dublin 18	Northing:	724255.097	Date Completed:	12/08/2020
Client:	Cairn Homes PLC	Elevation:	74.26	Drilled By:	T. Tindall
Engineer:	Waterman Moylan	Borehole Diameter:	200mm	Status:	FINAL




Depth (m)		Stratum Description	Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth			Scale	Depth	Depth	Type	Result		
	0.10	TOPSOIL. Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.			74.16					
	0.5				74.0					
	1.0				73.5					
	1.80				73.0	1.00	B	BR13 N=14 (3,3/3,4,3,4)		
	1.90				72.5	1.00	C			
	1.80	Obstruction - possible boulders or weathered bedrock.			72.46					
	1.90	End of Borehole at 1.90m			72.36	1.90	C	50 (25 for 5mm/50 for 0mm)		
	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:			Installation:			Backfill:			Remarks:	Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:		
	1.80	1.90	01:00				12/08	1.90	Dry				0.00	1.90	Arisings		


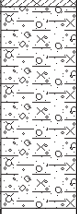


Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH12S										
Contract:		Brennanstown Road			Easting:		722504.969		Date Started:		12/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724224.963		Date Completed:		12/08/2020								
Client:		Cairn Homes PLC			Elevation:		72.42		Drilled By:		G. Macken								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill							
Scale	Depth					Scale	Depth	Depth	Type	Result									
	0.20	TOPSOIL.					72.22												
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.					72.0												
	1.0	Obstruction - possible boulders or weathered bedrock.					71.5	1.00	B	BR14 50 (25 for 50mm/50 for 5mm)									
	1.10	End of Borehole at 1.10m					71.32	1.10	C										
	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												
							66.5												
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 1.00mbgl.		
		1.00	1.10	01:00				12/08	1.10	Dry				0.00	1.10	Arisings			





Contract No: 5752		Cable Percussion Borehole Log										Borehole No: BH13S							
Contract:		Brennanstown Road				Easting:		722531.447		Date Started:		12/08/2020							
Location:		Cabinteely, Dublin 18				Northing:		724230.529		Date Completed:		12/08/2020							
Client:		Cairn Homes PLC				Elevation:		73.59		Drilled By:		G. Macken							
Engineer:		Waterman Moylan				Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth						Scale	Depth	Depth	Type	Result								
	0.20	TOPSOIL.					73.5												
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.					73.39												
	0.90	Obstruction - possible boulders or weathered bedrock.					73.0												
	1.0	End of Borehole at 0.90m					72.69												
	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												
							68.0												
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 0.80mbgl.		
		0.80	0.90	01:00				12/08	0.90	Dry				0.00	0.90	Arisings			








Contract No: 5752		Cable Percussion Borehole Log										Borehole No: BH14S							
Contract:		Brennanstown Road				Easting:		722599.749		Date Started:		06/08/2020							
Location:		Cabinteely, Dublin 18				Northing:		724238.597		Date Completed:		06/08/2020							
Client:		Cairn Homes PLC				Elevation:		74.12		Drilled By:		T. Tindall							
Engineer:		Waterman Moylan				Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth						Scale	Depth	Depth	Type	Result								
	0.10	TOPSOIL.					74.0	74.02											
	0.40	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.						73.72											
	0.5	Obstruction - possible boulders or weathered bedrock.						73.5											
		End of Borehole at 0.40m						73.0											
	1.0							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																		
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - also 0.40mbgl.		
		0.30	0.40	01:00				06/08	0.40	Dry				0.00	0.40	Arisings			

Contract No: 5752		Cable Percussion Borehole Log										Borehole No: BH15S							
Contract:		Brennanstown Road				Easting:		722633.677		Date Started:		06/08/2020							
Location:		Cabinteely, Dublin 18				Northing:		724236.099		Date Completed:		06/08/2020							
Client:		Cairn Homes PLC				Elevation:		72.76		Drilled By:		T. Tindall							
Engineer:		Waterman Moylan				Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill					
Scale	Depth						Scale	Depth	Depth	Type	Result								
	0.30	MADE GROUND: grey silty sandy gravel with low cobble content.					72.5	72.46											
	0.5	Obstruction - possible boulders or weathered bedrock.																	
		End of Borehole at 0.30m																	
	1.0																		
	1.5																		
	2.0																		
	2.5																		
	3.0																		
	3.5																		
	4.0																		
	4.5																		
	5.0																		
	5.5																		
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - also 0.30mbgl.		
		0.20	0.30	01:00				06/08	0.30	Dry				0.00	0.30	Arisings			








Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH16S										
Contract:		Brennanstown Road			Easting:		722635.535		Date Started:		11/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724206.358		Date Completed:		11/08/2020								
Client:		Cairn Homes PLC			Elevation:		71.67		Drilled By:		T. Tindall								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill							
Scale	Depth					Scale	Depth	Depth	Type	Result									
	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.				71.5	71.57												
	0.70	Obstruction - possible boulders or weathered bedrock. End of Borehole at 0.70m				71.0	70.97												
	0.5																		
	1.0																		
	1.5																		
	2.0																		
	2.5																		
	3.0																		
	3.5																		
	4.0																		
	4.5																		
	5.0																		
	5.5																		
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 0.30mbgl.		
		0.60	0.70	01:00				11/08	0.70	Dry				0.00	0.70	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH17S										
Contract:		Brennanstown Road			Easting:		722583.353		Date Started:		10/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724180.572		Date Completed:		10/08/2020								
Client:		Cairn Homes PLC			Elevation:		70.58		Drilled By:		G. Macken								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill							
Scale	Depth					Scale	Depth	Depth	Type	Result									
	0.30	TOPSOIL.				70.5													
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.				70.28													
	1.10	Obstruction - possible boulders or weathered bedrock. End of Borehole at 1.10m				70.0													
	1.10					69.5	69.48	1.00 1.10	B C	BR15 50 (25 for 25mm/50 for 5mm)									
	1.5					69.0													
	2.0					68.5													
	2.5					68.0													
	3.0					67.5													
	3.5					67.0													
	4.0					66.5													
	4.5					66.0													
	5.0					65.5													
	5.5					65.0													
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 0.90mbgl.		
		1.00	1.10	01:00				10/08	1.10	Dry				0.00	1.10	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH18S									
Contract:		Brennanstown Road			Easting:		722514.910		Date Started:		11/08/2020							
Location:		Cabinteely, Dublin 18			Northing:		724181.761		Date Completed:		11/08/2020							
Client:		Cairn Homes PLC			Elevation:		69.95		Drilled By:		G. Macken							
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth					Scale	Depth	Depth	Type	Result								
	0.20	TOPSOIL.					69.75											
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.					69.5											
	1.0						69.0	1.00	B	BR16 50 (4,5/50 for 90mm) 50 (25 for 5mm/50 for 0mm)								
	1.30						68.65	1.00	C									
	1.5	Obstruction - possible boulders or weathered bedrock.					68.5											
	2.0	End of Borehole at 1.30m					68.0											
	2.5						67.5											
	3.0						67.0											
	3.5						66.5											
	4.0						66.0											
	4.5						65.5											
	5.0						65.0											
	5.5						64.5											
							64.0											
	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 0.90mbgl.		
	1.20	1.30	01:00				11/08	1.30	Dry				0.00	1.30	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH19S										
Contract:		Brennanstown Road			Easting:		722528.853		Date Started:		11/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724167.924		Date Completed:		11/08/2020								
Client:		Cairn Homes PLC			Elevation:		69.08		Drilled By:		G. Macken								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill							
Scale	Depth					Scale	Depth	Depth	Type	Result									
	0.20	TOPSOIL.				69.0													
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.				68.88													
	0.60	Obstruction - possible boulders or weathered bedrock.				68.5	68.48												
	1.0	End of Borehole at 0.60m				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:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 0.50mbgl.		
		0.50	0.60	01:00				11/08	0.60	Dry				0.00	0.60	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH20S									
Contract:		Brennanstown Road			Easting:		722519.395		Date Started:		11/08/2020							
Location:		Cabinteely, Dublin 18			Northing:		724096.139		Date Completed:		11/08/2020							
Client:		Cairn Homes PLC			Elevation:		63.81		Drilled By:		G. Macken							
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth					Scale	Depth	Depth	Type	Result								
	0.20	TOPSOIL.					63.61											
	0.5	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.				63.5												
	0.80	Obstruction - possible boulders or weathered bedrock.				63.0	63.01											
	1.0	End of Borehole at 0.80m																
	1.5																	
	2.0																	
	2.5																	
	3.0																	
	3.5																	
	4.0																	
	4.5																	
	5.0																	
	5.5																	
	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - also 0.80mbgl.		
	0.70	0.80	01:00				11/08	0.80	Dry				0.00	0.80	Arisings			

Contract No: 5752		Cable Percussion Borehole Log										Borehole No: BH21S							
Contract:		Brennanstown Road				Easting:		722542.842		Date Started:		11/08/2020							
Location:		Cabinteely, Dublin 18				Northing:		724153.164		Date Completed:		11/08/2020							
Client:		Cairn Homes PLC				Elevation:		68.14		Drilled By:		G. Macken							
Engineer:		Waterman Moylan				Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth						Scale	Depth	Depth	Type	Result								
	0.20	TOPSOIL.					68.0												
	0.50	Brown slightly sandy slightly gravelly silty CLAY with low cobble content.					67.94												
	0.50	Obstruction - possible boulders or weathered bedrock.					67.64												
		End of Borehole at 0.50m					67.5												
	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						63.5												
	5.0						63.0												
	5.5						62.5												
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - also 0.50mbgl.		
		0.40	0.50	01:00				11/08	0.50	Dry				0.00	0.50	Arisings			

Contract No: 5752		Cable Percussion Borehole Log										Borehole No: BH23S							
Contract:		Brennanstown Road				Easting:		722579.882		Date Started:		07/08/2020							
Location:		Cabinteely, Dublin 18				Northing:		724124.231		Date Completed:		07/08/2020							
Client:		Cairn Homes PLC				Elevation:		66.57		Drilled By:		T. Tindall							
Engineer:		Waterman Moylan				Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth						Scale	Depth	Depth	Type	Result								
	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.					66.5	66.47											
	0.40	Obstruction - possible boulders or weathered bedrock. End of Borehole at 0.40m						66.17											
	0.5							66.0											
	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							61.5											
	5.5							61.0											
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - also 0.40mbgl.		
		0.30	0.40	01:00				07/08	0.40	Dry				0.00	0.40	Arisings			

Contract No: 5752		Cable Percussion Borehole Log							Borehole No: BH24S										
Contract:		Brennanstown Road			Easting:		722602.835		Date Started:		10/08/2020								
Location:		Cabinteely, Dublin 18			Northing:		724147.271		Date Completed:		10/08/2020								
Client:		Cairn Homes PLC			Elevation:		68.42		Drilled By:		T. Tindall								
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL								
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth						Scale	Depth	Depth	Type	Result								
	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.						68.32											
0.5								68.0											
1.0								67.5	1.00	B	BR17								
	1.20	Obstruction - possible boulders or weathered bedrock.						67.22	1.00	C	50 (25 for 85mm/50 for 5mm)								
		End of Borehole at 1.20m						67.0	1.20	C	50 (25 for 5mm/50 for 0mm)								
1.5								67.0											
2.0								66.5											
2.5								66.0											
3.0								65.5											
3.5								65.0											
4.0								64.5											
4.5								64.0											
5.0								63.5											
5.5								63.0											
								62.5											
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 1.20mbgl.		
		1.10	1.20	01:00				10/08	1.20	Dry				0.00	1.20	Arisings			

Contract No: 5752		Cable Percussion Borehole Log										Borehole No: BH25S							
Contract:		Brennanstown Road				Easting:		722611.665		Date Started:		10/08/2020							
Location:		Cabinteely, Dublin 18				Northing:		724127.402		Date Completed:		10/08/2020							
Client:		Cairn Homes PLC				Elevation:		67.33		Drilled By:		T. Tindall							
Engineer:		Waterman Moylan				Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth						Scale	Depth	Depth	Type	Result								
	0.10	TOPSOIL. Brown slightly sandy slightly gravelly silty CLAY with low cobble content.						67.23											
	0.90	Obstruction - possible boulders or weathered bedrock. End of Borehole at 0.90m						66.43											
	0.5							67.0											
	1.0							66.5											
	1.5							66.0											
	2.0							65.5											
	2.5							65.0											
	3.0							64.5											
	3.5							64.0											
	4.0							63.5											
	4.5							63.0											
	5.0							62.5											
	5.5							62.0											
								61.5											
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Second attempt made to advance borehole - 0.80mbgl.		
		0.80	0.90	01:00				10/08	0.90	Dry				0.00	0.90	Arisings			

Appendix 2
Rotary Corehole Logs and Photographs

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC02S
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Contract:	Brennanstown Road	Easting:	722650.774	Date Started:	02/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724289.427	Date Completed:	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	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.									
0.5					72.5						
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					68.5						
5.0					68.0						
5.40	5.40	Core barrell used - no recovery - highly weathered GRANITE.			67.51						
6.0					67.0						
6.5					66.5						
7.0					66.0						
7.5					65.5						
8.0	8.00	Soft light grey fine to coarse grained GRANITE. Highly weathered.			64.91						
8.5					64.5						
9.0					64.0	8.00 - 10.00	25	25	19		
9.5					63.5						
10.0	10.00	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 45°, occasional sub-vertical dip, clean.</i>			62.91						
10.5					62.5						10
11.0					62.0	10.00 - 11.50	87	67	31		7
11.5					61.5						
12.0					61.0						
12.5					60.5	11.50 - 13.00	83	83	48		10
13.0	13.00	End of Corehole at 13.00m			59.91						2
13.5					59.5						
14.0					59.0						
14.5					58.5						
					58.0						

	Installation:			Backfill:			Remarks:
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	13.00	Bentonite	Cable percussive borehole previously completed.

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC03S
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Contract:	Brennanstown Road	Easting:	722584.313	Date Started:	03/10/2020
Location:	Cabinteely, Dublin 18	Northing:	724223.868	Date Completed:	03/10/2020
Client:	Cairn Homes PLC	Elevation:	73.63	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		73.5							
	1.30	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.		72.33							
	3.20	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>		70.43						15	
						3.20 - 4.70	91	80	64		
						4.70 - 6.20	77	77	77	3	
	6.20	End of Corehole at 6.20m		67.43							

	Installation:			Backfill:			Remarks:
	From:	To:	Pipe Type:	From:	To:	Type:	Cable percussive borehole previously completed.
			0.00	6.20	Bentonite		

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC06S
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Contract:	Brennanstown Road	Easting:	722519.998	Date Started:	18/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724205.129	Date Completed:	18/11/2020
Client:	Cairn Homes PLC	Elevation:	71.56	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		71.0	70.76						
	0.80	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.		70.5							
	3.00	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>		68.5	68.56	3.00 - 4.50	96	84	68	14	
				68.0						2	
				67.5							
				67.0						10	
				66.5		4.50 - 6.00	83	67	0	6	
				66.0						15	
	6.00	End of Corehole at 6.00m		65.5	65.56						
				65.0							
				64.5							
				64.0							
				63.5							
				63.0							
				62.5							
				62.0							
				61.5							
				61.0							
				60.5							
				60.0							
				59.5							
				59.0							
				58.5							
				58.0							
				57.5							
				57.0							

	Installation:			Backfill:			Remarks: Cable percussive borehole previously completed.
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	6.00	Bentonite	

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC08S
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Contract:	Brennanstown Road	Easting:	722476.799	Date Started:	20/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724330.299	Date Completed:	20/11/2020
Client:	Cairn Homes PLC	Elevation:	78.75	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		78.5							
	1.10	Open hole drilling - driller reports returns of brown sandy gravelly silty clay with cobbles and boulders.		77.65							
	3.40	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>		75.35							
						3.40 - 4.90	91	79	79	2	
										Ni	
						4.90 - 6.40	100	36	36	6	
	6.40	End of Corehole at 6.40m		72.35							

	Installation:			Backfill:			Remarks:
	From:	To:	Pipe Type:	From:	To:	Type:	Cable percussive borehole previously completed.
				0.00	6.40	Bentonite	

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC10S
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Contract:	Brennanstown Road	Easting:	722657.744	Date Started:	02/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724304.402	Date Completed:	02/11/2020
Client:	Cairn Homes PLC	Elevation:	73.23	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		73.0							
0.5				72.5							
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				68.5							
5.0				68.0							
5.5				67.5	67.43						
5.80		Core barrell used - no recovery - highly weathered GRANITE.		67.0							
6.0				66.5							
6.5				66.0							
7.0				65.5	65.73						
7.50		Soft light grey fine to coarse grained GRANITE. Highly weathered.		65.0							
8.0				64.5		7.50 - 10.00	60	23	16		
8.5				64.0							
9.0				63.5							
9.5				63.0	63.13						
10.0		Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered.		62.5							
10.5		<i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional grey staining.</i>		62.0		10.00 - 11.50	100	70	36	12	
11.0				61.5							
11.5				61.0							
12.0				60.5		11.50 - 13.00	100	67	37	5	
12.5				60.0	60.23						
13.0	13.00	End of Corehole at 13.00m		59.5							
13.5				59.0							
14.0				58.5							

	Installation:			Backfill:			Remarks:
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	13.00	Bentonite	Cable percussive borehole previously completed.

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC11S
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Contract:	Brennanstown Road	Easting:	722490.491	Date Started:	23/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724255.097	Date Completed:	23/11/2020
Client:	Cairn Homes PLC	Elevation:	74.26	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		74.0							
0.5				73.5							
1.0				73.0							
1.5				72.5							
2.0	1.90	Open hole drilling - driller reports returns of brown sandy gravelly silty clay with cobbles and boulders.		72.0	72.36						
2.5				71.5							
3.0	3.00	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>		71.0	71.26					7	
3.5				70.5		3.00 - 4.50	90	81	69		
4.0				70.0						4	
4.5				69.5							
5.0				69.0		4.50 - 6.00	90	87	67		
5.5				68.5						8	
6.0	6.00	End of Corehole at 6.00m		68.0	68.26						
6.5				67.5							
7.0				67.0							
7.5				66.5							
8.0				66.0							
8.5				65.5							
9.0				65.0							
9.5				64.5							
10.0				64.0							
10.5				63.5							
11.0				63.0							
11.5				62.5							
12.0				62.0							
12.5				61.5							
13.0				61.0							
13.5				60.5							
14.0				60.0							
14.5				59.5							

	Installation:			Backfill:			Remarks: Cable percussive borehole previously completed.
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	6.00	Bentonite	

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC16S
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Contract:	Brennanstown Road	Easting:	722635.535	Date Started:	03/10/2020
Location:	Cabinteely, Dublin 18	Northing:	724206.358	Date Completed:	03/10/2020
Client:	Cairn Homes PLC	Elevation:	71.67	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL


Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill					
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m						
		Cable percussive borehole completed - see CP log.		71.5												
0.5	0.70	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.		71.0	70.97											
1.0					70.5											
1.5					70.0											
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											
7.0	7.20		Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>		64.5	64.47	7.20 - 8.70	93	72	13	11					
7.5				64.0												
8.0					63.5		8.70 - 10.20	87	64	48	6					
8.5					63.0											
9.0					62.5											
9.5					62.0							Ni				
10.0	10.20				61.5	61.47						3				
10.5		End of Corehole at 10.20m			61.0											
11.0					60.5											
11.5					60.0											
12.0				59.5												
12.5				59.0												
13.0				58.5												
13.5				58.0												
14.0				57.5												
14.5				57.0												

	Installation:			Backfill:			Remarks:
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	10.20	Bentonite	Cable percussive borehole previously completed.

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC17S
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Contract:	Brennanstown Road	Easting:	722583.353	Date Started:	17/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724180.572	Date Completed:	17/11/2020
Client:	Cairn Homes PLC	Elevation:	70.58	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL


Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		70.5							
0.5				70.0							
1.0	1.10	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.		69.5	69.48						
1.5				69.0							
2.0	2.00	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>		68.5	68.58	2.00 - 3.50	83	72	0	5	
2.5				68.0						10	
3.0				67.5							
3.5				67.0							
4.0				66.5		3.50 - 5.00	95	95	87	5	
4.5				66.0							
5.0	5.00	End of Corehole at 5.00m		65.5	65.58						
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							
10.0				60.5							
10.5				60.0							
11.0				59.5							
11.5				59.0							
12.0				58.5							
12.5				58.0							
13.0				57.5							
13.5				57.0							
14.0				56.5							
14.5				56.0							

	Installation:			Backfill:			Remarks: Cable percussive borehole previously completed.
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	5.00	Bentonite	

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC18S
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Contract:	Brennanstown Road	Easting:	722514.910	Date Started:	17/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724181.761	Date Completed:	17/11/2020
Client:	Cairn Homes PLC	Elevation:	69.95	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		69.5							
	1.30	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.		68.65							
	2.90	Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>		67.05		2.90 - 4.40	100	93	21	20	
				66.5						3	
				66.0						17	
				65.5							
				65.0		4.40 - 6.00	36	36	10	VOID	
				64.5							
				64.0						12	
				63.5							
				63.0		6.00 - 7.00	0	0	0	VOID	
	7.00	End of Corehole at 7.00m		62.95							
				62.5							
				62.0							
				61.5							
				61.0							
				60.5							
				60.0							
				59.5							
				59.0							
				58.5							
				58.0							
				57.5							
				57.0							
				56.5							
				56.0							
				55.5							

	Installation:			Backfill:			Remarks: Cable percussive borehole previously completed. Core barrell jamming in hole on possible ledge of bedrock.
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	7.00	Bentonite	

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC20S
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Contract:	Brennanstown Road	Easting:	722519.395	Date Started:	19/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724096.139	Date Completed:	19/11/2020
Client:	Cairn Homes PLC	Elevation:	63.81	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL


Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		63.5							
0.5	0.80	Open hole drilling - driller reports returns of gravel and fill.		63.0	63.01						
1.0				62.5							
1.5			62.0								
2.0			61.5								
2.5			61.0								
3.0	3.00	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.		60.8	60.81						
3.5				60.5							
4.0				60.0							
4.5				59.5							
5.0				59.0							
5.5				58.5							
6.0				58.0							
6.5				57.5							
7.0				57.0							
7.5	7.50		Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>		56.3	56.31					
8.0				56.0		7.50 - 9.00	100	100	100	4	
8.5				55.5							
9.0				55.0							
9.5			54.5								
10.0			54.0		9.00 - 10.50	91	42	39	13		
10.5	10.50	End of Corehole at 10.50m		53.5	53.31						
11.0				53.0							
11.5				52.5							
12.0				52.0							
12.5				51.5							
13.0				51.0							
13.5				50.5							
14.0				50.0							
14.5				49.5							
				49.0							

	Installation:			Backfill:			Remarks:
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	10.50	Bentonite	Cable percussive borehole previously completed.

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC23S
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Contract:	Brennanstown Road	Easting:	722579.882	Date Started:	19/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724124.231	Date Completed:	19/11/2020
Client:	Cairn Homes PLC	Elevation:	66.57	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill		
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m			
	0.40	Cable percussive borehole completed - see CP log.			66.17								
	0.5	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite.			66.0								
	1.0				65.5								
	1.5				65.0								
	2.0				64.5								
	2.5				64.0								
	3.0				63.5	63.57					15		
	3.00			Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i>				3.00 - 4.50	93	81	61	5	
	3.5											Ni	
	4.0												
	4.5												
	5.0												
	5.5												
	6.0												
	6.00	End of Corehole at 6.00m			60.57								
	6.5				60.0								
	7.0				59.5								
	7.5				59.0								
	8.0				58.5								
	8.5				58.0								
	9.0				57.5								
	9.5				57.0								
	10.0				56.5								
	10.5				56.0								
	11.0				55.5								
	11.5				55.0								
	12.0				54.5								
	12.5				54.0								
	13.0				53.5								
	13.5				53.0								
	14.0				52.5								
	14.5				52.0								

	Installation:			Backfill:			Remarks:
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	6.00	Bentonite	Cable percussive borehole previously completed.

Contract No: 5752	<h1>Rotary Corehole Log</h1>				Corehole No: RC25S
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Contract:	Brennanstown Road	Easting:	722611.665	Date Started:	18/11/2020
Location:	Cabinteely, Dublin 18	Northing:	724127.402	Date Completed:	18/11/2020
Client:	Cairn Homes PLC	Elevation:	67.33	Drilled By:	MEDL
Engineer:	Waterman Moylan	Rig Type:	Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
		Cable percussive borehole completed - see CP log.		67.0							
0.5	0.90	Open hole drilling - driller reports returns of gravelly sand with cobbles and boulders - highly weathered granite. <i>Discontinuities - rough, planar, tight to open, sub-horizontal to 60°, occasional sub-vertical dip, clean with occasional brown staining.</i> Strong to very strong light grey fine to coarse grained GRANITE. Fresh to slightly weathered.		66.5	66.43						
1.0				66.0							
1.5				65.5							
2.0				65.0							
2.5				64.5							
3.0	3.20			64.0	64.13	3.20 - 4.70	84	30	25	13	
3.5				63.5						5	
4.0				63.0						12	
4.5				62.5		4.70 - 6.20	100	79	55	7	
5.0				62.0						10	
5.5			61.5								
6.0	6.20	End of Corehole at 6.20m		61.0	61.13						
6.5				60.5							
7.0				60.0							
7.5				59.5							
8.0				59.0							
8.5				58.5							
9.0				58.0							
9.5				57.5							
10.0				57.0							
10.5				56.5							
11.0				56.0							
11.5				55.5							
12.0				55.0							
12.5				54.5							
13.0				54.0							
13.5				53.5							
14.0				53.0							
14.5				52.5							

	Installation:			Backfill:			Remarks: Cable percussive borehole previously completed.
	From:	To:	Pipe Type:	From:	To:	Type:	
				0.00	6.20	Bentonite	

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

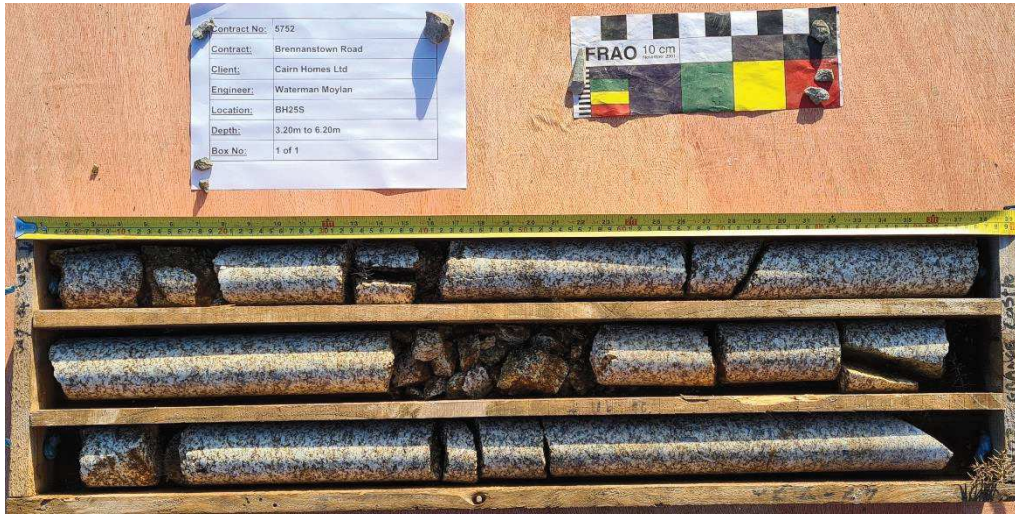


RC23S Box 1 of 1


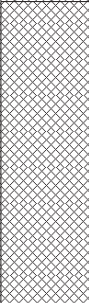

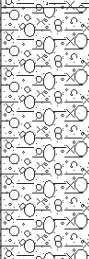



5752 – Brennanstown Road – South Site
Rotary Core Photographs

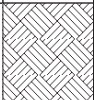
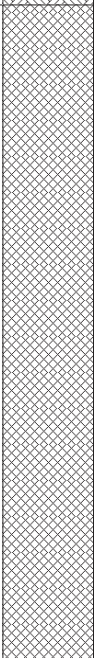

RC25S Box 1 of 1

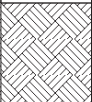
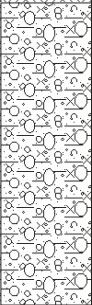




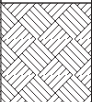

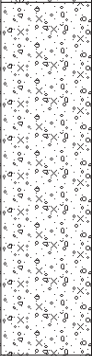

Appendix 3
Trial Pit Logs and Photographs


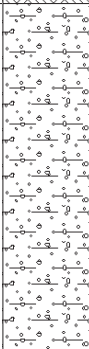


Contract No: 5752		Trial Pit Log				Trial Pit No: TP01S			
Contract:		Brennanstown Road	Easting:	722498.422	Date:	02/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724337.977	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	78.89	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	3.80 x 0.70 x 1.40	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.10	TOPSOIL			78.79				
	0.10	MADE GROUND: black grey brown sandy gravelly silty clay with medium cobble and some plastic fragments.			78.5	0.50	ES	MK20	
	0.70	Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles are angular to subangular of granite.			78.19				
	0.90	Firm brown slightly sandy gravelly silty CLAY with high cobble and boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).			78.0	77.99	0.90	B	MK21
	1.40	Pit terminated at 1.40m			77.5	77.49			
	1.5								
	2.0								
	2.5								
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

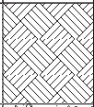
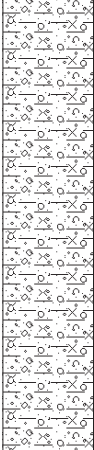
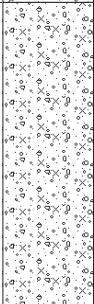

Contract No: 5752		Trial Pit Log				Trial Pit No: TP02S				
Contract:		Brennanstown Road	Easting:		722457.205	Date:		02/09/2020		
Location:		Cabinteely, Dublin 18	Northing:		724297.219	Excavator:		JCB 3CX		
Client:		Cairn Homes PLC	Elevation:		77.82	Logged By:		M. Kaliski		
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):		4.40 x 0.70 x 1.50	Status:		FINAL		
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike
Scale:	Depth					Scale:	Depth:	Depth	Type	Result
	0.20	TOPSOIL					77.62			
	0.30	MADE GROUND: brown slightly sandy gravelly silty clay with high cobble and low boulder content and some rags, scrap metal and concrete fragments.					77.52			
	0.50	MADE GROUND: grey sandy gravel with high cobble and low boulder content and some concrete fragments.					77.00			
	1.10	Firm brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles are angular to subangular of granite.					76.72	1.00	B	MK22
	1.30	Firm brown slightly sandy gravelly silty CLAY with high cobble and boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).					76.52			
	1.50	Pit terminated at 1.50m					76.32			
	2.00						76.00			
	2.50						75.50			
							75.00			
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental			






Contract No: 5752		Trial Pit Log				Trial Pit No: TP03S			
Contract:		Brennanstown Road	Easting:	722495.741	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724275.695	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	77.07	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	3.60 x 0.70 x 1.50	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL		77.0					
0.20		MADE GROUND: brown slightly silty slightly sandy gravelly silty clay with medium cobble and some concrete fragments.		76.87					
0.5				76.5					
1.0				76.0	1.00	B	MK24		
1.5	1.50	Pit terminated at 1.50m		75.57					
				75.5					
2.0				75.0					
2.5				74.5					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		


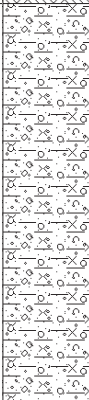
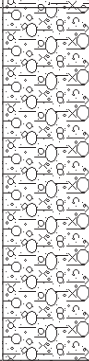

Contract No: 5752		Trial Pit Log				Trial Pit No: TP04S					
Contract:		Brennanstown Road	Easting:		722473.013	Date:		02/09/2020			
Location:		Cabinteely, Dublin 18	Northing:		724256.820	Excavator:		JCB 3CX			
Client:		Cairn Homes PLC	Elevation:		74.96	Logged By:		M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):		4.60 x 0.70 x 0.90	Status:		FINAL			
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike	
Scale:	Depth					Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL					74.76				
	0.5	Soft becoming firm brown slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).					74.5				
	0.80	Light brown silty sandy gravelly angular COBBLES and BOULDERS of granite.					74.16				
	0.90	Pit terminated at 0.90m					74.06				
	1.0						74.0	1.00	B	MK23	
	1.5						73.5				
	2.0						73.0				
	2.5						72.5				
							72.0				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry				B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental			

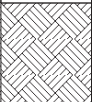
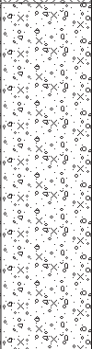


Contract No: 5752		Trial Pit Log				Trial Pit No: TP05S			
Contract:		Brennanstown Road	Easting:	722518.233	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724233.150	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	73.68	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	4.30 x 0.70 x 1.80	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL		73.5	73.48				
0.20		Light brown silty sandy fine to coarse, angular GRAVEL of granite with high cobble content. Sand is fine to coarse. Cobbles are angular to subangular of granite.		73.0					
0.5									
1.0									
1.10		Light brown silty sandy fine to coarse, angular GRAVEL of granite with high cobble and medium boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 600mm diameter).		72.5	72.58	1.00	B	MK09	
1.5									
1.80		Pit terminated at 1.80m							
2.0									
2.5									
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

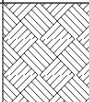
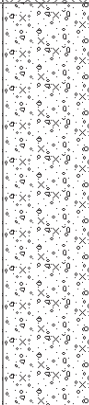
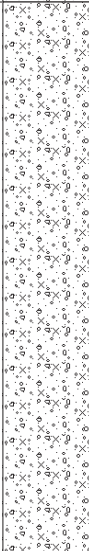

Contract No: 5752		Trial Pit Log				Trial Pit No: TP06S			
Contract:		Brennanstown Road	Easting:	722505.171	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724211.221	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	70.99	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	4.30 x 0.70 x 2.50	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.10	TOPSOIL			70.89				
		Light brown slightly silty sandy fine to coarse, angular GRAVEL of granite. Sand is fine to coarse.			70.5				
	0.80	Light brown slightly silty sandy fine to coarse, angular GRAVEL of granite with medium cobble content. Sand is fine to coarse. Cobbles are angular to subangular of granite.			70.19				
					70.0	1.00	B	MK10	
					69.5				
					69.0				
	2.50	Pit terminated at 2.50m			68.5	68.49			
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:	
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry				B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental	

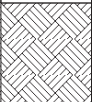
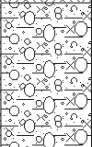
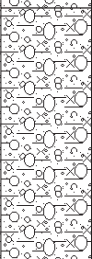

Contract No: 5752		Trial Pit Log				Trial Pit No: TP07S				
Contract:		Brennanstown Road		Easting:	722531.396	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18		Northing:	724189.511	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC		Elevation:	70.90	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan		Dimensions (LxWxD) (m):	3.90 x 0.70 x 1.70	Status:	FINAL			
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike
Scale:	Depth					Scale:	Depth:	Depth	Type	Result
	0.20	TOPSOIL					70.70			
	0.5	Soft becoming firm light brown slightly sandy gravelly silty CLAY with medium cobble content interbedded with clayey gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles are angular to subangular of granite.					70.5			
	1.10	Light brown grey slightly silty sandy fine to coarse, angular GRAVEL of granite with medium cobble and low boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).					70.0			
	1.70	Pit terminated at 1.70m					69.80	1.00	B	MK11
	2.0						69.20			
	2.5						69.0			
							68.5			
							68.0			
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental			

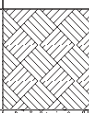
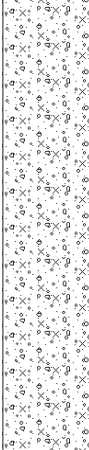

Contract No: 5752		Trial Pit Log				Trial Pit No: TP09S			
Contract:		Brennanstown Road	Easting:	722547.432	Date:	02/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724126.240	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	66.22	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	3.30 x 0.70 x 2.60	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.10	MADE GROUND: grey silty sandy gravel.			66.12				
	0.10	MADE GROUND: grey silty sandy gravelly angular cobbles of various lithologies with some plastic fragments.			66.0				
	0.70	Soft becoming firm brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).			65.52	1.00	B	MK16	
	1.50	Light grey brown silty sandy fine to coarse, angular GRAVEL of granite with medium cobble content. Sand is fine to coarse. Cobbles are angular to subangular of granite.			64.72				
	2.60	Pit terminated at 2.60m			63.62				
					63.5				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry					

Contract No: 5752		Trial Pit Log				Trial Pit No: TP10S		
Contract:	Brennanstown Road	Easting:	722557.871	Date:	01/09/2020			
Location:	Cabinteely, Dublin 18	Northing:	724231.090	Excavator:	JCB 3CX			
Client:	Cairn Homes PLC	Elevation:	74.19	Logged By:	M. Kaliski			
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	4.50 x 0.70 x 1.60	Status:	FINAL			
Level (mbgl)	Stratum Description		Legend	Level (mOD)		Samples / Field Tests		Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result
	0.10	TOPSOIL			74.09			
		Soft becoming firm brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles are angular to subangular of granite.			74.0			
	0.90	Firm brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).			73.29	1.00	B	MK08
	1.60	Pit terminated at 1.60m			72.59			
					72.5			
					72.0			
					71.5			
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:	
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry				

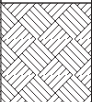
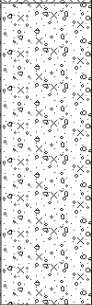
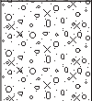

Contract No: 5752		Trial Pit Log				Trial Pit No: TP11S				
Contract:		Brennanstown Road		Easting:	722590.516	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18		Northing:	724120.860	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC		Elevation:	66.56	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan		Dimensions (LxWxD) (m):	4.80 x 0.70 x 1.00	Status:	FINAL			
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike
Scale:	Depth					Scale:	Depth:	Depth	Type	Result
	0.20	TOPSOIL				66.5				
	0.5	Light brown silty sandy fine to coarse, angular GRAVEL of granite with high cobble and low boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).				66.36				
	0.90	Light brown silty sandy gravelly angular COBBLES and BOULDERS of granite.				66.0				
	1.00	Pit terminated at 1.00m				65.66				
	1.5					65.56	1.00	B	MK15	
	2.0					65.5				
	2.5					65.0				
						64.5				
						64.0				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental			



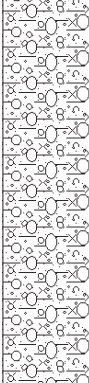
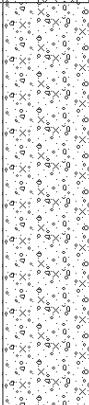

Contract No: 5752		Trial Pit Log				Trial Pit No: TP12S			
Contract:		Brennanstown Road	Easting:	722557.099	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724165.230	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	69.43	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	4.40 x 0.70 x 2.10	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL							
	0.20	Light brown silty sandy fine to coarse, angular GRAVEL of granite with medium cobble and low boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).			69.23				
	0.5				69.0				
	1.00	Light grey brown silty sandy fine to coarse, angular GRAVEL of granite with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 500mm diameter).			68.43	1.00	B	MK12	
	1.5				68.0				
	2.10	Pit terminated at 2.10m			67.33				
	2.5				67.0				
					66.5				
	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:		
	Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry				B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5752		Trial Pit Log				Trial Pit No: TP13S					
Contract:		Brennanstown Road		Easting:	722600.711	Date:	01/09/2020				
Location:		Cabinteely, Dublin 18		Northing:	724248.482	Excavator:	JCB 3CX				
Client:		Cairn Homes PLC		Elevation:	74.49	Logged By:	M. Kaliski				
Engineer:		Waterman Moylan		Dimensions (LxWxD) (m):	4.00 x 1.00 x 1.00	Status:	FINAL				
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth					Scale:	Depth:	Depth	Type	Result	
		TOPSOIL									
	0.20	Soft becoming firm light brown slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).				74.29					
	0.50	Firm brown slightly sandy gravelly silty CLAY with high cobble and boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular of granite. Cobbles and boulders are angular to subangular of granite (up to 600mm diameter).				74.0	73.99				
	1.00	Pit terminated at 1.00m				73.5	73.49	1.00	B	MK03	
	1.5										
	2.0										
	2.5										
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:			
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry							B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5752		Trial Pit Log				Trial Pit No: TP14S			
Contract:		Brennanstown Road	Easting:	722612.554	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724200.576	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	71.69	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	4.30 x 0.70 x 1.10	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL		71.5	71.49				
	0.5	Light grey brown silty sandy fine to coarse, angular GRAVEL of granite with high cobble and medium boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 500mm diameter).		71.0					
	1.10			70.59	1.00	B	MK07		
		Pit terminated at 1.10m		70.5					
	1.5			70.0					
	2.0			69.5					
	2.5			69.0					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

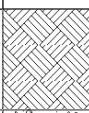
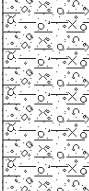
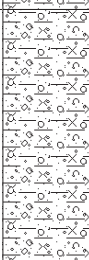
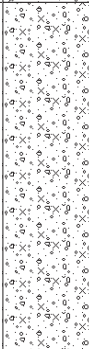


Contract No: 5752		Trial Pit Log				Trial Pit No: TP15S			
Contract:		Brennanstown Road	Easting:	722629.097	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724140.710	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	68.55	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	5.40 x 0.70 x 1.30	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL		68.5					
0.20		Light grey silty gravelly fine to coarse SAND with low cobble and boulder content. Gravel is fine to coarse, angular of granite. Cobbles and boulders are angular to subangular of granite (up to 300mm diameter).		68.35					
0.40		Light brown silty sandy fine to coarse, angular GRAVEL of granite with high cobble and low boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 600mm diameter).		68.15					
0.5				68.0					
1.0				67.5	1.00	B	MK14		
1.20		Light brown silty sandy gravelly angular COBBLES and BOULDERS of granite.		67.35					
1.30		Pit terminated at 1.30m		67.25					
1.5				67.0					
2.0				66.5					
2.5				66.0					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

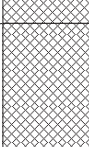
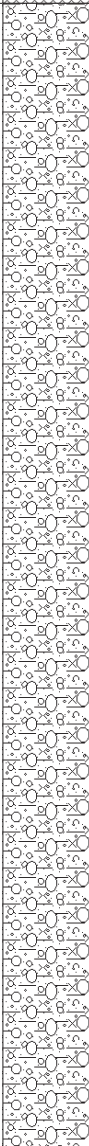
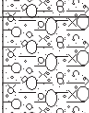

Contract No: 5752		Trial Pit Log				Trial Pit No: TP16S					
Contract:		Brennanstown Road		Easting:	722648.454	Date:	01/09/2020				
Location:		Cabinteely, Dublin 18		Northing:	724169.350	Excavator:	JCB 3CX				
Client:		Cairn Homes PLC		Elevation:	68.95	Logged By:	M. Kaliski				
Engineer:		Waterman Moylan		Dimensions (LxWxD) (m):	4.20 x 0.70 x 1.00	Status:	FINAL				
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike	
Scale:	Depth					Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL					68.75				
	0.5	Brown silty sandy fine to coarse, angular GRAVEL of granite with high cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 500mm diameter).					68.5				
	0.80	Light brown silty sandy gravelly angular COBBLES and BOULDERS of granite.					68.15				
	1.00	Pit terminated at 1.00m					68.0	67.95	1.00	B	MK13
	1.5						67.5				
	2.0						67.0				
	2.5						66.5				
							66.0				
	Termination:		Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:				
	Obstruction - possible boulders or bedrock.		Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental				

Contract No: 5752		Trial Pit Log				Trial Pit No: TP17S			
Contract:		Brennanstown Road		Easting:	722645.750	Date:	01/09/2020		
Location:		Cabinteely, Dublin 18		Northing:	724211.221	Excavator:	JCB 3CX		
Client:		Cairn Homes PLC		Elevation:	71.73	Logged By:	M. Kaliski		
Engineer:		Waterman Moylan		Dimensions (LxWxD) (m):	4.10 x 0.70 x 1.70	Status:	FINAL		
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.05	MADE GROUND: tarmacadam.			71.68				
	0.10	MADE GROUND: grey silty sandy gravel.			71.63				
		Soft to firm grey brown slightly sandy gravelly silty CLAY with high cobble and boulder content interbedded with clayey gravel. Sand is fine to coarse. Gravel is fine to coarse, angular of granite. Cobbles and boulders are angular to subangular of granite (up to 500mm diameter).			71.5				
	0.90	Light brown silty very sandy fine to coarse, angular to subangular GRAVEL of granite with high cobble and medium boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).			70.83				
	1.00					1.00	B	MK06	
	1.70	Pit terminated at 1.70m			70.03				
					70.0				
					69.5				
					69.0				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5752		Trial Pit Log				Trial Pit No: TP18S			
Contract:		Brennanstown Road	Easting:	722675.078	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724286.117	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	71.16	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	3.90 x 0.70 x 3.00	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.10	TOPSOIL with cobbles and plastic fragments.		71.06					
	0.10	MADE GROUND: dark grey brown slightly sandy slightly gravelly silty clay with medium cobble content with some ceramic and red bricks fragments.		71.0					
	0.5			70.5	0.50	ES	MK01		
	0.90	Firm light grey brown slightly sandy gravelly silty CLAY with medium cobble and frequent gravel laminas. Sand is fine to coarse. Gravel is fine to coarse, angular of granite. Cobbles are angular to subangular of granite.		70.26					
	1.0			70.0	1.00	B	MK02		
	1.20	Firm light grey brown slightly sandy gravelly silty CLAY with high cobble and boulder and frequent gravel laminas. Sand is fine to coarse. Gravel is fine to coarse, angular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).		69.96				▼	
	1.5			69.5					
	2.0			69.0					
	2.40	Light brown silty sandy gravelly angular COBBLES and BOULDERS of granite.		68.76					
	2.5			68.5					
	3.00	Pit terminated at 3.00m		68.16					
	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:		
	Scheduled depth	Pit walls stable.	1.20 Seepage				B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5752		Trial Pit Log				Trial Pit No: TP19S			
Contract:		Brennanstown Road	Easting:	722640.048	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724299.367	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	73.35	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	4.10 x 0.70 x 1.20	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.10	MADE GROUND: grey silty sandy gravel with high cobble content.			73.25				
	0.20	TOPSOIL			73.15				
	0.5	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				
	0.90	Firm light grey slightly sandy gravelly silty CLAY with high cobble and boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles and boulders are angular to subangular of granite (up to 600mm diameter).			72.5				
	1.0				72.45	1.00	B	MK04	
	1.20	Pit terminated at 1.20m			72.15				▼
	1.5				72.0				
	2.0				71.5				
	2.5				71.0				
					70.5				
	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:		
	Obstruction - possible boulders or bedrock.	Pit walls stable.	1.20 Seepage				B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5752		Trial Pit Log				Trial Pit No: TP20S			
Contract:		Brennanstown Road	Easting:	722689.220	Date:	01/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724318.952	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	73.37	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	4.60 x 0.70 x 1.90	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL							
	0.20	Soft brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles are angular to subangular of granite.			73.17				
	0.60	Firm light grey brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular of granite. Cobbles are angular to subangular of granite.			72.77				
	1.10	Light grey brown silty sandy fine to coarse, angular GRAVEL of granite with medium cobble and low boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).			72.27				
	1.80	Light brown silty sandy gravelly angular COBBLES and BOULDERS of granite.			71.57				
	1.90	Pit terminated at 1.90m			71.47				
	2.0								
	2.5								
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	Dry			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5752		Trial Pit Log				Trial Pit No: TP21S			
Contract:		Brennanstown Road	Easting:	722627.173	Date:	02/09/2020			
Location:		Cabinteely, Dublin 18	Northing:	724355.530	Excavator:	JCB 3CX			
Client:		Cairn Homes PLC	Elevation:	76.60	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	2.50 x 0.70 x 2.80	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.05	MADE GROUND: tarmacadam. MADE GROUND: grey silty sandy gravel.		76.5	76.55				
	0.30	Soft becoming firm yellow brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).			76.30				
	0.5			76.0	0.50	ES	MK17		
	1.0				75.5	1.00	B	MK18	
	1.5				75.0				
	2.0				74.5	2.00	B	MK19	
	2.5				74.0				
	2.60	Firm yellow brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of granite. Cobbles and boulders are angular to subangular of granite (up to 400mm diameter).			74.00				▼
	2.80	Pit terminated at 2.80m			73.80				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders or bedrock.	Pit walls stable.	2.60 Medium			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

TP01S Sidewall



TP01S Spoil



TP02S Sidewall



TP02S Spoil



TP03S Sidewall



TP03S Spoil



TP04S Sidewall



TP04S Spoil



TP05S Sidewall



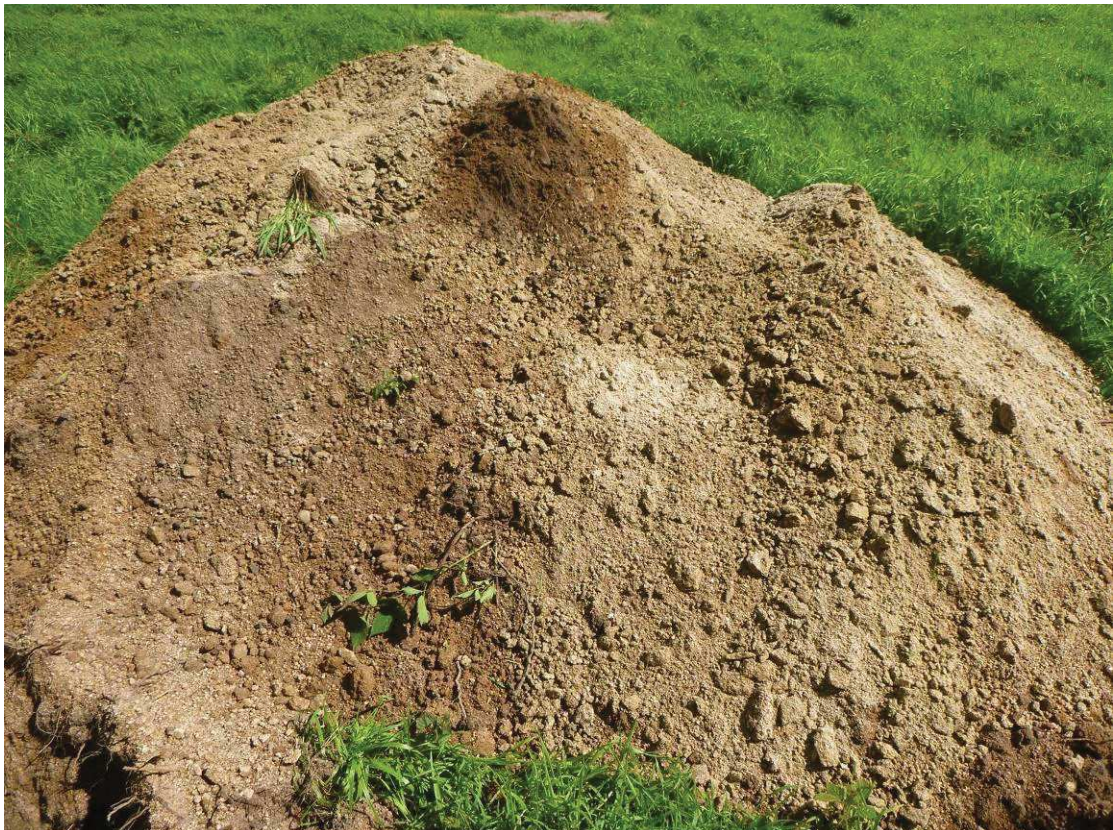
TP05S Spoil



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

SOAKAWAY TEST



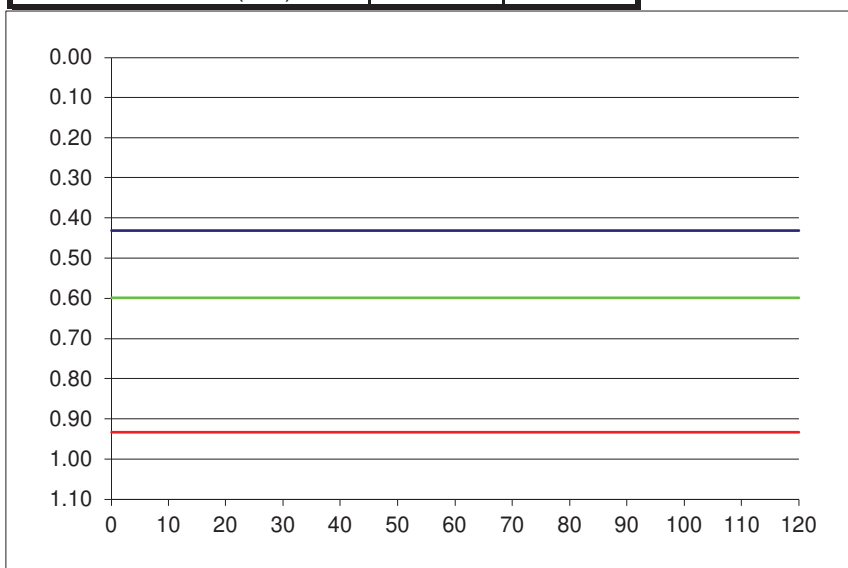
Project Reference:	5752
Contract name:	Brennanstown Road
Location:	Cabinteely, Dublin 18
Test No:	SA01S
Date:	02/09/2020

Ground Conditions		
From	To	Description
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:
Obstruction at 1.10mbgl.

Elapsed Time (mins)	Fall of Water (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	m ³
Area of Drainage	6.16	m ²
Area of Drainage (75%-25%)	3.35	m ²
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 /min or Fail /m/s

SOAKAWAY TEST



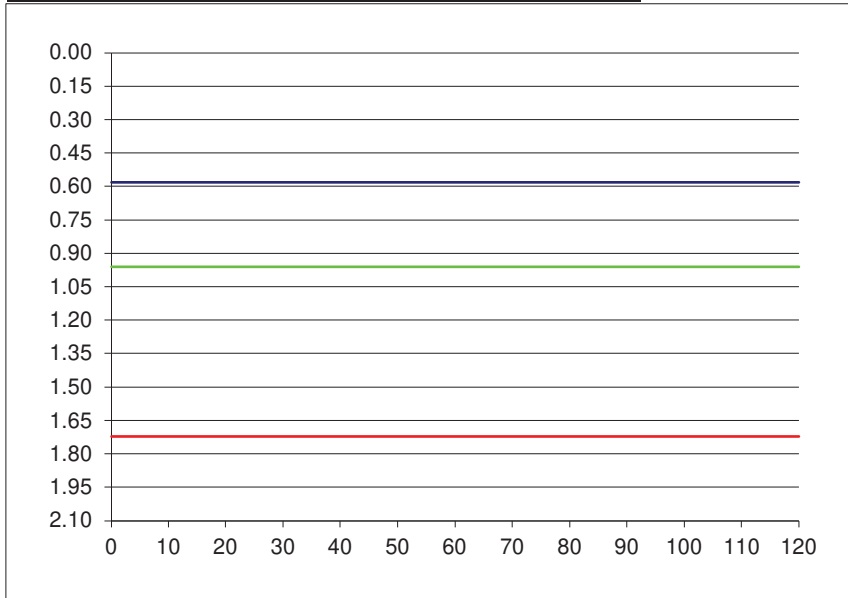
Project Reference:	5752
Contract name:	Brennanstown Road
Location:	Cabinteely, Dublin 18
Test No:	SA02S
Date:	02/09/2020

Ground Conditions		
From	To	
0.00	0.20	TOPSOIL.
0.20	1.40	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 (mins)	Fall of Water (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	m ³
Area of Drainage	12.18	m ²
Area of Drainage (75%-25%)	5.95	m ²
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 /min or Fail /m/s

SOAKAWAY TEST



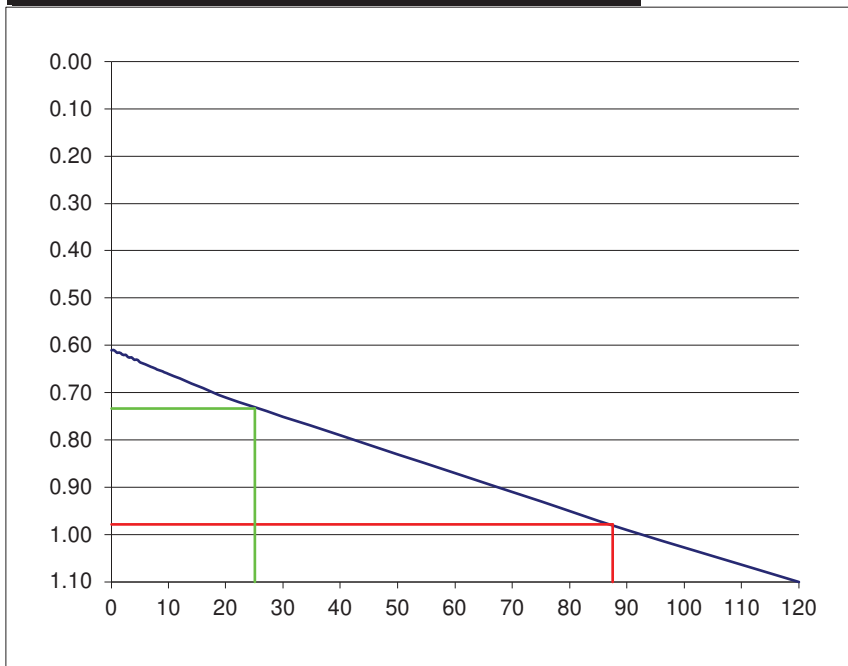
Project Reference:	5752
Contract name:	Brennanstown Road
Location:	Cabinteely, Dublin 18
Test No:	SA03S
Date:	02/09/2020

Ground Conditions		
From	To	
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.

Elapsed Time (mins)	Fall of Water (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 m ³
Area of Drainage	6.60 m ²
Area of Drainage (75%-25%)	3.08 m ²
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 3.42E-05
m/min m/s

SOAKAWAY TEST



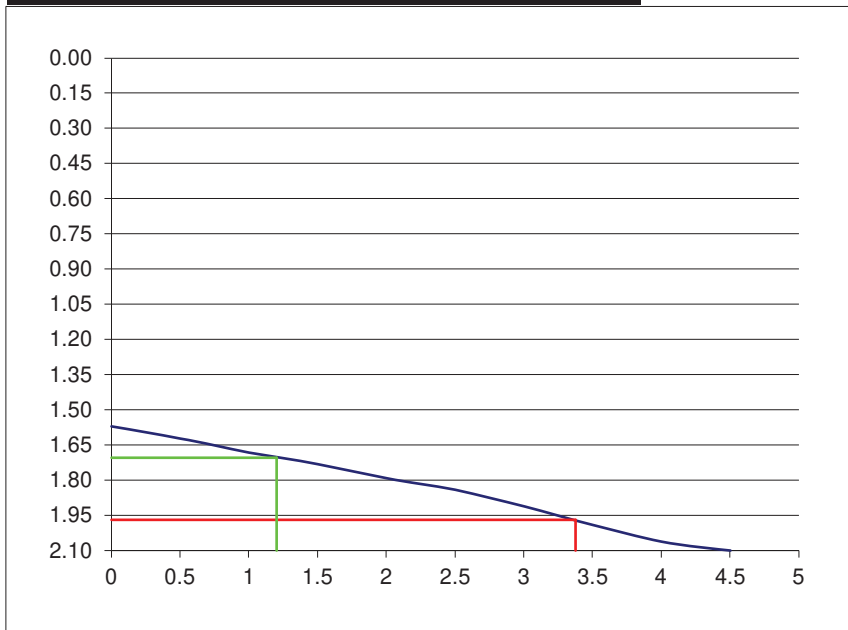
Project Reference:	5752
Contract name:	Brennanstown Road
Location:	Cabinteely, Dublin 18
Test No:	SA04S
Date:	02/09/2020

Ground Conditions		
From	To	
0.00	0.05	MADE GROUND: grey silty sandy gravel.
0.05	2.10	MADE GROUND: grey silty sandy gravel with high cobble content and occasional plastic fragments.

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

Elapsed Time (mins)	Fall of Water (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 m ³
Area of Drainage	15.12 m ²
Area of Drainage (75%-25%)	3.94 m ²
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



$f = \frac{0.06281}{\text{m/min}}$ or $\frac{1.05E-03}{\text{m/s}}$

SA01S Sidewall



SA01S Spoil



SA02S Sidewall



SA02S Spoil



SA03S Sidewall



SA03S Spoil



SA04S Sidewall



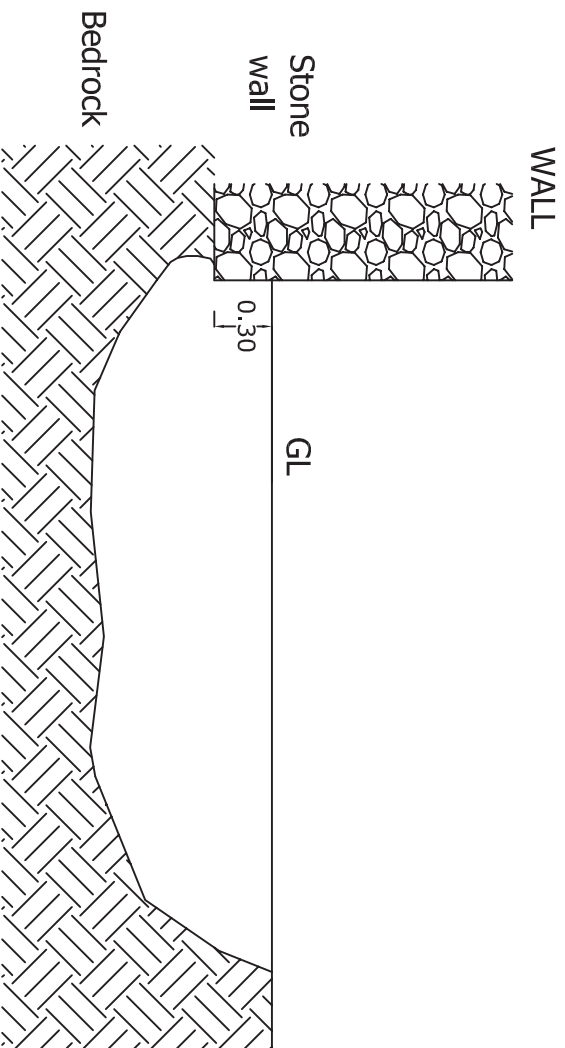
SA04S Spoil



Appendix 5
Foundation Pit Logs

FP01

Cross Section



Ground Conditions:

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

Photograph:



Trench Dimensions

Length:	Width:	Depth:
3.60m	0.80m	0.95m

Point:	Easting:	Northing:	Level:
Start	722587.165	724111.382	65.57



SITE INVESTIGATIONS LTD

Project:

Brennanstown Road

Client:

Cairn Homes PLC

Consultant:

Waterman Moylan

Logged by:

M. Kaliski

Excavation Started:

03/09/2020

Excavation Finished:

03/09/2020

CONTRACT NUMBER

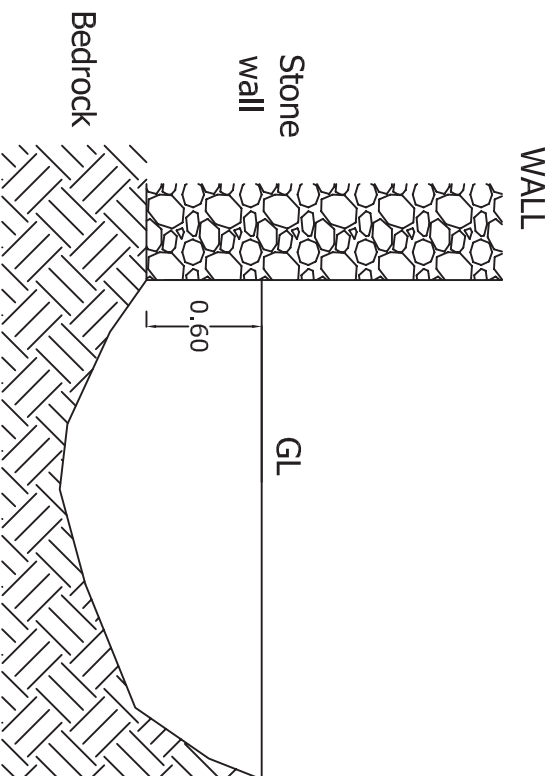
Scale: NOT TO SCALE, ALL DISTANCES IN m

DEPTH ARE TO THE TOP OF SERVICES

5752

FP02

Cross Section



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

Trench Dimensions

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

Ground Conditions:

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

Photograph:



SITE INVESTIGATIONS LTD

Project:

Brennanstown Road

Client:

Cairn Homes PLC

Consultant:

Waterman Moylan

Logged by:

M. Kaliski

Excavation Started:

03/09/2020

Excavation Finished:

03/09/2020

CONTRACT NUMBER

Scale:
NOT TO SCALE, ALL DISTANCES IN m

DEPTH ARE TO THE TOP OF SERVICES

5752

Appendix 6
Geotechnical Laboratory Test Results

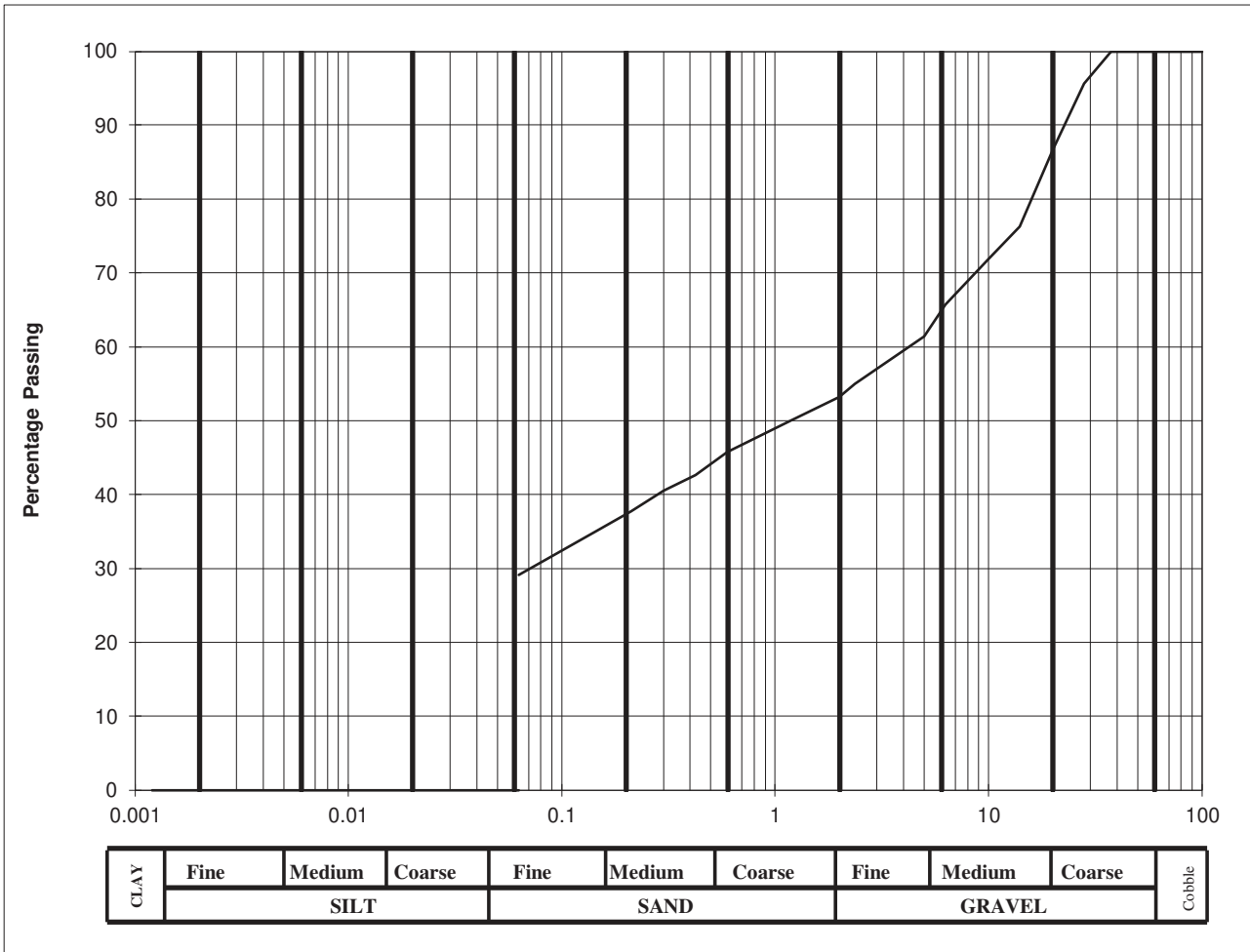
Classification Tests in accordance with BS1377: Part 4

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

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	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

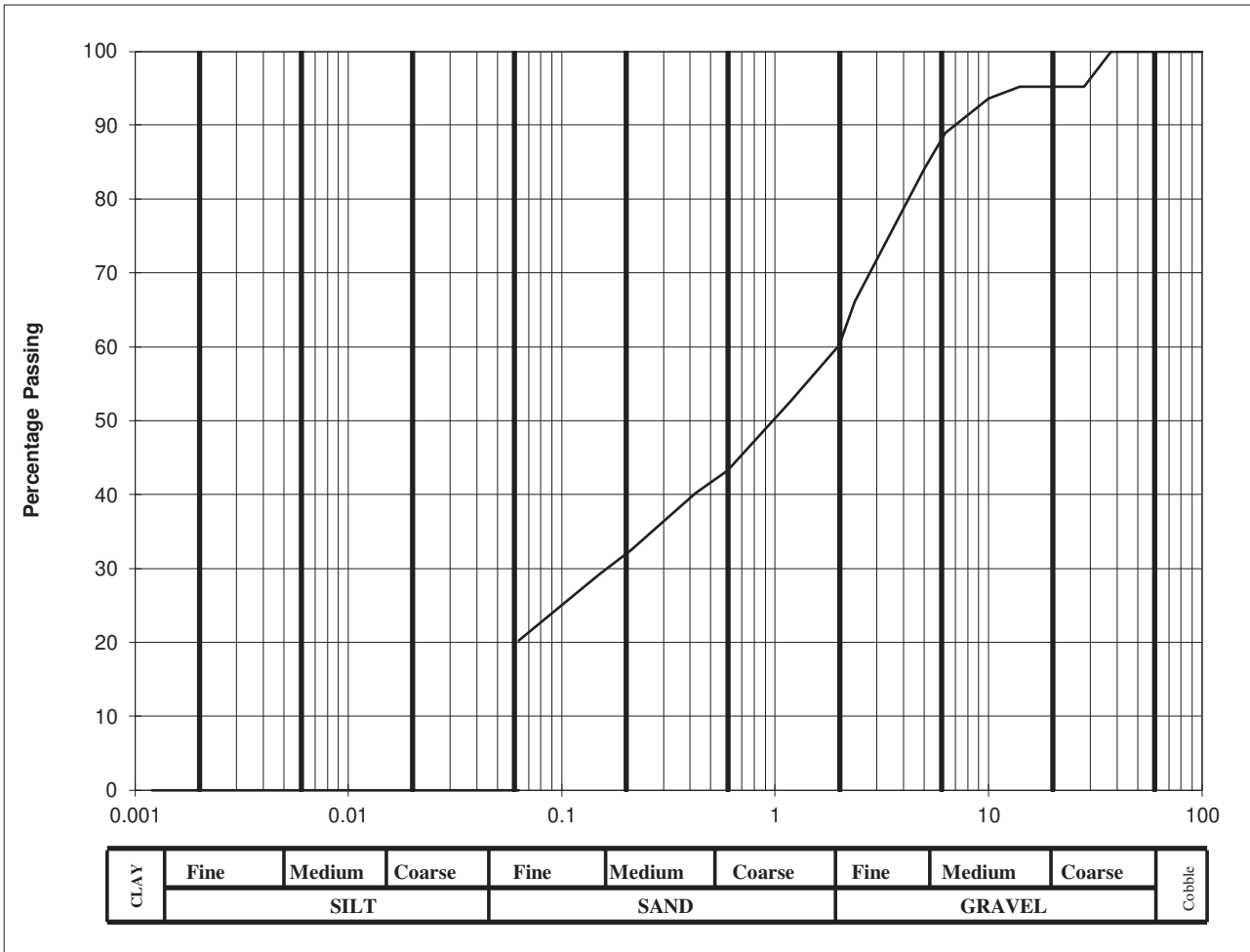
Lab. No :	20/852
Sample No :	MK21

Hole ID :	TP 01S
Depth, m :	0.90

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

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	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

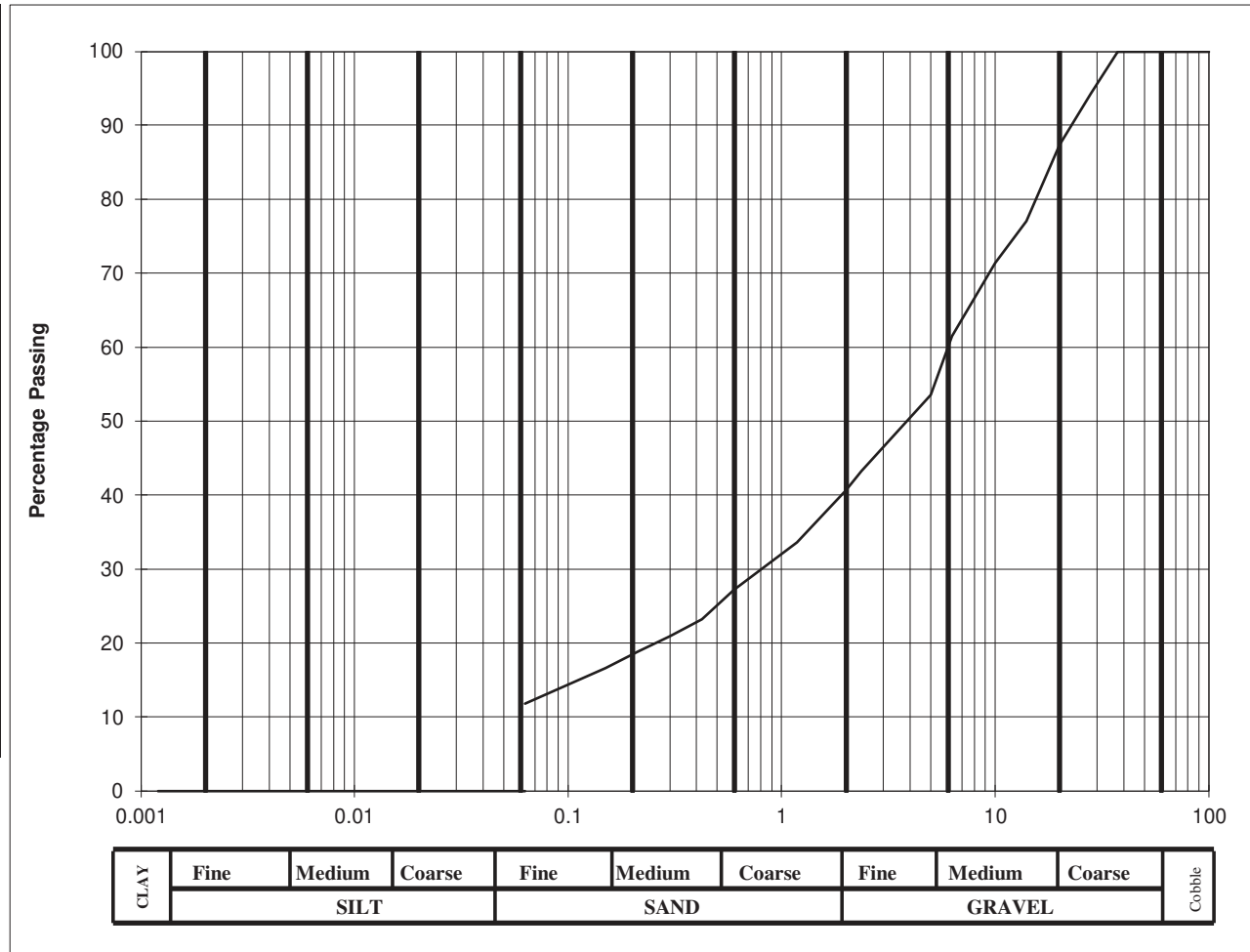
Lab. No :	20/853
Sample No :	MK11

Hole ID :	TP 07S
Depth, m :	1.00

Material description :	silty very sandy GRAVEL
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 size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	94.3		
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
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

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
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 (mBGL)	Sample No	Lab Ref	pH Value	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) g/L	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) %	Loss on Ignition (Organic Content) %	Chloride ion Content (water:soil ratio 2:1) %	% passing 2mm	Remarks
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	

Appendix 7
Environmental Laboratory Test Results



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

Tel: (01244) 528700

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

Attention: Stephen Letch

CERTIFICATE OF ANALYSIS

Date of report Generation: 08 October 2020
Customer: 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





CERTIFICATE OF ANALYSIS

Validated

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.



CERTIFICATE OF ANALYSIS

Validated

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

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type
	X Test	N No Determination Possible									
<p>Sample Types -</p> <p>S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</p>											
			22903249	TP01 N		0.50 - 0.50	250g Amber Jar (ALE210)	S			
			22903250	TP01 S		0.50 - 0.50	250g Amber Jar (ALE215)	S			
			22903252	TP01 S		0.90 - 0.90	250g Amber Jar (ALE210)	S			
			22903253	TP07 S		1.00 - 1.00	250g Amber Jar (ALE210)	S			
			22903254	TP18 S		0.50 - 0.50	250g Amber Jar (ALE215)	S			
			22903255	TP21 S		0.50 - 0.50	250g Amber Jar (ALE215)	S			
			22903256	TP21 S		1.00 - 1.00	250g Amber Jar (ALE210)	S			
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X		X			X		X	
CEN Readings	All	NDPs: 0 Tests: 4	X		X			X		X	
Chromium III	All	NDPs: 0 Tests: 4		X	X			X		X	
Coronene	All	NDPs: 0 Tests: 4		X	X			X		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4	X		X			X		X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 4	X		X			X		X	
EPH by GCxGC-FID	All	NDPs: 0 Tests: 4		X	X			X		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 4		X	X			X		X	
Fluoride	All	NDPs: 0 Tests: 4	X		X			X		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4			X	X			X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4		X	X			X		X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 7		X	X		X	X		X	X
Mercury Dissolved	All	NDPs: 0 Tests: 4	X		X			X		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 4		X	X			X		X	
PAH by GCMS	All	NDPs: 0 Tests: 4		X	X			X		X	



CERTIFICATE OF ANALYSIS

Validated

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

Results Legend

- X Test
- N No Determination Possible

Sample Types -

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

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
22903249	TP01 N		0.50 - 0.50	1kg TUB with Handle (ALE260)	S
22903250	TP01 S		0.50 - 0.50	250g Amber Jar (ALE210)	S
22903252	TP01 S		0.90 - 0.90	60g VOC (ALE215)	S
22903253	TP07 S		1.00 - 1.00	250g Amber Jar (ALE210)	S
22903254	TP18 S		0.50 - 0.50	1kg TUB with Handle (ALE260)	S
22903255	TP21 S		0.50 - 0.50	250g Amber Jar (ALE210)	S
22903256	TP21 S		1.00 - 1.00	60g VOC (ALE215)	S

Test	All	NDPs: 0 Tests: 4	22903249	22903250	22903252	22903253	22903254	22903255	22903256
PCBs by GCMS	All	NDPs: 0 Tests: 4	X	X			X	X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 4	X	X		X		X	
Sample description	All	NDPs: 0 Tests: 7	X	X	X	X	X	X	X
Total Dissolved Solids on Leachates	All	NDPs: 0 Tests: 4	X	X			X	X	
Total Organic Carbon	All	NDPs: 0 Tests: 4	X	X			X	X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 4	X	X			X	X	
VOC MS (S)	All	NDPs: 0 Tests: 4		X	X		X		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200925-152
Location: Brennanstown Road, Cabint

Client Reference: 5752
Order Number: 92/A/20

Report Number: 570403
Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
22903249	TP01 N	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	None
22903250	TP01 S	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	Vegetation
22903252	TP01 S	0.90 - 0.90	Dark Brown	Sandy Loam	Stones	Vegetation
22903253	TP07 S	1.00 - 1.00	Dark Brown	Sandy Loam	Stones	Vegetation
22903254	TP18 S	0.50 - 0.50	Dark Brown	Sand	Stones	Vegetation
22903255	TP21 S	0.50 - 0.50	Dark Brown	Loamy Sand	Stones	None
22903256	TP21 S	1.00 - 1.00	Light Brown	Loamy Sand	Stones	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 occurring 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.



CERTIFICATE OF ANALYSIS

Validated

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

Results Legend		Customer Sample Ref.	TP01 N	TP01 S	TP01 S	TP07 S	TP18 S	TP21 S
#	ISO17025 accredited.		Depth (m)	0.50 - 0.50	0.50 - 0.50	0.90 - 0.90	1.00 - 1.00	0.50 - 0.50
M	mCERTS accredited.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.	Date Sampled	22/09/2020	22/09/2020	22/09/2020	22/09/2020	22/09/2020	22/09/2020
diss.filt	Dissolved / filtered sample.	Sample Time		00:00:00				
tot.unfilt	Total / unfiltered sample.	Date Received	25/09/2020	25/09/2020	25/09/2020	25/09/2020	25/09/2020	25/09/2020
*	Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	200925-152	200925-152	200925-152	200925-152	200925-152	200925-152
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	22903249	22903250	22903252	22903253	22903254	22903255
(F)	Trigger breach confirmed	AGS Reference						
1-3*§@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	15	14	19	14	23	9.2
Loss on ignition	<0.7 %	TM018	3.55	3.32	4.25	1.4	9.51	2.01
Organic Carbon, Total	<0.2 %	TM132	0.462	0.416			4.98	0.226
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6			<0.6	<0.6
PCB congener 28	<3 µg/kg	TM168	<3	<3			<3	<3
PCB congener 52	<3 µg/kg	TM168	<3	<3			<3	<3
PCB congener 101	<3 µg/kg	TM168	<3	<3			<3	<3
PCB congener 118	<3 µg/kg	TM168	<3	<3			<3	<3
PCB congener 138	<3 µg/kg	TM168	<3	<3			<3	<3
PCB congener 153	<3 µg/kg	TM168	<3	<3			<3	<3
PCB congener 180	<3 µg/kg	TM168	<3	<3			<3	<3
Sum of detected PCB 7 Congeners	<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	15.5			18.2	13
Barium	<0.6 mg/kg	TM181	25.5	22.2			107	29.7
Cadmium	<0.02 mg/kg	TM181	0.375	0.337			2.19	0.95
Chromium	<0.9 mg/kg	TM181	15.9	14.2			19.3	9.13
Copper	<1.4 mg/kg	TM181	13.5	12.6			47.8	17.8
Lead	<0.7 mg/kg	TM181	28.2	24.7			134	12.1
Mercury	<0.14 mg/kg	TM181	<0.14	<0.14			<0.14	<0.14
Molybdenum	<0.1 mg/kg	TM181	2.23	2.33			3.72	1.09
Nickel	<0.2 mg/kg	TM181	21.9	19.1			48.7	22.3
Selenium	<1 mg/kg	TM181	1.99	1.69			1.57	<1
Zinc	<1.9 mg/kg	TM181	66.1	60.2			141	48.3
Coronene	<200 µg/kg	TM410	<200	<200			<200	<200
Mineral Oil >C10-C40	<5 mg/kg	TM415	<5	<5			<5	<5



CERTIFICATE OF ANALYSIS

Validated

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

PAH by GCMS

Results Legend			Customer Sample Ref.	TP01 N	TP01 S	TP18 S	TP21 S
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-3*§@	Sample deviation (see appendix)						
			Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	22/09/2020	22/09/2020	22/09/2020	22/09/2020
			Sample Time		00:00:00		
			Date Received	25/09/2020	25/09/2020	25/09/2020	25/09/2020
			SDG Ref	200925-152	200925-152	200925-152	200925-152
			Lab Sample No.(s)	22903249	22903250	22903254	22903255
			AGS Reference				
Component	LOD/Units	Method					
Naphthalene	<9 µg/kg	TM218	<9	<9	<9	<9	
			M	M	M	M	
Acenaphthylene	<12 µg/kg	TM218	<12	<12	<12	<12	
			M	M	M	M	
Acenaphthene	<8 µg/kg	TM218	<8	<8	<8	<8	
			M	M	M	M	
Fluorene	<10 µg/kg	TM218	<10	<10	<10	<10	
			M	M	M	M	
Phenanthrene	<15 µg/kg	TM218	<15	<15	20.2	<15	
			M	M	M	M	
Anthracene	<16 µg/kg	TM218	<16	<16	<16	<16	
			M	M	M	M	
Fluoranthene	<17 µg/kg	TM218	<17	<17	56	<17	
			M	M	M	M	
Pyrene	<15 µg/kg	TM218	<15	<15	45.1	<15	
			M	M	M	M	
Benz(a)anthracene	<14 µg/kg	TM218	<14	<14	31.9	<14	
			M	M	M	M	
Chrysene	<10 µg/kg	TM218	<10	<10	28.8	<10	
			M	M	M	M	
Benzo(b)fluoranthene	<15 µg/kg	TM218	<15	<15	28.9	<15	
			M	M	M	M	
Benzo(k)fluoranthene	<14 µg/kg	TM218	<14	<14	<14	<14	
			M	M	M	M	
Benzo(a)pyrene	<15 µg/kg	TM218	<15	<15	26.4	<15	
			M	M	M	M	
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	<18	<18	<18	<18	
			M	M	M	M	
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23	<23	<23	<23	
			M	M	M	M	
Benzo(g,h,i)perylene	<24 µg/kg	TM218	<24	<24	<24	<24	
			M	M	M	M	
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	<118	<118	237	<118	



CERTIFICATE OF ANALYSIS

Validated

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

TPH CWG (S)

Results Legend		Customer Sample Ref.	TP01 N	TP01 S	TP18 S	TP21 S		
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.	Depth (m)	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
(F)	Trigger breach confirmed	Date Sampled	22/09/2020	22/09/2020	22/09/2020	22/09/2020		
1-3*§@	Sample deviation (see appendix)	Sample Time		00:00:00				
		Date Received	25/09/2020	25/09/2020	25/09/2020	25/09/2020		
		SDG Ref	200925-152	200925-152	200925-152	200925-152		
		Lab Sample No.(s)	22903249	22903250	22903254	22903255		
		AGS Reference						
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	102	96.1	113	107		
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	<10	<10	<10		
Aliphatics >C6-C8	<10 µg/kg	TM089	<10	<10	<10	<10		
Aliphatics >C8-C10	<10 µg/kg	TM089	<10	<10	<10	<10		
Aliphatics >C10-C12	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aliphatics >C12-C16	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aliphatics >C16-C21	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aliphatics >C21-C35	<1000 µg/kg	TM414	1860	2130	4350	<1000		
Aliphatics >C35-C44	<1000 µg/kg	TM414	<1000	<1000	<1000	2120		
Total Aliphatics >C10-C44	<5000 µg/kg	TM414	<5000	<5000	<5000	<5000		
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414	<10000	<10000	10400	<10000		
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	<10	<10	<10		
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	<10	<10	<10		
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10	<10	<10	<10		
Aromatics > EC10-EC12	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromatics > EC12-EC16	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromatics > EC16-EC21	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromatics > EC21-EC35	<1000 µg/kg	TM414	1280	1180	4510	<1000		
Aromatics >EC35-EC44	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Aromatics > EC40-EC44	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000		
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414	<5000	<5000	5590	<5000		
Total Aliphatics & Aromatics >C5-C44	<10000 µg/kg	TM414	<10000	<10000	<10000	<10000		
GRO >C5-C6	<20 µg/kg	TM089	<20	<20	<20	<20		
GRO >C6-C7	<20 µg/kg	TM089	<20	<20	<20	<20		
GRO >C7-C8	<20 µg/kg	TM089	<20	<20	<20	<20		
GRO >C8-C10	<20 µg/kg	TM089	<20	<20	<20	<20		
GRO >C10-C12	<20 µg/kg	TM089	<20	<20	<20	<20		
Total Aliphatics >C5-C10	<50 µg/kg	TM089	<50	<50	<50	<50		
Total Aromatics >EC5-EC10	<50 µg/kg	TM089	<50	<50	<50	<50		
GRO >C5-C10	<20 µg/kg	TM089	<20	<20	<20	<20		



CERTIFICATE OF ANALYSIS

Validated

SDG: 200925-152
Location: Brennanstown Road, Cabint

Client Reference: 5752
Order Number: 92/A/20

Report Number: 570403
Superseded Report:

VOC MS (S)

Table with columns: Results Legend, Customer Sample Ref, TP01 N, TP01 S, TP18 S, TP21 S, Component, LOD/Units, Method. Rows include Dibromofluoromethane, Toluene-d8, 4-Bromofluorobenzene, Methyl Tertiary Butyl Ether, Benzene, Toluene, Ethylbenzene, p/m-Xylene, o-Xylene.



CERTIFICATE OF ANALYSIS

Validated

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

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Brennanstown Road, Cabinteely
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)	17
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.5
Particle Size <4mm	>95%		

Case	
SDG	200925-152
Lab Sample Number(s)	22903249
Sampled Date	22-Sep-2020
Customer Sample Ref.	TP01 N
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.462
Loss on Ignition (%)	3.55
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 10:1 eluate (mg/l)		A ₂ 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	3	5	6
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
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	6.43	<3	64.3	<30	500	800	1000

Leach Test Information

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



CERTIFICATE OF ANALYSIS

Validated

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

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	Site Location	Brennanstown Road, Cabinteely
Mass Sample taken (kg) 0.107	Natural Moisture Content (%)	18.5
Mass of dry sample (kg) 0.090	Dry Matter Content (%)	84.4
Particle Size <4mm >95%		

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

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Solid Waste Analysis	Result
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)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 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	3	5	6
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	100000
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

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CERTIFICATE OF ANALYSIS

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

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Brennanstown Road, Cabinteely
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%		

Case	
SDG	200925-152
Lab Sample Number(s)	22903254
Sampled Date	22-Sep-2020
Customer Sample Ref.	TP18 S
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	4.98
Loss on Ignition (%)	9.51
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 10:1 eluate (mg/l)		A ₂ 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	3	5	6
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
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CERTIFICATE OF ANALYSIS

Validated

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

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Brennanstown Road, Cabinteely
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%		

Case	
SDG	200925-152
Lab Sample Number(s)	22903255
Sampled Date	22-Sep-2020
Customer Sample Ref.	TP21 S
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.226
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 10:1 eluate (mg/l)		A ₂ 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	3	5	6
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	100000
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

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CERTIFICATE OF ANALYSIS

Validated

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 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
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).



CERTIFICATE OF ANALYSIS

Validated

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

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
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	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	29-Sep-2020	29-Sep-2020	29-Sep-2020	29-Sep-2020	29-Sep-2020	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



CERTIFICATE OF ANALYSIS

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

Appendix

General

1. 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 track record will be utilised.

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

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

7. Results relate only to the items tested.

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

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

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

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

12. 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 may occur.

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

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

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

17. **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 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).

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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



VSGTD-8G3US-66NCA

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: Stephen Letch	Company: Site Investigations Ltd	HazWasteOnline™ Training Record:	
Date: 26 Nov 2020 15:56 GMT		Course	Date
Telephone: 00353 86817 9449		Hazardous Waste Classification	09 Apr 2019
		Advanced Hazardous Waste Classification	09 Oct 2019

Report

Created by: Stephen Letch
Created date: 26 Nov 2020 15:56 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
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



#	Sample Name	Depth [m]	Classification Result	WAC Results		Page
				Inert	Non Haz	
3	TP21 S-220920-0.50-0.50		Non Hazardous	Pass	Pass	11

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	15
Appendix B: Rationale for selection of metal species	17
Appendix C: Version	17



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: TP01 S-220920-0.50-0.50	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: 14% (wet weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

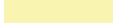
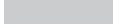


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>							
3	antimony { antimony trioxide }				0.871	mg/kg	1.197	0.897	mg/kg	0.0000897 %	✓	
	051-005-00-X	215-175-0	1309-64-4									
4	arsenic { arsenic pentoxide }				15.5	mg/kg	1.534	20.447	mg/kg	0.00204 %	✓	
	033-004-00-6	215-116-9	1303-28-2									
5	barium { barium sulphide }				22.2	mg/kg	1.233	23.55	mg/kg	0.00235 %	✓	
	016-002-00-X	244-214-4	21109-95-5									
6	cadmium { cadmium sulfate }				0.337	mg/kg	1.855	0.537	mg/kg	0.0000537 %	✓	
	048-009-00-9	233-331-6	10124-36-4									
7	copper { dicopper oxide; copper (I) oxide }				12.6	mg/kg	1.126	12.2	mg/kg	0.00122 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	24.7	mg/kg		21.242	mg/kg	0.00212 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.14	mg/kg	1.353	<0.189	mg/kg	<0.0000189 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	molybdenum { molybdenum(VI) oxide }				2.33	mg/kg	1.5	3.006	mg/kg	0.000301 %	✓	
	042-001-00-9	215-204-7	1313-27-5									
11	nickel { nickel sulfate }				19.1	mg/kg	2.637	43.31	mg/kg	0.00433 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
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 %	✓	
	034-002-00-8											
13	zinc { zinc sulphate }				60.2	mg/kg	2.469	127.84	mg/kg	0.0128 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14.2	mg/kg	1.462	17.849	mg/kg	0.00178 %	✓	
		215-160-9	1308-38-9									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
17	acenaphthylene		205-917-1	208-96-8	<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
18	acenaphthene		201-469-6	83-32-9	<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	fluorene		201-695-5	86-73-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	phenanthrene		201-581-5	85-01-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
21	anthracene		204-371-1	120-12-7	<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
22	fluoranthene		205-912-4	206-44-0	<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
23	pyrene		204-927-3	129-00-0	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
25	chrysene	601-048-00-0	205-923-4	218-01-9	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
29	indeno[123-cd]pyrene		205-893-2	193-39-5	<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene		205-883-8	191-24-2	<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
37	coronene		205-881-7	191-07-1	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.0285 %		



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 report.

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

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

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon) %	0.416	3	5
2	LOI (loss on ignition) %	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	pH	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



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: TP18 S-220920-0.50-0.50	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: 23% (wet weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

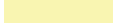
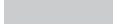


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>							
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	arsenic { arsenic pentoxide }				18.2	mg/kg	1.534	21.496	mg/kg	0.00215 %	✓	
	033-004-00-6	215-116-9	1303-28-2									
5	barium { barium sulphide }				107	mg/kg	1.233	101.628	mg/kg	0.0102 %	✓	
	016-002-00-X	244-214-4	21109-95-5									
6	cadmium { cadmium sulfate }				2.19	mg/kg	1.855	3.127	mg/kg	0.000313 %	✓	
	048-009-00-9	233-331-6	10124-36-4									
7	copper { dicopper oxide; copper (I) oxide }				47.8	mg/kg	1.126	41.439	mg/kg	0.00414 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	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 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.14	mg/kg	1.353	<0.189	mg/kg	<0.0000189 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	molybdenum { molybdenum(VI) oxide }				3.72	mg/kg	1.5	4.297	mg/kg	0.00043 %	✓	
	042-001-00-9	215-204-7	1313-27-5									
11	nickel { nickel sulfate }				48.7	mg/kg	2.637	98.873	mg/kg	0.00989 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
12	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											
13	zinc { zinc sulphate }				141	mg/kg	2.469	268.092	mg/kg	0.0268 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
14	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									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
17	acenaphthylene		205-917-1	208-96-8	<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
18	acenaphthene		201-469-6	83-32-9	<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	fluorene		201-695-5	86-73-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	phenanthrene		201-581-5	85-01-8	0.0202 mg/kg		0.0156 mg/kg	0.00000156 %	✓	
21	anthracene		204-371-1	120-12-7	<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
22	fluoranthene		205-912-4	206-44-0	0.056 mg/kg		0.0431 mg/kg	0.00000431 %	✓	
23	pyrene		204-927-3	129-00-0	0.0451 mg/kg		0.0347 mg/kg	0.00000347 %	✓	
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.0319 mg/kg		0.0246 mg/kg	0.00000246 %	✓	
25	chrysene	601-048-00-0	205-923-4	218-01-9	0.0288 mg/kg		0.0222 mg/kg	0.00000222 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.0289 mg/kg		0.0223 mg/kg	0.00000223 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.0264 mg/kg		0.0203 mg/kg	0.00000203 %	✓	
29	indeno[123-cd]pyrene		205-893-2	193-39-5	<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene		205-883-8	191-24-2	<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
37	coronene		205-881-7	191-07-1	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.0679 %		



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 report.

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

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

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	4.98	3	5
2	LOI (loss on ignition)	9.51	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	<0.04	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	<0.021	1	-
5	Mineral oil (C10 to C40)	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	0.237	100	-
7	pH	8.41	-	>6
8	ANC (acid neutralisation capacity)		-	-
Eluate Analysis 10:1				
9	arsenic	0.0063	0.5	2
10	barium	0.0429	20	100
11	cadmium	<0.0008	0.04	1
12	chromium	<0.01	0.5	10
13	copper	0.072	2	50
14	mercury	0.0003	0.01	0.2
15	molybdenum	<0.03	0.5	10
16	nickel	0.0158	0.4	10
17	lead	0.015	0.5	10
18	antimony	<0.01	0.06	0.7
19	selenium	<0.01	0.1	0.5
20	zinc	0.0522	4	50
21	chloride	<20	800	15,000
22	fluoride	<5	10	150
23	sulphate	<20	1,000	20,000
24	phenol index	<0.16	1	-
25	DOC (dissolved organic carbon)	67	500	800
26	TDS (total dissolved solids)	465	4,000	60,000

Key

	User supplied data
	Inert WAC criteria fail



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: TP21 S-220920-0.50-0.50	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: 9.2% (wet weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

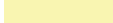
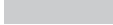


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>							
3	antimony { antimony trioxide }				<0.6	mg/kg	1.197	<0.718	mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4									
4	arsenic { arsenic pentoxide }				13	mg/kg	1.534	18.106	mg/kg	0.00181 %	✓	
	033-004-00-6	215-116-9	1303-28-2									
5	barium { barium sulphide }				29.7	mg/kg	1.233	33.264	mg/kg	0.00333 %	✓	
	016-002-00-X	244-214-4	21109-95-5									
6	cadmium { cadmium sulfate }				0.95	mg/kg	1.855	1.6	mg/kg	0.00016 %	✓	
	048-009-00-9	233-331-6	10124-36-4									
7	copper { dicopper oxide; copper (I) oxide }				17.8	mg/kg	1.126	18.197	mg/kg	0.00182 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	12.1	mg/kg		10.987	mg/kg	0.0011 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.14	mg/kg	1.353	<0.189	mg/kg	<0.0000189 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	molybdenum { molybdenum(VI) oxide }				1.09	mg/kg	1.5	1.485	mg/kg	0.000148 %	✓	
	042-001-00-9	215-204-7	1313-27-5									
11	nickel { nickel sulfate }				22.3	mg/kg	2.637	53.389	mg/kg	0.00534 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8											
13	zinc { zinc sulphate }				48.3	mg/kg	2.469	108.294	mg/kg	0.0108 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.13	mg/kg	1.462	12.116	mg/kg	0.00121 %	✓	
		215-160-9	1308-38-9									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
17	acenaphthylene		205-917-1	208-96-8	<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
18	acenaphthene		201-469-6	83-32-9	<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	fluorene		201-695-5	86-73-7	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
20	phenanthrene		201-581-5	85-01-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
21	anthracene		204-371-1	120-12-7	<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
22	fluoranthene		205-912-4	206-44-0	<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
23	pyrene		204-927-3	129-00-0	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
25	chrysene	601-048-00-0	205-923-4	218-01-9	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
29	indeno[123-cd]pyrene		205-893-2	193-39-5	<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene		205-883-8	191-24-2	<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
37	coronene		205-881-7	191-07-1	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.0271 %		



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 report.

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

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

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon) %	0.226	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	pH	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

Key

User supplied data



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



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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 21 Aug 2015

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

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

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

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

Data source date: 21 Aug 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

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

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

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

Data source date: 23 Jul 2015

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

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

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. (ATP6)

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



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. Worst 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)



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

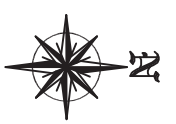
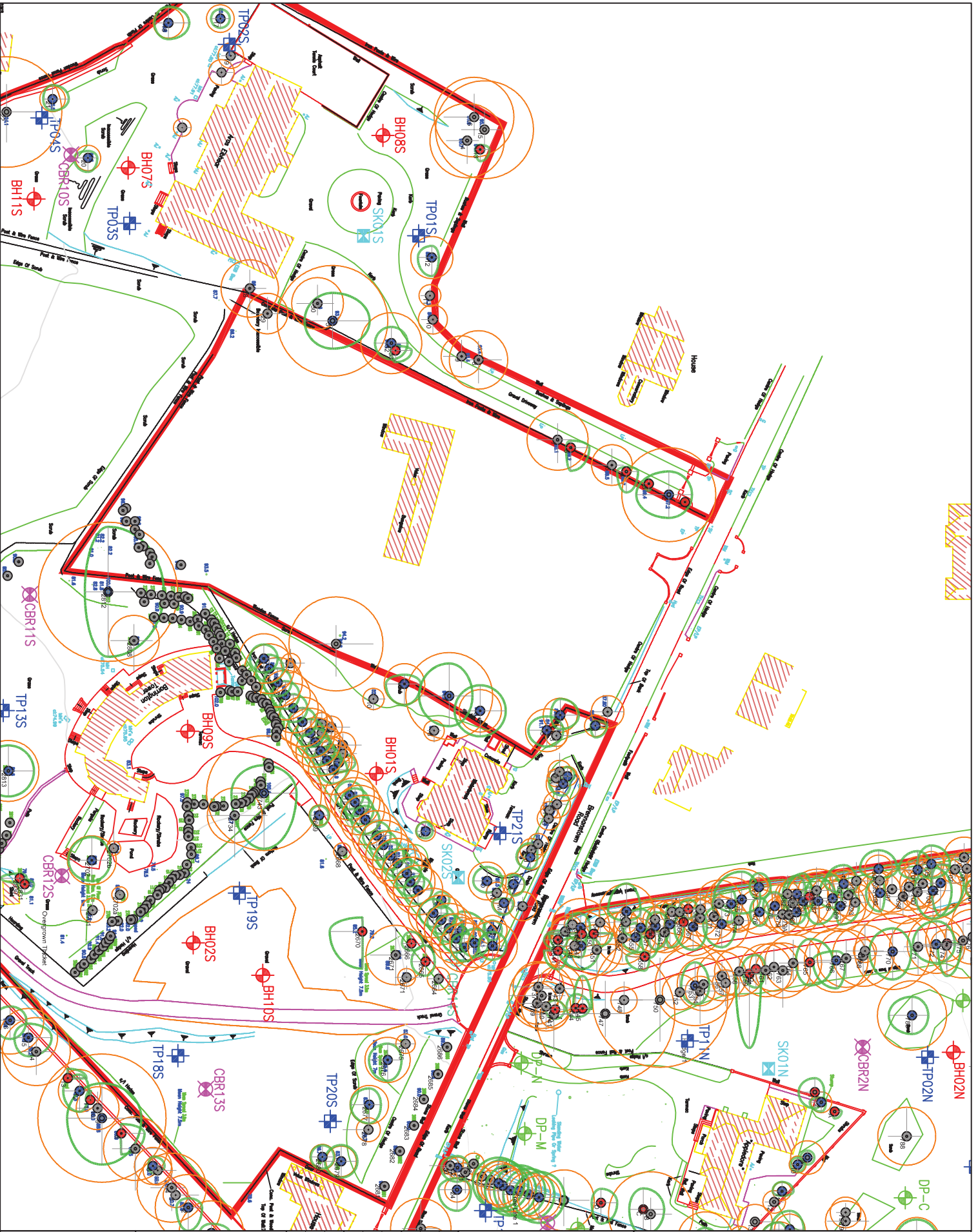
Appendix 8
Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Boreholes					
BH01S	722614.287	724328.872	75.89	322690.213	224300.510
BH02S	722650.774	724289.427	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	722518.233	724233.150	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	722640.048	724299.367	73.35	322715.980	224270.999
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 Transverse Mercator		Elevation	Irish National Grid	
	Easting	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
California Bearing Ratio Tests					
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

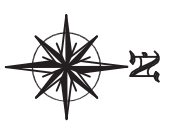
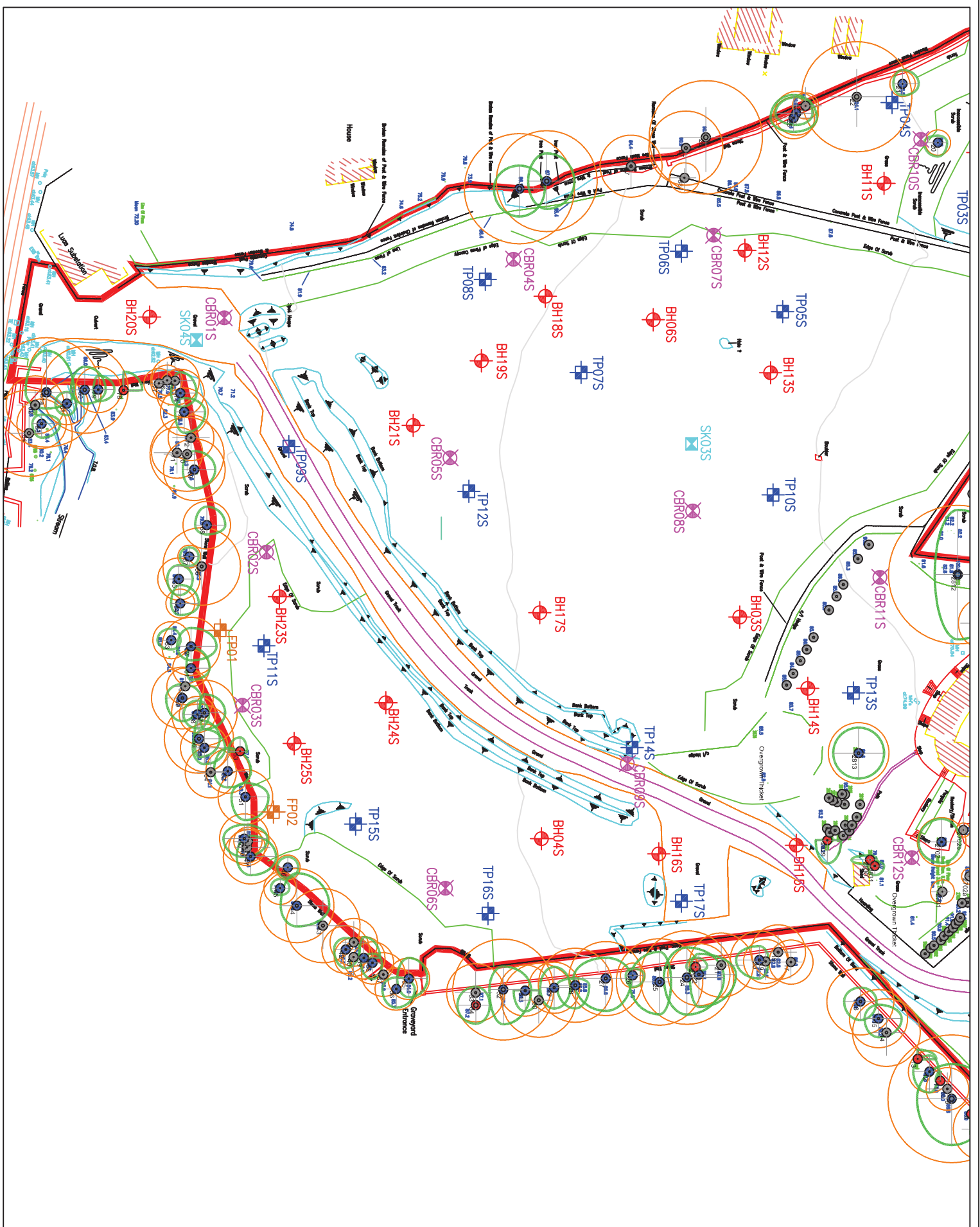


Legend:

- Cable Percussion Borehole
- Trial Pit
- Foundation Pit
- Dynamic Probe
- Soakaway Pit
- California Bearing Ratio Test

Client:	Cairn Homes PLC
Engineer:	Waterman Moylan
Project:	Brennanstown Road
Date:	02-10-2020
Description:	Site Investigation
Drawing:	SIL5752402/03
Scale:	Not to Scale
Rev:	1
Drawn by:	SL
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The Grange	
12th Lock Road	
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