



Iarnród Éireann
Cork Line Level Crossings
XC211 (19-135-2)

	T.PIT1
	Trial Pit Photographs
Client:	Iarnród Éireann
Engineer:	Jacob's
Date:	February 2020



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	T.PIT2
	Trial Pit Photographs
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Date:	February 2020



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	T.PIT2
	Trial Pit Photographs
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	Trial Pit Photographs
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	T.PIT3
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Engineer:	Jacob's
Date:	February 2020

Appendix E

Indirect CBR Test Results

Cork Line Level Crossings - Irish Rail

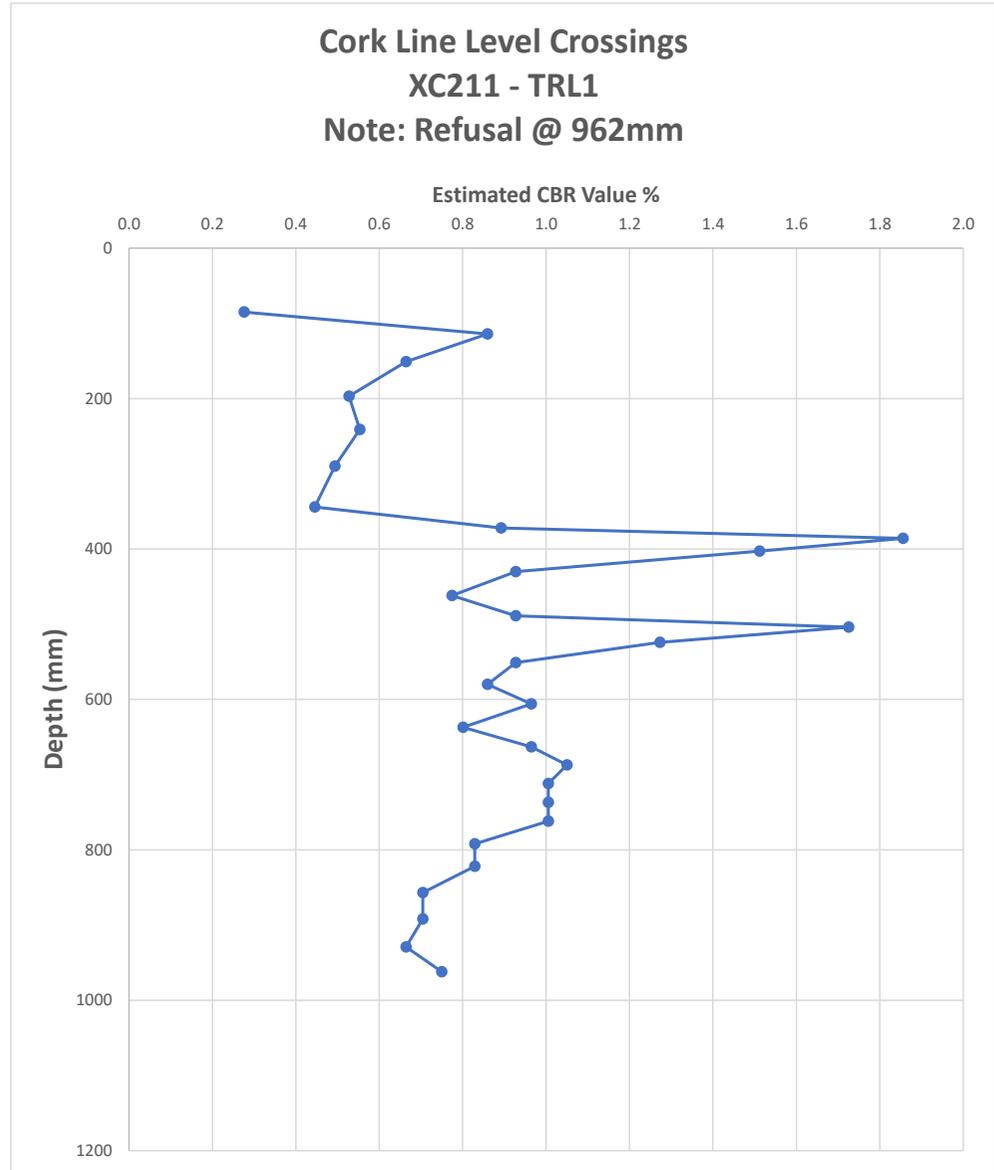
Transport Research Laboratory - Dynamic Cone Penetrometer Data

Location	XC211 - TRL1	Job No	19-135
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Easting	Northing	Elevation
554814.846	617962.459	98.149

Test Start Depth	0	mm/bgl	DATE
Start Reading:	1007	mm	09/03/2020

No. of Blows	READING (mm)	Penetration/blow (mm)	DEPTH	CBR %
1	922	85	85	0.3
2	893	29	114	0.9
3	856	37	151	0.7
4	810	46	197	0.5
5	766	44	241	0.6
6	717	49	290	0.5
7	663	54	344	0.4
8	635	28	372	0.9
9	621	14	386	1.9
10	604	17	403	1.5
11	577	27	430	0.9
12	545	32	462	0.8
13	518	27	489	0.9
14	503	15	504	1.7
15	483	20	524	1.3
16	456	27	551	0.9
17	427	29	580	0.9
18	401	26	606	1.0
19	370	31	637	0.8
20	344	26	663	1.0
21	320	24	687	1.0
22	295	25	712	1.0
23	270	25	737	1.0
24	245	25	762	1.0
25	215	30	792	0.8
26	185	30	822	0.8
27	150	35	857	0.7
28	115	35	892	0.7
29	78	37	929	0.7
30	45	33	962	0.7
31				



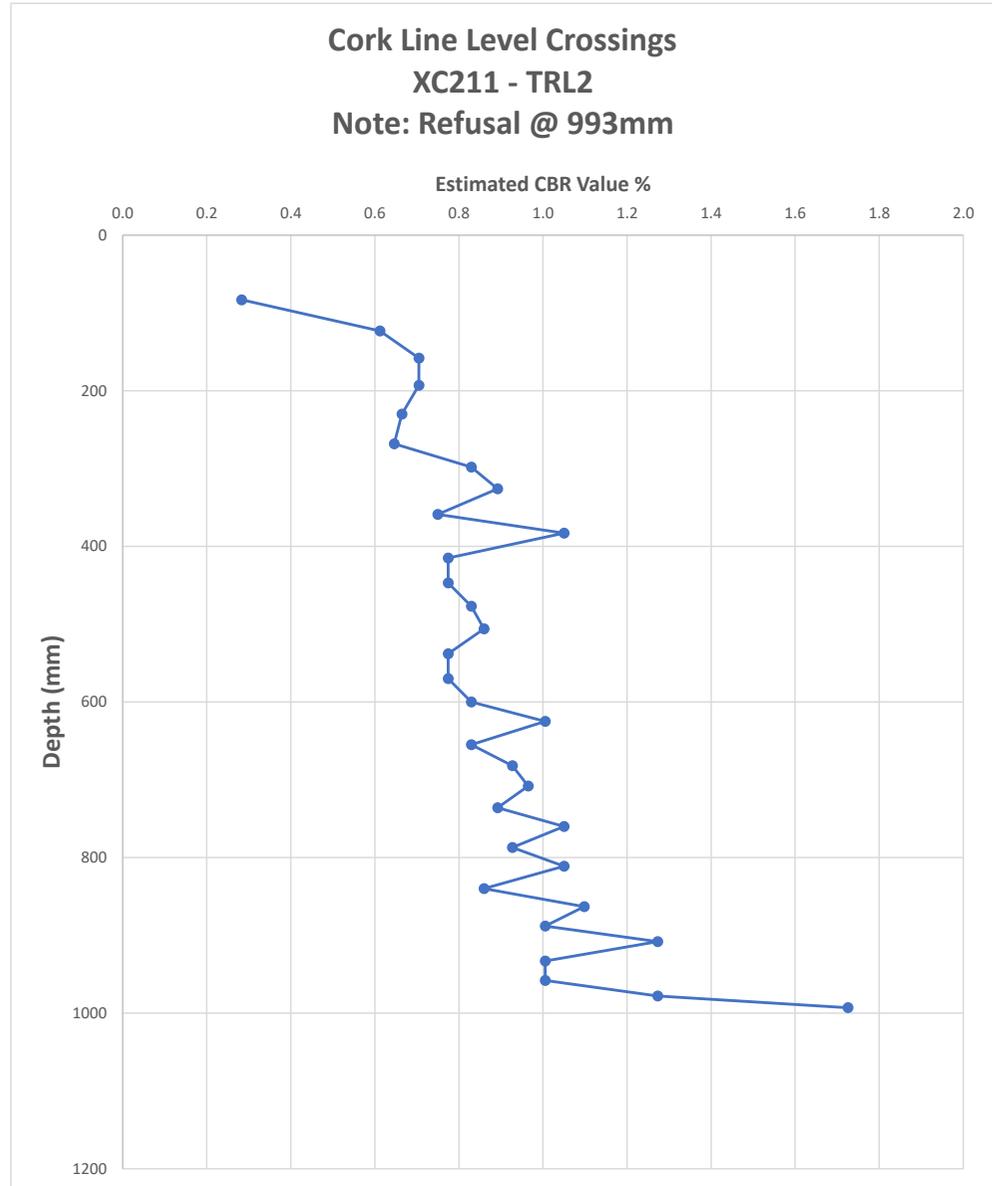
Cork Line Level Crossings - Irish Rail
Transport Research Laboratory - Dynamic Cone Penetrometer Data

Location	XC211 - TRL2	Job No	19-135
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Easting	Northing	Elevation
554820.522	617964.969	97.873

Test Start Depth	0	mm/bgl	DATE
Start Reading:	1053	mm	09/03/2020

No. of Blows	READING (mm)	Penetration/blow (mm)	DEPTH	CBR %
1	970	83	83	0.3
2	930	40	123	0.6
3	895	35	158	0.7
4	860	35	193	0.7
5	823	37	230	0.7
6	785	38	268	0.6
7	755	30	298	0.8
8	727	28	326	0.9
9	694	33	359	0.7
10	670	24	383	1.0
11	638	32	415	0.8
12	606	32	447	0.8
13	576	30	477	0.8
14	547	29	506	0.9
15	515	32	538	0.8
16	483	32	570	0.8
17	453	30	600	0.8
18	428	25	625	1.0
19	398	30	655	0.8
20	371	27	682	0.9
21	345	26	708	1.0
22	317	28	736	0.9
23	293	24	760	1.0
24	266	27	787	0.9
25	242	24	811	1.0
26	213	29	840	0.9
27	190	23	863	1.1
28	165	25	888	1.0
29	145	20	908	1.3
30	120	25	933	1.0
31	95	25	958	1.0
32	75	20	978	1.3
33	60	15	993	1.7
34				



Cork Line Level Crossings - Irish Rail

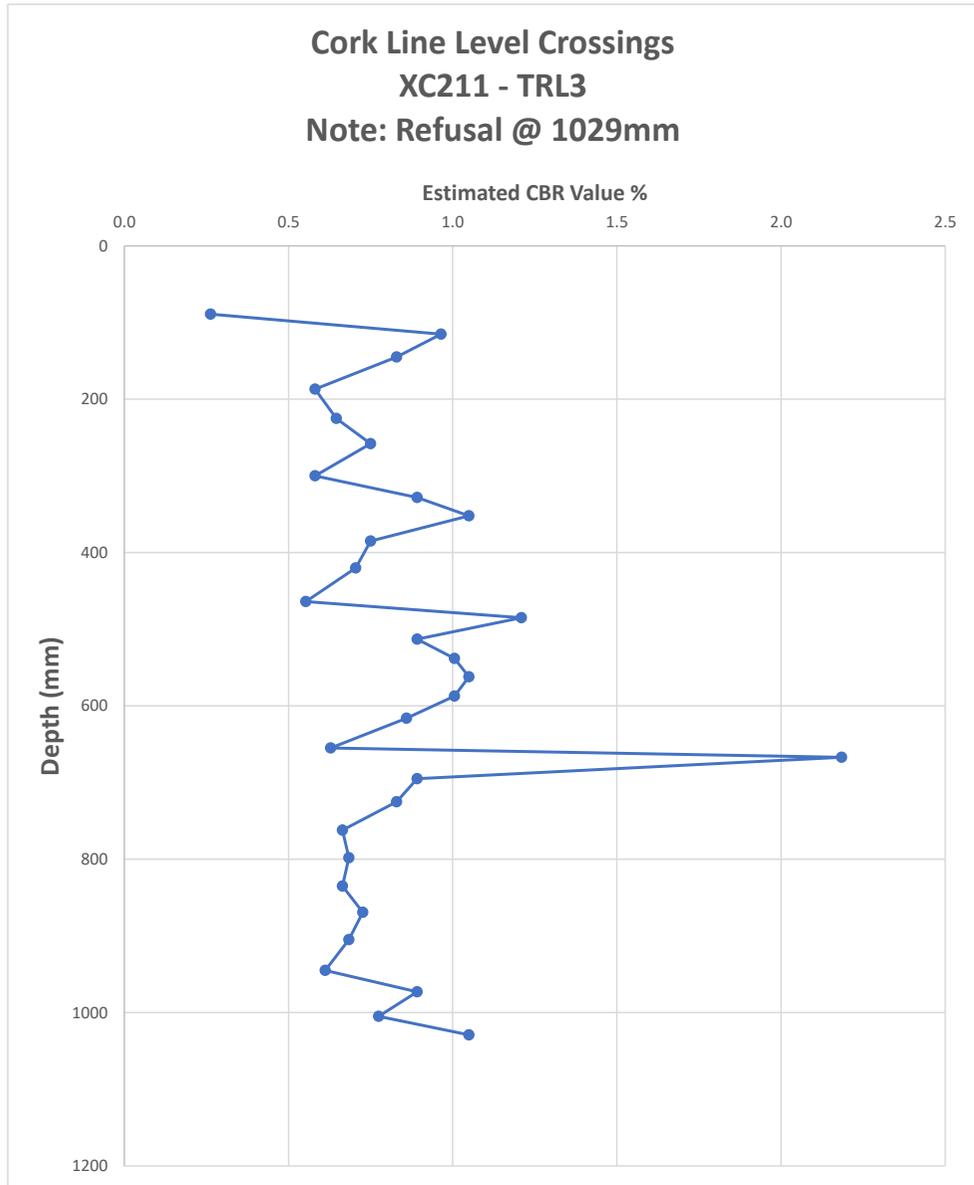
Transport Research Laboratory - Dynamic Cone Penetrometer Data

Location	XC211 - TRL3	Job No	19-135
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Easting	Northing	Elevation
554882.414	618087.375	101.182

Test Start Depth	0	mm/bgl	DATE
Start Reading:	1090	mm	09/03/2020

No. of Blows	READING (mm)	Penetration/blow (mm)	DEPTH	CBR %
1	1001	89	89	0.3
2	975	26	115	1.0
3	945	30	145	0.8
4	903	42	187	0.6
5	865	38	225	0.6
6	832	33	258	0.7
7	790	42	300	0.6
8	762	28	328	0.9
9	738	24	352	1.0
10	705	33	385	0.7
11	670	35	420	0.7
12	626	44	464	0.6
13	605	21	485	1.2
14	577	28	513	0.9
15	552	25	538	1.0
16	528	24	562	1.0
17	503	25	587	1.0
18	474	29	616	0.9
19	435	39	655	0.6
20	423	12	667	2.2
21	395	28	695	0.9
22	365	30	725	0.8
23	328	37	762	0.7
24	292	36	798	0.7
25	255	37	835	0.7
26	221	34	869	0.7
27	185	36	905	0.7
28	145	40	945	0.6
29	117	28	973	0.9
30	85	32	1005	0.8
31	61	24	1029	1.0
32				



Cork Line Level Crossings - Irish Rail

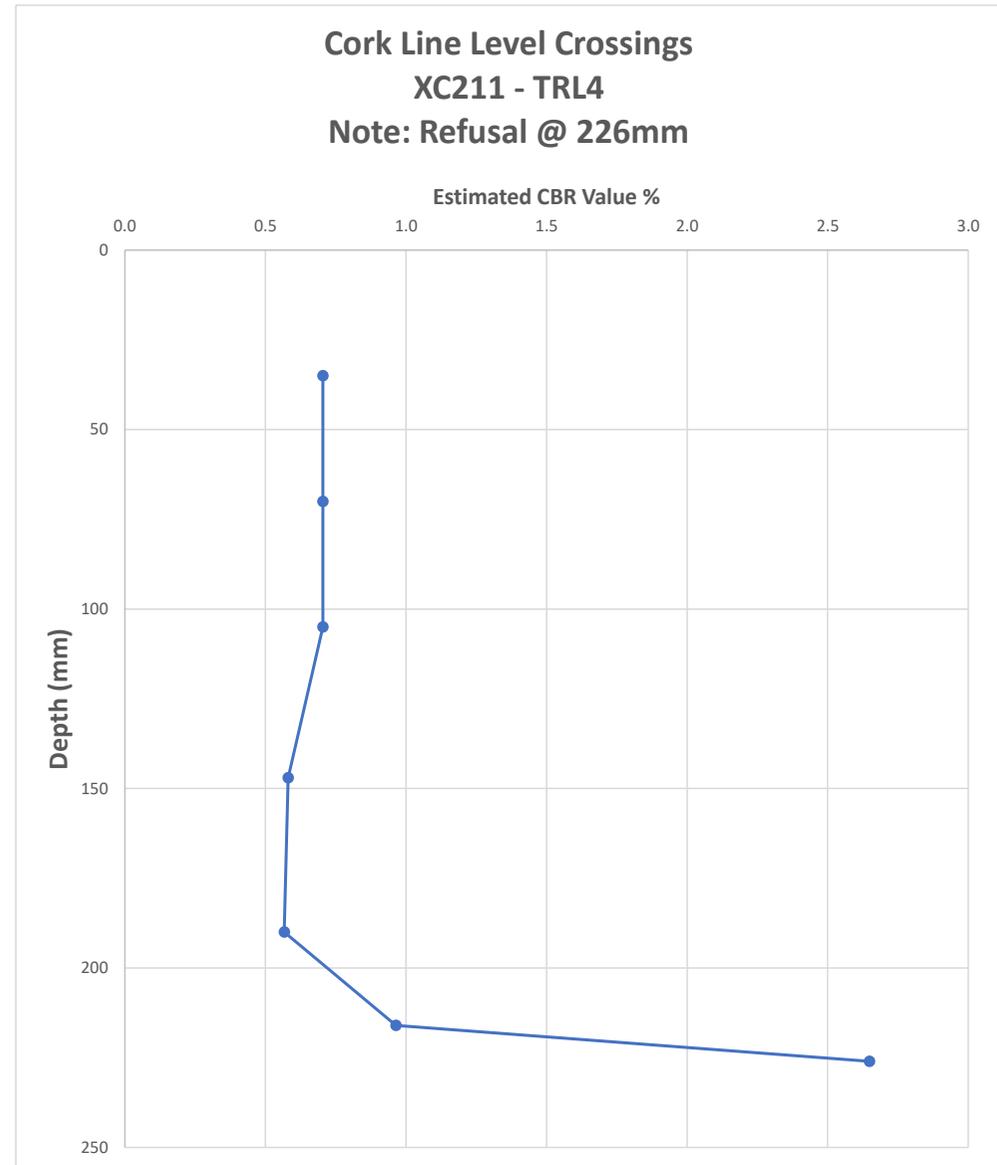
Transport Research Laboratory - Dynamic Cone Penetrometer Data

Location	XC211 - TRL4	Job No	19-135
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Easting	Northing	Elevation
554886.268	618091.178	101.803

Test Start Depth	0	mm/bgl	DATE
Start Reading:	1045	mm	09/03/2020

No. of Blows	READING (mm)	Penetration/blow (mm)	DEPTH	CBR %
1	1010	35	35	0.7
2	975	35	70	0.7
3	940	35	105	0.7
4	898	42	147	0.6
5	855	43	190	0.6
6	829	26	216	1.0
7	819	10	226	2.6
8	819	0	226	
9	819	0	226	
10				



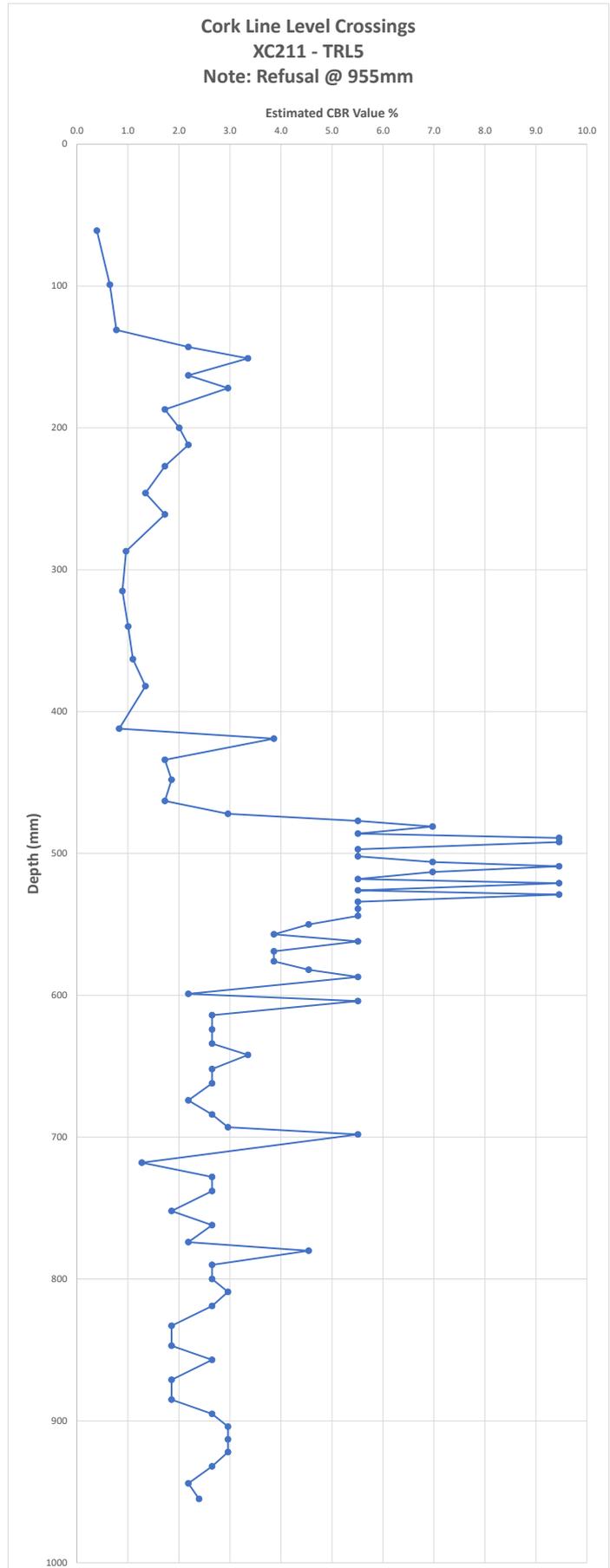
Cork Line Level Crossings - Irish Rail
 Transport Research Laboratory - Dynamic Cone Penetrometer Data

Location	XC211 - TRL5	Job No	19-135
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Easting	Northing	Elevation
554936.035	618184.51	111.629

Test Start Depth	0	mm/bgl	DATE
Start Reading:	1042	mm	09/03/2020

No. of Blows	READING (mm)	Penetration/blow (mm)	DEPTH	CBR %
1	981	61	61	0.4
2	943	38	99	0.6
3	911	32	131	0.8
4	899	12	143	2.2
5	891	8	151	3.4
6	879	12	163	2.2
7	870	9	172	3.0
8	855	15	187	1.7
9	842	13	200	2.0
10	830	12	212	2.2
11	815	15	227	1.7
12	796	19	246	1.3
13	781	15	261	1.7
14	755	26	287	1.0
15	727	28	315	0.9
16	702	25	340	1.0
17	679	23	363	1.1
18	660	19	382	1.3
19	630	30	412	0.8
20	623	7	419	3.9
21	608	15	434	1.7
22	594	14	448	1.9
23	579	15	463	1.7
24	570	9	472	3.0
25	565	5	477	5.5
26	561	4	481	7.0
27	556	5	486	5.5
28	553	3	489	9.5
29	550	3	492	9.5
30	545	5	497	5.5
31	540	5	502	5.5
32	536	4	506	7.0
33	533	3	509	9.5
34	529	4	513	7.0
35	524	5	518	5.5
36	521	3	521	9.5
37	516	5	526	5.5
38	513	3	529	9.5
39	508	5	534	5.5
40	503	5	539	5.5
41	498	5	544	5.5
42	492	6	550	4.5
43	485	7	557	3.9
44	480	5	562	5.5
45	473	7	569	3.9
46	466	7	576	3.9
47	460	6	582	4.5
48	455	5	587	5.5
49	443	12	599	2.2
50	438	5	604	5.5
51	428	10	614	2.6
52	418	10	624	2.6
53	408	10	634	2.6
54	400	8	642	3.4
55	390	10	652	2.6
56	380	10	662	2.6
57	368	12	674	2.2
58	358	10	684	2.6
59	349	9	693	3.0
60	344	5	698	5.5
61	324	20	718	1.3
62	314	10	728	2.6
63	304	10	738	2.6
64	290	14	752	1.9
65	280	10	762	2.6
66	268	12	774	2.2
67	262	6	780	4.5
68	252	10	790	2.6
69	242	10	800	2.6
70	233	9	809	3.0
71	223	10	819	2.6
72	209	14	833	1.9
73	195	14	847	1.9
74	185	10	857	2.6
75	171	14	871	1.9
76	157	14	885	1.9
77	147	10	895	2.6
78	138	9	904	3.0
79	129	9	913	3.0
80	120	9	922	3.0
81	110	10	932	2.6
82	98	12	944	2.2
83	87	11	955	2.4
84				



Cork Line Level Crossings - Irish Rail

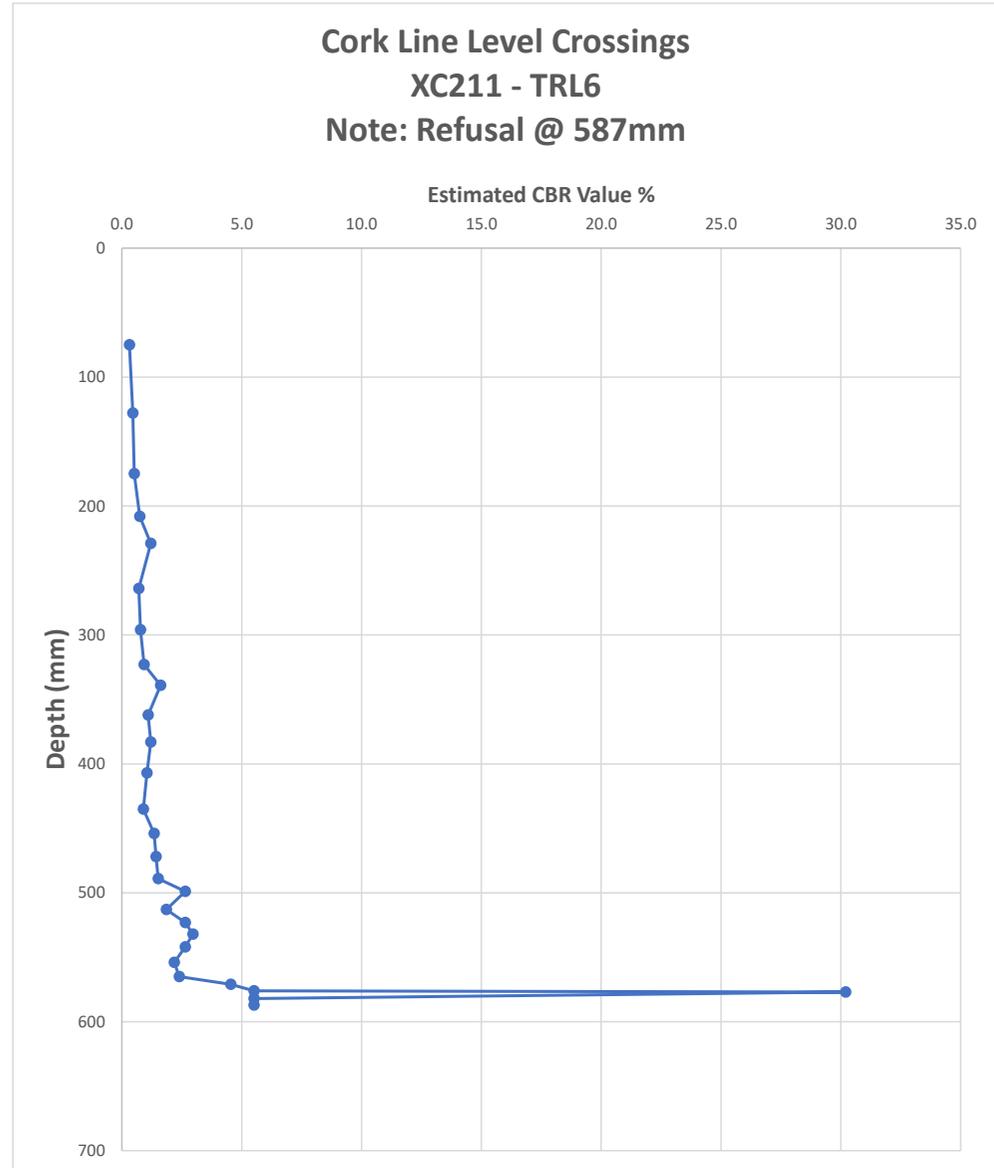
Transport Research Laboratory - Dynamic Cone Penetrometer Data

Location	XC211 - TRL6	Job No	19-135
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Easting	Northing	Elevation
554941.786	618184.849	112.108

Test Start Depth	0	mm/bgl	DATE
Start Reading:	1092	mm	09/03/2020

No. of Blows	READING (mm)	Penetration/blow (mm)	DEPTH	CBR %
1	1017	75	75	0.3
2	964	53	128	0.5
3	917	47	175	0.5
4	884	33	208	0.7
5	863	21	229	1.2
6	828	35	264	0.7
7	796	32	296	0.8
8	769	27	323	0.9
9	753	16	339	1.6
10	730	23	362	1.1
11	709	21	383	1.2
12	685	24	407	1.0
13	657	28	435	0.9
14	638	19	454	1.3
15	620	18	472	1.4
16	603	17	489	1.5
17	593	10	499	2.6
18	579	14	513	1.9
19	569	10	523	2.6
20	560	9	532	3.0
21	550	10	542	2.6
22	538	12	554	2.2
23	527	11	565	2.4
24	521	6	571	4.5
25	516	5	576	5.5
26	515	1	577	30.2
27	510	5	582	5.5
28	505	5	587	5.5
29	505	0	587	
30	505	0	587	
31				



Appendix F

Water Purging Data & Logs

Appendix G Geotechnical Soil Laboratory Test Results



LABORATORY TEST REPORT

MOISTURE CONTENT BS 1377 : Part 2 : 1990 Oven Drying Method cl 3.2

Site:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93346
Order No:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Tested:	31/03/2020
		Date Reported:	03/04/2020
		Specification:	Client

Sampled Ref: XC211-TP01 Type D Sample 3

Sample Type: Bulk **Location:** XC211-TP01 Type D Sample 3

Date Sampled: Client Info **Sample by:** Client

Depth: 0.4-0.9m **Material Type:** Soil

Moisture Content (%): 11

Tested in accordance with BS 1377: Part 2: 1990
Sample preparation by cone and quarter

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Approved Signature

James Fisher Testing Services (Ireland) Ltd
James Ward, Operations Manager





LABORATORY TEST REPORT

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP - BS 1377: Part 4: 1990

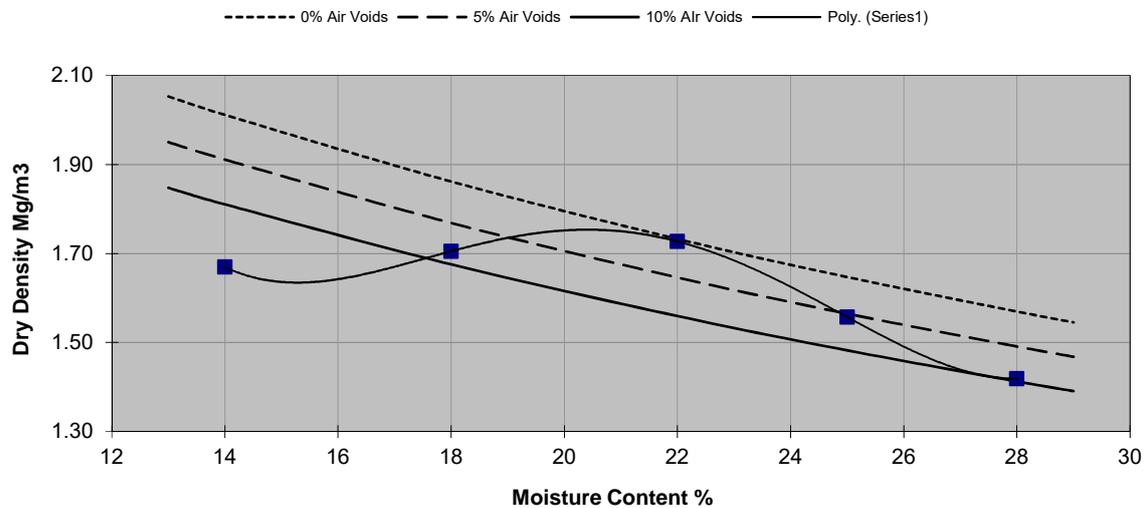
Project: Cork Line Level Crossings	Job No: 19-135
Client: OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.: ST 93345
Order No: 2003-104	Date Received: 09/03/2020
Originator: Ian Holley	Date Tested: 06/04/2020
	Date Reported: 07/04/2020
	Material: Soil
	Specification: Client

Client Sample Ref : XC211-TP01 Type B Sample 2	Sample Type : Bulk
Supplier: Client Info	Description : Soil
Location: 0.4-0.9m	

Date sampled : Client Info **Comments :** None
Sampling Cert : No

Rammer used :	4.5	No of layers:	3
No of sub samples :	5	% retained on 37.5mm sieve	0.6
Mould Size:	CBR	% retained on 20mm sieve	4.4

Bulk Density: Mg/m³	1.90	2.01	2.11	1.95	1.82
Moisture Content: %	14	18	22	25	28
Dry Density: Mg/m³	1.67	1.71	1.73	1.56	1.42



Maximum Dry Density (Mg/m³)	1.75
Optimum Moisture Content (%)	20

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Tested in accordance with BS 1377: Part 4:1990
 Particle Density (Mg/m³) - 2.8 (Assumed)

Approved Signature
 James Fisher Testing Services Limited
 Phil Thorp, Laboratory Manager

James Fisher Testing Services Limited, a company registered in England and Wales with registration number: 01182561

Registered office: Fisher House, PO Box 4, Barrow-in-Furness, Cumbria, LA14 1HR

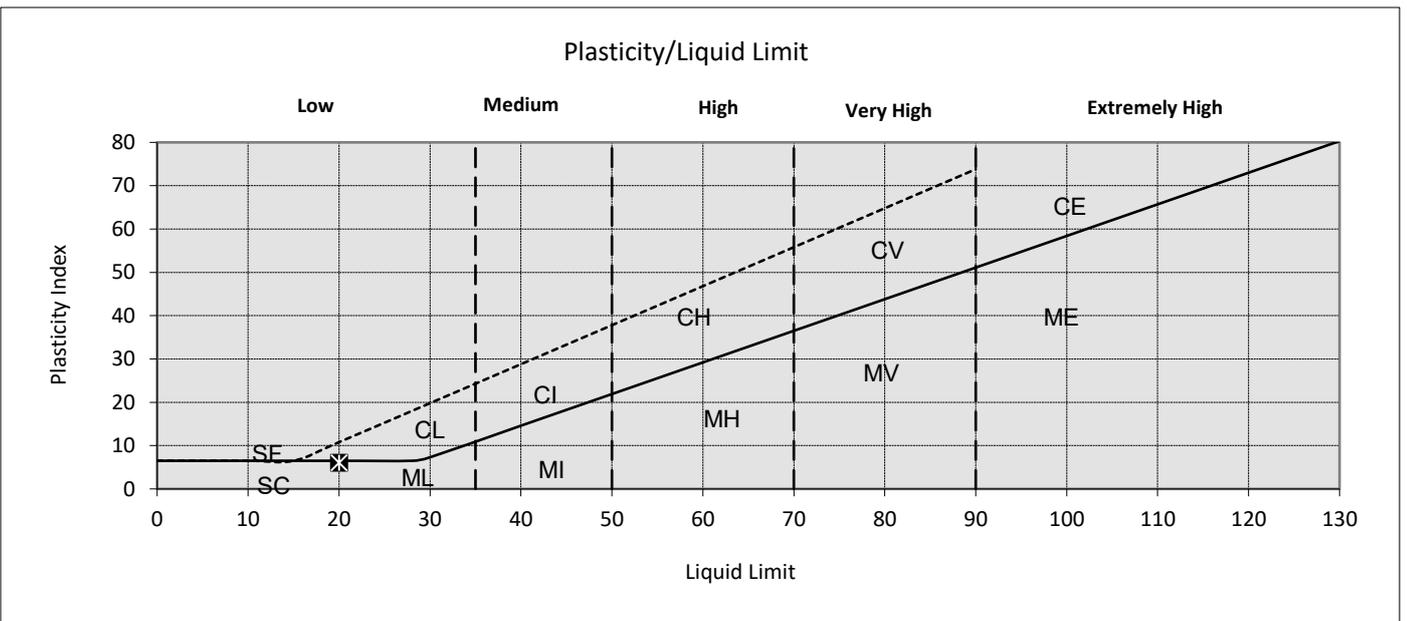




LABORATORY TEST REPORT
LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 CI 4.4,5.3

Site Ref.:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.:	ST 93347
Order No:	2003-104	Sample Ref.:	XC211-TP01 0.4-0.9m Type D Samp 3
Originator:	Ian Holley	Date Sampled:	Client Info
		Date Received:	09/03/2020
		Date Tested:	03/04/2020
		Date Reported:	03/04/2020

Sampling Certificate	No
Sampled By	Client
Sample Type	Bulk
Sample Preparation Method	Washed
MATERIAL	Soil
Retained 425 micron (%)	24
Natural Moisture Content (%)	13
Liquid Limit (single point)(%)	20
Plastic Limit (%)	14
Plasticity Index	6



The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Approved Signature
 James Fisher Testing Services Ltd
 Phil Thorp, Laboratory Manager



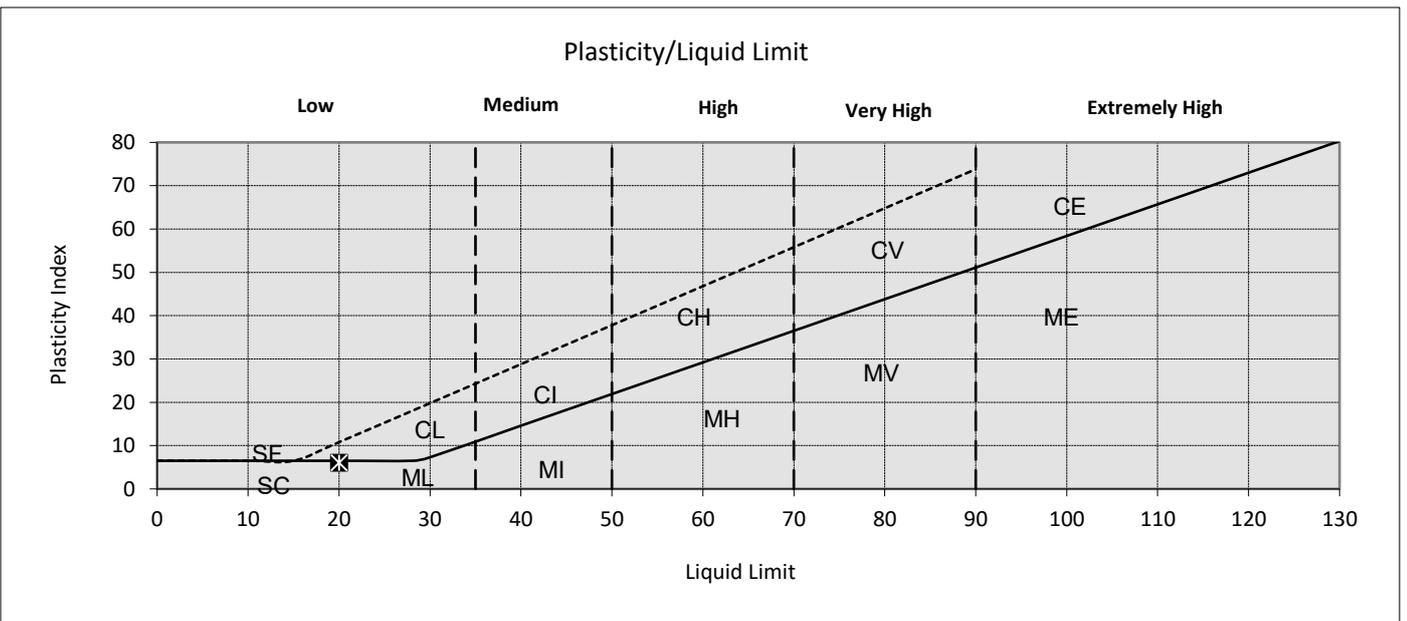


LABORATORY TEST REPORT

LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 CI 4.4,5.3

Site Ref.:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.:	ST 93347
Order No:	2003-104	Sample Ref.:	XC211-TP01 0.4-0.9m Type D Samp 3
Originator:	Ian Holley	Date Sampled:	Client Info
		Date Received:	09/03/2020
		Date Tested:	03/04/2020
		Date Reported:	03/04/2020

Sampling Certificate	No
Sampled By	Client
Sample Type	Bulk
Sample Preparation Method	Washed
MATERIAL	Soil
Retained 425 micron (%)	24
Natural Moisture Content (%)	13
Liquid Limit (single point)(%)	20
Plastic Limit (%)	14
Plasticity Index	6



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Approved Signature
 James Fisher Testing Services Ltd
 Phil Thorp, Laboratory Manager



LABORATORY TEST REPORT

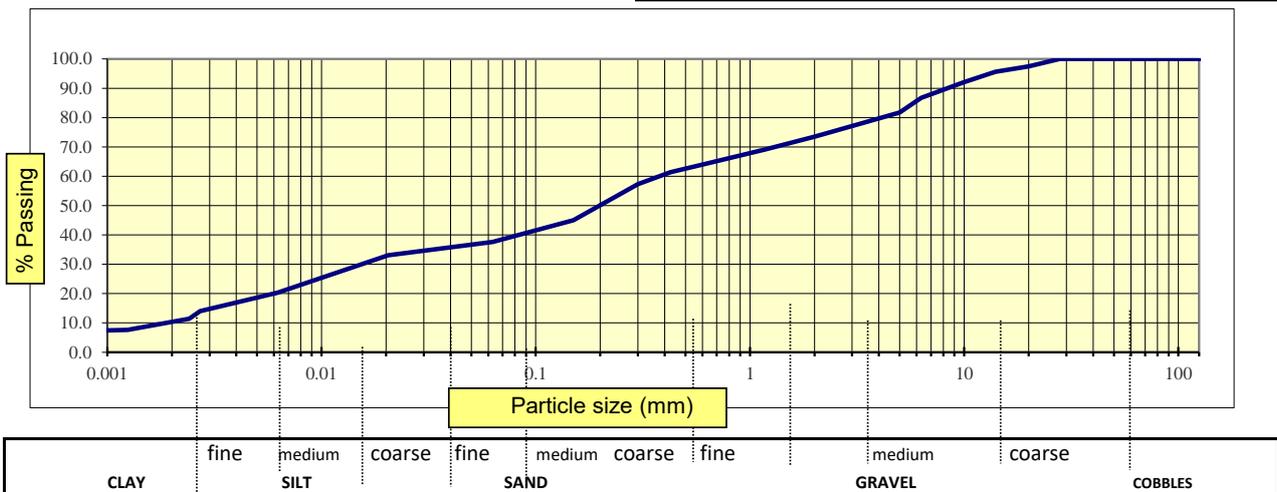
Determination of Particle Size Distribution - BS 1377 : Part 2 : 1990

Determination of Particle Size Distribution (Hydrometer Sedimentation) - BS 1377 : Part 2 : 1990 Cl. 9.5

Project:	Cork Line Level Crossings	Job No:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93344
		Date Received:	09/03/2020
		Date Reported:	02/04/2020
		Date Tested:	01/04/2020
Order No:	2003-104	Material:	Soil
Originator:	Ian Holley	Visual Description	Light Gravel, Sandy

Client Ref.	XC211-TP01 Type B Sample 2
Location:	XC211-TP01 Type B Sample 2
Supplier:	Bulk
Source:	Client Info.
Depth (m):	0.4-0.9m
Sampling Reason:	Client Request
Sampled By:	Client
Specification:	Client
Preparation Method:	Without Organics Preparation
Notes:	Disturbed sample from cleanout

BS Sieve Size	% Passing	Specification
300 mm	100	
125 mm	100	
100 mm	100	
75 mm	100	
63 mm	100	
50 mm	100	
37.5 mm	100	
28 mm	100	
20 mm	97	
14 mm	96	
10 mm	92	
6.3 mm	87	
5 mm	82	
3.35 mm	78	
2 mm	74	
1.18 mm	69	
0.6 mm	64	
0.425 mm	61	
0.3 mm	57	
0.15 mm	45	
0.063 mm	38	
0.020 mm	33	
0.006 mm	20	
0.003 mm	14	
0.002 mm	11	
0.001 mm	8	



Tested in accordance with BS 1377: Part 2 : 1990 Clause 9.2 and 9.5

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.
 Sedimentation by Hydrometer - Not UKAS


 Approved Signature

JAMES FISHER TESTING SERVICES (IRELAND) LTD.

James Ward, Operations Manager





Laboratory Test Report
Determination of shear Strength by Direct Shear (Small Shearbox)
in accordance with BS :1377: Part 7 : 1990 Clause 4

Project: Cork Line Level Crossing	Job No.:	19-135
Client: OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref. No.:	ST 93350
	Date Received:	09/03/2020
	Date Reported:	05/05/2020
	Material:	Earthworks
Order No.: 2003-104	Visual Description:	Brown SAND
Originator: Ian Holley	Specification:	TII Series 600

Client Ref:

ST 93350

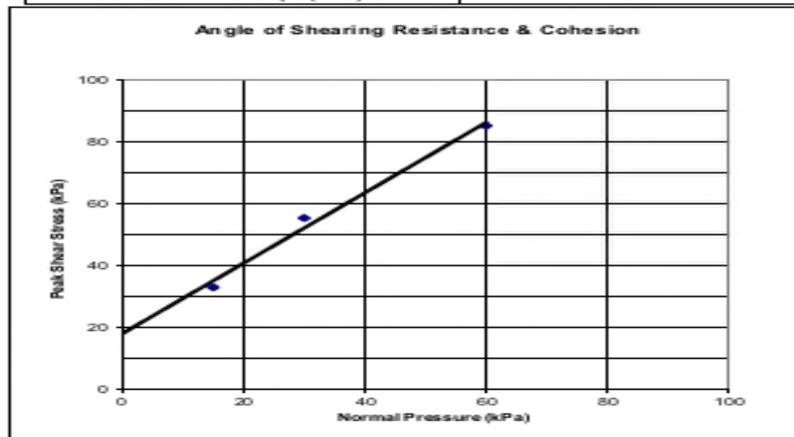
Certificate of sampling	Yes	Date Of Sampling:	Client info
Lab Reference No.	XC211-TP01 1.0-1.5m Sample 6	Sampled By:	OCB
Sample Source & Ticket No.	Site Won	Sample Preparation:	Bulk sample sieved through 20mm sieve
Sample Location / Orientation :	Cork Line Level Crossings	Tested Dry or Submerged:	Dry

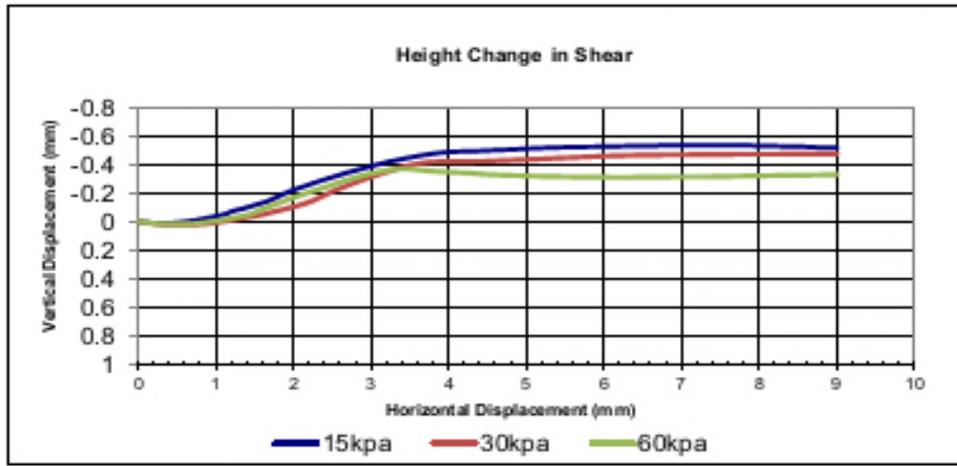
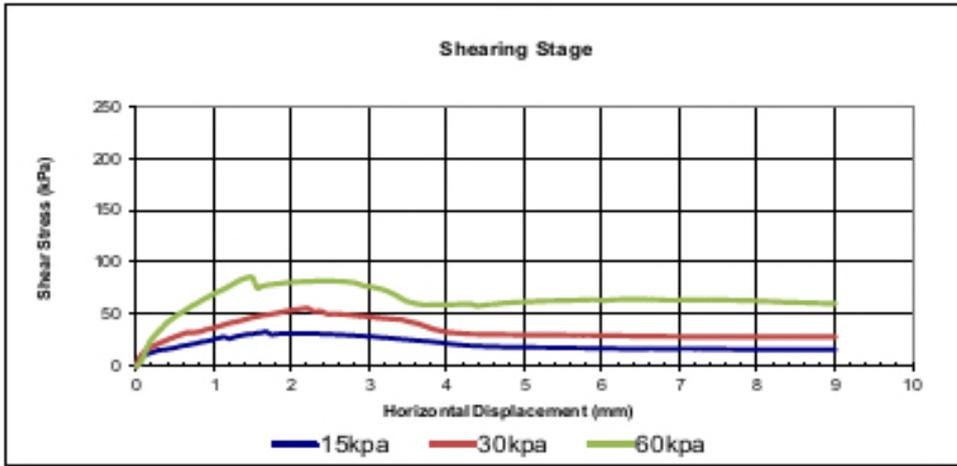
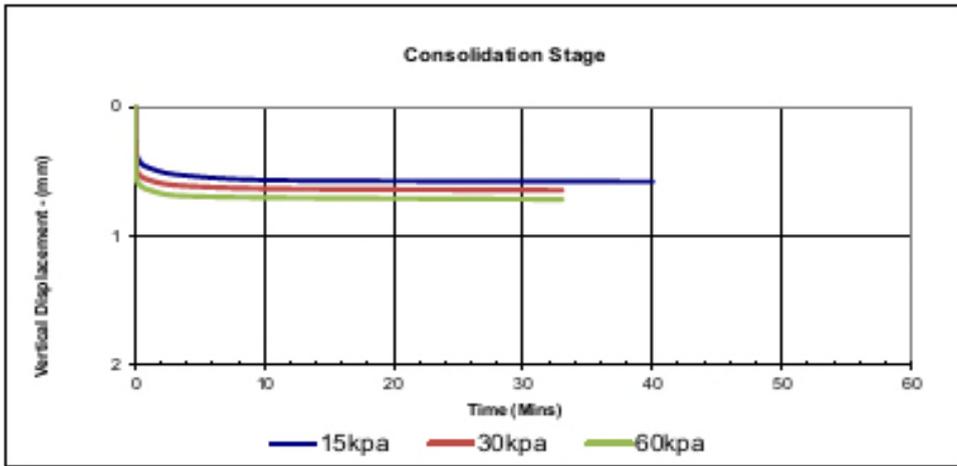
Results

SUMMARY OF TEST RESULTS:	
Angle of Shearing Resistance (°) ϕ'	48.5
Cohesion Intercept (kPa) c'	18.0

Sample Condition: Submerged
 Particle Density: 2.65 (Mg/m³) Assumed
 Sample Preparation: Remoulded (Hand Tamped)
 Material tested passing 2mm sieve

Initial Condition			
	Stage		
	1	2	3
Normal Pressure (kPa)	15	30	60
Height (mm)	19.47	19.23	19.41
Width (mm)	59.9	59.9	59.9
Bulk Density (Mg/m ³)	2.08	2.10	2.08
Dry Density (Mg/m ³)	1.84	1.86	1.84
Moisture Content (%)	13	13	13
Voids Ratio	0.443	0.425	0.438
Degree of Saturation	77.8	81.1	78.6
Shearing Stage			
Rate of Displacement (mm/min)	0.8	0.8	0.8
Peak Shear Stress (kPa)	32.9	55.4	85.2
Displacement at Peak Stress (mm)	1.7	2.2	1.5
Final Condition			
Bulk Density (Mg/m ³)	2.10	2.12	2.14
Dry Density (Mg/m ³)	1.84	1.88	1.88
Moisture Content (%)	14	13	14
Angle of Shearing Resistance (°) ϕ'	48.5		
Cohesion Intercept (kPa) c'	18.0		





Subcontracted to a Laboratory Accredited in this Testing

Approved Signature
 James Fisher Testing Services Limited
 James Ward, Operations Manager

LABORATORY TEST REPORT

BRE Test Suite B - Greenfield Site

Project:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co. Cork	Lab Ref. No.:	ST 93349
Order No.:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Reported:	08/04/2020
		Material:	Soil
		Date Tested:	07/04/2020
		Specification:	Client

Sample Details

XC211-TP01 Type B Sample 6

Supplier:	Client Info	Date of Sampling:	Client Info.
Source:	Client Info	Sampled By:	Client
Sample Location:	1.0-1.5m	Sampling Reason:	Request

Parameter	RESULT
pH	7.3
Sulphate Aqueous Extract (SO ₄) (mg/l)	<10
Sulphur as S, Total (%)	<0.01
Sulphate as SO ₄ , Total (%)	<0.01

Comments:

None

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Tested in accordance with the above specifications

Subcontracted to a laboratory UKAS accredited for this testing



Approved Signature
JAMES FISHER TESTING SERVICES (IRELAND) LTD.

James Ward, Operations Manager

LABORATORY TEST REPORT

To determine the Organic Content of Soil
in accordance with BS 1377

Project:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co. Cork	Lab Ref. No.:	ST 93349
Order No.:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Reported:	08/04/2020
		Material:	Soil
		Date Tested:	07/04/2020
		Specification:	Client

Sample Details

XC211-TP01 Type B Sample 6

Supplier:	Client Info	Date of Sampling:	Client Info
Source:	Client Info	Sampled By:	Client
Sample Location:	1.0-1.5m	Sampling Reason:	Request

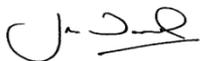
Result:

Organic Matter (%)	0.3
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Comments:

None

Tested in accordance with the above specifications
Subcontracted to a laboratory UKAS accredited for this testing



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James Ward, Operations Manager

LABORATORY TEST REPORT

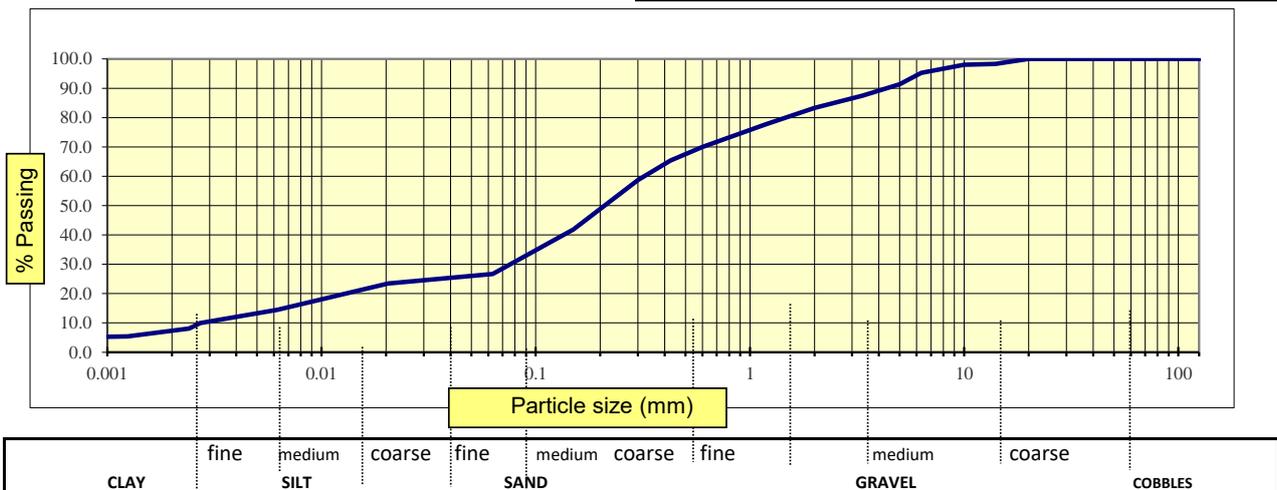
Determination of Particle Size Distribution - BS 1377 : Part 2 : 1990

Determination of Particle Size Distribution (Hydrometer Sedimentation) - BS 1377 : Part 2 : 1990 Cl. 9.5

Project:	Cork Line Level Crossings	Job No:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93348
		Date Received:	09/03/2020
		Date Reported:	02/04/2020
		Date Tested:	01/04/2020
Order No:	2003-104	Material:	Soil
Originator:	Ian Holley	Visual Description	Grey Clay, Sandy

Client Ref.	XC211-TP01 Type B Sample 6
Location:	XC211-TP01 Type B Sample 6
Supplier:	Bulk
Source:	Client Info.
Depth (m):	1.0-1.5m
Sampling Reason:	Client Request
Sampled By:	Client
Specification:	Client
Preparation Method:	Without Organics Preparation
Notes:	Disturbed sample from cleanout

BS Sieve Size	% Passing	Specification
300 mm	100	
125 mm	100	
100 mm	100	
75 mm	100	
63 mm	100	
50 mm	100	
37.5 mm	100	
28 mm	100	
20 mm	100	
14 mm	98	
10 mm	98	
6.3 mm	95	
5 mm	91	
3.35 mm	87	
2 mm	83	
1.18 mm	78	
0.6 mm	70	
0.425 mm	65	
0.3 mm	59	
0.15 mm	42	
0.063 mm	27	
0.020 mm	23	
0.006 mm	14	
0.003 mm	10	
0.002 mm	8	
0.001 mm	5	



Tested in accordance with BS 1377: Part 2 : 1990 Clause 9.2 and 9.5

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.
 Sedimentation by Hydrometer - Not UKAS


 Approved Signature

JAMES FISHER TESTING SERVICES (IRELAND) LTD.

□ James Ward, Operations Manager

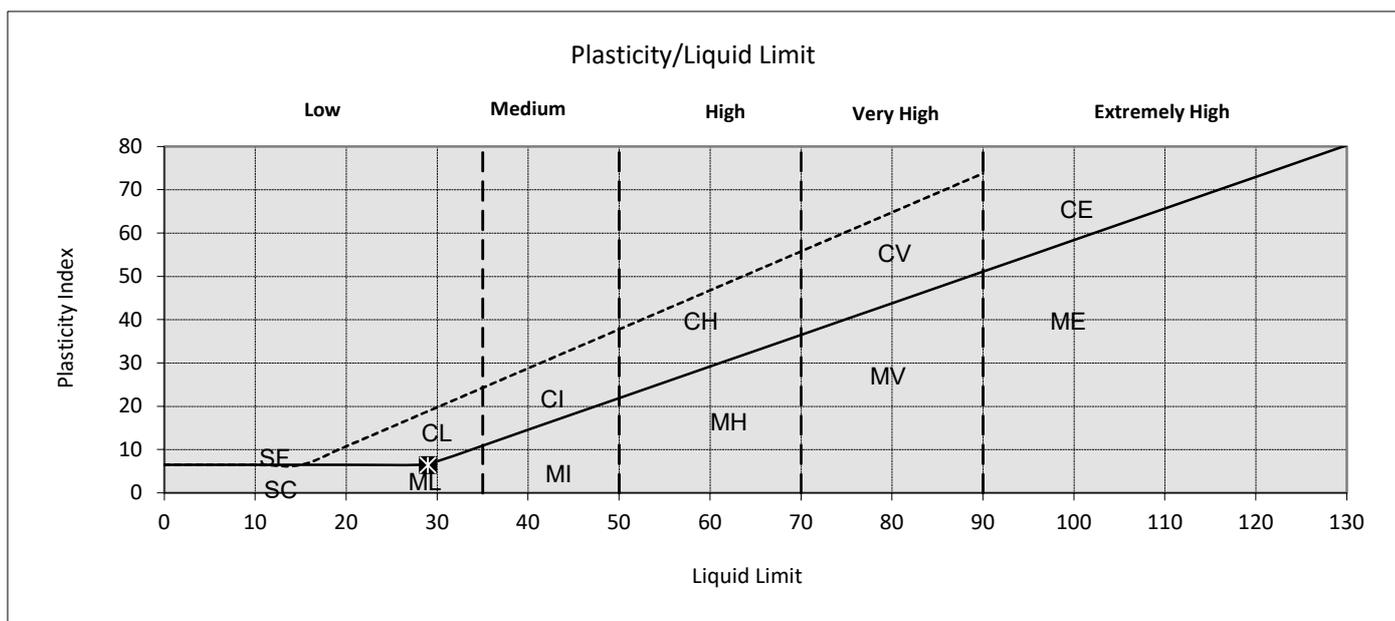




LABORATORY TEST REPORT
LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 CI 4.4,5.3

Site Ref.:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.:	ST 93352
Order No:	2003-104	Sample Ref.:	XC211-TP01 2.3-3.0m
Originator:	Ian Holley	Date Sampled:	Client Info
		Date Received:	09/03/2020
		Date Tested:	02/04/2020
		Date Reported:	21/04/2020

Sampling Certificate	No
Sampled By	Client
Sample Type	Bulk
Sample Preparation Method	Washed
MATERIAL	Soil
Retained 425 micron (%)	25
Natural Moisture Content (%)	24
Liquid Limit (single point)(%)	29
Plastic Limit (%)	22
Plasticity Index	6



The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Approved Signature
James Fisher Testing Services Ltd
Phil Thorp, Laboratory Manager





LABORATORY TEST REPORT

MOISTURE CONTENT BS 1377 : Part 2 : 1990 Oven Drying Method cl 3.2

Site:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93351
Order No:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Tested:	26/03/2020
		Date Reported:	03/04/2020
		Specification:	Client

Sampled Ref: XC211-TP01 Type D Sample 9

Sample Type: Bulk **Location:** XC211-TP01 Type D Sample 9

Date Sampled: Client Info **Sample by:** Client

Depth: 2.5-3.0m **Material Type:** Soil

Moisture Content (%): 20

Tested in accordance with BS 1377: Part 2: 1990
Sample preparation by cone and quarter

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Approved Signature

James Fisher Testing Services (Ireland) Ltd
James Ward, Operations Manager





Laboratory Test Report
Determination of shear Strength by Direct Shear (Small Shearbox)
 in accordance with BS :1377: Part 7 : 1990 Clause 4

Project: Cork Line Level Crossing	Job No.: 19-135
Client: OCB Geotechnical Unit 1 Carrigogna Middleton	Lab Ref. No.: ST 93354
Order No.: 2003-104	Date Received: 09/03/2020
Originator: Ian Holley	Date Reported: 22/05/2020
	Material: Earthworks
	Visual Description: Brown silty SAND
	Specification: TII Series 600

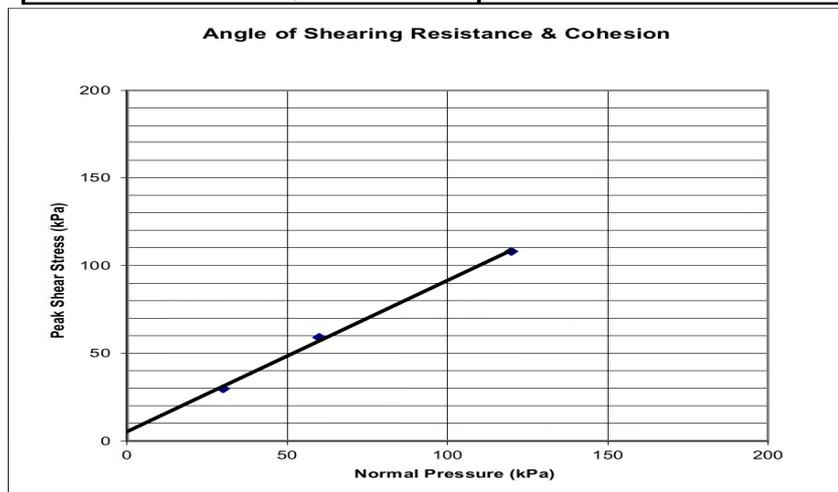
Client Ref:	ST 93354	
Certificate of sampling	Yes	Date Of Sampling: Client info
Lab Reference No.	XC211-TP01 3.0-3.4m Sample 10	Sampled By: OCB
Sample Source & Ticket No.	Site Won	Sample Preparation: Bulk sample sieved through 20mm sieve
Sample Location / Orientation :	Cork Line Level Crossings	Tested Dry or Submerged: Dry

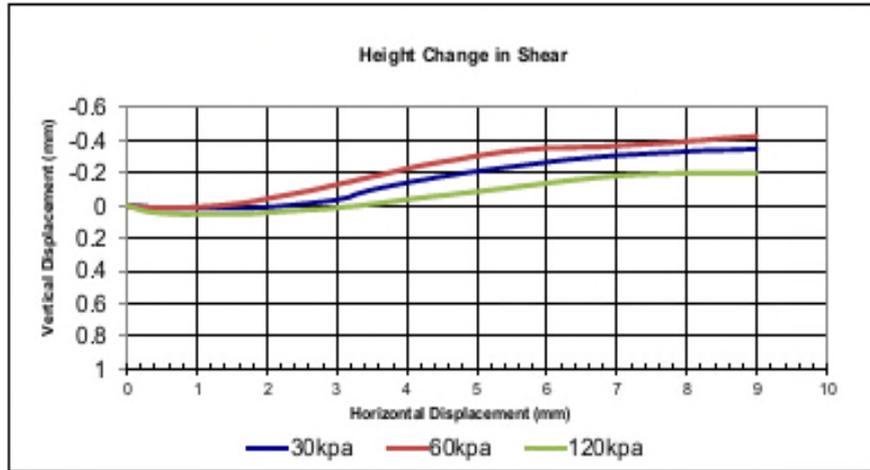
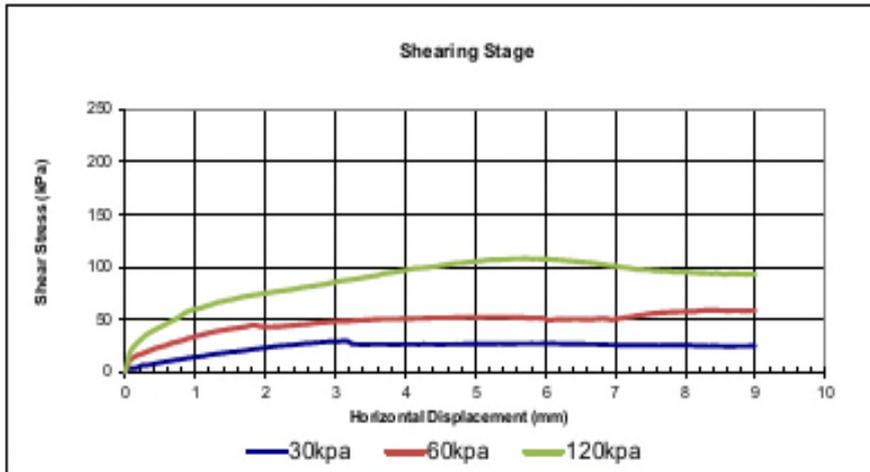
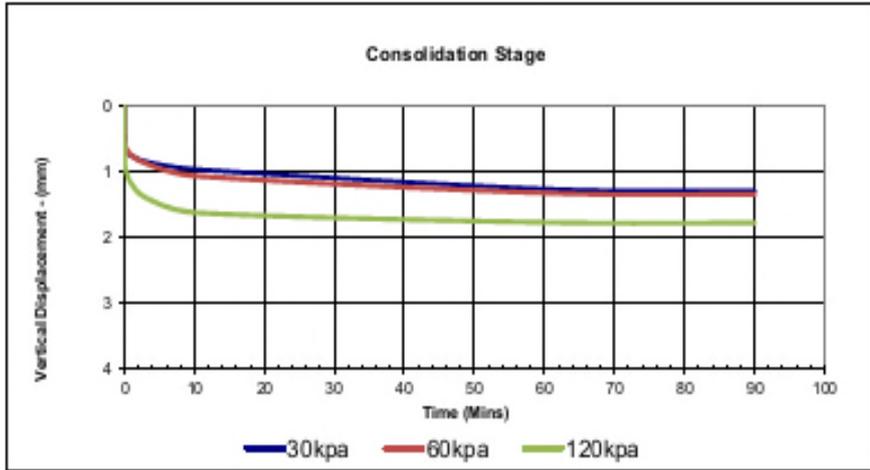
Results

SUMMARY OF TEST RESULTS:	
Angle of Shearing Resistance (°) ϕ'	40.5
Cohesion Intercept (kPa) c'	5.3

Sample Condition: Submerged
 Particle Density: 2.70(Mg/m³) Assumed
 Sample Preparation: Remoulded (Hand Tamped)
 Material tested passing 2mm sieve

Initial Condition			
	Stage		
	1	2	3
Normal Pressure (kPa)	30	60	120
Height (mm)	18.80	18.81	18.48
Width (mm)	59.9	59.9	59.9
Bulk Density (Mg/m ³)	2.08	2.07	2.11
Dry Density (Mg/m ³)	1.72	1.71	1.74
Moisture Content (%)	21	21	21
Voids Ratio	0.574	0.575	0.547
Degree of Saturation	98.8	98.6	103.6
Shearing Stage			
Rate of Displacement (mm/min)	0.8	0.8	0.8
Peak Shear Stress (kPa)	29.8	59.1	108.0
Displacement at Peak Stress (mm)	3.1	8.3	5.7
Final Condition			
Bulk Density (Mg/m ³)	2.20	2.16	2.27
Dry Density (Mg/m ³)	1.81	1.80	1.91
Moisture Content (%)	22	20	19
Angle of Shearing Resistance (°) ϕ'	40.5		
Cohesion Intercept (kPa) c'	5.3		





Subcontracted to a Laboratory Accredited in this Testing

Approved Signature
 James Fisher Testing Services Limited
 James Ward, Operations Manager

LABORATORY TEST REPORT

Determination of Particle Size Distribution - BS 1377 : Part 2 : 1990

Project:	Cork Line Level Crossings	Job No:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93353
Order No:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Reported:	25/03/2020
		Date Tested:	23/03/2020
		Material:	Soil
		Visual Description	Sandy Clay

Client Ref. XC211-TP01 Type B Sample 10

Location: XC211-TP01 Type B Sample 10

Supplier: Bulk

Source: Client Info.

Depth (m): 3.0-3.4m

Sampling Reason: Client Request

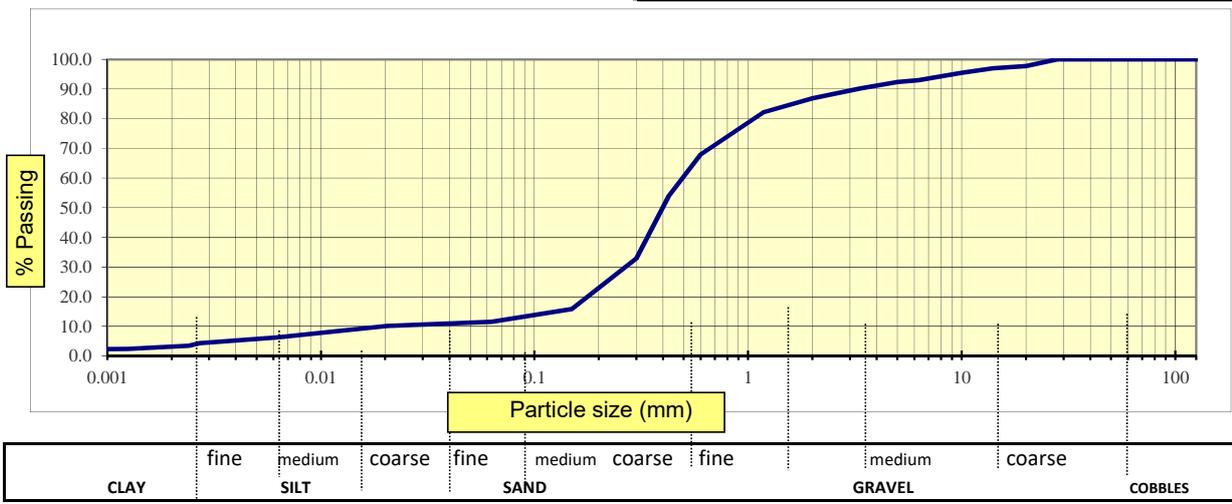
Sampled By: Client

Specification: Client

Preparation Method: Without Organics Preparation

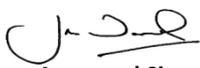
Notes: Disturbed sample from cleanout

BS Sieve Size	% Passing	Specification
300 mm	100	
125 mm	100	
100 mm	100	
75 mm	100	
63 mm	100	
50 mm	100	
37.5 mm	100	
28 mm	100	
20 mm	98	
14 mm	97	
10 mm	96	
6.3 mm	93	
5 mm	92	
3.35 mm	90	
2 mm	87	
1.18 mm	82	
0.6 mm	68	
0.425 mm	54	
0.3 mm	33	
0.15 mm	16	
0.063 mm	12	
0.020 mm	10	
0.006 mm	6	
0.003 mm	4	
0.002 mm	4	
0.001 mm	2	



Tested in accordance with BS 1377: Part 2 : 1990 Clause 3.2, 9.2 and 9.5

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 Sedimentation by Hydrometer - Not UKAS



Approved Signature
JAMES FISHER TESTING SERVICES (IRELAND) LTD.
 James Ward, Operations Manager





LABORATORY TEST REPORT

MOISTURE CONTENT BS 1377 : Part 2 : 1990 Oven Drying Method cl 3.2

Site:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93357
Order No:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Tested:	13/03/2020
		Date Reported:	25/03/2020
		Specification:	Client

Sampled Ref: XC211-TP02 Type D Sample 3

Sample Type: Bulk **Location:** XC211-TP02 Type D Sample 3

Date Sampled: Client Info **Sample by:** Client

Depth: 0.3-0.8m **Material Type:** Soil

Moisture Content (%): 21

Tested in accordance with BS 1377: Part 2: 1990
Sample preparation by cone and quarter

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Approved Signature

James Fisher Testing Services (Ireland) Ltd
James Ward, Operations Manager





LABORATORY TEST REPORT

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP - BS 1377: Part 4: 1990

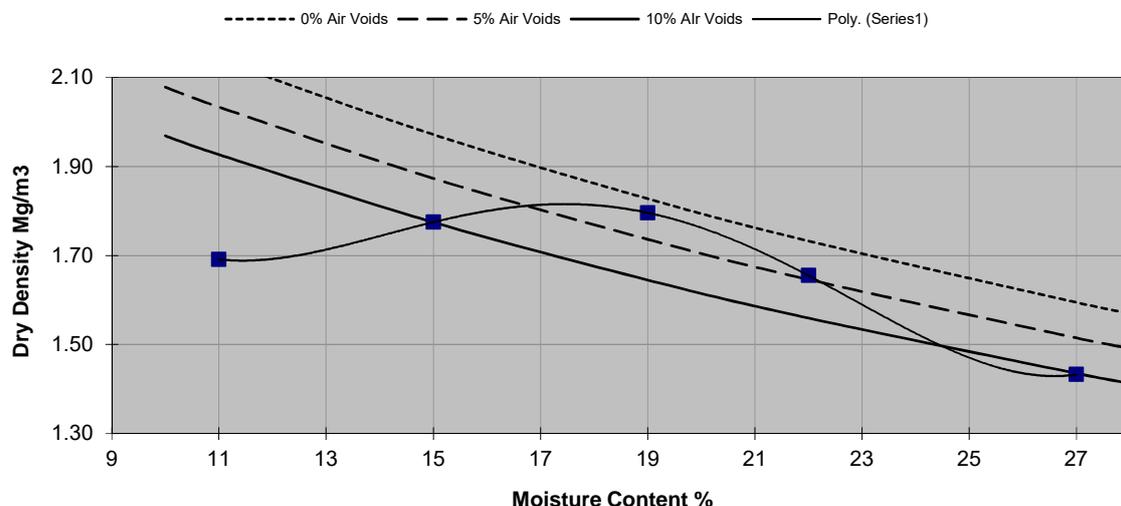
Project: Cork Line Level Crossings	Job No: 19-135
Client: OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.: ST 93356
Order No: 2003-104	Date Received: 09/03/2020
Originator: Ian Holley	Date Tested: 03/04/2020
	Date Reported: 06/04/2020
	Material: Soil
	Specification: Client

Client Sample Ref : XC211-TP02 Type B Sample 2	Sample Type : Bulk
Supplier: Client Info	Description : Soil
Location: 0.3-0.8m	

Date sampled : Client Info **Comments :** None
Sampling Cert : No

Rammer used :	4.5	No of layers:	3
No of sub samples :	5	% retained on 37.5mm sieve	0.3
Mould Size:	CBR	% retained on 20mm sieve	4.6

Bulk Density: Mg/m³	1.88	2.04	2.13	2.03	1.81
Moisture Content: %	11	15	19	22	27
Dry Density: Mg/m³	1.69	1.77	1.80	1.65	1.43



Maximum Dry Density (Mg/m³)	1.82
Optimum Moisture Content (%)	18

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Tested in accordance with BS 1377: Part 4:1990
 Particle Density (Mg/m³) - 2.8 (Assumed)

Approved Signature
 James Fisher Testing Services Limited
 Phil Thorp, Laboratory Manager

James Fisher Testing Services Limited, a company registered in England and Wales with registration number: 01182561

Registered office: Fisher House, PO Box 4, Barrow-in-Furness, Cumbria, LA14 1HR

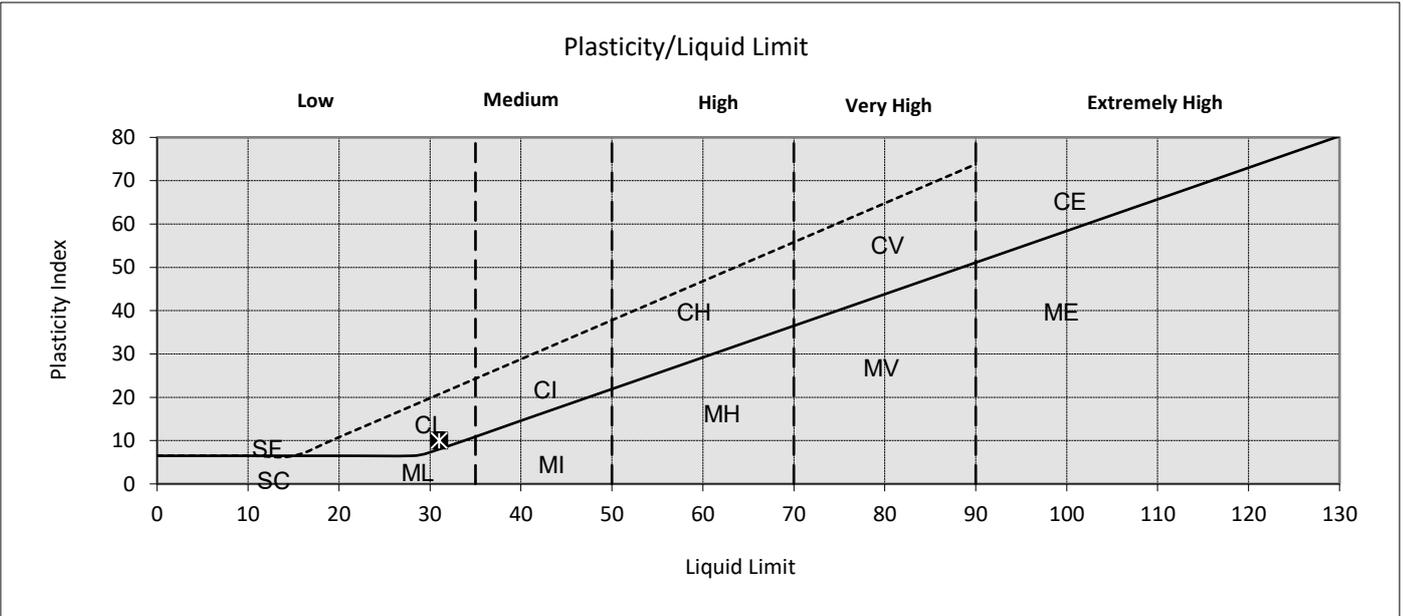




LABORATORY TEST REPORT
LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 CI 4.4,5.3

Site Ref.:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.:	ST 93358
Order No:	2003-104	Sample Ref.:	XC211-TP02 0.3-0.8m Type D Sample 3
Originator:	Ian Holley	Date Sampled:	Client Info
		Date Received:	09/03/2020
		Date Tested:	20/03/2020
		Date Reported:	31/03/2020

Sampling Certificate	No
Sampled By	Client
Sample Type	Bulk
Sample Preparation Method	Washed
MATERIAL	Soil
Retained 425 micron (%)	26
Natural Moisture Content (%)	25
Liquid Limit (single point)(%)	31
Plastic Limit (%)	21
Plasticity Index	10



The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Approved Signature
 James Fisher Testing Services Ltd
 Phil Thorp, Laboratory Manager





LABORATORY TEST REPORT

Determination of Particle Size Distribution - BS 1377 : Part 2 : 1990

Project: Cork Line Level Crossings	Job No: 19-135
Client: OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.: ST 93355
	Date Received: 09/03/2020
	Date Reported: 25/03/2020
	Date Tested: 23/03/2020
Order No: 2003-104	Material: Soil
Originator: Ian Holley	Visual Description: Large Cobble, Dark Sandy Clay

Client Ref.: XC211-TP02 Type B Sample 2

Location: XC211-TP02 Type B Sample 2

Supplier: Bulk

Source: Client Info.

Depth (m): 0.3-0.8m

Sampling Reason: Client Request

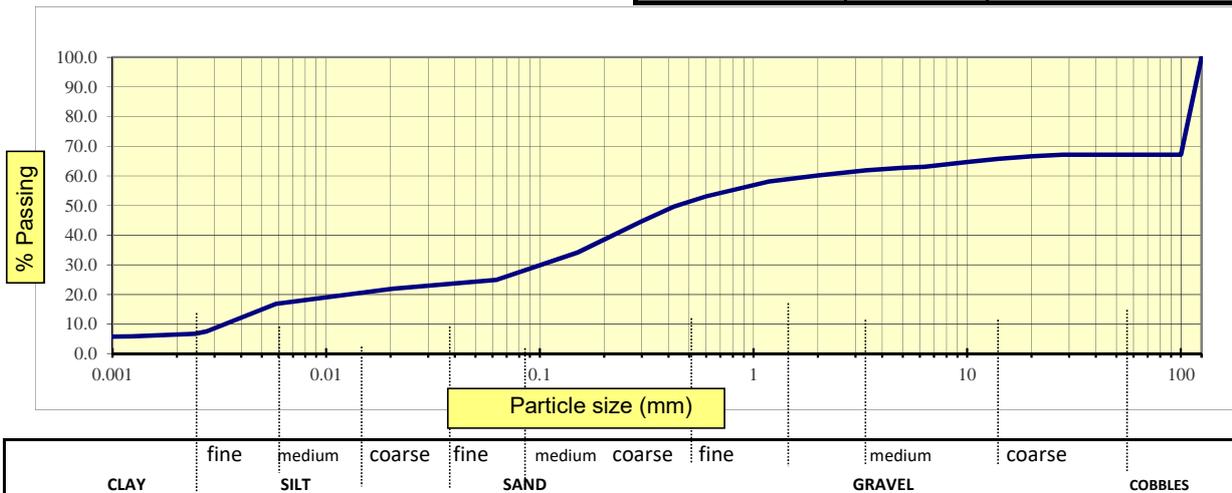
Sampled By: Client

Specification: Client

Preparation Method: Without Organics Preparation

Notes: Disturbed sample from cleanout

BS Sieve Size	% Passing	Specification
300 mm	100	
125 mm	100	
100 mm	67	
75 mm	67	
63 mm	67	
50 mm	67	
37.5 mm	67	
28 mm	67	
20 mm	67	
14 mm	66	
10 mm	65	
6.3 mm	63	
5 mm	63	
3.35 mm	62	
2 mm	60	
1.18 mm	58	
0.6 mm	53	
0.425 mm	50	
0.3 mm	45	
0.15 mm	34	
0.063 mm	25	
0.0205 mm	22	
0.0059 mm	17	
0.0028 mm	7.6	
0.0024 mm	6.7	
0.0012 mm	5.9	



Tested in accordance with BS 1377: Part 2 : 1990 Clause 3.2, 9.2 and 9.5

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.
 Sedimentation by Hydrometer - Not UKAS

Approved Signature
JAMES FISHER TESTING SERVICES (IRELAND) LTD.
 James Ward, Operations Manager





LABORATORY TEST REPORT

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP - BS 1377: Part 4: 1990

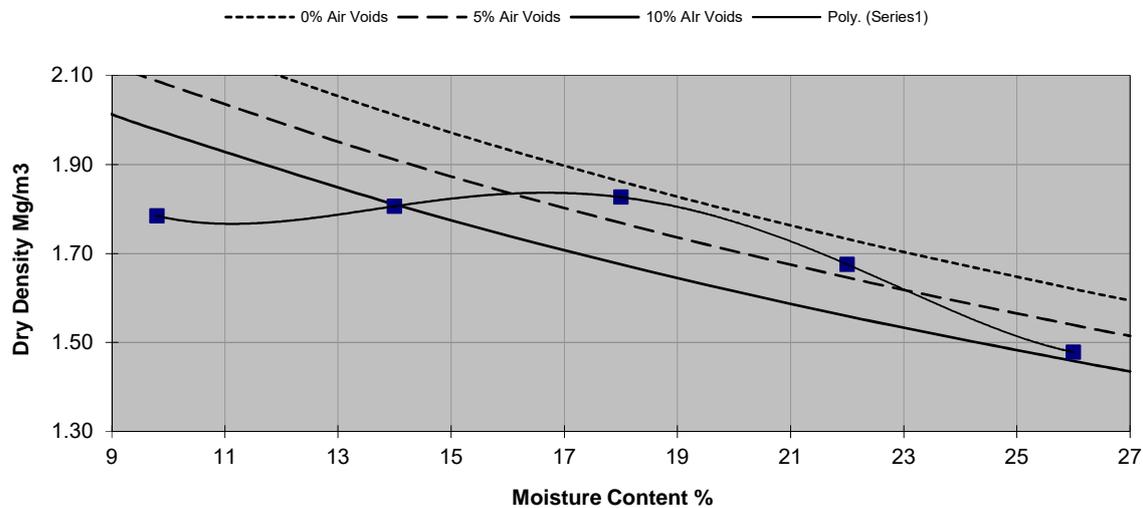
Project: Cork Line Level Crossings	Job No: 19-135
Client: OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.: ST 93360 Date Received: 09/03/2020 Date Tested: 03/04/2020 Date Reported: 06/04/2020
Order No: 2003-104	Material: Soil
Originator: Ian Holley	Specification: Client

Client Sample Ref : XC211-TP02 Type B Sample 6	Sample Type : Bulk
Supplier: Client Info	Description : Soil
Location: 1.6-2.1m	

Date sampled : Client Info **Comments :** None
Sampling Cert : No

Rammer used :	4.5	No of layers:	3
No of sub samples :	5	% retained on 37.5mm sieve	0.5
Mould Size:	CBR	% retained on 20mm sieve	5.5

Bulk Density: Mg/m³	1.96	2.07	2.16	2.04	1.86
Moisture Content: %	9.8	14	18	22	26
Dry Density: Mg/m³	1.78	1.81	1.83	1.68	1.48



Maximum Dry Density (Mg/m³)	1.84
Optimum Moisture Content (%)	17

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Tested in accordance with BS 1377: Part 4:1990
 Particle Density (Mg/m³) - 2.8 (Assumed)

Approved Signature
 James Fisher Testing Services Limited
 Phil Thorp, Laboratory Manager

James Fisher Testing Services Limited, a company registered in England and Wales with registration number: 01182561

Registered office: Fisher House, PO Box 4, Barrow-in-Furness, Cumbria, LA14 1HR



LABORATORY TEST REPORT

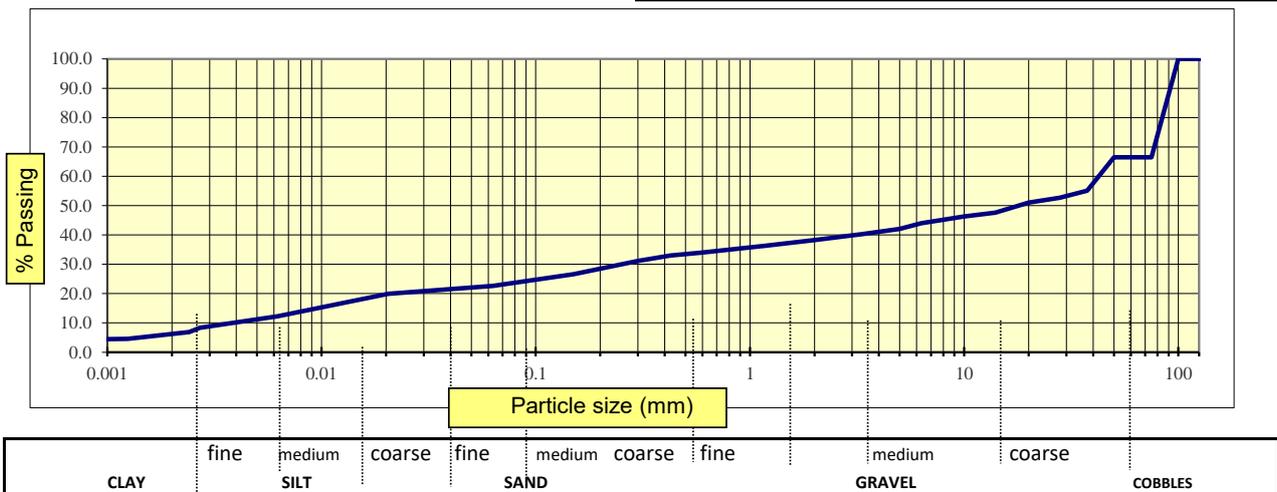
Determination of Particle Size Distribution - BS 1377 : Part 2 : 1990

Determination of Particle Size Distribution (Hydrometer Sedimentation) - BS 1377 : Part 2 : 1990 Cl. 9.5

Project:	Cork Line Level Crossings	Job No:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93359
		Date Received:	09/03/2020
		Date Reported:	02/04/2020
		Date Tested:	31/03/2020
Order No:	2003-104	Material:	Soil
Originator:	Ian Holley	Visual Description	Cobbly Light Clay, Sandy

Client Ref.	XC211-TP02 Type B Sample 6
Location:	XC211-TP02 Type B Sample 6
Supplier:	Bulk
Source:	Client Info.
Depth (m):	1.6-2.1m
Sampling Reason:	Client Request
Sampled By:	Client
Specification:	Client
Preparation Method:	Without Organics Preparation
Notes:	Disturbed sample from cleanout

BS Sieve Size	% Passing	Specification
300 mm	100	
125 mm	100	
100 mm	100	
75 mm	66	
63 mm	66	
50 mm	66	
37.5 mm	55	
28 mm	53	
20 mm	51	
14 mm	48	
10 mm	46	
6.3 mm	44	
5 mm	42	
3.35 mm	40	
2 mm	38	
1.18 mm	36	
0.6 mm	34	
0.425 mm	33	
0.3 mm	31	
0.15 mm	27	
0.063 mm	23	
0.020 mm	20	
0.006 mm	12	
0.003 mm	8	
0.002 mm	7	
0.001 mm	5	



Tested in accordance with BS 1377: Part 2 : 1990 Clause 9.2 and 9.5

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.
 Sedimentation by Hydrometer - Not UKAS


 Approved Signature

JAMES FISHER TESTING SERVICES (IRELAND) LTD.
 James Ward, Operations Manager



LABORATORY TEST REPORT

BRE Test Suite B - Greenfield Site

Project:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical	Lab Ref. No.:	ST 93363
	Unit 1 Carrigogna	Date Received:	09/03/2020
	Middleton	Date Reported:	08/04/2020
	Co. Cork	Material:	Soil
Order No.:	2003-104	Date Tested:	07/04/2020
Originator:	Ian Holley	Specification:	Client

Sample Details

XC211-TP02 Type D Sample 9

Supplier:	Client Info	Date of Sampling:	Client Info.
Source:	Client Info	Sampled By:	Client
Sample Location:	2.7-3.2m	Sampling Reason:	Request

Parameter	RESULT
pH	8.4
Sulphate Aqueous Extract (SO4) (mg/l)	<10
Sulphur as S, Total (%)	0.01
Sulphate as SO4, Total (%)	0.02

Comments:

None

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James Ward, Operations Manager



LABORATORY TEST REPORT

MOISTURE CONTENT BS 1377 : Part 2 : 1990 Oven Drying Method cl 3.2

Site:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93361
Order No:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Tested:	26/03/2020
		Date Reported:	03/04/2020
		Specification:	Client

Sampled Ref: XC211-TP02 Type D Sample 9

Sample Type: Bulk **Location:** XC211-TP02 Type D Sample 9

Date Sampled: Client Info **Sample by:** Client

Depth: 2.7-3.2m **Material Type:** Soil

Moisture Content (%): 12

Tested in accordance with BS 1377: Part 2: 1990
Sample preparation by cone and quarter

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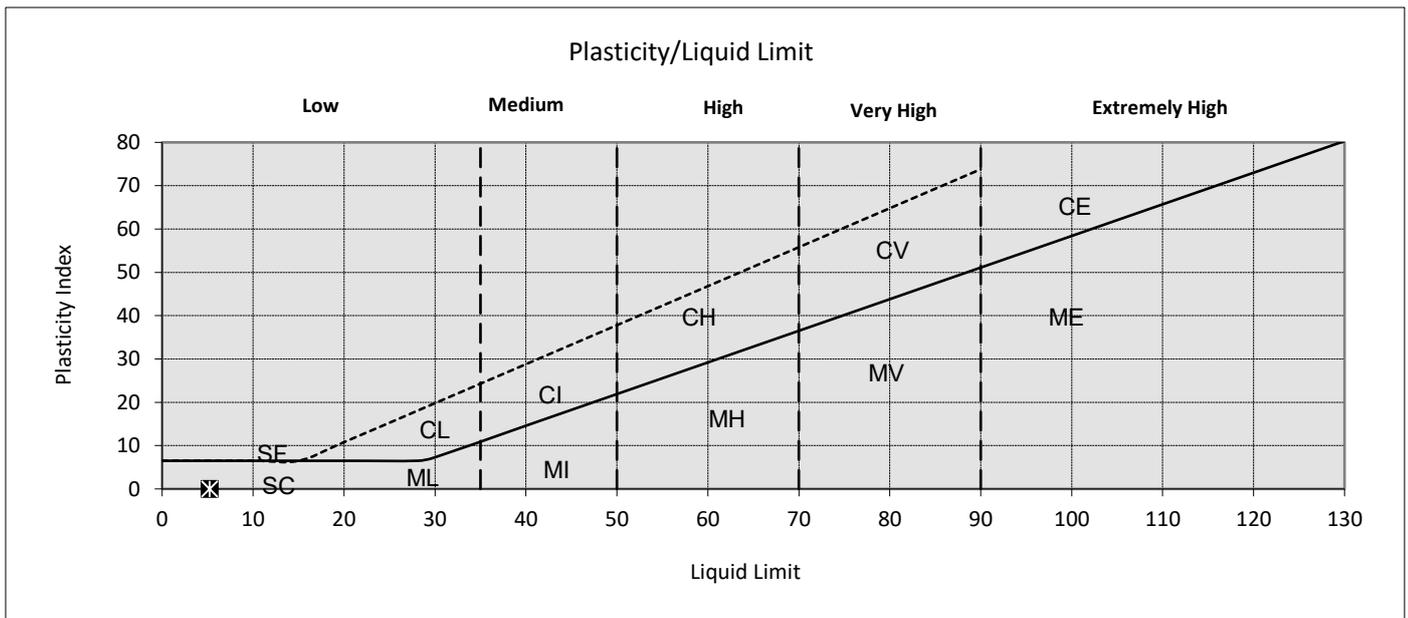




LABORATORY TEST REPORT
LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 CI 4.4,5.3

Site Ref.:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.:	ST 93362
Order No:	2003-104	Sample Ref.:	XC211-TP02 2.7-3.2m Type D Sample 9
Originator:	Ian Holley	Date Sampled:	Client Info
		Date Received:	09/03/2020
		Date Tested:	26/03/2020
		Date Reported:	31/03/2020

Sampling Certificate	No
Sampled By	Client
Sample Type	Bulk
Sample Preparation Method	Washed
MATERIAL	Soil
Retained 425 micron (%)	70
Natural Moisture Content (%)	11
Liquid Limit (single point)(%)	5
Plastic Limit (%)	Non-Plastic
Plasticity Index	N/A



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 Phil Thorp, Laboratory Manager



LABORATORY TEST REPORT

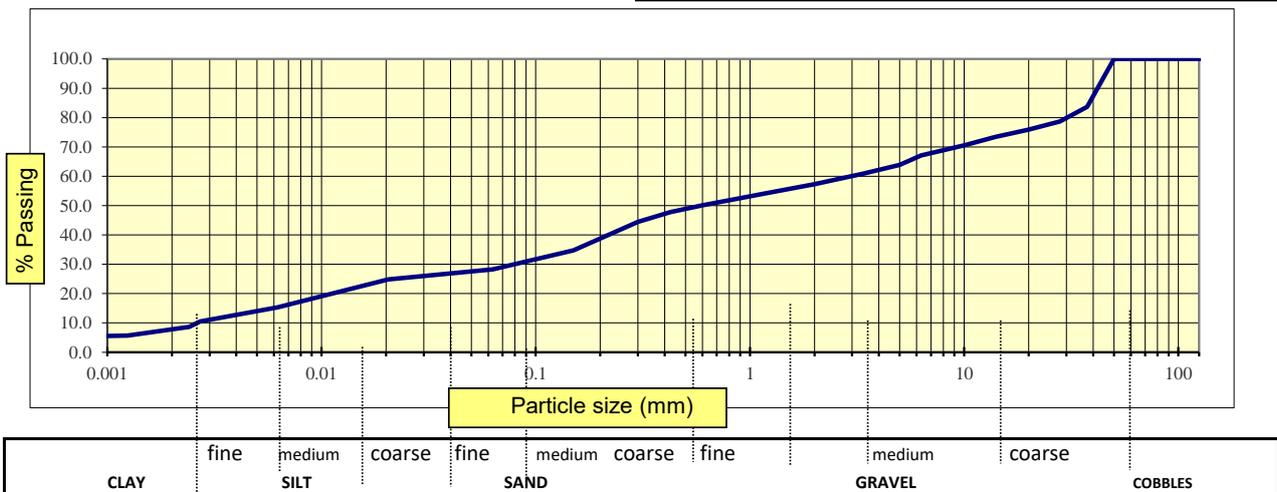
Determination of Particle Size Distribution - BS 1377 : Part 2 : 1990

Determination of Particle Size Distribution (Hydrometer Sedimentation) - BS 1377 : Part 2 : 1990 Cl. 9.5

Project:	Cork Line Level Crossings	Job No:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93364
		Date Received:	09/03/2020
		Date Reported:	02/04/2020
		Date Tested:	01/04/2020
Order No:	2003-104	Material:	Soil
Originator:	Ian Holley	Visual Description	Light Clay, Sandy

Client Ref.	XC211-TP03 Type B Sample 2
Location:	XC211-TP03 Type B Sample 2
Supplier:	Bulk
Source:	Client Info.
Depth (m):	0.3-0.8m
Sampling Reason:	Client Request
Sampled By:	Client
Specification:	Client
Preparation Method:	Without Organics Preparation
Notes:	Disturbed sample from cleanout

BS Sieve Size	% Passing	Specification
300 mm	100	
125 mm	100	
100 mm	100	
75 mm	100	
63 mm	100	
50 mm	100	
37.5 mm	84	
28 mm	79	
20 mm	76	
14 mm	73	
10 mm	71	
6.3 mm	67	
5 mm	64	
3.35 mm	61	
2 mm	57	
1.18 mm	54	
0.6 mm	50	
0.425 mm	48	
0.3 mm	44	
0.15 mm	35	
0.063 mm	28	
0.020 mm	25	
0.006 mm	15	
0.003 mm	11	
0.002 mm	9	
0.001 mm	6	



Tested in accordance with BS 1377: Part 2 : 1990 Clause 9.2 and 9.5

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 Sedimentation by Hydrometer - Not UKAS


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 James Ward, Operations Manager



LABORATORY TEST REPORT

BRE Test Suite B - Greenfield Site

Project:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co. Cork	Lab Ref. No.:	ST 93367
Order No.:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Reported:	06/04/2020
		Material:	Soil
		Date Tested:	31/03/2020
		Specification:	Client

Sample Details

XC211-TP03 Type D Sample 7

Supplier:	Client Info	Date of Sampling:	Client Info.
Source:	Client Info	Sampled By:	Client
Sample Location:	1.3-1.8m	Sampling Reason:	Request

Parameter	RESULT
pH	7.8
Sulphate Aqueous Extract as (SO4) (mg/l)	11
Sulphur as S, Total (%)	0.01
Sulphate as SO4, Total (%)	0.02

Comments:

None

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James Ward, Operations Manager



LABORATORY TEST REPORT

MOISTURE CONTENT BS 1377 : Part 2 : 1990 Oven Drying Method cl 3.2

Site:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93465
Order No:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Tested:	13/03/2020
		Date Reported:	25/03/2020
		Specification:	Client

Sampled Ref: XC211-TP03 Type D Sample 7

Sample Type: Bulk **Location:** XC211-TP03 Type D Sample 7

Date Sampled: Client Info **Sample by:** Client

Depth: 1.3-1.8m **Material Type:** Soil

Moisture Content (%): 18

Tested in accordance with BS 1377: Part 2: 1990
Sample preparation by cone and quarter

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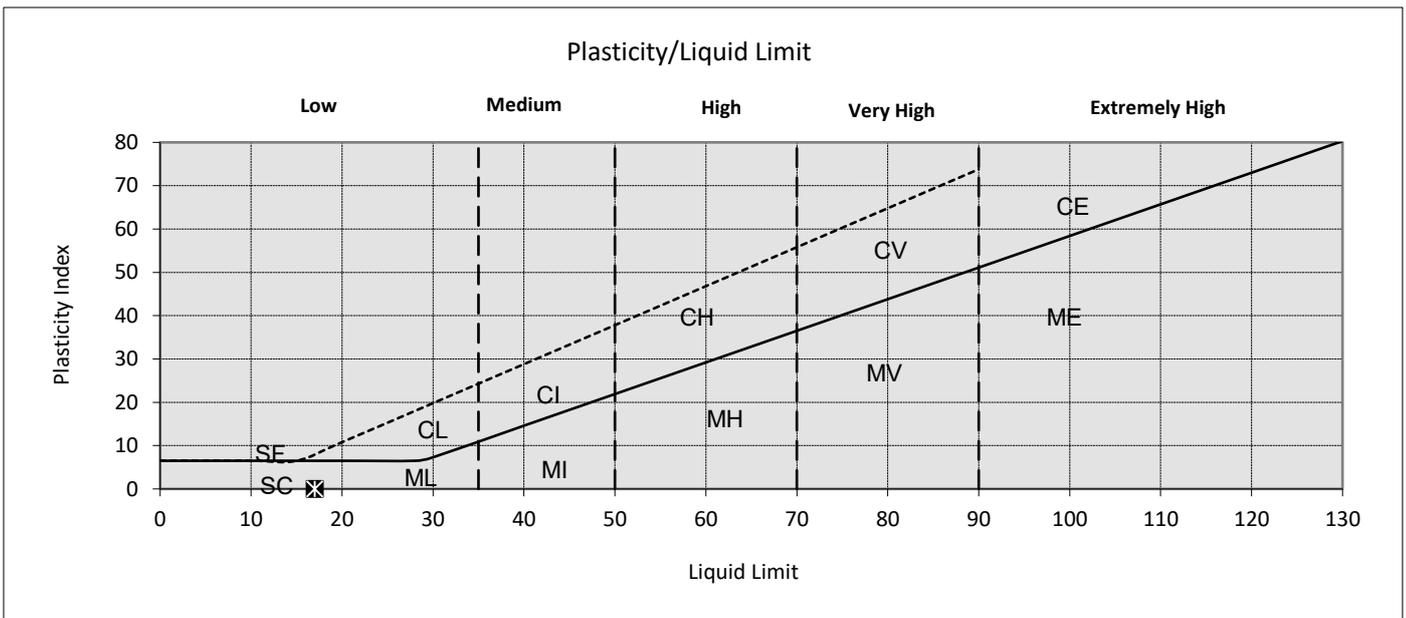




LABORATORY TEST REPORT
LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 CI 4.4,5.3

Site Ref.:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.:	ST 93366
Order No:	2003-104	Sample Ref.:	XC211-TP03 1.3-1.8m Type D Sample 7
Originator:	Ian Holley	Date Sampled:	Client Info
		Date Received:	09/03/2020
		Date Tested:	18/03/2020
		Date Reported:	31/03/2020

Sampling Certificate	No
Sampled By	Client
Sample Type	Bulk
Sample Preparation Method	Washed
MATERIAL	Soil
Retained 425 micron (%)	56
Natural Moisture Content (%)	12
Liquid Limit (single point)(%)	17
Plastic Limit (%)	Non-Plastic
Plasticity Index	N/A



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James Fisher Testing Services Ltd
Phil Thorp, Laboratory Manager





LABORATORY TEST REPORT

MOISTURE CONTENT BS 1377 : Part 2 : 1990 Oven Drying Method cl 3.2

Site:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93368
Order No:	2003-104	Date Received:	09/03/2020
Originator:	Ian Holley	Date Tested:	26/03/2020
		Date Reported:	03/04/2020
		Specification:	Client

Sampled Ref: XC211-TP03 Type D Sample 9

Sample Type: Bulk **Location:** XC211-TP03 Type D Sample 9

Date Sampled: Client Info **Sample by:** Client

Depth: 2.5-3.0m **Material Type:** Soil

Moisture Content (%): 11

Tested in accordance with BS 1377: Part 2: 1990
Sample preparation by cone and quarter

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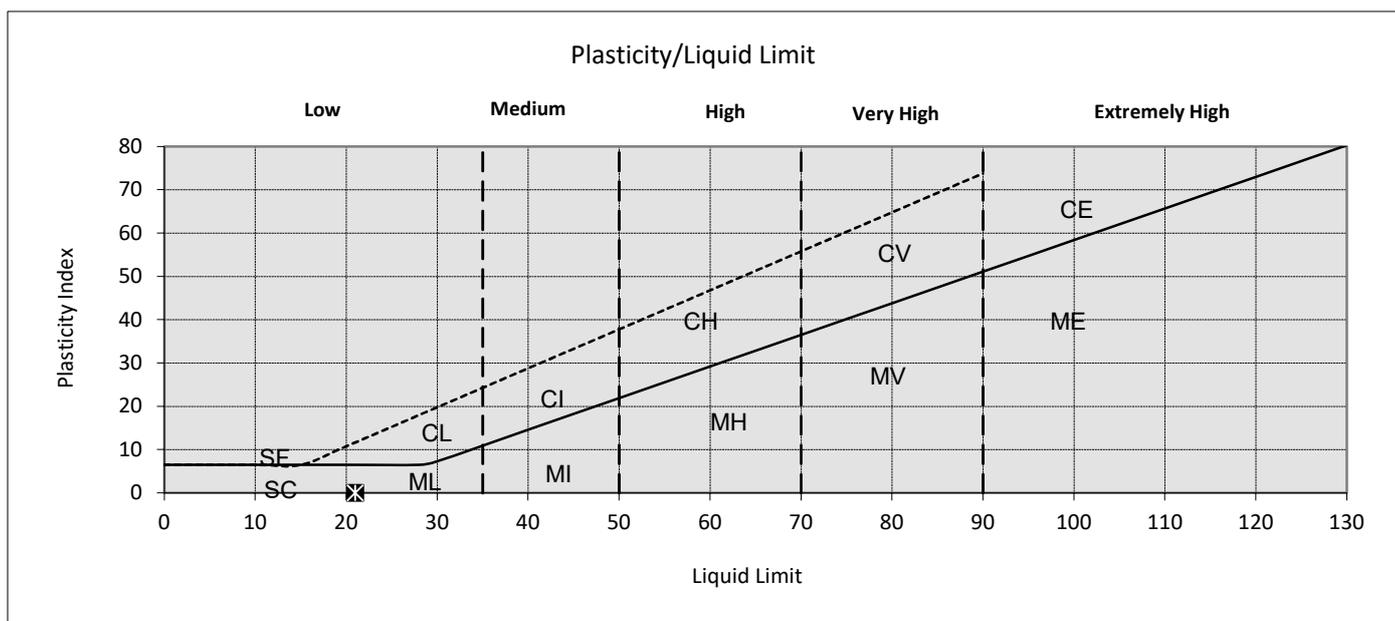




LABORATORY TEST REPORT
LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 CI 4.4,5.3

Site Ref.:	Cork Line Level Crossings	Job No.:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton Co Cork	Lab Ref No.:	ST 93369
Order No:	2003-104	Sample Ref.:	XC211-TP03 2.5-3.0m Type D S.9
Originator:	Ian Holley	Date Sampled:	Client Info
		Date Received:	09/03/2020
		Date Tested:	28/03/2020
		Date Reported:	21/04/2020

Sampling Certificate	No
Sampled By	Client
Sample Type	Bulk
Sample Preparation Method	Washed
MATERIAL	Soil
Retained 425 micron (%)	25
Natural Moisture Content (%)	10
Liquid Limit (single point)(%)	21
Plastic Limit (%)	Non-Plastic
Plasticity Index	N/A



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 Phil Thorp, Laboratory Manager



LABORATORY TEST REPORT

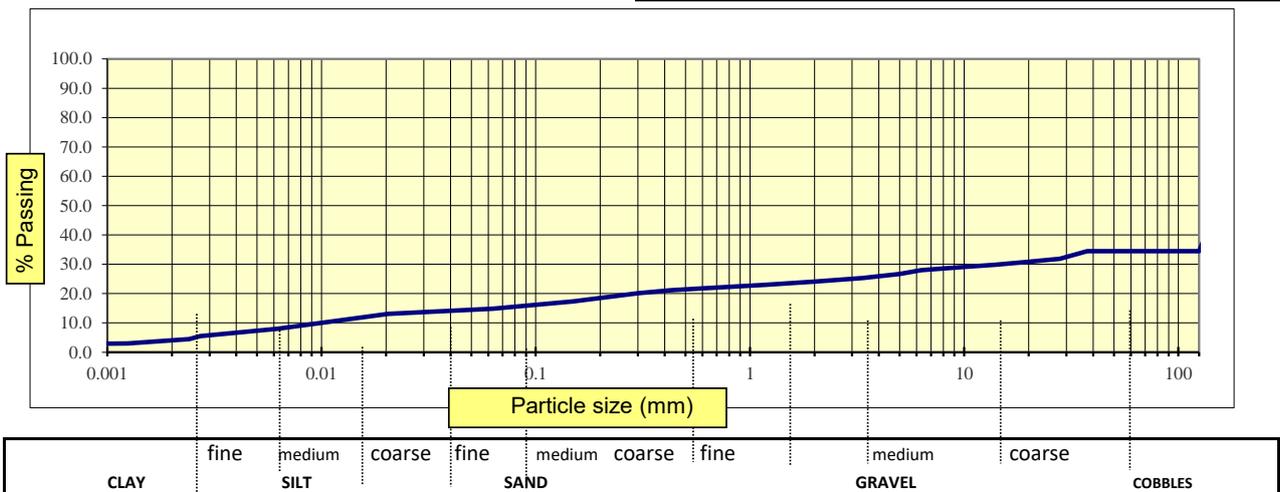
Determination of Particle Size Distribution - BS 1377 : Part 2 : 1990

Determination of Particle Size Distribution (Hydrometer Sedimentation) - BS 1377 : Part 2 : 1990 Cl. 9.5

Project:	Cork Line Level Crossings	Job No:	19-135
Client:	OCB Geotechnical Unit 1 Carrigogna Midleton	Lab Ref No.:	ST 93370
		Date Received:	09/03/2020
		Date Reported:	02/04/2020
		Date Tested:	31/03/2020
Order No:	2003-104	Material:	Soil
Originator:	Ian Holley	Visual Description	Large Cobble, Light Clay, Sandy

Client Ref.	XC211-TP03 Type B Sample 11
Location:	XC211-TP03 Type B Sample 11
Supplier:	Bulk
Source:	Client Info.
Depth (m):	3.7-4.2m
Sampling Reason:	Client Request
Sampled By:	Client
Specification:	Client
Preparation Method:	Without Organics Preparation
Notes:	Disturbed sample from cleanout

BS Sieve Size	% Passing	Specification
300 mm	100	
125 mm	34	
100 mm	34	
75 mm	34	
63 mm	34	
50 mm	34	
37.5 mm	34	
28 mm	32	
20 mm	31	
14 mm	30	
10 mm	29	
6.3 mm	28	
5 mm	27	
3.35 mm	25	
2 mm	24	
1.18 mm	23	
0.6 mm	22	
0.425 mm	21	
0.3 mm	20	
0.15 mm	17	
0.063 mm	15	
0.020 mm	13	
0.006 mm	8	
0.003 mm	6	
0.002 mm	5	
0.001 mm	3	



Tested in accordance with BS 1377: Part 2 : 1990 Clause 9.2 and 9.5

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 Sedimentation by Hydrometer - Not UKAS


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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample			Soil Description	ρ	ρ_d	W	< 425 μm sieve	W _L	W _P	I _p	ρ_s	Remarks	
	No.	Depth (m)												type
		from	to											
					Mg/m ³	%	%	%	%		Mg/m ³			
XC211-CP01	6	0.70	1.90	D	Brown slightly gravelly sandy CLAY		9.6	49 s	19 b	14	5			
XC211-CP01	9	1.90	2.50	D	Brown slightly sandy slightly gravelly CLAY		4.1	58 s	27 b	15	12			
XC211-CP01	14	3.50	4.50	D	Brown sandy slightly gravelly silty CLAY		9.7	61 s	20 a	13	7			
XC211-CP01	18	5.50	6.50	D	Brown slightly sandy gravelly CLAY.		2.1	41 s	23 b	13	10			
XC211-CP01	22	7.20	8.00	D	Brown slightly sandy slightly gravelly CLAY		12	57 s	27 b	15	12			
XC211-CP01	27	9.00	10.00	D	Brown slightly sandy slightly gravelly CLAY		14	62 s	30 a	15	15			
XC211-CP02	6	1.20	2.00	D	Brown slightly sandy slightly gravelly CLAY.		12	60 s	26 b	14	12			
XC211-CP02	12	3.00	4.00	D	Brown slightly sandy slightly gravelly CLAY		9.8	62 s	31 b	17	14			
XC211-CP02	16	5.00	6.00	D	Brown slightly sandy slightly gravelly CLAY		9.8	62 s	29 b	16	13			
XC211-CP02	21	7.00	8.00	D	Brown slightly sandy slightly gravelly CLAY.		12	74 s	30 a	16	14			
XC211-CP02	25	9.00	10.00	D	Brown sandy slightly gravelly CLAY		15	61 s	26 a	14	12			
XC211-CP02	29	11.00	12.00	D	Brown slightly sandy slightly gravelly CLAY		36	58 s	30 a	16	14			

General notes:

All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : ρ bulk density, linear

WL Liquid limit

WP Plastic limit

<425 μm preparation

ρ_s particle density

ρ_d dry density

a 4 point cone test

NP non - plastic

n from natural soil

-g = gas jar

w moisture content

b 1 point cone test

IP Plasticity Index

s sieved specimen

-p = small pycnometer

* test carried out to BS EN ISO 17892

h removed by hand

QA Ref
SLR 1
Rev 2.95
Mar 17



Project No N9426-20
Project Name Cork Line Level Crossings

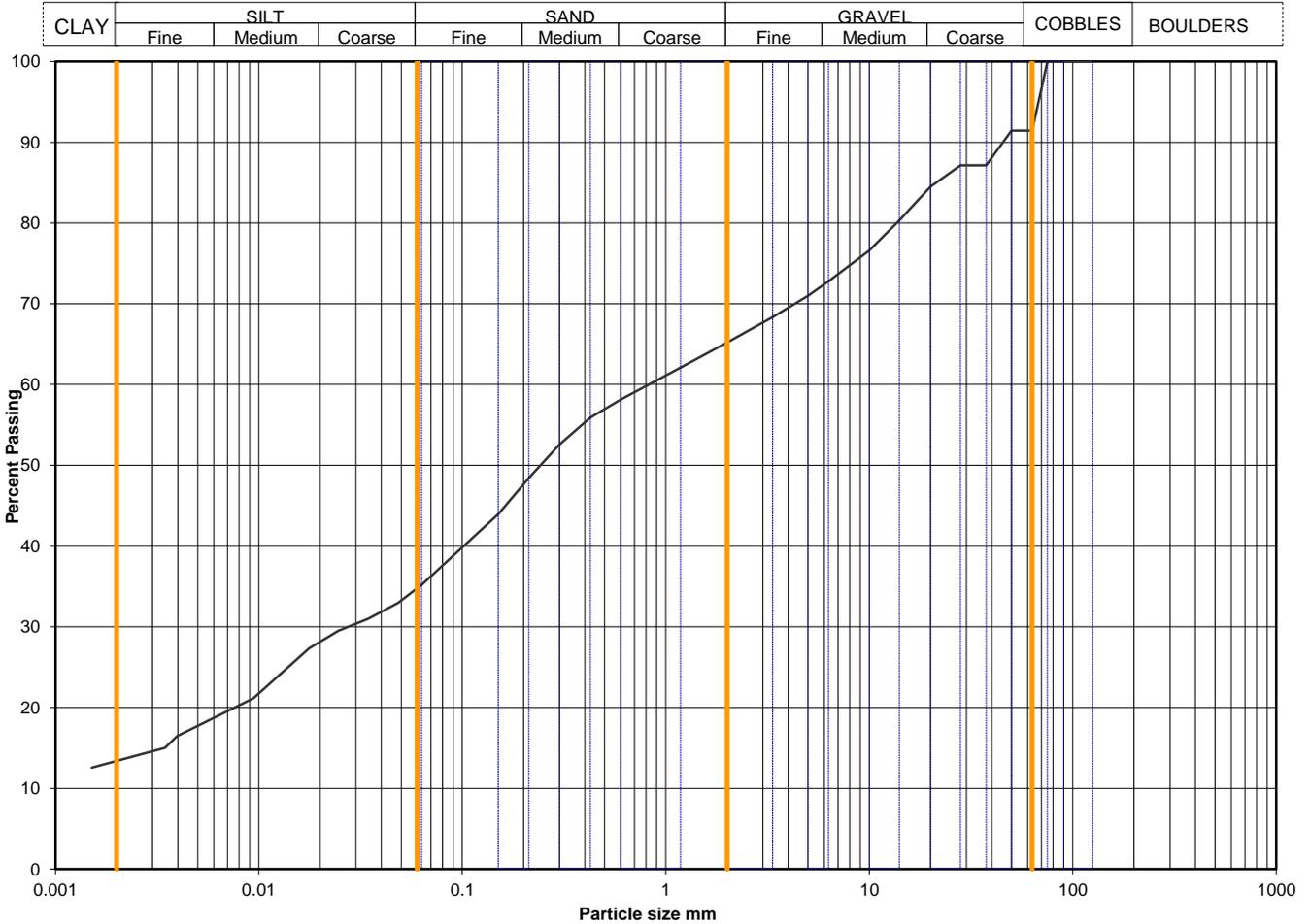
Figure
INDX

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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	XC211-CP01
	SOCO2020100629	Sample Depth (m BGL)	1.90 - 2.50
		Sample Type and No	B8
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	35
90	100	0.0484	33
75	100	0.0346	31
63	91	0.0246	30
50	91	0.0176	27
37.5	87	0.0094	21
28	87	0.0040	16
20	84	0.0034	15
14	80	0.0015	13
10	77		
6.3	73		
5.0	71		
3.35	68		
2.00	65		
1.18	62		
0.600	58	Particle density, Mg/m ³	
0.425	56	2.65 assumed	
0.300	53	Dry mass of sample, kg	
0.212	48	4.5	
0.150	44		
0.063	35		

Soil description	Brown slightly sandy slightly gravelly CLAY with one cobble.
Preparation / Pretreatment	Sieve: pre dried, Hydro: as BS1377
Remarks	

Sample Proportions	Cobbles / boulders	Whole	*<60mm
		Gravel	8.6
Sand	26.2	28.7	
Silt	30.0	32.8	
Clay	21.8	23.9	
	13.4	14.7	

*<60mm values to aid description only

Uniformity Coefficient	D60 / D10	Not applicable
-------------------------------	------------------	----------------

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.22
Jul 17



0001



Project No N9426-20
Project Name Cork Line Level Crossings

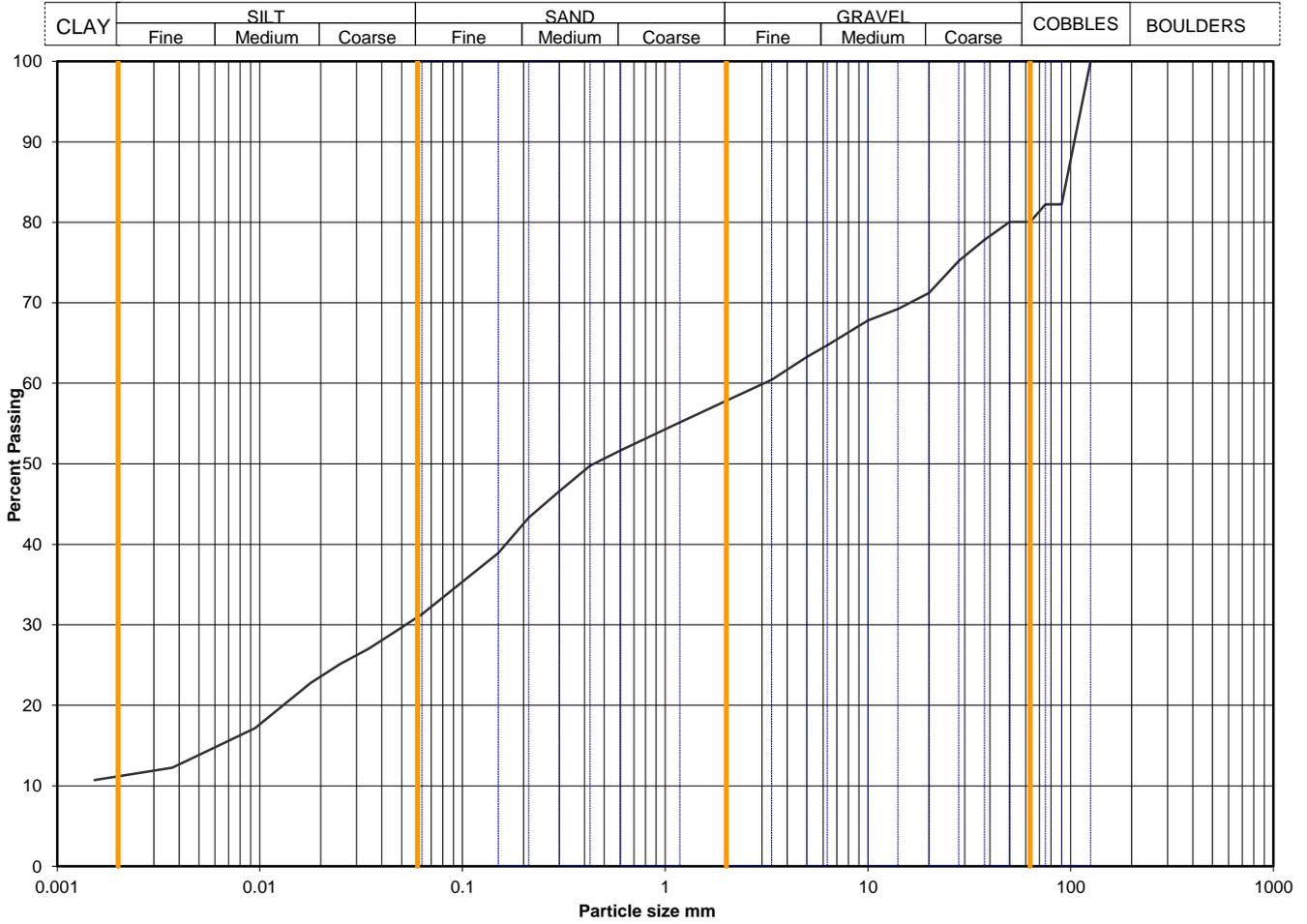
Figure
PSD

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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	XC211-CP01
	SOCO2020100635	Sample Depth (m BGL)	4.50 - 5.50
		Sample Type and No	B15
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	31
90	82	0.0482	29
75	82	0.0346	27
63	80	0.0247	25
50	80	0.0177	23
37.5	78	0.0095	17
28	75	0.0044	13
20	71	0.0037	12
14	69	0.0015	11
10	68		
6.3	65		
5.0	63		
3.35	60		
2.00	58		
1.18	55		
0.600	52		
0.425	50		
0.300	47		
0.212	43		
0.150	39		
0.063	31		
		Particle density, Mg/m ³	
		2.65	assumed
		Dry mass of sample, kg	
		20.0	

Soil description	Brown slightly sandy slightly gravelly CLAY with two cobbles.
Preparation / Pretreatment	Sieve: pre dried, Hydro: as BS1377
Remarks	

Sample Proportions	Cobbles / boulders	Whole	*<60mm
		Gravel	20.0
	Sand	22.2	27.8
	Silt	26.5	33.1
	Clay	20.1	25.1
		11.2	14.0

*<60mm values to aid description only

Uniformity Coefficient	D60 / D10	Not applicable
-------------------------------	------------------	----------------

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.22
Jul 17



Project No N9426-20
Project Name Cork Line Level Crossings

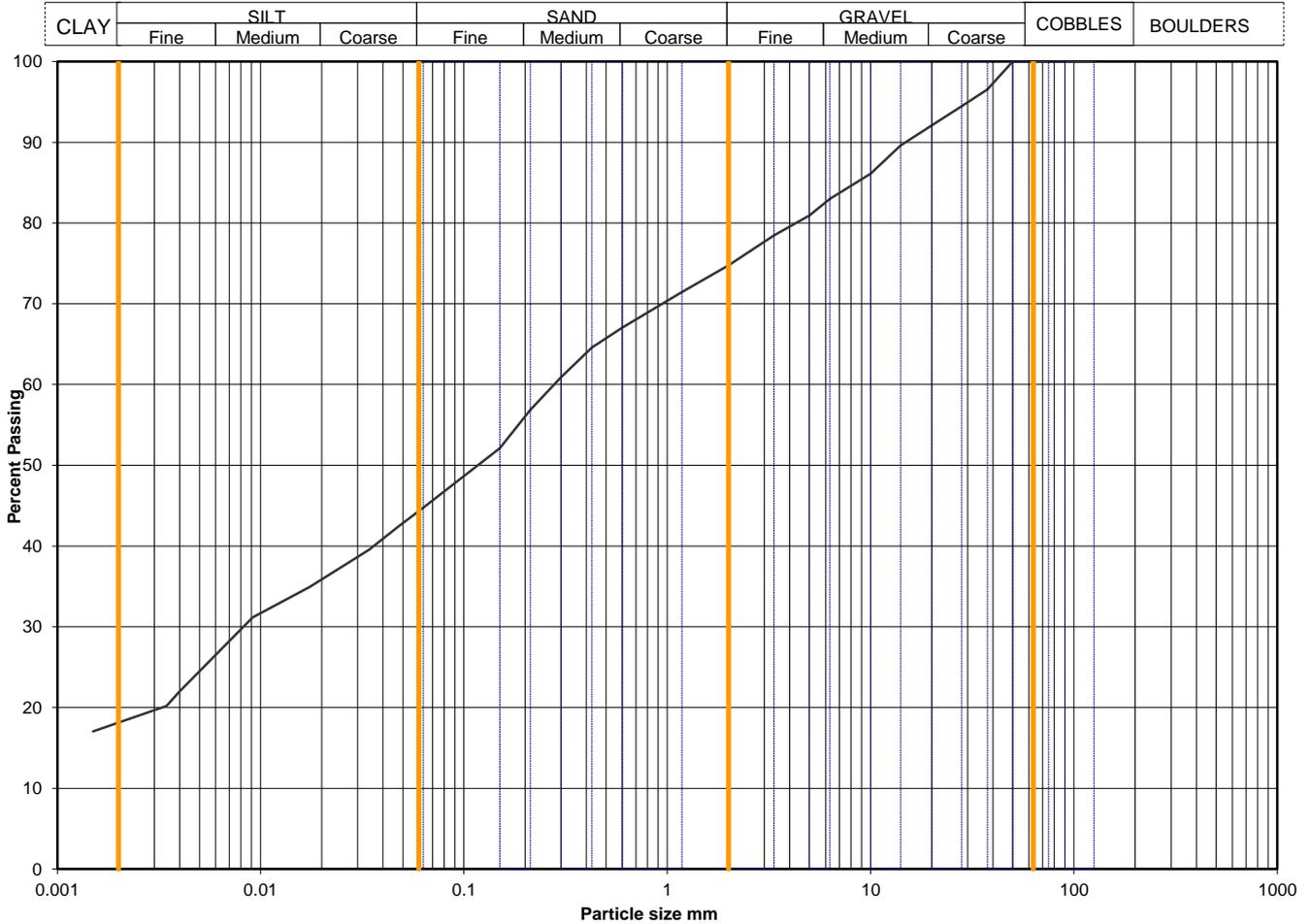
Figure
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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	XC211-CP01
	SOCO2020100646	Sample Depth (m BGL)	9.00 - 10.00
		Sample Type and No	B26
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	45
90	100	0.0475	42
75	100	0.0341	40
63	100	0.0243	37
50	100	0.0174	35
37.5	97	0.0091	31
28	94	0.0040	22
20	92	0.0034	20
14	90	0.0015	17
10	86		
6.3	83		
5.0	81		
3.35	78		
2.00	75		
1.18	71		
0.600	67		
0.425	65		
0.300	61		
0.212	57		
0.150	52		
0.063	45		
		Particle density, Mg/m ³	
		2.65	assumed
		Dry mass of sample, kg	
		2.8	

Soil description	Brown slightly sandy slightly gravelly CLAY.
Preparation / Pretreatment	Sieve: pre dried, Hydro: as BS1377
Remarks	

Sample Proportions	Cobbles / boulders	Whole	* <60mm
		Gravel	0.0
	Sand	25.3	25.3
	Silt	30.0	30.0
	Clay	26.6	26.6
		18.1	18.1

* <60mm values to aid description only

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.22
Jul 17



Project No N9426-20
Project Name Cork Line Level Crossings

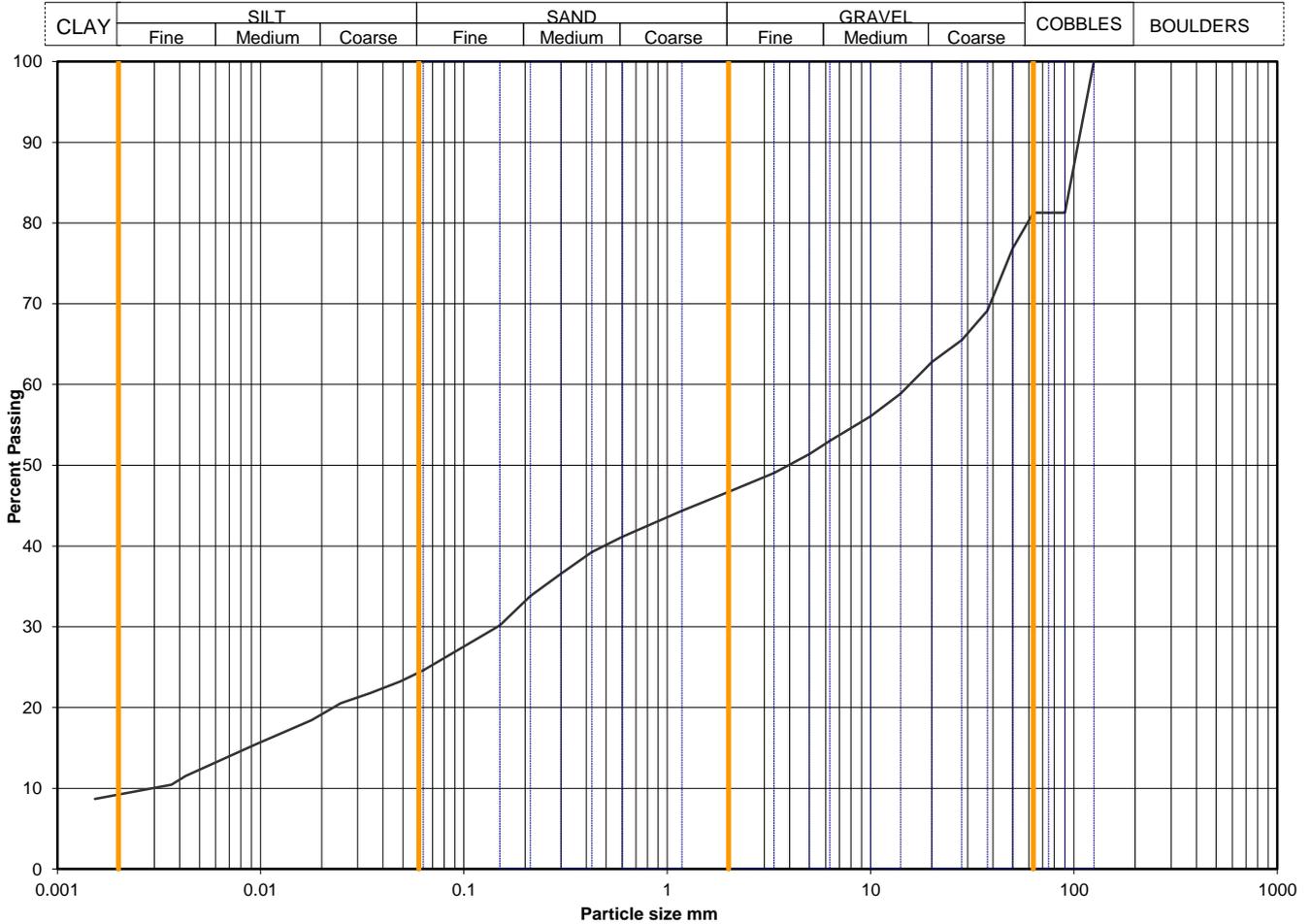
Figure
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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	XC211-CP02
	SOCO2020100650	Sample Depth (m BGL)	1.20 - 2.00
		Sample Type and No	B5
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	25
90	81	0.0486	23
75	81	0.0347	22
63	81	0.0248	21
50	77	0.0178	18
37.5	69	0.0094	15
28	66	0.0043	12
20	63	0.0036	10
14	59	0.0015	9
10	56		
6.3	53		
5.0	51		
3.35	49		
2.00	47		
1.18	44		
0.600	41		
0.425	39		
0.300	37		
0.212	34		
0.150	30		
0.063	25		

Particle density, Mg/m ³	2.65	assumed
Dry mass of sample, kg	8.4	

Soil description	Brown slightly sandy gravelly CLAY with one cobble.
Preparation / Pretreatment	Sieve: pre dried, Hydro: as BS1377
Remarks	

Sample Proportions	Cobbles / boulders	Gravel	Sand	Silt	Clay	Whole	* <60mm
						18.7	0.0
		34.6	42.6				
		22.1	27.2				
		15.4	18.9				
		9.2	11.3				

* <60mm values to aid description only

Uniformity Coefficient	D60 / D10	4858
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.22
Jul 17



0001



Project No N9426-20
Project Name Cork Line Level Crossings

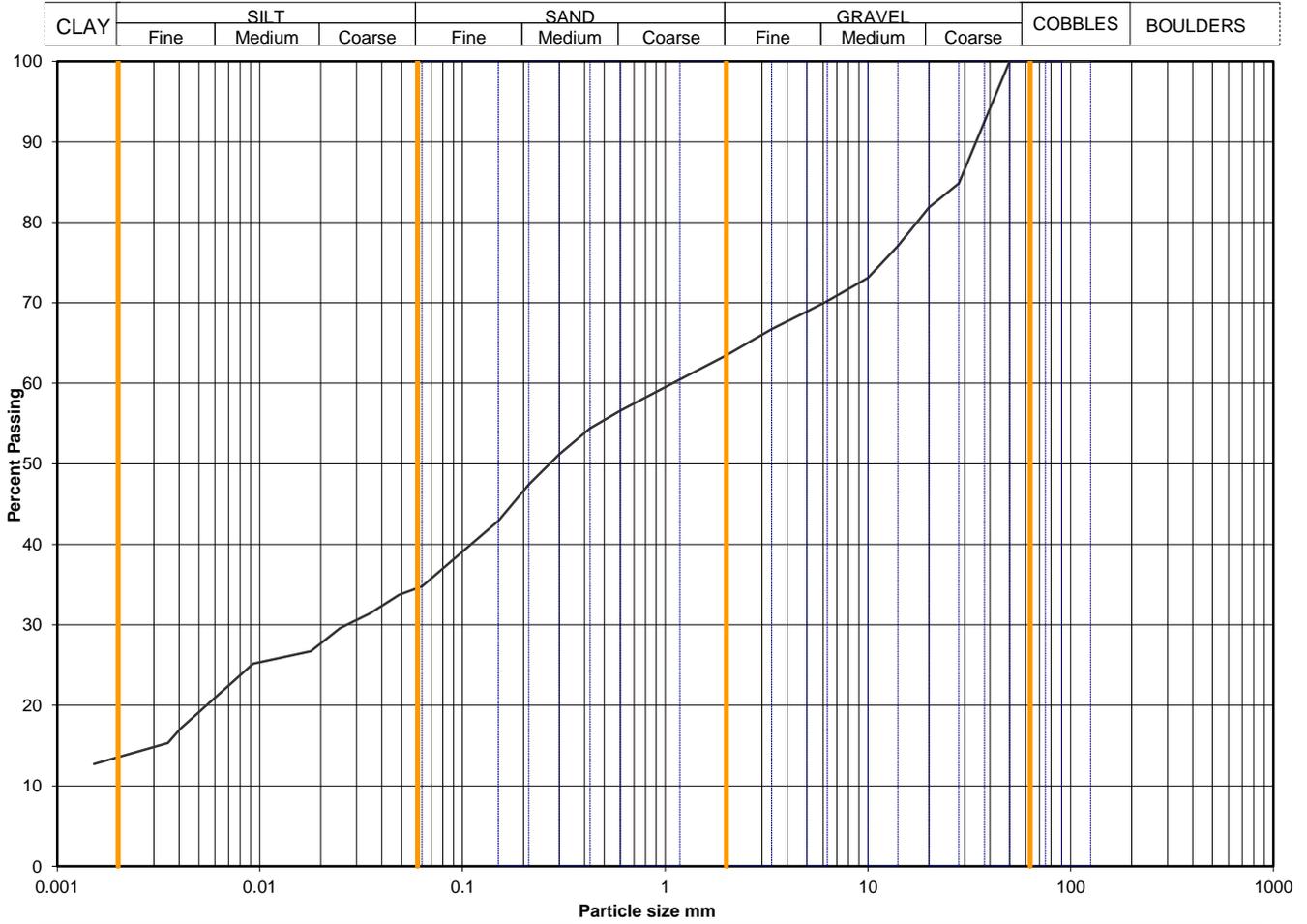
Figure
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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	XC211-CP02
	SOCO2020100652	Sample Depth (m BGL)	2.00 - 3.00
		Sample Type and No	B8
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	35
90	100	0.0486	34
75	100	0.0348	31
63	100	0.0248	30
50	100	0.0178	27
37.5	92	0.0093	25
28	85	0.0041	17
20	82	0.0035	15
14	77	0.0015	13
10	73		
6.3	70		
5.0	69		
3.35	67		
2.00	63		
1.18	60		
0.600	57	Particle density, Mg/m ³	
0.425	54	2.65 assumed	
0.300	51	Dry mass of sample, kg	
0.212	47	2.3	
0.150	43		
0.063	35		

Soil description	Brown slightly sandy gravelly CLAY.
Preparation / Pretreatment	Sieve: pre dried, Hydro: as BS1377
Remarks	

Sample Proportions	Cobbles / boulders	Whole	*<60mm
		Gravel	0.0
	Sand	36.5	36.5
	Silt	28.7	28.7
	Clay	21.2	21.2
*<60mm values to aid description only		13.6	13.6

Uniformity Coefficient	D60 / D10	Not applicable
-------------------------------	------------------	----------------

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.22
Jul 17



0001



Project No N9426-20
Project Name Cork Line Level Crossings

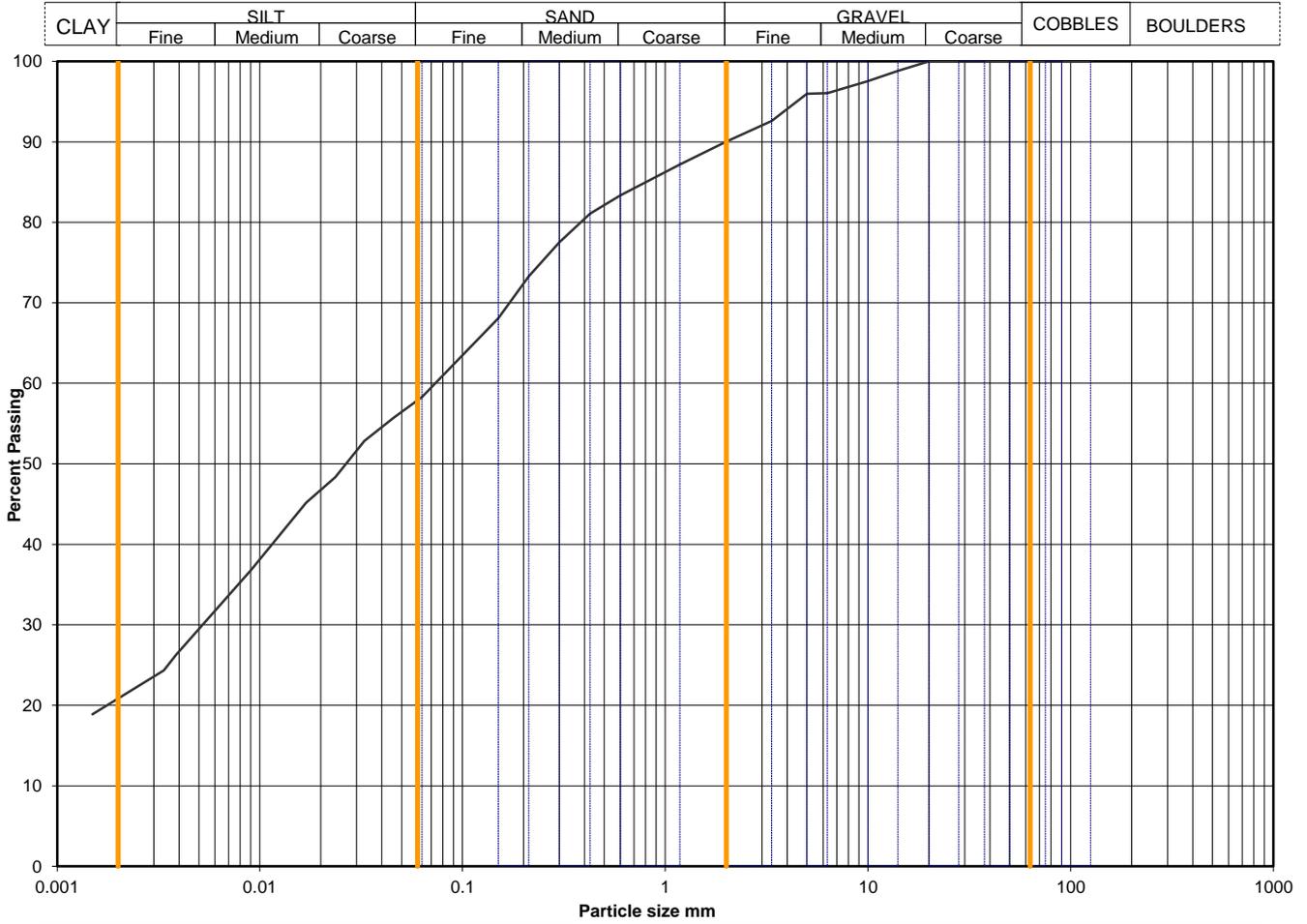
Figure
PSD

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Printed: 20/11/2020 10:00

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	XC211-CP02
	SOCO2020100661	Sample Depth (m BGL)	6.00 - 7.00
		Sample Type and No	D18
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	58
90	100	0.0456	56
75	100	0.0327	53
63	100	0.0236	48
50	100	0.0169	45
37.5	100	0.0091	37
28	100	0.0039	26
20	100	0.0034	24
14	99	0.0015	19
10	98		
6.3	96		
5.0	96		
3.35	93		
2.00	90		
1.18	87		
0.600	83	Particle density, Mg/m ³	
0.425	81	2.65	assumed
0.300	78	Dry mass of sample, kg	
0.212	73	1.0	
0.150	68		
0.063	58		

Soil description	Brown slightly sandy slightly gravelly CLAY.
Preparation / Pretreatment	Sieve: pre dried, Hydro: as BS1377
Remarks	

Sample Proportions	Cobbles / boulders	Whole	*<60mm
		Gravel	0.0
	Sand	10.0	10.0
	Silt	31.7	31.7
	Clay	37.4	37.4
		20.9	20.9

*<60mm values to aid description only

Uniformity Coefficient	D60 / D10	Not applicable
-------------------------------	------------------	----------------

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.22
Jul 17



0001



Project No N9426-20
Project Name Cork Line Level Crossings

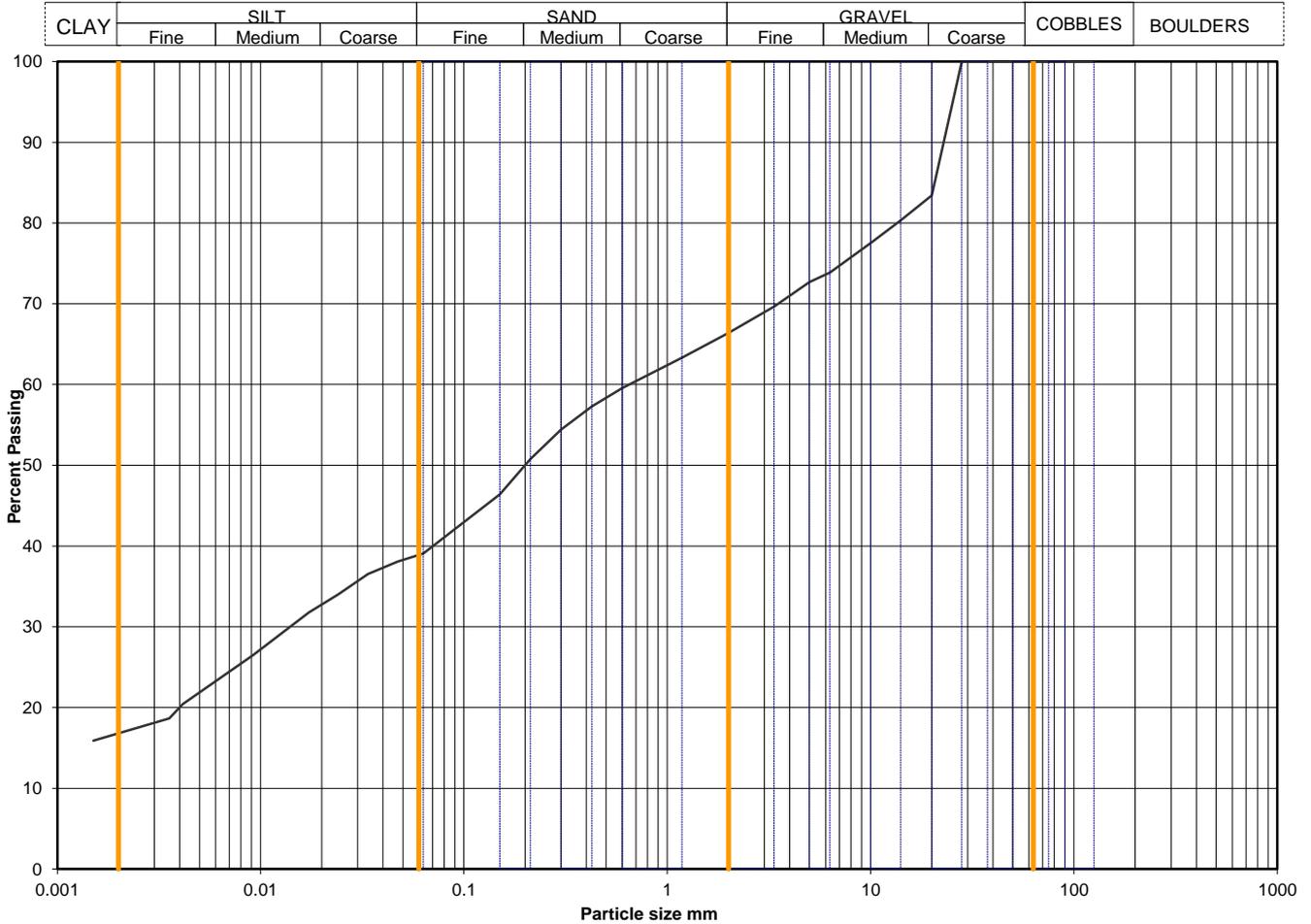
Figure
PSD

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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	XC211-CP02
	SOCO2020100669	Sample Depth (m BGL)	10.00 - 11.00
		Sample Type and No	B26
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	39
90	100	0.0472	38
75	100	0.0337	37
63	100	0.0242	34
50	100	0.0173	32
37.5	100	0.0092	26
28	100	0.0041	20
20	83	0.0036	19
14	80	0.0015	16
10	78		
6.3	74		
5.0	73		
3.35	70		
2.00	66		
1.18	63		
0.600	60		
0.425	57		
0.300	54		
0.212	51		
0.150	46		
0.063	39		

Particle density, Mg/m ³	2.65 assumed
Dry mass of sample, kg	3.5

Soil description	Brown slightly sandy slightly gravelly CLAY.
Preparation / Pretreatment	Sieve: pre dried, Hydro: as BS1377
Remarks	

Sample Proportions	Cobbles / boulders	Whole	* <60mm
		Gravel	0.0
	Sand	33.6	33.6
	Silt	27.3	27.3
	Clay	22.3	22.3
		16.8	16.8

* <60mm values to aid description only

Uniformity Coefficient	D60 / D10	Not applicable
------------------------	-----------	----------------

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.22
Jul 17



Project No N9426-20
Project Name Cork Line Level Crossings

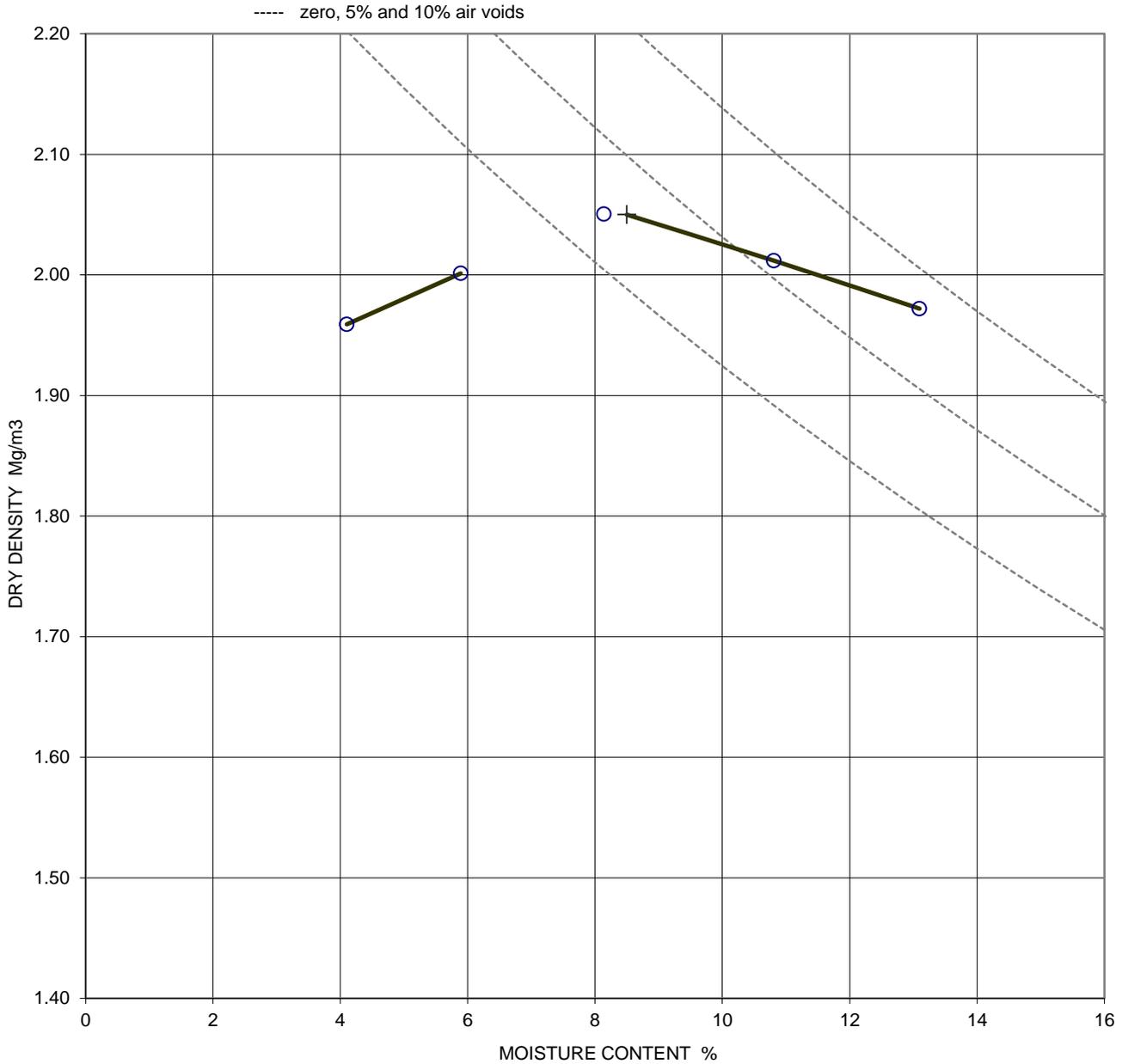
Figure
PSD

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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	XC211-CP02
	SOCO2020100654	Sample Depth (m BGL)	3.00 - 4.00
		Sample Type and No	B11
		Specimen Ref	



Soil description Brown slightly sandy slightly gravelly CLAY.

Test method BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 0 %

Material < 37.5mm > 20mm 3 %

Particle density 2.72 assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m³
2.05

Optimum moisture content, %
8.5

QA Ref
 SLD 4, 3.5/6
 Rev 2.8
 Sep 17



Project No N9426-20

Project Name Cork Line Level Crossings

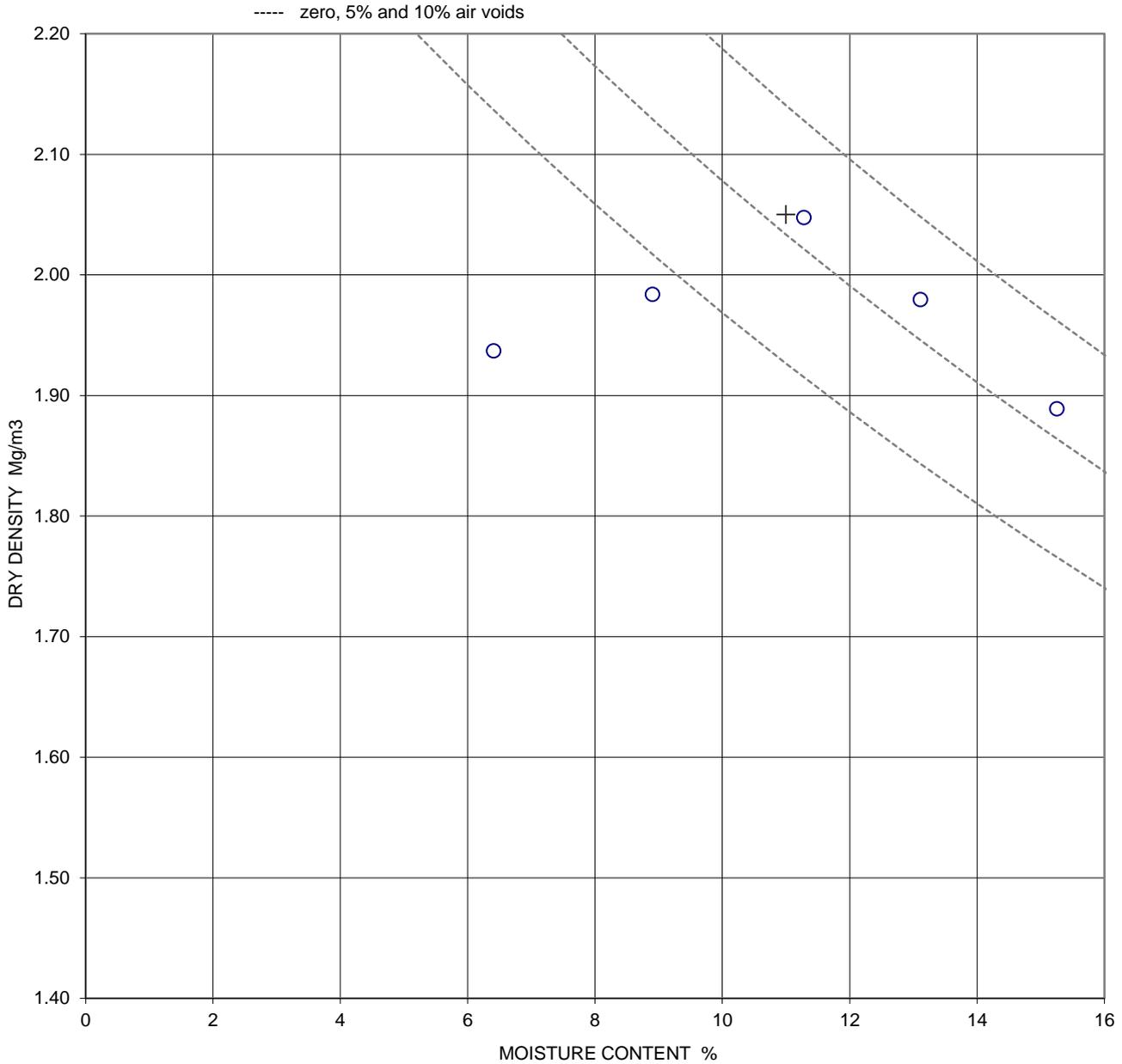
Figure
COMPH

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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	XC211-CP02
	SOCO2020100656	Sample Depth (m BGL)	4.00 - 5.00
		Sample Type and No	B13
		Specimen Ref	



Soil description Brown slightly sandy slightly gravelly CLAY.

Test method BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 0 %

Material < 37.5mm > 20mm 4 %

Particle density 2.80 assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m³
2.05

Optimum moisture content, %
11

QA Ref
 SLD 4, 3.5/6
 Rev 2.8
 Sep 17



Project No N9426-20
 Project Name Cork Line Level Crossings

Figure
COMPH

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Appendix H Environmental Laboratory Test Results

Project: Soil Samples

Client: Environmental Laboratory Services Ltd		Chemtest Job No.:					20-07165	20-07165		
Quotation No.: Q20-19728 Order No.: 6897		Chemtest Sample ID.:					981122	981123		
		Client Sample Ref.:					176540/003	176540/004		
		Client Sample ID.:					3	4		
		Sample Location:					XC211-TP01	XC211-TP01		
		Sample Type:					SOIL	SOIL		
		Top Depth (m):					0.05	3.00		
		Date Sampled:					20-Feb-2020	20-Feb-2020		
Determinand	Accred.	SOP	Type	Units	LOD					
pH	U	1010	10:1		N/A		10.0	8.6		
Cyanide (Free)	U	1300	10:1	mg/l	0.050		< 0.050	< 0.050		
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0		1.2	2.2		
Boron (Dissolved)	U	1450	10:1	µg/l	20		< 20	< 20		
Barium (Dissolved)	U	1450	10:1	µg/l	5.0		< 5.0	7.4		
Beryllium (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0		
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080		< 0.080	< 0.080		
Chromium (Dissolved)	U	1450	10:1	µg/l	1.0		1.8	5.1		
Copper (Dissolved)	U	1450	10:1	µg/l	1.0		1.8	2.4		
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50		< 0.50	< 0.50		
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0		
Lead (Dissolved)	U	1450	10:1	µg/l	1.0		2.3	6.4		
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0		
Vanadium (Dissolved)	U	1450	10:1	µg/l	1.0		1.9	8.6		
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0		3.5	16		
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0		< 5.0	< 5.0		
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10		36	< 0.10		
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10		
Aromatic TPH >C35-C44	N	1680	10:1	µg/l	50.00		< 50	< 50		
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0		36	< 5.0		
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10		36	< 10		
Benzene	U	1760	10:1	µg/l	1.0		< 1.0	< 1.0		
Toluene	U	1760	10:1	µg/l	1.0		< 1.0	< 1.0		
Ethylbenzene	U	1760	10:1	µg/l	1.0		< 1.0	< 1.0		

Project: Soil Samples

Client: Environmental Laboratory Services Ltd		Chemtest Job No.:				20-07165	20-07165	
Quotation No.: Q20-19728 Order No.: 6897		Chemtest Sample ID.:				981122	981123	
		Client Sample Ref.:				176540/003	176540/004	
		Client Sample ID.:				3	4	
		Sample Type:				XC211-TP01	XC211-TP01	
		Top Depth (m):				SOIL	SOIL	
		Date Sampled:				0.05	3.00	
						20-Feb-2020	20-Feb-2020	
Determinand	Accred.	SOP	Type	Units	LOD			
m & p-Xylene	U	1760	10:1	µg/l	1.0	< 1.0	< 1.0	
o-Xylene	U	1760	10:1	µg/l	1.0	< 1.0	< 1.0	
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	1.0	< 1.0	< 1.0	
Naphthalene	U	1800	10:1	µg/l	0.10	32	< 0.10	
Acenaphthylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Acenaphthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Fluorene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Phenanthrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[a]anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Chrysene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[b]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[k]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[a]pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Indeno(1,2,3-c,d)Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Dibenz(a,h)Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[g,h,i]perylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Total Of 16 PAH's	U	1800	10:1	µg/l	2.0	32	< 2.0	

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44	Pentane extraction / GCxGC FID detection
1680	Extractable Petroleum Hydrocarbons	Aliphatics: >C5–C6, >C6–C8, >C8–C10*, >C10–C12*, >C12–C16*, >C16–C21*, >C21–C35*, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10*, >C10–C12*, >C12–C16*, >C16–C21*, >C21–C35*, >C35–C44	Dichloromethane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

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

customerservices@chemtest.com

Project: Soil Testing

Client: Environmental Laboratory Services Ltd		Chemtest Job No.:					20-07190	20-07190
Quotation No.: Q20-19728 Order No.: 6881		Chemtest Sample ID.:					981249	981250
		Client Sample Ref.:					176306/003	176306/004
		Client Sample ID.:					3.0m	0.05m
		Sample Location:					TP02	TP02
		Sample Type:					SOIL	SOIL
		Date Sampled:					20-Feb-2020	20-Feb-2020
Determinand	Accred.	SOP	Type	Units	LOD			
pH	U	1010	10:1		N/A		8.6	7.9
Cyanide (Free)	U	1300	10:1	mg/l	0.050		< 0.050	< 0.050
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0
Boron (Dissolved)	U	1450	10:1	µg/l	20		< 20	< 20
Barium (Dissolved)	U	1450	10:1	µg/l	5.0		< 5.0	< 5.0
Beryllium (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080		< 0.080	< 0.080
Chromium (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0
Copper (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50		< 0.50	< 0.50
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0
Lead (Dissolved)	U	1450	10:1	µg/l	1.0		56	< 1.0
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0
Vanadium (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	< 1.0
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0		< 1.0	1.9
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0		< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10		240	< 0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10		220	30
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10		72	< 0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10		< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1680	10:1	µg/l	50.00		< 50	< 50
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0		540	31
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10		540	30
Benzene	U	1760	10:1	µg/l	1.0		< 1.0	< 1.0
Toluene	U	1760	10:1	µg/l	1.0		< 1.0	< 1.0
Ethylbenzene	U	1760	10:1	µg/l	1.0		< 1.0	< 1.0
m & p-Xylene	U	1760	10:1	µg/l	1.0		< 1.0	< 1.0

Project: Soil Testing

Client: Environmental Laboratory Services Ltd		Chemtest Job No.:					20-07190	20-07190
Quotation No.: Q20-19728 Order No.: 6881		Chemtest Sample ID.:					981249	981250
		Client Sample Ref.:					176306/003	176306/004
		Client Sample ID.:					3.0m	0.05m
		Sample Location:					TP02	TP02
		Sample Type:					SOIL	SOIL
		Date Sampled:					20-Feb-2020	20-Feb-2020
Determinand	Accred.	SOP	Type	Units	LOD			
o-Xylene	U	1760	10:1	µg/l	1.0	< 1.0	< 1.0	
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	1.0	< 1.0	< 1.0	
Naphthalene	U	1800	10:1	µg/l	0.10	180	< 0.10	
Acenaphthylene	U	1800	10:1	µg/l	0.10	3.7	< 0.10	
Acenaphthene	U	1800	10:1	µg/l	0.10	28	< 0.10	
Fluorene	U	1800	10:1	µg/l	0.10	16	< 0.10	
Phenanthrene	U	1800	10:1	µg/l	0.10	22	< 0.10	
Anthracene	U	1800	10:1	µg/l	0.10	3.2	< 0.10	
Fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[a]anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Chrysene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[b]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[k]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[a]pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Indeno(1,2,3-c,d)Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Dibenz(a,h)Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Benzo[g,h,i]perylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10	
Total Of 16 PAH's	U	1800	10:1	µg/l	2.0	250	< 2.0	

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:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
981248	176306/002	2	TP02	17-Feb-2020	B	Amber Glass 250ml
981248	176306/002	2	TP02	17-Feb-2020	B	Plastic Tub 500g

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44	Pentane extraction / GCxGC FID detection
1680	Extractable Petroleum Hydrocarbons	Aliphatics: >C5–C6, >C6–C8, >C8–C10*, >C10–C12*, >C12–C16*, >C16–C21*, >C21–C35*, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10*, >C10–C12*, >C12–C16*, >C16–C21*, >C21–C35*, >C35–C44	Dichloromethane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

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

customerservices@chemtest.com



Final Report

Report No.: 20-16827-1
Initial Date of Issue: 08-Jul-2020
Client: Environmental Laboratory Services Ltd
Client Address: Acorn Business Campus
Mahon Industrial Park
Blackrock
Cork
Ireland
Contact(s): Emer Kearney
Results
Project: Soil Samples
Quotation No.: Q20-19728
Date Received: 02-Jul-2020
Order No.: 7423
Date Instructed: 02-Jul-2020
No. of Samples: 2
Turnaround (Wkdays): 5
Results Due: 08-Jul-2020
Date Approved: 08-Jul-2020

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Leachate

Project: Soil Samples

Client: Environmental Laboratory Services Ltd		Chemtest Job No.:		20-16827	20-16827		
Quotation No.: Q20-19728		Chemtest Sample ID.:		1025420	1025421		
Order No.: 7423		Client Sample Ref.:		183057/001	183057/002		
		Client Sample ID.:		1	2		
		Sample Type:		SOIL	SOIL		
Determinand	Accred.	SOP	Type	Units	LOD		
pH	U	1010	10:1		N/A	10.3	9.2
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0	3.2	< 1.0
Boron (Dissolved)	U	1450	10:1	µg/l	20	45	33
Barium (Dissolved)	U	1450	10:1	µg/l	5.0	6.0	5.4
Beryllium (Dissolved)	U	1450	10:1	µg/l	1.0	< 1.0	< 1.0
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	10:1	µg/l	1.0	4.7	2.1
Copper (Dissolved)	U	1450	10:1	µg/l	1.0	2.4	1.4
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50	< 0.50	< 0.50
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0	4.3	< 1.0
Lead (Dissolved)	U	1450	10:1	µg/l	1.0	3.0	< 1.0
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0	< 1.0	< 1.0
Vanadium (Dissolved)	U	1450	10:1	µg/l	1.0	5.7	< 1.0
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0	10	2.9
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0	[A] < 5.0	[A] < 5.0
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10	[A] < 0.10	[A] < 0.10
Aromatic TPH >C35-C44	N	1680	10:1	µg/l	50.00	[A] < 50	[A] < 50
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0	[A] < 5.0	[A] < 5.0
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10	[A] < 10	[A] < 10
Benzene	U	1760	10:1	µg/l	1.0	[A] < 1.0	[A] < 1.0
Toluene	U	1760	10:1	µg/l	1.0	[A] < 1.0	[A] < 1.0
Ethylbenzene	U	1760	10:1	µg/l	1.0	[A] < 1.0	[A] < 1.0
m & p-Xylene	U	1760	10:1	µg/l	1.0	[A] < 1.0	[A] < 1.0
o-Xylene	U	1760	10:1	µg/l	1.0	[A] < 1.0	[A] < 1.0
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	1.0	[A] < 1.0	[A] < 1.0

Results - Leachate

Project: Soil Samples

Client: Environmental Laboratory Services Ltd	Chemtest Job No.:		20-16827	20-16827			
Quotation No.: Q20-19728	Chemtest Sample ID.:		1025420	1025421			
Order No.: 7423	Client Sample Ref.:		183057/001	183057/002			
	Client Sample ID.:		1	2			
	Sample Type:		SOIL	SOIL			
Determinand	Accred.	SOP	Type	Units	LOD		
Naphthalene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Chrysene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	1800	10:1	µg/l	2.0	< 2.0	< 2.0

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Eurofins 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:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1025420	183057/001	1			A	Amber Glass 250ml
1025420	183057/001	1			A	Plastic Tub 500g
1025421	183057/002	2			A	Amber Glass 250ml
1025421	183057/002	2			A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5-C6, >C6-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44 Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44	Pentane extraction / GCxGC FID detection
1680	Extractable Petroleum Hydrocarbons	Aliphatics: >C5-C6, >C6-C8, >C8-C10*, >C10-C12*, >C12-C16*, >C16-C21*, >C21-C35*, >C35-C44 Aromatics: >C5-C7, >C7-C8, >C8-C10*, >C10-C12*, >C12-C16*, >C16-C21*, >C21-C35*, >C35-C44	Dichloromethane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

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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

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Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

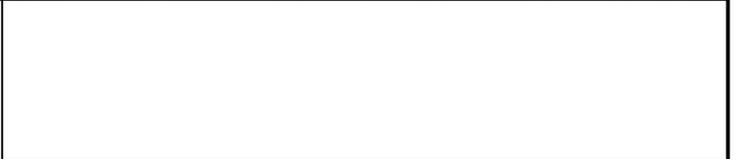
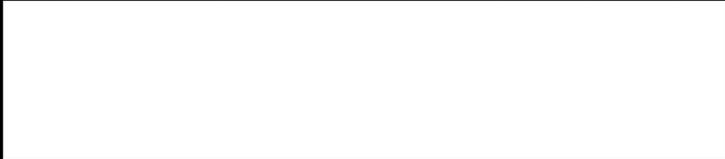
All water samples will be retained for 14 days from the date of receipt

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customerservices@chemtest.com

Appendix I Pre & Post Site Condition Photographs



Iarnród Éireann
 Cork Line Level Crossings
 XC211 (19-135-2)

	XC211
	Pre Works Site Photographs
Client:	Iarnród Éireann
Engineer:	Jacob's
Date:	2020