Development at Rathfarnham Castle. Rathfarnham Dublin

Stormwater Management Plan Report

March 2025

2332

Issue No. 1

CORA Consulting Engineers
Behan House,
10 Mount Street Lower
Dublin D02HT71
Tel: 01- 6611100

E: info@cora.ie

Table of Contents

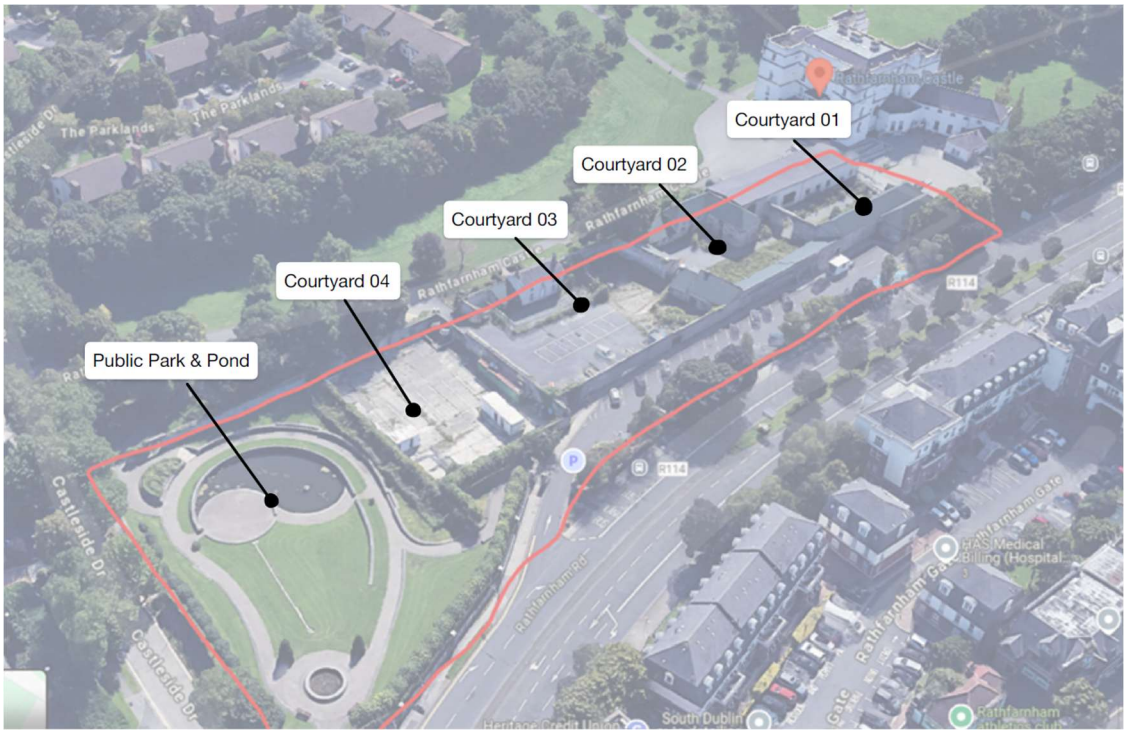
1 Introduction

1.1 General

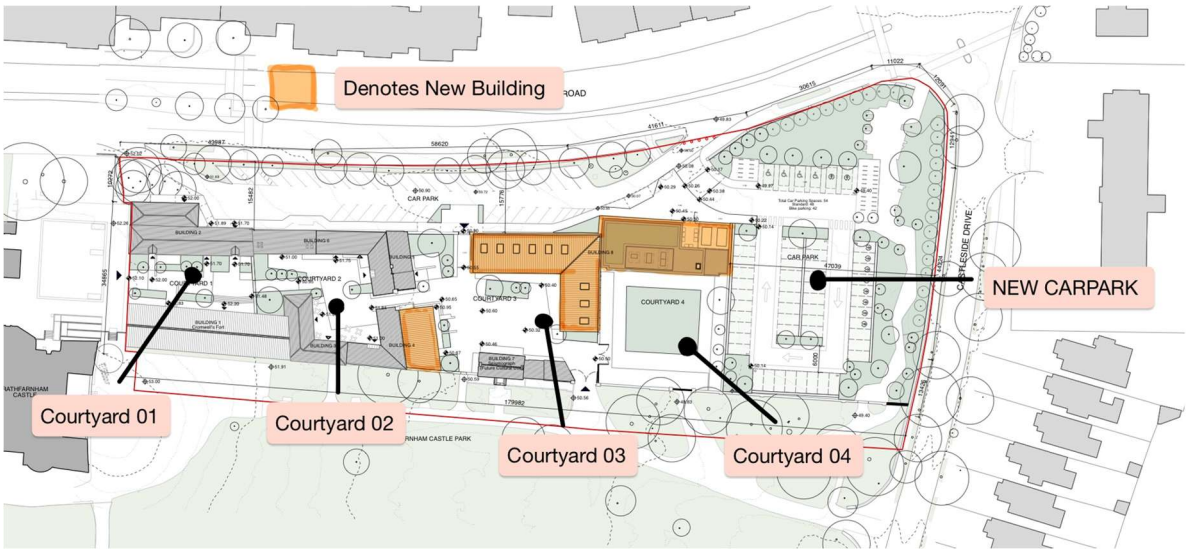
This report addresses the storm water management for the proposed development within the site adjacent to Rathfarnham Castle along Rathfarnham Road – The site is shown bounded by the red line in the diagram below.

The site consists of four existing courtyards with outbuildings and a public park with a small pond towards the north of the site – The proposed redevelopment broadly consists of the an internal refurbishment of the existing outbuildings and the construction of two new buildings in Courtyard 03 and a single building in Courtyard 04 – Refer to the existing and proposed site layouts shown below. The existing park & pond is to be repurposed as a carpark. The existing paved courtyard areas are to be fully redeveloped to include significant soft landscaping.

There is an existing surface water network located to the north of the site – This is visible on Irish Water record drawings and verified by a survey



Existing Site Layout

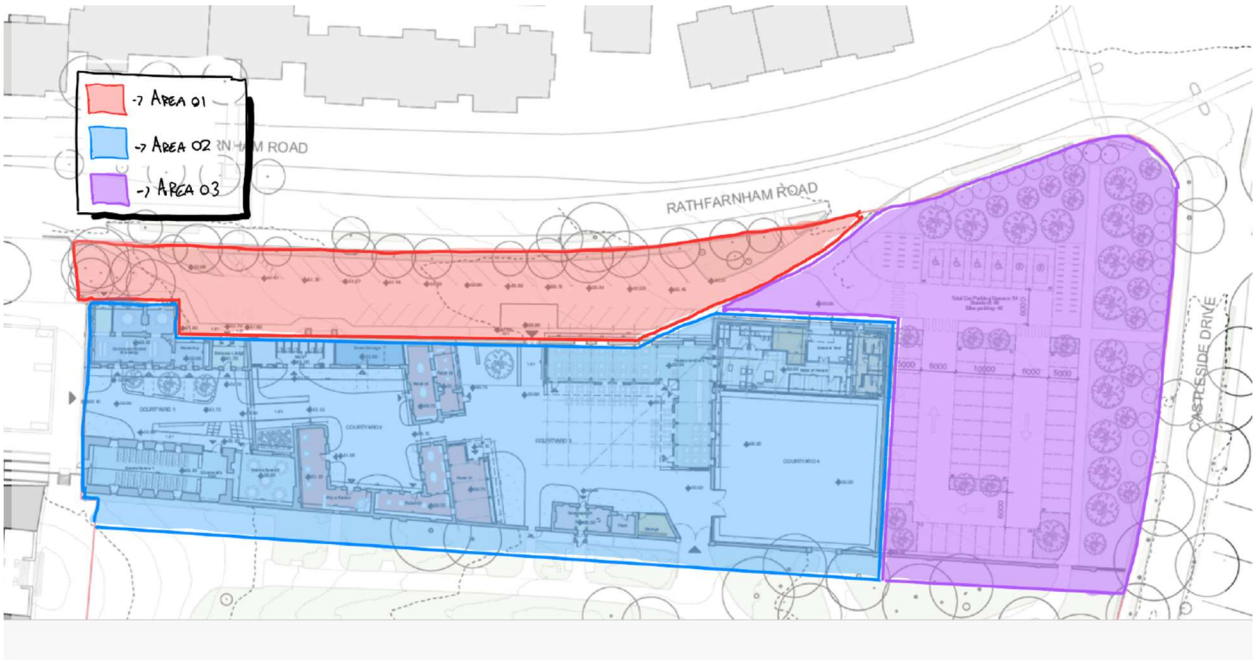


Proposed Site Layout

1.2 Proposed Stormwater Management Plan Summary

In order to comply with modern standards, stormwater shall be treated using nature-based solutions as far as possible in line with the South Dublin County Council Development Plan.

For the purposes of stormwater management the site is defined in 3 No. Sub-Catchments as identified in the image below.



Sub-catchment Area No.	Description	Gross Plan Area (m^2)	Stormwater management systems
1	Existing Impermeable Asphalt Carpark (No works included as part of this development to this area)	1885m^2	Existing Storm Water drainage infrastructure to be maintained
2	Existing Courtyards & Buildings	4585m^2	Attenuation tank formed with proprietary Aqua-cell attenuation system located beneath the new carpark to the north end of the site. Discharge to be connected to existing surface water network
3	New Carpark and soft landscaping	3585m^2 (1100m^2 is hardstanding, remaining area is soft landscaping)	Attenuation tank formed with crushed stone. Discharge to be connected to existing surface water network

The table above summarises the description of the sub-catchments and the proposed stormwater management for each. Each sub-catchment shall be described in greater details in section 2.

1.3 Blue & Green Roofs

Blue and Green Roof systems were considered for each building. However the roofs of the existing outbuildings and the proposed new buildings in courtyard 03 are pitched and the profile is not suitable for blue or green roofs.

A green roof is to be installed on the new building in courtyard 04

2 Stormwater Management Plan

2.1 Existing Site & Surface Water Run-Off

The proposed application site is approximately 10054m^2 and has been broken down into three catchment areas.

As noted above **catchment area 01** is an existing carpark. There is to be no significant works to this area as part of these redevelopment works and it is proposed to maintain the current drainage network in this area.

Catchment area 02 consists of the four courtyards & associated buildings. With regard to the existing paved courtyards and buildings there is no discernible surface water strategy
The roofs of the existing buildings are constructed from corrugated sheathing and the surface runoff from these is carried via rainwater downpipes to a series of gullies and some rainwater pipes discharge directly to the ground. The surface courtyards currently consist of a mix of hard landscaped surfaces including concrete, asphalt and cobbles.

Catchment area 03 currently consists of landscaped park with a small pond and walkways.

The site slopes naturally downhill from courtyard 01 to courtyard 04. A CCTV survey of the existing drainage pipework has established that there is network of pipework and gullies in courtyards 03 and 04. This connects to an existing combined sewer which is then connected to the Irish Water foul sewer on Castleside Drive – A copy of the survey drawing is shown in Appendix B

Using Met Eireann Rainfall Data the greenfield run-off for the overall site (Qbar) is taken as **2.87 l/s**. Details of the input data and calculations are in Appendix A.

2.2 Ground Conditions and Site Investigations

Trial Pits and soakaways were carried out on the site to establish the ground conditions. A layer of made ground overlays sandy gravel at approximately 800mm down. The overlying strata is considered soil type 3.

Two soakaway test were carried out – One in Courtyard 03 and the second in Courtyard 04. The first test resulted in a failure and did not produce a f-value. The second produced a value of 0.00019m/s and indicated water stabilising at 0.64m

Both tests indicate a low to zero value for soil permeability.

A record of these tests are included in Appendix C

2.3 Proposed Stormwater Management Plan – Design Methodology

Area 01

Area one comprises of the existing carpark that is situated adjacent to Rathfarnham Road – As part of this development there are no significant works proposed in this area and therefore it is proposed to maintain the existing stormwater infrastructure.

Area 02

Area 02 consists of the existing courtyards 01,02,03 & 04 and all associated buildings. The results of the soil infiltration tests indicate low to zero infiltration so the entire stormwater runoff for this area will be managed by means of an attenuation system.

A total storage capacity of 435m^3 will be provided. A single attenuation tank formed from proprietary Aqua-cells units and wrapped in an impermeable membrane will be constructed beneath the finished level of the proposed carpark – Refer to CORA drawings C0001 for details.

An attenuated discharge will be connected to the existing surface water network located to the north of the site. The discharge will be attenuated to the 2.3l/s which is the calculated apportioned Qbar for the greenfield run-off.

As noted above the soil infiltration test indicate very poor permeability. However it is noted, that in order to install the proposed landscape finishes the soil will be required to be excavated and

cultivated/rotovated to a depth of approximately 400mm. This will likely greatly improve the permeability of the soil and allow greater infiltration.

Area 03

Area 03 consists of the proposed car park and soft landscaping area. The stormwater runoff from the asphalt road and parking bays will be managed by means of an attenuation system. A total storage capacity of 140m^3 will be provided

A attenuated discharge will be connected to the existing surface water network located to the north of the site. The discharge will be attenuated to the 0.56l/s which is the calculated apportioned Qbar for the greenfield run-off.

A thick layer of crushed stone will form the subbase for the parking areas which will also serve as the attenuation tank. This will be wrapped in an Inbitex membrane to remove any hydrocarbons from the stormwater flow. Refer to drawing C0001 for details.

3.0 Conclusion of Stormwater Management Plan

The above stormwater management plan proposes *nature-based solutions* where practicable to treat stormwater runoff on the site. The suite of measures included in the proposed development shall make a significant improvement to the current situation where there is a substantial stormwater run-off directed to the public sewers, particularly on Castleside Drive.

Appendix A – Stormwater Management Calculations

CORA CONSULTING ENGINEERS
Behan House
10 Lower Mount Street
Dublin
D02 HT71
t: +353 1 6611100
e: info@cora.ie

Job No. 2332	Ref No.	Rev PL1	
Rathfarnham Castle		Page No. 1 OF 2	
By: DB		Checked: LE	
Title: SW Drainage: Input Data		Date: 07-Mar-2025	

Drainage Input Data

Site Coordinates:

	IG	ITM
E:	314470	714411
N:	228876	728901

Standard Average Annual Rainfall, SAAR =	821 mm	(From Met Éireann Historical Data)
SOIL Type =	3	
SOIL =	0.37	
Q_{BAR} =	**3.46 l/s/ha**	
Overall Site Area, ha =	0.83 ha	(From Site Plan)
Q_{BAR} =	**2.87 l/s**	
For urban site	**2.0 l/s**	
Soil Infiltration Rate, f =	0 m/s	(From Soils Tests)
	0 m/hr	

Growth Curve Factors:

1 Year	0.85
30 Year	2.13
100 Year	2.61
200 Year	2.86

CORA CONSULTING ENGINEERS
Behan House
10 Lower Mount Street
Dublin
D02 HT71
t: +353 1 6611100
e: info@cora.ie

Job No.	Ref No.	Rev
2332		PL1
		Page No. 1/2
By: DB		Checked: LE
Title: SW Drainage: Attenuation Storage Volume Carpark		Date: 07-Mar-2025

Calculation of Attenuation Volume

Length, l =	25 m	Area: 625.0 m²
Width, w =	25 m	
Depth, d =	0.75 m	
Free Volume, V_{free} =	30%	
M5-60min from Met Éireann Data =	18 mm	
M5-60m/M5-2d from Met Éireann Data, r =	0.275	
Return Period, years =	100 year	+ 20%
Impermeable Area, A =	1100 m²	
Outflow Factor, AF =	0.56 l/s	(0.00056 m³/s)
Max. Inflow (from RWHT) =	0.0 l/s =	0 m³/s

Duration	M5 Rainfalls	100 year Rainfall	100 year Rainfall + 20%	Inflow (m³)	Additional Inflow (m³)	Outflow (m³)	Storage Required (m³)
5 mins	6.7 mm	17.4 mm	20.9 mm	23.0	0	0.2	22.8
10 mins	9.4 mm	24.3 mm	29.2 mm	32.1	0	0.3	31.7
15 mins	11.0 mm	28.6 mm	34.3 mm	37.8	0	0.5	37.2
30 mins	14.1 mm	35.3 mm	42.4 mm	46.6	0	1.0	45.6
1 hour	18.0 mm	43.7 mm	52.4 mm	57.7	0	2.0	55.7
2 hours	23.0 mm	54.0 mm	64.8 mm	71.3	0	4.0	67.2
3 hours	26.6 mm	61.2 mm	73.4 mm	80.8	0	6.0	74.7
4 hours	29.4 mm	66.8 mm	80.2 mm	88.2	0	8.1	80.1
6 hours	34.0 mm	75.6 mm	90.7 mm	99.8	0	12.1	87.7
9 hours	39.2 mm	85.6 mm	102.7 mm	113.0	0	18.1	94.8
12 hours	43.4 mm	93.5 mm	112.2 mm	123.4	0	24.2	99.2
18 hours	50.1 mm	105.8 mm	127.0 mm	139.7	0	36.3	103.4
24 hours	55.5 mm	115.6 mm	138.7 mm	152.6	0	48.4	104.2

Rainfall Values are taken from Met Éirean Data for the site (see separate data sheet)

Required Storage, S_{reqd} =	**104.2 m³**	
Actual Storage, S_{act} =	**140.63 m³**	**(0.74)**

Storage Volume is OK

CORA CONSULTING ENGINEERS
Behan House
10 Lower Mount Street
Dublin
D02 HT71
t: +353 1 6611100
e: info@cora.ie

Job No.	Ref No.	Rev
2332		PL1
		Page No. 1/2
By: DB		Checked: LE
Title: SW Drainage: Attenuation Storage Volume Courtyard 01,02,03 & 04		Date: 07-Mar-2025

Calculation of Attenuation Volume

Length, l =	60 m	Area: 384.0 m²
Width, w =	6.4 m	
Depth, d =	1.2 m	
Free Volume, V_{free} =	95%	
M5-60min from Met Éireann Data =	18 mm	
M5-60m/M5-2d from Met Éireann Data, r =	0.275	

Return Period, years =	100 year		+ 20%
Impermeable Area, A =	4500 m²		
Outflow Factor, AF =	2.3 l/s		(0.0023 m³/s)
Max. Inflow (from RWHT) =	0.0 l/s	=	0 m³/s

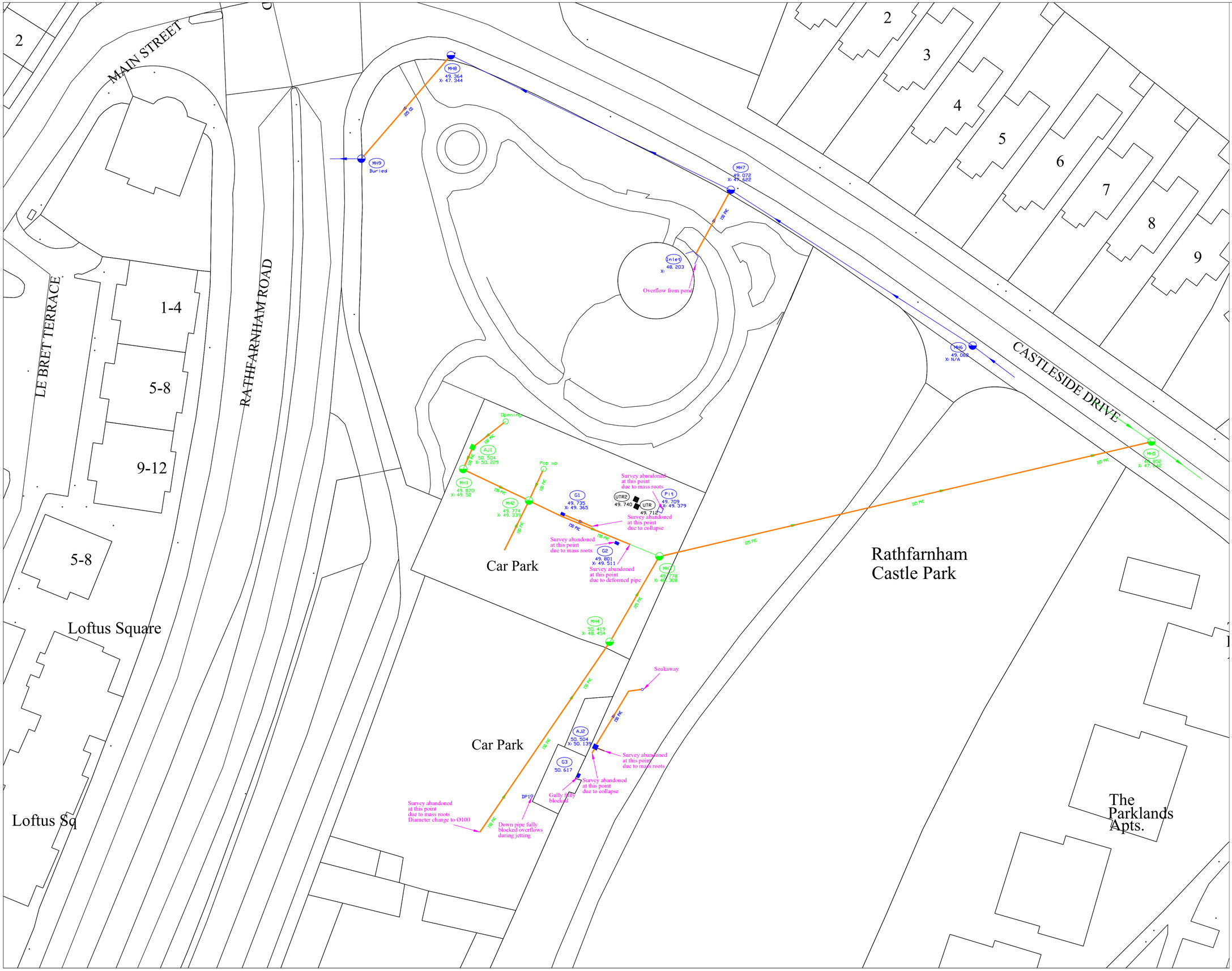
Duration	M5 Rainfalls	100 year Rainfall	100 year Rainfall + 20%	Inflow (m³)	Additional Inflow (m³)	Outflow (m³)	Storage Required (m³)
5 mins	6.7 mm	17.4 mm	20.9 mm	94.0	0	0.7	93.3
10 mins	9.4 mm	24.3 mm	29.2 mm	131.2	0	1.4	129.8
15 mins	11.0 mm	28.6 mm	34.3 mm	154.4	0	2.1	152.4
30 mins	14.1 mm	35.3 mm	42.4 mm	190.6	0	4.1	186.5
1 hour	18.0 mm	43.7 mm	52.4 mm	236.0	0	8.3	227.7
2 hours	23.0 mm	54.0 mm	64.8 mm	291.6	0	16.6	275.0
3 hours	26.6 mm	61.2 mm	73.4 mm	330.5	0	24.8	305.6
4 hours	29.4 mm	66.8 mm	80.2 mm	360.7	0	33.1	327.6
6 hours	34.0 mm	75.6 mm	90.7 mm	408.2	0	49.7	358.6
9 hours	39.2 mm	85.6 mm	102.7 mm	462.2	0	74.5	387.7
12 hours	43.4 mm	93.5 mm	112.2 mm	504.9	0	99.4	405.5
18 hours	50.1 mm	105.8 mm	127.0 mm	571.3	0	149.0	422.3
24 hours	55.5 mm	115.6 mm	138.7 mm	624.2	0	198.7	425.5

Rainfall Values are taken from Met Éirean Data for the site (see separate data sheet)

Required Storage, S_{reqd} =	**425.5 m³**	
Actual Storage, S_{act} =	**437.76 m³**	**(0.97)**

Storage Volume is OK

Appendix B – Drainage Survey Drawings



LEGEND

- Foul
- Surface
- Combined
- Overflow
- Rising Main
- Surveyed
- To be cleaned

UTR – Unable to rise
UTL – Unable to locate
UTS – Unable to survey
UTGA – Unable to get access
SA – Survey Abandoned

TEXT ANNOTATION

Pipe diameter of major outgoing pipe

Manhole Ref.
Survey Status
Cover Level
Invert Level

690
Yes
40. 740
X: 38. 340
825

Note: All levels are above ordnance datum Malin Head.

Issue	Date	Description	By	Chkd.

Client: South Dublin Co. Council

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

Engineer: CORA Consulting Engineers

CORA
CONSULTING ENGINEERS

USA Ltd.
Underground Surveying & Analysis Ltd.

Block 2, First floor offices,
Blessington Business Park, Santryhill
Blessington,
Co. Wicklow, W91 WX65
Tel: +353 45 934 010
e-mail: info@usa-ltd.ie

Project:
USA9440
RathfarnhamCastle

Title:
CCTV & Tpographic Survey
Survey Date: 27/08/2024

Scale @ A1: 1:1000

Prepared by: MW
Checked: JD
Date: 28/09/2024

Drawing No.: Overview
Issue: 0

Appendix C – Site Investigation Records & Results

FACTUAL REPORT

SITE INVESTIGATION
AT RATHFARNHAM CASTLE
STABLES AND COURTYARD
SOUTH DUBLIN CO.CO.

CORA
CONSULTING ENGINEERS

CONTENTS

APPENDICES

FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

General.

Recommendations made, and opinions expressed in the report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held for conditions which have not been revealed by exploratory work, or which occur between exploratory hole locations. Whilst the report may suggest the likely configuration of strata, both between exploratory hole locations, or below the maximum depth of the investigation, this is only indicative, and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

Boring Procedures.

Unless otherwise stated, the 'Shell and Auger' technique of soft ground boring has been employed. All boring operations sampling and/or logging of soils and in-situ testing complies with the recommendations of the British Standard Code of Practice BS 5930 (1981), 'Site Investigation' and BS 1377:1990, 'Methods of test for soils for civil engineering purposes'.

Whilst the technique allows the maximum data to be obtained in soft ground, some disturbance and variation of soft and layered soils is unavoidable. Attention is drawn to this condition, whenever it is suspected. Where cobbles and boulders are recorded, no conclusion should be drawn concerning the size, presence, lithological nature, or numbers per unit volume of ground.

Where peat has been encountered during siteworks, samples have been logged in accordance with the Von Post Classification (ref. Von Post, L. 1992. Sveriges Gologiska Undersoknings torvinventering och nogra av dess hittils vunna resultat (SGU peat inventory and some preliminary results) Svenska Mosskulturforeningens Tidskrift, Jonkoping, Swedden, 36, 1-37 & Hobbs N. B. Mire morphology and the properties of some British and foreign peats. QJEG, Vol. 19, 1986).

Routine Sampling.

Undisturbed samples of soils, predominantly cohesive in nature are obtained unless otherwise stated by a 104mm diameter open-drive tube sampler. In granular soils, and where undisturbed sampling is inappropriate, disturbed samples are collected. Smaller disturbed samples are also recovered at intervals to allow a visual examination of the full strata section.

In-Situ Testing.

Standard penetration tests, utilising either the standard split spoon sampler or solid cone and automatic trip-hammer are conducted unless otherwise where required by instruction. Subsequent to a seating drive of 150mm, a summation for the number of blows for 300mm penetration is recorded on the boring records together with the blow count for each 75mm penetration. In cases where incomplete penetration is obtained, the number of blows for the recorded value of penetration are noted. In coarse granular soils, a cone end is fitted to the sampler and a similar procedure adopted.

Groundwater.

The depth of entry of any influx of groundwater is recorded during the course of boring operations. However, the normal rate of boring does not usually permit the recording of an equilibrium level for any one water strike. Where possible drilling is suspended for a period of twenty minutes to monitor the subsequent rise in water level.

Groundwater conditions observed in the borings or pits are those appertaining to the period of investigation. It should be noted however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage condition, tidal variation or other causes.

Retention of Samples.

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded unless a period of retention of samples is agreed, it is our normal practice to discard all soil samples one month after submission of our final report.

REPORT ON A SITE INVESTIGATION
AT RATHFARNHAM CASTLE
DUBLIN

FOR
SOUTH DUBLIN COUNTY COUNCIL

CORA CONSULTING ENGINEERS

Report No. 25766 **January 2024**

I Introduction

New developments are proposed at the STABLES and COURTYARD at Rathfarnham Castle in Dublin.

An investigation of sub soil conditions in the development areas has been carried out for South Dublin County Council under the direction of CORA Consulting Engineers..

The investigation was carried out in two phases, designated Phase 1 and Phase II.

The programme of the geotechnical investigation included the following elements:

	Phase 1	Phase II
Foundation Inspections	4 nr	6 nr
Dynamic Probes	3 nr	
Window Samples	3 nr	
Trial Pits / BRE Digest 365	2 nr	
RILTA Suite Tests	3 nr	
Chemical Tests	2 nr	

The works were carried out in accordance with BS 5930, Code of Practice for Site Investigations (1999) and the appropriate Euro-codes.

This report includes all factual data pertaining to the project and briefly comments on the findings.

II Fieldwork

The site location and the position of the various exploration points are shown on the drawings enclosed in Appendix VI to this report. Locations were specified by CORA and marked out on site by IGSL.

The various elements of the investigation are detailed in the following paragraphs.

Foundation Inspection Pits

PHASE 1

Four trial excavations were undertaken to establish foundation details for existing boundary walls. The existing concrete surface was saw-cut and excavation by hand and mini-digger was carried out to determine details of the wall foundations.

Detailed records of each excavation with supporting photographs are presented in Appendix I and referenced F101 to F104.

The records note the stratification and sampling details and comment on ground water conditions.

Ref;	Top of Foundation	Foundation Thickness	Step-Out	Water
F101	> 1.60	N/A	N/A	1.60
F102	0.90	0.40	0.10	Dry
F103	0.25	0.25	0.10	Dry
F104	0.50	0.40	0.10	0.90

PHASE II

Six foundation excavations were completed in Phase II with details enclosed in Appendix IA.

The data is summarised as follows:

Ref;	Top of Foundation	Foundation Thickness	Step-Out	Water
F101A	> 1.40	N/A	N/A	0.98
F102A	No Foundation Identified (base of wall @ 0.50 metres)			Dry
F103A	0.52	0.18	0.20	Dry
F104A	No Foundation Identified (base of wall @ 0.84 metres)			Dry
F105A	No Foundation Identified (base of wall @ 0.50 metres)			Dry
F106A	No Foundation Identified (base of wall @ 0.65 metres)			Dry

Heavy Duty Probes

Heavy duty probing was carried out at three locations as indicated on the site plan and referenced DP01 to DP03.

A tracked Competitor Probe Rig was used to establish a strength/depth pattern. A 50kg hammer falling through 500mm is used to drive a 43.7mm diameter cone into the soil.

Probing is in accordance with the DPH specification of BS 1377: Part 9: 1990. In these tests, the soil resistance is measured in terms of the number of drop-hammer blows required to drive the test probe through each 100 mm increment of penetration. The results are presented in Appendix I1. Probing is generally terminated following successive blow counts in excess of 25, to avoid damage to the apparatus.

Soft soils are generally defined as a Probe Resistance of $N_{100} < 2$. In the case of very soft material, probe penetration under self-weight can occur. N_{100} values of Zero are then recorded.

Stiff or compact soils (suitable as a founding medium for light foundations) are indicated by a probe resistance of $N_{100} = 5$ with no underlying deterioration.

The probe data is summarised as follows with a dense Hardcore layer at surface in each location.

Ref. No.	Dense	Soft Zone	Stiff Soil	Refusal Depth
DP01	0 – 0.70	0.70 – 1.40	1.40 – 3.00	3.00
DP02	0 – 0.50	0.50 – 1.00	1.10 – 2.50	2.50
DP03	0 – 0.30	0.30 – 0.70	0.80 – 2.70	2.70

Window Sampling

Three 100mm soil cores were recovered adjoining each probe location using Window Sampling equipment. These are referenced WS01 to WS03 with details presented in Appendix III.

A steel cylinder is driven into the sub-soil and core is recovered in 1.00 metre long 100mm PVC Liners. These are returned to the IGSL Laboratory for examination.

The records confirm the presence of surface granular FILL overlying soft to firm gravelly CLAY

Details are summarised as follows:

Location	Made Ground	Soft / Firm Clay	Firm/Stiff Clay
WS01	0 – 0.50	0.50 – 2.10	2.10 - 2.90
WS02	0 – 0.50	0.50 – 1.20	1.20 – 2.50
WS03	0 – 0.30	0.30 – 0.90	0.90 – 2.60

BRE Digest 365 Test

Infiltration testing was carried out at two specified locations in accordance with BRE Digest 365 'Soakaway Design'. The stratification is noted on the individual Trial Pit records and the tests are referenced SA01 and SA02..

To obtain a measure of the infiltration rate of the sub-soils, water was poured into the test pit, and a record taken of the fall in water level against time. The test was carried over two cycles following initial soakage. Designs are based on the slowest infiltration rate, which is calculated from the final cycle.

The results are summarised as follows with full details presented in Appendix IV.

Ref No.	Soil Type	Infiltration Rate (f) Metres/ Minute
SA01	Fill / Gravelly CLAY	0.00000
SA02	Fill / Gravelly CLAY	0.00019

The results reflect the very low permeability of the local gravelly clay stratification.

III: Laboratory Tests

a. Environmental

Sub samples of the recovered soil have been sent EUROFINS environmental laboratory and testing has been carried out to RILTA SUITE (WAC) parameters.

A total of three samples were submitted for RILTA analysis and detailed test results are presented in Appendix V.

The results have been sent to environmental consultants **O'Callaghan Moran** and a detailed Waste Characterisation Assessment has been prepared and submitted directly to CORA. A copy of this document is also contained in Appendix V.

b. Chemical

Two samples were selected for sulphate, Chloride and pH analysis. Sulphate concentrations (SO4 2:1 extract) of 0.060 to 0.130 g/l were established with pH values of 7.9 and 8.6. Chloride contents were low (> 0.001 to 0.019 g/l). No special precautions are necessary to protect foundation concrete from sulphate aggression. A sulphate design class of DS-1 (ACEC Classification for Concrete) is indicated for concentrations less than 0.5 g/l.,

IGSL/JC
January 2025

Appendix I Foundation Pits

Phase I

FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin
Location:	FI01
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	28/11/2024

TRIAL PIT NO. FI01

PHOTOS

Summary of ground conditions

from	to	Description	Ground water
0.00	0.10	CONCRETE	Seepage from 1.6m BGL
0.10	0.30	Old Brick Layer	
0.30	1.60	MADEGROUND: Soft brown sllightly sandy gravelly silty Clay with high subarounded cobble content. Bricks and cobble/boulder sized concrete fragments	

Foundation depth:

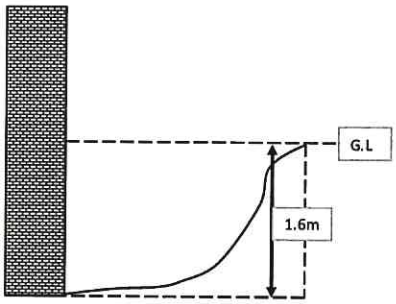
Samples:

0.5m	AA232726	B
1.0m	AA232727	B
1.5m	AA232728	B

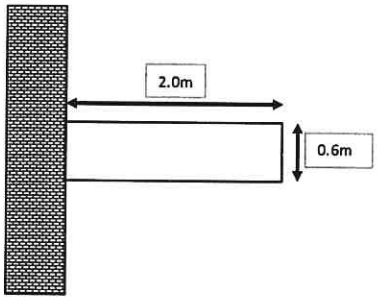
Detail: The base of the foundation was not reached because an arch in the underground part of the wall appeared during the excavation and in agreement with the engineer it was decided to stop the excavation.

Location:

Elevation



Plan



FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin
Location:	FI02
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	28/11/2024

TRIAL PIT NO. FI02

PHOTOS

Summary of ground conditions

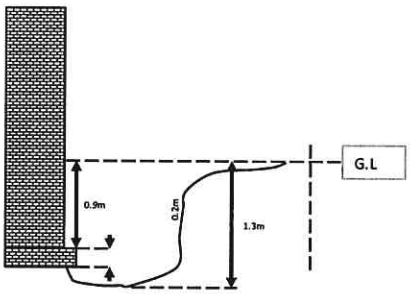
from	to	Description	Ground water
0.00	0.10	CONCRETE.	No
0.10	0.30	Uncompact grey angular gravel sized Stone (804).	
0.30	1.30	MADEGROUND: Soft brown sllightly sandy gravelly silty Clay with high subarounded cobble content.	
		subarounded.	

Foundation depth: 0.9m BGL

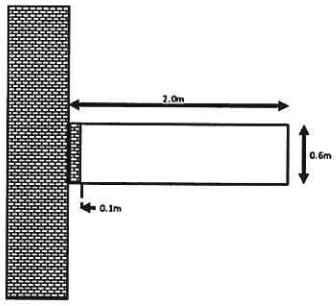
Location:

Samples:	0.5m	AA232729	B
	1.0m	AA232730	B

Elevation



Plan



FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin
Location:	FI03
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	28/11/2024

TRIAL PIT NO. FI03

PHOTOS

Summary of ground conditions

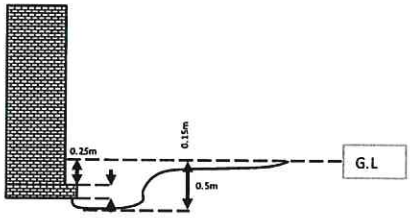
from	to	Description	Ground water
0.00	0.10	CONCRETE.	No
0.10	0.50	Soft brown sandy gravelly CLAY with low subangular cobble content	

Foundation depth: 0.25m BGL

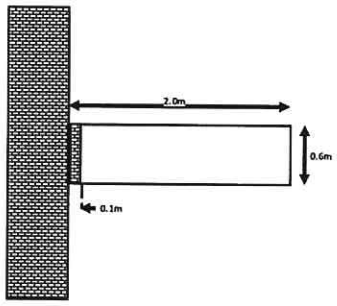
Location:

Samples: 0.5m AA232731 B

Elevation



Plan



FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin
Location:	FI04
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	28/11/2024

TRIAL PIT NO. FI04

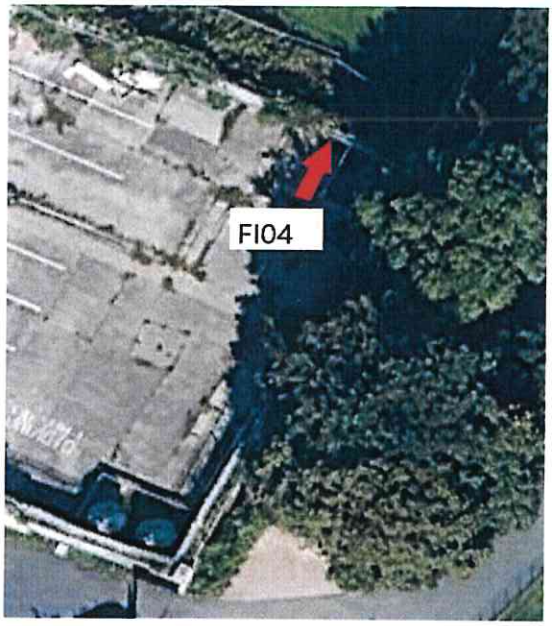
PHOTOS

Summary of ground conditions

from	to	Description	Ground water
0.00	0.10	CONCRETE.	Seepage from 0.9m BGL
0.10	0.50	MADEGROUND: uncompact grey subangular gravel sized Stone (804).	
0.50	0.90	Soft greyish brown slightly sandy gravelly CLAY with low subangular to subrounded cobble content.	

Foundation depth: 0.5m BGL

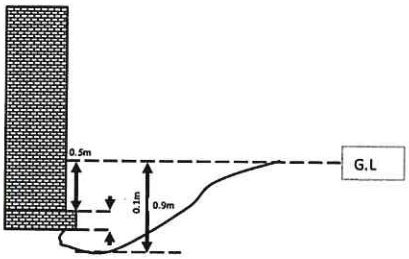
Location:



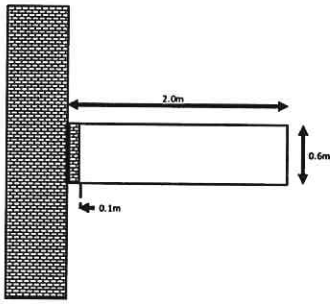
Samples:

0.5m	AA232732	B
0.9m	AA232733	B

Elevation



Plan



Appendix IA Foundation Pits

Phase II

FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin
Location:	FI01
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	09/01/2025

TRIAL PIT NO. FI01

PHOTOS

Summary of ground conditions

from	to	Description	Ground water
0.00	0.10	TARMACADAM	Rapid from 0.98m BGL
0.10	0.35	Uncompact (loose) dark grey angular gravel sized Stone.	
0.35	1.40	MADEGROUND: comprising of soft brown slightly sandy gravelly Clay with low subrounded cobble content. Sand is fine to medium. Gravel is angular fine to coarse. Rare subrounded gravel sized brick and concrete fragments (less than 2% of non-natural material). Recovered as moist to wet (from 0.98m BGL)	

Foundation depth:

Samples:

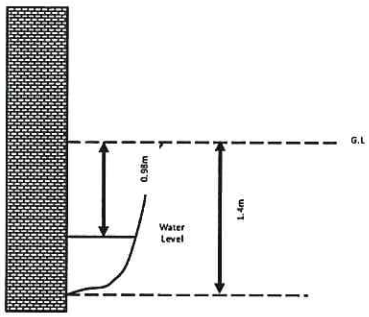
0.5m AA232619 B

1.4m AA232620 B

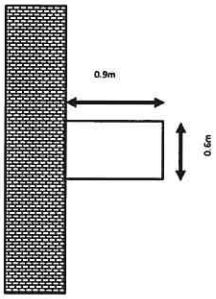
Location:

Detail: The base of the foundation was not reached because a rapid water ingress from 0.98m BGL

Elevation



Plan



FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin (Phase 2)
Location:	FI02
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	08/01/2025

TRIAL PIT NO. FI02 A

PHOTOS

Summary of ground conditions

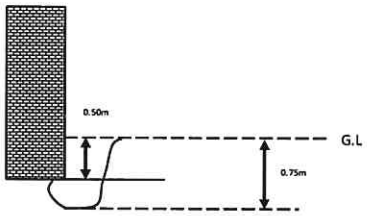
from	to	Description	Ground water
0.00	0.10	Old Bricks layer	NO
0.10	0.50	MADEGROUND: comprising of soft brown slightly gravelly sandy silty Clay with medium subrounded cobble content. Sand is fine to medium. Gravel is angular to subrounded fine to coarse. Rare subrounded gravel/cobble sized brick and concrete fragments (less than 2% of non-natural material). Recovered as moist.	
0.50	0.75	Soft brown slightly gravelly silty Clay. Gravel is subangular fine to coarse. Rare timber fragments (less than 2% of non-natural material) (MADEGROUND).	

Foundation depth:

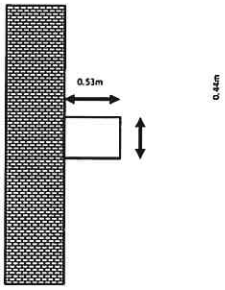
Samples:				
	0.5m	AA232612	B	
	1.4m	AA232613	B	

Location:

Elevation



Plan



FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin (Phase 2)
Location:	FI03
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	08/01/2025

TRIAL PIT NO. FI03A

PHOTOS

Summary of ground conditions

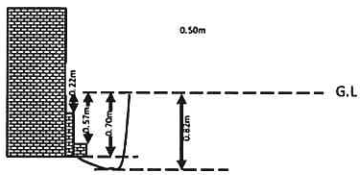
from	to	Description	Ground water
0.00	0.10	CONCRETE	NO
0.10	0.25	Od brick paving.	
0.25	0.57	MADEGROUND: comprising of uncompact (loose) greyish brown gravelly Sand with low subrounded cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Occasional subrounded gravel/cobble sized concrete and brick fragments, glass fragments (more than 2% of non-natural material)	
0.57	0.82	Soft brown slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse.	

Foundation depth:

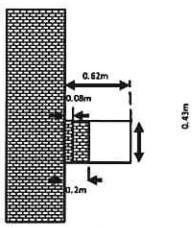
Samples:	0.5m	AA232612	B	
	1.4m	AA232613	B	

Location:

Elevation



Plan



FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin (Phase 2)
Location:	FI04
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	09/01/2025

TRIAL PIT NO. FI04

PHOTOS

Summary of ground conditions

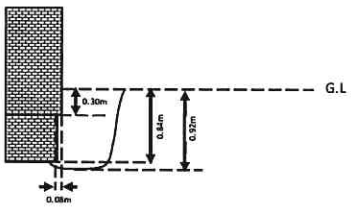
from	to	Description	Ground water
0.00	0.10	CONCRETE	NO
0.10	0.84	MADEGROUND: comprising of firm brown gravelly very sandy Clay with low subrounded cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Numerous gravel/cobble sized concrete and brick fragments (more than 2% of non natural-material).	
0.84	0.92	MADEGROUND: comprising of firm brown slightly sandy gravelly silty Clay with low subrounded cobble content. Sand is fine to medium. Gravel is subangular fine to coarse. Rare gravel/cobble sized concrete and brick fragments (less than 2% of non natural-material).	

Foundation depth:

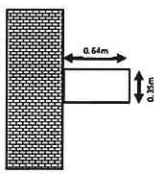
Samples:	0.5m	AA232617	B	
	1.4m	AA232618	B	

Location:

Elevation



Plan



FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin (Phase 2)
Location:	FI05
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	08/01/2025

TRIAL PIT NO. FI05

PHOTOS

Summary of ground conditions

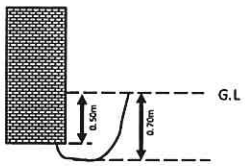
from	to	Description	Ground water
0.00	0.10	Old stone paving	
0.10	0.70	MADEGROUND: comprising of uncompact (loose) brownish grey gravelly Sand with high angular cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Abundant gravel/cobble/boulder (300mm wide) concrete and brick fragments (more than 2% of non-natural material).	NO

Foundation depth:

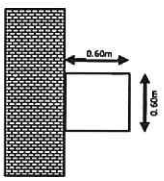
Samples:	0.1 - 0.7	AA232614	B	

Location:

Elevation



Plan



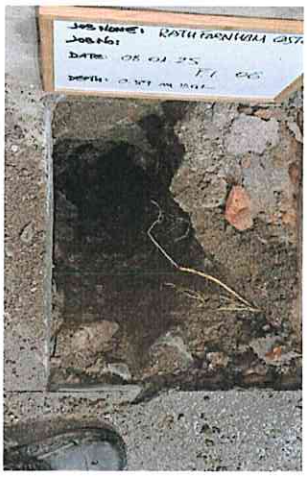
FOUNDATION INSPECTION PIT RECORD

25766

Contract:	Rathfarnham Castle, Dublin (Phase 2)
Location:	FI06
Engineer	CORA
Client:	HCC Architecture
Logged by:	CQ
Date:	08/01/2025

TRIAL PIT NO. FI06 A

PHOTOS



Summary of ground conditions

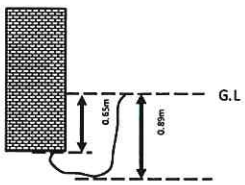
from	to	Description	Ground water
0.00	0.05	CONCRETE	NO
0.05	0.65	MADEGROUND: comprising of soft brown gravelly very sandy Silt/Clay with medium angular cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Occasional gravel/cobble sized concrete and brick fragments (more than 2% of non-natural material).	
0.65	0.89	MADEGROUND: comprising of soft greyish brown slightly gravelly sandy Silt/Clay. Sand is fine to medium. Gravel is angular to subrounded fine to coarse. Rare gravel sized concrete fragments (less than 2% of non-natural material).	

Foundation depth:

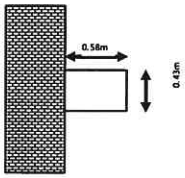
Samples:	0.05 - 0.65	AA232610	B	
	0.65 - 0.89	AA232611	B	

Location:

Elevation



Plan



Appendix II Dynamic Probes

Phase 1

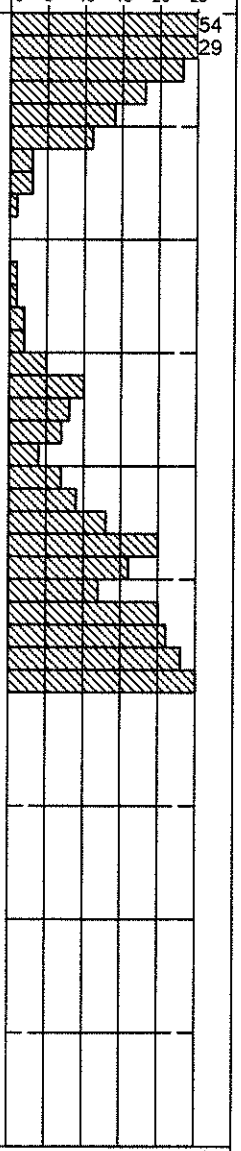
DYNAMIC PROBE RECORD

REPORT NUMBER 25766

CONTRACT	Stable & Courtyard at Rathfarnham Castle , Dublin 14	PROBE NO.	DP01
		SHEET	Sheet 1 of 1
CO-ORDINATES		DATE DRILLED	28/11/2024
GROUND LEVEL (mOD)	HAMMER MASS (kg) 50	DATE LOGGED	28/11/2024
CLIENT South Dublin Co.Co.	INCREMENT SIZE (mm) 100		
ENGINEER CORA	FALL HEIGHT (mm) 500	PROBE TYPE	DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0						0.00	54
						0.10	29
						0.20	23
						0.30	18
						0.40	14
						0.50	11
						0.60	3
						0.70	3
						0.80	1
						0.90	0
1.0						1.00	0
						1.10	1
						1.20	1
						1.30	2
						1.40	2
						1.50	5
						1.60	10
						1.70	8
						1.80	7
						1.90	4
2.0						2.00	7
						2.10	9
						2.20	13
						2.30	20
						2.40	16
						2.50	12
						2.60	20
						2.70	21
						2.80	23
						2.90	25
3.0	End of Probe at 3.00 m						
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 25766.GPJ IGSL.GDT 3/12/24

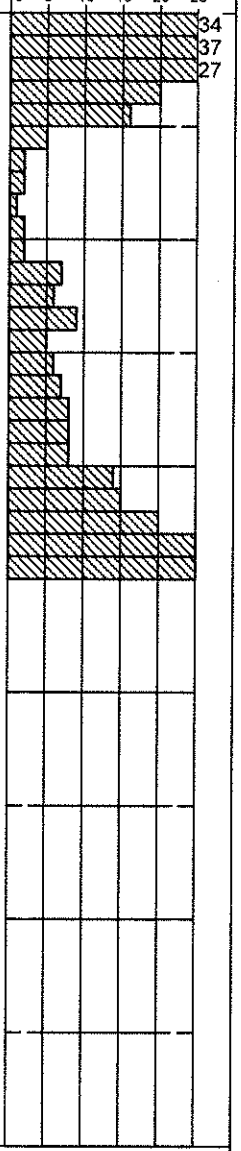
DYNAMIC PROBE RECORD

REPORT NUMBER 25766

CONTRACT	Stable & Courtyard at Rathfarnham Castle , Dublin 14	PROBE NO.	DP02
		SHEET	Sheet 1 of 1
CO-ORDINATES		DATE DRILLED	28/11/2024
GROUND LEVEL (mOD)	HAMMER MASS (kg) 50	DATE LOGGED	28/11/2024
CLIENT South Dublin Co.Co.	INCREMENT SIZE (mm) 100		
ENGINEER CORA	FALL HEIGHT (mm) 500	PROBE TYPE	DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0						0.00	34
						0.10	37
						0.20	27
						0.30	20
						0.40	16
						0.50	5
						0.60	2
						0.70	2
						0.80	1
						0.90	2
1.0						1.00	2
						1.10	7
						1.20	6
						1.30	9
						1.40	5
						1.50	6
						1.60	7
						1.70	8
						1.80	8
						1.90	8
2.0						2.00	14
						2.10	15
						2.20	20
						2.30	25
						2.40	25
	End of Probe at 2.50 m						
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 25766.GPJ IGSL.GDT 3/12/24

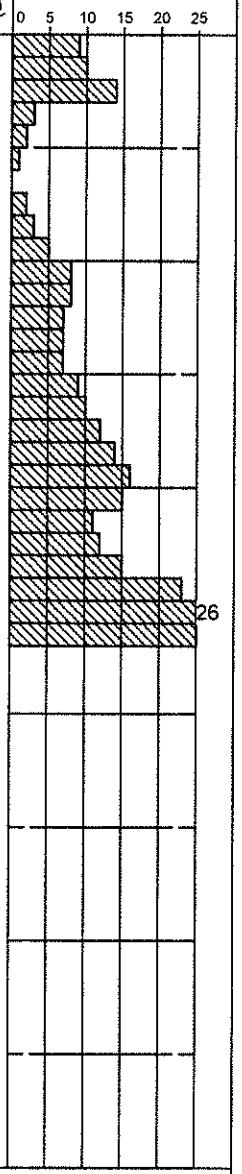
DYNAMIC PROBE RECORD

REPORT NUMBER 25766

CONTRACT	Stable & Courtyard at Rathfarnham Castle , Dublin 14	PROBE NO.	DP03
		SHEET	Sheet 1 of 1
CO-ORDINATES		DATE DRILLED	28/11/2024
GROUND LEVEL (mOD)	HAMMER MASS (kg) 50	DATE LOGGED	28/11/2024
CLIENT South Dublin Co.Co.	INCREMENT SIZE (mm) 100		
ENGINEER CORA	FALL HEIGHT (mm) 500	PROBE TYPE	DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0						0.00	9
						0.10	10
						0.20	14
						0.30	3
						0.40	2
						0.50	1
						0.60	0
						0.70	2
						0.80	3
						0.90	5
1.0						1.00	8
						1.10	8
						1.20	7
						1.30	7
						1.40	7
						1.50	9
						1.60	10
						1.70	12
						1.80	14
						1.90	16
2.0						2.00	15
						2.10	11
						2.20	12
						2.30	15
						2.40	23
						2.50	26
						2.60	25
	End of Probe at 2.70 m						
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 25766.GPJ IGSL.GDT 3/12/24

Appendix III Window Samples

Phase i

WINDOW SAMPLE RECORD

REPORT NUMBER 25766

CONTRACT	Stable & Courtyard at Rathfarnham Castle , Dublin 14
PROBE NO.	WS01
SHEET	Sheet 1 of 1
CO-ORDINATES	
GROUND LEVEL (mOD)	
DATE COMMENCED	28/11/2024
DATE COMPLETED	28/11/2024
CLIENT	South Dublin Co.Co.
ENGINEER	CORA
SAMPLED BY	IGSL
LOGGED BY	DM

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	(Loose to medium dense) Brown gravelly SAND with rare subangular cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to medium.									
	Soft to firm brown sandy very gravelly CLAY. Sand is fine to medium. Gravel is subangualr to subrounded fine to medium.		0.50			0.00-1.00	100			
1.0						0.50-1.50				
						1.00-2.00	100			
2.0	(Medium dense) Dark brown very gravelly medium SAND. Gravel is subangular to subrounded fine to medium.		2.10							
	Firm yellowish brown sandy very gravelly CLAY with occasional subangular cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse.		2.30			2.00-2.90	100			
3.0	Final Depth 2.90m		2.90							
4.0										
5.0										

General Remarks

Installations

WINDOW SAMPLE RECORD

REPORT NUMBER 25766

CONTRACT	Stable & Courtyard at Rathfarnham Castle , Dublin 14
PROBE NO.	WS02
SHEET	Sheet 1 of 1
CO-ORDINATES	
GROUND LEVEL (mOD)	
DATE COMMENCED	28/11/2024
DATE COMPLETED	28/11/2024
CLIENT	South Dublin Co.Co.
ENGINEER	CORA
SAMPLED BY	IGSL
LOGGED BY	DM

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	(Loose to medium dense) Black very gravelly SAND with rare subangular cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to medium.									
	Stiff brown very sandy very gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium.		0.50							
	Soft to firm brown very sandy gravelly CLAY with rare subrounded cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to medium.		0.80			0.00-1.00	100			
1.0	(Loose to medium dense) Black very sandy GRAVEL with rare subangular cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse.		1.00 1.20			0.50-1.50				
	Firm greyish brown sandy very gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse.					1.00-2.00	100			
2.0	Stiff brown very sandy very gravelly CLAY with occasional subrounded cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to medium.		2.00			2.00-2.50	100			
	Final Depth 2.50m		2.50							
3.0										
4.0										
5.0										

General Remarks

Installations

IGSL WS LOG 25766.GPJ IGSL.GDT 17/12/24

WINDOW SAMPLE RECORD

REPORT NUMBER 25766

CONTRACT	Stable & Courtyard at Rathfarnham Castle , Dublin 14
PROBE NO.	WS03
SHEET	Sheet 1 of 1
CO-ORDINATES	
GROUND LEVEL (mOD)	
DATE COMMENCED	28/11/2024
DATE COMPLETED	28/11/2024
CLIENT	South Dublin Co.Co.
ENGINEER	CORA
SAMPLED BY	IGSL
LOGGED BY	DM

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	(Loose to medium dense) Brown very gravelly SAND. Sand is medium. Gravel is subangular to subrounded fine to medium.		0.30							
	Firm to stiff brown sandy very gravelly CLAY with occasional subangular cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to medium.		0.90			0.00-1.00	100			
1.0	Stiff dark greyish brown sandy very gravelly CLAY with rare subangular cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to medium.					0.50-1.50				
						1.00-2.00	100			
2.0	Firm to stiff brown very sandy very gravelly CLAY with occasional subangular to subrounded cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to medium.		2.00			2.00-2.60	80			
	Final Depth 2.60m		2.60							
3.0										
4.0										
5.0										

General Remarks

Installations

IGSL WS LOG 25766.GPJ IGSL.GDT 17/12/24

Appendix IV BRE Digest 365 Tests

Phase I

TRIAL PIT RECORD

REPORT NUMBER 25766

CONTRACT	Rathfarnham Castle
LOGGED BY	CQ
CLIENT	HHC Architecture
ENGINEER	CORA
CO-ORDINATES	
GROUND LEVEL (m)	
TRIAL PIT NO.	TP01
SHEET	Sheet 1 of 1
DATE STARTED	28/11/2024
DATE COMPLETED	28/11/2024
EXCAVATION METHOD	JCB 3CX

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TARMACADAM		0.05							
MADEGROUND: (uncompact) light grey subangular gravel sized Stone (804)		0.20							
MADEGROUND: soft grey sandy gravelly Clay with high subangular to subrounded cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded. Gravel/cobble sized brick fragments, concrete blocks, plastic sheet fragments (more than 2% of non-naural material).		0.80							
1.0 Soft grey very slightly sandy gravelly silty CLAY with high subrounded cobble and boulder (up to 250mm wide) content. Sand is fine to medium. Gravel is fine to coarse subangular. Recovered as moist.					AA232722	B	1.00		
2.0 End of Trial Pit at 2.00m		2.00			AA232723	B	2.00		
3.0									
4.0									

Groundwater Conditions
No water was encountered during thhis excavation

Stability
The pit remained stable

General Remarks
The GPR maps were consulted and the locations were checked with CATSCAN by trained LUGS personnel.

IGSL TP LOG 25766.GPJ IGSL.GDT 29/11/24

TRIAL PIT RECORD

REPORT NUMBER 25766

CONTRACT	Rathfarnham Castle
TRIAL PIT NO.	**TP02**
SHEET	Sheet 1 of 1
LOGGED BY	CQ
CO-ORDINATES	
DATE STARTED	28/11/2024
DATE COMPLETED	28/11/2024
CLIENT	HHC Architecture
GROUND LEVEL (m)	
EXCAVATION METHOD	JCB 3CX
ENGINEER	CORA

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 CONCRETE		0.10							
MADEGROUND: (uncompact) light grey subangular gravel sized Stone (804)		0.50							
Soft brown slightly sandy gravelly silty CLAY with high subrounded cobble and boulder (up to 300mm wide) content. Sand is fine to medium. Gravel is fine to coarse subangular. Recovered as moist to wet.					AA232724	B	1.00		
2.0 End of Trial Pit at 2.00m		2.00		(Seepage)	AA232725	B	2.00		

Groundwater Conditions
A very low seepage of water has been encountered from 2.0 mBGL

Stability
The pit remained stable

General Remarks
The GPR maps were consulted and the locations were checked with CATSCAN by trained LUGS personnel.

IGSL TP LOG 25766.GPJ IGSL.GDT 29/11/24

Soakaway Design f -value from field tests (F2C) IGSL

Contract: Rathfarnham Castle, Dublin Contract No. 25766
Test No. SA01
Client CORA
Date: 29/01/1904

Summary of ground conditions

from	to	Description	Ground water
0.00	0.05	TARMACADAM	NO
0.05	0.20	MADE GROUND: (uncompact) light grey subangular gravel sized Stone (hardcore)	
0.20	0.80	MADE GROUND: soft grey sandy gravelly Clay with high subangular to subrounded cobble content. Gravel /cobble sized brick fragments, concrete blocks, plastic sheet fragments (more than 2% of non-naural material).	
0.80	2.00	Soft grey very slightly sandy gravelly silty CLAY with high subrounded cobble and boulder (up to 250mm wide) content.	

Notes: Samples: 1.00 AA232722 B
2.00 AA232723 B

Field Data

Depth to Water (m)	Elapsed Time (min)
0.655	0.00
0.656	1.00
0.657	2.00
0.658	3.00
0.659	4.00
0.660	5.00
0.661	6.00
0.661	7.00
0.661	8.00
0.661	9.00
0.661	10.00
0.661	12.00
0.661	14.00
0.661	16.00
0.661	18.00
0.661	20.00
0.661	25.00
0.661	30.00
0.661	35.00
0.661	40.00
0.661	50.00
0.661	60.00

Field Test

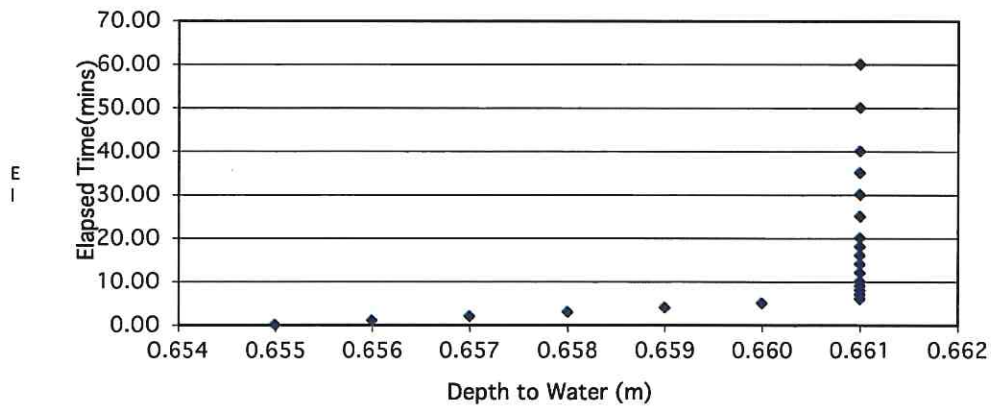
Depth of Pit (D)	2.00	m
Width of Pit (B)	0.60	m
Length of Pit (L)	2.00	m
Initial depth to Water =	0.655	m
Final depth to water =	0.661	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.2	m2
*Av. side area of permeable stratum over test perio	6.9784	m2
Total Exposed area =	8.1784	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

No fall in water after 6 mins

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Rathfarnham Castle, Dublin Contract No. 25766
Test No. SA02
Client CORA
Date: 29/01/1904

Summary of ground conditions

from	to	Description	Ground water
0.00	0.10	CONCRETE	Seepage from 2.0m BGL
0.05	0.50	MADEGROUND: (uncompact) light grey subangular gravel sized Stone (804)	
0.50	2.00	Soft brown slightly sandy gravelly silty CLAY with high subrounded cobble and boulder (up to 250mm wide) content. Sand is fine to medium. Gravel is fine to coarse subangular. Recovered as moist.	

Notes: Samples: 1.00 AA232722 B
2.00 AA232723 B

Field Data

Depth to Water (m)	Elapsed Time (min)
0.559	0.00
0.566	1.00
0.573	2.00
0.580	3.00
0.587	4.00
0.595	5.00
0.597	6.00
0.599	7.00
0.601	8.00
0.603	9.00
0.605	10.00
0.610	12.00
0.613	14.00
0.615	16.00
0.617	18.00
0.619	20.00
0.624	25.00
0.629	30.00
0.633	35.00
0.639	40.00
0.640	50.00
0.641	60.00

Field Test

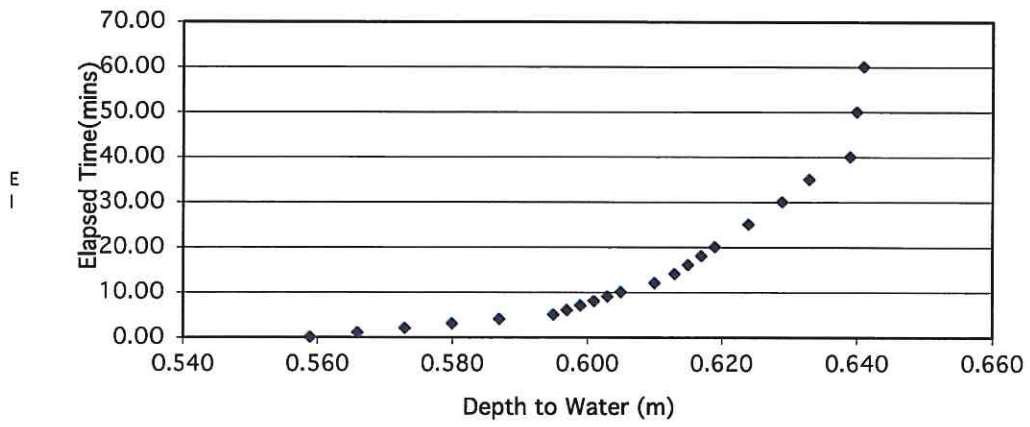
Depth of Pit (D)	2.00	m
Width of Pit (B)	0.60	m
Length of Pit (L)	2.00	m
Initial depth to Water =	0.559	m
Final depth to water =	0.641	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1.2	m2
*Av. side area of permeable stratum over test perio	7.28	m2
Total Exposed area =	8.48	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00019 m/min or 3.223E-06 m/sec

Note: Water stabilising at 0.64m

Depth of water vs Elapsed Time (mins)



Appendix V Laboratory Data

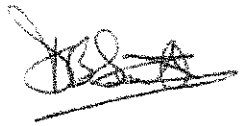
a. Results
b. WCA Report

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

Amended Report

Report No.:	24-42047-2		
Initial Date of Issue:	08-Jan-2025	**Date of Re-Issue:**	08-Jan-2025
Re-Issue Details:	This report has been revised and directly supersedes 24-42047-1 in its entirety		
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	Darren Keogh		
Project	25766 Rathfarnham		
Quotation No.:	Q24-34387	**Date Received:**	20-Dec-2024
Order No.:		**Date Instructed:**	20-Dec-2024
No. of Samples:	5		
Turnaround (Wkdays):	7	**Results Due:**	01-Jan-2025
Date Approved:	08-Jan-2025		

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Leachate

Project: 25766 Rathfarnham

Client: IGSL				Chemtest Job No.:		24-42047	24-42047	24-42047
Quotation No.: Q24-34387				Chemtest Sample ID.:		1912640	1912642	1912644
Order No.:				Client Sample Ref.:		TP1	TP2	WS2
				Sample Type:		SOIL	SOIL	SOIL
				Top Depth (m):		1.0	1.0	0.5
				Bottom Depth (m):				1.5
				Date Sampled:		16-Dec-2024	16-Dec-2024	16-Dec-2024
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**			
Ammonium	U	1220	10:1	mg/l	0.050	0.82	0.052	0.62
Ammonium	N	1220	10:1	mg/kg	0.10	10	0.60	7.8

Results - Soil

Project: 25766 Rathfarnham

Client: IGSL				Chemtest Job No.:		24-42047	24-42047	24-42047	24-42047	24-42047
Quotation No.: Q24-34387				Chemtest Sample ID.:		1912640	1912641	1912642	1912643	1912644
Order No.:				Client Sample Ref.:		TP1	TP1	TP2	WS1	WS2
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		1.0	2.0	1.0	0.5	0.5
				Bottom Depth (m):					1.5	1.5
				Date Sampled:		16-Dec-2024	16-Dec-2024	16-Dec-2024	16-Dec-2024	16-Dec-2024
				Asbestos Lab:		NEW-ASB		NEW-ASB		NEW-ASB
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type		U	2192		N/A	-		-		-
Asbestos Identification		U	2192		N/A	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected
Moisture		N	2030	%	0.020	19	23	19	19	17
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones	Stones	None	None
Soil Texture		N	2040		N/A	Clay	Sand	Clay	Clay	Clay
pH (2.5:1) at 20C		N	2010		4.0		7.9		8.6	
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.56		0.53		0.75
Magnesium (Water Soluble)		N	2120	g/l	0.010		< 0.010		< 0.010	
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010		0.060		0.13	
Total Sulphur		U	2175	%	0.010		0.037		0.042	
Sulphur (Elemental)		M	2180	mg/kg	1.0	14		1.1		100
Chloride (Water Soluble)		M	2220	g/l	0.010		< 0.010		0.019	
Nitrate (Water Soluble)		N	2220	g/l	0.010		< 0.010		< 0.010	
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50		< 0.50		< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	6.1		6.3		5.1
Ammonium (Water Soluble)		M	2220	g/l	0.01		< 0.01		< 0.01	
Sulphate (Total)		U	2430	%	0.010	0.10		0.076		0.31
Sulphate (Acid Soluble)		U	2430	%	0.010		0.070		0.11	
Arsenic		M	2455	mg/kg	0.5	16		23		34
Barium		M	2455	mg/kg	0.5	83		120		120
Cadmium		M	2455	mg/kg	0.10	2.8		3.5		5.2
Chromium		M	2455	mg/kg	0.5	25		42		51
Molybdenum		M	2455	mg/kg	0.5	5.4		7.7		14
Antimony		N	2455	mg/kg	2.0	< 2.0		< 2.0		< 2.0
Copper		M	2455	mg/kg	0.50	43		47		75
Mercury		M	2455	mg/kg	0.05	0.08		0.12		0.17
Nickel		M	2455	mg/kg	0.50	69		76		130
Lead		M	2455	mg/kg	0.50	27		45		60
Selenium		M	2455	mg/kg	0.25	1.7		1.4		2.2
Zinc		M	2455	mg/kg	0.50	120		180		210
Chromium (Trivalent)		N	2490	mg/kg	1.0	25		42		51
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50		< 0.50		< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05		< 0.05		< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05		< 0.05		< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05		< 0.05		< 0.05
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05		< 0.05		< 0.05

Results - Soil

Project: 25766 Rathfarnham

Client: IGSL				Chemtest Job No.:		24-42047	24-42047	24-42047	24-42047	24-42047
Quotation No.: Q24-34387				Chemtest Sample ID.:		1912640	1912641	1912642	1912643	1912644
Order No.:				Client Sample Ref.:		TP1	TP1	TP2	WS1	WS2
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		1.0	2.0	1.0	0.5	0.5
				Bottom Depth (m):					1.5	1.5
				Date Sampled:		16-Dec-2024	16-Dec-2024	16-Dec-2024	16-Dec-2024	16-Dec-2024
				Asbestos Lab:		NEW-ASB		NEW-ASB		NEW-ASB
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25		< 0.25		< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0		< 2.0		< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0		< 1.0		< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0		< 2.0		< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	< 3.0		< 3.0		3.1
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10		< 10		< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	< 5.0		< 5.0		< 5.0
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05		0.13		< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05		< 0.05		< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05		< 0.05		< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25		< 0.25		< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0		< 1.0		< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0		< 1.0		< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	6.6		7.1		7.5
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0		< 2.0		< 2.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	2.1		< 1.0		< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	6.6		7.1		7.7
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50		< 0.50		< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	< 10		< 10		11
Mineral Oil EPH		N	2670	mg/kg	10	< 10		< 10		< 10
Benzene		M	2760	µg/kg	1.0	< 1.0		< 1.0		< 1.0
Toluene		M	2760	µg/kg	1.0	< 1.0		< 1.0		< 1.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0		< 1.0		< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0		< 1.0		< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0		< 1.0		< 1.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0		< 1.0		< 1.0
Naphthalene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Phenanthrene		M	2800	mg/kg	0.10	0.46		< 0.10		< 0.10
Anthracene		M	2800	mg/kg	0.10	0.11		< 0.10		< 0.10
Fluoranthene		M	2800	mg/kg	0.10	0.51		< 0.10		< 0.10
Pyrene		M	2800	mg/kg	0.10	0.39		< 0.10		< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Chrysene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10

Results - Soil

Project: 25766 Rathfarnham

Client: IGSL				Chemtest Job No.:		24-42047	24-42047	24-42047	24-42047	24-42047
Quotation No.: Q24-34387				Chemtest Sample ID.:		1912640	1912641	1912642	1912643	1912644
Order No.:				Client Sample Ref.:		TP1	TP1	TP2	WS1	WS2
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		1.0	2.0	1.0	0.5	0.5
				Bottom Depth (m):					1.5	1.5
				Date Sampled:		16-Dec-2024	16-Dec-2024	16-Dec-2024	16-Dec-2024	16-Dec-2024
				Asbestos Lab:		NEW-ASB		NEW-ASB		NEW-ASB
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
Coronene		N	2800	mg/kg	0.10	< 0.10		< 0.10		< 0.10
PCB 28		U	2815	mg/kg	0.010	< 0.010		< 0.010		< 0.010
PCB 52		U	2815	mg/kg	0.010	< 0.010		< 0.010		< 0.010
PCB 101		U	2815	mg/kg	0.010	< 0.010		< 0.010		< 0.010
PCB 118		U	2815	mg/kg	0.010	< 0.010		< 0.010		< 0.010
PCB 153		U	2815	mg/kg	0.010	< 0.010		< 0.010		< 0.010
PCB 138		U	2815	mg/kg	0.010	< 0.010		< 0.010		< 0.010
PCB 180		U	2815	mg/kg	0.010	< 0.010		< 0.010		< 0.010
Tot PCBs Low (7 Congeners)		N	2815	mg/kg	0.05	< 0.05		< 0.05		< 0.05
Total Phenols		M	2920	mg/kg	0.10	< 0.10		< 0.10		< 0.10

Results - Single Stage WAC

Project: 25766 Rathfarnham

						Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-42047							
Chemtest Sample ID:	1912640							
Sample Ref:	TP1							
Sample ID:								
Sample Location:								
Top Depth(m):	1.0							
Bottom Depth(m):								
Sampling Date:	16-Dec-2024							
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625		M	%	0.43	3	5	6
Loss On Ignition	2610		M	%	1.9	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	< 10	500	--	--
Total Of 17 PAHs Lower	2800		N	mg/kg	1.5	100	--	--
pH at 20C	2010		M		8.5	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.0070	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0054	0.054	0.5	2	25
Barium	1455		U	0.010	0.10	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	0.0011	0.011	0.5	10	70
Copper	1455		U	0.0043	0.043	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.017	0.17	0.5	10	30
Nickel	1455		U	0.0013	0.013	0.4	10	40
Lead	1455		U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455		U	0.0036	0.036	0.06	0.7	5
Selenium	1455		U	0.0014	0.014	0.1	0.5	7
Zinc	1455		U	0.008	0.082	4	50	200
Chloride	1220		U	< 1.0	< 10	800	15000	25000
Fluoride	1220		U	0.25	2.5	10	150	500
Sulphate	1220		U	10	100	1000	20000	50000
Total Dissolved Solids	1020		N	220	2200	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	4.3	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	10

Waste Acceptance Criteria

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

Results - Single Stage WAC

Project: 25766 Rathfarnham

						Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-42047							
Chemtest Sample ID:	1912642							
Sample Ref:	TP2							
Sample ID:								
Sample Location:								
Top Depth(m):	1.0							
Bottom Depth(m):								
Sampling Date:	16-Dec-2024							
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625		M	%	0.61	3	5	6
Loss On Ignition	2610		M	%	2.9	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	< 10	500	--	--
Total Of 17 PAHs Lower	2800		N	mg/kg	< 1.0	100	--	--
pH at 20C	2010		M		8.4	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.0050	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0042	0.042	0.5	2	25
Barium	1455		U	< 0.005	< 0.050	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	0.0039	0.039	0.5	10	70
Copper	1455		U	0.0023	0.023	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.021	0.21	0.5	10	30
Nickel	1455		U	0.0007	0.0066	0.4	10	40
Lead	1455		U	0.0006	0.0058	0.5	10	50
Antimony	1455		U	0.0007	0.0069	0.06	0.7	5
Selenium	1455		U	0.0007	0.0066	0.1	0.5	7
Zinc	1455		U	0.007	0.067	4	50	200
Chloride	1220		U	< 1.0	< 10	800	15000	25000
Fluoride	1220		U	0.25	2.5	10	150	500
Sulphate	1220		U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020		N	66	660	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	8.6	86	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	9.3

Waste Acceptance Criteria

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

Results - Single Stage WAC

Project: 25766 Rathfarnham

						Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	24-42047							
Chemtest Sample ID:	1912644							
Sample Ref:	WS2							
Sample ID:								
Sample Location:								
Top Depth(m):	0.5							
Bottom Depth(m):	1.5							
Sampling Date:	16-Dec-2024							
Determinand	**SOP**	**HWOL Code**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625		M	%	0.89	3	5	6
Loss On Ignition	2610		M	%	2.6	--	--	10
Total BTEX	2760		M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	< 10	500	--	--
Total Of 17 PAHs Lower	2800		N	mg/kg	< 1.0	100	--	--
pH at 20C	2010		M		8.3	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.0060	--	To evaluate	To evaluate
Eluate Analysis				**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455		U	0.0027	0.027	0.5	2	25
Barium	1455		U	0.008	0.080	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455		U	0.0044	0.044	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.0058	0.058	0.5	10	30
Nickel	1455		U	0.0020	0.020	0.4	10	40
Lead	1455		U	0.0006	0.0059	0.5	10	50
Antimony	1455		U	0.0023	0.023	0.06	0.7	5
Selenium	1455		U	0.0007	0.0069	0.1	0.5	7
Zinc	1455		U	0.006	0.057	4	50	200
Chloride	1220		U	< 1.0	< 10	800	15000	25000
Fluoride	1220		U	0.15	1.5	10	150	500
Sulphate	1220		U	2.5	25	1000	20000	50000
Total Dissolved Solids	1020		N	62	620	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	5.4	54	500	800	1000

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

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	RE PW PL LE DW FW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW FW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW FW
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2015	Acid Neutralisation Capacity	Acid Reserve	Titration	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurememt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

Report Information

Key

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

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.
Any comments or interpretations are outside the scope of UKAS accreditation.
The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.
Uncertainty of measurement for the determinands tested are available upon request .
None of the results in this report have been recovery corrected.
All results are expressed on a dry weight basis.

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

For all other tests the samples were dried at ≤ 30°C prior to analysis.
All Asbestos testing is performed at the indicated laboratory .
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

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

Sample Retention and Disposal

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

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

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

Unit 15
Melbourne Business Park
Model Farm Road
Cork T12 WR89

O'Callaghan Moran & Associates
ENVIRONMENTAL MANAGEMENT FOR BUSINESS

T: 021 434 5366
E:admin@ocallaghanmoran.com
www.ocallaghanmoran.com

Waste Characterisation Assessment

Rathfarnham Castle

Rathfarnham

Dublin 14

Prepared For: -

IGSL Limited
Unit F
M7 Business Park
Naas
County Kildare

Prepared By: -

O'Callaghan Moran & Associates
Unit 15 Melbourne Business Park
Model Farm Road
Cork

January 2025

Project	Waste Characterisation: Rathfarnham Castle, Dublin 14			
Client	IGSL Limited			
Report No	**Date**	**Status**	**Prepared By**	**Reviewed By**
250010201	16/01/2025	Final	Austin Hynes PGeo MSc	Sean Moran B.Sc. MSc

TABLE OF CONTENTS

APPENDICES

2 WASTE CLASSIFICATION ASSESSMENT

2.1 Soil Sampling and Laboratory Analysis

2.1.1 *Site Investigation*

The site investigation was undertaken in November 2024 and included the collection three (3 No.) samples of made and natural ground collected from two (2 No.) trial pits and one (1 No.) window sample borehole. The location of the samples is shown on Figure 2.1. The logs are in Appendix 1.

There is bituminous surface underlain by Clause 804 GRAVEL at the surface of TP01 and Concrete underlain by Clause 804 GRAVEL at the surface of TP02. There is Made Ground comprising gravelly SAND at the surface of WS02 to 0.50 mbgl.

The subsurface of TP01 is composed of Made Ground to 0.80 mbgl. The Made Ground consists of sandy gravely CLAY with cobble content and non-natural material >2% of the soil matrix including fragments of brick, concrete and plastic. The Natural Ground is composed of sandy gravelly CLAY with cobble and boulder content to 2.00 mbgl.

At TP02, Natural Ground was encountered at 0.50 mbgl and comprises sandy gravelly CLAY with cobble and boulder content to 2.00 mbgl.

The Natural Ground at WS02 was encountered at 0.50 mbgl. There is sandy gravelly CLAY from 0.50-1.00 mbgl. Loose to medium dense, sandy GRAVEL with cobble content was encountered from 1.00-1.20 mbgl. This is underlain by firm to stiff , sandy gravelly CLAY to 2.50 mbgl.

2.1.2 *Sample Collection*

IGSL collected the samples and placed them in laboratory prepared containers that were stored in coolers prior to shipment to Chemtest Ltd.

2.1.3 *Laboratory Analysis*

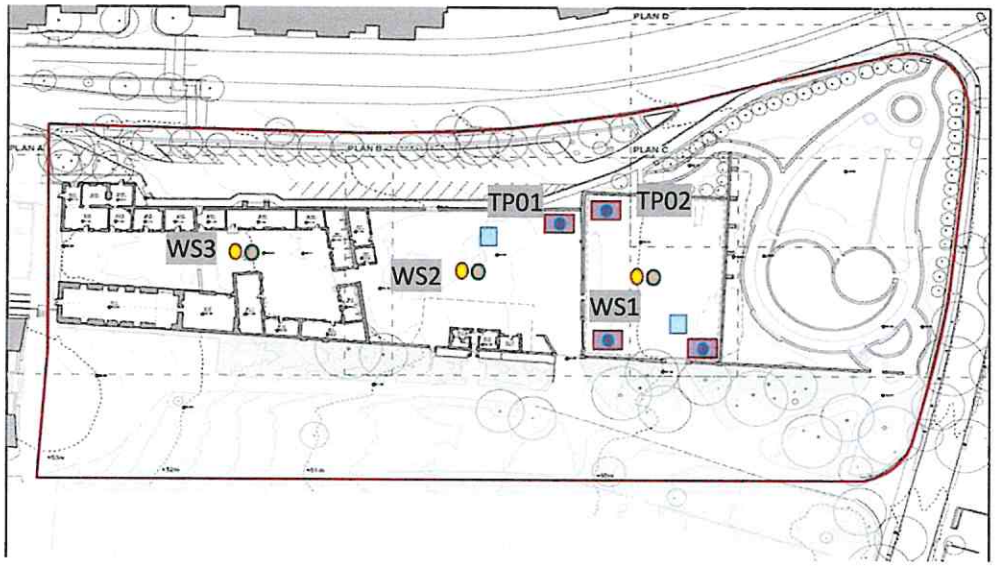
The samples were tested for, metals (arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium and zinc, total organic carbon (TOC), BTEX (benzene, toluene, ethylbenzene and xylene) aliphatic and aromatic hydrocarbons, polychlorinated biphenyls (PCB), mineral oil, polyaromatic hydrocarbons (PAH) and asbestos. Leachate generated from the samples was tested for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium and zinc, chloride, fluoride, soluble sulphate, phenols, dissolved organic carbon (DOC), total dissolved solids (TDS).

This parameter range facilitates an assessment of the hazardous properties of the waste, and also allows a determination of appropriate off-site management options based on the Waste Acceptance Criteria (WAC) applied by landfill operators.

The analytical methods were all ISO/CEN approved and the method detection limits were below the relevant guidance/threshold values. The full laboratory report is in Appendix 2.

Legend

- Proposed locations of Dynamic Probes
- Proposed Locations of Window samples
- Proposed trial pits circa 900 x 600 x 600 deep
- Proposed Location of Percolation Test - See attached test sheet



Site Key plan

Proposed Site Investigation

Quotes and works should include the following items:

The adjoining sketch shows the proposed location of all probes, window sampling and trial pits.

- 4 number trial pits to circa 600mm long x 600mm wide x 600mm deep, depth to depend on the depth of the existing foundation. Condition and details of the existing foundation and ground formation to be recorded. Trial pits to be backfilled with arisings on completion of logging.
- 3 number Dynamic probes approx 75mm diameter to refusal or maximum depth of 12m if no refusal.
- 3 number window sampling approx 100mm diameter to a depth of 4m depth.
- Samples for laboratory testing – from 3 of the trial pits
- An initial waste classification for 3 evenly distributed samples from the trial pits is required for waste classification purposes.
- Report with dynamic and window sample logs, trial pit details, bearing capacity and commentary on viability of proposed single storey new building along with and waste classification report.

All trial pits and borehole excavations to be back filled with arisings where possible and topped with hardcore to make level and safe. Any additional arisings to be left on site in agreed location.

Note archaeology is likely to be encountered during the trial pits and dynamic probe prep holes. Contactor to coordinate with the ARC Archaeologist appointed for the project for archaeological monitoring of all excavations.

Drawing Stage: PRICING						Drawn By: DB	Checked By:	Approved By: LE	Date: 29/02/2024	CORA CONSULTING ENGINEERS									Behan House, 10 Lower Mount Street, Dublin 2. D02 HT71 Tel. +353 (0)1 661 1100 e-mail. info@cora.ie web. www.cora.ie
Project Details: Rathfarnham Castle						Project Name: Rathfarnham Castle Dublin			Scale: NTS	Project Number: 2332									
Site Address:	Rathfarnham Dublin					Drawing Title: Site Investigation Scope of Works			Project	Originator: CORA	Zone:	Level:	Type:	Discipline:	Drawing No.: 5K02	Stage:	Revision: P1		
Client:	SDCC	P1	Issued for pricing	29/02/24	LE														
Architect:	HHC ARCHITECTS	REV. No.	REVISION DESCRIPTION	DATE	ISSUED BY														

O'Callaghan Moran & Associates

O'Callaghan Moran & Associates,
Unit 15 Melbourne Business Park,
Model Farm Road, Cork.
Tel. (021) 4345366

Email: info@ocallaghanmoran.com

Title:

Figure 2.1 Sample Location Plan

Legend

Client:

IGSL Limited

2.2 Waste Classification

The Haz Waste Online Classification Engine, developed in the UK by One Touch Data Ltd, was used to determine the waste classification. This tool was developed specifically to establish whether waste is non-hazardous or hazardous and has been approved for use in Ireland by the Environmental Protection Agency. The full Waste Classification Report is in Appendix 3 and the results are summarised in Table 2.1.

Table 2.1 Waste Classification

Sample No.	Depth	Classification	LoW Code
TP1	1.00	Non-Hazardous	17 09 04
TP2	1.00	Non-Hazardous	17 05 04
WS2	0.50-1.50	Non-Hazardous	17 05 04

Asbestos was not detected in any of the samples tested.

The sample from TP1 is classified as non-hazardous and the appropriate List of Waste Code is 17 09 04 (Construction and Demolition Waste other than those mentioned in 17 09 03*).

The samples from TP2 and WS2 are classified as non-hazardous and the appropriate List of Waste Code is 17 05 04 (Soil and Stone other than those mentioned in 17 05 03*).

2.3 Waste Acceptance Criteria

The results of the WAC testing are presented in Table 2.2, which includes for comparative purposes the WAC for Inert, Non Hazardous and Hazardous Waste Landfills pursuant to Article 16 of the EU Landfill Directive 1999/31/EC Annex II which establishes criteria and procedures for the acceptance of waste at landfills.

All samples meet the inert WAC.

Table 2.2 WAC Results

Parameter	Unit	TP1	TP2	WS2	Inert Landfill	Inert Landfill Increased Limits	Non-Hazardous Landfill	Hazardous Landfill
Depth	m	1.00	1.00	0.50-1.50				
Antimony	mg/kg	0.036	0.0069	0.023	0.06	0.18	0.7	5
Arsenic	mg/kg	0.054	0.042	0.027	0.5	1.5	2	25
Barium	mg/kg	0.10	<0.050	0.080	20	20	100	300
Cadmium	mg/kg	<0.0011	<0.0011	<0.0011	0.04	0.04	1	5
Chromium	mg/kg	0.011	0.039	<0.0050	0.5	0.5	10	70
Copper	mg/kg	0.043	0.023	0.044	2	2	50	100
Lead	mg/kg	<0.0050	0.0058	0.0059	0.5	0.5	10	50
Molybdenum	mg/kg	0.17	0.21	0.058	0.5	1.5	10	30
Nickel	mg/kg	0.013	0.0066	0.020	0.4	0.4	10	40
Selenium	mg/kg	0.014	0.0066	0.0069	0.1	0.3	0.5	7
Zinc	mg/kg	0.082	0.067	0.057	4	4	50	200
Mercury	mg/kg	<0.00050	<0.00050	<0.00050	0.01	0.01	0.2	2
Phenol	mg/kg	<0.30	<0.30	<0.30	1	1	NE	NE
Fluoride	mg/kg	2.5	2.5	1.5	10	10	150	500
Chloride	mg/kg	<10	<10	<10	800	2,400	15,000	25,000
Sulphate	mg/kg	100	<10	25	1000*	3,000	20000*	50,000
DOC **	mg/kg	<50	86	54	500	500	800	1,000
pH	pH units	8.5	8.4	8.3	NE	NE	NE	NE
TDS ***	mg/kg	2200	660	620	4,000	12,000	60,000	100,000
TOC	%	0.43	0.61	0.89	3	6	NE	6
Benzene	mg/kg	<0.001	<0.001	<0.001	6	6	NE	NE
Toluene	mg/kg	<0.001	<0.001	<0.001	6	6	NE	NE
Ethylbenzene	mg/kg	<0.001	<0.001	<0.001	6	6	NE	NE
m/p-Xylene	mg/kg	<0.001	<0.001	<0.001	6	6	NE	NE
o-Xylene	mg/kg	<0.001	<0.001	<0.001	6	6	NE	NE
PCB Total of 7	mg/kg	<0.10	<0.10	<0.10	1	1	NE	NE
Total 17 PAH's	mg/kg	1.5	<1.0	<1.0	NE	100	NE	NE
Mineral Oil	mg/kg	<10	<10	<10	500	500	NE	NE
Asbestos	% mass	NAD	NAD	NAD	NE	NE	NE	NE

NAD denotes No Asbestos Detected

* denotes sulphate level exceeding inert waste limit may be considered as complying if the TDS value does not exceed 6,000mg/kg at L/S = 10l/kg.

** denotes a higher limit may be accepted provided the DOC alternative values of 500mg/kg is achieved

*** denotes TDS. The values for TDS can be used to sulphate and chloride.

PAH over 1mg/kg and Mineral Oil over 50 mg/kg exceeds limit at soil recovery site in Ireland

2.4 Waste Management Options

The EPA has issued guidance on acceptance criteria for a range of parameters for soil recovery sites. This includes;

- Metals (solid conc. not leachability) in soil and stone (including As, Cd, Cr, Cu, Hg, Ni, Pub, Zn);
- Total organic carbon in soil and stone;
- Total BTEX (benzene, toluene, ethylbenzene, xylenes) in soil and stone;
- Mineral oil in soil and stone;
- Polycyclic aromatic hydrocarbons (PAHs) in soil and stone;
- Polychlorinated Biphenyls (PCBs) in soil and stone;
- Asbestos fibres in soil and stone.

The guidance requires that soils from brownfield sites should not exceed the limits for the parameters specified in Table 2.3 and 2.4. For metals limits have been specified for a range of soil types nationally separated into six domain areas.

Table 2.3 Soil Recovery Site Criteria

Parameter	Limit for Soil Recovery Sites
Total BTEX	0.05 mg/kg
Mineral Oil	50 mg/kg
Total PAHs	1 mg/kg
Total PCBs	0.05 mg/kg

The sample from TP2, which is classified as 17 05 04 and meets the inert WAC, meets the soil recovery criteria for Total PAH's, Mineral Oil, Total PCB's and Total BTEX. The sample from TP1 exceeds the soil recovery criteria for Total PAH's. This sample has therefore been classified as (B-1) suitable for Inert Landfill.

The soil and stone cannot be sent to soil recovery sites if the trigger levels for a particular domain are exceeded. There is however some flexibility in applying the limits. A derogation applies where up to three parameters can exceed the limit for a sample provided the concentration in the samples is no more than 1.5 times the trigger level. The site which is subject to this investigation is located in Domain 2 and the trigger levels are listed in Table 2.4.

Table 2.4 Soil Recovery Trigger Levels

		Domain 2 Trigger Level	1.5 times Trigger Level
Arsenic	**mg/kg**	24.90	37.35
Cadmium	**mg/kg**	3.28	4.92
Chromium	**mg/kg**	50.30	75.45
Copper	**mg/kg**	63.50	95.25
Mercury	**mg/kg**	0.36	0.54
Nickel	**mg/kg**	61.90	92.85
Lead	**mg/kg**	86.10	129.15
Zinc	**mg/kg**	197.00	295.5

The sample from WS2, which is classified as 17 05 04 and meets the Inert WAC, exceeds the soil recovery criteria for metal concentrations. The sample exceeds the trigger level for Arsenic, Chromium, Copper and Zinc, and 1.5 times trigger level for Cadmium and Nickel

Waste management options are summarised on Table 2.5. All are subject to approval of the waste management facility operators. Class A material meets the soil recovery criteria. Class B-1 material is suitable for recovery/disposal to inert Landfill.

Table 2.5 Waste Management Options

Sample No.	Depth	Classification	LoW Code	Category
TP1	1.00	Non-Hazardous	17 09 04	B-1
TP2	1.00	Non-Hazardous	17 05 04	A
WS2	0.50-1.50	Non-Hazardous	17 05 04	B-1

A	Meets Soil Recovery Criteria
B-1	Suitable for disposal/recovery to Inert Landfill

3 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

3.1.1 *Waste Classification*

Asbestos was not detected in any of the samples tested.

The sample from TP1 is classified as non-hazardous and the appropriate List of Waste Code is 17 09 04 (Construction and Demolition Waste other than those mentioned in 17 09 03*).

The samples from TP2 and WS2 are classified as non-hazardous and the appropriate List of Waste Code is 17 05 04 (Soil and Stone other than those mentioned in 17 05 03*).

If the soils have to be removed from the site the recovery/disposal options are outlined in Section 2.4.

3.2 Recommendations

OCM recommend that a copy of this report be provided in full to the relevant waste management facilities to which the made ground and subsoils will be consigned to confirm its suitability for acceptance.

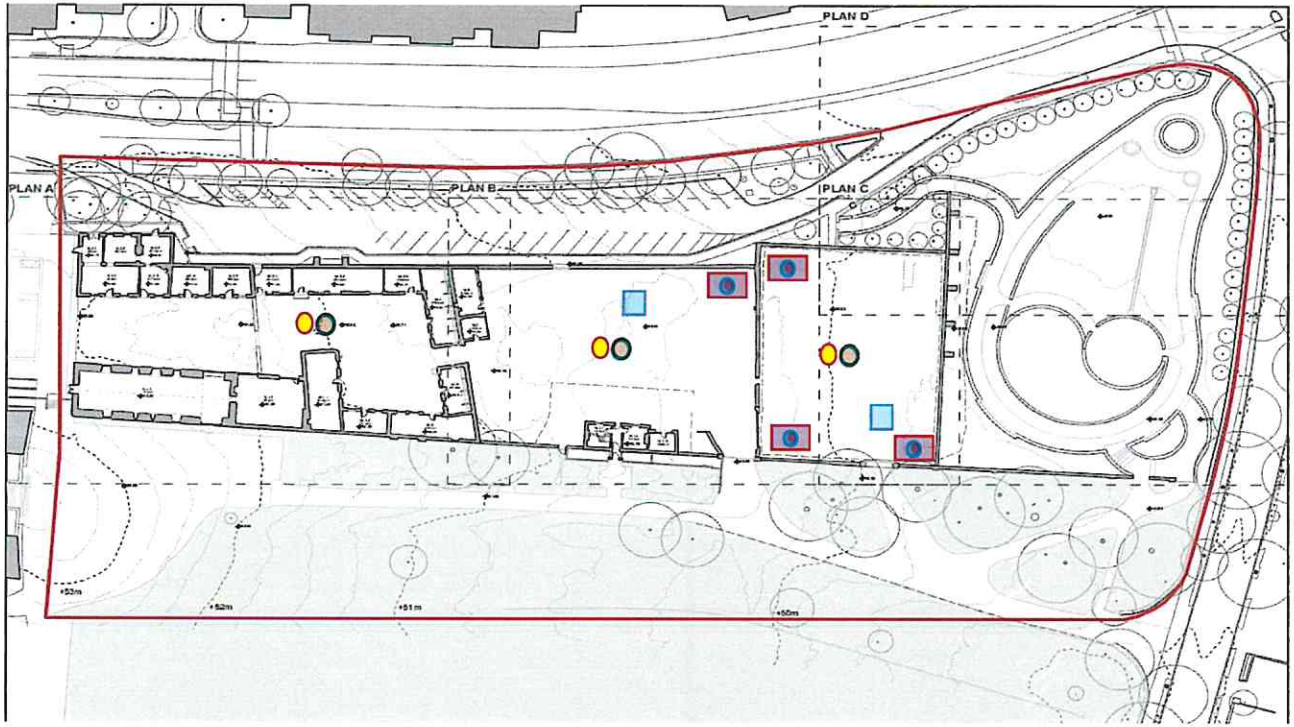
Appendix 1

Trial Pit and Window Sample Logs

Appendix VI Site Plans

Legend

- Proposed locations of Dynamic Probes
- Proposed Locations of Window samples
- Proposed trial pits circa 900 x 600 x 600 deep
- Proposed Location of Percolation Test - See attached test sheet



Site Key plan

PHASE I

Proposed Site Investigation

Quotes and works should include the following items:

The adjoining sketch shows the proposed location of all probes, window sampling and trial pits.

- 4 number trial pits to circa 600mm long x 600mm wide x 600mm deep, depth to depend on the depth of the existing foundation. Condition and details of the existing foundation and ground formation to be recorded. Trial pits to be backfilled with arisings on completion of logging.
- 3 number Dynamic probes approx 75mm diameter to refusal or maximum depth of 12m if no refusal.
- 3 number window sampling approx 100mm diameter to a depth of 4m depth.
- Samples for laboratory testing – from 3 of the trial pits
- An initial waste classification for 3 evenly distributed samples from the trial pits is required for waste classification purposes.
- Report with dynamic and window sample logs, trial pit details, bearing capacity and commentary on viability of proposed single storey new building along with and waste classification report.

All trial pits and borehole excavations to be back filled with arisings where possible and topped with hardcore to make level and safe. Any additional arisings to be left on site in agreed location.

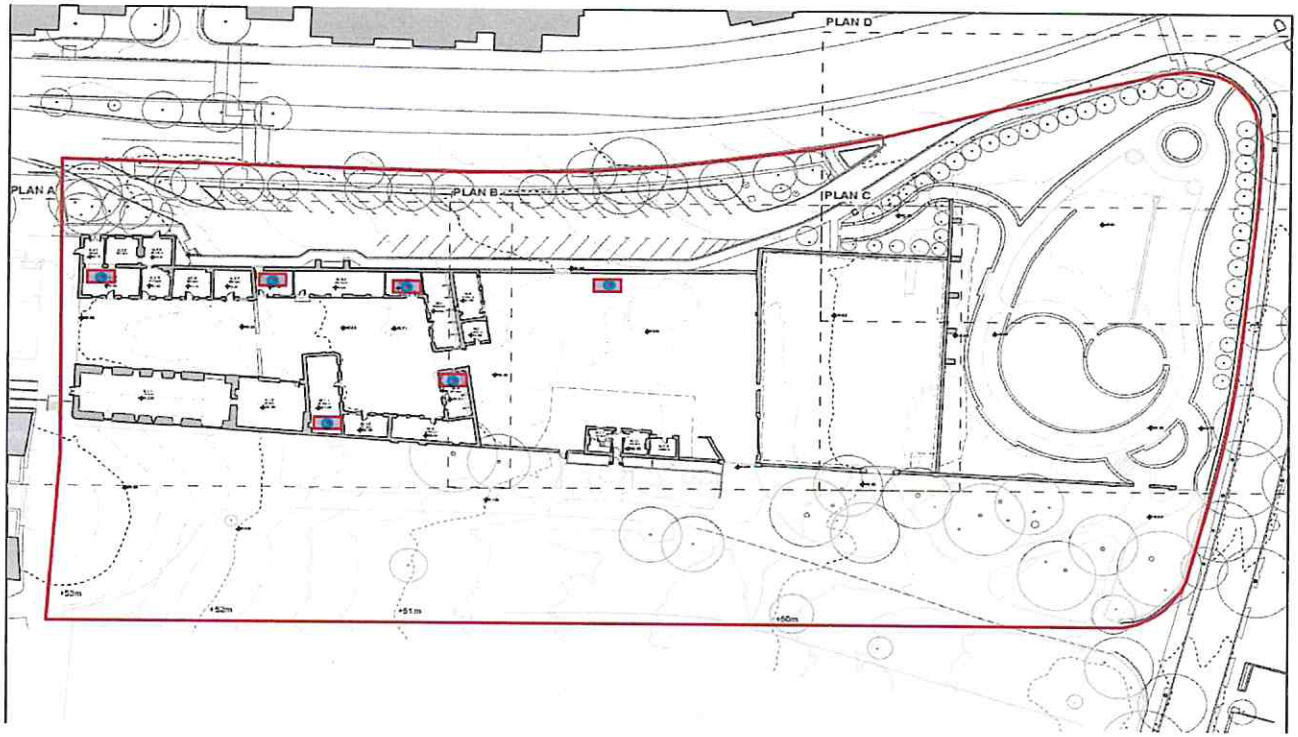
Note archaeology is likely to be encountered during the trial pits and dynamic probe prep holes. Contactor to coordinate with the ARC Archaeologist appointed for the project for archaeological monitoring of all excavations.

IGSL LTD.
Unit F, M7 Business Park
Naas, Co. Kildare
Phone: 045 846176 Fax: 846187
info@igsl.ie

Drawing Stage: PRICING						Drawn By: DB	Checked By:	Approved By: LE	Date: 29/02/2024	CORA CONSULTING ENGINEERS	Behan House, 10 Lower Mount Street, Dublin 2. D02 HT71 Tel: +353 (0)1 661 1100 e-mail: info@cora.ie web: www.cora.ie							
Project Details: Rathfarnham Castle						Project Name: Rathfarnham Castle Dublin			Scale: NTS	Project Number: 2332								
Site Address:	Rathfarnham Dublin																	
Client:	SDCC	P1	Issued for pricing	29/02/24	LE	Drawing Title: Site Investigation Scope of Works			Project:	Originator: CORA	Zone:	Level:	Type:	Discipline:	Drawing No.: SK02	Stage:	Revision: P1	
Architect:	HHC ARCHITECTS	REV. No.	REVISION DESCRIPTION	DATE	ISSUED BY													

Legend

Proposed trial pits circa 900 x 600 x 600 deep



Proposed Site Investigation

Quotes and works should include the following items:

The adjoining sketch shows the proposed location of all probes, window sampling and trial pits.

- 4 number trial pits to circa 600mm long x 600mm wide x 600mm deep, depth to depend on the depth of the existing foundation. Condition and details of the existing foundation and ground formation to be recorded. Trial pits to be backfilled with arisings on completion of logging.
- 3 number Dynamic probes approx 75mm diameter to refusal or maximum depth of 12m if no refusal.
- 3 number window sampling approx 100mm diameter to a depth of 4m depth.
- Samples for laboratory testing – from 3 of the trial pits
- An initial waste classification for 3 evenly distributed samples from the trial pits is required for waste classification purposes.
- Report with dynamic and window sample logs, trial pit details, bearing capacity and commentary on viability of proposed single storey new building along with and waste classification report.

All trial pits and borehole excavations to be back filled with arisings where possible and topped with hardcore to make level and safe. Any additional arisings to be left on site in agreed location.

Note archaeology is likely to be encountered during the trial pits and dynamic probe prep holes. Contactor to coordinate with the ARC Archaeologist appointed for the project for archaeological monitoring of all excavations.

IGSL LTD.
Unit F, M7 Business Park
Naas, Co. Kildare
Phone: 045 846176 Fax: 846197
info@igsl.ie

PHASE II

Site Key plan

Drawing Stage: PRICING						Drawn By: DB	Checked By:	Approved By: LE	Date: 29/02/2024	CORA CONSULTING ENGINEERS									
Project Details: Rathfarnham Castle		P3	Trial Pits Amended	03/12/24	DB	Project Name: Rathfarnham Castle Dublin			Scale: NTS	Project Number: 2332									
Site Address:	Rathfarnham Dublin	P2	Additional Trial Pits added	11/10/24	DB														
Client:	SDCC	P1	Issued for pricing	29/02/24	DB	Drawing Title: Site Investigation Scope of Works			Project:	Originator: CORA	Zone:	Level:	Type:	Discipline:	Drawing No.: SK02a	Stage:	Revision: P2		
Architect:	HHC ARCHITECTS	REV. No.	REVISION DESCRIPTION	DATE	ISSUED BY														

Behan House,
10 Lower Mount Street,
Dublin 2. D02 HT71
Tel: +353 (0)1 661 1100
e-mail: info@cora.ie
web: www.cora.ie