

Appendix 11.1. Site Investigation Factual Report, 16th August 2022



Our Ref: JMS/Rp/P21014 + attachments (*.pdf)

16th August, 2022

Ervia,
Colvill House,
24-26 Talbot St,
Dublin 1,
Ireland.

Re: CIP Lot 5 – Mortarstown, Site Investigation– Factual Report.

Introduction

In January 2021, Priority Geotechnical (PGL) were requested by Ervia to undertake a site investigation as part of the CIP Lot 5 Project, Co. Carlow. Atkins were acting as consulting engineers to the employer.

There are two sites included within the scope of works, Bagnenalstown and Mortarstown. This factual report relates to the site investigation works undertaken at Mortarstown. Mortarstown is located to the south west of Carlow Town, approximately 200m from the banks of the River Barrow. There is an associated pump station (Kilkenny Road Pumping Station) located to the north of this site on the Kilkenny Road to the South of the Institute of Technology Carlow. Both the WWTP and Pumping Station are being upgraded with the following works proposed at each location.

Location 2a: Kilkenny Road Pump Station

- Replace the existing Foul Pumps with 2 No. new Foul Pumps sized to transfer FFT (for the Stage 1 horizon of 58,000 PE) to the Mortarstown WwTP;
- Replace the existing Stormwater Pumps with 2 No. new Stormwater Transfer Pumps sized to allow transfer of Formula A when operated in parallel with the new Foul Pumps (Formula A- FFT for Stage 1 horizon of 58,000 PE) to the Mortarstown WwTP;
- Installation of a new Stormwater Overflow Screen at the Pump Station (sized for the Stage 2 horizon of 67,000 PE);
- Civil Works and modifications to the Pump Station to facilitate the installation of the new Pumps and the new Stormwater Overflow Screen (sized for the Stage 2 horizon of 67,000 PE).

Location 2b: Mortarstown WwTP:

- Replace the existing inlet works.
- Demolish the existing circular stormwater holding tank and replace with 1 No. 33m Ø circular tank with volume of 3,395m³. Repurpose the existing 24m Ø 1,650m³ final settlement tanks as auxiliary stormwater storage thus providing a combined storage volume of 5,025m³ to service the Stage 2 horizon of 67,000 PE;
- Provide 2 No. new circular primary settlement tanks (PST) (2,115m³ each) with travelling bridge scrapers to service the Stage 2 horizon of 67,000 PE;
- Replace the existing 3 No. air blowers at the aeration tanks with 4 No. new energy efficient air blowers (sized for the Stage 1 horizon of 58,000 PE) including modifications to the existing air delivery pipework to accommodate the newly installed air blowers;
- Provide extension to existing blower building to accommodate new blowers;
- Provide 2 no. new 32m Ø circular final settlement tank and new RAS/WAS pump station;
- Provide 1 no. new 7.2m Ø picket fence thickener and upgrade existing sludge treatment works;

- Provide all new interconnecting pipework associated with the proposed upgrade works (including the rerouting of the existing 400mm and 600mm Ø rising mains at the WwTP);
- Replace the existing Motor Control Centre (MCC) with intelligent MCC comprising PLC and associated SCADA system.

Scope of Works

The site investigation works are necessary to determine the condition and engineering properties of the ground at proposed sites. The original scope of works for Mortarstown, which was specified by Ervia, comprised of;

- 08Nr. trial pit excavations;
- 06Nr. cable percussion boreholes;
- 05Nr. rotary boreholes;
- Ground Penetrating Radar (GPR) Survey;
- All associated In-situ testing;
- All associated sampling and
- Factual reporting.

Quantities and details of works carried out are outlined, herein.

This factual report presents the fieldworks records and data obtained with regard to the site investigation at Mortarstown, Co. Carlow as part of the CIP Lot 5 project. This report should be read in conjunction with the accompanying (attached) exploratory and photographic records and laboratory test.

Site Works

This investigation was carried out in accordance with Eurocode 7- Geotechnical Design Part 2, ground investigation and testing (BS EN 1997-2: 2007) and the relevant British Standards (BS 5930 (2015) Code of Practice for Site Investigation and BS 1377, Method of Tests for Soil for Civil Engineering Purposes, *in situ* Tests Parts 1 to 9).

The intrusive fieldworks were undertaken between the 23rd February and 25th March, 2021 under the supervision of PGL's, Engineering Geologist. Details of the plant and equipment used are detailed on the relevant exploratory records, attached herein.

Metroscan on behalf of PGL, carried out a topographic survey along with a non-intrusive ground penetrating radar (GPR) survey to locate and identify existing utilities at the site. The findings accompany this factual report.

Cable Percussion Boreholes

Thirteen (13) cable percussion boreholes were advanced to depths of between 1.2m below existing ground level (bgl) and 11.8m bgl using PGL's Dando 2000 light cable percussion rig and 200mm diameter casing. Boreholes terminated after chiselling without progress. The records are attached, herein.

Location	Final Depth (m bgl)	Date Start (dd/mm/yyyy)
BH05	3.2	05/03/2021
BH05A	2.8	05/03/2021
BH06	2.8	08/03/2021
BH06A	2.9	24/03/2021
BH07	11.8	03/03/2021
BH08	6.4	02/03/2021
BH10	1.2	09/03/2021
BH10A	1.2	09/03/2021
BH11	6.2	11/03/2021

Chiselling Records				
Location	Depth Top (m bgl)	Depth Base (m bgl)	Duration (hh:mm)	Tool
BH05	3.2	3.2	01:00	Chisel
BH05A	2.8	2.8	01:00	Chisel.
BH06	2.8	2.8	01:00	Chisel
BH06A	2.9	2.9	01:00	Chisel
BH07	11.8	11.8	01:00	Chisel
BH08	6.4	6.4	01:00	Chisel
BH10	1.2	1.2	01:00	Chisel
BH10A	1.2	1.2	01:00	Chisel
BH11	6.2	6.2	01:00	Chisel.

Rotary Boreholes

Subsequently five (05) rotary boreholes were drilled to depths 8.0m bgl to 20.0m bgl using PGL's EMCI-450 rotary rig using 131mm dia. Symmetrex casing and T6H. The exploratory records are attached, herein.

Location	Final Depth (m bgl)	Date Start (dd/mm/yyyy)
RC05	20.0	22/03/2021
RC06	20.0	23/03/2021
RC07	20.4	16/03/2021
RC10	8.0	24/03/2021
RC11	17.0	25/03/2021

Trial Pits

Eight (08) number trial pits were excavated to depths of between 1.2m bgl and 2.8m bgl using a 3t tracked excavator. The trial pit exploratory records are attached, herein.

Location	Final Depth (m bgl)	Date Start (dd/mm/yyyy)
TP05	2.8	04/03/2021
TP06	2.8	04/03/2021
TP07	1.2	04/03/2021
TP08	2.8	04/03/2021
TP10	2.7	11/03/2021
TP11	2.1	11/03/2021
TP12	2.8	04/03/2021
TP13	2.65	04/03/2021

Survey and Drawings

Upon completion of the fieldworks, the 'as built' exploration locations were surveyed using Trimble 5700/5800 GPS equipment to the Ordinance Survey Irish Trans Mercator system of co-ordinates (ITM) and elevations to Malin Head datum. The exploratory locations are summarised below and shown on the Exploratory Location layout and Plan (P21014-SI-B, P21014-SI-02 & P21014-SI-03) attached.

Location	Easting	Northing	Ground Level (mOD)	Final Depth (m bgl)	Date Start (dd/mm/yyyy)
BH05	671282.7	674750.8	50.55	3.2	05/03/2021
BH05A	671282.3	674751.3	50.08	2.8	05/03/2021
BH06	671298.5	674782.1	49.53	2.8	08/03/2021
BH06A	671299.4	674781.6	49.56	2.9	24/03/2021
BH07	671454.6	674844.3	49.15	11.8	03/03/2021
BH08	671478.5	674801.4	49.76	6.4	02/03/2021

Location	Easting	Northing	Ground Level (mOD)	Final Depth (m bgl)	Date Start (dd/mm/yyyy)
BH10	671187.6	674863.9	50.11	1.2	09/03/2021
BH10A	671187.6	674865.6	50.11	1.2	09/03/2021
BH11	671571.5	675621.1	46.4	6.2	11/03/2021
RC05	671282.3	674751.3	50.08	20.0	22/03/2021
RC06	671299.4	674781.6	49.56	20.0	23/03/2021
RC07	671454.6	674844.3	49.15	20.4	16/03/2021
RC10	671187.6	674863.9	50.11	8.0	24/03/2021
RC11	671571.5	675621.1	46.4	17.0	25/03/2021
ST01	671557.7	674802.6	49.44	1.5	03/03/2021
ST02	671532.4	674820.1	49.07	1.2	03/03/2021
ST03	671493.7	674837.4	48.7	1.5	03/03/2021
ST04	671301.5	674840	47.91	2.0	11/03/2021
ST05	671206.8	674876.5	48.25	2.3	11/03/2021
TP05	671536.1	674797.2	50.46	2.8	04/03/2021
TP06	671515.7	674815.9	49.48	2.8	04/03/2021
TP07	671403.7	674805	49.37	1.2	04/03/2021
TP08	671396.3	674776.8	48.98	2.8	04/03/2021
TP10	671270.3	674836.2	47.78	2.7	11/03/2021
TP11	671241.4	674851	48.13	2.1	11/03/2021
TP12	671569.1	675624.7	46.34	2.8	04/03/2021
TP13	671422.5	674841.1	48.88	2.65	04/03/2021

Sampling

A total of fifty five (55) bulk disturbed samples (B), forty nine (49) small disturbed samples (D), seven (07) undisturbed samples (U), eighteen (18) environmental samples (ENV) and 11.5lin.m of rotary core were recovered from the exploratory holes in accordance with Geotechnical Investigation and Sampling– Sampling Methods and Groundwater Measurements (EN ISO 22475-1:2006).

In-Situ Testing

Standard Penetration Test

Standard Penetration Tests, N values, were typically carried out in the boreholes using the 60° solid cone in place of the standard split barrel sampler. The Standard Penetration Test was carried out in accordance with Geotechnical Investigation and Testing, Part 3 Standard penetration test, BS EN ISO 22476-3:2005+A1:2011. Sixty three (63) SPT's were carried out in cable percussion and rotary boreholes. The data is presented on the exploratory logs accompanying this factual report.

Dynamic Cone Penetrometer

Nine (09) Transport Research Laboratory, dynamic cone penetrometer tests, TRL DCP (8kg drop weight, 575mm drop height) were carried out during the period of investigation. DCP probes were advanced to depths (ground level) 0.18m bgl to 0.89m bgl to establish (unadjusted) *in situ* California Bearing Ratio, CBR using both the Kleyn and TII DN-PAV-03021 equations. (*An adjustment factor of 0.5 is recommended*). The exploratory logs accompany this factual report

Laboratory Testing

Laboratory testing was scheduled by Atkins and carried out by PGL in accordance with BS1377 (1990), Methods of test for soils for civil engineering purposes and the ISRM suggested methods for rock characterisation, testing and monitoring. Specialist environmental testing was carried out by Chemtest UK Ltd. on behalf of PGL. The lab test results are summarised hereafter and accompany this factual report.

Please note that all samples shall be retained for a period no longer than 28 days from the date of this report. Thereafter all remaining samples shall be appropriately disposed of unless a written instruction to the contrary is received by PGL prior to the date of this reporting and within the 28 day period outlined above. Laboratory testing will result in a reduction of sample quantity and in some cases the use of the full sample mass. Samples already tested may not be suitable or available for further testing.

SUMMARY OF LABORATORY TESTSING

Soil		
Type	Nr.	Remarks
Natural Moisture Content	41	3% to 29%
Atterberg Limits	30	Liquid Limit, LL 22% to 49%
		Plastic Limit, PL 14% to 30%
		Plasticity Index, PI 7 to 19
Particle Size Distribution	30	22Nr. hydrometer analysis on fine soils
Dry density/ Moisture content relationship	03	BH07 3.10, BH08 2.0m & BH11 2.5m Maximum dry density: 1.8Mg/m ³ to 1.9Mg/m ³ Optimum moisture content: 10.3% to 18.7%
Moisture condition value (MCV)	01	BH11 2.5m

Soil		
Type	Nr.	Remarks
MCV Relationship	01	BH11 3.6m
Unconsolidated undrained triaxial	01	BH07 7.3m See attached results
pH	05	8.6 to 8.9
Sulphate (2:1 Water Soluble) as SO ₄	05	<0.010g/l
Total sulphur	05	<0.010% to 0.025%
Sulphate (Acid soluble)	05	<0.010% to 0.029%
Organic matter	02	0.57% to 1.5%
Environmental	11	See attached results
Waste Acceptance Criteria (WAC)	09	See attached results

Rock		
Type	Nr.	Remarks
Point Loads Is50	04	3.8MPa to 7.2MPa
Unconfined compressive strength	02	71.27MPa to 102.97MPa

Published Geology

Solid

The Geological Survey of Ireland, 1:100,000 mapping (Sheet 19) was reviewed to determine the geology of the site. The geology of the area is defined by two units with the majority of the site underlain by the Ballyadams Formation (BA). This is described as crinoidal Packstone/ Wackestone Limestone. The Milford Formation (MI) is mapped to the east and characterised by peloidal calcarenitic Limestone. Historic borehole ID's (2617SWW340, 2617SWW373) indicated a depth to bedrock between 7.6m and 18.9m.

Superficial Deposits

Teagasc subsoil mapping indicates the study area is underlain by Made Ground and Gravels (GLs) derived from Limestone. Alluvial deposits are associated with the channel of the River Barrow. The national aquifer vulnerability mapping indicated a high vulnerability rating across the area.

Ground and Groundwater Conditions

The full details of the ground conditions encountered are provided for on the exploratory records accompanying this report. The records provide descriptions, in accordance with BS 5930 (2015) and Eurocode 7, Geotechnical Investigation and Testing, Identification and classification of soils, Part 1, Identification and description (EN ISO 14688-1: 2002),– Identification and Classification of Soil, Part 2: Classification Principles (EN ISO 14688-2:2004) and Identification and Classification of Rock, Part 1: Identification & Description (EN ISO 14689-1:2004) of the materials encountered, in situ testing and details of the samples taken, together with any observations made during the ground investigation.

Groundwater was encountered at depths 2.6m bgl to 13.9m bgl during the period of works. Groundwater observations may be subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions, tidal variations etc. Four (04) groundwater monitoring standpipes were installed under the scope of works. The groundwater regime should be assessed from standpipe well installations, where available.

SUMMARY OF GROUNDWATER

Location	Depth Strike (m bgl)	Remarks	Standpipe (Y/N)
BH05	-	None encountered	N
BH05A	-	None encountered.	N
BH06	-	None encountered	N
BH06A	-	None encountered	N
BH07	-	None encountered	N
BH08	4.9	See shift data.	N
BH10	-	None encountered	N
BH10A	-	None encountered.	N
BH11	3.6	See shift data.	N
RC05	7.6	Refer to shift data.	Y
RC06	6.2	Refer to shift data	N
RC07	13.9	See shift data.	Y
RC10	8	See shift data.	Y
RC11	7.1	Refer to shift data.	Y
ST01	-	None encountered.	N
ST02	-	None encountered.	N
ST03	-	None encountered.	N

Location	Depth Strike (m bgl)	Remarks	Standpipe (Y/N)
ST04	-	None encountered	N
ST05	-	None encountered	N
TP05	-	None encountered.	N
TP06	-	None encountered.	N
TP07	-	None encountered.	N
TP08	-	None encountered.	N
TP10	2.6	Slow flow rate of flow	N
TP11	-	None encountered	N
TP12	-	None encountered.	N
TP13	-	None encountered.	N

Four (04) 50mm diameter HDPE standpipes were installed for the purpose of groundwater monitoring. A summary of standpipe details is presented hereafter.

SUMMARY OF STANDPIPE CONSTRUCTION

Location	Depth Top (m bgl)	Depth Base (m bgl)	Diameter (mm)	Pipe Type
RC05	0.00	1.00	50	PLAIN
	1.00	20.00	50	SLOTTED
RC07	0.00	1.00	50	PLAIN
	1.00	20.00	50	SLOTTED
RC10	0.00	1.00	50	PLAIN
	1.00	8.00	50	SLOTTED
RC11	0.00	1.00	50	PLAIN
	1.00	17.00	50	SLOTTED

Groundwater levels were recorded from standpipe installations on a subsequent site visit. The readings are presented below.

SUMMARY OF GROUNDWATER MONITORING

Location	16/04/2021 (m bgl)
BH05	5.5
BH07	4.50
BH10	5.2
BH11	2.95

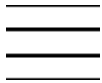
Exploratory holes were backfilled upon instruction from the engineer. Backfill details are shown graphically on the exploratory logs accompanying this factual report.



GRAVEL Backfill to installation/ borehole



ARISINGS Backfill



uPVC slotted pipe



BENTONITE Backfill to installation/
borehole

Should you have any queries in relation to the data collected, please do not hesitate to contact our office.

Yours sincerely,
For **Priority Geotechnical,**

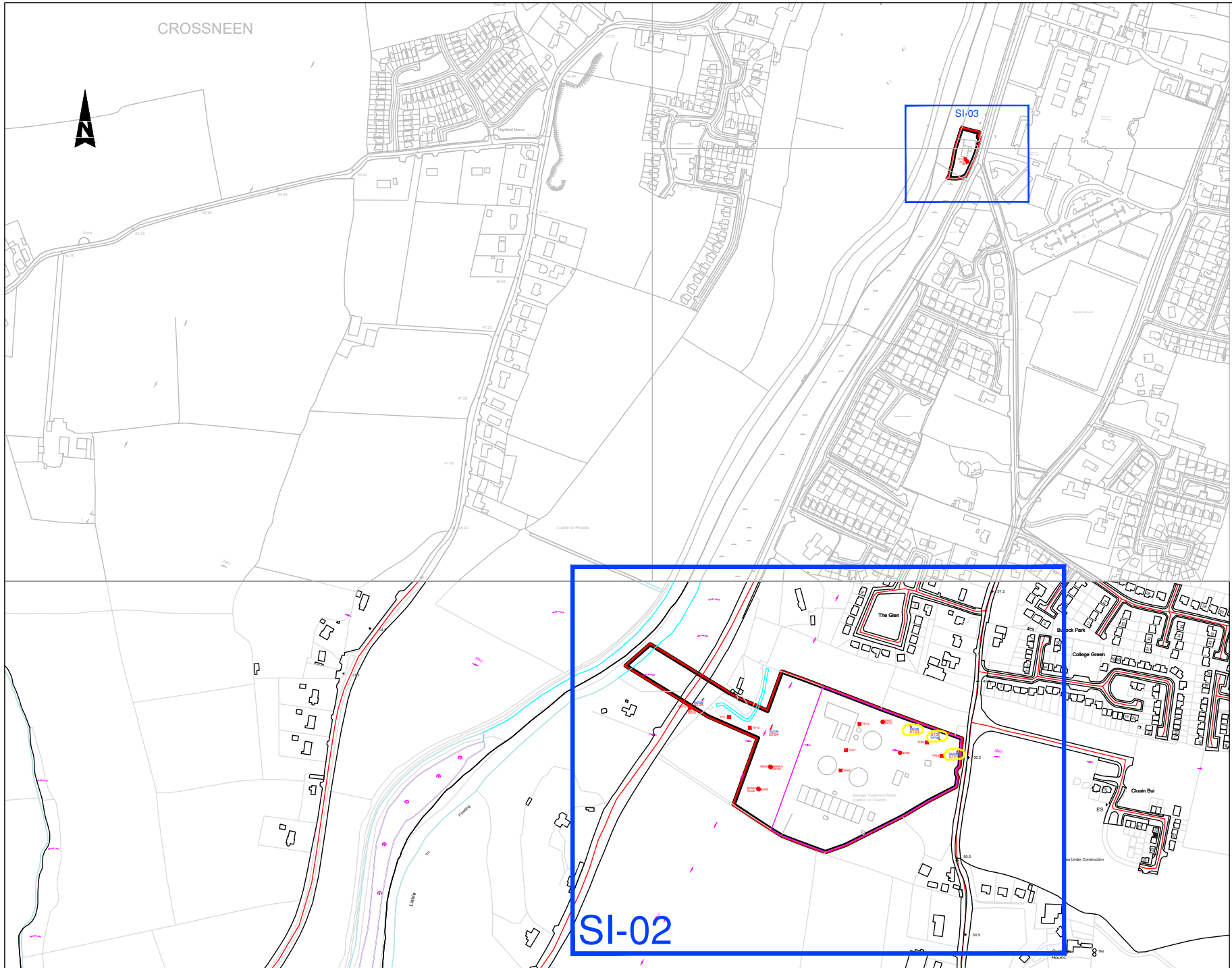


James McSweeney BSc
Engineering Geologist

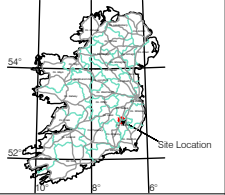
No responsibility can be held by PGL for ground conditions between exploratory locations. The exploratory logs provide for ground profiles and configuration of strata relevant to the investigation depths achieved during the fieldworks. Caution shall be taken when extrapolating between such exploratory locations. No liability is accepted for ground conditions extraneous to the exploratory locations.

No account has been taken of potential subsidence or ground movement due to mineral extraction, mining works or karstification below or in proximity to the site, unless specifically addressed.

This report has been prepared for Employer and their Representative as outline, herein. The information should not be used without their prior written permission. PGL accepts no responsibility or liability for this document being used other than for the purposes for which it was intended.



Priority Geotechnical Site



JOB NAME:

Carlow Site Investigation
Mortarstown

Sheet Title:

EXPLORATORY LOCATION
LAYOUT

JOB NUMBER:

P21014

DRAWING NUMBER:

P21014-SI-B

DRAWN BY:

Gary Curtin

DATE:

19/05/2021

SCALE:

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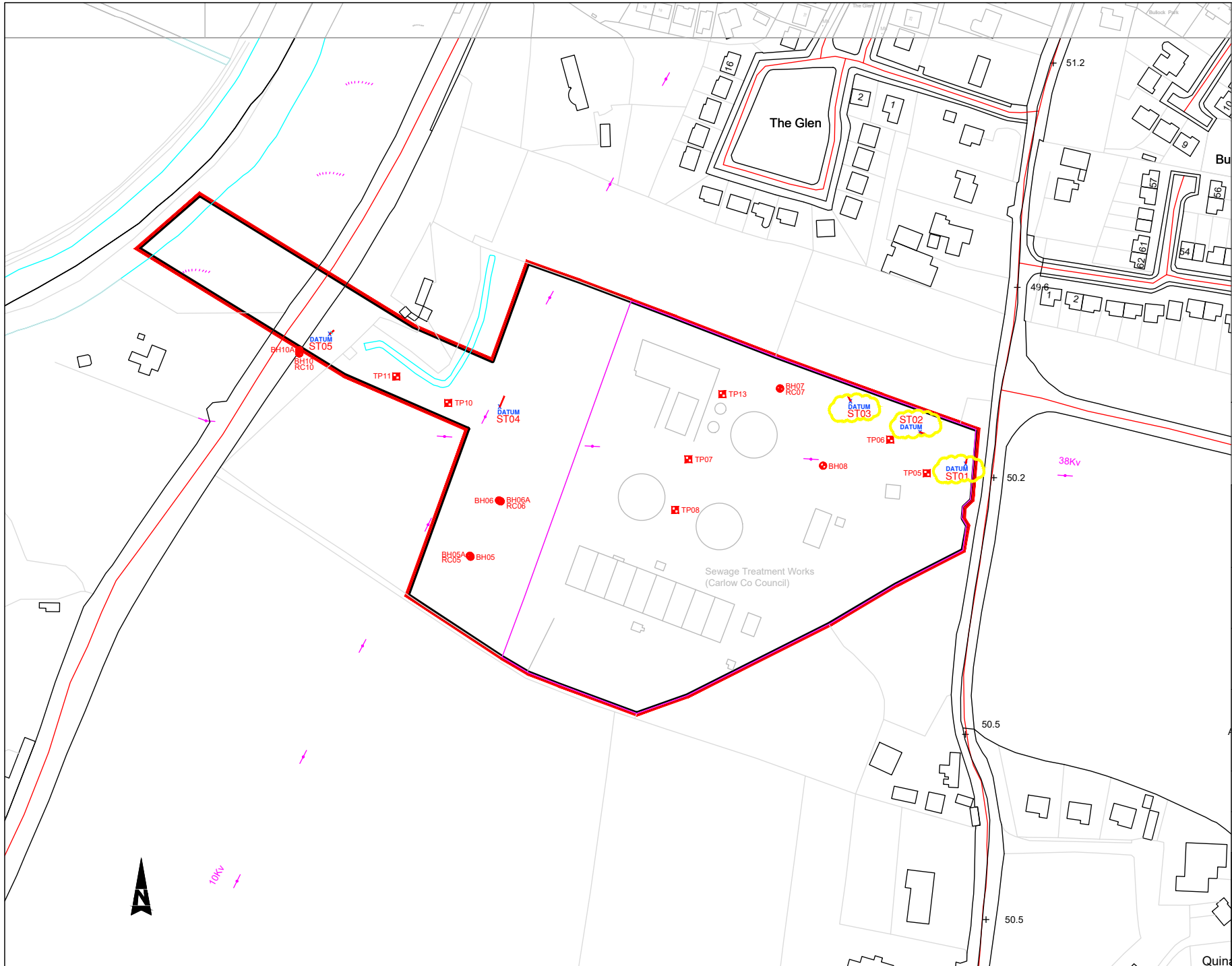
APPROVED:

GH

REVISION:

D01





KEY:

- ST00 DATUM Denotes Silt Trench and Datum location
- TP00 Denotes Trial Pit location
- BH00 Denotes Borehole location
- DP00 Denotes Dynamic Probe location
- RC00 Denotes Rotary Core location

JOB NAME:
Carlow Site Investigation

Mortarstown WWTP

Sheet Title:
LOCATION PLAN

JOB NUMBER:
P21014

DRAWING NUMBER:
P21014-SI-02

DRAWN BY:
Gary Curtin

DATE:
05/03/2021

SCALE:
1:2,000 ON A3

APPROVED:
GH

REVISION:
D01

SI-03

TP12
BH11
RC11



KEY:

- ST00 DATUM Denotes Silt Trench and Datum location
- TP00 Denotes Trial Pit location
- BH00 Denotes Borehole location
- DP00 Denotes Dynamic Probe location
- RC00 Denotes Rotary Core location
- ST00
- AA00

JOB NAME:
Carlow Site Investigation
Mortarstown, Kilkenny Rd Site

Sheet Title:
LOCATION PLAN

JOB NUMBER:
P21014

DRAWING NUMBER:
P21014-SI-03

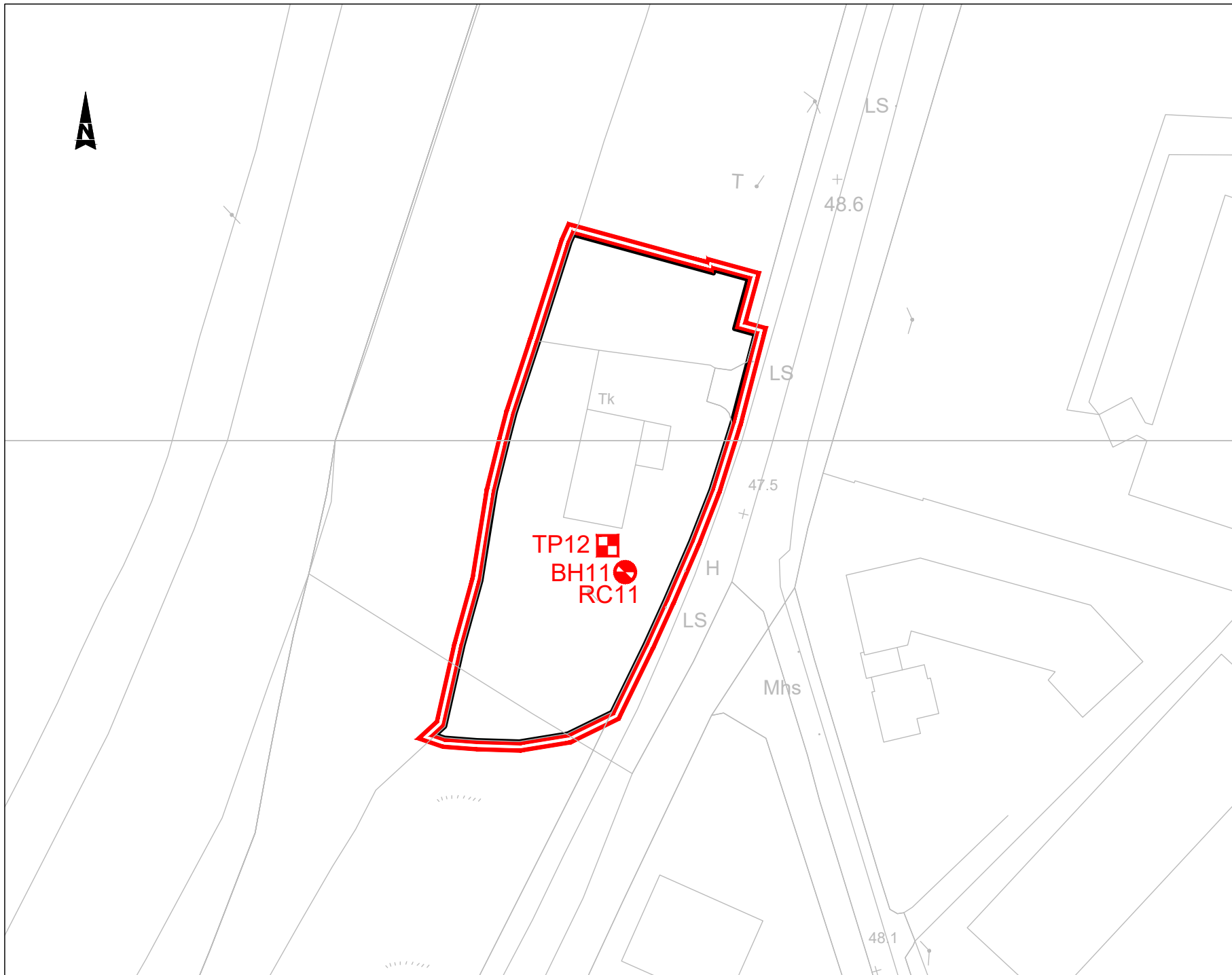
DRAWN BY:
Gary Curtin

DATE:
05/03/2021

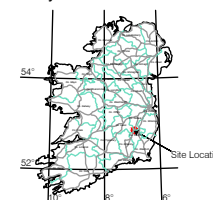
SCALE: 1:500 ON A3	APPROVED: GH
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REVISION:
D01





Priority Geotechnical Site



JOB NAME:

Carlow Site Investigation

Mortarstown Road Station

Sheet Title:

EXPLORATORY LOCATION
LAYOUT

JOB NUMBER:

P21014

DRAWING NUMBER:

P21014-SI-C

DRAWN BY:

Gary Curtin

DATE:

19/05/2021

SCALE:

1:500 ON A3

APPROVED:

GH

REVISION:

D01



KEY TO SYMBOLS ON EXPLORATORY HOLE RECORDS

All linear dimensions are in metres or millimetres

DESCRIPTIONS

** Drillers Description
Friable Easily crumbled

SAMPLES

U() Undisturbed 102mm diameter sample, () denotes number of blows to drive sampler
U()F, U()P F- not recovered, P-partially recovered
U38 Undisturbed 38mm diameter sample
P(F), (P) Piston sample - disturbed
B Bulk sample - disturbed
D Jar Sample - disturbed
W Water Sample
CBR California Bearing Ratio mould sample
ES Chemical Sample for Contamination Analysis
SPTLS Standard Penetration Test S lump sample from split sampler

CORE RECOVERY AND ROCK QUALITY

TCR Total Core Recovery (% of Core Run)
SCR Solid Core Recovery (length of core having at least one full diameter as % of core run)
RQD Rock Quality Designation (length of solid core greater than 100mm as % of core run)
Where there is insufficient space for the TCR, SCR and RQD, the results may be found in the remarks column
If Fracture Spacing in mm (Minimum/Average/Maximum) NI - non intact, NR - no recovery
AZCL Assumed Zone of Core Loss
NI Non intact

GROUNDWATER

▽ Groundwater strike
▼ Groundwater level after standing period
Date/Water Date of shift (day/month)/Depth to water at end of previous shift shown above the date and depth to water at beginning of shift given below the date

INSITU TESTING

S Standard Penetration Test - split barrel sampler
C Standard Penetration Test - solid 60° cone
SW Self Weight Penetration
Ivp, HVp (R) In Situ Vane Test, Hand Vane Test (R) demonstrates remoulded strength
K(F), (C), (R), (P) Permeability Test
HP Hand Penetrometer Test

MEASURED PROPERTIES

N Standard Penetration Test - blows required to drive 300mm after seating drive
x/y Denotes x blows for y mm within the Standard Penetration Test
x*/y Denotes x blows for y mm within the seating drive
 c_u Undrained Shear Strength (kN/m²)
CBR California Bearing Ratio

ROTARY DRILLING SIZES

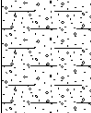
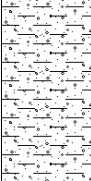
Index Letter	Nominal Diameter (mm)	
	Borehole	Core
N	75	54
H	99	76
P	120	92
S	146	113

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By JC		Borehole No. BH05 Sheet 1 of 1	
						Logged By BS			
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671283E - 674751N		Hole Type CP	
Location: Mortarstown, Co. Carlow.						Level: 50.55 m OD		Scale 1:50	
Client: Irish Water						Date: 05/03/2021 -			

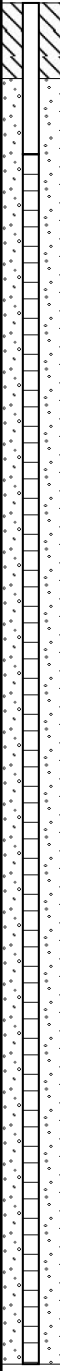
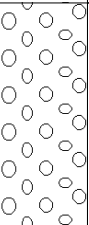
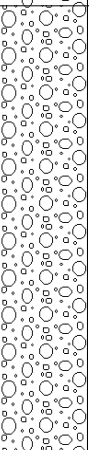
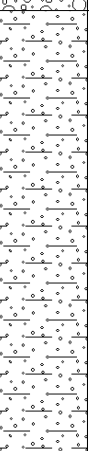
Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	50.25		(TOPSOIL)	
	0.50 - 1.00	B						Firm, brown, slightly sandy slightly gravelly SILT.	1
	1.00	D							
	1.20	SPT (C)	N=13 (4,4/4,3,3,3)						
	1.50 - 2.00	B			1.40	49.15		Firm to stiff, brown, slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub angular to sub rounded.	2
	2.00	D							
	2.00 - 2.45	U							
	2.45 - 2.60	D							
	2.50 - 3.00	B							
	2.80 - 3.25	D							
	2.80	SPT (C)	N=42 (1,2/3,3,16,20)						3
	3.00	D			3.20	47.35		End of Borehole at 3.200m	4
	3.20	SPT (C)	50 (25 for 75mm/50 for 0mm)						5
									6
									7
									8
									9

Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
				None encountered	3.20	200	200	3.20	3.20	01:00	Chisel
					Equipment:						
					Dondo 2000						

Remarks: Borehole terminated at 3.20m bgl due to obstruction. See also BH05A.	Shift Data:		
	GW (m bgl)	Shift	Depth (m bgl)
		05/03/2021 08:00 Dry 05/03/2021 18:00	0.00 3.20
Remarks Start of shift End of borehole.			

 Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By JC		Borehole No. BH05A			
						Logged By BS		Sheet 1 of 1			
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671282E - 674751N			Hole Type CP		
Location: Mortarstown, Co. Carlow.						Level: 50.08 m OD			Scale 1:50		
Client: Irish Water						Date: 05/03/2021 -					
Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description			
		Depth (m bgl)	Type	Results							
					0.30	49.78		(TOPSOIL)	1		
	0.50 - 1.00	B						Medium dense, brown, clayey very gravelly SAND. sand is fine to coarse. Gravel is fine to coarse, sub angular to rounded.			
	1.00	D									
	1.20	SPT (C)	N=15 (3,3/4,4,3,4)								
	1.50 - 2.00	B			1.40	48.68					
		2.00	D						2		
	2.00 - 2.45	D									
	2.00	SPT (C)	N=8 (2,2/1,2,3,2)								
		2.50 - 2.80	B								
		2.80	D			2.80	47.28		End of Borehole at 2.800m	3	
	2.80	SPT (C)	50 (25 for 75mm/50 for 0mm)						4		
									5		
									6		
									7		
									8		
									9		
Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
				None encountered.	2.80	200	200	2.80	2.80	01:00	Chisel.
					Equipment: Dando 2000						
Remarks:							Shift Data:				
Borehole terminated at 2.80m bgl, obstruction.							GW (m bgl)	Shift	Depth (m bgl)	Remarks	
								05/03/2021 08:00	0.00	Start of shift	
							Dry	05/03/2021 18:00	2.80	End of borehole.	
							Dry	08/03/2021 08:00	2.80	Start of shift.	
							Dry	08/03/2021 18:00	2.80	End of borehole.	

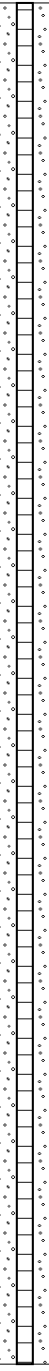
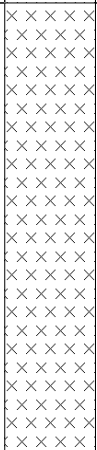
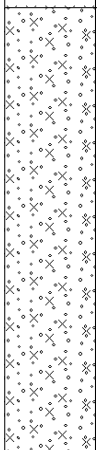
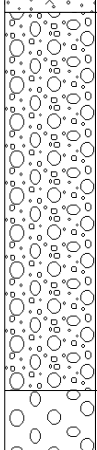
				Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie				Drilled By: KM		Borehole No. RC05	
						Logged By: BS		Sheet 1 of 3			
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671282E - 674751N				Hole Type RC	
Location: Mortarstown, Co. Carlow.						Level: 50.08 m OD				Scale 1:50	
Client: Irish Water						Dates: 22/03/2021 23/03/2021					

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
							1.50	48.58		Open hole boring. Driller described: Clayey Boulders.	1
										Open hole boring. Driller described: Gravelly Boulders.	2
							4.50	45.58		Open hole boring. Driller described: medium dense, clayey Gravel.	5
							7.50	42.58		Open hole boring. Driller described: Stiff, slightly sandy gravelly SILT.	8
		N=23 (6,5/6,7,4,6) (C)									6
		N=19 (5,4/2,6,5,6) (C)									7
		N=7 (3,2/1,2,2,2) (C)					9.00	41.08			9

Groundwater:					Hole Information:			Equipment: EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist.
7.60				Refer to shift data.	20.00	76	76		

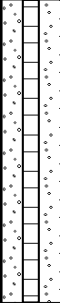
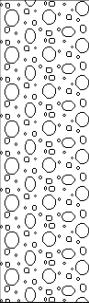
Remarks: Borehole terminated at 20.00m bgl. Bedrock not reached.	Shift Data:		Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
			3.2	18/03/2021 18:00	20.00	End of shift.
			3.2	22/03/2021 08:00	0.00	Start of shift.
			4.1	22/03/2021 18:00	17.50	End of shift.
				23/03/2021 08:00	17.50	Start of shift.

				Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie				Drilled By: KM		Borehole No. RC05 Sheet 2 of 3	
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671282E - 674751N				Hole Type RC	
Location: Mortarstown, Co. Carlow.						Level: 50.08 m OD				Scale 1:50	
Client: Irish Water						Dates: 22/03/2021 23/03/2021					

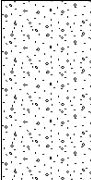
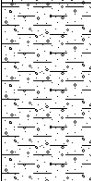
Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
		N=8 (1,2/2,3,2,1) (C)								Open hole boring, Driller descried: Stiff, SILT.	10
		N=4 (3,2/2,1,0,1) (C)				12.00	38.08			Open hole boring. Driller described: Loose to medium dense, silty Gravel.	12
		N=15 (4,5/6,2,3,4) (C)								Open hole boring. Dense, gravelly Boulders.	15
		N=31 (8,10/8,6,8,9) (C)				15.00	35.08				16
		25 (14,19/25 for 75mm) (C)									17
	17.50 - 18.00			100			17.50	32.58		Core run attempted. Assumed Boulder. Recovered as: Grey Limestone.	18
							18.00	32.08			

Groundwater:					Hole Information:			Equipment: EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist.
7.60				Refer to shift data.	20.00	76	76		

Remarks: Borehole terminated at 20.00m bgl. Bedrock not reached.	Shift Data:		Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
			3.2	18/03/2021 18:00	20.00	End of shift.
			3.2	22/03/2021 08:00	0.00	Start of shift.
			4.1	22/03/2021 18:00	17.50	End of shift.
				23/03/2021 08:00	17.50	Start of shift.

		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By: KM		Borehole No. RC05 Sheet 3 of 3	
								Logged By: BS			
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671282E - 674751N				Hole Type RC	
Location: Mortarstown, Co. Carlow.						Level: 50.08 m OD				Scale 1:50	
Client: Irish Water						Dates: 22/03/2021 23/03/2021					
Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
							20.00	30.08		Open hole boring. Driller described: Gravely Boulders.	19
										End of Borehole at 20.000m	20
											21
											22
											23
											24
											25
											26
											27
Groundwater:				Hole Information:				Equipment:		EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment		Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:		Compressed air mist.
7.60				Refer to shift data.		20.00	76	76			
Remarks: Borehole terminated at 20.00m bgl. Bedrock not reached.						Shift Data:		Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
								3.2	18/03/2021 18:00	20.00	End of shift.
								3.2	22/03/2021 08:00	0.00	Start of shift.
								4.1	22/03/2021 18:00	17.50	End of shift.
					23/03/2021 08:00	17.50	Start of shift.				

 Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By JC		Borehole No. BH06		
						Logged By RD		Sheet 1 of 1		
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671299E - 674782N			Hole Type CP	
Location: Mortarstown, Co. Carlow.						Level: 49.53 m OD			Scale 1:50	
Client: Irish Water						Date: 08/03/2021 -				

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	49.22		(TOPSOIL)	
	0.50 - 1.00	B						Loose, rown, gravely SAND. Sand is fine to coarse. Gravel is fine to coarse, sub angular to sub rounded.	1
	1.00	D							
	1.20 - 1.65 1.20	D SPT (C)	N=8 (1,2/2,1,3,2)						
	1.50 - 2.00	B			1.50	48.02		Brown, slightly sandy slightly gravely CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub angular to sub rounded.	2
	2.00	D							
	2.45 - 2.60 2.50 - 2.80 2.60	D B SPT (C)	68 (7,8/68 for 225mm)		2.80	46.72		End of Borehole at 2.800m	3
									4
									5
									6
									7
									8
									9

Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
				None encountered	2.80	200	200	2.80	2.80	01:00	Chisel
					Equipment:						

Remarks: Borehole terminated 2.80m bgl due to obstruction. See also BH06A.	Shift Data:			Shift	Depth (m bgl)	Remarks
	GW (m bgl)	08/03/2021	08:00	0.00	Start of shift	
	Dry	08/03/2021	18:00	2.80	End of borehole.	

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By JC		Borehole No. BH06A
						Logged By RD		
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671299E - 674782N		Hole Type CP
Location: Mortarstown, Co. Carlow.						Level: 49.56 m OD		Scale 1:50
Client: Irish Water						Date: 24/03/2021 -		

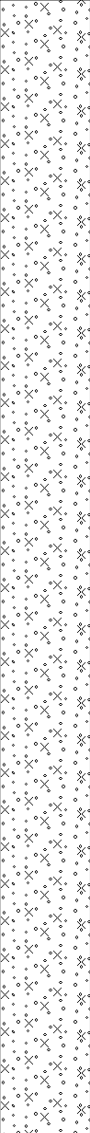
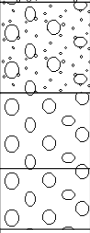
Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	49.26		(TOPSOIL)	
	0.50 - 1.00	B						Brown, slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub angular to rounded.	
	1.00	D			1.00	48.56			1
	1.20 - 1.65	B							
	1.20	SPT (C)	N=9 (1,2/2,2,3,2)						
	1.50 - 2.00	B							
	2.00	D							2
2.00 - 2.45	D								
	2.00	SPT (C)	N=10 (1,2/2,2,3,3)						
	2.60 - 2.90	B							
	2.90	SPT (C)	50 (25 for 75mm/50 for 60mm)		2.90	46.66		End of Borehole at 2.900m	3
									4
									5
									6
									7
									8
									9

Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
				None encountered	2.90	200	200	2.90	2.90	01:00	Chisel
					Equipment:						

Remarks: Borehole terminated at 2.90m bgl due to obstruction.	Shift Data:		
	GW (m bgl)	Shift	Depth (m bgl)
	Dry	08/03/2021 08:00 08/03/2021 18:00	0.00 2.90
			Remarks
			Start of shift Borehole end

Groundwater:					Hole Information:			Equipment:	EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist.	
6.20	3.0	20		Refer to shift data	20.00	76	76			
Remarks: Borehole terminated at 20.00m bgl, refusal.					Shift Data:		Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
							3.0	23/03/2021 08:00	0.00	Start of shift.
							4.0	23/03/2021 18:00	12.00	End of shift.
							4.0	24/03/2021 00:00	12.00	Start of shift
							0.8	24/03/2021 18:00	20.00	End of shift.

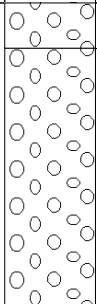
				Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie				Drilled By: KM		Borehole No. RC06	
						Logged By:		Sheet 2 of 3			
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671299E - 674782N				Hole Type RC	
Location: Mortarstown, Co. Carlow.						Level: 49.56 m OD				Scale 1:50	
Client: Irish Water						Dates: 23/03/2021 24/03/2021					

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
		N=7 (2,2/0,2,2,3) (C)								Open hole boring. Driller described: Loose to dense, silty Gravel.	10
		N=5 (3,2/2,0,1,2) (C)									11
		N=13 (4,6/4,3,2,4) (C)									12
		N=36 (6,9/5,12,9,10) (C)									13
		N=43 (10,9/12,12,9,10) (C)									14
		50 (25 for 75mm/50 for 17.0mm) 17.60 (C)	0	0	0	16.50	33.06				15
						17.10	32.46				Open hole boring. Driller described: Dense, Gravel with boulders.
					17.60	31.96	Core run attempted, poor recovery. Driller described: Boulders.		18		
							18.00	31.56		Open hole boring. Driller described: Boulders.	

Groundwater:					Hole Information:			Equipment: EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist.
6.20	3.0	20		Refer to shift data	20.00	76	76		

Remarks: Borehole terminated at 20.00m bgl, refusal.	Shift Data:		Groundwater (m bgl)		Shift		Hole Depth (m bgl)		Remarks	
			3.0		23/03/2021 08:00		0.00		Start of shift.	
			4.0		23/03/2021 18:00		12.00		End of shift.	
			0.8		24/03/2021 00:00		12.00		Start of shift.	
					24/03/2021 18:00		20.00		End of shift.	

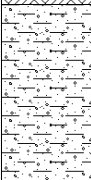
 Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie										Drilled By: KM		Borehole No. RC06	
										Logged By:		Sheet 3 of 3	
Project Name: CIP Lot 5					Project No. P21014		Co-ords: 671299E - 674782N			Hole Type RC			
Location: Mortarstown, Co. Carlow.							Level: 49.56 m OD			Scale 1:50			
Client: Irish Water							Dates: 23/03/2021 24/03/2021						

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
		50 (25 for 18.00 - 18.30 19.25/50 for 0mm) (C)		0	0	0	18.30	31.26		Core run attempted. Poor recovery. Driller described: Boulders.	19
		50 (19,25/50 for 0mm) (C)					20.00	29.56		Open hole boring. Driller described: Dense, Boulder.	
										End of Borehole at 20.000m	20
											21
											22
											23
											24
											25
											26
											27

Groundwater:					Hole Information:			Equipment: EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist.
6.20	3.0	20		Refer to shift data	20.00	76	76		

Remarks: Borehole terminated at 20.00m bgl, refusal.	Shift Data:	Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
		3.0	23/03/2021 08:00	0.00	Start of shift.
		4.0	23/03/2021 18:00	12.00	End of shift.
		0.8	24/03/2021 00:00	12.00	Start of shift.
			24/03/2021 18:00	20.00	End of shift.

 Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By JC		Borehole No. BH07		
						Logged By BS		Sheet 1 of 2		
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671455E - 674844N			Hole Type CP	
Location: Mortarstown, Co. Carlow.						Level: 49.15 m OD			Scale 1:50	
Client: Irish Water						Date: 03/03/2021 - 04/03/2021				

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	48.85		(TOPSOIL)	
	0.50 - 1.00	B						Brown, slightly sandy gravelly CLAY. Gravel is fine to coarse, sub angular.	1
	1.00	D							
	1.20 - 1.85	U							
	1.50 - 2.00	B			1.50	47.65			
	1.65 - 1.80	D							
	1.80 - 2.25	D							
	2.00	D							
	2.00 - 2.50	B						Grey, slightly sandy gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub angular to sub rounded.	2
	2.50	D							
	2.50 - 2.95	D			2.60	46.55			
	2.60 - 3.00	B							
	3.00	D							
	3.10 - 3.55	U							
	3.50 - 4.00	B							
	3.55 - 3.70	D							
	3.80 - 4.25	D							
	3.80	SPT (C)	N=6 (1,1/2,1,2,1)						4
	4.00	D							
	4.50 - 5.00	B							
	5.00	D							
	5.00 - 5.45	D							
	5.00	SPT (C)	N=13 (3,3/4,3,3,3)						5
	6.00 - 6.50	B			6.00	43.15			
	6.50	D							
	6.50 - 6.95	D							
	6.50	SPT (C)	N=13 (2,3/3,3,4,3)						7
	7.30 - 7.75	U							
	7.75 - 7.90	D							
	8.00 - 8.50	B							
8.20 - 8.95	D							8	
8.50	D								
8.50	SPT (C)	N=11 (2,3/2,3,3,3)						9	

Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
				None encountered	11.80	200	200	11.80	11.80	01:00	Chisel
					Equipment: Dando 2000						

Remarks: Borehole terminated at 11.8m bgl due to obstruction. Inspection pit done.						Shift Data:							
						GW (m bgl)		Shift		Depth (m bgl)		Remarks	
								03/03/2021 08:00		0.00		Start of shift	
								03/03/2021 18:00		7.00		Borehole stands	
						5.6		04/03/2021 08:00		7.00		Start of shift	
								04/03/2021 18:00		11.80		Borehole end	

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By JC		Borehole No. BH07 Sheet 2 of 2		
						Logged By BS				
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671455E - 674844N			Hole Type CP	
Location: Mortarstown, Co. Carlow.						Level: 49.15 m OD			Scale 1:50	
Client: Irish Water						Date: 03/03/2021 - 04/03/2021				

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
Well Backfill		9.20 - 9.60	B		9.20	39.95		Firm, grey, slightly sandy CLAY.	
		9.60	SPT (C)	N=25 (4,5/5,6,7,7)				Stiff, grey, slightly sandy gravelly CLAY, medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub angular to sub rounded. Cobbles are 63-90mm, sub angular to sub rounded.	10
		10.30 - 10.80	B						
		10.80	SPT (C)	N=35 (5,7/7,8,10,10)					11
		11.80	SPT (C)	25 (25,25/25 for 60mm)	11.80	37.35		End of Borehole at 11.800m	12
									13
									14
									15
									16
									17
									18

Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
				None encountered	11.80	200	200	11.80	11.80	01:00	Chisel
					Equipment:						

Remarks: Borehole terminated at 11.8m bgl due to obstruction. Inspection pit done.						Shift Data: <table style="width:100%; border-collapse: collapse;"> <tr> <th>GW (m bgl)</th> <th>Shift</th> <th>Depth (m bgl)</th> <th>Remarks</th> </tr> <tr> <td></td> <td>03/03/2021 08:00</td> <td>0.00</td> <td>Start of shift</td> </tr> <tr> <td></td> <td>03/03/2021 18:00</td> <td>7.00</td> <td>Borehole stands</td> </tr> <tr> <td>5.6</td> <td>04/03/2021 08:00</td> <td>7.00</td> <td>Start of shift</td> </tr> <tr> <td></td> <td>04/03/2021 18:00</td> <td>11.80</td> <td>Borehole end</td> </tr> </table>				GW (m bgl)	Shift	Depth (m bgl)	Remarks		03/03/2021 08:00	0.00	Start of shift		03/03/2021 18:00	7.00	Borehole stands	5.6	04/03/2021 08:00	7.00	Start of shift		04/03/2021 18:00	11.80	Borehole end
										GW (m bgl)	Shift	Depth (m bgl)	Remarks																
							03/03/2021 08:00	0.00	Start of shift																				
							03/03/2021 18:00	7.00	Borehole stands																				
5.6	04/03/2021 08:00	7.00	Start of shift																										
	04/03/2021 18:00	11.80	Borehole end																										

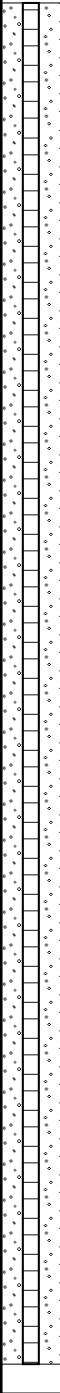
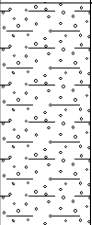
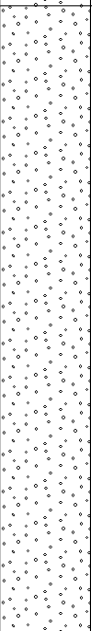
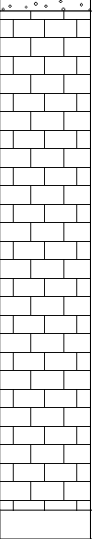
 Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie										Drilled By: KM		Borehole No. RC07	
										Logged By: BS		Sheet 1 of 3	
Project Name: CIP Lot 5					Project No. P21014			Co-ords: 671455E - 674844N			Hole Type RC		
Location: Mortarstown, Co. Carlow.					Level: 49.15 m OD			Scale 1:50					
Client: Irish Water					Dates: 16/03/2021			19/03/2021					

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
										Open hole boring. Driller described: Clayey Gravel.	
											1
											2
											3
											4
											5
											6
											7
											8
											9

Groundwater:					Hole Information:			Equipment: EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist
13.90				See shift data.	20.40	76	76		

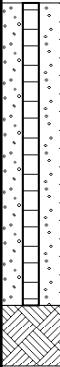
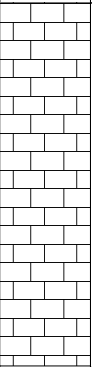
Remarks: Borehole terminated at 20.40m bgl. 50mm dia. standpipe installed.	Shift Data:	Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
			16/03/2021 08:00	0.00	Start of shift.
			16/03/2021 18:00	4.50	End of shift.
			18/03/2021 08:00	4.50	Start of shift.
			18/03/2021 18:00	16.20	End of shift.
		3.6	19/03/2021 08:00	16.20	Start of shift.
		3.2	19/03/2021 18:00	20.40	End of borehole.

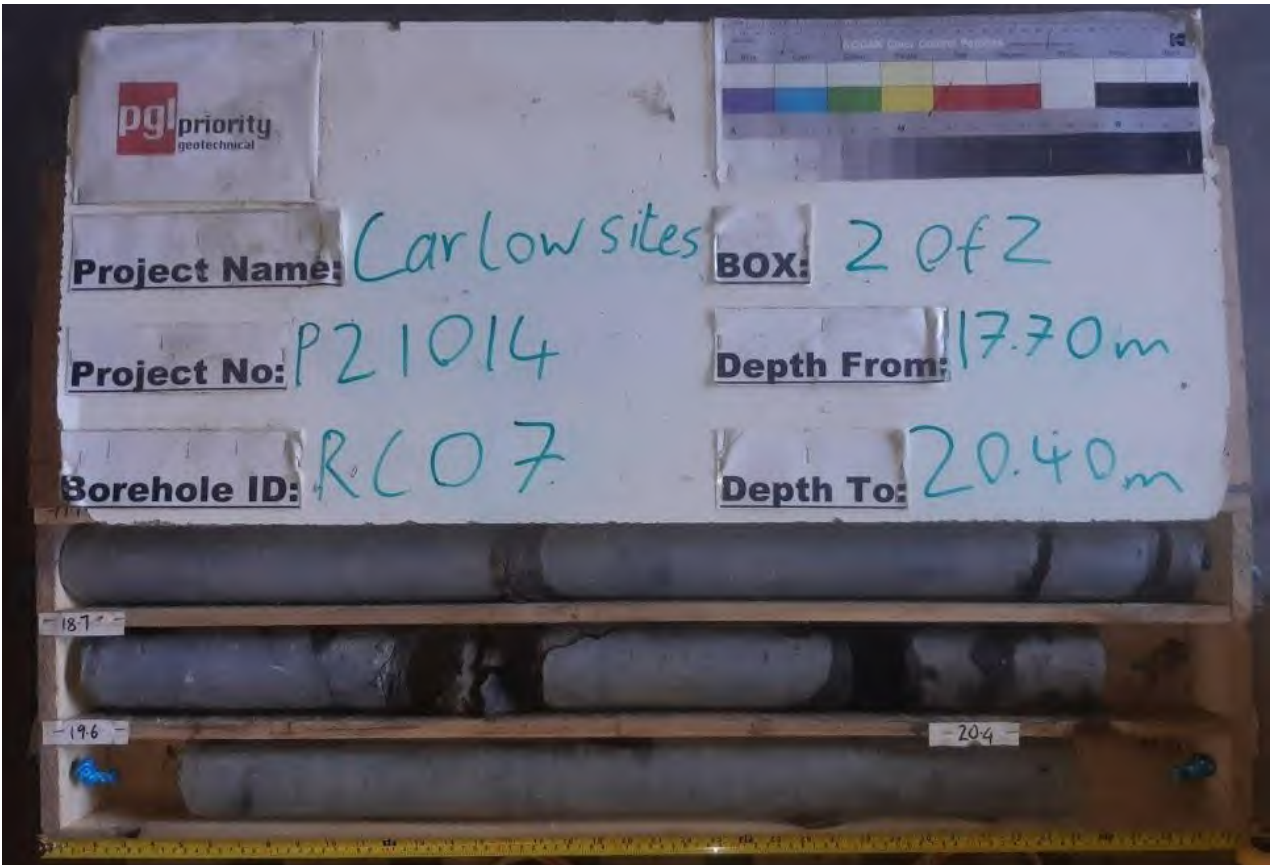
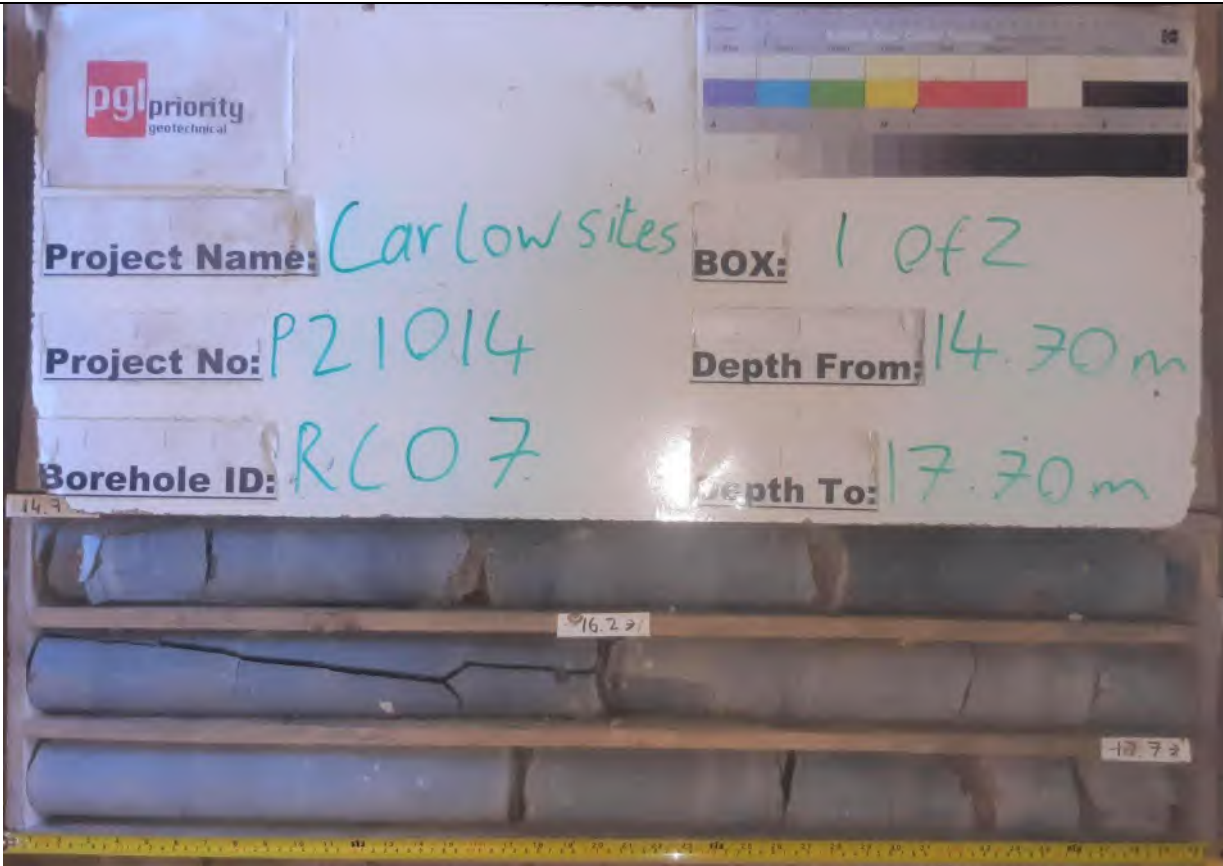
				Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie				Drilled By: KM		Borehole No. RC07	
						Logged By: BS		Sheet 2 of 3			
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671455E - 674844N				Hole Type RC	
Location: Mortarstown, Co. Carlow.						Level: 49.15 m OD				Scale 1:50	
Client: Irish Water						Dates: 16/03/2021				19/03/2021	

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
		25 (17,24/25 for 75mm) (C)				10.50	38.65		Open hole boring. Driller described: Clayey Gravel.	10	
										Open hole boring. Driller described: Medium dense, Gravel.	11
		50 (25 for 75mm/50 for 0mm) (C)				14.70	34.45			Lithology: Medium strong, blue grey LIMESTONE.	15
		14.70 - 16.20	100mm 370mm 280mm	94	64	45	9/m		Weathering: Core is moderately weathered. Clay replacement seen at 19.00m and 19.35m. There is orange discolouration on the fracture surfaces due to oxidation. There is some clay smearing on the core.	16	
16.20 - 17.70	70mm 410mm 90mm	100	87	65	9/m	Fractures: Set 1: dipping at 10 degrees, undulating and rough with wide spacing. Set 2: dipping at 80 degrees, undulating and rough, with close to wide spacing.	17				
						3/m			Details: Stylolites are seen on the core. There is also some fossil material.	18	

Groundwater:					Hole Information:			Equipment: EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist
13.90				See shift data.	20.40	76	76		

Remarks: Borehole terminated at 20.40m bgl. 50mm dia. standpipe installed.	Shift Data:		Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
				16/03/2021 08:00	0.00	Start of shift.
				16/03/2021 18:00	4.50	End of shift.
				18/03/2021 08:00	4.50	Start of shift.
				18/03/2021 18:00	16.20	End of shift.
				19/03/2021 08:00	16.20	Start of shift.
				19/03/2021 18:00	20.40	End of borehole.

		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie					Drilled By: KM		Borehole No. RC07 Sheet 3 of 3			
							Logged By: BS					
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671455E - 674844N			Hole Type RC			
Location: Mortarstown, Co. Carlow.						Level: 49.15 m OD			Scale 1:50			
Client: Irish Water						Dates: 16/03/2021 19/03/2021						
Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description		
				TCR	SCR	RQD						
		17.70 - 18.70	20mm 300mm 150mm	100	93	77	6/m 1/m 20.40	28.75		Lithology: Medium strong, blue grey LIMESTONE. Weathering: Core is moderately weathered. Clay replacement seen at 19.00m and 19.35m. There is orange discolouration on the fracture surfaces due to oxidation. There is some clay smearing on the core. Fractures: Set 1: dipping at 10 degrees, undulating and rough with wide spacing. Set 2: dipping at 80 degrees, undulating and rough, with close to wide spacing. Details: Stylolites are seen on the core. There is also some fossil material. End of Borehole at 20.400m	19	
		18.70 - 19.60		100	59	43					20	
		19.60 - 20.40		98	98	95					21	
											22	
											23	
											24	
											25	
											26	
											27	
Groundwater:				Hole Information:			Equipment: EMCI-450					
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment		Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist		
13.90				See shift data.		20.40	76	76				
Remarks: Borehole terminated at 20.40m bgl. 50mm dia. standpipe installed.				Shift Data:		Groundwater (m bgl)		Shift		Hole Depth (m bgl)		Remarks
								16/03/2021 08:00		0.00		Start of shift.
								16/03/2021 18:00		4.50		End of shift.
								18/03/2021 08:00		4.50		Start of shift.
								18/03/2021 18:00		16.20		End of shift.
		19/03/2021 08:00		16.20		Start of shift.						
		19/03/2021 18:00		20.40		End of borehole.						



Number: RC07	Project Carlow Site Investigations - Mortarstown Project No P21014 Engineer Atkins	
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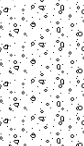
Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By JC		Borehole No. BH08 Sheet 1 of 1	
						Logged By BS			
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671479E - 674801N		Hole Type CP	
Location: Mortarstown, Co. Carlow.						Level: 49.76 m OD		Scale 1:50	
Client: Irish Water						Date: 02/03/2021 - 03/03/2021			

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	49.46		(TOPSOIL)	
	0.50 - 1.00	B						Soft, brown, slightly sandy slightly gravelly SILT. Gravel is fine to coarse, sub angular to sub rounded.	1
	1.00	D							
	1.20 - 1.65	D							
	1.20	SPT (C)	N=6 (1,1/2,2,1,1)						
	1.50 - 2.00	B							
	2.00	D							2
	2.00 - 2.45	U							
	2.45 - 2.60	D							
	2.50 - 3.00	D							
	2.60 - 3.05	D							
	2.60	SPT (C)	N=5 (1,2/2,1,1,1)		2.50	47.26		Soft to firm, brown, slightly sandy slightly gravelly CLAY.	3
	3.00	D							
	3.20 - 3.65	U							
	3.65 - 3.80	D							
3.80 - 4.25	D								
3.80	SPT (C)	N=11 (2,2/3,2,3,3)						4	
4.50 - 5.00	B								
4.90	D								
5.00	SPT (C)	N=17 (4,4/5,4,4,4)						5	
5.50 - 6.00	B				5.50	44.26		Brown, slightly silty sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse.	6
6.40	SPT (C)	50 (25 for 75mm/50 for 75mm)		6.40	43.36		End of Borehole at 6.400m	7	
								8	
								9	

Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
4.90	4	20		See shift data.	6.40	200	200	6.40	6.40	01:00	Chisel
					Equipment:						
					Dando 2000						

Remarks: Borehole terminated at 6.40m bgl due to obstruction. Inspection pit 1 hour.	Shift Data:			
	GW (m bgl)	Shift	Depth (m bgl)	Remarks
	4.00	02/03/2021 08:00	0.00	Start of shift
	2.60	03/03/2021 08:00	4.90	End of shift.
	3.20	03/03/2021 18:00	6.40	End of borehole.

						Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Drilled By JC		Borehole No. BH10	
						Logged By RD		Sheet 1 of 1				
Project Name: CIP Lot 5						Project No. P21014		Co-ords: 671188E - 674864N		Hole Type CP		
Location: Mortarstown, Co. Carlow.						Level: 50.11 m OD		Scale 1:50				
Client: Irish Water						Date: 09/03/2021 -						

Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.20	49.90		(TOPSOIL)	
		0.50 - 1.00	B					Brown, clayey very sandy GRAVEL with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub rounded. Cobbles are 63-150mm, sub rounded to angular.	1
		1.20	SPT (C)	50 (25 for 50mm/50 for 10mm)	1.20	48.90		End of Borehole at 1.200m	2
									3
									4
									5
									6
									7
									8
									9

Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
				None encountered	1.20	200	200	1.20	1.20	01:00	Chisel
					Equipment:						

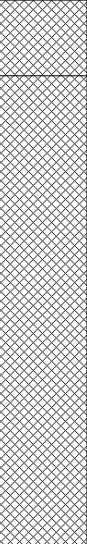
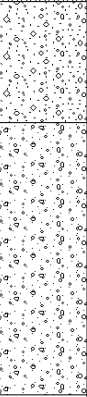
Remarks:				Shift Data:			
Borehole terminated at 1.20m bgl due to obstruction.				GW (m bgl) Shift Depth (m bgl) Remarks 09/03/2021 08:00 0.00 Start of shift. Dry 09/03/2021 18:00 1.20 End of borehole.			

						Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Drilled By JC		Borehole No. BH10A	
						Logged By RD		Sheet 1 of 1				
Project Name: CIP Lot 5						Project No. P21014		Co-ords: 671188E - 674866N		Hole Type CP		
Location: Mortarstown, Co. Carlow.						Level: 50.11 m OD		Scale 1:50				
Client: Irish Water						Date: 09/03/2021 -						

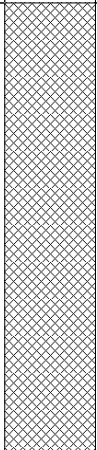
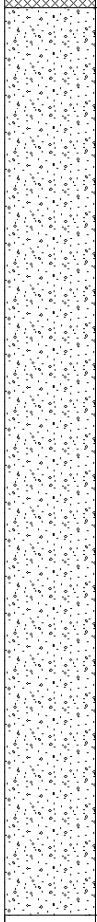
Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
		0.50 - 1.00	B		0.30	49.81	(TOPSOIL)		
		1.20	SPT (C)	50 (25 for 100mm/50 for 120mm)	1.20	48.91	Brown, silty very sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub rounded. Cobbles are 63-120mm, sub angular to sub rounded.		1
							End of Borehole at 1.200m		2
									3
									4
									5
									6
									7
									8
									9

Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
				None encountered.	1.20	200	200	1.20	1.20	01:00	Chisel
					Equipment:						

Remarks: Borehole terminated at 1.20m bgl due to obstruction. Inspection pit done.	Shift Data:			Shift	Depth (m bgl)	Remarks
	GW (m bgl)			09/03/2021 08:00	0.00	Start of shift
	Dry			09/03/2021 18:00	1.20	End of borehole.

 Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie						Drilled By JC/SR		Borehole No. BH11			
						Logged By		Sheet 1 of 1			
Project Name: CIP Lot 5				Project No. P21014		Co-ords: 671572E - 675621N			Hole Type CP		
Location: Mortarstown, Co. Carlow.						Level: 46.40 m OD			Scale 1:50		
Client: Irish Water						Date: 11/03/2021 - 11/03/2021					
Well Backfill	Water Strike (m bgl)	Sample and In Situ Testing			Depth (m bgl)	Level (mOD)	Legend	Stratum Description			
		Depth (m bgl)	Type	Results							
		0.50 - 1.00	B		0.50	45.90		(MADE GROUND) CLAY.			
		1.00	D						(MADE GROUND) Soft, brown, organic slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse. sub-angular to rounded. Medium cobble content, 63mm to 130mm dia, sub-angular to sub-rounded . Fabric found.	1	
		1.20	SPT (C)	N=7 (3,4/2,2,1,2)							
			1.50 - 2.00	B							
			2.00	D						2	
			2.00 - 2.45	D							
			2.00	SPT (C)	N=7 (1,2/2,1,2,2)						
			2.50 - 2.95	U							
			2.50 - 3.00	B							
			2.95 - 3.10	D						3	
		3.00	D								
		3.20 - 3.65	D								
		3.20	SPT (C)	N=8 (1,1/2,2,1,3)							
		3.60 - 4.00	B		3.60	42.80					
		4.00	SPT (C)	N=25 (4,5/5,6,7,7)					4		
		4.50 - 5.00	B		4.40	42.00					
		5.00	SPT (C)	N=35 (4,6/8,8,9,10)					5		
		5.50 - 6.00	B								
		6.00	SPT (C)	50 (10,13/50 for 150mm)	6.20	40.20			6		
		End of Borehole at 6.200m							7		
									8		
									9		
Groundwater:					Hole Information:			Chiselling Details:			
Struck (m bgl)	Rose to (m bgl)	After (mins)	Sealed (m bgl)	Comment	Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Top (m)	Base (m)	Duration (hh:mm)	Tool
3.60	3.0	20		See shift data.	6.20	200	200	6.20	6.20	01:00	Chisel.
					Equipment:						
Remarks:					Shift Data:						
Borehole terminated at 6.20m bgl due to obstruction.					GW (m bgl)		Shift		Depth (m bgl)		Remarks
							10/03/2021 08:00		0.00		Start of shift.
							10/03/2021 18:00		1.20		End of shift.
							11/03/2021 08:00		1.20		Start of shift.
					4.50		11/03/2021 18:00		6.20		End of borehole.

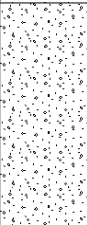
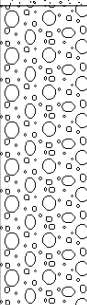
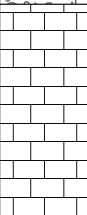
 Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie										Drilled By: KM		Borehole No. RC11	
										Logged By: BS		Sheet 1 of 2	
Project Name: CIP Lot 5					Project No. P21014			Co-ords: 671572E - 675621N			Hole Type RC		
Location: Mortarstown, Co. Carlow.					Level: 46.40 m OD			Scale 1:50					
Client: Irish Water					Dates: 25/03/2021			26/03/2021					

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
							3.00	43.40		Open hole boring. Driller described: (Made Ground) Gravel.	1
											2
											3
										Open hole boring. Driller described: Dense, Sandy Gravel.	4
											5
											6
											7
											8
											9

Groundwater:					Hole Information:			Equipment: EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method: Compressed air mist	
7.10				Refer to shift data.	17.00	76	76		

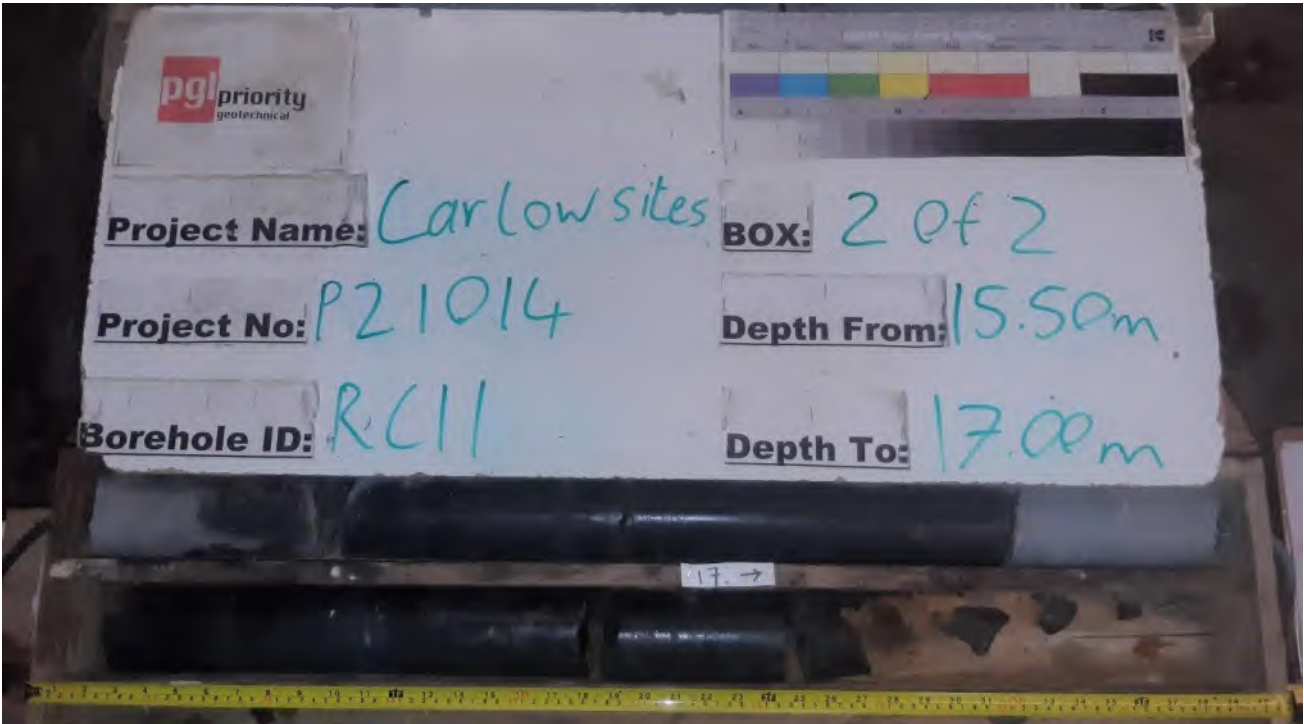
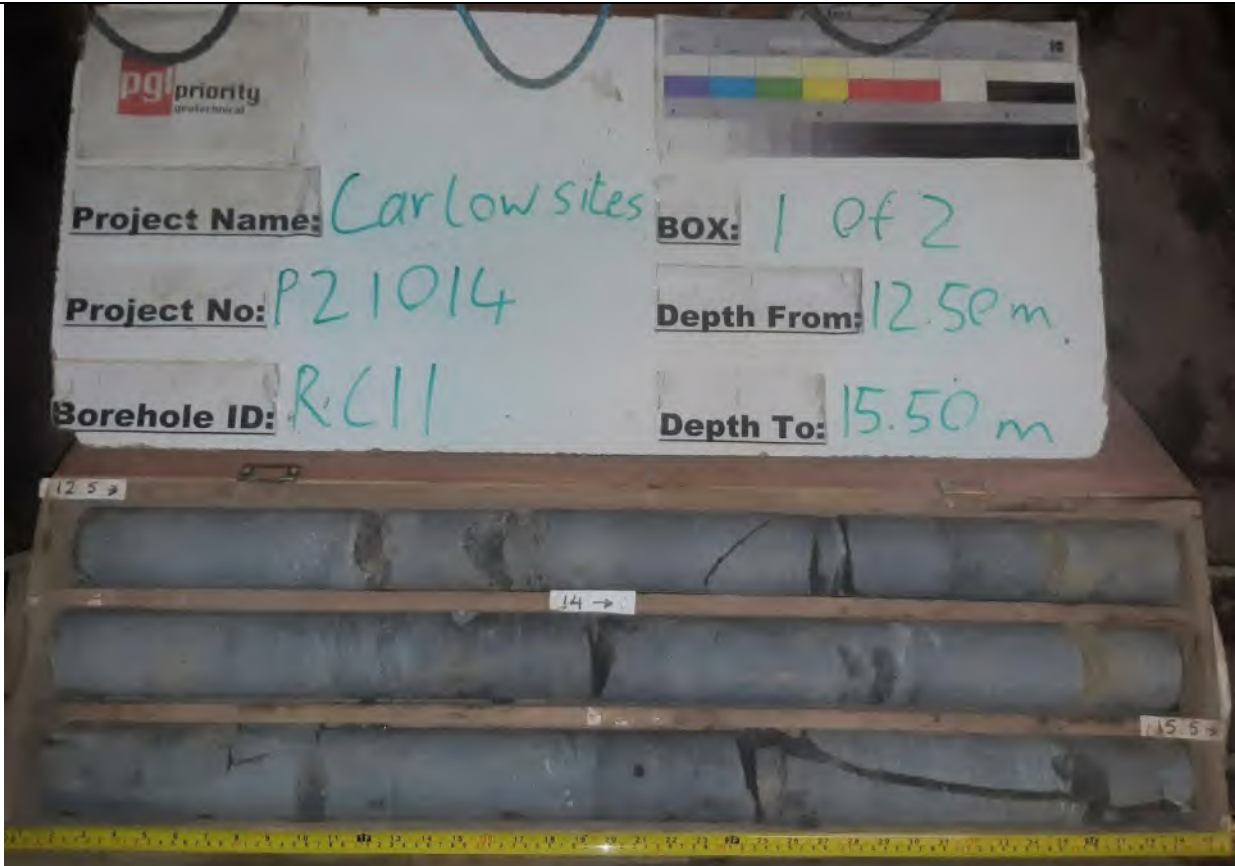
Remarks: Borehole terminated at 17.00m bgl, obstruction.	Shift Data:		Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
			6.5	25/03/2021 08:00	0.00	Start of shift
			3.2	25/03/2021 18:00	7.50	End of shift.
			3.2	26/03/2021 08:00	7.50	Start of shift.
				26/03/2021 18:00	17.00	End of shift.

 Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie										Drilled By: KM		Borehole No. RC11	
										Logged By: BS		Sheet 2 of 2	
Project Name: CIP Lot 5					Project No. P21014		Co-ords: 671572E - 675621N			Hole Type RC			
Location: Mortarstown, Co. Carlow.							Level: 46.40 m OD			Scale 1:50			
Client: Irish Water							Dates: 25/03/2021 26/03/2021						

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%)			Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description	
				TCR	SCR	RQD					
		N=41 (12,12/8,9,11,13) (C)								Open hole boring. Driller described: Dense, Sandy Gravel.	10
		N=48 (12,7/10,13,11,14) (C)					10.50	35.90		Driller described: Gravel with Dense, Boulders.	11
		N=71 (16,12/14,13,19,25) (C)					12.50	33.90			12
		12.50 - 14.00	25mm 460mm 100mm	97	88	63	7/m			Lithology: Strong, blue grey LIMESTONE. Weathering: Slightly weathered with minor clay infill on the fracture surfaces and clay smearing on the core. Fractures: Set1: dipping at 90 degrees, undulating and rough with close to medium spacing.	13
		14.00 - 15.50	70mm 600mm 80mm	100	80	53	8/m			Details: There are some stylolite on the core.	14
		15.50 - 17.00	50mm 400mm 170mm	100	95	91	6/m				15
						17.00	29.40			End of Borehole at 17.000m	17
											18

Groundwater:					Hole Information:			Equipment: EMCI-450	
Struck (m bgl)	Level (m bgl)	After (min)	Sealed	Comment	Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)	Method:	Compressed air mist
7.10				Refer to shift data.	17.00	76	76		

Remarks: Borehole terminated at 17.00m bgl, obstruction.	Shift Data:		Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
			6.5	25/03/2021 08:00	0.00	Start of shift
			3.2	25/03/2021 18:00	7.50	End of shift.
			3.2	26/03/2021 08:00	7.50	Start of shift.
				26/03/2021 18:00	17.00	End of shift.



Number: RC11	Project Carlow Site Investigations - Mortarstown Project No P21014 Engineer Atkins	
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Trial Pit No
ST01
Sheet 1 of 1

Project Name: CIP Lot 5

Project No.
P21014

Co-ords: 671558E - 674803N
Level: 49.44m OD

Date
03/03/2021

Location: Mortarstown, Co. Carlow.

Dimensions (m): 3.30

Depth:
1.50m BGL

Scale
1:25

Logged
MF

Client: Irish Water

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
				1.50	47.94		(MADE GROUND) Brown, slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.	1
							End of Pit at 1.500m	2
								3
								4
								5

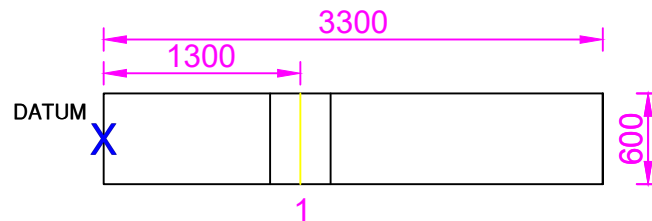
Stability: Good

Plant: 3t tracked excavator.

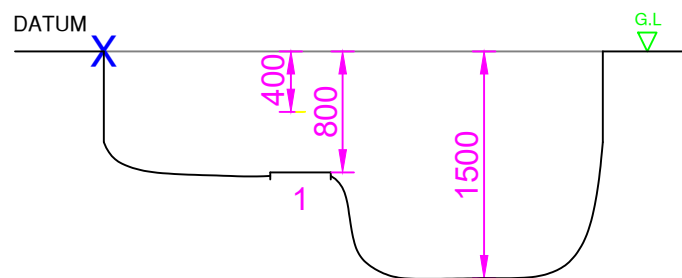
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Slit trench terminated at 1.50m bgl. Refer to DWG P20154 ST01 for cross sectional detail.

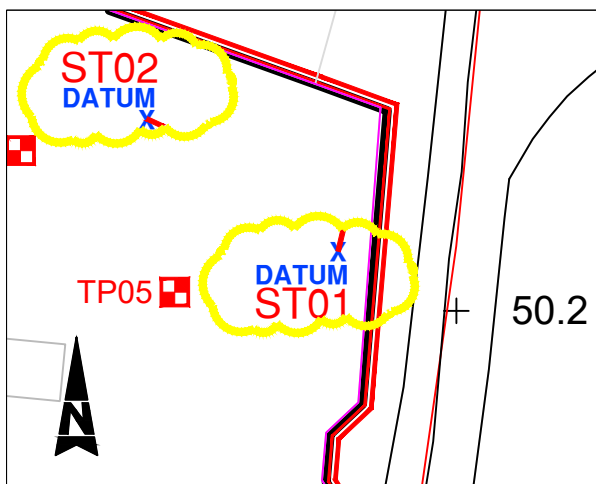


SLIT TRENCH PLAN, 1:50 ON A4



1. 2no. plastic ESB covers over ducts in a bed of sand and yellow warning tape at 0.4m blg

SLIT TRENCH SECTION, 1:50 ON A4



SLIT TRENCH LOCATION PLAN, 1:1000 ON A4

DATUM COORDINATES:
EASTING: XXXXXX.XX
NORTHING: XXXXXX.XX
LEVEL: XX.XXXmAOD

SLIT TRENCH NUMBER:

ST01

JOB NAME:

Carlow Site Investigation

JOB NUMBER:

P21014

DRAWING NUMBER:

P21014-ST01

KEY:
DATUM: X

SLIT TRENCH DIMENSIONS:
LENGTH: 3.30m
WIDTH: 0.60m
DEPTH: 1.50m

STRATA SHOWN ON DETAILED LOG

DRAWN BY:
Gary Curtin

DATE:
05/03/2021

LOGGED BY:
M.F.

DATE:
03/03/2021

SCALE:
AS STATED

APPROVED:
GH

REVISION:
D01





Number: ST01	Project Carlow Site Investigations - Mortarstown Project No P21014 Engineer Atkins	
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Number: ST01	Project Project No Engineer Carlow Site Investigations - Mortarstown P21014 Atkins	
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Number:

ST01

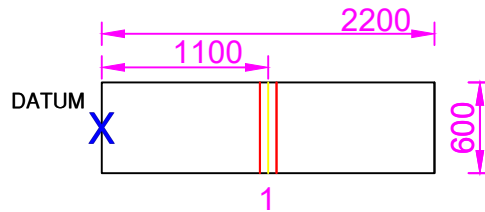
Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins

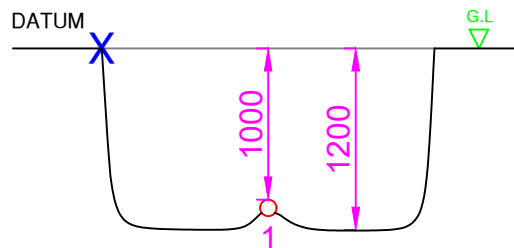
		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Trial Pit No ST02 Sheet 1 of 1	
Project Name: CIP Lot 5		Project No. P21014		Co-ords: 671532E - 674820N Level: 49.07m OD		Date 03/03/2021
Location: Mortarstown, Co. Carlow.				Dimensions (m): 0.60 2.20		Scale 1:25
Client: Irish Water				Depth: 1.20m BGL		Logged MF

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
				1.20	47.87		(MADE GROUND) Brown, slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.	1
							End of Pit at 1.200m	2
								3
								4
								5

Stability: Good Plant: 3t tracked excavator. Backfill: Arisings.	Groundwater: None encountered.
Remarks: Slit trench terminated at 1.20m bgl. Refer to DWG P20154 ST02 for cross sectional detail.	

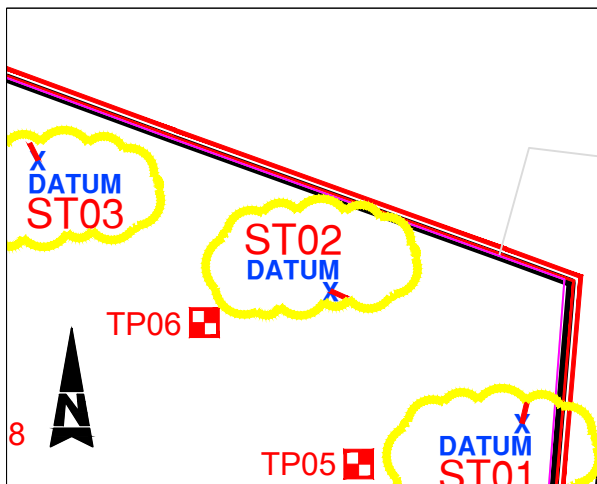


SLIT TRENCH PLAN, 1:50 ON A4



1. 110MMØ black PVC duct

SLIT TRENCH SECTION, 1:50 ON A4



SLIT TRENCH LOCATION PLAN, 1:1000 ON A4

DATUM COORDINATES: EASTING: XXXXXX.XX NORTHING: XXXXXX.XX LEVEL: XX.XXXmAOD		SLIT TRENCH NUMBER: ST02
KEY: DATUM: X		JOB NAME: Carlow Site Investigation
SLIT TRENCH DIMENSIONS: LENGTH: 2.20m WIDTH: 0.60m DEPTH: 1.20m		JOB NUMBER: P21014
STRATA SHOWN ON DETAILED LOG		DRAWING NUMBER: P21014-ST02
DRAWN BY: Gary Curtin	DATE: 05/03/2021	
LOGGED BY: M.F.	DATE: 03/03/2021	
SCALE: AS STATED	APPROVED: GH	



Number:

ST02

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



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Trial Pit No

ST03

Sheet 1 of 1

Project Name: CIP Lot 5

Project No.
P21014

Co-ords: 671494E - 674837N
Level: 48.70m OD

Date
03/03/2021

Location: Mortarstown, Co. Carlow.

Dimensions (m):

2.80

Scale
1:25

Client: Irish Water

Depth:
1.50m BGL

Logged
MF

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
				1.50	47.20		(MADE GROUND) Brown, slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.	1
							End of Pit at 1.500m	2
								3
								4
								5

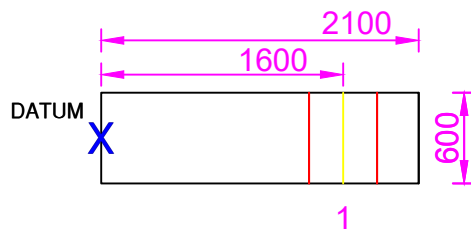
Stability: Good

Plant: 3t tracked excavator.

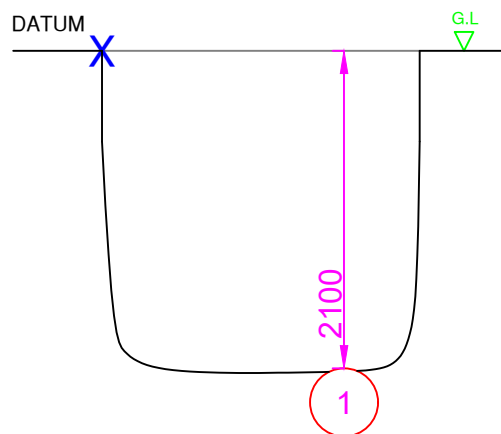
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Slit trench terminated at 1.50m bgl. Refer to DWG P20154 ST03 for cross sectional detail.

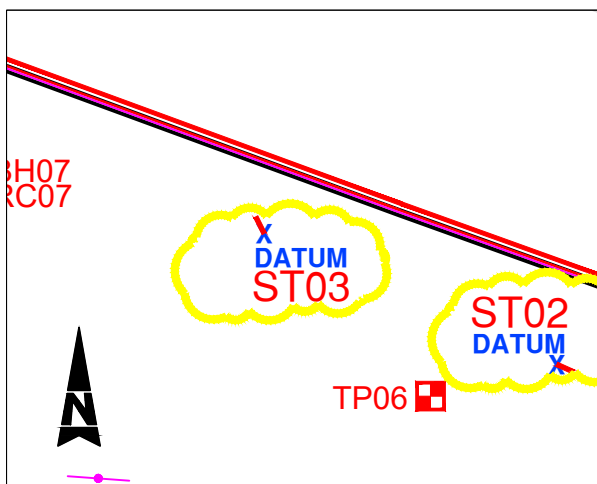


SLIT TRENCH PLAN, 1:50 ON A4



1. 450MMØ concrete storm pipe

SLIT TRENCH SECTION, 1:50 ON A4



SLIT TRENCH LOCATION PLAN, 1:1000 ON A4

DATUM COORDINATES:
EASTING: XXXXXX.XX
NORTHING: XXXXXX.XX
LEVEL: XX.XXXmAOD

SLIT TRENCH NUMBER:

ST03

JOB NAME:

Carlow Site Investigation

JOB NUMBER:

P21014

DRAWING NUMBER:

P21014-ST03

KEY:
DATUM: X

SLIT TRENCH DIMENSIONS:
LENGTH: 2.80m
WIDTH: 0.60m
DEPTH: 2.10m

STRATA SHOWN ON DETAILED LOG

DRAWN BY:
Gary Curtin

DATE:
05/03/2021

LOGGED BY:
M.F.

DATE:
04/03/2021

SCALE:
AS STATED

APPROVED:
GH

REVISION:
D01





Number: ST03	Project Project No Engineer Carlow Site Investigations - Mortarstown P21014 Atkins	
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Number:

ST03

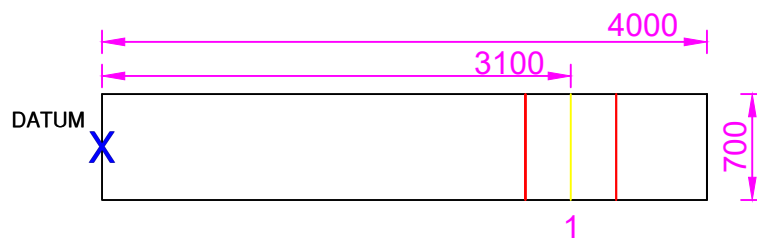
Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins

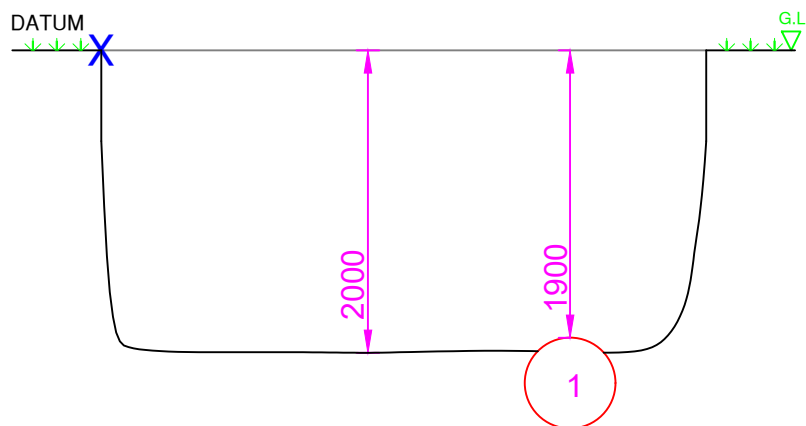
		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Trial Pit No ST04 Sheet 1 of 1	
Project Name: CIP Lot 5		Project No. P21014		Co-ords: 671301E - 674840N Level: 47.91m OD		Date 11/03/2021
Location: Mortarstown, Co. Carlow.				Dimensions (m): 0.70 4.00		Scale 1:25
Client: Irish Water				Depth: 2.00m BGL		Logged RD

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
				0.20	47.71		(TOPSOIL). Dark brown, slightly sandy gravelly organic SILT.	
	0.40	D					Firm, light brown, slightly gravelly SILT with medium cobble content. Gravel is fine to coarse and angular to sub-rounded. Cobbles are 63mm to 120mm dia and sub-angular to sub-rounded.	
	0.60 - 1.60	B		0.60	47.31		Brown, slightly sandy slightly gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded to rounded. Cobbles are up to 200mm dia, sub-angular to rounded.	1
				2.00	45.91		End of Pit at 2.000m	2
								3
								4
								5

Stability: Good Plant: 3t track machine Backfill: Arisings	Groundwater: None encountered
Remarks: Slit trench terminated at 2.00m bgl. Refer to DWG P21014 ST04 for cross section detail.	

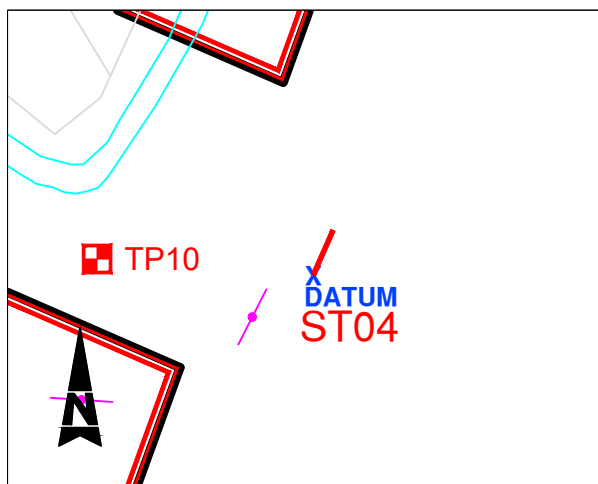


SLIT TRENCH PLAN, 1:50 ON A4



1. 600MMØ approx. concrete out flow pipe

SLIT TRENCH SECTION, 1:50 ON A4



SLIT TRENCH LOCATION PLAN, 1:1000 ON A4

DATUM COORDINATES: EASTING: 671298.9 NORTHING: 674834.1 LEVEL: 47.627mAOD		SLIT TRENCH NUMBER: ST04
KEY: DATUM: X		JOB NAME: Carlow Site Investigation
SLIT TRENCH DIMENSIONS: LENGTH: 4.00m WIDTH: 0.70m DEPTH: 2.00m		JOB NUMBER: P21014
STRATA SHOWN ON DETAILED LOG		DRAWING NUMBER: P21014-ST04
DRAWN BY: Gary Curtin	DATE: 18/03/2021	
LOGGED BY: R.D.	DATE: 11/03/2021	
SCALE: AS STATED	APPROVED: GH	
REVISION: D01		



Number:

ST04

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



Number:

ST04

Project
Project No
Engineer

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P21014
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Trial Pit No

ST05

Sheet 1 of 1

Project Name: CIP Lot 5

Project No.
P21014

Co-ords: 671207E - 674877N
Level: 48.25m OD

Date
11/03/2021

Location: Mortarstown, Co. Carlow.

Dimensions (m):

3.30

0.70

Scale
1:25

Client: Irish Water

Depth:
2.30m BGL

Logged
AO

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.50 - 1.50	B		0.10	48.15		(MADE GROUND) Grey blue, GRAVEL. Clause 804 or similar. Gravel is fine to coarse and angular.	1
				(MADE GROUND) Light brown, gravelly SAND with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is fine to coarse and angular to sub-rounded. Cobbles are 63mm to 200mm dia and angular to sub-rounded. Boulders are 200mm to 400mm dia, sub-angular to sub-rounded and Limestone lithology.	2			
				2.30	45.95		End of Pit at 2.300m	3
								4
								5

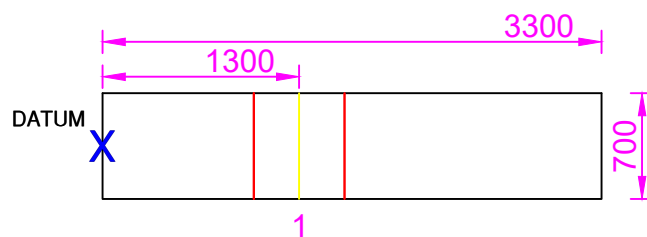
Stability: Poor

Plant: 3t track machine

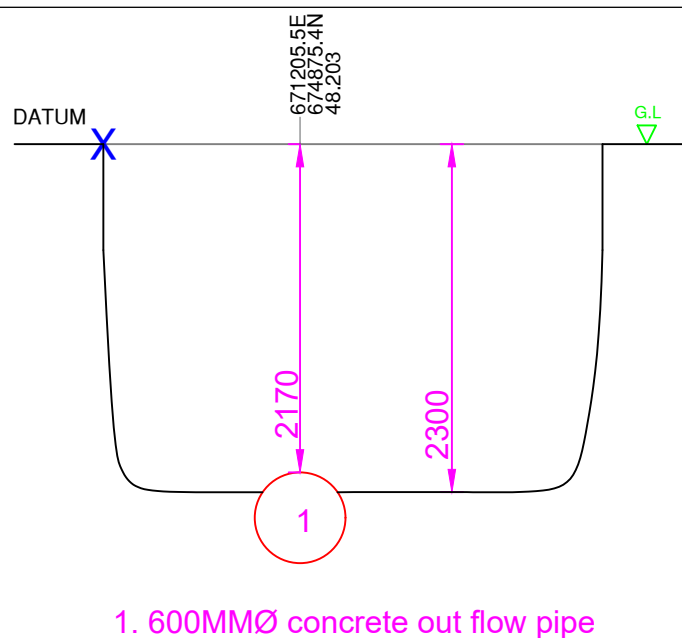
Backfill: Arisings

Groundwater: None encountered

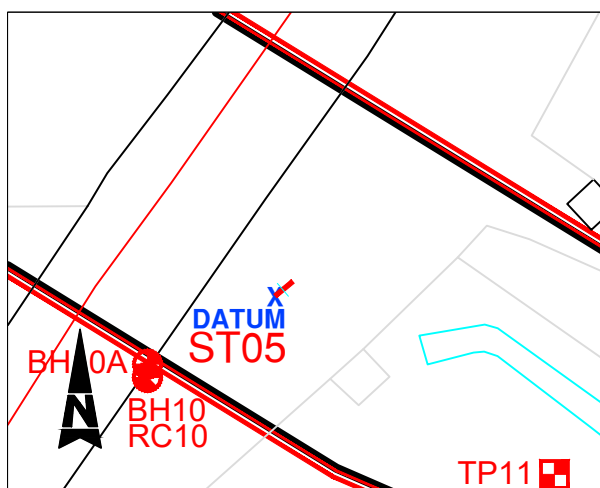
Remarks: Slit trench terminated at 2.30m bgl. Refer to DWG P21014 ST05 for cross section detail.



SLIT TRENCH PLAN, 1:50 ON A4



SLIT TRENCH SECTION, 1:50 ON A4



SLIT TRENCH LOCATION PLAN, 1:1000 ON A4

DATUM COORDINATES: EASTING: 671204.5 NORTHING: 674874.6 LEVEL: 48.307mAOD		SLIT TRENCH NUMBER: ST05
KEY: DATUM: X		JOB NAME: Carlow Site Investigation
SLIT TRENCH DIMENSIONS: LENGTH: 3.30m WIDTH: 0.70m DEPTH: 2.30m		JOB NUMBER: P21014
STRATA SHOWN ON DETAILED LOG		DRAWING NUMBER: P21014-ST05
DRAWN BY: Gary Curtin	DATE: 18/03/2021	
LOGGED BY: R.D.	DATE: 11/03/2021	
SCALE: AS STATED	APPROVED: GH	
REVISION: D01		



Number:

ST05

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



Number:

ST05

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins

		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Trial Pit No TP05 Sheet 1 of 1	
Project Name: CIP Lot 5		Project No. P21014		Co-ords: 671536E - 674797N Level: 50.46m OD		Date 04/03/2021
Location: Mortarstown, Co. Carlow.				Dimensions (m): 0.00 2.90		Scale 1:25
Client: Irish Water				Depth: 2.80m BGL		Logged MF

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.00 - 0.50	B					(TOPSOIL) Brown, slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.	
	0.50 0.50 - 1.20	ENV B		0.50	49.96		Grey brown, clayey very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are up to 100mm dia, sub-rounded to rounded.	1
	1.20 1.40 - 2.80	ENV B		1.20	49.26		Firm, brown, slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.	2
				2.80	47.66		End of Pit at 2.800m	3
								4
								5

Stability: Moderate Plant: 3t tracked excavator. Backfill: Arisings.	Groundwater: None encountered.
Remarks: Trial pit terminated at 2.80m bgl. Max extent of track machine.	

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP05	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	50.455	671536.103	674797.187

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	25	0	0	0.000		
1	48	23	23	0.048	7.6	11
1	64	16	16	0.064	12	16
1	90	26	26	0.09	6.5	10
1	121	31	31	0.121	5.2	8.0
1	137	16	16	0.137	12	16
5	183	46	9.2	0.183	24	29
5	207	24	4.8	0.207	56	58
5	250	43	8.6	0.25	27	31
10	311	61	6.1	0.311	41	45
10	378	67	6.7	0.378	37	40
10	430	52	5.2	0.43	51	53
10	475	45	4.5	0.475	61	62
10	528	53	5.3	0.528	49	52
10	590	62	6.2	0.59	40	44
20	722	132	6.6	0.722	37	41
20	794	72	3.6	0.794	81	78
30	875	81	2.7	0.875	116	106
30	964	89	3.0	0.964	103	96
20	1060	96	4.8	1.06	56	58
10	1062	2	0.2	1.062	-	-

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed



Number: TP05	Project Carlow Site Investigations - Mortarstown Project No P21014 Engineer Atkins	
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Number:

TP05

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins

Project Name: CIP Lot 5	Project No. P21014	Co-ords: 671516E - 674816N Level: 49.48m OD	Date 04/03/2021
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Location: Mortarstown, Co. Carlow.	Dimensions (m): 2.40 0.60	Scale 1:25
Client: Irish Water	Depth: 2.80m BGL	Logged MF

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.30 - 1.30 0.40	B ENV		0.30	49.18		(TOPSOIL) Brown, slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are up to 120mm dia, sub-angular to sub-rounded.	
							Loose, brown, slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub=angular to sub-rounded.	1
	1.90 - 2.50 2.00	B ENV		1.90	47.58		Firm, grey, slightly sandy gravelly CLAY. Sand is fine to coarse.	2
	2.50 - 2.80	B		2.50	46.98		Firm, light brown, slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.	
				2.80	46.68		End of Pit at 2.800m	3
								4
								5

Stability: Moderate	Groundwater: None encountered.
Plant: 3t tracked excavator.	
Backfill: Arisings.	
Remarks: Trial pit terminated at 2.80m bgl. Max extent of track machine.	

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP06	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	49.484	671515.667	674815.915

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	28	0	0.0	0.000		
2	62	34	17.0	0.062	11	15
2	84	22	11.0	0.084	20	24
2	88	4	2.0	0.088	170	145
4	126	38	9.5	0.126	24	28
5	158	32	6.4	0.158	39	42
5	224	66	13.2	0.224	15	20
5	279	55	11.0	0.279	20	24
5	353	74	14.8	0.353	13	17
10	402	49	4.9	0.402	54	56
10	470	68	6.8	0.47	36	40
10	473	3	0.3	0.473	-	-

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed



Number:

TP06

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



Number:

TP06

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP07
Sheet 1 of 1

Project Name: CIP Lot 5

Project No.
P21014

Co-ords: 671404E - 674805N
Level: 49.37m OD

Date
04/03/2021

Location: Mortarstown, Co. Carlow.

Dimensions (m):

2.20

0.60

Depth:
1.20m BGL

Scale
1:25

Logged
MF

Client: Irish Water

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.20 - 1.20	B		0.20	49.17		(TOPSOIL)	1
	0.50	ENV					Brown, slightly gravelly sandy CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are up to 200mm dia, sub-angular to sub-rounded.	
				1.20	48.17		End of Pit at 1.200m	2
								3
								4
								5

Stability: Moderate

Plant: 3t tracked excavator.

Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 1.20m bgl. Concrete service encountered.

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP07	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	49.371	671403.675	674804.978

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	26	0	0	0.000		
1	32	6	6	0.032	42	45
1	75	43	43	0.075	3.5	5.7
1	92	17	17	0.092	11	15
1	110	18	18	0.11	10	14
1	119	9	9	0.119	25	30
5	160	41	8.2	0.16	28	33
10	175	15	1.5	0.175	245	197
5	182	7	1.4	0.182	267	212
5	184	2	0.4	0.184	-	-

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP07A	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	49.371	671403.675	674804.978

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	25	0	0	0.000		
2	70	45	22.5	0.07	7.9	11
2	115	45	22.5	0.115	7.9	11
2	131	16	8	0.131	29	34
4	153	22	5.5	0.153	47	50
5	170	17	3.4	0.17	87	83
5	178	8	1.6	0.178	226	184
10	184	6	0.6	0.184	784	518

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed



Number: TP07	Project Carlow Site Investigations - Mortarstown Project No P21014 Engineer Atkins	
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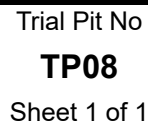


Number:

TP07

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



Date
04/03/2021

Scale
1:25

Logged
MF

Remarks: Trial pit terminated at 2.80m bgl. Max extent of track machine.

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP08	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	48.981	671396.289	674776.798

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	35	0	0	0.000		
2	94	59	29.5	0.094	5.6	8.4
2	140	46	23	0.14	7.6	11
2	184	44	22	0.184	8.1	12
4	200	16	4	0.2	70	70
5	335	135	27	0.335	6.2	9
5	394	59	11.8	0.394	18	22
10	435	41	4.1	0.435	68	68
10	464	29	2.9	0.464	106	98
10	483	19	1.9	0.483	181	153
10	502	19	1.9	0.502	181	153
10	527	25	2.5	0.527	128	115
10	548	21	2.1	0.548	160	138
20	571	23	1.15	0.571	343	261
20	575	27	1.35	0.575	280	220

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed



Number:

TP08

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



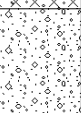
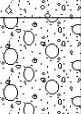
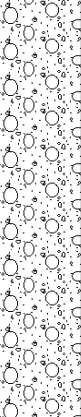
Number:

TP08

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins

		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie				Trial Pit No TP10 Sheet 1 of 1	
Project Name: CIP Lot 5		Project No. P21014		Co-ords: 671270E - 674836N Level: 47.78m OD		Date 11/03/2021	
Location: Mortarstown, Co. Carlow.				Dimensions (m): 0.80		Scale 1:25	
Client: Irish Water				Depth: 2.70m BGL		Logged RD	

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
				0.20	47.58		(TOPSOIL) Dark brown, slightly gravelly organic CLAY.	
	0.50	ENV					Brown, slightly gravelly SILT. Gravel is fine to coarse.	
	0.60 - 1.00	B		0.60	47.18		Brown, gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is fine to coarse and sub-angular to rounded. Cobbles are 63mm to 100mm dia and rounded.	
	1.00 - 2.00	B		1.00	46.78		Grey, slightly clayey SAND and GRAVEL with high cobble content and low boulder content. Sand is fine to coarse. Gravel is fine to coarse and sub-angular to rounded. Cobbles are 63mm to 200mm dia and sub-rounded. Boulders are 200mm to 400mm dia and sub-rounded.	1
	1.50	ENV						2
				2.70	45.08		End of Pit at 2.700m	3
								4
								5

Stability: Moderate Plant: 3t track machine Backfill: Arisings		Groundwater: Slow flow rate at 2.60m bgl
Remarks: Trial pit terminated at 2.70m bgl. Max extent of machine.		

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP10	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	47.78	671270.296	674836.182

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	25	0	0	0.000		
1	52	27	27	0.052	6.2	9.3
1	68	16	16	0.068	12	16
1	74	6	6	0.074	42	45
1	82	8	8	0.082	29	34
1	88	6	6	0.088	42	45
5	120	32	6.4	0.12	39	42
5	172	52	10.4	0.172	21	25
5	202	30	6	0.202	42	45
10	279	77	7.7	0.279	31	35
10	360	81	8.1	0.36	29	33
10	420	60	6	0.42	42	45
10	488	68	6.8	0.488	36	40
10	542	54	5.4	0.542	48	51
10	602	60	6	0.602	42	45
10	711	109	10.9	0.711	20	24
10	820	109	10.9	0.82	20	24
20	831	11	0.55	0.831	876	568

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed



Number:

TP10

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins

		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Trial Pit No TP11 Sheet 1 of 1	
Project Name: CIP Lot 5		Project No. P21014		Co-ords: 671241E - 674851N Level: 48.13m OD		Date 11/03/2021
Location: Mortarstown, Co. Carlow.				Dimensions (m): 0.70 2.00		Scale 1:25
Client: Irish Water				Depth: 2.10m BGL		Logged RD

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
				0.20	47.93		(TOPSOIL) Brown, slightly gravelly organic CLAY. Gravel is fine to medium and rounded.	
	0.50 0.50 - 1.30	ENV B		0.50	47.63		Brown, slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse and sub-angular to rounded.	
							Brown, slightly gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse and sub-rounded to rounded. Cobbles are 63mm to 100mm dia and sub-rounded.	1
	1.30 - 2.10 1.50	B ENV		1.30	46.83		Grey, very gravelly SAND with high cobble content and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse and sub-rounded to rounded. Cobbles are 63mm to 200mm dia and sub-rounded. Boulders are 200mm to 400mm dia and rounded.	2
				2.10	46.03		End of Pit at 2.100m	3
								4
								5

Stability: Moderate Plant: 3t track machine Backfill: Arisings	Groundwater: None encountered
Remarks: Trial pit terminated at 2.10m bgl.	

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP11	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	48.128	671241.442	674850.981

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	20	0	0	0.000		
1	45	25	25	0.045	6.9	10
1	70	25	25	0.07	6.9	10
1	88	18	18	0.088	10	14
1	110	22	22	0.11	8.1	12
1	115	5	5	0.115	53	55
5	172	57	11.4	0.172	19	23
5	225	53	10.6	0.225	20	25
5	270	45	9	0.27	25	30
10	320	50	5	0.32	53	55
10	410	90	9	0.41	25	30
10	472	62	6.2	0.472	40	44
10	630	158	15.8	0.63	12	16
20	710	80	4	0.71	70	70

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed



Number:

TP11

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



Number:

TP11

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins

		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Trial Pit No TP12 Sheet 1 of 1	
Project Name: CIP Lot 5		Project No. P21014		Co-ords: 671569E - 675625N Level: 46.34m OD		Date 04/03/2021
Location: Mortarstown, Co. Carlow.				Dimensions (m): 0.60 2.80		Scale 1:25
Client: Irish Water				Depth: 2.80m BGL		Logged KH

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.00 - 1.90	B					(MADE GROUND) Brown, very clayey very gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.	1
	0.50	ENV						
	2.00 2.00 - 2.80	ENV B		1.90	44.44		(MADE GROUND) Grey, slightly gravelly sandy SILT with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are up to 150mm dia, sub-angular to sub-rounded.	2
				2.80	43.54		End of Pit at 2.800m	3
								4
								5

Stability: Moderate Plant: 3t tracked excavator. Backfill: Arisings.		Groundwater: None encountered.
Remarks: Trial pit terminated at 2.80m bgl. Max extent of track machine.		

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP12	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	46.336	671569.065	675624.73

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	30	0	0	0.000		
1	72	42	42	0.072	3.6	5.8
1	101	29	29	0.101	5.7	8.6
1	111	10	10	0.111	22	26
1	120	9	9	0.12	25	30
1	134	14	14	0.134	14	19
5	183	49	9.8	0.183	23	27
5	207	24	4.8	0.207	56	58
5	260	53	10.6	0.26	20	25
10	345	85	8.5	0.345	27	31
5	378	33	6.6	0.378	37	41
5	406	28	5.6	0.406	46	49
10	502	96	9.6	0.502	23	28
10	578	76	7.6	0.578	31	35
20	712	134	6.7	0.712	37	40
20	823	111	5.55	0.823	47	49
20	874	51	2.55	0.874	125	112
10	894	20	2	0.894	170	145

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed



Number:

TP12

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins

		Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie			Trial Pit No TP13 Sheet 1 of 1	
Project Name: CIP Lot 5		Project No. P21014		Co-ords: 671422E - 674841N Level: 48.88m OD		Date 04/03/2021
Location: Mortarstown, Co. Carlow.				Dimensions (m): 0.60 2.40		Scale 1:25
Client: Irish Water				Depth: 2.65m BGL		Logged MF

Water Strike & Backfill	Samples & In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
				0.20	48.68		(TOPSOIL) Brown, SILT.	
	0.30 - 1.30	B					Brown, slightly gravelly sandy CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are up to 200mm dia, sub-angular to sub-rounded, limestone.	
	0.50	ENV						
	1.50 - 2.65	B					1.40m - 1.50m: Lens of sandy Gravel.	
	2.00	ENV						
				2.65	46.23		End of Pit at 2.650m	

Stability: Moderate Plant: 3t tracked excavator. Backfill: Arisings.		Groundwater: None encountered.
Remarks: Trial pit terminated at 2.65m bgl due to instability.		

No	Job	Location	Date	Engineer
P21014	Carlow Sites	DCP_TP13	16/04/2021	MF

Drop	Weight	Cone	Correlation
575mm	8kg	60°	TRL DCP

Starting Depth mm	Ground Level	Easting	Northing
0	48.877	671422.48	674841.13

Blows	Depth (mm)	Penetration (mm)	Penetration Per blow (mm)	Penetration (m bgl)	CBR, % (Kleyn)	CBR, % (TII DN-PAV-03021)
0	32	0	0	0.000		
2	84	52	26	0.084	6.5	9.6
2	136	52	26	0.136	6.5	9.6
2	191	55	27.5	0.191	6.1	9.1
4	238	47	11.75	0.238	18	22
5	270	32	6.4	0.27	39	42
5	307	37	7.4	0.307	32	36
10	411	104	10.4	0.411	21	25
10	470	59	5.9	0.47	43	46
10	525	55	5.5	0.525	47	50
10	580	55	5.5	0.58	47	50
20	710	130	6.5	0.71	38	42
20	805	95	4.75	0.805	57	58
20	860	55	2.75	0.86	113	104
20	911	51	2.55	0.911	125	112
10	970	59	5.9	0.97	43	46
10	1050	80	8	1.05	29	34
10	1120	70	7	1.12	35	39
10	1180	375	37.5	1.18	4.1	6.6

Adjustments	0.71	moderate
	0.5	dry
	0.35	very dry
	0.5	not assessed



Number:

TP13

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
Atkins



Number:

TP13

Project
Project No
Engineer

Carlow Site Investigations - Mortarstown
P21014
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KEY TO SYMBOLS - LABORATORY TEST RESULT

U	Undisturbed Sample	
P	Piston Sample	
TWS	Thin Wall Sample	
B	Bulk Sample - Disturbed	
D	Jar Sample - Disturbed	
W	Water Sample	
pH	Acidity/Alkalinity Index	
SO ₃	% - Total Sulphate Content (acid soluble)	
SO ₃	g/ltr - Water Soluble Sulphate (Water or 2:1 Aqueous Soil Extract)	
+	Calcareous Reaction	
Cl	Chloride Content	
PI	Plasticity Index	
<425	% of material in sample passing 425 micron sieve	
LL	Liquid Limit	
PL	Plastic Limit	
MC	Water Content	
NP	Non Plastic	
Y _b	Bulk Density	
Y _d	Dry Density	
Ps	Particle Density	
U/D	Undrained/Drained Triaxial	
U/C	Unconsolidated/Consolidated Triaxial	
T/M	Single Stage/Multistage Triaxial	
100/38	Sample Diameter (mm)	
REM	Remoulded Triaxial Test Specimen	
TST	Triaxial Suction Test	
V	Vane Test	
DSB	Drained Shear Box	
RSB	Residual Shear Box	
RS	Ring Shear	
σ ₃	Cell Pressure	
σ ₁ -σ ₃	Deviator Stress	
c	Cohesion	
c ₋	Effective Cohesion Intercept	
φ	Angle of Shearing Resistance - Degrees	
φ ₋	Effective Angle of Shearing Resistance	
ε _f	Strain at Failure	
*	Failed under 1 st Load	
**	Failed under 2 nd Load	
#	Untestable	
##	Excessive Strain	
p _{-o}	Effective Overburden Pressure	
m _v	Coefficient of Volume Decrease	
c _v	Coefficient of Consolidation	
Opt	Optimum	
Nat	Natural	
Std	Standard Compaction - 2.5kg Rammer	(¶ CBR)
Hvy	Heavy Compaction - 4.5kg Rammer	(§ CBR)
Vib	Vibratory Compaction	
CBR	California Bearing Ratio	
Sat m.c.	Saturation Moisture Content	
MCV	Moisture Condition Value	

Natural Moisture Content/Atterberg Limits Summary

Job Ref

BS 1377 : Part 2 : 1990 : Clause 3

Location

Carlow Site Investigation

P21014

Hole ID	Sample Ref	Depth (m)	Sample Type	Sample Description	MC	LL	PL	PI	% Pass 425
BH06	4	1.5	B	Slightly sandy slightly gravelly CLAY	22	33	20	13	72.6
BH06A	3	1.2	B	Slightly gravelly sandy CLAY	25	29	20	9	82.3
BH07	1	0.5	B	Slightly gravelly CLAY	19	30	18	12	68.3
BH07	6	1.5	B	Slightly sandy slightly gravelly CLAY with medium cobble content	18	27	17	10	75.5
BH07	8	2	B	Slightly sandy slightly gravelly CLAY	19	27	17	10	94.2
BH07	11	2.6	B	Slightly sandy CLAY	19	26	16	10	96.9
BH07	16	3.5	B	Slightly sandy CLAY	20	24	15	9	99.4
BH07	18	4.5	B	Slightly sandy CLAY	27	36	22	14	99.7
BH07	19	5	D	Slightly sandy CLAY	26	34	19	15	99.9
BH07	22	6.5	D	Slightly sandy CLAY	29	36	20	16	99.6
BH07	25	7.75	D	Slightly sandy CLAY	21				
BH07	26	8	B	Slightly sandy CLAY	23	22	14	8	96.9
BH07	29	9.2	B	Slightly sandy slightly gravelly CLAY	13	23	14	9	58.8
BH07	30	10.3	B	Slightly sandy slightly gravelly CLAY	14				
BH08	1	0.5	B	Slightly sandy slightly gravelly CLAY	13	21	14	7	77.6
BH08	4	1.5	B	Slightly sandy slightly gravelly CLAY	21				
BH08	6	2	U	Slightly sandy slightly gravelly CLAY	20				
BH08	9	2.5	B	Slightly sandy slightly gravelly CLAY	24	36	21	15	99
BH08	14	4.5	B	Slightly sandy gravelly SILT	28	41	23	18	99.9
BH08	16	5.5	B	Slightly silty sandy GRAVEL with medium cobble content	4				

Natural Moisture Content/Atterberg Limits Summary

Job Ref

BS 1377 : Part 2 : 1990 : Clause 3

Location

Carlow Site Investigation

P21014

Hole ID	Sample Ref	Depth (m)	Sample Type	Sample Description	MC	LL	PL	PI	% Pass 425
BH10A	1	0.5	B	Silty very sandy GRAVEL with medium cobble content	18	40	28	12	44.9
BH11	9	3	D	Slightly sandy slightly gravelly CLAY	19				
BH11	11	3.6	B	Slightly clayey very sandy GRAVEL with high cobble content	13				
BH11	12	4.5	B	Very clayey very sandy GRAVEL	12	22	13	9	59.2
ST04	2	0.6	B	Slightly sandy slightly gravelly CLAY	17				
TP05	2	0.5	B	Clayey very sandy GRAVEL	8				
TP05	3	1.4	B	Slightly gravelly sandy CLAY	19	30	18	12	77.1
TP06	1	0.3	B	Slightly gravelly sandy CLAY	16	27	17	10	74.2
TP06	2	1.9	B	Slightly sandy gravelly CLAY	20	31	22	9	81.9
TP06	3	2.5	B	Slightly sandy CLAY	22	32	19	13	98.9
TP07	1	0.2	B	Slightly gravelly sandy CLAY	14	26	17	9	65.8
TP08	1	0.2	B	Clayey very gravelly SAND	3	27	17	10	60.1
TP08	2	1.4	B	Slightly sandy slightly gravelly CLAY with low cobble content	19	24	16	8	82.1
TP10	1	0.6	B	Clayey gravelly SAND	24	26	19	7	81
TP10	2	1	B	Slightly clayey SAND and GRAVEL with low cobble content	9	30	19	11	19.3
TP11	1	0.5	B	Slightly gravelly sandy CLAY	21				
TP11	2	1.3	B	Clayey very gravelly SAND	13				
TP12	1	0	B	Very clayey very gravelly SAND	20	41	26	15	62.8
TP12	2	2	B	Slightly gravelly sandy SILT	22	49	30	19	68.1
TP13	1	0.3	B	Slightly gravelly sandy CLAY	17	33	20	13	73

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH05

Location

Carlow Site Investigation

Sample No

3

Depth

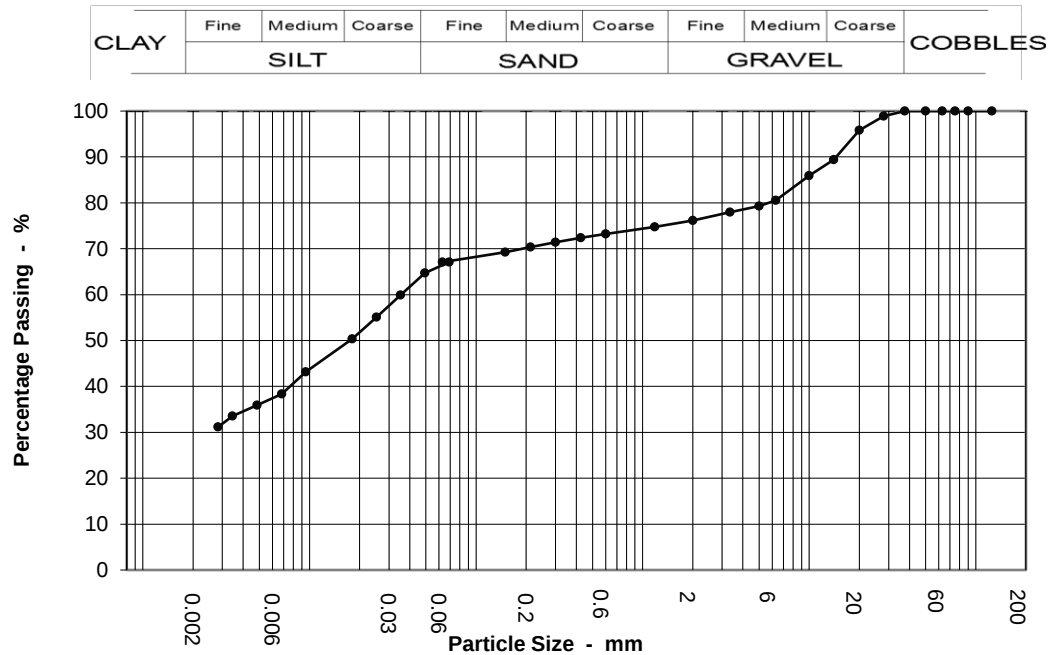
1.50 m

Soil Description

Slightly sandy gravelly CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.069	67
90	100	0.049	65
75	100	0.035	60
63	100	0.025	55
50	100	0.018	50
37.5	100	0.010	43
28	99	0.007	38
20	96	0.005	36
14	89	0.003	34
10	86	0.003	31
6.3	81	0.001	29
5	79		
3.35	78		
2	76		
1.18	75		
0.6	73		
0.425	72		
0.3	71		
0.212	70		
0.15	69		
0.063	67		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	24.0
Sand	9.0
Silt	37.0
Clay	30.0

Grading Analysis	
D100	37.50
D60	0.04
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH05A

Location

Carlow Site Investigation

Sample No

1

Depth

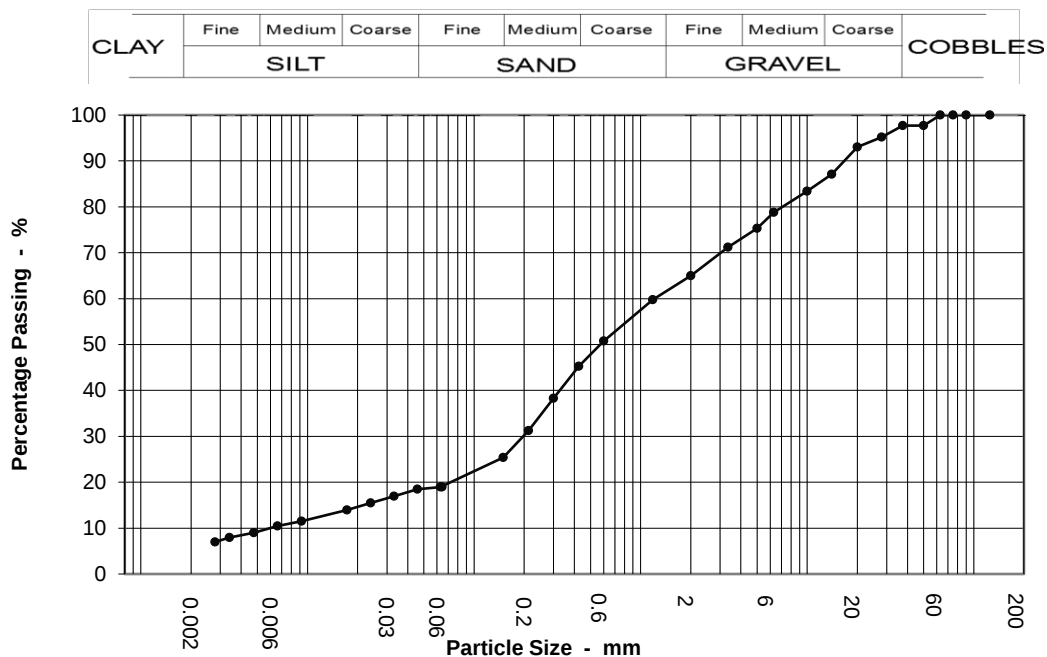
0.50 m

Soil Description

Clayey very gravelly SAND

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.064	19
90	100	0.046	18
75	100	0.033	17
63	100	0.024	15
50	98	0.017	14
37.5	98	0.009	11
28	95	0.007	10
20	93	0.005	9
14	87	0.003	8
10	83	0.003	7
6.3	79	0.001	5
5	75		
3.35	71		
2	65		
1.18	60		
0.6	51		
0.425	45		
0.3	38		
0.212	31		
0.15	25		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	35.0
Sand	46.0
Silt	13.0
Clay	6.0

Grading Analysis	
D100	63.00
D60	1.21
D10	0.01
Uniformity Coefficient	200.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH05A

Location

Carlow Site Investigation

Sample No

6

Depth

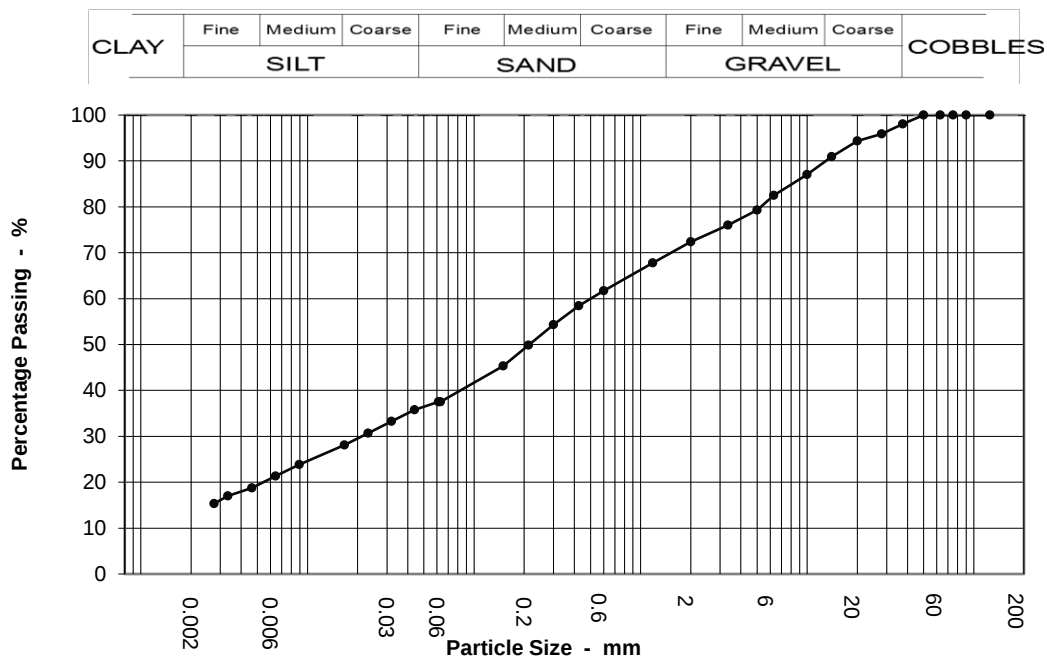
2.50 m

Soil Description

Slightly gravelly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.061	38
90	100	0.044	36
75	100	0.032	33
63	100	0.023	31
50	100	0.017	28
37.5	98	0.009	24
28	96	0.006	21
20	94	0.005	19
14	91	0.003	17
10	87	0.003	15
6.3	82	0.001	9
5	79		
3.35	76		
2	72		
1.18	68		
0.6	62		
0.425	58		
0.3	54		
0.212	50		
0.15	45		
0.063	38		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	28.0
Sand	35.0
Silt	24.0
Clay	14.0

Grading Analysis	
D100	50.00
D60	0.50
D10	0.00
Uniformity Coefficient	490.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH06

Location

Carlow Site Investigation

Sample No

4

Depth

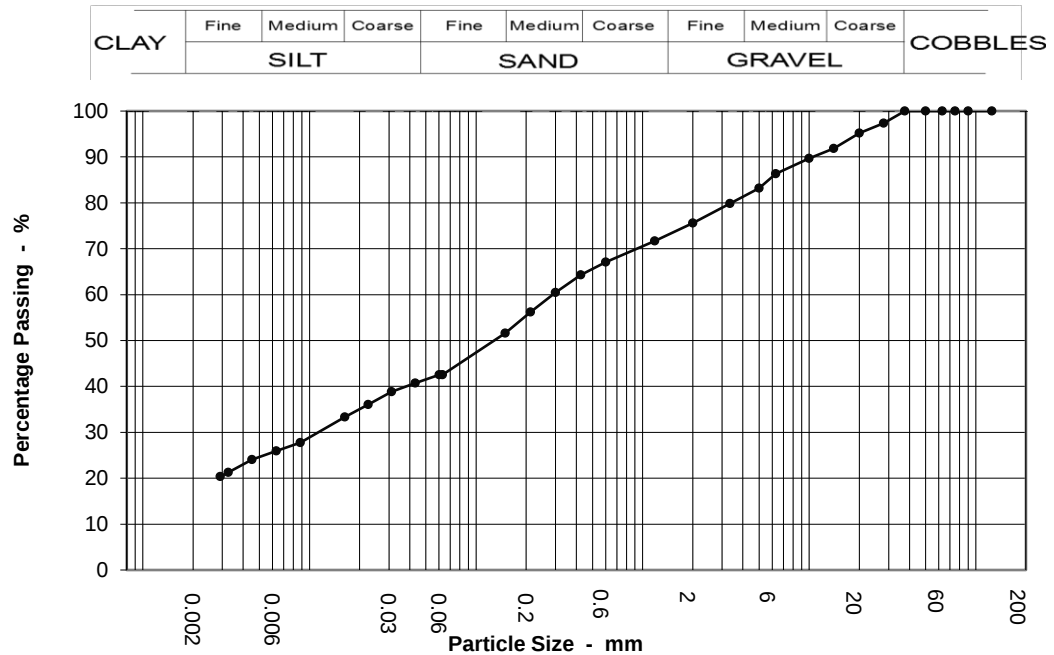
1.50 m

Soil Description

Slightly sandy slightly gravelly CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.060	43
90	100	0.043	41
75	100	0.031	39
63	100	0.023	36
50	100	0.016	33
37.5	100	0.009	28
28	97	0.006	26
20	95	0.005	24
14	92	0.003	21
10	90	0.003	20
6.3	86	0.001	13
5	83		
3.35	80		
2	76		
1.18	72		
0.6	67		
0.425	64		
0.3	60		
0.212	56		
0.15	52		
0.063	43		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	24.0
Sand	33.0
Silt	24.0
Clay	18.0

Grading Analysis	
D100	37.50
D60	0.29
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH06A

Location

Carlow Site Investigation

Sample No

3

Depth

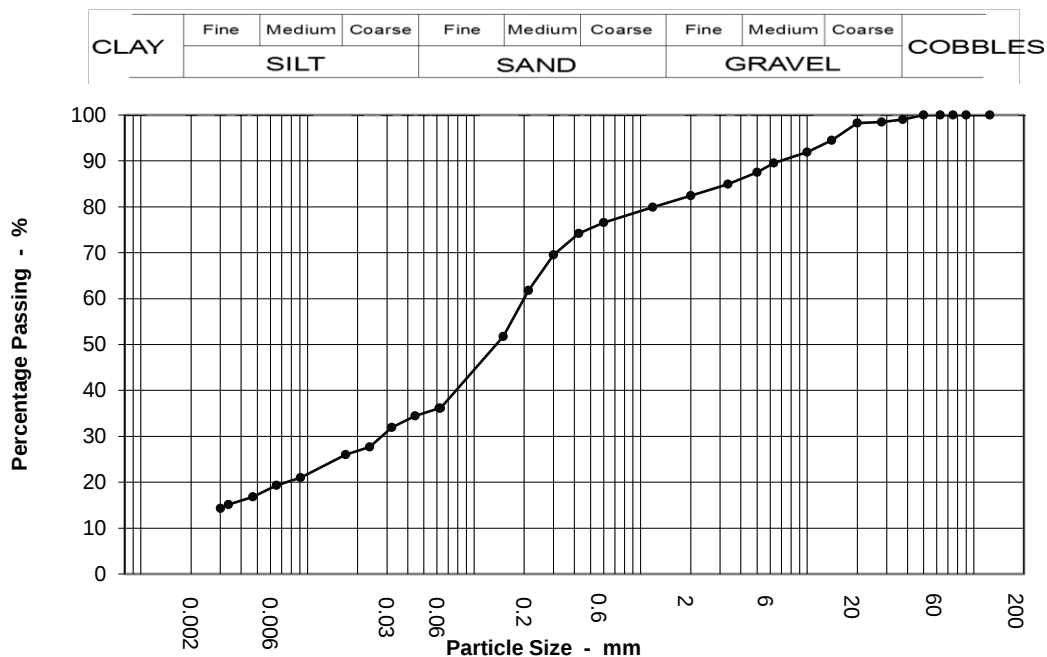
1.20 m

Soil Description

Slightly gravelly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.062	36
90	100	0.044	34
75	100	0.032	32
63	100	0.024	28
50	100	0.017	26
37.5	99	0.009	21
28	98	0.007	19
20	98	0.005	17
14	95	0.003	15
10	92	0.003	14
6.3	90	0.001	8
5	87		
3.35	85		
2	82		
1.18	80		
0.6	77		
0.425	74		
0.3	70		
0.212	62		
0.15	52		
0.063	36		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	18.0
Sand	46.0
Silt	24.0
Clay	13.0

Grading Analysis	
D100	50.00
D60	0.20
D10	0.00
Uniformity Coefficient	180.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH07

Location

Carlow Site Investigation

Sample No

6

Depth

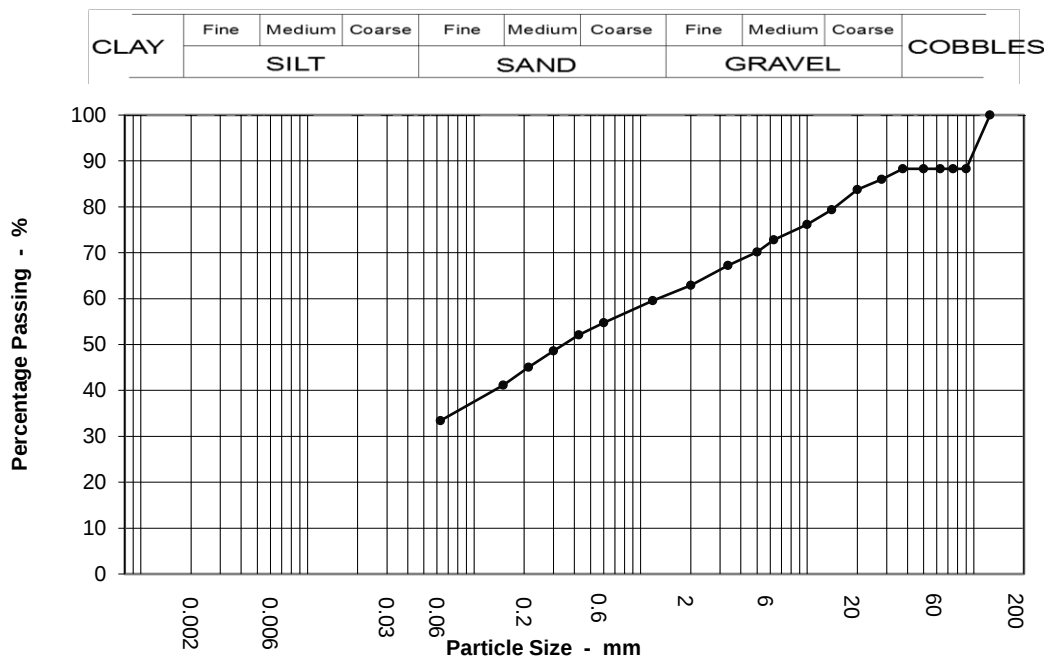
1.50 m

Soil Description

Slightly sandy slightly gravelly CLAY with medium cobble content

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	88		
75	88		
63	88		
50	88		
37.5	88		
28	86		
20	84		
14	79		
10	76		
6.3	73		
5	70		
3.35	67		
2	63		
1.18	60		
0.6	55		
0.425	52		
0.3	49		
0.212	45		
0.15	41		
0.063	33		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions	
Cobbles	12.0
Gravel	25.0
Sand	29.0
Silt & Clay	33.0

Grading Analysis	
D100	125.00
D60	1.27
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH07

Location

Carlow Site Investigation

Sample No

16

Depth

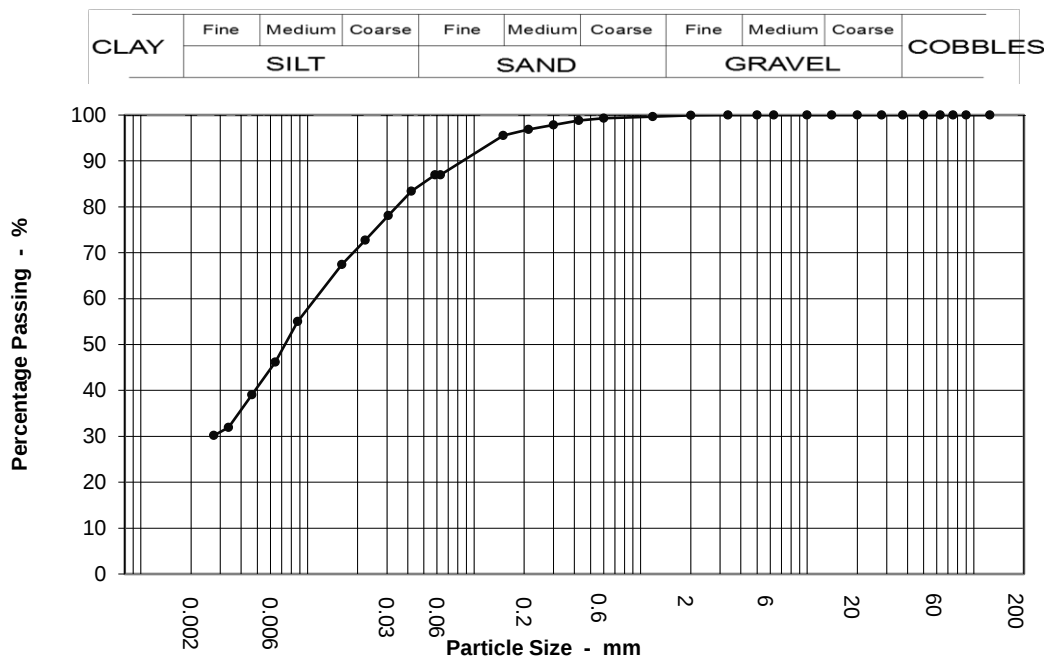
3.50 m

Soil Description

Slightly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.058	87
90	100	0.042	83
75	100	0.031	78
63	100	0.022	73
50	100	0.016	67
37.5	100	0.009	55
28	100	0.006	46
20	100	0.005	39
14	100	0.003	32
10	100	0.003	30
6.3	100	0.001	20
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	97		
0.15	96		
0.063	87		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	13.0
Silt	62.0
Clay	25.0

Grading Analysis	
D100	5.00
D60	0.01
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH07

Location

Carlow Site Investigation

Sample No

21

Depth

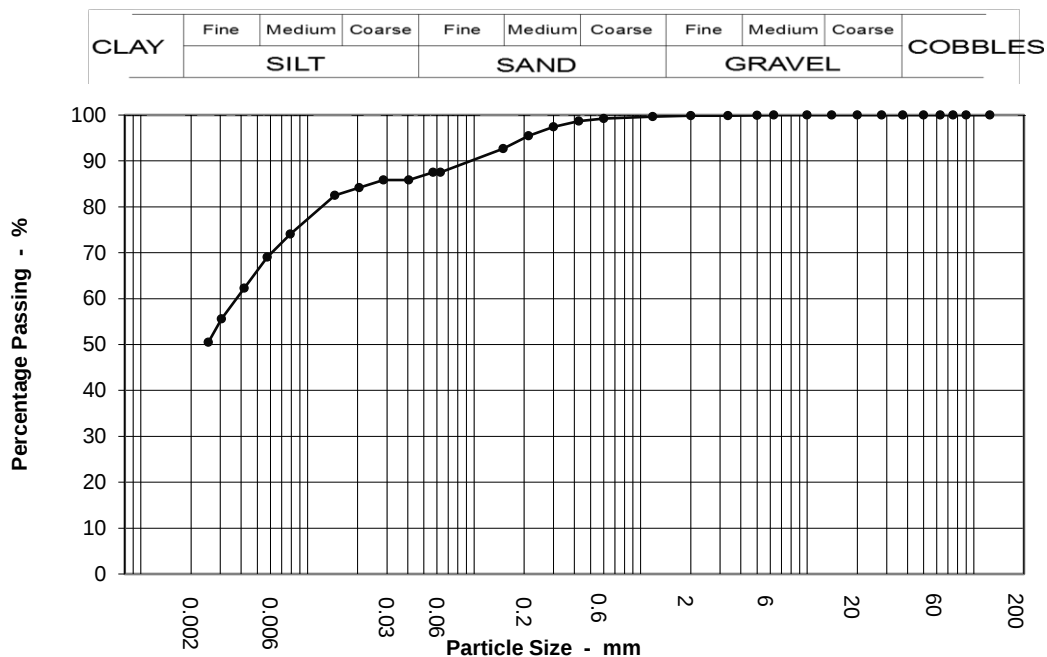
6.00 m

Soil Description

Slightly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.057	88
90	100	0.041	86
75	100	0.029	86
63	100	0.020	84
50	100	0.015	82
37.5	100	0.008	74
28	100	0.006	69
20	100	0.004	62
14	100	0.003	56
10	100	0.003	50
6.3	100	0.001	30
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	97		
0.212	95		
0.15	93		
0.063	88		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	12.0
Silt	42.0
Clay	46.0

Grading Analysis	
D100	6.30
D60	0.00
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH07

Location

Carlow Site Investigation

Sample No

24

Depth

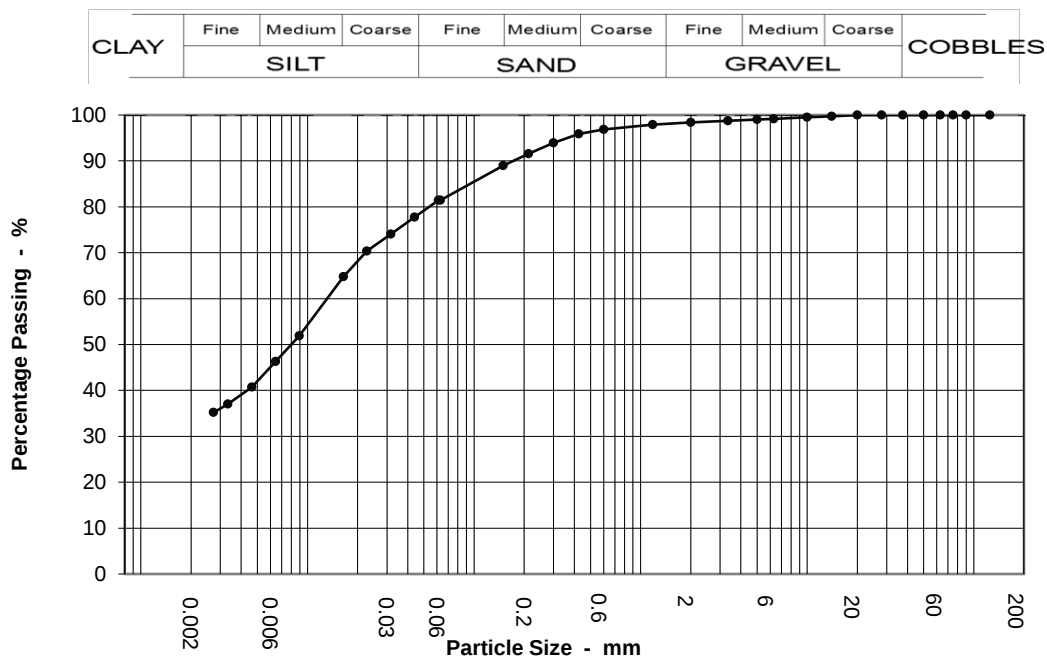
7.30 m

Soil Description

Slightly sandy CLAY

Sample type

U



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.061	81
90	100	0.044	78
75	100	0.032	74
63	100	0.023	70
50	100	0.016	65
37.5	100	0.009	52
28	100	0.006	46
20	100	0.005	41
14	100	0.003	37
10	99	0.003	35
6.3	99	0.001	28
5	99		
3.35	99		
2	98		
1.18	98		
0.6	97		
0.425	96		
0.3	94		
0.212	92		
0.15	89		
0.063	81		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	2.0
Sand	17.0
Silt	50.0
Clay	31.0

Grading Analysis	
D100	20.00
D60	0.01
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH08

Location

Carlow Site Investigation

Sample No

4

Depth

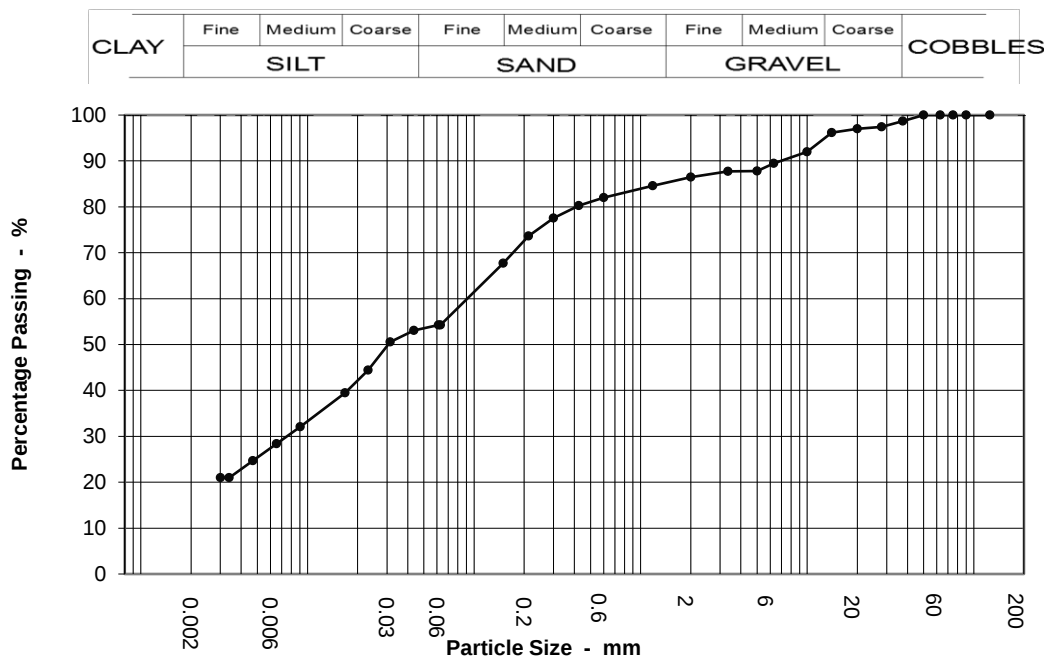
1.50 m

Soil Description

Slightly sandy slightly gravelly CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.061	54
90	100	0.044	53
75	100	0.031	51
63	100	0.023	44
50	100	0.017	39
37.5	99	0.009	32
28	97	0.007	28
20	97	0.005	25
14	96	0.003	21
10	92	0.003	21
6.3	90	0.001	11
5	88		
3.35	88		
2	86		
1.18	85		
0.6	82		
0.425	80		
0.3	78		
0.212	74		
0.15	68		
0.063	54		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	14.0
Sand	32.0
Silt	36.0
Clay	18.0

Grading Analysis	
D100	50.00
D60	0.09
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH08

Location

Carlow Site Investigation

Sample No

16

Depth

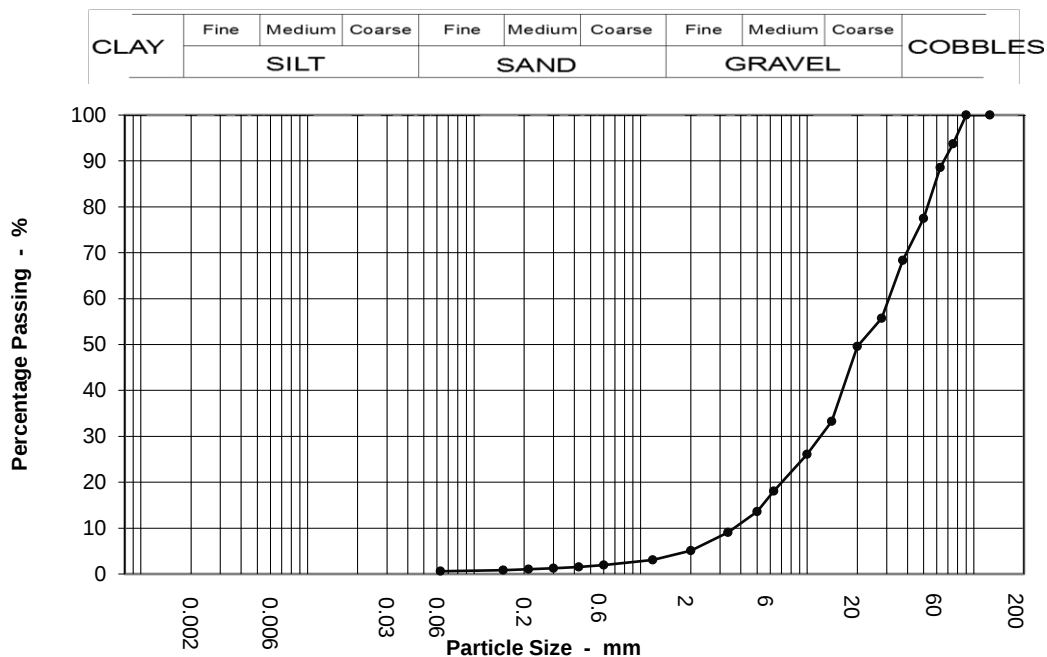
5.50 m

Soil Description

Slightly silty sandy GRAVEL with medium cobble content

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	94		
63	89		
50	77		
37.5	68		
28	56		
20	50		
14	33		
10	26		
6.3	18		
5	14		
3.35	9		
2	5		
1.18	3		
0.6	2		
0.425	2		
0.3	1		
0.212	1		
0.15	1		
0.063	1		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions	
Cobbles	11.0
Gravel	84.0
Sand	4.0
Silt & Clay	1.0

Grading Analysis	
D100	90.00
D60	30.90
D10	3.65
Uniformity Coefficient	8.50

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH10

Location

Carlow Site Investigation

Sample No

1

Depth

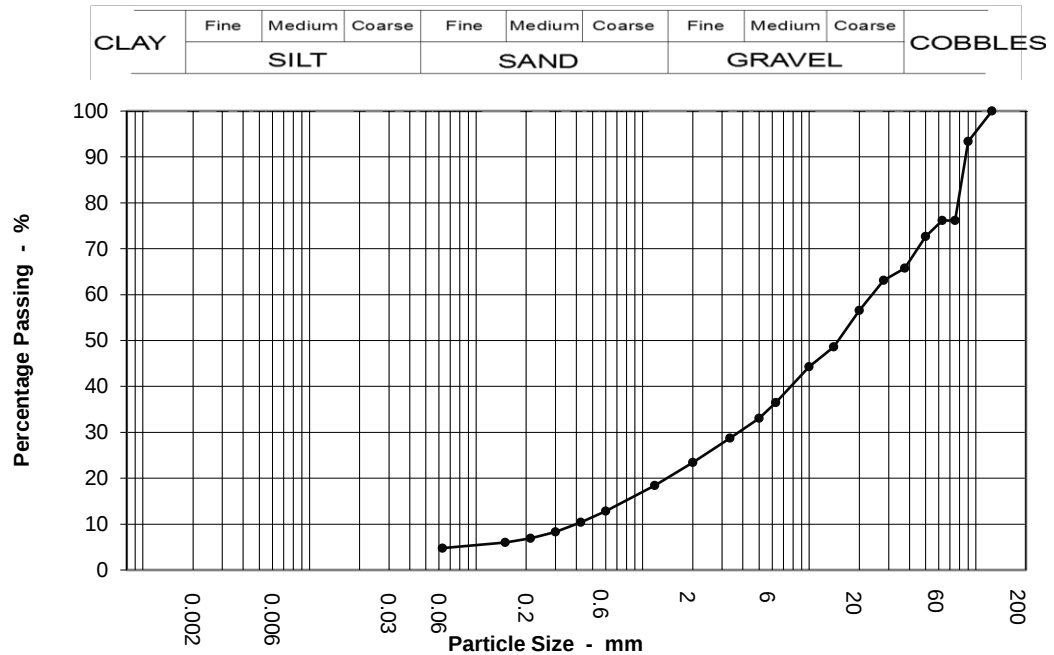
0.50 m

Soil Description

Clayey very sandy GRAVEL with high cobble content

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	93		
75	76		
63	76		
50	73		
37.5	66		
28	63		
20	57		
14	49		
10	44		
6.3	36		
5	33		
3.35	29		
2	23		
1.18	18		
0.6	13		
0.425	10		
0.3	8		
0.212	7		
0.15	6		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions	
Cobbles	24.0
Gravel	53.0
Sand	19.0
Silt & Clay	5.0

Grading Analysis	
D100	125.00
D60	23.90
D10	0.40
Uniformity Coefficient	60.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH10A

Location

Carlow Site Investigation

Sample No

1

Depth

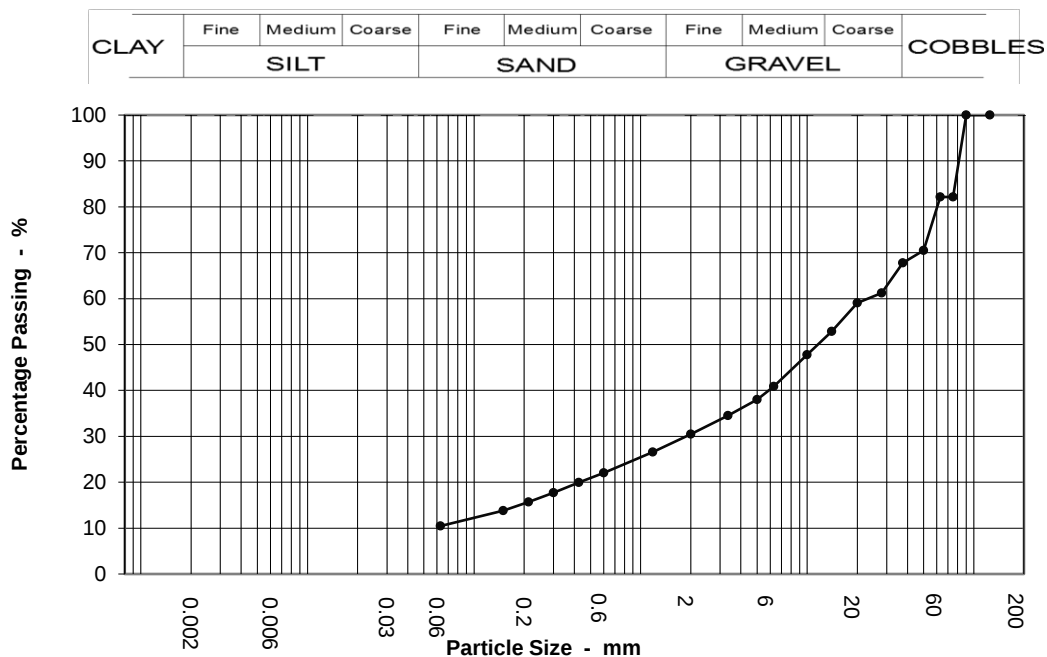
0.50 m

Soil Description

Silty very sandy GRAVEL with medium cobble content

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	82		
63	82		
50	70		
37.5	68		
28	61		
20	59		
14	53		
10	48		
6.3	41		
5	38		
3.35	35		
2	30		
1.18	27		
0.6	22		
0.425	20		
0.3	18		
0.212	16		
0.15	14		
0.063	10		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions	
Cobbles	18.0
Gravel	52.0
Sand	20.0
Silt & Clay	10.0

Grading Analysis	
D100	90.00
D60	23.10
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH11

Location

Carlow Site Investigation

Sample No

11

Depth

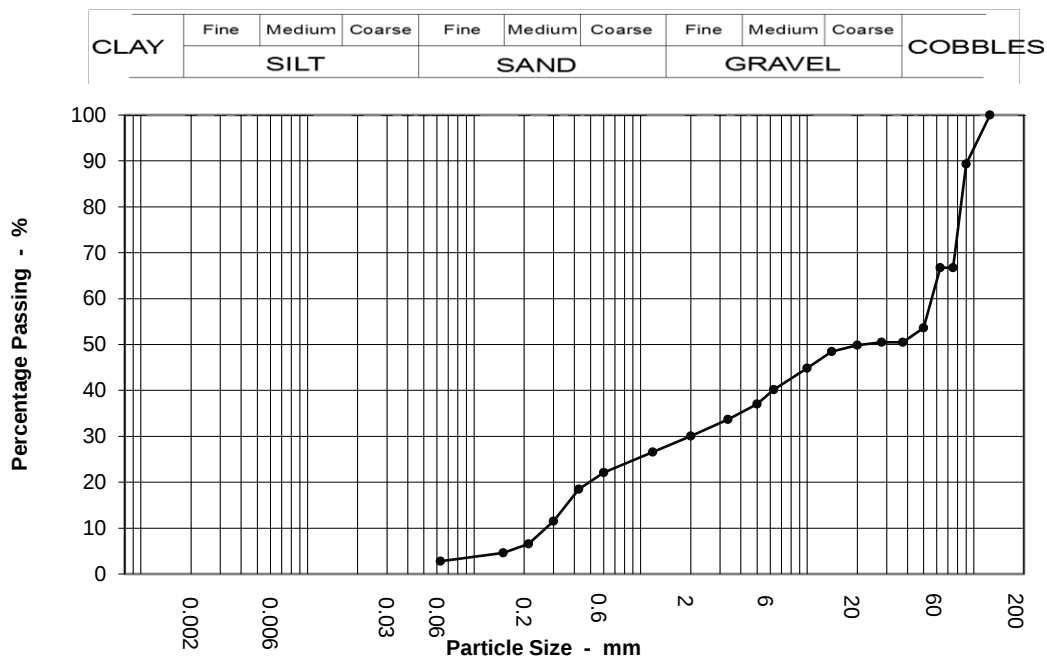
3.60 m

Soil Description

Slightly clayey very sandy GRAVEL with high cobble content

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	89		
75	67		
63	67		
50	54		
37.5	50		
28	50		
20	50		
14	48		
10	45		
6.3	40		
5	37		
3.35	34		
2	30		
1.18	27		
0.6	22		
0.425	18		
0.3	12		
0.212	7		
0.15	5		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions	
Cobbles	33.0
Gravel	37.0
Sand	27.0
Silt & Clay	3.0

Grading Analysis	
D100	125.00
D60	55.90
D10	0.27
Uniformity Coefficient	210.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

BH11

Location

Carlow Site Investigation

Sample No

12

Depth

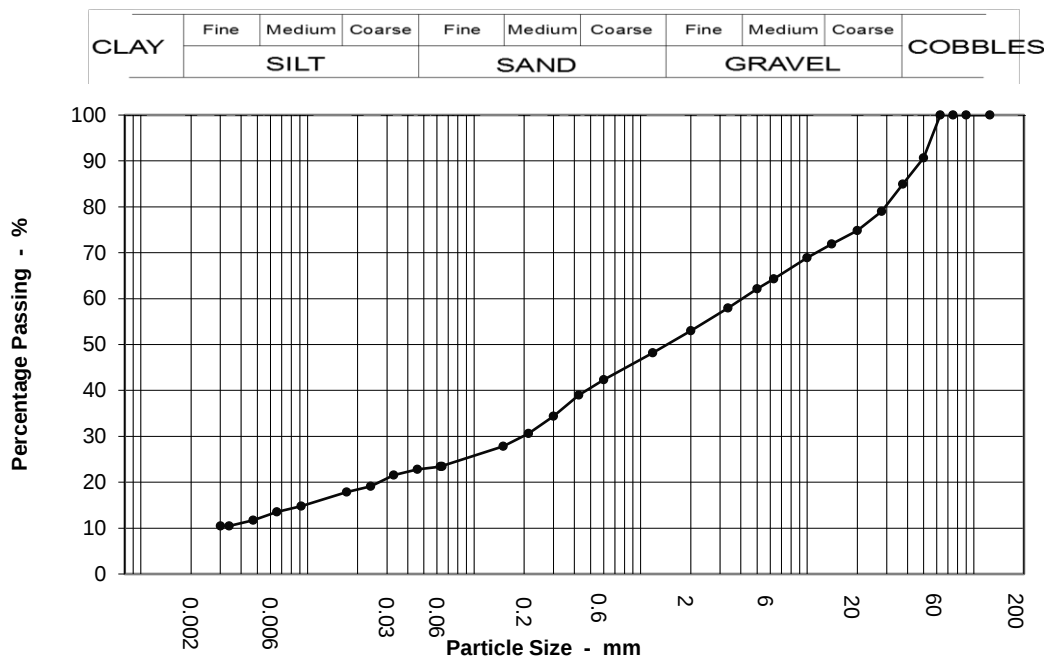
4.50 m

Soil Description

Very clayey very sandy GRAVEL

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.064	23
90	100	0.046	23
75	100	0.033	22
63	100	0.024	19
50	91	0.017	18
37.5	85	0.009	15
28	79	0.007	14
20	75	0.005	12
14	72	0.003	10
10	69	0.003	10
6.3	64	0.001	6
5	62		
3.35	58		
2	53		
1.18	48		
0.6	42		
0.425	39		
0.3	34		
0.212	31		
0.15	28		
0.063	23		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	47.0
Sand	30.0
Silt	14.0
Clay	9.0

Grading Analysis	
D100	63.00
D60	4.08
D10	0.00
Uniformity Coefficient	1600.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

ST04

Location

Carlow Site Investigation

Sample No

2

Depth

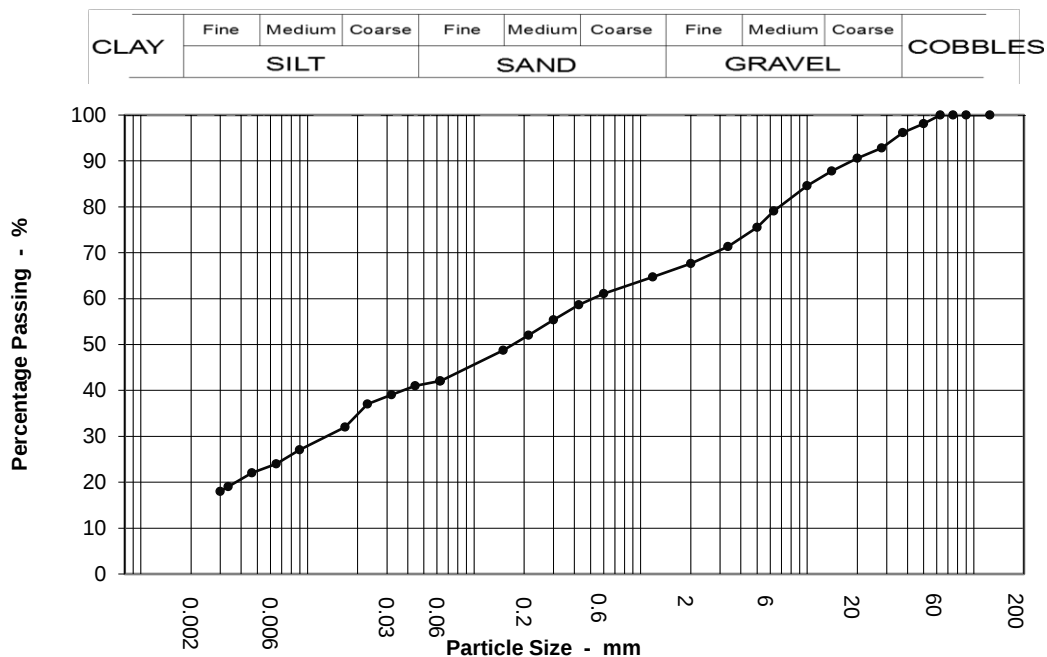
0.60 m

Soil Description

Slightly sandy slightly gravelly CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.062	42
90	100	0.044	41
75	100	0.032	39
63	100	0.023	37
50	98	0.017	32
37.5	96	0.009	27
28	93	0.006	24
20	91	0.005	22
14	88	0.003	19
10	85	0.003	18
6.3	79	0.001	11
5	75		
3.35	71		
2	68		
1.18	65		
0.6	61		
0.425	59		
0.3	55		
0.212	52		
0.15	49		
0.063	42		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	32.0
Sand	26.0
Silt	26.0
Clay	16.0

Grading Analysis	
D100	63.00
D60	0.51
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP05

Location

Carlow Site Investigation

Sample No

2

Depth

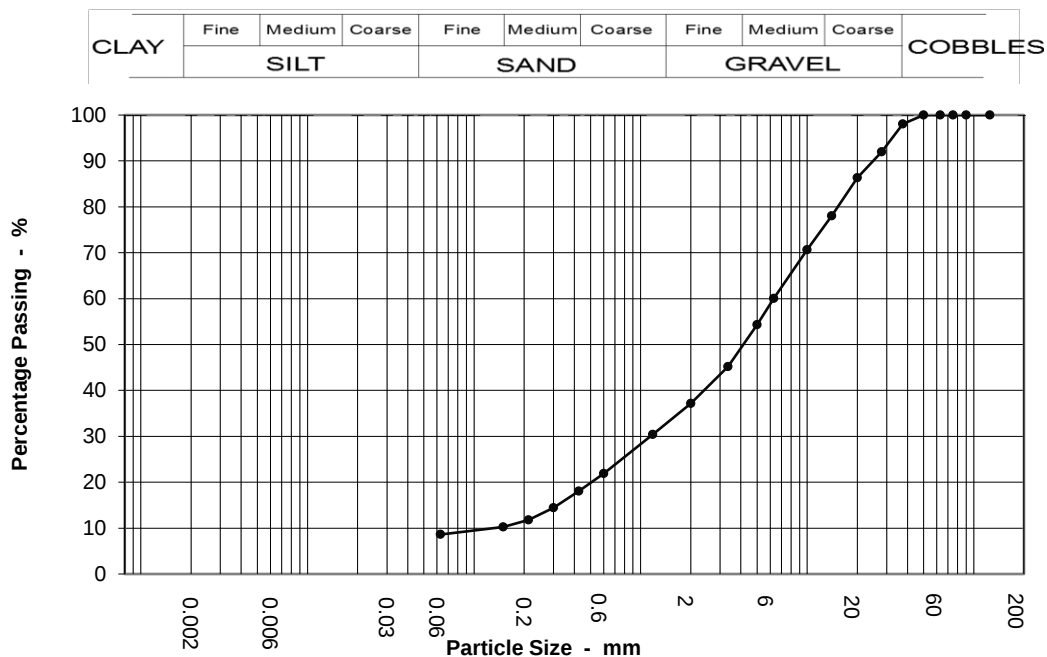
0.50 m

Soil Description

Clayey very sandy GRAVEL

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	92		
20	86		
14	78		
10	71		
6.3	60		
5	54		
3.35	45		
2	37		
1.18	30		
0.6	22		
0.425	18		
0.3	14		
0.212	12		
0.15	10		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	63.0
Sand	29.0
Silt & Clay	9.0

Grading Analysis	
D100	50.00
D60	6.29
D10	0.13
Uniformity Coefficient	47.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP05

Location

Carlow Site Investigation

Sample No

3

Depth

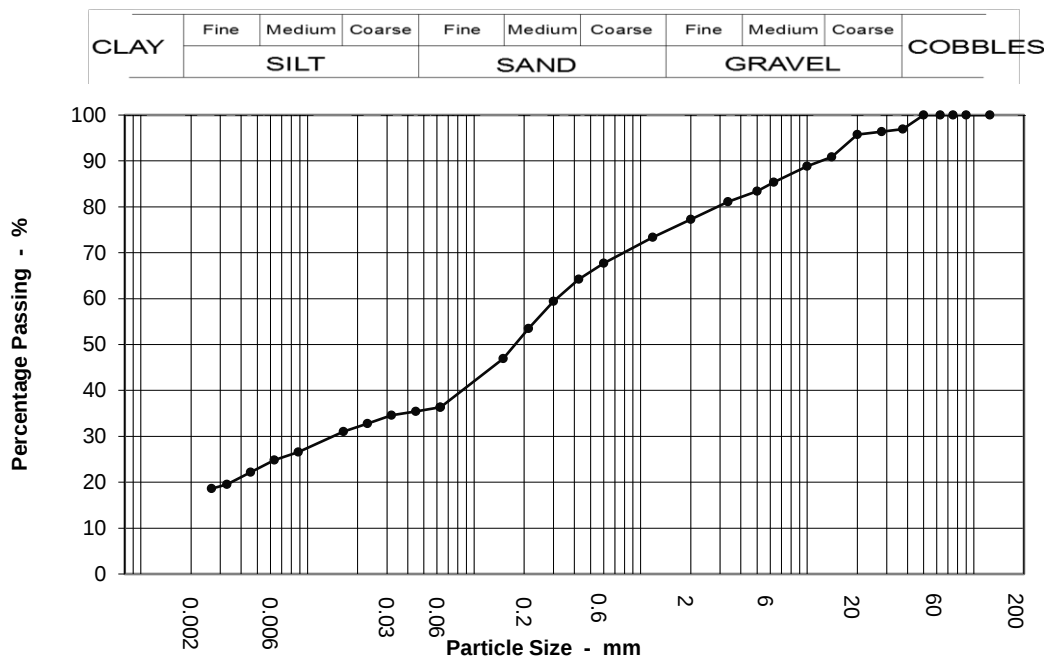
1.40 m

Soil Description

Slightly gravelly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.063	36
90	100	0.045	35
75	100	0.032	35
63	100	0.023	33
50	100	0.016	31
37.5	97	0.009	27
28	96	0.006	25
20	96	0.005	22
14	91	0.003	19
10	89	0.003	19
6.3	85	0.001	15
5	83		
3.35	81		
2	77		
1.18	73		
0.6	68		
0.425	64		
0.3	59		
0.212	53		
0.15	47		
0.063	36		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	23.0
Sand	41.0
Silt	19.0
Clay	17.0

Grading Analysis	
D100	50.00
D60	0.31
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP06

Location

Carlow Site Investigation

Sample No

1

Depth

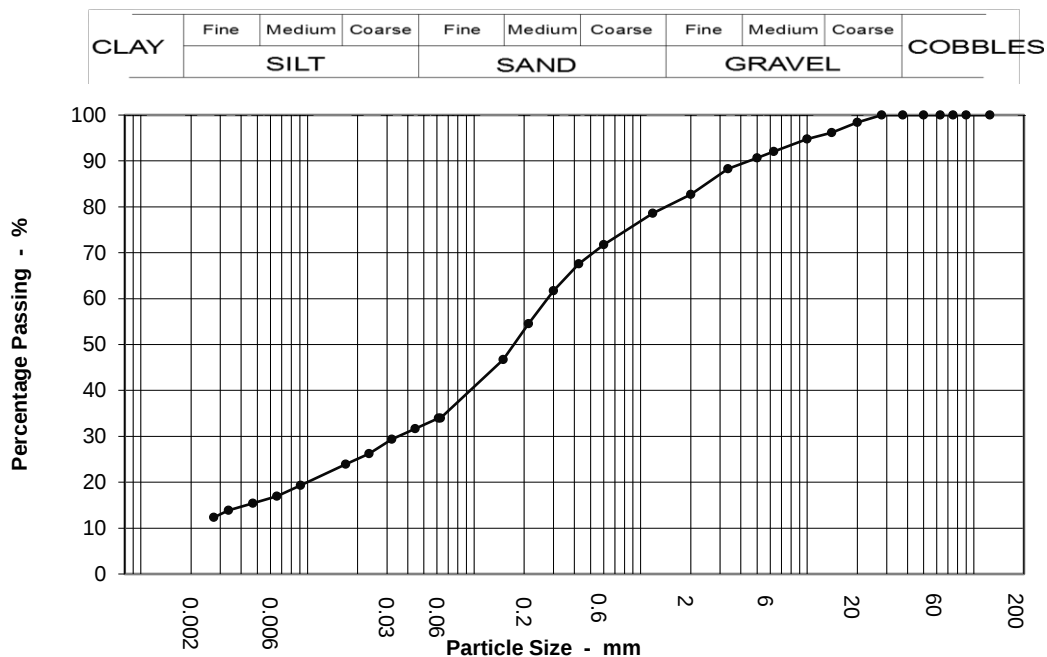
0.30 m

Soil Description

Slightly gravelly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.061	34
90	100	0.044	32
75	100	0.032	29
63	100	0.023	26
50	100	0.017	24
37.5	100	0.009	19
28	100	0.007	17
20	98	0.005	15
14	96	0.003	14
10	95	0.003	12
6.3	92	0.001	11
5	91		
3.35	88		
2	83		
1.18	79		
0.6	72		
0.425	68		
0.3	62		
0.212	55		
0.15	47		
0.063	34		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	17.0
Sand	49.0
Silt	22.0
Clay	12.0

Grading Analysis	
D100	28.00
D60	0.28
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP06

Location

Carlow Site Investigation

Sample No

2

Depth

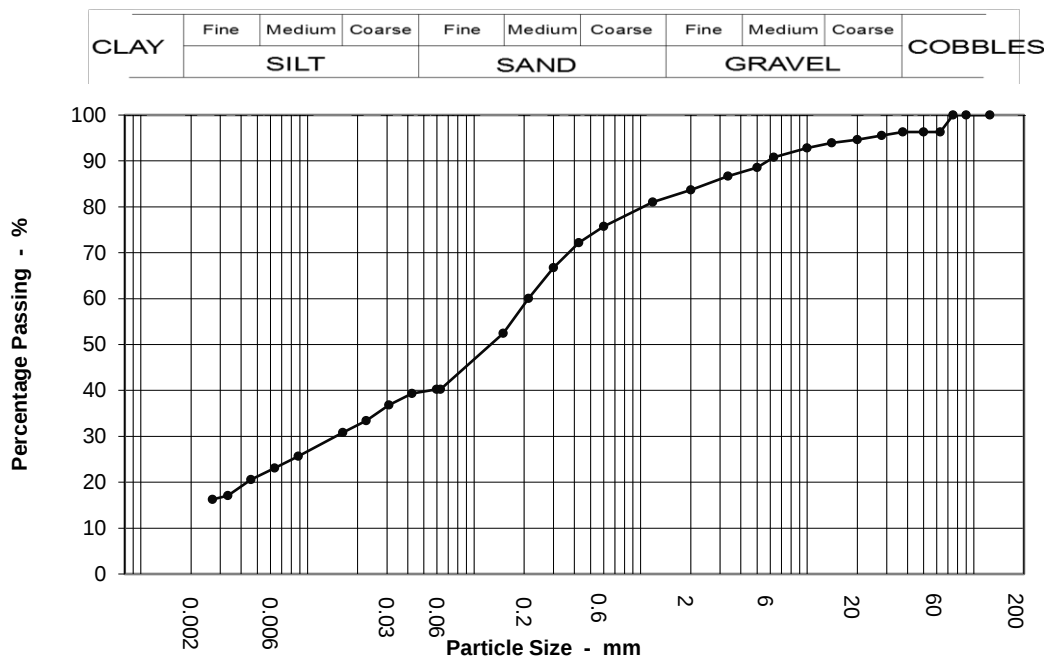
1.90 m

Soil Description

Slightly sandy gravelly CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.060	40
90	100	0.042	39
75	100	0.031	37
63	96	0.023	33
50	96	0.016	31
37.5	96	0.009	26
28	96	0.006	23
20	95	0.005	21
14	94	0.003	17
10	93	0.003	16
6.3	91	0.001	13
5	89		
3.35	87		
2	84		
1.18	81		
0.6	76		
0.425	72		
0.3	67		
0.212	60		
0.15	52		
0.063	40		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	4.0
Gravel	13.0
Sand	43.0
Silt	26.0
Clay	15.0

Grading Analysis	
D100	75.00
D60	0.21
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP06

Location

Carlow Site Investigation

Sample No

3

Depth

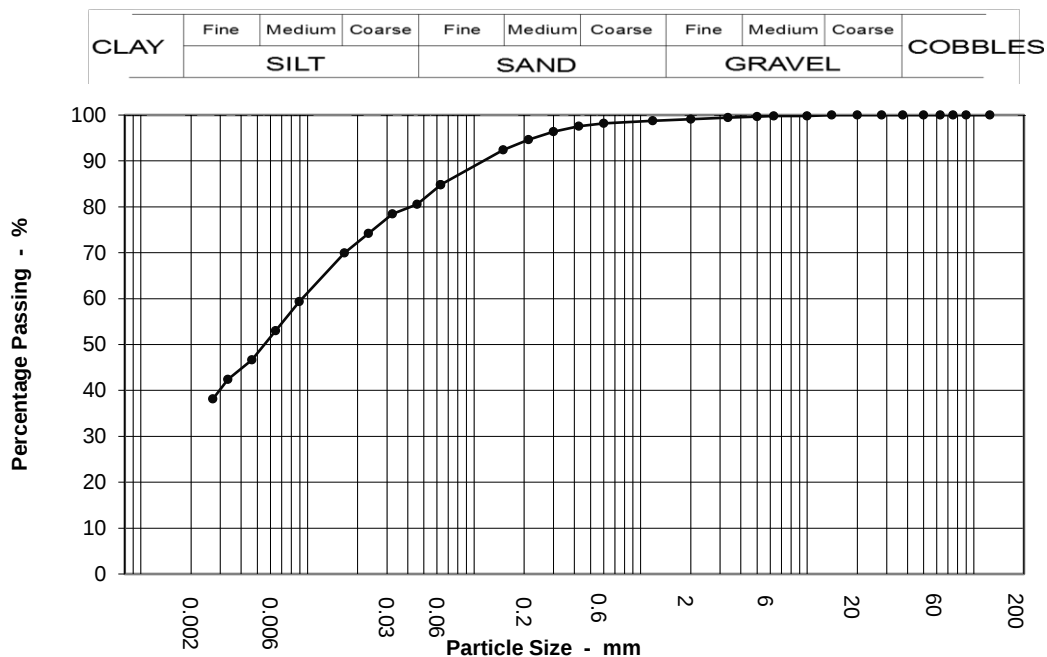
2.50 m

Soil Description

Slightly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.063	85
90	100	0.045	81
75	100	0.032	78
63	100	0.023	74
50	100	0.017	70
37.5	100	0.009	59
28	100	0.006	53
20	100	0.005	47
14	100	0.003	42
10	100	0.003	38
6.3	100	0.001	32
5	100		
3.35	99		
2	99		
1.18	99		
0.6	98		
0.425	98		
0.3	96		
0.212	95		
0.15	92		
0.063	85		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	1.0
Sand	14.0
Silt	50.0
Clay	35.0

Grading Analysis	
D100	14.00
D60	0.01
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP07

Location

Carlow Site Investigation

Sample No

1

Depth

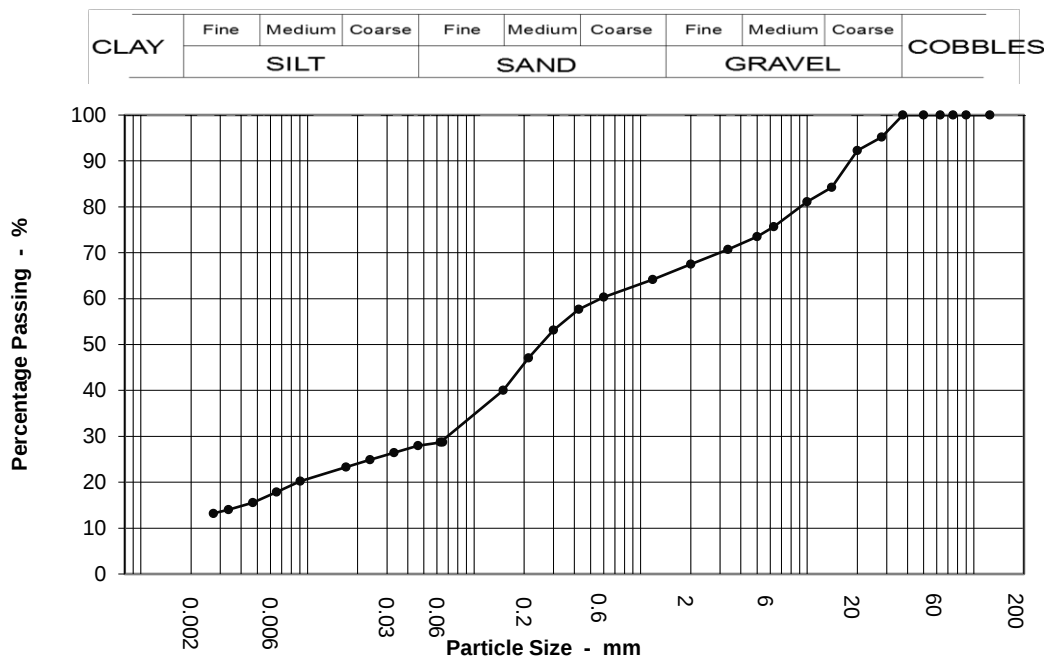
0.20 m

Soil Description

Slightly gravelly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.065	29
90	100	0.046	28
75	100	0.033	26
63	100	0.024	25
50	100	0.017	23
37.5	100	0.009	20
28	95	0.007	18
20	92	0.005	16
14	84	0.003	14
10	81	0.003	13
6.3	76	0.001	11
5	74		
3.35	71		
2	68		
1.18	64		
0.6	60		
0.425	58		
0.3	53		
0.212	47		
0.15	40		
0.063	29		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	32.0
Sand	39.0
Silt	17.0
Clay	12.0

Grading Analysis	
D100	37.50
D60	0.58
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP08

Location

Carlow Site Investigation

Sample No

1

Depth

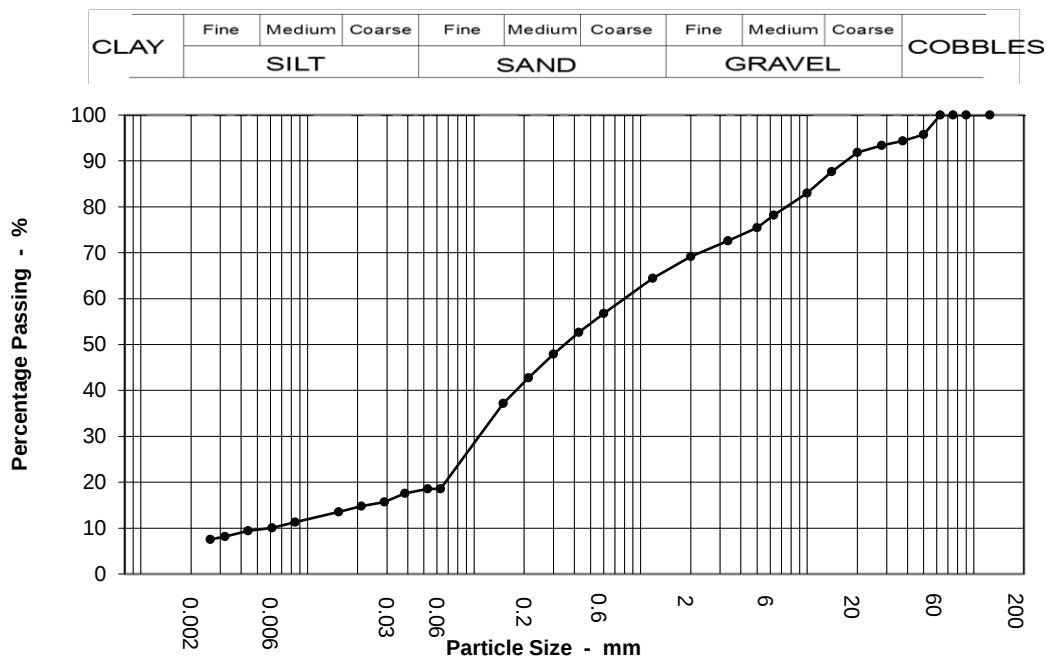
0.20 m

Soil Description

Clayey very gravelly SAND

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.053	19
90	100	0.038	18
75	100	0.029	16
63	100	0.021	15
50	96	0.015	13
37.5	94	0.008	11
28	93	0.006	10
20	92	0.004	9
14	88	0.003	8
10	83	0.003	8
6.3	78	0.001	6
5	75		
3.35	73		
2	69		
1.18	64		
0.6	57		
0.425	53		
0.3	48		
0.212	43		
0.15	37		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	31.0
Sand	51.0
Silt	12.0
Clay	7.0

Grading Analysis	
D100	63.00
D60	0.80
D10	0.01
Uniformity Coefficient	130.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP08

Location

Carlow Site Investigation

Sample No

2

Depth

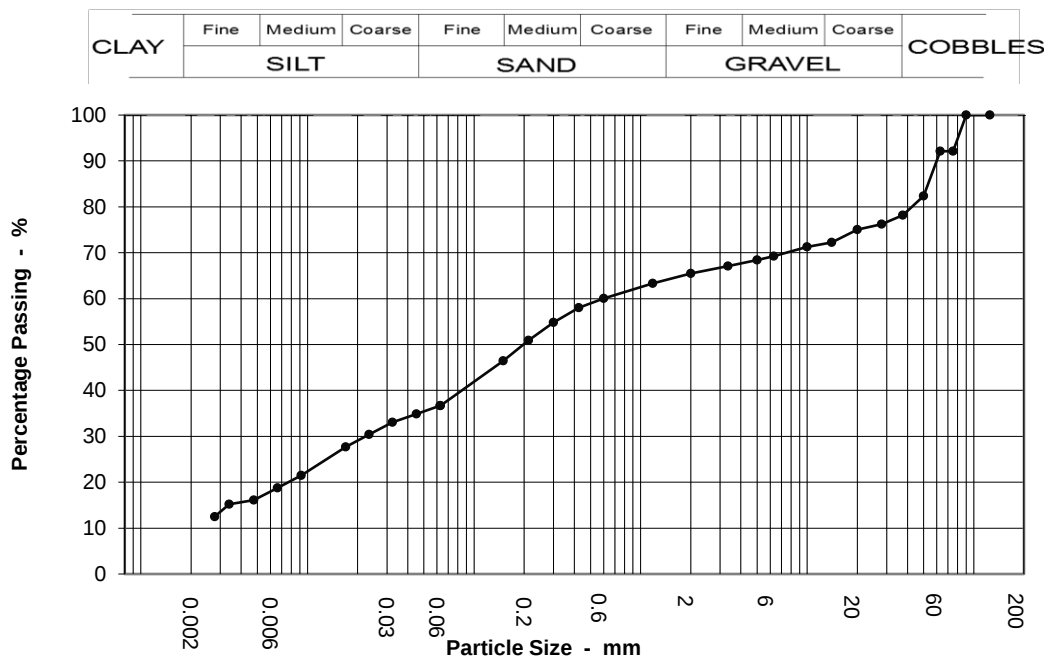
1.40 m

Soil Description

Slightly sandy slightly gravelly CLAY with low cobble content

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.063	37
90	100	0.045	35
75	92	0.032	33
63	92	0.023	30
50	82	0.017	28
37.5	78	0.009	21
28	76	0.007	19
20	75	0.005	16
14	72	0.003	15
10	71	0.003	13
6.3	69	0.001	10
5	68		
3.35	67		
2	65		
1.18	63		
0.6	60		
0.425	58		
0.3	55		
0.212	51		
0.15	46		
0.063	37		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	8.0
Gravel	27.0
Sand	29.0
Silt	26.0
Clay	11.0

Grading Analysis	
D100	90.00
D60	0.60
D10	0.00
Uniformity Coefficient	380.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP10

Location

Carlow Site Investigation

Sample No

2

Depth

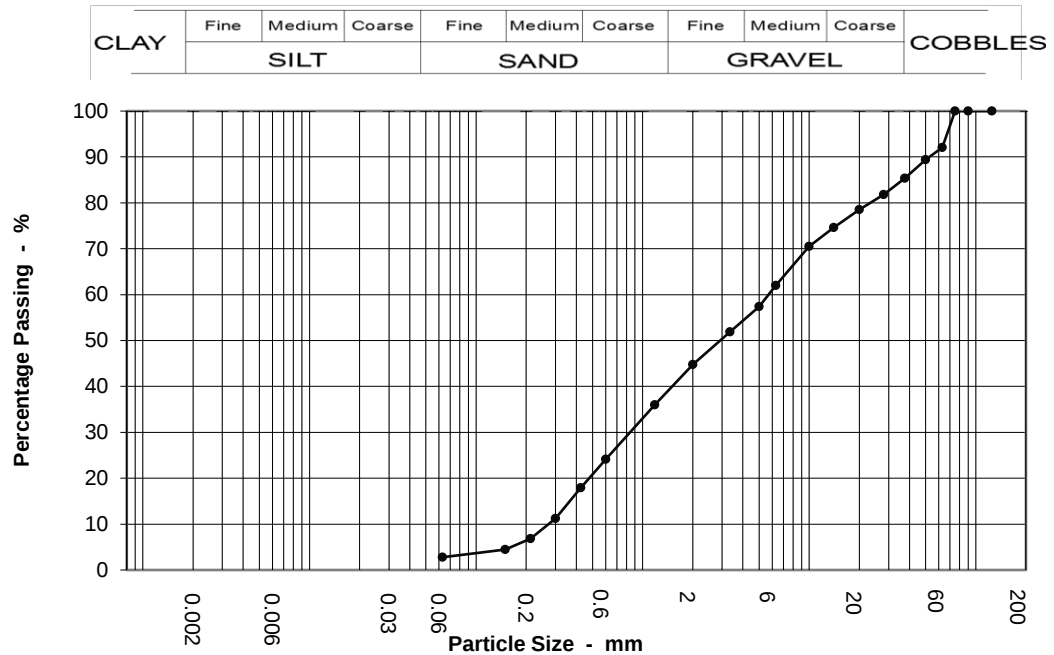
1.00 m

Soil Description

Slightly clayey SAND and GRAVEL with low cobble content

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	92		
50	89		
37.5	85		
28	82		
20	79		
14	75		
10	71		
6.3	62		
5	57		
3.35	52		
2	45		
1.18	36		
0.6	24		
0.425	18		
0.3	11		
0.212	7		
0.15	4		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions	
Cobbles	8.0
Gravel	47.0
Sand	42.0
Silt & Clay	3.0

Grading Analysis	
D100	75.00
D60	5.70
D10	0.27
Uniformity Coefficient	21.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP11

Location

Carlow Site Investigation

Sample No

1

Depth

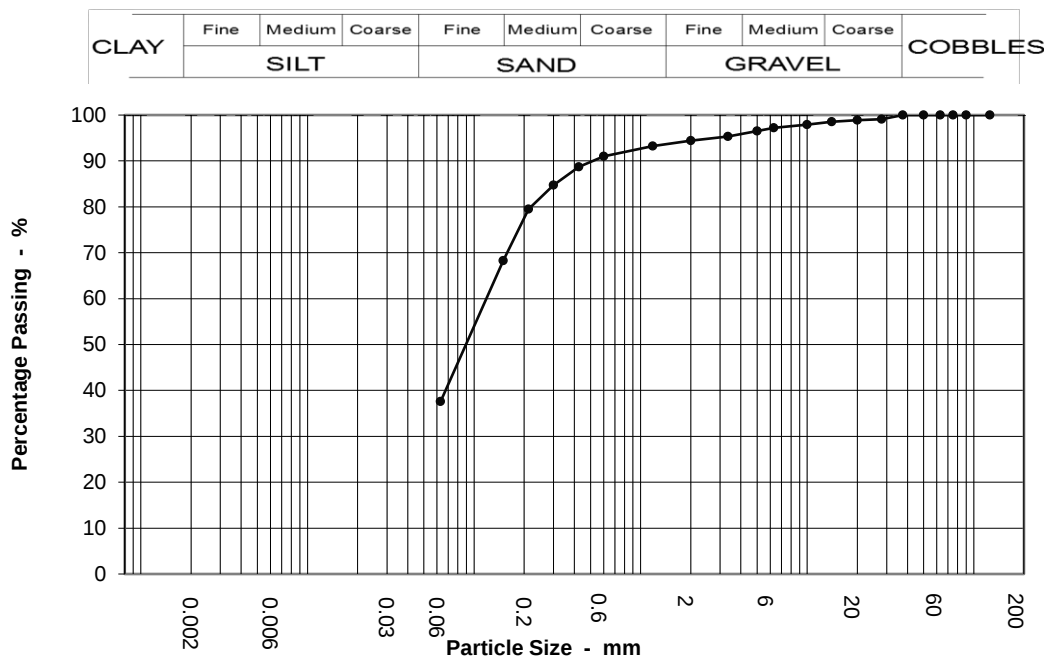
0.50 m

Soil Description

Slightly gravelly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	99		
14	99		
10	98		
6.3	97		
5	97		
3.35	95		
2	94		
1.18	93		
0.6	91		
0.425	89		
0.3	85		
0.212	79		
0.15	68		
0.063	38		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	6.0
Sand	57.0
Silt & Clay	38.0

Grading Analysis	
D100	37.50
D60	0.12
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP12

Location

Carlow Site Investigation

Sample No

1

Depth

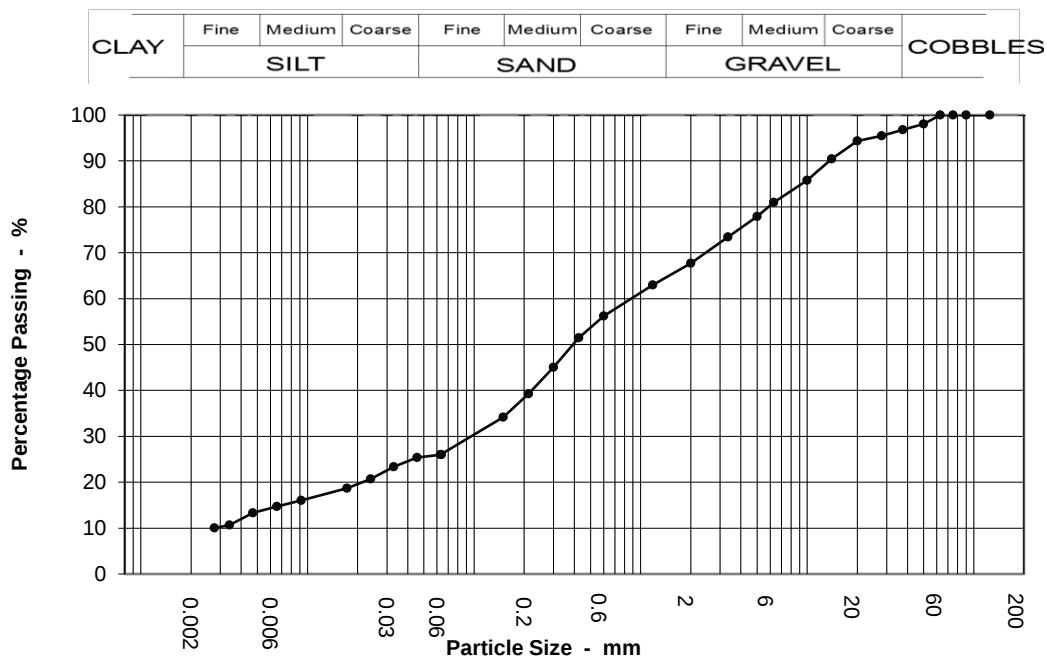
0.00 m

Soil Description

Very clayey very gravelly SAND

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.064	26
90	100	0.045	25
75	100	0.033	23
63	100	0.024	21
50	98	0.017	19
37.5	97	0.009	16
28	95	0.007	15
20	94	0.005	13
14	90	0.003	11
10	86	0.003	10
6.3	81	0.001	8
5	78		
3.35	73		
2	68		
1.18	63		
0.6	56		
0.425	51		
0.3	45		
0.212	39		
0.15	34		
0.063	26		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	32.0
Sand	42.0
Silt	17.0
Clay	9.0

Grading Analysis	
D100	63.00
D60	0.88
D10	0.00
Uniformity Coefficient	320.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP12

Location

Carlow Site Investigation

Sample No

2

Depth

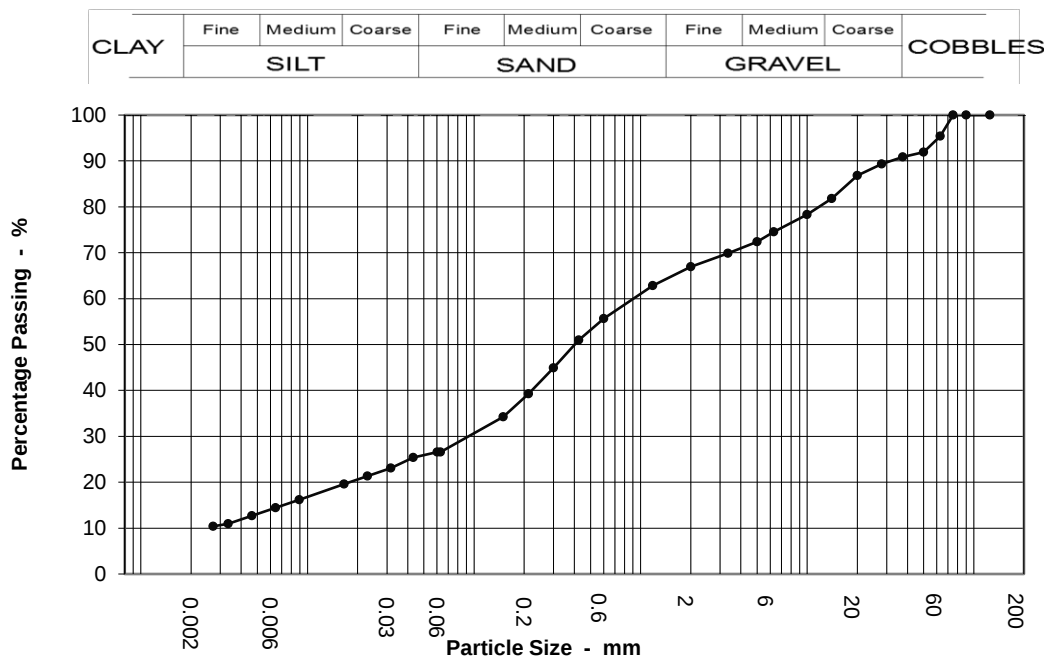
2.00 m

Soil Description

Slightly gravelly sandy SILT

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.060	27
90	100	0.043	25
75	100	0.032	23
63	95	0.023	21
50	92	0.017	20
37.5	91	0.009	16
28	89	0.006	14
20	87	0.005	13
14	82	0.003	11
10	78	0.003	10
6.3	75	0.001	8
5	72		
3.35	70		
2	67		
1.18	63		
0.6	56		
0.425	51		
0.3	45		
0.212	39		
0.15	34		
0.063	27		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	5.0
Gravel	28.0
Sand	40.0
Silt	17.0
Clay	9.0

Grading Analysis	
D100	75.00
D60	0.91
D10	0.00
Uniformity Coefficient	370.00

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP13

Location

Carlow Site Investigation

Sample No

1

Depth

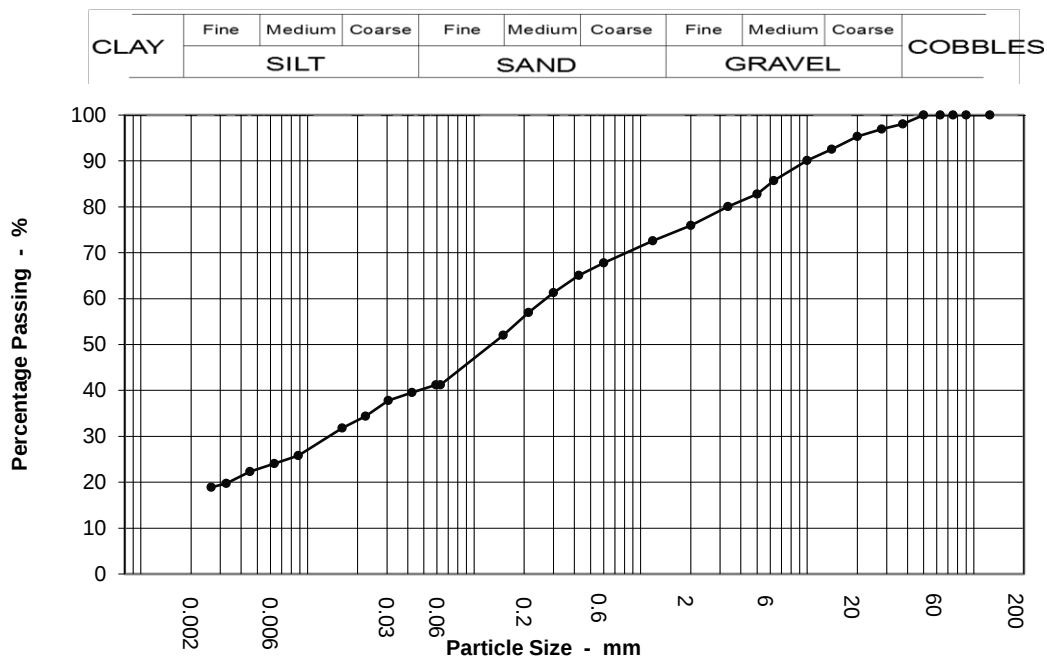
0.30 m

Soil Description

Slightly gravelly sandy CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.059	41
90	100	0.042	40
75	100	0.031	38
63	100	0.022	34
50	100	0.016	32
37.5	98	0.009	26
28	97	0.006	24
20	95	0.005	22
14	93	0.003	20
10	90	0.003	19
6.3	86	0.001	15
5	83		
3.35	80		
2	76		
1.18	73		
0.6	68		
0.425	65		
0.3	61		
0.212	57		
0.15	52		
0.063	41		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	24.0
Sand	35.0
Silt	24.0
Clay	17.0

Grading Analysis	
D100	50.00
D60	0.27
D10	
Uniformity Coefficient	

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

Job Ref

P21014

Borehole / Pit
No

TP13

Location

Carlow Site Investigation

Sample No

2

Depth

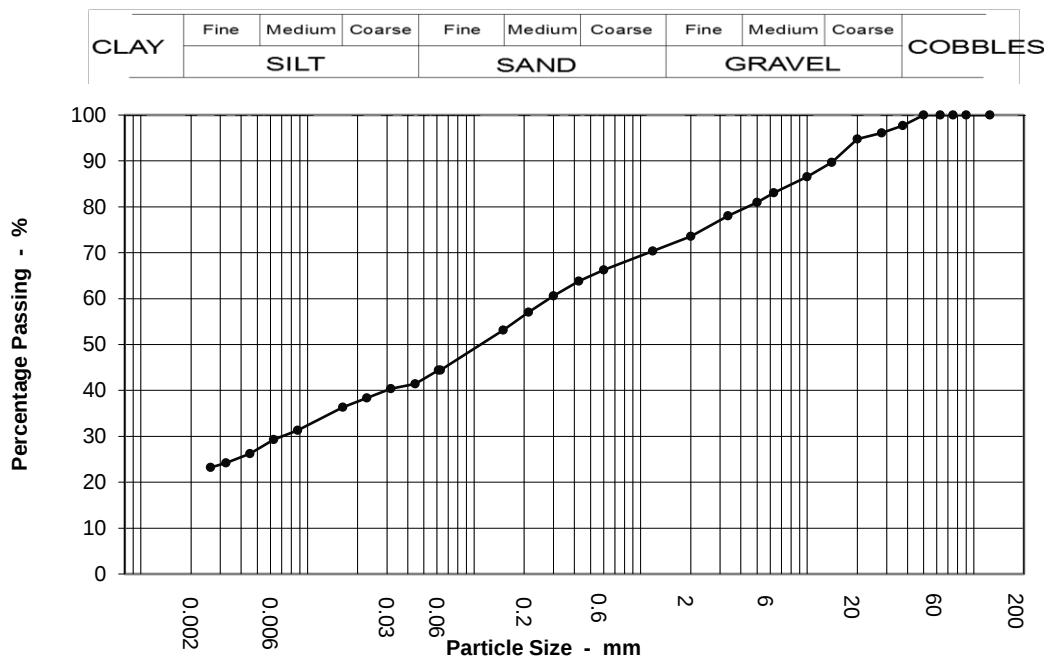
1.50 m

Soil Description

Slightly sandy slightly gravelly CLAY

Sample type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.061	44
90	100	0.044	41
75	100	0.032	40
63	100	0.023	38
50	100	0.016	36
37.5	98	0.009	31
28	96	0.006	29
20	95	0.005	26
14	90	0.003	24
10	87	0.003	23
6.3	83	0.001	19
5	81		
3.35	78		
2	74		
1.18	70		
0.6	66		
0.425	64		
0.3	61		
0.212	57		
0.15	53		
0.063	44		

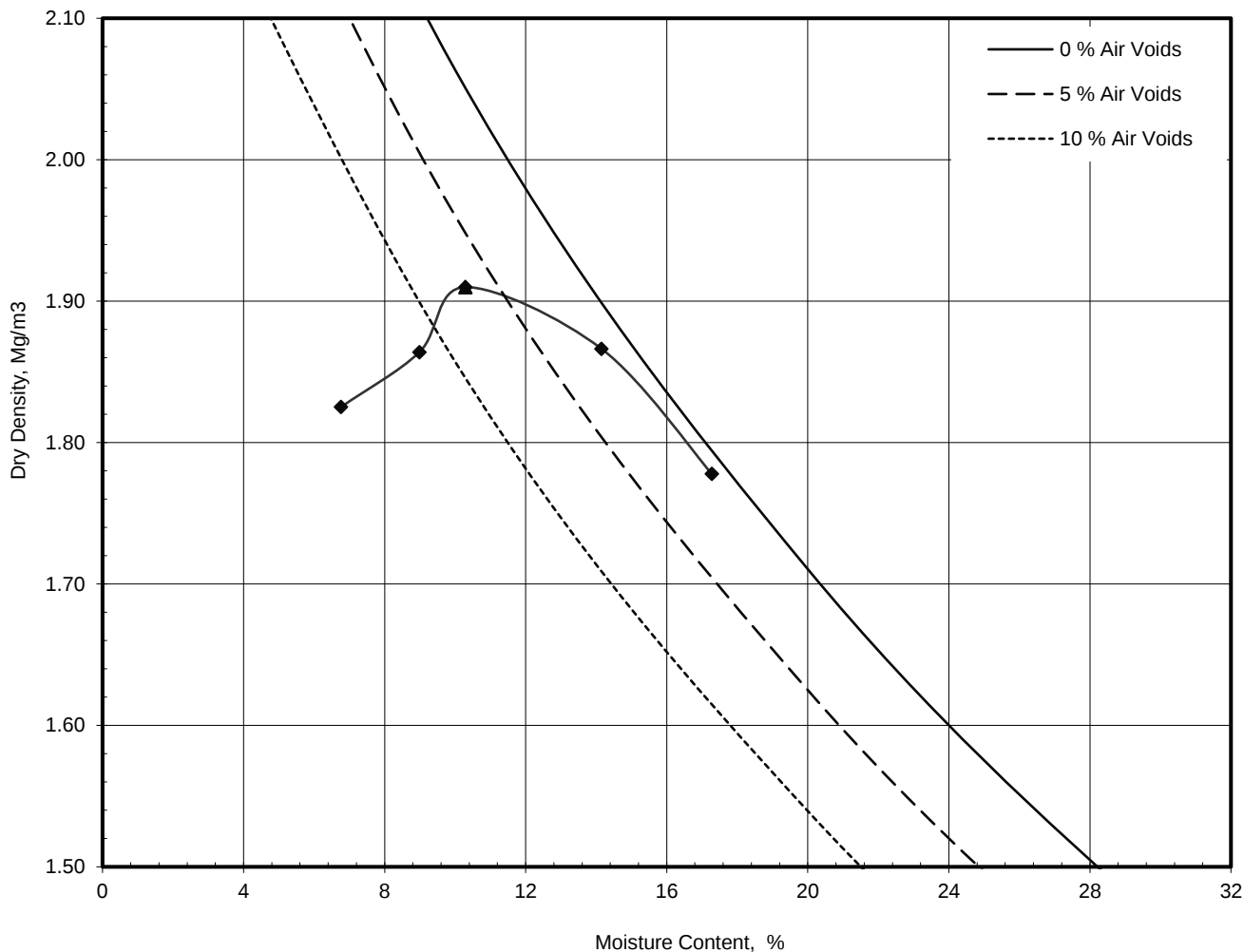
Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.5
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	26.0
Sand	29.0
Silt	23.0
Clay	21.0

Grading Analysis	
D100	50.00
D60	0.28
D10	
Uniformity Coefficient	

	Dry Density / Moisture Content Relationship Light Compaction	Job Ref	P21014
		Borehole / Pit No	BH07
Location	Carlow Site Investigation	Sample No	13
Soil Description	Slightly sandy CLAY	Depth	3.10 m
		Sample Type	U
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer	Keylab ID	PGL120210408154

Compaction Test Reference/No.

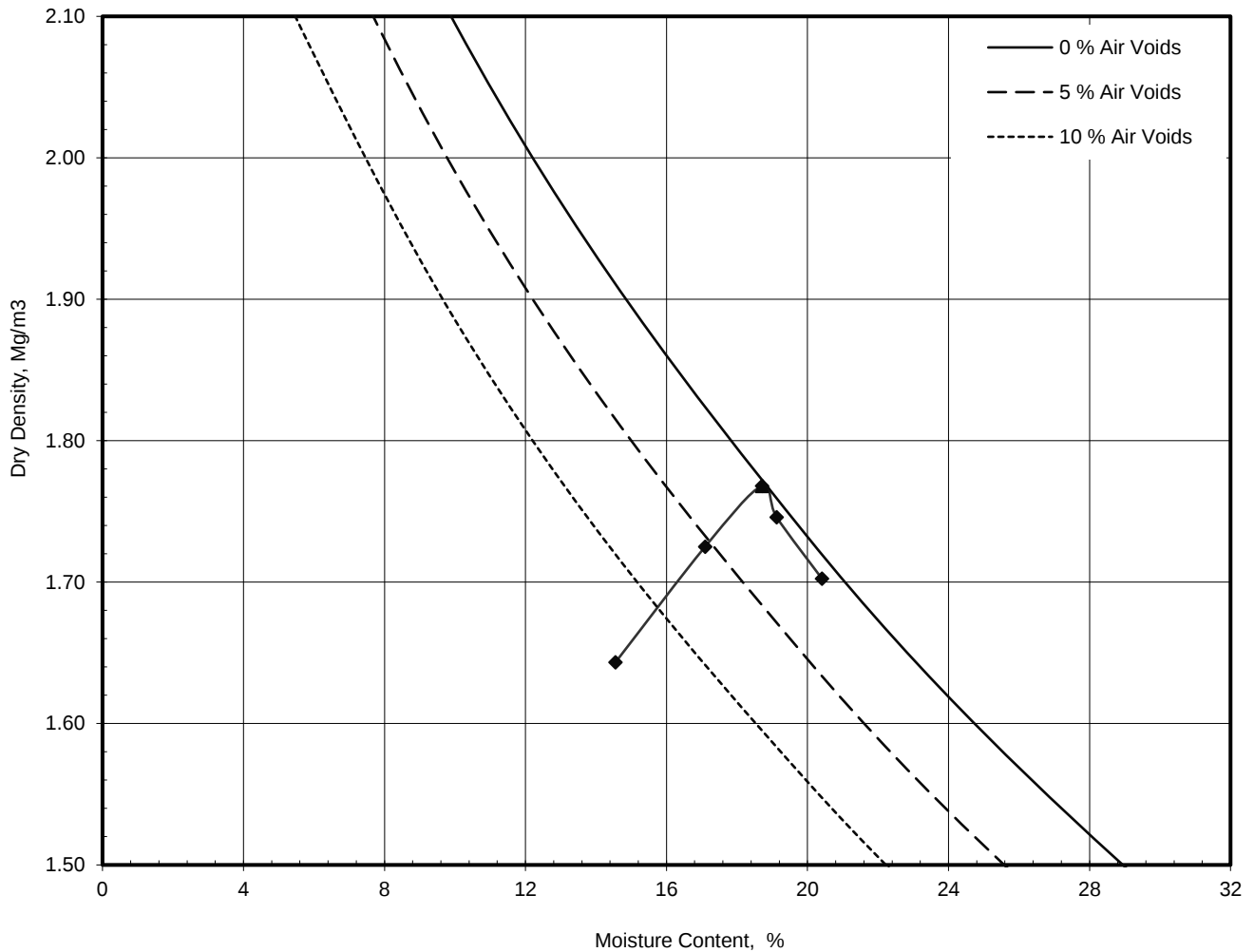


Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Single sample tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.60
Maximum Dry Density	Mg/m³	1.90
Optimum Moisture Content	%	10.3
Natural Moisture Content	%	17.28

Operator	Checked	Approved	Remarks	Fig Sheet 1 of 1
		Cilla		

	Dry Density / Moisture Content Relationship Light Compaction	Job Ref	P21014
		Borehole / Pit No	BH08
Location	Carlow Site Investigation	Sample No	6
Soil Description	Slightly sandy slightly gravelly CLAY	Depth	2.00 m
		Sample Type	U
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer	Keylab ID	PGL120210408172

Compaction Test Reference/No.

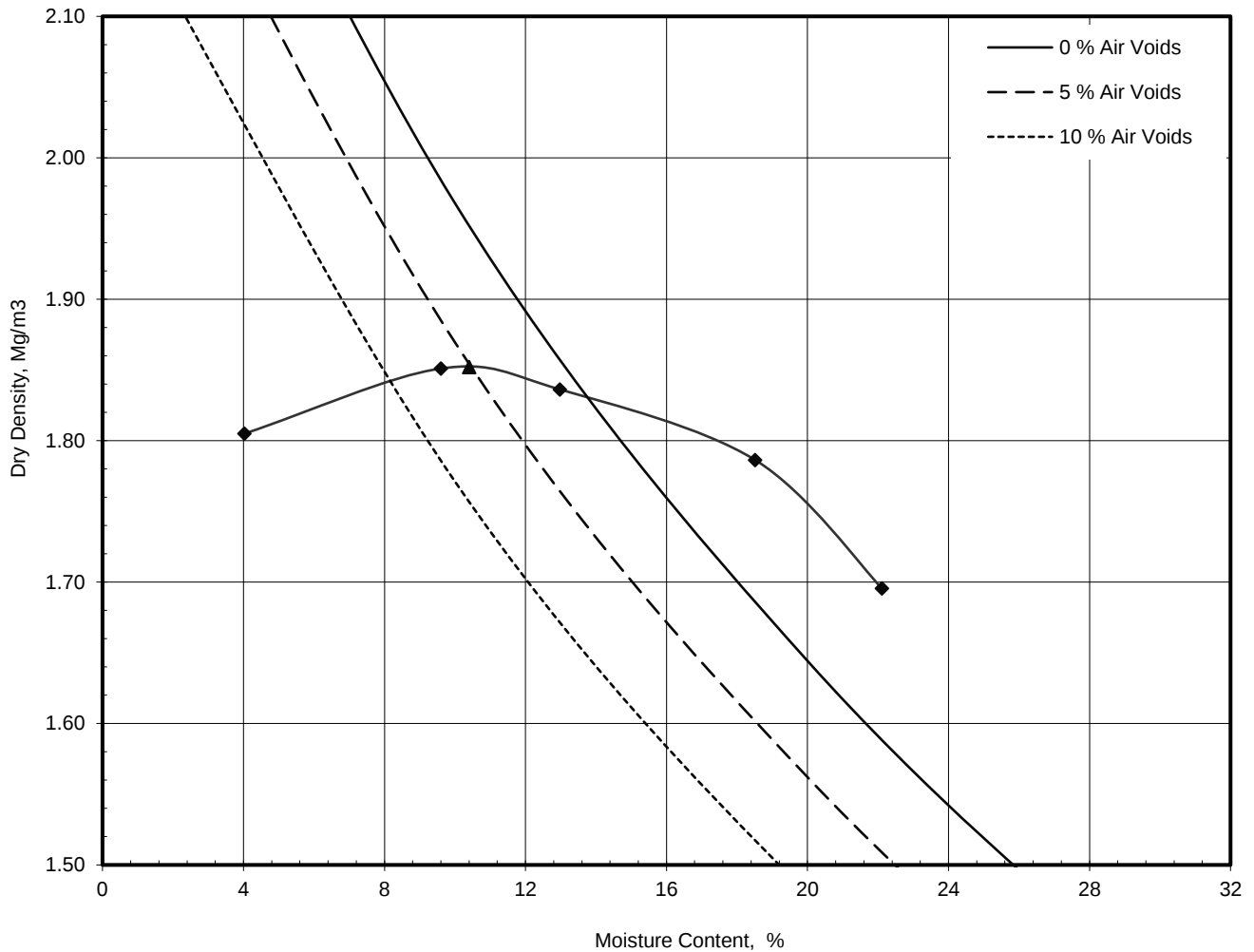


Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Single sample tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.80
Optimum Moisture Content	%	18.7
Natural Moisture Content	%	19.13

Operator	Checked	Approved	Remarks	Fig
		Cilla		
Sheet 1 of 1				

	Dry Density / Moisture Content Relationship Light Compaction	Job Ref	P21014
		Borehole / Pit No	BH11
Location	Carlow Site Investigation	Sample No	8
Soil Description	Slightly sandy gravelly CLAY	Depth	2.50 m
		Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer	Keylab ID	PGL12021043068

Compaction Test Reference/No.



Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Single sample tested	
Material Retained on 37.5 mm Sieve	%	8
Material Retained on 20.0 mm Sieve	%	12
Particle Density - Assumed	Mg/m³	2.45
Maximum Dry Density	Mg/m³	1.90
Optimum Moisture Content	%	10.4
Natural Moisture Content	%	22.11

Operator	Checked	Approved	Remarks	Fig
		Cilla		
Sheet 1 of 1				

Moisture Condition Value

BS 1377 : Part 4 : 1990 Clause 5

Job Ref

P21014

Location

Carlow Site Investigation

Borehole / Pit
No

BH11

Sample No

8

Soil Description

Slightly sandy gravelly CLAY

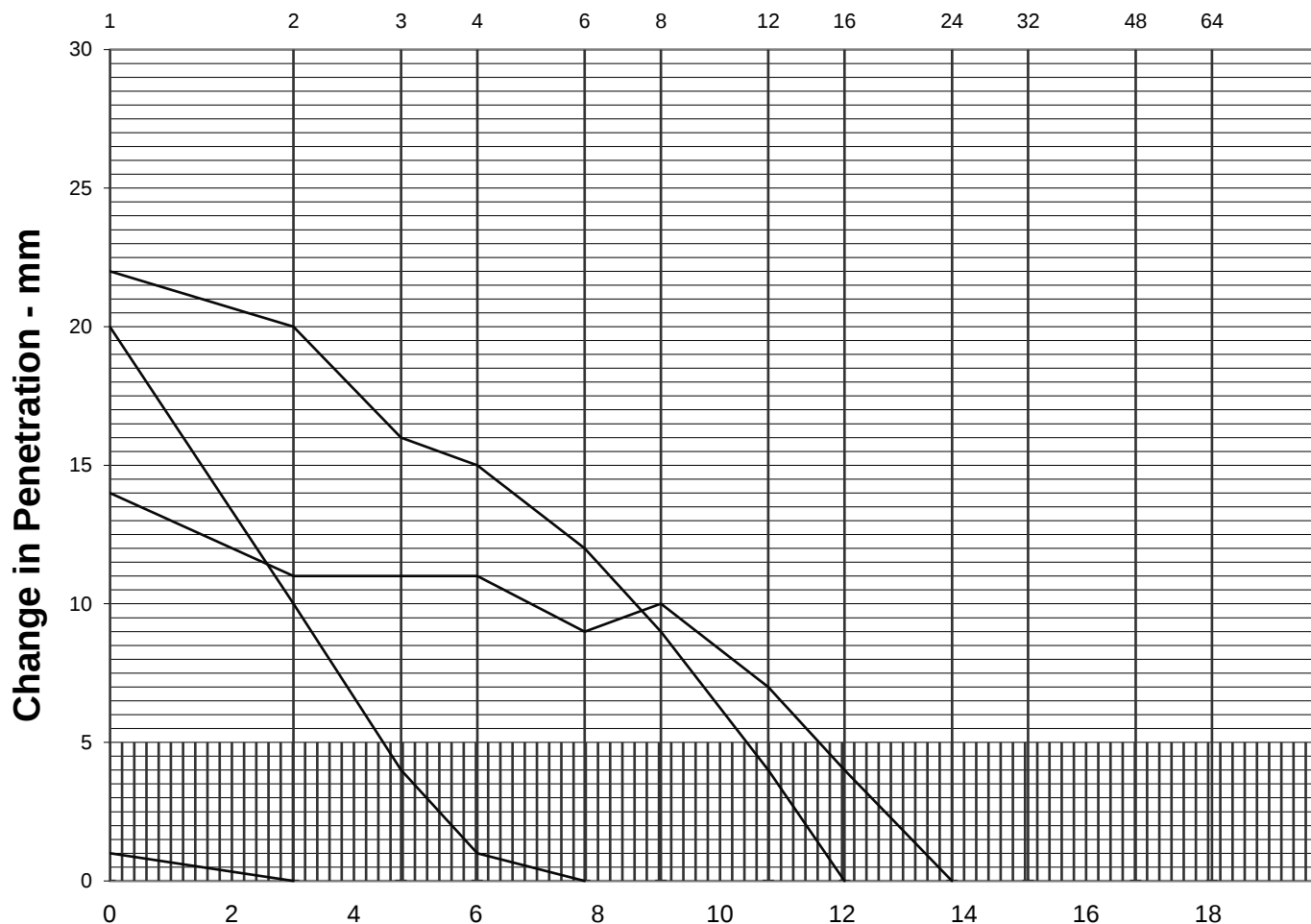
Sample Type

B

Depth

2.50 m

Number of Blows



Moisture Condition Value

Specimen No	1	2	3	4	5	6
Moisture Condition Value	0.0	4.5	10.5	11.6		
Moisture Content %	21.13	17.98	14.63	11.15		
Bulk density after compaction Mg/m ³	1.99	2.07	2.10	2.10		
Dry density after compaction Mg/m ³	1.64	1.75	1.83	1.89		
Hand vane strength kPa						
Method of determining MCV	Steepest fit line	Steepest fit line	Steepest fit line	Steepest fit line	Steepest fit line	
Mass retained on 20mm sieve %	12.3					

MCV Relationship Graph

BS 1377 : Part 4 : 1990 Clause 5

Job Ref

P21014

Borehole / Pit
No

BH11

Sample No

8

Sample Type

B

Depth

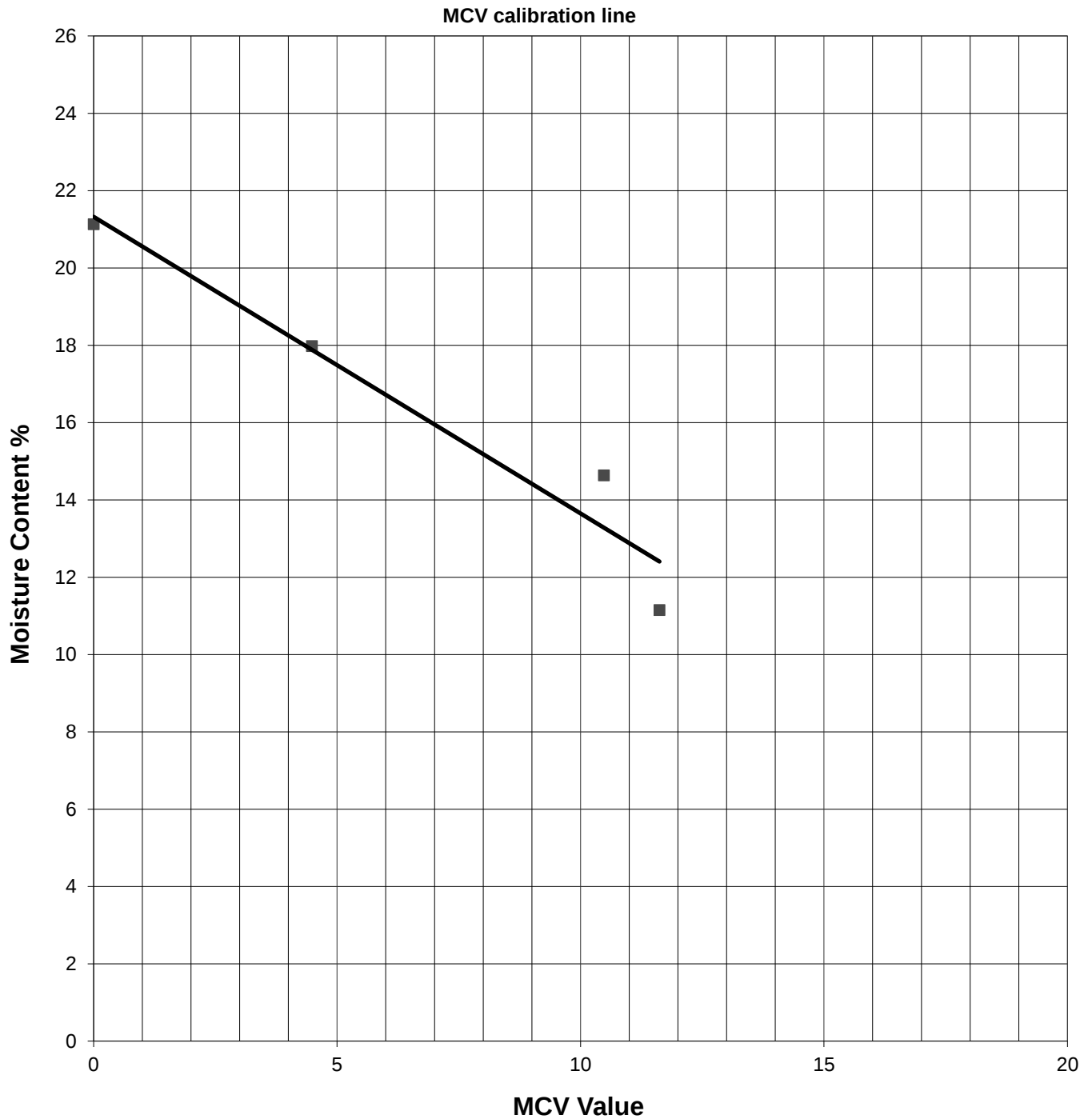
2.50 m

Location

Carlow Sites

Soil Description

Slightly sandy gravelly CLAY



Operator

Checked

Approved

Remarks Single sample / Separate batches tested

Moisture Condition Value

BS 1377 : Part 4 : 1990 Clause 5

Job Ref

P21014

Location

Carlow Site Investigation

Borehole / Pit
No

BH11

Sample No

11

Soil Description

Slightly clayey very sandy GRAVEL with high cobble content

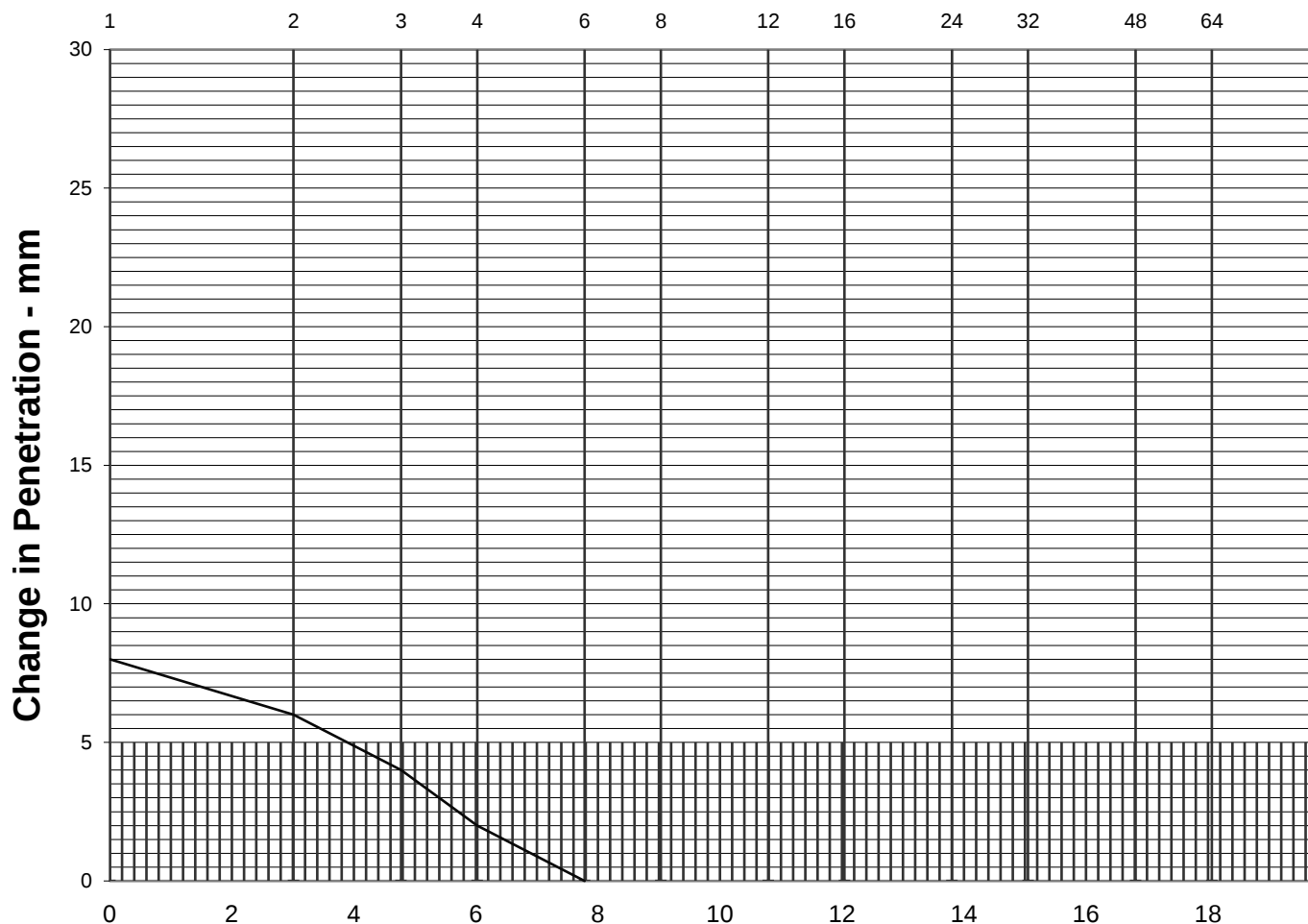
Sample Type

B

Depth

3.60 m

Number of Blows



Moisture Condition Value

Specimen No	1	2	3	4	5	6
Moisture Condition Value	4.1					
Moisture Content %	12.53					
Bulk density after compaction Mg/m ³	2.01					
Dry density after compaction Mg/m ³	1.79					
Hand vane strength kPa						
Method of determining MCV	Steepest fit line	Steepest fit line	Steepest fit line	Steepest fit line	Steepest fit line	
Mass retained on 20mm sieve %	51.6					

Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen

Job Ref	P21014
Borehole/Pit No.	BH07
Sample No.	24
Depth	7.30
Sample Type	U
KeyLAB ID	PGL120210408155
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen

Test Number
Length
Diameter
Bulk Density
Moisture Content
Dry Density

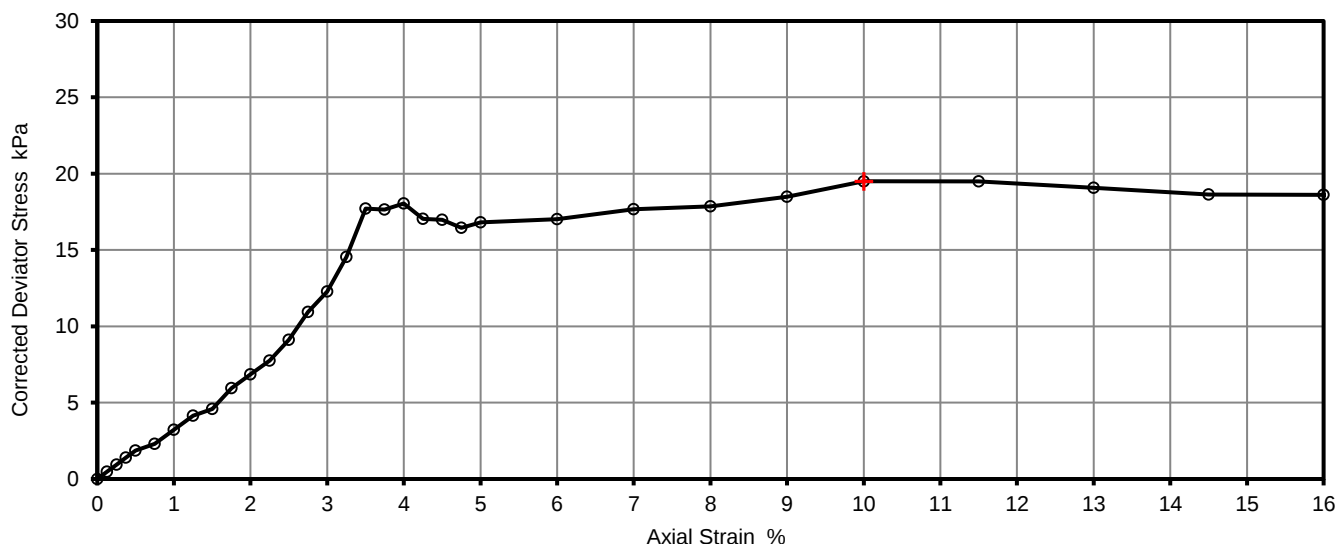
1	
200.0	mm
100.0	mm
2.72	Mg/m ³
17.6	%
2.31	Mg/m ³

Rate of Strain
Cell Pressure
At failure

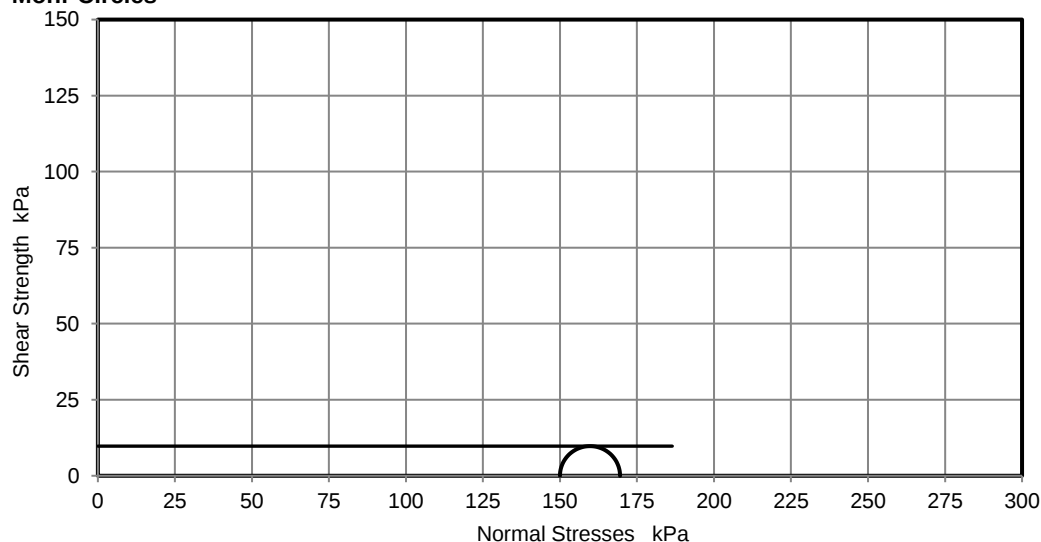
Axial Strain
Deviator Stress, $(\sigma_1 - \sigma_3)_f$
Undrained Shear Strength, c_u
Mode of Failure

	%/min
150	kPa
10.0	%
20	kPa
10	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Plastic	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected
for area change and
membrane effects

Mohr circles and their
interpretation is not covered
by BS1377.
This is provided for
information only.

Remarks

Approved

Printed

Fig. No.

1

Sheet

1

Lab Sheet Reference :



Final Report

Report No.:	21-19245-1		
Initial Date of Issue:	11-Jun-2021		
Client	Priority Geotechnical Ltd		
Client Address:	Unit 12 Owenacurra Business Park Midleton County Cork Ireland		
Contact(s):	Colette Kelly		
Project	P21014 Carlow Sites		
Quotation No.:		Date Received:	08-Jun-2021
Order No.:	13548	Date Instructed:	08-Jun-2021
No. of Samples:	5		
Turnaround (Wkdays):	5	Results Due:	14-Jun-2021
Date Approved:	11-Jun-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Soil

Project: P21014 Carlow Sites

Client: Priority Geotechnical Ltd	Chemtest Job No.:				21-19245	21-19245	21-19245	21-19245	21-19245
Quotation No.:	Chemtest Sample ID.:				1216389	1216390	1216391	1216392	1216393
	Sample Location:				BH06A	BH07	BH07	BH05A	BH07
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				2.0	0.5	2.6	2.5	7.3
	Date Sampled:				03-Jun-2021	03-Jun-2021	03-Jun-2021	03-Jun-2021	03-Jun-2021
Determinand	Accred.	SOP	Units	LOD					
Moisture	N	2030	%	0.020	17	15	16	13	17
pH	U	2010		4.0	8.6	8.7	8.8	8.9	8.9
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Sulphur	U	2175	%	0.010	0.025	0.020	0.015	< 0.010	< 0.010
Sulphate (Acid Soluble)	U	2430	%	0.010	0.029	0.022	< 0.010	< 0.010	0.013
Organic Matter	U	2625	%	0.40	1.5				

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
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 <37°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.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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 45 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

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.:	21-15859-1		
Initial Date of Issue:	19-May-2021		
Client	Priority Geotechnical Ltd		
Client Address:	Unit 12 Owenacurra Business Park Midleton County Cork Ireland		
Contact(s):	Colette Kelly		
Project	P21014 Carlow Sites		
Quotation No.:		Date Received:	13-May-2021
Order No.:	13548	Date Instructed:	13-May-2021
No. of Samples:	1		
Turnaround (Wkdays):	5	Results Due:	19-May-2021
Date Approved:	19-May-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Soil

Project: P21014 Carlow Sites

Client: Priority Geotechnical Ltd	Chemtest Job No.:		21-15859		
Quotation No.:	Chemtest Sample ID.:		1199522		
	Sample Location:		BH07		
	Sample Type:		SOIL		
	Top Depth (m):		7.75		
	Date Sampled:		10-May-2021		
Determinand	Accred.	SOP	Units	LOD	
Moisture	N	2030	%	0.020	17
Organic Matter	U	2625	%	0.40	0.57

Test Methods

SOP	Title	Parameters included	Method summary
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 <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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 45 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

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



Final Report

Report No.:	21-10576-1		
Initial Date of Issue:	12-Apr-2021		
Client	Priority Geotechnical Ltd		
Client Address:	Unit 12 Owenacurra Business Park Midleton County Cork Ireland		
Contact(s):	Colette Kelly		
Project	P21014 Carlow Sites		
Quotation No.:		Date Received:	01-Apr-2021
Order No.:	13548	Date Instructed:	01-Apr-2021
No. of Samples:	5		
Turnaround (Wkdays):	5	Results Due:	09-Apr-2021
Date Approved:	12-Apr-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - 2 Stage WAC

Project: P21014 Carlow Sites

Chemtest Job No: 21-10576							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1171455							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: RC05										
Top Depth(m): 1.00										
Bottom Depth(m):										
Sampling Date: 22-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				3	5	6	
Loss On Ignition	2610	M	%				1.0	--	10	
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg				200	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.041	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0002	0.0002	0.0004	0.0024	0.5	2	25	
Barium	1455	U	0.005	< 0.005	0.010	0.0063	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0010	0.0009	0.0021	0.0013	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.013	0.012	0.026	0.12	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0079	0.0018	0.016	0.026	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	9.2	1.4	18	24	800	15000	25000	
Fluoride	1220	U	0.28	0.20	< 1.0	2.1	10	150	500	
Sulphate	1220	U	20	2.2	40	45	1000	20000	50000	
Total Dissolved Solids	1020	N	120	53	250	620	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	6.4	4.2	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	2.2

Leachate Test Information	
Leachant volume 1st extract/l	0.346
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.221

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 - 2 Stage WAC

Project: P21014 Carlow Sites

Chemtest Job No: 21-10576							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1171456							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: RC05										
Top Depth(m): 2.00										
Bottom Depth(m):										
Sampling Date: 22-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.20	3	5	6
Loss On Ignition	2610	M	%				1.1	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg				290	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.067	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0005	0.0003	0.0010	0.0034	0.5	2	25	
Barium	1455	U	0.005	< 0.005	0.011	0.0060	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0022	0.0008	0.0044	0.0025	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.011	0.0086	0.021	0.089	0.5	10	30	
Nickel	1455	U	0.0019	< 0.0005	0.0038	0.0022	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0041	< 0.0005	0.0082	0.0047	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	10	1.2	20	22	800	15000	25000	
Fluoride	1220	U	0.25	0.19	< 1.0	2.0	10	150	500	
Sulphate	1220	U	12	1.7	24	29	1000	20000	50000	
Total Dissolved Solids	1020	N	130	58	260	660	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	13	8.2	< 50	87	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	1.7

Leachate Test Information	
Leachant volume 1st extract/l	0.347
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.200

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 - 2 Stage WAC

Project: P21014 Carlow Sites

Chemtest Job No: 21-10576							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1171457							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: RC06										
Top Depth(m): 1.00										
Bottom Depth(m):										
Sampling Date: 23-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.64	3	5	6
Loss On Ignition	2610	M	%				2.7	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg				240	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.021	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0005	0.0009	0.0010	0.0087	0.5	2	25	
Barium	1455	U	0.007	< 0.005	0.015	0.0071	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	0.0013	0.0011	0.0026	0.011	0.5	10	70	
Copper	1455	U	0.0013	0.0023	0.0025	0.0013	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0054	0.0048	0.011	0.049	0.5	10	30	
Nickel	1455	U	0.0006	0.0016	0.0011	0.015	0.4	10	40	
Lead	1455	U	< 0.0005	0.0007	< 0.0005	0.0063	0.5	10	50	
Antimony	1455	U	0.0005	< 0.0005	0.0010	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0016	0.0006	0.0032	0.0067	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	3.3	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.25	0.27	< 1.0	2.7	10	150	500	
Sulphate	1220	U	9.9	< 1.0	20	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	150	72	300	790	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	12	8.7	< 50	90	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	16

Leachate Test Information	
Leachant volume 1st extract/l	0.317
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.170

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 - 2 Stage WAC

Project: P21014 Carlow Sites

Chemtest Job No: 21-10576							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1171458							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: RC06										
Top Depth(m): 2.00										
Bottom Depth(m):										
Sampling Date: 23-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				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 (Mineral Oil)	2670	M	mg/kg				420	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					8.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.020			--	To evaluate	To evaluate	
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0010	0.0008	0.0019	0.0078	0.5	2	25	
Barium	1455	U	0.008	< 0.005	0.015	0.0089	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	0.0013	0.0006	0.0025	0.0069	0.5	10	70	
Copper	1455	U	0.0019	0.0016	0.0036	0.0022	2	50	100	
Mercury	1455	U	0.00006	< 0.00005	0.00012	0.00007	0.01	0.2	2	
Molybdenum	1455	U	0.0078	0.0057	0.015	0.059	0.5	10	30	
Nickel	1455	U	0.0008	0.0011	0.0016	0.010	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0008	0.0006	0.0015	0.0060	0.06	0.7	5	
Selenium	1455	U	0.0013	0.0006	0.0024	0.0063	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	2.5	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.29	0.28	< 1.0	2.8	10	150	500	
Sulphate	1220	U	10	< 1.0	19	12	1000	20000	50000	
Total Dissolved Solids	1020	N	160	78	300	860	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	10	5.5	< 50	60	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	25

Leachate Test Information	
Leachant volume 1st extract/l	0.293
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.202

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 - 2 Stage WAC

Project: P21014 Carlow Sites

Chemtest Job No: 21-10576							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1171459							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: RC06										
Top Depth(m): 3.00										
Bottom Depth(m):										
Sampling Date: 23-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.25	3	5	6
Loss On Ignition	2610	M	%				1.3	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg				580	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					9.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.048	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0005	0.0005	0.0010	0.0051	0.5	2	25	
Barium	1455	U	0.005	< 0.005	0.010	0.0073	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0007	0.0006	0.0014	0.0010	2	50	100	
Mercury	1455	U	0.00008	< 0.00005	0.00016	0.00011	0.01	0.2	2	
Molybdenum	1455	U	0.0070	0.0035	0.014	0.040	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	3.3	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.25	0.17	< 1.0	1.8	10	150	500	
Sulphate	1220	U	4.7	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	110	53	220	610	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	3.3	< 2.5	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.8

Leachate Test Information	
Leachant volume 1st extract/l	0.331
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.252

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
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity 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.
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).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
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	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 <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
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
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
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.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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 45 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

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.:	21-08436-1		
Initial Date of Issue:	25-Mar-2021		
Client	Priority Geotechnical Ltd		
Client Address:	Unit 12 Owenacurra Business Park Midleton County Cork Ireland		
Contact(s):	Colette Kelly		
Project	P21014 Carlow		
Quotation No.:		Date Received:	17-Mar-2021
Order No.:	13548	Date Instructed:	17-Mar-2021
No. of Samples:	4		
Turnaround (Wkdays):	7	Results Due:	25-Mar-2021
Date Approved:	25-Mar-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - 2 Stage WAC

Project: P21014 Carlow

Chemtest Job No: 21-08436							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1161592							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: TP11										
Top Depth(m): 0.5										
Bottom Depth(m):										
Sampling Date: 11-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				3	5	6	
Loss On Ignition	2610	M	%				1.7	--	10	
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.012	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0002	0.0006	0.0005	0.0053	0.5	2	25	
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	0.0006	0.0007	0.0011	0.0070	0.5	10	70	
Copper	1455	U	0.0014	0.0012	0.0028	0.0012	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0021	0.0014	0.0042	0.015	0.5	10	30	
Nickel	1455	U	< 0.0005	0.0009	< 0.0005	0.0080	0.4	10	40	
Lead	1455	U	< 0.0005	0.0005	< 0.0005	0.0048	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0005	< 0.0005	0.0010	< 0.0005	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	5.0	1.0	< 10	13	800	15000	25000	
Fluoride	1220	U	0.92	0.71	1.8	7.3	10	150	500	
Sulphate	1220	U	1.3	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	85	50	170	530	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	6.4	5.6	< 50	57	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.325
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.148

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 - 2 Stage WAC

Project: P21014 Carlow

Chemtest Job No: 21-08436							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1161593							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: TP11										
Top Depth(m): 1.5										
Bottom Depth(m):										
Sampling Date: 11-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				3	5	6	
Loss On Ignition	2610	M	%				--	--	10	
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					9.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.013	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0003	0.0004	0.0006	0.0035	0.5	2	25	
Barium	1455	U	0.005	< 0.005	0.011	0.0068	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	0.0017	0.0007	0.0034	0.0081	0.5	10	70	
Copper	1455	U	0.0007	< 0.0005	0.0015	0.0009	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0040	0.0018	0.0080	0.021	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0006	0.0005	0.0011	0.0052	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	5.6	1.9	11	24	800	15000	25000	
Fluoride	1220	U	0.24	0.17	< 1.0	1.8	10	150	500	
Sulphate	1220	U	1.8	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	100	47	210	540	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	4.9	4.1	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.1

Leachate Test Information	
Leachant volume 1st extract/l	0.333
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.221

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 - 2 Stage WAC

Project: P21014 Carlow

Chemtest Job No: 21-08436							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1161594							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: TP10										
Top Depth(m): 0.5										
Bottom Depth(m):										
Sampling Date: 11-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				3	5	6	
Loss On Ignition	2610	M	%				--	--	10	
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090			--	To evaluate	To evaluate	
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0007	0.0010	0.0013	0.0094	0.5	2	25	
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	0.0006	0.0006	0.0012	0.0062	0.5	10	70	
Copper	1455	U	0.0019	0.0012	0.0038	0.0015	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0040	0.0019	0.0079	0.021	0.5	10	30	
Nickel	1455	U	< 0.0005	0.0006	< 0.0005	0.0057	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0005	< 0.0005	0.0011	< 0.0005	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	4.6	1.4	< 10	16	800	15000	25000	
Fluoride	1220	U	0.45	0.28	< 1.0	2.9	10	150	500	
Sulphate	1220	U	< 1.0	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	100	55	210	590	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	6.3	4.4	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.320
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.134

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 - 2 Stage WAC

Project: P21014 Carlow

Chemtest Job No: 21-08436							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1161595							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: TP10										
Top Depth(m): 1.0										
Bottom Depth(m):										
Sampling Date: 11-Mar-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				3	5	6	
Loss On Ignition	2610	M	%				--	--	10	
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					9.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.024	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0003	0.0004	0.0006	0.0036	0.5	2	25	
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300	
Cadmium	1455	U	< 0.00012	< 0.00012	< 0.0012	< 0.0012	0.04	1	5	
Chromium	1455	U	0.0006	< 0.0005	0.0013	0.0014	0.5	10	70	
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0026	0.0008	0.0052	0.012	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	6.6	< 1.0	13	15	800	15000	25000	
Fluoride	1220	U	0.25	0.19	< 1.0	2.0	10	150	500	
Sulphate	1220	U	2.3	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	78	38	160	470	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	4.1	3.4	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	3.8

Leachate Test Information	
Leachant volume 1st extract/l	0.343
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.396

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
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity 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.
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).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
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	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 <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
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
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
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.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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 45 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

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.:	21-07538-1		
Initial Date of Issue:	18-Mar-2021		
Client	Priority Geotechnical Ltd		
Client Address:	Unit 12 Owenacurra Business Park Midleton County Cork Ireland		
Contact(s):	Colette Kelly		
Project	P21012 Carlow		
Quotation No.:		Date Received:	10-Mar-2021
Order No.:	13358	Date Instructed:	11-Mar-2021
No. of Samples:	11		
Turnaround (Wkdays):	6	Results Due:	18-Mar-2021
Date Approved:	18-Mar-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Leachate

Project: P21012 Carlow

Client: Priority Geotechnical Ltd	Chemtest Job No.:					21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538
Quotation No.:	Chemtest Sample ID.:					1157126	1157127	1157128	1157129	1157130	1157131	1157132	1157133
	Sample Location:					TP05	TP05	TP06	TP06	TP07	TP08	TP08	TP12
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.5	1.2	0.4	2.0	0.5	0.6	1.5	0.5
	Date Sampled:					04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021
Determinand	Accred.	SOP	Type	Units	LOD								
Ammonium	U	1220	10:1	mg/l	0.050	< 0.050	< 0.050	0.47	0.13	0.089	0.066	0.11	1.7
Ammonium	N	1220	10:1	mg/kg	0.10	0.84	0.81	5.9	1.4	1.1	0.77	1.3	20

Results - Leachate

Project: P21012 Carlow

Client: Priority Geotechnical Ltd	Chemtest Job No.:					21-07538	21-07538	21-07538
Quotation No.:	Chemtest Sample ID.:					1157134	1157135	1157136
	Sample Location:					TP12	TP13	TP13
	Sample Type:					SOIL	SOIL	SOIL
	Top Depth (m):					2.0	0.5	2.0
	Date Sampled:					04-Mar-2021	04-Mar-2021	04-Mar-2021
Determinand	Accred.	SOP	Type	Units	LOD			
Ammonium	U	1220	10:1	mg/l	0.050	0.070	0.068	0.057
Ammonium	N	1220	10:1	mg/kg	0.10	0.76	0.76	0.64

Results - Soil

Project: P21012 Carlow

Client: Priority Geotechnical Ltd	Chemtest Job No.:		21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538
Quotation No.:	Chemtest Sample ID.:		1157126	1157127	1157128	1157129	1157130	1157131	1157132	1157133	1157134	1157134	1157134
	Sample Location:		TP05	TP05	TP06	TP06	TP07	TP08	TP08	TP12	TP12	TP12	TP12
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		0.5	1.2	0.4	2.0	0.5	0.6	1.5	0.5	2.0	2.0	2.0
	Date Sampled:		04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021
	Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	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	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	13	6.3	14	16	11	10	14	14	15
pH	M	2010		4.0	8.8	9.1	8.6	8.1	8.7	8.7	8.7	8.7	8.6
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.53	< 0.40	< 0.40	0.74	< 0.40	< 0.40	< 0.40	0.46	0.65
Sulphur (Elemental)	M	2180	mg/kg	1.0	< 1.0	< 1.0	< 1.0	6.1	< 1.0	< 1.0	< 1.0	< 1.0	28
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	11	8.5	3.3	3.3	2.3	2.7	3.8	2.4	3.4
Sulphate (Total)	M	2430	%	0.010	0.062	0.020	0.014	0.030	0.011	0.017	0.026	0.058	0.10
Arsenic	M	2450	mg/kg	1.0	14	18	12	7.1	15	15	15	14	14
Barium	M	2450	mg/kg	10	47	28	46	33	53	52	47	66	85
Cadmium	M	2450	mg/kg	0.10	0.82	0.70	1.0	0.52	1.6	1.2	1.5	0.96	1.0
Chromium	M	2450	mg/kg	1.0	16	12	18	13	19	18	16	13	14
Molybdenum	M	2450	mg/kg	2.0	< 2.0	< 2.0	2.0	< 2.0	2.0	2.8	< 2.0	< 2.0	< 2.0
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	6.8	2.0	< 2.0	< 2.0
Copper	M	2450	mg/kg	0.50	16	11	19	12	25	21	22	16	17
Mercury	M	2450	mg/kg	0.10	0.10	< 0.10	0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10	0.10
Nickel	M	2450	mg/kg	0.50	21	18	28	15	40	29	36	19	21
Lead	M	2450	mg/kg	0.50	26	61	24	22	28	23	21	22	25
Selenium	M	2450	mg/kg	0.20	0.27	< 0.20	0.60	0.45	0.62	0.48	0.31	0.44	0.58
Zinc	M	2450	mg/kg	0.50	59	44	69	49	79	64	66	56	61
Chromium (Trivalent)	N	2490	mg/kg	1.0	16	12	18	13	19	18	16	13	14
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	0.91	< 0.20	0.46	0.89	0.38	1.2	< 0.20	0.71	0.76
Mineral Oil	N	2670	mg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: P21012 Carlow

Client: Priority Geotechnical Ltd	Chemtest Job No.:				21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538
Quotation No.:	Chemtest Sample ID.:				1157126	1157127	1157128	1157129	1157130	1157131	1157132	1157133	1157134
	Sample Location:				TP05	TP05	TP06	TP06	TP07	TP08	TP08	TP12	TP12
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.5	1.2	0.4	2.0	0.5	0.6	1.5	0.5	2.0
	Date Sampled:				04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD									
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.25	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.17	0.15
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	0.41	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.34	0.29
Pyrene	M	2800	mg/kg	0.10	0.42	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.27	0.24
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.13	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.17	0.13
Chrysene	M	2800	mg/kg	0.10	0.14	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.20	0.14
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.21	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.25	0.16
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.20	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.24	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.15	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.13	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.20	< 0.10
Coronene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	2800	mg/kg	2.0	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.1	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: P21012 Carlow

Client: Priority Geotechnical Ltd	Chemtest Job No.:		21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538	21-07538
Quotation No.:	Chemtest Sample ID.:		1157126	1157127	1157128	1157129	1157130	1157131	1157132	1157133	1157134
	Sample Location:		TP05	TP05	TP06	TP06	TP07	TP08	TP08	TP12	TP12
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		0.5	1.2	0.4	2.0	0.5	0.6	1.5	0.5	2.0
	Date Sampled:		04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021
	Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD							
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Results - Soil

Project: P21012 Carlow

Client: Priority Geotechnical Ltd	Chemtest Job No.:				21-07538	21-07538
Quotation No.:	Chemtest Sample ID.:				1157135	1157136
	Sample Location:				TP13	TP13
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.5	2.0
	Date Sampled:				04-Mar-2021	04-Mar-2021
	Asbestos Lab:				DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	11	14
pH	M	2010		4.0	8.8	8.6
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40	< 0.40
Sulphur (Elemental)	M	2180	mg/kg	1.0	2.4	1.3
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	3.4	1.7
Sulphate (Total)	M	2430	%	0.010	0.016	0.023
Arsenic	M	2450	mg/kg	1.0	14	13
Barium	M	2450	mg/kg	10	77	52
Cadmium	M	2450	mg/kg	0.10	2.0	1.1
Chromium	M	2450	mg/kg	1.0	19	17
Molybdenum	M	2450	mg/kg	2.0	2.4	< 2.0
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0
Copper	M	2450	mg/kg	0.50	40	30
Mercury	M	2450	mg/kg	0.10	< 0.10	0.10
Nickel	M	2450	mg/kg	0.50	48	32
Lead	M	2450	mg/kg	0.50	24	31
Selenium	M	2450	mg/kg	0.20	0.76	0.70
Zinc	M	2450	mg/kg	0.50	77	68
Chromium (Trivalent)	N	2490	mg/kg	1.0	19	17
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	0.29	1.1
Mineral Oil	N	2670	mg/kg	10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	86
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	86
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: P21012 Carlow

Client: Priority Geotechnical Ltd	Chemtest Job No.:				21-07538	21-07538
Quotation No.:	Chemtest Sample ID.:				1157135	1157136
	Sample Location:				TP13	TP13
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.5	2.0
	Date Sampled:				04-Mar-2021	04-Mar-2021
	Asbestos Lab:				DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	460
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	460
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	540
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Coronene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10	< 0.10

Results - Soil

Project: P21012 Carlow

Client: Priority Geotechnical Ltd	Chemtest Job No.:		21-07538	21-07538
Quotation No.:	Chemtest Sample ID.:		1157135	1157136
	Sample Location:		TP13	TP13
	Sample Type:		SOIL	SOIL
	Top Depth (m):		0.5	2.0
	Date Sampled:		04-Mar-2021	04-Mar-2021
	Asbestos Lab:		DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD
Total Phenols	M	2920	mg/kg	0.30
				< 0.30
				< 0.30

Results - Single Stage WAC

Project: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157126					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP05							
Top Depth(m): 0.5							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	0.91	3	5	6
Loss On Ignition	2610	M	%	3.3	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	2.0	100	--	--
pH	2010	M		8.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.062	--	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	0.0024	0.024	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0019	0.019	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0018	0.018	0.5	10	30
Nickel	1455	U	0.0006	0.0065	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0005	0.0055	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.17	1.7	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	78	780	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	7.5	75	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.

Results - Single Stage WAC

Project: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157127					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP05							
Top Depth(m): 1.2							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	< 0.20	3	5	6
Loss On Ignition	2610	M	%	0.98	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		9.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.071	--	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	0.0030	0.030	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0010	0.011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0006	0.0057	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.23	2.3	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	57	570	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	5.8	58	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	6.3

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: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157128					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP06							
Top Depth(m): 0.4							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	0.46	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 (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.069	--	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	0.0004	0.0042	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0012	0.012	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0016	0.016	0.5	10	30
Nickel	1455	U	0.0006	0.0057	0.4	10	40
Lead	1455	U	0.0006	0.0057	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.1	11	800	15000	25000
Fluoride	1220	U	0.23	2.3	10	150	500
Sulphate	1220	U	2.6	26	1000	20000	50000
Total Dissolved Solids	1020	N	78	780	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	10	100	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	14

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: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157129					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP06							
Top Depth(m): 2.0							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	0.89	3	5	6
Loss On Ignition	2610	M	%	3.8	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.034	--	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	0.0012	0.012	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0017	0.017	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0023	0.023	0.5	10	30
Nickel	1455	U	0.0006	0.0058	0.4	10	40
Lead	1455	U	0.0006	0.0055	0.5	10	50
Antimony	1455	U	0.0008	0.0083	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.2	12	800	15000	25000
Fluoride	1220	U	0.24	2.4	10	150	500
Sulphate	1220	U	1.1	11	1000	20000	50000
Total Dissolved Solids	1020	N	55	540	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	8.2	82	500	800	1000

Solid Information

Dry mass of test portion/kg 0.090

Moisture (%) 16

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: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157130					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP07							
Top Depth(m): 0.5							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	0.38	3	5	6
Loss On Ignition	2610	M	%	2.8	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.038	--	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	0.0011	0.011	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0019	0.019	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0019	0.019	0.5	10	30
Nickel	1455	U	0.0011	0.011	0.4	10	40
Lead	1455	U	0.0010	0.0095	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.1	11	800	15000	25000
Fluoride	1220	U	0.26	2.6	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	64	640	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	11	110	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	11

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: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157131					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP08							
Top Depth(m): 0.6							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	1.2	3	5	6
Loss On Ignition	2610	M	%	2.3	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.056	--	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	0.0013	0.013	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	0.0006	0.0057	0.5	10	70
Copper	1455	U	0.0024	0.024	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0021	0.021	0.5	10	30
Nickel	1455	U	0.0013	0.013	0.4	10	40
Lead	1455	U	0.0009	0.0095	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0007	0.0068	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.28	2.8	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	17	170	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: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157132					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP08							
Top Depth(m): 1.5							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	< 0.20	3	5	6
Loss On Ignition	2610	M	%	1.4	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.070	--	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	0.0002	0.0024	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0006	0.0060	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0029	0.029	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.1	11	800	15000	25000
Fluoride	1220	U	0.26	2.6	10	150	500
Sulphate	1220	U	2.7	27	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	4.1	< 50	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	14

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: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157133					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP12							
Top Depth(m): 0.5							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	0.71	3	5	6
Loss On Ignition	2610	M	%	3.6	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	2.1	100	--	--
pH	2010	M		8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.058	--	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	0.0007	0.0074	0.5	2	25
Barium	1455	U	0.009	0.090	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0018	0.018	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0019	0.019	0.5	10	30
Nickel	1455	U	0.0005	0.0053	0.4	10	40
Lead	1455	U	0.0009	0.0088	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0006	0.0056	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	4.7	47	800	15000	25000
Fluoride	1220	U	0.22	2.2	10	150	500
Sulphate	1220	U	20	200	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	13	130	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	14

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: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157134					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP12							
Top Depth(m): 2.0							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	0.76	3	5	6
Loss On Ignition	2610	M	%	4.0	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.048	--	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	0.0010	0.010	0.5	2	25
Barium	1455	U	0.039	0.39	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0018	0.018	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0045	0.045	0.5	10	30
Nickel	1455	U	0.0011	0.011	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0010	0.010	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.7	17	800	15000	25000
Fluoride	1220	U	0.33	3.3	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	140	1400	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	5.8	58	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	15

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: P21012 Carlow

Chemtest Job No: 21-07538					Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1157135					Limits		
Sample Ref:					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:							
Sample Location: TP13							
Top Depth(m): 0.5							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	0.29	3	5	6
Loss On Ignition	2610	M	%	2.4	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.049	--	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	0.0009	0.0094	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	0.0010	0.010	0.5	10	70
Copper	1455	U	0.0033	0.033	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0008	0.0078	0.5	10	30
Nickel	1455	U	0.0019	0.019	0.4	10	40
Lead	1455	U	0.0013	0.013	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0005	0.0054	0.1	0.5	7
Zinc	1455	U	0.005	0.049	4	50	200
Chloride	1220	U	2.0	20	800	15000	25000
Fluoride	1220	U	0.28	2.8	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	78	780	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	6.2	62	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	11

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: P21012 Carlow

Project File 2021-2022					Landfill Waste Acceptance Criteria		
Chemtest Job No: 21-07538					Limits		
Chemtest Sample ID: 1157136					Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Ref:							
Sample ID:							
Sample Location: TP13							
Top Depth(m): 2.0							
Bottom Depth(m):							
Sampling Date: 04-Mar-2021							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	1.1	3	5	6
Loss On Ignition	2610	M	%	3.5	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	540	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.081	--	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	0.0004	0.0039	0.5	2	25
Barium	1455	U	< 0.005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00012	< 0.0012	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0013	0.013	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0011	0.011	0.5	10	30
Nickel	1455	U	0.0007	0.0071	0.4	10	40
Lead	1455	U	0.0006	0.0055	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.1	11	800	15000	25000
Fluoride	1220	U	0.46	4.6	10	150	500
Sulphate	1220	U	2.0	20	1000	20000	50000
Total Dissolved Solids	1020	N	59	580	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	6.0	60	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	14

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
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity 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.
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).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
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	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 <37°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
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
2450	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
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
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.
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*; Dibenzo[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
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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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 45 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

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

[illegible]

Unconfined Compressive Strength, UCS

Job Name **Carlow Site Investigation**
Job Number **P21014**

Borehole: **RC07**
Depth: **15.5** m
Rock Type **LIMESTONE**

Bulk Density **2.71** Mg/m³
Load at Failure, P **467.1** kN

Stress at Failure **102.97** MPa



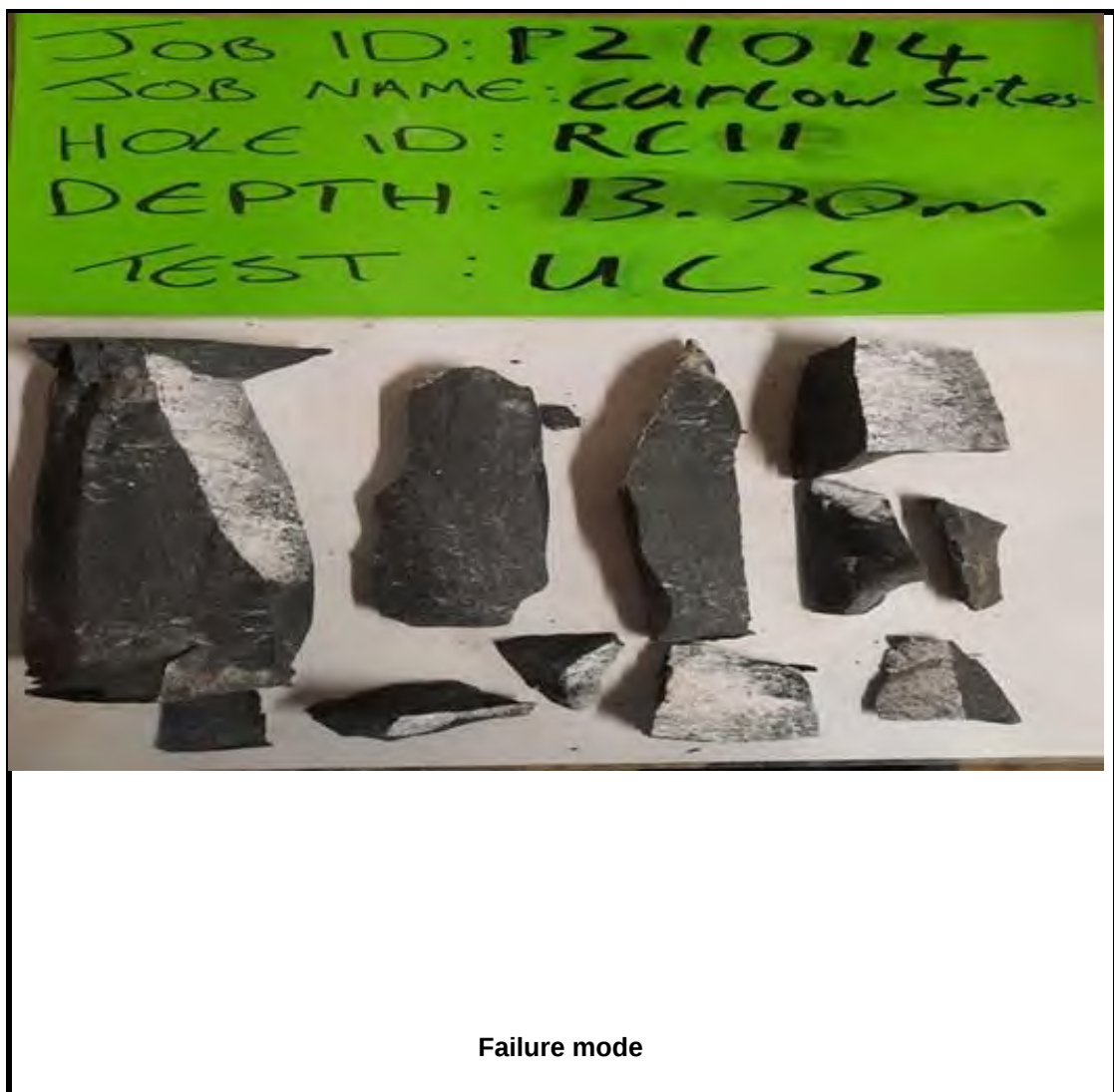
Unconfined Compressive Strength, UCS

Job Name **Carlow Site Investigation**
Job Number **P21014**

Borehole: **RC11**
Depth: **13.7** m
Rock Type **LIMESTONE**

Bulk Density **2.63** Mg/m³
Load at Failure, P **323.3** kN

Stress at Failure **71.27** MPa





+

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200

Legend

1. Station

2. Platform

3. Track

4. Signal

5. Crossing

6. Overpass

7. Underpass

8. Tunnel

9. Bridge

10. Road

11. Sidewalk

12. Bicycle Lane

13. Parking Lot

14. Building

15. Tree

16. Water

17. Fencing

18. Signage

19. Light Pole

20. Street Light

21. Traffic Light

22. Fire Hydrant

23. Manhole

24. Storm Drain

25. Sewer Line

26. Gas Line

27. Water Line

28. Electric Line

29. Telephone Line

30. Cable Line

31. Fiber Optic Line

32. Data Line

33. Power Line

34. Gas Line

35. Water Line

36. Electric Line

37. Telephone Line

38. Cable Line

39. Fiber Optic Line

40. Data Line

41. Power Line

42. Gas Line

43. Water Line

44. Electric Line

45. Telephone Line

46. Cable Line

47. Fiber Optic Line

48. Data Line

49. Power Line

50. Gas Line

51. Water Line

52. Electric Line

53. Telephone Line

54. Cable Line

55. Fiber Optic Line

56. Data Line

57. Power Line

58. Gas Line

59. Water Line

60. Electric Line

61. Telephone Line

62. Cable Line

63. Fiber Optic Line

64. Data Line

65. Power Line

66. Gas Line

67. Water Line

68. Electric Line

69. Telephone Line

70. Cable Line

71. Fiber Optic Line

72. Data Line

73. Power Line

74. Gas Line

75. Water Line

76. Electric Line

77. Telephone Line

78. Cable Line

79. Fiber Optic Line

80. Data Line

81. Power Line

82. Gas Line

83. Water Line

84. Electric Line

85. Telephone Line

86. Cable Line

87. Fiber Optic Line

88. Data Line

89. Power Line

90. Gas Line

91. Water Line

92. Electric Line

93. Telephone Line

94. Cable Line

95. Fiber Optic Line

96. Data Line

97. Power Line

98. Gas Line

99. Water Line

100. Electric Line

101. Telephone Line

102. Cable Line

103. Fiber Optic Line

104. Data Line

105. Power Line

106. Gas Line

107. Water Line

108. Electric Line

109. Telephone Line

110. Cable Line

111. Fiber Optic Line

112. Data Line

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114. Gas Line

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116. Electric Line

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118. Cable Line

119. Fiber Optic Line

120. Data Line

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124. Electric Line

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137. Power Line

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153. Power Line

154. Gas Line

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156. Electric Line

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158. Cable Line

159. Fiber Optic Line

160. Data Line

161. Power Line

162. Gas Line

163. Water Line

164. Electric Line

165. Telephone Line

166. Cable Line

167. Fiber Optic Line

168. Data Line

169. Power Line

170. Gas Line

171. Water Line

172. Electric Line

173. Telephone Line

174. Cable Line

175. Fiber Optic Line

176. Data Line

177. Power Line

178. Gas Line

179. Water Line

180. Electric Line

181. Telephone Line

182. Cable Line

183. Fiber Optic Line

184. Data Line

185. Power Line

186. Gas Line

187. Water Line

188. Electric Line

189. Telephone Line

190. Cable Line

191. Fiber Optic Line

192. Data Line

193. Power Line

194. Gas Line

195. Water Line

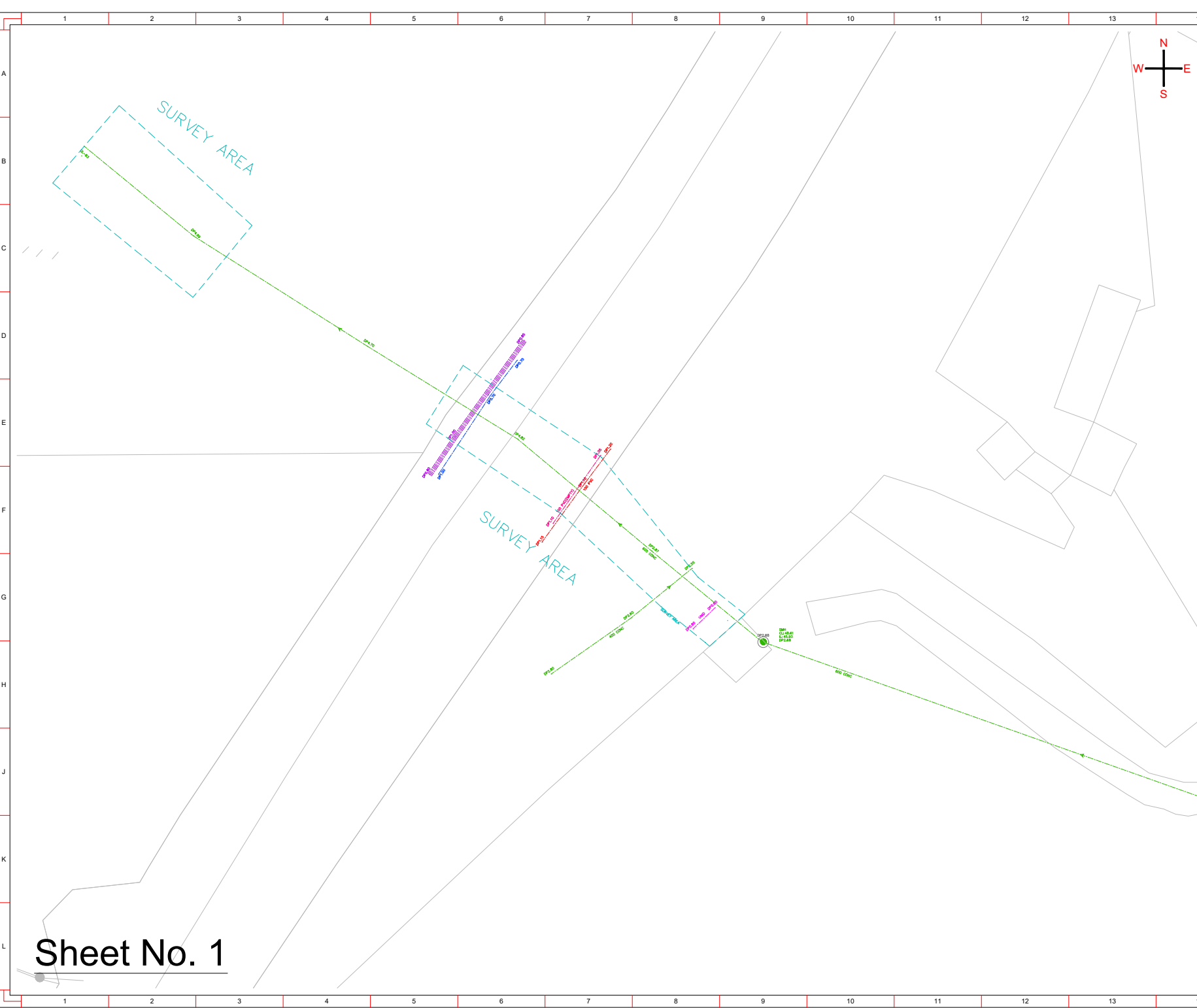
196. Electric Line

197. Telephone Line

198. Cable Line

199. Fiber Optic Line

200. Data Line



SERVICES LEGEND

	UNDERGROUND ELECTRICITY LINE		FOUL DRAINAGE
	ELECTRICAL WHOLE		STORM DRAINAGE
	OVERHEAD LINE WITH POLE		STORM DRAINAGE PIPES
	OVERHEAD ELECTRIC		COMBINED DRAINAGE
	UNDERGROUND IN ELECTRICITY LINE		COMBINED DRAINAGE PIPES
	IN HIGH STREET LIGHT		PRODUCT DRAINAGE
	MAN PILLAR		PRODUCT DRAINAGE PIPES
	CIR		CHEMICAL LINE
	FIR CHAMBER		CHEMICAL PIPES
	OVERHEAD LINE WITH POLE		ROAD GULLY
	ENET		GULLY TRAP
	ENET CHAMBER		WATER PAIN
	CORRIS		SLICE VALVE
	CORRIS CHAMBER		FIRE HYDRANT
	CORRIS CHAMBER		WATER METER
	VISIGN CHAMBER		SCOUR VALVE
	FIBRE		PRESSURE RELEASE VALVE
	FIBRE CHAMBER		AIR VALVE
	AURORA TELECOM		NON-RETURN VALVE
	AURORA TELECOM CHAMBER		FUEL LINE/TANK
	CATV		GAS LINE
	CITY CHAMBER		GAS HIGH PRESSURE LINE
	BT		GROUND LEVEL (metres - on datum)
	BT CHAMBER		COVER LEVEL (metres - on datum)
	FAST		ASIDE LEVEL (metres - on datum)
	FAST CHAMBER		DEPTH TO TOP OF SERVICE DUCT OR CABLE
	FAST FIBRE		DP ON MANHOLE/S + INSET LEVEL OF PIPES
	FAST CHAMBER		DP ON MANHOLE/S + INSET LEVEL OF CHAMBER
	UNIDENTIFIED SERVICE		UNABLE TO OPEN
	UNIDENTIFIED SERVICE		OUTSIDE SURVEY AREA
	EARTH LINE AND RODS		UNABLE TO TRACE
	WATER/TELECOM		
	WATER/TELECOM		
	WATER/TELECOM		
	WATER/TELECOM		
	WATER/TELECOM		
	WATER/TELECOM		
	WATER/TELECOM		
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	WATER/TELECOM		

Please note that the absence of services on this drawing is not real proof that these services are not present in the ground. While every method of underground utility locating has been adhered to in this survey, some services may be outside the range of the GPR and electro-magnetic locating gear. These ground conditions and/or services outlined underneath other services can also prove impossible to locate. Due to the fact that not all Utility Service Plans were provided to Metrocon by the contractor, Metrocon cannot be held responsible for any services that have not been identified. The contractor should not assume that all services have been identified and located. The contractor should be aware that:

Hard / vacuum excavation is advised to determine exact depth and position of service prior to excavation commencing. Please note that the drawing provided is valid for 60 days from date stated below.

Drawing is intended solely for use of the contractor named below.

Accuracy Levels

In ideal conditions the accuracy levels of the EML is +/-5% whilst the GPR outputs accuracy levels of 10% up to 2.5m depth. These accuracy levels can vary depending on ground conditions, depths of services, congestion of services (may cause signal to bleed on to other services).

Depths noted on drawings should be taken as indicative and hand / vacuum excavation is advised where exact depth are required. Diameter of services will be given where direct access is available through visual inspection, eg manhole.

Survey Limitations

Non-conducive services pose a difficult task to identify. Certain buried fibre optic cables are difficult to identify with GPR. They can easily be traced when placed in a conduit by the means of a snake or cobra rod.
PE gas mains can also prove difficult to identify.

If Moticon cannot get an accurate signal from a service, it will be noted on the drawing that the service is "Taken from records GL-64".

If services cannot be opened on site, they will be marked on the drawing as "Unable to open".

Excluded from the survey areas otherwise stated

Domestic service. Services above ground. Disconnected services above no signal can be inferred.

Notes

1. GPR scanning frequency 250 and 700 mhz
Depth of investigation 2.5m, self calibrating.
2. Radio detection equipment:
Vivax Metrotech VproLoc2 / RD7000
3. GPR scanning limited to smooth surfaces only no obstruction.
Survey area marked on drawing
4. All depths stated are an indication of depth
caution required when excavating.
5. All Utilities are classified QL- B2 unless noted otherwise.

PAS 128

Study Title	Study Location	Study Design	Study Period	Study Results
1. Comparison of the two methods	10, 15	Unpaired	Unpaired	Assignment of 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280, 285, 290, 295, 300, 305, 310, 315, 320, 325, 330, 335, 340, 345, 350, 355, 360, 365, 370, 375, 380, 385, 390, 395, 400, 405, 410, 415, 420, 425, 430, 435, 440, 445, 450, 455, 460, 465, 470, 475, 480, 485, 490, 495, 500, 505, 510, 515, 520, 525, 530, 535, 540, 545, 550, 555, 560, 565, 570, 575, 580, 585, 590, 595, 600, 605, 610, 615, 620, 625, 630, 635, 640, 645, 650, 655, 660, 665, 670, 675, 680, 685, 690, 695, 700, 705, 710, 715, 720, 725, 730, 735, 740, 745, 750, 755, 760, 765, 770, 775, 780, 785, 790, 795, 800, 805, 810, 815, 820, 825, 830, 835, 840, 845, 850, 855, 860, 865, 870, 875, 880, 885, 890, 895, 900, 905, 910, 915, 920, 925, 930, 935, 940, 945, 950, 955, 960, 965, 970, 975, 980, 985, 990, 995, 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1035, 1040, 1045, 1050, 1055, 1060, 1065, 1070, 1075, 1080, 1085, 1090, 1095, 1100, 1105, 1110, 1115, 1120, 1125, 1130, 1135, 1140, 1145, 1150, 1155, 1160, 1165, 1170, 1175, 1180, 1185, 1190, 1195, 1200, 1205, 1210, 1215, 1220, 1225, 1230, 1235, 1240, 1245, 1250, 1255, 1260, 1265, 1270, 1275, 1280, 1285, 1290, 1295, 1300, 1305, 1310, 1315, 1320, 1325, 1330, 1335, 1340, 1345, 1350, 1355, 1360, 1365, 1370, 1375, 1380, 1385, 1390, 1395, 1400, 1405, 1410, 1415, 1420, 1425, 1430, 1435, 1440, 1445, 1450, 1455, 1460, 1465, 1470, 1475, 1480, 1485, 1490, 1495, 1500, 1505, 1510, 1515, 1520, 1525, 1530, 1535, 1540, 1545, 1550, 1555, 1560, 1565, 1570, 1575, 1580, 1585, 1590, 1595, 1600, 1605, 1610, 1615, 1620, 1625, 1630, 1635, 1640, 1645, 1650, 1655, 1660, 1665, 1670, 1675, 1680, 1685, 1690, 1695, 1700, 1705, 1710, 1715, 1720, 1725, 1730, 1735, 1740, 1745, 1750, 1755, 1760, 1765, 1770, 1775, 1780, 1785, 1790, 1795, 1800, 1805, 1810, 1815, 1820, 1825, 1830, 1835, 1840, 1845, 1850, 1855, 1860, 1865, 1870, 1875, 1880, 1885, 1890, 1895, 1900, 1905, 1910, 1915, 1920, 1925, 1930, 1935, 1940, 1945, 1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015, 2020, 2025, 2030, 2035, 2040, 2045, 2050, 2055, 2060, 2065, 2070, 2075, 2080, 2085, 2090, 2095, 2100, 2105, 2110, 2115, 2120, 2125, 2130, 2135, 2140, 2145, 2150, 2155, 2160, 2165, 2170, 2175, 2180, 2185, 2190, 2195, 2200, 2205, 2210, 2215, 2220, 2225, 2230, 2235, 2240, 2245, 2250, 2255, 2260, 2265, 2270, 2275, 2280, 2285, 2290, 2295, 2300, 2305, 2310, 2315, 2320, 2325, 2330, 2335, 2340, 2345, 2350, 2355, 2360, 2365, 2370, 2375, 2380, 2385, 2390, 2395, 2400, 2405, 2410, 2415, 2420, 2425, 2430, 2435, 2440, 2445, 2450, 2455, 2460, 2465, 2470, 2475, 2480, 2485, 2490, 2495, 2500, 2505, 2510, 2515, 2520, 2525, 2530, 2535, 2540, 2545, 2550, 2555, 2560, 2565, 2570, 2575, 2580, 2585, 2590, 2595, 2600, 2605, 2610, 2615, 2620, 2625, 2630, 2635, 2640, 2645, 2650, 2655, 2660, 2665, 2670, 2675, 2680, 2685, 2690, 2695, 2700, 2705, 2710, 2715, 2720, 2725, 2730, 2735, 2740, 2745, 2750, 2755, 2760, 2765, 2770, 2775, 2780, 2785, 2790, 2795, 2800, 2805, 2810, 2815, 2820, 2825, 2830, 2835, 2840, 2845, 2850, 2855, 2860, 2865, 2870, 2875, 2880, 2885, 2890, 2895, 2900, 2905, 2910, 2915, 2920, 2925, 2930, 2935, 2940, 2945, 2950, 2955, 2960, 2965, 2970, 2975, 2980, 2985, 2990, 2995, 3000, 3005, 3010, 3015, 3020, 3025, 3030, 3035, 3040, 3045, 3050, 3055, 3060, 3065, 3070, 3075, 3080, 3085, 3090, 3095, 3100, 3105, 3110, 3115, 3120, 3125, 3130, 3135, 3140, 3145, 3150, 3155, 3160, 3165, 3170, 3175, 3180, 3185, 3190, 3195, 3200, 3205, 3210, 3215, 3220, 3225, 3230, 3235, 3240, 3245, 3250, 3255, 3260, 3265, 3270, 3275, 3280, 3285, 3290, 3295, 3300, 3305, 3310, 3315, 3320, 3325, 3330, 3335, 3340, 3345, 3350, 3355, 3360, 3365, 3370, 3375, 3380, 3385, 3390, 3395, 3400, 3405, 3410, 3415, 3420, 3425, 3430, 3435, 3440, 3445, 3450, 3455, 3460, 3465, 3470, 3475, 3480, 3485, 3490, 3495, 3500, 3505, 3510, 3515

Client : PGL
Site Address : Mortarstown WWTP
Carlow

Drawing Title: Underground Services Plan	Drwg No:	1
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Date: 12th February 2021	Sheet No:	1
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Scale: 1:200 @ A1	Coordinates: ITM	Revision No:	
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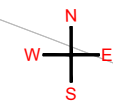
Address: Rathjarney
Piercestown
Co. Wexford
Tel (086) 8522298
(086) 1935847

Email: john@metroscan.ie
ciaran@metroscan.ie

Website: www.metroscan.ie

Sheet No. 1

Sheet No. 2



SERVICES LEGEND

UNDERGROUND ELECTRICITY LINE	FIXAL DRAINAGE
ELECTRICAL PIVOTAL	FIXAL AJ
OVERHEAD LINE WITH POLE	STORM DRAINAGE
OVERHEAD ELECTRIC	STORM DRAINAGE PIVOTAL
OVERHEAD 11KV	COMBINED DRAINAGE
UNDERGROUND 11KV ELECTRICITY LINE	COMBINED DRAINAGE PIVOTAL
ON HIGH STREET LIGHT	PRODUCT DRAINAGE
IRON PILLAR	PRODUCT DRAINAGE PIVOTAL
ERI	CHEMICAL LINE
ERI CHAMBER	CHEMICAL PIVOTAL
OVERHEAD LINE WITH POLE	ROAD GULLY
ENET	GULLY TRAP
COPIES CHAMBER	WATER MAIN
COPIES CHAMBER	SLICE VALVE
COPIES CHAMBER	FIRE WISDMAT
COPIES CHAMBER	WATER PETER
FIBRE	SCOUR VALVE
FIBRE CHAMBER	PRESSURE RELEASE VALVE
AURORA TELECOM	AIR VALVE
AURORA TELECOM CHAMBER	NON RETURN VALVE
CATV	FUEL LINE/TANK
CATV CHAMBER	GAS SV
BT	GAS LINE
BT CHAMBER	GAS HIGH PRESSURE LINE
ESTAT	GROUND LEVEL (METER) - IN SAVING
ESTAT CHAMBER	CL 10.00 COVER LEVEL (METER) - IN SAVING
SSRO FIBRE	CL 10.00 COVER LEVEL (METER) - IN SAVING
SSRO CHAMBER	CL 10.00 COVER LEVEL (METER) - IN SAVING
UNIDENTIFIED SERVICE	DEPTH TO TOP OF SERVICE DUCT OR CABLE
UNIDENTIFIED CHAMBER	DEPTH TO TOP OF SERVICE DUCT OR CABLE
EARTH LINE AND ROSS	UNABLE TO OPEN
TRAFFIC SENSORS	UNABLE TO OPEN
CCTV POLE	UNABLE TO OPEN
UTILITIES CABINET	UNABLE TO OPEN

Please note that the absence of services on this drawing is not proof that these services are not present in the ground. There may be a number of reasons for this, including the fact that the drawing is a plan view and does not show the depth of the services. The absence of services on this drawing is not proof that these services are not present in the ground. There may be a number of reasons for this, including the fact that the drawing is a plan view and does not show the depth of the services. The absence of services on this drawing is not proof that these services are not present in the ground. There may be a number of reasons for this, including the fact that the drawing is a plan view and does not show the depth of the services.

Accuracy Levels
In ideal conditions the accuracy levels of the GPR is +/- 10% while the GPR outside accuracy levels of 10% up to 2.5m depth. Accuracy levels are not dependent on ground conditions. Depth of service, completion of services may cause signal to be lost or to other services.
Depth noted on drawings should be taken as indicative and based on vacuum excavation is advised where exact depth are required. Operator of services will be given where direct access is available through visual inspection, air methods.

Service Limitations
Non-conductive services pose a difficult task to identify. Direct buried flow pipes cables are difficult to identify with GPR. They can easily be located when placed in a conduit by the means of a snake or cable reel.
GPR may not be able to penetrate through concrete.
If a location cannot get an accurate signal from a service, it will be noted on the drawing that the service is 'Taken from records' or 'CL 10.00'.
If a service cannot be opened or seen, they will be marked on the drawing as 'UNABLE TO OPEN'.
Excluded from the survey unless otherwise stated.

Notes

1. GPR scanning frequency 250 and 700 mhz
2. Depth of investigation 3.5m, self-calibrating.
3. Radio detection equipment: Vixax Metrotech VproLoc2 / RD7000
4. GPR scanning limited to smooth surfaces only no obstruction.
5. Survey area marked on drawing.
6. All depths stated are an indication of depth caution required when excavating.
7. All Utilities are indicated CL 10.00 unless noted otherwise.

PAS 128

Drawn Date	Scale	Location	Survey Method
18/01/2024	1:200	18/01/2024	18/01/2024
18/01/2024	1:200	18/01/2024	18/01/2024
18/01/2024	1:200	18/01/2024	18/01/2024
18/01/2024	1:200	18/01/2024	18/01/2024
18/01/2024	1:200	18/01/2024	18/01/2024
18/01/2024	1:200	18/01/2024	18/01/2024
18/01/2024	1:200	18/01/2024	18/01/2024
18/01/2024	1:200	18/01/2024	18/01/2024
18/01/2024	1:200	18/01/2024	18/01/2024

Client : PGL
Site Address : Mortarstown WWTP
Carlow

Drawing Title: Underground Services Plan
Drwg No: 1

Date: 12th February 2021
Sheet No: 2

Scale: 1:200 @ A1
Coordinates: ITM
Revision No:



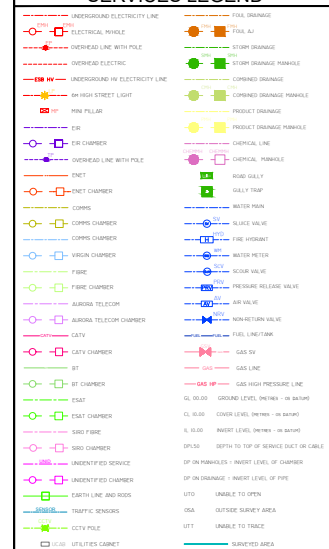
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ciar@metroscan.ie
Website: www.metroscan.ie

Sheet No.3



SURVEY AREA

SERVICES LEGEND



Please state that the absence of services on this drawing is not solid proof that these services are not present in the ground. While every method of underground utility locating has been adhered to in this survey, some services may be outside the range of the GPR and electro-magnetic locate signals. Poor ground conditions and/or services installed underneath other services can also prove to be difficult to locate. Due to the fact that not all Utility Service Plans were provided to Metrotrans by the contractor, Metrotrans cannot be held responsible for any services that have not been identified. The contractor should not assume that all services have been identified and must exercise a duty of care when excavating. Hand / vacuum excavators is advised to determine exact depth and position of service prior to excavation commencing. Please note that the drawing provided is valid for 90 days from date stated below.

Accuracy Levels

In ideal conditions the accuracy levels of the EML is $\pm 5\%$ whilst the GPR outputs accuracy levels of 10% up to 2.5m depth. These accuracy levels can vary depending on ground conditions, depths of services, congestion of services (may cause signal to bleed on to other services).

Depths noted on drawings should be taken as indicative and hand / vacuum excavation is advised where exact depth are required. Disruption of services will be noted where direct access is available (through visual inspection, as appropriate).

Survey Limitations

Non-conductive services pose a difficult task to identify. Direct buried fiber optic cables are difficult to identify with GPR. They can easily be traced when placed in a conduit by the means of a sonic or cable trace. PE gas mains can also prove difficult to identify.

If Metascan cannot get an accurate signal from a service, it will be noted on the drawing that the service is "Taken from records GI-64".

If manholes cannot be opened on site, they will be marked on the drawing as UTO (unable to open).

Services from the utility not shown on the drawing are not to be installed.

Notes

1. GPR scanning frequency 250 and 700 mhz
Depth of investigation 2.5m, self calibrating.
2. Radio detection equipment:
Vivax Metrotech VproLoc2 / RD7000
3. GPR scanning limited to smooth surfaces only no obstruction.
Survey area marked on drawing
4. All depths stated are an indication of depth
caution required when excavating.
5. All Utilities are classified QL- B2 unless noted otherwise.

PAS 128

[illegible]

Client : PGL
Site Address : Mortarstown WWTP
Carlow

Drawing Title: Underground Services Plan	Drwg No:	1
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Date: 12th February 2021	Sheet No:	3
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Scale: 1:200 @ A1	Coordinates: ITM	Revision No:	
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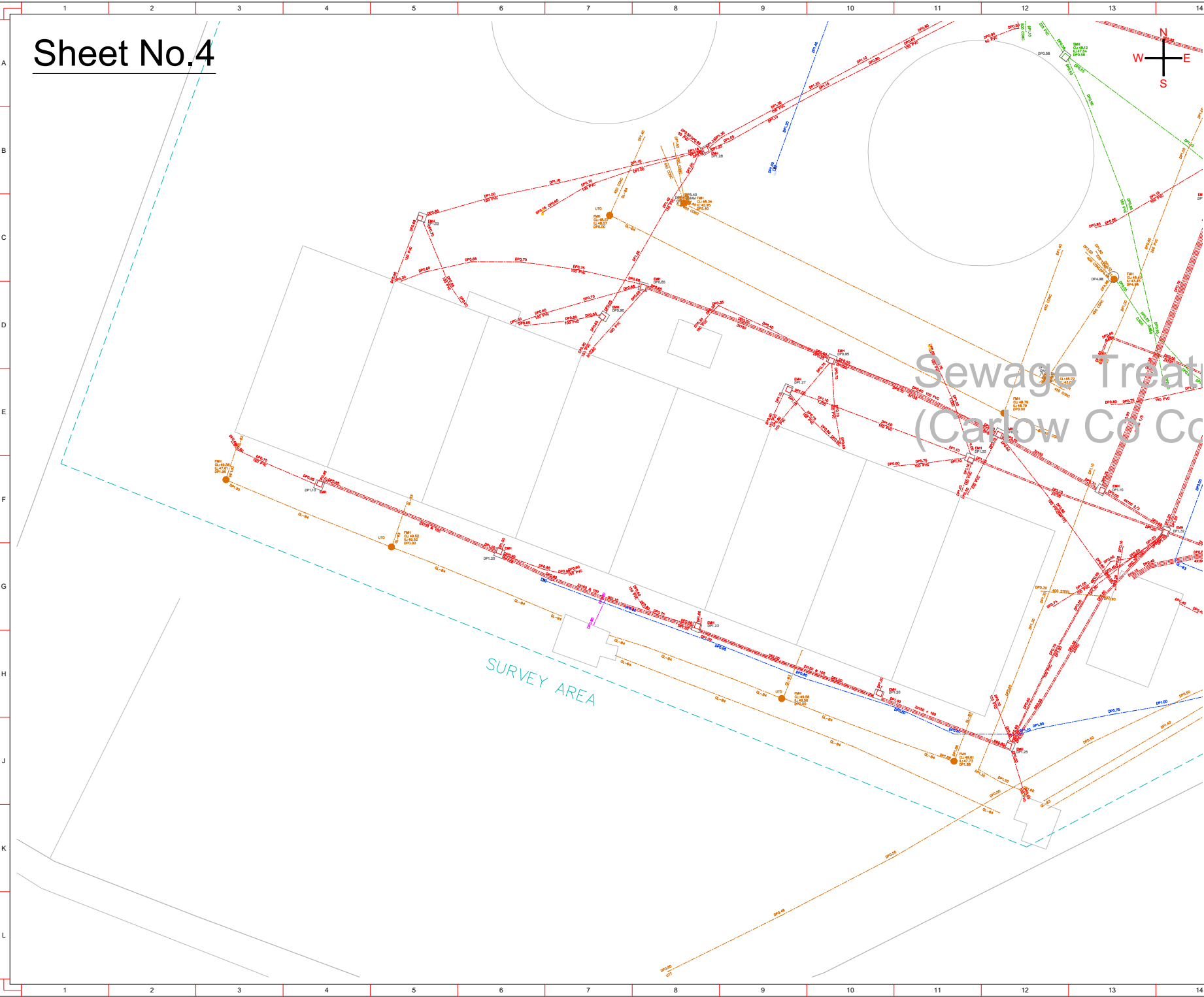
METROSCAN
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Sheet No.4



SERVICES LEGEND

- UNDERGROUND ELECTRICITY LINE
- ELECTRICITY PIVOTAL
- OVERHEAD LINE WITH POLE
- OVERHEAD ELECTRIC
- UNDERGROUND HV ELECTRICITY LINE
- ON HIGH STREET LIGHT
- IRON PILLAR
- ERI
- ERI CHAMBER
- OVERHEAD LINE WITH POLE
- ENET
- CORPUS CHAMBER
- CORPUS CHAMBER
- VIRGUS CHAMBER
- FIBRE CHAMBER
- AURORA TELECOM
- AURORA TELECOM CHAMBER
- CATV
- CATV CHAMBER
- BT
- BT CHAMBER
- ESTAT
- ESTAT CHAMBER
- SISO FIBRE
- UNIDENTIFIED SERVICE
- UNIDENTIFIED CHAMBER
- EARTH LINE AND ROSS
- TRAFFIC SENSORS
- CCTV POLE
- UTILITY CABINET
- TRAIL DRAINAGE
- STORY DRAINAGE
- COMBINED DRAINAGE
- COMBINED DRAINAGE PIVOTAL
- PRODUCT DRAINAGE
- PRODUCT DRAINAGE PIVOTAL
- CHEMICAL LINE
- CHEMICAL PIVOTAL
- ROAD GULLY
- GULLY TRAP
- WATER MAIN
- SLICE VALVE
- FIRE WISDMAT
- WATER METER
- SCOUR VALVE
- PRESSURE RELEASE VALVE
- AIR VALVE
- NON RETURN VALVE
- FUEL LINE/TANK
- GAS SV
- GAS HP
- GAS HIGH PRESSURE LINE
- CL 00.00 GROUND LEVEL (METER) - IN SITU
- CL 00.00 COVER LEVEL (METER) - IN SITU
- CL 00.00 INVERT LEVEL (METER) - IN SITU
- DP 00.00 DEPTH TO TOP OF SERVICE DUCT OR CABLE
- DP 00.00 INVERT LEVEL OF CHAMBER
- DP 00.00 UNABLE TO OPEN
- USA OUTSIDE SURVEY AREA
- UTT UNABLE TO TRACE
- SURVEYED AREA

Please note that the absence of services on this drawing is not a proof that these services are not present in the ground. The absence of services may be due to the fact that the survey was not conducted in the area of the GPR and/or the GPR was not used in the area of the GPR. The absence of services may be due to the fact that the survey was not conducted in the area of the GPR and/or the GPR was not used in the area of the GPR. The absence of services may be due to the fact that the survey was not conducted in the area of the GPR and/or the GPR was not used in the area of the GPR.

Accuracy Levels
In ideal conditions the accuracy levels of the GPR is +/- 0.1m while the GPR outside accuracy levels of 10% up to 2.5m depth. The accuracy levels may vary depending on ground conditions, depth of service, complexity of services, etc. The accuracy levels may vary depending on ground conditions, depth of service, complexity of services, etc. The accuracy levels may vary depending on ground conditions, depth of service, complexity of services, etc.

Access Limitations
Non-conductive services pose a difficult task to identify. Direct buried flow with cables are difficult to identify with GPR. They can easily be located when placed in a conduit by the means of a snake or cable reel. If the service cannot be located by the means of a snake or cable reel, it will be noted on the drawing that the service is 'Taken from records' or 'Not located'. If the service cannot be located by the means of a snake or cable reel, it will be noted on the drawing that the service is 'Taken from records' or 'Not located'. If the service cannot be located by the means of a snake or cable reel, it will be noted on the drawing that the service is 'Taken from records' or 'Not located'.

Notes

1. GPR scanning frequency 250 and 700 mhz
2. Depth of investigation 2.5m, self calibrating.
3. Radio detection equipment: Vixax Metrotech VproLoc2 / RD7000
4. GPR scanning limited to smooth surfaces only no obstruction.
5. Survey area marked on drawing.
6. All depths stated are an indication of depth caution required when excavating.
7. All Utilities are classified CL, RD, RD unless noted otherwise.

PAS 128

Drawn Date	Scale	Location	Client	Project
15/02/2021	1:200	12th February 2021	PGL	Mortartstown WWTP

Client : PGL
Site Address : Mortartstown WWTP
Carlow

Drawing Title: Underground Services Plan
Drwg No: 1

Date: 12th February 2021
Sheet No: 4

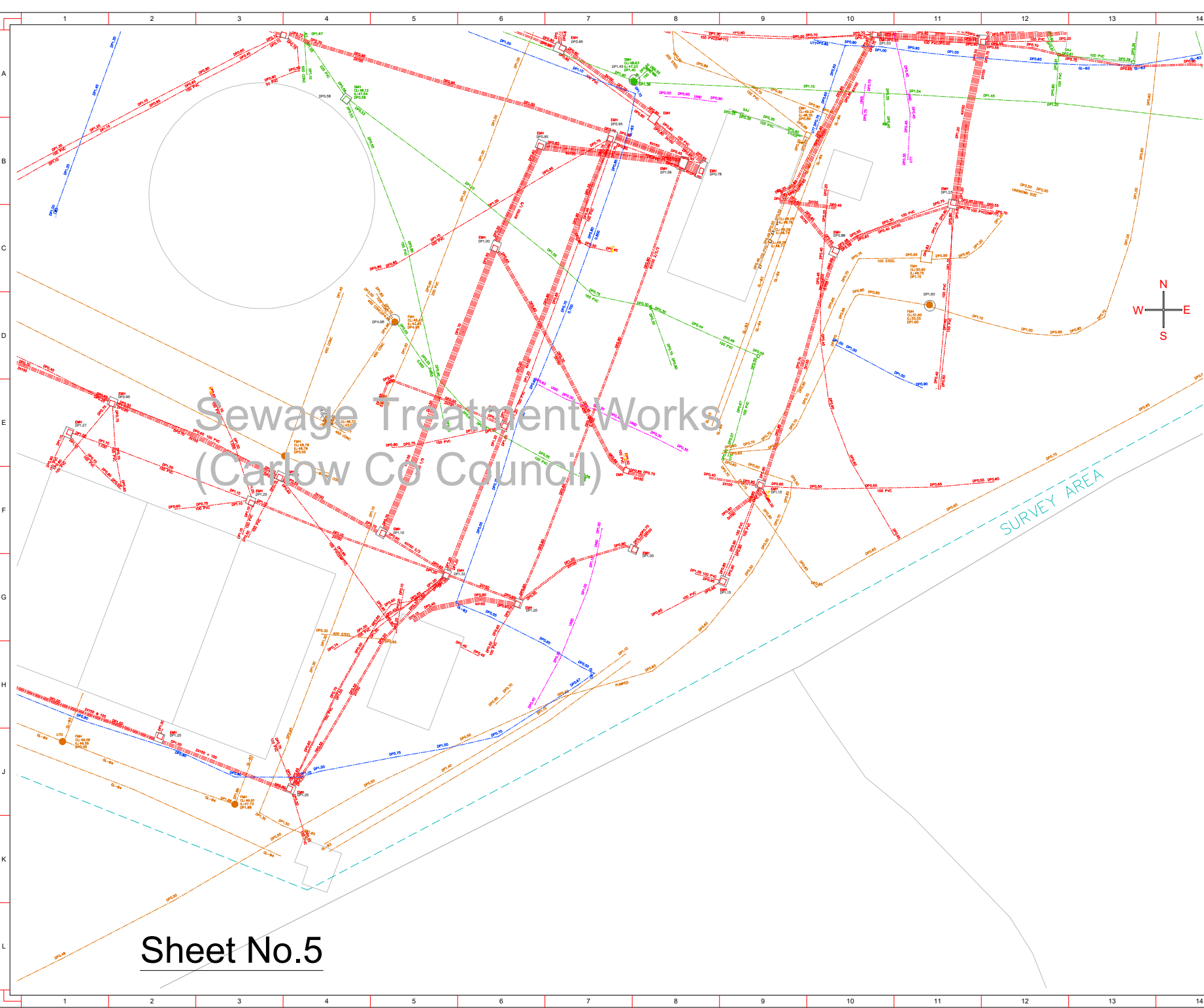
Scale: 1:200 @ A1
Coordinates: ITM
Revision No:



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Sewage Treatment Works (Carlow Co Council)

Sheet No.5

SERVICES LEGEND

- [illegible]

Please note that the absence of services on this drawing is not valid proof that these services are not present in the ground. While every method of underground utility locating has been adhered to in this survey, some services may be outside the range of the GPR and other magnetic locator signal. Poor ground conditions and/or services installed underneath other services can also prove impossible to locate. Due to the fact that not all Utility Service Plans were provided to Mathematic by the contractor Mathematic cannot be held responsible for any services that have been identified. The contractor should not assume that all services have been identified and must exercise a duty of care when excavating. Hand / vacuum excavation is advised to determine exact depth and position of service prior to excavation commencing. Please note that the drawing provided is valid for 65 days from date stated below.

Accuracy Levels

In ideal conditions the accuracy levels of the EML is $\pm 0.5\%$ whilst the GPR outputs accuracy levels of 10% up to 2.5m depth. These accuracy levels can vary depending on ground conditions, depths of services, congestion of services (may cause signal to be lost on to other services).

Depths noted on drawings should be taken as indicative and hand / vacuum excavation is advised where exact depth are required. Diameter of services will be given where direct access is available through visual inspection, eg manholes.

Access to Installation

Non-conductable services pose a difficult task to identify. Direct buried fibre optic cables are difficult to identify with GPR. They can easily be traced when placed in a conduit by the means of a sonde or cobra reel. PE gas mains can also prove difficult to identify.

If Metascan cannot get an accurate signal from a service, it will be noted on the drawing that the service is "Taken from records Q1-B4".

If manholes cannot be opened on site, they will be marked on the drawing as UTO (unable to open).

Excluded from the survey unless otherwise stated:

Notes

1. GPR scanning frequency 250 and 700 mhz
Depth of investigation 2.5m, self calibrating.
2. Radio detection equipment:
Vivax Metrotech VproLoc2 / RD7000
3. GPR scanning limited to smooth surfaces only no obstruction.
Survey area marked on drawing
4. All depths stated are an indication of depth
caution required when excavating.
5. All Utilities are classified C1 - D2 unless noted otherwise.

PAS 128

[illegible]

Client : PGL
Site Address : Mortarstown WWTP
Carlow

Drawing Title: Underground Services Plan	Drwg No:	1
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Date: 12th February 2021	Sheet No:	5
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Scale: 1:200 @ A1	Coordinates: ITM	Revision No:	
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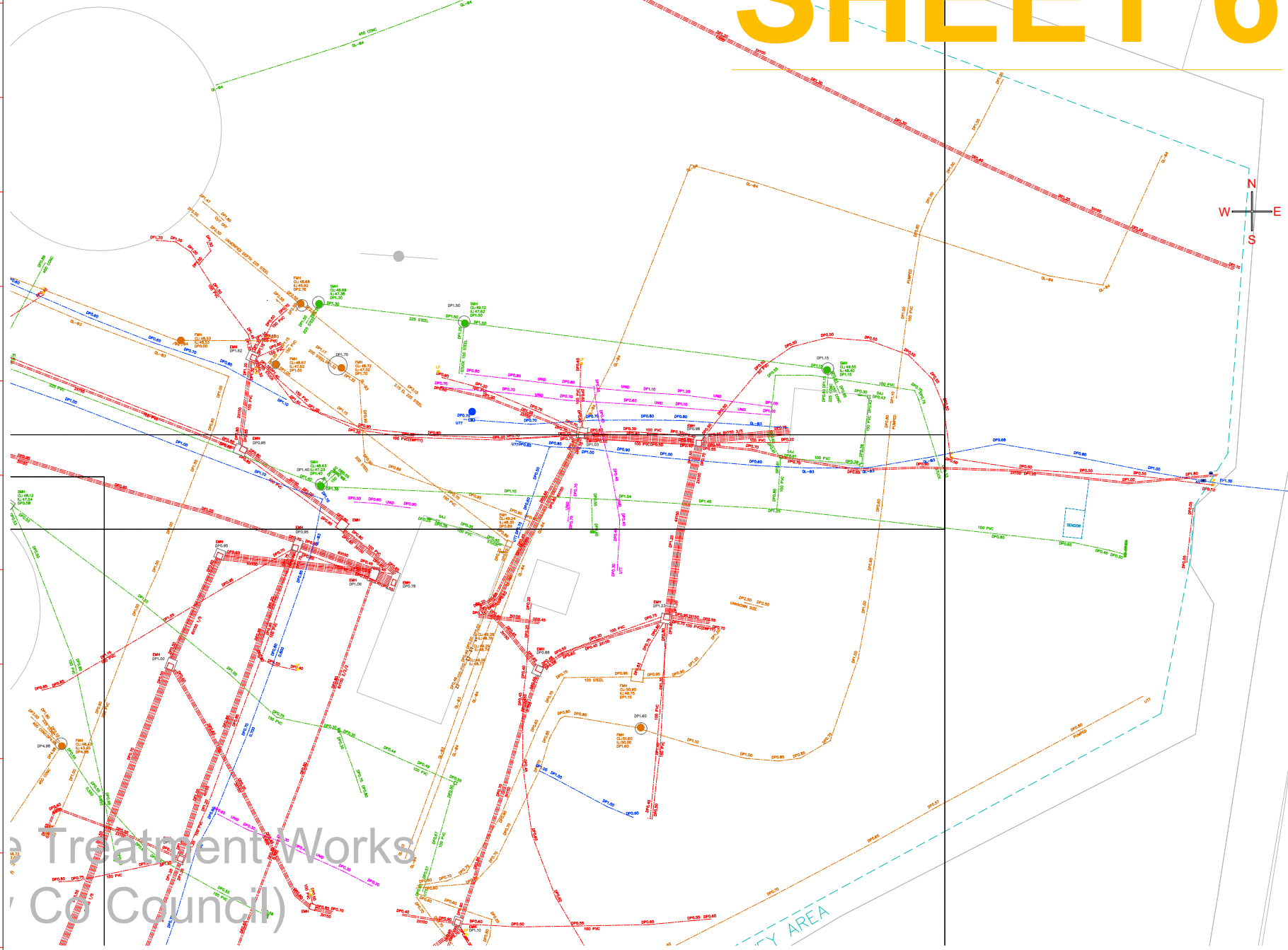


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SHEET 6

[illegible]

Please note that the absence of services on this drawing is not solid proof that these services are not present in the ground. While every method of underground utility locating has been adhered to in this survey, some services may be outside the range of the GPR and electro-magnetic locating tools. Poor ground conditions and/or services installed underneath other services can also prove to be a hindrance. Due to the fact that not all Utility Service Plans were provided to Metrotech by the Contractor, Metrotech cannot be held responsible for any services that have not been identified. The contractor should not assume that all services have been identified and must exercise a duty of care when excavating. Hand / vacuum excavation is advised to determine exact depth and position of service prior to excavation commencing. Please note that the drawing provided is valid for 60 days from date stated below.

1. GPR scanning frequency 250 and 700 mhz
Depth of investigation 2.5m, self calibrating.
2. Radio detection equipment:
Vivax Metrotech VproLoc2 / RD7000
3. GPR scanning limited to smooth surfaces only no obstruction.
Survey area marked on drawing
4. All depths stated are an indication of depth
caution required when excavating.
5. All Utilities are classified QL- B2 unless noted otherwise.

PAS 128			
Asset type	Supply type	Location/destination	Supplying site
		method	method
1) Continuity of the road network	12-1	landfill	landfill
2) UK Road Network	12-1	landfill	landfill
	12-2	landfill	landfill
	12-3	landfill	landfill
	12-4	landfill	landfill
	12-5	landfill	landfill
	12-6	landfill	landfill
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	12-97	landfill	landfill
	12-98	landfill	landfill
	12-99	landfill	landfill
	12-100	landfill	landfill

Client : PGL
Site Address : Mortarstown WWTP
Carlow

Drawing Title: Underground Services Plan		Drwg No:	1
Date: 12th February 2021		Sheet No:	6
Scale: 1:200 @ A1	Coordinates: ITM	Revision No:	

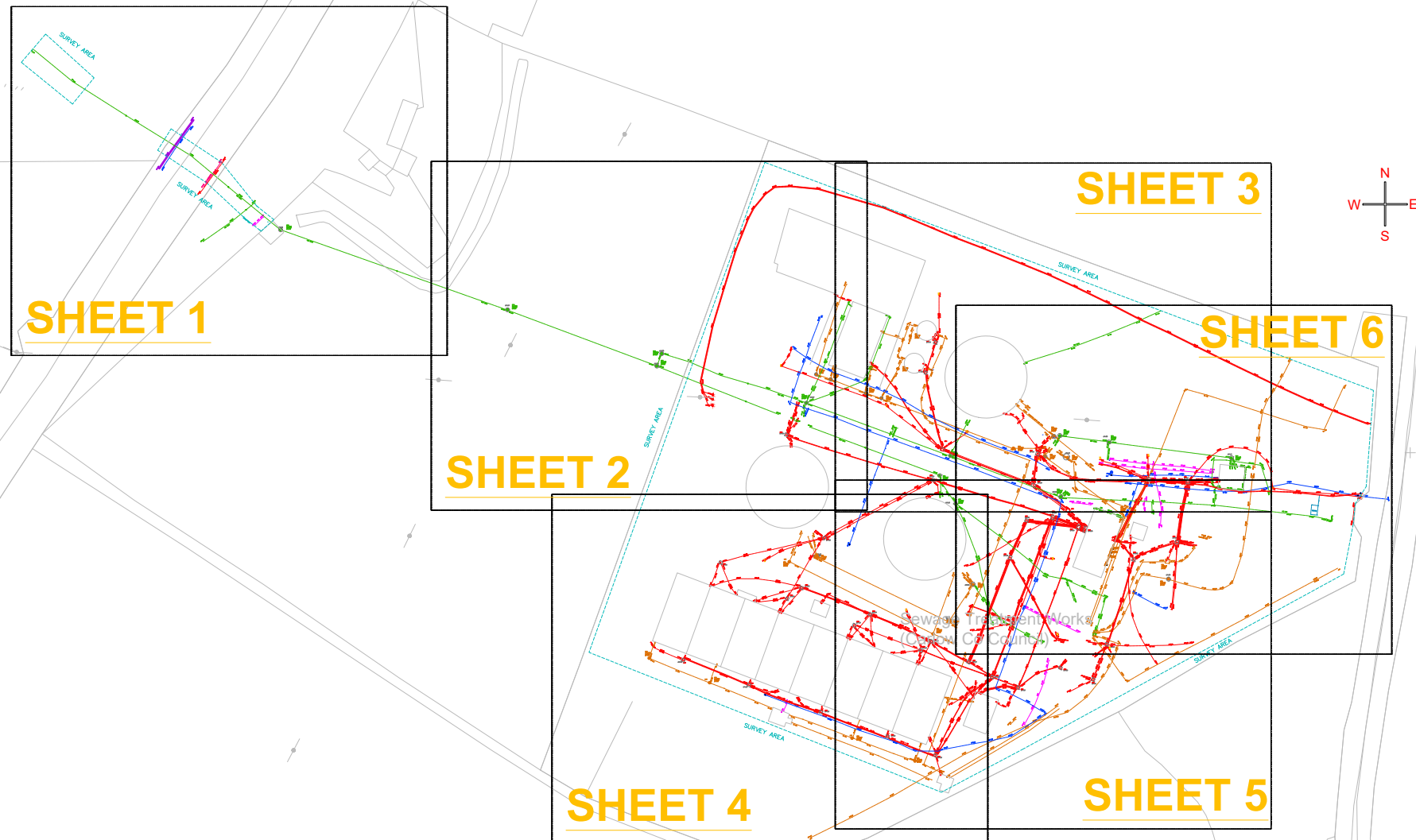
METROSCAN
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(086) 1935847

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Website: www.metroscan.ie

Key Plan



SERVICES LEGEND

[illegible]

Please state that the absence of services on this drawing is not solid proof that these services are not present in the ground. While every method of underground utility locating has been adhered to in this survey, some services may be outside the range of GPR and electro-magnetic locate signals. Poor ground conditions and/or services installed underneath other services can also prove to be difficult to locate. Due to the fact that not all Utility Service Plans were provided to Metrotrans by the contractor, Metrotrans cannot be held responsible for any services that have not been identified. The contractor should not assume that all services have been identified and must exercise a duty of care when excavating. Hand / vacuum excavators is advised to determine exact depth and position of service prior to excavation commencing. Please note that the drawing provided is valid for 90 days from date stated below.

Accuracy Levels

In ideal conditions the accuracy levels of the EML is $\pm 0.5\%$ whilst the GPR outputs accuracy levels of 10% up to 2.5m depth. These accuracy levels can vary depending on ground conditions, depths of services, congestion of services (may cause signal to bleed on to other services).

Depths noted on drawings should be taken as indicative and hand / vacuum excavation is advised where exact depth are required.

Diameter of services will be given where direct access is available through visual inspection, eg manhole.

Survey Limitations

Non-conductable services pose a difficult task to identify. Direct buried fibre optic cables are difficult to identify with GPR. They can easily be traced when placed in a conduit by the means of a sonic or cables reel.

PE gas mains can also prove difficult to identify.

If Motecoran cannot get an accurate signal from a service, it will be noted on the drawing that the service is 'Taken from records Q1-Q4'.

If a manhole cannot be surveyed on site, they will be marked on the drawing as UTO (unable to open).

Excluded from the survey unless otherwise stated:

Notes

1. GPR scanning frequency 250 and 700 mhz
Depth of investigation 2.5m, self calibrating.
2. Radio detection equipment:
Vivax Metrotech VProLoc2 / RD7000
3. GPR scanning limited to smooth surfaces only no obstruction.
Survey area marked on drawing
4. All depths stated are an indication of depth
caution required when excavating.
5. All Utilities are classified QL- B2 unless noted otherwise.

PAS 128

[illegible]

Client : PGL
Site Address : Mortarstown WWTP
Carlow

Drawing Title: Underground Services Plan	Drwg No:	1
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Date: 12th February 2021	Sheet No:	Key
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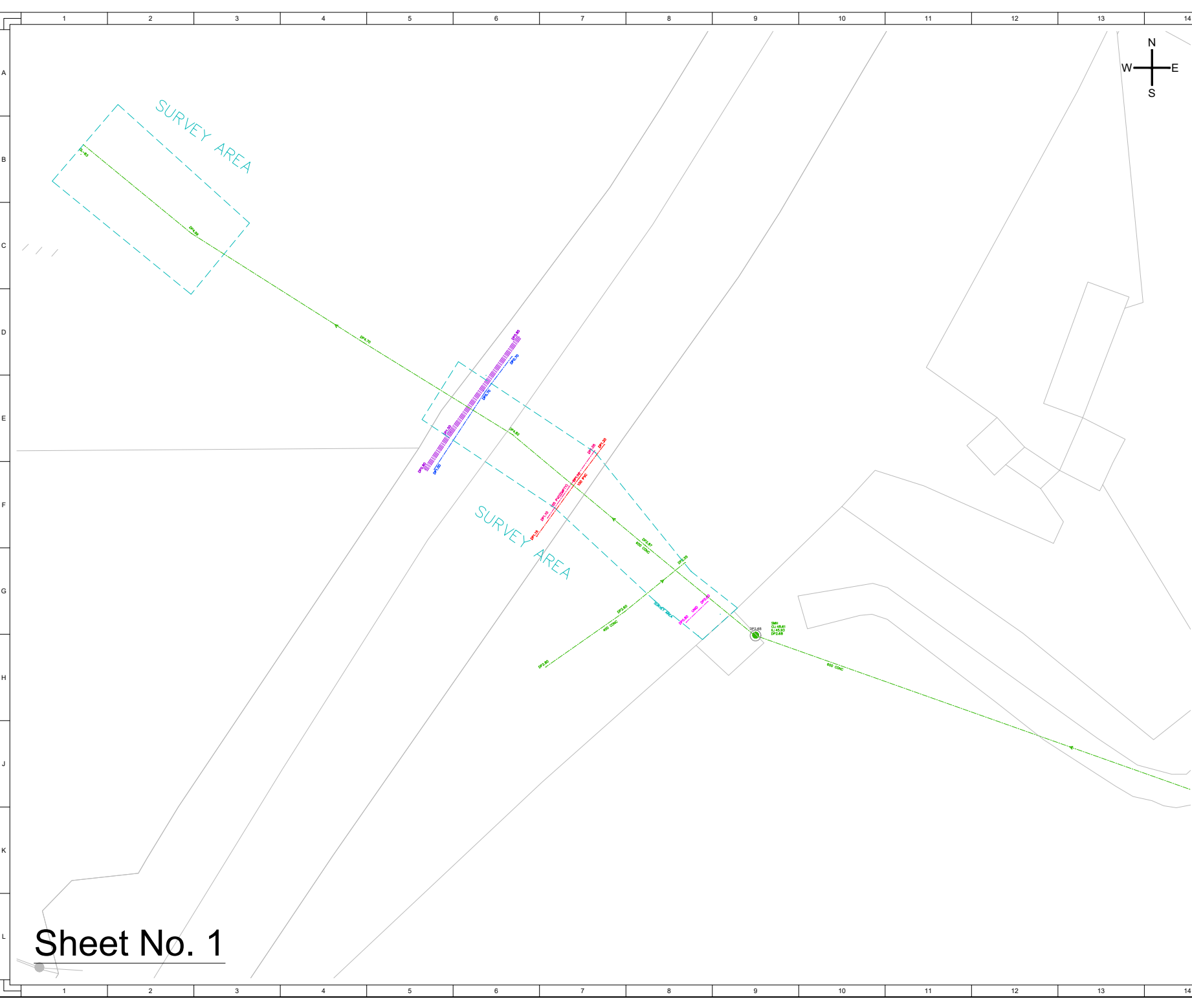
Scale: 1:200 @ A1	Coordinates: ITM	Revision No:	
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Website: www.metroscan.ie



SERVICES LEGEND

UNDERGROUND ELECTRICITY LINE	FIXAL DRAINAGE
ELECTRICAL PIVOTAL	STORM DRAINAGE
OVERHEAD LINE WITH POLE	STORM DRAINAGE PIVOTAL
OVERHEAD ELECTRIC	COMBINED DRAINAGE
OH HIGH STREET LIGHT	COMBINED DRAINAGE PIVOTAL
IRON PILLAR	PRODUCT DRAINAGE
ERI	PRODUCT DRAINAGE PIVOTAL
ERI CHAMBER	CHEMICAL LINE
OVERHEAD LINE WITH POLE	CHEMICAL PIVOTAL
ENET	ROAD GULLY
ENET CHAMBER	GULLY TRAP
CORRIS	WATER MAIN
CORRIS CHAMBER	SLICE VALVE
CORRIS CHAMBER	FIRE WISDMANT
FIBRE	WATER PETER
FIBRE CHAMBER	SCOUR VALVE
AURORA TELECOM	PRESSURE RELEASE VALVE
AURORA TELECOM CHAMBER	AIR VALVE
CATV	NON RETURN VALVE
CATV CHAMBER	FUEL LINE/TANK
BT	GAS SV
BT CHAMBER	GAS LINE
ESTAT	GAS HIGH PRESSURE LINE
ESTAT CHAMBER	GROUND LEVEL (METER) - IN SAVING
SSIO FIBRE	COVER LEVEL (METER) - IN SAVING
SSIO CHAMBER	COVER LEVEL (METER) - IN SAVING
UNIDENTIFIED SERVICE	DEPTH TO TOP OF SERVICE DUCT OR CABLE
UNIDENTIFIED CHAMBER	DEPTH TO TOP OF SERVICE DUCT OR CABLE
EMT LINE AND ROSS	UNABLE TO OPEN
TRAFFIC SENSORS	UNABLE TO OPEN
CCTV POLE	UNABLE TO OPEN
UTILITIES CABINET	UNABLE TO OPEN

Please note that the absence of services on the drawing is not proof that these services are not present in the ground. There may be a number of reasons why services are not shown, including but not limited to the scope of the GPR and electromagnetic survey. For ground conditions and/or services shown, the contractor should not assume that all services have been identified and must exercise a duty of care when excavating.

Notes / excavations are advised to determine exact depth and position of service prior to excavation commencing. Please note that the drawing is not a scale for 50 days from the date of issue.

Accuracy Levels

In ideal conditions the accuracy levels of the GPR is +/- 10% whilst the GPR outside accuracy levels of 10% up to 2.5m depth. They can easily be located when placed in a conduit by the means of a sound or cable reel.

It is not possible to identify non-conductive services pose a difficult task to identify. Direct buried flow cable are difficult to identify with GPR.

If a location cannot get an accurate signal from a service, it will be noted on the drawing that the service is "Taken from records or LTO".

If a service cannot be opened on site, they will be marked on the drawing as LTO (unable to open).

Excluded from the survey unless otherwise stated.

Accuracy levels: Services shown on drawing. Accuracy levels shown on drawing are not to be taken.

Notes

- GPR scanning frequency 250 and 700 mhz
- Depth of investigation 3.5m, self-calibrating.
- Radio detection equipment: Vixax Metrotech VproLoc2 / RD7000
- GPR scanning limited to smooth surfaces only no obstruction.
- Survey area marked on drawing.
- All depths stated are an indication of depth caution required when excavating.
- All Utilities are classified O.U. R2 unless noted otherwise.

PAS 128

Index Type	Index	Index	Index
1.1	Index	Index	Index
1.2	Index	Index	Index
1.3	Index	Index	Index
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1.5	Index	Index	Index
1.6	Index	Index	Index
1.7	Index	Index	Index
1.8	Index	Index	Index
1.9	Index	Index	Index
1.10	Index	Index	Index

Client : PGL

Site Address : Mortarstown WWTP Carlow

Drawing Title: Underground Services Plan

Drwg No: 1

Date: 12th February 2021

Sheet No: 1

Scale: 1:200 @ A1

Coordinates: ITM

Revision No:

METROSCAN

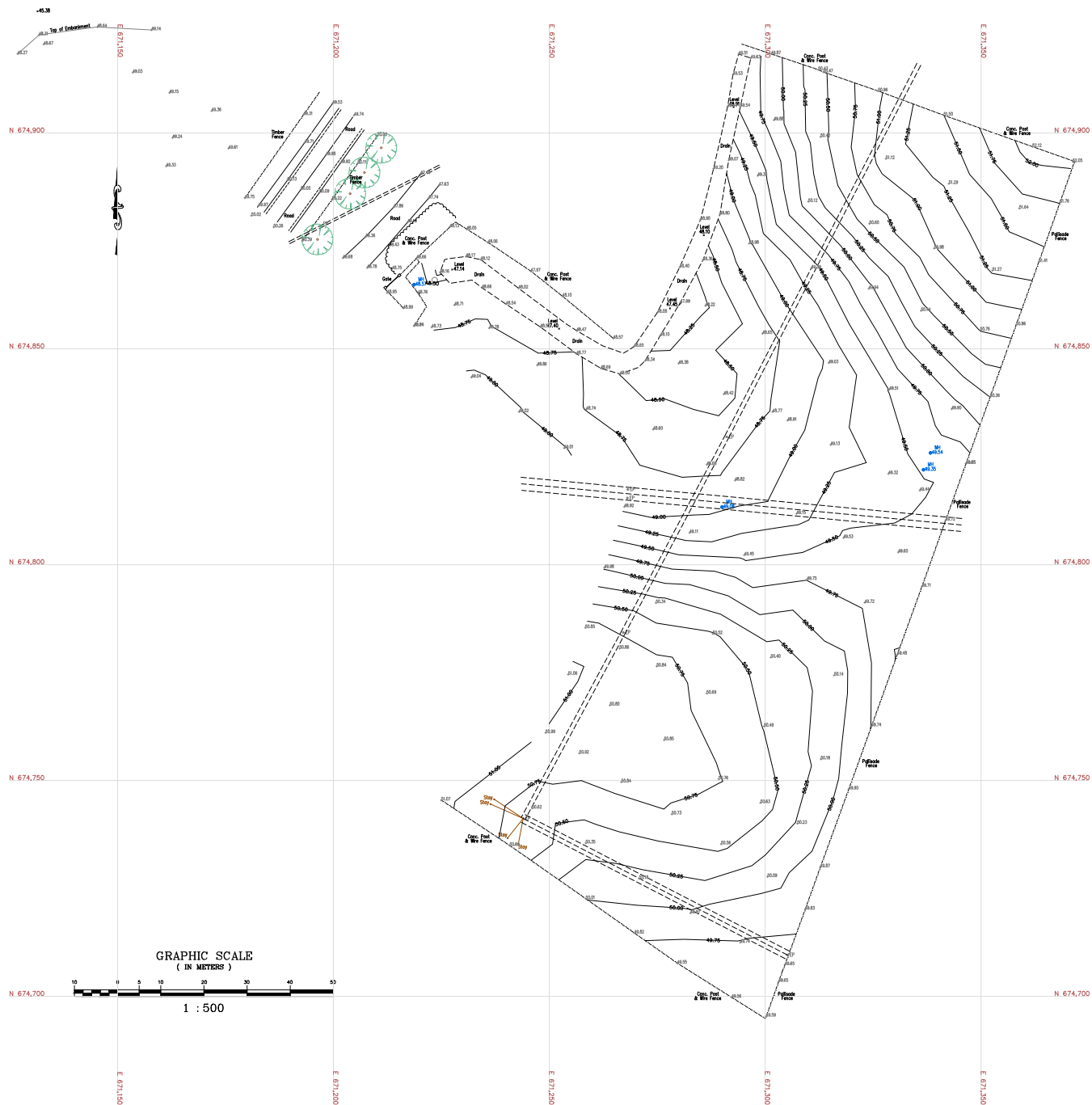
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Sheet No. 1



- NOTES:**
1. All levels are relative to Ordnance Datum
 2. 25m sq grid relative to Irish Transverse Mercator co-ordinate reference system
 3. Contours are at 0.25m intervals

SYMBOL LEGEND			
○ TP	Telecom Pole	○ DP	ESB Pole
○ LS	Lamp Standard	● RL	Traffic Light
+ Sign	Sign	+1 Sign	Traffic Sign
○ Camera	Camera	○ BS	Bollard
○ Stop	Stop	○ Post	Post
○ Light	Light	○ BS	Bin
○ Box	Gas Box	○ Gas	Gas
○ Telecom Duct	Telecom Duct	○ ESB Duct	ESB Duct
○ Cable TV Duct	Cable TV Duct	○ Service	Service
○ Fire Hydrant	Fire Hydrant	○ DR	Earth Rod
○ Manhole & Cover Level	Manhole & Cover Level	○ Arm	Armstrong Junction
○ Tree	Tree	○ Bush/Shrub	Bush/Shrub
○ Air Valve	Air Valve	○ Shut	Shut
○ Water Valve	Water Valve	○ Spot	Spot
○ Ridge Height	Ridge Height	○ Eaves	Eaves
○ Finished Floor Level	Finished Floor Level	○ Roof	Roof
○ Coping Height	Coping Height	○ Boundary	Boundary

LINE TYPE LEGEND			
——	Ball	——	Building
——	Footpath	——	Pipth
——	Concrete Edge	——	Slap
——	Fence	——	Mound
——	Centerline of Trees	——	Hedge
——	Drain/River	——	Flower Bed
——	ESB Line	——	Telecom Line
——	Kerb	——	Road
——	Contour Major	——	Contour Minor
——	Bottom of Bank	——	Top of Bank
——	Yellow Line	——	White Line

REVISIONS	
No.	Description

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Topographical Survey of Mortarstown/Kilkenny Road Site at Mortarstown Upper, Carlow.



- NOTES:
1. All levels are relative to Ordnance Datum Malin Head
 2. 25m sq grid relative to Irish Transverse Mercator co-ordinate reference system
 3. Contours are at 0.25m intervals

SYMBOL LEGEND			
TP	Telecom Pole	GP	ESB Pole
LS	Lamp Standard	TL	Traffic Light
SG	Sign	TS	Traffic Sign
CC	Camera	BS	Bollard
ST	Sty	PT	Post
LI	Light	BL	Bin
GB	Gas Box	GS	Gas
TD	Telecom Duct	ED	ESB Duct
TB	Telecom Box	EB	ESB Box
CTV	Cable TV Duct	CS	Service
FD	Fire Hydrant	ER	Earth Rod
ML	Manhole & Cover Level	AR	Armstrong Junction
GV	Gully	DR	Drain
TR	Tree	BSH	Bush/Shrub
GP	Grass	FP	Flower Bed
AV	Air Valve	SV	Shut-off Valve
WV	Water Valve	WM	Water Meter
RV	Ridge Height	FFL	Finished Floor Level
BL	Boundary Height	CH	Coping Height

LINE TYPE LEGEND		Building
Footpath	Plinth	
Concrete Edge	Slap	
Fence	Mound	
Centerline of Trees	Hedge	
Drain/River	Flower Bed	
ESB Line	Telecom Line	
Kerb	Road	
Contour Major	Contour Minor	
Bottom of Bank	Top of Bank	
Yellow Line	White Line	

REVISIONS	
No.	Description

METROSCAN
UTILITY LOCATING

Address: Rathjarney
Piercestown
Co. Wexford
Tel (086) 8522298
(086) 1935847

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Topographical Survey of Mortantown/Kilkenny
Road Site at Mortantown Upper, Carlow.