NEW ACCESS ROAD TO
HOUSING DEVELOPMENT
MARSH ROAD DROGHEDA

WATERMAN MOYLAN
CONSULTING ENGINEERS

CONTENTS

APPENDICES

FOREWORD

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

General.

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

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

Boring Procedures.

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

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

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

Routine Sampling.

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

In-Situ Testing.

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

Groundwater.

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

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

Retention of Samples.

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

REPORT ON A SITE INVESTIGATION
AT A PROPOSED HOUSING DEVELOPMENT
LIHAF NEWTOWN DROGHEDA
FOR
LOUTH COUNTY COUNCIL
AND
WATERMAN MOYLAN
CONSULTING ENGINEERS

Report No. 20951 **JULY 2018**

I Introduction

A new housing development is proposed for a site located off Marsh Road in Drogheda. The development will include a new access road from the main road to the proposed housing estate.

The project engineers, (Waterman Moylan) have ordered a geotechnical investigation along the route of the proposed new access road and IGSL, following tender procedures, carried out this work between May and July 2018.

The programme of the investigation included boreholes, trial pits, and plate bearing tests to establish geotechnical criteria on which to base design. Work was carried out in accordance with BS 5930, Code of Practice for Site Investigations (1999) and Euro-code 7.

In addition to the geotechnical work on the proposed new route, slit trenches were opened at four locations on the R150 Marsh Road. This necessitated obtaining road opening licenses from Louth County Council and maintaining appropriate traffic management procedures for the duration of the slit trench works.

A programme of laboratory testing to confirm geotechnical and environmental soil parameters followed site operations.

This report includes all factual data pertaining to the project and comments on the geotechnical findings relative to the proposed development.

II Fieldwork

The investigation was carried on a site located south of Marsh Road, bounded to the south by the Main Dublin Belfast Railway Line and to the east by the county boundary.

The site location and position of exploratory boreholes, trial pits and plate tests is shown on the plans, provided by Waterman Moylan and enclosed in Appendix VI to this report. All as constructed locations have been referenced to National Grid Co-ordinates and O.D. levels established.

Ground level rises quite steeply from the Marsh Road (OD 6.00) to the housing site (OD 28.00) with a surface of grassed top soil.

The investigation on the proposed new roadway consisted of the following elements:

* Boreholes at three locations
* Machine excavated Trial Pits at eight locations
* Plate Bearing Tests (In Situ CBR) at four locations
* Geotechnical and environmental laboratory testing

Slit trenches were opened at four locations across the R150 to establish the services present close to the new site access.

a. Boreholes

Three boreholes were constructed in the specified locations using conventional cable percussion boring. A Dando 2000 Rig was employed with 200mm nominal casing.

Prior to commencement a trial pit was opened by hand to 1.00 metres to ensure that shallow services were not damaged.

Detailed boring records have been prepared and are enclosed in Appendix I. These show the stratification, detail samples recovered and give results of standard penetration tests. Comment is also included on ground water conditions pertaining at the time of boring and any obstructions to normal boring are also detailed.

Top soil was initially noted overlying a stratum of firm becoming stiff brown sandy gravelly SILT/CLAY. This stratum continues to the final bored depth of 10.00 metres, becoming very stiff to hard below about 5.00 metres.

Sand layers were noted in BH01 from 2.40 to 5.10 metres and in BH03 from 1.40 to 2.20 metres.

Ground water was not encountered during the course of the borehole investigation, however 50mm slotted standpipes were installed in the three locations to facilitate future water monitoring. The standpipe installations were protected by steel covers.

b. Trial Pits

A JCB excavator was used to open trial pits at eight specified locations under geotechnical engineering supervision. Detailed records are contained in Appendix II showing the stratification, noting the stability and ground water regime and recording the samples recovered.

The records show a good uniformity. Topsoil overlies a stratum of brown sandy gravelly SILT / CLAY which continues to approximately 3.00 metres in each location.

The stratum is generally described as firm to stiff in consistency, however soft zones were noted in TP03, TP07 and TP08.

Some water ingress was noted in TP03, TP04, TP06 and TP08, variously described as seepage to moderate.

Trial Pits were backfilled with excavated material, compacted in layers with topsoil replaced on completion.

c. Plate Bearing Tests (In Situ CBR)

Four plate-bearing tests were carried out to establish in situ CBR values. A 450mm diameter steel plate is loaded and offloaded incrementally over two cycles. The load settlement graphs are completed and equivalent CBR values are calculated. Tests were carried out at a depth of 0.70 metres, below the upper organic topsoil.

Results can be summarised as follows with data presented in Appendix III.

Test No.	**CBR at Load Cycle (%)**	**CBR at Reload (%)**
CBR 01	0.1	0.9
CBR 02	0.1	2.3
CBR 03	0.4	1.7
CBR 004	0.3	2.9

d. Slit Trenches

Four slit trenches were scheduled on the main R150 (Marsh Road). Application was made to Louth County Council for a Road Opening License, which was granted on 24/5/2018.

The road surface was saw cut along the trench length and trenches were excavated using a combination of careful hand and machine-assisted excavation. All services encountered were logged with their location and level established.

Detailed trench records have been prepared noting the following:

a. Location plotted to National Grid
b. Stratification
c. Service Locations
d. Photographs

Trenches were excavated to 1.50 metres BGL and various services have been identified, including 600mm Ductile Water / Sewer, 400mm Concrete Sewer, 150mm HDPE Gas and 150mm Wavin.

Following the excavation and logging the slit trenches were backfilled in accordance with Local Authority requirements, using compacted Clause 804 before final black top reinstatement.

All slit trench records are presented in Appendix IV.

III Testing

a. In Situ Standard Penetration Tests

Standard penetration tests were carried out at approximate 1.00 metre intervals in the geotechnical boreholes to measure relative in-situ soil strength. N values are noted in the right hand column of the boring records, representing the blow count required to drive the standard sampler 300mm into the soil, following initial seating blows. Where full test penetration was not achieved the blow count for a specific penetration is recorded, or refusal is indicated where appropriate

The results of the tests are summarised as follows:

STRATUM	N VALUE RANGE	COMMENT
Brown gravely CLAY/SILT		
1.00 m BGL	11 to 17	Firm to Stiff
2.00 m BGL	14 to 20	Stiff
3.00 m BGL	14 to 23	Stiff
4.00 m BGL	24 to 29	Stiff to very Stiff
5.00 m BGL	21 to 51	Stiff to very Stiff
6.00 m BGL	28 to 47	Very Stiff
7.00 m BGL	29 to 41	Very Stiff
8.00 m BGL	38 to 65	Very Stiff to Hard
9.00 m BGL	37 to 53	Very Stiff to Hard
1.00 m BGL	41 to > 50	Hard

SPT refusals were noted at the base of BH01 and BH02.

b. Laboratory Testing

All geotechnical samples from the boreholes and trial pits have been returned to the IGSL laboratory for initial visual inspection, a schedule of testing was prepared and tests as appropriate carried out. Laboratory data is presented in Appendix V. Chemical and environmental testing was carried out by Exova-Jones in the UK.

The tests consisted of the following.

a. Classification (Liquid and Plastic Limits)
b. PSD Grading (Wet sieve and Hydrometer analysis)
c. Sulphate and pH determination
d. Environmental RILTA Suite.

Classification:

The liquid and plastic limits were established for samples of the glacial till overburden. The results are tabulated with relevant moisture content and confirm some variation in the soil from sandy SILT to gravelly CLAY matrix material. Results plot mainly in the CL zone of the standard classification.

Grading:

Particle Size Distribution curves was established for four soil samples using wet sieve and hydrometer analysis. The soils are generally described as sandy gravelly CLAY or SILT and the straight-line grading are typical of glacial soils. One sample from BH02 at 8.00 metres grades as a finer sandy SILT.

Sulphate and pH:

Six samples were sent for sulphate and pH analysis to a specialist chemical laboratory. Sulphate concentrations (SO_4 2:1 extract) of < 0.0015 to 0.0130 g/l were established with pH from 7.6 to 8.5. No special precautions are necessary to protect foundation concrete from sulphate aggression. A sulphate design class of DS-1 (ACEC Classification for Concrete) is indicated for concentrations less than 0.5 g/l.

Environmental RILTA Suite

Detailed environmental analysis was carried out on six samples of soil from the site. Results are compared to the Landfill Waste Acceptance Criteria Limits and fall under the heading for INERT material.

No Asbestos was detected during routine screening of the samples tested.

Results indicate that material excavated from this site can be disposed of within the site itself or sent to a licensed Inert landfill facility.

IV Discussion

A large housing development is proposed for a site off the Marsh Road in Drogheda. The development itself is NOT the subject of this geotechnical investigation which concentrates on the access route to the housing.

The new access road to the housing site is to be constructed from Marsh Road to the proposed housing development. The road traverses green field conditions rising from approximately 6.00 OD to 28.00 OD.

SUMMARY SOIL CONDITIONS

Boreholes and Trial Pit have determined overburden soil conditions along the road route. CBR values have been determined at intervals by Plate Bearing Tests.

The Trial Pits were taken to approximately 3.00 metres BGL and the three boreholes extended to a scheduled depth of 10.00 metres. Bedrock was not encountered during the course of the work.

The soils generally comprise glacial till (firm occasionally stiff boulder clay) with some bands of silty sand and sandy silt. Below about 5.00 metres the glacial till becomes very stiff to hard with cobble and boulder material encountered.

Ground water was not encountered in the boreholes, however in the trial pits some light ingress was noted at varying depths, probably associated with granular pockets within the generally cohesive glacial till.

The findings are presented on a longitudinal section taken along the centre line of the new road. This section is found with site plans in Appendix VI.

ROAD CONSTRUCTION

The characteristics of the main stratum have been established, the soils consist of low plasticity silty gravelly CLAY with some thin bands of sand or silt. N values in the material range from N=15 (1.00 to 2.00 metres) to N=40 (below about 5 metres). This reflects firm to very stiff soil consistency and no difficulties are envisaged in excavation or in stability. The soils should be suitable for re-use in landscaping to screen the existing waste -water treatment plant.

CBR

The ground is fairly level close to the proposed housing site and road construction will be close to grade in this area. CBR values at 0.70 metres BGL were very low (< 1%) and the use of a geo-grid would be recommended. Very careful visual inspection of excavated formation is advised to ensure that all organic material is removed.

IGSL/JC
JULY 2018

Appendix I Borehole Records

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**BOREHOLE NO.**	**BH01**
		SHEET	Sheet 1 of 1
CO-ORDINATES	710,335.08 E 775,149.91 N	**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)	20.96	**BOREHOLE DEPTH (m)**	10.00
		DATE COMMENCED	14/05/2018
		DATE COMPLETED	15/05/2018
CLIENT	Louth County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Waterman Moylan	**ENERGY RATIO (%)**	
		BORED BY	C.Redpath
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL		20.36	0.60	AA90762	B	0.25			
1	Firm brown slightly sandy SILT/CLAY with gravel				AA90763	ENV B	1.00 1.00		N = 13 (1, 2, 2, 3, 4, 4)	
2			18.56	2.40	AA90764	ENV B	2.00 2.00		N = 15 (2, 3, 3, 3, 4, 5)	
3	Medium dense fine to coarse brown/orange slightly silty SAND				AA90765	ENV B	3.00 3.00		N = 20 (2, 4, 3, 4, 6, 7)	
4					AA90766	ENV B	4.00 4.00		N = 29 (4, 4, 6, 7, 8, 8)	
5			15.86	5.10	AA90767	ENV B	5.00 5.00		N = 51 (7, 8, 11, 11, 14, 15)	
6	Very stiff to hard grey sandy gravelly CLAY with occasional cobbles				AA90768	ENV B	6.00 6.00		N = 47 (9, 11, 12, 12, 11, 12)	
7					AA90769	ENV B	7.00 7.00		N = 41 (8, 7, 9, 8, 10, 14)	
8					AA90770	ENV B	8.00 8.00		N = 65 (9, 11, 15, 17, 18, 15)	
9					AA90771	ENV B	9.00 9.00		N = 53 (7, 10, 10, 15, 15, 13)	
10	End of Borehole at 10.00 m		10.96	10.00		ENV	10.00		N = 50/275 mm (4, 8, 10, 16, 14, 10)	

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
6.7	6.9	0.75	
8.3	8.5	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
15-05-18	10.00	1.00	10.00	50mm SP

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS CAT scanned location and hand dug inspection pit.

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
U - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

ISGL BH LOG 11M 20951.GPJ IGSL.GDT 31/7/18

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**BOREHOLE NO.**	**BH02**
		SHEET	Sheet 1 of 1
CO-ORDINATES	710,377.14 E 775,119.16 N	**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)	22.81	**BOREHOLE DEPTH (m)**	10.00
		DATE COMMENCED	15/05/2018
		DATE COMPLETED	15/05/2018
CLIENT	Louth County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Waterman Moylan	**ENERGY RATIO (%)**	
		BORED BY	C.Redpath
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	TOPSOIL		22.31	0.50	AA90772	B	0.25			
1	Firm brown slightly sandy SILT/CLAY with gravel and occasional cobbles		20.91	1.90	AA90773	ENV B	1.00 1.00		N = 17 (2, 3, 3, 4, 4, 6)	
2	Firm brown very sandy SILT/CLAY (Possibly very silty sand)		20.01	2.80	AA90774	ENV B	2.00 2.00		N = 20 (4, 5, 5, 3, 5, 7)	
3	Stiff brown sandy SILT/CLAY with occasional gravel		17.71	5.10	AA90775	ENV B	3.00 3.00		N = 14 (1, 3, 3, 3, 4, 4)	
4					AA90776	ENV B	4.00 4.00		N = 24 (4, 4, 4, 6, 7, 7)	
5	Stiff to very stiff grey slightly silty CLAY				AA90777	ENV B	5.00 5.00		N = 26 (3, 5, 4, 7, 8, 7)	
6					AA90778	ENV B	6.00 6.00		N = 28 (3, 6, 6, 7, 6, 9)	
7					AA90779	ENV B	7.00 7.00		N = 29 (4, 6, 5, 8, 8, 8)	
8					AA90780	ENV B	8.00 8.00		N = 39 (6, 7, 11, 11, 9, 8)	
9					AA90781	ENV B	9.00 9.00		N = 48 (7, 12, 12, 11, 11, 14)	
10	End of Borehole at 10.00 m		12.81	10.00		ENV	10.00		N = 50/225 mm (6, 10, 14, 18, 18)	

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
1.4	1.6	0.75	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
15-05-18	10.00	1.00	10.00	50mm SP

REMARKS CAT scanned location and hand dug inspection pit.

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
U - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

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GEOTECHNICAL BORING RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**BOREHOLE NO.**	**BH03**
		SHEET	Sheet 1 of 1
CO-ORDINATES	710,389.84 E 775,072.56 N	**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)	29.83	**BOREHOLE DEPTH (m)**	10.00
		DATE COMMENCED	11/05/2018
		DATE COMPLETED	14/05/2018
CLIENT	Louth County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Waterman Moylan	**ENERGY RATIO (%)**	
		BORED BY	C.Redpath
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	TOPSOIL		29.53	0.30	AA90751	B	0.25			
	Soft to firm brown slightly sandy SILT/CLAY with some gravel									
1					AA90752	ENV B	1.00 1.00		N = 11 (1, 2, 2, 3, 3, 3)	
			28.43	1.40						
	Loose to medium dense brown medium to coarse slightly gravelly SAND									
2			27.63	2.20	AA90753	ENV B	2.00 2.00		N = 14 (2, 2, 3, 4, 3, 4)	
	Stiff brown slightly sandy CLAY with occasional gravel									
3					AA90754	ENV B	3.00 3.00		N = 23 (2, 4, 4, 6, 6, 7)	
4					AA90755	ENV B	4.00 4.00		N = 25 (1, 3, 5, 6, 7, 7)	
			25.23	4.60						
	Firm orange/brown very sandy SILT/CLAY (Possibly very silty/clayey sand)									
5					AA90756	ENV B	5.00 5.00		N = 21 (4, 4, 5, 5, 6, 5)	
6					AA90757	ENV B	6.00 6.00		N = 29 (4, 6, 7, 7, 8, 7)	
7					AA90758	ENV B	7.00 7.00		N = 29 (4, 5, 6, 7, 8, 8)	
			22.03	7.80						
	Stiff grey slightly sandy CLAY		21.83	8.00						
8	Very stiff grey sandy gravelly CLAY with occasional cobbles				AA90759	ENV B	8.00 8.00		N = 38 (7, 7, 8, 9, 9, 12)	
9					AA90760	ENV B	9.00 9.00		N = 37 (7, 8, 8, 8, 10, 11)	
			19.83	10.00						
10	End of Borehole at 10.00 m					ENV	10.00		N = 41 (7, 8, 7, 10, 11, 13)	

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
9.3	9.6	0.75	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
14-05-18	10.00	1.00	10.00	50mm SP

REMARKS CAT scanned location and hand dug inspection pit.

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
U - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

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Appendix II Trial Pit Records

TRIAL PIT RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**TRIAL PIT NO.**	**TP1**
		SHEET	Sheet 1 of 1
LOGGED BY	IGSL	**CO-ORDINATES**	710,267.91 E 775,241.17 N
		DATE STARTED	10/05/2018
		DATE COMPLETED	10/05/2018
CLIENT	Louth County Council	**GROUND LEVEL (m)**	6.43
ENGINEER	Waterman Moylan	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL: Firm dark brown sandy gravelly CLAY. Sand is fine. Gravel is subangular to round of dark grey limestone and occasional shale and siliceous stones. Grass and roots content		0.40	6.03						
Stiff brown sandy gravelly cobbly CLAY. Sand is medium. Gravel is subangular to round of grey limestone, calcareous mudstone, occasional quartz and other lithologies. Boulders content of round grey limestone						Env	0.50-0.50		
1.0					AA70635	B	1.00-1.00		
Firm to stiff brown sandy gravelly CLAY. Sand is medium. Gravel is fine to course, subangular to subround of calcareous mudstone, grey limestone, occasional quartz and other lithologies. Orange mottled		1.50	4.93		AA70636	B	1.45-1.55		
2.0									
Stiff to very stiff brown sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse of calcareous mudstone, black limestone and occasional weathered granite		2.40	4.03		AA70637	B	2.30-2.40		
End of Trial Pit at 2.80m		2.80	3.63		AA70638	B	2.70-2.80		
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Poor stability from 0.60 m to 2.40 m depth with sidewall collapse

General Remarks

TRIAL PIT RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	TRIAL PIT NO.	TP2
		SHEET	Sheet 1 of 1
LOGGED BY	IGSL	CO-ORDINATES	710,271.72 E 775,193.04 N
		DATE STARTED	10/05/2018
		DATE COMPLETED	10/05/2018
CLIENT	Louth County Council	GROUND LEVEL (m)	12.23
ENGINEER	Waterman Moylan	EXCAVATION METHOD	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL: Firm dark brown grey sandy gravelly CLAY. Sand is fine. Grass and roots content									
Soft to firm brown sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to round, elongate, plattery of calcareous mudstone, black limestone and occasional middle size gravel of quartz. Grey and orange mottled. Roots content		0.50	11.73			Env	0.50-0.50		
1.0					AA70632	B	1.00-1.00		
					AA70633	B	1.40-1.50		
Stiff grey gravelly CLAY. Occasional cobbles and rounded boulders of grey limestone		1.80	10.43						
2.0				1 (Seepage)	AA70634	B	2.20-2.30		
Stiff brown grey gravelly CLAY		2.70	9.53						
End of Trial Pit at 2.80m		2.80	9.43						
3.0									
4.0									

Groundwater Conditions
Seepage at 2.40m depth

Stability
Poor stability from 1.00 m to 2.10 m depth with sidewall collapse

General Remarks

IGSL TP LOG 20951.GPJ IGSL.GDT 31/7/18

TRIAL PIT RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**TRIAL PIT NO.**	**TP3**
		SHEET	Sheet 1 of 1
LOGGED BY	IGSL	**CO-ORDINATES**	710,369.99 E 775,131.00 N
		DATE STARTED	10/05/2018
		DATE COMPLETED	10/05/2018
CLIENT	Louth County Council	**GROUND LEVEL (m)**	21.62
ENGINEER	Waterman Moylan	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL: Firm dark brown grey sandy gravelly CLAY. Sand is fine. Grass and roots content		0.25	21.37						
Stiff brown sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to rounded of calcareous mudstone, grey limestone, calcarenite and various lithologies						Env	0.50-0.50		
1.0					AA84798	B	1.00-1.00		
Soft to firm brown sandy gravelly CLAY		1.40	20.22		AA84799	B	1.40-1.50		
Soft to firm brown very sandy gravelly CLAY. Packs of medium size sand content		1.60	20.02						
Soft to firm brown sandy gravelly CLAY		1.80	19.82						
2.0 Firm brown slightly sandy slightly gravelly CLAY		2.10	19.52						
Firm to stiff slightly sandy gravelly CLAY		2.40	19.22	1 (Seepage)	AA84800	B	2.20-2.30		
End of Trial Pit at 2.90m		2.90	18.72						
3.0									
4.0									

Groundwater Conditions
Seepage at 2.30m depth

Stability
Poor stability from 1.10 m to 2.10 m depth with sidewall collapse

General Remarks

IGSL TP LOG 20951.GPJ IGSL.GDT 31/7/18

TRIAL PIT RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**TRIAL PIT NO.**	**TP4**
		SHEET	Sheet 1 of 1
LOGGED BY	IGSL	**CO-ORDINATES**	710,388.40 E 775,097.95 N
		DATE STARTED	10/05/2018
		DATE COMPLETED	10/05/2018
CLIENT	Louth County Council	**GROUND LEVEL (m)**	27.04
ENGINEER	Waterman Moylan	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL: Firm dark brown grey sandy gravelly CLAY. Sand is fine. Gravel is fine to medium of calcareous mudstone, dark grey limestone and occasional quartz. Grey and orange mottled. Grass and roots content		0.35	26.69						
Firm brown sandy gravelly cobbly CLAY. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of calcareous mudstone, grey limestone, occasional weakly cemented red sandstone and various lithologies. Cobbles are subrounded of grey limestone. Orange mottled						Env	0.50-0.50		
1.0					AA84793	B	1.00-1.00		
Stiff brown sandy gravelly cobbly CLAY		1.20	25.84						
Stiff brown sandy gravelly very cobbly CLAY		1.60	25.44		AA84794	B	1.60-1.70		
2.0									
Stiff brown sandy gravelly very cobbly CLAY. Boulders content and occasional gravel of weathered granite		2.10	24.94		AA84795	B	2.10-2.20		
Dense slightly clayey slightly gravelly SAND		2.30	24.74		AA84796	B	2.50-2.60		
3.0									
Dense clayey sandy GRAVEL		3.20	23.84	1 (Moderate)	AA84797	B	3.20-3.30		
End of Trial Pit at 3.30m		3.30	23.74						
4.0									

Groundwater Conditions
Moderate water flow at 3.20 m depth

Stability
Poor stability from 0.70 m to 2.30 m depth with sidewall collapse

General Remarks

IGSL TP LOG 20951.GPJ IGSL.GDT 31/7/18

TRIAL PIT RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**TRIAL PIT NO.**	**TP5**
		SHEET	Sheet 1 of 1
LOGGED BY	IGSL	**CO-ORDINATES**	710,398.31 E 775,008.20 N
		DATE STARTED	10/05/2018
		DATE COMPLETED	10/05/2018
CLIENT	Louth County Council	**GROUND LEVEL (m)**	31.64
ENGINEER	Waterman Moylan	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL: Soft to firm dark brown sandy gravelly CLAY. Sand is fine. Gravel is fine to medium, subangular to subrounded of calcareous mudstone, dark grey limestone and weakly cemented red sandstone. Grass and roots content		0.35	31.29						
Firm dark brown sandy gravelly cobbly CLAY. Sand is fine. Gravel is fine to coarse. Gravel and cobbles are subangular to subrounded of dark grey limestone and various lithologies						Env	0.50-0.50		
1.0					AA84790	B	1.00-1.00		
Soft to firm brown sandy gravelly cobbly CLAY. Gravel content of rounded quartz		1.50	30.14						
					AA84791	B	1.80-1.90		
2.0 Firm brown sandy gravelly cobbly CLAY. Occasional granite boulders content. Occasional grey and orange mottled.		2.00	29.64						
					AA84792	B	2.40-2.50		
End of Trial Pit at 2.90m		2.90	28.74						
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Poor stability from 0.60 m to 1.10 m and from 2.00 to 2.30 m depth

General Remarks

TRIAL PIT RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**TRIAL PIT NO.**	**TP6**
		SHEET	Sheet 1 of 1
LOGGED BY	IGSL	**CO-ORDINATES**	710,449.99 E 774,938.24 N
		DATE STARTED	09/05/2018
		DATE COMPLETED	09/05/2018
CLIENT	Louth County Council	**GROUND LEVEL (m)**	28.70
ENGINEER	Waterman Moylan	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL: Soft dark brown sandy gravelly CLAY. Sand is fine. Gravel is fine to medium. Tiles content. Grass and roots content									
Soft to firm brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to medium of calcareous mudstone, dark grey limestone, weakly cemented red sandstone and sandstone with granite minerals		0.50	28.20			Env	0.50-0.50		
1.0 Firm brown sandy gravelly CLAY		1.00	27.70		AA84783	B	1.00-1.00		
					AA84784	B	1.40-1.50		
Medium dense clayey gravelly SAND. Sand is medium. Gravel is fine to medium of dark grey limestone, mudstone and occasional rounded siliceous stones and weakly cemented red sandstone		1.60	27.10						
2.0 Firm to stiff brown very sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse, subrounded of red sandstone, strong black sandstone. Occasional cobbles of black sandstone		2.00	26.70	1 (Seepage)	AA84785	B	2.10-2.20		
					AA84786	B	2.50-2.60		
End of Trial Pit at 2.90m		2.90	25.80						
3.0									
4.0									

Groundwater Conditions
Seepage at 2.20m depth

Stability
Poor stability from 0.50 m to 0.80 m and from 1.00 m to 2.00 m depth with sidewall collapse

General Remarks

TRIAL PIT RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**TRIAL PIT NO.**	**TP7**
		SHEET	Sheet 1 of 1
LOGGED BY	IGSL	**CO-ORDINATES**	710,473.35 E 774,915.85 N
		DATE STARTED	09/05/2018
		DATE COMPLETED	09/05/2018
CLIENT	Louth County Council	**GROUND LEVEL (m)**	28.07
ENGINEER	Waterman Moylan	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL: Firm dark brown sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular of dark grey limestone. Tiles content. Hays, grass and roots content		0.20	27.87						
Firm to stiff brown sandy gravelly slightly cobbly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular, elongate of very weak calcareous mudstone, siliceous stone and shale. Occasional orange and grey mottled						Env	0.50-0.50		
1.0 Soft brown sandy gravelly slightly cobbly CLAY		1.10	26.97		AA84780	B	1.00-1.00		
					AA84781	B	1.70-1.80		
2.0 Firm brown sandy gravelly slightly cobbly CLAY		2.00	26.07						
					AA84782	B	2.20-2.30		
3.0 End of Trial Pit at 3.00m		3.00	25.07						
4.0									

Groundwater Conditions
Dry

Stability
Poor stability from 1.15 m to 2.00 m depth with sidewall collapse

General Remarks

IGSL TP LOG 20951.GPJ IGSL.GDT 31/7/18

TRIAL PIT RECORD

REPORT NUMBER 20951

CONTRACT	LIHAF - Newtown,Drogheda,Co.Louth	**TRIAL PIT NO.**	**TP8**
		SHEET	Sheet 1 of 1
LOGGED BY	IGSL	**CO-ORDINATES**	710,550.52 E 730,555.70 N
		DATE STARTED	09/05/2018
		DATE COMPLETED	09/05/2018
CLIENT	Louth County Council	**GROUND LEVEL (m)**	27.27
ENGINEER	Waterman Moylan	**EXCAVATION METHOD**	JCB

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL: Firm dark brown sandy gravelly CLAY. Sand is fine. Gravel is fine to medium, subrounded of dark grey limestone, weakly cemented red sandstone and calcarenite									
Soft brown sandy gravelly CLAY. Gravel is fine to coarse of calcareous mudstone, black limestone, weakly cemented red sandstone and subrounded to rounded siliceous stones		0.50	26.77			Env	0.50-0.50		
1.0					AA84787	B	1.00-1.00		
				1 (Moderate)					
2.0					AA84788	B	1.60-1.70		
Firm brown sandy gravelly CLAY		2.50	24.77		AA84789	B	2.50-2.60		
3.0 End of Trial Pit at 3.00m		3.00	24.27						
4.0									

Groundwater Conditions
Moderate water flow at 1.50 m depth

Stability
Poor stability under 1.10 m and very poor stability under 1.80 m depth

General Remarks

IGSL TP LOG 20951.GPJ IGSL.GDT 31/7/18

Appendix III Plate Bearing Tests

PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

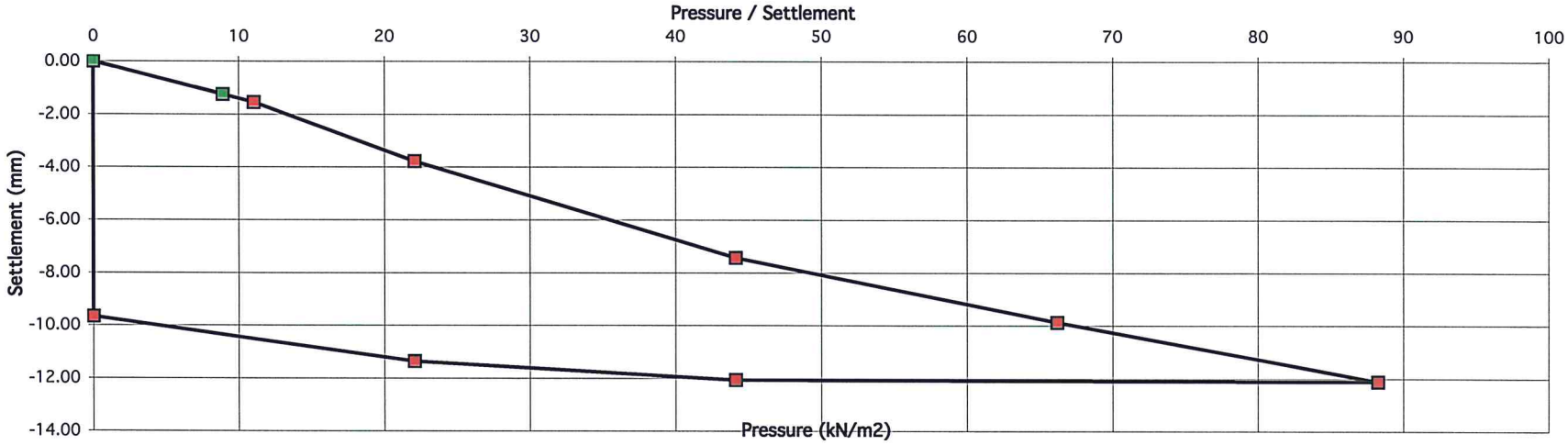
Reference No.	R87895
Contract	LIHAF Newtown Road Drogheda Louth
Test No.	CBR01 Load
Location	710449.985 E 774938.242 N
Depth	0.7 m
Client	Louth County Council
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	J. Borlado
Authorised by	
Date	09/05/2018

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Sample Ref No. N/A

Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 7
Modulus of subgrade reaction = 5 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 0.1 %

PLATE TEST REPORT SHEET (F3.1)

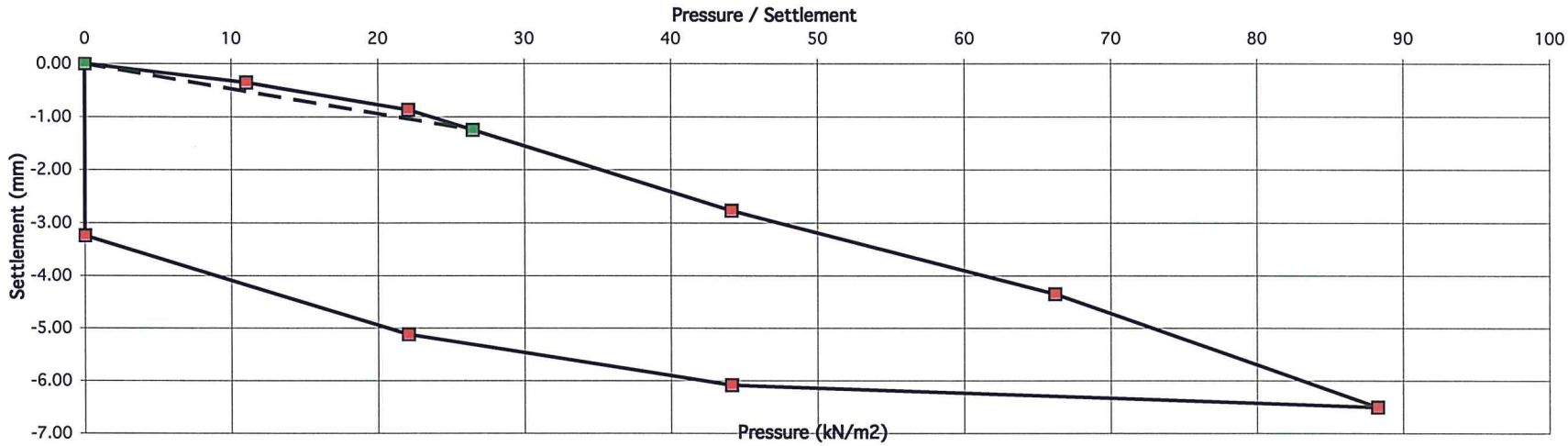
Applied Pressure/Settlement Curve

Reference No.	R87895
Contract	LIHAF Newtown Road Drogheda Louth
Test No.	CBR01 Reload
Location	710449.985 E 774938.242 N
Depth	0.7 m
Client	Louth County Council
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	J. Borlado
Authorised by	
Date	09/05/2018

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 21
Modulus of subgrade reaction = 14 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 0.9 %

PLATE TEST REPORT SHEET (F3.1)

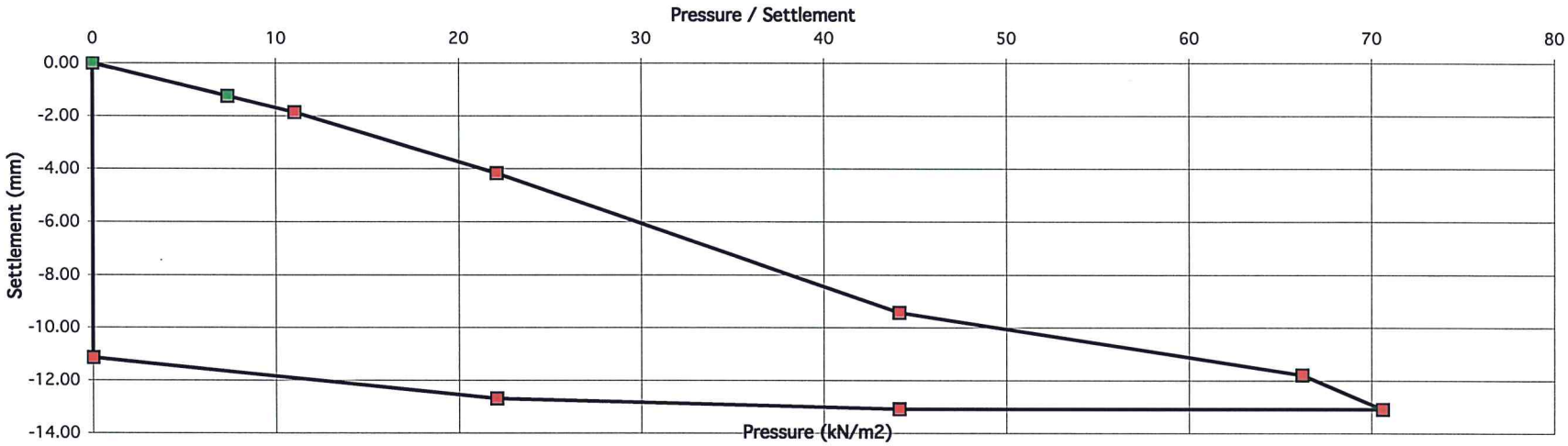
Applied Pressure/Settlement Curve

Reference No.	R87896
Contract	LIHAF Newtown Road Drogheda Louth
Test No.	CBR02 Load
Location	710473.345 E 774915.845 N
Depth	0.7 m
Client	Louth County Council
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	J. Borlado
Authorised by	
Date	09/05/2018

Description of soil under test
(natural soil, placed fill, sub-base)

Brown sandy gravelly CLAY

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 6
Modulus of subgrade reaction = 4 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 0.1 %

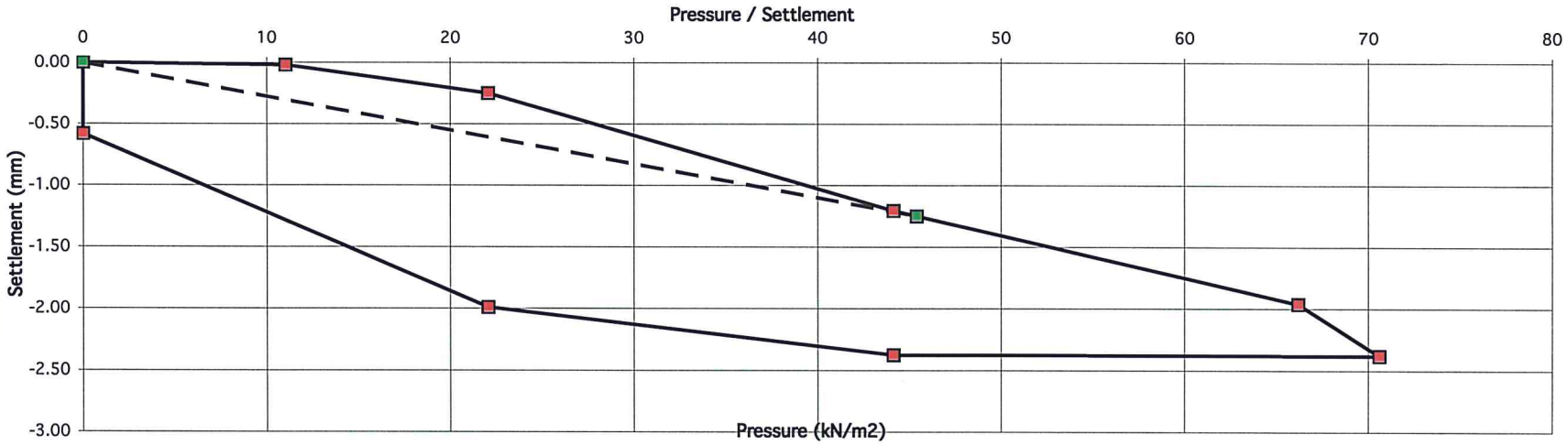
PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

Reference No.	R87896
Contract	LIHAF Newtown Road Drogheda Louth
Test No.	CBR02 Reload
Location	710473.345 E 774915.845 N
Depth	0.7 m
Client	Louth County Council
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	J. Borlado
Authorised by	
Date	09/05/2018

Description of soil under test
(natural soil, placed fill, sub-base)
Brown sandy gravelly CLAY

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 36
Modulus of subgrade reaction = 23 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 2.3 %

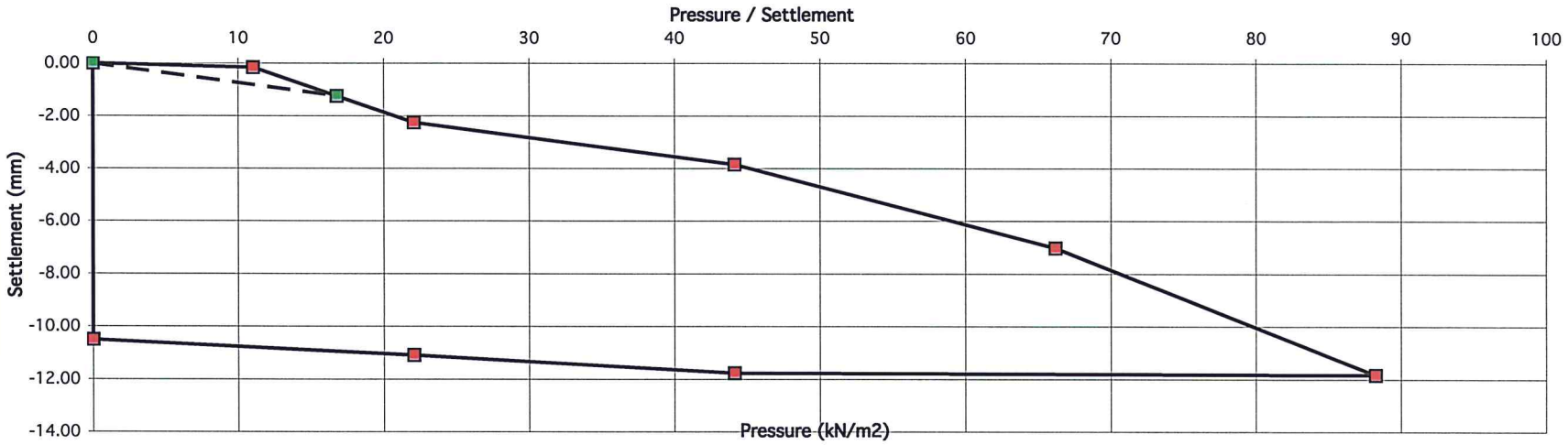
PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

Reference No.	R87897
Contract	LIHAF Newtown Road Drogheda Louth
Test No.	CBR03 Load
Location	710550.521 E 774891.916 N
Depth	0.7 m
Client	Louth County Council
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	J. Borlado
Authorised by	
Date	09/05/2018

Description of soil under test
(natural soil, placed fill, sub-base)
Brown sandy gravelly CLAY

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 13
Modulus of subgrade reaction = 9 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 0.4 %

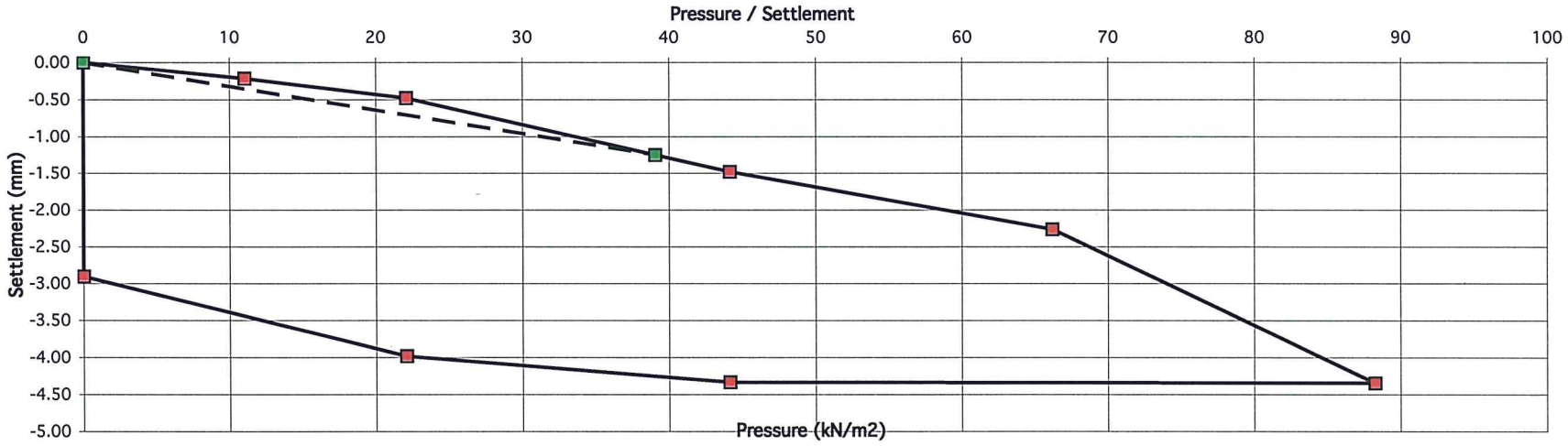
PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

Reference No.	R87897
Contract	LIHAF Newtown Road Drogheda Louth
Test No.	CBR03 Reload
Location	710550.521 E 774891.916 N
Depth	0.7 m
Client	Louth County Council
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	J. Borlado
Authorised by	
Date	09/05/2018

Description of soil under test
(natural soil, placed fill, sub-base)
Brown sandy gravelly CLAY

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 31
Modulus of subgrade reaction = 20 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 1.7 %

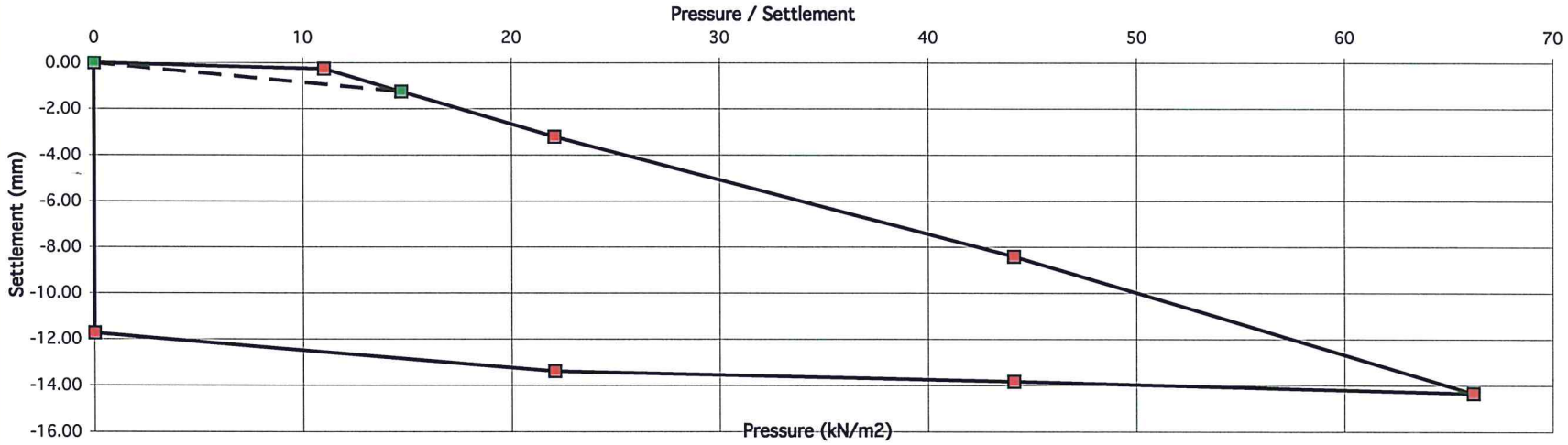
PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

Reference No.	R87898
Contract	LIHAF Newtown Road Drogheda Louth
Test No.	CBR04 Load
Location	710568.637 E 774907.498 N
Depth	0.7 m
Client	Louth County Council
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	J. Borlado
Authorised by	
Date	10/05/2018

Description of soil under test
(natural soil, placed fill, sub-base)
Brown sandy gravelly CLAY

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 12
Modulus of subgrade reaction = 8 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 0.3 %

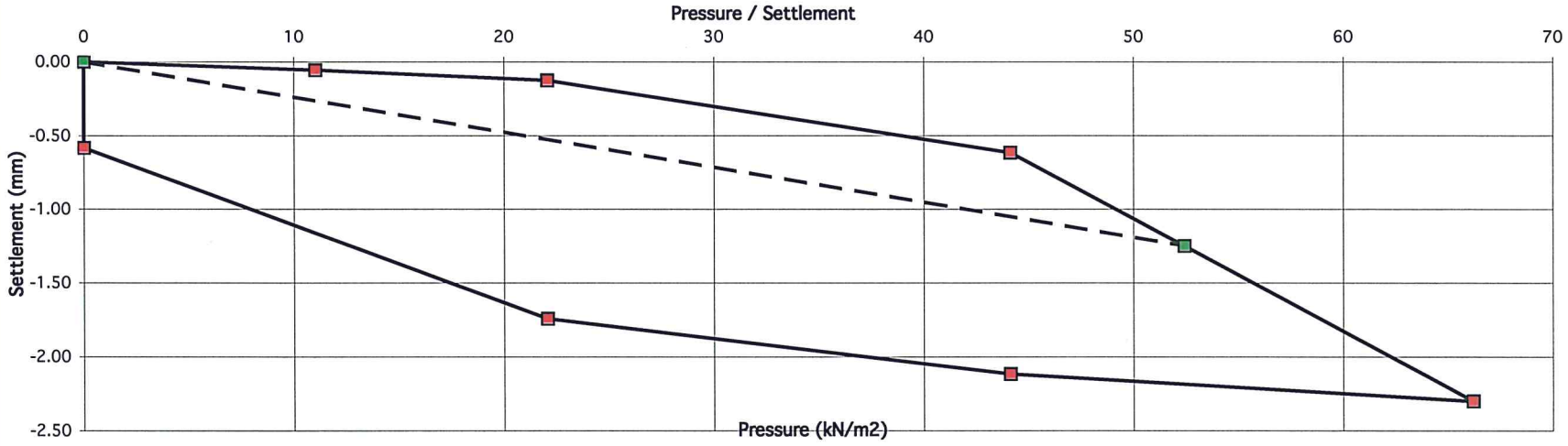
PLATE TEST REPORT SHEET (F3.1)

Applied Pressure/Settlement Curve

Reference No.	R87898
Contract	LIHAF Newtown Road Drogheda Louth
Test No.	CBR04 Reload
Location	710568.637 E 774907.498 N
Depth	0.7 m
Client	Louth County Council
Plate Diameter:	450 mm
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test
Technician	J. Borlado
Authorised by	
Date	10/05/2018

Description of soil under test
(natural soil, placed fill, sub-base)
Brown sandy gravelly CLAY

Sample Ref No. N/A
Depth 0.00 m bgl



Gradient at 1.25 mm settlement intersection = 42
Modulus of subgrade reaction = 27 MPa/m
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10 2.9 %

Appendix IV Slit Trench Data

Report No. 20951	SLIT TRENCH RECORD	FACING DIRECTION: N / W / E / S	IGSL

		Survey				
Project: Newtown Drogheda		Easting (m)	Northing (m)	Elevation (mOD)	Slit Trench No.	1
Engineer: Watermoylan Moylan					Sheet	1 of 1
Crew: JC/Flannagans	Start of Trench	710376.788	775312.441		Date Commenced	23/07/2018
Location Marsh Road Drogheda	End of Trench	710378.353	775305.396		Date Completed	24/07/2018

Ground Conditions

From (m)	To (m)	Soil Description
0	0.1	Tarmacadam
0.1	0.8	Dense angular GRAVEL
0.8	1.5	Medium dense fine to coarse sandy GRAVEL

Photograph

Trench Dimensions	
LHS of Trench (m)	0.0
RHS of Trench (m)	7.3
Trench Depth (m)	1.5
Trench Width (m)	0.6

Location

Facing Direction	East
Facing Features	Flogas entrance
Groundwater	

SAMPLES

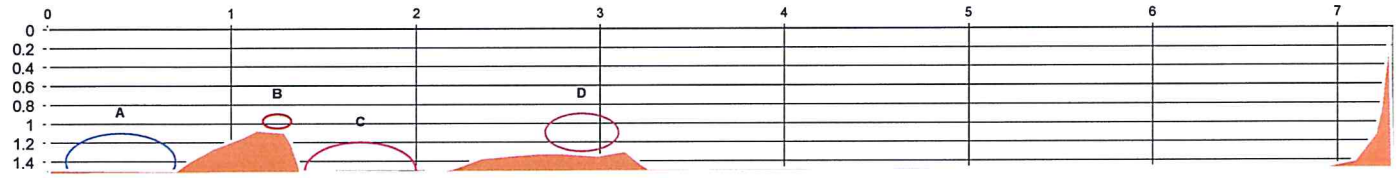
Bag at 0.80m 81515

Excavation Quantities

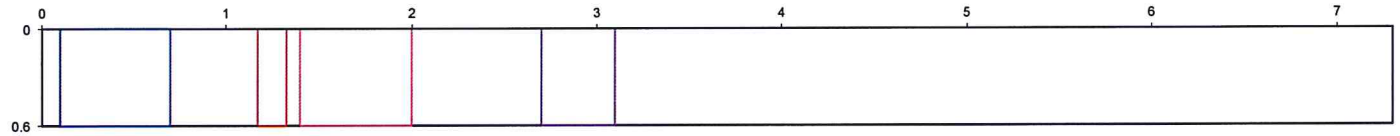
Surface	Length (m)	Material
Road	7.3	
Path (LHS)		
Path (RHS)		
Grass Verge (LHS)		
Grass Verge (RHS)		
Other		
Total Length	7.3	

Zero Metres Taken As: LHS Kerb

X-Section



Plan



	Diameter (mm)	Material	Description	Distance (m)	Depth to crown (m)	Angle (deg.)
Service A	600	Ductile	Sewer/Water	0.4	1.1	90
Service B	150	HDPE	GAS	1.25	0.9	90
Service C	600	Ductile	Sewer/Water	1.7	1.2	90
Service D	400	Concrete	Sewer	2.9	0.9	90
Service E						
Service F						
Service G						
Service H						
Service I						
Service J						
Service K						
Service L						
Service M						

Report No. 20951	SLIT TRENCH RECORD	FACING DIRECTION: N W E S	IGSL

		Survey				
Project: Newtown Drogheda		Easting (m)	Northing (m)	Elevation (mOD)	Slit Trench No.	2
Engineer: Watermoylan Moylan					Sheet	1 of 1
Crew: JC/Flannagans	Start of Trench	710434.547	775323.692		Date Commenced	23/07/2018
Location Marsh Road Drogheda	End of Trench	710435.412	775317.492		Date Completed	23/07/2018

Ground Conditions

From (m)	To (m)	Soil Description
0	0.1	Tarmacadam
0.1	0.5	Dense angular GRAVEL
0.5	1.5	Medium dense fine to coarse sandy GRAVEL

Photograph

Trench Dimensions	
LHS of Trench (m)	0.0
RHS of Trench (m)	7.3
Trench Depth (m)	1.6
Trench Width (m)	0.6

Facing Direction	East
Facing Features	Flogas entrance
Groundwater	

Location

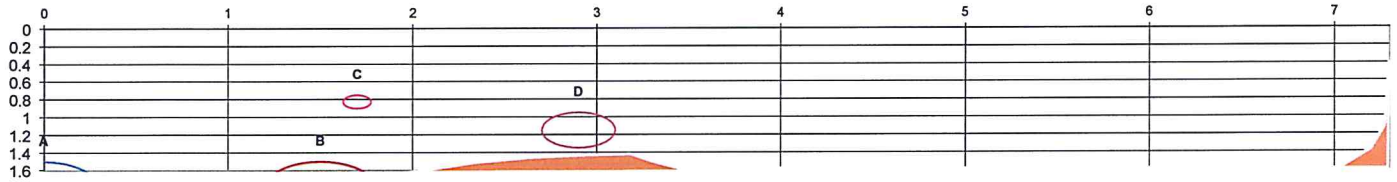
SAMPLES

Excavation Quantities

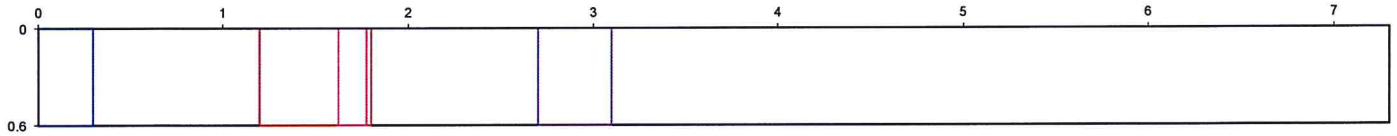
Surface	Length (m)	Material
Road	7.3	
Path (LHS)		
Path (RHS)		
Grass Verge (LHS)		
Grass Verge (RHS)		
Other		
Total Length	7.3	

Zero Metres Taken As: LHS Kerb

X-Section



Plan



	Diameter (mm)	Material	Description	Distance (m)	Depth to crown (m)	Angle (deg.)
Service A	600	Ductile	Sewer/Water	0	1.5	90
Service B	600	Ductile	Sewer/Water	1.5	1.5	90
Service C	150	HDPE	GAS	1.7	0.75	90
Service D	400	Concrete	Sewer	2.9	0.95	90
Service E						
Service F						
Service G						
Service H						
Service I						
Service J						
Service K						
Service L						
Service M						

Report No. 20951	SLIT TRENCH RECORD	FACING DIRECTION: N W E S	IGSL

		Survey				
Project: Newtown Drogheda		Easting (m)	Northing (m)	Elevation (mOD)	Slit Trench No.	3
Engineer: Watermoylan Moylan					Sheet	1 of 1
Crew: JC/Flannagans	Start of Trench	710529.715	775337.861		Date Commenced	24/07/2018
Location Marsh Road Drogheda	End of Trench	710527.649	775343.339		Date Completed	24/07/2018

Ground Conditions

From (m)	To (m)	Soil Description
0	0.1	Tarmacadam
0.1	1	Dense angular GRAVEL
1		Teram
1	1.5	Soft brown sandy very gravelly SILT / silty Gravel
		with strong odour of hydrocarbons

Photograph

Trench Dimensions	
LHS of Trench (m)	0.0
RHS of Trench (m)	7.5
Trench Depth (m)	1.5
Trench Width (m)	0.6

Location

Excavation Quantities

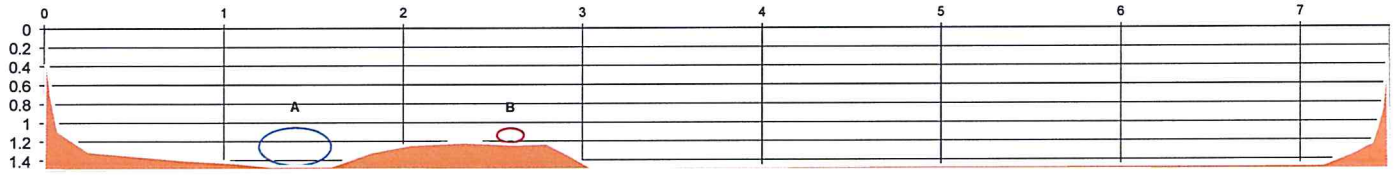
Surface	Length (m)	Material
Road	7.5	
Path (LHS)		
Path (RHS)		
Grass Verge (LHS)		
Grass Verge (RHS)		
Other		
Total Length	7.5	

Facing Direction	West
Facing Features	Flogas entrance
Groundwater	

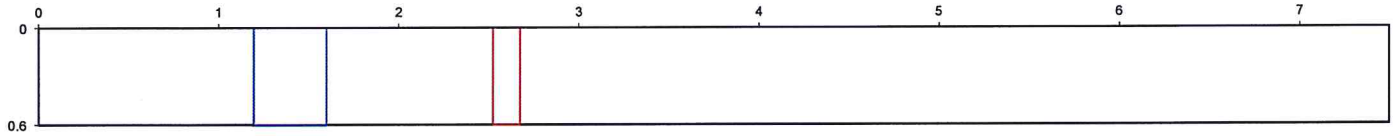
SAMPLES
Bag at 1.20m 81517

Zero Metres Taken As: LHS Kerb

X-Section



Plan



	Diameter (mm)	Material	Description	Distance (m)	Depth to crown (m)	Angle (deg.)
Service A	400	Concrete	Sewer	1.4	1.05	90
Service B	150	HDPE	GAS	2.6	1.06	90
Service C						
Service D						
Service E						
Service F						
Service G						
Service H						
Service I						
Service J						
Service K						
Service L						
Service M						

Report No. 20951	SLIT TRENCH RECORD	FACING DIRECTION: N W E S	IGSL

		Survey				
Project: Newtown Drogheda		Easting (m)	Northing (m)	Elevation (mOD)	Slit Trench No.	4
Engineer: Watermoylan Moylan					Sheet	1 of 1
Crew: JC/Flannagans	Start of Trench	710585.077	775348.501		Date Commenced	24/07/2018
Location Marsh Road Drogheda	End of Trench	710583.554	775355.433		Date Completed	24/07/2018

Ground Conditions

From (m)	To (m)	Soil Description
0	0.1	Tarmacadam
0.1	0.6	Dense angular GRAVEL
0.6		Teram
0.6	1.5	Medium dense fine to coarse sandy GRAVEL

Photograph

Trench Dimensions	
LHS of Trench (m)	0.0
RHS of Trench (m)	7.3
Trench Depth (m)	1.5
Trench Width (m)	0.6

Facing Direction	West
Facing Features	Flogas entrance
Groundwater	

Location

SAMPLES

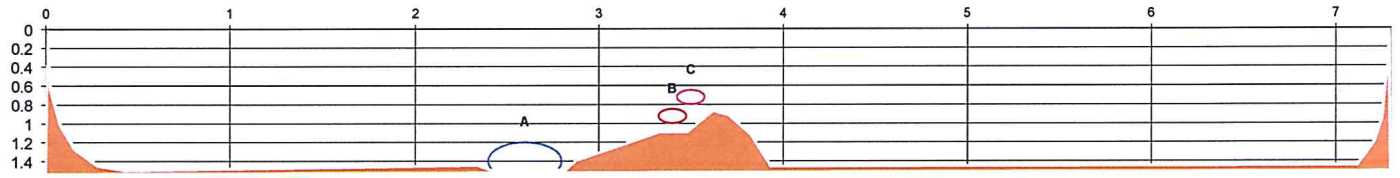
Bag at 0.80m 81516

Excavation Quantities

Surface	Length (m)	Material
Road	7.3	
Path (LHS)		
Path (RHS)		
Grass Verge (LHS)		
Grass Verge (RHS)		
Other		
Total Length	7.3	

Zero Metres Taken As: LHS Kerb

X-Section



Plan

	Diameter (mm)	Material	Description	Distance (m)	Depth to crown (m)	Angle (deg.)
Service A	400	Concrete	Sewer	2.6	1.2	90
Service B	150	HDPE	GAS	3.4	0.85	90
Service C	150	Wavin	??????	3.5	0.65	90
Service D						
Service E						
Service F						
Service G						
Service H						
Service I						
Service J						
Service K						
Service L						
Service M						

Appendix V Laboratory Results

IGSL Ltd
Materials Laboratory
Unit J5, M7 Business Park
Newhall, Naas
Co. Kildare
045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits

Tested in accordance with BS1377:Part 2:1990, clauses 3.2*, 4.3, 4.4 & 5.3

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. **R88482** Contract No. 20951 Contract Name: LIHAF , Newtown,Drogheda,Co.Louth

Customer Moylans

Samples Received: 21/05/18 Date Tested: 01/06/18

BH/TP	Sample No.	Depth (m)	Lab. Ref	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
BH01	AA90768	6.0	A18/4227	D	19	31	17	14	87	WS	4.4	C L	Dark brown slightly sandy, slightly gravelly, CLAY
BH02	AA90773	1.0	A18/4228	D	20	27	16	11	61	WS	4.4	C L	Brown sandy gravelly CLAY
BH02	AA90775	3.0	A18/4229	D	14	23	15	8	51	WS	4.4	C L	Brown slightly sandy, gravelly, CLAY
BH02	AA90780	8.0	A18/4230	D	23	24	NP	NP	99	WS	4.4		Brown slightly sandy, SILT
BH03	AA90756	5.0	A18/4232	D	21	22	NP	NP	99	WS	4.4		Brown sandy SILT
BH03	AA90760	9.0	A18/4233	D	24	30	17	13	96	WS	4.4	C L	Dark brown slightly sandy, slightly gravelly, CLAY

Notes: Preparation: WS - Wet sieved; AR - As received; NP - Non plastic
Liquid Limit Clause: 4.3 Cone Penetrometer definitive method; 4.4 Cone Penetrometer one point method
Sample Type: B - Bulk Disturbed; U - Undisturbed

Remarks:

NOTE: *Clause 3.2 of BS1377 is a "withdrawn" standard due to publication of ISO17892-1:2014
Opinions and interpretations are outside the scope of accreditation.
The results relate to the specimens tested. Any remaining material will be retained for one month.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports

H Byrne (Laboratory Manager)

Approved by	Date	Page
H Byrne	12/6/18	1 of 1

TEST REPORT

Determination of Particle Size Distribution

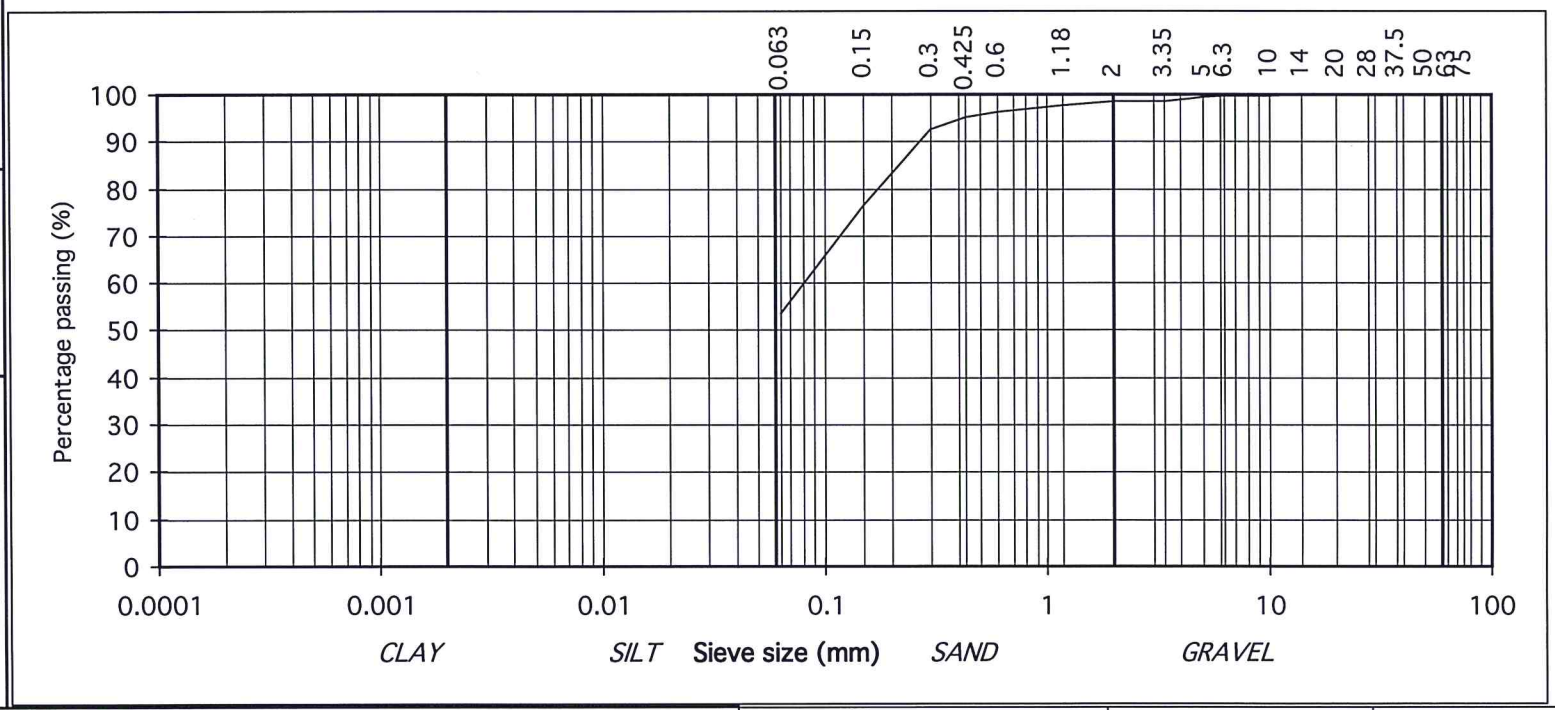
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

ISO 17025 INAB TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	100	
20	100	
14	100	
10	100	
6.3	100	
5	99	
3.35	99	
2	98	
1.18	98	SAND
0.6	96	
0.425	95	
0.3	93	
0.15	76	
0.063	54	SILT/CLAY

Contract No:	20951	Report No.	R89376
Contract:	LIHAF Newtown,Drogheda,Co.Louth		
BH/TP :	BH01		
Sample No.	AA90765	Lab. Sample No.	A18/4226
Sample Type:	B		
Depth (m)	3.00	Customer:	Moylans
Date Received	21/05/2018	Date Testing started	01/06/2018
Description:	Brown sandy, slightly gravelly, SILT/CLAY		

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	13/06/18	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

ISO 17025 INAB TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	100	
20	100	
14	99	
10	99	
6.3	99	
5	99	
3.35	98	
2	98	
1.18	98	SAND
0.6	98	
0.425	98	
0.3	98	
0.15	96	
0.063	90	SILT/CLAY
0.033	79	
0.024	74	
0.016	68	
0.009	57	
0.007	51	
0.005	47	
0.001	30	

Contract No: 20951 Report No. R89377

Contract: LIHAF Newtown,Drogheda,Co.Louth

BH/TP : BH01

Sample No. AA90768 Lab. Sample No. A18/4227

Sample Type: B

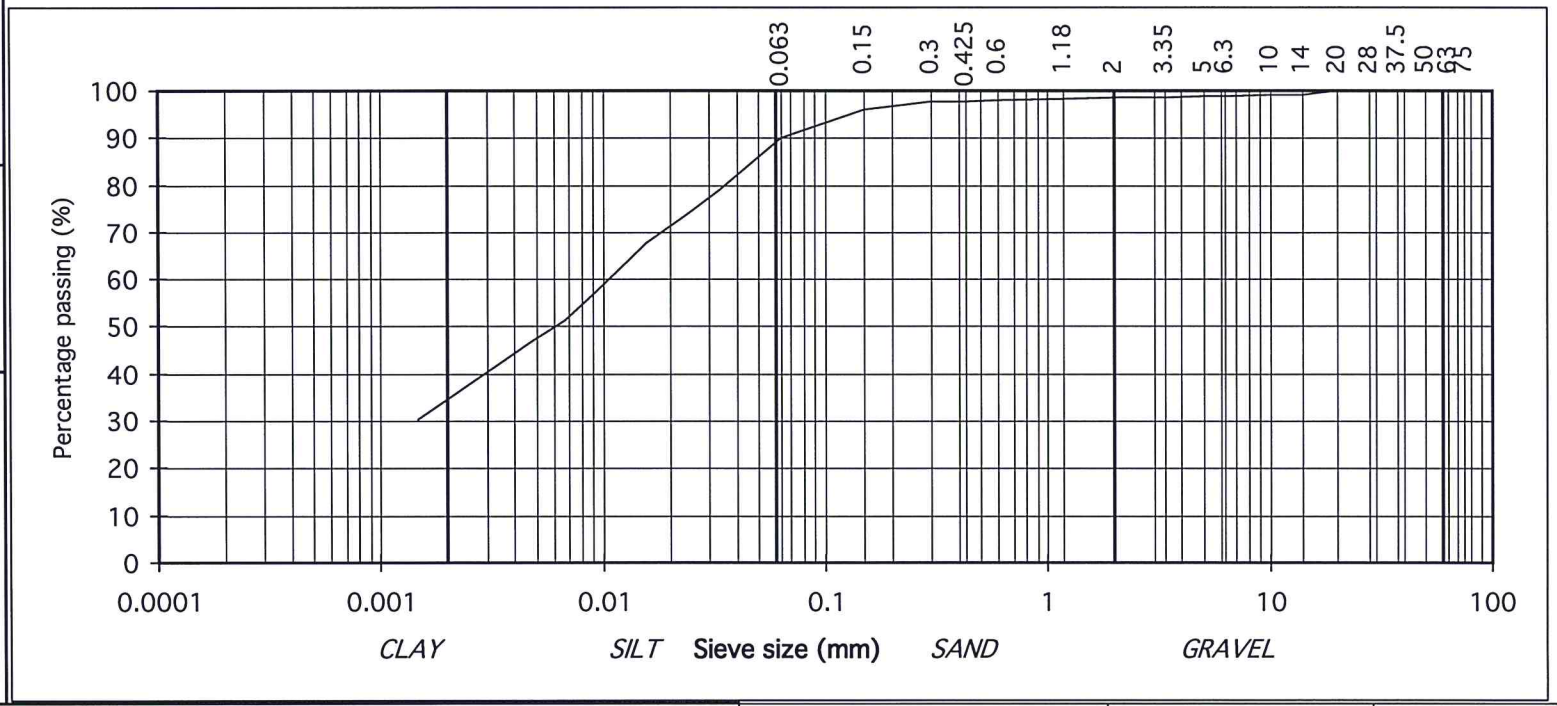
Depth (m) 6.00 Customer: Moylans

Date Received 21/05/2018 Date Testing started 01/06/2018

Description: Dark brown slightly sandy, slightly gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	13/06/18	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

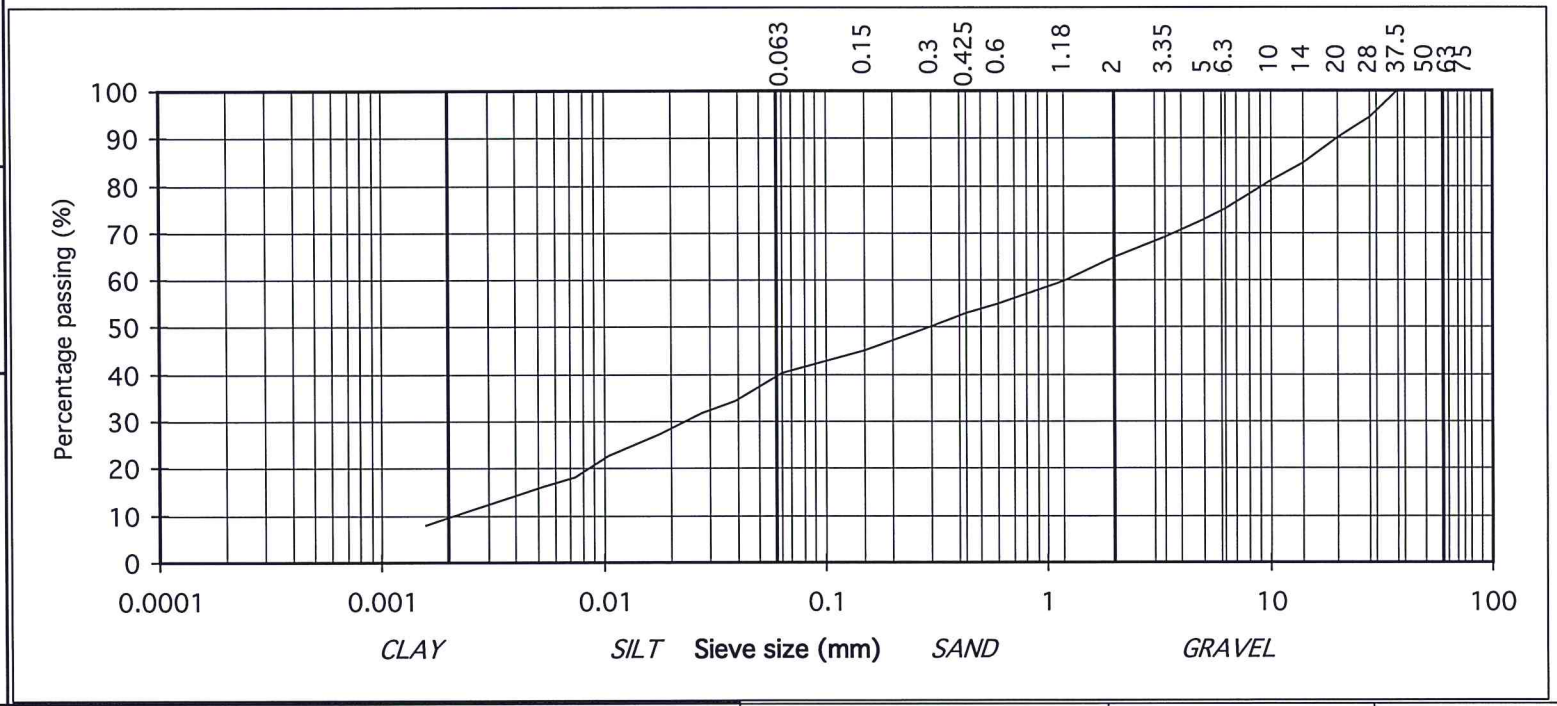
(note: Sedimentation stage not accredited)

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	94	
20	90	
14	85	
10	81	
6.3	75	
5	73	
3.35	69	
2	65	
1.18	60	SAND
0.6	55	
0.425	53	
0.3	50	
0.15	45	
0.063	40	SILT/CLAY
0.039	34	
0.028	32	
0.018	27	
0.010	23	
0.007	18	
0.005	16	
0.002	8	

Contract No:	20951	Report No.	R89378
Contract:	LIHAF Newtown,Drogheda,Co.Louth		
BH/TP :	BH02		
Sample No.	AA90775	Lab. Sample No.	A18/4229
Sample Type:	B		
Depth (m)	3.00	Customer:	Moylans
Date Received	21/05/2018	Date Testing started	01/06/2018
Description:	Brown slightly sandy, gravelly, CLAY		

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	13/06/18	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

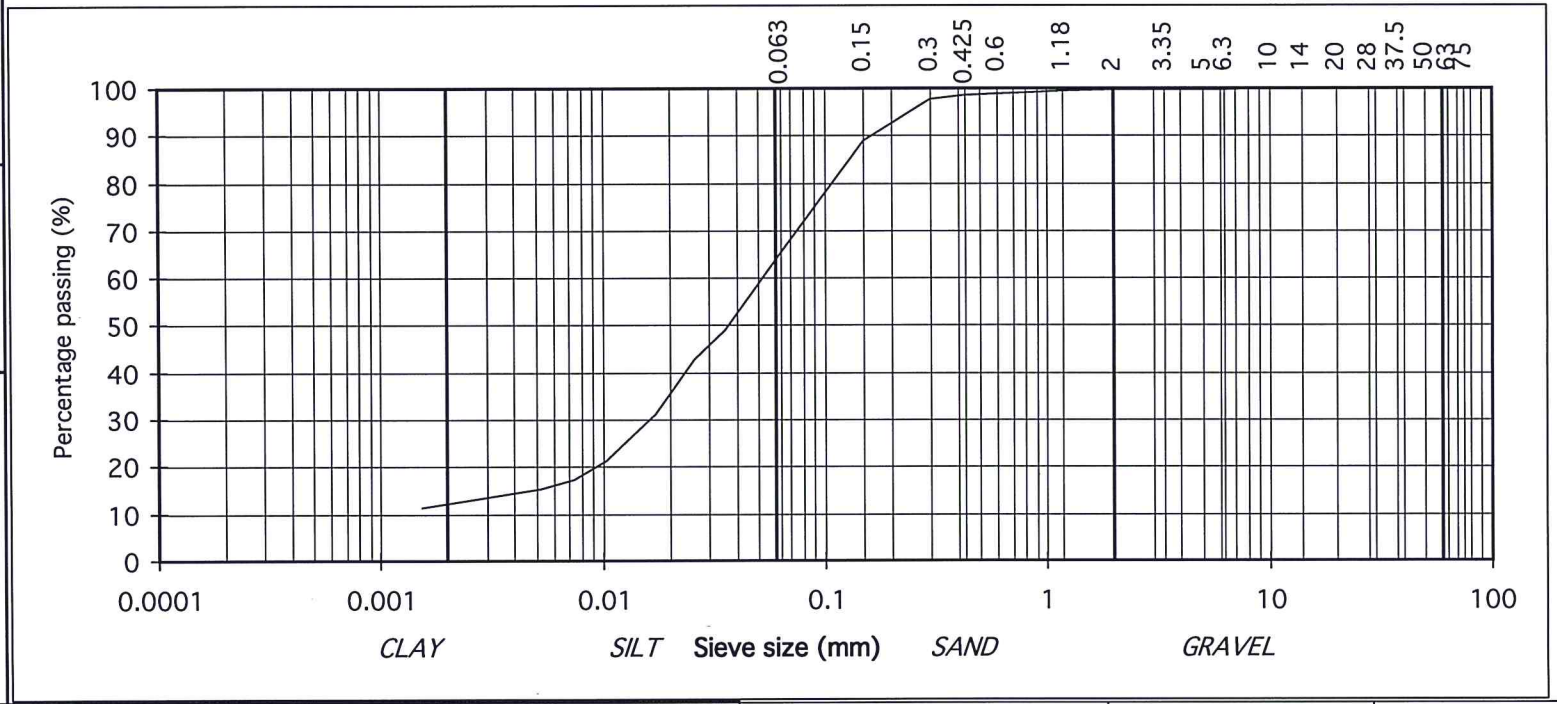
ISO 17025 INAB TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	100	
20	100	
14	100	
10	100	
6.3	100	
5	100	
3.35	100	
2	100	
1.18	99	SAND
0.6	99	
0.425	99	
0.3	98	
0.15	89	
0.063	65	SILT/CLAY
0.036	49	
0.026	43	
0.017	31	
0.010	21	
0.007	17	
0.005	15	
0.002	11	

Contract No:	20951	Report No.	R89379
Contract:	LIHAF Newtown,Drogheda,Co.Louth		
BH/TP :	BH02		
Sample No.	AA90780	Lab. Sample No.	A18/4230
Sample Type:	B		
Depth (m)	8.00	Customer:	Moylans
Date Received	21/05/2018	Date Testing started	01/06/2018
Description:	Brown slightly sandy, SILT		

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	13/06/18	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

ISO 17025 INAB TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	100	
20	99	
14	97	
10	96	
6.3	95	
5	94	
3.35	91	
2	91	
1.18	89	SAND
0.6	87	
0.425	85	
0.3	81	
0.15	70	
0.063	59	SILT/CLAY
0.036	47	
0.026	44	
0.017	38	
0.010	31	
0.007	24	
0.005	22	
0.002	13	

Contract No: 20951 Report No. R89380

Contract: LIHAF Newtown,Drogheda,Co.Louth

BH/TP : BH03

Sample No. AA90754 Lab. Sample No. A18/4231

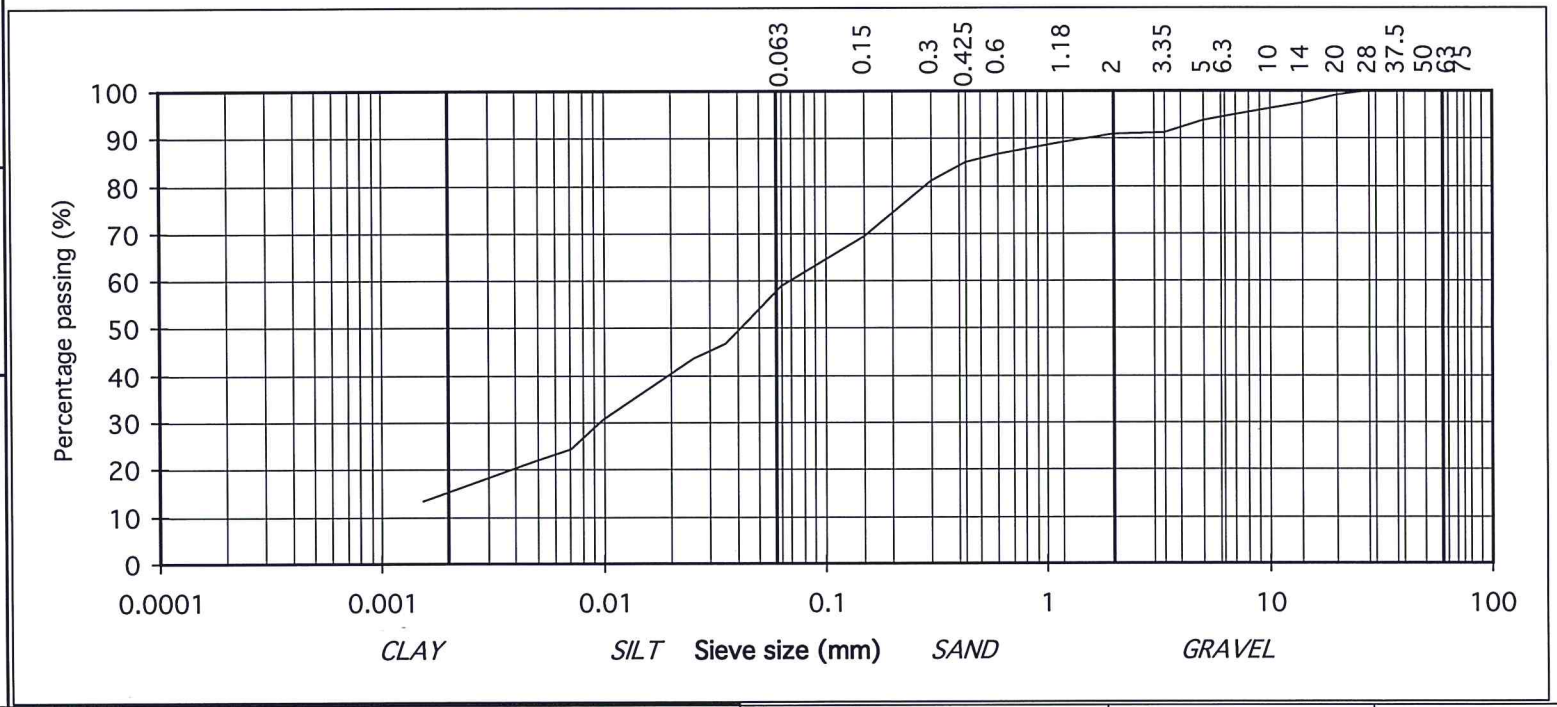
Sample Type: B

Depth (m) 3.00 Customer: Moylans

Date Received 21/05/2018 Date Testing started 01/06/2018

Description: Mottled brown slightly sandy, slightly gravelly, SILT/CLAY

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	13/06/18	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

ISO 17025 INAB TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	100	
20	100	
14	100	
10	99	
6.3	99	
5	99	
3.35	99	
2	98	
1.18	98	SAND
0.6	97	
0.425	97	
0.3	96	
0.15	91	
0.063	84	SILT/CLAY
0.036	72	
0.026	62	
0.017	46	
0.010	31	
0.007	25	
0.005	23	
0.002	16	

Contract No: 20951 Report No. R89381

Contract: LIHAF Newtown,Drogheda,Co.Louth

BH/TP : BH03

Sample No. AA90760 Lab. Sample No. A18/4233

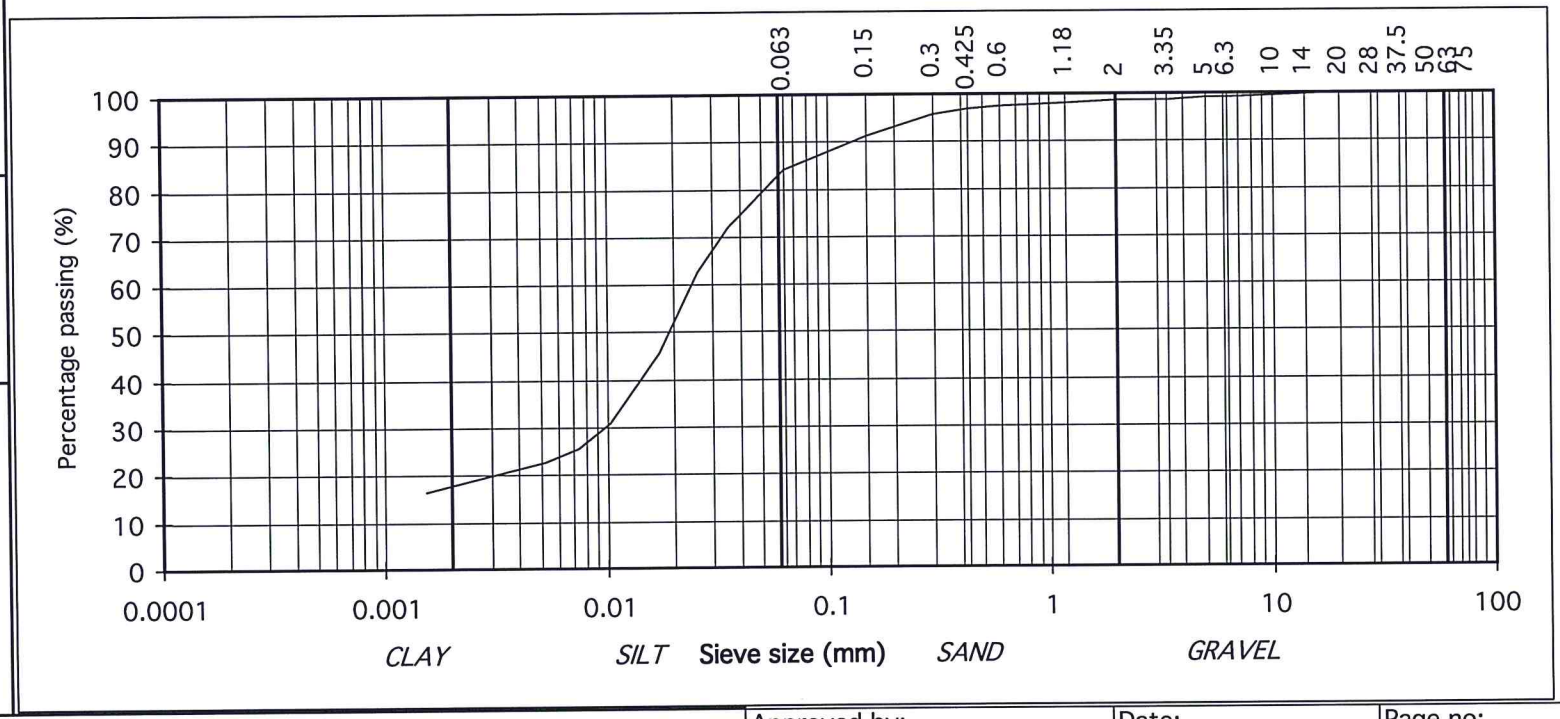
Sample Type: B

Depth (m) 9.00 Customer: Moylans

Date Received 21/05/2018 Date Testing started 01/06/2018

Description: Dark brown slightly sandy, slightly gravelly, CLAY

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	13/06/18	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

IGSL
Unit F
M7 Business Park
Naas
Co Kildare
Ireland

Attention :	Darren Keogh
Date :	31st May, 2018
Your reference :	
Our reference :	Test Report 18/7348 Batch 1
Location :	LIHAF Newtown - Drogheda, Louth
Date samples received :	15th May, 2018
Status :	Final report
Issue :	1

Eight samples were received for analysis on 15th May, 2018 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

Compiled By:

Phil Sommerton BSc
Project Manager

Exova Jones Environmental

Client Name: IGSL
Reference:
Location: LIHAF Newtown - Drogheda, Louth
Contact: Darren Keogh
JE Job No.: 18/7348

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24					
Sample ID	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8					
Depth	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00			Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J					
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	09/05/2018	09/05/2018	09/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1			LOD/LOR	Units	Method No.
Date of Receipt	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018					
Antimony	-	3	4	3	4	-	3	2			<1	mg/kg	TM30/PM15
Arsenic #	-	16.6	20.1	14.9	14.3	-	13.9	10.0			<0.5	mg/kg	TM30/PM15
Barium #	-	85	121	104	105	-	117	311			<1	mg/kg	TM30/PM15
Cadmium #	-	0.6	1.5	0.9	1.2	-	1.1	1.4			<0.1	mg/kg	TM30/PM15
Chromium #	-	71.7	96.4	57.5	114.8	-	69.0	66.9			<0.5	mg/kg	TM30/PM15
Copper #	-	29	44	35	36	-	39	27			<1	mg/kg	TM30/PM15
Lead #	-	16	25	19	20	-	21	27			<5	mg/kg	TM30/PM15
Mercury #	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Molybdenum #	-	2.0	9.1	5.2	8.5	-	4.9	2.5			<0.1	mg/kg	TM30/PM15
Nickel #	-	59.0	68.5	52.3	66.2	-	62.8	38.2			<0.7	mg/kg	TM30/PM15
Selenium #	-	<1	2	1	<1	-	<1	<1			<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	-	69	269	172	108	-	79	485			<50	mg/kg	TM50/PM29
Water Soluble Boron #	-	0.4	0.5	0.4	0.6	-	0.3	1.4			<0.1	mg/kg	TM74/PM32
Zinc #	-	77	98	84	97	-	92	162			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Acenaphthene #	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Fluorene #	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Phenanthrene #	-	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Anthracene #	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Fluoranthene #	-	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Pyrene #	-	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	<0.06	<0.06	<0.06	<0.06	-	<0.06	<0.06			<0.06	mg/kg	TM4/PM8
Chrysene #	-	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.02			<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	-	<0.07	<0.07	<0.07	<0.07	-	<0.07	<0.07			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Coronene	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
PAH 6 Total #	-	<0.22	<0.22	<0.22	<0.22	-	<0.22	<0.22			<0.22	mg/kg	TM4/PM8
PAH 17 Total	-	<0.64	<0.64	<0.64	<0.64	-	<0.64	<0.64			<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.02			<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	<1	<1	<1	<1	-	<1	<1			<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	101	108	110	98	-	99	103			<0	%	TM4/PM8
Mineral Oil (C10-C40)	-	<30	<30	<30	<30	-	<30	<30			<30	mg/kg	TM5/PM8/PM16

Exova Jones Environmental

Client Name: IGSL
Reference:
Location: LIHAF Newtown - Drogheda, Louth
Contact: Darren Keogh
JE Job No.: 18/7348

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8					
Depth	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00					
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J					
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	09/05/2018	09/05/2018	09/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018					
TPH CWG													
Aliphatics													
>C5-C6 #	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C6-C8 #	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C8-C10	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C10-C12 #	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	-	<4	<4	<4	<4	-	<4	<4			<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	-	<7	<7	<7	<7	-	<7	<7			<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	-	<7	<7	<7	<7	-	<7	<7			<7	mg/kg	TM5/PM8/PM16
>C35-C40	-	<7	<7	<7	<7	-	<7	<7			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	-	<26	<26	<26	<26	-	<26	<26			<26	mg/kg	TM5/PM8/PM12/PM16
>C6-C10	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C10-C25	-	<10	<10	<10	<10	-	<10	<10			<10	mg/kg	TM5/PM8/PM16
>C25-C35	-	<10	<10	<10	<10	-	<10	<10			<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	-	<4	<4	<4	<4	-	<4	<4			<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	-	<7	<7	<7	<7	-	<7	<7			<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	-	<7	<7	<7	<7	-	<7	<7			<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	-	<7	<7	<7	<7	-	<7	<7			<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	-	<26	<26	<26	<26	-	<26	<26			<26	mg/kg	TM5/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	-	<52	<52	<52	<52	-	<52	<52			<52	mg/kg	TM5/PM8/PM12/PM16
>EC6-EC10 #	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC10-EC25	-	<10	<10	<10	<10	-	<10	<10			<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	-	<10	<10	<10	<10	-	<10	<10			<10	mg/kg	TM5/PM8/PM16
MTBE #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM31/PM12
Benzene #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM31/PM12
Toluene #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM31/PM12
Ethylbenzene #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM31/PM12
m/p-Xylene #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM31/PM12
o-Xylene #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM31/PM12
PCB 28 #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	<5	<5	<5	-	<5	<5			<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	<35	<35	<35	-	<35	<35			<35	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: IGSL
Reference:
Location: LIHAF Newtown - Drogheda, Louth
Contact: Darren Keogh
JE Job No.: 18/7348

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8					
Depth	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00					
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J					
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	09/05/2018	09/05/2018	09/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018					
Phenol #	-	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01			<0.01	mg/kg	TM26/PM21
Natural Moisture Content	-	18.8	19.0	17.6	18.5	-	17.6	31.7			<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	-	15.8	16.0	15.0	15.6	-	15.0	24.0			<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3			<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0130	<0.0015	-	0.0065	-	0.0106	0.0037	<0.0015			<0.0015	g/l	TM38/PM20
Chromium III	-	71.7	96.4	57.5	114.8	-	69.0	66.9			<0.5	mg/kg	NONE/NONE
Total Cyanide #	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	-	0.14	0.34	0.27	0.36	-	0.31	1.08			<0.02	%	TM21/PM24
Organic Matter	0.3	0.2	-	0.5	-	0.2	0.5	1.9			<0.2	%	TM21/PM24
Sulphide	-	<10	<10	<10	<10	-	<10	<10			<10	mg/kg	TM106/PM119
Elemental Sulphur	-	<1	<1	<1	<1	-	<1	<1			<1	mg/kg	TM108/PM114
pH #	8.29	8.31	7.84	8.62	8.11	8.48	8.45	7.57			<0.01	pH units	TM73/PM11
Mass of raw test portion	-	0.1087	0.1058	0.1046	0.1098	-	0.1048	0.1148				kg	NONE/PM17
Mass of dried test portion	-	0.09	0.09	0.09	0.09	-	0.09	0.09				kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

Exova Jones Environmental

Client Name: IGSL
Reference:
Location: LIHAF Newtown - Drogheda, Louth
Contact: Darren Keogh
JE Job No.: 18/7348

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	4-6	7-9	10-12	13-15	19-21	22-24					LOD/LOR	Units	Method No.
Sample ID	TP2	TP3	TP4	TP5	TP7	TP8							
Depth	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00							
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J							
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018	09/05/2018	09/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018	15/05/2018							
Dissolved Antimony #	0.003	<0.002	<0.002	<0.002	<0.002	<0.002					<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	0.03	<0.02	<0.02	<0.02	<0.02	<0.02					<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025					<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025					<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.004	<0.003	0.006	<0.003	0.010	0.025					<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.04	<0.03	0.06	<0.03	0.10	0.25					<0.03	mg/kg	TM30/PM17
Dissolved Boron #	<0.012	<0.012	<0.012	<0.012	<0.012	0.027					<0.012	mg/l	TM30/PM17
Dissolved Boron (A10) #	<0.12	<0.12	<0.12	<0.12	<0.12	0.27					<0.12	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005					<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	0.0035					<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	0.035					<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007					<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07					<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	<0.002	0.004	0.006	0.004	<0.002					<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	<0.02	0.04	0.06	0.04	<0.02					<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002	0.002					<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	0.02					<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003					<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03					<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	0.004	0.004	<0.003	0.005	<0.003	0.014					<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	0.04	0.04	<0.03	0.05	<0.03	0.14					<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001					<0.00001	mg/l	TM61/PM38
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001					<0.0001	mg/kg	TM61/PM38
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	<0.3	<0.3	<0.3	0.4	<0.3					<0.3	mg/l	TM173/PM0
Fluoride	<3	<3	<3	<3	4	<3					<3	mg/kg	TM173/PM0
Sulphate as SO4 #	0.77	1.89	0.92	0.94	0.93	0.80					<0.05	mg/l	TM38/PM0
Sulphate as SO4 #	7.7	18.9	9.2	9.4	9.3	8.0					<0.5	mg/kg	TM38/PM0
Chloride #	0.3	0.5	0.5	0.8	0.5	0.4					<0.3	mg/l	TM38/PM0
Chloride #	<3	5	5	8	5	4					<3	mg/kg	TM38/PM0
Ammoniacal Nitrogen as N #	0.05	0.05	0.05	0.05	0.04	0.05					<0.03	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	0.5	0.5	0.5	0.5	0.4	0.5					<0.3	mg/kg	TM38/PM0
Dissolved Organic Carbon	5	5	2	6	3	9					<2	mg/l	TM60/PM0
Dissolved Organic Carbon	50	50	20	60	30	90					<20	mg/kg	TM60/PM0
Total Dissolved Solids #	68	83	53	59	84	59					<35	mg/l	TM20/PM0
Total Dissolved Solids #	680	830	530	590	840	590					<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =	82.6
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	-
Particle Size <4mm =	>95%	Eluate Volume (l)	0.781

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/7348**			
Sample No	**6**			
Client Sample No	**TP2**			
Depth/Other	**0.50-1.00**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**10/05/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.14	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.04	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	<0.0001	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	0.03	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	0.04	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	7.7	1000	20000	50000
Total Dissolved Solids	680	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	50	500	800	1000

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =	84.7
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	-
Particle Size <4mm =	>95%	Eluate Volume (l)	0.784

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/7348**			
Sample No	**9**			
Client Sample No	**TP3**			
Depth/Other	**0.50-1.00**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**10/05/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.34	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached A10 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	<0.0001	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	0.04	4	50	200
Chloride	5	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	18.9	1000	20000	50000
Total Dissolved Solids	830	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	50	500	800	1000

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =	86.4
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	-
Particle Size <4mm =	>95%	Eluate Volume (l)	0.786

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/7348**			
Sample No	**12**			
Client Sample No	**TP4**			
Depth/Other	**0.50-1.00**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**10/05/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.27	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.06	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	<0.0001	0.01	0.2	2
Molybdenum	0.04	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	5	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	9.2	1000	20000	50000
Total Dissolved Solids	530	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	20	500	800	1000

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =	81.6
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	-
Particle Size <4mm =	>95%	Eluate Volume (l)	0.78

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/7348**			
Sample No	**15**			
Client Sample No	**TP5**			
Depth/Other	**0.50-1.00**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**10/05/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.36	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	<0.0001	0.01	0.2	2
Molybdenum	0.06	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	0.05	4	50	200
Chloride	8	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	9.4	1000	20000	50000
Total Dissolved Solids	590	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	60	500	800	1000

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =	85.9
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	-
Particle Size <4mm =	>95%	Eluate Volume (l)	0.775

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/7348**			
Sample No	**21**			
Client Sample No	**TP7**			
Depth/Other	**0.50-1.00**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**09/05/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.31	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.10	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	<0.0001	0.01	0.2	2
Molybdenum	0.04	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	5	800	15000	25000
Fluoride	4	10	150	500
Sulphate as SO4	9.3	1000	20000	50000
Total Dissolved Solids	840	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	-	Dry Matter Content Ratio (%) =	78.2
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	-
Particle Size <4mm =	>95%	Eluate Volume (l)	0.775

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/7348**			
Sample No	**24**			
Client Sample No	**TP8**			
Depth/Other	**0.50-1.00**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**09/05/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	1.08	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached A10 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.25	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	0.035	0.5	10	70
Copper	<0.07	2	50	100
Mercury	<0.0001	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	0.14	4	50	200
Chloride	4	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	8.0	1000	20000	50000
Total Dissolved Solids	590	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	90	500	800	1000

Client Name: IGSL

Matrix : Solid

Reference:

Location: LIHAF Newtown - Drogheda, Louth

Contact: Darren Keogh

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
18/7348	1	TP2	0.50-1.00	4-6	No Interpretation Possible
18/7348	1	TP3	0.50-1.00	7-9	No Interpretation Possible
18/7348	1	TP4	0.50-1.00	10-12	No Interpretation Possible
18/7348	1	TP5	0.50-1.00	13-15	No Interpretation Possible
18/7348	1	TP7	0.50-1.00	19-21	No Interpretation Possible
18/7348	1	TP8	0.50-1.00	22-24	No Interpretation Possible

Client Name: IGSL
Reference:
Location: LIHAF Newtown - Drogheda, Louth
Contact: Darren Keogh

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/7348	1	TP2	0.50-1.00	5	25/05/2018	**General Description (Bulk Analysis)**	Soil/Stones
					25/05/2018	**Asbestos Fibres**	NAD
					25/05/2018	**Asbestos Fibres (2)**	NAD
					25/05/2018	**Asbestos ACM**	NAD
					25/05/2018	**Asbestos ACM (2)**	NAD
					25/05/2018	**Asbestos Type**	NAD
					25/05/2018	**Asbestos Type (2)**	NAD
					25/05/2018	**Asbestos Level Screen**	NAD
18/7348	1	TP3	0.50-1.00	8	25/05/2018	**General Description (Bulk Analysis)**	Soil/Stones
					25/05/2018	**Asbestos Fibres**	NAD
					25/05/2018	**Asbestos Fibres (2)**	NAD
					25/05/2018	**Asbestos ACM**	NAD
					25/05/2018	**Asbestos ACM (2)**	NAD
					25/05/2018	**Asbestos Type**	NAD
					25/05/2018	**Asbestos Type (2)**	NAD
					25/05/2018	**Asbestos Level Screen**	NAD
18/7348	1	TP4	0.50-1.00	11	25/05/2018	**General Description (Bulk Analysis)**	Soil/Stones
					25/05/2018	**Asbestos Fibres**	NAD
					25/05/2018	**Asbestos Fibres (2)**	NAD
					25/05/2018	**Asbestos ACM**	NAD
					25/05/2018	**Asbestos ACM (2)**	NAD
					25/05/2018	**Asbestos Type**	NAD
					25/05/2018	**Asbestos Type (2)**	NAD
					25/05/2018	**Asbestos Level Screen**	NAD
18/7348	1	TP5	0.50-1.00	14	25/05/2018	**General Description (Bulk Analysis)**	Soil/Stone
					25/05/2018	**Asbestos Fibres**	NAD
					25/05/2018	**Asbestos Fibres (2)**	NAD
					25/05/2018	**Asbestos ACM**	NAD
					25/05/2018	**Asbestos ACM (2)**	NAD
					25/05/2018	**Asbestos Type**	NAD
					25/05/2018	**Asbestos Type (2)**	NAD
					25/05/2018	**Asbestos Level Screen**	NAD
18/7348	1	TP7	0.50-1.00	20	25/05/2018	**General Description (Bulk Analysis)**	Soil/Stone
					25/05/2018	**Asbestos Fibres**	NAD
					25/05/2018	**Asbestos Fibres (2)**	NAD

Client Name: IGSL
Reference:
Location: LIHAF Newtown - Drogheda, Louth
Contact: Darren Keogh

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/7348	1	TP7	0.50-1.00	20	25/05/2018	**Asbestos ACM**	NAD
					25/05/2018	**Asbestos ACM (2)**	NAD
					25/05/2018	**Asbestos Type**	NAD
					25/05/2018	**Asbestos Type (2)**	NAD
					25/05/2018	**Asbestos Level Screen**	NAD
18/7348	1	TP8	0.50-1.00	23	25/05/2018	**General Description (Bulk Analysis)**	Soil/Stone
					25/05/2018	**Asbestos Fibres**	NAD
					25/05/2018	**Asbestos Fibres (2)**	NAD
					25/05/2018	**Asbestos ACM**	NAD
					25/05/2018	**Asbestos ACM (2)**	NAD
					25/05/2018	**Asbestos Type**	NAD
					25/05/2018	**Asbestos Type (2)**	NAD
					25/05/2018	**Asbestos Level Screen**	NAD

Client Name: IGSL

Matrix : Solid

Reference:

Location: LIHAF Newtown - Drogheda, Louth

Contact: Darren Keogh

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
18/7348	1	TP2	0.50-1.00	4-6	GRO	Solid Samples were received at a temperature above 9°C.
18/7348	1	TP3	0.50-1.00	7-9	GRO	Solid Samples were received at a temperature above 9°C.
18/7348	1	TP4	0.50-1.00	10-12	GRO	Solid Samples were received at a temperature above 9°C.
18/7348	1	TP5	0.50-1.00	13-15	GRO	Solid Samples were received at a temperature above 9°C.
18/7348	1	TP7	0.50-1.00	19-21	GRO	Solid Samples were received at a temperature above 9°C.
18/7348	1	TP8	0.50-1.00	22-24	GRO	Solid Samples were received at a temperature above 9°C.

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

Client Name: IGSL

Matrix : CEN 10:1 1 Batch

Reference:

Location: LIHAF Newtown - Drogheda, Louth

Contact: Darren Keogh

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
18/7348	1	TP2	0.50-1.00	4-6	TDS	Sample holding time exceeded
18/7348	1	TP3	0.50-1.00	7-9	TDS	Sample holding time exceeded
18/7348	1	TP4	0.50-1.00	10-12	TDS	Sample holding time exceeded
18/7348	1	TP5	0.50-1.00	13-15	TDS	Sample holding time exceeded
18/7348	1	TP7	0.50-1.00	19-21	TDS	Sample holding time exceeded
18/7348	1	TP8	0.50-1.00	22-24	TDS	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/7348

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 18/7348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes

JE Job No: 18/7348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

JE Job No: 18/7348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM38	Samples are brominated to reduce all mercury compounds to Mercury (II) which is analysed using method TM061.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes

JE Job No: 18/7348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM108	Determination of Elemental Sulphur by Reversed Phase High Performance Liquid Chromatography with Ultra Violet spectroscopy.	PM114	End over end extraction of dried and crushed soil samples for organic analysis. The solvent mix varies depending on analysis required			AD	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Appendix - Methods used for WAC (2003/33/EC)

Leachate tests	
10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and filtered over 0.45 µm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ba	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Hg	I.S. EN 13370 rec. EN 1483 (CVAAS)
Mo	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Fluoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometic methods after distillation)* (BY HPLC - Jones Env)
DOC	I.S. EN 1484
TDS	I.S. EN 15216
Compositional analysis	
TOC	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Mineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Metals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 (ICP-OES)
Other	
Dry matter	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fischer-titration and either volumetric or coulometric detection.
LOI	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS

**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

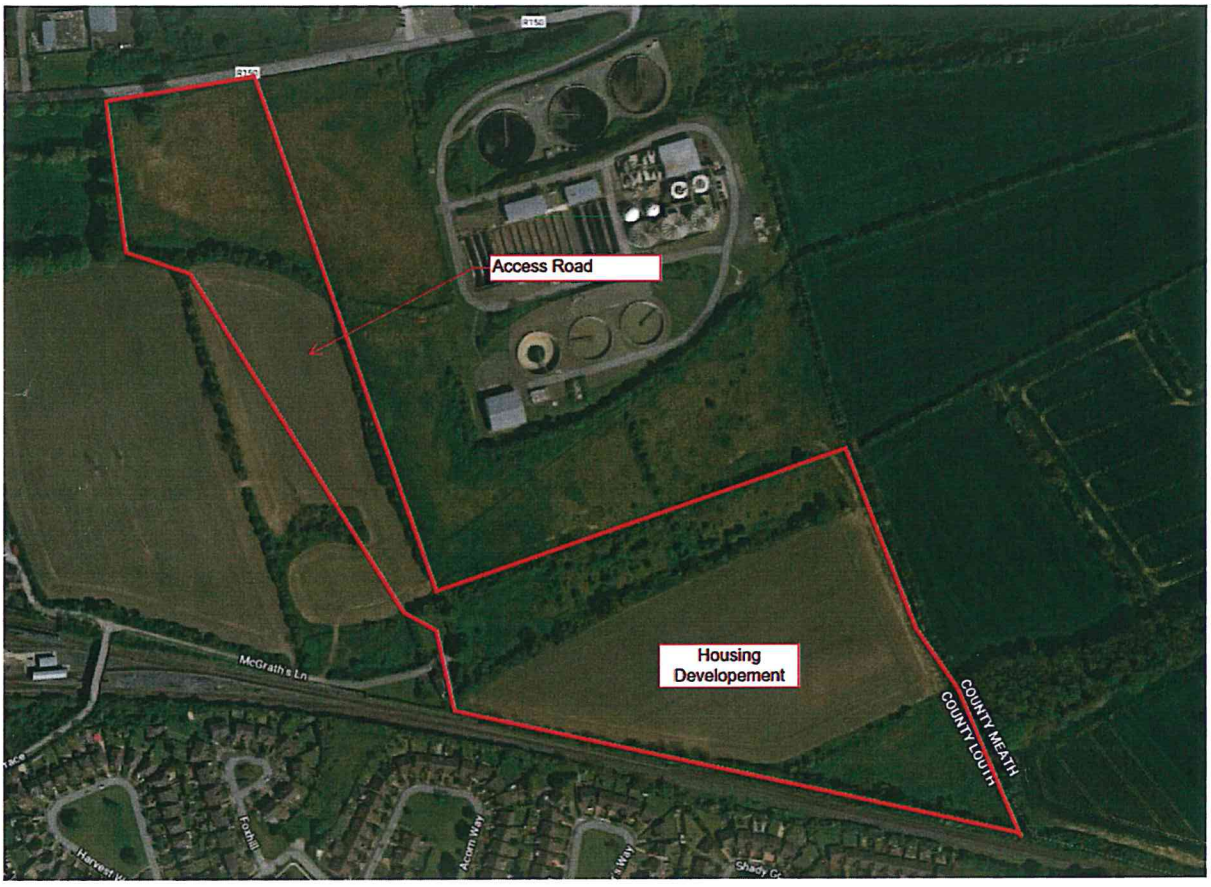
***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.

Appendix VI Site Plans / Sections

Waterman Moylan
Engineering Consultants

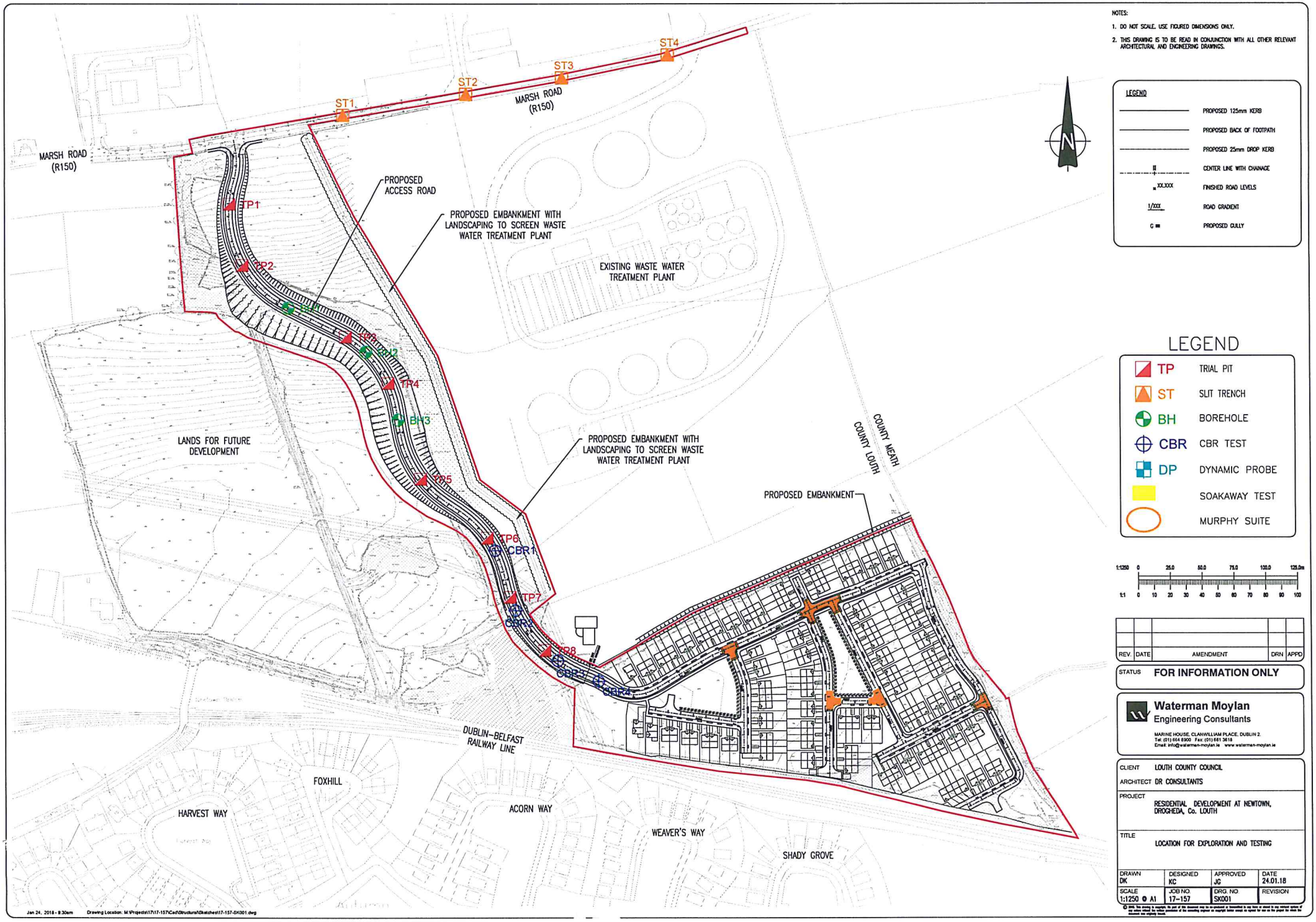
APPENDICES

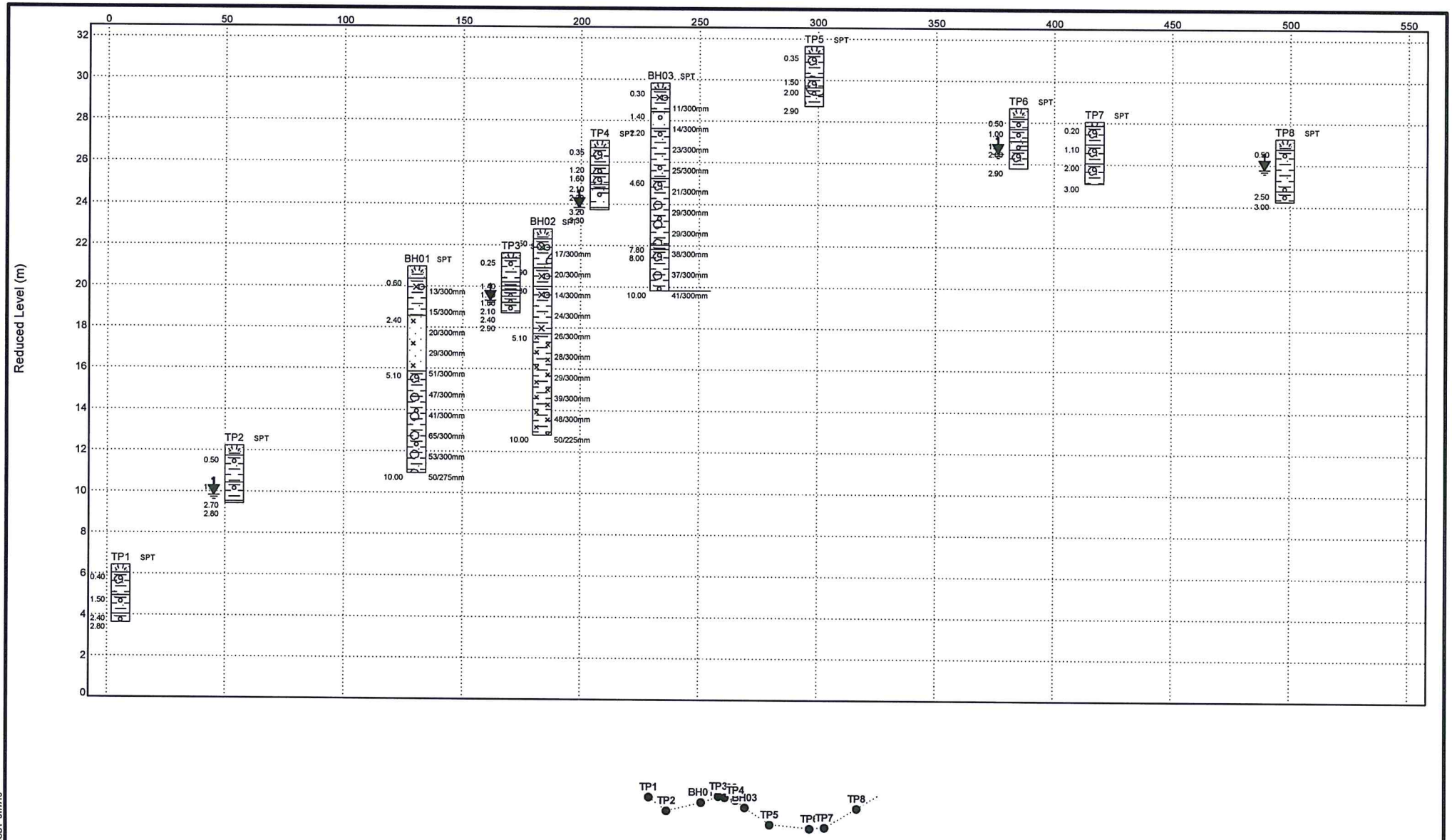
A. Site Location Map



Site Location 17-157 - SK001

Specification for Site Investigation
Project Number: 17-157
Document Reference: 17-157sir.001


NOTES:
1. DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS.
LEGEND
PROPOSED 125mm KERB
PROPOSED BACK OF FOOTPATH
PROPOSED 25mm DROP KERB
CENTER LINE WITH CHAINAGE
XX.XXX FINISHED ROAD LEVELS
1/XXX ROAD GRADIENT
PROPOSED GULLY
N
MARSH ROAD (R150)
ST1
ST2
ST3
ST4
MARSH ROAD (R150)
PROPOSED ACCESS ROAD
PROPOSED EMBANKMENT WITH LANDSCAPING TO SCREEN WASTE WATER TREATMENT PLANT
EXISTING WASTE WATER TREATMENT PLANT
TP1
TP2
BH1
TP3
BH2
TP4
BH3
TP5
LANDS FOR FUTURE DEVELOPMENT
PROPOSED EMBANKMENT WITH LANDSCAPING TO SCREEN WASTE WATER TREATMENT PLANT
COUNTY MEATH
COUNTY LOUTH
PROPOSED EMBANKMENT
TP6
CBR1
TP7
CBR2
CBR3
TP8
CBR4
CBR5
DUBLIN–BELFAST RAILWAY LINE
FOXHILL
HARVEST WAY
ACORN WAY
WEAVER'S WAY
SHADY GROVE
LEGEND
TP TRIAL PIT
ST SLIT TRENCH
BH BOREHOLE
CBR CBR TEST
DP DYNAMIC PROBE
SOAKAWAY TEST
MURPHY SUITE
1:1250 0 25.0 50.0 75.0 100.0 125.0m
1:1 0 10 20 30 40 50 60 70 80 90 100
REV. DATE AMENDMENT DRN APPD
STATUS FOR INFORMATION ONLY
Waterman Moylan
Engineering Consultants
MARINE HOUSE, CLANWILLIAM PLACE, DUBLIN 2.
Tel: (01) 664 6900 Fax: (01) 661 3618
Email: info@waterman-moylan.ie www.waterman-moylan.ie
CLIENT LOUTH COUNTY COUNCIL
ARCHITECT DR CONSULTANTS
PROJECT RESIDENTIAL DEVELOPMENT AT NEWTOWN, DROGHEDA, Co. LOUTH
TITLE LOCATION FOR EXPLORATION AND TESTING
DRAWN DK | DESIGNED KC | APPROVED JC | DATE 24.01.18
SCALE 1:1250 @ A1 | JOB NO. 17-157 | DRG. NO. SK001 | REVISION
Jan 24, 2018 - 9:30am Drawing Location: M:\Projects\17\17-157\Cad\Structural\Sketches\17-157-SK001.dwg



LITHOLOGY GRAPHICS

- TOPSOIL
- Sandy gravelly silty CLAY
- Silty SAND
- Sandy gravelly cobbly CLAY
- Sandy gravelly silty clay with cobbles and boulders
- Silty CLAY
- Gravelly SAND
- Sandy gravelly CLAY
- Sandy CLAY
- Silty gravelly CLAY
- Clayey gravelly SAND
- Clayey sandy GRAVEL
- Silty sandy gravelly bouldery CLAY

SUBSURFACE SECTION A-A

Client: Louth County Council

Project: LIHAF - Newtown,Drogheda,Co.Louth

Number: 20951

FENCE A3 CARRIGTWOHILL 20951.GPJ IGSL.GDT 31/7/18