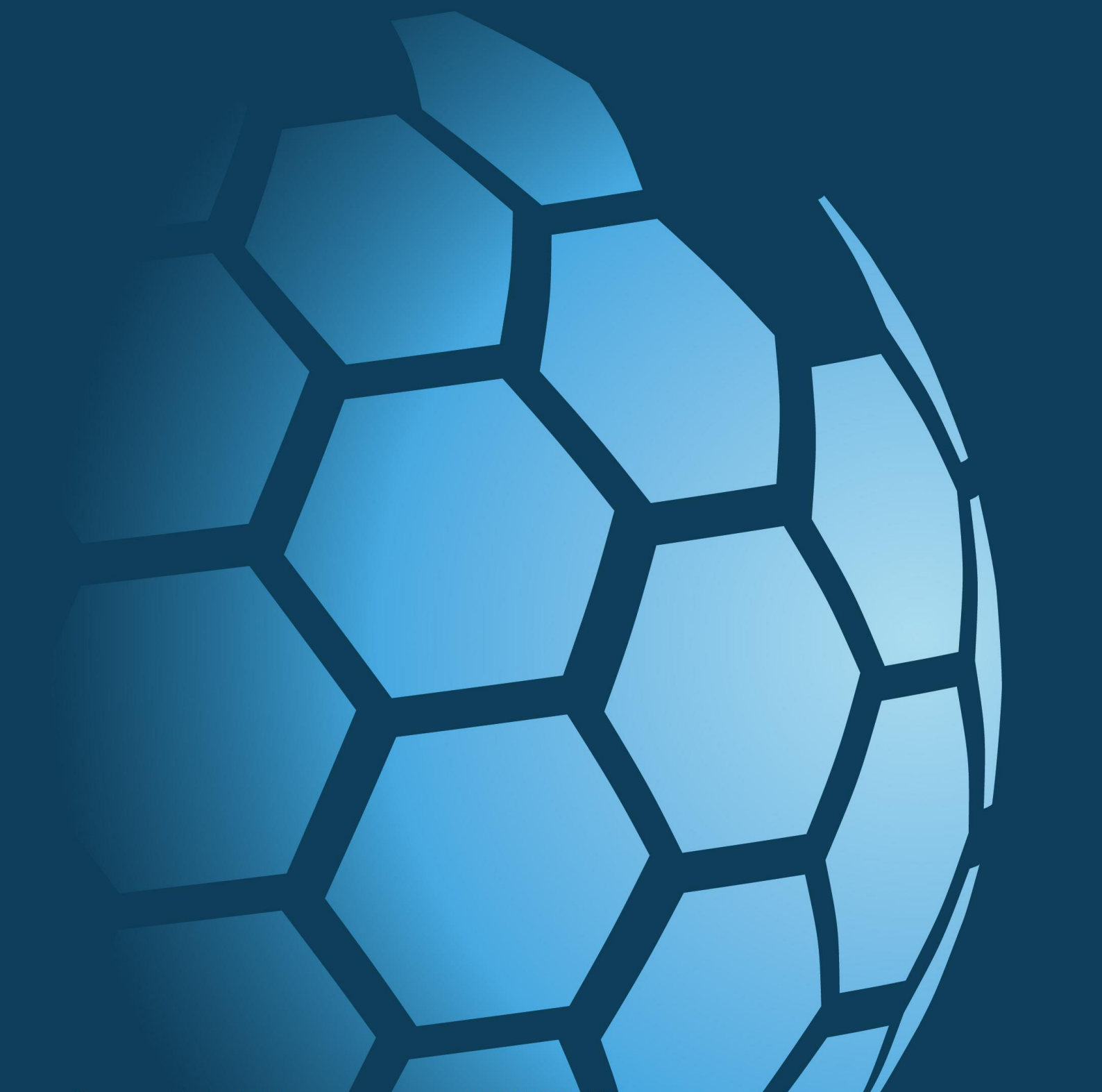




CAUSEWAY
— GEOTECH

APPENDIX E

Infiltration test results



Project No.: 17-0524

Site: Ballymun NCOD - Site Investigation

Test Location: SA01

Date 02/06/2017

Causeway Geotech Ltd
Infiltration Test

Analysis using method as described in
BRE Digest 365 and
CIRIA Report C697-The SUDS Manual

width (m) length (m)
test pit top dimensions 0.65 1.45
test pit base dimensions 0.65 0.55
test pit depth 1.5 m

infiltration rate (q) is very low
depth to groundwater before adding water (m) = Dry

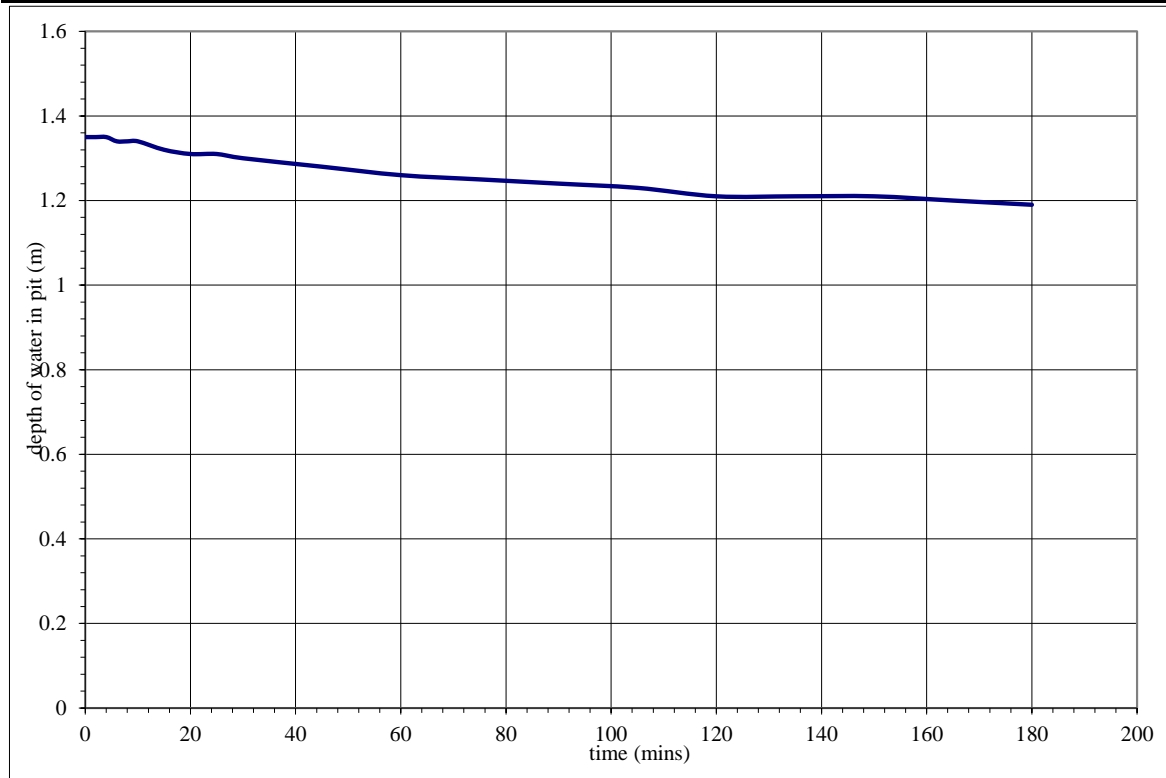
time (mins)	depth to water surface (m)	depth of water in pit (m)
0	0.15	1.35
1	0.15	1.35
2	0.15	1.35
4	0.15	1.35
6	0.16	1.34
8	0.16	1.34
10	0.16	1.34
15	0.18	1.32
20	0.19	1.31
25	0.19	1.31
30	0.2	1.3
45	0.22	1.28
60	0.24	1.26
75	0.25	1.25
90	0.26	1.24
105	0.27	1.23
120	0.29	1.21
135	0.29	1.21
150	0.29	1.21
165	0.3	1.2
180	0.31	1.19

From graph below:

test start - 75% depth at
1.0125 m water depth
time is not determined

test end - 25% depth at
0.3375 m water depth
time is not determined

time (mins)	depth to water surface (m)	depth of water in pit (m)	time elapsed (mins)	volume of water lost (m3)	Area of walls and base at 50% drop (m2)	q (m/min)	q (m/h)



Project No.: 17-0524

Site: Ballymun NCOD - Site Investigation

Test Location: SA02

Date 02/06/2017

Causeway Geotech Ltd
Infiltration Test

Analysis using method as described in
BRE Digest 365 and
CIRIA Report C697-The SUDS Manual

width (m) length (m)
test pit top dimensions 0.65 1.65
test pit base dimensions 0.65 0.85
test pit depth 1.5 m

infiltration rate (q) is very low
depth to groundwater before adding water (m) = Dry

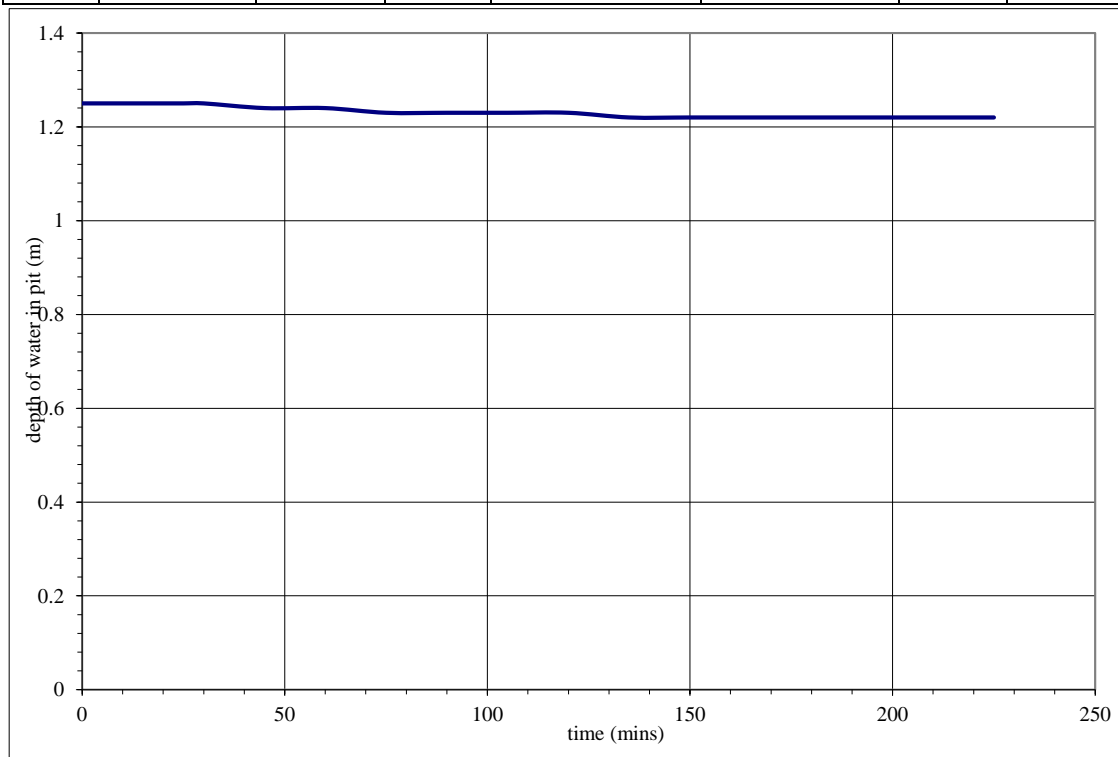
time (mins)	depth to water surface (m)	depth of water in pit (m)
0	0.25	1.25
1	0.25	1.25
2	0.25	1.25
4	0.25	1.25
6	0.25	1.25
8	0.25	1.25
10	0.25	1.25
15	0.25	1.25
20	0.25	1.25
25	0.25	1.25
30	0.25	1.25
45	0.26	1.24
60	0.26	1.24
75	0.27	1.23
90	0.27	1.23
105	0.27	1.23
120	0.27	1.23
135	0.28	1.22
150	0.28	1.22
165	0.28	1.22
180	0.28	1.22
195	0.28	1.22
210	0.28	1.22
225	0.28	1.22

From graph below:

test start - 75% depth at
0.9375 m water depth
time is not determined

test end - 25% depth at
0.3125 m water depth
time is not determined

time (mins)	depth to water surface (m)	depth of water in pit (m)	time elapsed (mins)	volume of water lost (m3)	Area of walls and base at 50% drop (m2)	q (m/min)	q (m/h)



Project No.: 17-0524

Site: Ballymun NCOD - Site Investigation

Test Location: SA03

Date 13/06/2017

Causeway Geotech Ltd
Infiltration Test

Analysis using method as described in
BRE Digest 365 and
CIRIA Report C697-The SUDS Manual

width (m) length (m)
test pit top dimensions 0.65 1.6
test pit base dimensions 0.65 0.1
test pit depth 1.5 m

infiltration rate (q) is very low
depth to groundwater before adding water (m) = DRY

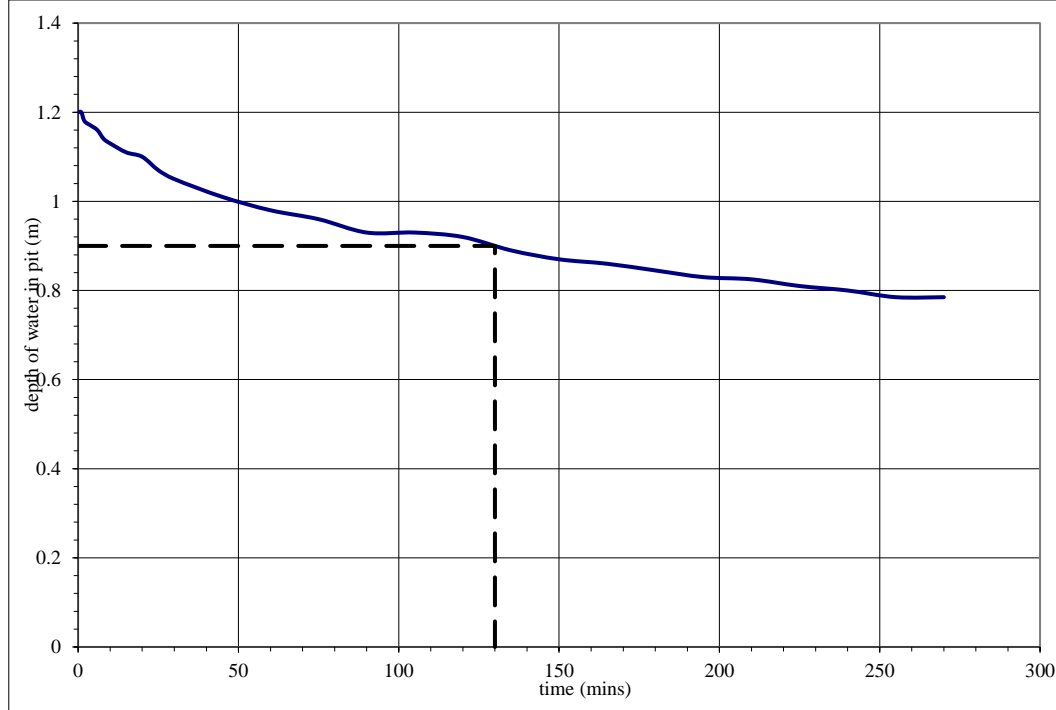
time (mins)	depth to water surface (m)	depth of water in pit (m)
0	0.3	1.2
1	0.3	1.2
2	0.32	1.18
4	0.33	1.17
6	0.34	1.16
8	0.36	1.14
10	0.37	1.13
15	0.39	1.11
20	0.4	1.1
25	0.43	1.07
30	0.45	1.05
45	0.49	1.01
60	0.52	0.98
75	0.54	0.96
90	0.57	0.93
105	0.57	0.93
120	0.58	0.92
135	0.61	0.89
150	0.63	0.87
165	0.64	0.86
180	0.655	0.845
195	0.67	0.83
210	0.675	0.825
225	0.69	0.81
240	0.7	0.8
255	0.715	0.785
270	0.715	0.785

From graph below:

test start - 75% depth at
0.9 m water depth
time is 130.0 minutes

test end - 25% depth at
0.3 m water depth
time is not determined

time (mins)	depth to water surface (m)	depth of water in pit (m)	time elapsed (mins)	volume of water lost (m3)	Area of walls and base at 50% drop (m2)	q (m/min)	q (m/h)
130	0.6	0.9					



Project No.: 17-0524

Site: Ballymun NCOD - Site Investigation

Test Location: SA04

Date 13/06/2017

Causeway Geotech Ltd
Infiltration Test

Analysis using method as described in
BRE Digest 365 and
CIRIA Report C697-The SUDS Manual

width (m) length (m)
test pit top dimensions 0.65 1.5
test pit base dimensions 0.65 0.6
test pit depth 1.5 m

infiltration rate (q) is very low
depth to groundwater before adding water (m) = DRY

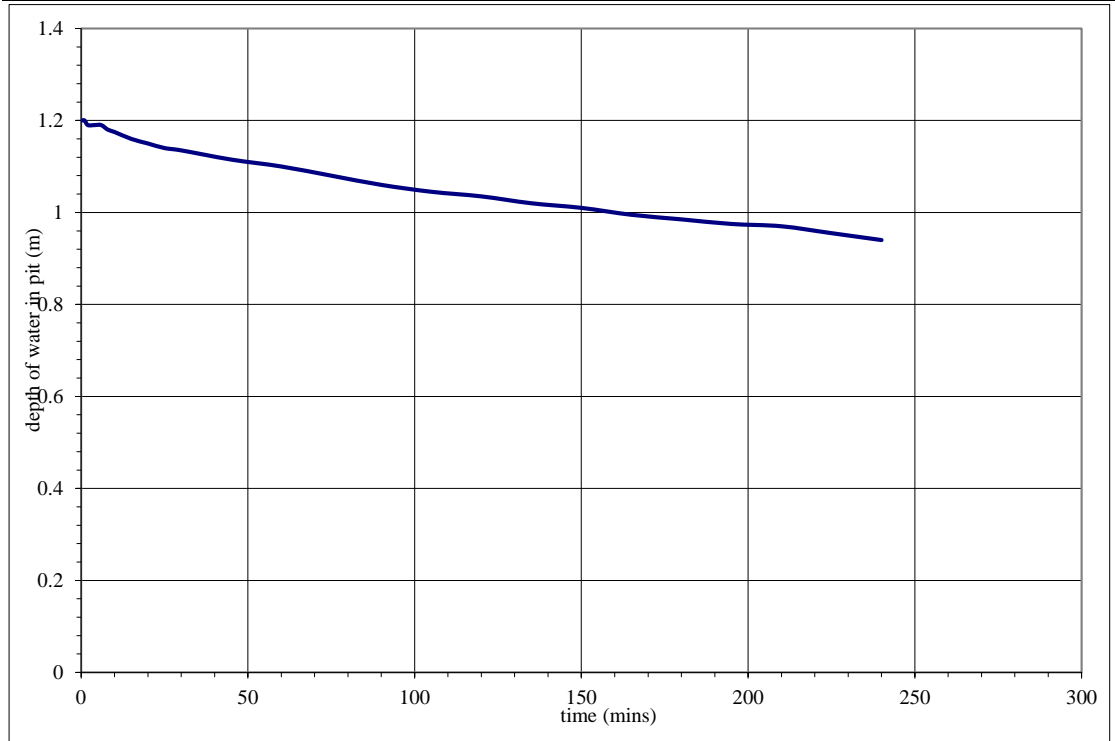
time (mins)	depth to water surface (m)	depth of water in pit (m)
0	0.3	1.2
1	0.3	1.2
2	0.31	1.19
4	0.31	1.19
6	0.31	1.19
8	0.32	1.18
10	0.325	1.175
15	0.34	1.16
20	0.35	1.15
25	0.36	1.14
30	0.365	1.135
45	0.385	1.115
60	0.4	1.1
75	0.42	1.08
90	0.44	1.06
105	0.455	1.045
120	0.465	1.035
135	0.48	1.02
150	0.49	1.01
165	0.505	0.995
180	0.515	0.985
195	0.525	0.975
210	0.53	0.97
225	0.545	0.955
240	0.56	0.94

From graph below:

test start - 75% depth at
0.9 m water depth
time is not determined

test end - 25% depth at
0.3 m water depth
time is not determined

time (mins)	depth to water surface (m)	depth of water in pit (m)	time elapsed (mins)	volume of water lost (m3)	Area of walls and base at 50% drop (m2)	q (m/min)	q (m/h)



Project No.: 17-0524

Site: Ballymun NCOD - Site Investigation

Test Location: SA05

Date 13/06/2017

Causeway Geotech Ltd
Infiltration Test

Analysis using method as described in
BRE Digest 365 and
CIRIA Report C697-The SUDS Manual

width (m) length (m)
test pit top dimensions 0.65 1.5
test pit base dimensions 0.65 0.6
test pit depth 1.5 m

test infiltration rate (q) = 0.068 m/h
depth to groundwater before adding water (m) = DRY

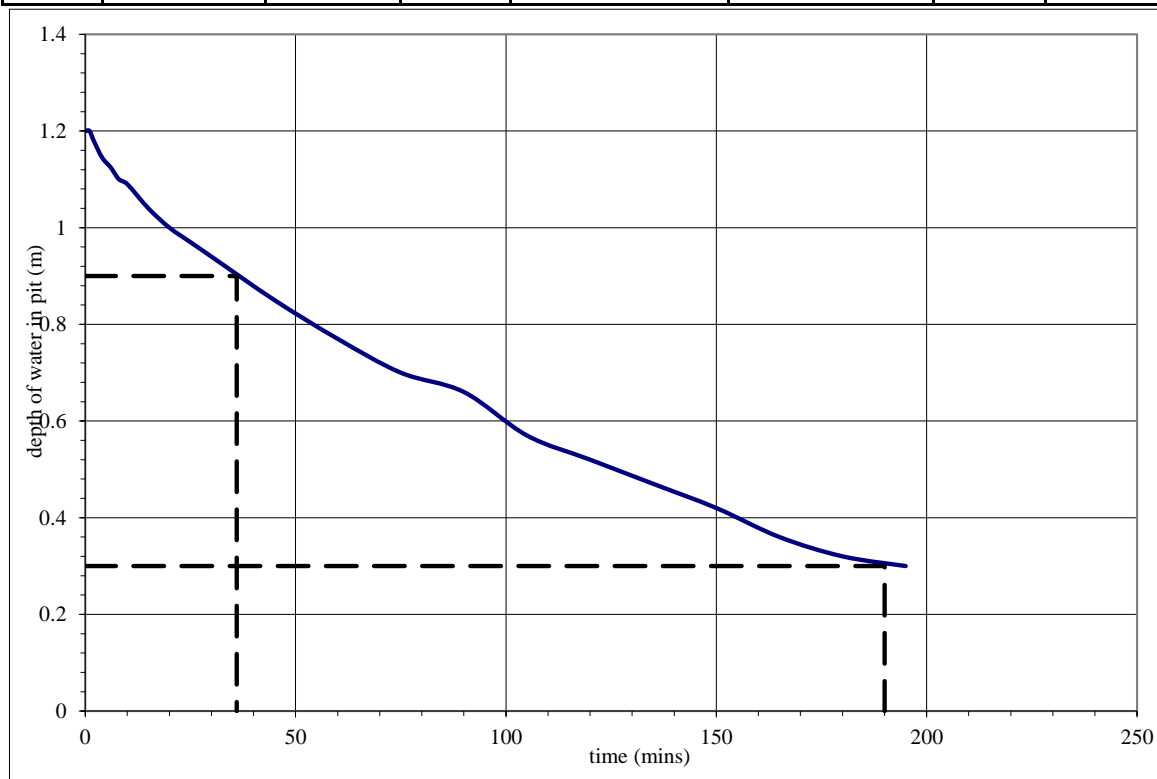
time (mins)	depth to water surface (m)	depth of water in pit (m)
0	0.3	1.2
1	0.3	1.2
2	0.32	1.18
4	0.355	1.145
6	0.375	1.125
8	0.4	1.1
10	0.41	1.09
15	0.46	1.04
20	0.5	1
25	0.53	0.97
30	0.56	0.94
45	0.65	0.85
60	0.73	0.77
75	0.8	0.7
90	0.84	0.66
105	0.93	0.57
120	0.98	0.52
135	1.03	0.47
150	1.08	0.42
165	1.14	0.36
180	1.18	0.32
195	1.2	0.3

From graph below:

test start - 75% depth at
0.9 m water depth
time is 36.0 minutes

test end - 25% depth at
0.3 m water depth
time is 190.0 minutes

time (mins)	depth to water surface (m)	depth of water in pit (m)	time elapsed (mins)	volume of water lost (m3)	Area of walls and base at 50% drop (m2)	q (m/min)	q (m/h)
36	0.6	0.9					
190	1.2	0.3	154	0.37	2.16	1.1E-03	0.068

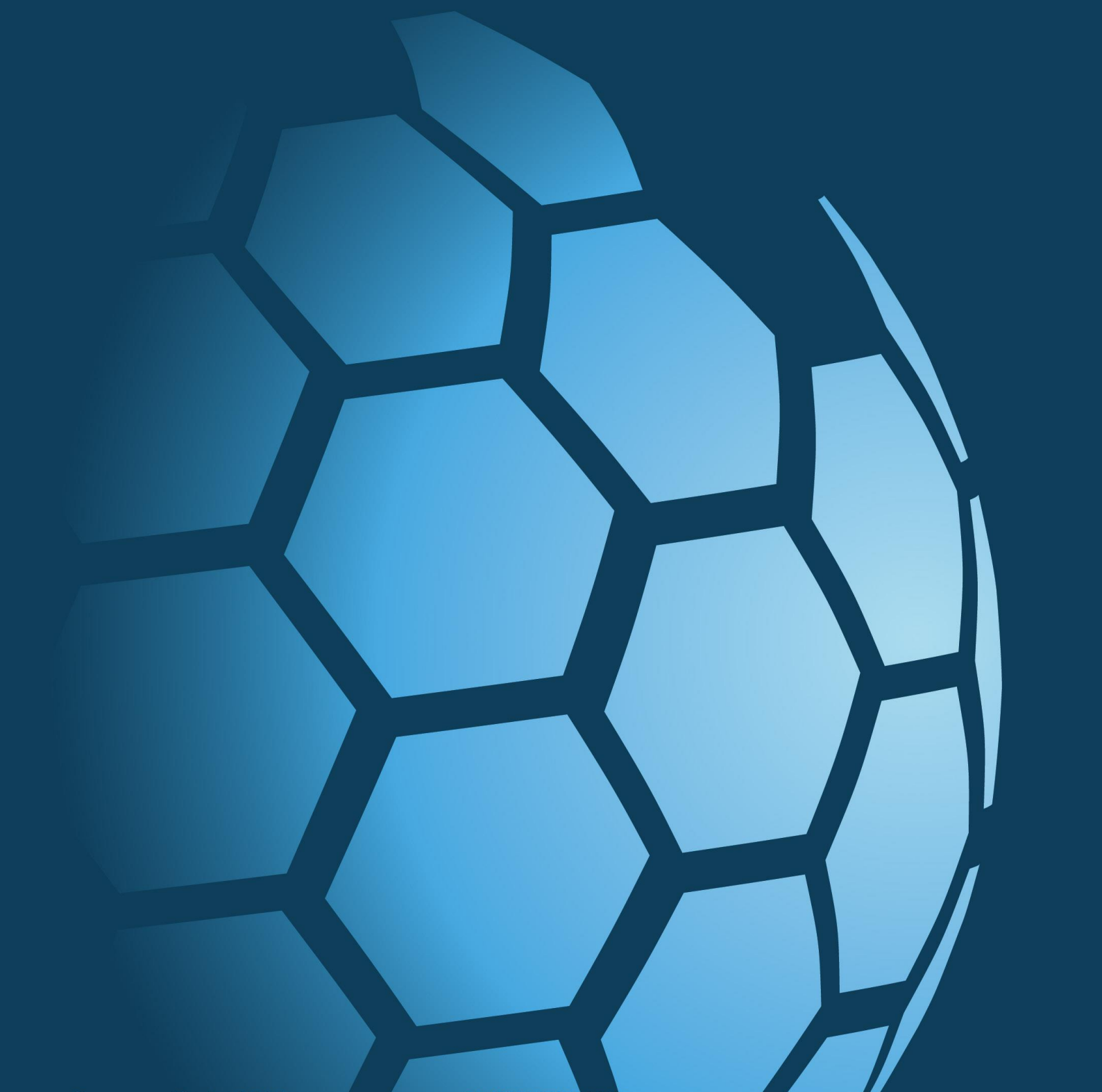




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APPENDIX F

Infiltration test photographs





SA01



SA01



SA01



SA01



SA02



SA02



SA02



SA02



SA03



SA03



SA03



SA03



SA03



SA03



SA04



SA04



SA04



SA04



SA04



SA04



SA05



SA05



SA05



SA05



SA05



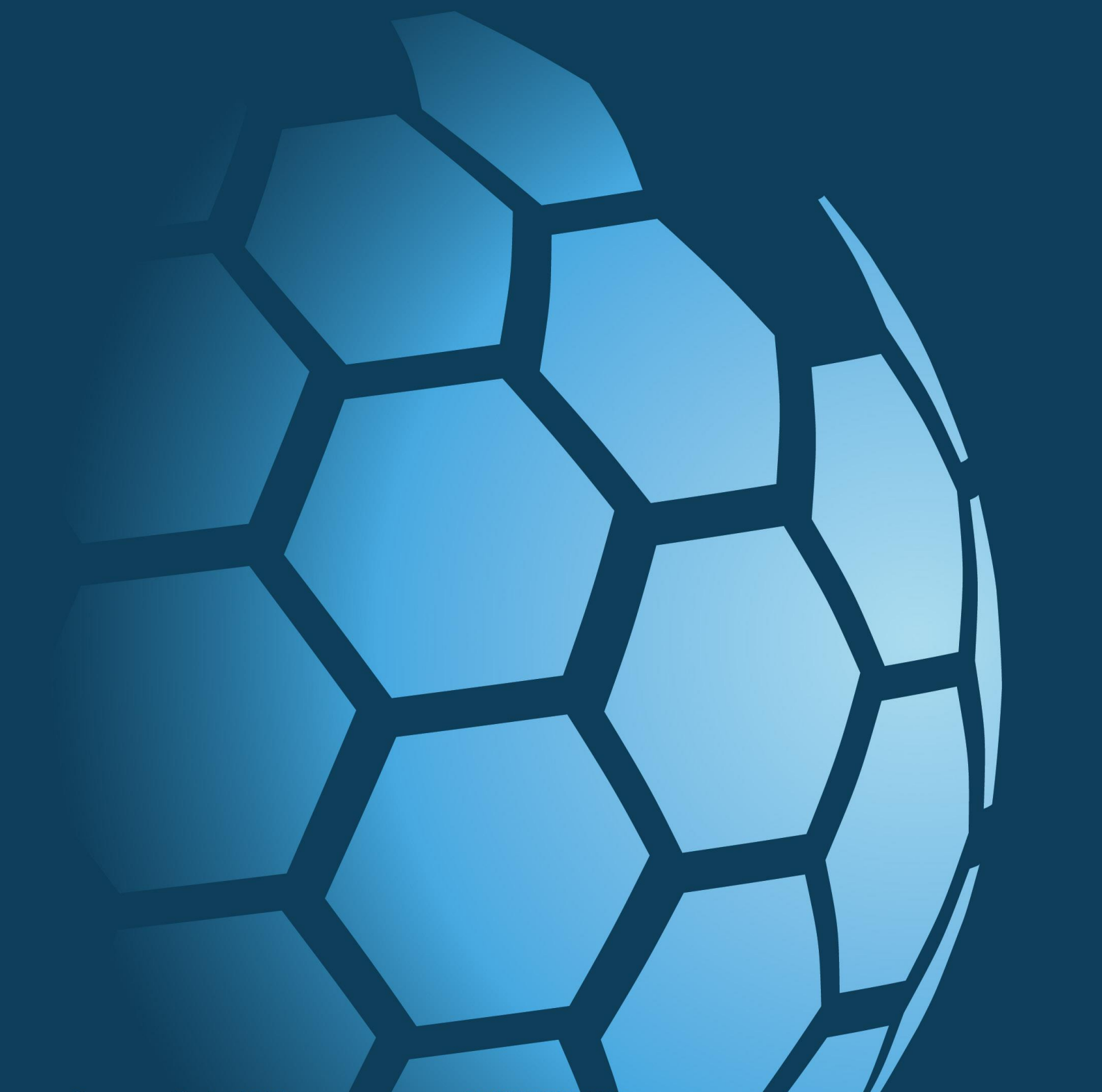
SA05



CAUSEWAY
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APPENDIX G

Indirect in-situ CBR test results



Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

Test Number: DCP TP01 Test 1

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	10	22
510		
510	28	6.2
565		
565	12	17
602		
602	8	30
634		
634	6.2	41
665		
665	4.3	66
678		
678	3	>100
684		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

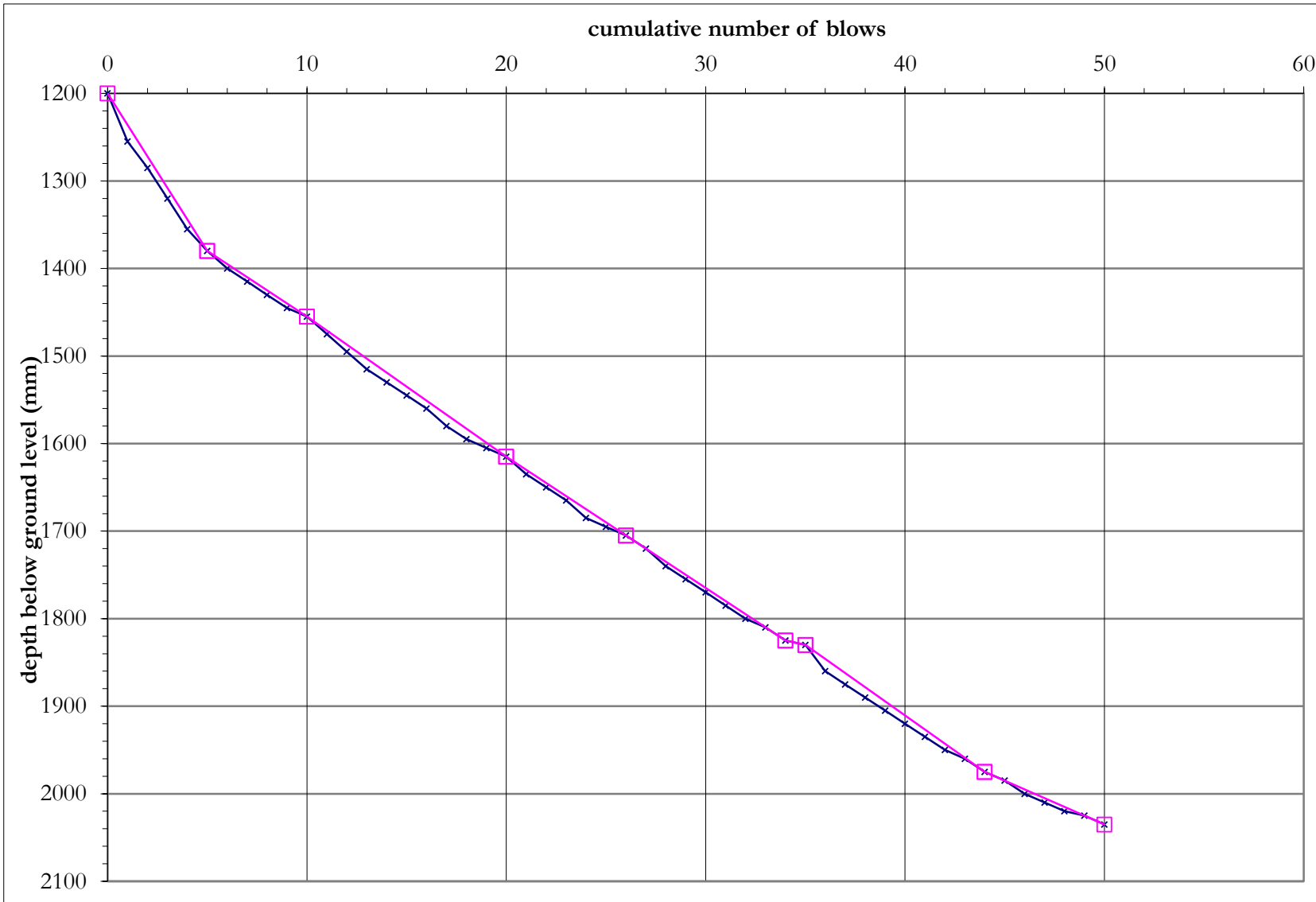
Test Number: DCP TP01 Test 2

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
1200 to 1380	36	4.4
1380 to 1455	15	13
1455 to 1615	16	12
1615 to 1705	15	13
1705 to 1825	15	13
1825 to 1830	5	55
1830 to 1975	16	12
1975 to 2035	10	22

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

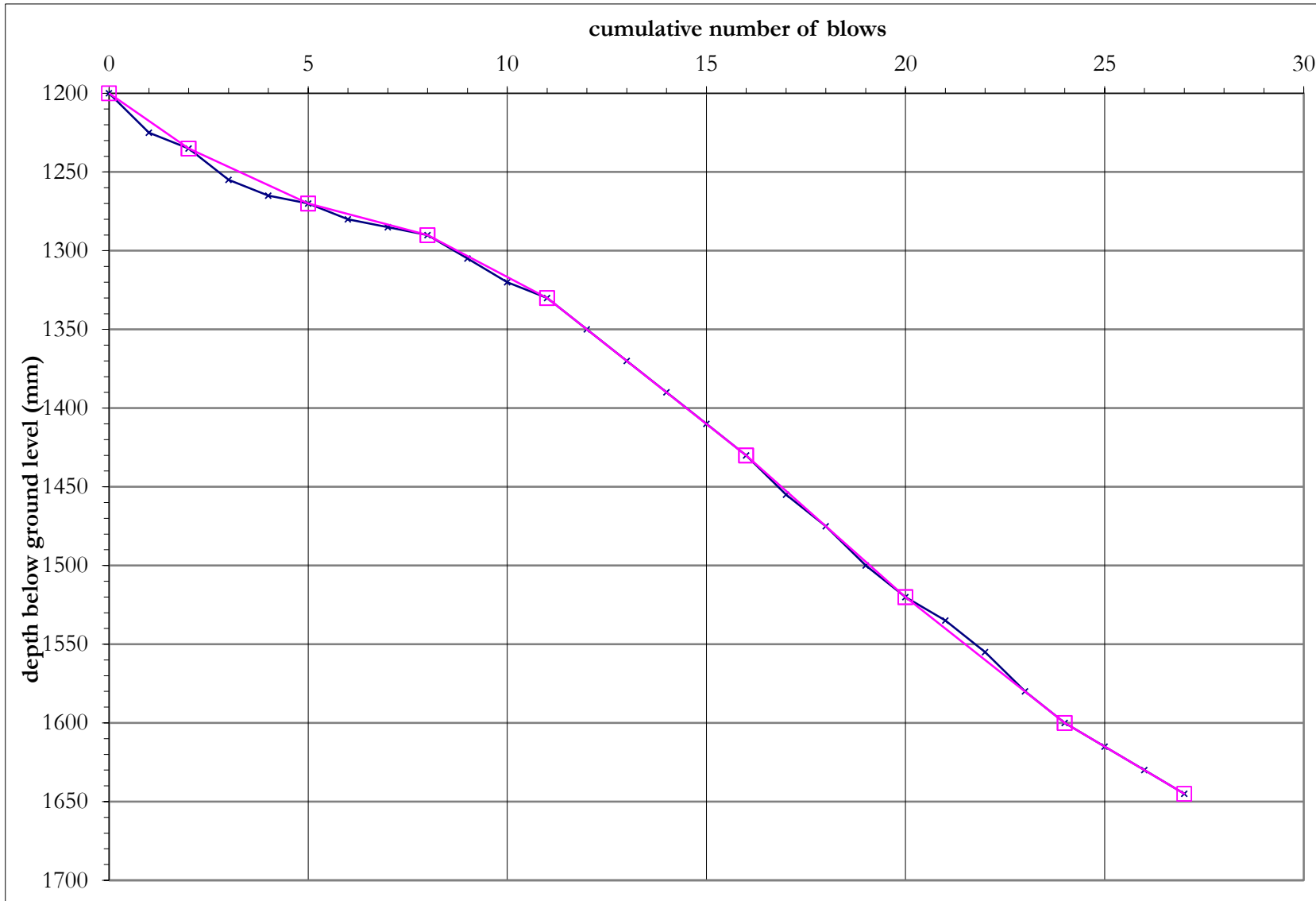
Test Number: DCP TP02 Test 2

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
1200	18	11
1235		
1235	12	18
1270		
1270	6.7	38
1290		
1290	13	16
1330		
1330	20	9.3
1430		
1430	23	8
1520		
1520	20	9.3
1600		
1600	15	13
1645		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

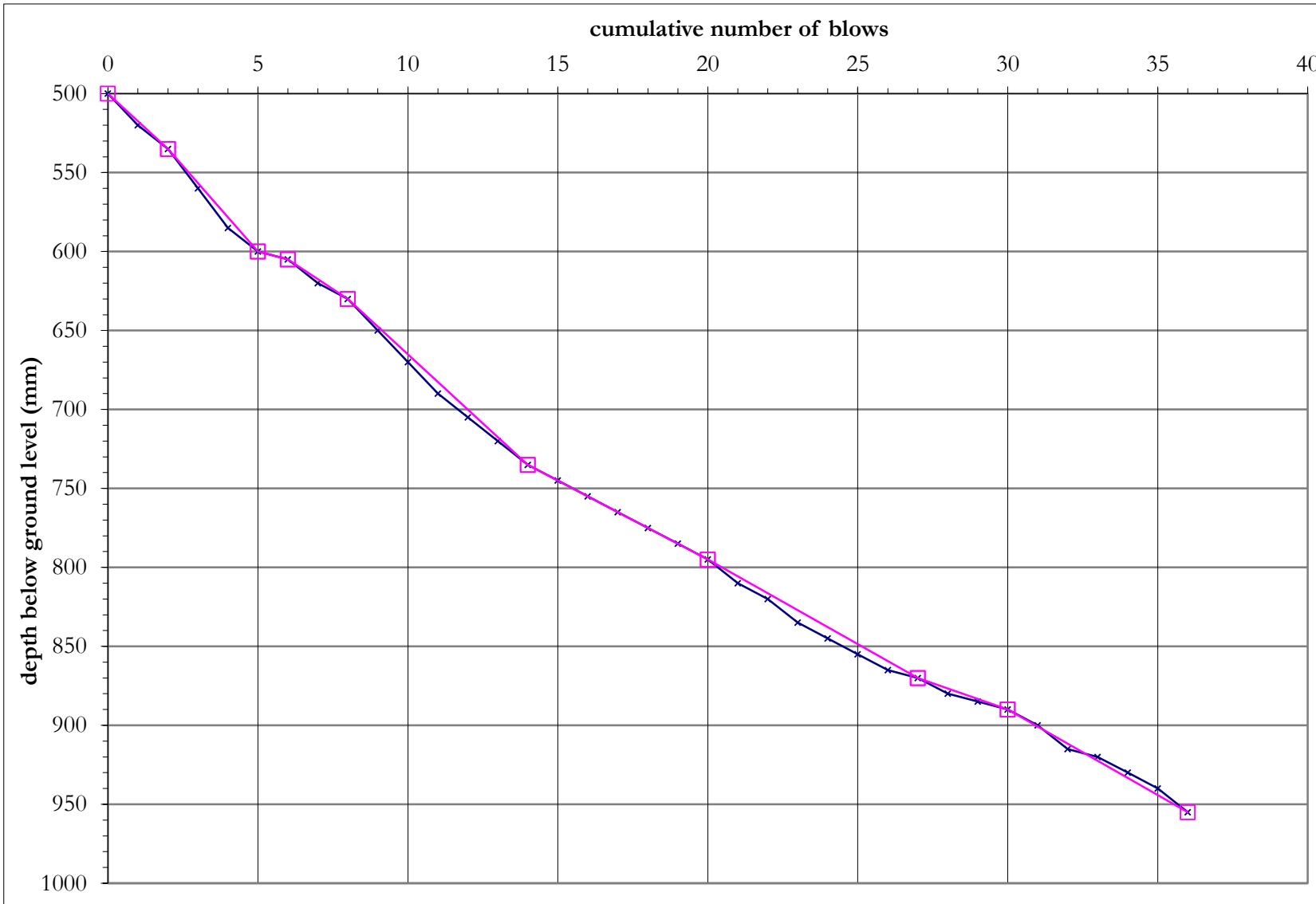
Test Number: DCP TP05 Test 1

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	18	11
535		
535	22	8.4
600		
600	5	55
605		
605	13	17
630		
630	18	11
735		
735	10	22
795		
795	11	21
870		
870	6.7	38
890		
890	11	20
955		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

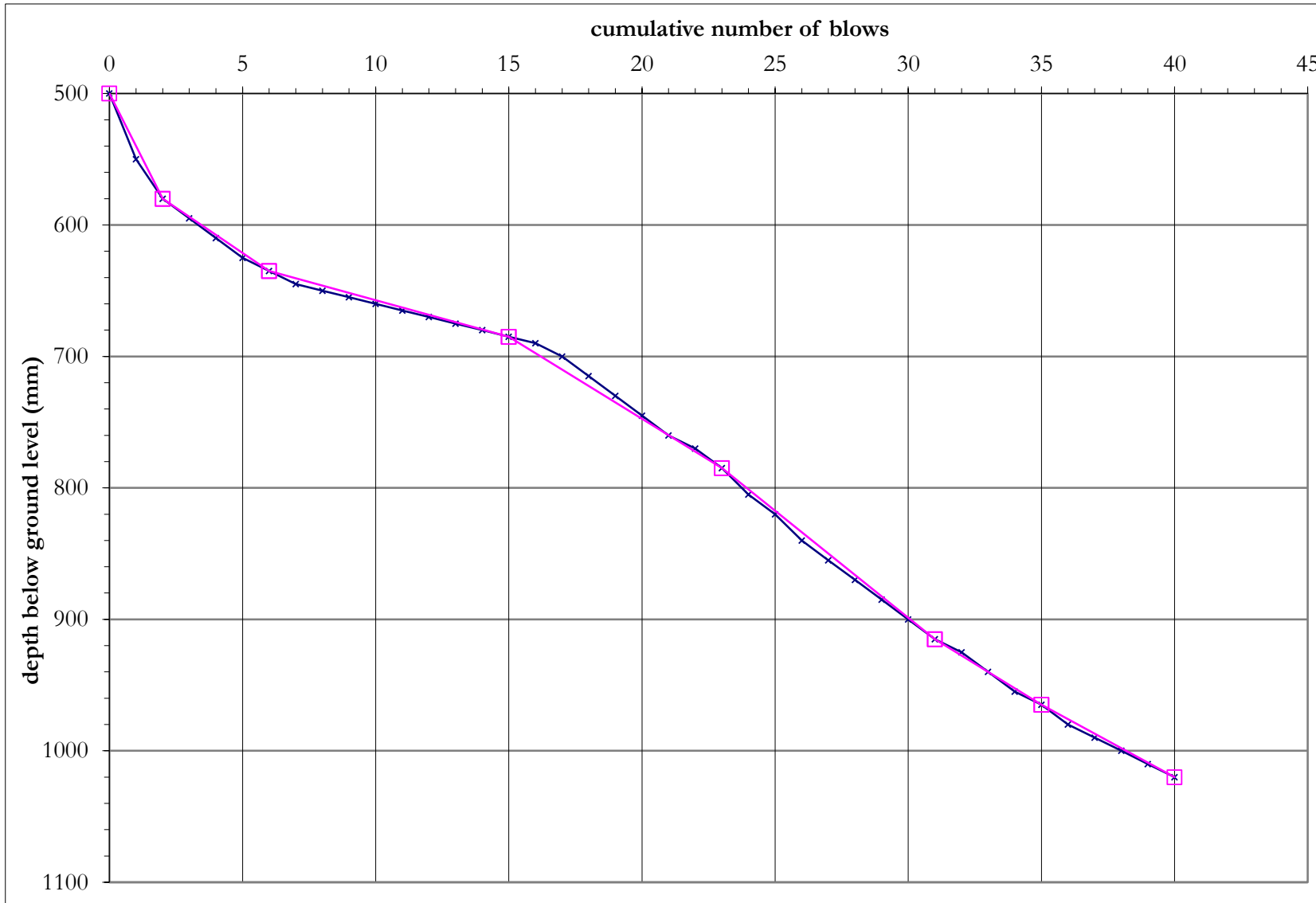
Test Number: DCP TP06 Test 1

CBR estimated using Kley & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	40	3.8
580		
580	14	15
635		
635	5.6	48
685		
685	13	17
785		
785	16	12
915		
915	13	17
965		
965	11	20
1020		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

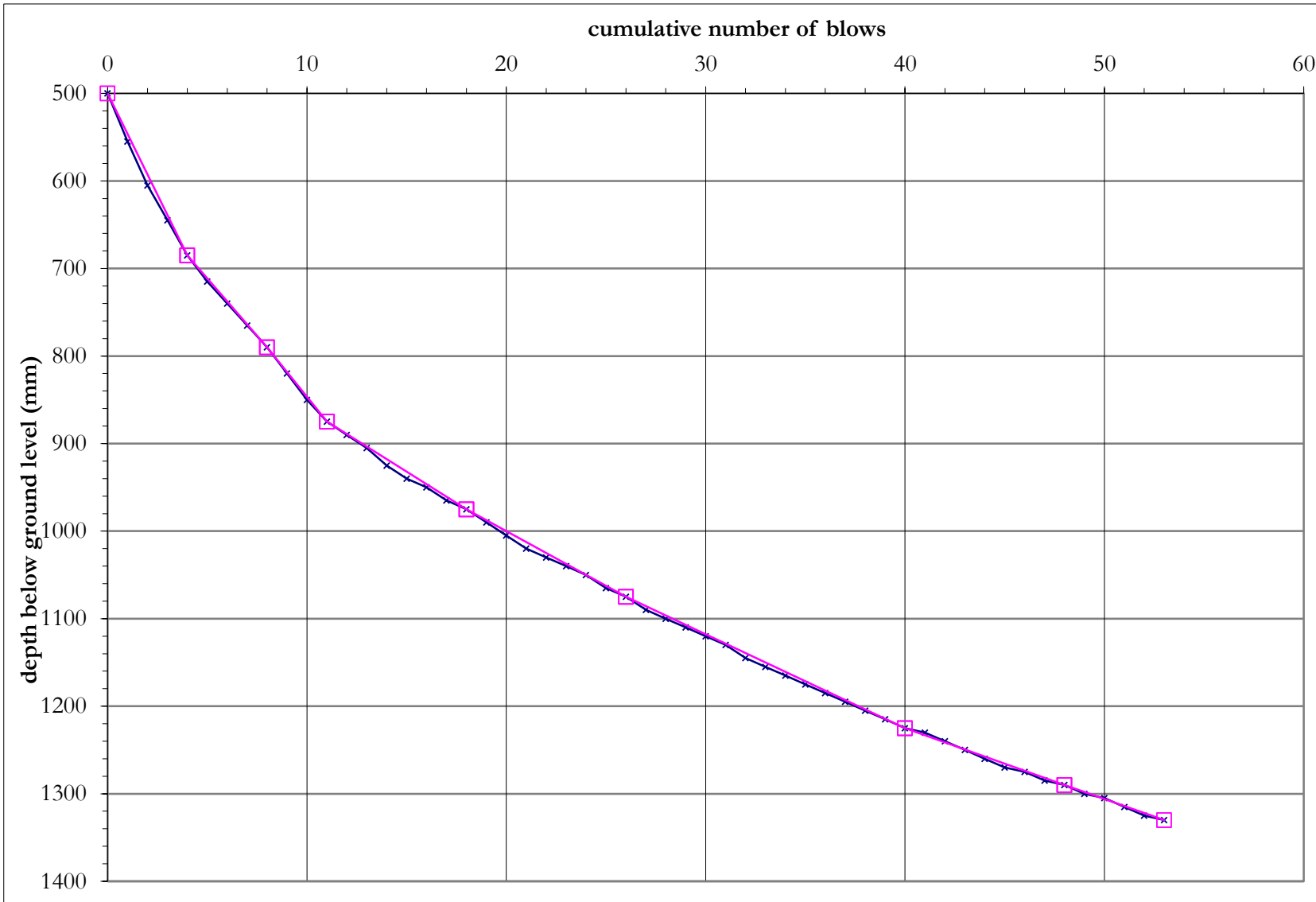
Test Number: DCP TP07 Test 1

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	46	3.2
685		
685	26	6.5
790		
790	28	5.9
875		
875	14	14
975		
975	13	17
1075		
1075	11	21
1225		
1225	8.1	29
1290		
1290	8	30
1330		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

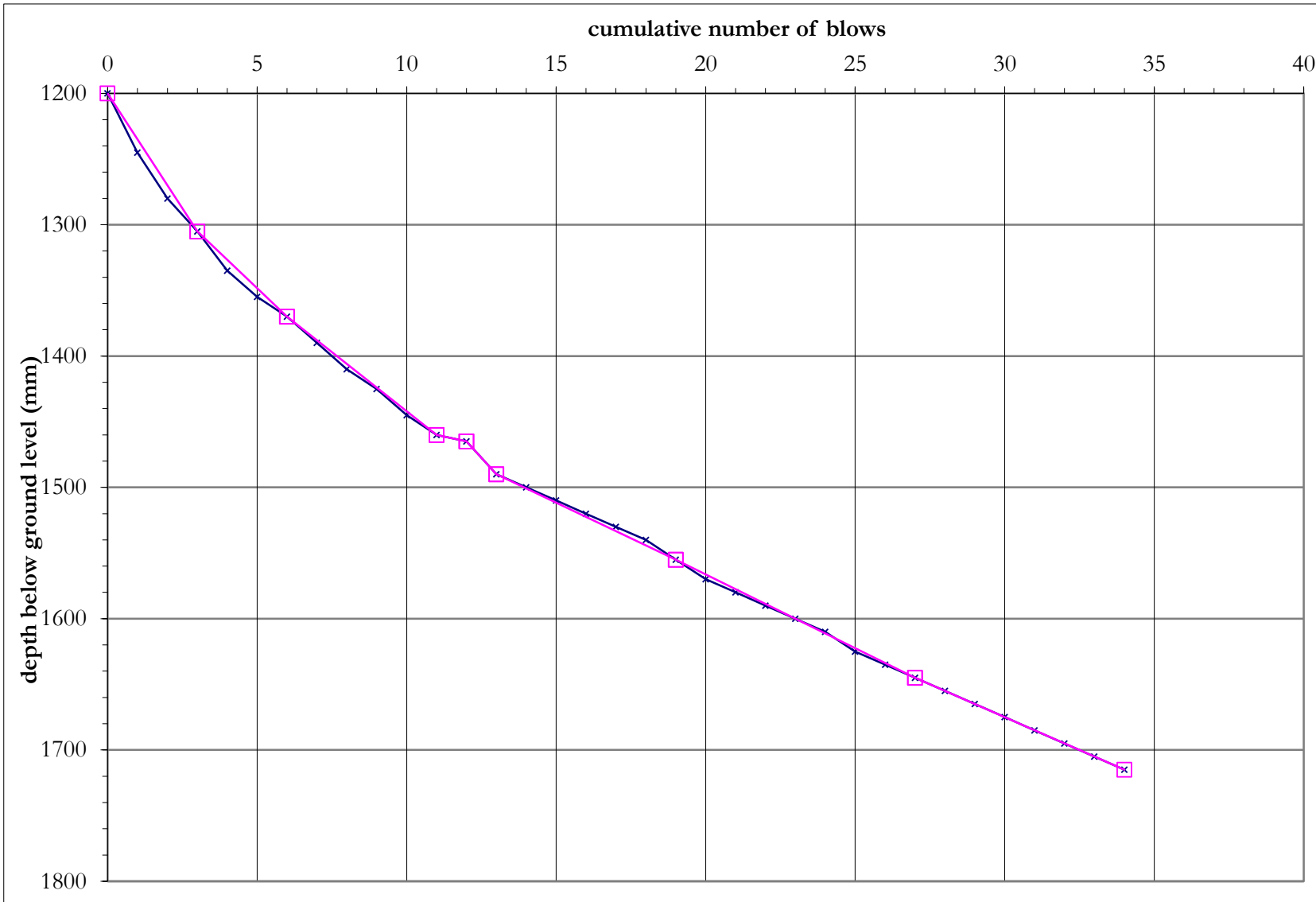
Test Number: DCP TP07 Test 2

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
1200	35	4.5
1305	22	8.4
1370	18	11
1460	5	55
1465	25	7
1490	11	20
1555	11	19
1645	10	22

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

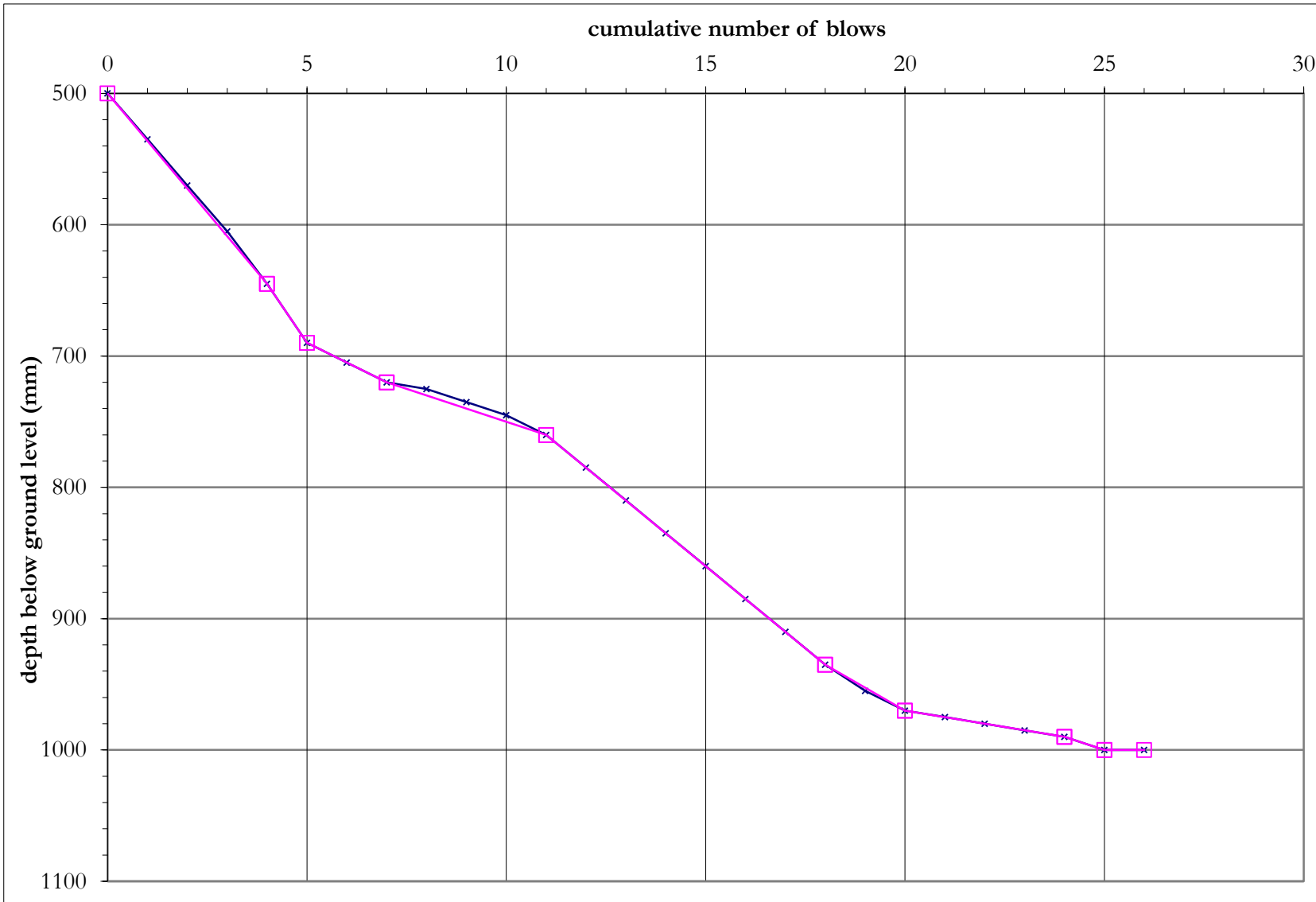
Test Number: DCP TP08 Test 1

CBR estimated using Kley & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	36	4.3
645		
645	45	3.3
690		
690	15	13
720		
720	10	22
760		
760	25	7
935		
935	18	11
970		
970	5	55
990		
990	10	22
1000		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

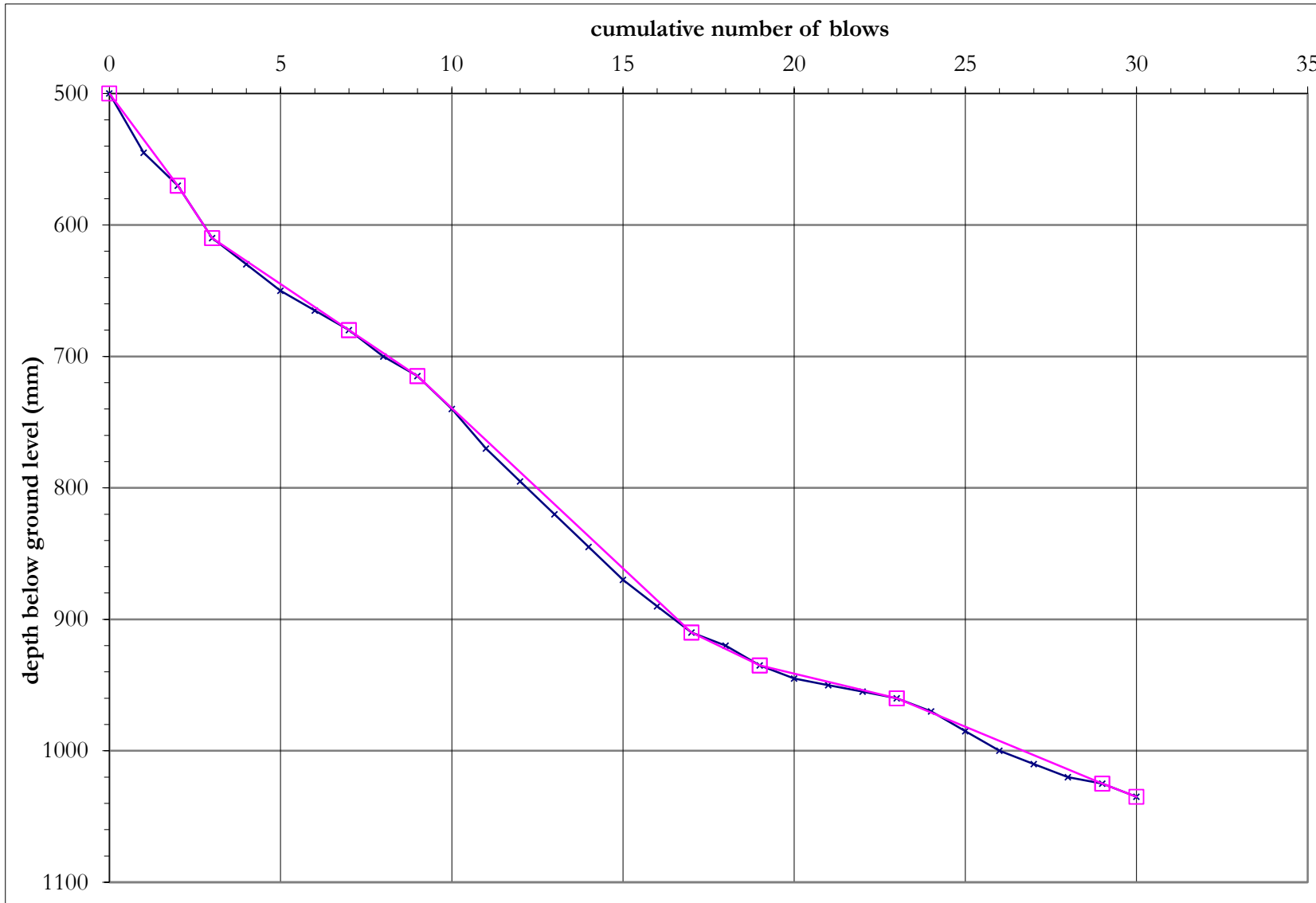
Test Number: DCP TP08 Test 2

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	35	4.5
570	40	3.8
610	18	11
680	18	11
715	24	7.2
910	13	17
935	6.3	41
960	11	20
1025	10	22

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

Test Number: DCP TP09 Test 1

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	40	3.8
580		
580	28	6.2
635		
635	12	18
720		
720	15	13
750		
750	23	7.6
820		
820	18	10
875		
875	14	15
945		
945	11	19
1025		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

Test Number: DCP TP10 Test 1

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	18	11
535		
535	40	3.8
615		
615	15	13
630		
630	43	3.5
715		
715	33	5
780		
780	26	6.7
935		
935	11	19
980		
980	13	16
1060		
1060	10	22
1100		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

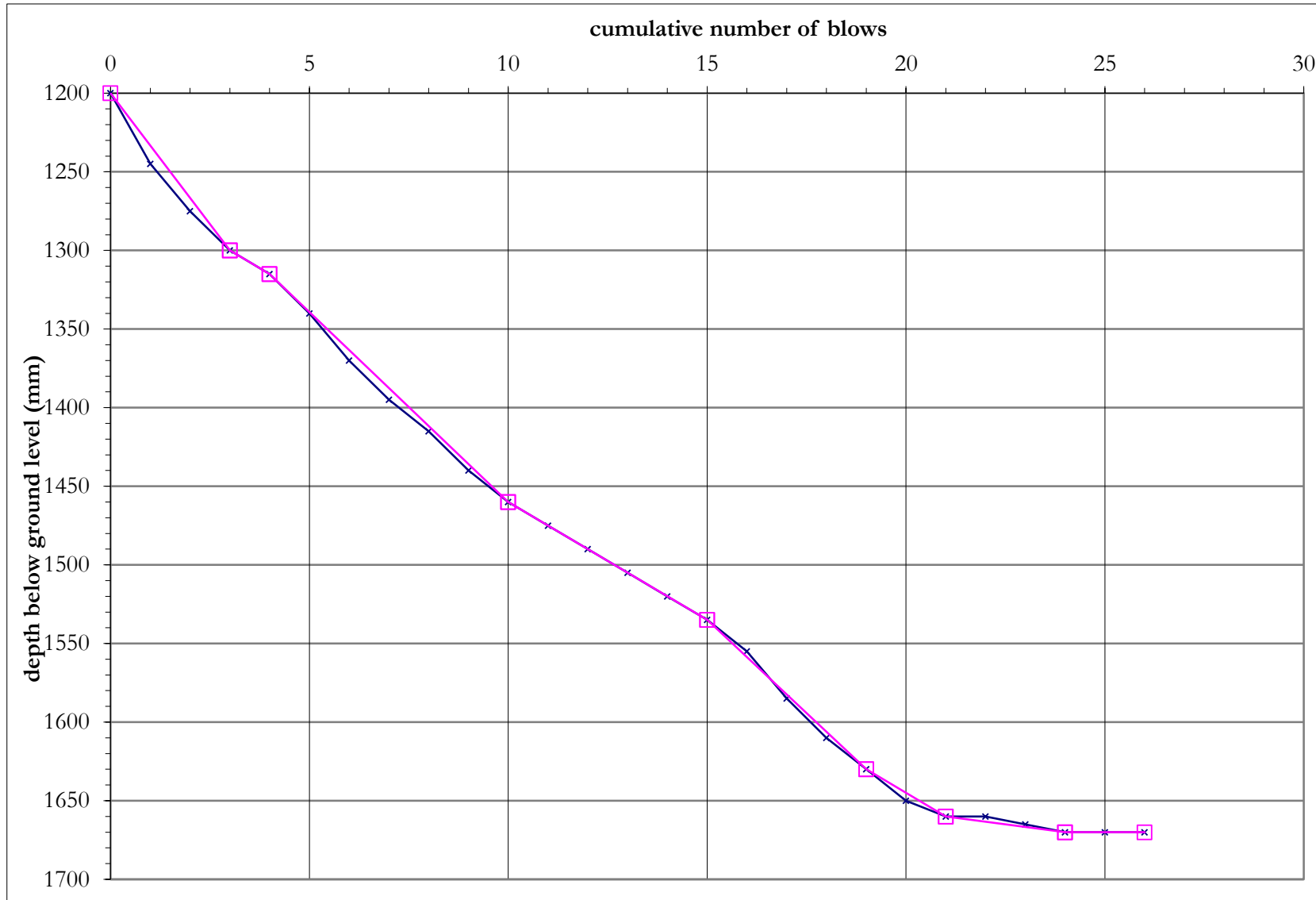
Test Number: DCP TP10 Test 2

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
1200	33	4.8
1300		
1300	15	13
1315		
1315	24	7.3
1460		
1460	15	13
1535		
1535	24	7.4
1630		
1630	15	13
1660		
1660	3.3	92
1670		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

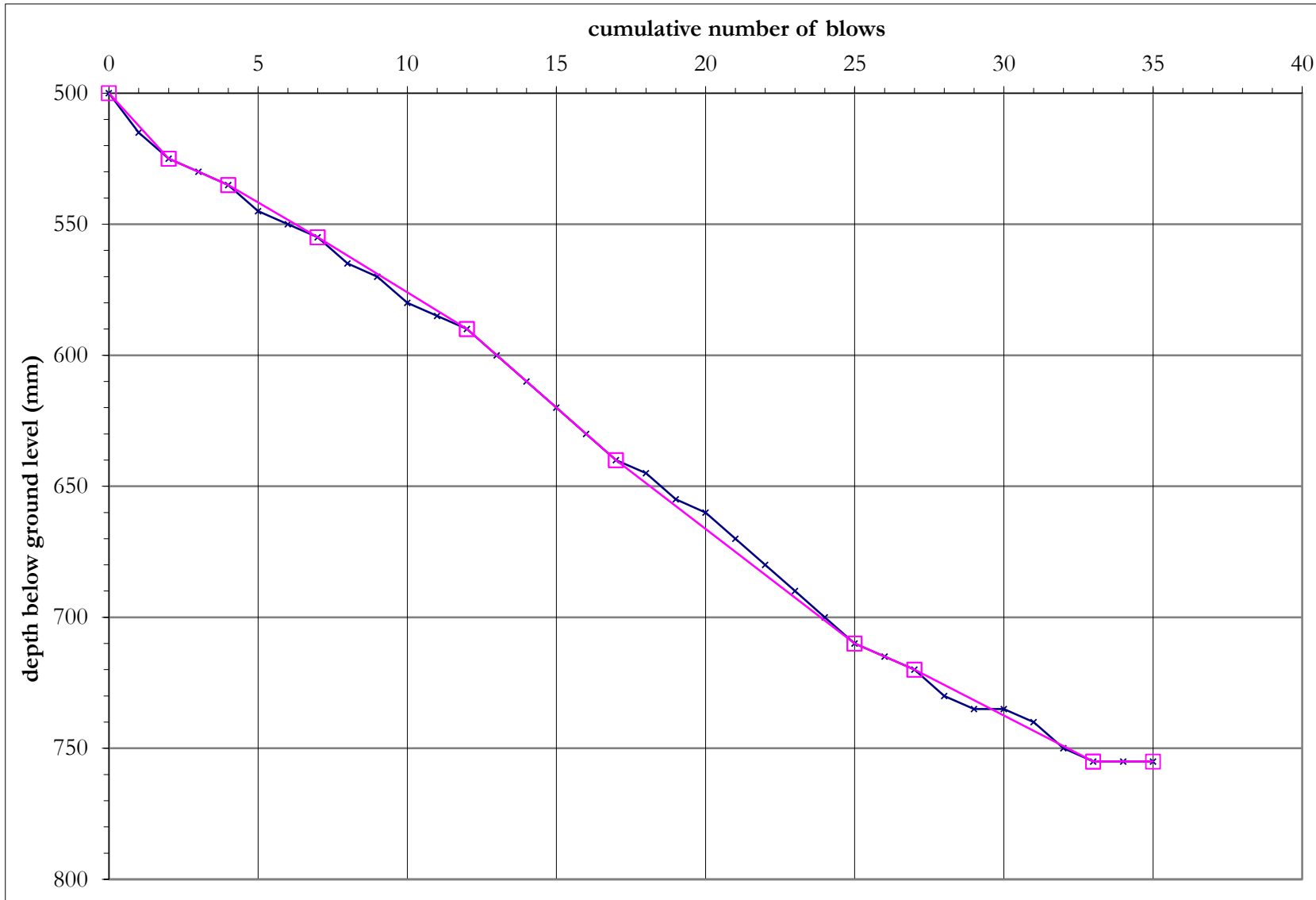
Test Number: DCP TP12 Test 1

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	13	17
525		
535	5	55
555	6.7	38
590	7	36
640	10	22
710	8.8	27
720	5	55
755	5.8	45

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

Test Number: DCP TP12 Test 2

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
1200	40	3.8
1240		
1240	10	22
1260		
1260	24	7.4
1355		
1355	33	4.8
1455		
1455	23	7.6
1525		
1525	6.9	36
1580		
1580	17	12
1630		
1630	30	5.5
1720		
1720	22	8.4
1785		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

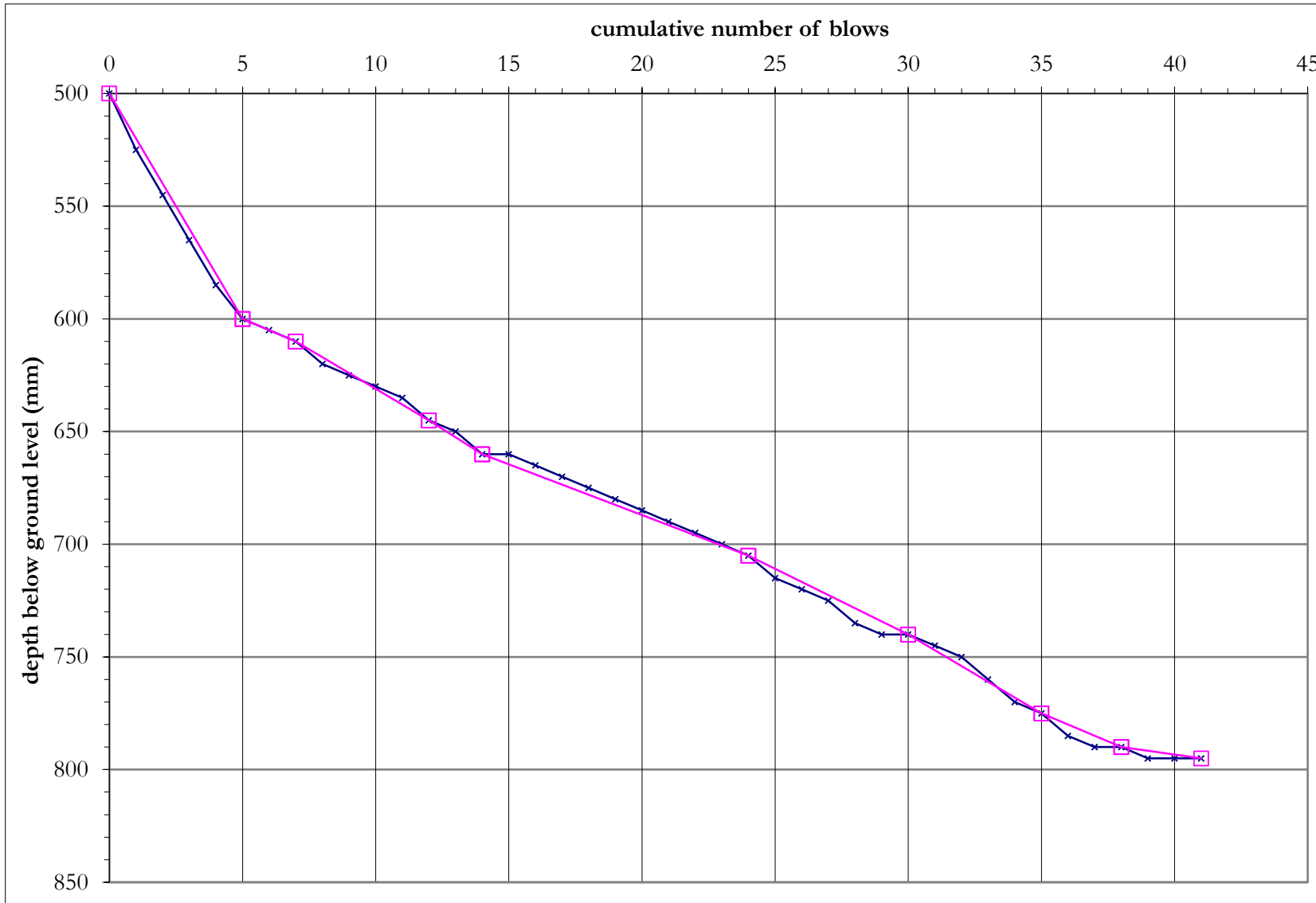
Test Number: DCP TP14 Test 1

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	20	9.3
600		
600	1.7	>100
610		
610	7	36
645		
645	1.9	>100
660		
660	4.5	63
705		
705	5.8	45
740		
740	7	36
775		
775	5	55
790		
790	1.7	>100
795		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

Test Number: DCP TP14 Test 2

CBR estimated using Kley & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
1200	40	3.8
1280		
1280	18	10
1390		
1390	5	55
1410		
1410	6.9	36
1465		
1465	5	55
1495		
1495	15	13
1570		
1570	12	18
1640		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

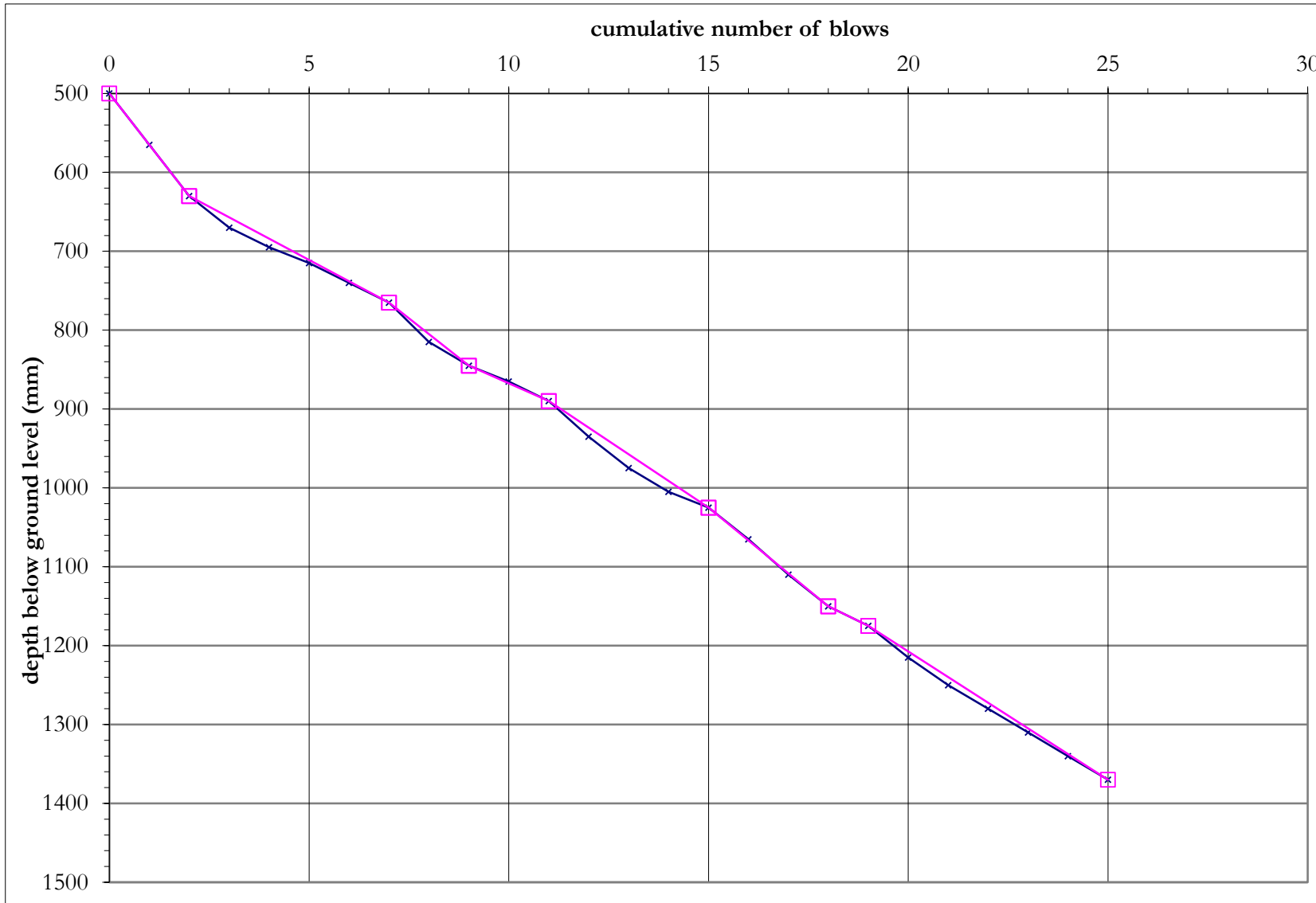
Test Number: DCP TP15 Test 1

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



depth from to (mm)	mm/blow	CBR (%)
500	65	2
630		
630	23	8
765		
765	40	3.8
845		
845	5.6	47
890		
890	34	4.7
1025		
1025	42	3.6
1150		
1150	25	7
1175		
1175	33	5
1370		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Ballymun NCOD - Site Investigation

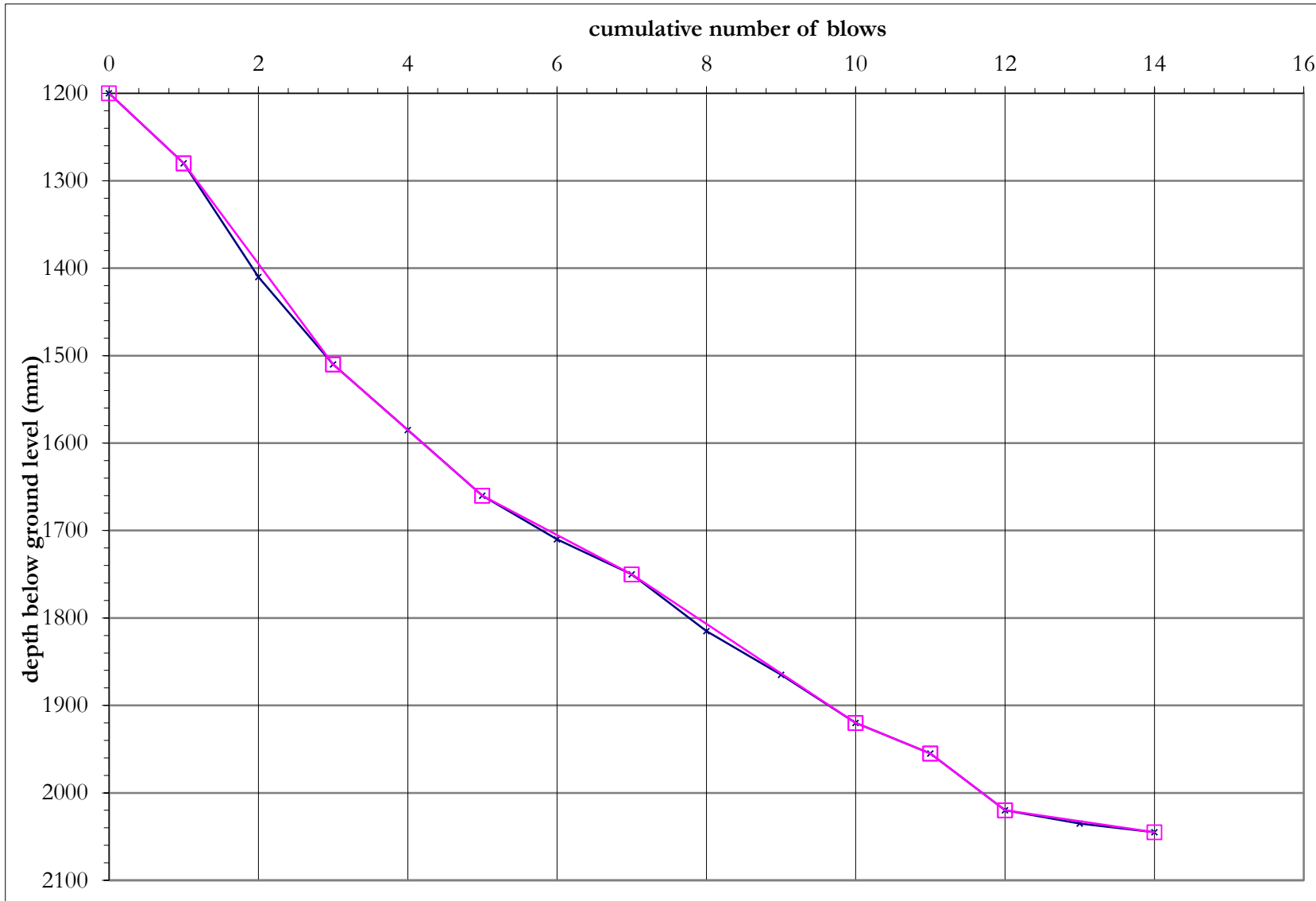
Test Number: DCP TP15 Test 2

CBR estimated using Kleyn & Van Heerden (1983):

$$\text{Log CBR} = 2.632 - 1.28 \text{ Log (mm/blow)}$$

Report No: 17-0524

Date: 07-Jun-17



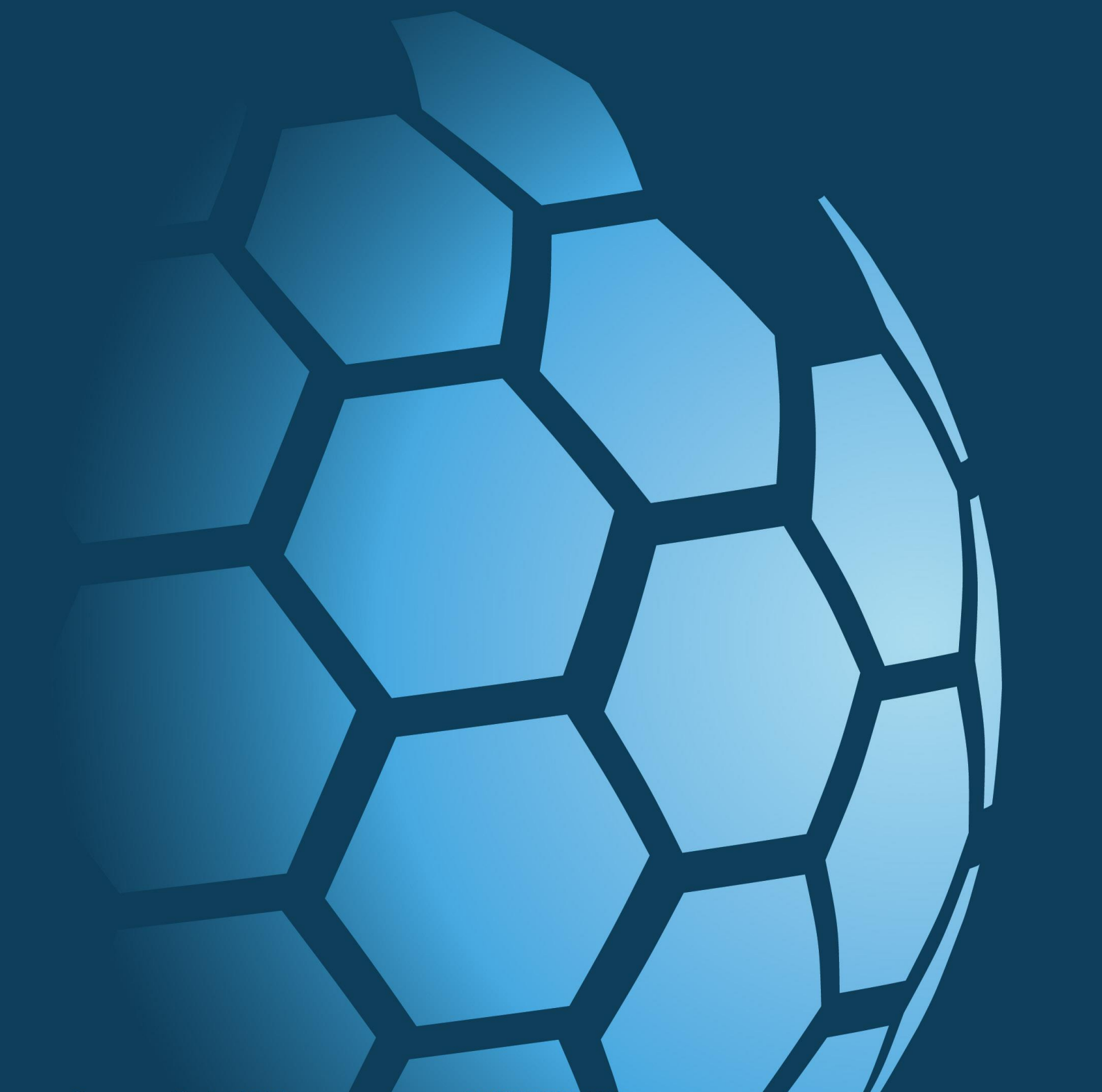
depth from to (mm)	mm/blow	CBR (%)
1200	80	1.6
1280		
1280	38	4
1510		
1510	75	1.7
1660		
1660	11	19
1750		
1750	57	2.4
1920		
1920	35	4.5
1955		
1955	65	2
2020		
2020	13	17
2045		



CAUSEWAY
— GEOTECH

APPENDIX H

Geotechnical laboratory test results





**SOIL AND ROCK SAMPLE ANALYSIS
LABORATORY TEST REPORT**

Client:	Dublin City Council
Engineer:	TOBIN Consulting Engineers
From:	Stephen Watson Laboratory Manager Causeway Geotech Ltd
Tel:	+44(0)2827666640
E-mail:	stephen.watson@causewaygeotech.com
Date:	04/07/17
Ref:	17-0524

Ballymun NCOD - Site Investigation

We are pleased to attach the results of laboratory testing carried out for the above project. This memo and its attachments constitute a report of the results of tests as detailed in the *Contents page(s)*.

The attached results complete the testing requested and we would therefore wish to confirm that samples will be retained without charge for a period of 60 days from the above date after which they will be appropriately disposed of unless we receive written instructions to the contrary prior to that date.

We trust our report meets with your approval but if you have any queries or require additional information, please do not hesitate to contact the undersigned.

Approved Signatory

Stephen Watson
Laboratory Manager



Project Name **Ballymun NCOD - Site Investigation**

Report Reference. **17-0524**

The table below details the tests carried out, the specifications used and the number of tests included in this report:

Material tested	Type of test/Properties measured/Range of measurement	Standard specifications	Number of test results included in the report
SOIL	Moisture content - oven drying method	BS 1377-2:1990	10
SOIL	Liquid limit - cone penetrometer	BS 1377-2:1990	10
SOIL	Liquid limit - cone penetrometer - one point	BS 1377-2:1990	10
SOIL	Plastic limit	BS 1377-2:1990	10
SOIL	Plasticity index and liquidity index	BS 1377-2:1990	10
SOIL	Particle size distribution - wet sieving	BS 1377-2:1990	6
SOIL	Particle size distribution - dry sieving	BS 1377-2:1990	6
SOIL	Particle size distribution -sedimentation hydrometer method	BS 1377-2:1990	6
SOIL	pH Value of Soil		6
SOIL	Sulphate Content water extract		6



Summary of Classification Test Results

Project No. 17-0524		Project Name Ballymun NCOD - Site Investigation												
Hole No.	Sample				Soil Description	Density		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Casagrande Classification
	Ref	Top	Base	Type		bulk Mg/m3	dry							
BH01	9	3.00		B	Dark brown slightly sandy gravelly CLAY.			9.1	53	27 -1pt	11	16		CL
BH02	9	4.00		B	Dark grey sandy gravelly CLAY with low cobble content.			8.7	46	27 -1pt	13	14		CL
BH03	6	3.00		B	Dark sandy gravelly CLAY.			10.0	54	27 -1pt	13	14		CL
BH07	3	2.00		D	Brown sandy gravelly CLAY.			8.1	44	28 -1pt	13	15		CL
BH14	4	2.00		B	Brown sandy gravelly CLAY with low cobble content.			9.8	44	26 -1pt	15	11		CL
TP08	5	2.00		B	Brown sandy gravelly CLAY.			12.0	49	27 -1pt	15	12		CL
TP09	4	2.00		B	Grey sandy gravelly CLAY.			10.0	51	27 -1pt	16	11		CL
TP12	5	2.00		B	MADE GROUND: Greyish brown sandy gravelly CLAY with fragments of red brick.			21.0	27	40 -1pt	NP			
TP12	7	3.00		B	Grey mottled brown sandy slightly gravelly CLAY.			13.0	65	22 -1pt	12	10		CL
TP15	4	2.00		B	Brown slightly sandy gravelly CLAY.			18.0	51	34 -1pt	20	14		CL

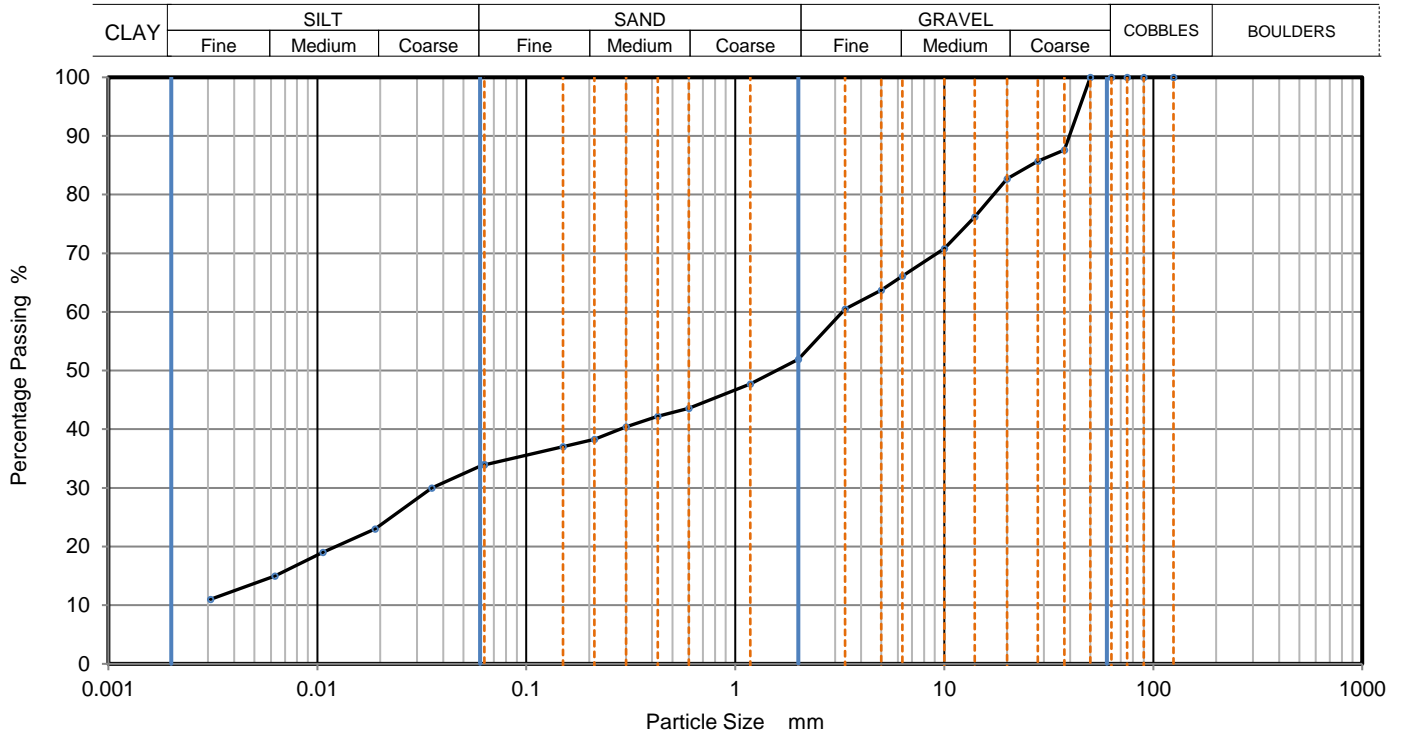
All tests performed in accordance with BS1377:1990 unless specified otherwise

Key Density test Linear measurement unless : wd - water displacement wi - immersion in water Liquid Limit 4pt cone unless : cas - Casagrande method 1pt - single point test Particle density sp - small pyknometer gj - gas jar	Date Printed 07/04/2017 00:00	Approved By Stephen.Watson	Table 1 sheet 1
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PARTICLE SIZE DISTRIBUTION

Job Ref	17-0524
Borehole/Pit No.	BH01
Site Name	Ballymun NCOD - Site Investigation
Sample No.	9
Soil Description	Dark brown slightly sandy gravelly CLAY.
Depth, m	3.00
Specimen Reference	6
Specimen Depth	m
Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5
KeyLAB ID	Caus20170621196



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	34
90	100	0.0353	30
75	100	0.0189	23
63	100	0.0106	19
50	100	0.0063	15
37.5	88	0.0031	11
28	86		
20	83		
14	76		
10	71		
6.3	66		
5	64		
3.35	61		
2	52		
1.18	48		
0.6	44		
0.425	42	Particle density (assumed) 1.40 Mg/m3	
0.3	40		
0.212	38		
0.15	37		
0.063	34		

Dry Mass of sample, g 3591

Sample Proportions	% dry mass
Cobbles	0
Gravel	48
Sand	18
Fines <0.063mm	34

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
Preparation and testing in accordance with BS1377 unless noted below



PARTICLE SIZE DISTRIBUTION

Job Ref **17-0524**

Borehole/Pit No. **BH02**

Site Name **Ballymun NCOD - Site Investigation**

Sample No. **9**

Soil Description **Dark grey sandy gravelly CLAY with low cobble content.**

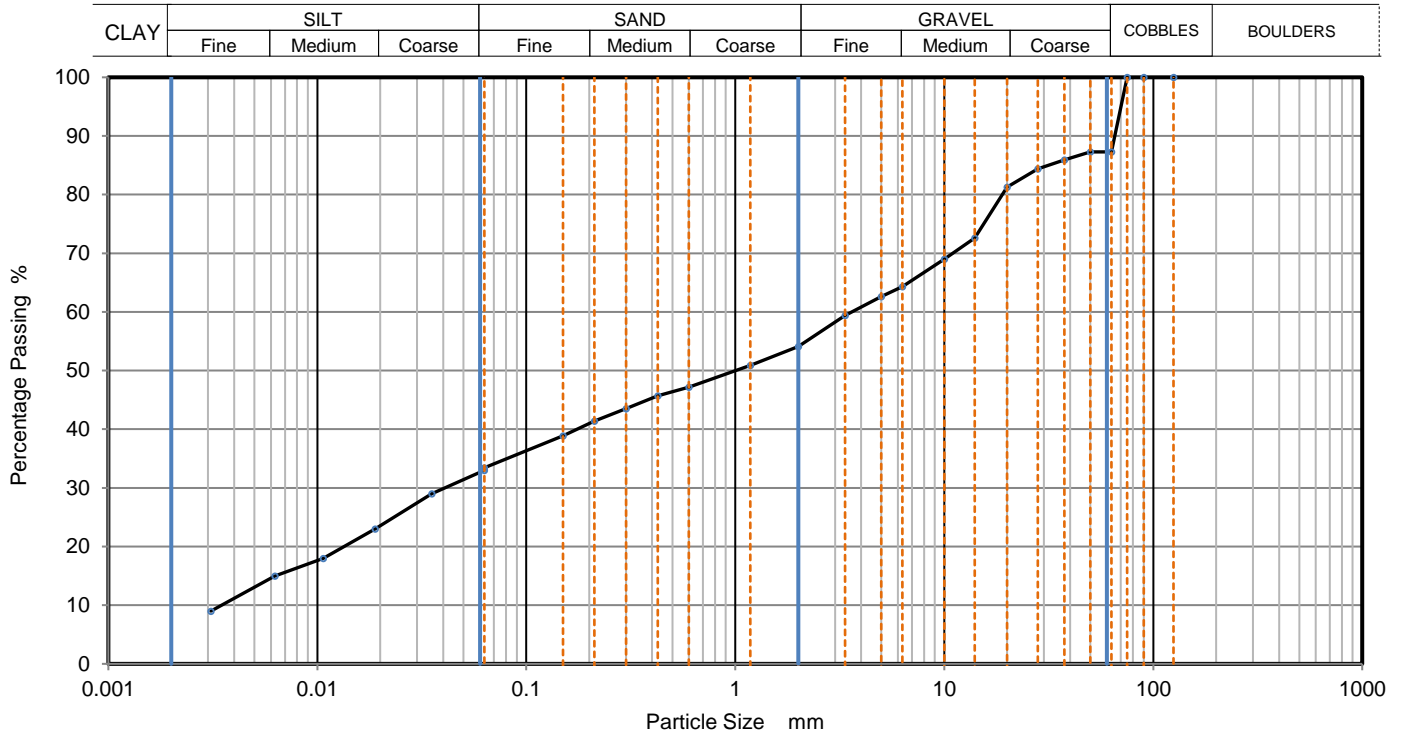
Depth, m **4.00**

Specimen Reference **6** Specimen Depth **m**

Sample Type **B**

Test Method **BS1377:Part 2:1990, clauses 9.2 and 9.5**

KeyLAB ID **Caus20170621197**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	33
90	100	0.0353	29
75	100	0.0189	23
63	87	0.0107	18
50	87	0.0063	15
37.5	86	0.0031	9
28	84		
20	81		
14	73		
10	69		
6.3	64		
5	63		
3.35	59		
2	54		
1.18	51		
0.6	47	Particle density (assumed)	
0.425	46	1.40 Mg/m ³	
0.3	44		
0.212	41		
0.15	39		
0.063	33		

Dry Mass of sample, g

6905

Sample Proportions	% dry mass
Cobbles	13
Gravel	33
Sand	21
Fines <0.063mm	33

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	1100
Curvature Coefficient	0.13

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved

Stephen.Watson

Sheet printed

04/07/2017 14:55

Fig 1

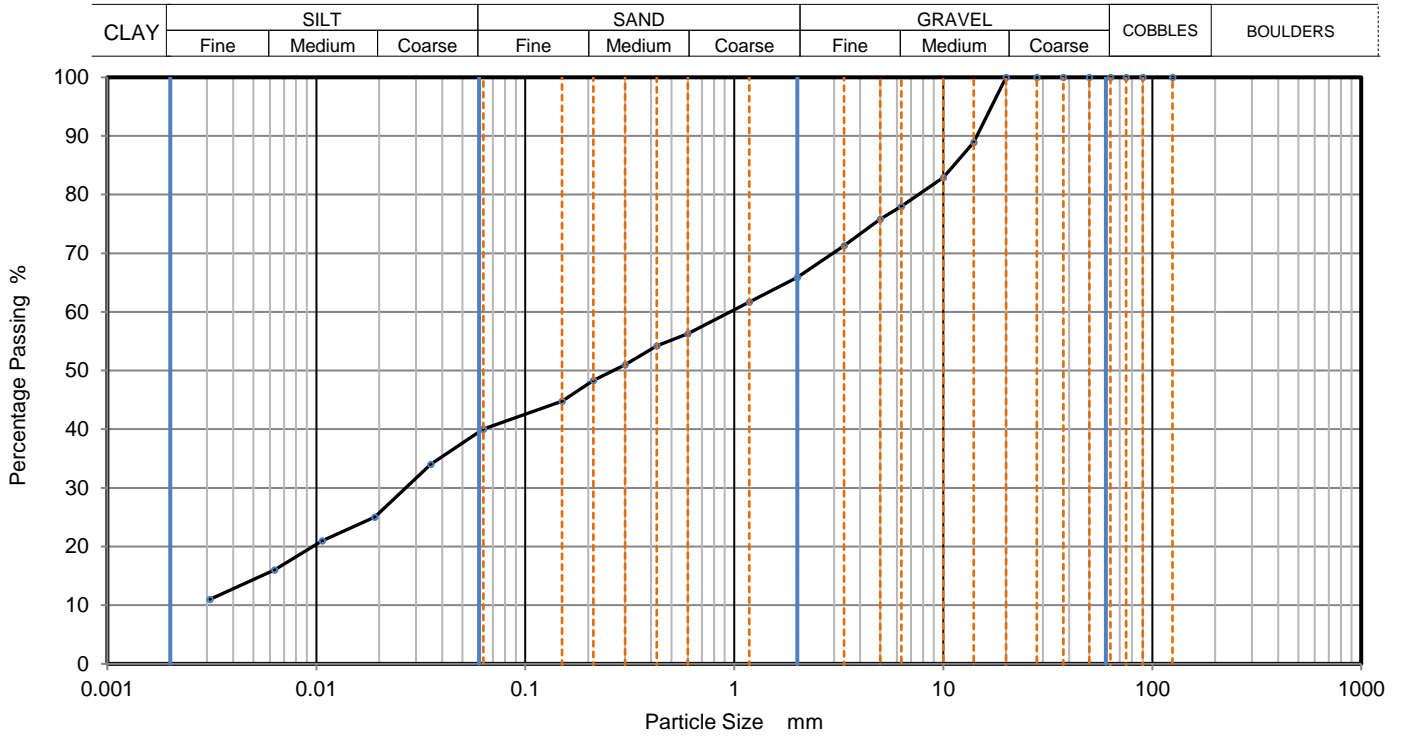
Sheet



PARTICLE SIZE DISTRIBUTION

Job Ref	17-0524
Borehole/Pit No.	BH03
Sample No.	6
Depth, m	3.00
Sample Type	B
KeyLAB ID	Caus20170621198

Site Name	Ballymun NCOD - Site Investigation	
Soil Description	Dark sandy gravelly CLAY.	
Specimen Reference	6	Specimen Depth m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	40
90	100	0.0353	34
75	100	0.0190	25
63	100	0.0107	21
50	100	0.0063	16
37.5	100	0.0031	11
28	100		
20	100		
14	89		
10	83		
6.3	78		
5	76		
3.35	71		
2	66		
1.18	62		
0.6	56	Particle density (assumed) 1.40 Mg/m ³	
0.425	54		
0.3	51		
0.212	48		
0.15	45		
0.063	40		

Dry Mass of sample, g 3993

Sample Proportions	% dry mass
Cobbles	0
Gravel	34
Sand	26
Fines <0.063mm	40

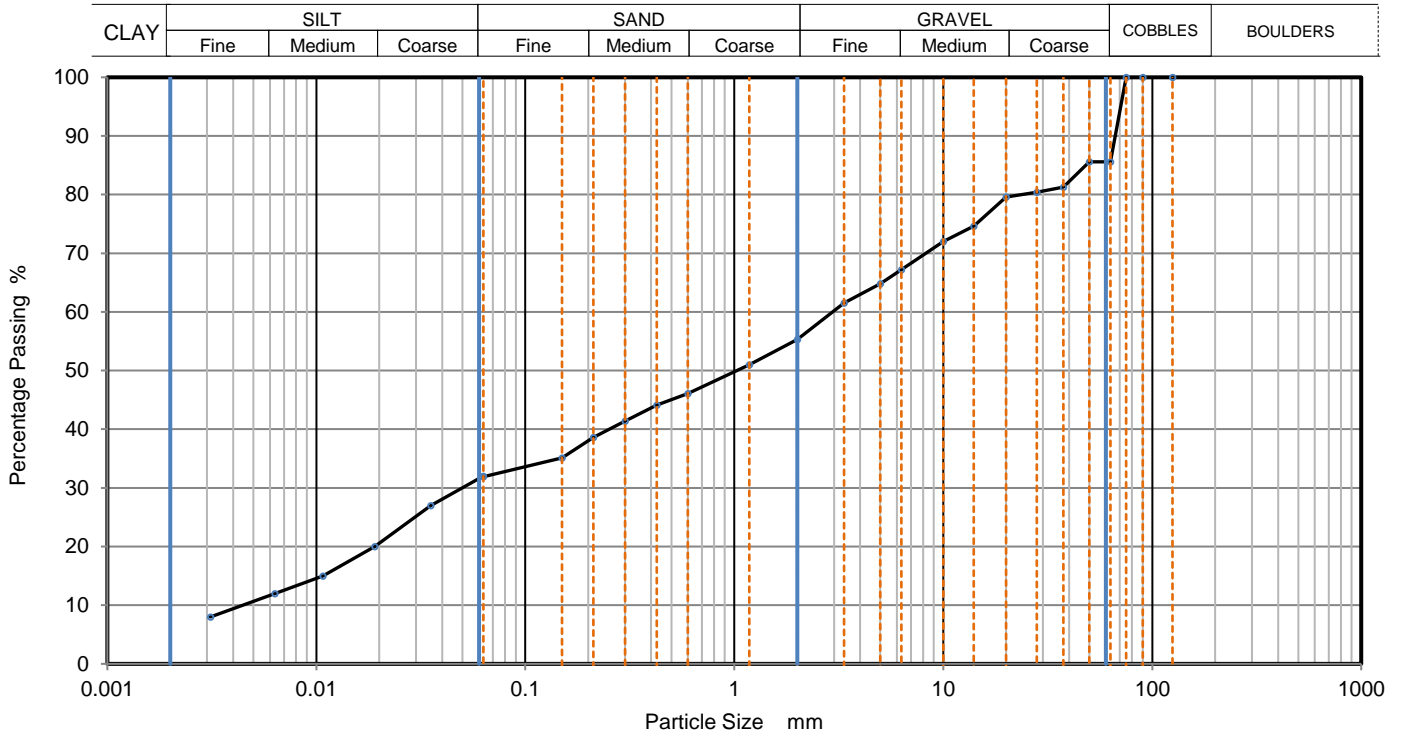
Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
Preparation and testing in accordance with BS1377 unless noted below



PARTICLE SIZE DISTRIBUTION

Job Ref	17-0524
Borehole/Pit No.	BH14
Sample No.	4
Depth, m	2.00
Sample Type	B
KeyLAB ID	Caus20170621200



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	32
90	100	0.0353	27
75	100	0.0190	20
63	86	0.0107	15
50	86	0.0063	12
37.5	81	0.0031	8
28	80		
20	80		
14	75		
10	72		
6.3	67		
5	65		
3.35	62		
2	55		
1.18	51		
0.6	46	Particle density (assumed) 1.40 Mg/m ³	
0.425	44		
0.3	41		
0.212	39		
0.15	35		
0.063	32		

Dry Mass of sample, g 4305

Sample Proportions	% dry mass
Cobbles	14
Gravel	30
Sand	23
Fines <0.063mm	32

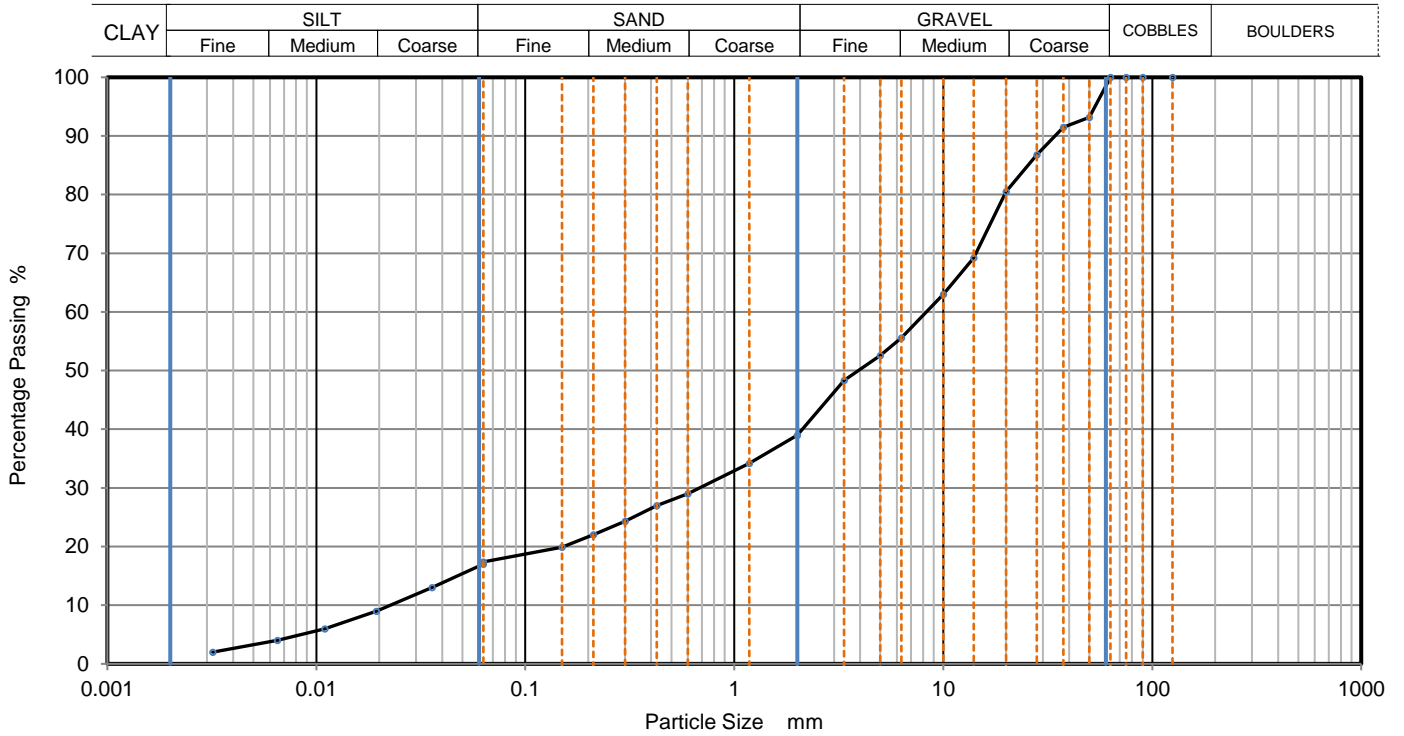
Grading Analysis	
D100	mm
D60	mm 2.96
D30	mm 0.05
D10	mm 0.00472
Uniformity Coefficient	630
Curvature Coefficient	0.18

Remarks
Preparation and testing in accordance with BS1377 unless noted below



PARTICLE SIZE DISTRIBUTION

Job Ref	17-0524
Borehole/Pit No.	TP12
Site Name	Ballymun NCOD - Site Investigation
Sample No.	5
Soil Description	MADE GROUND: Greyish brown sandy gravelly CLAY with fragments of red brick.
Depth, m	2.00
Specimen Reference	6
Specimen Depth	m
Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5
KeyLAB ID	Caus20170621203



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	17
90	100	0.0357	13
75	100	0.0194	9
63	100	0.0110	6
50	93	0.0065	4
37.5	92	0.0032	2
28	87		
20	81		
14	69		
10	63		
6.3	56		
5	53		
3.35	48		
2	39		
1.18	34		
0.6	29		
0.425	27	Particle density (assumed) 1.40 Mg/m3	
0.3	24		
0.212	22		
0.15	20		
0.063	17		

Dry Mass of sample, g 6503

Sample Proportions	% dry mass
Cobbles	0
Gravel	61
Sand	22
Fines <0.063mm	17

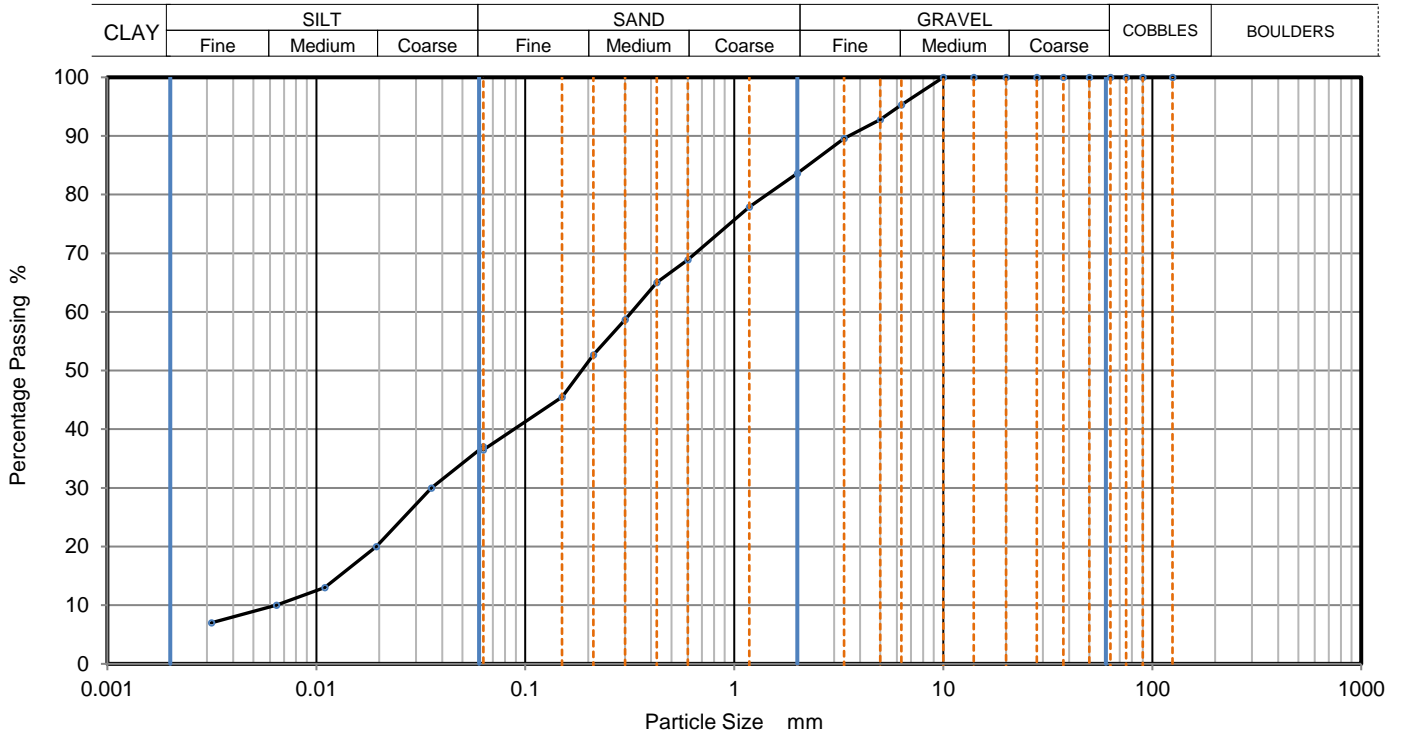
Grading Analysis	
D100	mm
D60	mm 8.28
D30	mm 0.684
D10	mm 0.0218
Uniformity Coefficient	380
Curvature Coefficient	2.6

Remarks
Preparation and testing in accordance with BS1377 unless noted below



PARTICLE SIZE DISTRIBUTION

Job Ref	17-0524
Borehole/Pit No.	TP12
Sample No.	7
Depth, m	3.00
Sample Type	B
KeyLAB ID	Caus20170621204



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	37
90	100	0.0355	30
75	100	0.0194	20
63	100	0.0110	13
50	100	0.0064	10
37.5	100	0.0031	7
28	100		
20	100		
14	100		
10	100		
6.3	95		
5	93		
3.35	90		
2	84		
1.18	78		
0.6	69		
0.425	65	Particle density (assumed) 1.40 Mg/m ³	
0.3	59		
0.212	53		
0.15	46		
0.063	37		

Dry Mass of sample, g 2449

Sample Proportions	% dry mass
Cobbles	0
Gravel	16
Sand	47
Fines <0.063mm	36

Grading Analysis		
D100	mm	
D60	mm	0.323
D30	mm	0.0359
D10	mm	0.00649
Uniformity Coefficient		50
Curvature Coefficient		0.62

Remarks
Preparation and testing in accordance with BS1377 unless noted below



Final Report

Report No.: 17-16445-1

Initial Date of Issue: 03-Jul-2017

Client: Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project: 17-0524 Ballymun NCOD

Quotation No.: **Date Received:** 27-Jun-2017

Order No.: **Date Instructed:** 27-Jun-2017

No. of Samples: 6

Turnaround (Wkdays): 5 **Results Due:** 03-Jul-2017

Date Approved: 03-Jul-2017

Approved By:


Details: Martin Dyer, Laboratory Manager

Project: 17-0524 Ballymun NCOD

Client: Causeway Geotech Ltd	Chemtest Job No.:				17-16445	17-16445	17-16445	17-16445	17-16445	17-16445
Quotation No.:	Chemtest Sample ID.:				475655	475656	475657	475658	475659	475660
Order No.:	Client Location ID.:				BH01	BH02	BH03	BH14	TP12	TP15
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				3.00	4.00	3.00	2.00	2.00	2.00
	Date Sampled:				26-Jun-2017	26-Jun-2017	26-Jun-2017	26-Jun-2017	26-Jun-2017	26-Jun-2017
Determinand	Accred.	SOP	Units	LOD						
Moisture	N	2030	%	0.020	9.5	9.4	9.3	10	18	17
pH	U	2010		N/A	8.1	8.3	8.3	8.4	8.2	8.3
Sulphate (2:1 Water Soluble) as SO ₄	U	2120	g/l	0.010	0.42	0.23	0.14	< 0.010	0.18	0.017

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"

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

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:

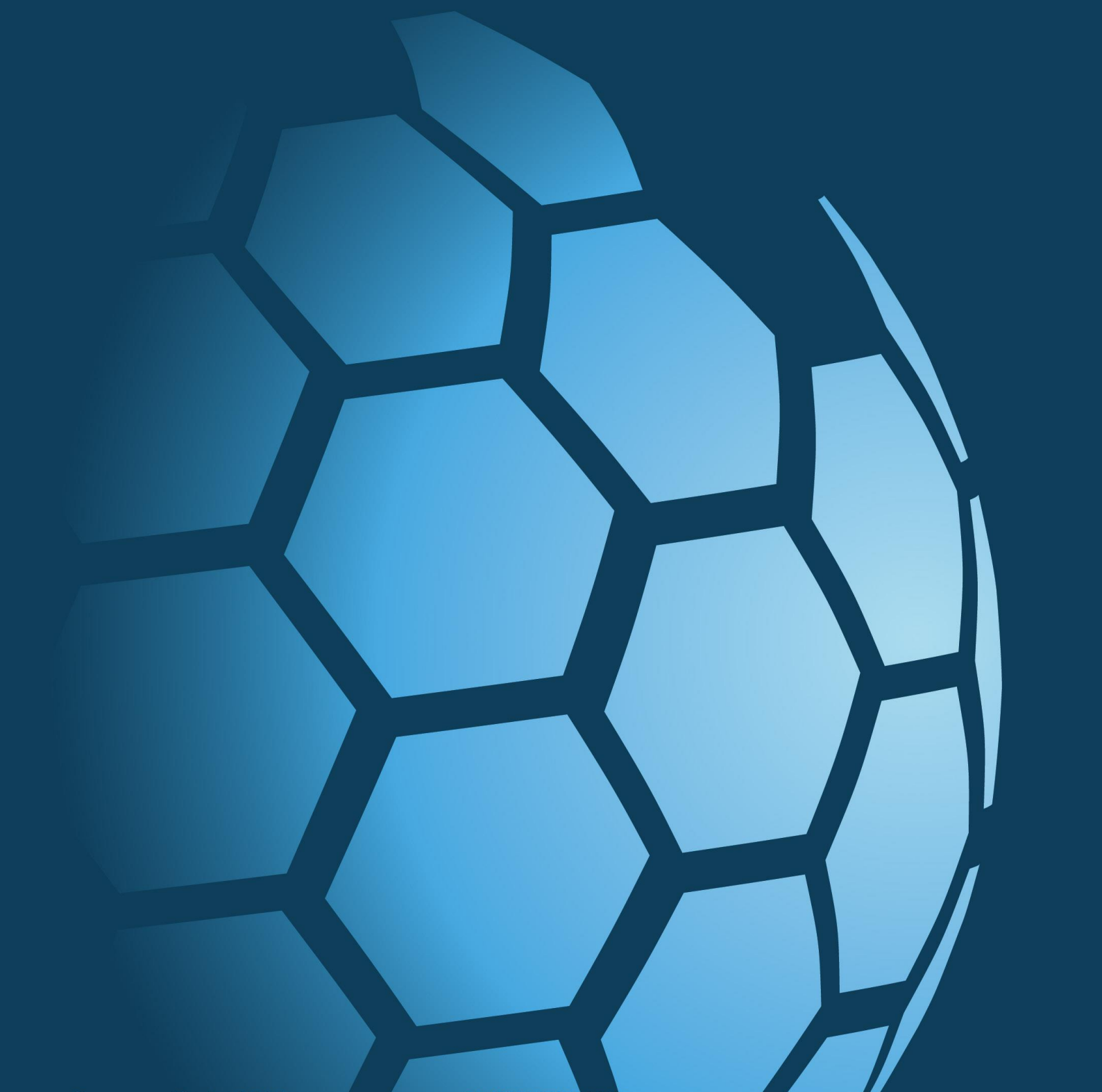
customerservices@chemtest.co.uk



CAUSEWAY
— GEOTECH

APPENDIX I

Environmental laboratory test results





Final Report

Report No.: 17-14673-1

Initial Date of Issue: 14-Jul-2017

Client: Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project: 17-0524 - Ballymun NCOD

Quotation No.: **Date Received:** 12-Jun-2017

Order No.: **Date Instructed:** 06-Jul-2017

No. of Samples: 1

Turnaround (Wkdays): 7 **Results Due:** 14-Jul-2017

Date Approved: 14-Jul-2017

Approved By:



Details: Martin Dyer, Laboratory Manager

Project: 17-0524 - Ballymun NCOD

Chemtest Job No: 17-14673							Landfill Waste Acceptance Criteria Limits		
Chemtest Sample ID: 466474							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Location ID: BH1									
Sample Ref:									
Top Depth(m): 0.50									
Bottom Depth(m):									
Sampling Date: 08-Jun-2017									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%				6.0	3	5
Loss On Ignition	2610	U	%				9.2	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--
pH	2010	U					7.2	--	>6
Acid Neutralisation Capacity	2015	N	mol/kg				0.035	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	0.0083	0.0066	< 0.050	0.068	0.5	2	25
Barium	1450	U	0.14	0.075	< 0.50	0.82	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.012	0.017	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0025	0.0045	< 0.050	< 0.050	0.5	10	30
Nickel	1450	U	0.0029	0.0025	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0018	0.0019	< 0.010	0.019	0.06	0.7	5
Selenium	1450	U	0.0031	0.0023	< 0.010	0.024	0.1	0.5	7
Zinc	1450	U	0.0061	0.0013	< 0.50	< 0.50	4	50	200
Chloride	1220	U	5.9	< 1.0	11	< 10	800	15000	25000
Fluoride	1220	U	0.22	0.41	< 1.0	3.9	10	150	500
Sulphate	1220	U	40	15	77	180	1000	20000	50000
Total Dissolved Solids	1020	N	290	190	560	2000	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	19	17	< 50	170	500	800	1000

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	22

Leachate Test Information	
Leachant volume 1st extract/l	0.300
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.203

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.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample ID:	Sample Location ID:	Sample Ref:	Sampled Date:	Deviation Code(s):	Containers Received:
466474	BH1		08-Jun-2017	B	Amber Glass 250ml
466474	BH1		08-Jun-2017	B	Amber Glass 60ml
466474	BH1		08-Jun-2017	B	Plastic Tub 500g

Report Information

Key

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- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
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- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

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

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.co.uk



Final Report

Report No.: 17-14701-1

Initial Date of Issue: 14-Jul-2017

Client: Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project: 17-0524 Ballymun NCOD

Quotation No.: **Date Received:** 12-Jun-2017


Order No.: **Date Instructed:** 06-Jul-2017

No. of Samples: 5

Turnaround (Wkdays): 7 **Results Due:** 14-Jul-2017

Date Approved: 14-Jul-2017

Approved By:



Details: Martin Dyer, Laboratory Manager

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-14701							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466631							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP12										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 09-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				0.95	3	5	6
Loss On Ignition	2610	U	%				2.7	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] 74	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				8.7	100	--	--
pH	2010	U					8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.11	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.043	0.019	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0033	0.0012	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0098	0.011	< 0.050	0.11	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	0.0014	0.0019	< 0.010	0.018	0.06	0.7	5	
Selenium	1450	U	0.0014	0.0013	< 0.010	0.013	0.1	0.5	7	
Zinc	1450	U	0.0016	0.0017	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	4.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.26	0.26	< 1.0	2.6	10	150	500	
Sulphate	1220	U	22	10	44	120	1000	20000	50000	
Total Dissolved Solids	1020	N	100	69	200	730	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	8.2	7.2	< 50	73	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.0

Leachate Test Information	
Leachant volume 1st extract/l	0.333
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.213

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.

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-14701							Landfill Waste Acceptance Criteria Limits		
Chemtest Sample ID: 466632							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Location ID: TP12									
Sample Ref:									
Top Depth(m): 1.50									
Bottom Depth(m):									
Sampling Date: 09-Jun-2017									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%			1.1	3	5	6
Loss On Ignition	2610	U	%			3.7	--	--	10
Total BTEX	2760	U	mg/kg			[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg			[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			4.6	100	--	--
pH	2010	U				8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.13	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	0.0012	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.089	0.047	< 0.50	0.52	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0027	0.0018	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0079	0.0068	< 0.050	0.069	0.5	10	30
Nickel	1450	U	0.0011	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0019	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0030	0.0013	< 0.50	< 0.50	4	50	200
Chloride	1220	U	4.6	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.27	0.24	< 1.0	2.4	10	150	500
Sulphate	1220	U	95	18	190	270	1000	20000	50000
Total Dissolved Solids	1020	N	280	110	550	1300	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	8.8	6.9	< 50	71	500	800	1000

Soild 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	0.212

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.

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-14701							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466635							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP14										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 09-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				1.0	3	5	6
Loss On Ignition	2610	U	%				3.2	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.11	--	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 12457-3 at L/S 10 l/kg			
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.036	0.014	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0036	0.0024	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0066	0.0078	< 0.050	0.077	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	0.0055	0.0060	0.011	0.059	0.06	0.7	5	
Selenium	1450	U	0.0038	< 0.0010	< 0.010	< 0.010	0.1	0.5	7	
Zinc	1450	U	0.0018	< 0.0010	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	4.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.38	0.34	< 1.0	3.4	10	150	500	
Sulphate	1220	U	35	6.8	69	100	1000	20000	50000	
Total Dissolved Solids	1020	N	150	79	300	870	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	8.7	8.9	< 50	89	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.327
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.198

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.

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-14701							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466636							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP14										
Sample Ref:										
Top Depth(m): 1.50										
Bottom Depth(m):										
Sampling Date: 09-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				0.62	3	5	6
Loss On Ignition	2610	U	%				2.2	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.12	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.019	0.016	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0033	0.0014	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0061	0.0099	< 0.050	0.094	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5	
Selenium	1450	U	0.0023	0.0013	< 0.010	0.014	0.1	0.5	7	
Zinc	1450	U	0.0020	0.0015	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	2.5	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.34	0.34	< 1.0	3.4	10	150	500	
Sulphate	1220	U	29	7.8	58	100	1000	20000	50000	
Total Dissolved Solids	1020	N	130	77	260	830	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	11	6.9	< 50	74	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	10

Leachate Test Information	
Leachant volume 1st extract/l	0.330
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.212

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.

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-14701							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466637							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP15										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 09-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				1.0	3	5	6
Loss On Ignition	2610	U	%				2.7	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					9.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.13	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.012	0.011	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0026	0.0016	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0084	0.014	< 0.050	0.13	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5	
Selenium	1450	U	0.0014	< 0.0010	< 0.010	< 0.010	0.1	0.5	7	
Zinc	1450	U	0.0021	0.0013	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	4.3	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.39	0.30	< 1.0	3.1	10	150	500	
Sulphate	1220	U	38	8.8	75	120	1000	20000	50000	
Total Dissolved Solids	1020	N	150	79	300	870	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	8.7	9.8	< 50	97	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	11

Leachate Test Information	
Leachant volume 1st extract/l	0.328
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.191

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.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample ID:	Sample Location ID:	Sample Ref:	Sampled Date:	Deviation Code(s):	Containers Received:
466631	TP12		09-Jun-2017	B	Amber Glass 250ml
466631	TP12		09-Jun-2017	B	Amber Glass 60ml
466631	TP12		09-Jun-2017	B	Plastic Tub 500g
466632	TP12		09-Jun-2017	B	Amber Glass 250ml
466632	TP12		09-Jun-2017	B	Amber Glass 60ml
466632	TP12		09-Jun-2017	B	Plastic Tub 500g
466635	TP14		09-Jun-2017	B	Amber Glass 250ml
466635	TP14		09-Jun-2017	B	Amber Glass 60ml
466635	TP14		09-Jun-2017	B	Plastic Tub 500g
466636	TP14		09-Jun-2017	B	Amber Glass 250ml
466636	TP14		09-Jun-2017	B	Amber Glass 60ml
466636	TP14		09-Jun-2017	B	Plastic Tub 500g
466637	TP15		09-Jun-2017	B	Amber Glass 250ml
466637	TP15		09-Jun-2017	B	Amber Glass 60ml
466637	TP15		09-Jun-2017	B	Plastic Tub 500g

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"

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

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.co.uk



Final Report

Report No.: 17-14716-1

Initial Date of Issue: 17-Jul-2017

Client: Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project: 17-0524 - Ballymun NCOD

Quotation No.: **Date Received:** 12-Jun-2017

Order No.: **Date Instructed:** 06-Jul-2017

No. of Samples: 10

Turnaround (Wkdays): 7 **Results Due:** 14-Jul-2017

Date Approved: 17-Jul-2017

Approved By:


Details: Martin Dyer, Laboratory Manager

Project: 17-0524 - Ballymun NCOD

Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466779							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP1										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 07-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				[B] 2.3	3	5	6
Loss On Ignition	2610	U	%				6.4	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					7.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.031	--	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 12457-3 at L/S 10 l/kg			
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.043	0.029	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0051	0.0028	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0060	0.0077	< 0.050	0.075	0.5	10	30	
Nickel	1450	U	0.0017	0.0019	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	0.0011	< 0.0010	< 0.010	< 0.010	0.06	0.7	5	
Selenium	1450	U	0.0017	< 0.0010	< 0.010	< 0.010	0.1	0.5	7	
Zinc	1450	U	0.0051	0.0014	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	7.7	< 1.0	15	< 10	800	15000	25000	
Fluoride	1220	U	1.1	1.2	2.2	12	10	150	500	
Sulphate	1220	U	85	21	170	290	1000	20000	50000	
Total Dissolved Solids	1020	N	270	130	530	1400	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	14	12	< 50	120	500	800	1000	

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

Leachate Test Information	
Leachant volume 1st extract/l	0.318
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.208

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.

Project: 17-0524 - Ballymun NCOD

Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits		
Chemtest Sample ID: 466780							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Location ID: TP1									
Sample Ref:									
Top Depth(m): 1.50									
Bottom Depth(m):									
Sampling Date: 07-Jun-2017									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%	[B] 0.48			3	5	6
Loss On Ignition	2610	U	%	2.2			--	--	10
Total BTEX	2760	U	mg/kg	[B] < 0.010			6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10			1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	[B] < 10			500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0			100	--	--
pH	2010	U		8.3			--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.10			--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.014	0.0080	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0012	< 0.0010	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0083	0.018	< 0.050	0.17	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0011	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	3.0	1.3	< 10	15	800	15000	25000
Fluoride	1220	U	0.21	0.20	< 1.0	2.0	10	150	500
Sulphate	1220	U	15	7.1	30	80	1000	20000	50000
Total Dissolved Solids	1020	N	85	59	170	620	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	8.4	9.8	< 50	96	500	800	1000

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.5

Leachate Test Information	
Leachant volume 1st extract/l	0.332
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.192

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.

Project: 17-0524 - Ballymun NCOD

Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466781							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP2										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 07-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				[B] 1.9	3	5	6
Loss On Ignition	2610	U	%				5.2	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.072	--	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 12457-3 at L/S 10 l/kg			
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.027	0.054	< 0.50	0.51	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0058	0.0069	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.010	0.012	< 0.050	0.12	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	0.0070	0.0085	0.014	0.083	0.06	0.7	5	
Selenium	1450	U	< 0.0010	0.0013	< 0.010	0.012	0.1	0.5	7	
Zinc	1450	U	0.0038	0.0013	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	4.0	1.2	< 10	15	800	15000	25000	
Fluoride	1220	U	0.31	0.39	< 1.0	3.8	10	150	500	
Sulphate	1220	U	69	27	140	320	1000	20000	50000	
Total Dissolved Solids	1020	N	200	110	400	1200	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	11	11	< 50	110	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.325
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.196

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.

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Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits		
Chemtest Sample ID: 466782							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Location ID: TP2									
Sample Ref:									
Top Depth(m): 1.50									
Bottom Depth(m):									
Sampling Date: 07-Jun-2017									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%	[B] 0.56			3	5	6
Loss On Ignition	2610	U	%	2.2			--	--	10
Total BTEX	2760	U	mg/kg	[B] < 0.010			6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10			1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	[B] < 10			500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0			100	--	--
pH	2010	U		8.3			--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.085			--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.046	0.097	< 0.50	0.91	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0020	0.0013	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.012	0.019	< 0.050	0.18	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0020	0.0024	< 0.010	0.024	0.1	0.5	7
Zinc	1450	U	0.0014	0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	3.9	1.6	< 10	19	800	15000	25000
Fluoride	1220	U	0.26	0.29	< 1.0	2.9	10	150	500
Sulphate	1220	U	19	11	38	120	1000	20000	50000
Total Dissolved Solids	1020	N	100	78	200	810	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	8.0	8.2	< 50	82	500	800	1000

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.7

Leachate Test Information	
Leachant volume 1st extract/l	0.331
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.206

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.

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Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466785							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP5										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 07-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				[B] 2.8	3	5	6
Loss On Ignition	2610	U	%				6.8	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					7.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.092	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.014	0.011	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0046	0.0064	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0035	0.0057	< 0.050	0.054	0.5	10	30	
Nickel	1450	U	< 0.0010	0.0017	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	0.0011	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	0.0012	0.0015	< 0.010	0.015	0.06	0.7	5	
Selenium	1450	U	0.0018	0.0018	< 0.010	0.018	0.1	0.5	7	
Zinc	1450	U	0.0045	0.0021	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	2.2	1.2	< 10	13	800	15000	25000	
Fluoride	1220	U	0.29	0.63	< 1.0	5.9	10	150	500	
Sulphate	1220	U	26	12	51	140	1000	20000	50000	
Total Dissolved Solids	1020	N	140	120	280	1200	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	12	13	< 50	130	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	17

Leachate Test Information	
Leachant volume 1st extract/l	0.315
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.204

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.

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Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466787							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP6										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 07-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				[B] 3.3	3	5	6
Loss On Ignition	2610	U	%				5.5	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.10	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.016	0.0081	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0051	0.0028	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0065	0.0063	< 0.050	0.063	0.5	10	30	
Nickel	1450	U	0.0011	0.0014	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	0.0012	< 0.0010	< 0.010	< 0.010	0.06	0.7	5	
Selenium	1450	U	0.0019	0.0019	< 0.010	0.019	0.1	0.5	7	
Zinc	1450	U	0.0037	0.0040	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	3.0	4.3	< 10	42	800	15000	25000	
Fluoride	1220	U	0.45	0.53	< 1.0	5.2	10	150	500	
Sulphate	1220	U	57	14	110	190	1000	20000	50000	
Total Dissolved Solids	1020	N	190	99	380	1100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	13	10	< 50	100	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.326
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.190

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.

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Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466793							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP9										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 08-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				2.8	3	5	6
Loss On Ignition	2610	U	%				7.1	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					7.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.15	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	0.0011	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.026	0.027	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0048	0.0040	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0031	0.0045	< 0.050	< 0.050	0.5	10	30	
Nickel	1450	U	< 0.0010	0.0015	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	0.0014	< 0.010	0.012	0.5	10	50	
Antimony	1450	U	< 0.0010	0.0011	< 0.010	< 0.010	0.06	0.7	5	
Selenium	1450	U	0.0012	0.0022	< 0.010	0.021	0.1	0.5	7	
Zinc	1450	U	0.0028	0.0025	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	4.1	1.4	< 10	17	800	15000	25000	
Fluoride	1220	U	0.46	0.62	< 1.0	6.0	10	150	500	
Sulphate	1220	U	55	16	110	210	1000	20000	50000	
Total Dissolved Solids	1020	N	200	120	390	1300	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	14	17	< 50	170	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	18

Leachate Test Information	
Leachant volume 1st extract/l	0.311
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.208

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.

Project: 17-0524 - Ballymun NCOD

Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466794							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP9										
Sample Ref:										
Top Depth(m): 1.50										
Bottom Depth(m):										
Sampling Date: 08-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				0.35	3	5	6
Loss On Ignition	2610	U	%				2.2	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.069	--	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 12457-3 at L/S 10 l/kg			
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.012	0.0079	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0024	< 0.0010	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0084	0.016	< 0.050	0.15	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5	
Selenium	1450	U	< 0.0010	0.0014	< 0.010	0.012	0.1	0.5	7	
Zinc	1450	U	0.0020	< 0.0010	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	6.6	< 1.0	13	< 10	800	15000	25000	
Fluoride	1220	U	0.21	0.14	< 1.0	1.5	10	150	500	
Sulphate	1220	U	34	7.1	68	100	1000	20000	50000	
Total Dissolved Solids	1020	N	120	61	240	670	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	14	8.0	< 50	86	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	11

Leachate Test Information	
Leachant volume 1st extract/l	0.329
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.186

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.

Project: 17-0524 - Ballymun NCOD

Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits		
Chemtest Sample ID: 466795							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Location ID: TP10									
Sample Ref:									
Top Depth(m): 0.50									
Bottom Depth(m):									
Sampling Date: 08-Jun-2017									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%	0.54			3	5	6
Loss On Ignition	2610	U	%	2.4			--	--	10
Total BTEX	2760	U	mg/kg	[B] < 0.010			6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10			1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	[B] < 10			500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0			100	--	--
pH	2010	U		8.3			--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.079			--	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 12457-3 at L/S 10 l/kg	
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.0069	0.0036	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0020	< 0.0010	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0031	0.0040	< 0.050	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0014	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0014	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	2.8	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.27	0.29	< 1.0	2.9	10	150	500
Sulphate	1220	U	6.9	3.0	14	34	1000	20000	50000
Total Dissolved Solids	1020	N	92	69	180	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	8.2	8.4	< 50	84	500	800	1000

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.3

Leachate Test Information	
Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.190

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.

Project: 17-0524 - Ballymun NCOD

Chemtest Job No: 17-14716							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 466797							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: TP11										
Sample Ref:										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 08-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				1.9	3	5	6
Loss On Ignition	2610	U	%				5.3	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] 64	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				8.0	100	--	--
pH	2010	U					8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.14	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.022	0.012	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0039	0.0022	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0066	0.0081	< 0.050	0.079	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	0.0014	0.0015	< 0.010	0.015	0.06	0.7	5	
Selenium	1450	U	0.0022	0.0011	< 0.010	0.012	0.1	0.5	7	
Zinc	1450	U	0.0073	0.0019	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	4.7	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.42	0.40	< 1.0	4.0	10	150	500	
Sulphate	1220	U	100	22	200	310	1000	20000	50000	
Total Dissolved Solids	1020	N	220	98	430	1100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	11	8.9	< 50	91	500	800	1000	

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

Leachate Test Information	
Leachant volume 1st extract/l	0.319
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.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample ID:	Sample Location ID:	Sample Ref:	Sampled Date:	Deviation Code(s):	Containers Received:
466779	TP1		07-Jun-2017	B	Amber Glass 250ml
466779	TP1		07-Jun-2017	B	Amber Glass 60ml
466779	TP1		07-Jun-2017	B	Plastic Tub 500g
466780	TP1		07-Jun-2017	B	Amber Glass 250ml
466780	TP1		07-Jun-2017	B	Amber Glass 60ml
466780	TP1		07-Jun-2017	B	Plastic Tub 500g
466781	TP2		07-Jun-2017	B	Amber Glass 250ml
466781	TP2		07-Jun-2017	B	Amber Glass 60ml
466781	TP2		07-Jun-2017	B	Plastic Tub 500g
466782	TP2		07-Jun-2017	B	Amber Glass 250ml
466782	TP2		07-Jun-2017	B	Amber Glass 60ml
466782	TP2		07-Jun-2017	B	Plastic Tub 500g
466785	TP5		07-Jun-2017	B	Amber Glass 250ml
466785	TP5		07-Jun-2017	B	Amber Glass 60ml
466785	TP5		07-Jun-2017	B	Plastic Tub 500g
466787	TP6		07-Jun-2017	B	Amber Glass 250ml
466787	TP6		07-Jun-2017	B	Amber Glass 60ml
466787	TP6		07-Jun-2017	B	Plastic Tub 500g
466793	TP9		08-Jun-2017	B	Amber Glass 250ml
466793	TP9		08-Jun-2017	B	Amber Glass 60ml
466793	TP9		08-Jun-2017	B	Plastic Tub 500g
466794	TP9		08-Jun-2017	B	Amber Glass 250ml
466794	TP9		08-Jun-2017	B	Amber Glass 60ml
466794	TP9		08-Jun-2017	B	Plastic Tub 500g
466795	TP10		08-Jun-2017	B	Amber Glass 250ml
466795	TP10		08-Jun-2017	B	Amber Glass 60ml
466795	TP10		08-Jun-2017	B	Plastic Tub 500g
466797	TP11		08-Jun-2017	B	Amber Glass 250ml
466797	TP11		08-Jun-2017	B	Amber Glass 60ml
466797	TP11		08-Jun-2017	B	Plastic Tub 500g

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"

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

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.co.uk



Final Report

Report No.: 17-15199-1

Initial Date of Issue: 17-Jul-2017

Client: Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project: 17-0524 Ballymun NCOD

Quotation No.: **Date Received:** 15-Jun-2017


Order No.: **Date Instructed:** 06-Jul-2017

No. of Samples: 2

Turnaround (Wkdays): 7 **Results Due:** 14-Jul-2017

Date Approved: 17-Jul-2017

Approved By:



Details: Martin Dyer, Laboratory Manager

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-15199							Landfill Waste Acceptance Criteria Limits		
Chemtest Sample ID: 469556							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Location ID: BH16									
Sample Ref:									
Top Depth(m): 0.50									
Bottom Depth(m):									
Sampling Date: 13-Jun-2017									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%	0.46			3	5	6
Loss On Ignition	2610	U	%	2.2			--	--	10
Total BTEX	2760	U	mg/kg	[B] < 0.010			6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10			1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	[B] < 10			500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0			100	--	--
pH	2010	U		8.3			--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.13			--	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 12457-3 at L/S 10 l/kg	
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.0062	0.0038	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0022	< 0.0010	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0052	0.0087	< 0.050	0.083	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0016	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0045	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	3.1	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.21	0.24	< 1.0	2.4	10	150	500
Sulphate	1220	U	14	2.5	28	38	1000	20000	50000
Total Dissolved Solids	1020	N	72	59	140	600	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	8.4	8.2	< 50	82	500	800	1000

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.4

Leachate Test Information	
Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.201

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.

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-15199							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 469557							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: BH16										
Sample Ref:										
Top Depth(m): 1.50										
Bottom Depth(m):										
Sampling Date: 13-Jun-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				1.7	3	5	6
Loss On Ignition	2610	U	%				3.4	--	--	10
Total BTEX	2760	U	mg/kg				[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				[B] 320	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				4.1	100	--	--
pH	2010	U					8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.16	--	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 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25	
Barium	1450	U	0.024	0.026	< 0.50	< 0.50	20	100	300	
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0029	0.0015	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0089	0.017	< 0.050	0.16	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50	
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5	
Selenium	1450	U	0.0038	0.0028	< 0.010	0.029	0.1	0.5	7	
Zinc	1450	U	0.0055	0.0015	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	5.6	1.8	11	22	800	15000	25000	
Fluoride	1220	U	0.30	0.33	< 1.0	3.3	10	150	500	
Sulphate	1220	U	160	52	320	650	1000	20000	50000	
Total Dissolved Solids	1020	N	290	120	580	1400	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	7.9	6.2	< 50	64	500	800	1000	

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.327
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.207

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.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample ID:	Sample Location ID:	Sample Ref:	Sampled Date:	Deviation Code(s):	Containers Received:
469556	BH16		13-Jun-2017	B	Amber Glass 250ml
469556	BH16		13-Jun-2017	B	Amber Glass 60ml
469556	BH16		13-Jun-2017	B	Plastic Tub 500g
469557	BH16		13-Jun-2017	B	Amber Glass 250ml
469557	BH16		13-Jun-2017	B	Amber Glass 60ml
469557	BH16		13-Jun-2017	B	Plastic Tub 500g

Report Information

Key

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- 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"

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

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.co.uk



Final Report

Report No.: 17-17531-1

Initial Date of Issue: 12-Jul-2017

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project 17-0524 Ballymun NCOD

Quotation No.:		Date Received:	06-Jul-2017
Order No.:		Date Instructed:	06-Jul-2017
No. of Samples:	2		
Turnaround (Wkdays):	5	Results Due:	12-Jul-2017
Date Approved:	12-Jul-2017		

Approved By:

Details: Martin Dyer, Laboratory Manager

Project: 17-0524 Ballymun NCOD

Client: Causeway Geotech Ltd	Chemtest Job No.:				17-17531	17-17531
Quotation No.:	Chemtest Sample ID.:				480882	480883
Order No.:	Client Location ID.:				BH16	BH16
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.50	1.50
	Date Sampled:				13-Jun-2017	13-Jun-2017
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected

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"

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

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.co.uk



Final Report

Report No.: 17-17533-1

Initial Date of Issue: 12-Jul-2017

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project 17-0524 Ballymun NCOD

Quotation No.:		Date Received:	06-Jul-2017
Order No.:		Date Instructed:	06-Jul-2017
No. of Samples:	5		
Turnaround (Wkdays):	5	Results Due:	12-Jul-2017
Date Approved:	12-Jul-2017		

Approved By:

Details: Martin Dyer, Laboratory Manager

Project: 17-0524 Ballymun NCOD

Client: Causeway Geotech Ltd		Chemtest Job No.:		17-17533	17-17533	17-17533	17-17533	17-17533
Quotation No.:	Chemtest Sample ID.:		480887	480888	480889	480890	480891	
Order No.:	Client Location ID.:		TP12	TP12	TP14	TP14	TP15	
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	
	Top Depth (m):		0.50	1.50	0.50	1.50	0.50	
	Date Sampled:		09-Jun-2017	09-Jun-2017	09-Jun-2017	09-Jun-2017	09-Jun-2017	
	Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	
Determinand	Accred.	SOP	Units	LOD				
ACM Type	U	2192		N/A	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected

Report Information

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Uncertainty of measurement for the determinands tested are available upon request

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All results are expressed on a dry weight basis

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Sample Deviation Codes

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- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample

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.co.uk



Final Report

Report No.: 17-17534-1

Initial Date of Issue: 13-Jul-2017

Client: Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project: 17-0524 - Ballymun NCOD

Quotation No.: **Date Received:** 06-Jul-2017

Order No.: **Date Instructed:** 06-Jul-2017

No. of Samples: 10

Turnaround (Wkdays): 5 **Results Due:** 12-Jul-2017

Date Approved: 13-Jul-2017

Approved By:



Details: Martin Dyer, Laboratory Manager

Results - Soil

Project: 17-0524 - Ballymun NCOD

Client: Causeway Geotech Ltd		Chemtest Job No.:		17-17534	17-17534	17-17534	17-17534	17-17534	17-17534	17-17534	17-17534	17-17534	17-17534
Quotation No.:		Chemtest Sample ID.:		480892	480893	480894	480895	480896	480897	480898	480899	480900	
Order No.:		Client Location ID.:		TP1	TP1	TP2	TP2	TP5	TP6	TP9	TP9	TP10	
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
		Top Depth (m):		0.50	1.50	0.50	1.50	0.50	0.50	0.50	1.50	0.50	
		Date Sampled:		07-Jun-2017	07-Jun-2017	07-Jun-2017	07-Jun-2017	07-Jun-2017	07-Jun-2017	08-Jun-2017	08-Jun-2017	08-Jun-2017	
		Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	
Determinand	Accred.	SOP	Units	LOD									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	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

Project: 17-0524 - Ballymun NCOD

Results - Soil

Client: Causeway Geotech Ltd	Chemtest Job No.: 17-17534				
Quotation No.:	Chemtest Sample ID.: 480901				
Order No.:	Client Location ID.: TP11				
	Sample Type: SOIL				
	Top Depth (m): 0.50				
	Date Sampled: 08-Jun-2017				
	Asbestos Lab: COVENTRY				
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected

Report Information

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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

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.co.uk



Final Report

Report No.: 17-17535-1

Initial Date of Issue: 12-Jul-2017

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project 17-0524 - Ballymun NCOD

Quotation No.:		Date Received:	06-Jul-2017
Order No.:		Date Instructed:	06-Jul-2017
No. of Samples:	1		
Turnaround (Wkdays):	5	Results Due:	12-Jul-2017
Date Approved:	12-Jul-2017		

Approved By:

Details: Glynn Harvey, Laboratory Manager

Project: 17-0524 - Ballymun NCOD

Results - Soil

Client: Causeway Geotech Ltd	Chemtest Job No.: 17-17535				
Quotation No.:	Chemtest Sample ID.: 480902				
Order No.:	Client Location ID.: BH1				
	Sample Type: SOIL				
	Top Depth (m): 0.50				
	Date Sampled: 08-Jun-2017				
	Asbestos Lab: COVENTRY				
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected

Report Information

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Comments or interpretations are beyond the scope of UKAS accreditation

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Sample Deviation Codes

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- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample

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.co.uk



2183

Final Report

Report No.: 17-17797-1

Initial Date of Issue: 17-Jul-2017

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Brian Mooney
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project 17-0524 Ballymun NCOD

Quotation No.: **Date Received:** 10-Jul-2017

Order No.: **Date Instructed:** 11-Jul-2017

No. of Samples: 2

Turnaround (Wkdays): 5 **Results Due:** 17-Jul-2017

Date Approved: 17-Jul-2017

Approved By:



Details: Keith Jones, Technical Manager

Project: 17-0524 Ballymun NCOD

Client: Causeway Geotech Ltd	Chemtest Job No.:				17-17797	17-17797
Quotation No.:	Chemtest Sample ID.:				482189	482194
Order No.:	Client Location ID.:				BH10	BH15
	Sample Type:				SOIL	SOIL
	Top Depth (m):				1.50	0.50
	Date Sampled:				06-Jul-2017	07-Jul-2017
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected

Report Information

Key

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- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

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

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.co.uk



Final Report

Report No.: 17-17945-1

Initial Date of Issue: 19-Jul-2017

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Aisling O'Kane
Colm Hurley
Darren O'Mahony
John Cameron
John Duggan
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Stephen Curtis
Stephen Franey
Stephen Watson

Project 17-0524 Ballymun NCOD


Quotation No.: **Date Received:** 11-Jul-2017

Order No.: **Date Instructed:** 11-Jul-2017

No. of Samples: 2

Turnaround (Wkdays): 7 **Results Due:** 19-Jul-2017

Date Approved: 19-Jul-2017

Approved By:


Details: Glynn Harvey, Laboratory Manager

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-17945							Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 482912							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample Location ID: BH10										
Sample Ref:										
Top Depth(m): 1.50										
Bottom Depth(m):										
Sampling Date: 06-Jul-2017										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				7.0	3	5	6
Loss On Ignition	2610	U	%				6.7	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				200	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				240	100	--	--
pH	2010	U					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.063	--	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 12457-3 at L/S 10 l/kg			
Arsenic	1450	U	0.0079	0.0066	< 0.050	0.068	0.5	2	25	
Barium	1450	U	0.078	0.045	< 0.50	0.50	20	100	300	
Cadmium	1450	U	0.00026	< 0.00010	< 0.010	< 0.010	0.04	1	5	
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70	
Copper	1450	U	0.0078	0.0045	< 0.050	< 0.050	2	50	100	
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.17	0.057	0.33	0.74	0.5	10	30	
Nickel	1450	U	0.0041	0.0023	< 0.050	< 0.050	0.4	10	40	
Lead	1450	U	0.0030	0.0033	< 0.010	0.032	0.5	10	50	
Antimony	1450	U	0.14	0.088	0.27	0.95	0.06	0.7	5	
Selenium	1450	U	0.0030	0.0016	< 0.010	0.018	0.1	0.5	7	
Zinc	1450	U	0.016	0.0049	< 0.50	< 0.50	4	50	200	
Chloride	1220	U	12	1.6	24	32	800	15000	25000	
Fluoride	1220	U	0.63	0.52	1.2	5.4	10	150	500	
Sulphate	1220	U	310	57	620	970	1000	20000	50000	
Total Dissolved Solids	1020	N	530	150	1000	2100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	19	16	< 50	160	500	800	1000	

Soild 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	0.274

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.

Project: 17-0524 Ballymun NCOD

Chemtest Job No: 17-17945							Landfill Waste Acceptance Criteria Limits		
Chemtest Sample ID: 482913							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Location ID: BH15									
Sample Ref:									
Top Depth(m): 0.50									
Bottom Depth(m):									
Sampling Date: 07-Jul-2017									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%				1.6	3	5
Loss On Ignition	2610	U	%				5.1	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				< 10	500	--
Total (Of 17) PAH's	2700	N	mg/kg				9.5	100	--
pH	2010	U					8.3	--	>6
Acid Neutralisation Capacity	2015	N	mol/kg				0.057	--	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 12457-3 at L/S 10 l/kg	
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.075	0.033	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	0.0048	0.0015	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0047	0.0016	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0077	0.0092	< 0.050	0.089	0.5	10	30
Nickel	1450	U	0.0012	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0040	0.0014	< 0.010	0.018	0.06	0.7	5
Selenium	1450	U	0.0026	0.0011	< 0.010	0.013	0.1	0.5	7
Zinc	1450	U	0.011	0.0024	< 0.50	< 0.50	4	50	200
Chloride	1220	U	11	1.9	22	33	800	15000	25000
Fluoride	1220	U	0.39	0.39	< 1.0	3.9	10	150	500
Sulphate	1220	U	36	8.4	71	130	1000	20000	50000
Total Dissolved Solids	1020	N	270	100	530	1300	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	15	12	< 50	120	500	800	1000

Soild Information	
Dry mass of test portion/kg	0.175
Moisture (%)	14

Leachate Test Information	
Leachant volume 1st extract/l	0.322
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.274

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.

Report Information

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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

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:

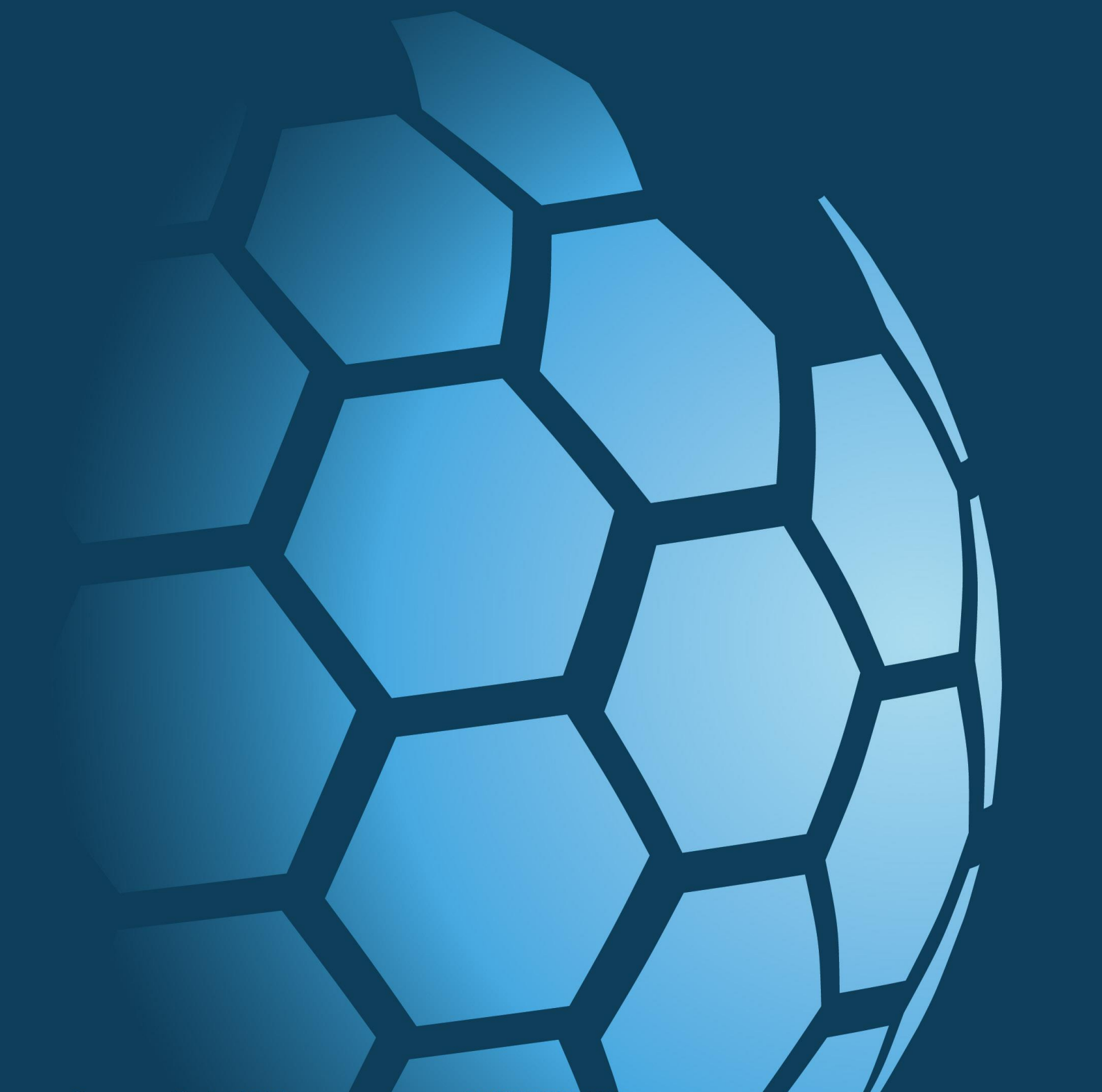
customerservices@chemtest.co.uk



CAUSEWAY
— GEOTECH

APPENDIX J

SPT hammer energy measurement report



SPT Calibration Report



Hammer Energy Measurement Report

Type of Hammer: TERRIER
 Client: CAUSEWAY GEOTECH
 Test No: EQU1760
 Test Depth (m): 7.50
 Date of Test: **18 February 2017**
 Valid until: **18 February 2018**
 Hammer ID: **DT/0659**

Mass of the hammer: $m = 63.5\text{kg}$
 Falling height: $h = 0.76\text{m}$
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$
Characteristics of the instrumented rod
 Diameter: $d_r = 0.052\text{m}$
 Length of the instrumented rod: 0.558m
 Area: $A = 11.61\text{cm}^2$
 Modulus: $E_o = 206843\text{MPa}$

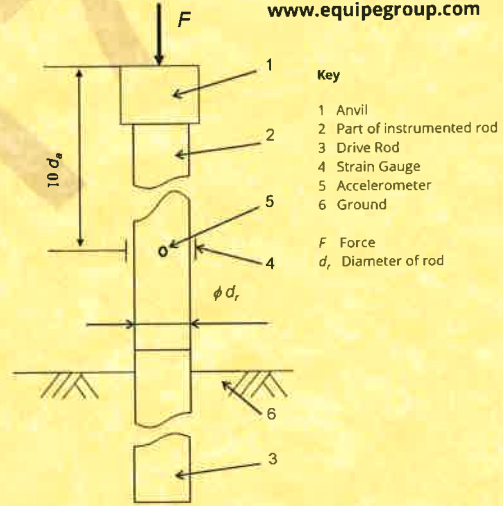
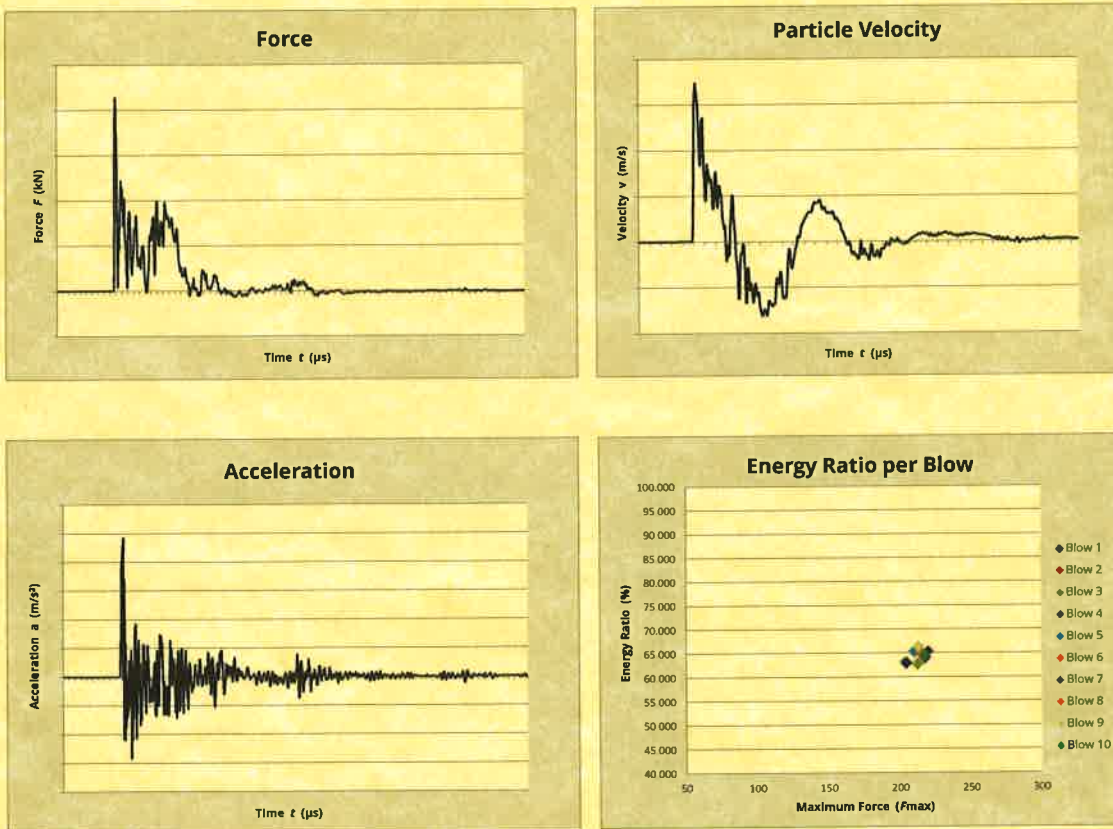


Fig. B.1 and B.2 BS EN ISO 22476-3 : 2005 + A1 : 2011



Observations:
 1.

$E_{\text{meas}} = 0.305\text{ kN-m}$
 $E_{\text{theor}} = 0.473\text{ kN-m}$
Energy Ratio $= \frac{E_{\text{meas}}}{E_{\text{theor}}}$ **64.45%**

Equipe SPT Analyzer Operators: AF
 Prepared by: *[Signature]* Checked by: *[Signature]* Date: 02/03/2017

SPT Calibration Report



Hammer Energy Measurement Report

Type of Hammer: TERRIER
 Client: CAUSEWAY GEOTECH
 Test No: EQU1758
 Test Depth (m): 7.50
 Date of Test: **18 February 2017**
 Valid until: **18 February 2018**
 Hammer ID: **DT/0421**

Mass of the hammer: $m = 63.5\text{kg}$
 Falling height: $h = 0.76\text{m}$
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$
Characteristics of the instrumented rod
 Diameter: $d_r = 0.052\text{m}$
 Length of the instrumented rod: 0.558m
 Area: $A = 11.61\text{cm}^2$
 Modulus: $E_a = 206843\text{MPa}$

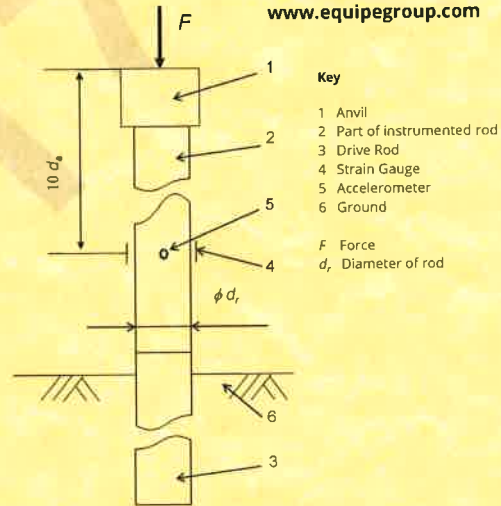
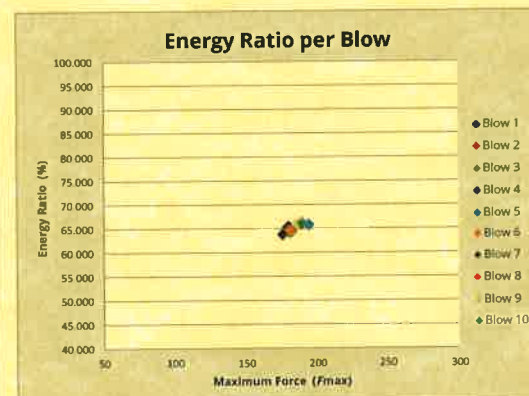
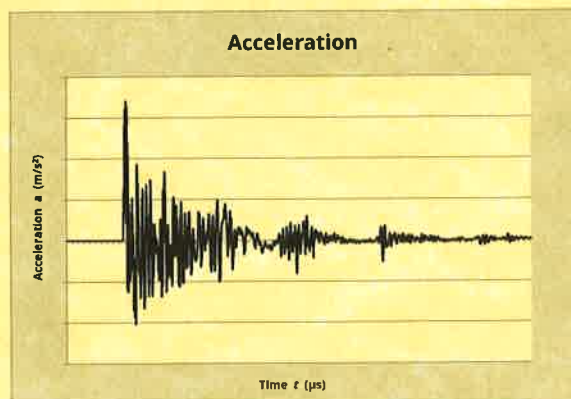
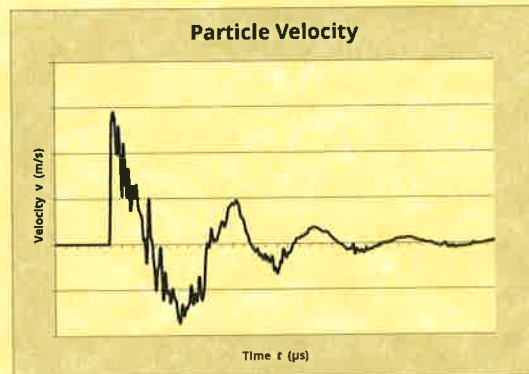
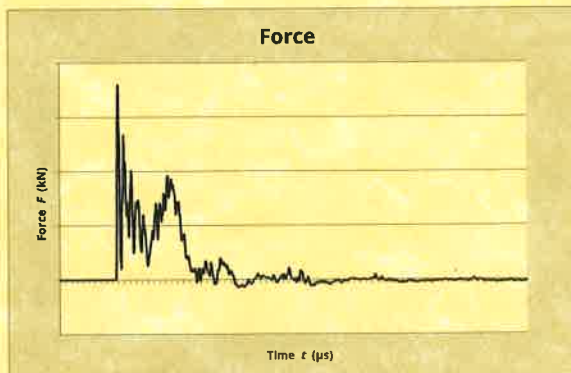


Fig. B.1 and B.2 BS EN ISO 22476-3 : 2005 + A1 : 2011



Observations:
1.

$E_{\text{meas}} = 0.307\text{ kN-m}$
 $E_{\text{theor}} = 0.473\text{ kN-m}$

$$\text{Energy Ratio} = \frac{E_{\text{meas}}}{E_{\text{theor}}} = 64.98\%$$

Equipe SPT Analyzer Operators:

AF

Prepared by:

Checked by:

Date

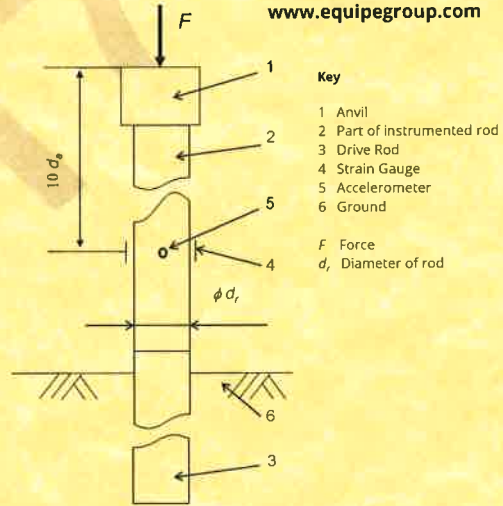
02/03/2017

SPT Calibration Report



Hammer Energy Measurement Report

Type of Hammer: TERRIER
 Client: CAUSEWAY GEOTECH
 Test No: EQU1757
 Test Depth (m): 7.50
 Date of Test: 18 February 2017
 Valid until: 18 February 2018
 Hammer ID: DT/15169

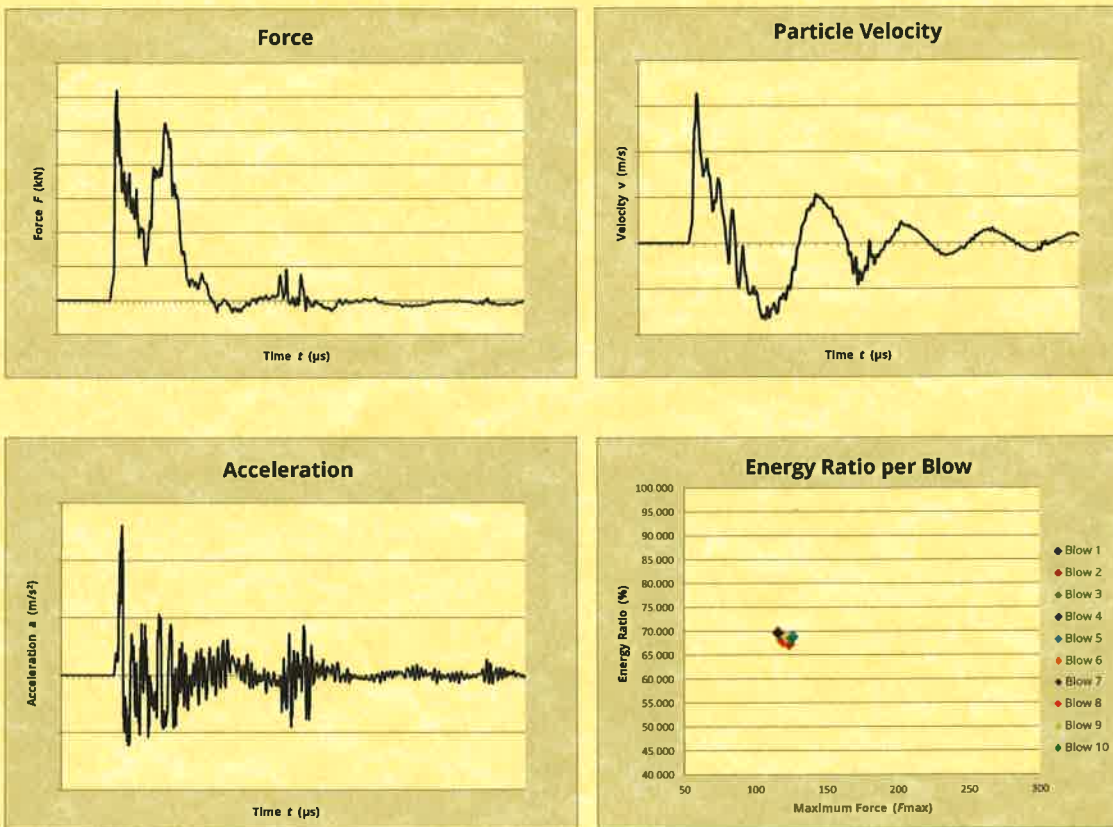


Mass of the hammer: $m = 63.5\text{kg}$
 Falling height: $h = 0.76\text{m}$
 Theoretical energy: $E_{\text{theor}} = m \times g \times h = 473\text{J}$

Characteristics of the instrumented rod

Diameter: $d_r = 0.052\text{ m}$
 Length of the instrumented rod: 0.558 m
 Area: $A = 11.61\text{ cm}^2$
 Modulus: $E_a = 206843\text{ MPa}$

Fig. B.1 and B.2 BS EN ISO 22476-3 : 2005 + A1 : 2011



Observations:
 1.

$E_{\text{meas}} = 0.323\text{ kN-m}$
 $E_{\text{theor}} = 0.473\text{ kN-m}$

$$\text{Energy Ratio} = \frac{E_{\text{meas}}}{E_{\text{theor}}} = 68.33\%$$

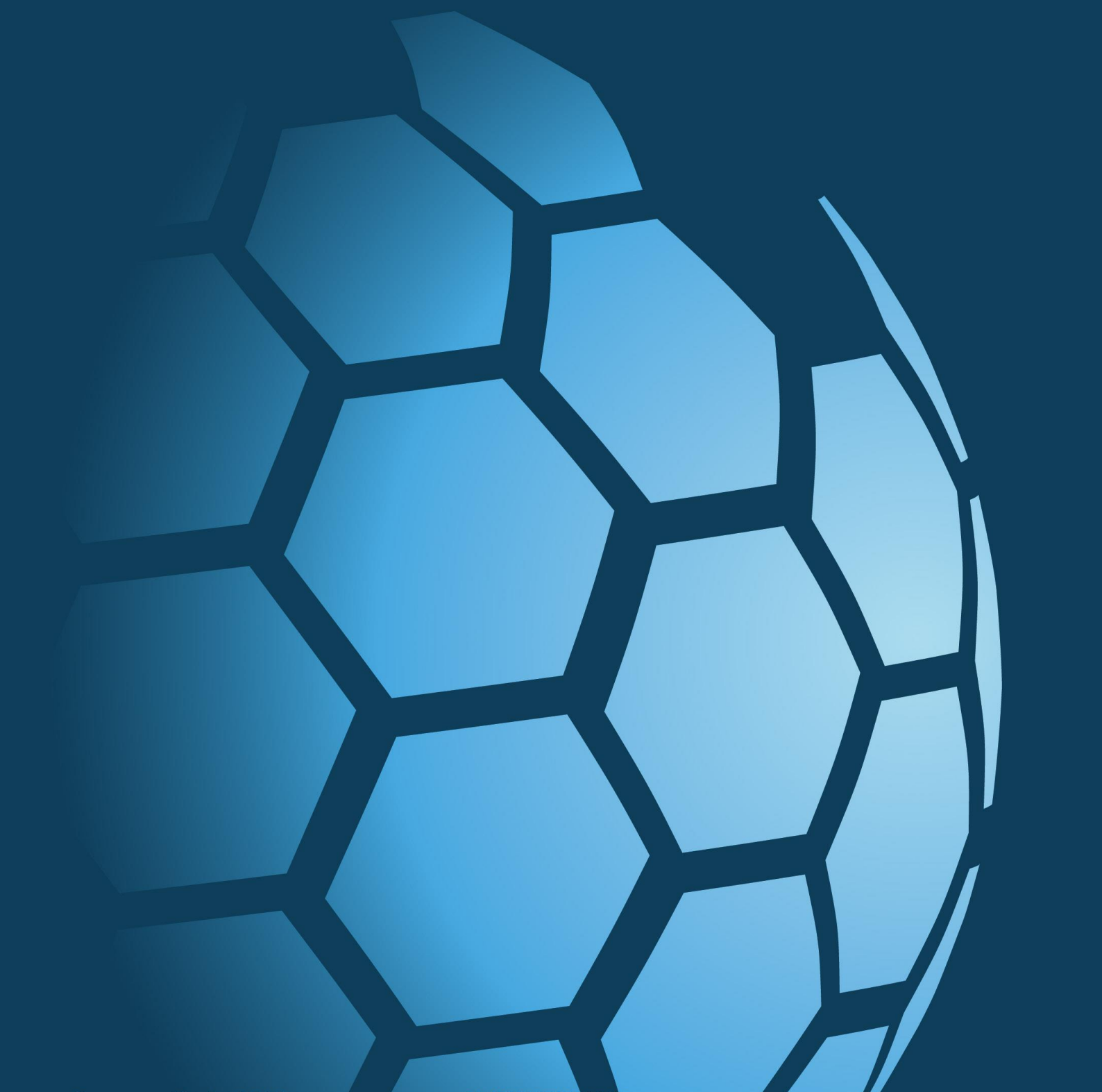
Equipe SPT Analyzer Operators: AF
 Prepared by: *[Signature]* Checked by: *[Signature]* Date: 02/03/2017



CAUSEWAY
— GEOTECH

APPENDIX K

SLIT TRENCH LOGS AND DRAWINGS





CAUSEWAY
GEOTECH

Project No.: 17-0524	Project Name: Ballymun NCOD - Site Investigation	Trial Pit No.: ST01
Co-ordinates: 315152.93 E	Client: Dublin City Council	Sheet 1 of 1
Method: Slit Trenching	Client's Representative: TOBIN Consulting Engineers	Scale: 1:25
Plant: 3T Tracked Excavator	Ground Level: 61.94 mOD	Date: 12/10/2017
		Logger: SG

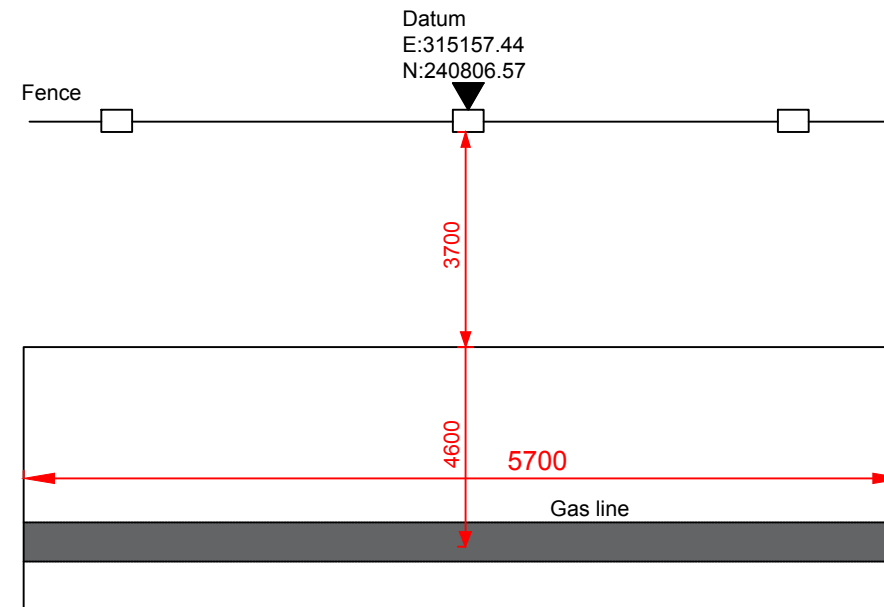
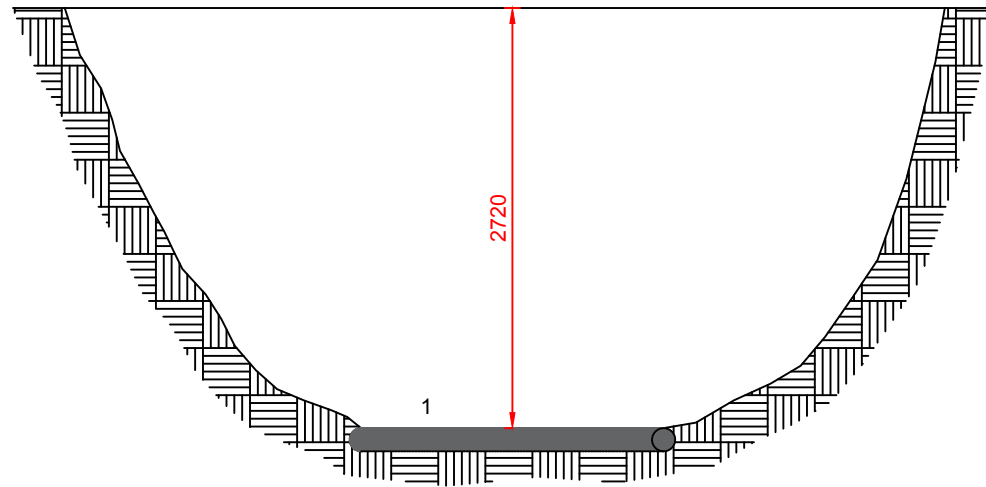
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			61.89	(0.05)		TOPSOIL	
				(2.50)		MADE GROUND: Firm to stiff brown slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse.	
			59.39	2.55		End of trial pit at 2.55m	

Remarks	Water Strikes:		Stability:
	Struck at (m):	Remarks:	Stable
			Width: 1.70
			Length: 5.70

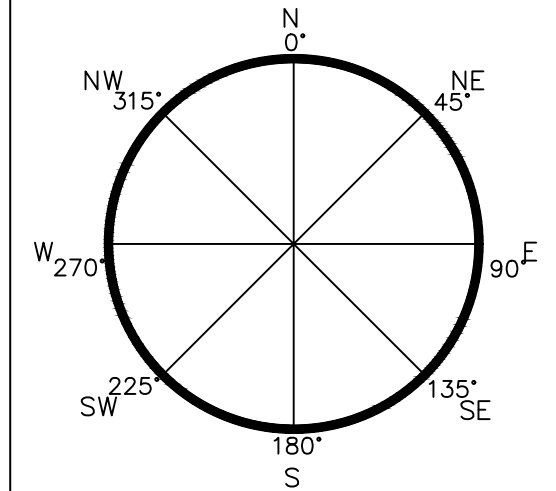
JOB NUMBER: 17-0524 JOB NAME: Ballymun NCOD - Site Investigation LOCATION: ST-01

CLIENT: Dublin City Council CLIENTS REPRESENTATIVE: Tobin Consulting Engineers CREW: SG PLANT & EQUIPMENT: 3 Tonne Excavator & hand tools

TRENCH: (SECTION & PLAN)



TRENCH - ORIENTATION



TRENCH ORIENTATED : FROM NORTH

COORDINATES: DATUM

EASTING: 315157.44
NORTHING: 240806.57
ELEVATION: 61.57

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01	Gas	250	2.72	4.60	250mm Steel Gas line (4.60m from green fence)
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					

TRENCH LENGTH (m) : 5.70
TRENCH DEPTH (m) : 2.72
TRENCH WIDTH (m) : 1.70

STABILITY: POOR

GROUNDWATER: @2.50

SCALE: NTS@A3

DRAWN: BS

CHECKED: CH

DATE EXCAVATED: 12/10/2017





CAUSEWAY
GEOTECH

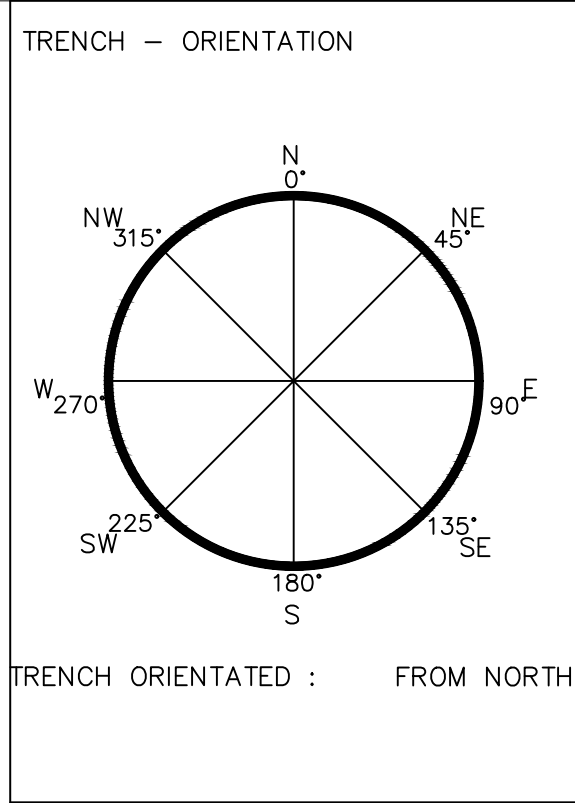
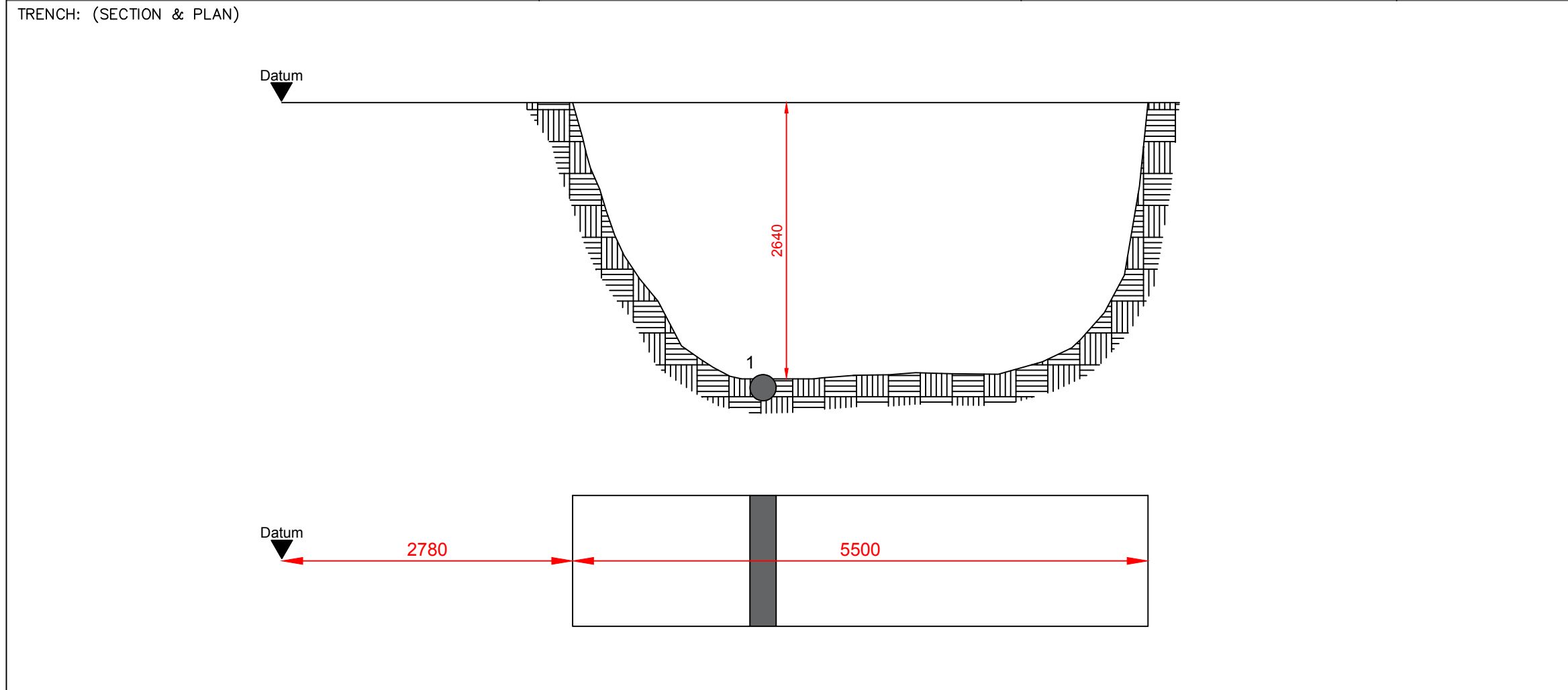
Project No.: 17-0524	Project Name: Ballymun NCOD - Site Investigation	Trial Pit No.: ST02
Co-ordinates: 315154.11 E	Client: Dublin City Council	Sheet 1 of 1
Method: Slit Trenching	Client's Representative: TOBIN Consulting Engineers	Scale: 1:25
Plant: 3T Tracked Excavator	Ground Level: 61.86 mOD	Date: 12/10/2017
		Logger: SG

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			61.80	(0.06)		TOPSOIL	
				(2.24)		MADE GROUND: Stiff brown slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse.	
			59.56	2.30 (0.34)		MADE GROUND: Greyish brown very sandy subangular and rounded fine to coarse GRAVEL. Sand is fine to coarse.	
			59.22	2.64		End of trial pit at 2.64m	

Remarks	Water Strikes:		Stability: Unstable
	Struck at (m):	Remarks:	
			Width: 1.25 Length: 5.50

JOB NUMBER: 17-0524 JOB NAME: Ballymun NCOD - Site Investigation LOCATION: ST-02

CLIENT: Dublin City Council CLIENTS REPRESENTATIVE: Tobin Consulting Engineers CREW: SG PLANT & EQUIPMENT: 3 Tonne Excavator & hand tools



COORDINATES: DATUM
 EASTING: 315158.75
 NORTHING: 240795.40
 ELEVATION: 61.54

No:	Type of Service:	Diameter (in mm)	Depth to Top of Service (m)	Distance to Centre of Service (m)	Details/Comments
01	Gas	250	2.64	4.60	250mm Steel Gas line
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					

TRENCH LENGTH (m) : 5.50
 TRENCH DEPTH (m) : 2.64
 TRENCH WIDTH (m) : 1.25
 STABILITY: POOR
 GROUNDWATER: @2.50
 SCALE: NTS@A3
 DRAWN: BS
 CHECKED: CH
 DATE EXCAVATED: 12/10/2017

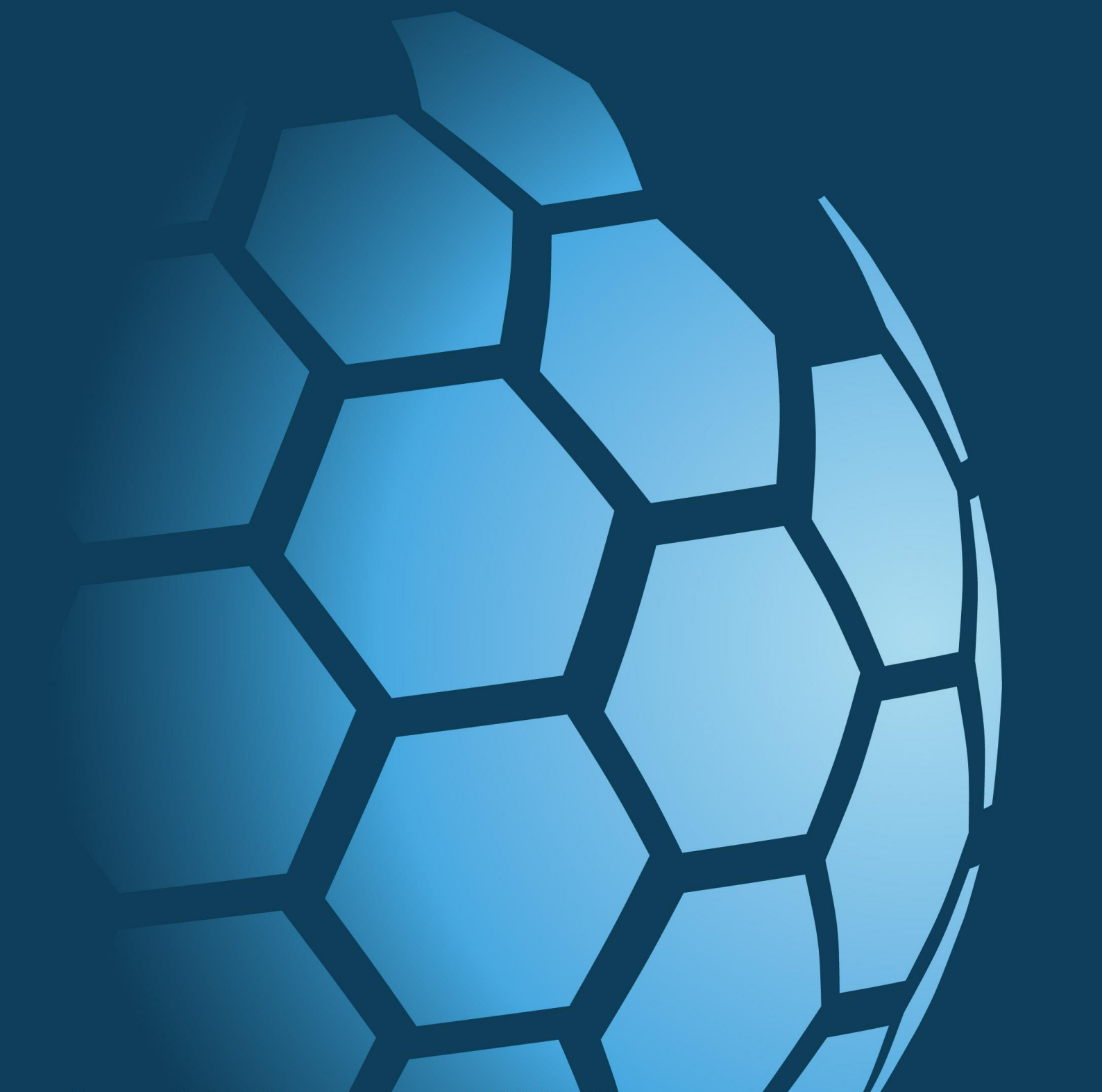




CAUSEWAY
— GEOTECH

APPENDIX L

SLIT TRENCH PHOTOGRAPHS





ST01





ST01





ST01



ST02

