10.2 Dundalk Bio-Pharmaceutical Facility GroundInvestigation Report' (Ground InvestigationsIreland, 2019)

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Ground Investigations Ireland

Dundalk Bio-Pharmaceutical Facility

Ground Investigation Report

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GROUND INVESTIGATIONS IRELAND

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CONTENTS

APPENDICES

1.0 Preamble

On the instructions of Greg Daly Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between November and December 2018 at the site of the proposed Bio-Pharmaceutical Facility in Dundalk, Co. Louth. Further work consisting of additional trial pits and rotary core boreholes were completed in January 2019.

2.0 Overview

It is proposed to construct a new manufacturing facility with associated services, access roads and car parking at the proposed site. The site is currently greenfield and is serviced by an existing access road and roundabout from the N52 providing a direct link to Dundalk town and the M1 Motorway.

The site is currently used for agricultural purposes and is bounded to the north by the Mulaharlin Road and the N52, to the east by agricultural lands with some residential development along the existing road network. A housing estate is present to the south east of the site and the southern site boundary is formed by the Marlbog Road. The site is situated to the north of the Boyne River Estuary and approximately three kilometres from the coast. The Mulagharlin Road and the Dublin to Belfast Railway line form the western boundary. The topographical survey provided for the site has a generally consistent topography with areas of high (+27m OD) and (+17m OD) low ground present over the proposed site development area.

3.0 Desk Study

The previous site use from inspection of the historic mapping available on the OSi digital Geohive viewer is likely to be agricultural with the field boundaries similar to the current arrangement. A pump is noted to the east of the proposed facility on the 25" mapping (1888-1913) and a Haynestown Cottage is noted on both the 6" (1837 – 1852) and 25" mapping to the north. A rock exposure is noted on the map to the south of the site and an area of soft or marshy ground is noted to the east associated with a watercourse, perhaps the site of a spring.

The GSI quaternary mapping indicate the site is underlain by Till derived from Lower Palaeozoic sandstones and shales with rock sub crops or outcrops noted along the line of the railway directly to the east of the site and further away to the south of the site. Alluvium associated with local watercourses is present to the east of the current site, between the proposed pumping station and the building with further larger areas surrounding the site. outside of the current site

The mineral layer on the mapping notes lead discovered in drain near railway cutting. Noted on old 6in. map. A brick and tile factory is noted to the south of the site and calcite is noted to the east of the site adjacent to the coast.

The 1:100k Bedrock mapping indicates the site is underlain by the Clontail Formation consisting of calcareous red-mica greywacke, with a lithological description of Green-grey, medium to thickly bedded, coarse and very fine grained Tae greywackes, with dark grey, thinly bedded, poorly graded, quartzose fine sandstone to siltstone units. Both lithologies contain distinctive brown-red coloured biotite. No karst features are noted close to the proposed site or in the Clontail Formation. This formation is noted as a Poor

Aquifer - Bedrock which is Generally Unproductive except for Local Zones with groundwater vulnerability noted as high associated with areas of outcropping bedrock or shallow overburden cover.

The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant. A pumping station is noted to the east of the proposed facility and may require excavations to install plant and equipment. Earthworks are anticipated to be required to provide a level platform for the proposed building and to construct car parking and yard areas in the undulating topography.

3.1. Purpose and Scope

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 30 No. Trial Pits to a maximum depth of 3.5m BGL
- Carry out 6 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Carry out 40 No. Dynamic Probes to determine soil strength/density characteristics
- Carry out 40 No. Plate Bearing Tests to determine subgrade modulus/CBR parameters
- Carry out 20 No. Cable Percussion Boreholes to a maximum depth of 4.3m BGL
- Carry out 5 No. Rotary Core Boreholes to a maximum depth of 9.7m BGL
- Geotechnical & Environmental Laboratory testing
- Report with recommendations

4.0 Subsurface Exploration

4.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.
The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

4.2. Trial Pits

The trial pits were excavated using a 13T tracked excavator at the locations shown in the exploratory hole location plan in Appendix 1. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The trial pits were sampled, logged and photographed by a Geotechnical Engineer/Engineering Geologist prior to backfilling with arisings. Notes were made of any

services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the trial pit logs which are provided in Appendix 2 of this Report.

4.3. Soakaway Testing

The soakaway testing was carried out in selected trial pits at the locations shown in the exploratory hole location plan in Appendix 1. These pits were carefully excavated and filled with water to assess the infiltration characteristics of the proposed site. The pits were allowed to drain and the drop in water level was recorded over time as required by BRE Digest 365. The pits were logged prior to completing the soakaway test and were backfilled with arising's upon completion. The soakaway test results are provided in Appendix 3 of this Report.

4.4. Dynamic Probing

The dynamic probe tests (DPH) were carried out at the locations shown in the location plan in Appendix 1 in accordance with B.S. 1377: Part 9 1990. The test consists of mechanically driving a cone with a 50kg weight in 100mm intervals and monitoring the number of blows required. An equivalent Standard Penetration Test (SPT) 'N' value may be calculated by dividing the total number of blows over a 300mm drive length by 1.5. The dynamic probe logs are provided in Appendix 4 of this Report.

4.5. Insitu Plate Bearing Test

The plate bearing tests were carried out using a 305mm or 450mm diameter plate at the locations shown on the site plan in Appendix 1. The plate was loaded in increments using a hydraulic jack and an excavator to provide a reaction and the displacement was monitored in accordance with BS1377 Part 9 using independently mounted digital strain gauges. The constrained modulus and equivalent CBR are calculated in accordance with HD29/75 and are provided on the test reports in Appendix 6 of this Report.

4.6. Cable Percussion Boreholes (pending)

The Cable Percussion Boreholes were drilled using a Dando 2000 drilling rig with regular in-situ testing and sampling undertaken to facilitate the production of geotechnical logs and laboratory testing. BH02, BH04 and BH06 were cancelled and replaced with further rotary boreholes elsewhere on the site.

The standard method of boring in soil for site investigation is known as the Cable Percussion method. It consists of using a Shell in non cohesive soils and a clay cutter in cohesive soils, both operated on a wire cable. Very hard soils, boulders and other hard obstructions are broken up by chiselling and the fragments removed with the Shell. Where ground conditions made it necessary, the borehole was lined with 200mm diameter steel casing. While the use of the Cable Percussion method of boring gives the maximum data on soil conditions, some mixing of laminated soil is inevitable. For this reason, thin lenses of granular material may not be noticed. Disturbed samples were taken from the boring tools at suitable depths, so that there is a representative sample at the top of each change in stratum and thereafter at regular intervals

down the borehole until the next stratum was encountered. The disturbed samples were then sealed and sent to the laboratory where they were visually examined to confirm the description of the relevant strata. Standard Penetration Tests were carried out in the boreholes. The results of these tests, together with the depths at which the tests were taken are shown on the accompanying borehole records. The test consists of a thick wall sampler tube, 50mm external diameter, being driven into the soil by a monkey weighing 63.5kg and with a free drop of 760mm. For gravels and glacial till the driving shoe was replaced by a solid 60º cone. The Standard Penetration Test number referred to as the 'N' value is the number of blows required to drive the tube 300mm, after an initial penetration of 150mm. The number gives a guide to the consistency of the soil and can also be used to estimate the relative strength/density at the depth of the test and also to estimate the bearing capacity and compressibility of the soil. The cable percussion borehole logs are provided in Appendix 6 of this Report.

4.7. Rotary Boreholes

The rotary coring was carried out by a track mounted T44 Beretta rig at the locations shown on the location plan in Appendix 1. The rotary boreholes were completed from the ground surface or alternatively, where noted on the individual borehole log, from the base of the cable percussion borehole where a temporary liner was installed to facilitate follow-on rotary coring.

The T44 Beretta is equipped with rubber tracks which allow for short travel on pavement surfaces avoiding any damage to the surface. The T44 Beretta utilises a triple tube core barrel system operated using a wireline drilling process. The outer barrel is rotated by the drill rods and at its lower end, carries the coring bit. The inner barrel is mounted on a swivel so that it does not rotate during the process. The third barrel or liner is placed within the second one to retain the core intact and to preserve as much as possible the fabric of the drilling stratum. The core is cut by the coring bit and passes to the inner liner. The core is brought up to the surface within the inner barrel on a small diameter wire rope or line attached to the "overshoot" recovery tool which is then placed into a core box in order of recovery. A drilling fluid, typically air mist or water flush is passed from the surface through hollow drill rods to the drill bit and is used to cool the drill bit. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids. It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring. The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The rotary borehole logs are provided in Appendix 6 of this Report.

4.8. Surveying

The exploratory hole locations have been recorded using a Trimble R10 GNSS System which records the coordinates and elevation of the locations to ITM or Irish National Grid as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

4.9. Groundwater/Gas Monitoring Installations

Groundwater and or Gas Monitoring Installation were installed upon the completion of the boreholes to enable sampling and the determination of the equilibrium groundwater level. The typical groundwater monitoring installation consists of a 50mm HDPE slotted pipe with a pea gravel response zone and bentonite seal installed to the Engineers specification. Where required the standpipe is sealed with a gas tap and finished with a durable steel cover fixed in place with a concrete surround. The installation details are provided on the exploratory hole logs in the appendices of this Report.

4.10. Laboratory Testing

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design.
Environmental testing, including Waste Acceptance Criteria (WAC), pH and sulphate testing was carried out by Jones Environmental Laboratory in the UK.
Geotechnical testing consisting of moisture content, Atterberg limits, Particle Size Distribution (PSD), hydrometer, California Bearing Ratio (CBR) and Moisture Condition Value (MCV) tests were carried out in NMTL's Geotechnical Laboratory in Carlow. The results of the laboratory testing are included in Appendix 7 of this Report.

5.0 Ground Conditions

5.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were consistent across the site and are generally comprised;

- Topsoil/Surfacing
- Granular Deposits
- Cohesive Deposits
- Presumed Weathered Rock
- Bedrock

TOPSOIL: Topsoil was encountered in all the exploratory holes and was present typically to a maximum depth of 0.3m BGL.

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Topsoil and were described typically as *soft, soft to firm or firm to stiff brown sandy gravelly CLAY with occasional cobbles and boulders* overlying a *stiff or very stiff grey brown sandy gravelly CLAY with occasional cobbles and boulders*. The

secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. The strength of the cohesive deposits typically increased with depth and was typically firm to stiff or stiff below 1.5m BGL in the majority of the exploratory holes. Soft to firm or firm cohesive deposits were present at some locations to a depth of up to 3.0m BGL in places as shown in the dynamic probing logss which give a strength profile site depth. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

GRANULAR DEPOSITS: The granular deposits were encountered at the base of the cohesive deposits in TP3, TP7 and TP9 below depths of 1.8m to 3.0m BGL and were typically described as Grey brown orange clayey slightly sandy GRAVEL with frequent angular cobbles and occasional boulders and was noted as possible weathered Rock. The secondary sand/gravel and silt/clay constituents varied across the site and with depth while occasional or frequent cobble and boulder content also present where noted on the exploratory hole logs. It should be noted that many of the trial pits where granular deposits or groundwater were encountered, experienced instability. This was described either as side wall spalling or as side wall collapse in the remarks section at the base of the trial pit logs.

PRESUMED WEATHERED BEDROCK: In the majority of trial pits and cable percussion boreholes presumed weathered rock was encountered in which the trial pits were terminated upon encountering the more competent bedrock, in which further excavation became more difficult. Some trial pits note that boulders were encountered and at depth it can be difficult to determine the nature of the obstruction, weather it is bedrock or a large boulder which makes excavation difficult within the confines of the trial pit. Rotary coring is recommended to verify the depth to bedrock across the site, particularly where it is present within the depth of proposed excavations on the site.

BEDROCK: The rotary core boreholes recovered Weak to very strong grey thinly bedded fine grained SANDSTONE. The depth to rock varies from 1.20m BGL in RC05 to a maximum of 5.00m BGL in BH03+RC01. The total core recovery is good, typically 100% but with some runs dropping to 80% where clay infilling was noted or in the upper weathered rock where the core may have been non-intact. The SCR and RQD both are relatively poor in the upper weathered zone, however both indices show an increase with depth in each of the boreholes. The rock testing consisting of point loads indicated the strength of the Sandstone to be 2.35 MPa to 11.66 MPa.

5.2. Insitu Strength Testing

The correlated DPH blow counts indicate that the overburden deposits are variable and range from stiff to very stiff in the top meter often reducing in stiffness with depth before refusing at similar depths to the trial pits. There are a number of probes which indicate lenses of firm cohesive deposits at depths of between 2.0m and 3.0m Some areas of soft or soft to firm deposits were encountered on the roadway into the site in DP30 to DP40.

5.3. Laboratory Testing

The results from the completed laboratory testing is included in Appendix 7 of this report, further testing will be included once complete in a revision to this report.

5.4. Groundwater

Groundwater strikes are noted on the exploratory hole logs where they occurred and where possible drilling was suspended for twenty minutes to allow the subsequent rise in groundwater to be recorded. We would point out that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the tide, time of year, rainfall, nearby construction and other factors. For this reason, standpipes are proposed to be installed in the cable percussion boreholes to allow the equilibrium groundwater level to be determined. The groundwater monitoring is included in Appendix 8 of this report.

APPENDIX 1 - Site Location Plan

LEGEND:

BH01–20	Cable Percussion Borehole
RC01–05	Rotary Borehole
TP01–30	Trial Pit, CBR & Dynamic Probe
CBR31–40	CBR only

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PROJECT:	IPS Dundalk
DRAWING No.:	GII-8115-10-18 01
DATE:	Jan 2019
CLIENT:	GDCL
SCALE:	NTS @ A3

Version:	Date:	Drawn By:	Checked:
No.	Date	Initials	Initials
01	21.01.19	JC	CF

LEGEND:

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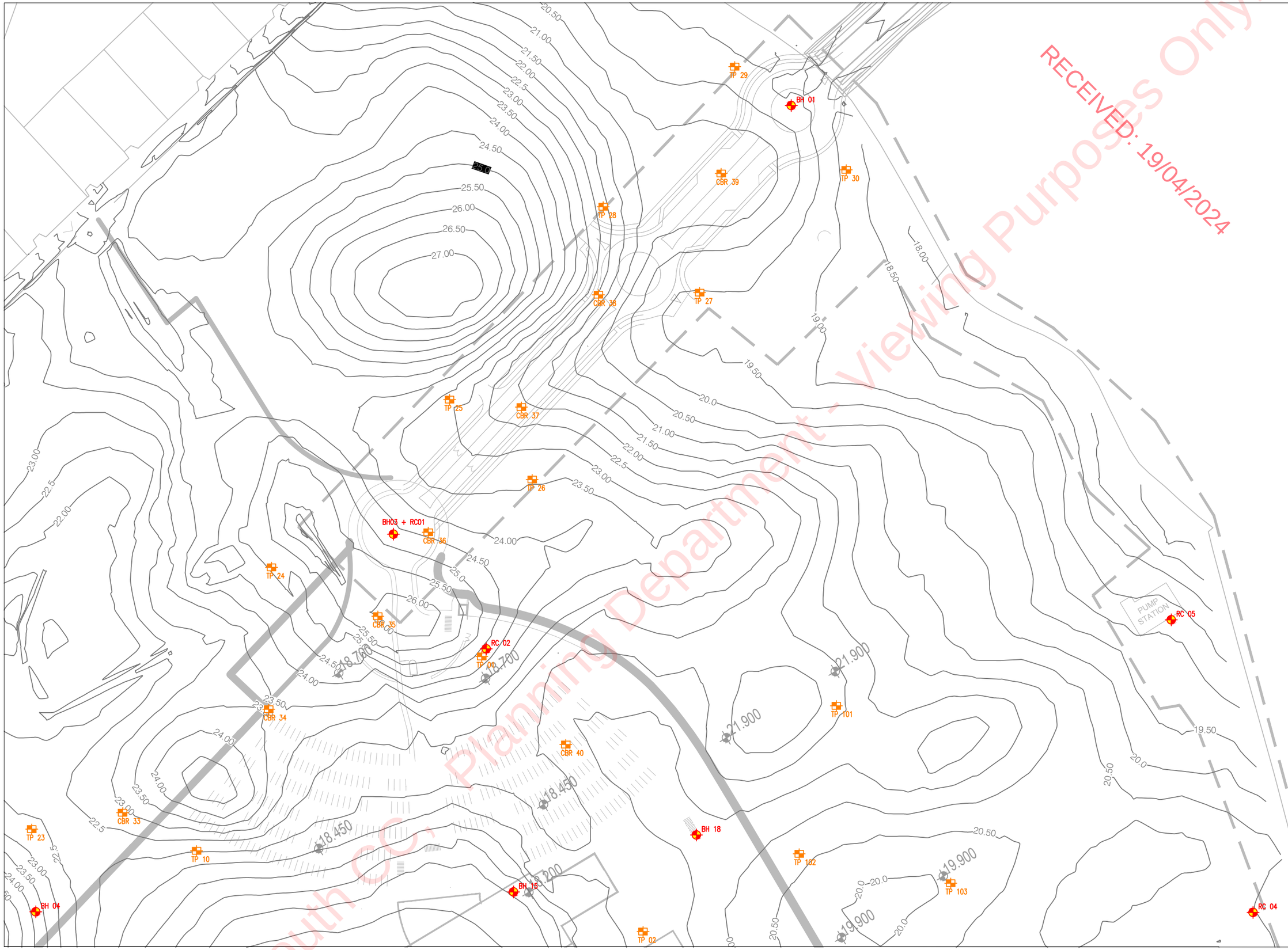
PROJECT:	IPS Dundalk
DRAWING No.:	GII-8115-10-18 02
DATE:	Jan 2019
CLIENT:	GDCL
SCALE:	NTS @ A3

Version:	Date:	Drawn By:	Checked:
No.	Date	Initials	Initials
01	21.01.19	JC	CF



LEGEND:

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RC01–05	Rotary Borehole
TP01–30	Trial Pit, CBR & Dynamic Probe
CBR31–40	CBR only

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PROJECT:	IPS Dundalk
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DATE:	Jan 2019
CLIENT:	GDCL
SCALE:	NTS @ A3

Version:	Date:	Drawn By:	Checked:
No.	Date	Initials	Initials
01	21.01.19	JC	CF

APPENDIX 2 – Trial Pit Records

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Site IPS Integrated Project			**Trial Pit Number** TP01
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 24.26	**Client** GDCL Consulting
	Location (dGPS) 704256.8 E 803324.7 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				24.11	(0.15) 0.15	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				23.96	(0.15) 0.30	Soft brown silty slightly sandy slightly gravelly CLAY.		
1.00	B				(0.90)	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles and rare boulders.		
				23.06	1.20	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
					(1.10)			
				21.96	2.30	Refusal at 2.3m BGL due to boulders. Complete at 2.30m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP01

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Site IPS Integrated Project			**Trial Pit Number** TP02
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 21.74	**Client** GDCL Consulting
	Location (dGPS) 704327.5 E 803204.2 N	**Dates** 09/11/2018	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				21.59	0.15			
					(0.15)	Soft dark brown silty slightly sandy slightly gravelly CLAY with rare cobbles.		
				21.44	0.30			
						Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
					(0.70)			
				20.74	1.00	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
					(0.60)			
1.50	B			20.14	1.60	Refusal at 1.60m BGL due to boulder.		
						Complete at 2.00m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP2

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Site IPS Integrated Project			**Trial Pit Number** TP03
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 19.45	**Client** GDCL Consulting
	Location (dGPS) 704367.9 E 803114.8 N	**Dates** 09/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				19.35	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.30)	Soft dark brown silty slightly sandy slightly gravelly CLAY.		
				19.05	0.40	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
					(0.70)			
1.00	B			18.35	1.10	Stiff to very stiff grey brown slightly sandy gravelly CLAY with frequent subangular to angular cobbles.		
					(0.90)			
				17.45	2.00	Grey brown orange clayey slightly sandy GRAVEL with frequent angular cobbles and occasional boulders. (Weathered Rock)		
					(0.50)			
2.50	B			16.95	2.50	Refusal at 2.50m BGL due to boulder.		
						Complete at 2.50m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP3

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Site IPS Integrated Project			**Trial Pit Number** TP04
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 16.73	**Client** GDCL Consulting
	Location (dGPS) 704455 E 803029.4 N	**Dates** 09/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				16.58	0.15			
					(0.20)	Soft dark brown silty slightly sandy slightly gravelly CLAY.		
				16.38	0.35			
					(0.65)	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
1.00	B			15.73	1.00			
					(1.10)	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
2.00	B			14.63	2.10			
						Refusal at 2.10m BGL due to boulder.		
						Complete at 2.50m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP4

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Site IPS Integrated Project			**Trial Pit Number** TP05
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 16.82	**Client** GDCL Consulting
	Location (dGPS) 704553.3 E 802903.6 N	**Dates** 09/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				16.67	(0.15) 0.15	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				16.57	(0.10) 0.25	Soft dark brown silty slightly sandy slightly gravelly CLAY with rare cobbles.		
					(0.75)	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with frequent subrounded to angular cobbles.		
				15.82	1.00	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
					(0.40)			
				15.42	1.40	Refusal at 1.40m BGL due to boulder/rock.		
						Complete at 2.50m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP5

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Site IPS Integrated Project			**Trial Pit Number** TP06
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 16.15	**Client** GDCL Consulting
	Location (dGPS) 704405.4 E 802881.1 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				15.95	0.20	Firm grey brown mottled silty slightly sandy slightly gravelly CLAY with rare subangular to subrounded cobbles.		
					(1.10)			
1.00	B							
				14.85	1.30	Stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(1.10)			
2.30	B			13.75	2.40	Refusal at 2.4m BGL due to boulders.		
						Complete at 2.40m		

Plan

Remarks

Groundwater encountered at 2.3m BGL in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP6

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Site IPS Integrated Project			**Trial Pit Number** TP07
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 16.41	**Client** GDCL Consulting
	Location (dGPS) 704373.3 E 802947.4 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				16.31	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				16.11	(0.20) 0.30	Soft brown silty slightly sandy slightly gravelly CLAY.		
					(0.60)	Soft to firm grey brown mottled silty slightly sandy slightly gravelly CLAY with rare subangular to angular cobbles.		
1.00	B			15.51	0.90	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(0.90)			
				14.61	1.80	Grey brown clayey slightly sandy GRAVEL with occasional subangular to angular cobbles and rare boulders. (Possible Weathered Rock)		
					(0.60)			
2.30	B			14.01	2.40	Refusal at 2.4m BGL due to boulders.		
						Complete at 2.40m		

Plan

Remarks

Groundwater encountered at 2.3m BGL in Trial Pit.
Trial Pit sidewalls collasping 2.3m BGL.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP7

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Site IPS Integrated Project			**Trial Pit Number** TP08
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 16.56	**Client** GDCL Consulting
	Location (dGPS) 704299.6 E 803024.2 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				16.46	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				16.31	(0.15) 0.25	Soft brown silty slightly sandy slightly gravelly CLAY.		
					(1.05)	Firm grey brown mottled silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.20	B			15.26	1.30	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.80)			
2.10	B			14.46	2.10	Refusal at 2.1m BGL due to boulders.		
						Complete at 2.10m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP8

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Site IPS Integrated Project			**Trial Pit Number** TP09
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 18.89	**Client** GDCL Consulting
	Location (dGPS) 704220.9 E 803160.7 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				18.69	0.20			
					(0.20)	Soft dark brown silty slightly sandy slightly gravelly CLAY with rare cobble.		
				18.49	0.40			
						Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(0.90)			
1.00	B							
				17.59	1.30			
						Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(1.50)			
2.30	B							
				16.09	2.80	Refusal at 2.8m BGL due to boulders.		
						Complete at 2.80m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP09

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Site IPS Integrated Project			**Trial Pit Number** TP10
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 21.99	**Client** GDCL Consulting
	Location (dGPS) 704131.6 E 803239.8 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				21.89	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.50)	Soft brown silty slightly sandy slightly gravelly CLAY with rare cobble.		
				21.39	0.60	Firm orange brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.00	B				(0.90)			
				20.49	1.50	Stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles.		
					(1.50)			
2.50	B							
				18.99	3.00	Very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
					(0.30)			
				18.69	3.30	Refusal at 3.30m BGL due to boulders.		
						Complete at 3.30m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP10

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Site IPS Integrated Project			**Trial Pit Number** TP11
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 21.28	**Client** GDCL Consulting
	Location (dGPS) 704098 E 803189.9 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				21.18	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.50)	Soft to firm brown silty slightly sandy slightly gravelly CLAY with rare cobble.		
				20.68	0.60	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.00	B				(1.20)			
				19.48	1.80	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
2.20	B				(1.60)			
				17.88	3.40	Refusal at 3.40m BGL due to boulders.		
						Complete at 3.40m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP11

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Site IPS Integrated Project			**Trial Pit Number** TP12
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 17.98	**Client** GDCL Consulting
	Location (dGPS) 704215.2 E 803017.5 N	**Dates** 07/11/2018	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				17.88	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				17.68	(0.20) 0.30	Soft brown silty slightly sandy slightly gravelly CLAY with rare subrounded to angular cobbles.		
					(1.00)	Firm grey brown mottled slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.20	B			16.68	1.30	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.90)			
				15.78	2.20	Refusal at 2.2m BGL due to boulders.		
						Complete at 2.20m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP12

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Site IPS Integrated Project			**Trial Pit Number** TP13
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 18.91	**Client** GDCL Consulting
	Location (dGPS) 704329.9 E 802858.4 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				18.71	0.20	Firm grey brown silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.		
					(0.60)			
				18.11	0.80	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
1.00	B				(0.80)			
				17.31	1.60	Refusal at 1.60m BGL due to boulders.		
						Complete at 1.60m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP13

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Site IPS Integrated Project			**Trial Pit Number** TP14
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 22.97	**Client** GDCL Consulting
	Location (dGPS) 704234.9 E 802882.4 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				22.87	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				22.67	(0.20) 0.30	Soft brown silty slightly sandy slightly gravelly CLAY with rare subangular to subrounded cobbles.		
					(0.50)	Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
				22.17	0.80			
1.00	B				(0.50)	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
				21.67	1.30	Refusal at 1.30m BGL due to boulders.		
						Complete at 1.30m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP14

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Site IPS Integrated Project			**Trial Pit Number** TP15
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 21.05	**Client** GDCL Consulting
	Location (dGPS) 704208.7 E 802949.4 N	**Dates** 07/11/2018	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				20.85	0.20			
					(0.20)	Soft to firm brown silty slightly sandy slightly gravelly CLAY with rare subangular to subrounded cobbles.		
				20.65	0.40			
					(1.00)	Firm to stiff brown silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.00	B							
				19.65	1.40			
					(0.70)	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
2.00	B							
				18.95	2.10	Refusal at 2.10m BGL due to boulders.		
						Complete at 2.10m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP15

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Site IPS Integrated Project			**Trial Pit Number** TP16
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 20.65	**Client** GDCL Consulting
	Location (dGPS) 704145.1 E 803015.6 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				20.45	(0.20) 0.20	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.70)	Soft to firm brown silty slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
1.00	B			19.75	0.90	Firm to stiff grey light brown silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(1.10)			
2.50	B			18.65	2.00	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent angular cobbles and rare boulders.		
					(1.40)			
3.40	B			17.25	3.40	Refusal at 3.4m BGL due to boulders.		
						Complete at 3.40m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP16

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Site IPS Integrated Project			**Trial Pit Number** TP17
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 23.31	**Client** GDCL Consulting
	Location (dGPS) 704116.6 E 803086.8 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				23.21	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.35)	Soft to firm brown silty slightly sandy slightly gravelly CLAY with rare subangular to subrounded cobbles.		
				22.86	0.45	Firm to stiff light brown grey silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(0.65)			
				22.21	1.10	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
1.50	B							
					(1.60)			
				20.61	2.70	Very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and boulders.		
3.00	B				(0.60)			
				20.01	3.30	Refusal at 3.30m BGL due to boulders.		
						Complete at 3.30m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP17

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Site IPS Integrated Project			**Trial Pit Number** TP18
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 24.29	**Client** GDCL Consulting
	Location (dGPS) 704026.2 E 803115.9 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				24.19	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				23.99	(0.20) 0.30	Soft to firm brown silty slightly sandy slightly gravelly CLAY.		
0.50	B				(0.70)	Firm dark brown silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
				23.29	1.00	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.80	B			22.39	(0.90) 1.90	Very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
				20.89	(1.50) 3.40	Refusal at 3.40m BGL due to boulders.		
						Complete at 3.40m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP18

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Site IPS Integrated Project			**Trial Pit Number** TP19
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 23.86	**Client** GDCL Consulting
	Location (dGPS) 704096.4 E 803035.4 N	**Dates** 08/11/2018	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				23.76	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.40)	Soft to firm brown silty slightly sandy slightly gravelly CLAY with rare subangular to subrounded cobbles.		
				23.36	0.50	Firm to stiff light brown grey silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.00	B				(0.70)			
				22.66	1.20	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
2.00	B				(1.00)			
				21.66	2.20	Refusal at 2.20m BGL due to boulders.		
						Complete at 2.20m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP19

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Site IPS Integrated Project			**Trial Pit Number** TP20
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 23.12	**Client** GDCL Consulting
	Location (dGPS) 704140.8 E 802956.3 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				23.02	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				22.82	(0.20) 0.30	Soft brown silty slightly sandy slightly gravelly CLAY with rare subrounded to angular cobbles.		
0.50	B				(0.70)	Firm to stiff grey light brown silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
				22.12	1.00	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent angular cobbles and rare boulders.		
1.60	B				(1.30)			
				20.82	2.30	Refusal at 2.3m BGL due to boulders.		
						Complete at 2.30m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP20

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Site IPS Integrated Project			**Trial Pit Number** TP21
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 22.38	**Client** GDCL Consulting
	Location (dGPS) 704214.9 E 802831.2 N	**Dates** 07/11/2018	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				22.23	(0.15) 0.15	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
						Firm grey brown silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.		
					(0.65)			
				21.58	0.80	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
1.00	B							
					(1.40)			
2.00	B							
				20.18	2.20	Refusal at 2.20m BGL due to boulders.		
						Complete at 2.20m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP21

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Site IPS Integrated Project			**Trial Pit Number** TP22
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 25.72	**Client** GDCL Consulting
	Location (dGPS) 703996.6 E 803183.4 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				25.62	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.30)	Soft to firm brown silty slightly sandy slightly gravelly CLAY.		
				25.32	0.40	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.00	B				(1.30)			
				24.02	1.70	Stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles.		
					(1.20)			
				22.82	2.90	Very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.40)			
3.20	B			22.42	3.30	Refusal at 3.30m BGL due to boulders.		
						Complete at 3.30m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP22

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Site IPS Integrated Project			**Trial Pit Number** TP23
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 22.54	**Client** GDCL Consulting
	Location (dGPS) 704059.6 E 803249.6 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				22.39	(0.15) 0.15	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
						Soft to firm brown silty slightly sandy slightly gravelly CLAY with rare cobble.		
					(0.65)			
0.80	B			21.74	0.80	Firm to stiff orange brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(1.40)			
1.80	B							
				20.34	2.20	Stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles.		
					(0.80)			
				19.54	3.00	Very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
					(0.30)			
				19.24	3.30	Refusal at 3.30m BGL due to boulders.		
						Complete at 3.30m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP23

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Site IPS Integrated Project			**Trial Pit Number** TP24
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 25.01	**Client** GDCL Consulting
	Location (dGPS) 704164.3 E 803363.8 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				24.81	0.20			
					(0.15)	Soft brown silty slightly sandy slightly gravelly CLAY.		
				24.66	0.35			
						Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(0.85)			
0.90	B							
				23.81	1.20			
						Stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles.		
					(0.80)			
				23.01	2.00			
						Very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.60)			
2.30	B							
				22.41	2.60	Refusal at 2.60m BGL due to boulders.		
						Complete at 2.60m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP24

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Site IPS Integrated Project			**Trial Pit Number** TP25
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 23.11	**Client** GDCL Consulting
	Location (dGPS) 704242.9 E 803436.6 N	**Dates** 07/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				22.96	0.15			
					(0.15)	Soft brown silty slightly sandy slightly gravelly CLAY.		
				22.81	0.30			
						Firm orange brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(0.80)			
1.00	B			22.01	1.10			
						Stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles.		
					(1.20)			
2.20	B			20.81	2.30			
						Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.70)			
				20.11	3.00	Refusal at 3.0m BGL due to boulders.		
						Complete at 3.00m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP25

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Site IPS Integrated Project			**Trial Pit Number** TP26
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 23.39	**Client** GDCL Consulting
	Location (dGPS) 704279 E 803402.3 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				23.24	(0.15) 0.15	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.25)	Soft brown silty slightly sandy slightly gravelly CLAY with rare cobbles.		
				22.99	0.40	Firm orange brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles and rare boulders.		
					(0.80)			
				22.19	1.20	Stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles.		
1.50	B				(1.10)			
				21.09	2.30	Very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.70)			
				20.39	3.00	Refusal at 3.0m BGL due to boulders.		
						Complete at 3.00m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP26

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Site IPS Integrated Project			**Trial Pit Number** TP27
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 19.44	**Client** GDCL Consulting
	Location (dGPS) 704352.1 E 803484.1 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				19.34	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.30)	Soft brown silty slightly sandy slightly gravelly CLAY.		
				19.04	0.40	Firm orange brown slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
					(0.50)			
				18.54	0.90	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
1.00	B				(0.60)			
				17.94	1.50	Stiff to very stiff grey brown sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(1.50)			
2.50	B							
				16.44	3.00	Refusal at 3.0m BGL due to boulders.		
						Complete at 3.00m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP27

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Site IPS Integrated Project			**Trial Pit Number** TP28
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 22.12	**Client** GDCL Consulting
	Location (dGPS) 704310.1 E 803521.6 N	**Dates** 08/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				22.02	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.30)	Soft brown silty slightly sandy slightly gravelly CLAY with rare cobbles.		
				21.72	0.40	Firm to stiff orange brown slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
1.00	B				(0.90)			
				20.82	1.30	Stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles.		
					(1.30)			
2.60	B			19.52	2.60	Stiff to very stiff grey brown sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.60)			
				18.92	3.20	Refusal at 3.2m BGL due to boulders.		
						Complete at 3.20m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP28

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Site IPS Integrated Project			**Trial Pit Number** TP29
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 19.67	**Client** GDCL Consulting
	Location (dGPS) 704367.6 E 803583.3 N	**Dates** 09/11/2018	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				19.57	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
						Soft brown silty slightly sandy slightly gravelly CLAY.		
					(0.50)			
				19.07	0.60	Firm orange brown slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
					(1.10)			
1.40	B							
				17.97	1.70	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(0.80)			
				17.17	2.50	Stiff to very stiff grey brown sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.50)			
				16.67	3.00	Grey brown orange clayey slightly sandy GRAVEL with frequent angular cobbles and occasional boulders. (Weathered Rock)		
					(0.50)			
3.50	B			16.17	3.50	Refusal at 3.5m BGL due to boulder/rock		
						Complete at 3.50m		

Plan

Remarks

Groundwater encountered at 3.2m BGL in Trial Pit.
Trial Pit sidewalls collasping 2.5m BGL.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP29

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Site IPS Integrated Project			**Trial Pit Number** TP30
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 18.91	**Client** GDCL Consulting
	Location (dGPS) 704415.8 E 803538.3 N	**Dates** 09/11/2018	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				18.81	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.30)	Soft brown silty slightly sandy slightly gravelly CLAY with rare cobble.		
				18.51	0.40	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
1.00	B				(1.10)			
				17.41	1.50	Very stiff grey brown sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
					(0.50)			
				16.91	2.00	Refusal at 2.0m BGL due to boulder.		
						Complete at 2.00m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.TP30

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Site IPS Integrated Project			**Trial Pit Number** TP101
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 4.9x0.9	**Ground Level (mOD)** 22.18	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704412.1 E 803303.3 N	**Dates** 10/01/2019	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				22.08	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B				(0.80)	Soft brown slightly sandy gravelly CLAY with frequent sub angular to sub rounded cobbles. Gravel is sub angular to sub rounded fine to coarse.		
1.00	B			21.28	0.90	Firm to stiff grey brown slightly sandy slightly gravelly silty CLAY with frequent subangular to angular cobbles.		
					(2.10)			
				19.18	3.00	Weathered Rock recovered as brown grey angular to sub angular fine to coarse Gravel and Cobbles of Sandstone		
					(0.50)			
				18.68	3.50	TP terminated - presumed rock Complete at 3.50m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	R'OT	8115-10-18.TP01

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Site IPS Integrated Project			**Trial Pit Number** TP102
Machine : 10T Excavator **Method :** Trial Pit	**Dimensions** 3.9x0.9	**Ground Level (mOD)** 20.61	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704396.8 E 803239.2 N	**Dates** 10/01/2019	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				20.51	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.30)	Soft brown slightly sandy gravelly CLAY with frequent sub angular to sub rounded cobbles. Gravel is sub angular to sub rounded fine to coarse.		
				20.21	0.40	Firm to stiff grey brown slightly sandy slightly gravelly silty CLAY with frequent subangular to angular cobbles and rare boulders. Gravel is sub angular to sub rounded fine to coarse		
					(1.40)			
				18.81	1.80	Weathered Rock recovered as brown grey angular to sub angular fine to coarse Gravel and Cobbles of Sandstone		
					(0.70)			
				18.11	2.50	TP terminated - presumed rock Complete at 2.50m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	R'OT	8115-10-18.TP01

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Site IPS Integrated Project			**Trial Pit Number** TP103
Machine : 10T Excavator **Method :** Trial Pit	**Dimensions** 4.9x0.9	**Ground Level (mOD)** 20.10	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704462.4 E 803225.4 N	**Dates** 10/01/2019	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				20.00	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.60)	Soft brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles. Gravel is sub angular to sub rounded fine to coarse.		
0.50	B			19.40	0.70	Firm to stiff grey brown slightly sandy slightly gravelly silty CLAY with frequent subangular to angular cobbles and rare boulders. Gravel is sub angular to sub rounded fine to coarse		
1.00	B				(1.10)			
				18.30	1.80	Weathered Rock recovered as brown grey angular to sub angular fine to coarse Gravel and Cobbles of Sandstone		
					(0.70)			
				17.60	2.50	TP terminated - presumed rock		
						Complete at 2.50m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	R'OT	8115-10-18.TP01

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Site IPS Integrated Project			**Trial Pit Number** TP104
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 4.9x0.9	**Ground Level (mOD)** 20.05	**Client** GDCL Consulting
	Location (dGPS) 704448.4 E 803160.4 N	**Dates** 10/01/2019	**Engineer**

Job Number 8115-10-18

Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				19.95	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B				(0.70)	Soft brown slightly sandy gravelly CLAY with frequent sub angular to sub rounded cobbles. Gravel is sub angular to sub rounded fine to coarse.		
1.00	B			19.25	0.80	Soft to firm grey brown slightly sandy slightly gravelly silty CLAY with occasional subangular to angular cobbles and rare boulders.		
2.00	B				(1.90)			
				17.35	2.70	Weathered Rock recovered as brown grey angular to sub angular fine to coarse Gravel and Cobbles of Sandstone		
					(0.30)			
				17.05	3.00	TP terminated - presumed rock		
						Complete at 3.00m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	R'OT	8115-10-18.TP01

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Site IPS Integrated Project			**Trial Pit Number** TP105
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 4.9x0.9	**Ground Level (mOD)** 20.22	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704509.3 E 803146.6 N	**Dates** 10/01/2019	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				19.92	0.30	Soft brown slightly sandy gravelly CLAY with frequent sub angular to sub rounded cobbles. Gravel is sub angular to sub rounded fine to coarse.		
0.50	B				(0.60)			
				19.32	0.90	Firm grey brown slightly sandy slightly gravelly silty CLAY with occasional rounded to angular cobbles and rare boulders.		
1.00	B				(1.00)			
				18.32	1.90	Weathered Rock recovered as brown grey angular to sub angular fine to coarse Gravel and Cobbles of Sandstone with sandy Clay infill		
					(1.10)			
				17.22	3.00	TP terminated - presumed rock		
						Complete at 3.00m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Trial Pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	R'OT	8115-10-18.TP01

APPENDIX 3 – Soakaway Records

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Site IPS Integrated Project			**Trial Pit Number** SA01
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** L x W x D 2.20 x 0.70 x 1.80m	**Ground Level (mOD)** 24.29	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704026.2 E 803115.9 N	**Dates** 15/11/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				23.99	0.30	Firm dark brown silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(0.80)			
				23.19	1.10	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(0.70)			
				22.49	1.80	Complete at 1.80m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Soakaway conducted in trial pit.
Trial Pit backfilled upon completion.
Completed adjacent to TP18.

Scale (approx)	Logged By	Figure No.
1:25	S. Connolly	8115-10-18.SA01

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Site IPS Integrated Project			**Trial Pit Number** SA02
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** L x W x D 2.40 x 0.70 x 1.90m	**Ground Level (mOD)** 21.28	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704098 E 803189.9 N	**Dates** 08/11/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				21.18	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					(0.40)	Soft to firm brown silty slightly sandy slightly gravelly CLAY with rare cobble.		
				20.78	0.50	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
					(1.40)			
				19.38	1.90	Complete at 1.90m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Soakaway conducted in trial pit.
Trial Pit backfilled upon completion.
Completed adjacent to TP11.

Scale (approx)	Logged By	Figure No.
1:25	S. Connolly	8115-10-18.SA02

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Site IPS Integrated Project			**Trial Pit Number** SA03
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** L x W x D 2.50 x 0.80 x 1.90m	**Ground Level (mOD)** 24.26	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704256.8 E 803324.7 N	**Dates** 15/11/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				24.11	(0.15) 0.15	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				23.96	(0.15) 0.30	Soft brown silty slightly sandy slightly gravelly CLAY.		
					(0.70)	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles and rare boulders.		
				23.26	1.00	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
					(0.90)			
				22.36	1.90	Complete at 1.90m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Soakaway conducted in trial pit.
Trial Pit backfilled upon completion.
Completed adjacent to TP01.

Scale (approx)	Logged By	Figure No.
1:25	S. Connolly	8115-10-18.SA01

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Site IPS Integrated Project			**Trial Pit Number** SA04
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** L x W x D 2.60 x 0.80 x 1.70m	**Ground Level (mOD)** 16.73	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704455 E 803029.4 N	**Dates** 15/11/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				16.58	0.15			
					(0.20)	Soft dark brown silty slightly sandy slightly gravelly CLAY.		
				16.38	0.35			
					(0.65)	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional subrounded to angular cobbles.		
				15.73	1.00			
					(0.70)	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and occasional boulders.		
				15.03	1.70			
						Complete at 1.70m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Soakaway conducted in trial pit.
Trial Pit backfilled upon completion.
Completed adjacent to TP04.

Scale (approx)	Logged By	Figure No.
1:25	CCostigan	8115-10-18.SA04

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Site IPS Integrated Project			**Trial Pit Number** SA05
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** L x W x D 2.60 x 0.90 x 1.30m	**Ground Level (mOD)** 18.91	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704329.9 E 802858.4 N	**Dates** 15/11/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				18.71	0.20	Firm grey brown silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles.		
					(0.60)			
				18.11	0.80	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent subangular to angular cobbles and rare boulders.		
					(0.50)			
				17.61	1.30	Complete at 1.30m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Soakaway conducted in trial pit.
Trial Pit backfilled upon completion.
Completed adjacent to TP13.

Scale (approx)	Logged By	Figure No.
1:25	S. Connolly	8115-10-18.sa05

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Site IPS Integrated Project			**Trial Pit Number** SA06
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** L x W x D 2.00 x 0.80 x 1.90m	**Ground Level (mOD)** 23.12	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704140.8 E 802956.3 N	**Dates** 15/11/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				23.02	(0.10) 0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
				22.82	(0.20) 0.30	Soft brown silty slightly sandy slightly gravelly CLAY with rare subrounded to angular cobbles.		
					(0.70)	Firm to stiff grey light brown silty slightly sandy slightly gravelly CLAY with occasional subangular to angular cobbles.		
				22.12	1.00	Stiff to very stiff grey brown slightly sandy slightly gravelly CLAY with frequent angular cobbles and rare boulders.		
					(0.90)			
				21.22	1.90	Complete at 1.90m		

Plan

Remarks

No groundwater encountered in Trial Pit.
Trial Pit sidewalls are stable.
Soakaway conducted in trial pit.
Trial Pit backfilled upon completion.
Completed adjacent to TP20.

Scale (approx)	Logged By	Figure No.
1:25	S. Connolly	8115-10-18.SA06

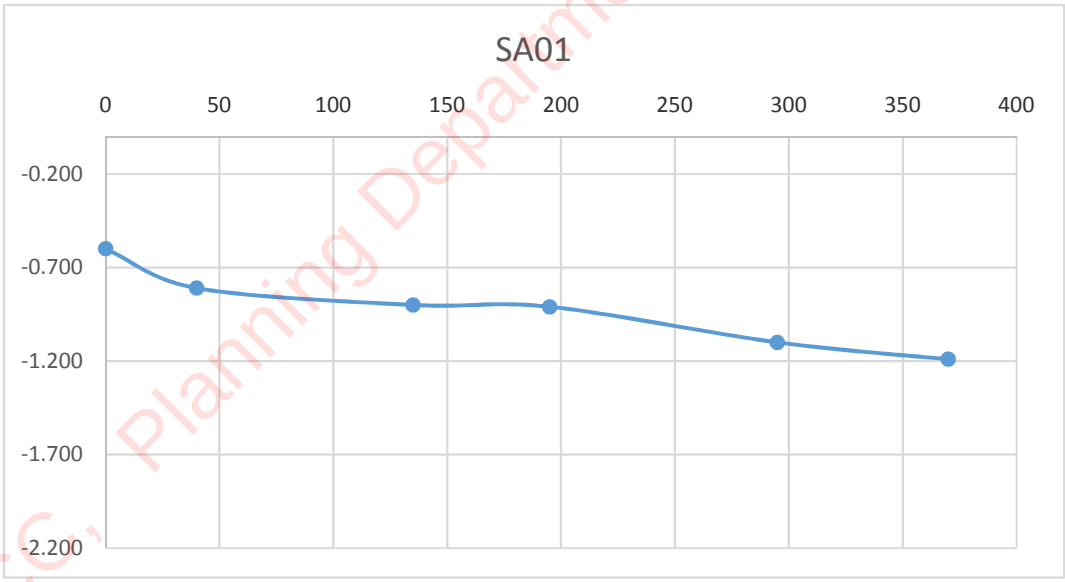
SA01

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.20m x 0.70m X 1.80m (L x W x D)

Date	Time	Water level (m bgl)
16/11/2018	0	-0.600
16/11/2018	40	-0.810
16/11/2018	135	-0.900
16/11/2018	195	-0.910
16/11/2018	295	-1.100
16/11/2018	370	-1.190

Start depth	Depth of Pit		Diff	75% full	25%full
0.60	**1.800**		**1.200**	**0.9**	**1.5**

Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.200	0.700		0.600	0.92
Tp75-25 (from graph) (s)		**81600**	50% Eff Depth	ap50 (m2)
			0.600	5.02
f =	**2.256E-06**	**m/s**		



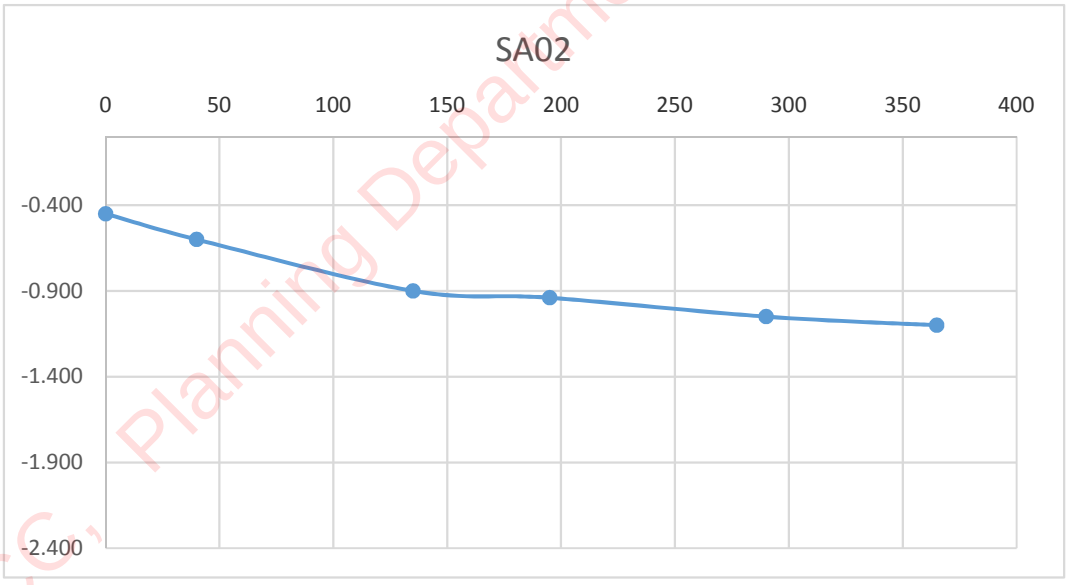
SA02

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.40m x 0.70m x 1.90m (L x W x D)

Date	Time	Water level (m bgl)
16/11/2018	0	-0.450
16/11/2018	40	-0.600
16/11/2018	135	-0.900
16/11/2018	195	-0.940
16/11/2018	290	-1.050
16/11/2018	365	-1.100

Start depth	Depth of Pit		Diff	75% full	25%full
0.45	**1.900**		**1.450**	**0.8125**	**1.5375**

Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.400	0.700		0.725	1.22
Tp75-25 (from graph) (s)		**87000**	50% Eff Depth	ap50 (m2)
			0.725	6.175
f =	**2.267E-06**	**m/s**		



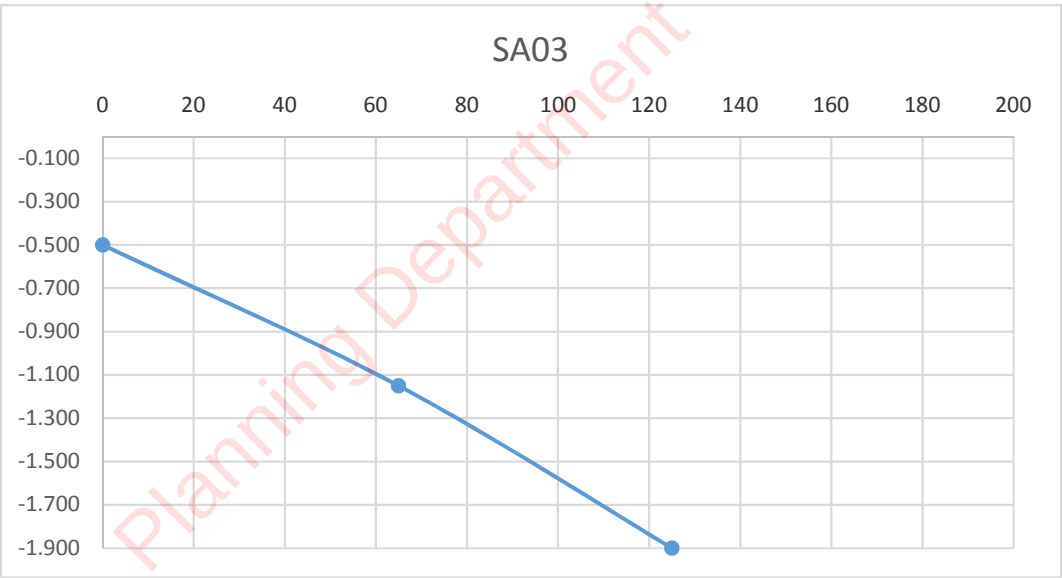
SA03

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.50m x 0.80m x 1.90m (L x W x D)

Date	Time	Water level (m bgl)
16/11/2018	0	-0.500
16/11/2018	65	-1.150
16/11/2018	125	-1.900

Start depth	Depth of Pit		Diff	75% full	25%full
0.50	**1.900**		**1.400**	**0.85**	**1.55**

Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.500	0.800		0.700	1.40
Tp75-25 (from graph) (s)		**3600**	50% Eff Depth	ap50 (m2)
			0.700	6.62
f =	**5.874E-05**	**m/s**		



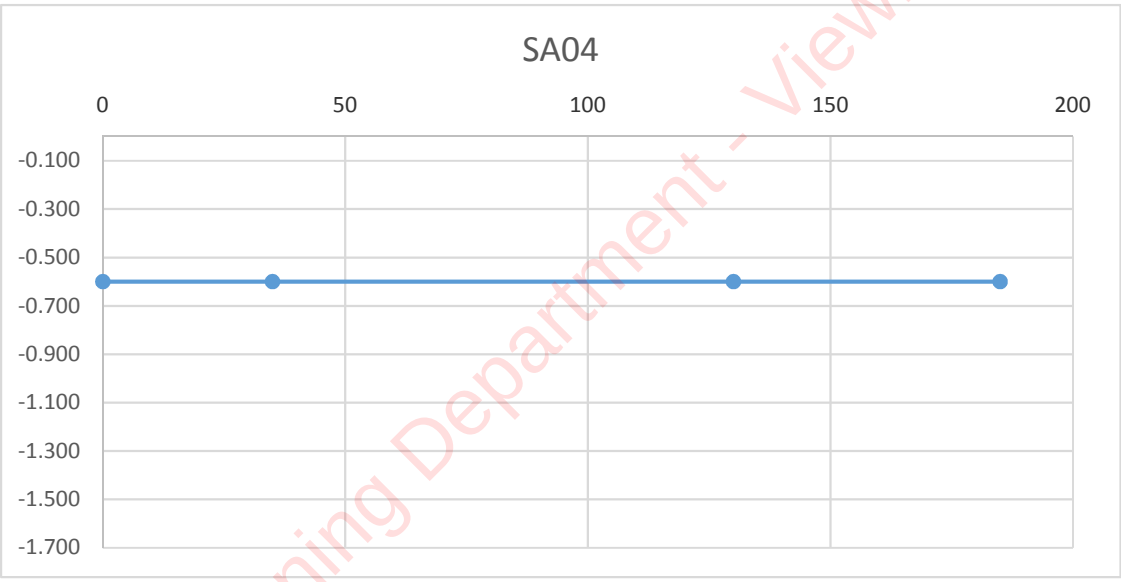
SA04

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.60m x 0.80m x 1.70m (L x W x D)

Date	Time	Water level (m bgl)
15/11/2018	0	-0.600
15/11/2018	35	-0.600
15/11/2018	130	-0.600
15/11/2018	185	-0.600

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.60	1.700	1.100	0.875	1.425



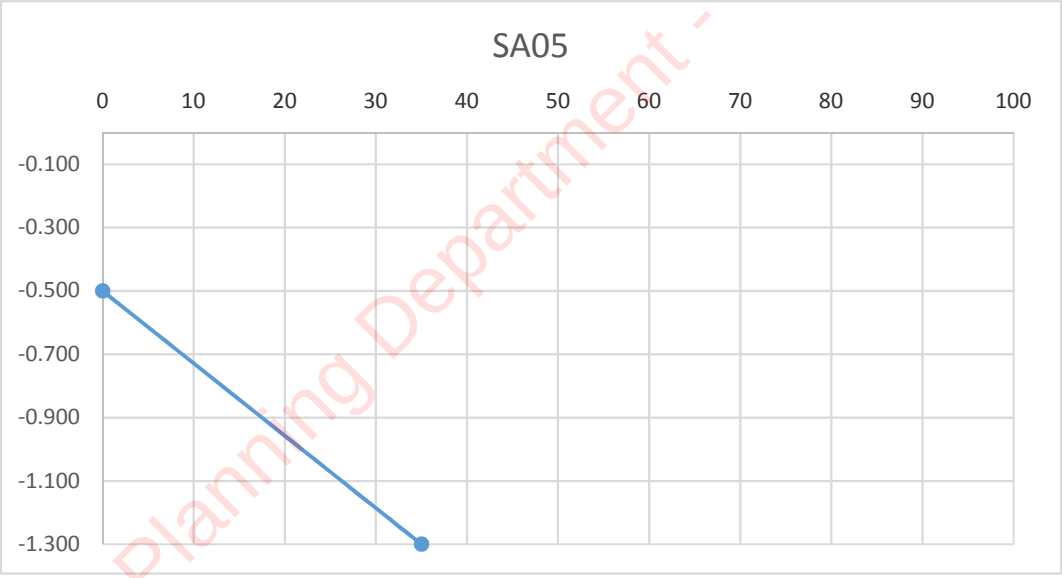
SA05

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.60m x 0.90m x 1.30m (L x W x D)

Date	Time	Water level (m bgl)
16/11/2018	0	-0.500
16/11/2018	35	-1.300

Start depth	Depth of Pit		Diff	75% full	25%full
0.50	**1.300**		**0.800**	**0.7**	**1.1**

Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.600	0.900		0.400	0.94
Tp75-25 (from graph) (s)		**1080**	50% Eff Depth	ap50 (m2)
			0.400	5.14
f =	**1.686E-04**	**m/s**		



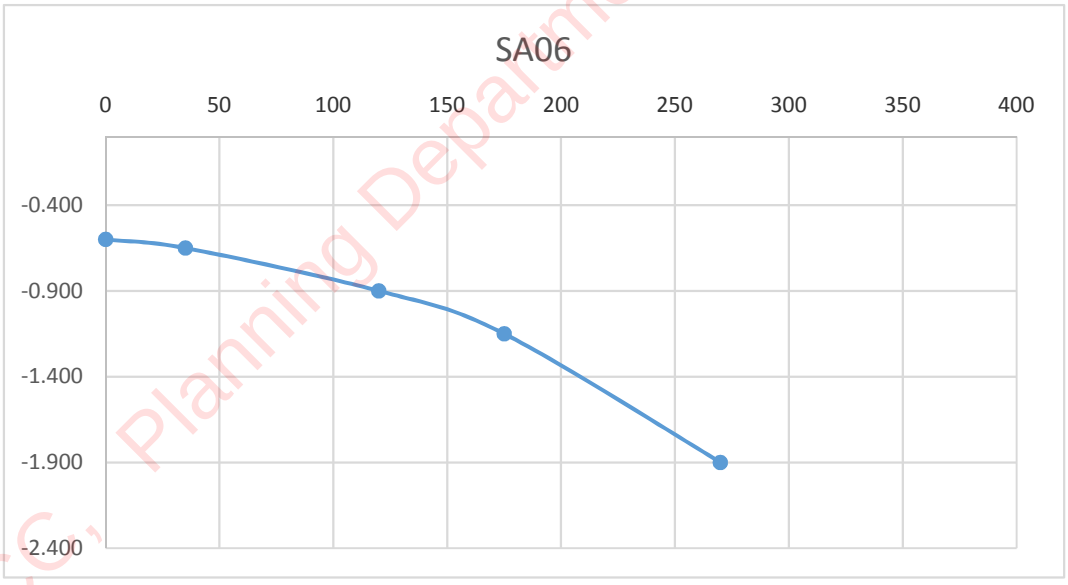
SA06

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.00m x 0.80m x 1.90m (L x W x D)

Date	Time	Water level (m bgl)
16/11/2018	0	-0.600
16/11/2018	35	-0.650
16/11/2018	120	-0.900
16/11/2018	175	-1.150
16/11/2018	270	-1.900

Start depth	Depth of Pit		Diff	75% full	25%full
0.60	**1.900**		**1.300**	**0.925**	**1.575**

Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.000	0.800		0.650	1.04
Tp75-25 (from graph) (s)		**5700**	50% Eff Depth	ap50 (m2)
			0.650	5.24
f =	**3.482E-05**	**m/s**		



APPENDIX 4 – Dynamic Probe Records

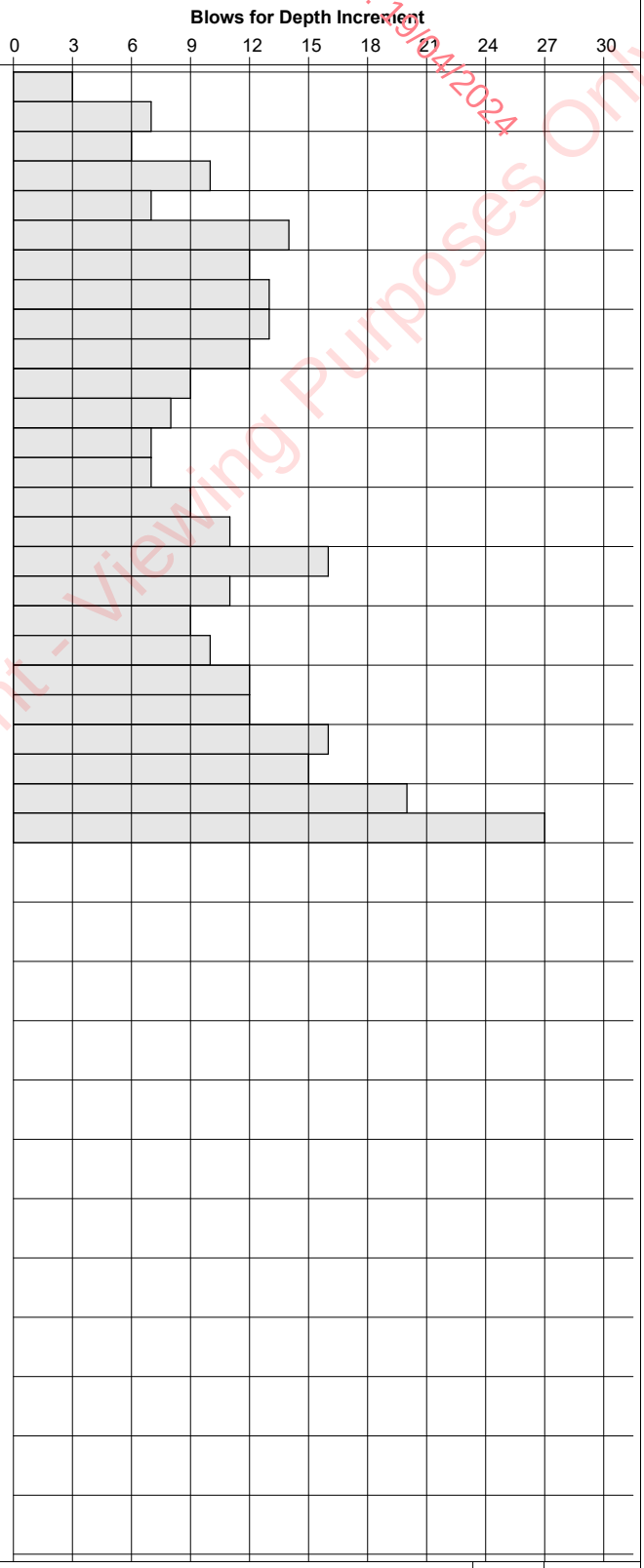
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH01

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	24.26	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704257.8 E 803325.7 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		24.26	0.00
0.10-0.20	7			
0.20-0.30	6			
0.30-0.40	10			
0.40-0.50	7			
0.50-0.60	14		23.76	0.50
0.60-0.70	12			
0.70-0.80	13			
0.80-0.90	13			
0.90-1.00	12			
1.00-1.10	9		23.26	1.00
1.10-1.20	8			
1.20-1.30	7			
1.30-1.40	7			
1.40-1.50	9			
1.50-1.60	11		22.76	1.50
1.60-1.70	16			
1.70-1.80	11			
1.80-1.90	9			
1.90-2.00	10			
2.00-2.10	12		22.26	2.00
2.10-2.20	12			
2.20-2.30	16			
2.30-2.40	15			
2.40-2.50	20			
2.50-2.60	27		21.76	2.50
			21.26	3.00
			20.76	3.50
			20.26	4.00
			19.76	4.50
			19.26	5.00



Remarks
Refusal at 2.60m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

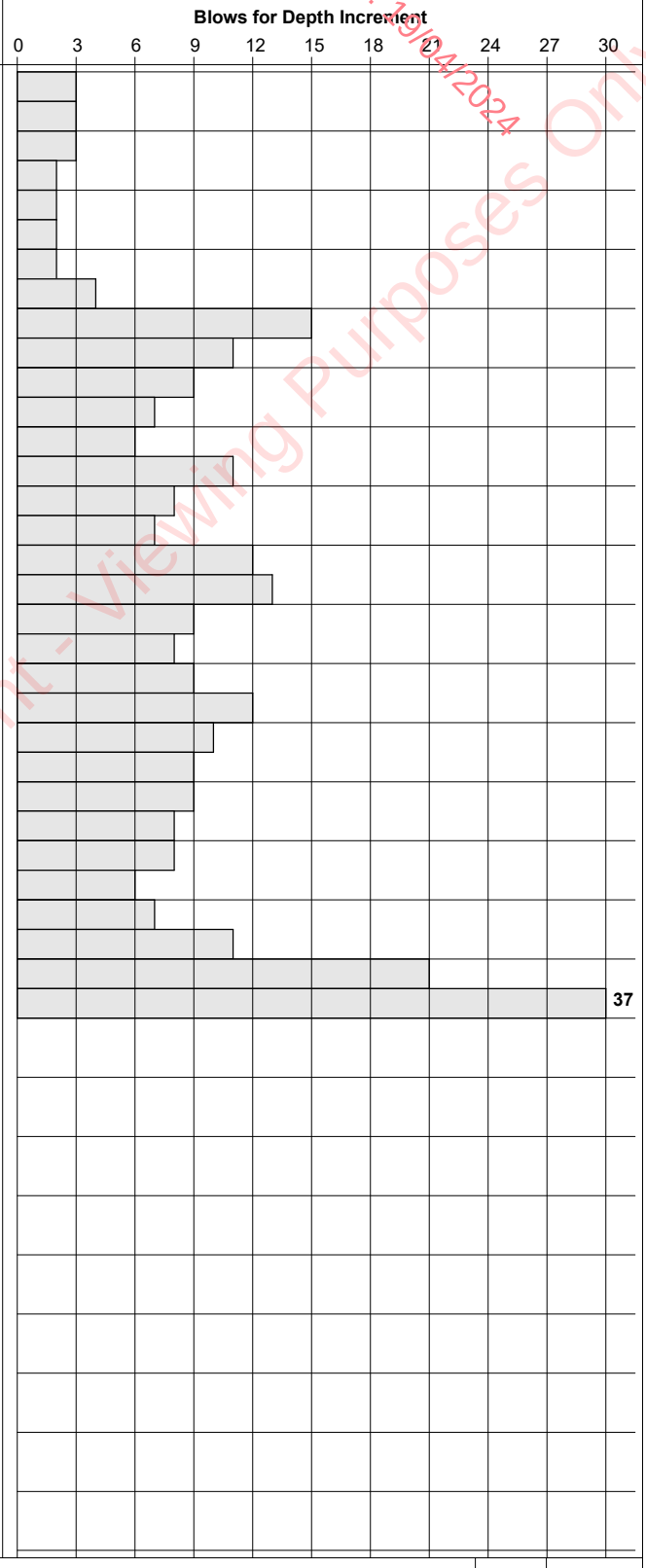
Figure No.
8115-10-18.DPH01

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH02

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	21.74	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704328.5 E 803205.2 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		21.74	0.00
0.10-0.20	3			
0.20-0.30	3			
0.30-0.40	2			
0.40-0.50	2			
0.50-0.60	2		21.24	0.50
0.60-0.70	2			
0.70-0.80	4			
0.80-0.90	15			
0.90-1.00	11			
1.00-1.10	9		20.74	1.00
1.10-1.20	7			
1.20-1.30	6			
1.30-1.40	11			
1.40-1.50	8			
1.50-1.60	7		20.24	1.50
1.60-1.70	12			
1.70-1.80	13			
1.80-1.90	9			
1.90-2.00	8			
2.00-2.10	9		19.74	2.00
2.10-2.20	12			
2.20-2.30	10			
2.30-2.40	9			
2.40-2.50	9			
2.50-2.60	8		19.24	2.50
2.60-2.70	8			
2.70-2.80	6			
2.80-2.90	7			
2.90-3.00	11			
3.00-3.10	21		18.74	3.00
3.10-3.20	37			
			18.24	3.50
			17.74	4.00
			17.24	4.50
			16.74	5.00



Remarks
Refusal at 3.20m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH02

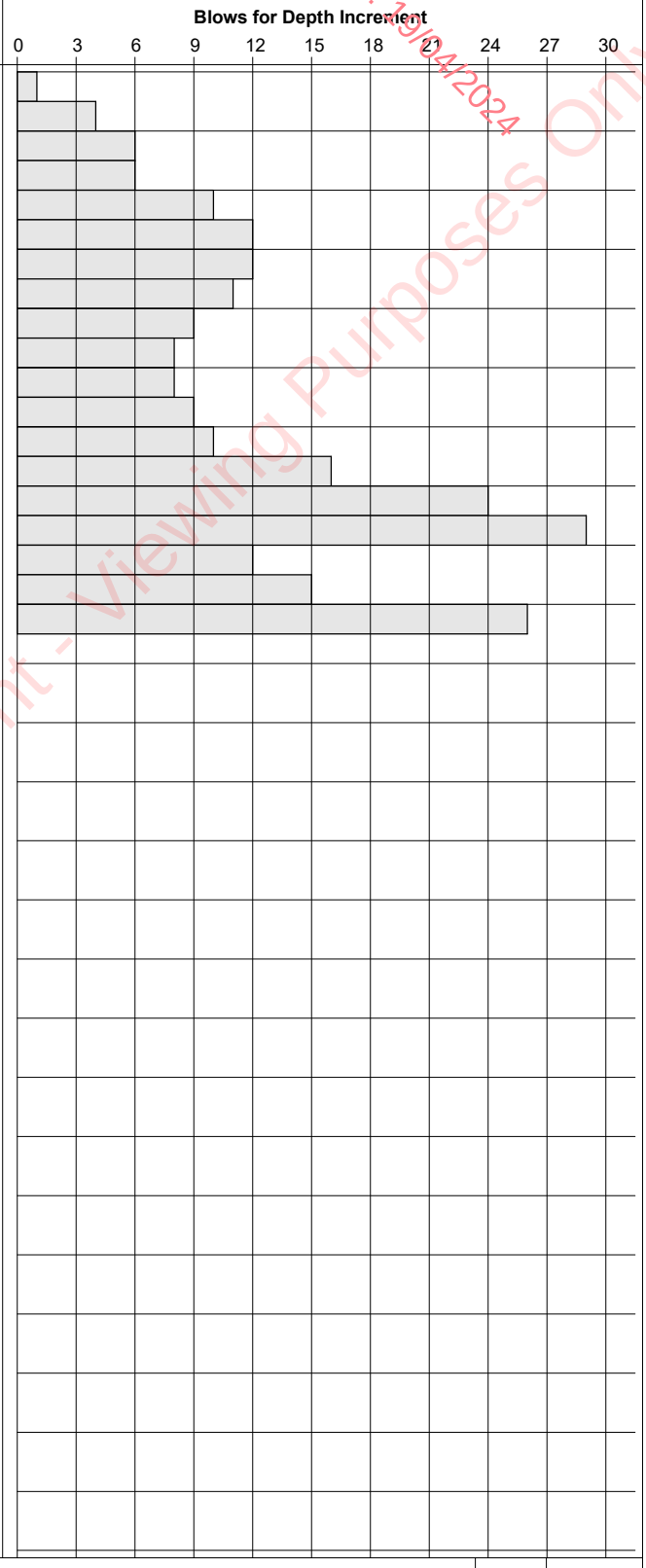
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH03

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	19.45	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704368.9 E 803115.8 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	1	
0.10-0.20	4	
0.20-0.30	6	
0.30-0.40	6	
0.40-0.50	10	
0.50-0.60	12	
0.60-0.70	12	
0.70-0.80	11	
0.80-0.90	9	
0.90-1.00	8	
1.00-1.10	8	
1.10-1.20	9	
1.20-1.30	10	
1.30-1.40	16	
1.40-1.50	24	
1.50-1.60	29	
1.60-1.70	12	
1.70-1.80	15	
1.80-1.90	26	



Remarks
Refusal at 1.90m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

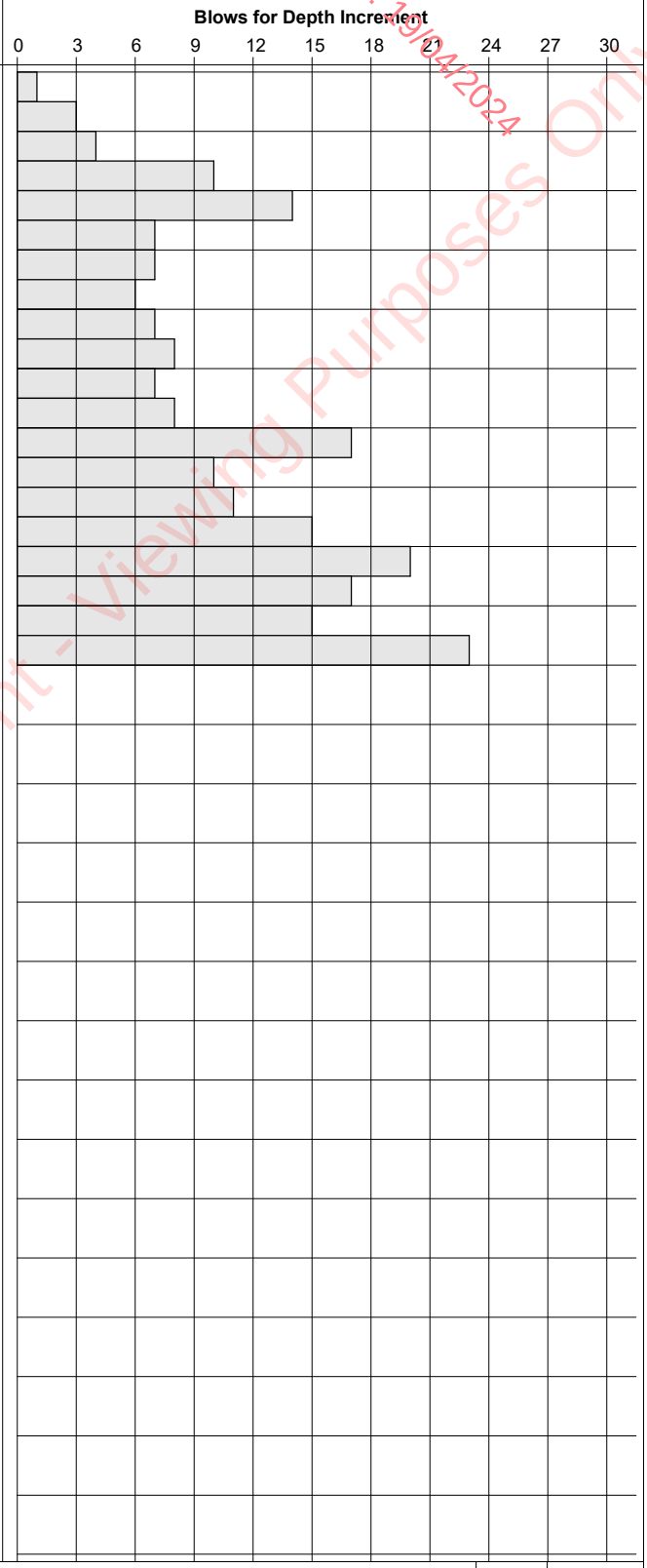
Figure No.
8115-10-18.DPH03

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH04

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	16.73	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704456 E 803030.4 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	1	
0.10-0.20	3	
0.20-0.30	4	
0.30-0.40	10	
0.40-0.50	14	
0.50-0.60	7	
0.60-0.70	7	
0.70-0.80	6	
0.80-0.90	7	
0.90-1.00	8	
1.00-1.10	7	
1.10-1.20	8	
1.20-1.30	17	
1.30-1.40	10	
1.40-1.50	11	
1.50-1.60	15	
1.60-1.70	20	
1.70-1.80	17	
1.80-1.90	15	
1.90-2.00	23	



Remarks
Refusal at 2.00m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH04

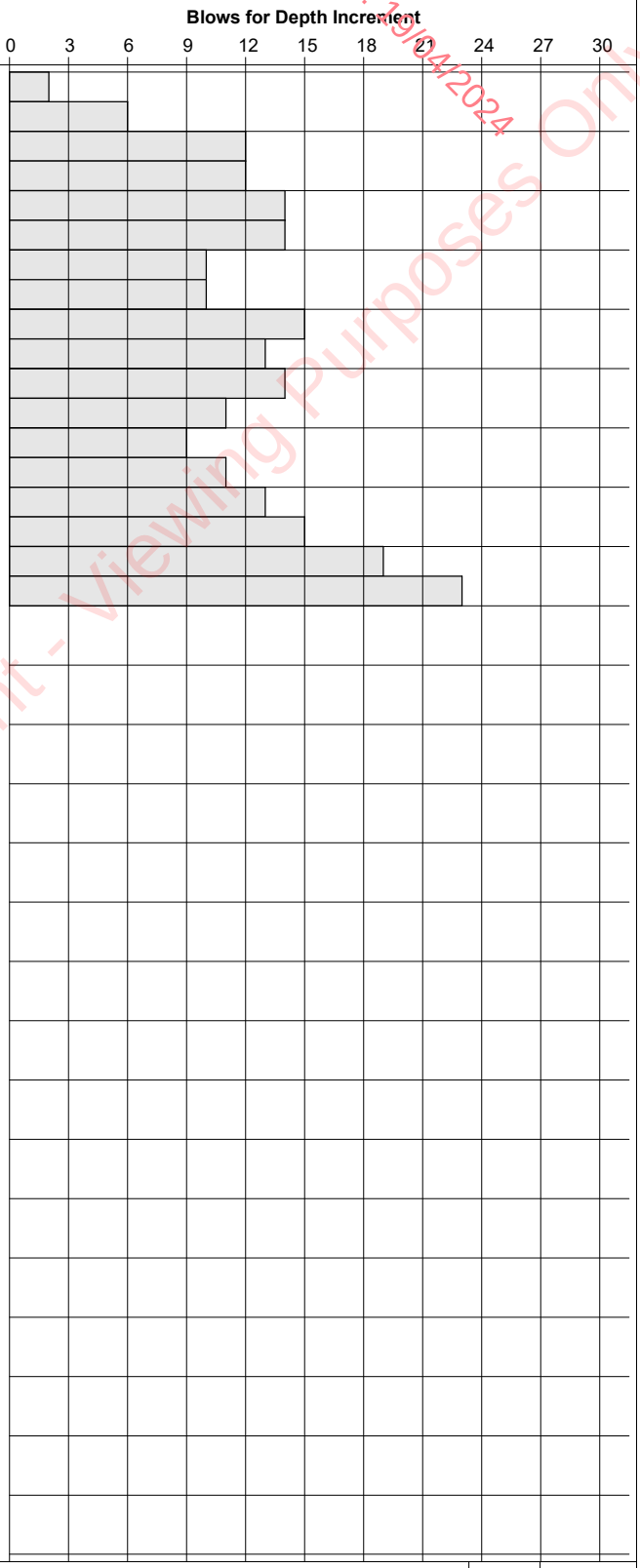
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH05

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	16.82	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704554.3 E 802904.6 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		16.82	0.00
0.10-0.20	6			
0.20-0.30	12			
0.30-0.40	12			
0.40-0.50	14			
0.50-0.60	14		16.32	0.50
0.60-0.70	10			
0.70-0.80	10			
0.80-0.90	15			
0.90-1.00	13			
1.00-1.10	14		15.82	1.00
1.10-1.20	11			
1.20-1.30	9			
1.30-1.40	11			
1.40-1.50	13			
1.50-1.60	15		15.32	1.50
1.60-1.70	19			
1.70-1.80	23			
			14.82	2.00
			14.32	2.50
			13.82	3.00
			13.32	3.50
			12.82	4.00
			12.32	4.50
			11.82	5.00



Remarks
Refusal at 1.80m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

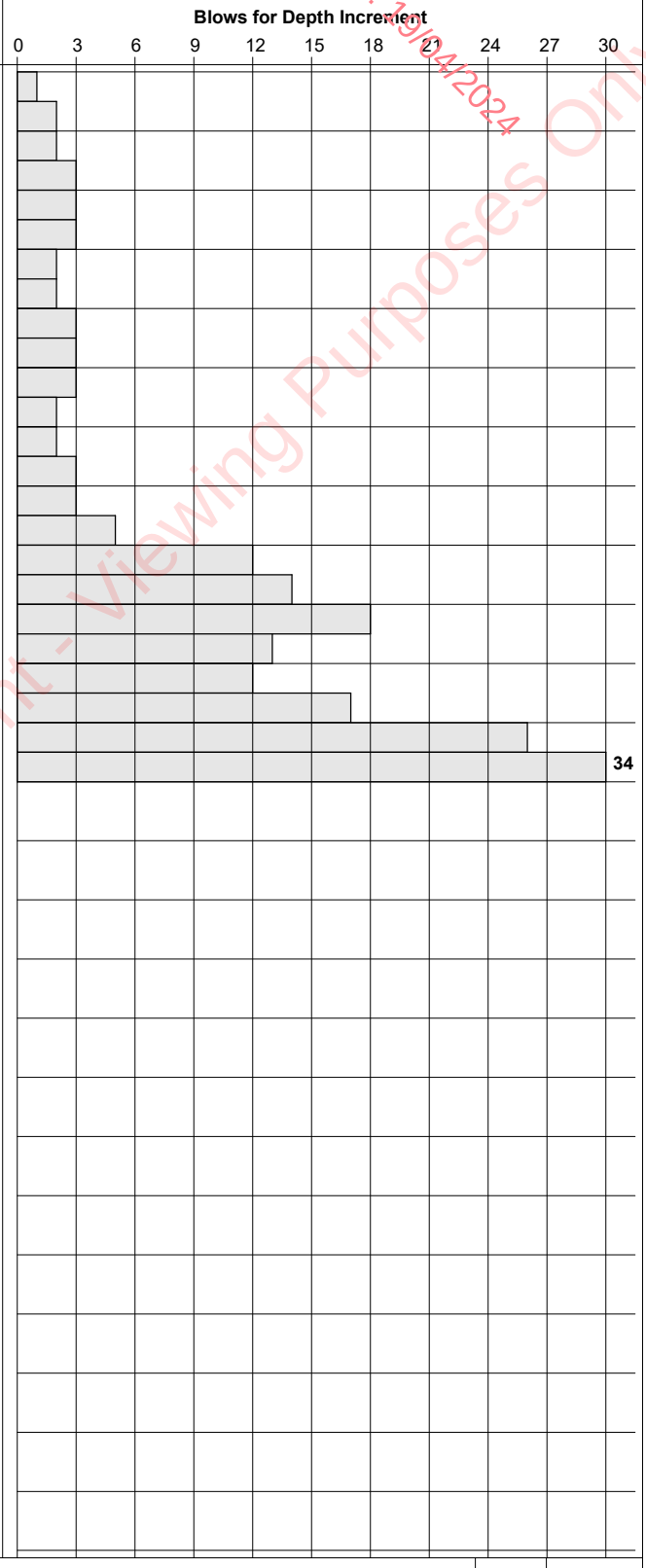
Figure No.
8115-10-18.DPH05

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH06

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	16.15	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704406.4 E 802882.1 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	1	
0.10-0.20	2	
0.20-0.30	2	
0.30-0.40	3	
0.40-0.50	3	
0.50-0.60	3	
0.60-0.70	2	
0.70-0.80	2	
0.80-0.90	3	
0.90-1.00	3	
1.00-1.10	3	
1.10-1.20	2	
1.20-1.30	2	
1.30-1.40	3	
1.40-1.50	3	
1.50-1.60	5	
1.60-1.70	12	
1.70-1.80	14	
1.80-1.90	18	
1.90-2.00	13	
2.00-2.10	12	
2.10-2.20	17	
2.20-2.30	26	
2.30-2.40	34	



Remarks
Refusal at 2.40m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH06

Ground Investigations Ireland Ltd

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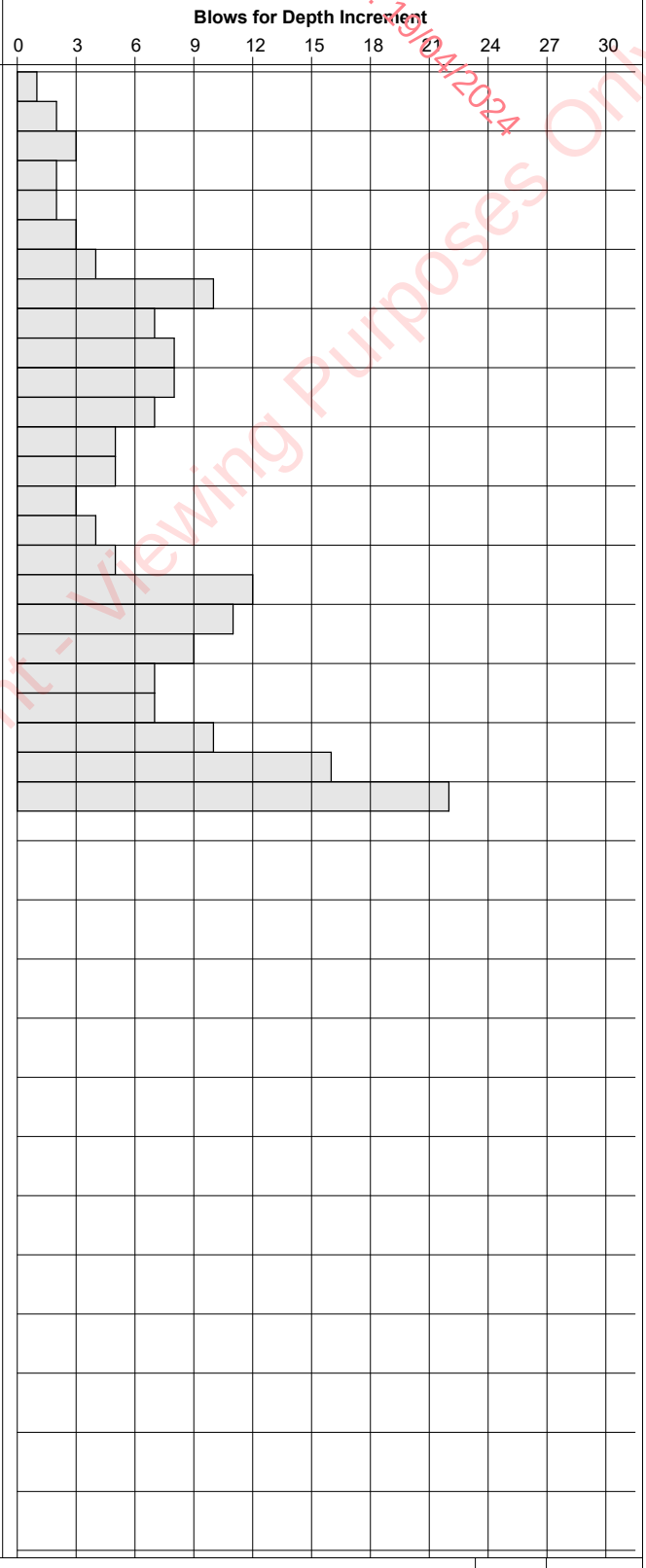
Site	Probe Number
IPS Integrated Project	DPH07

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	16.41	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704374.3 E 802948.4 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	1	
0.10-0.20	2	
0.20-0.30	3	
0.30-0.40	2	
0.40-0.50	2	
0.50-0.60	3	
0.60-0.70	4	
0.70-0.80	10	
0.80-0.90	7	
0.90-1.00	8	
1.00-1.10	8	
1.10-1.20	7	
1.20-1.30	5	
1.30-1.40	5	
1.40-1.50	3	
1.50-1.60	4	
1.60-1.70	5	
1.70-1.80	12	
1.80-1.90	11	
1.90-2.00	9	
2.00-2.10	7	
2.10-2.20	7	
2.20-2.30	10	
2.30-2.40	16	
2.40-2.50	22	



Remarks
Refusal at 2.50m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH07

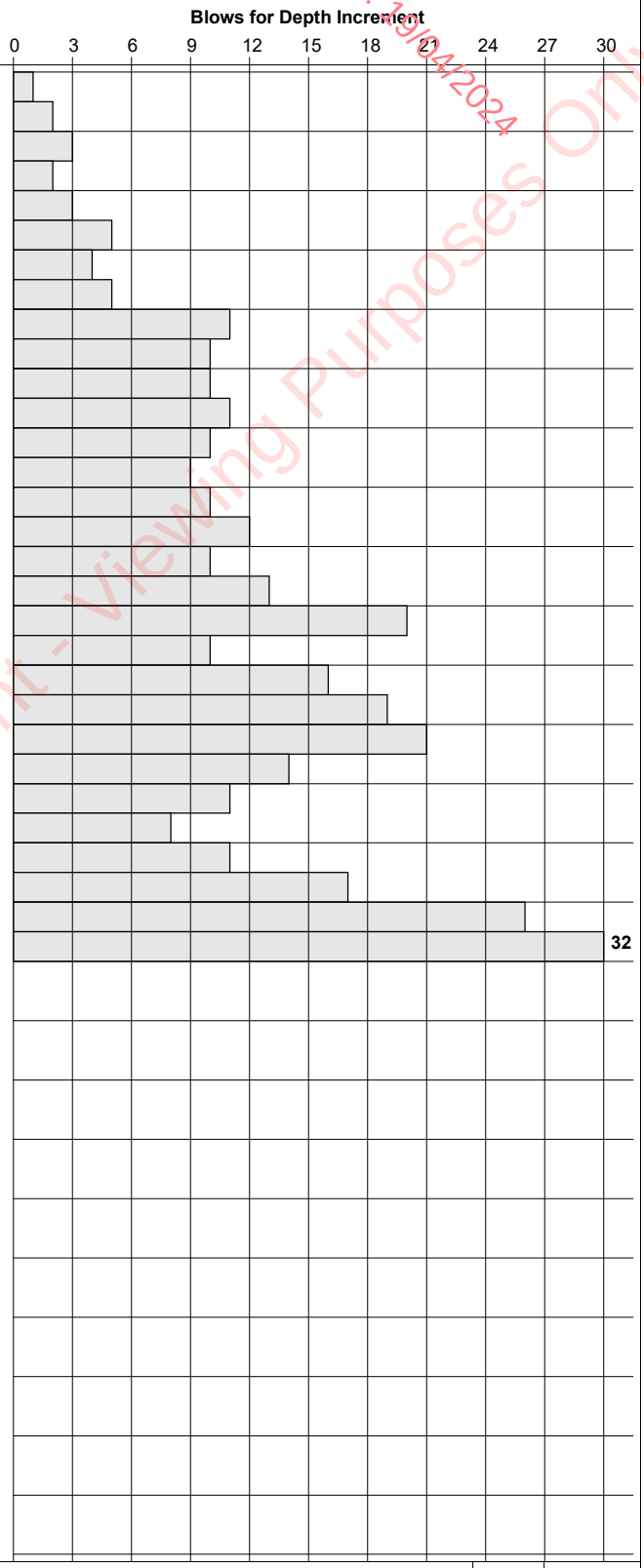
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH08

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	16.56	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704300.6 E 803025.2 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	1		16.56	0.00
0.10-0.20	2			
0.20-0.30	3			
0.30-0.40	2			
0.40-0.50	3			
0.50-0.60	5		16.06	0.50
0.60-0.70	4			
0.70-0.80	5			
0.80-0.90	11			
0.90-1.00	10			
1.00-1.10	10		15.56	1.00
1.10-1.20	11			
1.20-1.30	10			
1.30-1.40	9			
1.40-1.50	10			
1.50-1.60	12		15.06	1.50
1.60-1.70	10			
1.70-1.80	13			
1.80-1.90	20			
1.90-2.00	10			
2.00-2.10	16		14.56	2.00
2.10-2.20	19			
2.20-2.30	21			
2.30-2.40	14			
2.40-2.50	11			
2.50-2.60	8		14.06	2.50
2.60-2.70	11			
2.70-2.80	17			
2.80-2.90	26			
2.90-3.00	32		13.56	3.00
			13.06	3.50
			12.56	4.00
			12.06	4.50
			11.56	5.00



Remarks
Refusal at 3.00m BGL 25 blows for 25mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH08

Ground Investigations Ireland Ltd

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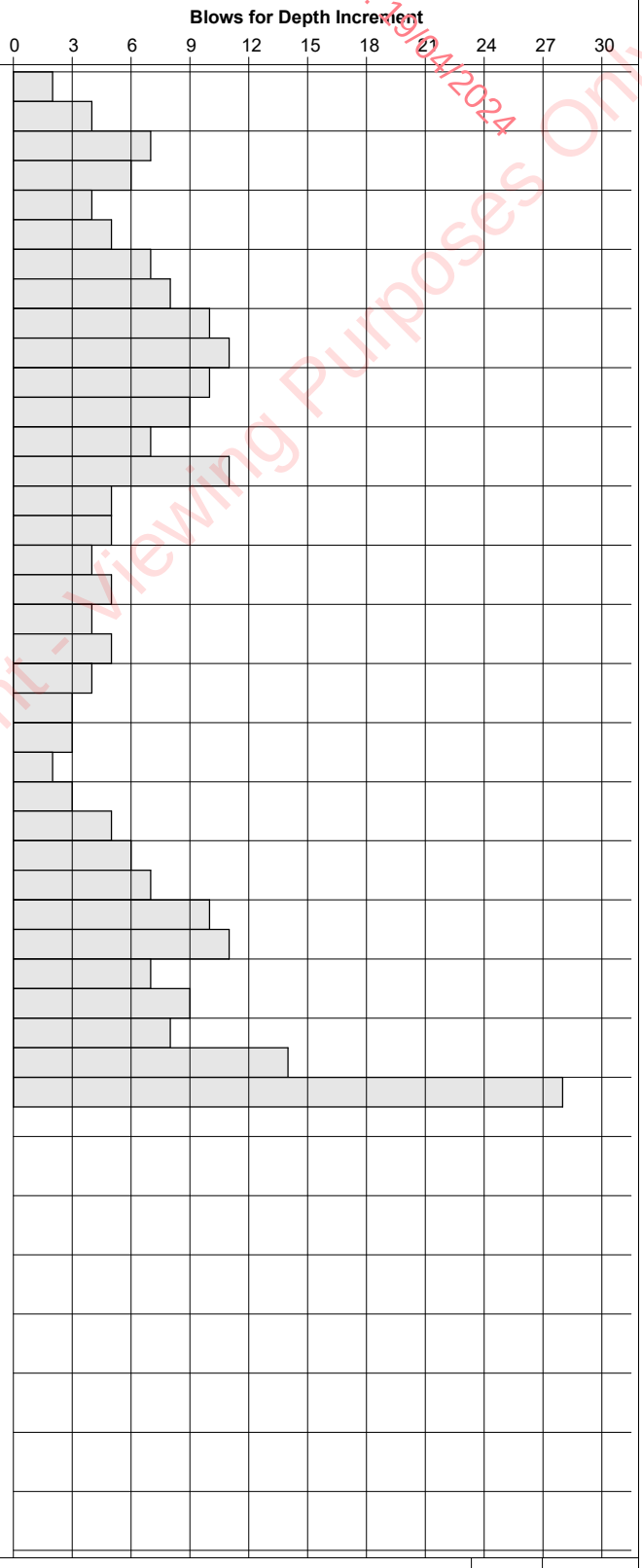
Site	Probe Number
IPS Integrated Project	DPH09

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	18.89	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704221.9 E 803161.7 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		18.89	0.00
0.10-0.20	4			
0.20-0.30	7			
0.30-0.40	6			
0.40-0.50	4			
0.50-0.60	5		18.39	0.50
0.60-0.70	7			
0.70-0.80	8			
0.80-0.90	10			
0.90-1.00	11			
1.00-1.10	10		17.89	1.00
1.10-1.20	9			
1.20-1.30	7			
1.30-1.40	11			
1.40-1.50	5			
1.50-1.60	5		17.39	1.50
1.60-1.70	4			
1.70-1.80	5			
1.80-1.90	4			
1.90-2.00	5			
2.00-2.10	4		16.89	2.00
2.10-2.20	3			
2.20-2.30	3			
2.30-2.40	2			
2.40-2.50	3			
2.50-2.60	5		16.39	2.50
2.60-2.70	6			
2.70-2.80	7			
2.80-2.90	10			
2.90-3.00	11			
3.00-3.10	7		15.89	3.00
3.10-3.20	9			
3.20-3.30	8			
3.30-3.40	14			
3.40-3.50	28		15.39	3.50
			14.89	4.00
			14.39	4.50
			13.89	5.00



Remarks
Refusal at 3.50m BGL 30 blows for 25mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH09

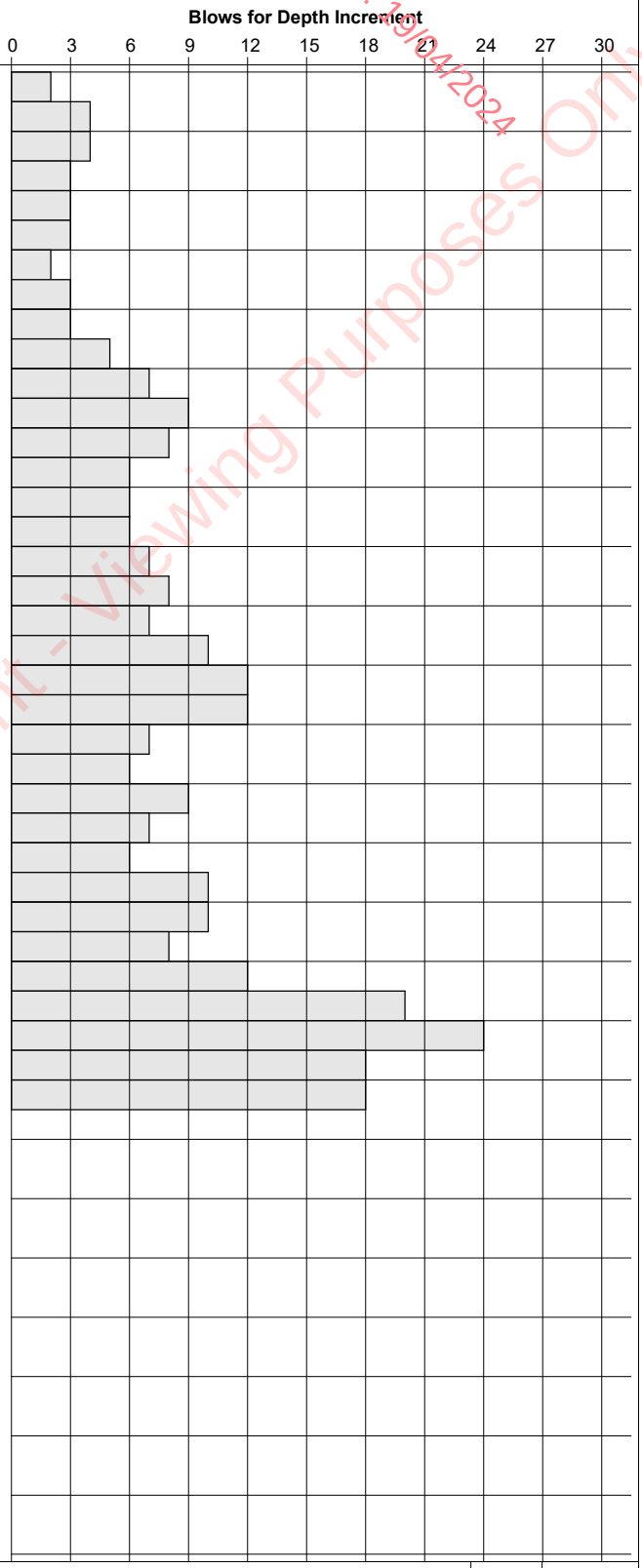
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH10

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	21.99	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704132.6 E 803240.8 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		21.99	0.00
0.10-0.20	4			
0.20-0.30	4			
0.30-0.40	3			
0.40-0.50	3			
0.50-0.60	3		21.49	0.50
0.60-0.70	2			
0.70-0.80	3			
0.80-0.90	3			
0.90-1.00	5			
1.00-1.10	7		20.99	1.00
1.10-1.20	9			
1.20-1.30	8			
1.30-1.40	6			
1.40-1.50	6			
1.50-1.60	6		20.49	1.50
1.60-1.70	7			
1.70-1.80	8			
1.80-1.90	7			
1.90-2.00	10			
2.00-2.10	12		19.99	2.00
2.10-2.20	12			
2.20-2.30	7			
2.30-2.40	6			
2.40-2.50	9			
2.50-2.60	7		19.49	2.50
2.60-2.70	6			
2.70-2.80	10			
2.80-2.90	10			
2.90-3.00	8			
3.00-3.10	12		18.99	3.00
3.10-3.20	20			
3.20-3.30	24			
3.30-3.40	18			
3.40-3.50	18		18.49	3.50
			17.99	4.00
			17.49	4.50
			16.99	5.00



Remarks
Refusal at 3.50m BGL 30 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH10

Ground Investigations Ireland Ltd

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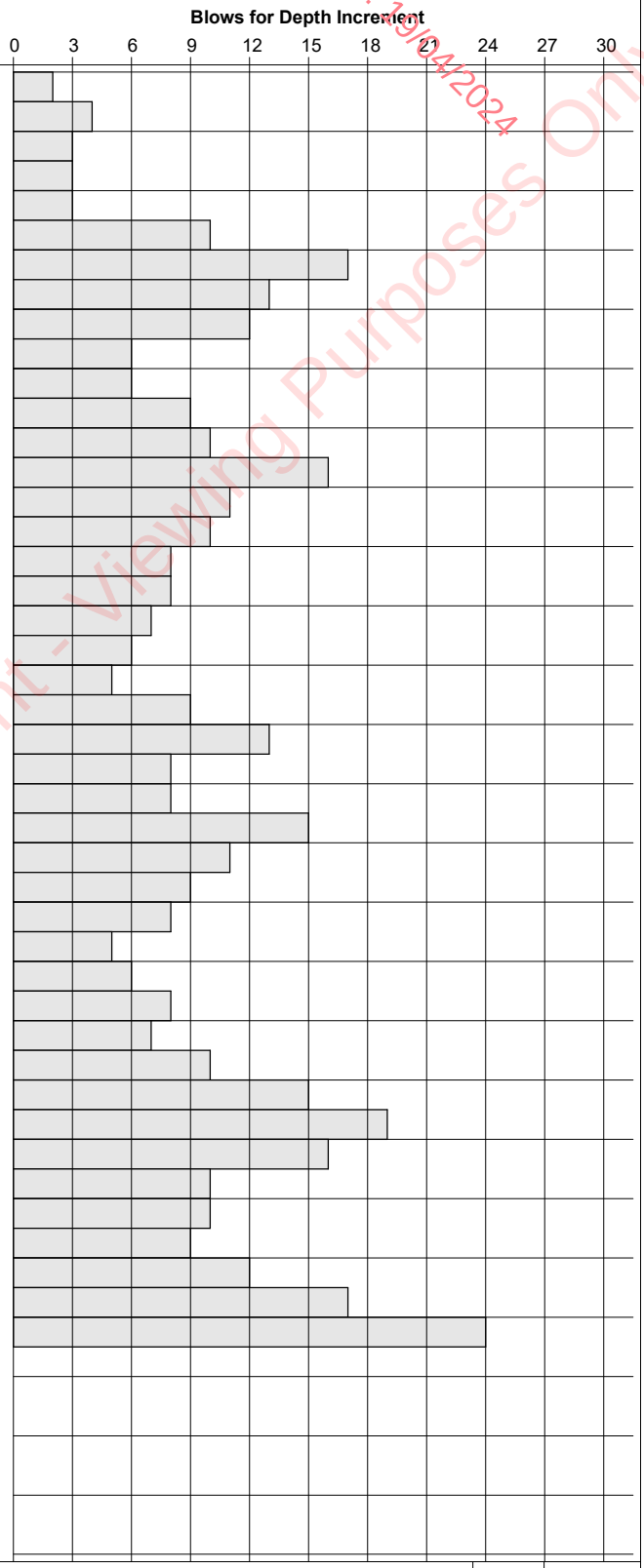
Site	Probe Number
IPS Integrated Project	DPH11

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	21.28	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704099 E 803190.9 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		21.28	0.00
0.10-0.20	4			
0.20-0.30	3			
0.30-0.40	3			
0.40-0.50	3			
0.50-0.60	10		20.78	0.50
0.60-0.70	17			
0.70-0.80	13			
0.80-0.90	12			
0.90-1.00	6			
1.00-1.10	6		20.28	1.00
1.10-1.20	9			
1.20-1.30	10			
1.30-1.40	16			
1.40-1.50	11			
1.50-1.60	10		19.78	1.50
1.60-1.70	8			
1.70-1.80	8			
1.80-1.90	7			
1.90-2.00	6			
2.00-2.10	5		19.28	2.00
2.10-2.20	9			
2.20-2.30	13			
2.30-2.40	8			
2.40-2.50	8			
2.50-2.60	15		18.78	2.50
2.60-2.70	11			
2.70-2.80	9			
2.80-2.90	8			
2.90-3.00	5			
3.00-3.10	6		18.28	3.00
3.10-3.20	8			
3.20-3.30	7			
3.30-3.40	10			
3.40-3.50	15			
3.50-3.60	19		17.78	3.50
3.60-3.70	16			
3.70-3.80	10			
3.80-3.90	10			
3.90-4.00	9			
4.00-4.10	12		17.28	4.00
4.10-4.20	17			
4.20-4.30	24			
			16.78	4.50
			16.28	5.00



Remarks
Refusal at 4.30m BGL 30 blows for 50mm

Scale (approx)	Logged By
1:25	CF

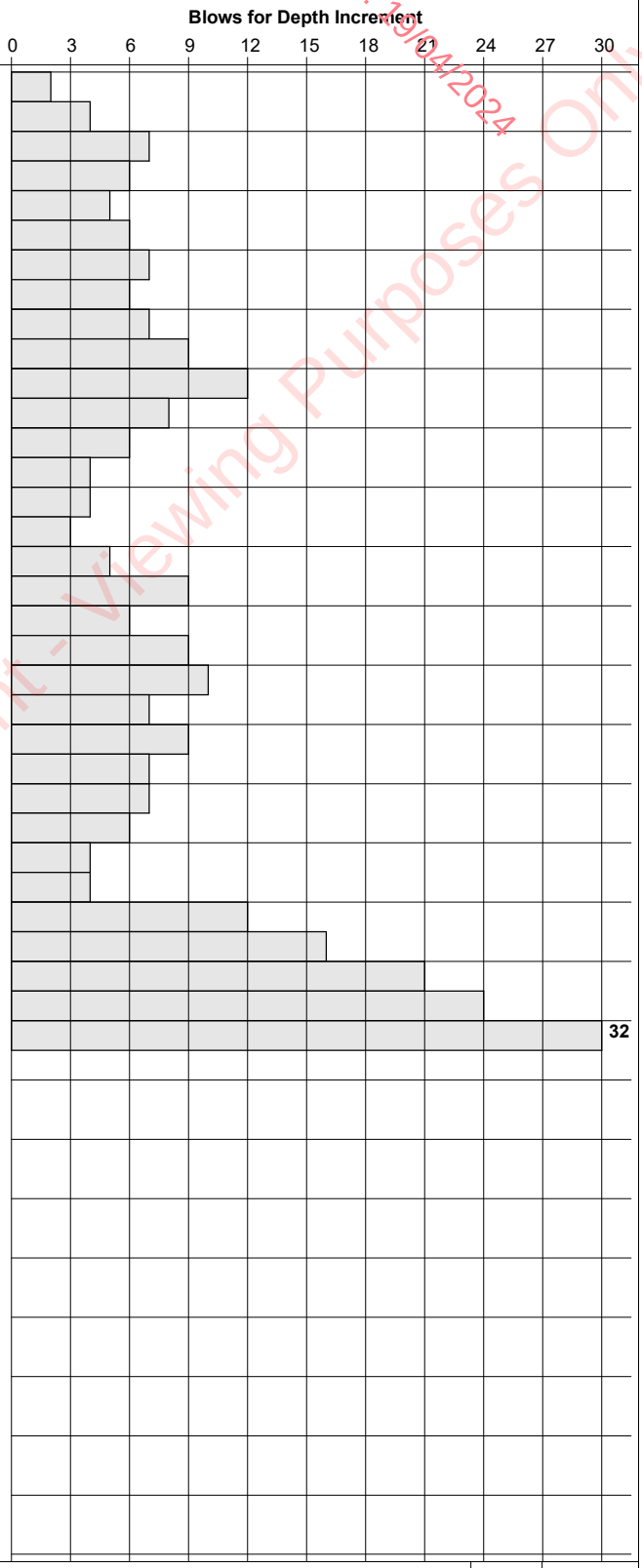
Figure No.
8115-10-18.DPH11

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH12

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	17.98	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704216.2 E 803018.5 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		17.98	0.00
0.10-0.20	4			
0.20-0.30	7			
0.30-0.40	6			
0.40-0.50	5			
0.50-0.60	6		17.48	0.50
0.60-0.70	7			
0.70-0.80	6			
0.80-0.90	7			
0.90-1.00	9			
1.00-1.10	12		16.98	1.00
1.10-1.20	8			
1.20-1.30	6			
1.30-1.40	4			
1.40-1.50	4			
1.50-1.60	3		16.48	1.50
1.60-1.70	5			
1.70-1.80	9			
1.80-1.90	6			
1.90-2.00	9			
2.00-2.10	10		15.98	2.00
2.10-2.20	7			
2.20-2.30	9			
2.30-2.40	7			
2.40-2.50	7			
2.50-2.60	6		15.48	2.50
2.60-2.70	4			
2.70-2.80	4			
2.80-2.90	12			
2.90-3.00	16			
3.00-3.10	21		14.98	3.00
3.10-3.20	24			
3.20-3.30	32			
			14.48	3.50
			13.98	4.00
			13.48	4.50
			12.98	5.00



Remarks

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH12

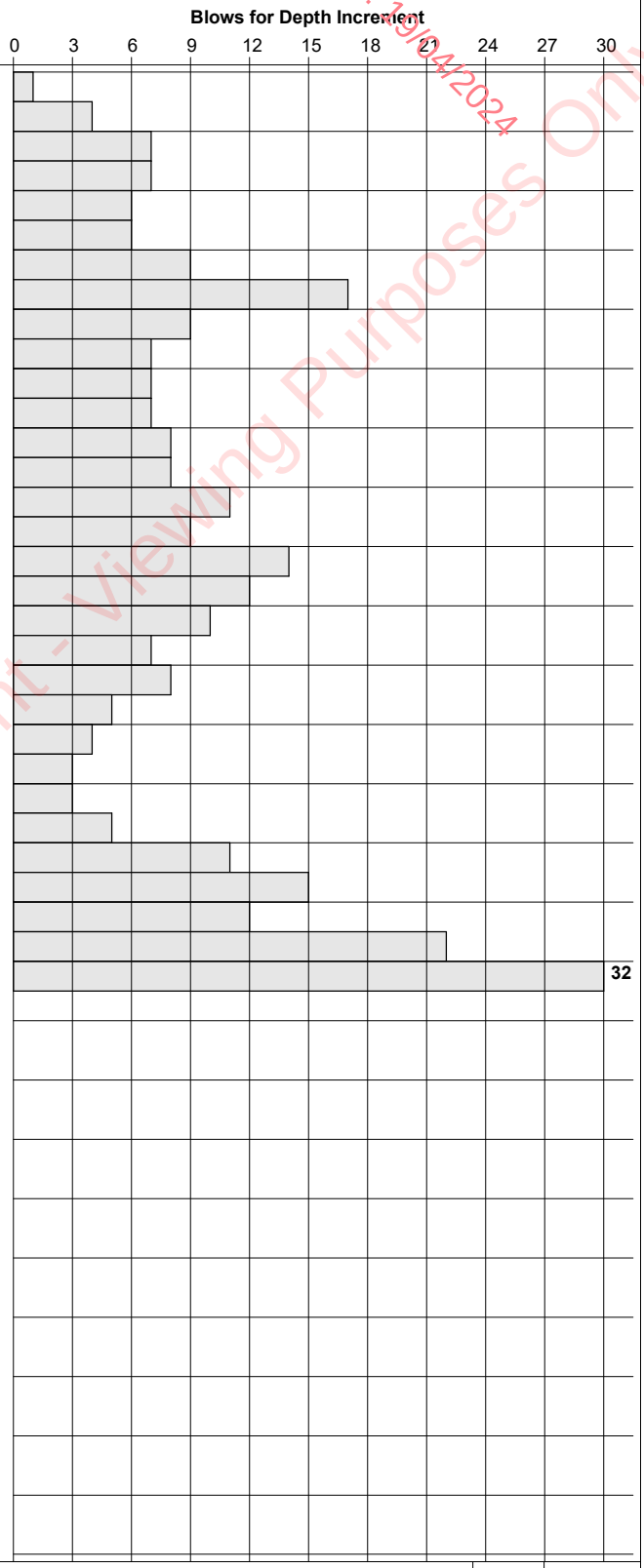
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH13

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	18.91	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704330.9 E 802859.4 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	1		18.91	0.00
0.10-0.20	4			
0.20-0.30	7			
0.30-0.40	7			
0.40-0.50	6			
0.50-0.60	6		18.41	0.50
0.60-0.70	9			
0.70-0.80	17			
0.80-0.90	9			
0.90-1.00	7			
1.00-1.10	7		17.91	1.00
1.10-1.20	7			
1.20-1.30	8			
1.30-1.40	8			
1.40-1.50	11			
1.50-1.60	9		17.41	1.50
1.60-1.70	14			
1.70-1.80	12			
1.80-1.90	10			
1.90-2.00	7			
2.00-2.10	8		16.91	2.00
2.10-2.20	5			
2.20-2.30	4			
2.30-2.40	3			
2.40-2.50	3			
2.50-2.60	5		16.41	2.50
2.60-2.70	11			
2.70-2.80	15			
2.80-2.90	12			
2.90-3.00	22			
3.00-3.10	32		15.91	3.00
			15.41	3.50
			14.91	4.00
			14.41	4.50
			13.91	5.00



Remarks
Refusal at 3.10m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH13

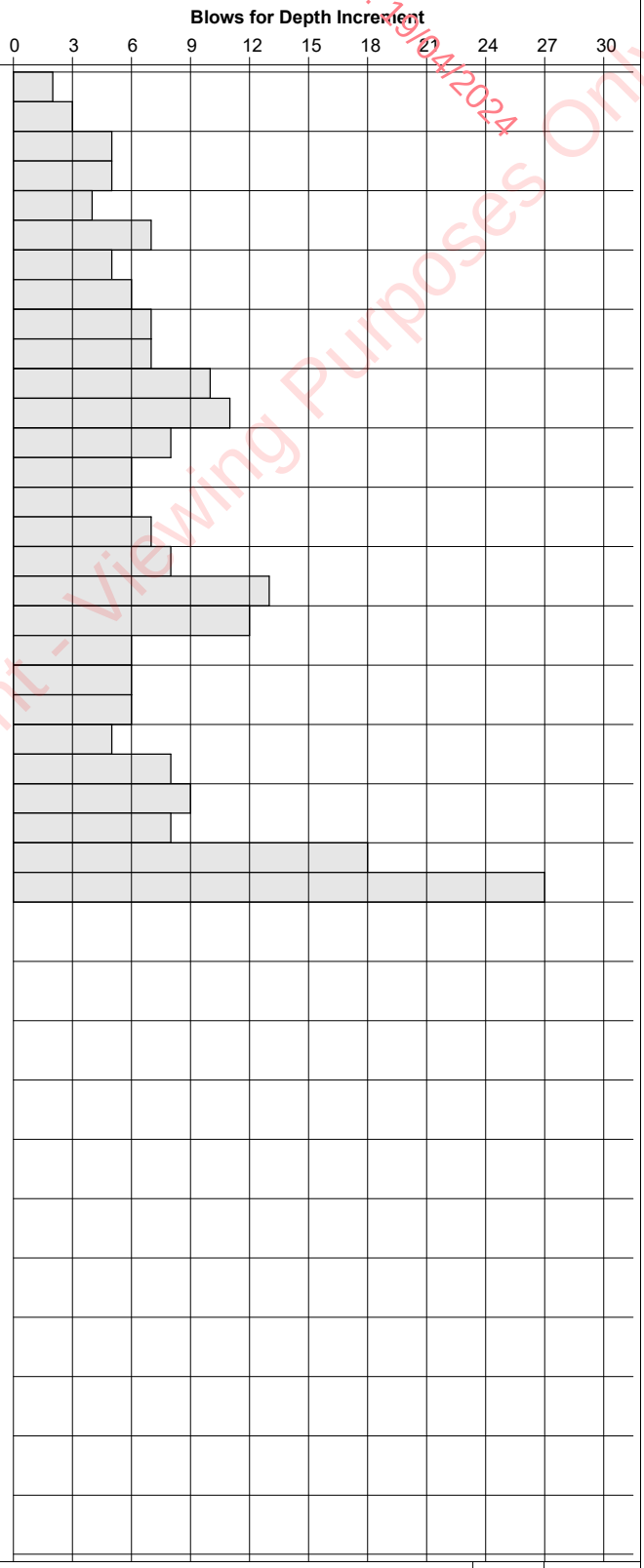
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH14

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	22.97	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704235.9 E 802883.4 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		22.97	0.00
0.10-0.20	3			
0.20-0.30	5			
0.30-0.40	5			
0.40-0.50	4			
0.50-0.60	7		22.47	0.50
0.60-0.70	5			
0.70-0.80	6			
0.80-0.90	7			
0.90-1.00	7			
1.00-1.10	10		21.97	1.00
1.10-1.20	11			
1.20-1.30	8			
1.30-1.40	6			
1.40-1.50	6			
1.50-1.60	7		21.47	1.50
1.60-1.70	8			
1.70-1.80	13			
1.80-1.90	12			
1.90-2.00	6			
2.00-2.10	6		20.97	2.00
2.10-2.20	6			
2.20-2.30	5			
2.30-2.40	8			
2.40-2.50	9			
2.50-2.60	8		20.47	2.50
2.60-2.70	18			
2.70-2.80	27			
			19.97	3.00
			19.47	3.50
			18.97	4.00
			18.47	4.50
			17.97	5.00



Remarks
Refusal at 2.80m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH14

Ground Investigations Ireland Ltd

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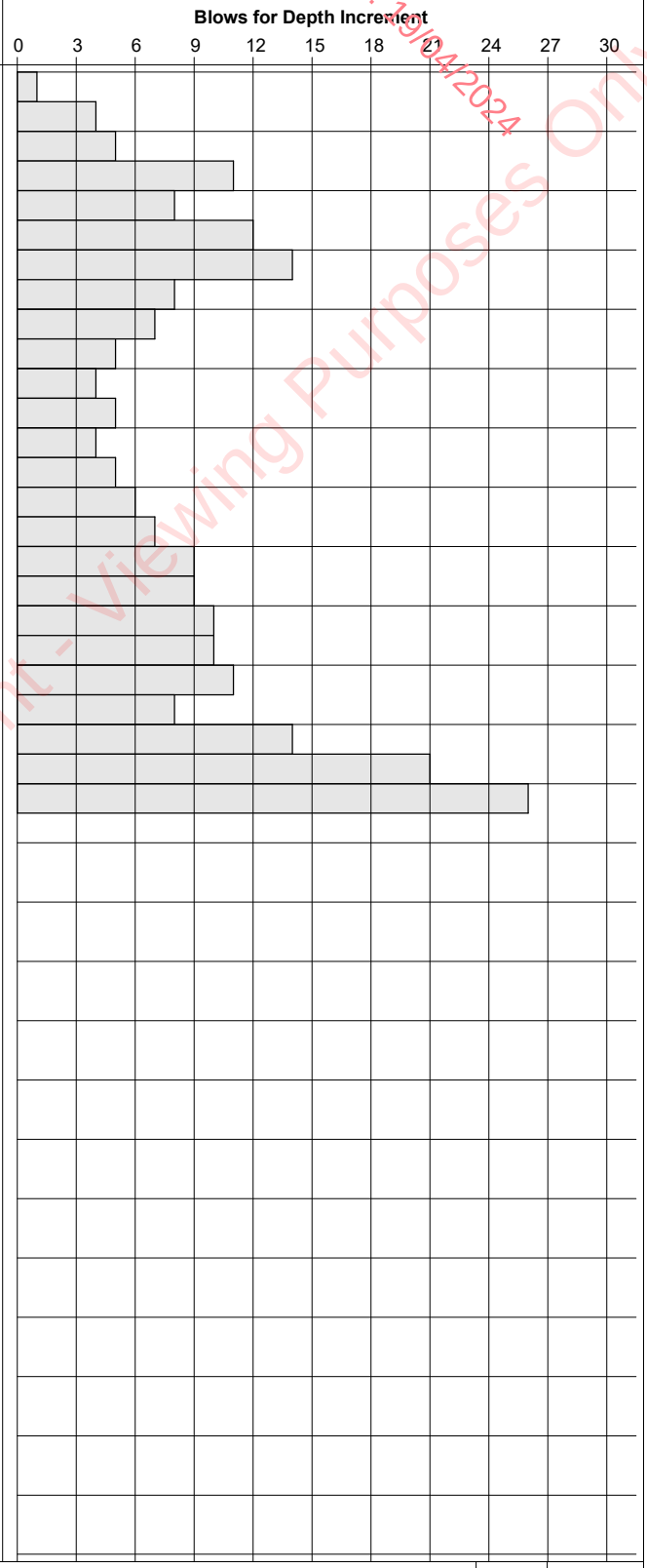
Site	Probe Number
IPS Integrated Project	DPH15

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	21.05	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704209.7 E 802950.4 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	1	
0.10-0.20	4	
0.20-0.30	5	
0.30-0.40	11	
0.40-0.50	8	
0.50-0.60	12	
0.60-0.70	14	
0.70-0.80	8	
0.80-0.90	7	
0.90-1.00	5	
1.00-1.10	4	
1.10-1.20	5	
1.20-1.30	4	
1.30-1.40	5	
1.40-1.50	6	
1.50-1.60	7	
1.60-1.70	9	
1.70-1.80	9	
1.80-1.90	10	
1.90-2.00	10	
2.00-2.10	11	
2.10-2.20	8	
2.20-2.30	14	
2.30-2.40	21	
2.40-2.50	26	



Remarks
Refusal a 2.50m BGL 25 blows for 75mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH15

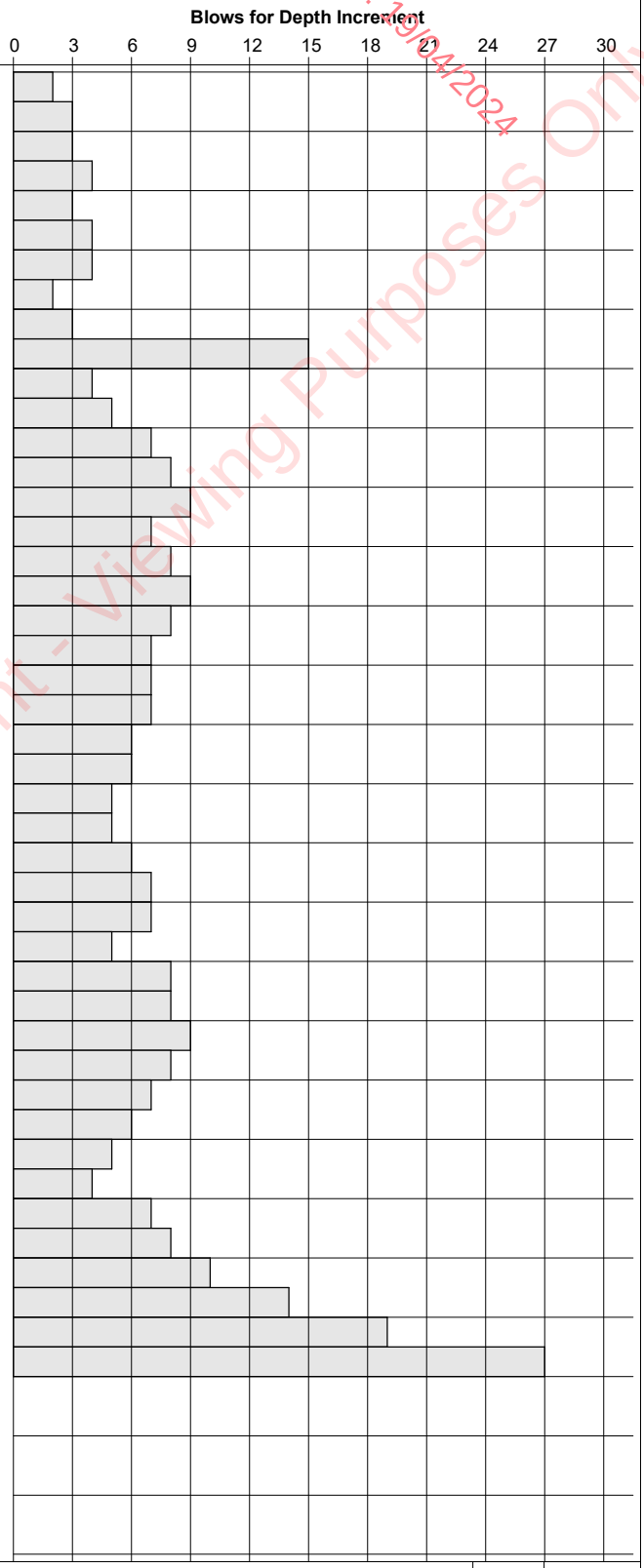
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH16

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	20.65	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704146.1 E 803016.6 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		20.65	0.00
0.10-0.20	3			
0.20-0.30	3			
0.30-0.40	4			
0.40-0.50	3			
0.50-0.60	4		20.15	0.50
0.60-0.70	4			
0.70-0.80	2			
0.80-0.90	3			
0.90-1.00	15			
1.00-1.10	4		19.65	1.00
1.10-1.20	5			
1.20-1.30	7			
1.30-1.40	8			
1.40-1.50	9			
1.50-1.60	7		19.15	1.50
1.60-1.70	8			
1.70-1.80	9			
1.80-1.90	8			
1.90-2.00	7			
2.00-2.10	7		18.65	2.00
2.10-2.20	7			
2.20-2.30	6			
2.30-2.40	6			
2.40-2.50	5			
2.50-2.60	5		18.15	2.50
2.60-2.70	6			
2.70-2.80	7			
2.80-2.90	7			
2.90-3.00	5			
3.00-3.10	8		17.65	3.00
3.10-3.20	8			
3.20-3.30	9			
3.30-3.40	8			
3.40-3.50	7			
3.50-3.60	6		17.15	3.50
3.60-3.70	5			
3.70-3.80	4			
3.80-3.90	7			
3.90-4.00	8			
4.00-4.10	10		16.65	4.00
4.10-4.20	14			
4.20-4.30	19			
4.30-4.40	27			
			16.15	4.50
			15.65	5.00



Remarks
Refusal at 4.40m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH16

Ground Investigations Ireland Ltd

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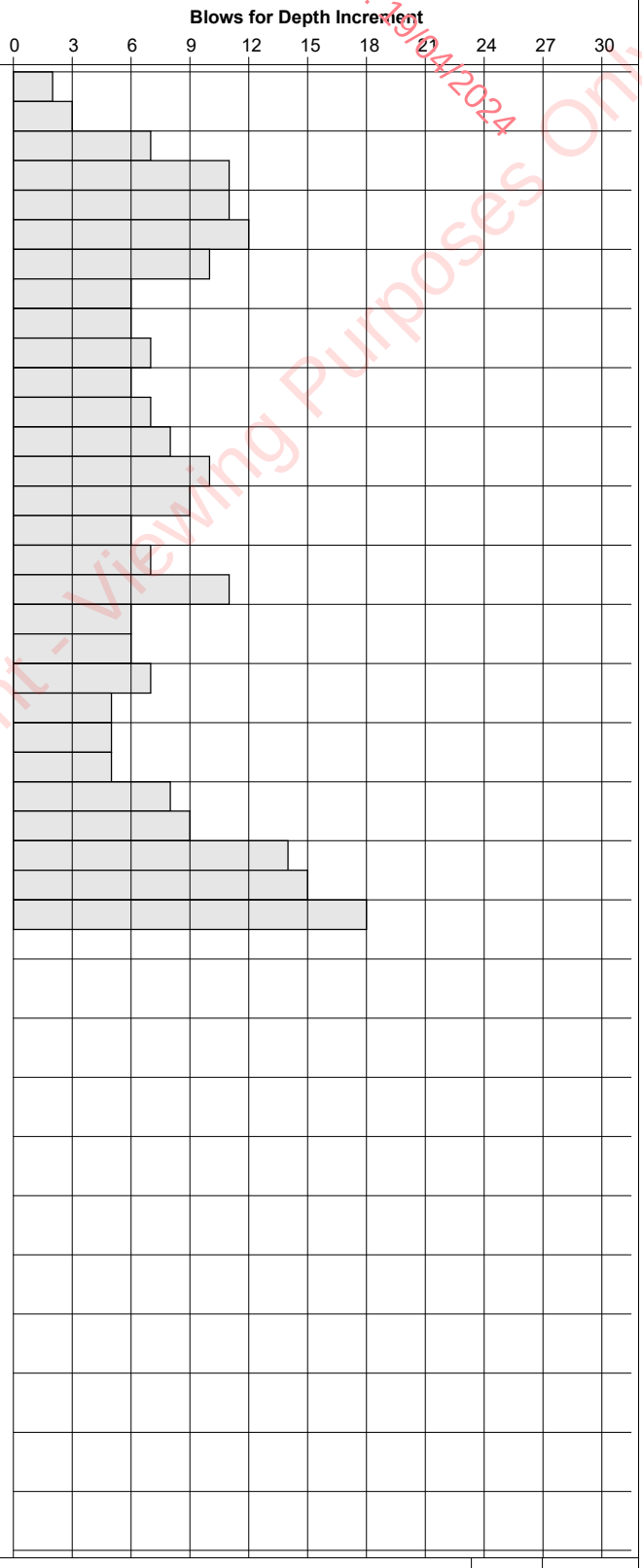
Site	Probe Number
IPS Integrated Project	DPH17

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	23.31	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704117.6 E 803087.8 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		23.31	0.00
0.10-0.20	3			
0.20-0.30	7			
0.30-0.40	11			
0.40-0.50	11			
0.50-0.60	12		22.81	0.50
0.60-0.70	10			
0.70-0.80	6			
0.80-0.90	6			
0.90-1.00	7			
1.00-1.10	6		22.31	1.00
1.10-1.20	7			
1.20-1.30	8			
1.30-1.40	10			
1.40-1.50	9			
1.50-1.60	6		21.81	1.50
1.60-1.70	7			
1.70-1.80	11			
1.80-1.90	6			
1.90-2.00	6			
2.00-2.10	7		21.31	2.00
2.10-2.20	5			
2.20-2.30	5			
2.30-2.40	5			
2.40-2.50	8			
2.50-2.60	9		20.81	2.50
2.60-2.70	14			
2.70-2.80	15			
2.80-2.90	18			
			20.31	3.00
			19.81	3.50
			19.31	4.00
			18.81	4.50
			18.31	5.00



Remarks
Refusal a 2.90m BGL 30 blows for 75mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH17

Ground Investigations Ireland Ltd

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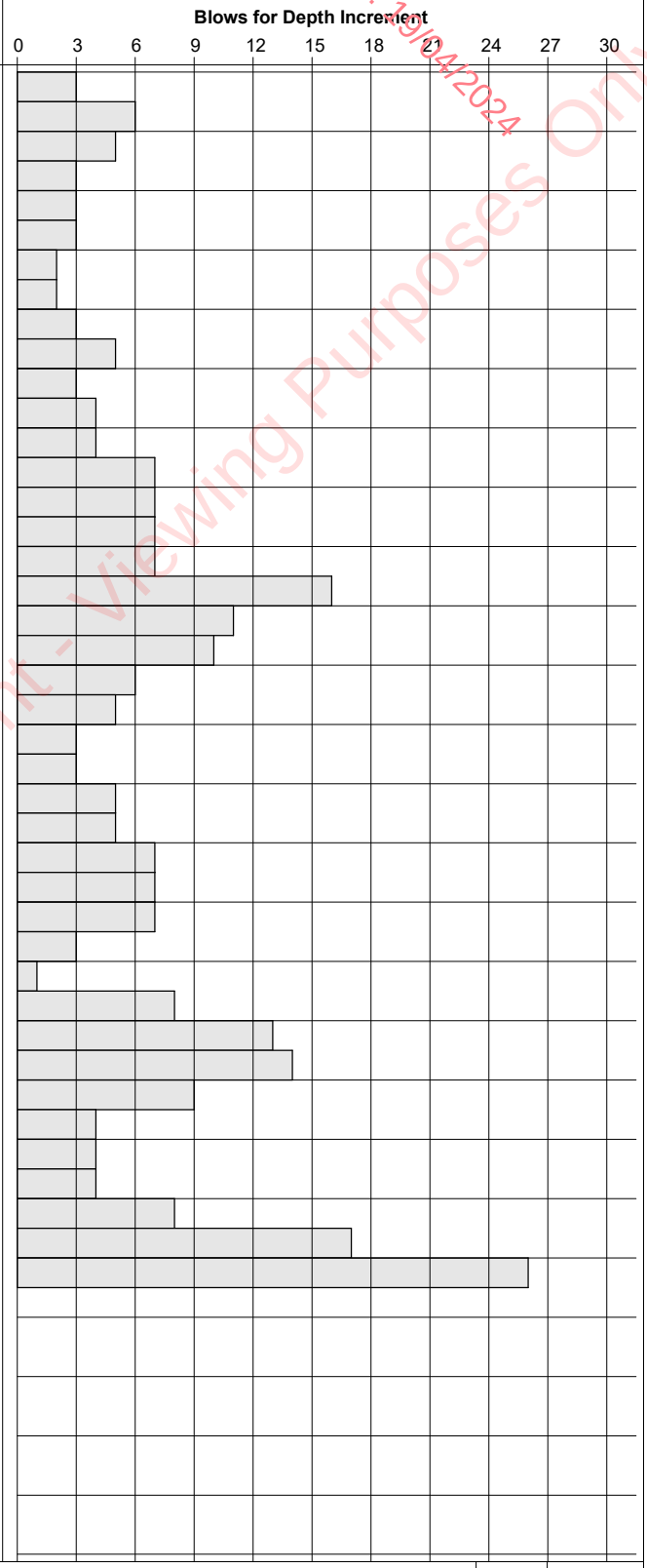
Site	Probe Number
IPS Integrated Project	DPH18

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	24.29	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704027.2 E 803116.9 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		24.29	0.00
0.10-0.20	6			
0.20-0.30	5			
0.30-0.40	3			
0.40-0.50	3			
0.50-0.60	3		23.79	0.50
0.60-0.70	2			
0.70-0.80	2			
0.80-0.90	3			
0.90-1.00	5			
1.00-1.10	3		23.29	1.00
1.10-1.20	4			
1.20-1.30	4			
1.30-1.40	7			
1.40-1.50	7			
1.50-1.60	7		22.79	1.50
1.60-1.70	7			
1.70-1.80	16			
1.80-1.90	11			
1.90-2.00	10			
2.00-2.10	6		22.29	2.00
2.10-2.20	5			
2.20-2.30	3			
2.30-2.40	3			
2.40-2.50	5			
2.50-2.60	5		21.79	2.50
2.60-2.70	7			
2.70-2.80	7			
2.80-2.90	7			
2.90-3.00	3			
3.00-3.10	1		21.29	3.00
3.10-3.20	8			
3.20-3.30	13			
3.30-3.40	14			
3.40-3.50	9			
3.50-3.60	4		20.79	3.50
3.60-3.70	4			
3.70-3.80	4			
3.80-3.90	8			
3.90-4.00	17			
4.00-4.10	26		20.29	4.00
			19.79	4.50
			19.29	5.00



Remarks
Refusal at 4.10m BGL 30 blows for 25mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH18

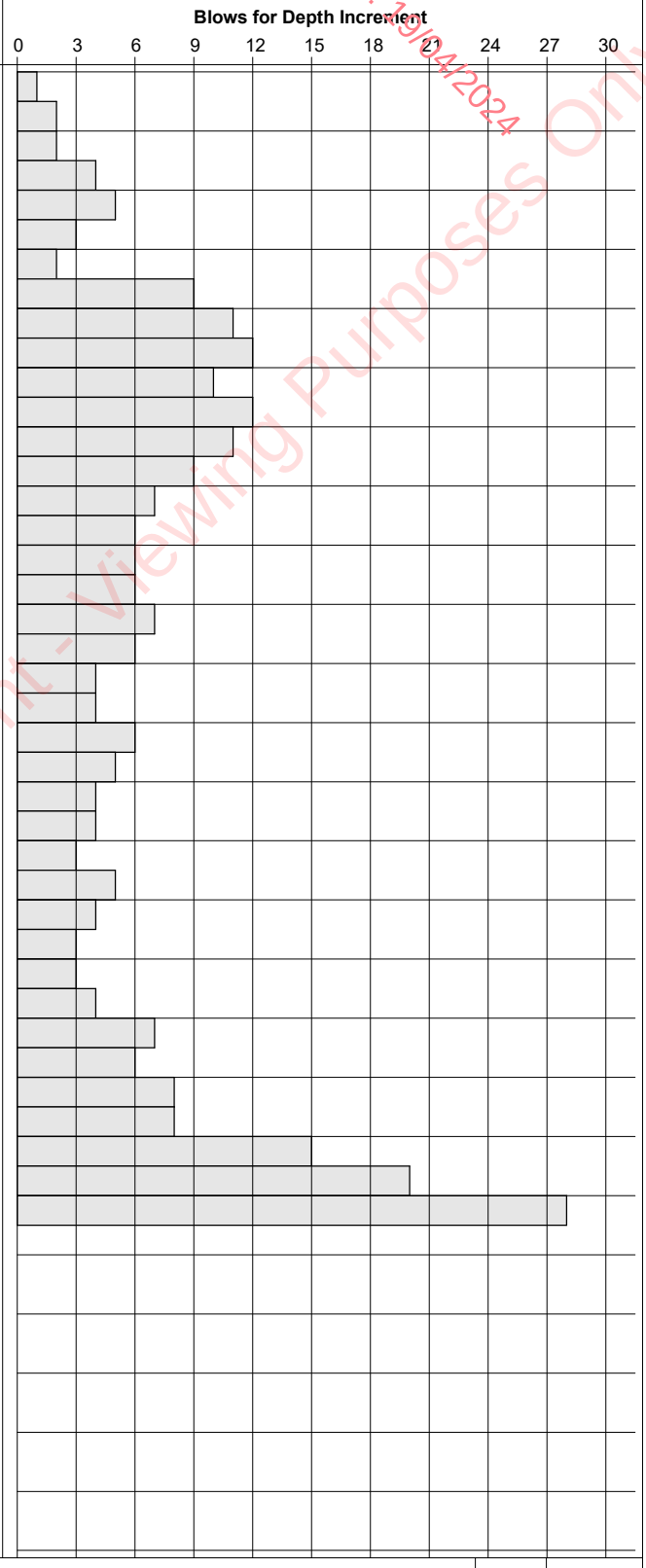
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH19

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	23.86	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704097.4 E 803036.4 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	1		23.86	0.00
0.10-0.20	2			
0.20-0.30	2			
0.30-0.40	4			
0.40-0.50	5			
0.50-0.60	3		23.36	0.50
0.60-0.70	2			
0.70-0.80	9			
0.80-0.90	11			
0.90-1.00	12			
1.00-1.10	10		22.86	1.00
1.10-1.20	12			
1.20-1.30	11			
1.30-1.40	9			
1.40-1.50	7			
1.50-1.60	6		22.36	1.50
1.60-1.70	6			
1.70-1.80	6			
1.80-1.90	7			
1.90-2.00	6			
2.00-2.10	4		21.86	2.00
2.10-2.20	4			
2.20-2.30	6			
2.30-2.40	5			
2.40-2.50	4			
2.50-2.60	4		21.36	2.50
2.60-2.70	3			
2.70-2.80	5			
2.80-2.90	4			
2.90-3.00	3			
3.00-3.10	3		20.86	3.00
3.10-3.20	4			
3.20-3.30	7			
3.30-3.40	6			
3.40-3.50	8			
3.50-3.60	8		20.36	3.50
3.60-3.70	15			
3.70-3.80	20			
3.80-3.90	28			
			19.86	4.00
			19.36	4.50
			18.86	5.00



Remarks
Refusal at 3.90m BGL 26 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH19

Ground Investigations Ireland Ltd

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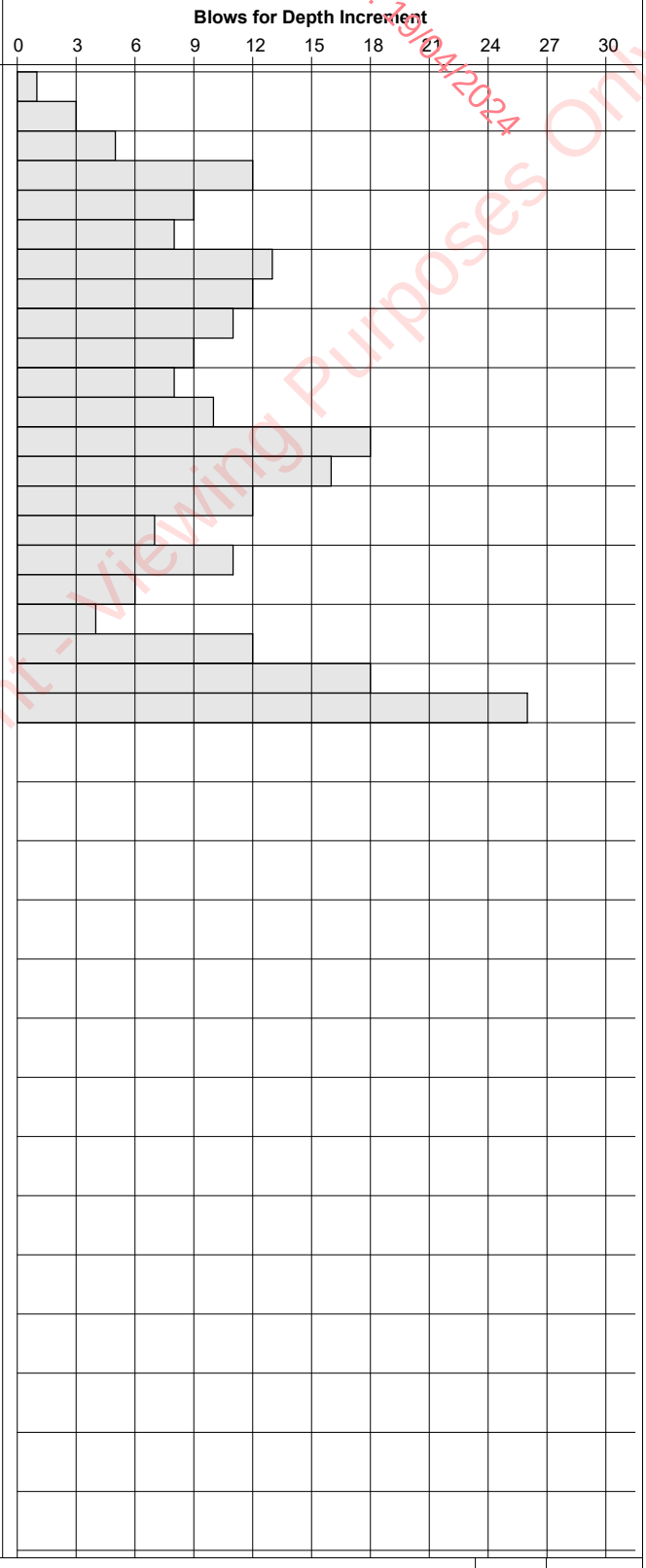
Site	Probe Number
IPS Integrated Project	DPH20

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	23.12	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704141.8 E 802957.3 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	1		23.12	0.00
0.10-0.20	3			
0.20-0.30	5			
0.30-0.40	12			
0.40-0.50	9			
0.50-0.60	8		22.62	0.50
0.60-0.70	13			
0.70-0.80	12			
0.80-0.90	11			
0.90-1.00	9			
1.00-1.10	8		22.12	1.00
1.10-1.20	10			
1.20-1.30	18			
1.30-1.40	16			
1.40-1.50	12			
1.50-1.60	7		21.62	1.50
1.60-1.70	11			
1.70-1.80	6			
1.80-1.90	4			
1.90-2.00	12			
2.00-2.10	18		21.12	2.00
2.10-2.20	26			
			20.62	2.50
			20.12	3.00
			19.62	3.50
			19.12	4.00
			18.62	4.50
			18.12	5.00



Remarks
Refusal at 2.20m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH20

Ground Investigations Ireland Ltd

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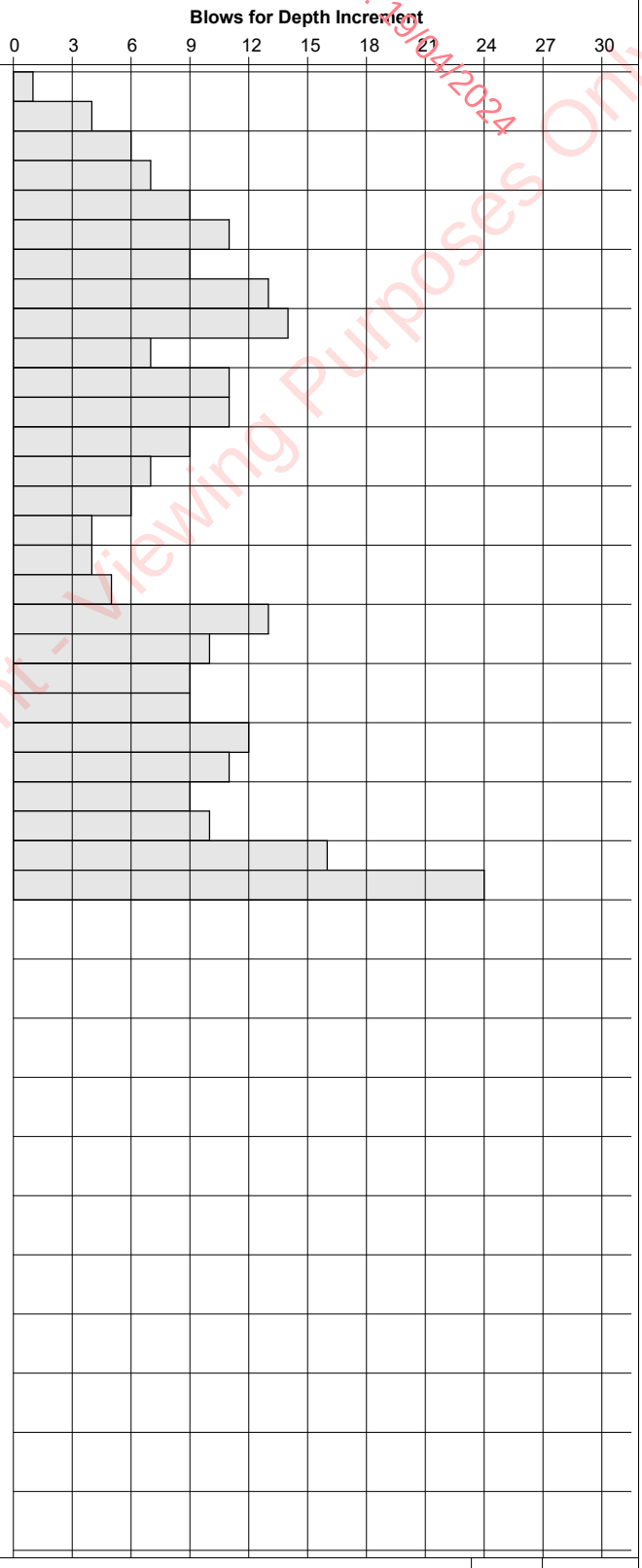
Site	Probe Number
IPS Integrated Project	DPH21

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	22.38	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704215.9 E 802832.2 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	1		22.38	0.00
0.10-0.20	4			
0.20-0.30	6			
0.30-0.40	7			
0.40-0.50	9			
0.50-0.60	11		21.88	0.50
0.60-0.70	9			
0.70-0.80	13			
0.80-0.90	14			
0.90-1.00	7			
1.00-1.10	11		21.38	1.00
1.10-1.20	11			
1.20-1.30	9			
1.30-1.40	7			
1.40-1.50	6			
1.50-1.60	4		20.88	1.50
1.60-1.70	4			
1.70-1.80	5			
1.80-1.90	13			
1.90-2.00	10			
2.00-2.10	9		20.38	2.00
2.10-2.20	9			
2.20-2.30	12			
2.30-2.40	11			
2.40-2.50	9			
2.50-2.60	10		19.88	2.50
2.60-2.70	16			
2.70-2.80	24			
			19.38	3.00
			18.88	3.50
			18.38	4.00
			17.88	4.50
			17.38	5.00



Remarks
Refusal at 2.80m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH21

Ground Investigations Ireland Ltd

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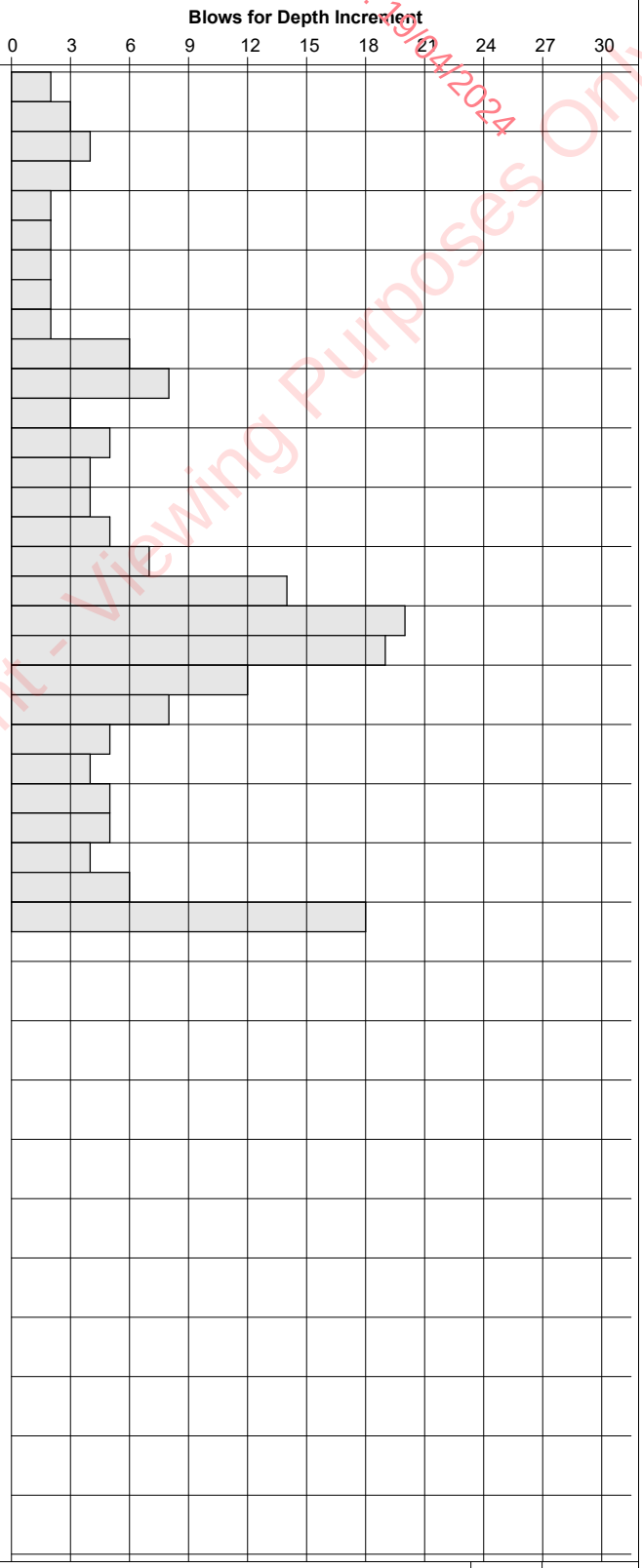
Site	Probe Number
IPS Integrated Project	DPH22

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	25.72	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	703997.6 E 803184.4 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		25.72	0.00
0.10-0.20	3			
0.20-0.30	4			
0.30-0.40	3			
0.40-0.50	2			
0.50-0.60	2		25.22	0.50
0.60-0.70	2			
0.70-0.80	2			
0.80-0.90	2			
0.90-1.00	6			
1.00-1.10	8		24.72	1.00
1.10-1.20	3			
1.20-1.30	5			
1.30-1.40	4			
1.40-1.50	4			
1.50-1.60	5		24.22	1.50
1.60-1.70	7			
1.70-1.80	14			
1.80-1.90	20			
1.90-2.00	19			
2.00-2.10	12		23.72	2.00
2.10-2.20	8			
2.20-2.30	5			
2.30-2.40	4			
2.40-2.50	5			
2.50-2.60	5		23.22	2.50
2.60-2.70	4			
2.70-2.80	6			
2.80-2.90	18			
			22.72	3.00
			22.22	3.50
			21.72	4.00
			21.22	4.50
			20.72	5.00



Remarks
Refusal at 2.90m BGL 30 blows for 25mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH22

Ground Investigations Ireland Ltd

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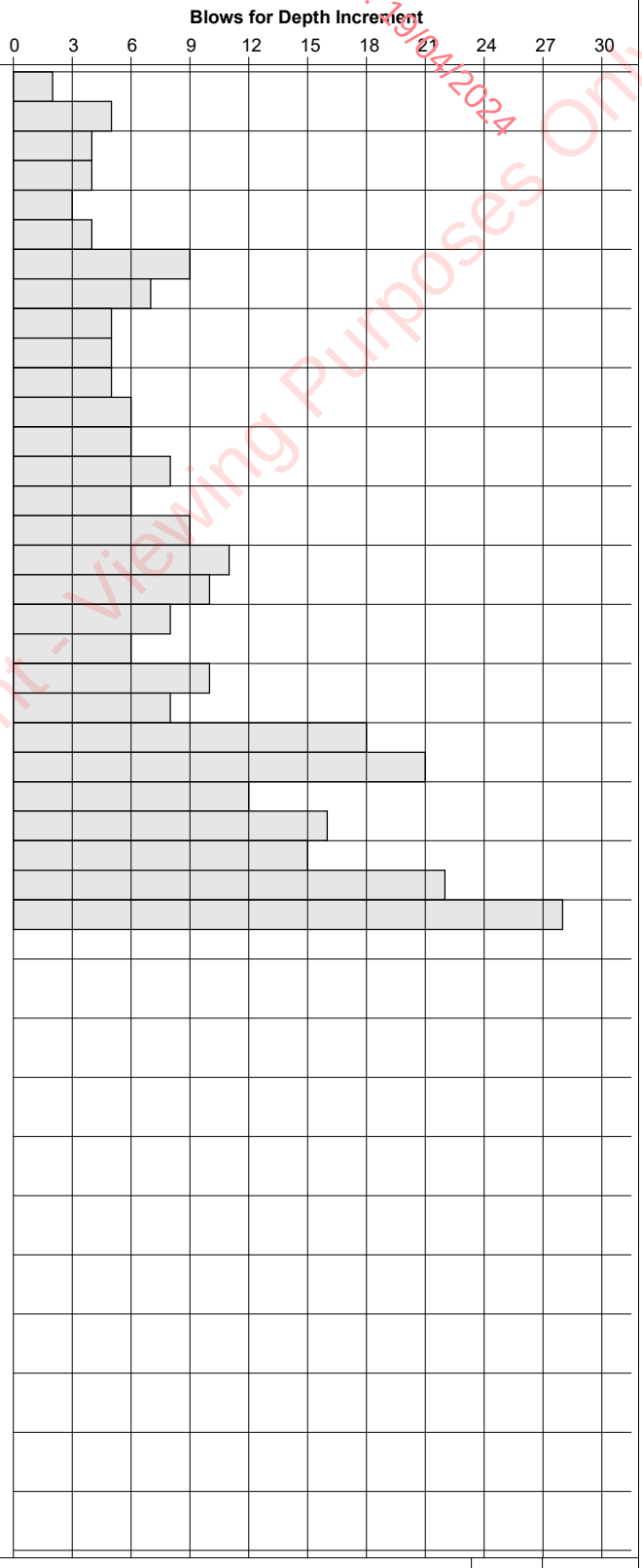
Site	Probe Number
IPS Integrated Project	DPH23

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	22.54	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704060.6 E 803250.6 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		22.54	0.00
0.10-0.20	5			
0.20-0.30	4			
0.30-0.40	4			
0.40-0.50	3			
0.50-0.60	4		22.04	0.50
0.60-0.70	9			
0.70-0.80	7			
0.80-0.90	5			
0.90-1.00	5			
1.00-1.10	5		21.54	1.00
1.10-1.20	6			
1.20-1.30	6			
1.30-1.40	8			
1.40-1.50	6			
1.50-1.60	9		21.04	1.50
1.60-1.70	11			
1.70-1.80	10			
1.80-1.90	8			
1.90-2.00	6			
2.00-2.10	10		20.54	2.00
2.10-2.20	8			
2.20-2.30	18			
2.30-2.40	21			
2.40-2.50	12			
2.50-2.60	16		20.04	2.50
2.60-2.70	15			
2.70-2.80	22			
2.80-2.90	28			
			19.54	3.00
			19.04	3.50
			18.54	4.00
			18.04	4.50
			17.54	5.00



Remarks
Refusal at 2.90m BGL 30 blows for 25mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH23

Ground Investigations Ireland Ltd

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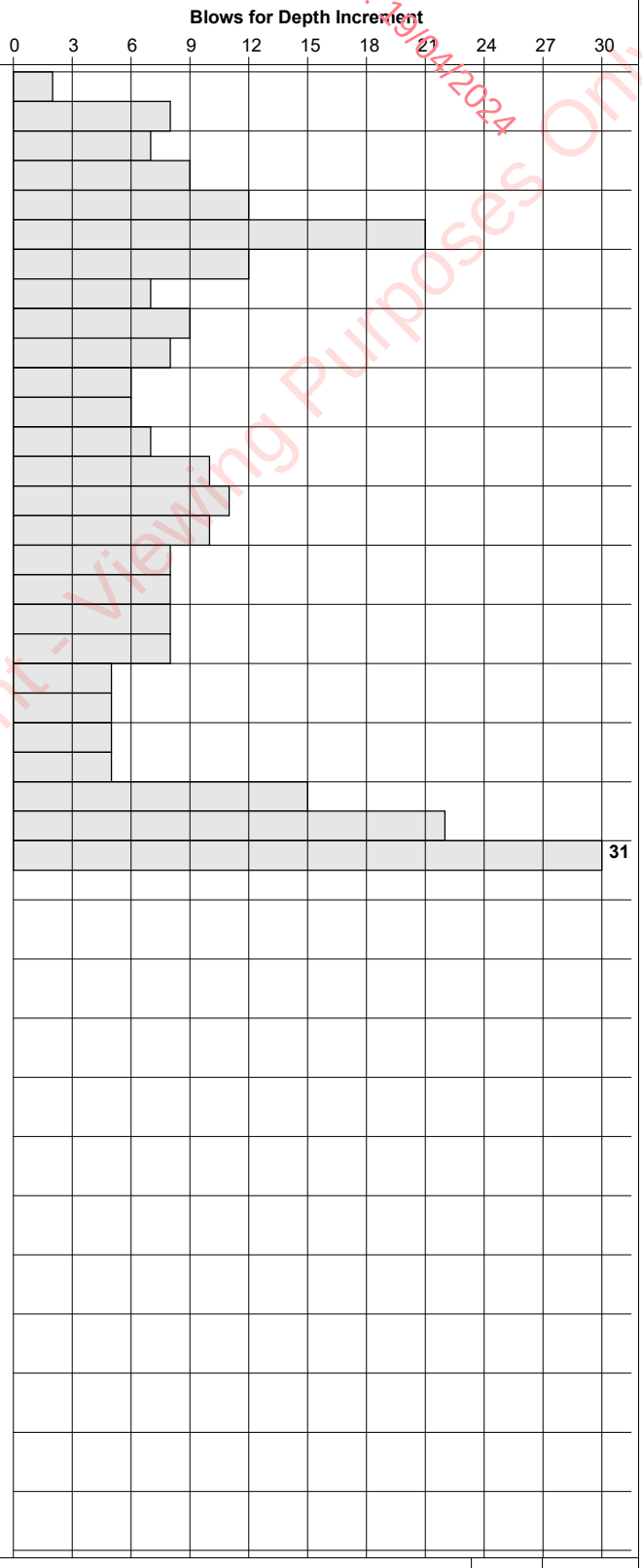
Site	Probe Number
IPS Integrated Project	DPH24

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	25.01	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704165.3 E 803364.8 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		25.01	0.00
0.10-0.20	8			
0.20-0.30	7			
0.30-0.40	9			
0.40-0.50	12			
0.50-0.60	21		24.51	0.50
0.60-0.70	12			
0.70-0.80	7			
0.80-0.90	9			
0.90-1.00	8			
1.00-1.10	6		24.01	1.00
1.10-1.20	6			
1.20-1.30	7			
1.30-1.40	10			
1.40-1.50	11			
1.50-1.60	10		23.51	1.50
1.60-1.70	8			
1.70-1.80	8			
1.80-1.90	8			
1.90-2.00	8			
2.00-2.10	5		23.01	2.00
2.10-2.20	5			
2.20-2.30	5			
2.30-2.40	5			
2.40-2.50	15			
2.50-2.60	22		22.51	2.50
2.60-2.70	31			
			22.01	3.00
			21.51	3.50
			21.01	4.00
			20.51	4.50
			20.01	5.00



Remarks
Refusal at 2.70m BGL 30 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH24

Ground Investigations Ireland Ltd

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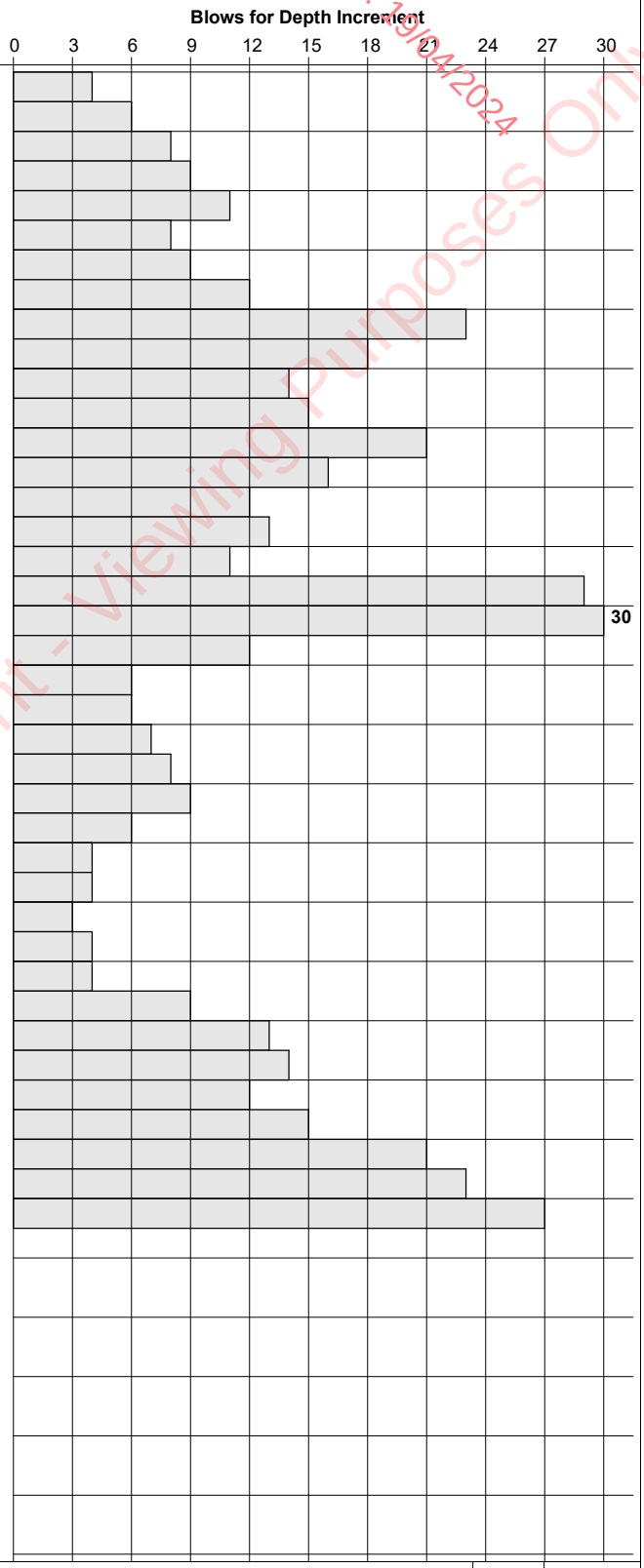
Site	Probe Number
IPS Integrated Project	DPH25

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	23.11	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704243.9 E 803437.6 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		23.11	0.00
0.10-0.20	6			
0.20-0.30	8			
0.30-0.40	9			
0.40-0.50	11			
0.50-0.60	8		22.61	0.50
0.60-0.70	9			
0.70-0.80	12			
0.80-0.90	23			
0.90-1.00	18			
1.00-1.10	14		22.11	1.00
1.10-1.20	15			
1.20-1.30	21			
1.30-1.40	16			
1.40-1.50	12			
1.50-1.60	13		21.61	1.50
1.60-1.70	11			
1.70-1.80	29			
1.80-1.90	30			
1.90-2.00	12			
2.00-2.10	6		21.11	2.00
2.10-2.20	6			
2.20-2.30	7			
2.30-2.40	8			
2.40-2.50	9			
2.50-2.60	6		20.61	2.50
2.60-2.70	4			
2.70-2.80	4			
2.80-2.90	3			
2.90-3.00	4			
3.00-3.10	4		20.11	3.00
3.10-3.20	9			
3.20-3.30	13			
3.30-3.40	14			
3.40-3.50	12			
3.50-3.60	15		19.61	3.50
3.60-3.70	21			
3.70-3.80	23			
3.80-3.90	27			
			19.11	4.00
			18.61	4.50
			18.11	5.00



Remarks

Scale (approx)	Logged By
1:25	CF

Figure No.

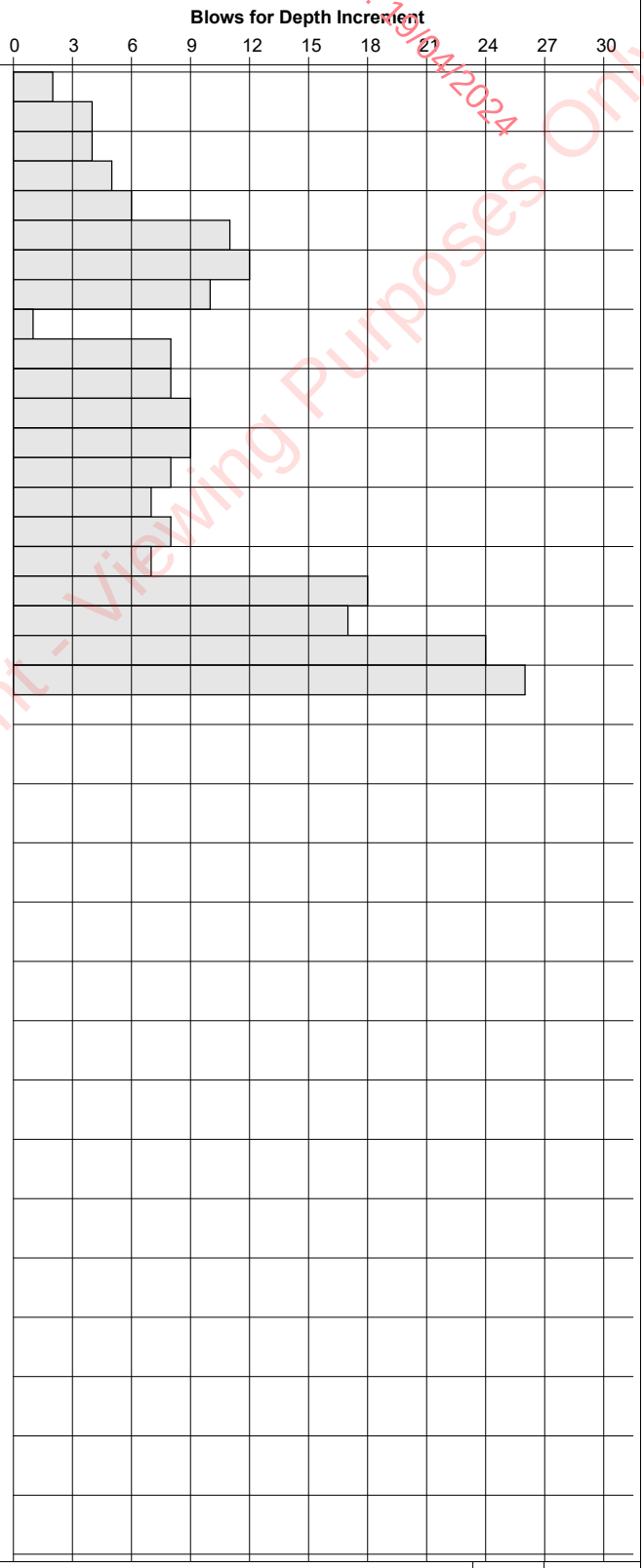
8115-10-18.DPH25

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH26

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	23.39	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704280 E 803403.3 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		23.39	0.00
0.10-0.20	4			
0.20-0.30	4			
0.30-0.40	5			
0.40-0.50	6			
0.50-0.60	11		22.89	0.50
0.60-0.70	12			
0.70-0.80	10			
0.80-0.90	1			
0.90-1.00	8			
1.00-1.10	8		22.39	1.00
1.10-1.20	9			
1.20-1.30	9			
1.30-1.40	8			
1.40-1.50	7			
1.50-1.60	8		21.89	1.50
1.60-1.70	7			
1.70-1.80	18			
1.80-1.90	17			
1.90-2.00	24			
2.00-2.10	26		21.39	2.00
			20.89	2.50
			20.39	3.00
			19.89	3.50
			19.39	4.00
			18.89	4.50
			18.39	5.00



Remarks
Refusal at 2.10m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH26

Ground Investigations Ireland Ltd

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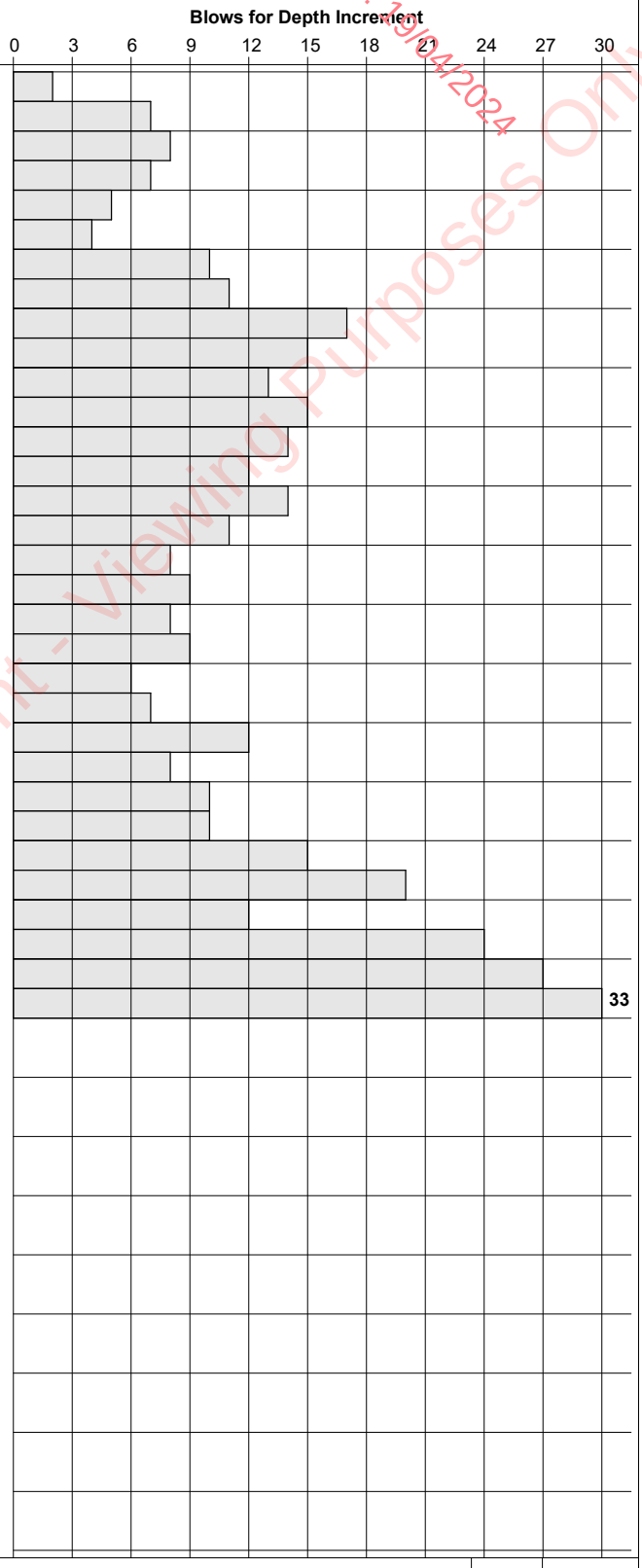
Site	Probe Number
IPS Integrated Project	DPH27

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	19.44	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704353.1 E 803485.1 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		19.44	0.00
0.10-0.20	7			
0.20-0.30	8			
0.30-0.40	7			
0.40-0.50	5			
0.50-0.60	4		18.94	0.50
0.60-0.70	10			
0.70-0.80	11			
0.80-0.90	17			
0.90-1.00	15			
1.00-1.10	13		18.44	1.00
1.10-1.20	15			
1.20-1.30	14			
1.30-1.40	12			
1.40-1.50	14			
1.50-1.60	11		17.94	1.50
1.60-1.70	8			
1.70-1.80	9			
1.80-1.90	8			
1.90-2.00	9			
2.00-2.10	6		17.44	2.00
2.10-2.20	7			
2.20-2.30	12			
2.30-2.40	8			
2.40-2.50	10			
2.50-2.60	10		16.94	2.50
2.60-2.70	15			
2.70-2.80	20			
2.80-2.90	12			
2.90-3.00	24			
3.00-3.10	27		16.44	3.00
3.10-3.20	33			
			15.94	3.50
			15.44	4.00
			14.94	4.50
			14.44	5.00



Remarks

Scale (approx)	Logged By
1:25	CF

Figure No.

8115-10-18.DPH27

Ground Investigations Ireland Ltd

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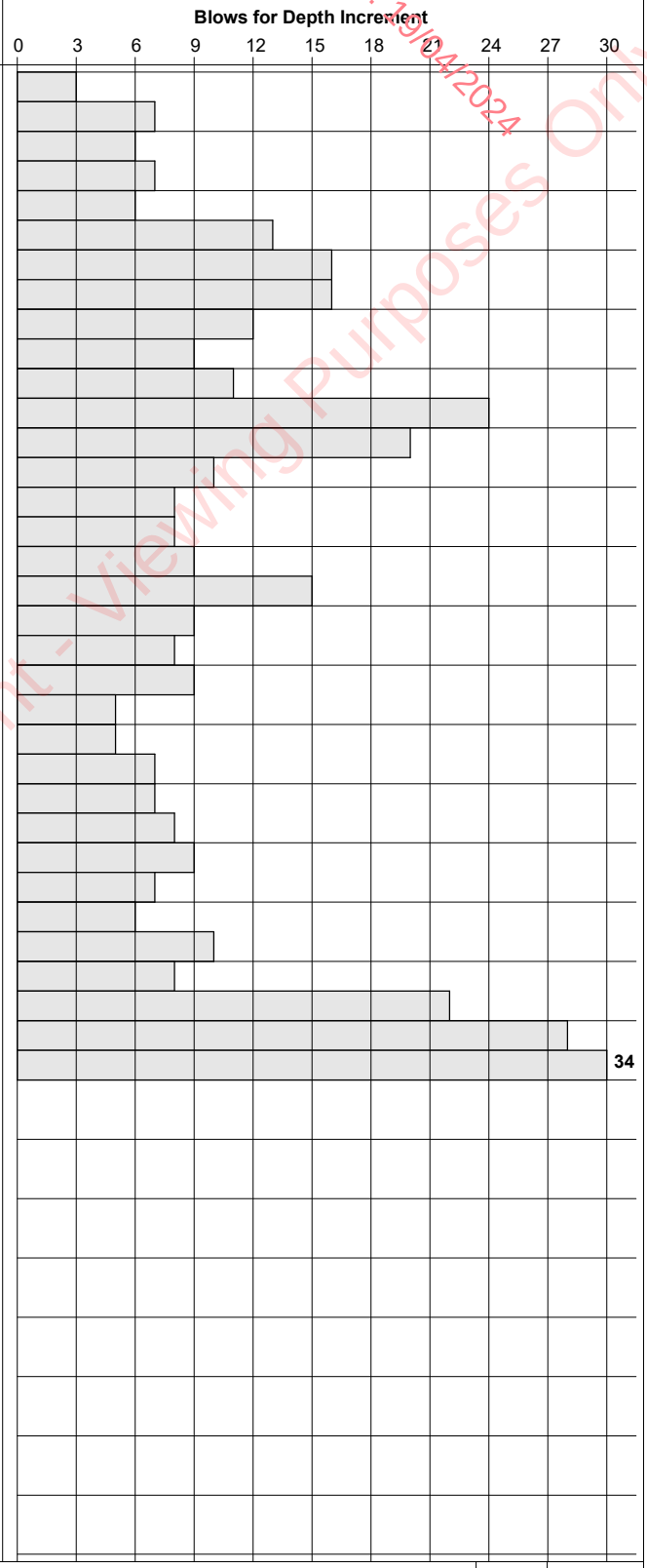
Site	Probe Number
IPS Integrated Project	DPH28

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	22.12	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704311.1 E 803522.6 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		22.12	0.00
0.10-0.20	7			
0.20-0.30	6			
0.30-0.40	7			
0.40-0.50	6			
0.50-0.60	13		21.62	0.50
0.60-0.70	16			
0.70-0.80	16			
0.80-0.90	12			
0.90-1.00	9			
1.00-1.10	11		21.12	1.00
1.10-1.20	24			
1.20-1.30	20			
1.30-1.40	10			
1.40-1.50	8			
1.50-1.60	8		20.62	1.50
1.60-1.70	9			
1.70-1.80	15			
1.80-1.90	9			
1.90-2.00	8			
2.00-2.10	9		20.12	2.00
2.10-2.20	5			
2.20-2.30	5			
2.30-2.40	7			
2.40-2.50	7			
2.50-2.60	8		19.62	2.50
2.60-2.70	9			
2.70-2.80	7			
2.80-2.90	6			
2.90-3.00	10			
3.00-3.10	8		19.12	3.00
3.10-3.20	22			
3.20-3.30	28			
3.30-3.40	34			
			18.62	3.50
			18.12	4.00
			17.62	4.50
			17.12	5.00



Remarks

Scale (approx)	Logged By
1:25	CF

Figure No.

8115-10-18.DPH28

Ground Investigations Ireland Ltd

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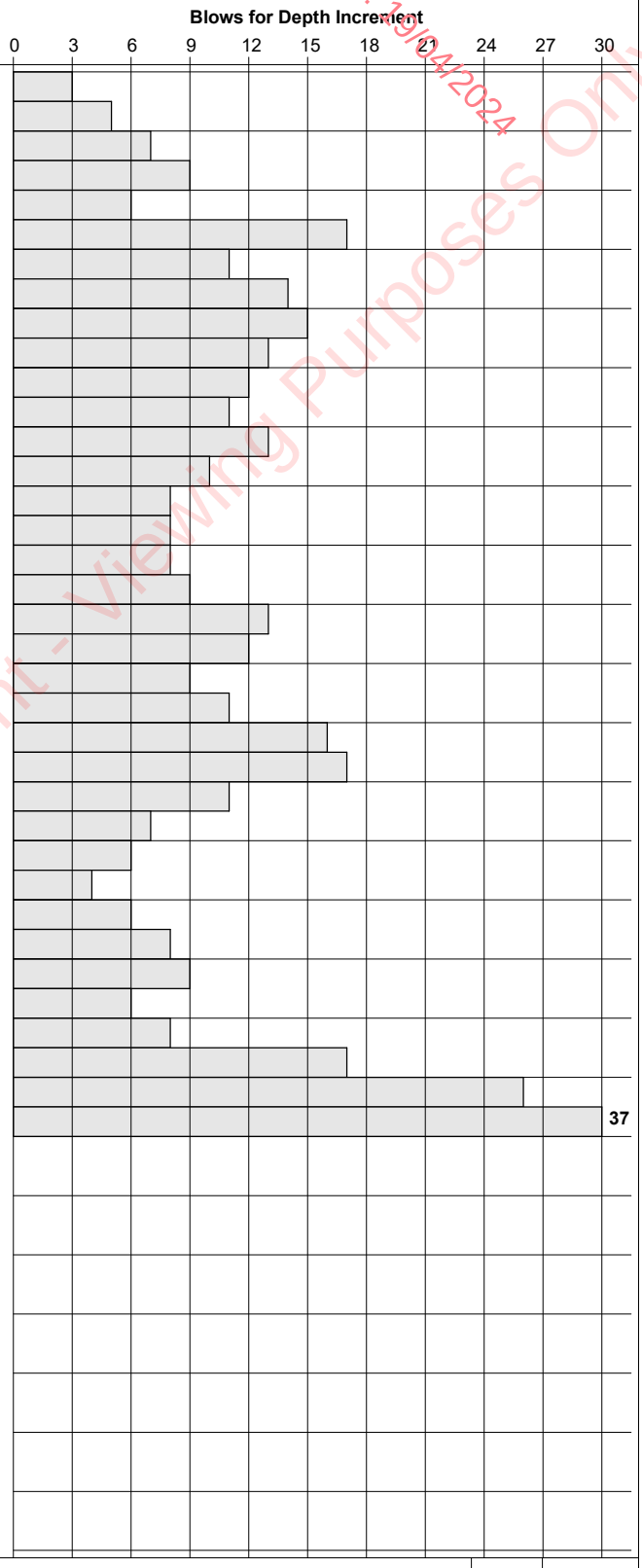
Site	Probe Number
IPS Integrated Project	DPH29

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	19.67	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704368.6 E 803584.3 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		19.67	0.00
0.10-0.20	5			
0.20-0.30	7			
0.30-0.40	9			
0.40-0.50	6			
0.50-0.60	17		19.17	0.50
0.60-0.70	11			
0.70-0.80	14			
0.80-0.90	15			
0.90-1.00	13			
1.00-1.10	12		18.67	1.00
1.10-1.20	11			
1.20-1.30	13			
1.30-1.40	10			
1.40-1.50	8			
1.50-1.60	8		18.17	1.50
1.60-1.70	8			
1.70-1.80	9			
1.80-1.90	13			
1.90-2.00	12			
2.00-2.10	9		17.67	2.00
2.10-2.20	11			
2.20-2.30	16			
2.30-2.40	17			
2.40-2.50	11			
2.50-2.60	7		17.17	2.50
2.60-2.70	6			
2.70-2.80	4			
2.80-2.90	6			
2.90-3.00	8			
3.00-3.10	9		16.67	3.00
3.10-3.20	6			
3.20-3.30	8			
3.30-3.40	17			
3.40-3.50	26			
3.50-3.60	37		16.17	3.50
			15.67	4.00
			15.17	4.50
			14.67	5.00



Remarks
Refusal at 3.60m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH29

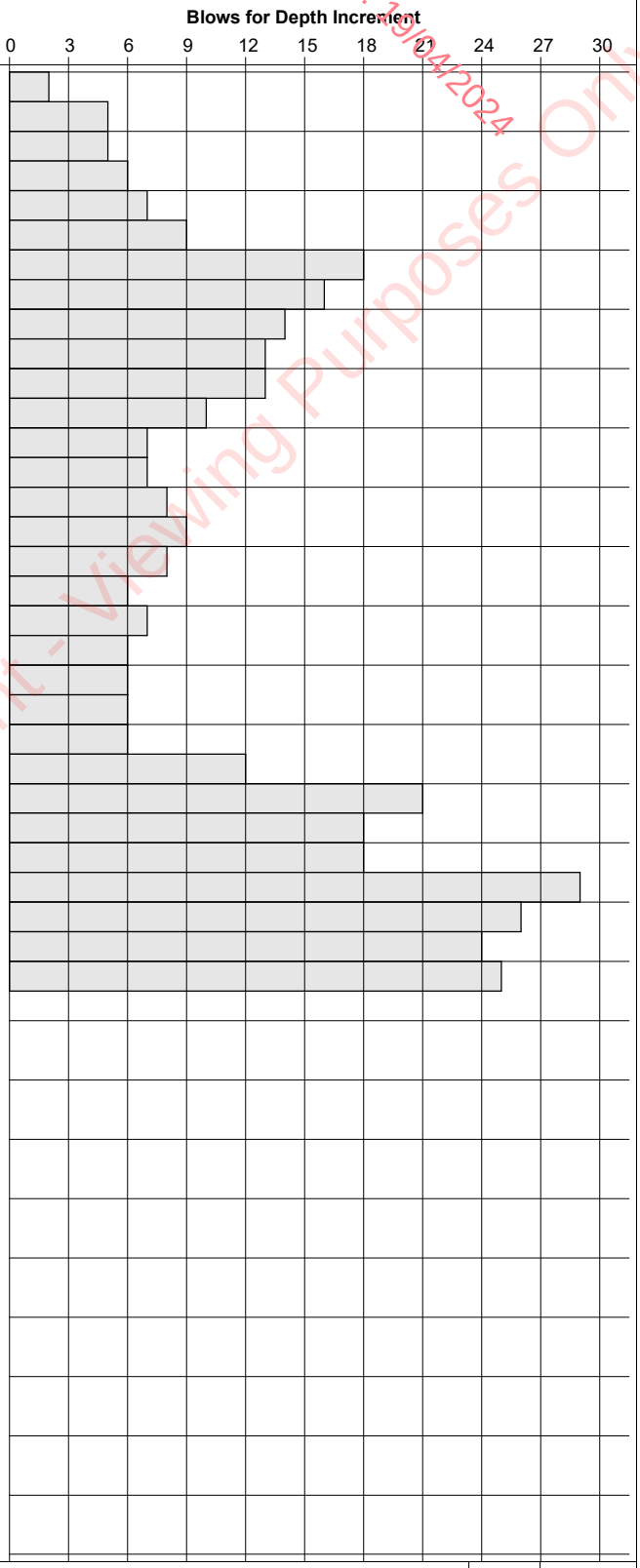
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH30

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm	18.91	GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
	704416.8 E 803539.3 N	16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		18.91	0.00
0.10-0.20	5			
0.20-0.30	5			
0.30-0.40	6			
0.40-0.50	7			
0.50-0.60	9		18.41	0.50
0.60-0.70	18			
0.70-0.80	16			
0.80-0.90	14			
0.90-1.00	13			
1.00-1.10	13		17.91	1.00
1.10-1.20	10			
1.20-1.30	7			
1.30-1.40	7			
1.40-1.50	8			
1.50-1.60	9		17.41	1.50
1.60-1.70	8			
1.70-1.80	6			
1.80-1.90	7			
1.90-2.00	6			
2.00-2.10	6		16.91	2.00
2.10-2.20	6			
2.20-2.30	6			
2.30-2.40	12			
2.40-2.50	21			
2.50-2.60	18		16.41	2.50
2.60-2.70	18			
2.70-2.80	29			
2.80-2.90	26			
2.90-3.00	24			
3.00-3.10	25		15.91	3.00
			15.41	3.50
			14.91	4.00
			14.41	4.50
			13.91	5.00



Remarks

Scale (approx)	Logged By
1:25	CF

Figure No.

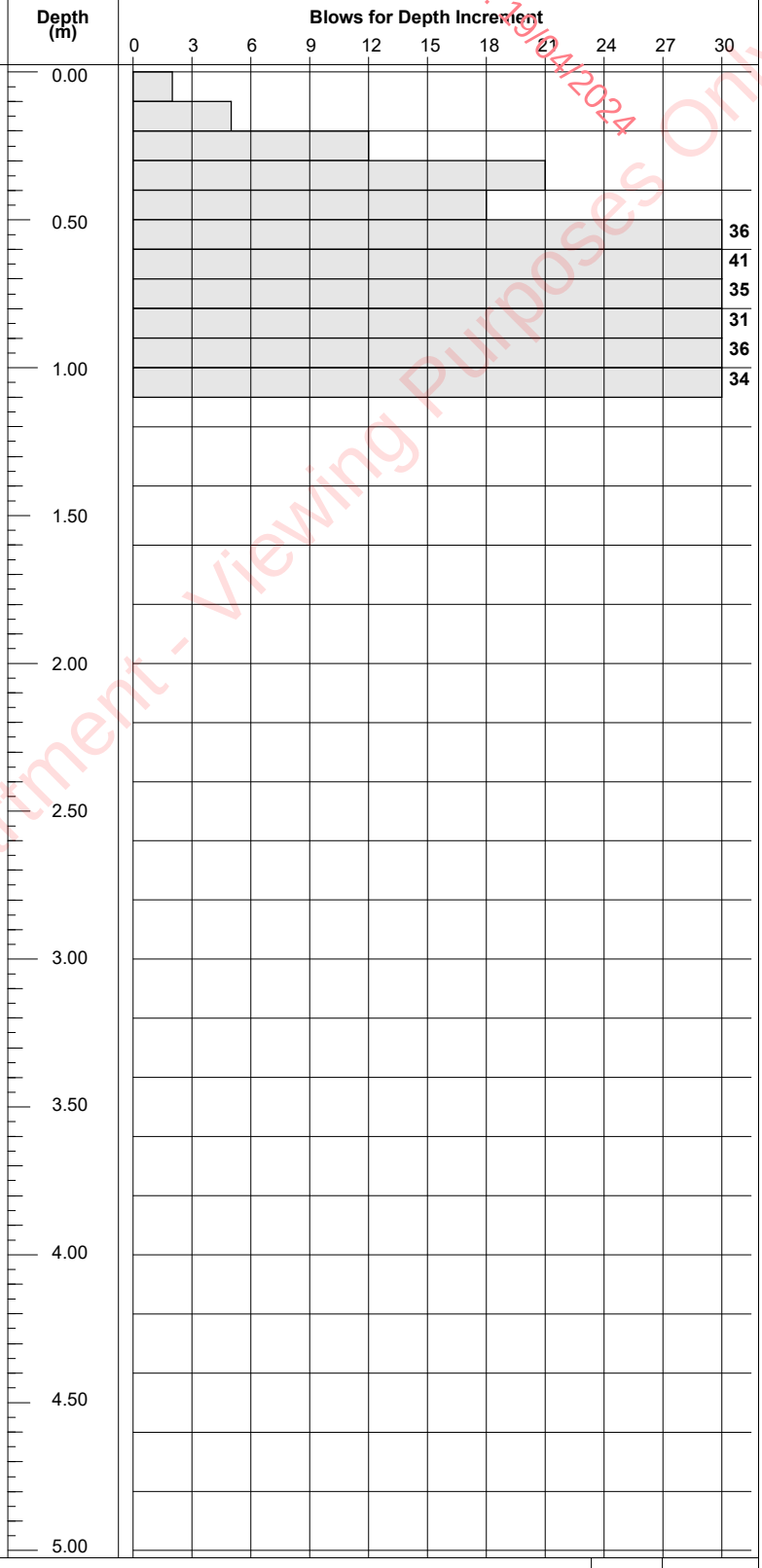
8115-10-18.DPH30

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH31

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)
0.00-0.10	2		
0.10-0.20	5		
0.20-0.30	12		
0.30-0.40	21		
0.40-0.50	18		
0.50-0.60	36		
0.60-0.70	41		
0.70-0.80	35		
0.80-0.90	31		
0.90-1.00	36		
1.00-1.10	34		



Remarks
Refusal at 1.10m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH31

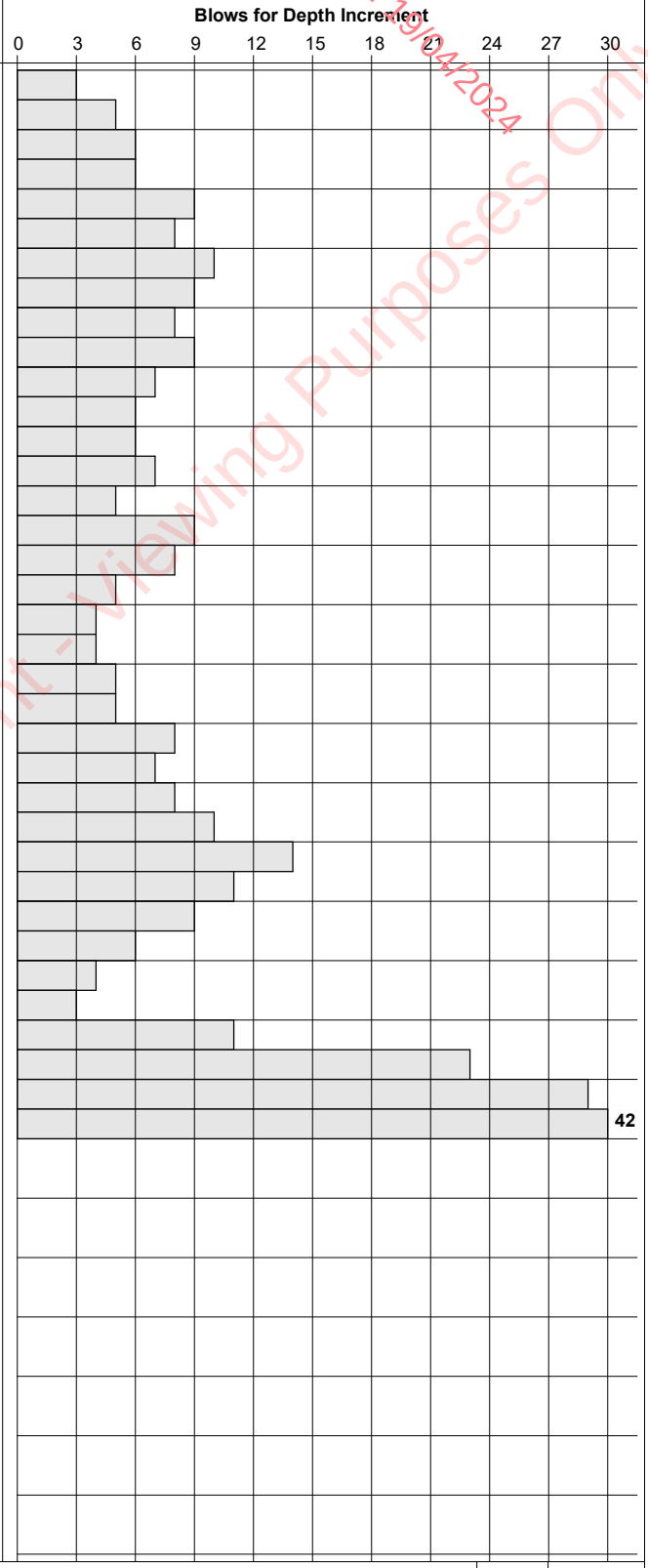
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH32

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3			0.00
0.10-0.20	5			
0.20-0.30	6			
0.30-0.40	6			
0.40-0.50	9			
0.50-0.60	8			0.50
0.60-0.70	10			
0.70-0.80	9			
0.80-0.90	8			
0.90-1.00	9			
1.00-1.10	7			1.00
1.10-1.20	6			
1.20-1.30	6			
1.30-1.40	7			
1.40-1.50	5			
1.50-1.60	9			1.50
1.60-1.70	8			
1.70-1.80	5			
1.80-1.90	4			
1.90-2.00	4			
2.00-2.10	5			2.00
2.10-2.20	5			
2.20-2.30	8			
2.30-2.40	7			
2.40-2.50	8			
2.50-2.60	10			2.50
2.60-2.70	14			
2.70-2.80	11			
2.80-2.90	9			
2.90-3.00	6			
3.00-3.10	4			3.00
3.10-3.20	3			
3.20-3.30	11			
3.30-3.40	23			
3.40-3.50	29			
3.50-3.60	42			3.50
				4.00
				4.50
				5.00



Remarks

Scale (approx)	Logged By
1:25	CF

Figure No.

8115-10-18.DPH32

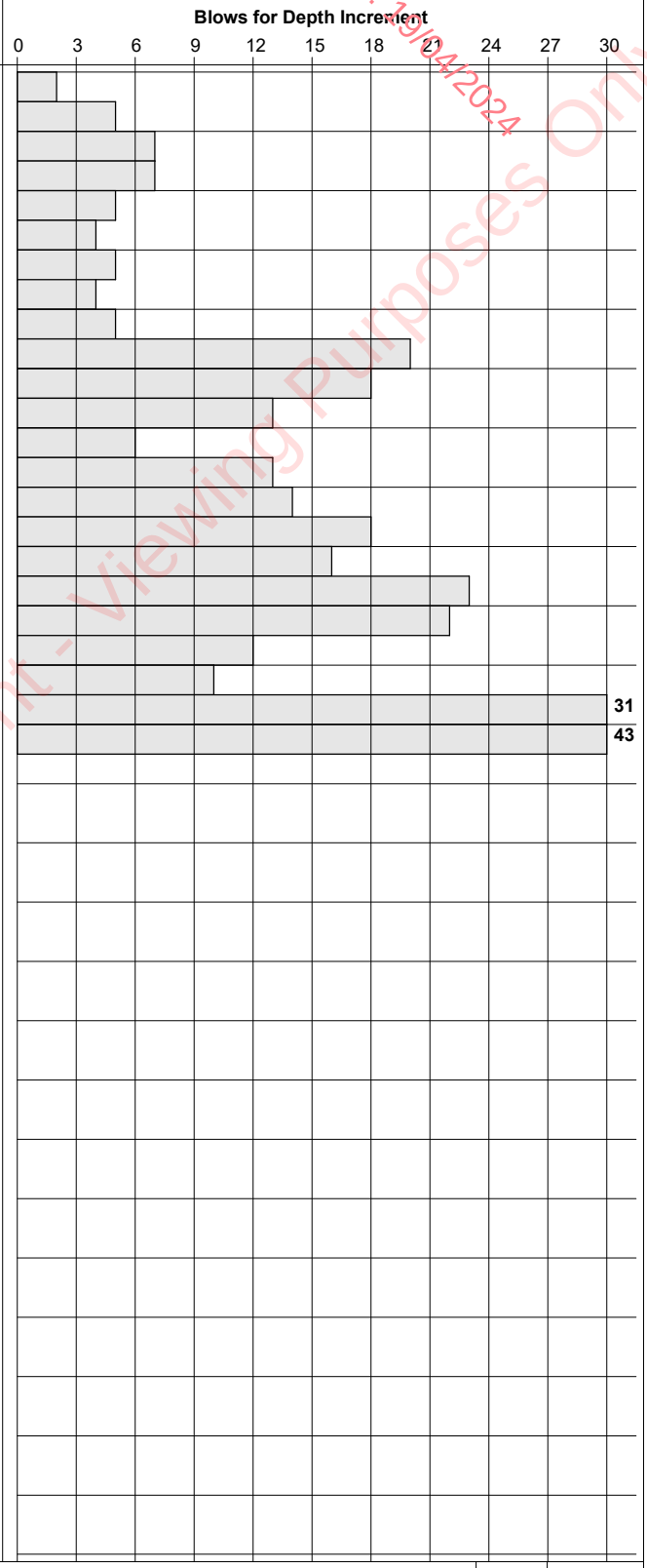
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH33

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2			0.00
0.10-0.20	5			
0.20-0.30	7			
0.30-0.40	7			
0.40-0.50	5			
0.50-0.60	4			0.50
0.60-0.70	5			
0.70-0.80	4			
0.80-0.90	5			
0.90-1.00	20			1.00
1.00-1.10	18			
1.10-1.20	13			
1.20-1.30	6			
1.30-1.40	13			
1.40-1.50	14			1.50
1.50-1.60	18			
1.60-1.70	16			
1.70-1.80	23			
1.80-1.90	22			
1.90-2.00	12			2.00
2.00-2.10	10			
2.10-2.20	31			
2.20-2.30	43			
				2.50
				3.00
				3.50
				4.00
				4.50
				5.00



Remarks
Refusal at 2.30m BGL 25 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH33

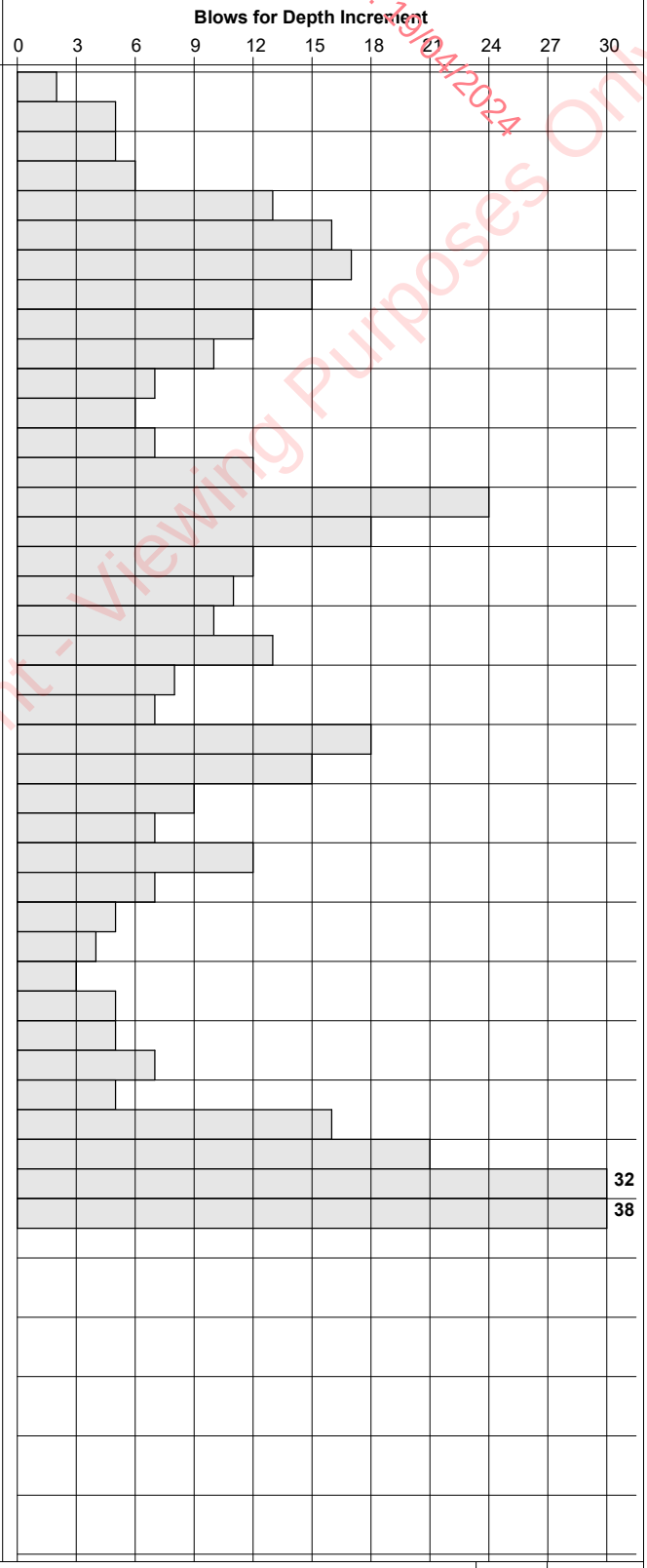
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH34

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2			0.00
0.10-0.20	5			
0.20-0.30	5			
0.30-0.40	6			
0.40-0.50	13			
0.50-0.60	16			0.50
0.60-0.70	17			
0.70-0.80	15			
0.80-0.90	12			
0.90-1.00	10			
1.00-1.10	7			1.00
1.10-1.20	6			
1.20-1.30	7			
1.30-1.40	12			
1.40-1.50	24			
1.50-1.60	18			1.50
1.60-1.70	12			
1.70-1.80	11			
1.80-1.90	10			
1.90-2.00	13			
2.00-2.10	8			2.00
2.10-2.20	7			
2.20-2.30	18			
2.30-2.40	15			
2.40-2.50	9			
2.50-2.60	7			2.50
2.60-2.70	12			
2.70-2.80	7			
2.80-2.90	5			
2.90-3.00	4			
3.00-3.10	3			3.00
3.10-3.20	5			
3.20-3.30	5			
3.30-3.40	7			
3.40-3.50	5			
3.50-3.60	16			3.50
3.60-3.70	21			
3.70-3.80	32			
3.80-3.90	38			
				4.00
				4.50
				5.00



Remarks

Scale (approx)	Logged By
1:25	CF

Figure No.

8115-10-18.DPH34

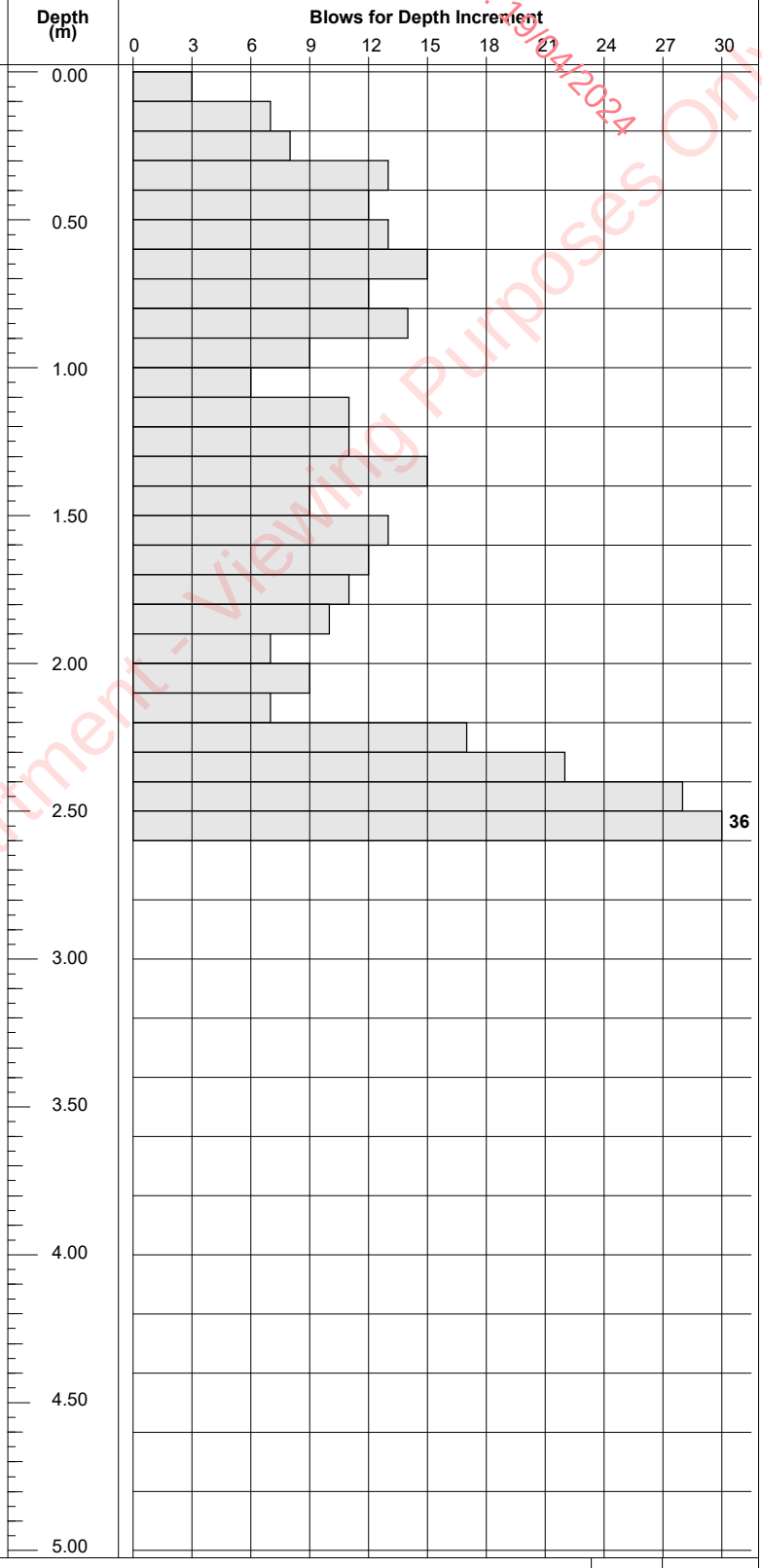
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH35

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)
0.00-0.10	3		
0.10-0.20	7		
0.20-0.30	8		
0.30-0.40	13		
0.40-0.50	12		
0.50-0.60	13		
0.60-0.70	15		
0.70-0.80	12		
0.80-0.90	14		
0.90-1.00	9		
1.00-1.10	6		
1.10-1.20	11		
1.20-1.30	11		
1.30-1.40	15		
1.40-1.50	9		
1.50-1.60	13		
1.60-1.70	12		
1.70-1.80	11		
1.80-1.90	10		
1.90-2.00	7		
2.00-2.10	9		
2.10-2.20	7		
2.20-2.30	17		
2.30-2.40	22		
2.40-2.50	28		
2.50-2.60	36		



Remarks

Scale (approx)	Logged By
1:25	CF

Figure No.

8115-10-18.DPH35

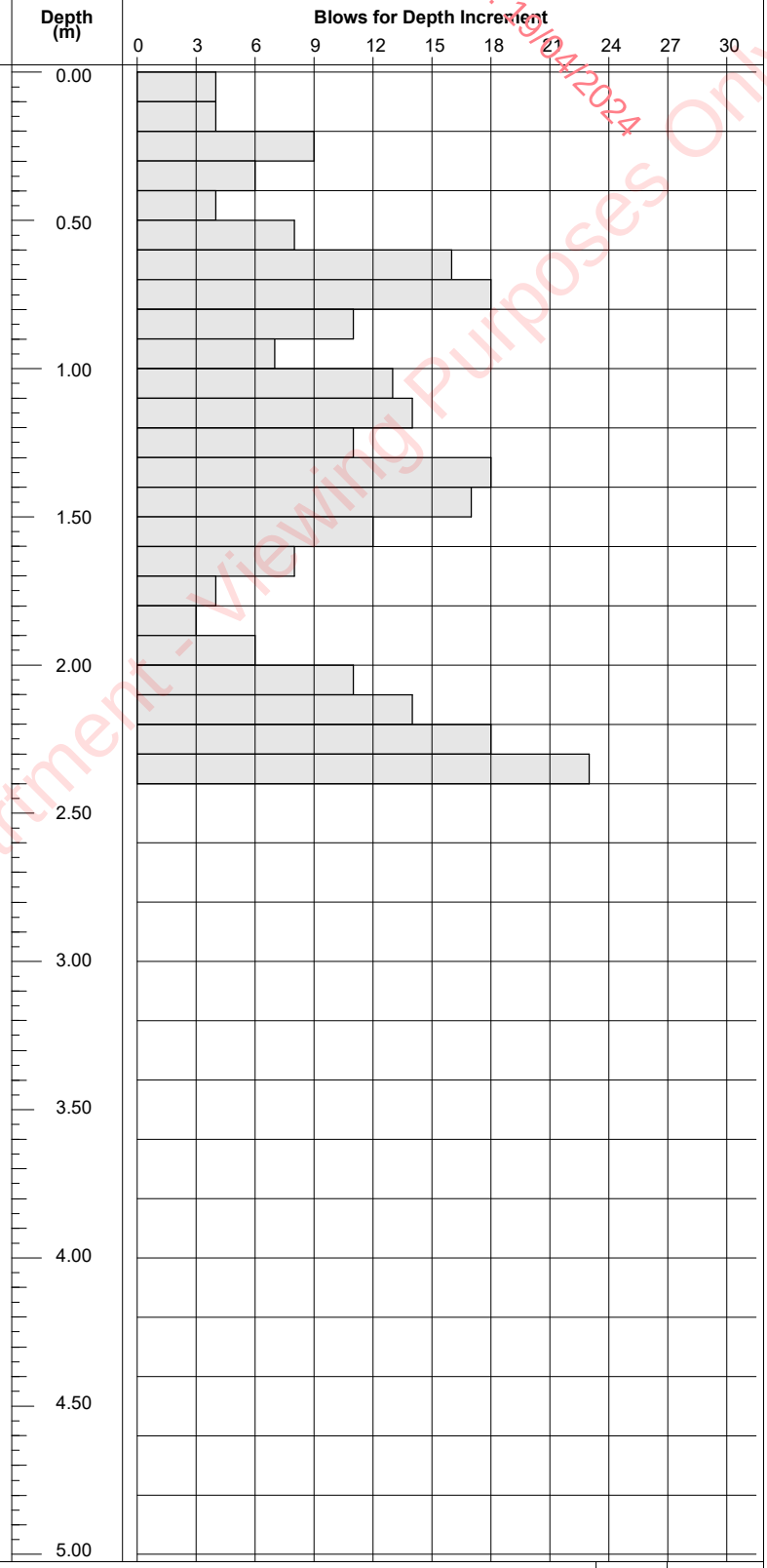
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH36

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)
0.00-0.10	4		
0.10-0.20	4		
0.20-0.30	9		
0.30-0.40	6		
0.40-0.50	4		
0.50-0.60	8		
0.60-0.70	16		
0.70-0.80	18		
0.80-0.90	11		
0.90-1.00	7		
1.00-1.10	13		
1.10-1.20	14		
1.20-1.30	11		
1.30-1.40	18		
1.40-1.50	17		
1.50-1.60	12		
1.60-1.70	8		
1.70-1.80	4		
1.80-1.90	3		
1.90-2.00	6		
2.00-2.10	11		
2.10-2.20	14		
2.20-2.30	18		
2.30-2.40	23		



Remarks
Refusal at 2.40m BGL 30 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH36

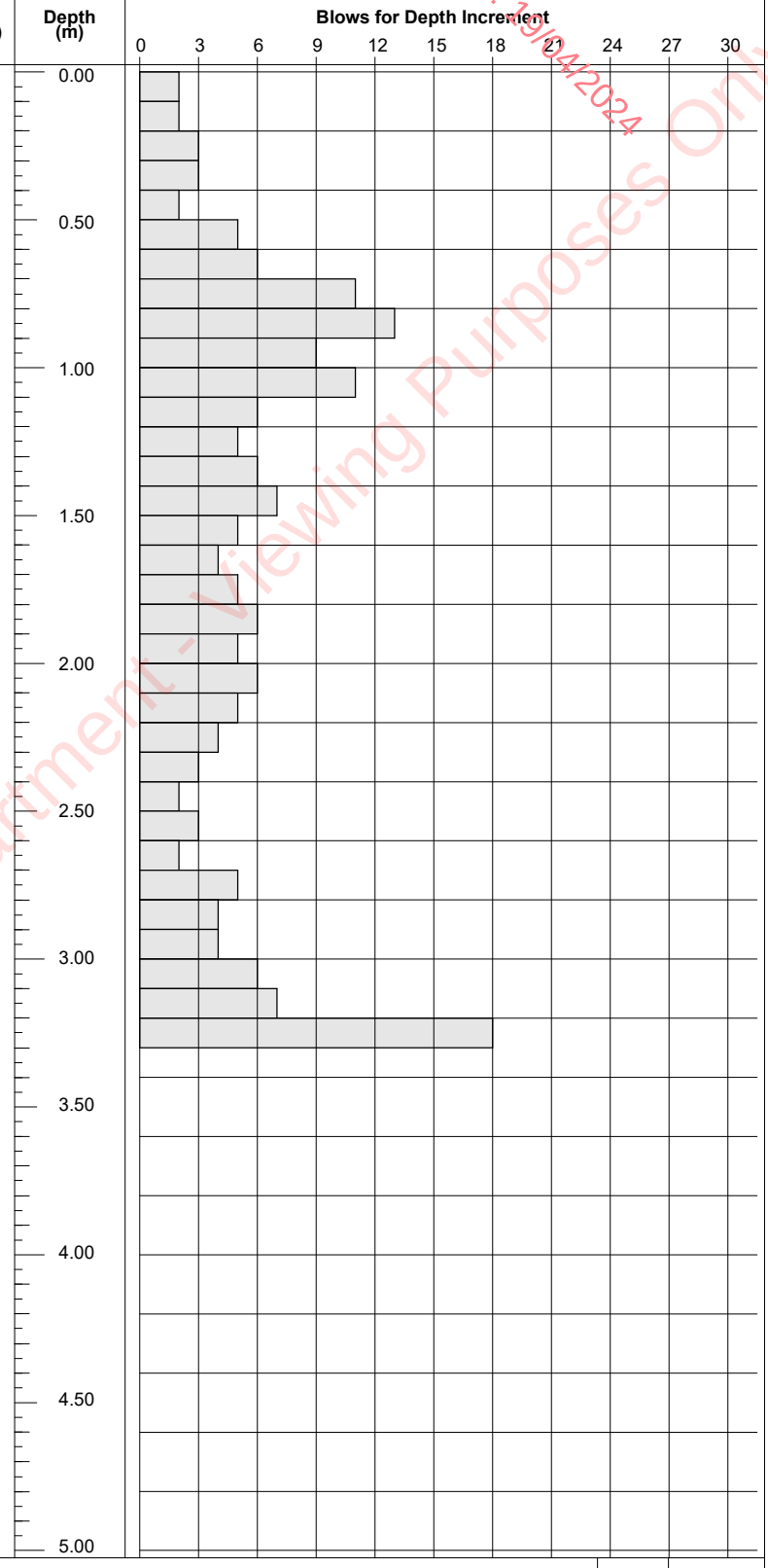
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH37

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)
0.00-0.10	2		
0.10-0.20	2		
0.20-0.30	3		
0.30-0.40	3		
0.40-0.50	2		
0.50-0.60	5		
0.60-0.70	6		
0.70-0.80	11		
0.80-0.90	13		
0.90-1.00	9		
1.00-1.10	11		
1.10-1.20	6		
1.20-1.30	5		
1.30-1.40	6		
1.40-1.50	7		
1.50-1.60	5		
1.60-1.70	4		
1.70-1.80	5		
1.80-1.90	6		
1.90-2.00	5		
2.00-2.10	6		
2.10-2.20	5		
2.20-2.30	4		
2.30-2.40	3		
2.40-2.50	2		
2.50-2.60	3		
2.60-2.70	2		
2.70-2.80	5		
2.80-2.90	4		
2.90-3.00	4		
3.00-3.10	6		
3.10-3.20	7		
3.20-3.30	18		



Remarks
Refusal at 3.30m BGL 30 blows for 75mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH37

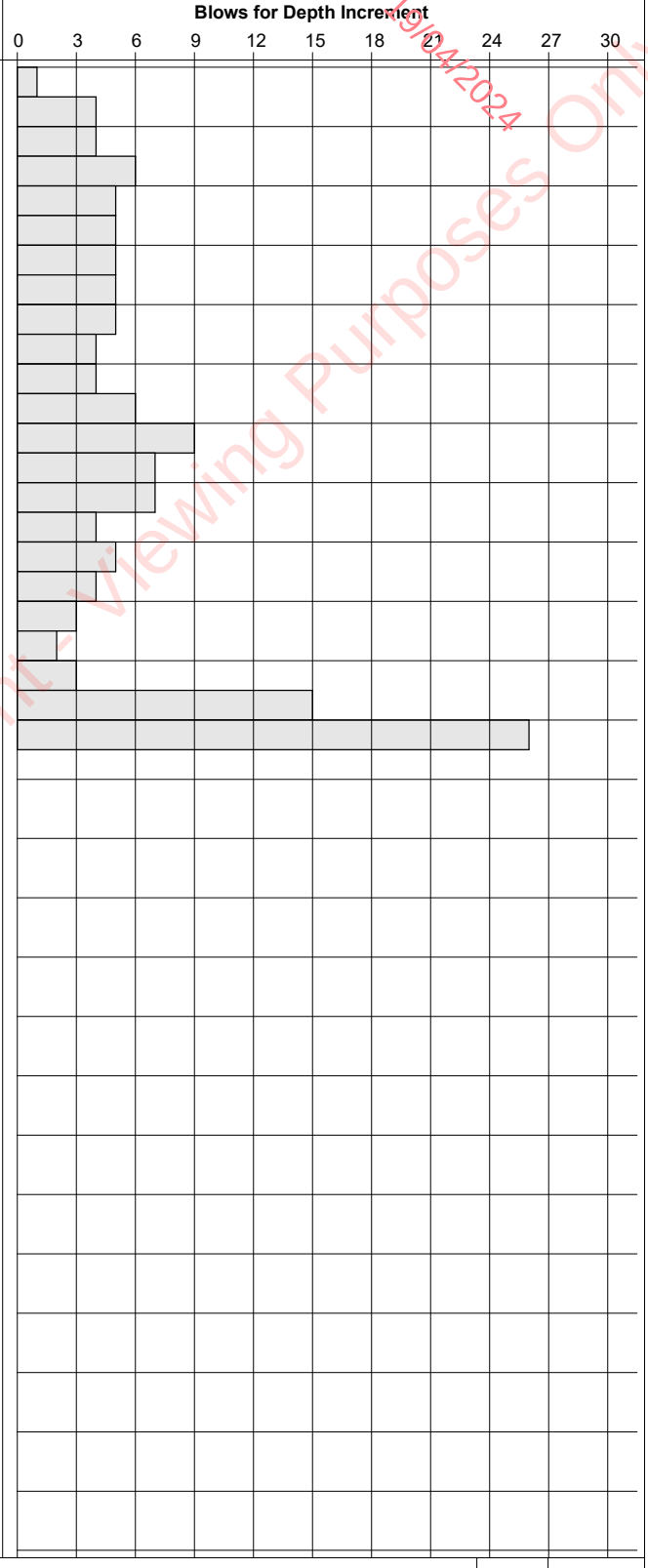
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH38

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	1			0.00
0.10-0.20	4			
0.20-0.30	4			
0.30-0.40	6			
0.40-0.50	5			
0.50-0.60	5			0.50
0.60-0.70	5			
0.70-0.80	5			
0.80-0.90	5			
0.90-1.00	4			
1.00-1.10	4			1.00
1.10-1.20	6			
1.20-1.30	9			
1.30-1.40	7			
1.40-1.50	7			
1.50-1.60	4			1.50
1.60-1.70	5			
1.70-1.80	4			
1.80-1.90	3			
1.90-2.00	2			
2.00-2.10	3			2.00
2.10-2.20	15			
2.20-2.30	26			
				2.50
				3.00
				3.50
				4.00
				4.50
				5.00



Remarks
Refusal at 2.30m BGL 30 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH38

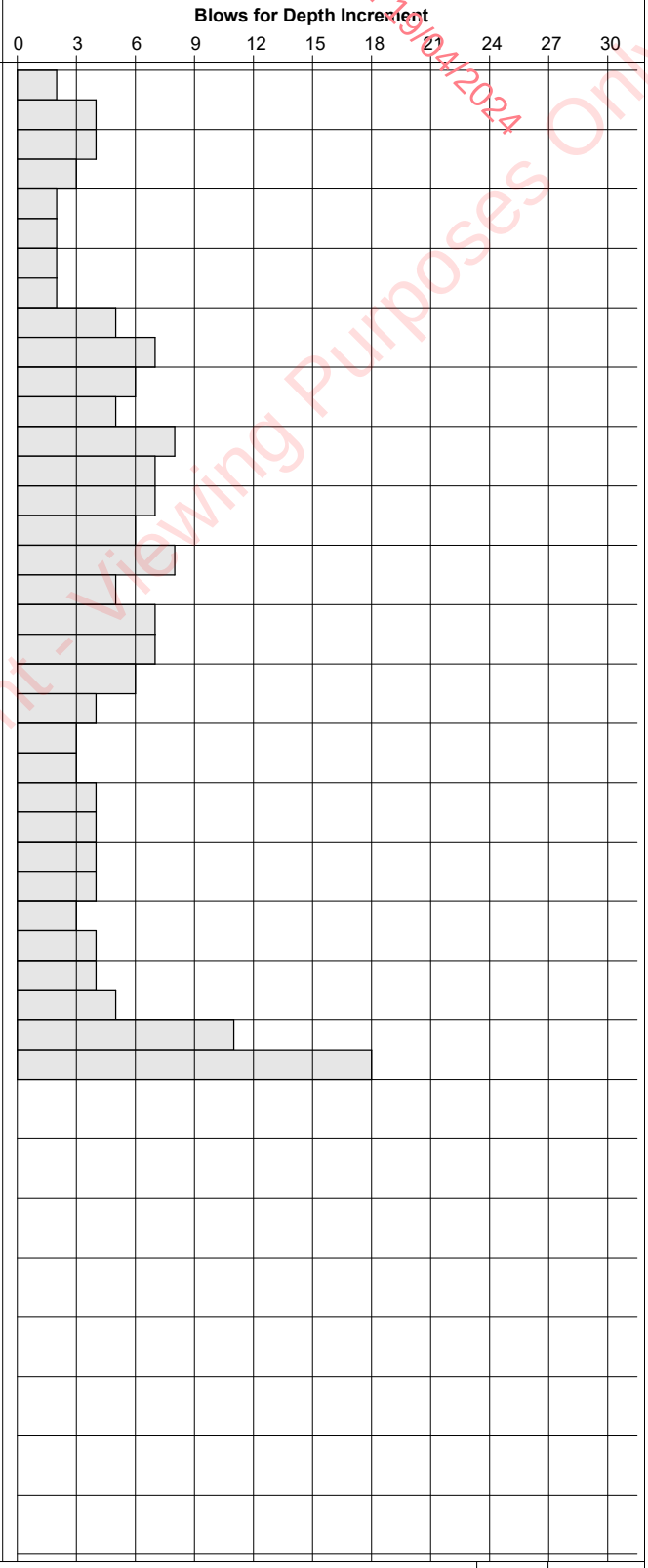
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH39

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)
0.00-0.10	2		
0.10-0.20	4		
0.20-0.30	4		
0.30-0.40	3		
0.40-0.50	2		
0.50-0.60	2		
0.60-0.70	2		
0.70-0.80	2		
0.80-0.90	5		
0.90-1.00	7		
1.00-1.10	6		
1.10-1.20	5		
1.20-1.30	8		
1.30-1.40	7		
1.40-1.50	7		
1.50-1.60	6		
1.60-1.70	8		
1.70-1.80	5		
1.80-1.90	7		
1.90-2.00	7		
2.00-2.10	6		
2.10-2.20	4		
2.20-2.30	3		
2.30-2.40	3		
2.40-2.50	4		
2.50-2.60	4		
2.60-2.70	4		
2.70-2.80	4		
2.80-2.90	3		
2.90-3.00	4		
3.00-3.10	4		
3.10-3.20	5		
3.20-3.30	11		
3.30-3.40	18		



Remarks
Refusal at 3.40m BGL 30 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH39

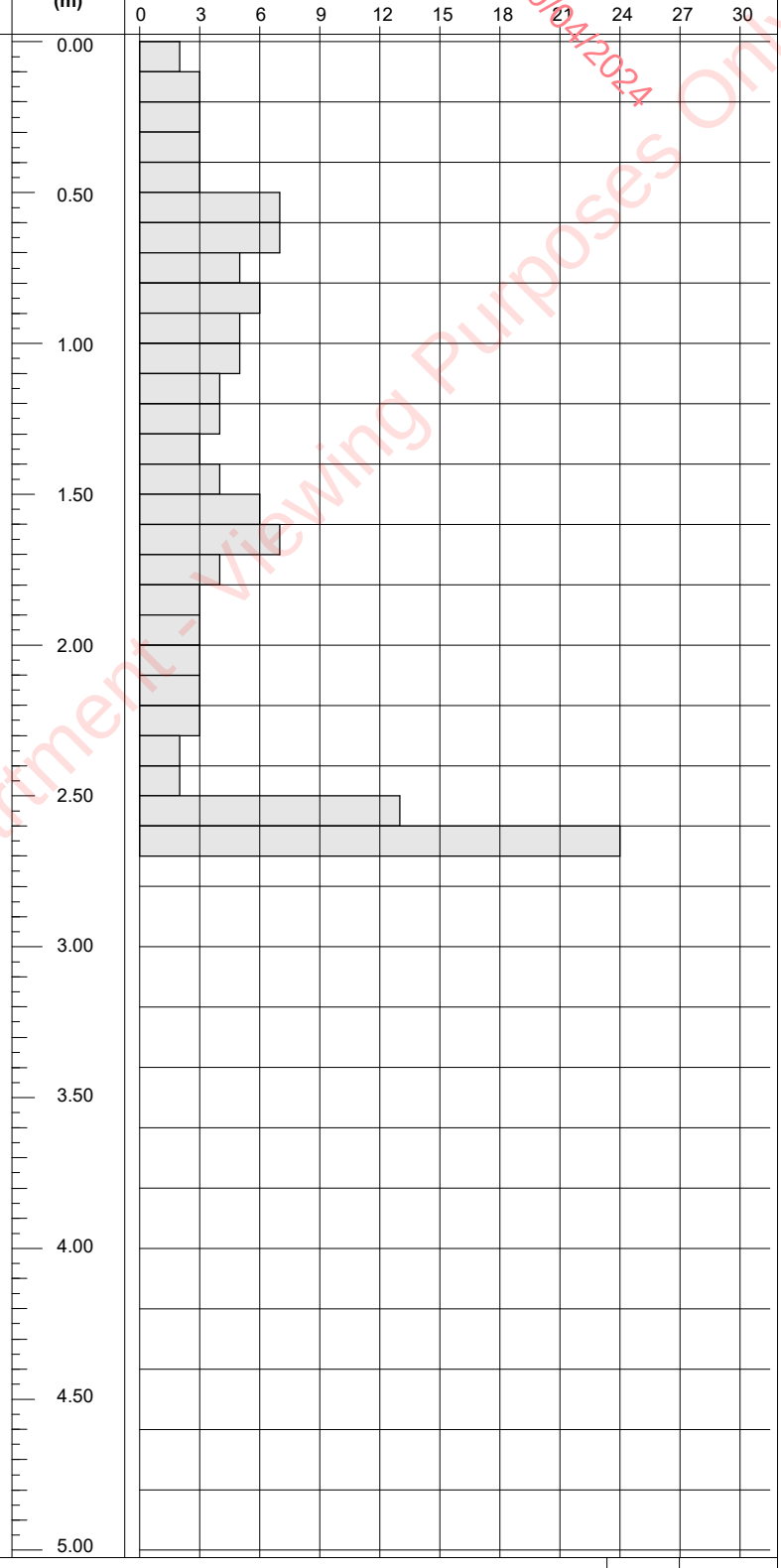
Ground Investigations Ireland Ltd

www.gii.ie

Site	Probe Number
IPS Integrated Project	DPH40

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe DPH, Fall height 500mm, hammer wt 50Kg.	43.7mm		GDCL Consulting	8115-10-18
	Location	**Dates**	**Engineer**	**Sheet**
		16/11/2018		1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)
0.00-0.10	2		
0.10-0.20	3		
0.20-0.30	3		
0.30-0.40	3		
0.40-0.50	3		
0.50-0.60	7		
0.60-0.70	7		
0.70-0.80	5		
0.80-0.90	6		
0.90-1.00	5		
1.00-1.10	5		
1.10-1.20	4		
1.20-1.30	4		
1.30-1.40	3		
1.40-1.50	4		
1.50-1.60	6		
1.60-1.70	7		
1.70-1.80	4		
1.80-1.90	3		
1.90-2.00	3		
2.00-2.10	3		
2.10-2.20	3		
2.20-2.30	3		
2.30-2.40	2		
2.40-2.50	2		
2.50-2.60	13		
2.60-2.70	24		



Remarks
Refusal at 2.70m BGL 30 blows for 50mm

Scale (approx)	Logged By
1:25	CF

Figure No.
8115-10-18.DPH40

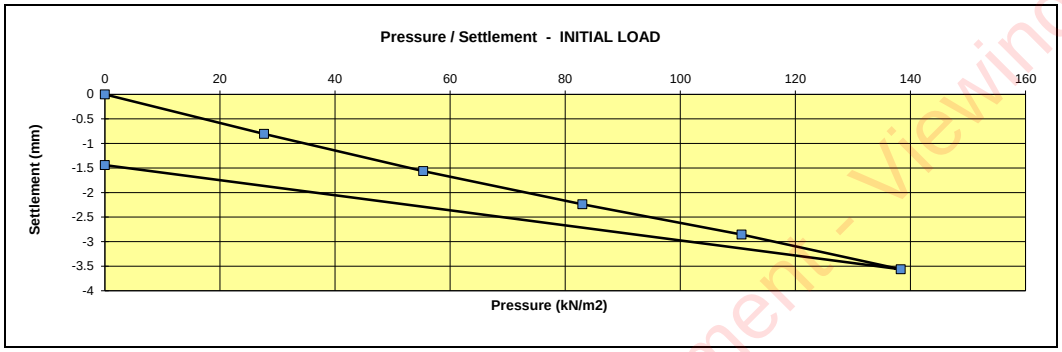
APPENDIX 5 – Plate Testing Records

Testall Ltd
295A Moorlough Rd
Drumclay
Newtownbutler
Co. Fermanagh
BT92 8BJ

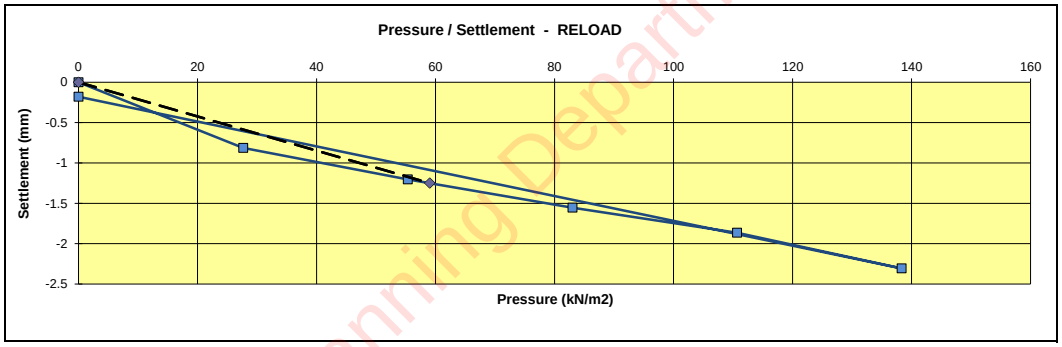
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8369**	**Site / Client Ref. No.**	KC/14/11/7 PB 1
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 1
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.105m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.6



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.81
55	-1.56
83	-2.24
111	-2.86
138	-3.56
0	-1.44



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.81
55	-1.20
83	-1.55
111	-1.86
138	-2.31
0	-0.18

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	20	MN / m²
Modulus of subgrade reaction (k)	=	22562	30350	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**2**	**4**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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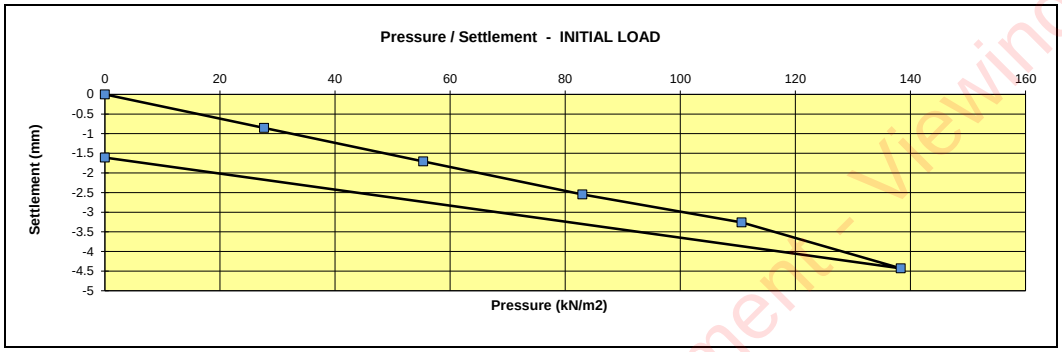
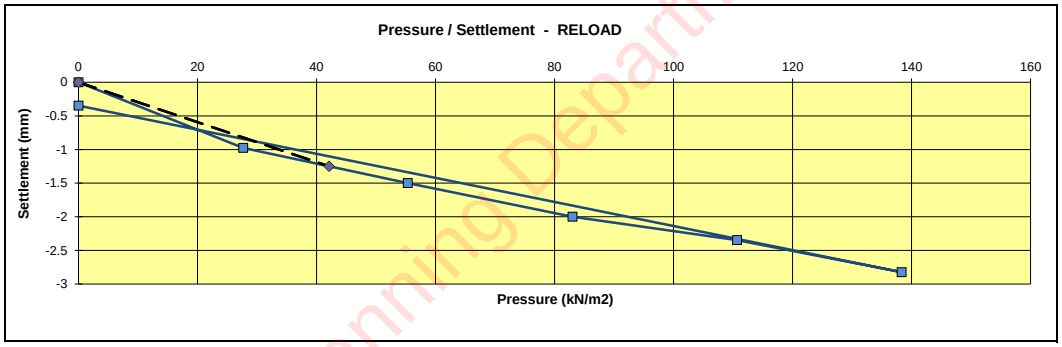
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8368**	**Site / Client Ref. No.**	KC/14/11/6 PB 2
Supplier	Insitu	**Source**	Insitu
Material Description	Brown clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 2
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.125m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.85
55	-1.71
83	-2.55
111	-3.26
138	-4.43
0	-1.61



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.98
55	-1.50
83	-2.00
111	-2.35
138	-2.82
0	-0.35

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	10	16	MN / m²
Modulus of subgrade reaction (k)	=	20840	21657	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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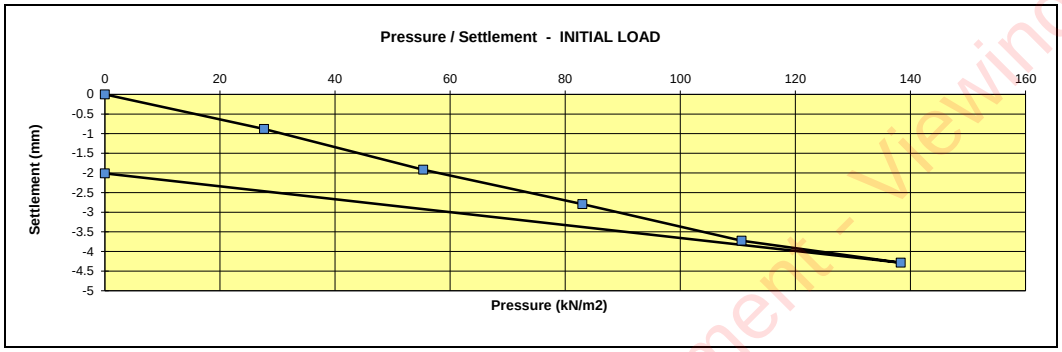
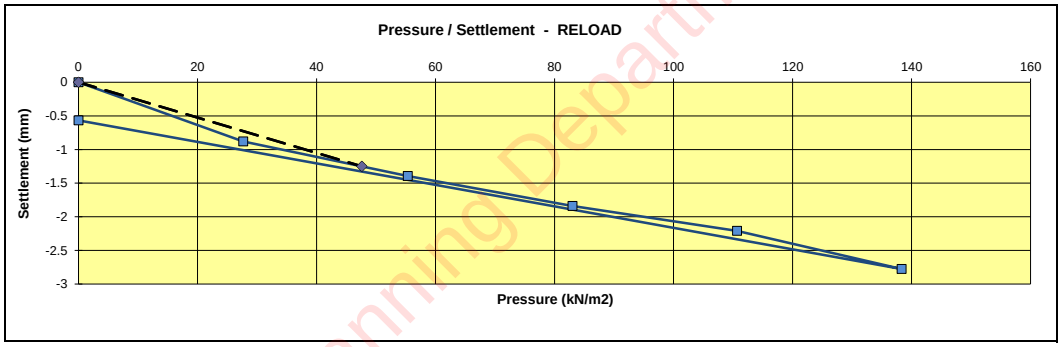
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8367**	**Site / Client Ref. No.**	KC/14/11/5 PB 3
Supplier	Insitu	**Source**	Insitu
Material Description	Light brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 3
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.108m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.3



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.88
55	-1.92
83	-2.79
111	-3.73
138	-4.29
0	-2.01



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.88
55	-1.39
83	-1.84
111	-2.21
138	-2.78
0	-0.57

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	11	16	MN / m²
Modulus of subgrade reaction (k)	=	19304	24481	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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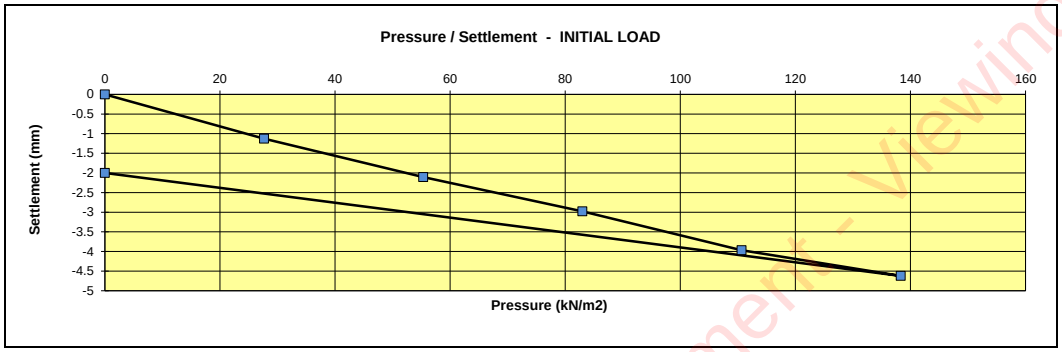
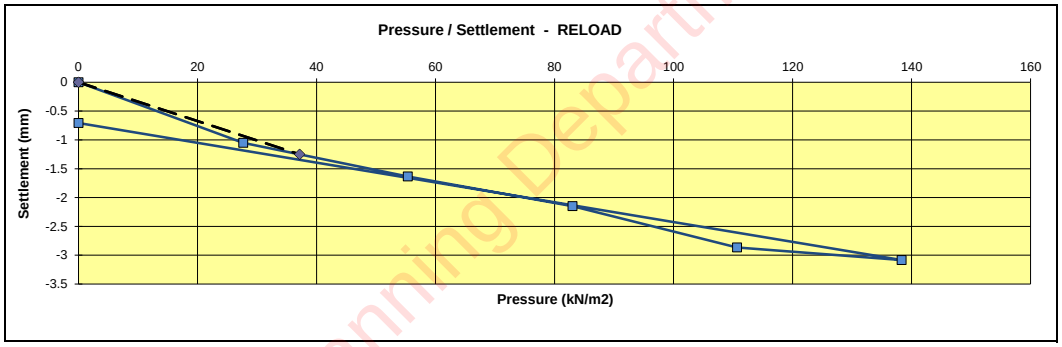
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8366**	**Site / Client Ref. No.**	KC/14/11/4 PB 4
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 4
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.1m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.6



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.13
55	-2.11
83	-2.98
111	-3.97
138	-4.62
0	-2.00



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.05
55	-1.63
83	-2.15
111	-2.87
138	-3.08
0	-0.71

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	10	15	MN / m²
Modulus of subgrade reaction (k)	=	16017	19104	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**1**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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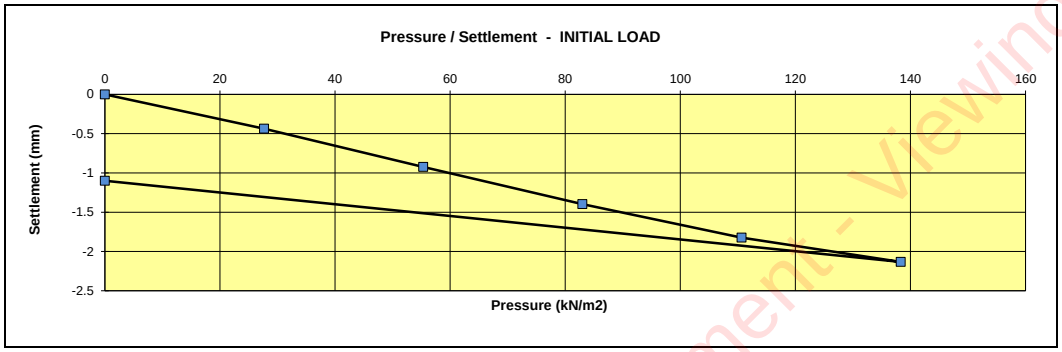
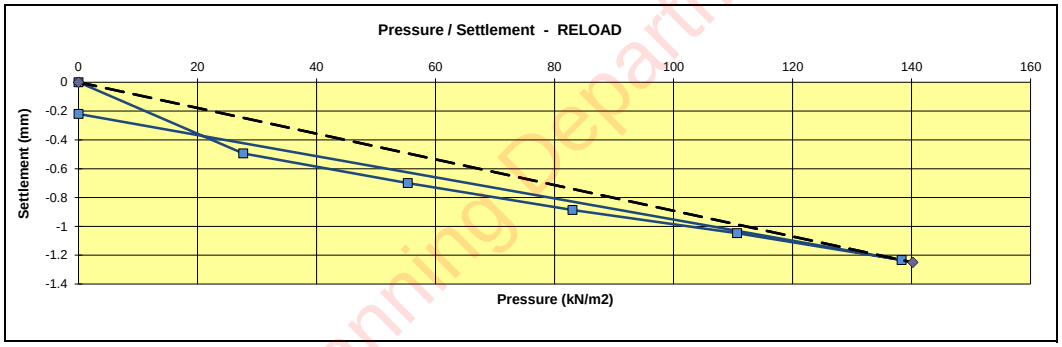
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8365**	**Site / Client Ref. No.**	KC/14/11/3 PB 5
Supplier	Insitu	**Source**	Insitu
Material Description	Light brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 5
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.1m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.44
55	-0.92
83	-1.40
111	-1.82
138	-2.13
0	-1.10



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.49
55	-0.70
83	-0.89
111	-1.05
138	-1.23
0	-0.22

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	21	37	MN / m²
Modulus of subgrade reaction (k)	=	38272	72095	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.7		
Equivelent CBR % Value	=	**5**	**16**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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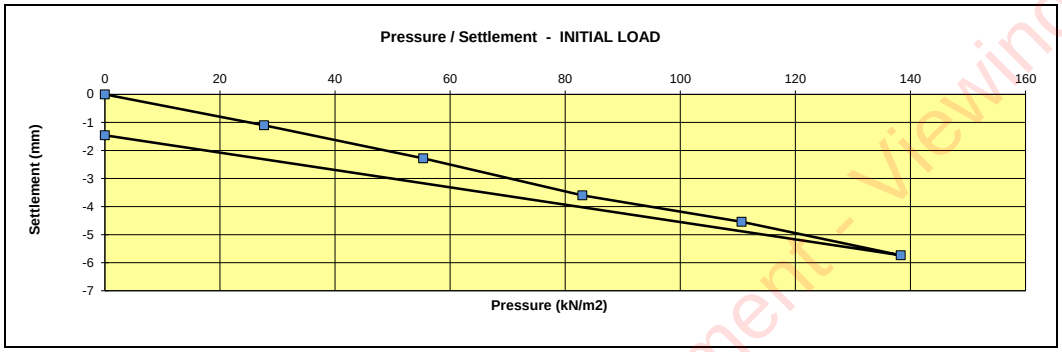
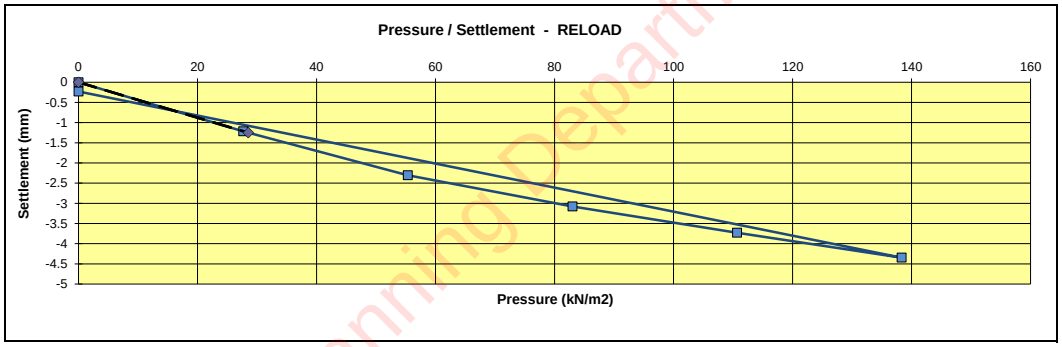
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8352**	**Site / Client Ref. No.**	KC/12/11/6 PB 6
Supplier	Insitu	**Source**	Insitu
Material Description	Grey brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 6
Date Tested / Operator	12/11/2018 KC	**Level**	OGL - 0.8m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	5.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.10
55	-2.28
83	-3.60
111	-4.54
138	-5.74
0	-1.46



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.22
55	-2.30
83	-3.08
111	-3.73
138	-4.35
0	-0.23

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	8	10	MN / m²
Modulus of subgrade reaction (k)	=	16035	14663	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.3		
Equivelent CBR % Value	=	**1**	**1**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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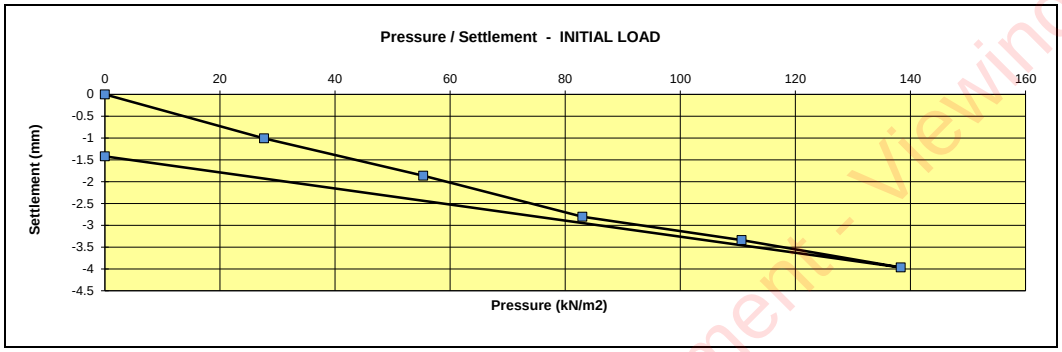
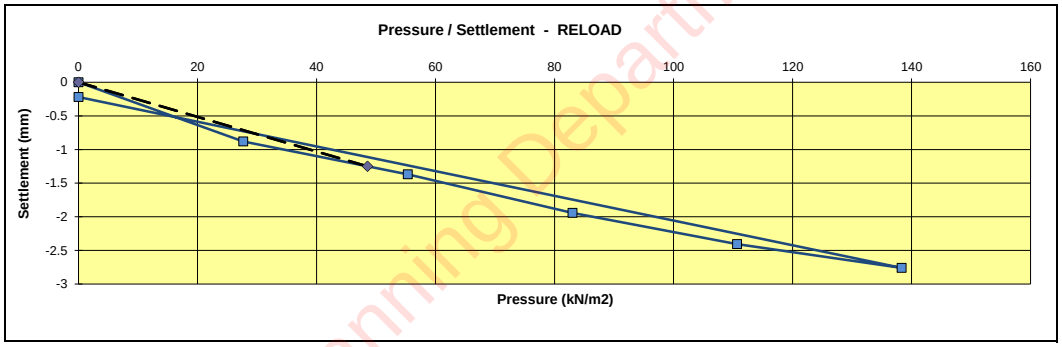
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8351**	**Site / Client Ref. No.**	KC/12/11/5 PB 7
Supplier	Insitu	**Source**	Insitu
Material Description	Yellow brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 7
Date Tested / Operator	12/11/2018 KC	**Level**	OGL - 0.54m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.0



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.01
55	-1.86
83	-2.80
111	-3.34
138	-3.97
0	-1.42



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.88
55	-1.37
83	-1.94
111	-2.41
138	-2.76
0	-0.22

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	11	16	MN / m²
Modulus of subgrade reaction (k)	=	18268	24969	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.4		
Equivelent CBR % Value	=	**1**	**3**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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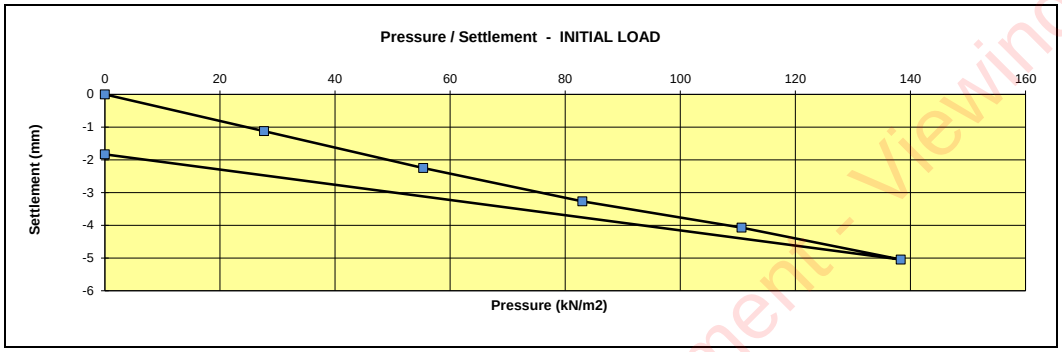
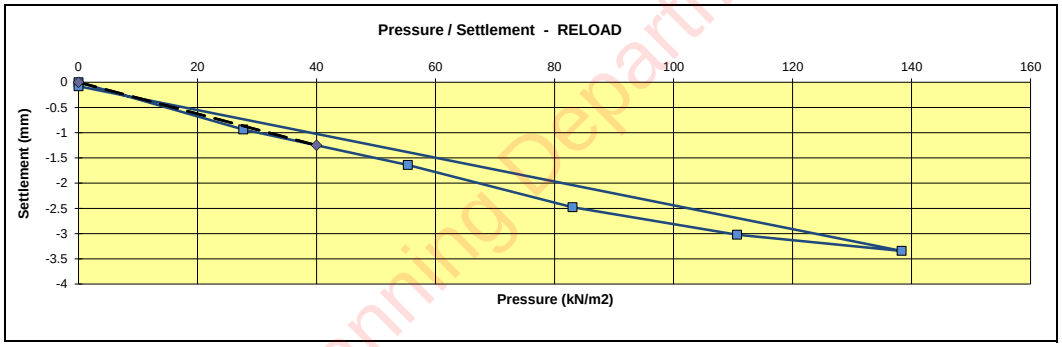
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8350**	**Site / Client Ref. No.**	KC/12/11/4 PB 8
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 8
Date Tested / Operator	12/11/2018 KC	**Level**	OGL - 0.4m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	5.0



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.12
55	-2.25
83	-3.27
111	-4.07
138	-5.05
0	-1.83



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.94
55	-1.64
83	-2.48
111	-3.02
138	-3.34
0	-0.08

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	9	13	MN / m²
Modulus of subgrade reaction (k)	=	15826	20565	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**1**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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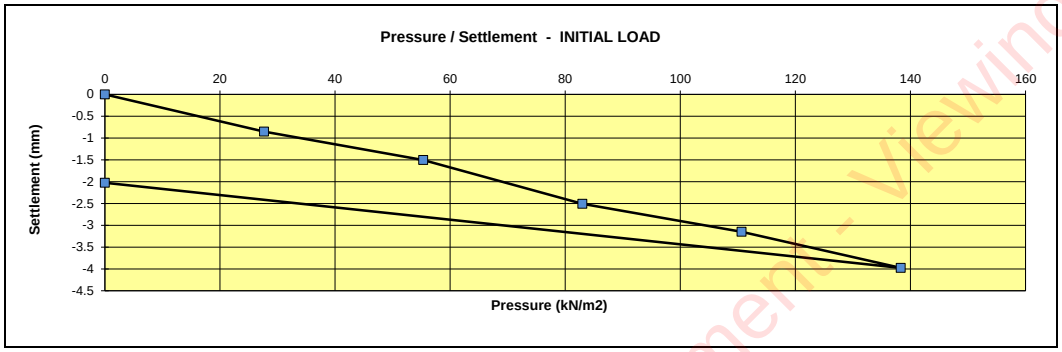
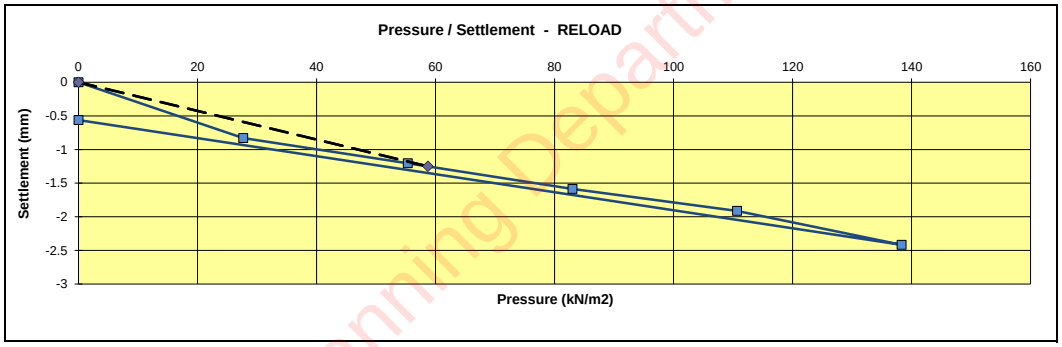
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8364**	**Site / Client Ref. No.**	KC/14/11/2 PB 9
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 9
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.1m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.0



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.85
55	-1.50
83	-2.51
111	-3.15
138	-3.98
0	-2.03



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.83
55	-1.20
83	-1.59
111	-1.91
138	-2.42
0	-0.56

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	11	19	MN / m²
Modulus of subgrade reaction (k)	=	22909	30185	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**2**	**4**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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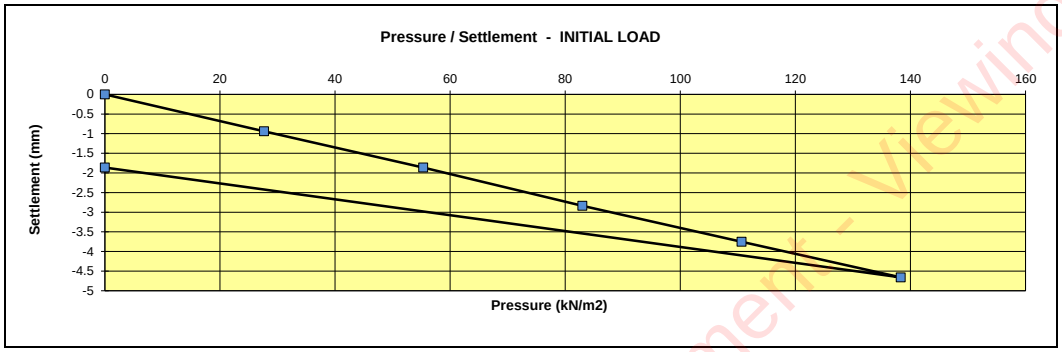
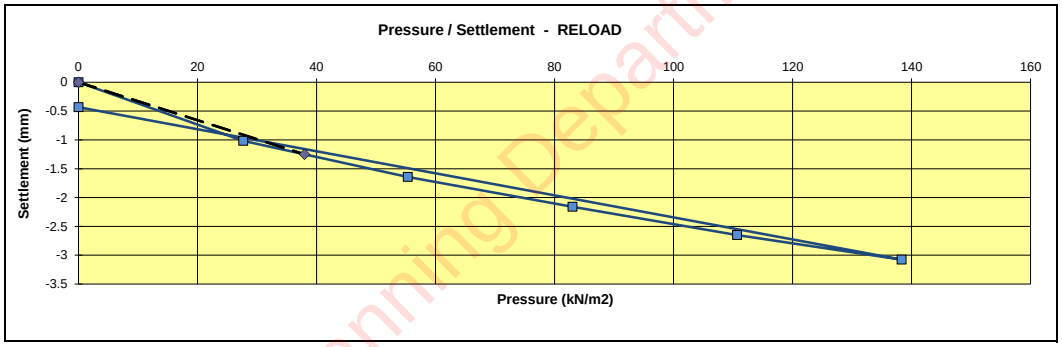
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8362**	**Site / Client Ref. No.**	KC/13/11/9 PB 10
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 10
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.105m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.94
55	-1.86
83	-2.84
111	-3.75
138	-4.66
0	-1.86



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.02
55	-1.64
83	-2.16
111	-2.65
138	-3.08
0	-0.43

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	10	15	MN / m²
Modulus of subgrade reaction (k)	=	19003	19524	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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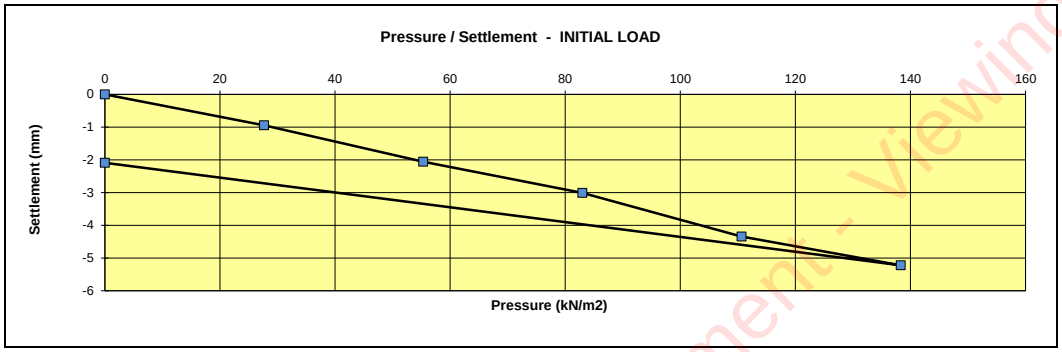
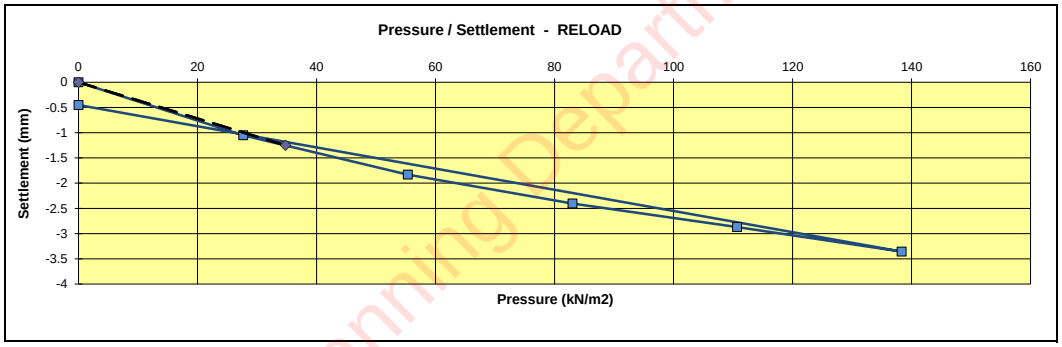
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8361**	**Site / Client Ref. No.**	KC/13/11/8 PB 11
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 11
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.11m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	5.2



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.95
55	-2.06
83	-3.01
111	-4.34
138	-5.22
0	-2.09



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.05
55	-1.83
83	-2.40
111	-2.87
138	-3.36
0	-0.45

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	9	13	MN / m²
Modulus of subgrade reaction (k)	=	18114	17875	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**1**	**1**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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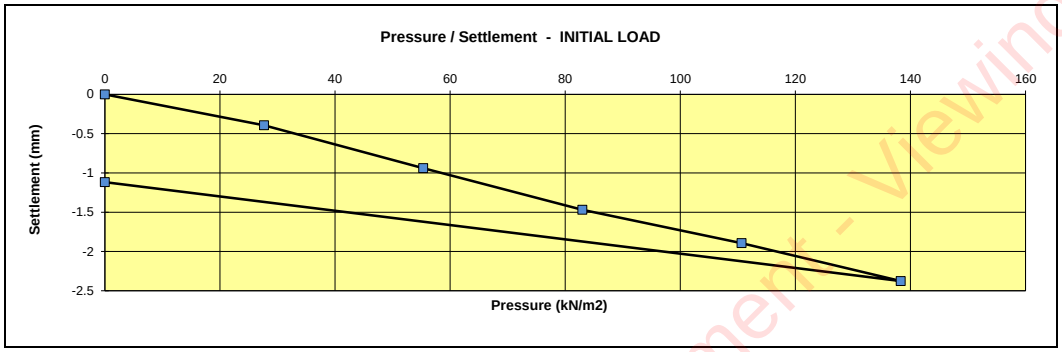
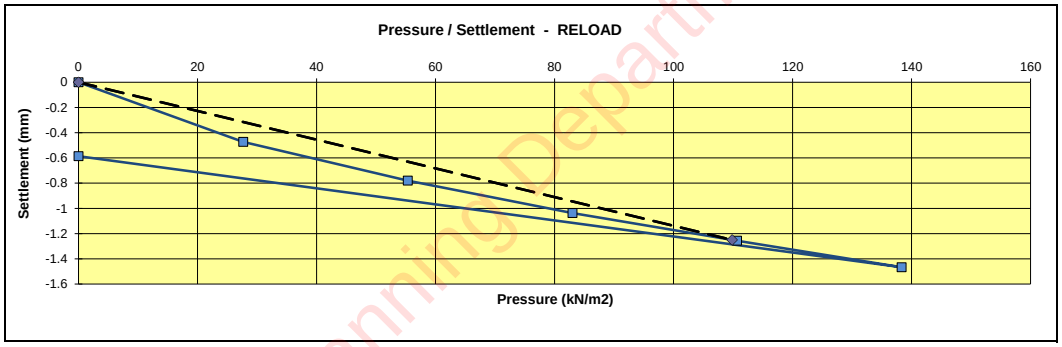
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8349**	**Site / Client Ref. No.**	KC/12/11/3 PB 12
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 12
Date Tested / Operator	12/11/2018 KC	**Level**	OGL - 0.2m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.39
55	-0.94
83	-1.47
111	-1.89
138	-2.38
0	-1.12



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.47
55	-0.78
83	-1.04
111	-1.26
138	-1.47
0	-0.59

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	19	31	MN / m²
Modulus of subgrade reaction (k)	=	36775	56476	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**5**	**10**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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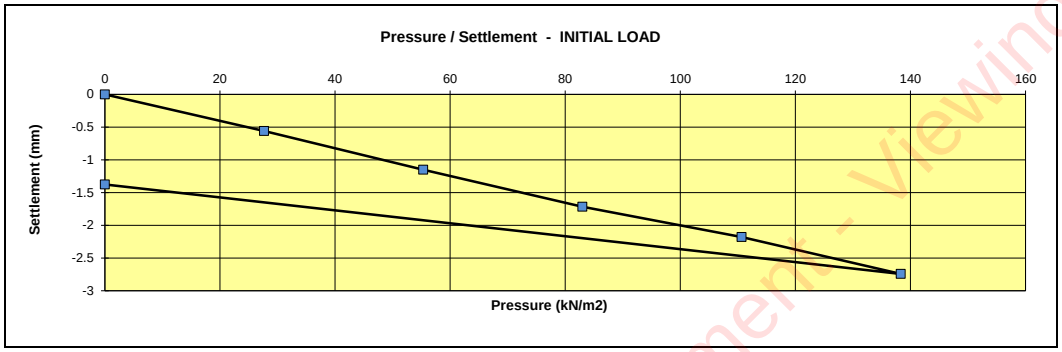
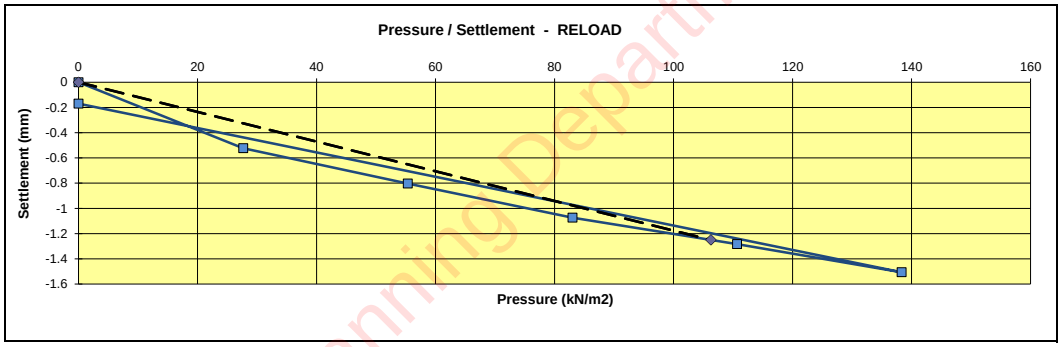
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8353**	**Site / Client Ref. No.**	KC/12/11/7 PB 13
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 13
Date Tested / Operator	12/11/2018 KC	**Level**	OGL - 0.2m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.56
55	-1.15
83	-1.72
111	-2.18
138	-2.74
0	-1.38



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.52
55	-0.80
83	-1.07
111	-1.28
138	-1.51
0	-0.17

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	16	30	MN / m²
Modulus of subgrade reaction (k)	=	30964	54649	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.8		
Equivelent CBR % Value	=	**4**	**10**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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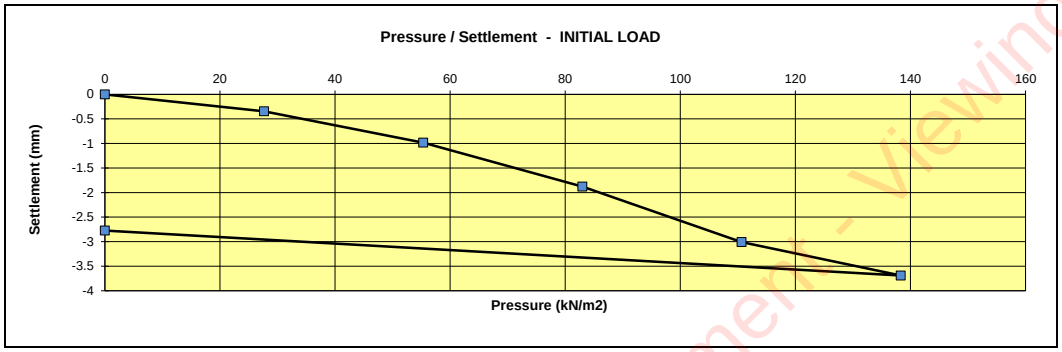
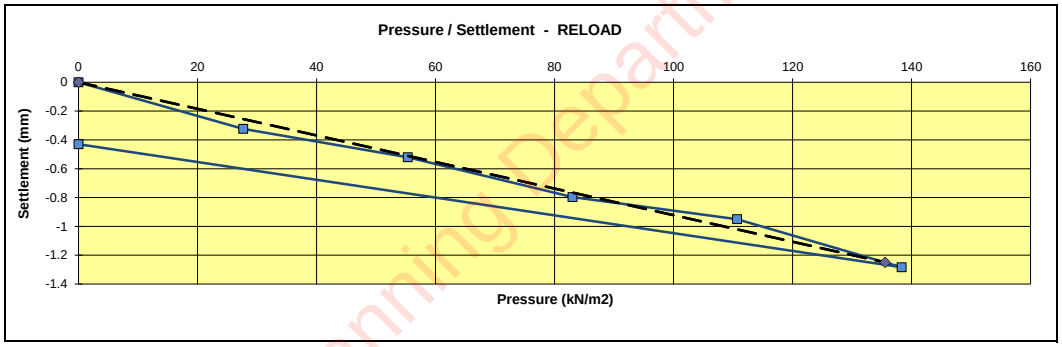
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8355**	**Site / Client Ref. No.**	KC/13/11/2 PB 14
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 14
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.4m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.35
55	-0.98
83	-1.88
111	-3.01
138	-3.69
0	-2.77



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.32
55	-0.52
83	-0.80
111	-0.95
138	-1.28
0	-0.43

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	12	35	MN / m²
Modulus of subgrade reaction (k)	=	32684	69711	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		2.9	
Equivelent CBR % Value	=	**4**	**15**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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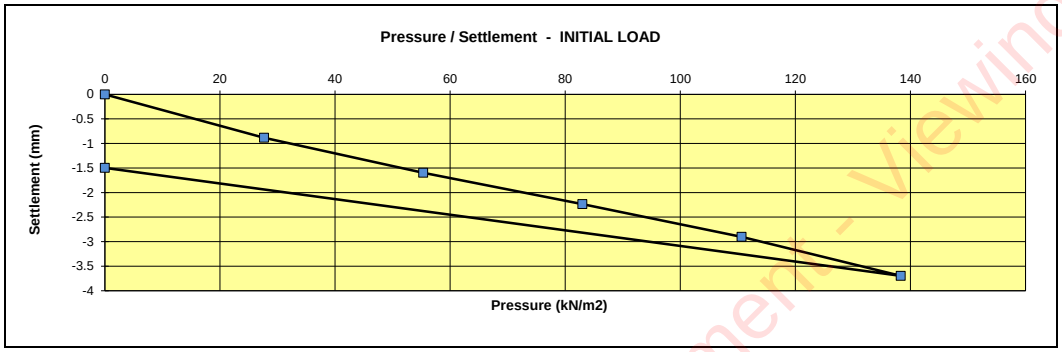
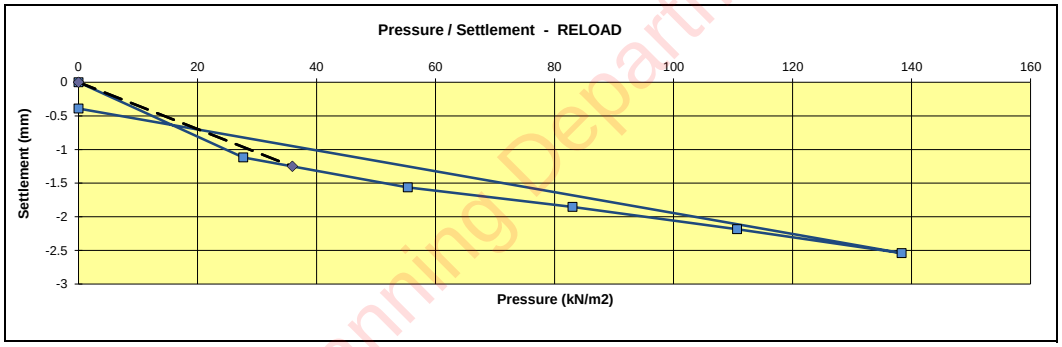
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8357**	**Site / Client Ref. No.**	KC/13/11/4 PB 15
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 15
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.12m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.88
55	-1.60
83	-2.24
111	-2.90
138	-3.70
0	-1.50



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.12
55	-1.56
83	-1.85
111	-2.18
138	-2.54
0	-0.39

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	12	18	MN / m²
Modulus of subgrade reaction (k)	=	21539	18473	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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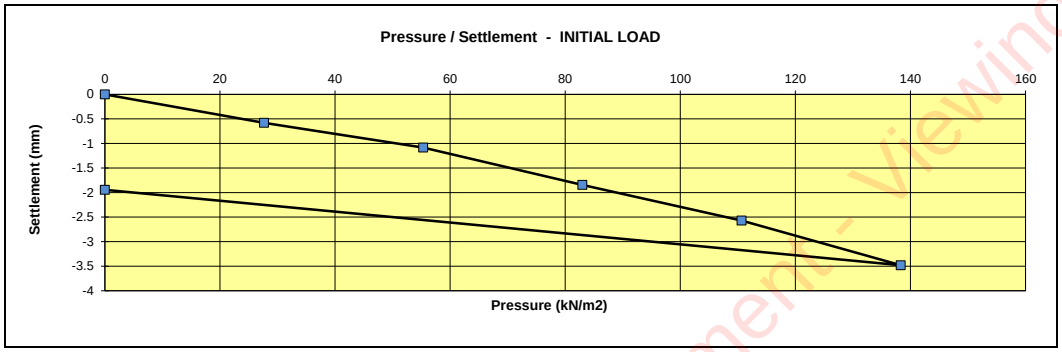
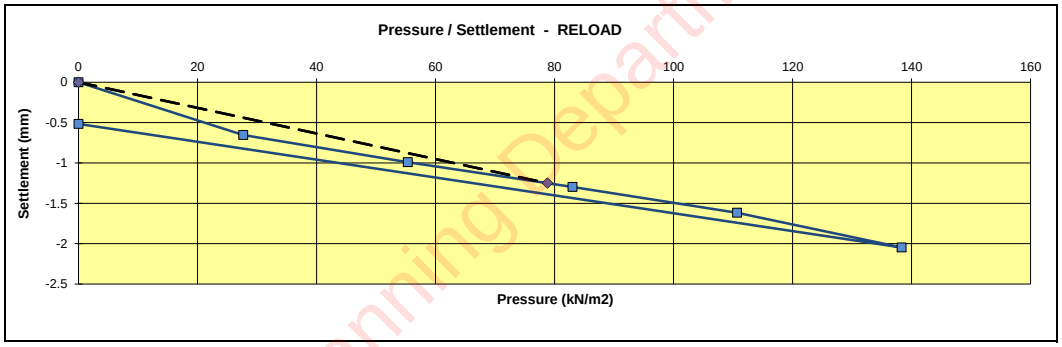
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8348**	**Site / Client Ref. No.**	KC/12/11/2 PB 16
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 16
Date Tested / Operator	12/11/2018 KC	**Level**	OGL - 0.6m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.58
55	-1.08
83	-1.84
111	-2.57
138	-3.48
0	-1.94



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.65
55	-0.99
83	-1.30
111	-1.62
138	-2.05
0	-0.52

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	22	MN / m²
Modulus of subgrade reaction (k)	=	31573	40515	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.7		
Equivelent CBR % Value	=	**4**	**6**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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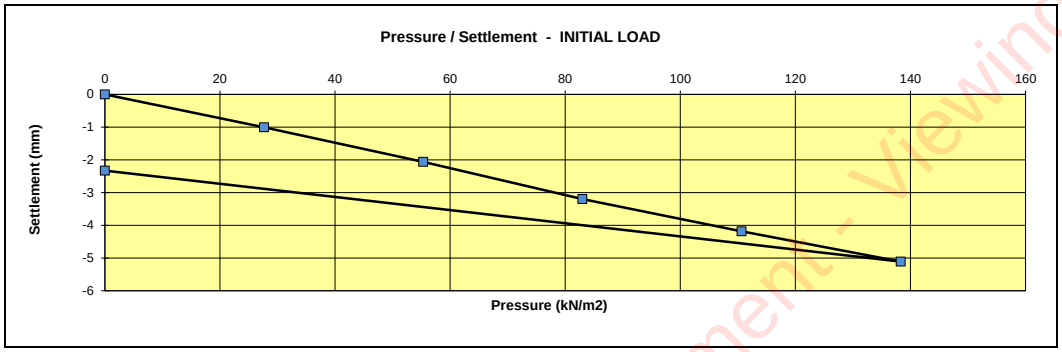
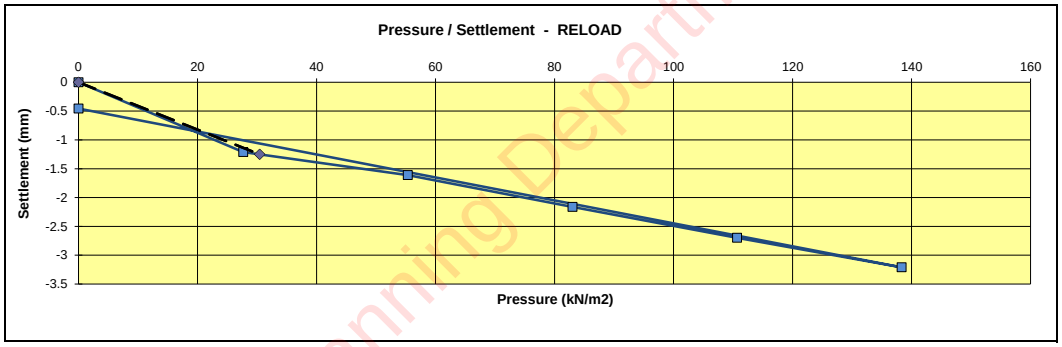
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8386**	**Site / Client Ref. No.**	KC/16/11/6 PB 17
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 17
Date Tested / Operator	16/11/2018 KC	**Level**	OGL - 0.12m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	5.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.01
55	-2.06
83	-3.20
111	-4.18
138	-5.11
0	-2.33



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.21
55	-1.61
83	-2.16
111	-2.70
138	-3.21
0	-0.46

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	9	14	MN / m²
Modulus of subgrade reaction (k)	=	17503	15649	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**1**	**1**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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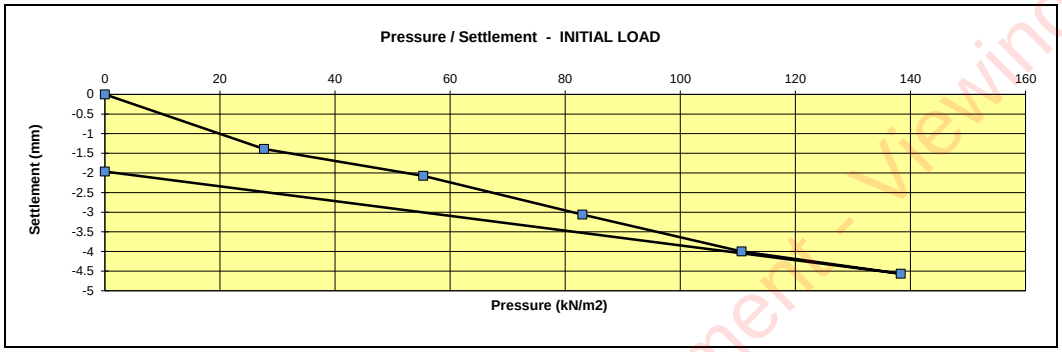
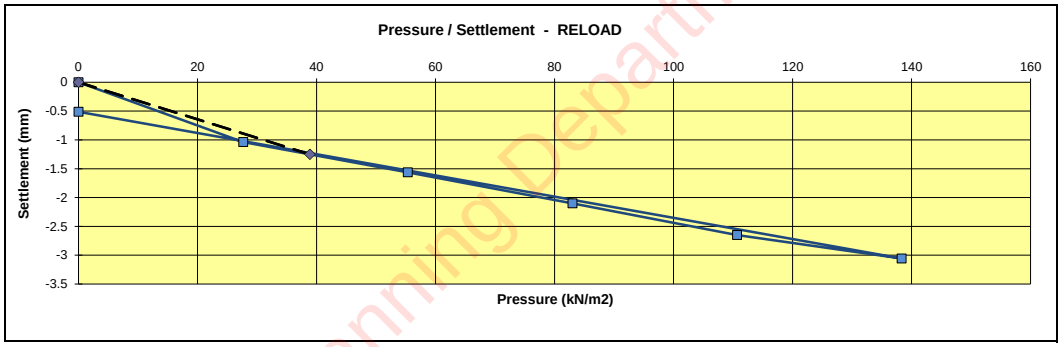
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8358**	**Site / Client Ref. No.**	KC/13/11/5 PB 18
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 18
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.1m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.6



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.39
55	-2.07
83	-3.06
111	-4.00
138	-4.57
0	-1.96



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.04
55	-1.56
83	-2.10
111	-2.65
138	-3.06
0	-0.51

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	10	15	MN / m²
Modulus of subgrade reaction (k)	=	12888	19989	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**1**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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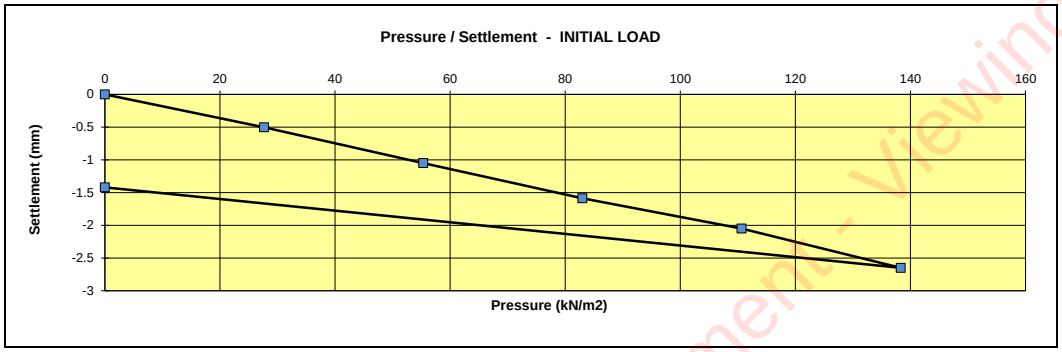
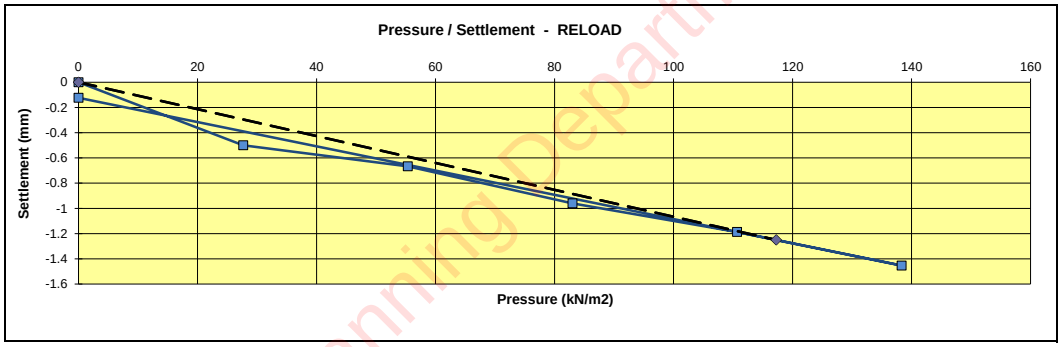
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8356**	**Site / Client Ref. No.**	KC/13/11/3 PB 19
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 19
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.26m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.50
55	-1.05
83	-1.59
111	-2.05
138	-2.65
0	-1.42



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.50
55	-0.67
83	-0.96
111	-1.19
138	-1.45
0	-0.12

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	17	31	MN / m²
Modulus of subgrade reaction (k)	=	33755	60286	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.8		
Equivelent CBR % Value	=	**4**	**12**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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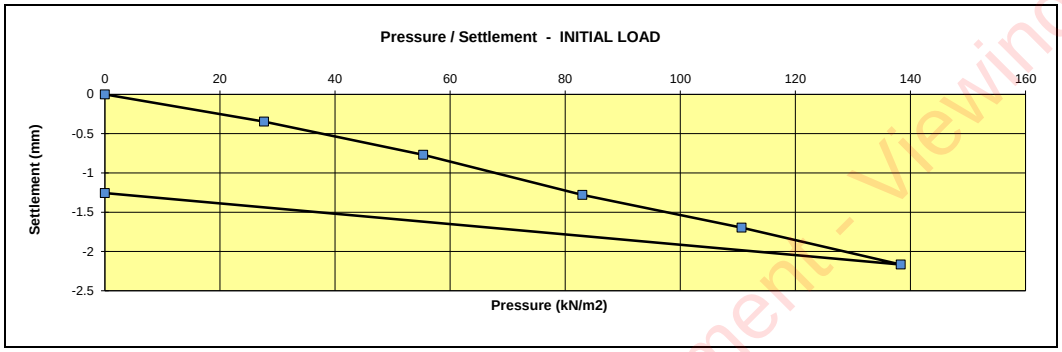
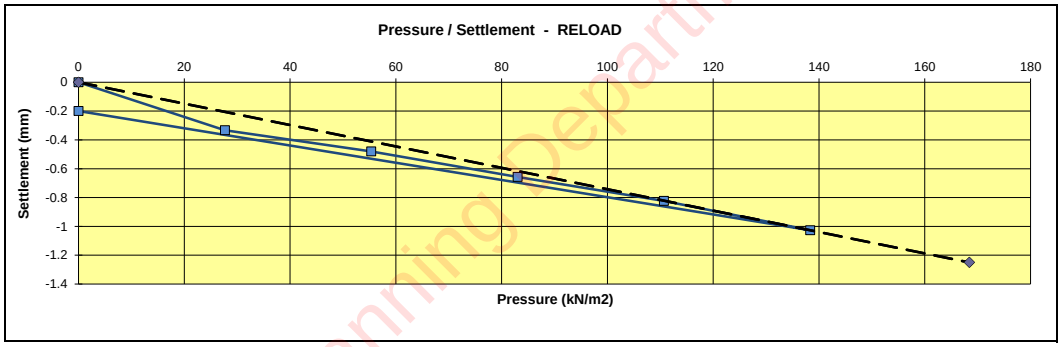
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** 200672

ERN Sample No.	**SA8347**	**Site / Client Ref. No.**	KC/12/11/1 PB 20
Supplier	Insitu	**Source**	Insitu
Material Description	Brown clay with rock	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 20
Date Tested / Operator	12/11/2018 KC	**Level**	OGL - 0.76m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.2



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.35
55	-0.77
83	-1.28
111	-1.70
138	-2.17
0	-1.26



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.33
55	-0.48
83	-0.66
111	-0.82
138	-1.03
0	-0.20

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	21	44	MN / m²
Modulus of subgrade reaction (k)	=	41843	86607	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	2.1		
Equivelent CBR % Value	=	**6**	**22**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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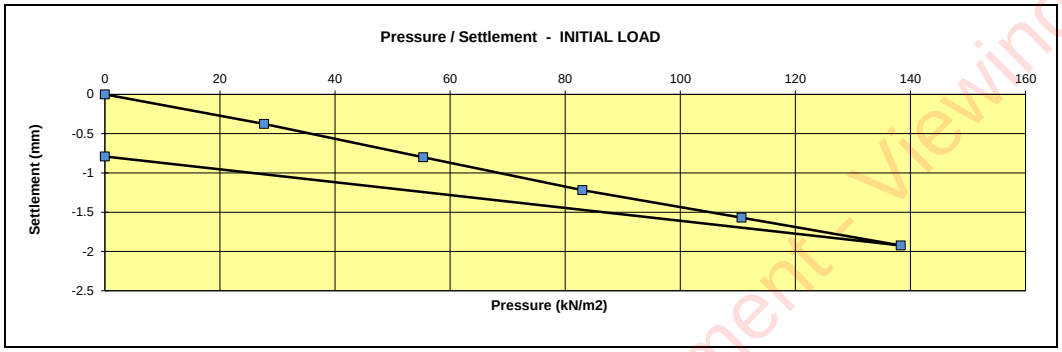
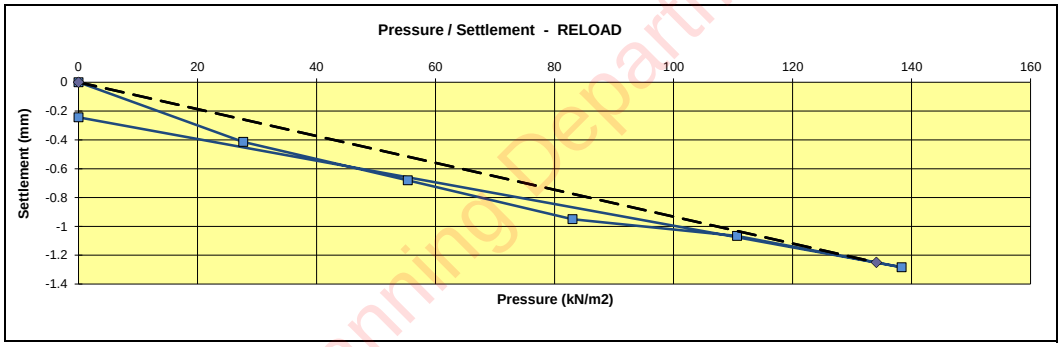
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8354**	**Site / Client Ref. No.**	KC/13/11/1 PB 21
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 21
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.1m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	1.9



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.38
55	-0.80
83	-1.22
111	-1.57
138	-1.92
0	-0.79



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.41
55	-0.68
83	-0.95
111	-1.07
138	-1.28
0	-0.24

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	23	35	MN / m²
Modulus of subgrade reaction (k)	=	43899	68945	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**7**	**15**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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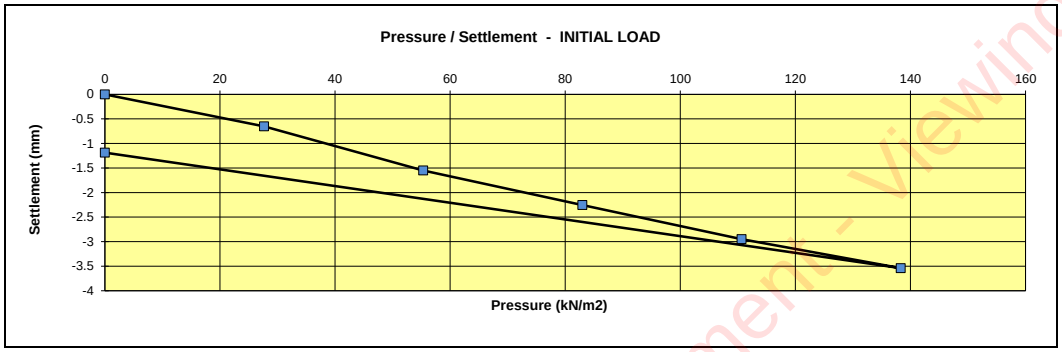
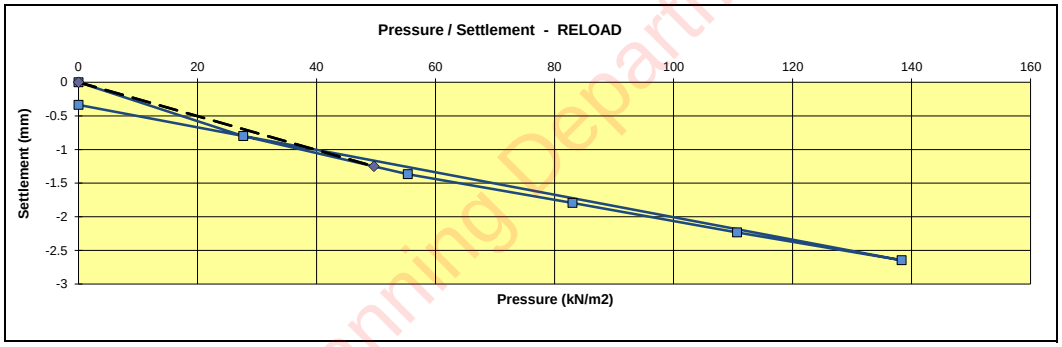
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8359**	**Site / Client Ref. No.**	KC/13/11/6 PB 22
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 22
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.15m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.65
55	-1.55
83	-2.25
111	-2.95
138	-3.54
0	-1.19



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.80
55	-1.37
83	-1.79
111	-2.23
138	-2.65
0	-0.34

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	17	MN / m²
Modulus of subgrade reaction (k)	=	23694	25524	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.3		
Equivelent CBR % Value	=	**2**	**3**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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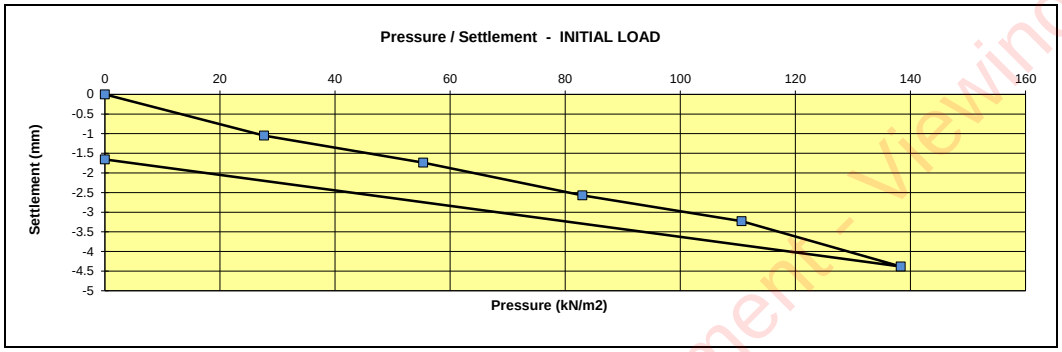
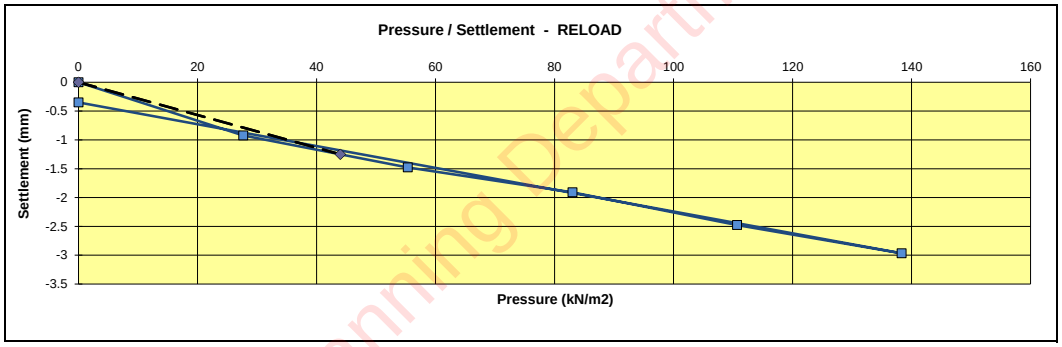
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8360**	**Site / Client Ref. No.**	KC/13/11/7 PB 23
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 23
Date Tested / Operator	13/11/2018 KC	**Level**	OGL - 0.1m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.05
55	-1.74
83	-2.57
111	-3.23
138	-4.38
0	-1.66



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.92
55	-1.48
83	-1.91
111	-2.48
138	-2.97
0	-0.35

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	10	15	MN / m²
Modulus of subgrade reaction (k)	=	18350	22626	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**1**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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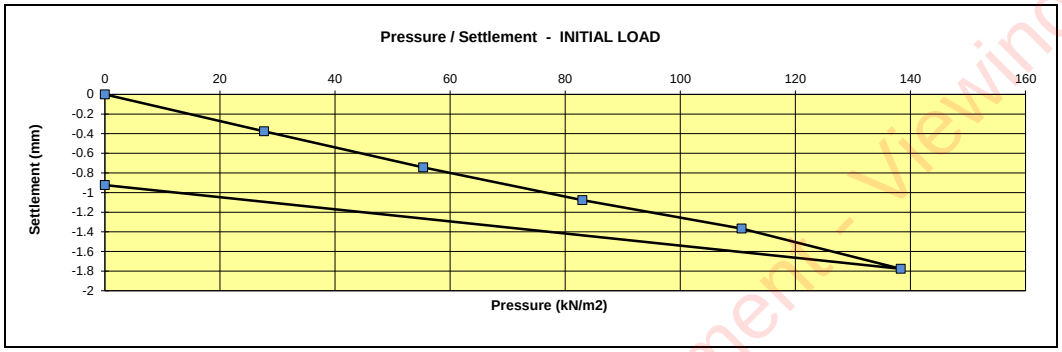
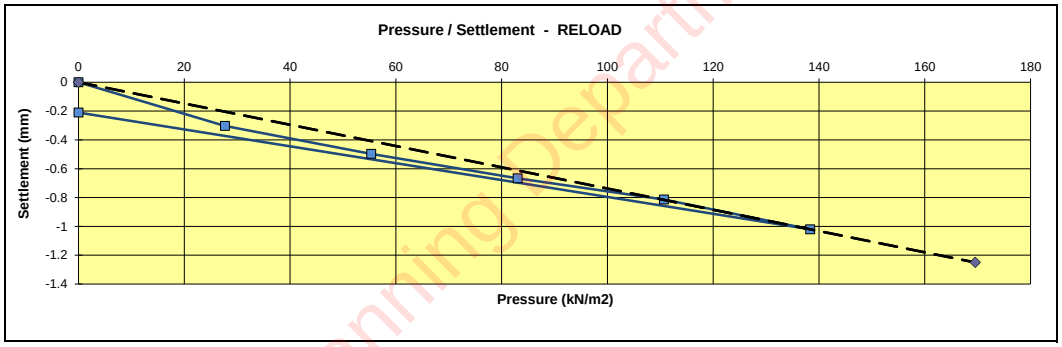
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8363**	**Site / Client Ref. No.**	KC/14/11/1 PB 24
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 24
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.21m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	1.8



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.38
55	-0.74
83	-1.08
111	-1.37
138	-1.78
0	-0.92



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.30
55	-0.50
83	-0.67
111	-0.81
138	-1.02
0	-0.21

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	25	44	MN / m²
Modulus of subgrade reaction (k)	=	51183	87173	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.7		
Equivelent CBR % Value	=	**9**	**22**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan for Testall Ltd **Date:** 22/11/2018

Authorised signatories : ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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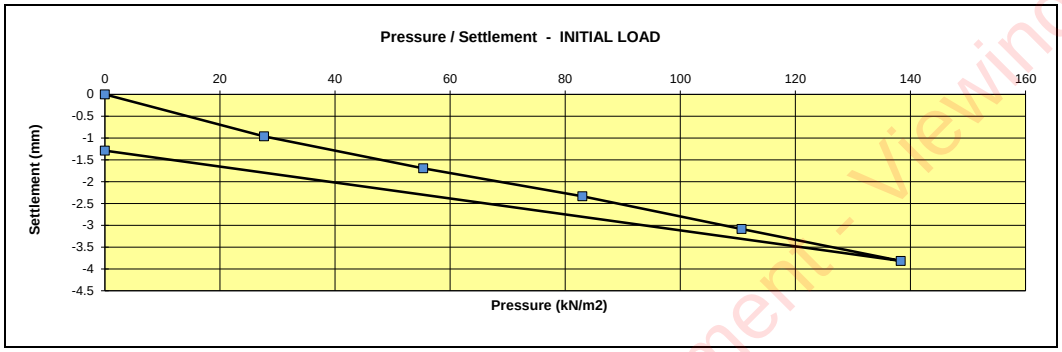
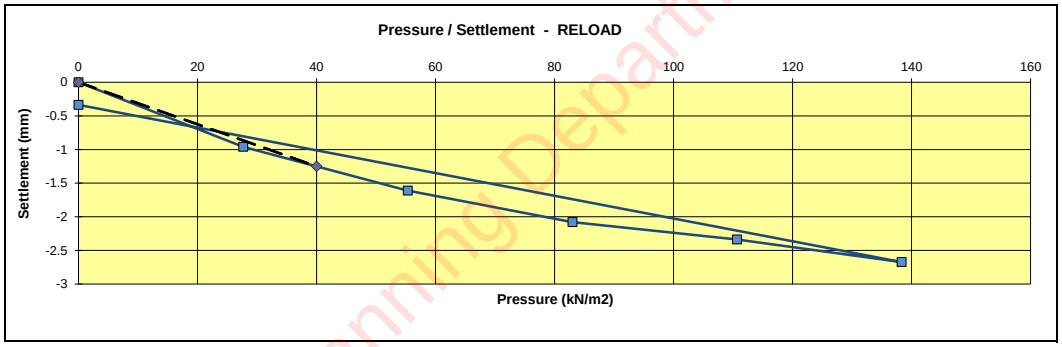
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8371**	**Site / Client Ref. No.**	KC/14/11/9 PB 25
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 25
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.145m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.8



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.96
55	-1.69
83	-2.34
111	-3.09
138	-3.82
0	-1.29



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.96
55	-1.61
83	-2.08
111	-2.34
138	-2.67
0	-0.34

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	12	17	MN / m²
Modulus of subgrade reaction (k)	=	19813	20574	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.4		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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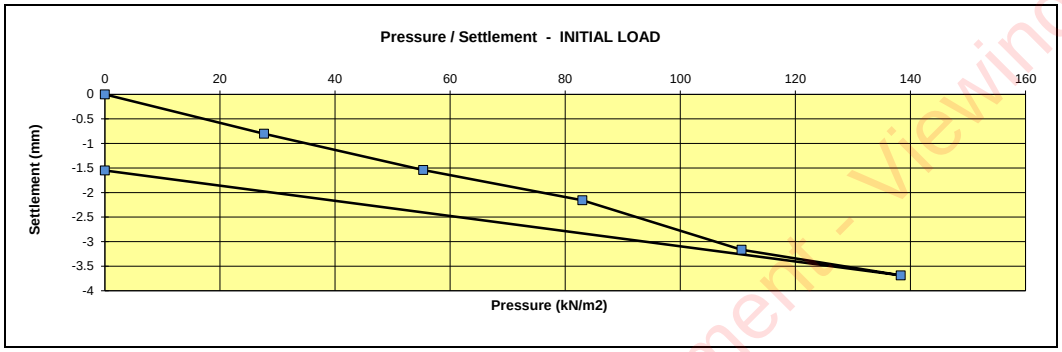
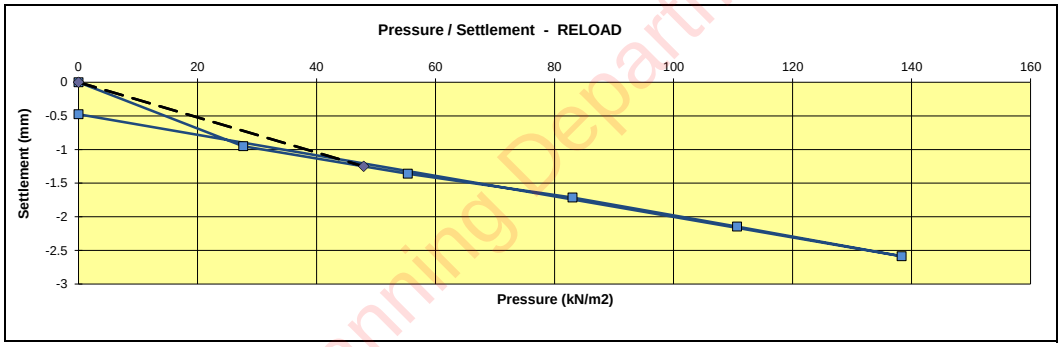
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8370**	**Site / Client Ref. No.**	KC/14/11/8 PB 26
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 26
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.11m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.80
55	-1.54
83	-2.16
111	-3.17
138	-3.69
0	-1.55



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.95
55	-1.36
83	-1.71
111	-2.15
138	-2.59
0	-0.48

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	12	17	MN / m²
Modulus of subgrade reaction (k)	=	22853	24636	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.4		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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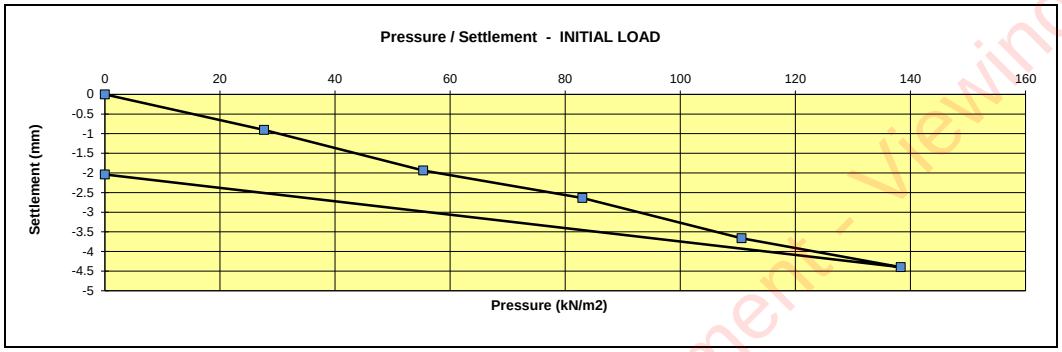
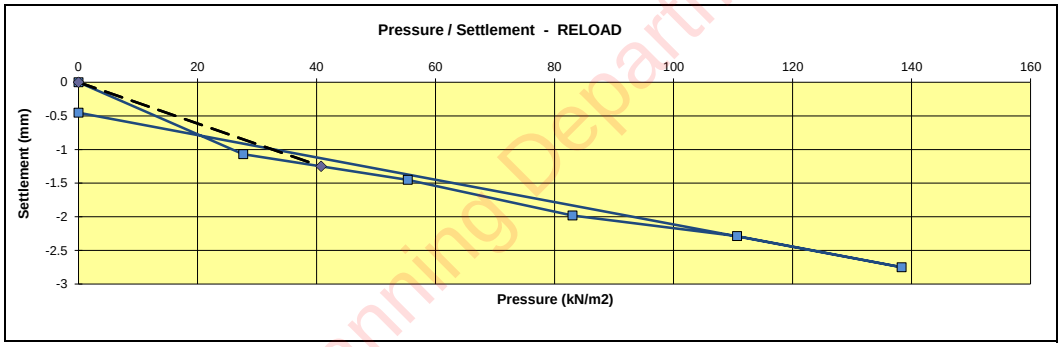
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** 200672

ERN Sample No.	**SA8375**	**Site / Client Ref. No.**	KC/15/11/3 PB 27
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 27
Date Tested / Operator	15/11/2018 KC	**Level**	OGL - 0.12m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.91
55	-1.94
83	-2.64
111	-3.66
138	-4.40
0	-2.04



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.07
55	-1.45
83	-1.98
111	-2.29
138	-2.75
0	-0.45

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	10	16	MN / m²
Modulus of subgrade reaction (k)	=	18969	20966	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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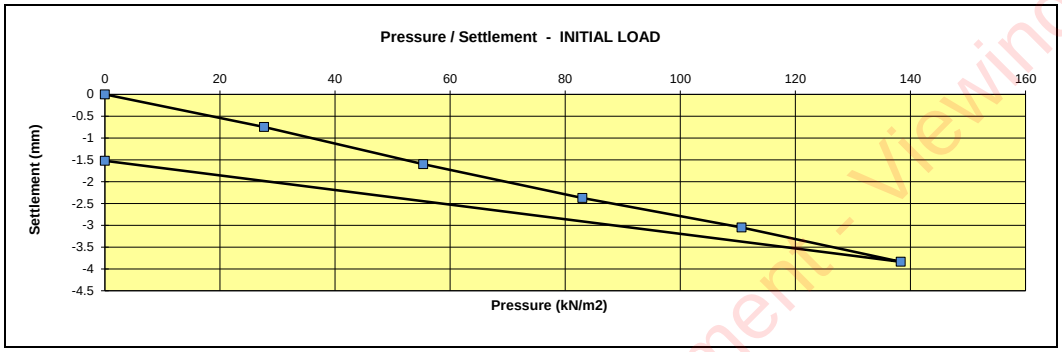
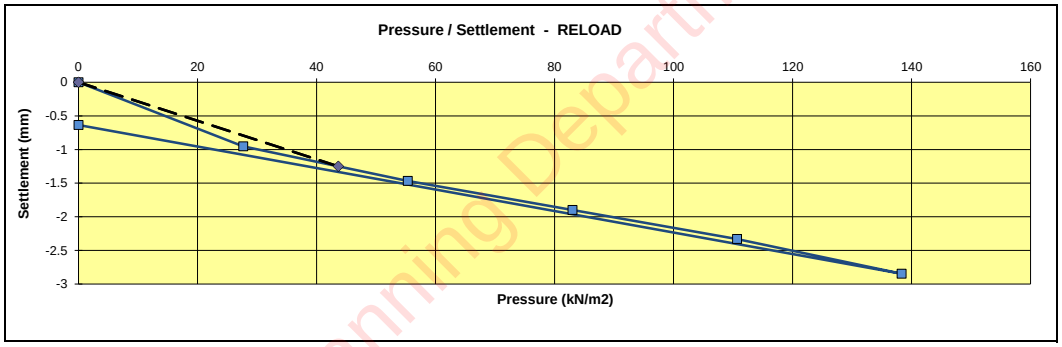
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8372**	**Site / Client Ref. No.**	KC/14/11/10 PB 28
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 28
Date Tested / Operator	14/11/2018 KC	**Level**	OGL - 0.118m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.8



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.75
55	-1.60
83	-2.37
111	-3.05
138	-3.84
0	-1.52



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.95
55	-1.47
83	-1.90
111	-2.33
138	-2.85
0	-0.64

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	12	16	MN / m²
Modulus of subgrade reaction (k)	=	22618	22449	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.3		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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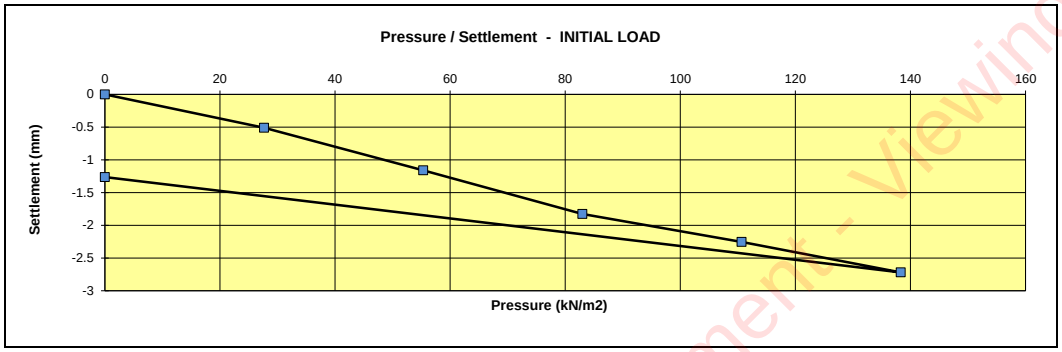
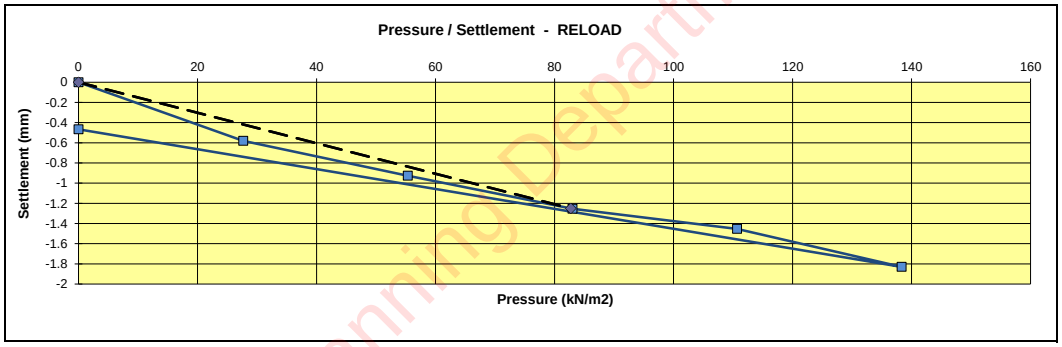
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8373**	**Site / Client Ref. No.**	KC/15/11/1 PB 29
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 29
Date Tested / Operator	15/11/2018 KC	**Level**	OGL - 0.115m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.51
55	-1.16
83	-1.83
111	-2.25
138	-2.72
0	-1.26



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.58
55	-0.93
83	-1.25
111	-1.45
138	-1.83
0	-0.47

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	17	25	MN / m²
Modulus of subgrade reaction (k)	=	30374	42535	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**4**	**6**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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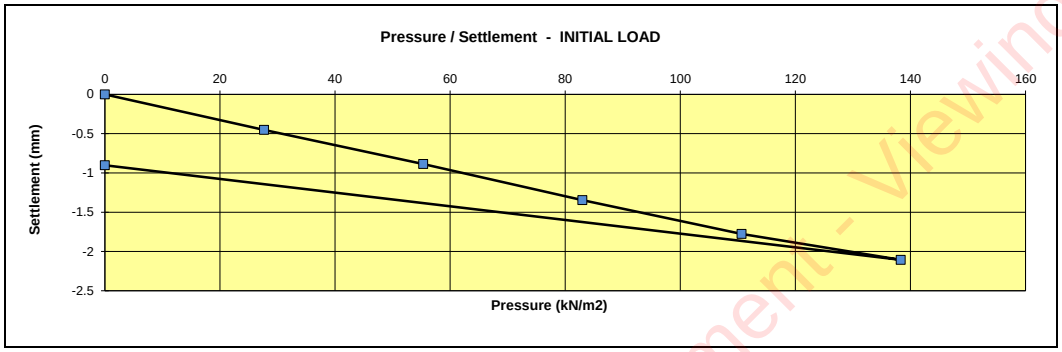
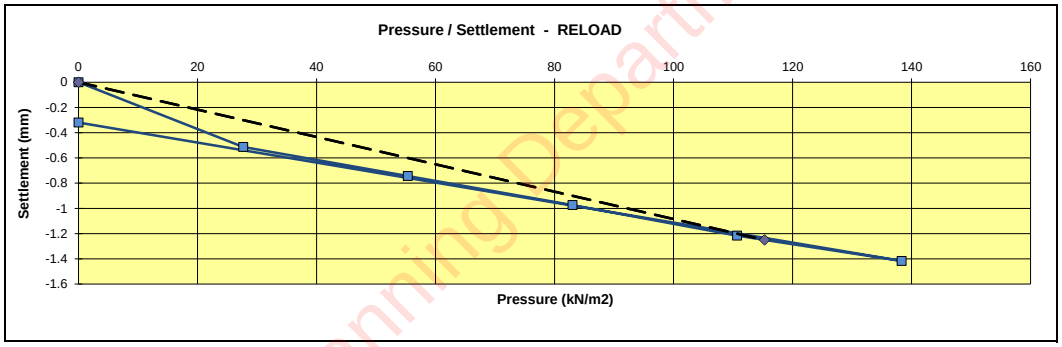
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8374**	**Site / Client Ref. No.**	KC/15/11/2 PB 30
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 30
Date Tested / Operator	15/11/2018 KC	**Level**	OGL - 0.25m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.45
55	-0.89
83	-1.35
111	-1.78
138	-2.11
0	-0.90



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.51
55	-0.74
83	-0.97
111	-1.22
138	-1.42
0	-0.32

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	21	32	MN / m²
Modulus of subgrade reaction (k)	=	39690	59278	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**6**	**11**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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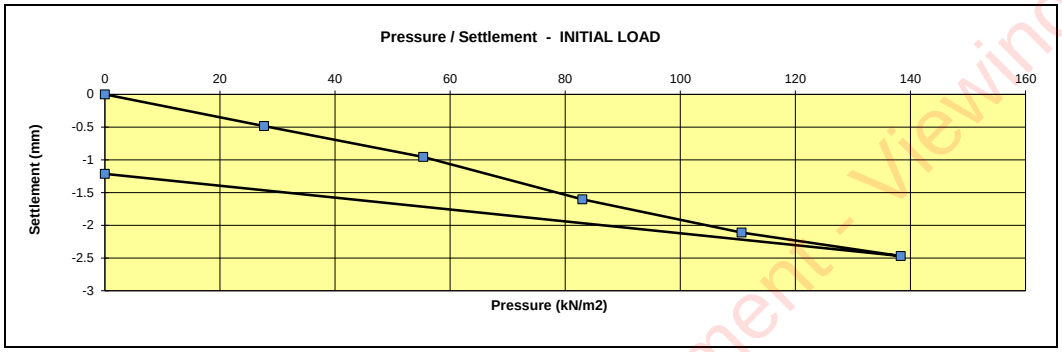
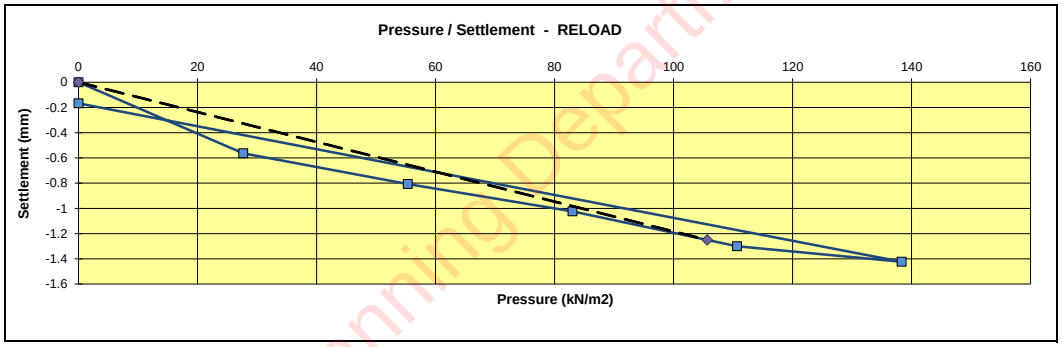
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8385**	**Site / Client Ref. No.**	KC/16/11/5 PB 31
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 31
Date Tested / Operator	16/11/2018 KC	**Level**	OGL - 0.1m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.48
55	-0.96
83	-1.60
111	-2.11
138	-2.47
0	-1.21



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.56
55	-0.81
83	-1.02
111	-1.30
138	-1.42
0	-0.17

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	18	32	MN / m²
Modulus of subgrade reaction (k)	=	34907	54336	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.7		
Equivelent CBR % Value	=	**5**	**10**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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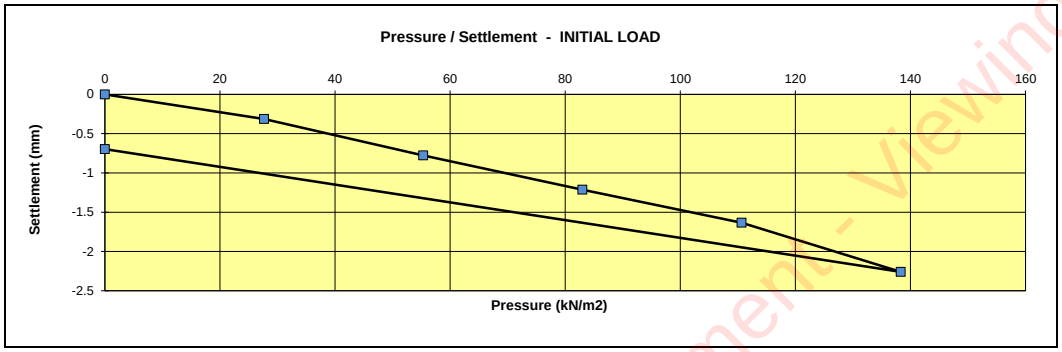
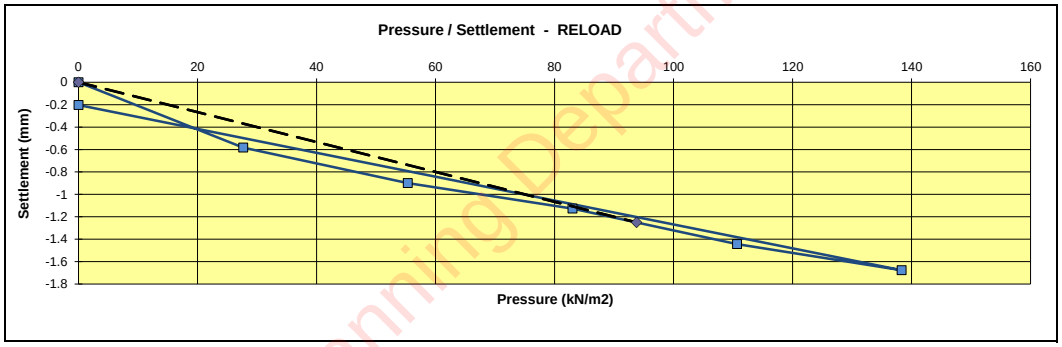
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8384**	**Site / Client Ref. No.**	KC/16/11/4 PB 32
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 32
Date Tested / Operator	16/11/2018 KC	**Level**	OGL - 0.14m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.3



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.31
55	-0.78
83	-1.21
111	-1.63
138	-2.26
0	-0.70



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.58
55	-0.90
83	-1.13
111	-1.44
138	-1.68
0	-0.20

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	20	27	MN / m²
Modulus of subgrade reaction (k)	=	43922	48221	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.3		
Equivelent CBR % Value	=	**7**	**8**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

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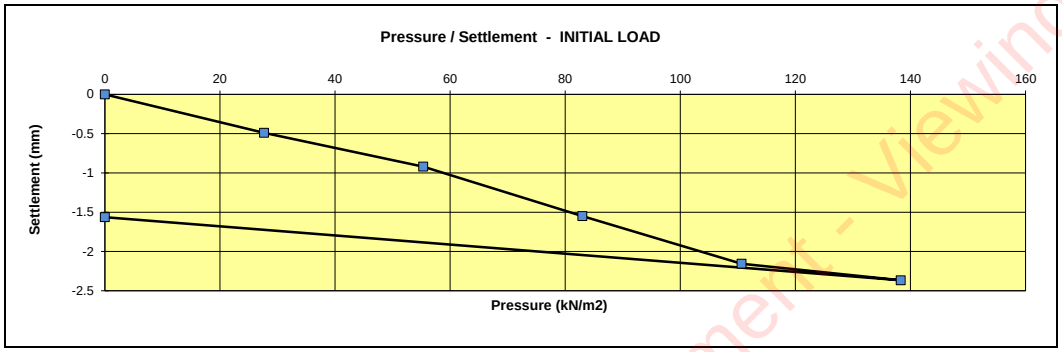
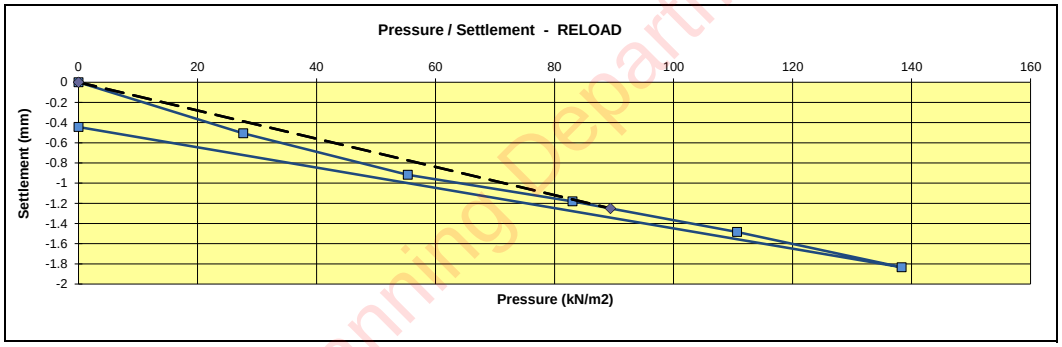
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8383**	**Site / Client Ref. No.**	KC/16/11/3 PB 33
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 33
Date Tested / Operator	16/11/2018 KC	**Level**	OGL - 0.195m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	2.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.49
55	-0.92
83	-1.55
111	-2.16
138	-2.37
0	-1.56



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.51
55	-0.92
83	-1.18
111	-1.48
138	-1.83
0	-0.44

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	19	25	MN / m²
Modulus of subgrade reaction (k)	=	35905	45963	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.3		
Equivelent CBR % Value	=	**5**	**7**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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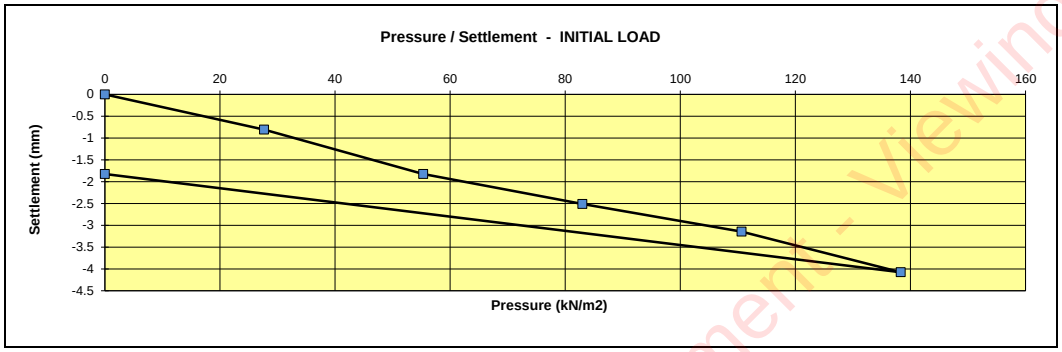
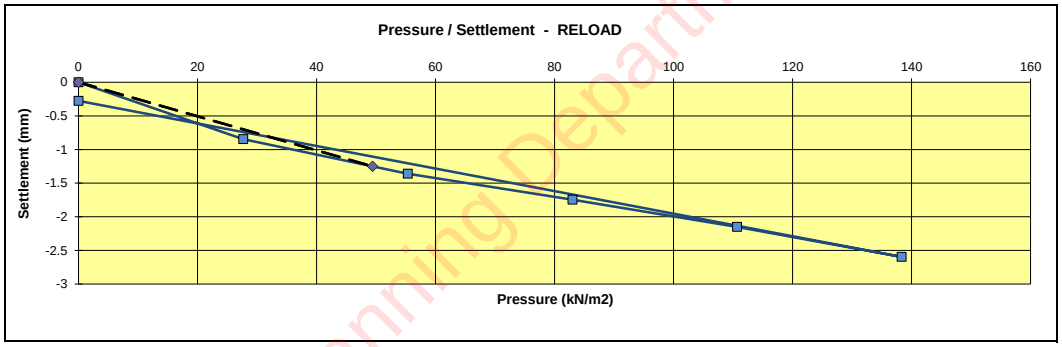
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8382**	**Site / Client Ref. No.**	KC/16/11/2 PB 34
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 34
Date Tested / Operator	16/11/2018 KC	**Level**	OGL - 0.12m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.81
55	-1.82
83	-2.51
111	-3.15
138	-4.08
0	-1.83



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.85
55	-1.36
83	-1.75
111	-2.15
138	-2.60
0	-0.28

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	11	17	MN / m²
Modulus of subgrade reaction (k)	=	20430	25405	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**2**	**3**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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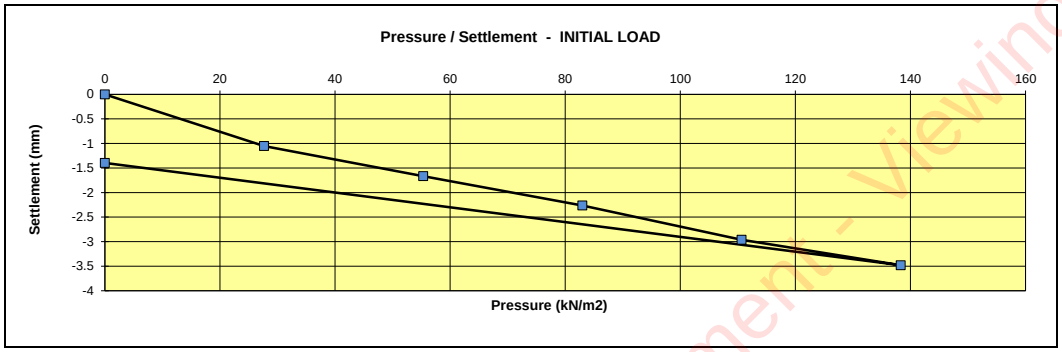
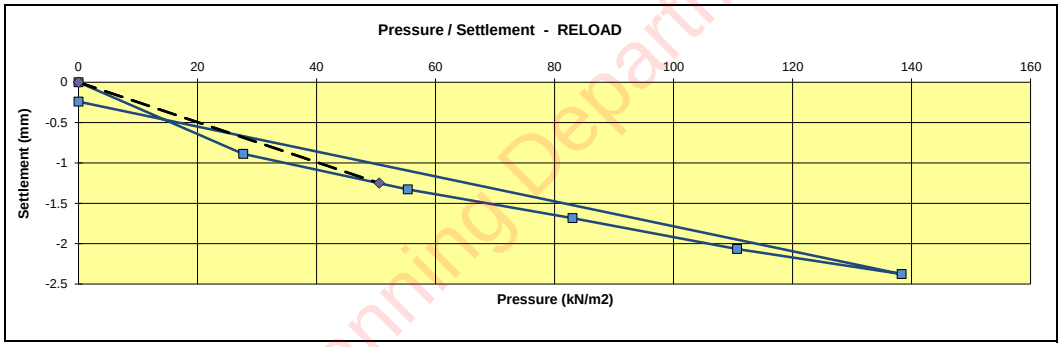
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8380**	**Site / Client Ref. No.**	KC/15/11/8 PB 35
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 35
Date Tested / Operator	15/11/2018 KC	**Level**	OGL - 0.11m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-1.05
55	-1.67
83	-2.26
111	-2.96
138	-3.48
0	-1.40



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.89
55	-1.33
83	-1.68
111	-2.07
138	-2.38
0	-0.24

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	19	MN / m²
Modulus of subgrade reaction (k)	=	18788	25974	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.5	
Equivelent CBR % Value	=	**2**	**3**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

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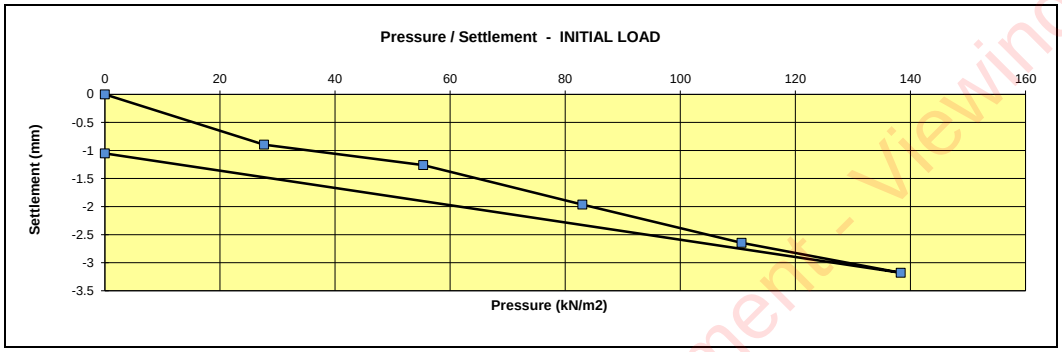
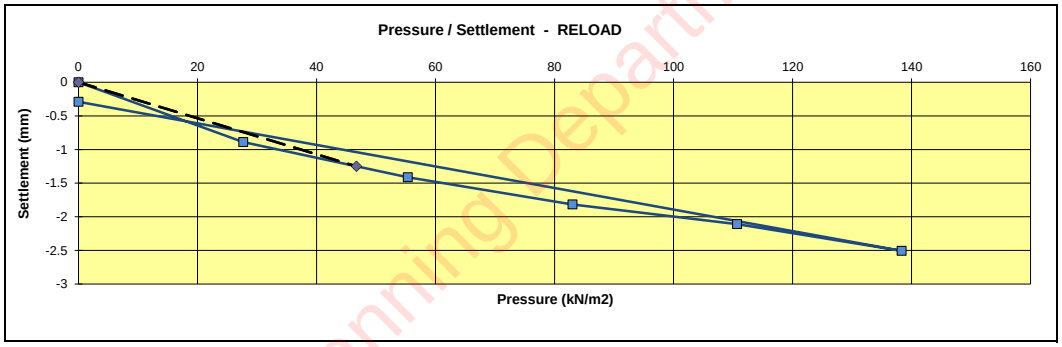
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8379**	**Site / Client Ref. No.**	KC/15/11/7 PB 36
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 36
Date Tested / Operator	15/11/2018 KC	**Level**	OGL - 0.105m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.2



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.90
55	-1.26
83	-1.96
111	-2.65
138	-3.18
0	-1.05



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.89
55	-1.41
83	-1.82
111	-2.11
138	-2.51
0	-0.29

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	14	18	MN / m²
Modulus of subgrade reaction (k)	=	28062	24013	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.3		
Equivelent CBR % Value	=	**3**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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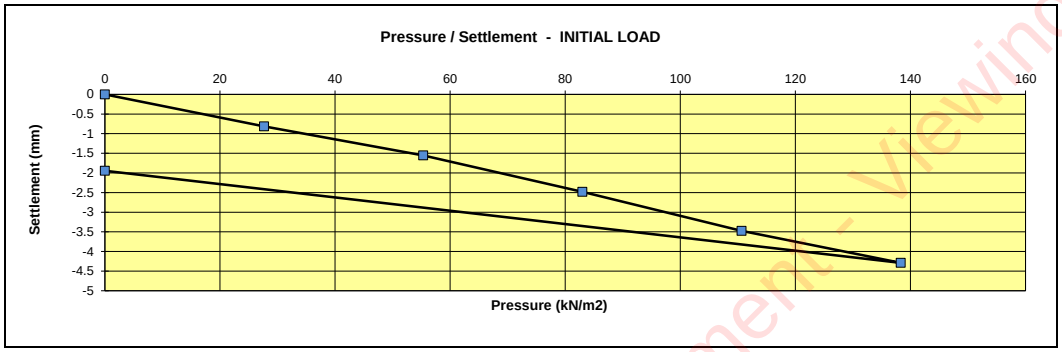
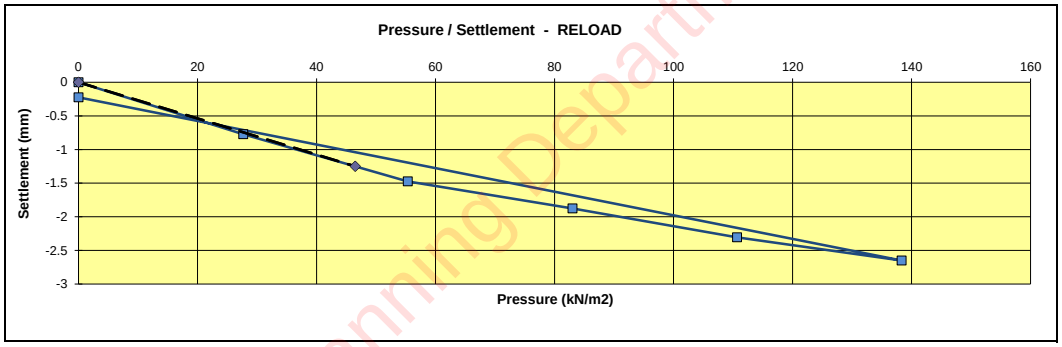
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8378**	**Site / Client Ref. No.**	KC/15/11/6 PB 37
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 37
Date Tested / Operator	15/11/2018 KC	**Level**	OGL - 0.125m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.3



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.82
55	-1.55
83	-2.48
111	-3.48
138	-4.29
0	-1.95



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.77
55	-1.47
83	-1.88
111	-2.31
138	-2.65
0	-0.22

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	11	17	MN / m²
Modulus of subgrade reaction (k)	=	22595	23914	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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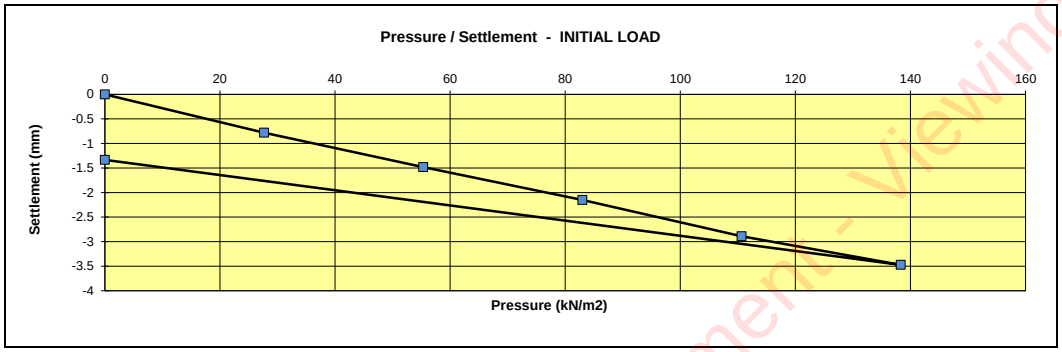
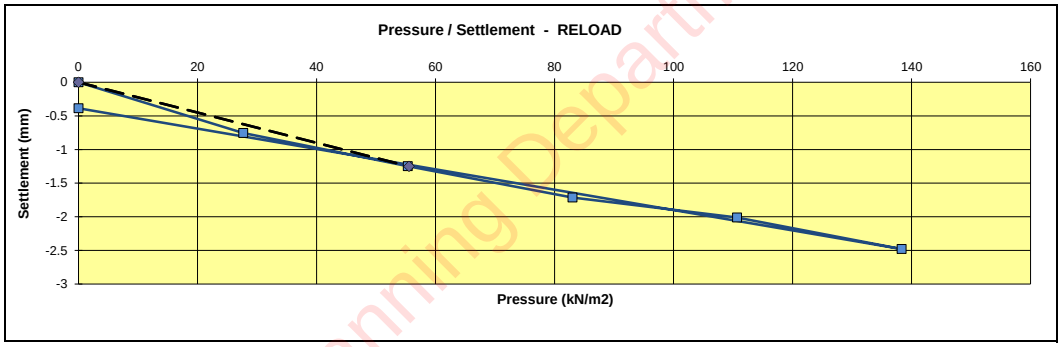
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8377**	**Site / Client Ref. No.**	KC/15/11/5 PB 38
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 38
Date Tested / Operator	15/11/2018 KC	**Level**	OGL - 0.115m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.78
55	-1.48
83	-2.15
111	-2.89
138	-3.47
0	-1.33



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.75
55	-1.25
83	-1.71
111	-2.01
138	-2.48
0	-0.39

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	18	MN / m²
Modulus of subgrade reaction (k)	=	23779	28555	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.4		
Equivelent CBR % Value	=	**2**	**3**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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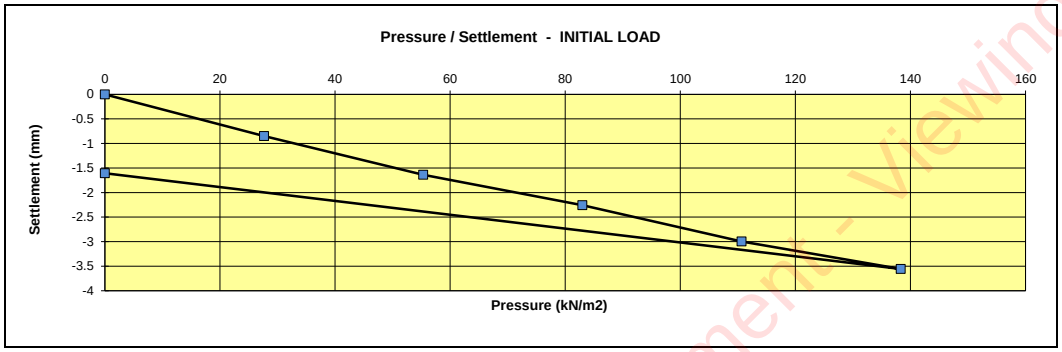
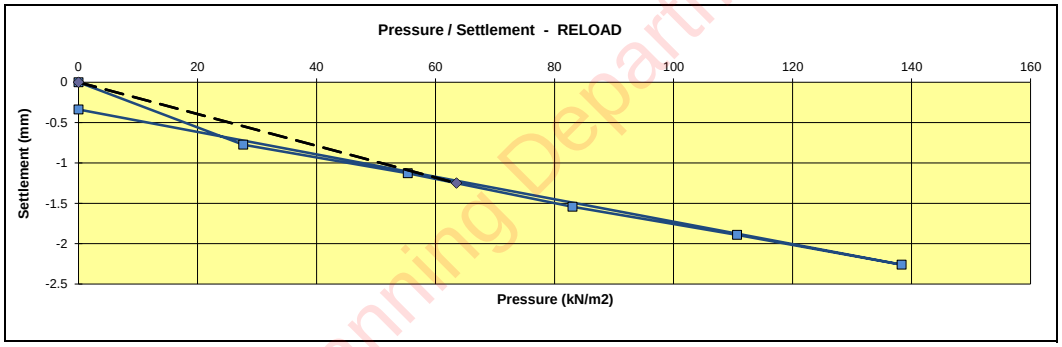
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8376**	**Site / Client Ref. No.**	KC/15/11/4 PB 39
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 39
Date Tested / Operator	15/11/2018 KC	**Level**	OGL - 0.12m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	3.6



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.85
55	-1.64
83	-2.26
111	-3.00
138	-3.56
0	-1.61



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.77
55	-1.13
83	-1.54
111	-1.89
138	-2.26
0	-0.34

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	20	MN / m²
Modulus of subgrade reaction (k)	=	21461	32664	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivelent CBR % Value	=	**2**	**4**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

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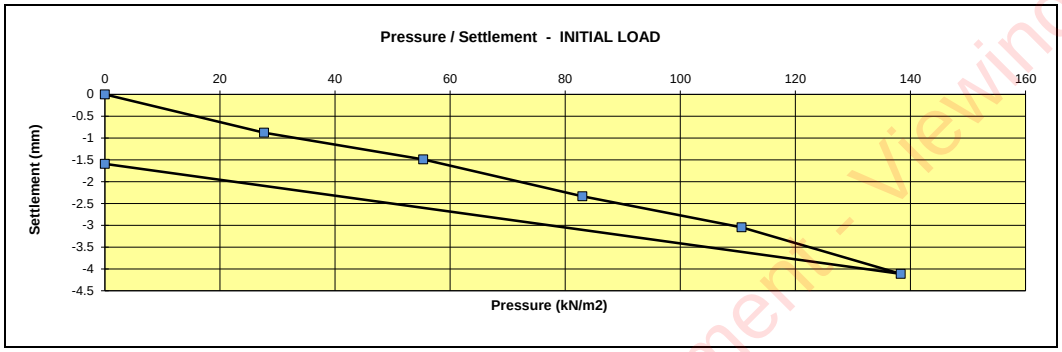
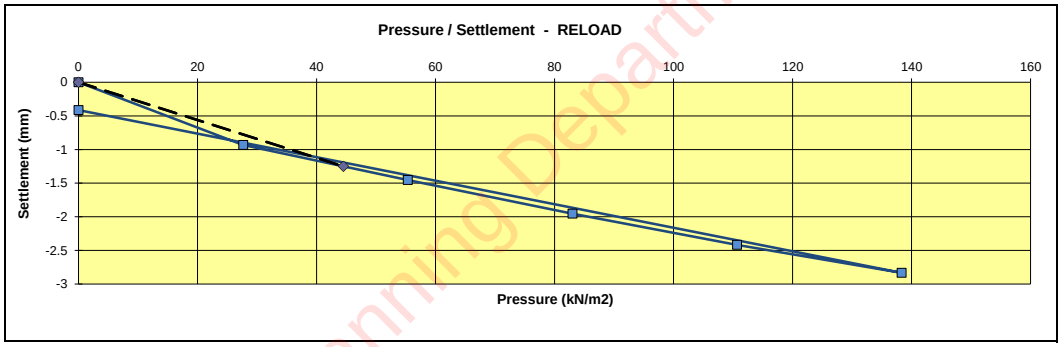
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd **Contract :** IPS Site Investigation, Dundalk **Job No :** J00672

ERN Sample No.	**SA8381**	**Site / Client Ref. No.**	KC/16/11/1 PB 40
Supplier	Insitu	**Source**	Insitu
Material Description	Brown gravelly clay	**Deposition**	IPS Site Investigation, Dundalk
Chainage	Building 1	**Offset**	Flag 40
Date Tested / Operator	16/11/2018 KC	**Level**	OGL - 0.1m
Plate Size (mm)	450	**Plate Correction factor**	0.64 (in accordance with HD 25-26/10)
Max Applied Pressure (KN/m²)	138	**Max Deformation (mm)**	4.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.88
55	-1.49
83	-2.34
111	-3.05
138	-4.11
0	-1.59



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
28	-0.93
55	-1.45
83	-1.95
111	-2.42
138	-2.83
0	-0.41

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	11	16	MN / m²
Modulus of subgrade reaction (k)	=	22886	22890	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivelent CBR % Value	=	**2**	**2**	

in accordance with HD 25-26/10 in Volume 7 Section 2, Part 2A (Pavement Foundation and Design) of the of the TII DMRB (TII Publication No. DN-PAV-03021)

Remarks:

Signed: D. Jordan **Date:** 22/11/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Quality Manager

UKAS TESTING 8995

APPENDIX 6 – Cable Percussion & Rotary Borehole Records

Ground Investigations Ireland Ltd
www.gii.ie

Site IPS Integrated Project			**Borehole Number** BH01
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 2.7m	**Ground Level (mOD)** 19.60	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704391.8 E 803566 N	**Dates** 13/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					19.50	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B						Stiff grey brown slightly sandy slightly gravelly CLAY with occasional sub-angular cobbles.		
1.00-1.45 1.00	SPT(C) N=17 B			1,2/6,3,3,5					
						(2.60)			
1.50	U1								
2.00-2.45 2.00	SPT(C) N=18 B			2,2/3,4,6,5					
				Water strike(1) at 2.60m, rose to 2.30m in 20 mins.	16.90	2.70	Refusal due to presumed boulders.		▼1 ▽1
							Complete at 2.70m		

Remarks
Groundwater encountered at 2.6m BGL in borehole.
Refusal at 2.7m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 2.60m to 2.70m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH01

Ground Investigations Ireland Ltd
www.gii.ie

Site IPS Integrated Project			**Borehole Number** BH03
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 4.3m	**Ground Level (mOD)** 24.66	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704217.6 E 803378.5 N	**Dates** 12/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					24.61	0.05	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B						Firm to sitff grey brown slightly sandy slightly gravelly CLAY with occasional sub-angular cobbles.		
1.00-1.45 1.00	SPT(C) N=10 B			1,1/2,4,2,2					
1.50	U1					(2.95)			
2.00-2.45 2.00	SPT(C) N=10 B			1,2/2,3,3,2					
3.00-3.45	SPT(C) N=14			2,3/3,4,4,3	21.66	3.00	Firm grey brown slightly sandy slightly gravelly CLAY with occasional sub-angular cobbles.		
						(1.00)			
4.00-4.16	SPT(C) 50/10			3,3/50	20.66	4.00	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional sub-angular cobbles.		
						(0.30)			
					20.36	4.30	Refusal due to boulders/rock.		
							Complete at 4.30m		

Remarks
No groundwater encountered in Borehole.
Refusal at 4.3m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 4.30m to 4.30m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH03

Ground Investigations Ireland Ltd
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Site IPS Integrated Project			**Borehole Number** BH06
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 3.6m	**Ground Level (mOD)** 22.33	**Client** GDCL Consulting
	Location (dGPS) 704066 E 803128.8 N	**Dates** 12/12/2018	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					22.23	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B						Firm brown slightly sandy slightly gravelly CLAY with occasional angular cobbles.		
1.00-1.45 1.00	SPT(C) N=15 B			1,3/5,3,3,4		(2.40)			
2.00-2.45 2.00	SPT(C) N=13 B			2,2/3,3,4,3					
					19.83	2.50	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles.		
						(0.50)			
3.00-3.45 3.00	SPT(C) N=50 B			2,3/3,5,5,37	19.33	3.00	Very stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders.		
						(0.60)			
					18.73	3.60	Refusal due to boulder/rock.		
							Complete at 3.60m		

Remarks
No groundwater encountered in Borehole.
Refusal at 3.6m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 3.60m to 3.60m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH06

Ground Investigations Ireland Ltd
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Site	Borehole Number
IPS Integrated Project	BH07

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter 200mm to 0.6m	Ground Level (mOD) 21.13	Client GDCL Consulting	Job Number 8115-10-18
	Location (dGPS) 704137.6 E 803000.1 N	Dates 12/12/2018	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					21.03	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
						(0.50)			
0.50	B				20.53	0.60	Brown silty slightly sandy gravelly CLAY with occasional angular cobbles. Refusal due to boulder/rock.		
							Complete at 0.60m		

Remarks
No groundwater encountered in Borehole.
Refusal at 0.6m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 0.60m to 0.60m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No.
8115-10-18.BH07

Ground Investigations Ireland Ltd
www.gii.ie

Site IPS Integrated Project			**Borehole Number** BH08
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 3.1m	**Ground Level (mOD)** 22.05	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704181.8 E 802942.3 N	**Dates** 05/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					21.95	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.			
0.50	B					(1.40)	Firm brown silty slightly sandy gravelly CLAY.			
1.00-1.45 1.00	SPT(C) N=10 B			2,2/3,2,3,2						
					20.55	1.50	Soft to firm brown sandy slightly gravelly CLAY with rare angular to subrounded cobbles.			
2.00-2.45 2.00	SPT(C) N=6 B			2,1/2,1,1,2		(1.50)				
3.00-3.10 3.00	SPT(C) 50*/100 50/0 B			25,25/50	19.05 18.95	3.00 3.10	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Refusal due to boulder/rock.			
							Complete at 3.10m			

Remarks
No groundwater encountered in Borehole.
Refusal at 3.1m BGL due to rock/boulder.
50mm Standpipe installed 3.1m BGL in Borehole. Backfilled with gravel and fitted with raised cover.
Chiselling from 3.10m to 3.10m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH08

Ground Investigations Ireland Ltd
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Site IPS Integrated Project			**Borehole Number** BH09
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 2.8m	**Ground Level (mOD)** 19.31	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704142.8 E 803143.1 N	**Dates** 14/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					19.01	0.30			
0.50	B						Firm grey brown slightly sandy slightly gravelly CLAY with occasional sub-rounded cobbles.		
1.00-1.45 1.00	SPT(C) N=10 B			1,2/2,2,3,3		(1.70)			
2.00-2.42 2.00	SPT(C) 50/265 B			1,3/6,9,13,22	17.31	2.00	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional sub-rounded cobbles.		
						(0.80)			
					16.51	2.80	Refusal due to boulders/rock.		
							Complete at 2.80m		

Remarks
No groundwater encountered in Borehole.
Refusal at 2.8m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 2.80m to 2.80m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH09

Ground Investigations Ireland Ltd
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Site IPS Integrated Project			**Borehole Number** BH10
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 2.1m	**Ground Level (mOD)** 18.30	**Client** GDCL Consulting
	Location (dGPS) 704203.8 E 803036.3 N	**Dates** 11/12/2018	**Engineer**
			Job Number 8115-10-18 **Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					18.20	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B						Firm brown silty slightly sandy gravelly CLAY.		
						(1.40)			
1.00-1.45 1.00	SPT(C) N=15 B			2,2/3,4,4,4					
					16.80	1.50	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders.		
						(0.60)			
2.00	B				16.20	2.10	Refusal due to boulder/rock.		
							Complete at 2.10m		

Remarks
No groundwater encountered in Borehole.
Refusal at 2.1m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 2.10m to 2.10m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH10

Ground Investigations Ireland Ltd
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Site IPS Integrated Project			**Borehole Number** BH11
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 2.1m	**Ground Level (mOD)** 18.15	**Client** GDCL Consulting
	Location (dGPS) 704250.5 E 802967.7 N	**Dates** 05/12/2018	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					18.05	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B					(1.40)	Soft to firm brown slightly sandy slightly gravelly CLAY with rare angular cobbles.		
1.00-1.45 1.00	SPT(C) N=40 B			1,2/2,2,4,32					
					16.65	1.50	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles.		
						(0.50)			
2.00-2.10 2.00	SPT(C) 26*/100 50/0 B			1,25/50	16.15 16.05	2.00 2.10	Very stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Refusal due to boulder/rock.		
							Complete at 2.10m		

Remarks
No groundwater encountered in Borehole.
Refusal at 2.1m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 2.10m to 2.10m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH11

Ground Investigations Ireland Ltd
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Site IPS Integrated Project			**Borehole Number** BH12
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 2.1m	**Ground Level (mOD)** 18.82	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704207.6 E 803183.8 N	**Dates** 13/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					18.72	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B						Firm reddish brown slightly sandy slightly gravelly CLAY with occasional sub-angular cobbles.		
1.00-1.45 1.00	SPT(C) N=11 B			1,2/2,3,3,3		(1.90)			
2.00-2.03 2.00	SPT(C) 50*/25 50/0 B			50/50	16.82 16.72	2.00 2.10	Stiff reddish brown slightly sandy slightly gravelly CLAY with occasional sub-angular cobbles. Refusal due to boulders/rock.		
							Complete at 2.10m		

Remarks
No groundwater encountered in Borehole.
Refusal at 2.1m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 2.10m to 2.10m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH12

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Site IPS Integrated Project			**Borehole Number** BH13
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 0.9m	**Ground Level (mOD)** 17.27	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704241 E 803057.5 N	**Dates** 04/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					17.17	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
						(0.70)	Made Ground: Brown slightly sandy slightly gravelly CLAY. (FILL)		
					16.47	0.80			
					16.37	0.90	CONCRETE Refusal due to obstruction of boulder/concrete.		
							Complete at 0.90m		

Remarks
No groundwater encountered in Borehole.
Refusal at 0.9m BGL due to concrete/boulder.
Borehole backfilled upon completion.
Chiselling from 0.90m to 0.90m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH13

Ground Investigations Ireland Ltd
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Site IPS Integrated Project			**Borehole Number** BH14
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 2.4m	**Ground Level (mOD)** 16.58	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704290.5 E 802988.2 N	**Dates** 06/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					16.48	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
						(0.50)			
0.50	B				15.98	0.60	Soft to firm brown slightly sandy slightly gravelly CLAY with rare angular cobbles.		
1.00-1.45 1.00	SPT(C) N=20 B			2,2/4,5,5,6		(0.90)	Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional cobbles.		
					15.08	1.50	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles.		
						(0.70)			
2.00-2.40 2.00	SPT(C) 50/250 B			3,2/3,4,5,38	14.38	2.20			
						(0.20)			
					14.18	2.40	Very stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Refusal due to boulder/rock.		
							Complete at 2.40m		

Remarks
No groundwater encountered in Borehole.
Refusal at 2.4m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 2.40m to 2.40m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH14

Ground Investigations Ireland Ltd
www.gii.ie

Site IPS Integrated Project			**Borehole Number** BH15
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 2.1m	**Ground Level (mOD)** 20.03	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704270.6 E 803221.5 N	**Dates** 13/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					19.93	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B						Firm grey brown slightly sandy sandy slightly gravelly CLAY with occasional sub-angular cobbles.		
1.00-1.45 1.00	SPT(C) N=15 B			3,3/4,3,4,4		(1.90)			
2.00-2.45 2.00	SPT(C) N=8 B			2,1/3,2,1,2	18.03	2.00	Soft grey brown slightly sand slightly gravelly CLAY with occasional sub-angular cobbles.		
						(0.60)			
					17.43	2.60	Refusal due to boulder/rock.		
							Complete at 2.60m		

Remarks
No groundwater encountered in Borehole.
Refusal at 2.1m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 2.60m to 2.60m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH15

Ground Investigations Ireland Ltd
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Site	Borehole Number
IPS Integrated Project	BH16

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter 200mm to 3.1m	Ground Level (mOD) 18.37	Client GDCL Consulting	Job Number 8115-10-18
	Location (dGPS) 704334.7 E 803117.4 N	Dates 11/12/2018	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					18.27	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.			
0.50	B					(1.40)	Firm brown slightly sandy slightly gravelly CLAY with occasional angular cobbles.			
1.00-1.45 1.00	SPT(C) N=15 B			3,4/3,3,4,5						
1.50	U1 100%				16.87	1.50	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles.			
2.00-2.45 2.00	SPT(C) N=17 B			2,3/4,4,4,5		(1.50)				
3.00-3.10 3.00	SPT(C) 50*/100 50/0 B			25,25/50	15.37 15.27	3.00 3.10	Very stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Refusal due to boulder/rock.			
							Complete at 3.10m			

Remarks
No groundwater encountered in Borehole.
Refusal at 3.1m BGL due to rock/boulder.
50mm Standpipe installed 3.1m BGL in Borehole. Backfilled with gravel and fitted with raised cover.
Chiselling from 3.10m to 3.10m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No.
8115-10-18.BH06

Ground Investigations Ireland Ltd
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Site IPS Integrated Project			**Borehole Number** BH17
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 1.6m	**Ground Level (mOD)** 16.42	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704337.2 E 803013.3 N	**Dates** 07/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					16.32	0.10 (0.30)	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
					16.02	0.40	Soft brown slightly sandy slightly gravelly CLAY.		
0.50	B						Firm to stiff brown slightly sandy slightly gravelly CLAY with rare cobbles.		
1.00-1.45 1.00	SPT(C) N=16 B			1,4/3,5,3,5		(1.05)			
					14.97 14.82	1.45 (0.15) 1.60	Very stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Refusal due to boulder/rock.		
							Complete at 1.60m		

Remarks
No groundwater encountered in Borehole.
Refusal at 1.60m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 1.60m to 1.60m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH17

Ground Investigations Ireland Ltd
www.gii.ie

Site IPS Integrated Project			**Borehole Number** BH18
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm to 3.1m	**Ground Level (mOD)** 21.34	**Client** GDCL Consulting	**Job Number** 8115-10-18
	Location (dGPS) 704350.6 E 803246.7 N	**Dates** 10/12/2018	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					21.14	(0.20) 0.20	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B						Firm brown slightly sandy slightly gravelly CLAY.		
1.00-1.45 1.00	SPT(C) N=10 B			1,2/2,3,2,3					
1.50	U1 100%					(2.80)			
2.00-2.45 2.00	SPT(C) N=14 B			2,3/4,4,3,3					
3.00-3.10 3.00	SPT(C) 50*/100 50/0 B			25,25/50	18.34 18.24	3.00 3.10	Very stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Refusal due to boulder/rock.		
							Complete at 3.10m		

Remarks
No groundwater encountered in Borehole.
Refusal at 3.1m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 3.10m to 3.10m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No. 8115-10-18.BH18

Ground Investigations Ireland Ltd
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Site	Borehole Number
IPS Integrated Project	BH19

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter 200mm to 4.3m	Ground Level (mOD) 20.60	Client GDCL Consulting	Job Number 8115-10-18
	Location (dGPS) 704391.9 E 803182.5 N	Dates 10/12/2018	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					20.50	0.10	TOPSOIL: Brown slightly sandy slightly gravelly Clay with rootlets.		
0.50	B						Firm brown slightly sandy slightly gravelly CLAY with rare angular cobbles.		
1.00-1.45 1.00	SPT(C) N=9 B			1,1/1,2,4,2		(2.40)			
1.50	U1 100%								
2.00-2.45 2.00	SPT(C) N=12 B			2,3/2,3,3,4					
					18.10	2.50	Stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles.		
3.00-3.45 3.00	SPT(C) N=17 B			2,2/3,4,5,5		(1.50)			
3.50	U1 85%								
4.00-4.30	SPT(C) 50/150			3,4/5,45	16.60	4.00	Very stiff grey brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders.		
						(0.30)			
					16.30	4.30	Refusal due to boulder/rock.		
							Complete at 4.30m		

Remarks
No groundwater encountered in Borehole.
Refusal at 4.3m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 4.30m to 4.30m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No.
8115-10-18.BH19

Ground Investigations Ireland Ltd
www.gii.ie

Site	Borehole Number
IPS Integrated Project	BH20

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter 200mm to 1.1m	Ground Level (mOD) 18.85	Client GDCL Consulting	Job Number 8115-10-18
	Location (dGPS) 704435.3 E 803078.1 N	Dates 07/12/2018	Engineer	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	TOPSOIL: Light brown slightly sandy slightly gravelly Clay with rootlets.		
					18.55	0.30			
0.50	B					(0.80)	Firm reddish brown slightly sandy slightly gravelly CLAY with occasional subrounded cobbles.		
1.00-1.10 1.00	SPT(C) 25*/50 50/50 B			25/50	17.75	1.10	Refusal due to boulder/rock. Complete at 1.10m		

Remarks
No groundwater encountered in Borehole.
Refusal at 1.1m BGL due to rock/boulder.
Borehole backfilled upon completion.
Chiselling from 1.10m to 1.10m for 1.0 hour.

Scale (approx)	Logged By
1:50	CCostigan

Figure No.
8115-10-18.BH20

Ground Investigations Ireland Ltd
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Site IPS Intergrated Project			**Borehole Number** BH03 + RC01
Machine : T44 **Flush :** **Core Dia:** mm **Method :** Rotary Cored	**Casing Diameter** HQ to 8.20m	**Ground Level (mOD)** 24.65	**Client** GDCL Consulting
	Location (dGPS) 704218.423 E 803378.802 N	**Dates** 07/01/2019	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						24.60	0.05	TOPSOIL		
								Firm to stiff grey brown slightly sandy slightly gravelly CLAY with occasional sub angular cobbles		
0.50					B					
1.00-1.45 1.00					1,1/2,4,2,2 SPT(C) N=10 B					
1.50					U1					
2.00-2.45 2.00					1,2/2,3,3,2 SPT(C) N=10 B		(3.95)			
2.50					U1					
3.00-3.45 3.00					2,3/3,4,4,3 SPT(C) N=14 B					
4.00 4.00-4.23 4.00	38	8	0		3,3/50 SPT(C) 50/75 B	20.65	4.00	Driller notes: Grey Silt. Recovery consists of soft grey sandy gravelly silty CLAY. Gravel fine to coarse sub angular to sub rounded.		
							(1.00)			
5.00				NI		19.65	5.00	WEATHERED ROCK: Weak to medium strong thinly bedded fine grained SANDSTONE distinctly weathered. (5.00m - 5.45m) Non-Intact		
5.20 5.40							(0.45)			
				6		19.20	5.45	Strong to very strong grey thinly bedded fine grained SANDSTONE partially weathered with some calcite veins penetrating (5.40m - 6.00m)This sequence contains one fracture set. F1: Close to medium spacing, dipping 50 to 70°, undulating, stepped, planar, smooth to rough, tight to open with some brown staining (6.00m - 6.30m) Non-Intact (6.30m - 8.20m)This sequence contains one fracture set. F1: Close to medium spacing, dipping 50 to 70°, undulating, stepped, plannar, smooth to rough, tight to open with some brown staining		
6.00	100	83	26							
6.30				NI						
6.70				6			(2.75)			
7.20	100	100	41							
				5						
8.20						16.45	8.20	Complete at 8.20m		

Remarks
RC01 terminated at 8.20m BGL
RC01 completed in BH03
Chiselling from 4.30m to 4.30m for 1 hour.

Scale (approx)	Logged By
1:50	RO'T

Figure No. 8115-10-18.RC01

Ground Investigations Ireland Ltd
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Site IPS Intergrated Project			**Borehole Number** RC02
Machine : T44 **Flush :** **Core Dia:** mm **Method :** Rotary Cored	**Casing Diameter** HQ to 7.90m **Location** (dGPS) 704258.655 E 803328.005 N	**Ground Level (mOD)** 24.35 **Dates** 05/01/2019	**Client** GDCL Consulting **Engineer**	**Job Number** 8115-10-18 **Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	43	0	0				(1.60)	Driller notes: Clay. Recovery consists of soft to firm brown slightly sandy gravelly CLAY. Gravel fine to coarse sub angular to sub rounded.		
1.60	100	27	9	9		22.75	1.60	Strong to very strong dark grey thinly bedded fine grained SANDSTONE partially weathered with some calcite veins penetrating (1.60m - 3.70m) This sequence contains two fracture set. F1: Closely spaced dipping 30 to 50°, planar, smooth to rough, tight to open with some brown staining and clay infill. F2: Closely spaced dipping 70 to 90°, planar, undulating, smooth to rough, tight to open with some brown sandy clay infill with brown staining.		
2.20	93	93	6	7						
3.70	100	73	47	11			(6.30)	(3.70m - 6.70m) This sequence contains two fracture set. F1: Close to medium spacing, dipping 30 to 50°, planar, smooth to rough, tight to open with some brown staining and clay infill. F2: Closely spaced dipping 70 to 90°, planar, undulating, smooth to rough, tight to open with some brown sandy clay infill with brown staining.		
5.20	100	73	43							
6.70	100	55	0	NI				(6.70m - 7.90m) Non-Intact		
7.90						16.45	7.90	Complete at 7.90m		

Remarks
RC02 terminated at 7.90m BGL
Installation: 0.00 - 3.00m - Bentonite seal with plain pipe, 3.00 - 7.50m Gravel filter with slotted pipe - Raised cover

Scale (approx)	Logged By
1:50	RO'T

Figure No. 8115-10-18.RC02

Ground Investigations Ireland Ltd
www.gii.ie

Site IPS Intergrated Project			**Borehole Number** RC03
Machine : T44 **Flush :** **Core Dia:** mm **Method :** Rotary Cored	**Casing Diameter** HQ to 9.70m	**Ground Level (mOD)** 19.23	**Client** GDCL Consulting
	Location (dGPS) 704545.569 E 803099.056 N	**Dates** 03/01/2019	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
	38	25	0				(1.60)	Driller notes: Brown Clay. Recovery consists of soft brown slightly sandy gravelly CLAY. Gravel fine to coarse sub angular to sub rounded.		
1.60						17.63	1.60	WEATHERED ROCK: Recovery consists of weak to medium strong thinly bedded fine grained SANDSTONE distinctly weathered 1.60 - 3.30m BBL - Core Non Intact		
2.00	46	30	0	NI			(1.70)			
3.30				7		15.93	3.30	Strong to very strong grey thinly bedded fine grained SANDSTONE partially weathered with some calcite veins penetrating This sequence contains 2 fracture sets. F1: Closely spaced dipping 10 to 30°, undulating, smooth to rough, tight to open with some brown staining, no infill. F2: Closely spacred dipping 70 to 90°. undulating, planar, smooth to rough, tight to open with some brown staining and clay infill 3.70 - 4.10m BGL - Core Non Intact		
3.70				NI						
4.10	86	67	30	8			(1.90)			
5.20	93	40	25	NI		14.03	5.20	Weak to strong brown grey thinly bedded fine grained SANDSTONE distinctly to partially weathered with some calcite veins penetrating. 5.20 - 7.10m BGL - Core Non Intact with brown surface staining with grey sandy gravelly Clay infill		
6.70							(1.90)			
7.10	100	85	46	11		12.13	7.10	Strong to very strong grey thinly bedded fine grained SANDSTONE distinctly to partially weathered with calcite veins penetrating. This sequence contains 2 fracture sets. F1: Close to medium spacing dipping 20 to 50°, undulating, planar, smooth to rough, tight to open with some brown staining, no infill. F2: Very closely to closely spaced sipping 70 to 90° plannar, undulating, smooth to rough, tight to open with some brown staining and clay infill. 8.00 - 8.50m BGL - Core Non Intact		
8.00										
8.20				NI			(2.60)			
8.50	100	93	27	3				8.50 - 9.00m BGL - This sequence contains 2 fracture sets. F1: Close to medium spacing dipping 20 to 50°, undulating, planar, smooth to rough, tight to open with some brown staining, no infill. F2: Very closely to closely spaced sipping 70 to 90° planar, undulating, smooth to rough, tight to open with some brown staining and clay infill. 9.00 - 9.70m BGL - Core Non Intact		
9.00				NI						
9.70						9.53	9.70	Complete at 9.70m		

Remarks
RC03 terminated at 9.70m BGL
Installation: 0.00 - 1.50m - Bentonite seal with plain pipe, 1.50 - 6.50m Gravel filter with slotted pipe - Raised cover

Scale (approx)	Logged By
1:50	RO'T

Figure No. 8115-10-18.RC03

Ground Investigations Ireland Ltd
www.gii.ie

Site IPS Intergrated Project			**Borehole Number** RC04
Machine : T44 **Flush :** **Core Dia:** mm **Method :** Rotary Cored	**Casing Diameter** HQ to 9.70m	**Ground Level (mOD)** 20.60	**Client** GDCL Consulting
	Location (dGPS) 704594.608 E 803212.682 N	**Dates** 03/01/2019-04/01/2019	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
	13	0	0					Driller notes brown gravelly Clay. Recovery consists of brown slightly sandy gravelly CLAY. Gravel fine to coarse sub angular to sub rounded		
2.20	9	0	0				(4.50)			
3.70	57	47	29							
4.50				5		16.10	4.50	Strong to very strong grey thinly bedded dark grey fine grained SANDSTONE with interbedded mudstone, distinctly to partially weathered (4.50m - 5.80m)This sequence has two fracture sets. F1: Very closely to closely spaced, dipping 20 to 50°, undulating, stepped, planar, smooth to rough, tight to open with some brown staining and clay infill. F2: Very closely to closely spaced, dipping 70 to 90° undulating, stepped, smooth to rough, tight to open with brown staining, no infill		
5.20										
5.80	87	53	53	NI			(3.70)	(5.80 - 6.90) - Core Non Intact		
6.70										
6.90	100	87	18	6				(6.90m - 8.20m)This sequence has two fracture sets. F1: Very closely to closely spaced dipping 10 to 30°, undulating, planar, smooth to rough, tight to open with some grey gravelly clay infill. F2: Very closely to closely spaced, dipping 70 to 90°. undulating, planar, smooth to rough, tight to open		
8.20	100	93	20	8		12.40	8.20	Strong to very strong grey thinly bedded fine grained SANDSTONE with inter bedded siltstone, partially weathered. (8.20m - 9.70m)This sequence has two fracture sets. F1: Very closely to closely spaced dipping 10 to 30°, undulating, planar, smooth to rough, tight to open with some grey gravelly clay infill. F2: Very closely to closely spaced, dipping 70 to 90°. undulating, planar, smooth to rough, tight to open		
							(1.50)			
9.70						10.90	9.70	Complete at 9.70m		

Remarks
RC04 terminated at 9.70m BGL

Scale (approx)	Logged By
1:50	RO'T

Figure No. 8115-10-18.RC04

Ground Investigations Ireland Ltd
www.gii.ie

Site IPS Intergrated Project			**Borehole Number** RC05
Machine : T44 **Flush :** **Core Dia:** mm **Method :** Rotary Cored	**Casing Diameter** HQ to 9.70m	**Ground Level (mOD)** 18.75	**Client** GDCL Consulting
	Location (dGPS) 704558.703 E 803340.882 N	**Dates** 04/01/2019	**Engineer**
			Job Number 8115-10-18
			Sheet 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
	45	23	0					Driller notes: Brown Clay. Recovery consists of soft brown slightly sandy gravelly CLAY. Gravel fine to coarse sub angular to sub rounded		
1.20						17.55	(1.20) 1.20			
				NI			(1.00)	WEATHERED ROCK: Recovery consists of weak thinly bedded brown fine grained SANDSTONE distinctly weathered		
2.20	83	33	6	NI		16.55	2.20	Weak to medium strong thinly bedded brown SANDSTONE distinctly yo partially weathered. Core non intact with some brown surface staining and clay infill		
3.70							(2.20)			
4.40	100	86	38	13		14.35	4.40	Strong to very strong thinly bedded dark grey fine grained SANDSTONE partially weathered with some calcite veins penetrating. This sequence contains two fracture sets. F1: Closely to widely spaced, dipping 40 to 50s, planar, undulating, smooth to rough, tight to open with some clay infill. F2: Very closely to closely spaced dipping 70 to 90° planar, smooth to rough, tight to open with some brown staining and clay infill		
5.10										
5.40	100	100	48							
6.50	100	100	68	7			(5.30)			
8.25	100	100	49							
9.70						9.05	9.70	Complete at 9.70m		

Remarks
RC05 terminated at 9.70m BGL
Installation: 0.00 - 4.0m - Bentonite seal with plain pipe, 4.00 - 9.70m Gravel filter with slotted pipe - Raised cover

Scale (approx)	Logged By
1:50	RO'T

Figure No. 8115-10-18.RC05

Rotary Core Photographs – IPS Dundalk

APPENDIX 7 – Laboratory Testing

National Materials Testing Laboratory Ltd.

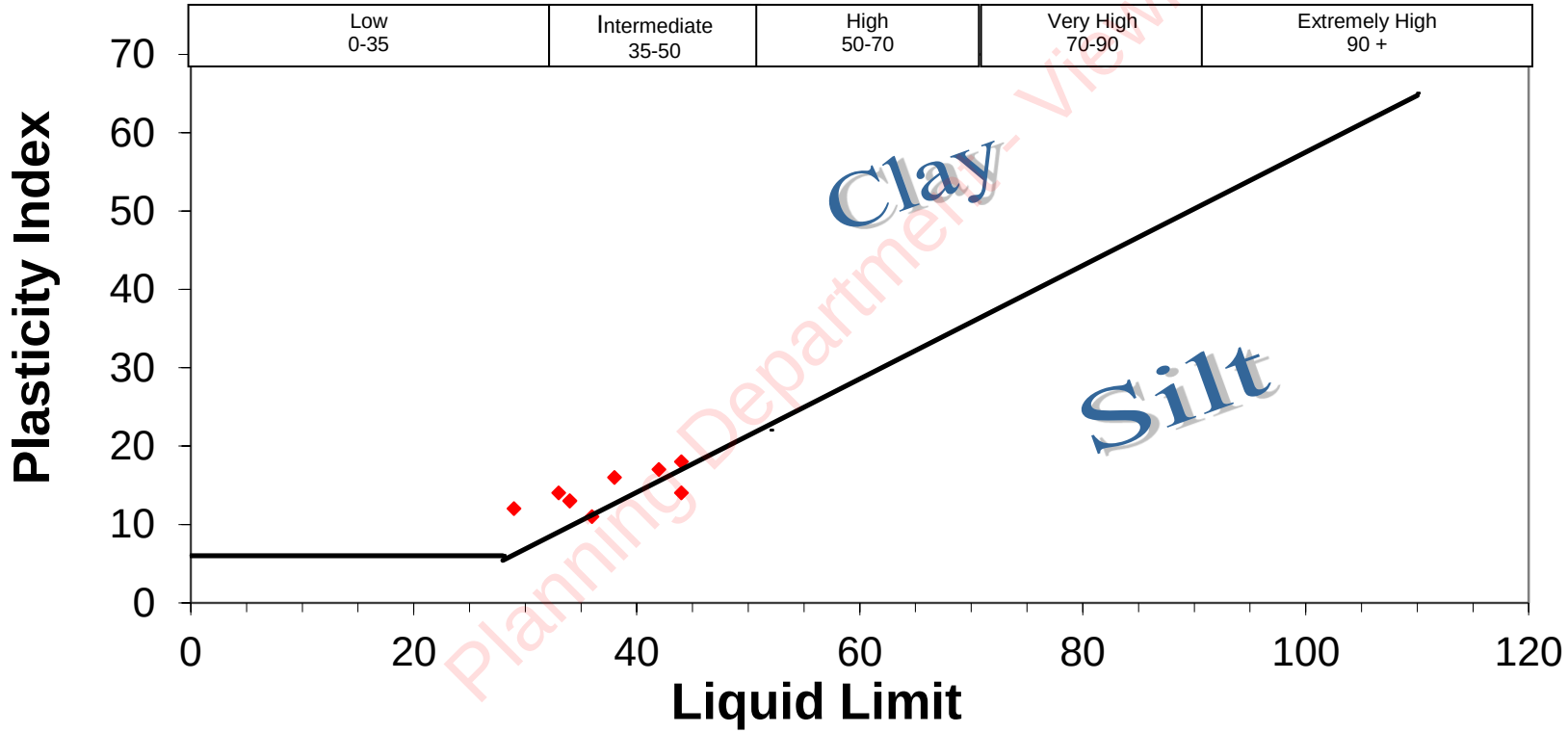
SUMMARY OF TEST RESULTS

				Particle			Index Properties		Bulk	Cell	Undrained Triaxial Tests		Lab	
BH/TP	Depth	sample	Moisture	Density	<425um	LL	PL	PI	Density	Presssure	Compressive	Strain at	Vane	Remarks
No	m	No.	%	Mg/m3	%	%	%	%	Mg/m3	kPa	Stress kPa	Failure %	kPa	
TP01	1.00	B	15.3		18.9	44	26	18						
TP03	1.00	B	16.6		42.1	36	25	11						
TP08	1.20	B	15.7		48.4	29	17	12						
TP15	1.00	B	17.2		21.9	42	25	17						
TP17	3.00	B	16.6		28.6	33	19	14						
TP19	1.00	B	12.9		32.5	34	21	13						
TP21	1.00	B	18.4		39.9	38	22	16						
TP23	0.80	B	23.2		41.6	44	30	14						
TP28	1.00	B	13.3		36.6	34	21	13						

NMTL	Notes :	Job ref No.	NMTL 2753	Table
	1. All BS tests carried out using preferred (definitive) method unless otherwise stated.	Location	IPS Dundalk	

NMTL LTD
Unit 18c, Tullow Industrial Estate
Tullow
County Carlow
Tel: 00353 59 9180822
Mob: 00353 872575508
billachana@eircom.net

Contract:	**IPS Dundalk**
Client:	**Ground Investigations Ireland Ltd**
Engineer:	**N/A**
Date:	**11/12/2018**
Tested By:	**Tzr** **Checked:** **Bc**
Job ref No.	**NMTL 2753**

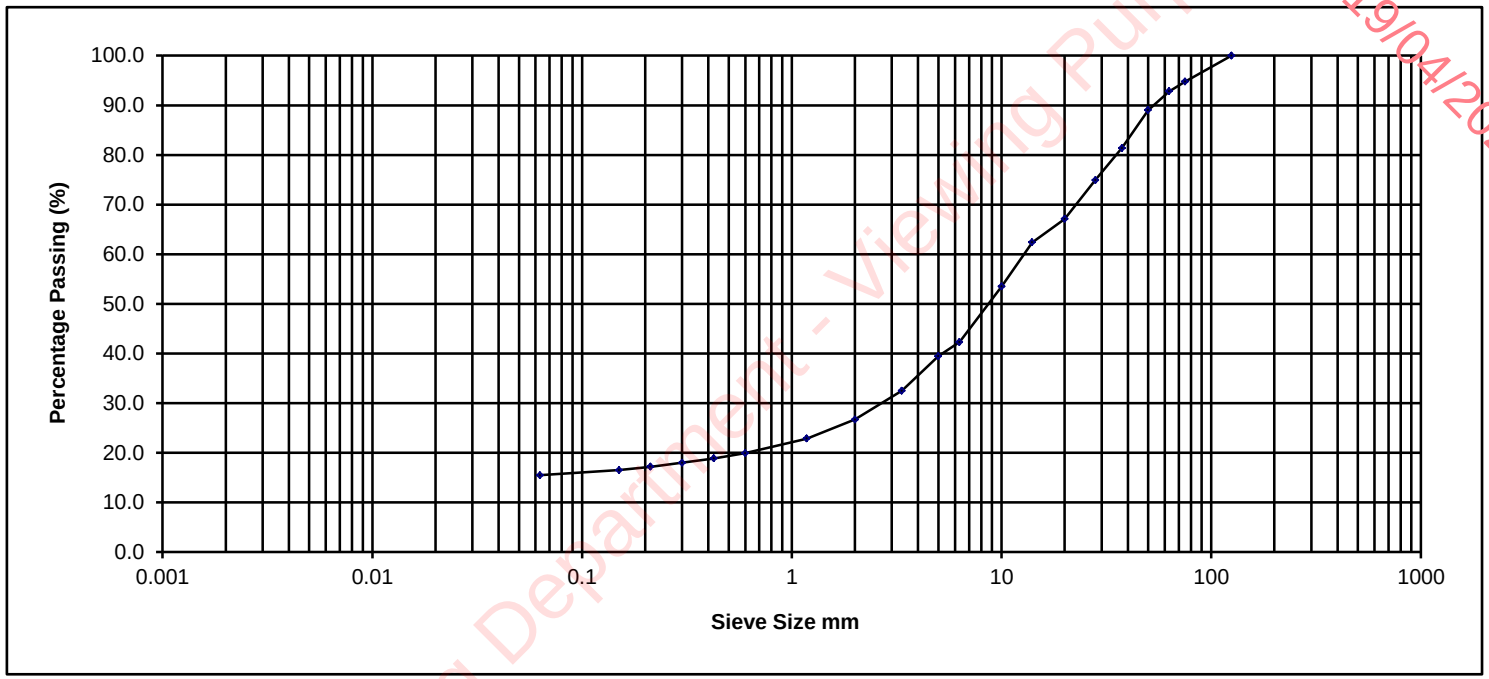


NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	94.7
63.000	92.8
50.000	89.0
37.500	81.4
28.000	74.9
20.000	67.1
14.000	62.4
10.000	53.5
6.300	42.3
5.000	39.5
3.350	32.5
2.000	26.7
1.180	22.9
0.600	19.9
0.425	18.9
0.300	18.0
0.212	17.2
0.150	16.5
0.063	15.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		15.5			11.2			66.1		7.2	0.0

Sample Description: Brown slightly sandy clayey silty fine to coarse GRAVEL with some cobbles.

Project: IPS Dundalk

Operator	Checked	Approved	Date sample tested
Tzr	Nc	Bc	04/12/2018

Project No.	NMTL 2753
BH/TP No.	TP01
Sample No.	B
Depth	1.00m

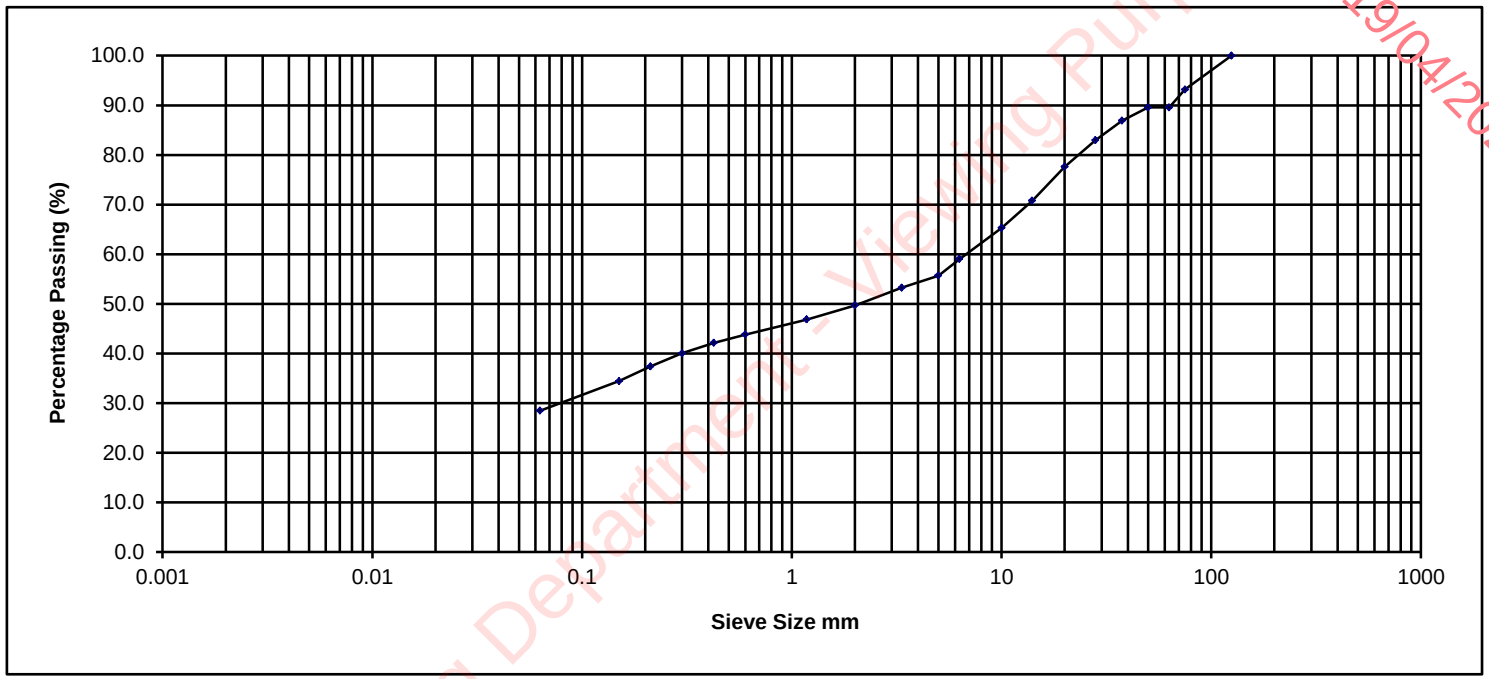
NM TL Ltd

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	93.2
63.000	89.6
50.000	89.6
37.500	86.9
28.000	83.0
20.000	77.6
14.000	70.8
10.000	65.3
6.300	59.0
5.000	55.7
3.350	53.3
2.000	49.7
1.180	46.9
0.600	43.8
0.425	42.1
0.300	40.1
0.212	37.4
0.150	34.4
0.063	28.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		28.5			21.2			39.9		10.4	0.0

Sample Description: Brown slightly sandy gravelly silty CLAY with some cobbles.

Project: IPS Dundalk

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	04/12/2018

Project No.	NMTL 2753
BH/TP No.	TP04
Sample No.	B
Depth	1.00m

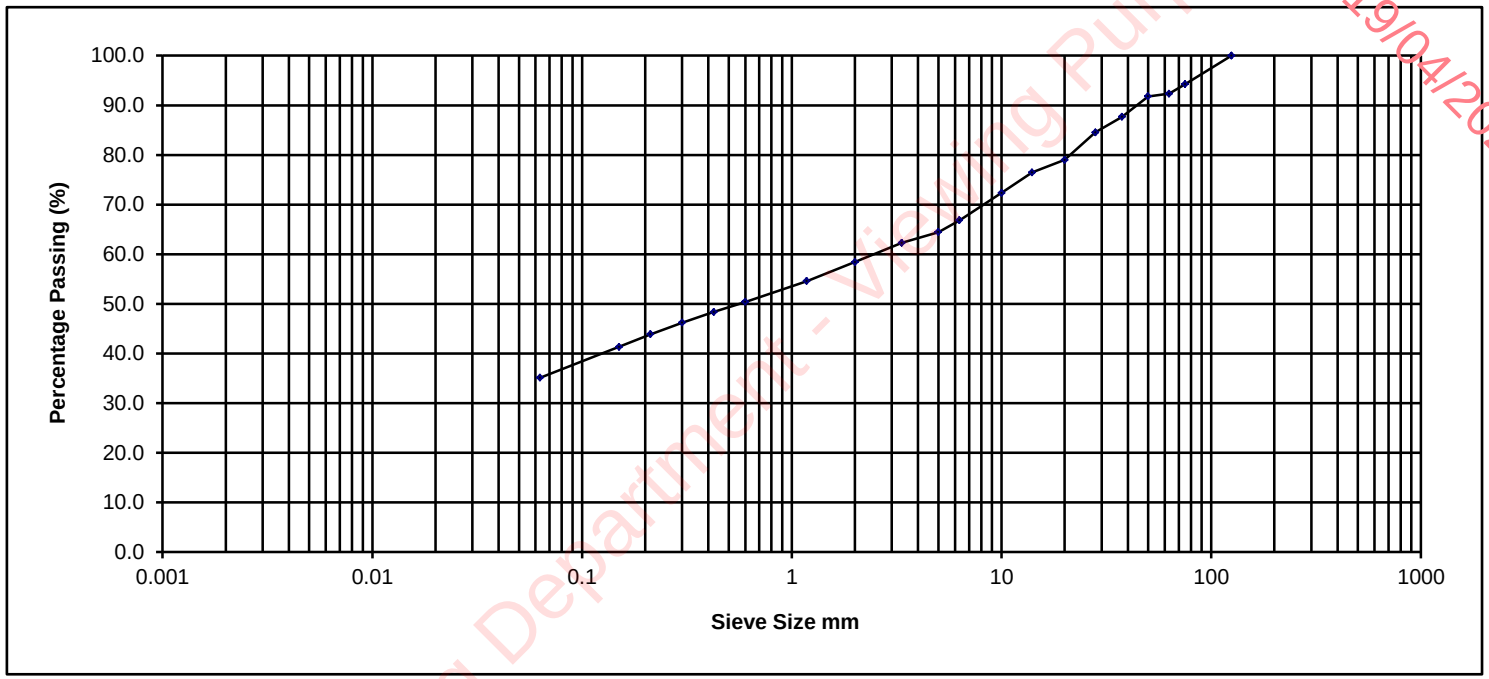
NM TL Ltd

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	94.2
63.000	92.3
50.000	91.8
37.500	87.7
28.000	84.5
20.000	79.0
14.000	76.5
10.000	72.3
6.300	66.8
5.000	64.5
3.350	62.3
2.000	58.4
1.180	54.6
0.600	50.4
0.425	48.4
0.300	46.2
0.212	43.9
0.150	41.3
0.063	35.1



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		35.1			23.3			33.9		7.7	0.0

Sample Description: Brown slightly sandy gravelly slightly silty CLAY with some cobbles.

Project: IPS Dundalk

Operator	Checked	Approved	Date sample tested	
Tzr	Nc	Bc	04/12/2018	

Project No.	NMTL 2753
BH/TP No.	TP08
Sample No.	B
Depth	1.20m

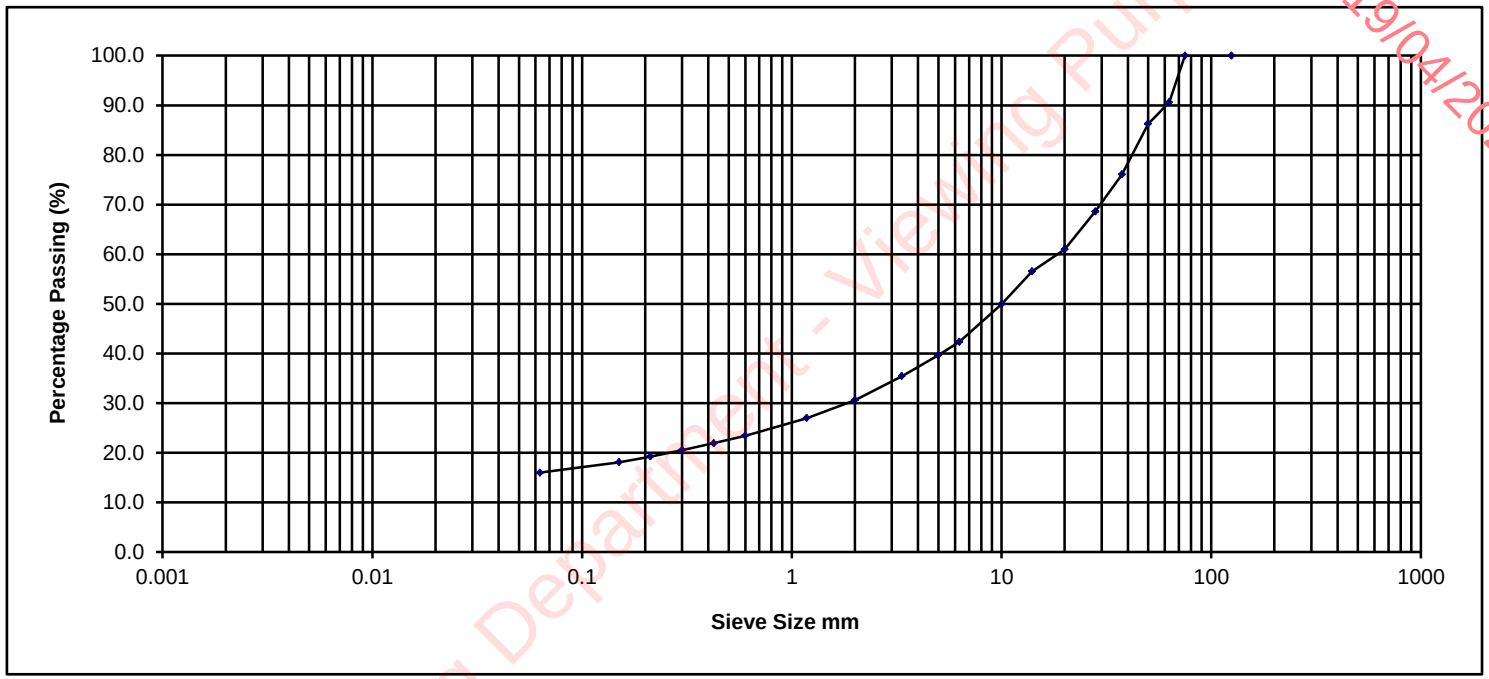
NM TL Ltd

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	90.6
50.000	86.3
37.500	76.1
28.000	68.6
20.000	61.0
14.000	56.6
10.000	50.0
6.300	42.4
5.000	39.7
3.350	35.4
2.000	30.6
1.180	27.0
0.600	23.4
0.425	21.9
0.300	20.5
0.212	19.2
0.150	18.1
0.063	16.0



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		16.0			14.6			60.0		9.4	0.0

Sample Description: Brown sandy silty clay with fine to coarse GRAVEL with some cobbles.

Project: IPS Dundalk

Operator	Checked	Approved	Date sample tested
Tzr	Nc	Bc	04/12/2018

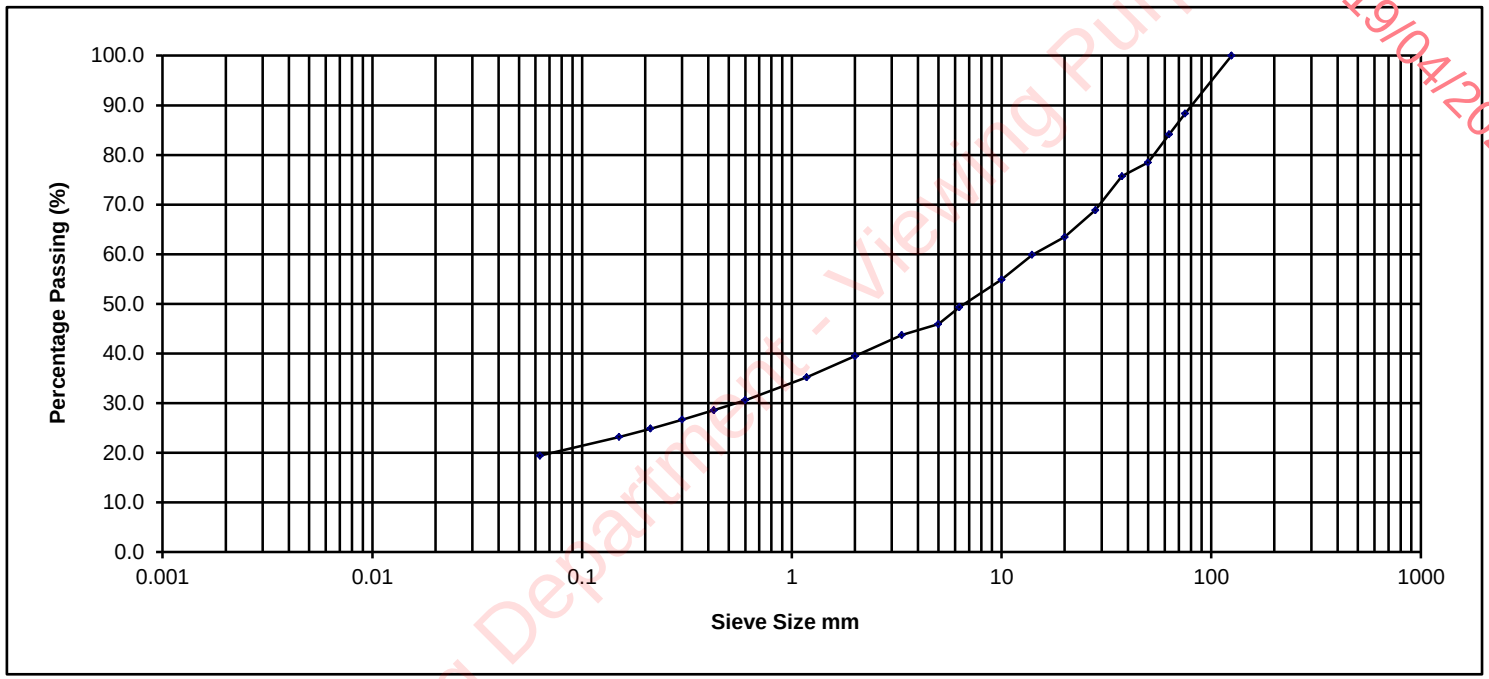
Project No.	NMTL 2753
BH/TP No.	TP015
Sample No.	B
Depth	1.00m

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	88.3
63.000	84.1
50.000	78.5
37.500	75.7
28.000	68.9
20.000	63.5
14.000	59.9
10.000	54.9
6.300	49.3
5.000	45.9
3.350	43.7
2.000	39.5
1.180	35.2
0.600	30.6
0.425	28.6
0.300	26.7
0.212	24.9
0.150	23.2
0.063	19.4



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		19.4			20.1			44.7		15.9	0.0

Sample Description: Brown slightly sandy gravelly slightly silty CLAY with some cobbles.

Project: IPS Dundalk

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	04/12/2018

Project No.	NMTL 2753
BH/TP No.	TP017
Sample No.	B
Depth	3.00m

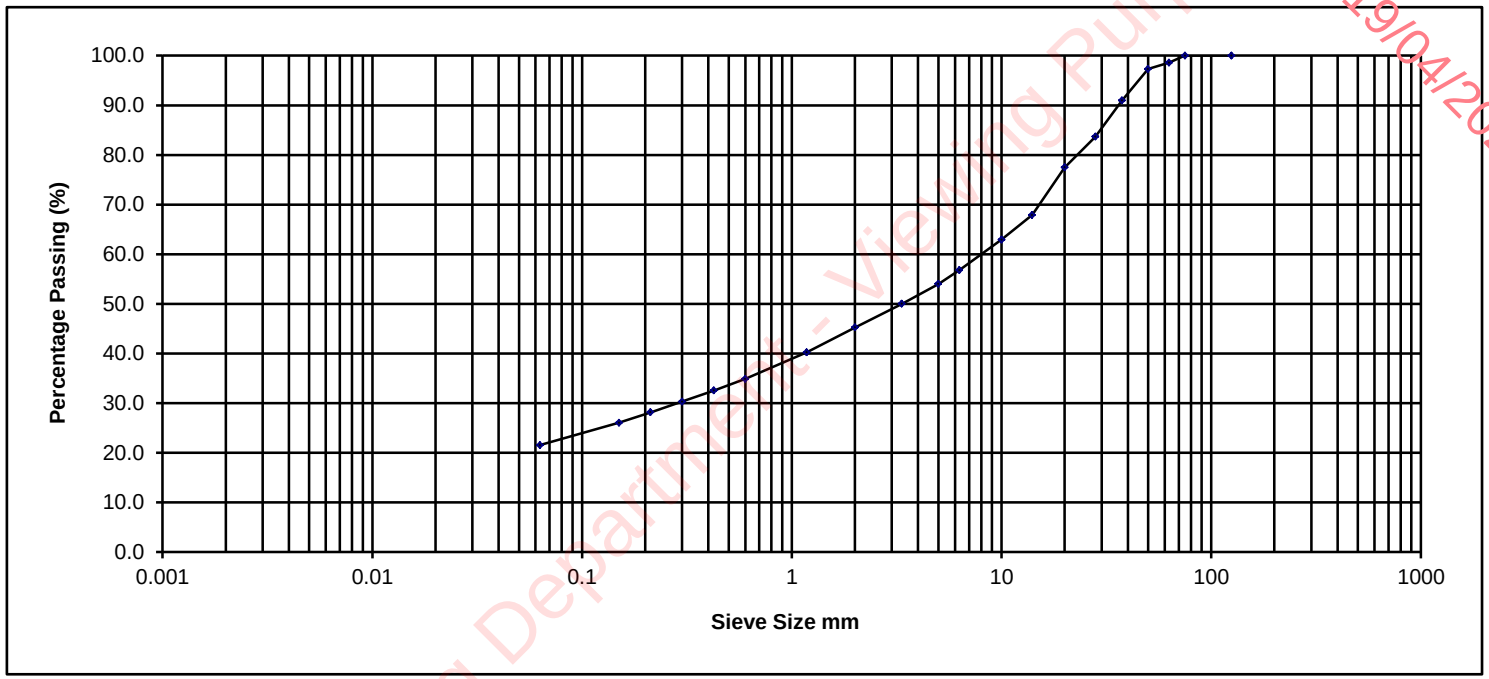
NM TL Ltd

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	98.6
50.000	97.3
37.500	91.0
28.000	83.7
20.000	77.5
14.000	67.9
10.000	62.9
6.300	56.8
5.000	54.0
3.350	50.0
2.000	45.3
1.180	40.2
0.600	34.9
0.425	32.5
0.300	30.3
0.212	28.2
0.150	26.1
0.063	21.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		21.5			23.7			53.3		1.4	0.0

Sample Description: Brown slightly sandy gravelly slightly silty CLAY with occasional cobbles.

Project: IPS Dundalk

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	04/12/2018

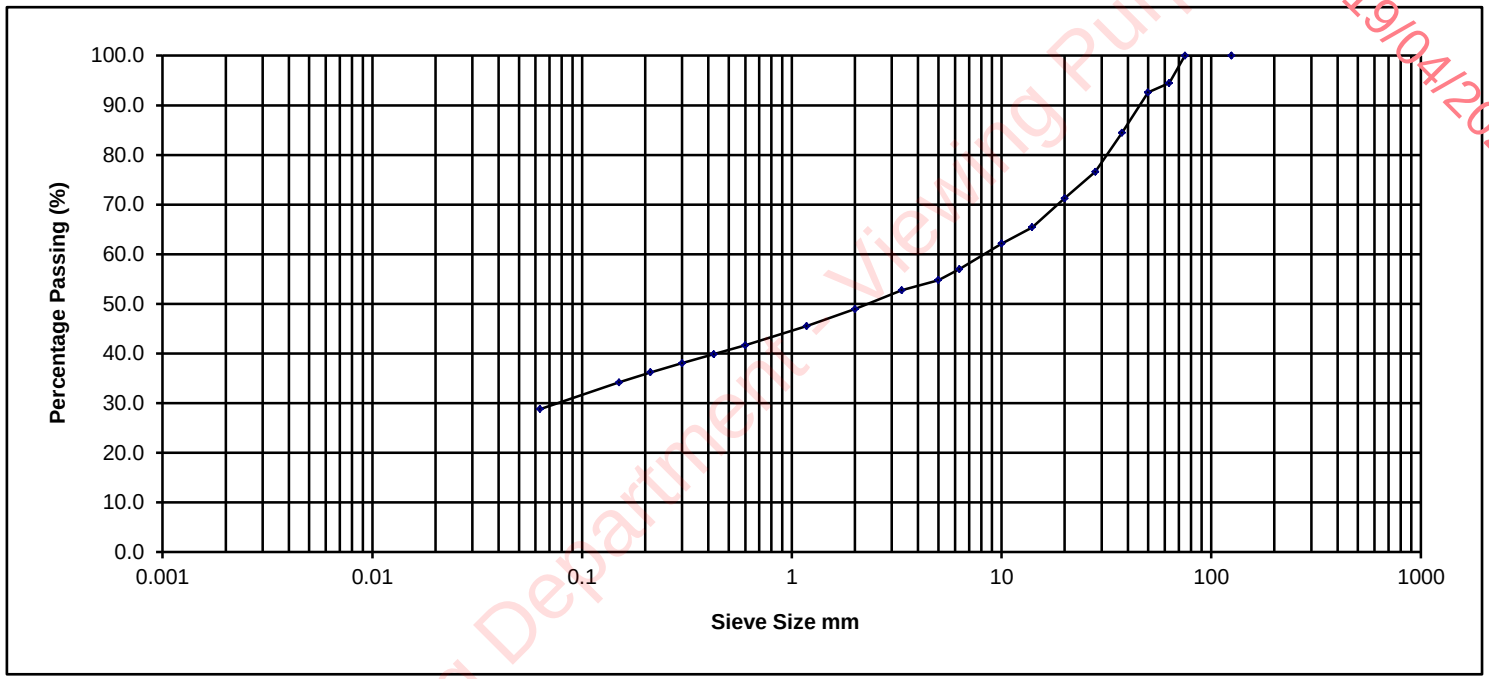
Project No.	NMTL 2753
BH/TP No.	TP019
Sample No.	B
Depth	1.00m

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	94.5
50.000	92.6
37.500	84.4
28.000	76.6
20.000	71.3
14.000	65.4
10.000	62.1
6.300	57.0
5.000	54.8
3.350	52.7
2.000	48.9
1.180	45.5
0.600	41.7
0.425	39.9
0.300	38.1
0.212	36.2
0.150	34.2
0.063	28.8



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		28.8			20.1			45.5		5.5	0.0

Sample Description: Brown slightly sandy gravelly slightly silty CLAY with some cobbles.

Project: IPS Dundalk

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	04/12/2018

Project No.	NMTL 2753
BH/TP No.	TP021
Sample No.	B
Depth	1.00m

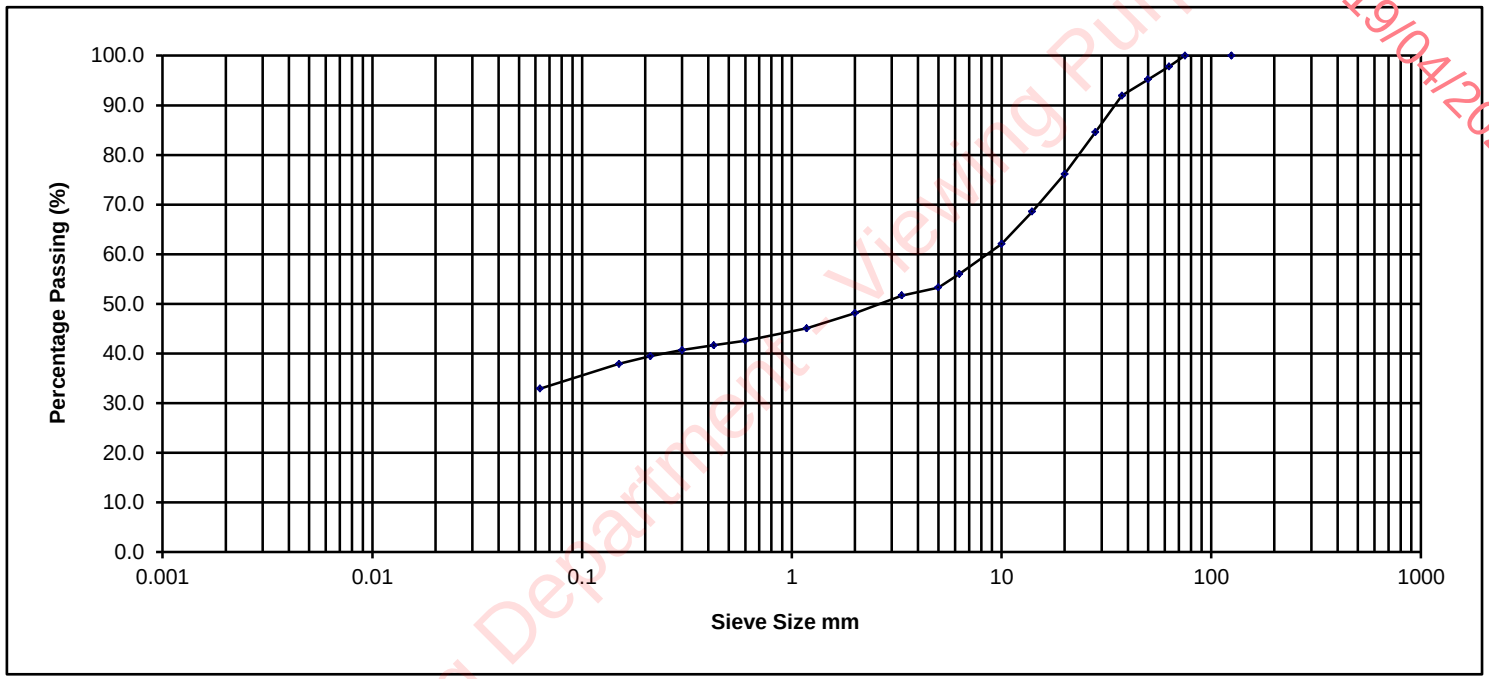
NM TL Ltd

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	97.8
50.000	95.2
37.500	92.0
28.000	84.6
20.000	76.2
14.000	68.6
10.000	62.1
6.300	56.0
5.000	53.3
3.350	51.7
2.000	48.1
1.180	45.1
0.600	42.6
0.425	41.6
0.300	40.7
0.212	39.5
0.150	37.9
0.063	32.9



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		32.9			15.2			49.7		2.2	0.0

Sample Description: Brown slightly sandy gravelly clayey SILT, with occasional cobbles.

Project: IPS Dundalk

Operator	Checked	Approved	Date sample tested
Tzr	Nc	Bc	04/12/2018

Project No.	NMTL 2753
BH/TP No.	TP023
Sample No.	B
Depth	0.80m

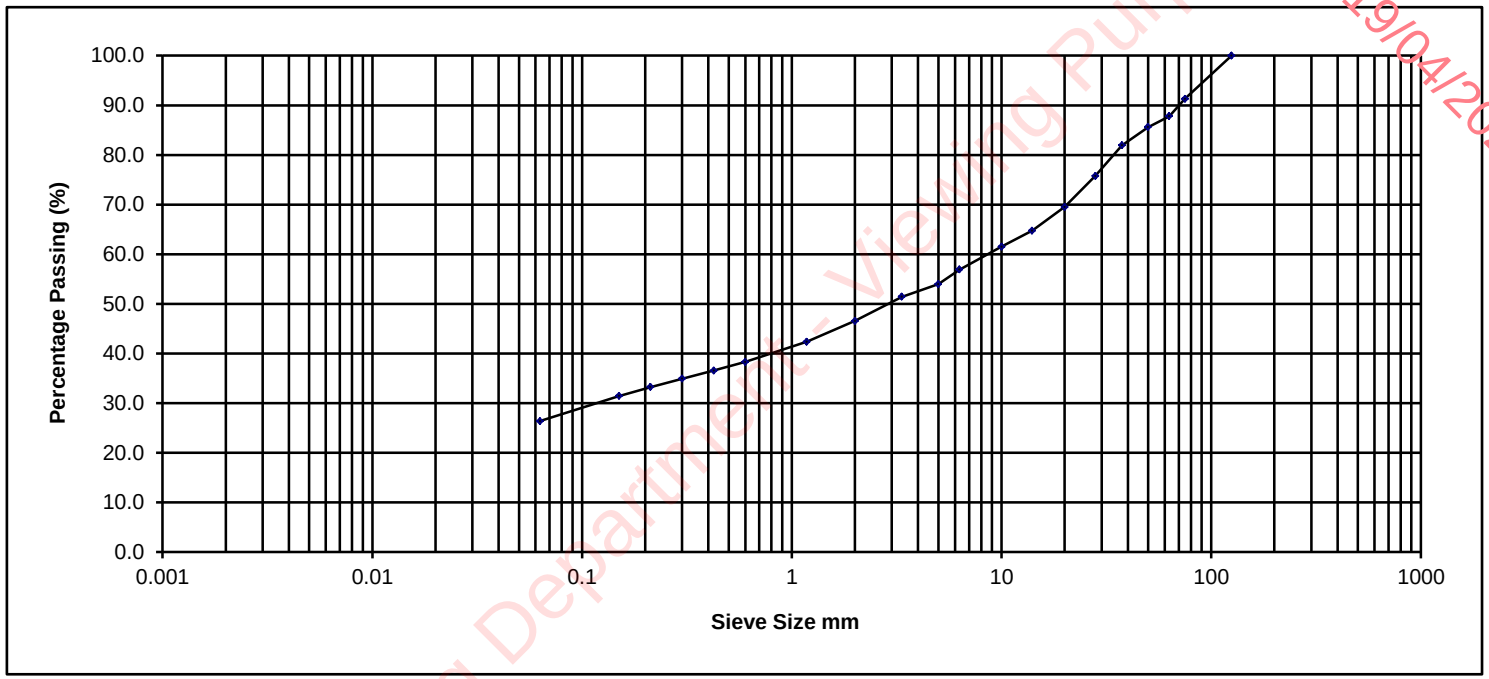
NM TL Ltd

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	91.3
63.000	87.8
50.000	85.6
37.500	81.9
28.000	75.8
20.000	69.5
14.000	64.8
10.000	61.5
6.300	56.9
5.000	54.0
3.350	51.4
2.000	46.6
1.180	42.4
0.600	38.3
0.425	36.6
0.300	34.9
0.212	33.2
0.150	31.4
0.063	26.4



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		26.4			20.2			41.2		12.2	0.0

Sample Description: Brown slightly sandy gravelly silty CLAY with some cobbles.

Project: IPS Dundalk

Operator	Checked	Approved	Date sample tested
Tzr	Nc	Bc	04/12/2018

Project No.	NMTL 2753
BH/TP No.	TP028
Sample No.	B
Depth	1.00m

NM TL Ltd

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description: Brown slightly sandy clayey silty fine to coarse GRAVEL with some cobbles.

Date: 5-Dec-18

Test Method: BS 1377: Part 4 : 1990 :7.4

Force Measuring Device: VJT-08211 — Test 1

Preperatic: Remoulded with 2.5 kg rammer at natural moisture content

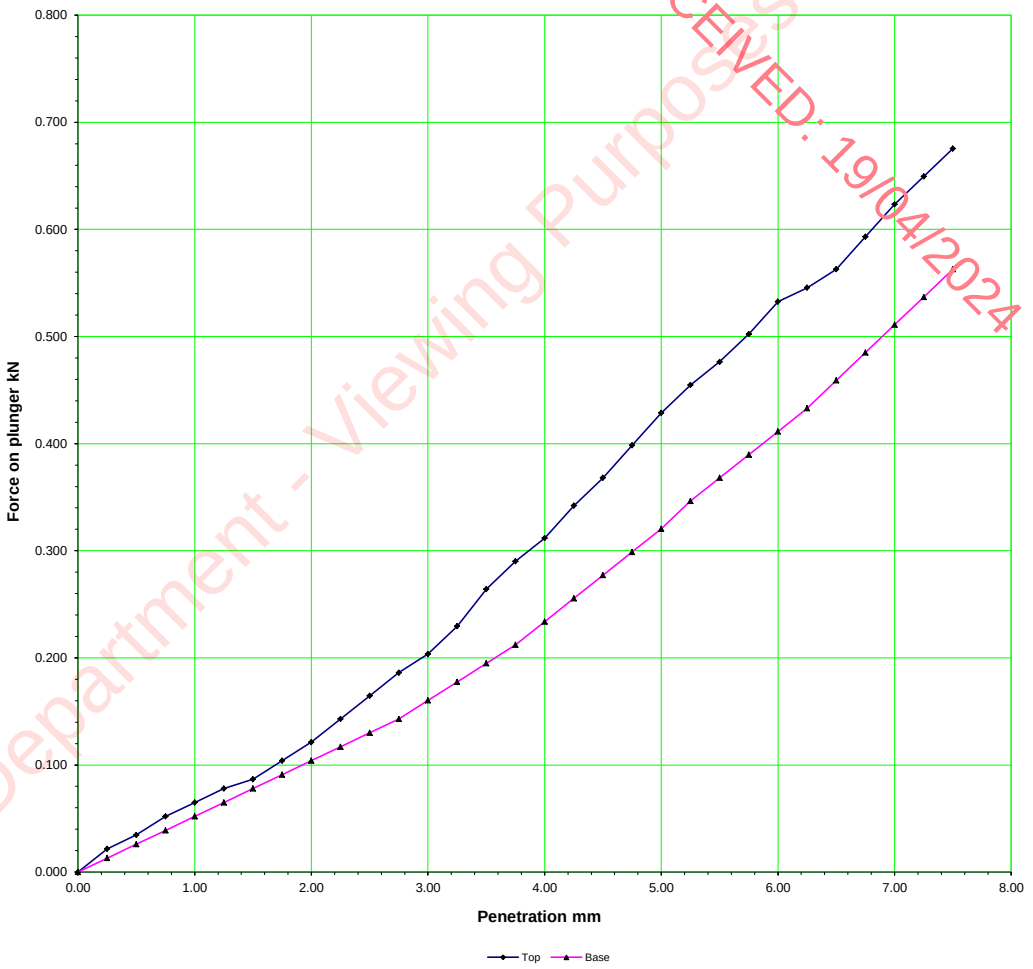
Surcharge: 10 kPa — Mean Calibration: 4.33 N/Div

Penetration of plunger mm — Force Gauge reading divisions — Force on plunger kN — Mean Calibration: 4.33 N/Div

California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	5.0	3.0	0.022	0.013		
0.50	8.0	6.0	0.035	0.026		
0.75	12.0	9.0	0.052	0.039		
1.00	15.0	12.0	0.065	0.052		
1.25	18.0	15.0	0.078	0.065		
1.50	20.0	18.0	0.087	0.078		
1.75	24.0	21.0	0.104	0.091		
2.00	28.0	24.0	0.121	0.104		
2.25	33.0	27.0	0.143	0.117		
2.50	**38.0**	**30.0**	**0.165**	**0.130**	**1.25**	**0.98**
2.75	43.0	33.0	0.186	0.143		
3.00	47.0	37.0	0.204	0.160		
3.25	53.0	41.0	0.229	0.178		
3.50	61.0	45.0	0.264	0.195		
3.75	67.0	49.0	0.290	0.212		
4.00	72.0	54.0	0.312	0.234		
4.25	79.0	59.0	0.342	0.255		
4.50	85.0	64.0	0.368	0.277		
4.75	92.0	69.0	0.398	0.299		
5.00	**99.0**	**74.0**	**0.429**	**0.320**	**2.14**	**1.60**
5.25	105.0	80.0	0.455	0.346		
5.50	110.0	85.0	0.476	0.368		
5.75	116.0	90.0	0.502	0.390		
6.00	123.0	95.0	0.533	0.411		
6.25	126.0	100.0	0.546	0.433		
6.50	130.0	106.0	0.563	0.459		
6.75	137.0	112.0	0.593	0.485		
7.00	144.0	118.0	0.624	0.511		
7.25	150.0	124.0	0.650	0.537		
7.50	156.0	130.0	0.675	0.563		

Moisture content after test		Top	Middle	Base	Specimen wt g	4955
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1735.56	1698.21	1946.46	Length mm	127.0
Mass of dry soil + container	g	1530.24	1505.92	1723.23		
Weight of container	g	141.41	185.32	189.35		
Mass of moisture	g	205.32	192.29	223.23	Average MC %	14.63
Dry weight	g	1388.83	1320.60	1533.88	Density Mg/m3	2.15
Moisture content	%	14.78	14.56	14.55	Dry Density Mg/m3	1.88



NM TL Ltd

Project: IPS Dundalk

		Date
Operator	Tch	5-Dec-18
Checked	Nc	
Approved	Bc	

Project No.	NMTL2573
BH/TP	TP01
Sample No.	B
Depth	1.00m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description: Yellowish brown slightly sandy SILT/CLAY

Date: 6-Dec-18

Test Method: BS 1377: Part 4 : 1990 :7.4

Force Measuring Device: VJT08211 — Test 1

Preperatic: Remoulded with 2.5 kg rammer at natural moisture content

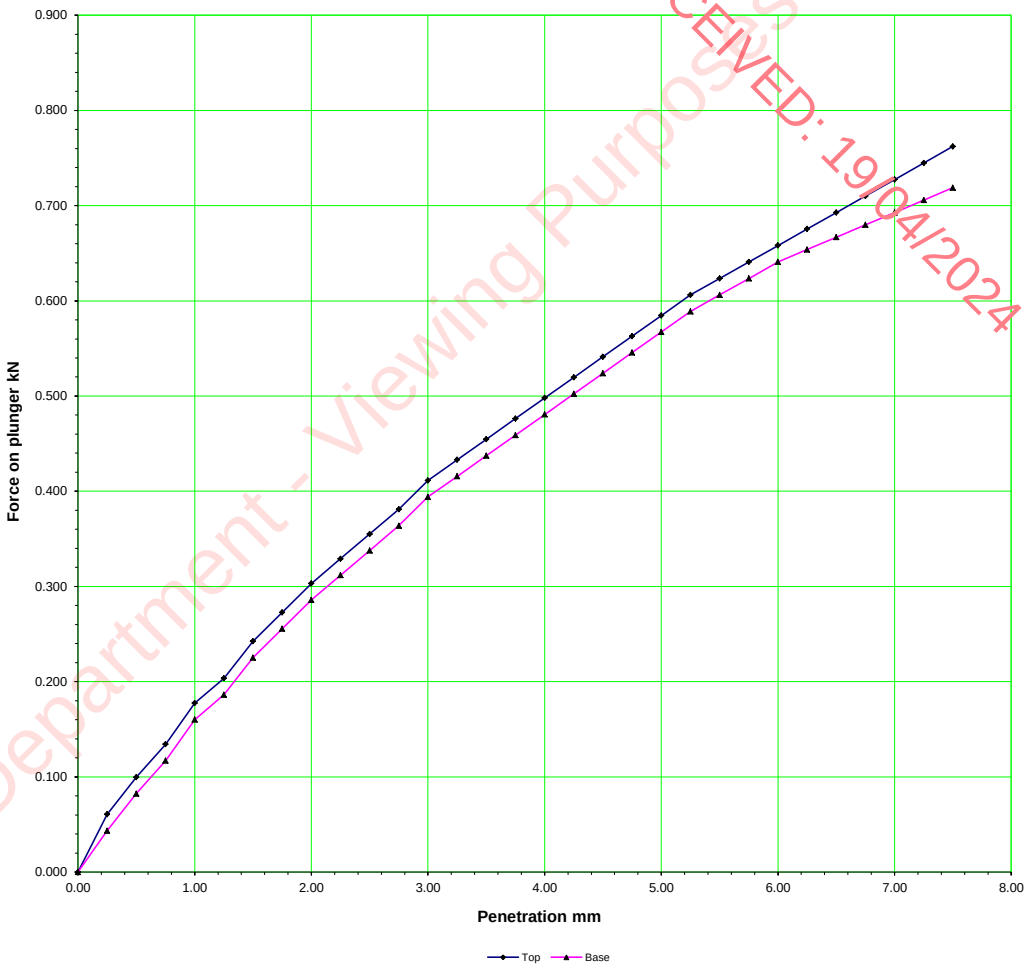
Surcharge: 10 kPa — Mean Calibration: 4.33 N/Div

Penetration of plunger mm: Force Gauge reading divisions — Force on plunger kN: 4.33 N/Div

California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	14.0	10.0	0.061	0.043		
0.50	23.0	19.0	0.100	0.082		
0.75	31.0	27.0	0.134	0.117		
1.00	41.0	37.0	0.178	0.160		
1.25	47.0	43.0	0.204	0.186		
1.50	56.0	52.0	0.242	0.225		
1.75	63.0	59.0	0.273	0.255		
2.00	70.0	66.0	0.303	0.286		
2.25	76.0	72.0	0.329	0.312		
2.50	**82.0**	**78.0**	**0.355**	**0.338**	**2.69**	**2.56**
2.75	88.0	84.0	0.381	0.364		
3.00	95.0	91.0	0.411	0.394		
3.25	100.0	96.0	0.433	0.416		
3.50	105.0	101.0	0.455	0.437		
3.75	110.0	106.0	0.476	0.459		
4.00	115.0	111.0	0.498	0.481		
4.25	120.0	116.0	0.520	0.502		
4.50	125.0	121.0	0.541	0.524		
4.75	130.0	126.0	0.563	0.546		
5.00	**135.0**	**131.0**	**0.585**	**0.567**	**2.92**	**2.84**
5.25	140.0	136.0	0.606	0.589		
5.50	144.0	140.0	0.624	0.606		
5.75	148.0	144.0	0.641	0.624		
6.00	152.0	148.0	0.658	0.641		
6.25	156.0	151.0	0.675	0.654		
6.50	160.0	154.0	0.693	0.667		
6.75	164.0	157.0	0.710	0.680		
7.00	168.0	160.0	0.727	0.693		
7.25	172.0	163.0	0.745	0.706		
7.50	176.0	166.0	0.762	0.719		

Moisture content after test		Top	Middle	Base	Specimen wt g	4530
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1508.79	1527.87	1946.90	Length mm	127.0
Mass of dry soil + container	g	1232.38	1243.84	1593.08		
Weight of container	g	145.01	144.01	188.96		
Mass of moisture	g	276.41	284.03	353.82	Average MC %	25.48
Dry weight	g	1087.37	1099.83	1404.12	Density Mg/m3	1.97
Moisture content	%	25.42	25.82	25.20	Dry Density Mg/m3	1.57



NM TL Ltd

Project: IPS Dundalk

		Date
Operator	Tch	6-Dec-18
Checked	Nc	
Approved	Bc	

Project No.	NMTL2573
BH/TP	TP06
Sample No.	B
Depth	1.00m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description Brown slightly sandy slightly gravelly SILT/CLAY

Date 6-Dec-18

Test Method BS 1377: Part 4 : 1990 :7.4

Force Measuring Device VJT08211 Test 1

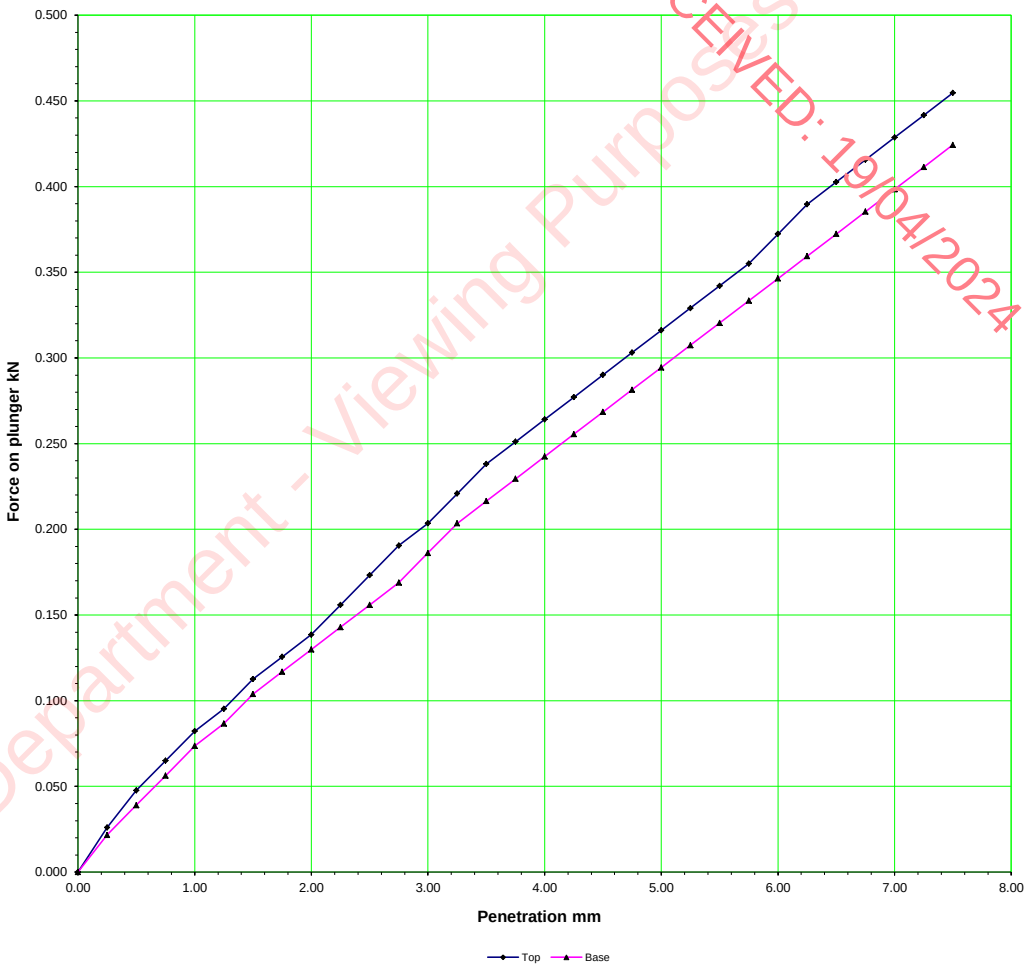
Preperatic Remoulded with 2.5 kg rammer at natural moisture content

Surcharge 10 kPa Mean Calibration 4.33 N/Div

Penetration of plunger mm | Force Gauge reading divisions | Force on plunger kN | California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	6.0	5.0	0.026	0.022		
0.50	11.0	9.0	0.048	0.039		
0.75	15.0	13.0	0.065	0.056		
1.00	19.0	17.0	0.082	0.074		
1.25	22.0	20.0	0.095	0.087		
1.50	26.0	24.0	0.113	0.104		
1.75	29.0	27.0	0.126	0.117		
2.00	32.0	30.0	0.139	0.130		
2.25	36.0	33.0	0.156	0.143		
2.50	**40.0**	**36.0**	**0.173**	**0.156**	**1.31**	**1.18**
2.75	44.0	39.0	0.191	0.169		
3.00	47.0	43.0	0.204	0.186		
3.25	51.0	47.0	0.221	0.204		
3.50	55.0	50.0	0.238	0.217		
3.75	58.0	53.0	0.251	0.229		
4.00	61.0	56.0	0.264	0.242		
4.25	64.0	59.0	0.277	0.255		
4.50	67.0	62.0	0.290	0.268		
4.75	70.0	65.0	0.303	0.281		
5.00	**73.0**	**68.0**	**0.316**	**0.294**	**1.58**	**1.47**
5.25	76.0	71.0	0.329	0.307		
5.50	79.0	74.0	0.342	0.320		
5.75	82.0	77.0	0.355	0.333		
6.00	86.0	80.0	0.372	0.346		
6.25	90.0	83.0	0.390	0.359		
6.50	93.0	86.0	0.403	0.372		
6.75	96.0	89.0	0.416	0.385		
7.00	99.0	92.0	0.429	0.398		
7.25	102.0	95.0	0.442	0.411		
7.50	105.0	98.0	0.455	0.424		

Moisture content after test		Top	Middle	Base	Specimen wt g	4480
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1640.95	1971.62	1770.68	Length mm	127.0
Mass of dry soil + container	g	1433.38	1724.21	1548.77		
Weight of container	g	143.97	190.91	189.64		
Mass of moisture	g	207.57	247.41	221.91	Average MC %	16.19
Dry weight	g	1289.41	1533.30	1359.13	Density Mg/m3	1.94
Moisture content	%	16.10	16.14	16.33	Dry Density Mg/m3	1.67



NM TL Ltd

Project: IPS Dundalk

		Date
Operator	Tch	6-Dec-18
Checked	Nc	
Approved	Bc	

Project No.	NMTL2573
BH/TP	TP10
Sample No.	B
Depth	2.50m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description Brown silty gravelly SAND

Date 6-Dec-18

Test Method BS 1377: Part 4 : 1990 :7.4

Force Measuring Device VJT08211 Test 1

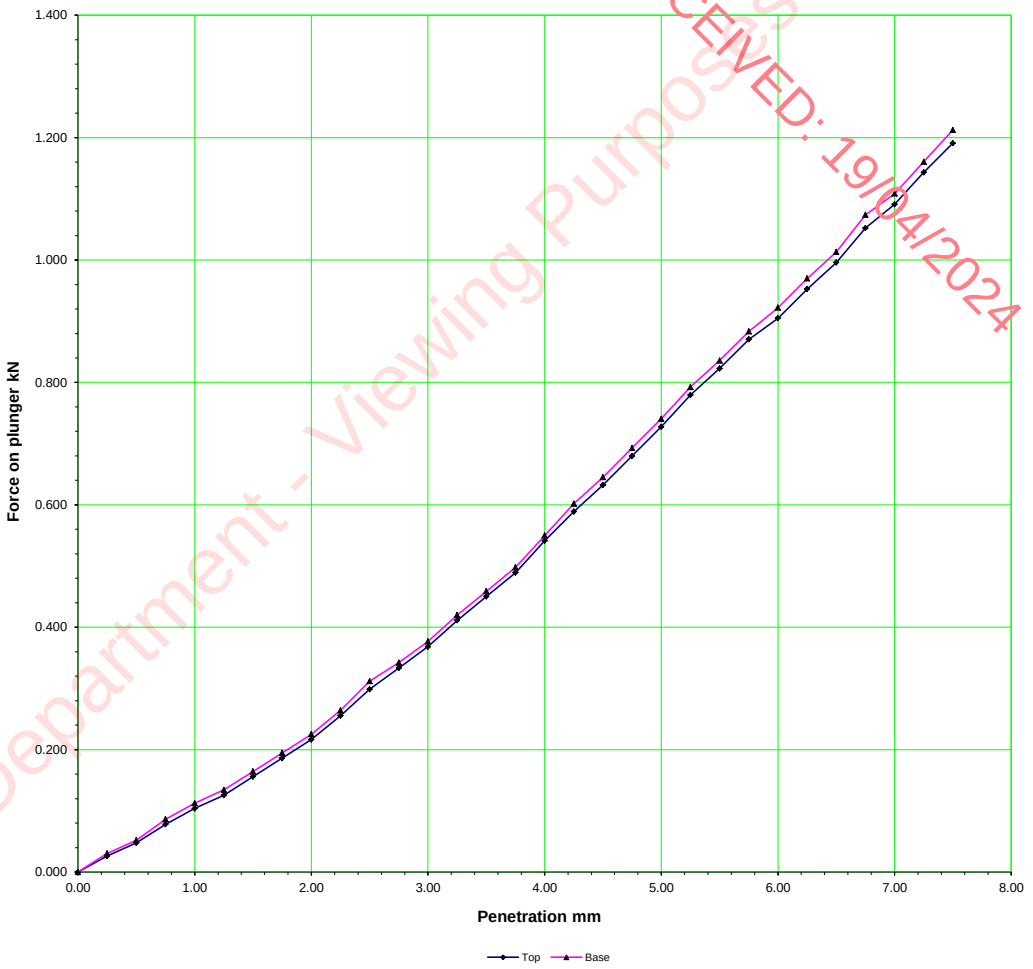
Preperatic Remoulded with 2.5 kg rammer at natural moisture content

Surcharge 10 kPa Mean Calibration 4.33 N/Div

Penetration of plunger mm | Force Gauge reading divisions | Force on plunger kN | California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	6.0	7.0	0.026	0.030		
0.50	11.0	12.0	0.048	0.052		
0.75	18.0	20.0	0.078	0.087		
1.00	24.0	26.0	0.104	0.113		
1.25	29.0	31.0	0.126	0.134		
1.50	36.0	38.0	0.156	0.165		
1.75	43.0	45.0	0.186	0.195		
2.00	50.0	52.0	0.217	0.225		
2.25	59.0	61.0	0.255	0.264		
2.50	**69.0**	**72.0**	**0.299**	**0.312**	**2.26**	**2.36**
2.75	77.0	79.0	0.333	0.342		
3.00	85.0	87.0	0.368	0.377		
3.25	95.0	97.0	0.411	0.420		
3.50	104.0	106.0	0.450	0.459		
3.75	113.0	115.0	0.489	0.498		
4.00	125.0	127.0	0.541	0.550		
4.25	136.0	139.0	0.589	0.602		
4.50	146.0	149.0	0.632	0.645		
4.75	157.0	160.0	0.680	0.693		
5.00	**168.0**	**171.0**	**0.727**	**0.740**	**3.64**	**3.70**
5.25	180.0	183.0	0.779	0.792		
5.50	190.0	193.0	0.823	0.836		
5.75	201.0	204.0	0.870	0.883		
6.00	209.0	213.0	0.905	0.922		
6.25	220.0	224.0	0.953	0.970		
6.50	230.0	234.0	0.996	1.013		
6.75	243.0	248.0	1.052	1.074		
7.00	252.0	256.0	1.091	1.108		
7.25	264.0	268.0	1.143	1.160		
7.50	275.0	280.0	1.191	1.212		

Moisture content after test		Top	Middle	Base	Specimen wt g	5090
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1225.20	1375.00	2302.03	Length mm	127.0
Mass of dry soil + container	g	1088.38	1220.44	2030.54		
Weight of container	g	141.04	185.73	153.53		
Mass of moisture	g	136.82	154.56	271.49	Average MC %	14.61
Dry weight	g	947.34	1034.71	1877.01	Density Mg/m3	2.21
Moisture content	%	14.44	14.94	14.46	Dry Density Mg/m3	1.93



NM TL Ltd

Project: IPS Dundalk

		Date
Operator	Tch	6-Dec-18
Checked	Nc	
Approved	Bc	

Project No.	NMTL2573
BH/TP	TP15
Sample No.	B
Depth	2.00m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description Brown slightly sandy slightly gravelly clayey SILT.

Date 6-Dec-18

Test Method BS 1377: Part 4 : 1990 :7.4

Force Measuring Device S86-010304 Test 1

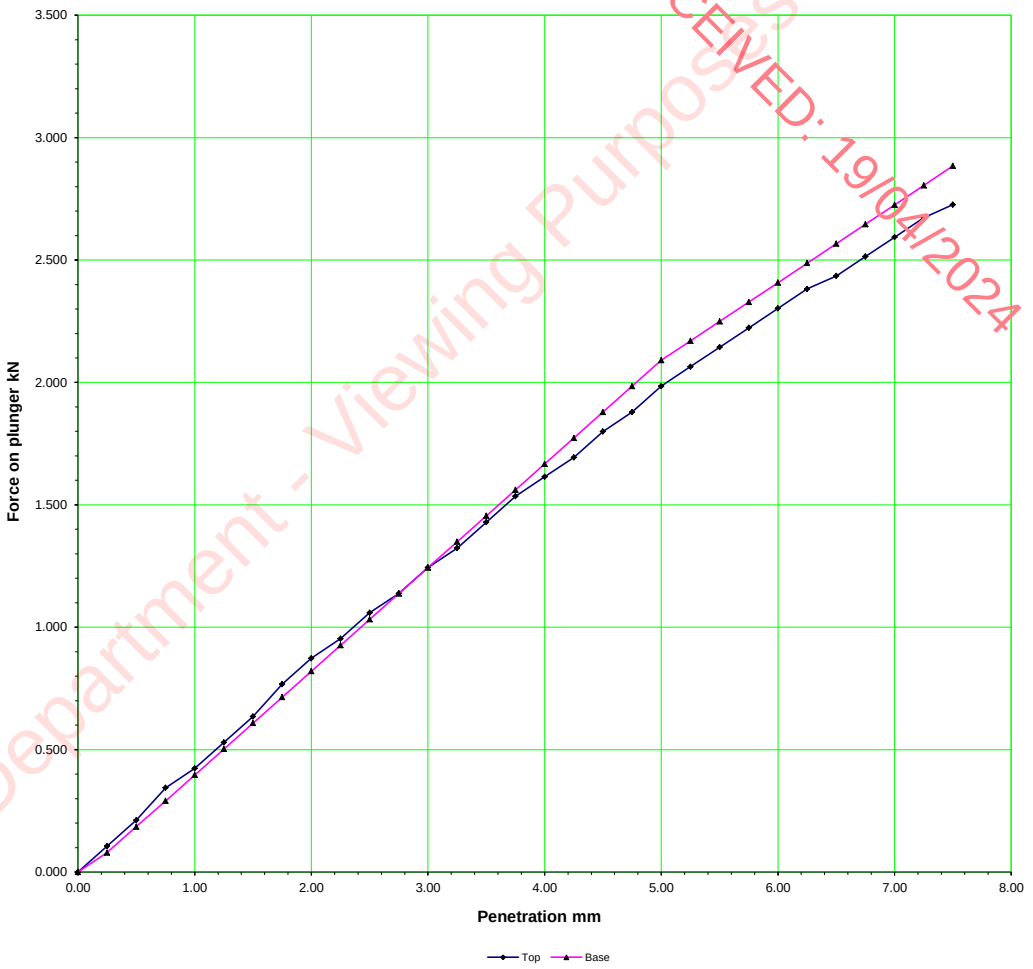
Preperatic Remoulded with 2.5 kg rammer at natural moisture content

Surcharge 10 kPa Mean Calibration 26.47 N/Div

Penetration of plunger mm | Force Gauge reading divisions | Force on plunger kN | California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	4.0	3.0	0.106	0.079		
0.50	8.0	7.0	0.212	0.185		
0.75	13.0	11.0	0.344	0.291		
1.00	16.0	15.0	0.423	0.397		
1.25	20.0	19.0	0.529	0.503		
1.50	24.0	23.0	0.635	0.609		
1.75	29.0	27.0	0.767	0.714		
2.00	33.0	31.0	0.873	0.820		
2.25	36.0	35.0	0.953	0.926		
2.50	**40.0**	**39.0**	**1.059**	**1.032**	**8.02**	**7.82**
2.75	43.0	43.0	1.138	1.138		
3.00	47.0	47.0	1.244	1.244		
3.25	50.0	51.0	1.323	1.349		
3.50	54.0	55.0	1.429	1.455		
3.75	58.0	59.0	1.535	1.561		
4.00	61.0	63.0	1.614	1.667		
4.25	64.0	67.0	1.694	1.773		
4.50	68.0	71.0	1.800	1.879		
4.75	71.0	75.0	1.879	1.985		
5.00	**75.0**	**79.0**	**1.985**	**2.090**	**9.92**	**10.45**
5.25	78.0	82.0	2.064	2.170		
5.50	81.0	85.0	2.144	2.249		
5.75	84.0	88.0	2.223	2.328		
6.00	87.0	91.0	2.302	2.408		
6.25	90.0	94.0	2.382	2.487		
6.50	92.0	97.0	2.435	2.567		
6.75	95.0	100.0	2.514	2.646		
7.00	98.0	103.0	2.594	2.725		
7.25	101.0	106.0	2.673	2.805		
7.50	103.0	109.0	2.726	2.884		

		Top	Middle	Base		
Moisture content after test					Specimen wt g	4780
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1260.17	1939.02	1799.72	Length mm	127.0
Mass of dry soil + container	g	1119.36	1715.76	1592.88		
Weight of container	g	145.30	189.15	189.07		
Mass of moisture	g	140.81	223.26	206.84	Average MC %	14.60
Dry weight	g	974.06	1526.61	1403.81	Density Mg/m3	2.07
Moisture content	%	14.46	14.62	14.73	Dry Density Mg/m3	1.81



NM TL Ltd

Project: IPS Dundalk

		Date
Operator	Tch	6-Dec-18
Checked	Nc	
Approved	Bc	

Project No.	NMTL2573
BH/TP	TP16
Sample No.	B
Depth	1.00m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description: Brown slightly sandy slightly gravelly SILT/CLAY

Date: 6-Dec-18

Test Method: BS 1377: Part 4 : 1990 :7.4

Force Measuring Device: VJT-08211 — Test 1

Preperatic: Remoulded with 2.5 kg rammer at natural moisture content

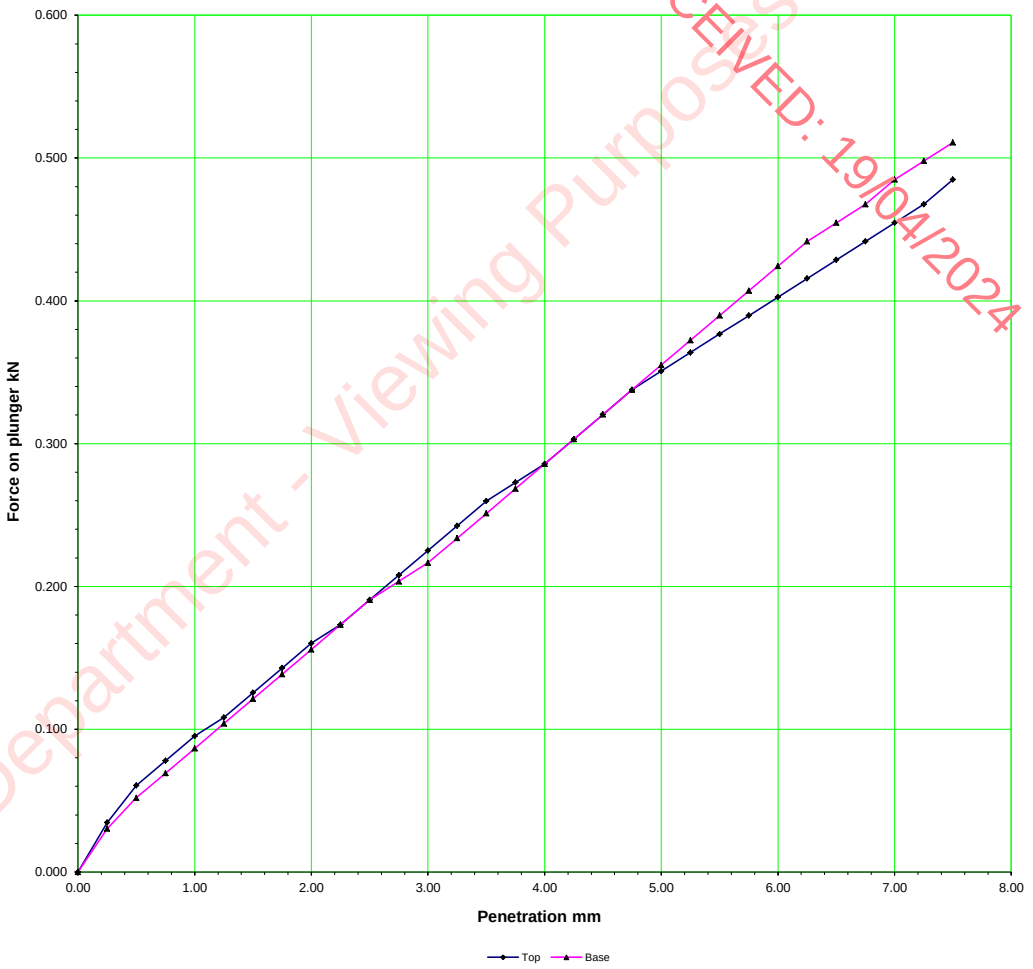
Surcharge: 10 kPa — Mean Calibration: 4.33 N/Div

Penetration of plunger mm: Force Gauge reading divisions — Force on plunger kN: 4.33 N/Div

California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	8.0	7.0	0.035	0.030		
0.50	14.0	12.0	0.061	0.052		
0.75	18.0	16.0	0.078	0.069		
1.00	22.0	20.0	0.095	0.087		
1.25	25.0	24.0	0.108	0.104		
1.50	29.0	28.0	0.126	0.121		
1.75	33.0	32.0	0.143	0.139		
2.00	37.0	36.0	0.160	0.156		
2.25	40.0	40.0	0.173	0.173		
2.50	**44.0**	**44.0**	**0.191**	**0.191**	**1.44**	**1.44**
2.75	48.0	47.0	0.208	0.204		
3.00	52.0	50.0	0.225	0.217		
3.25	56.0	54.0	0.242	0.234		
3.50	60.0	58.0	0.260	0.251		
3.75	63.0	62.0	0.273	0.268		
4.00	66.0	66.0	0.286	0.286		
4.25	70.0	70.0	0.303	0.303		
4.50	74.0	74.0	0.320	0.320		
4.75	78.0	78.0	0.338	0.338		
5.00	**81.0**	**82.0**	**0.351**	**0.355**	**1.75**	**1.78**
5.25	84.0	86.0	0.364	0.372		
5.50	87.0	90.0	0.377	0.390		
5.75	90.0	94.0	0.390	0.407		
6.00	93.0	98.0	0.403	0.424		
6.25	96.0	102.0	0.416	0.442		
6.50	99.0	105.0	0.429	0.455		
6.75	102.0	108.0	0.442	0.468		
7.00	105.0	112.0	0.455	0.485		
7.25	108.0	115.0	0.468	0.498		
7.50	112.0	118.0	0.485	0.511		

Moisture content after test		Top	Middle	Base	Specimen wt g	4940
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1727.56	1810.63	1908.66	Length mm	127.0
Mass of dry soil + container	g	1512.59	1578.40	1670.99		
Weight of container	g	190.37	143.58	189.05		
Mass of moisture	g	214.97	232.23	237.67	Average MC %	16.16
Dry weight	g	1322.22	1434.82	1481.94	Density Mg/m3	2.14
Moisture content	%	16.26	16.19	16.04	Dry Density Mg/m3	1.85



NM TL Ltd	**Project:** IPS Dundalk		Date	Project No. NMTL2573
		Operator	Tch 6-Dec-18	BH/TP TP17
		Checked	Nc	Sample No. B
		Approved	Bc	Depth 1.50m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description: Brown slightly sandy slightly gravelly silty CLAY with occasional cobbles.

Date: 5-Dec-18

Test Method: BS 1377: Part 4 : 1990 :7.4

Force Measuring Device: S86 010304 — Test 1

Preperatic: Remoulded with 2.5 kg rammer at natural moisture content

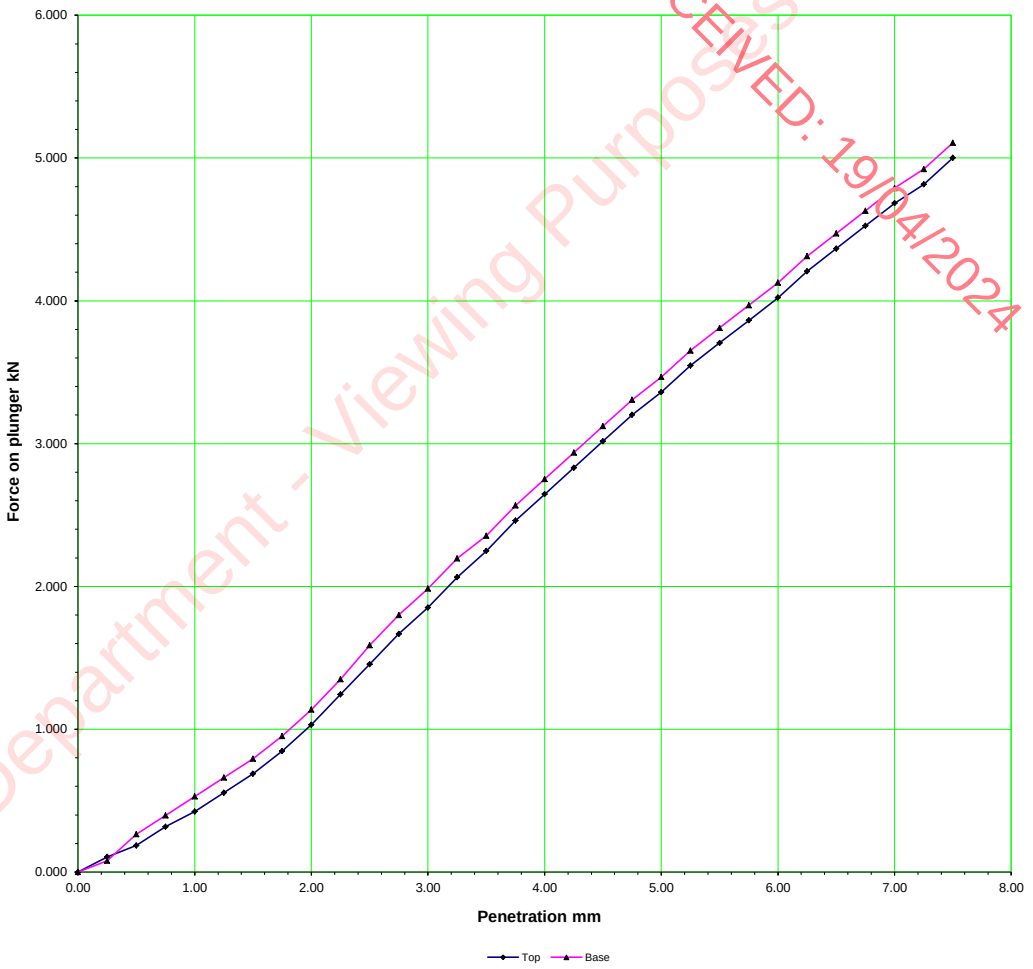
Surcharge: 10 kPa — Mean Calibration: 26.46 N/Div

Penetration of plunger mm: Force Gauge reading divisions — Force on plunger kN: 26.46 N/Div

California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	4.0	3.0	0.106	0.079		
0.50	7.0	10.0	0.185	0.265		
0.75	12.0	15.0	0.318	0.397		
1.00	16.0	20.0	0.423	0.529		
1.25	21.0	25.0	0.556	0.662		
1.50	26.0	30.0	0.688	0.794		
1.75	32.0	36.0	0.847	0.953		
2.00	39.0	43.0	1.032	1.138		
2.25	47.0	51.0	1.244	1.349		
2.50	**55.0**	**60.0**	**1.455**	**1.588**	**11.03**	**12.03**
2.75	63.0	68.0	1.667	1.799		
3.00	70.0	75.0	1.852	1.985		
3.25	78.0	83.0	2.064	2.196		
3.50	85.0	89.0	2.249	2.355		
3.75	93.0	97.0	2.461	2.567		
4.00	100.0	104.0	2.646	2.752		
4.25	107.0	111.0	2.831	2.937		
4.50	114.0	118.0	3.016	3.122		
4.75	121.0	125.0	3.202	3.308		
5.00	**127.0**	**131.0**	**3.360**	**3.466**	**16.80**	**17.33**
5.25	134.0	138.0	3.546	3.651		
5.50	140.0	144.0	3.704	3.810		
5.75	146.0	150.0	3.863	3.969		
6.00	152.0	156.0	4.022	4.128		
6.25	159.0	163.0	4.207	4.313		
6.50	165.0	169.0	4.366	4.472		
6.75	171.0	175.0	4.525	4.631		
7.00	177.0	181.0	4.683	4.789		
7.25	182.0	186.0	4.816	4.922		
7.50	189.0	193.0	5.001	5.107		

Moisture content after test		Top	Middle	Base	Specimen wt g	4855
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1803.89	1114.31	2364.87	Length mm	127.0
Mass of dry soil + container	g	1622.22	1008.51	2111.55		
Weight of container	g	192.50	190.57	143.38		
Mass of moisture	g	181.67	105.80	253.32	Average MC %	12.84
Dry weight	g	1429.72	817.94	1968.17	Density Mg/m3	2.11
Moisture content	%	12.71	12.93	12.87	Dry Density Mg/m3	1.87



NM TL Ltd

Project: IPS Dundalk

		Date
Operator	Tch	5-Dec-18
Checked	Nc	
Approved	Bc	

Project No.	NMTL2573
BH/TP	TP19
Sample No.	B
Depth	1.00m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description: Brown slightly sandy slightly gravelly SILT/CLAY

Date: 6-Dec-18

Test Method: BS 1377: Part 4 : 1990 :7.4

Force Measuring Device: VJT-08211 — Test 1

Preperatic: Remoulded with 2.5 kg rammer at natural moisture content

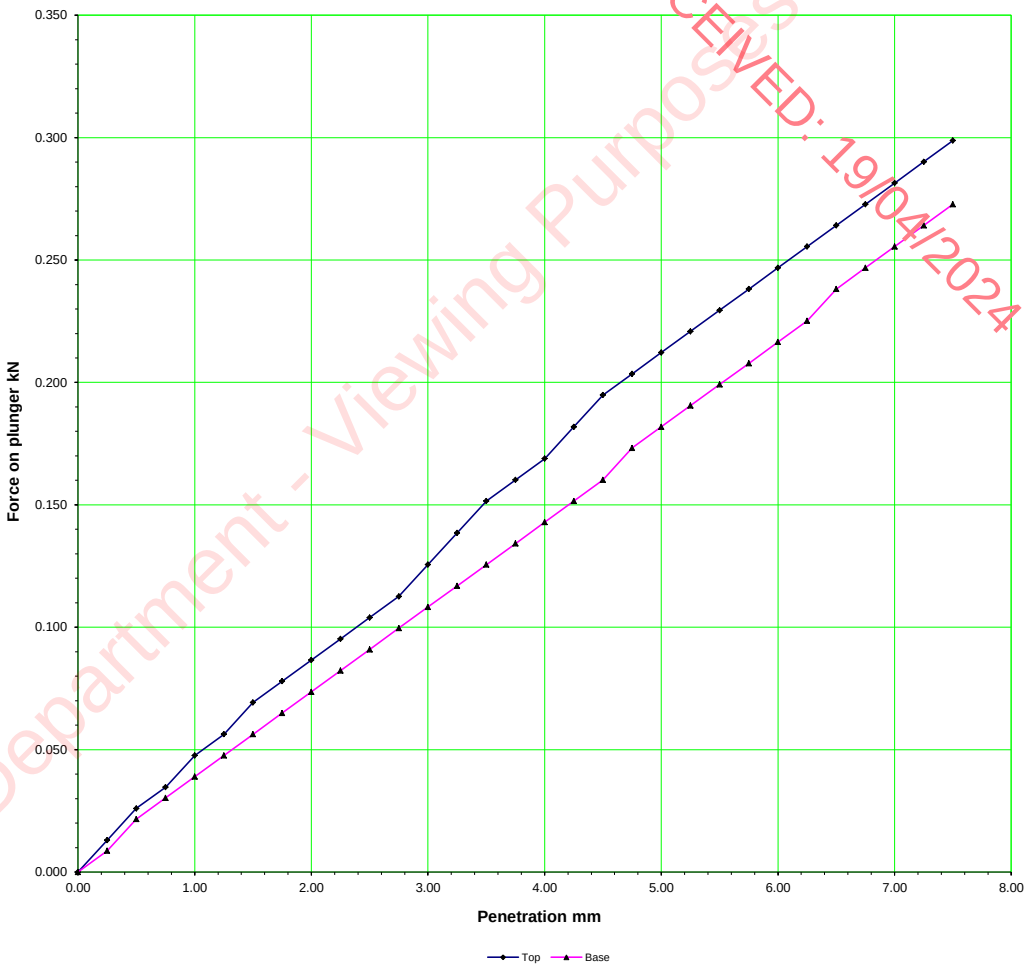
Surcharge: 10 kPa — Mean Calibration: 4.33 N/Div

Penetration of plunger mm: Force Gauge reading divisions — Force on plunger kN: 4.33 N/Div

California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	3.0	2.0	0.013	0.009		
0.50	6.0	5.0	0.026	0.022		
0.75	8.0	7.0	0.035	0.030		
1.00	11.0	9.0	0.048	0.039		
1.25	13.0	11.0	0.056	0.048		
1.50	16.0	13.0	0.069	0.056		
1.75	18.0	15.0	0.078	0.065		
2.00	20.0	17.0	0.087	0.074		
2.25	22.0	19.0	0.095	0.082		
2.50	**24.0**	**21.0**	**0.104**	**0.091**	**0.79**	**0.69**
2.75	26.0	23.0	0.113	0.100		
3.00	29.0	25.0	0.126	0.108		
3.25	32.0	27.0	0.139	0.117		
3.50	35.0	29.0	0.152	0.126		
3.75	37.0	31.0	0.160	0.134		
4.00	39.0	33.0	0.169	0.143		
4.25	42.0	35.0	0.182	0.152		
4.50	45.0	37.0	0.195	0.160		
4.75	47.0	40.0	0.204	0.173		
5.00	**49.0**	**42.0**	**0.212**	**0.182**	**1.06**	**0.91**
5.25	51.0	44.0	0.221	0.191		
5.50	53.0	46.0	0.229	0.199		
5.75	55.0	48.0	0.238	0.208		
6.00	57.0	50.0	0.247	0.217		
6.25	59.0	52.0	0.255	0.225		
6.50	61.0	55.0	0.264	0.238		
6.75	63.0	57.0	0.273	0.247		
7.00	65.0	59.0	0.281	0.255		
7.25	67.0	61.0	0.290	0.264		
7.50	69.0	63.0	0.299	0.273		

Moisture content after test		Top	Middle	Base	Specimen wt g	4870
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1750.46	1822.69	1798.89	Length mm	127.0
Mass of dry soil + container	g	1521.10	1577.85	1564.11		
Weight of container	g	188.50	142.22	188.62		
Mass of moisture	g	229.36	244.84	234.78	Average MC %	17.11
Dry weight	g	1332.60	1435.63	1375.49	Density Mg/m3	2.11
Moisture content	%	17.21	17.05	17.07	Dry Density Mg/m3	1.80



NM TL Ltd	**Project:** IPS Dundalk		Date	Project No.	NMTL2573
		Operator	Tch 6-Dec-18	BH/TP	TP21
		Checked	Nc	Sample No.	B
		Approved	Bc	Depth	2.00m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description: Brown slightly sandy gravelly clayey SILT, with occasional cobbles.

Date: 5-Dec-18

Test Method: BS 1377: Part 4 : 1990 :7.4

Force Measuring Device: VJT08211 — Test 1

Preperatic: Remoulded with 2.5 kg rammer at natural moisture content

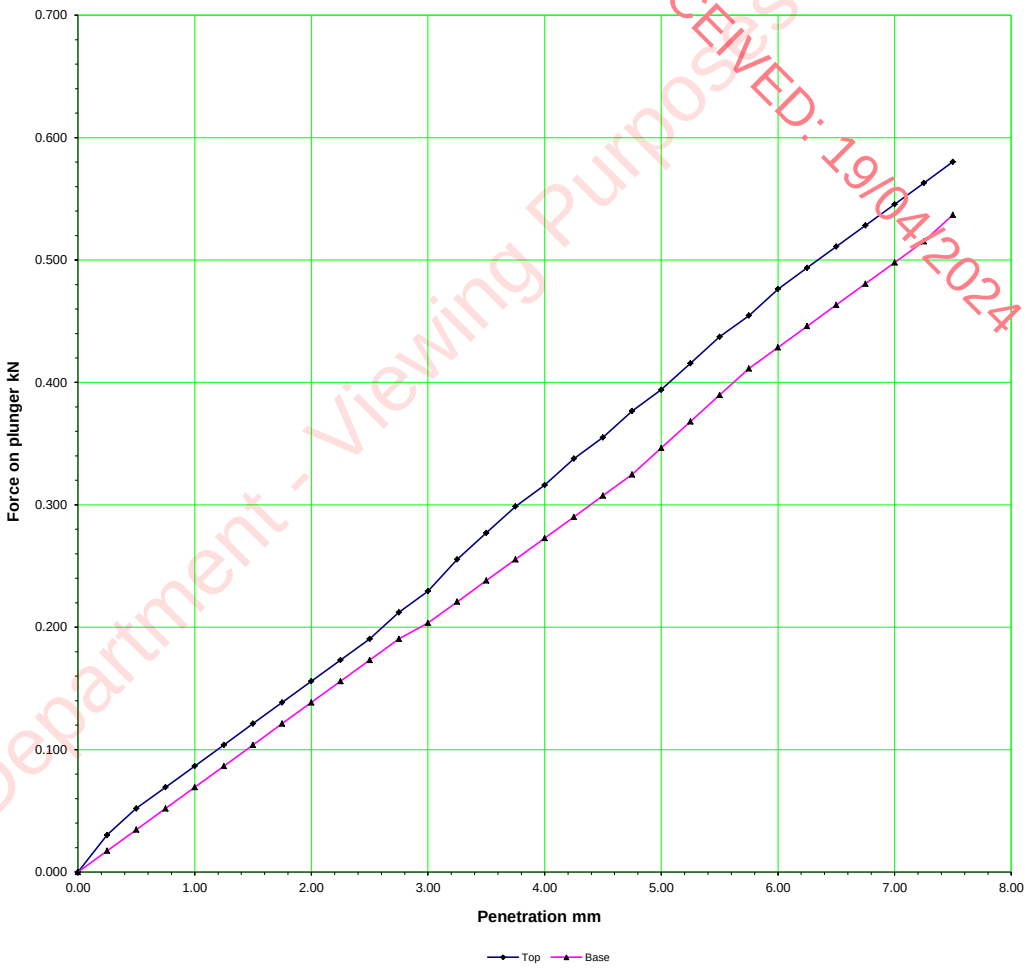
Surcharge: 10 kPa — Mean Calibration: 4.33 N/Div

Penetration of plunger mm: Force Gauge reading divisions — Force on plunger kN: 4.33 N/Div

California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	7.0	4.0	0.030	0.017		
0.50	12.0	8.0	0.052	0.035		
0.75	16.0	12.0	0.069	0.052		
1.00	20.0	16.0	0.087	0.069		
1.25	24.0	20.0	0.104	0.087		
1.50	28.0	24.0	0.121	0.104		
1.75	32.0	28.0	0.139	0.121		
2.00	36.0	32.0	0.156	0.139		
2.25	40.0	36.0	0.173	0.156		
2.50	**44.0**	**40.0**	**0.191**	**0.173**	**1.44**	**1.31**
2.75	49.0	44.0	0.212	0.191		
3.00	53.0	47.0	0.229	0.204		
3.25	59.0	51.0	0.255	0.221		
3.50	64.0	55.0	0.277	0.238		
3.75	69.0	59.0	0.299	0.255		
4.00	73.0	63.0	0.316	0.273		
4.25	78.0	67.0	0.338	0.290		
4.50	82.0	71.0	0.355	0.307		
4.75	87.0	75.0	0.377	0.325		
5.00	**91.0**	**80.0**	**0.394**	**0.346**	**1.97**	**1.73**
5.25	96.0	85.0	0.416	0.368		
5.50	101.0	90.0	0.437	0.390		
5.75	105.0	95.0	0.455	0.411		
6.00	110.0	99.0	0.476	0.429		
6.25	114.0	103.0	0.494	0.446		
6.50	118.0	107.0	0.511	0.463		
6.75	122.0	111.0	0.528	0.481		
7.00	126.0	115.0	0.546	0.498		
7.25	130.0	119.0	0.563	0.515		
7.50	134.0	124.0	0.580	0.537		

		Top	Middle	Base		
Moisture content after test					Specimen wt g	4745
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1967.73	1496.73	1414.18	Length mm	127.0
Mass of dry soil + container	g	1632.64	1241.01	1175.86		
Weight of container	g	191.28	143.66	143.77		
Mass of moisture	g	335.09	255.72	238.32	Average MC %	23.21
Dry weight	g	1441.36	1097.35	1032.09	Density Mg/m3	2.06
Moisture content	%	23.25	23.30	23.09	Dry Density Mg/m3	1.67



NM TL Ltd

Project: IPS Dundalk

		Date
Operator	Tch	5-Dec-18
Checked	Nc	
Approved	Bc	

Project No.	NMTL2573
BH/TP	TP23
Sample No.	B
Depth	0.80m

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description: Brown slightly sandy gravelly silty CLAY, with some cobbles.

Date: 6-Dec-18

Test Method: BS 1377: Part 4 : 1990 :7.4

Force Measuring Device: S86-010304 — Test 1

Preperatic: Remoulded with 2.5 kg rammer at natural moisture content

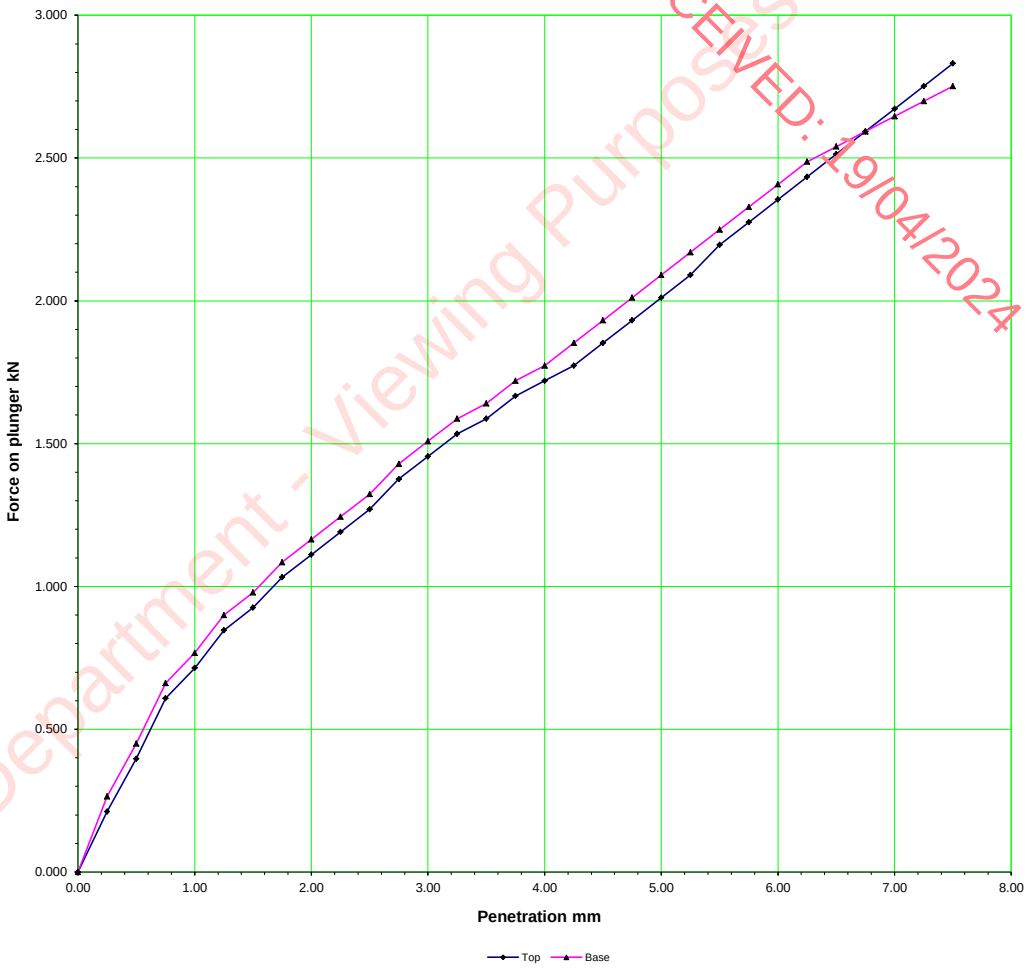
Surcharge: 10 kPa — Mean Calibration: 26.46 N/Div

Penetration of plunger: Force Gauge reading divisions — Force on plunger: 26.46 N/Div

California Bearing Ratio Results

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	CBR % Top	CBR % Base
0.00	0.0	0.0	0.000	0.000		
0.25	8.0	10.0	0.212	0.265		
0.50	15.0	17.0	0.397	0.450		
0.75	23.0	25.0	0.609	0.662		
1.00	27.0	29.0	0.714	0.767		
1.25	32.0	34.0	0.847	0.900		
1.50	35.0	37.0	0.926	0.979		
1.75	39.0	41.0	1.032	1.085		
2.00	42.0	44.0	1.111	1.164		
2.25	45.0	47.0	1.191	1.244		
2.50	**48.0**	**50.0**	**1.270**	**1.323**	**9.62**	**10.02**
2.75	52.0	54.0	1.376	1.429		
3.00	55.0	57.0	1.455	1.508		
3.25	58.0	60.0	1.535	1.588		
3.50	60.0	62.0	1.588	1.641		
3.75	63.0	65.0	1.667	1.720		
4.00	65.0	67.0	1.720	1.773		
4.25	67.0	70.0	1.773	1.852		
4.50	70.0	73.0	1.852	1.932		
4.75	73.0	76.0	1.932	2.011		
5.00	**76.0**	**79.0**	**2.011**	**2.090**	**10.05**	**10.45**
5.25	79.0	82.0	2.090	2.170		
5.50	83.0	85.0	2.196	2.249		
5.75	86.0	88.0	2.276	2.328		
6.00	89.0	91.0	2.355	2.408		
6.25	92.0	94.0	2.434	2.487		
6.50	95.0	96.0	2.514	2.540		
6.75	98.0	98.0	2.593	2.593		
7.00	101.0	100.0	2.672	2.646		
7.25	104.0	102.0	2.752	2.699		
7.50	107.0	104.0	2.831	2.752		

Moisture content after test		Top	Middle	Base	Specimen wt g	4635
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	1524.28	1277.13	2133.27	Length mm	127.0
Mass of dry soil + container	g	1366.88	1150.28	1899.09		
Weight of container	g	186.50	187.78	146.61		
Mass of moisture	g	157.40	126.85	234.18	Average MC %	13.29
Dry weight	g	1180.38	962.50	1752.48	Density Mg/m3	2.01
Moisture content	%	13.33	13.18	13.36	Dry Density Mg/m3	1.78



NM TL Ltd

Project: IPS Dundalk

		Date
Operator	Tch	6-Dec-18
Checked	Nc	
Approved	Bc	

Project No.	NMTL2573
BH/TP	TP28
Sample No.	B
Depth	1.00m

SINGLE POINT MOISTURE CONDITION VALUE TEST

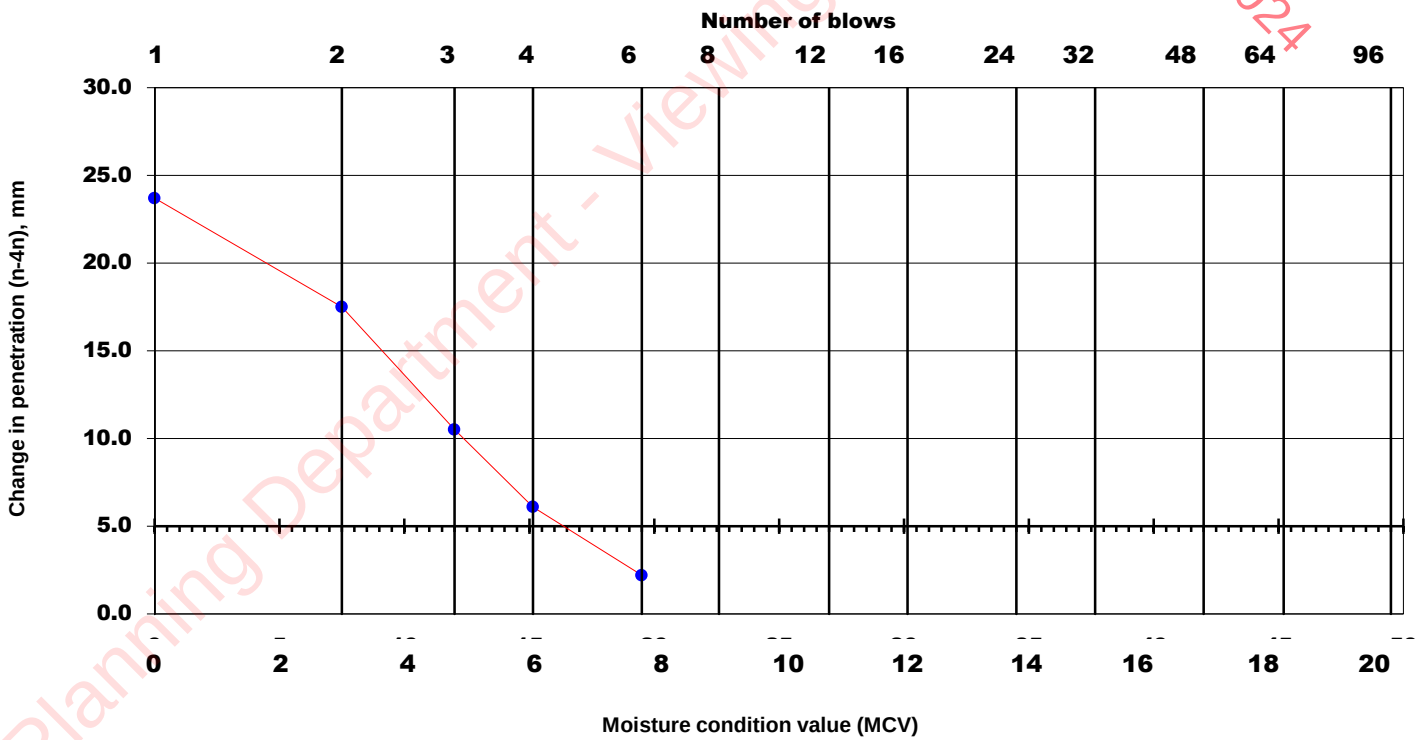
Single sample mass		
Initial sample mass	1488.56	g
Moisture content	14.8	%
Dry mass	1296.4	g
Mass retained on 20mm sieve	g	32.9 %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
ISS Dundalk	Borehole/ Pit No.	TP01
Soil description:	Sample no.	B
Brown slightly sandy clayey silty fine to coarse GRAVEL with some cobbles.	Depth	1.00m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	05/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **6.6** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	66.3	23.7
2	54.3	17.5
3	47.0	10.5
4	42.6	6.1
6	38.5	2.2
8	36.8	
12	36.5	
16	36.5	
24	36.3	
32		
48		
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Tch	Nc	Bc

SINGLE POINT MOISTURE CONDITION VALUE TEST

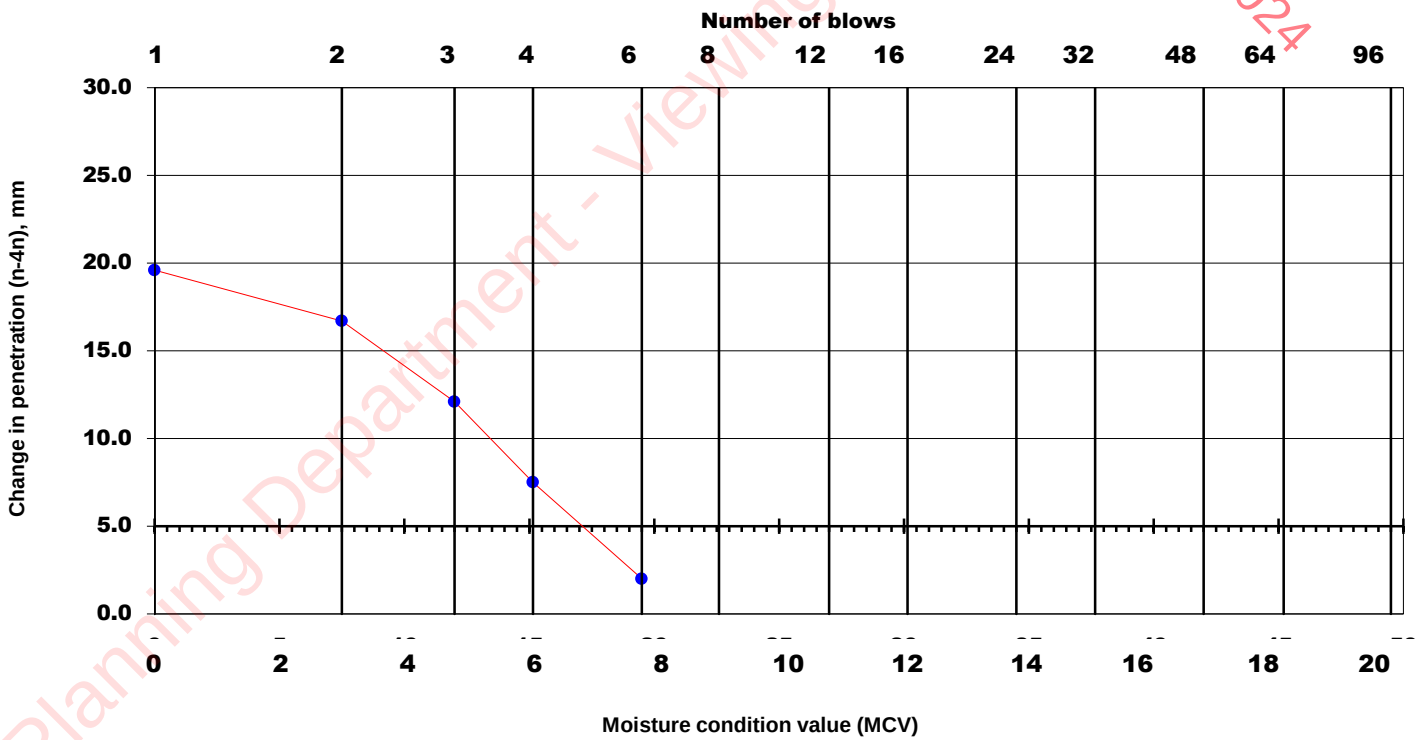
Single sample mass		
Initial sample mass	1491.51	g
Moisture content	25.6	%
Dry mass	1187.3	g
Mass retained on 20mm sieve	0	g %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
ISP Dundalk	Borehole/ Pit No.	TP06
Soil description:	Sample no.	B
Yellowish brown slightly sandy SILT/CLAY	Depth	1.00m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	06/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **6.9** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	73.4	19.6
2	63.6	16.7
3	58.6	12.1
4	53.8	7.5
6	48.3	2.0
8	46.9	
12	46.5	
16	46.3	
24	46.3	
32		
48		
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Tch	Nc	Bc

SINGLE POINT MOISTURE CONDITION VALUE TEST

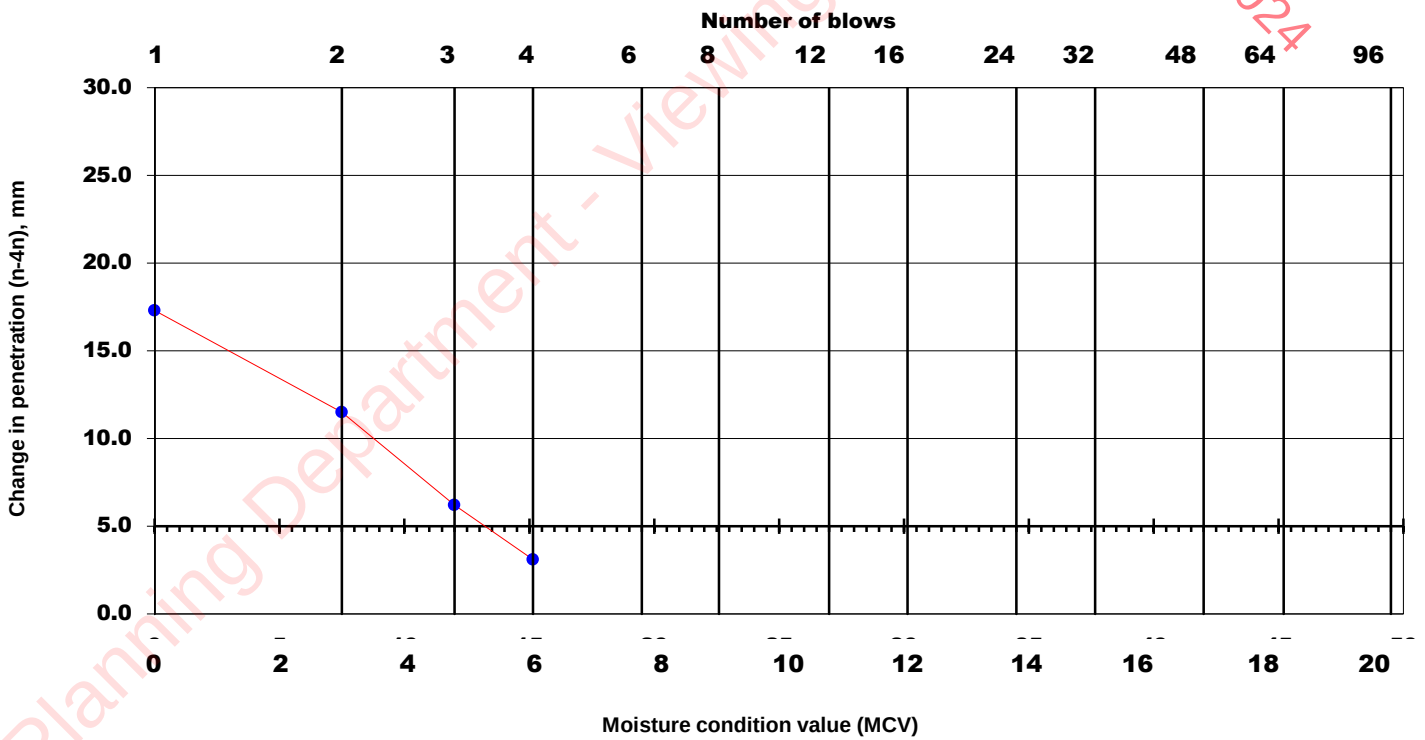
Single sample mass		
Initial sample mass	1490.96	g
Moisture content	16.1	%
Dry mass	1284.4	g
Mass retained on 20mm sieve	g	17.8 %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
ISP Dundalk	Borehole/ Pit No.	TP10
Soil description:	Sample no.	B
Brown slightly sandy slightly gravelly SILT/CLAY	Depth	2.50m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	06/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **5.1** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	58.2	17.3
2	49.5	11.5
3	44.2	6.2
4	40.9	3.1
6	78.7	
8	38.0	
12	38.0	
16	37.8	
24		
32		
48		
64		
96		
128		
192		
256		



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Operator	Checked	Approved
Tch	Nc	Bc

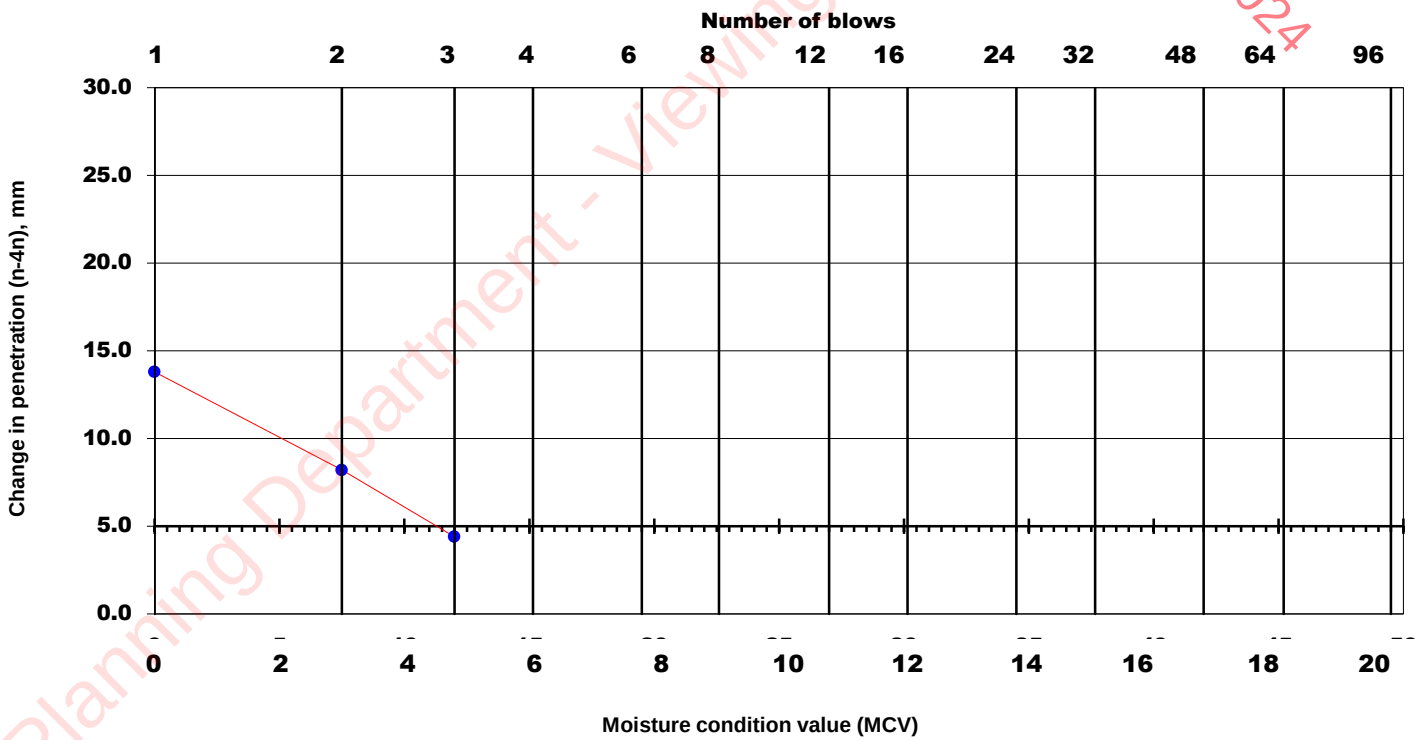
SINGLE POINT MOISTURE CONDITION VALUE TEST

Single sample mass		
Initial sample mass	1489.77	g
Moisture content	14.8	%
Dry mass	1297.9	g
Mass retained on 20mm sieve	g	21 %

* Delete as appropriate

Project Name: ISP Dundalk			Job ref.	NMTL_2753
			Borehole/ Pit No.	TP15
Soil description:			Sample no.	B
Brown silty gravelly SAND			Depth	2.00m
Test method	BS 1377 : Part 4 : 1990 : 5		Date Tested	06/12/2018
			Date Sampled	N/A
MCV	**4.5**	**Natural**	Date Received	28/11/2018

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	51.8	13.8
2	44.4	8.2
3	40.5	4.4
4	38.0	
6	36.3	
8	36.2	
12	36.1	
16		
24		
32		
48		
64		
96		
128		
192		
256		



Operator	Checked	Approved
Tch	Nc	Bc

NMTL Ltd

SINGLE POINT MOISTURE CONDITION VALUE TEST

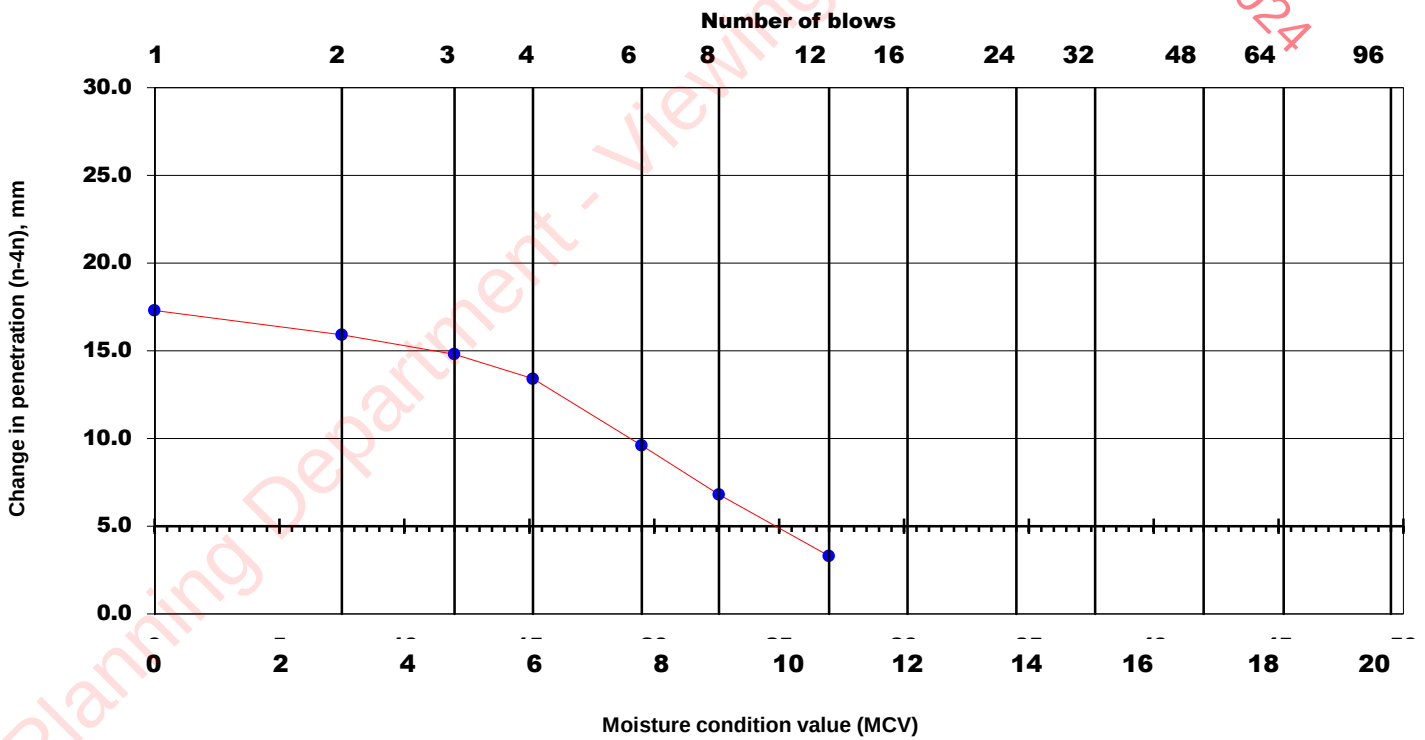
Single sample mass		
Initial sample mass	1480.01	g
Moisture content	14.4	%
Dry mass	1293.6	g
Mass retained on 20mm sieve	g	4.6 %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
ISP Dundalk	Borehole/ Pit No.	TP16
Soil description:	Sample no.	B
Brown slightly sandy slightly gravelly clayey SILT	Depth	1.00m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	06/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **10** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	68.9	17.3
2	59.7	15.9
3	55.0	14.8
4	51.6	13.4
6	46.8	9.6
8	43.8	6.8
12	40.2	3.3
16	38.2	
24	37.2	
32	37.0	
48	36.9	
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Tch	Nc	Bc

SINGLE POINT MOISTURE CONDITION VALUE TEST

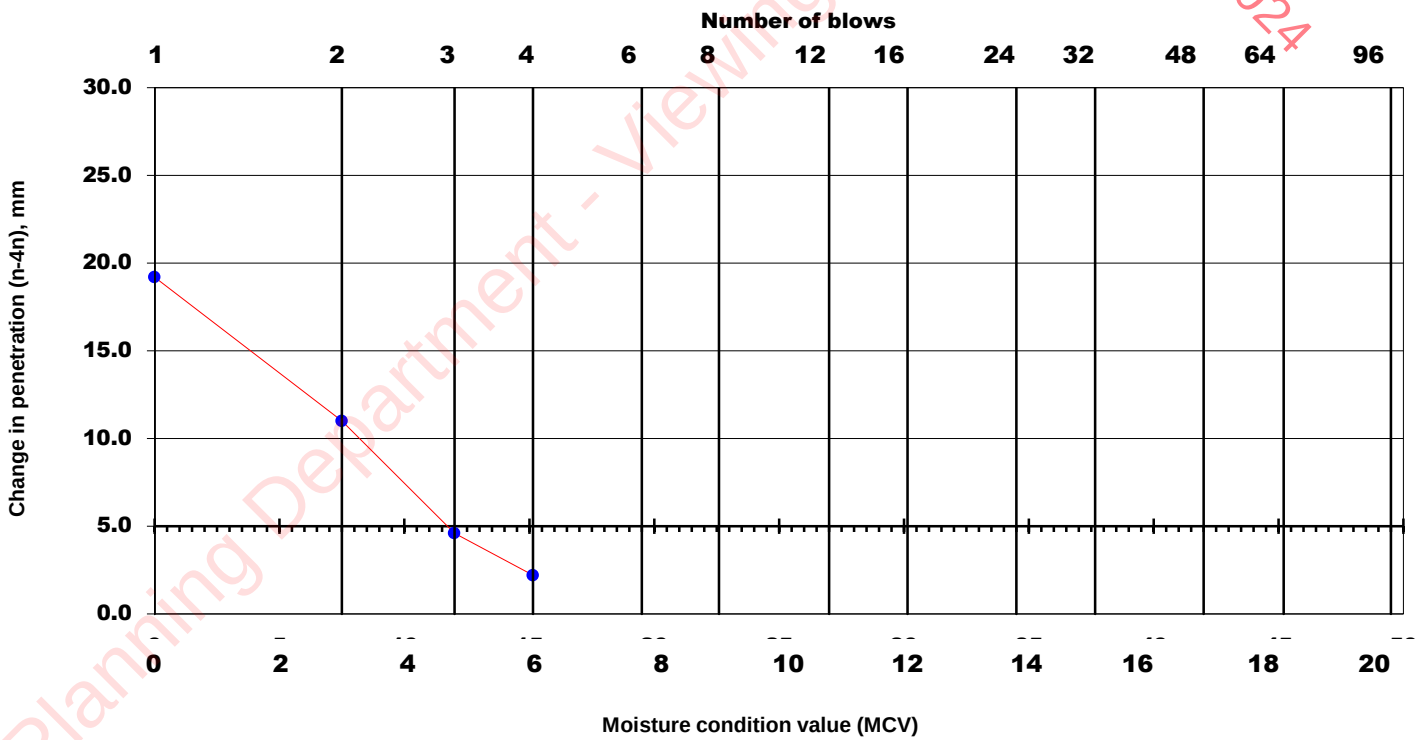
Single sample mass		
Initial sample mass	1489.43	g
Moisture content	16.3	%
Dry mass	1280.3	g
Mass retained on 20mm sieve	g	26.9 %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
ISP Dundalk	Borehole/ Pit No.	TP17
Soil description:	Sample no.	B
Brown slightly sandy slightly gravelly SILT/CLAY	Depth	1.50m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	06/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **4.7** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	58.6	19.2
2	48.5	11.0
3	42.0	4.6
4	39.4	2.2
6	37.5	
8	37.5	
12	37.4	
16	37.2	
24		
32		
48		
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Tch	Nc	Bc

SINGLE POINT MOISTURE CONDITION VALUE TEST

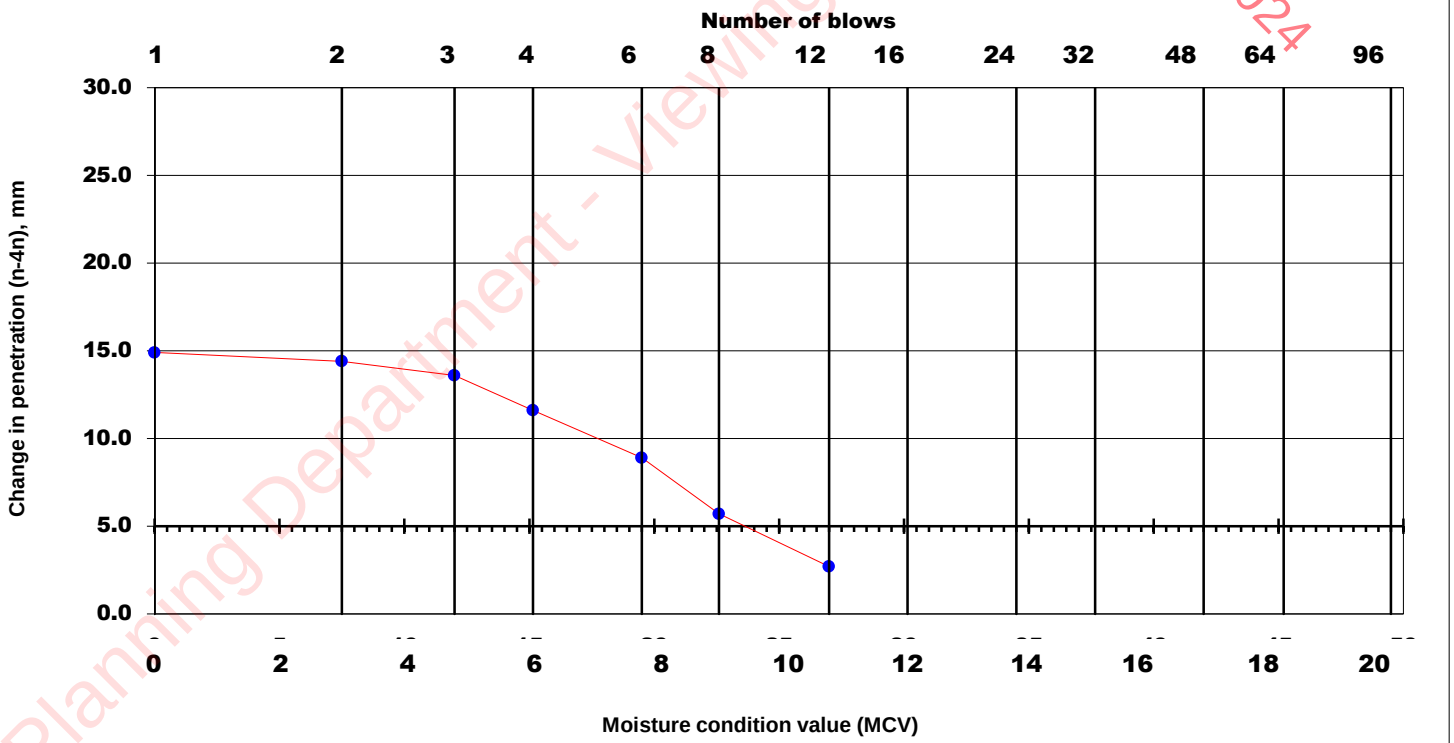
Single sample mass		
Initial sample mass	1489.36	g
Moisture content	12.8	%
Dry mass	1320.9	g
Mass retained on 20mm sieve	g	22.5 %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
ISP Dundalk	Borehole/ Pit No.	TP19
Soil description:	Sample no.	B
Brown slightly sandy slightly gravelly silty CLAY, with occasional cobbles.	Depth	1.00m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	05/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **9.5** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	63.3	14.9
2	55.6	14.4
3	51.6	13.6
4	48.4	11.6
6	44.5	8.9
8	41.2	5.7
12	38.0	2.7
16	36.8	
24	35.6	
32	35.5	
48	35.3	
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Tch	Nc	Bc

SINGLE POINT MOISTURE CONDITION VALUE TEST

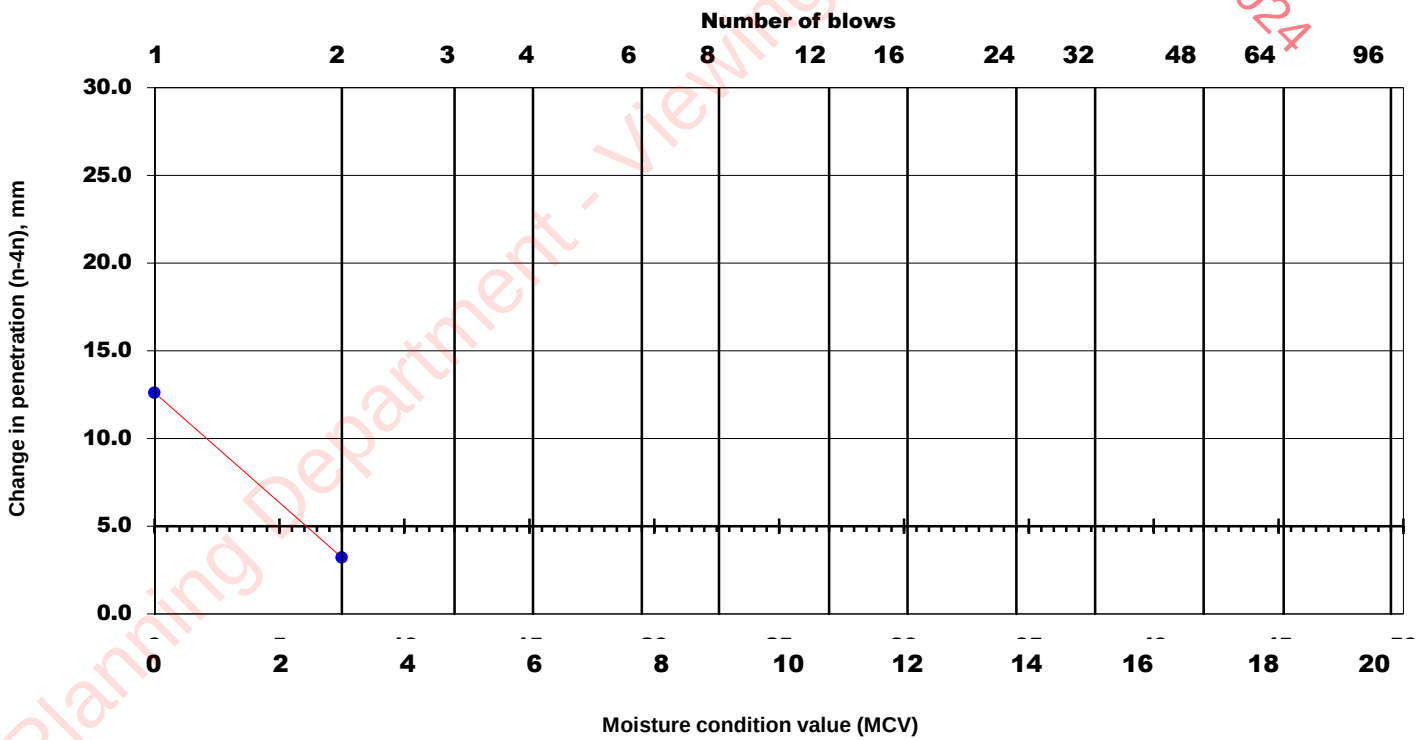
Single sample mass		
Initial sample mass	1482.75	g
Moisture content	17.2	%
Dry mass	1265.6	g
Mass retained on 20mm sieve	g	5.4 %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
ISP Dundalk	Borehole/ Pit No.	TP21
Soil description:	Sample no.	B
Brown slightly sandy slightly gravelly SILT/CLAY	Depth	2.00m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	06/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **2.4** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	51.4	12.6
2	41.6	3.2
3	39.0	
4	38.8	
6	38.4	
8	38.4	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Tch	Nc	Bc

SINGLE POINT MOISTURE CONDITION VALUE TEST

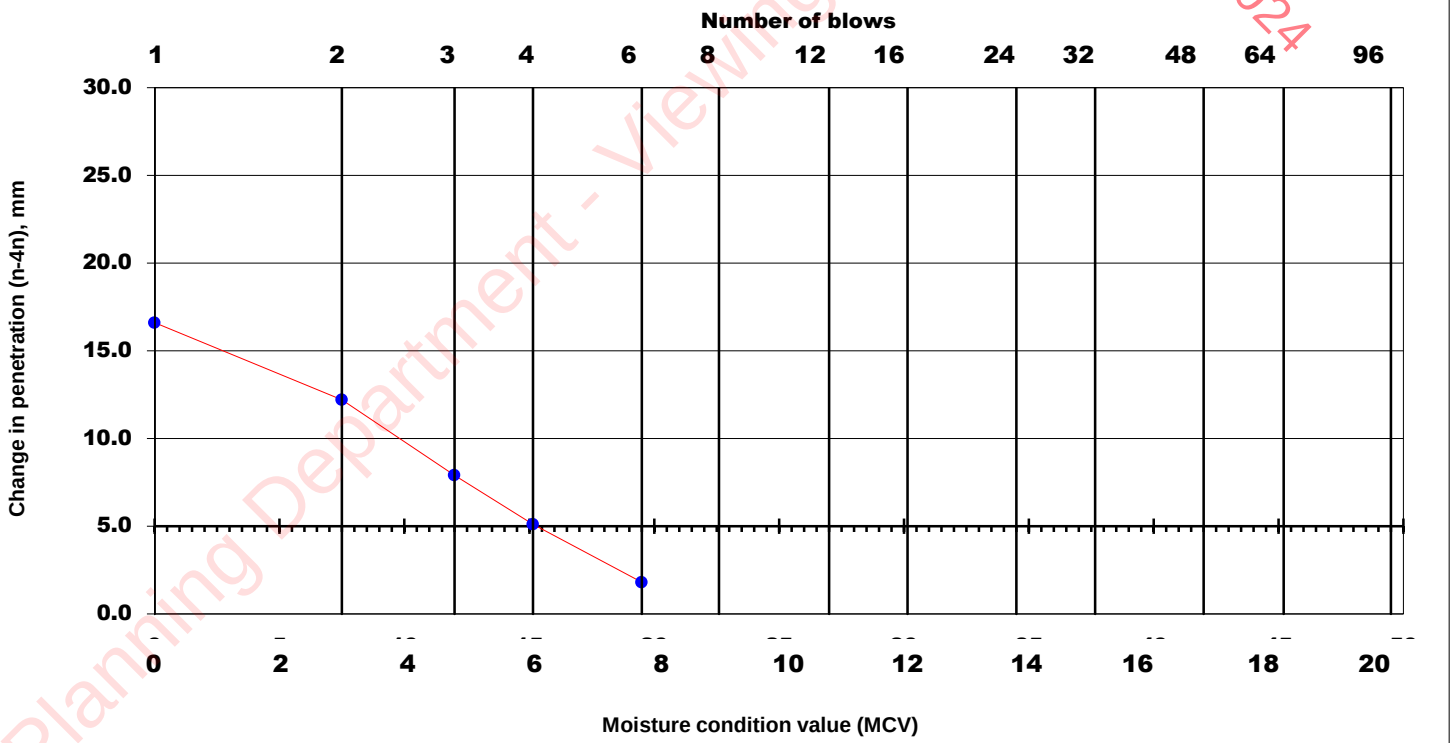
Single sample mass		
Initial sample mass	1497.42	g
Moisture content	23.1	%
Dry mass	1216.1	g
Mass retained on 20mm sieve	g	23.8 %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
IPS Dundalk	Borehole/ Pit No.	TP23
Soil description:	Sample no.	B
Brown slightly sandy gravelly clayey SILT, woit occasional cobbles.	Depth	0.80m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	05/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **6.2** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	67.7	16.6
2	58.6	12.2
3	54.0	7.9
4	51.1	5.1
6	47.7	1.8
8	46.4	
12	46.1	
16	46.0	
24	45.9	
32		
48		
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Tch	Nc	Bc

SINGLE POINT MOISTURE CONDITION VALUE TEST

Single sample mass		
Initial sample mass	1490.27	g
Moisture content	13.5	%
Dry mass	1312.9	g
Mass retained on 20mm sieve	g	30.4 %

* Delete as appropriate

Project Name:	Job ref.	NMTL_2753
ISP Dundalk	Borehole/ Pit No.	TP28
Soil description:	Sample no.	B
Brown slightly sandy gravelly silty CLAY with some cobbles.	Depth	1.00m
Test method BS 1377 : Part 4 : 1990 : 5	Date Tested	06/12/2018
	Date Sampled	N/A
	Date Received	28/11/2018

MCV **10** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	66.4	16.1
2	58.1	15.3
3	54.1	14.8
4	50.3	12.9
6	45.5	9.2
8	42.8	6.9
12	39.3	3.4
16	37.4	
24	36.3	
32	35.9	
48	35.9	
64		
96		
128		
192		
256		

NMTL Ltd

Operator	Checked	Approved
Tch	Nc	Bc

National Materials Testing Laboratory Ltd.

SUMMARY OF TEST RESULTS

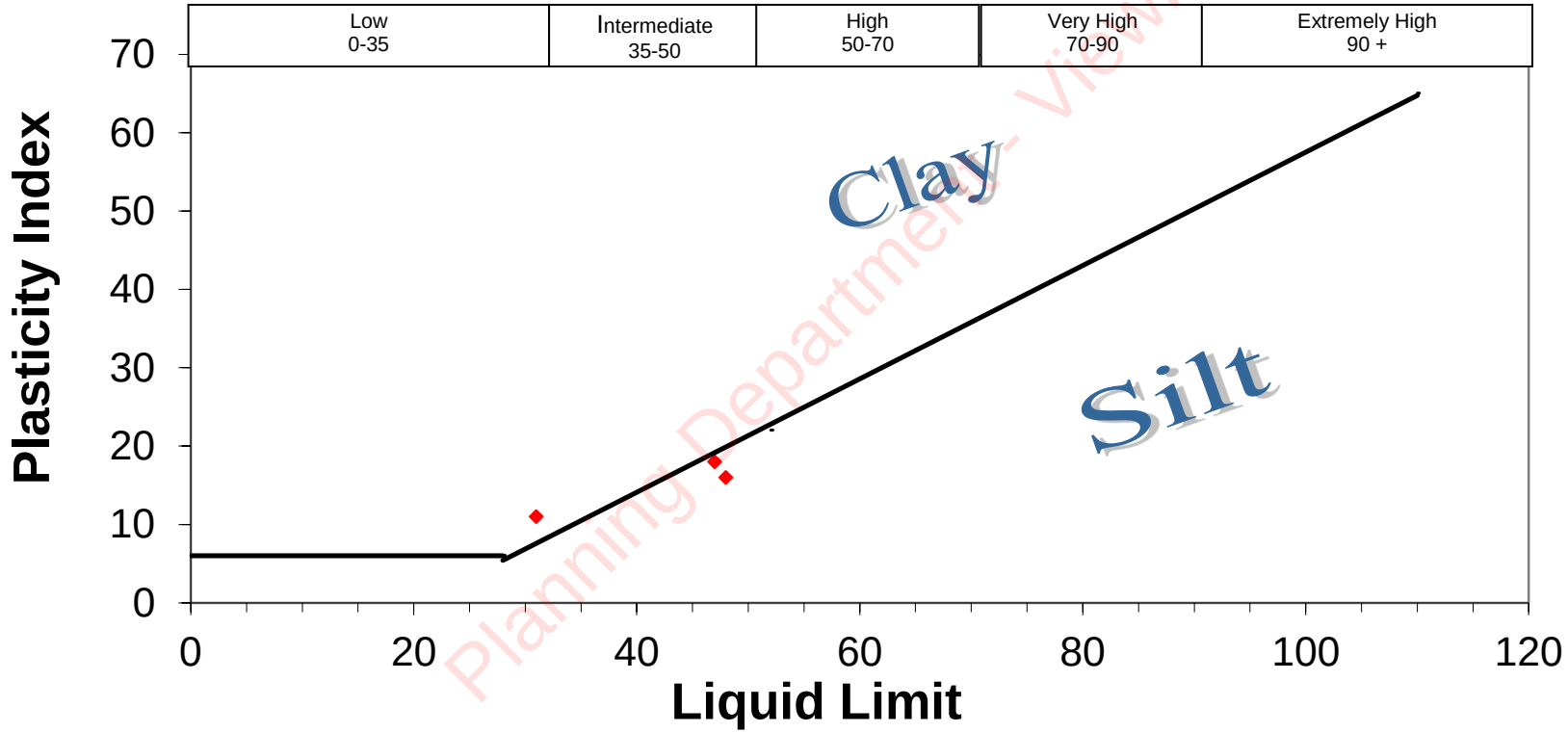
				Particle			Index Properties		Bulk	Cell	Undrained Triaxial Tests		Lab	
BH/TP	Depth	sample	Moisture	Density	<425um	LL	PL	PI	Density	Presssure	Compressive	Strain at	Vane	Remarks
No	m	No.	%	Mg/m3	%	%	%	%	Mg/m3	kPa	Stress kPa	Failure %	kPa	
TP07	0.5	B	18.0											
TP101	0.50	B	18.8		43.5	48	32	16						
TP104	0.50	B	20.0		49.4	47	29	18						
TP105	1.00	B	14.0		31.6	31	20	11						

NMTL	Notes :	Job ref No.	NMTL 2825	GII Project ID:	8115-10-18
	1. All BS tests carried out using preferred (definitive) method unless otherwise stated.	Location	IPS Dundalk		

Revision-02

NMTL LTD
Unit 18c, Tullow Industrial Estate
Tullow
County Carlow
Tel: 00353 59 9180822
Mob: 00353 872575508
billachana@eircom.net

Contract:	**IPS Dundalk**		
Client:	**Ground Investigations Ireland Ltd**		
Engineer:	**N/A**		
GII Project ID	**8115-10-18**		
Date:	**04/03/2019**		
Tested By:	**Tzr**	**Checked:**	**Bc**
Job ref No.	**NMTL 2825**		



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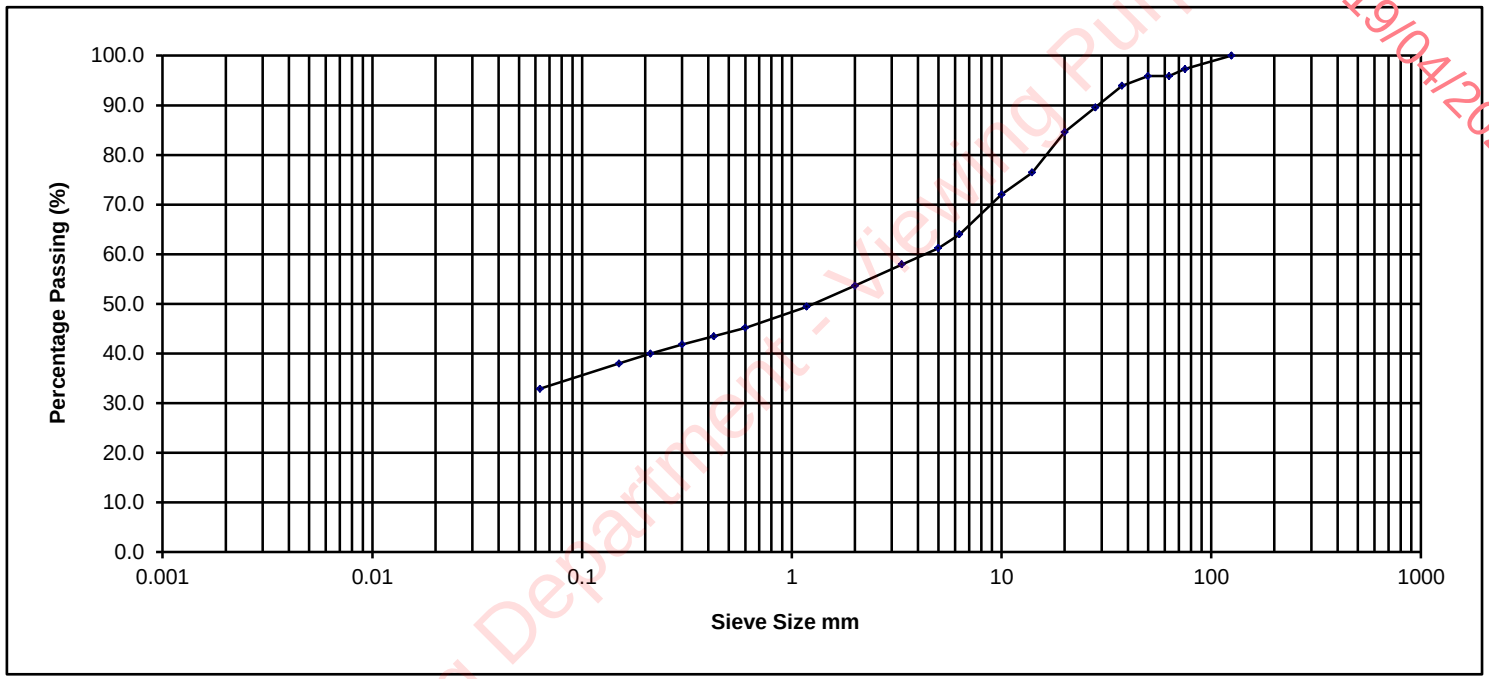
Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	97.3
63.000	95.9
50.000	95.9
37.500	93.9
28.000	89.6
20.000	84.6
14.000	76.5
10.000	72.0
6.300	64.0
5.000	61.2
3.350	58.0
2.000	53.7
1.180	49.4
0.600	45.2
0.425	43.5
0.300	41.8
0.212	40.0
0.150	38.0
0.063	32.9



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		32.9			20.8			42.2		4.1	0.0

Sample Description: Brown slightly sandy gravelly clayey SILT with occasional cobbles.

Project: IPS Dundalk

GII Project ID: 8115-10-18

Operator	Checked	Approved	Date sample tested
Tzr	Nc	Bc	31/01/2019

Project No.	NMTL 2825
BH/TP No.	TP101
Sample No.	B
Depth	0.50m

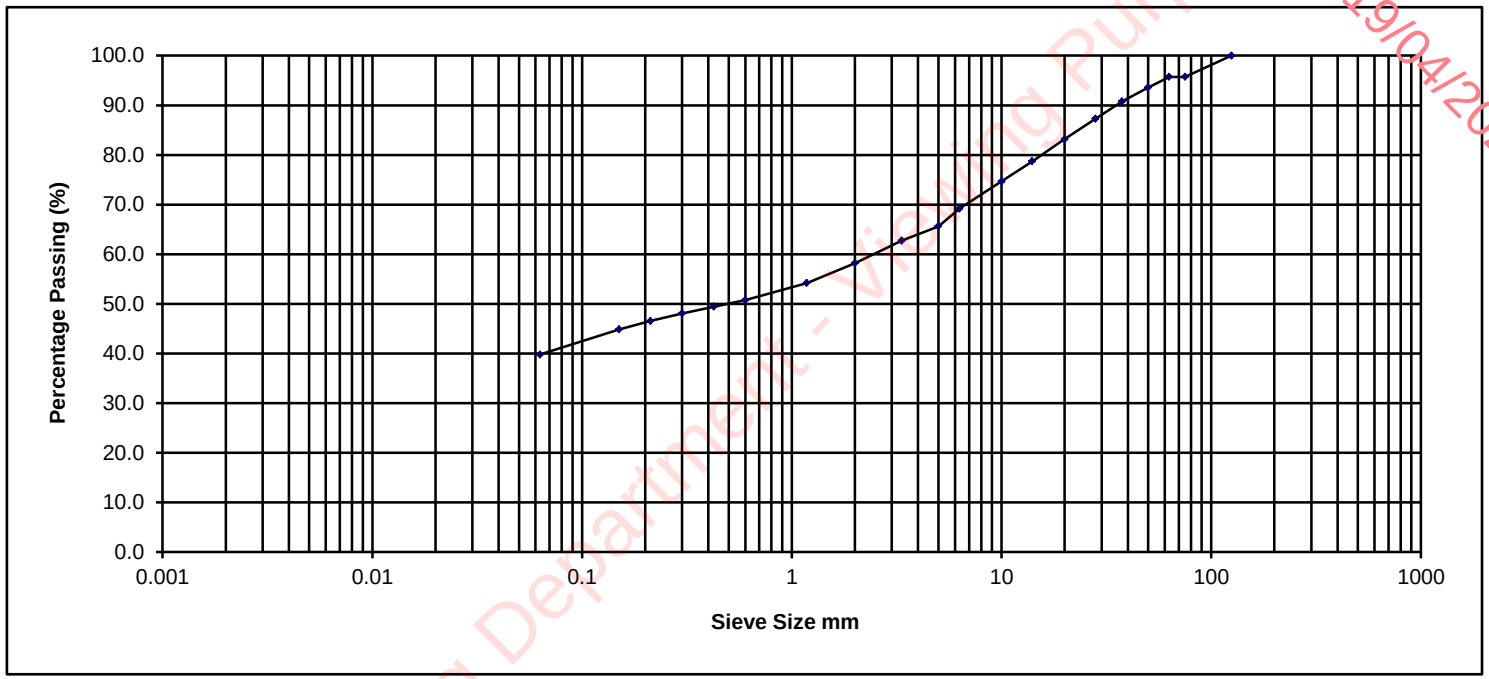
NM TL Ltd

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	95.7
63.000	95.7
50.000	93.6
37.500	90.7
28.000	87.3
20.000	83.2
14.000	78.7
10.000	74.7
6.300	69.2
5.000	65.6
3.350	62.7
2.000	58.2
1.180	54.2
0.600	50.7
0.425	49.4
0.300	48.1
0.212	46.6
0.150	44.8
0.063	39.8



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		39.8			18.4			37.5		4.3	0.0

Sample Description: Brown slightly sandy gravelly clayey SILT with occasional cobbles.

Project: IPS Dundalk

GII Project ID: 8115-10-18

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	31/01/2019

Project No.	NMTL 2825
BH/TP No.	TP104
Sample No.	B
Depth	0.50m

NM TL Ltd

NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	96.5
63.000	96.0
50.000	92.5
37.500	88.2
28.000	85.4
20.000	80.0
14.000	73.5
10.000	66.7
6.300	59.3
5.000	55.9
3.350	52.1
2.000	45.5
1.180	39.8
0.600	34.0
0.425	31.6
0.300	29.3
0.212	27.0
0.150	24.9
0.063	19.7

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
		19.7			25.8			50.5		4.0	0.0

Sample Description: Brown slightly sandy gravelly silty CLAY with occasional cobbles.

Project: IPS Dundalk

GII Project ID: **8115-10-18**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	31/01/2019

Project No.	NMTL 2825
BH/TP No.	TP105
Sample No.	B
Depth	1.00m

NM TL Ltd

SINGLE POINT MOISTURE CONDITION VALUE TEST

Single sample mass		
Initial sample mass	1494.05	g
Moisture content	18.9	%
Dry mass	1256.3	g
Mass retained on 20mm sieve	15.4	g %

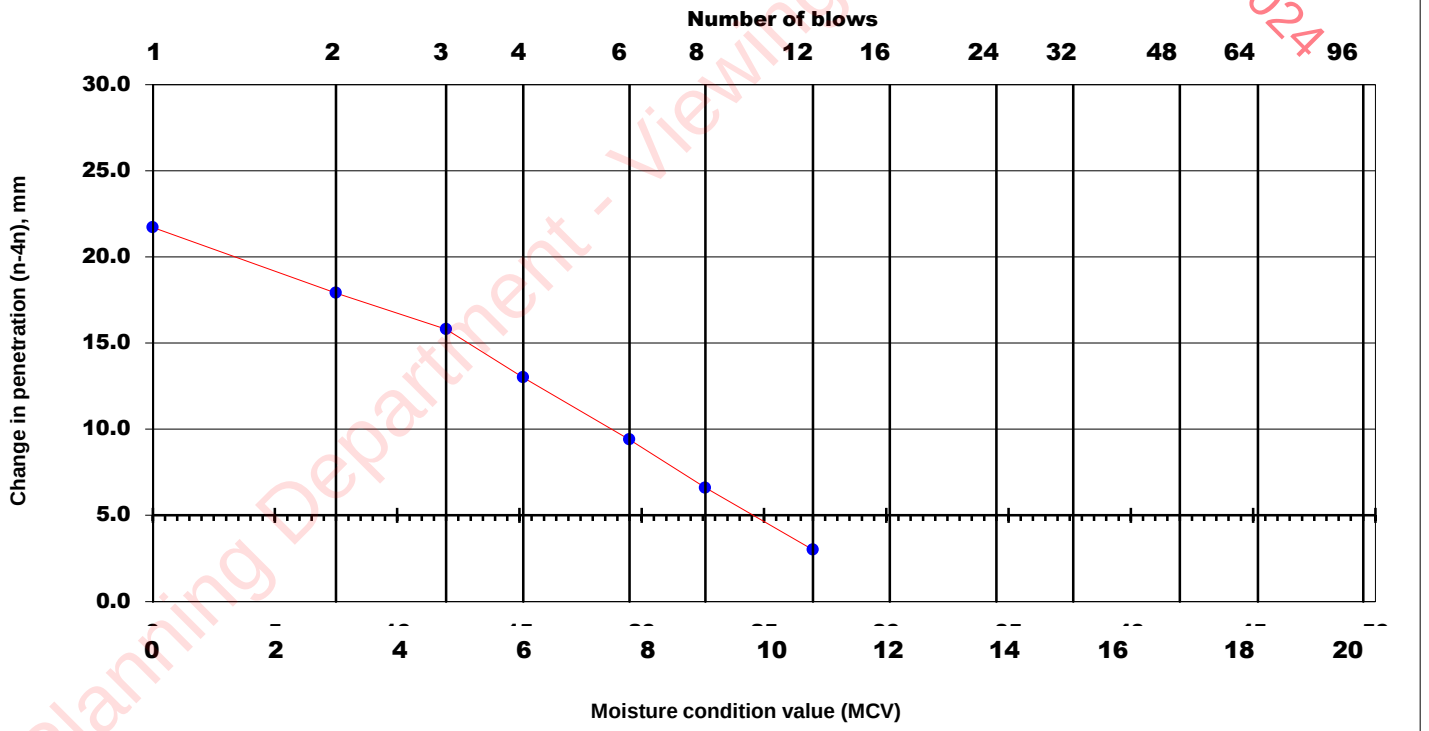
* Delete as appropriate

Project Name:	IPS Dundalk
Soil description:	Brown slightly sandy gravelly clayey SILT with occasional cobbles.
Test method	BS 1377 : Part 4 : 1990 : 5

Job ref.	NMTL2825 GII Project ID 8115-10-18
Borehole/ Pit No.	TP101
Sample no.	B
Depth	0.50m
Date Tested	31/01/2019
Date Sampled	N/A
Date Received	22/01/2019

MCV **9.8** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	65.8	21.7
2	77.4	17.9
3	83.2	15.8
4	87.5	13.0
6	92.2	9.4
8	95.3	6.6
12	99.0	3.0
16	100.5	
24	101.6	
32	101.9	
48	102.0	
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Ms	Nc	Bc

SINGLE POINT MOISTURE CONDITION VALUE TEST

Single sample mass		
Initial sample mass	1495.62	g
Moisture content	14.0	%
Dry mass	1311.5	g
Mass retained on 20mm sieve	20.0	g %

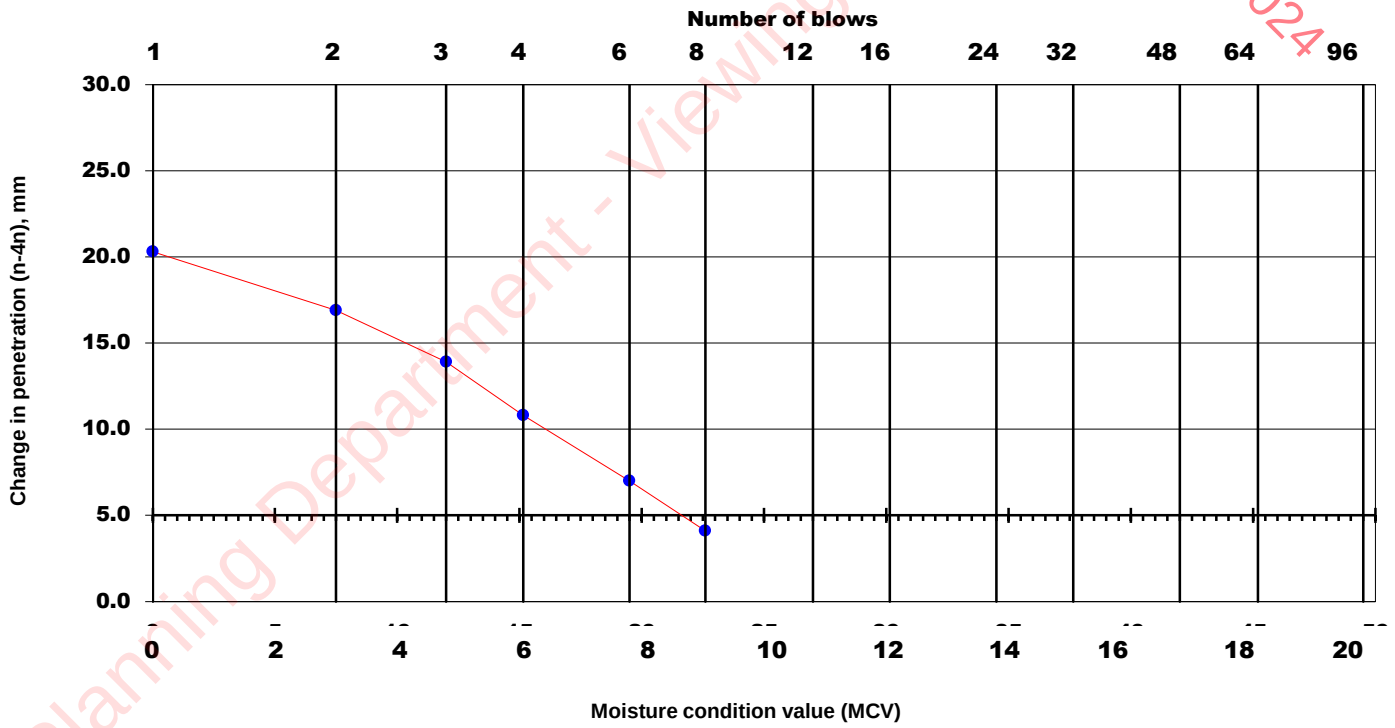
* Delete as appropriate

Project Name:	IPS Dundalk
Soil description:	Brown slightly sandy gravelly silty CLAY with occasional cobbles.
Test method	BS 1377 : Part 4 : 1990 : 5

Job ref.	NMTL2825 GII Project ID 8115-10-18
Borehole/ Pit No.	TP105
Sample no.	B
Depth	1.00m
Date Tested	31/01/2019
Date Sampled	N/A
Date Received	22/01/2019

MCV **8.6** **Natural**

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	77.8	20.3
2	88.5	16.9
3	94.4	13.9
4	98.1	10.8
6	102.4	7.0
8	105.4	4.1
12	108.3	
16	108.9	
24	109.4	
32	109.5	
48		
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Ms	Nc	Bc

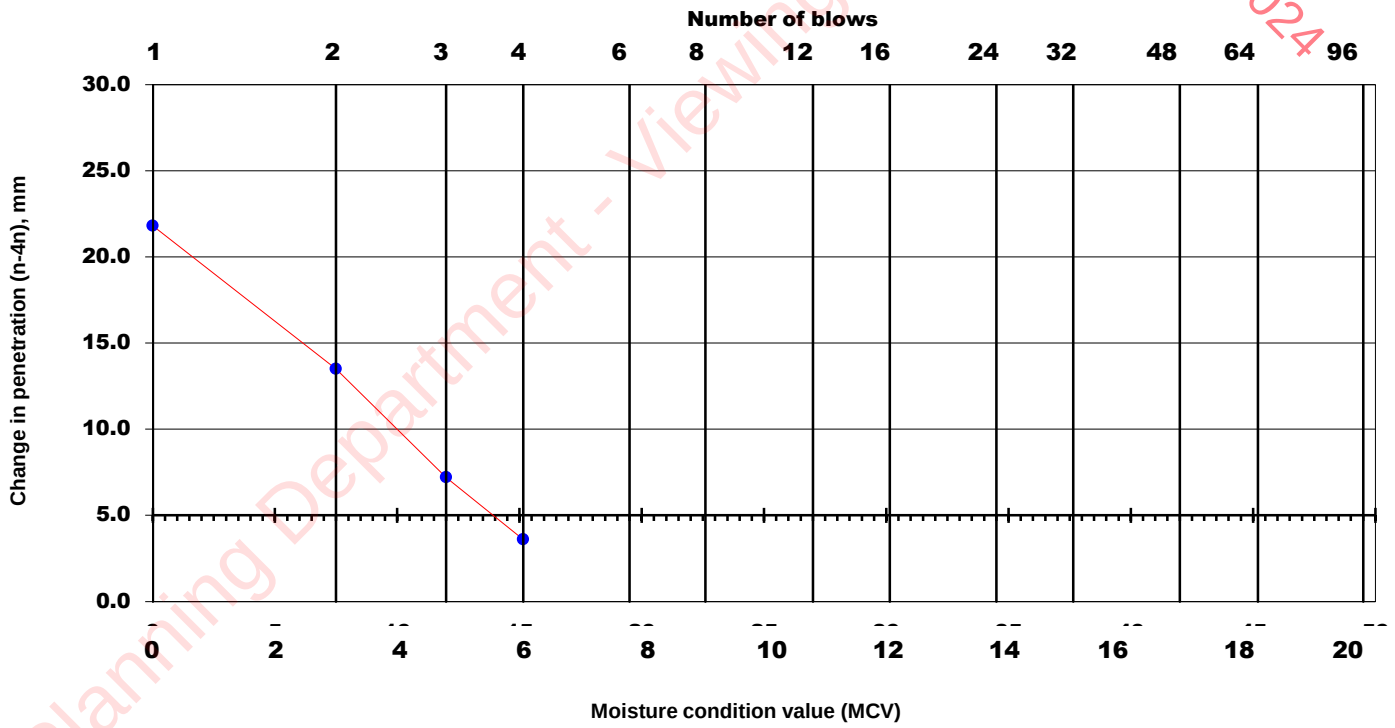
SINGLE POINT MOISTURE CONDITION VALUE TEST

Single sample mass		
Initial sample mass	1492.29	g
Moisture content	17.7	%
Dry mass	1267.6	g
Mass retained on 20mm sieve	g	7.29 %

* Delete as appropriate

Project Name: IPS Dundalk		Job ref.	NMTL2825 GII Project ID 8115-10-18
		Borehole/ Pit No.	TP25
Soil description:		Sample no.	B
Brown slightly sandy slightly gravelly SILT/CLAY		Depth	1.0m
Test method	BS 1377 : Part 4 : 1990 : 5	Date Tested	14/02/2019
		Date Sampled	N/A
MCV	**5.6** **Natural**	Date Received	22/01/2019

Total number of blows n	Penetration or protrusion mm	Change in penetration n to 4n mm
1	65.2	21.8
2	53.4	13.5
3	47.1	7.2
4	43.4	3.6
6	40.6	
8	39.9	
12	39.9	
16	39.8	
24		
32		
48		
64		
96		
128		
192		
256		



NMTL Ltd

Operator	Checked	Approved
Ms	Nc	Bc

NATIONAL MATERIALS TESTING LABORATORY LTD.

DETERMINATION OF THE CALIFORNIA BEARING RATIO TEST
BS 1377 : PART 4 : CLAUSE 7 : 1990

Soil Description: Brown slightly sandy slightly gravelly SILT/CLAY

Date: 14-Feb-19

Test Method: BS 1377: Part 4 : 1990 :7.4

Force Measuring Device: VJT 08211 — Test 1

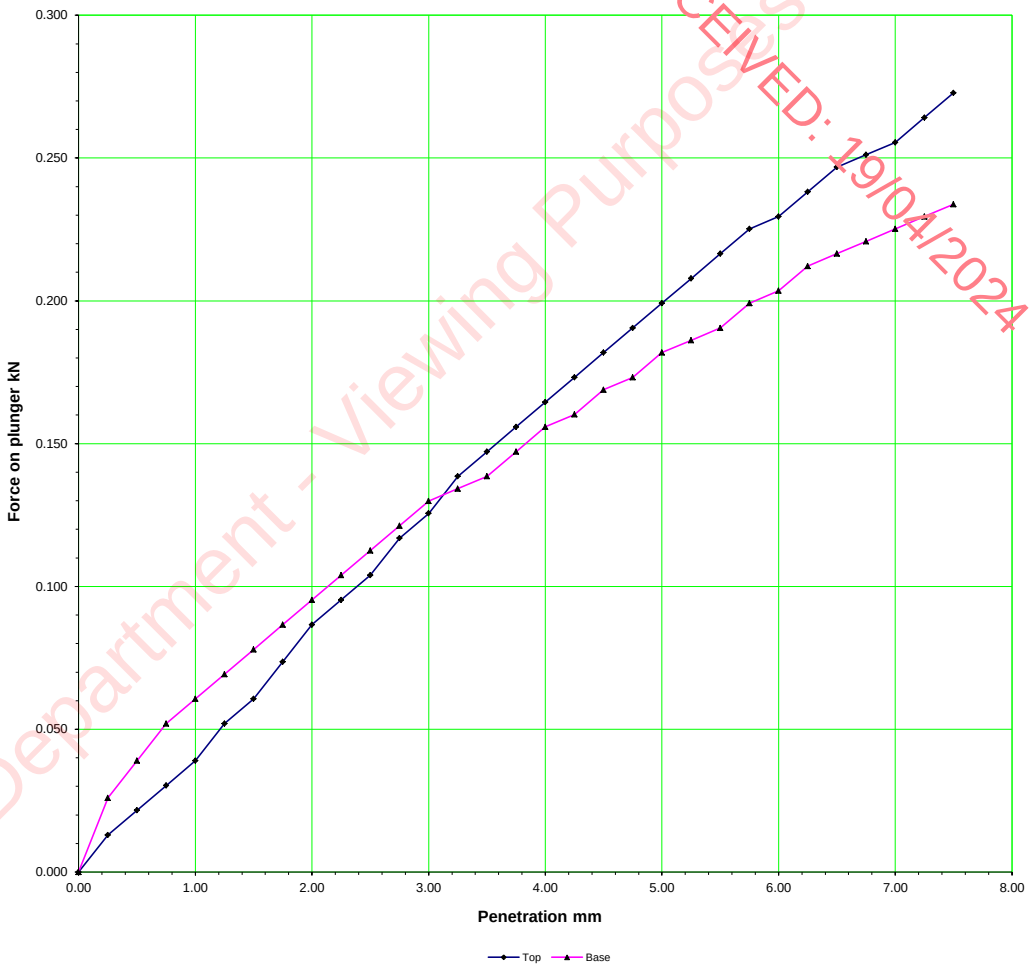
Preperatic: Remoulded with 2.5 kg rammer at natural moisture content

Surcharge: 10 kPa — Mean Calibration: 4.33 N/Div

Penetration of plunger mm — Force Gauge reading divisions — Force on plunger kN — California Bearing Ratio Results %

Penetration of plunger mm	Force Gauge reading divisions Top	Force Gauge reading divisions Bottom	Force on plunger kN Top	Force on plunger kN Bottom	California Bearing Ratio Results % Top	California Bearing Ratio Results % Base
0.00	0.0	0.0	0.000	0.000		
0.25	3.0	6.0	0.013	0.026		
0.50	5.0	9.0	0.022	0.039		
0.75	7.0	12.0	0.030	0.052		
1.00	9.0	14.0	0.039	0.061		
1.25	12.0	16.0	0.052	0.069		
1.50	14.0	18.0	0.061	0.078		
1.75	17.0	20.0	0.074	0.087		
2.00	20.0	22.0	0.087	0.095		
2.25	22.0	24.0	0.095	0.104		
2.50	**24.0**	**26.0**	**0.104**	**0.113**	**0.79**	**0.85**
2.75	27.0	28.0	0.117	0.121		
3.00	29.0	30.0	0.126	0.130		
3.25	32.0	31.0	0.139	0.134		
3.50	34.0	32.0	0.147	0.139		
3.75	36.0	34.0	0.156	0.147		
4.00	38.0	36.0	0.165	0.156		
4.25	40.0	37.0	0.173	0.160		
4.50	42.0	39.0	0.182	0.169		
4.75	44.0	40.0	0.191	0.173		
5.00	**46.0**	**42.0**	**0.199**	**0.182**	**1.00**	**0.91**
5.25	48.0	43.0	0.208	0.186		
5.50	50.0	44.0	0.217	0.191		
5.75	52.0	46.0	0.225	0.199		
6.00	53.0	47.0	0.229	0.204		
6.25	55.0	49.0	0.238	0.212		
6.50	57.0	50.0	0.247	0.217		
6.75	58.0	51.0	0.251	0.221		
7.00	59.0	52.0	0.255	0.225		
7.25	61.0	53.0	0.264	0.229		
7.50	63.0	54.0	0.273	0.234		

		Top	Middle	Base		
Moisture content after test					Specimen wt g	5055
Container No.		Tray	Tray	Tray	Diameter mm	152
Mass of wet soil + container	g	######	2057.60	1483.17	Length mm	127.0
Mass of dry soil + container	g	######	1782.51	1290.95		
Weight of container	g	188.25	144.62	145.80		
Mass of moisture	g	260.94	275.09	192.22	Average MC %	16.78
Dry weight	g	######	1637.89	1145.15	Density Mg/m3	2.19
Moisture content	%	16.76	16.80	16.79	Dry Density Mg/m3	1.88



NM TL Ltd

Project: IPS Dundalk

GII Project ID: 8115-10-18

		Date		
Operator	Tch	14-Feb-19	Trial Pit No.	TP20
Checked	Nc		Sample No.	B
Approved	Bc		Depth	0.50m

Project No. NMTL2825

Certificate of Analysis

Certificate Number	19-01332
	28-Jan-19
Client	Professional Soils Laboratory Ltd 5/7 Hexthorpe Road Hexthorpe DN4 0AR

Our Reference	19-01332
Client Reference	PSL19/0529
Order No	(not supplied)
Contract Title	IPS Dundalk
Description	2 Soil samples.
Date Received	24-Jan-19
Date Started	24-Jan-19
Date Completed	28-Jan-19
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 19-01332
Client Ref PSL19/0529
Contract Title IPS Dundalk

			Lab No	1449260	1449261
			Sample ID	TP09	BH19
			Depth	1.00	2.00
			Other ID		
			Sample Type	B	B
			Sampling Date	23/01/19	23/01/19
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Inorganics					
pH	DETSC 2008#			7.2	7.5
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	13	< 10
Sulphur as S, Total	DETSC 2320	0.01	%	< 0.01	< 0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.01	< 0.01

Information in Support of the Analytical Results

Our Ref 19-01332
Client Ref PSL19/0529
Contract IPS Dundalk

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1449260	TP09 1.00 SOIL	23/01/19	PT 1L		
1449261	BH19 2.00 SOIL	23/01/19	PG		

Key: P-Plastic T-Tub G-Bag

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

LABORATORY REPORT

4043

Contract Number: PSL19/0529

Report Date: 29 January 2019

Client's Reference: 8115-10-18

Client Name: Ground Investigations Ireland Ltd
Catherinestown House
Hazelhatch Road
Newcastle
Co Durham

For the attention of: Conor Finnerty

Contract Title: IPS Dundalk

Date Received: 22/1/2019
Date Commenced: 22/1/2019
Date Completed: 29/1/2019

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

S Royle (Laboratory Manager)
S Eyre (Senior Technician)
L Knight (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH01		B	1.00		Brown mottled grey very gravelly sandy CLAY.
BH03		B	1.00		Brown very gravelly very sandy CLAY.
BH06		B	2.00		Brown very sandy clayey silty GRAVEL.
BH08		B	1.00		Brown very sandy clayey silty GRAVEL.
BH08		B	2.00		Brown very sandy clayey silty GRAVEL.
BH08		B	3.00		Brown sandy clayey silty GRAVEL.
BH09		B	1.00		Brown very gravelly sandy CLAY.
BH09		B	2.00		Brown very gravelly sandy CLAY.
BH10		B	1.00		Brown mottled grey very gravelly very sandy CLAY.
BH11		B	1.00		Brown very gravelly sandy CLAY.
BH11		B	2.00		Brown sandy clayey silty GRAVEL.
BH12		B	1.00		Brown very sandy clayey silty GRAVEL.
BH12		B	2.00		Brown slightly sandy clayey silty GRAVEL.
BH14		B	1.00		Brown very gravelly sandy CLAY.
BH15		B	1.00		Brown very gravelly sandy CLAY.
BH15		B	2.00		Brown very sandy clayey silty GRAVEL.
BH16		B	1.00		Brown very gravelly sandy CLAY.
BH16		B	2.00		Brown very gravelly sandy CLAY.
BH17		B	1.00		Brown mottled grey very gravelly very sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH18		B	2.00		Brown mottled grey very gravelly sandy CLAY.
BH19		B	1.00		Brown very gravelly sandy CLAY.
BH19		B	3.00		Brown very gravelly sandy CLAY.
BH20		B	1.00		Brown very gravelly sandy CLAY.
TP02		B	1.50		Brown very sandy clayey silty GRAVEL.
TP03		B	1.00		Brown very sandy clayey silty GRAVEL.
TP03		B	2.50		Brown sandy clayey GRAVEL with cobbles.
TP07		B	1.00		Brown very gravelly sandy CLAY.
TP09		B	1.00		Brown very sandy clayey silty GRAVEL.
TP09		B	2.30		Brown very sandy clayey silty GRAVEL.
TP11		B	1.00		Brown very gravelly sandy CLAY.
TP12		B	1.20		Brown very gravelly sandy CLAY.
TP16		B	3.40		Brown very gravelly very sandy CLAY.
TP18		B	1.80		Brown very gravelly very sandy CLAY.
TP22		B	1.60		Brown very gravelly slightly sandy CLAY.
TP24		B	0.90		Brown very gravelly very sandy CLAY.
TP24		B	2.30		Brown clayey silty SAND & GRAVEL.
TP26		B	1.50		Brown very gravelly sandy CLAY.
TP29		B	3.50		Brown mottled grey sandy clayey GRAVEL with many cobbles.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP30		B	1.00		Brown sandy clayey silty GRAVEL.

UKAS TESTING
4043

PSL
Professional Soils Laboratory

IPS Dundalk

Contract No:
PSL19/0529
Client Ref:
8115-101-18

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH01		B	1.00		17			41	21	20	57	Intermediate plasticity CI.
BH03		B	1.00		15			37	19	18	46	Intermediate plasticity CI.
BH06		B	2.00		5.8							
BH08		B	1.00		14							
BH08		B	2.00		12				NP			
BH08		B	3.00		9.0							
BH09		B	1.00		14							
BH09		B	2.00		15			34	18	16	44	Low plasticity CL.
BH10		B	1.00		16			36	19	17	47	Intermediate plasticity CI.
BH11		B	1.00		22							
BH11		B	2.00		1.9							
BH12		B	1.00		15							
BH12		B	2.00		13							
BH14		B	1.00		15							
BH15		B	1.00		14			33	18	15	44	Low plasticity CL.
BH15		B	2.00		14							
BH16		B	1.00		14							
BH16		B	2.00		14							
BH17		B	1.00		18			38	19	19	48	Intermediate plasticity CI.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

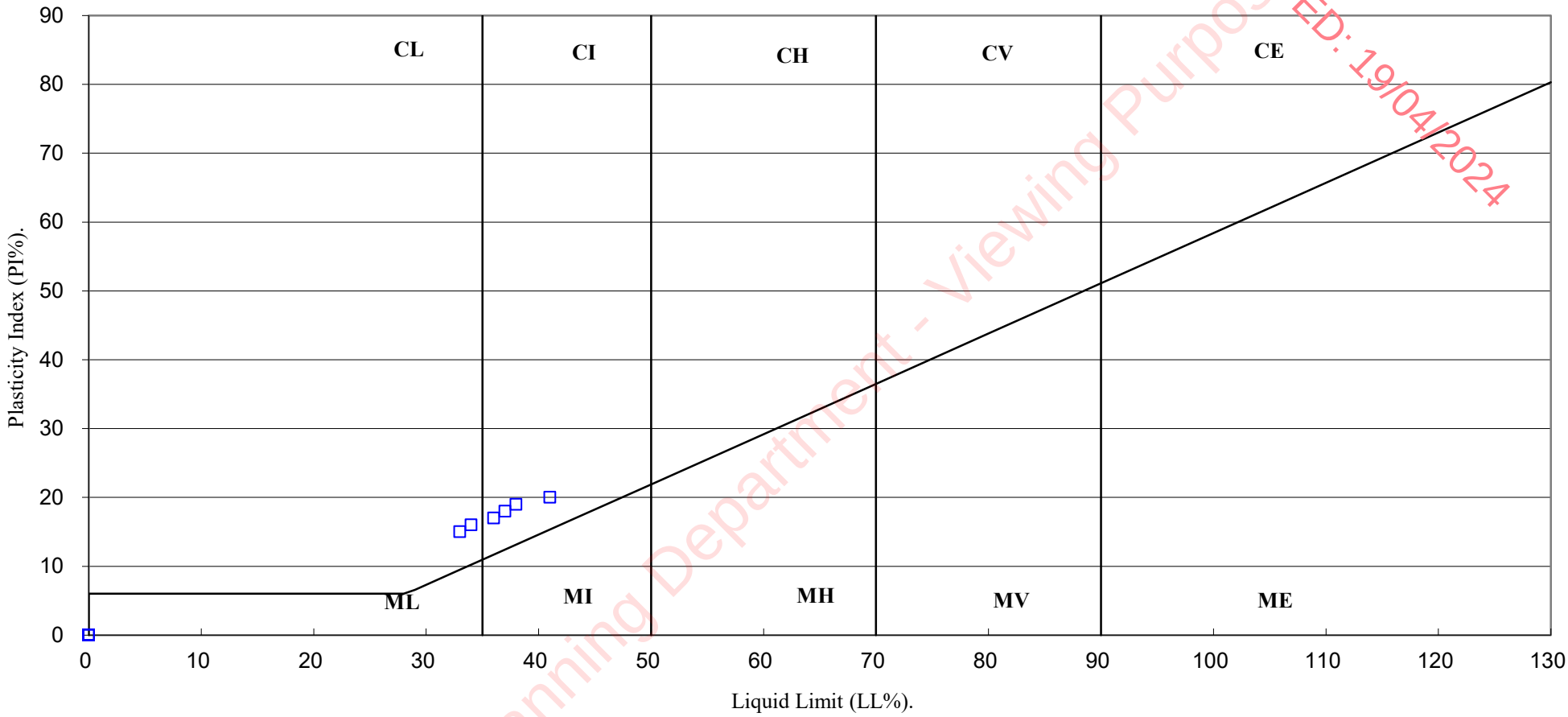
UKAS TESTING 4043

PSL Professional Soils Laboratory

IPS Dundalk

Contract No:
PSL19/0529
Client Ref:
8115-10-18

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	IPS Dundalk	Contract No: PSL19/0529 Client Ref: 8115-10-18

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH18		B	2.00		16			36	18	18	44	Intermediate plasticity CI.
BH19		B	1.00		16							
BH19		B	3.00		18			38	19	19	42	Intermediate plasticity CI.
BH20		B	1.00		11							
TP02		B	1.50		12							
TP03		B	1.00		14							
TP03		B	2.50		11							
TP07		B	1.00		22							
TP09		B	1.00		17							
TP09		B	2.30		15							
TP11		B	1.00		20							
TP12		B	1.20		13							
TP16		B	3.40		19							
TP18		B	1.80		15							
TP22		B	1.60		15							
TP24		B	0.90		13							
TP24		B	2.30		15							
TP26		B	1.50		13							
TP29		B	3.50		9.0							

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

IPS Dundalk

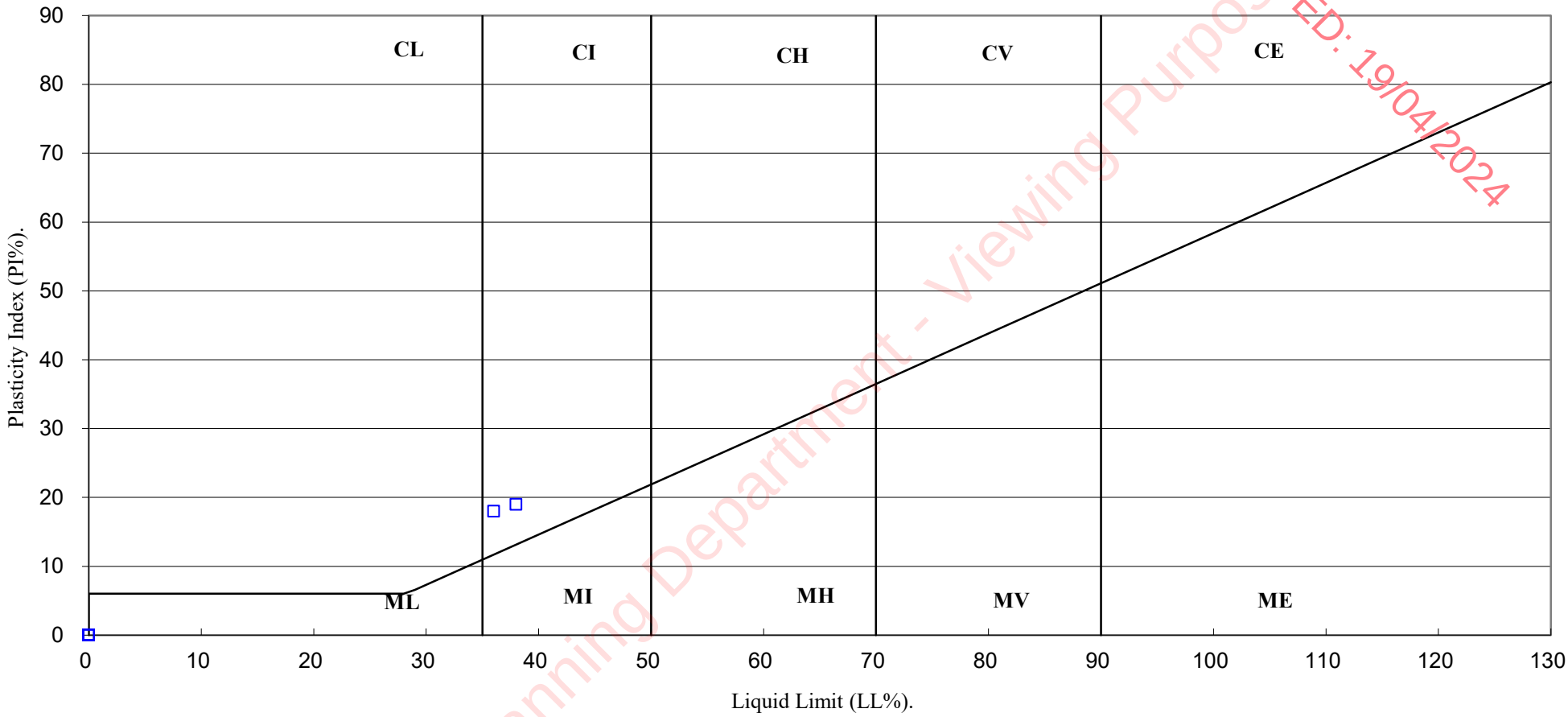
Contract No:

PSL19/0529

Client Ref:

8115-10-18

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	Professional Soils Laboratory	IPS Dundalk	Contract No: PSL19/0529 Client Ref: 8115-10-18

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP30		B	1.00		14							

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

IPS Dundalk

Contract No:

PSL19/0529

Client Ref:

8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

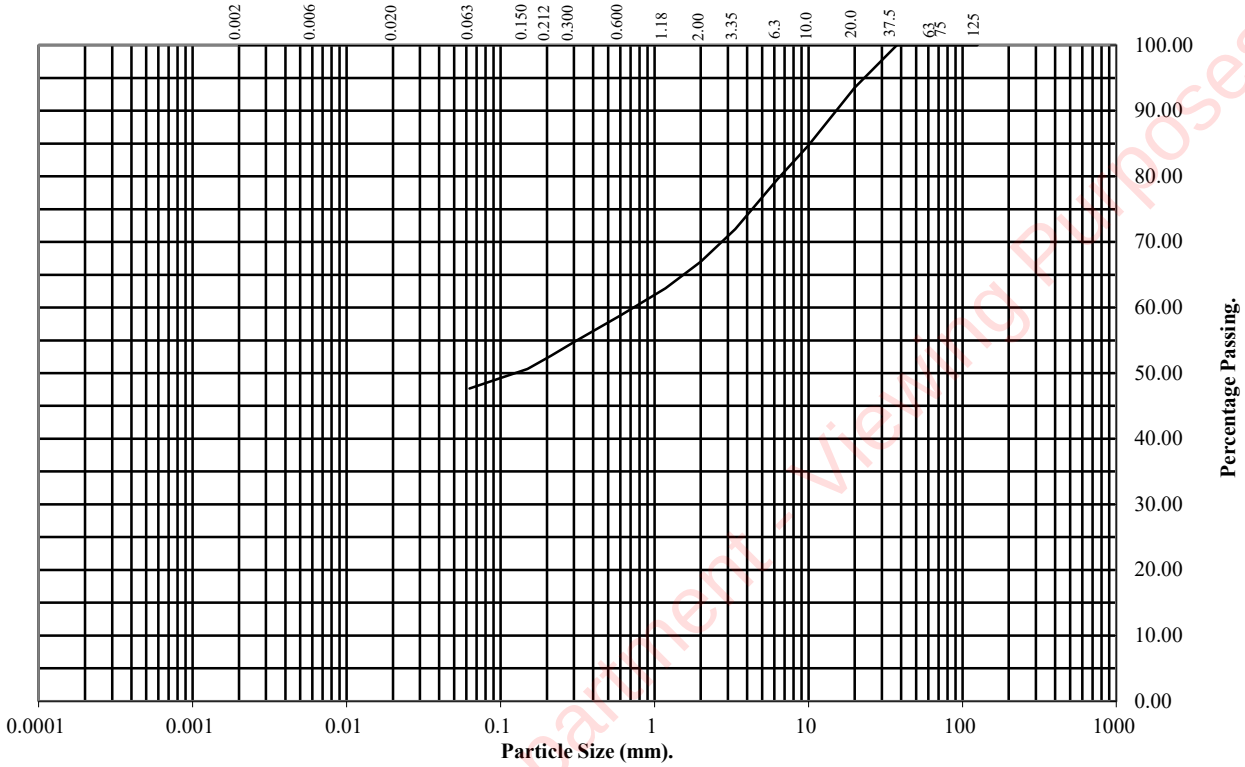
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH01 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	94
10	85
6.3	80
3.35	72
2	67
1.18	63
0.6	59
0.3	55
0.212	53
0.15	51
0.063	48

Soil Fraction	Total Percentage
Cobbles	0
Gravel	33
Sand	19
Silt/Clay	48

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

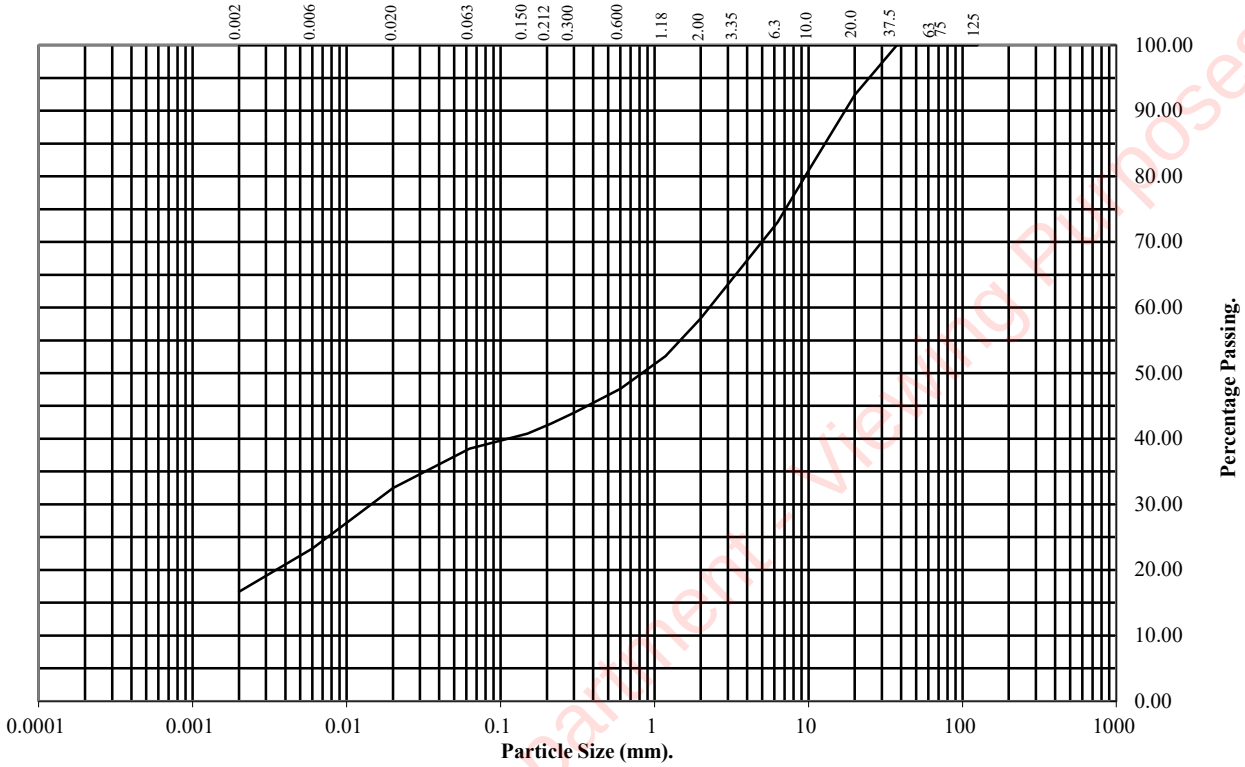
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH03 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	92
10	81
6.3	73
3.35	65
2	58
1.18	53
0.6	48
0.3	44
0.212	42
0.15	41
0.063	38

Particle Diameter	Percentage Passing
0.02	32
0.006	23
0.002	17

Soil Fraction	Total Percentage
Cobbles	0
Gravel	42
Sand	20
Silt	21
Clay	17

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

IPS Dundalk

Contract No:
PSL19/0529
Client Ref:
8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

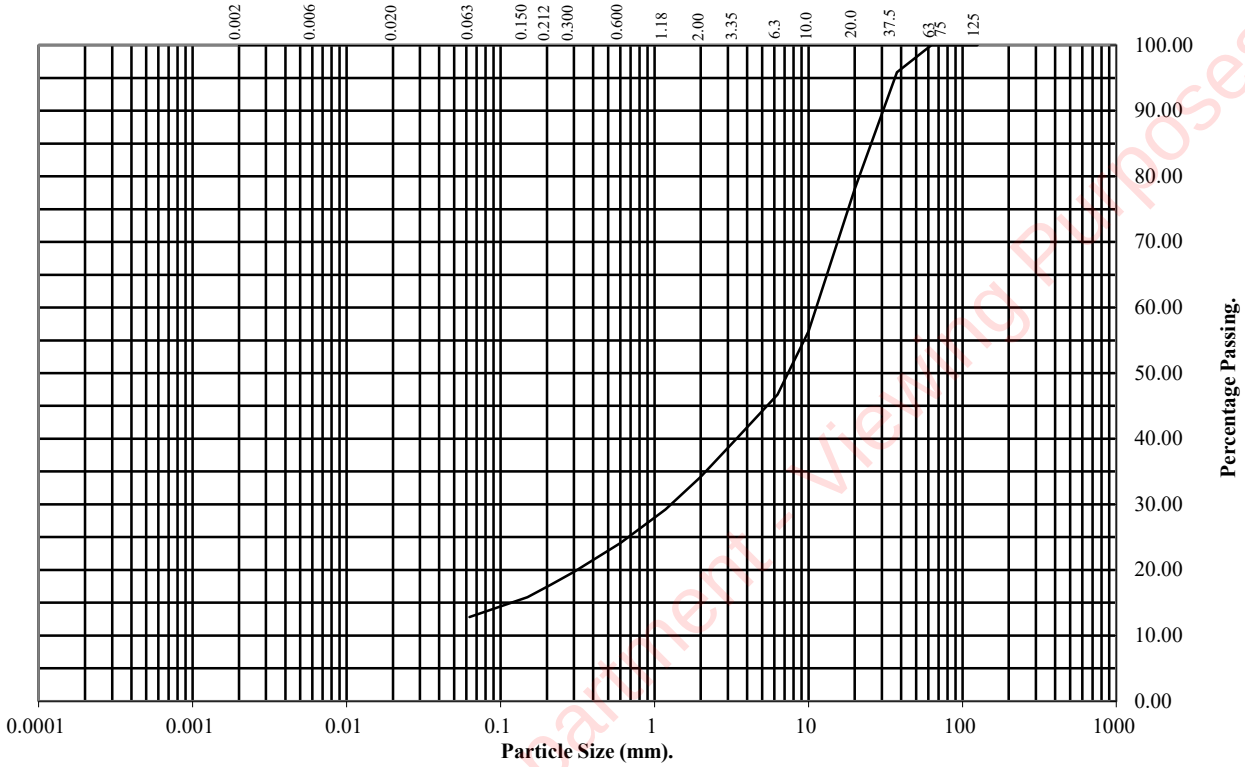
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH08 **Top Depth (m):** 2.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	96
20	78
10	56
6.3	47
3.35	40
2	34
1.18	29
0.6	24
0.3	20
0.212	18
0.15	16
0.063	13

Soil Fraction	Total Percentage
Cobbles	0
Gravel	66
Sand	21
Silt/Clay	13

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

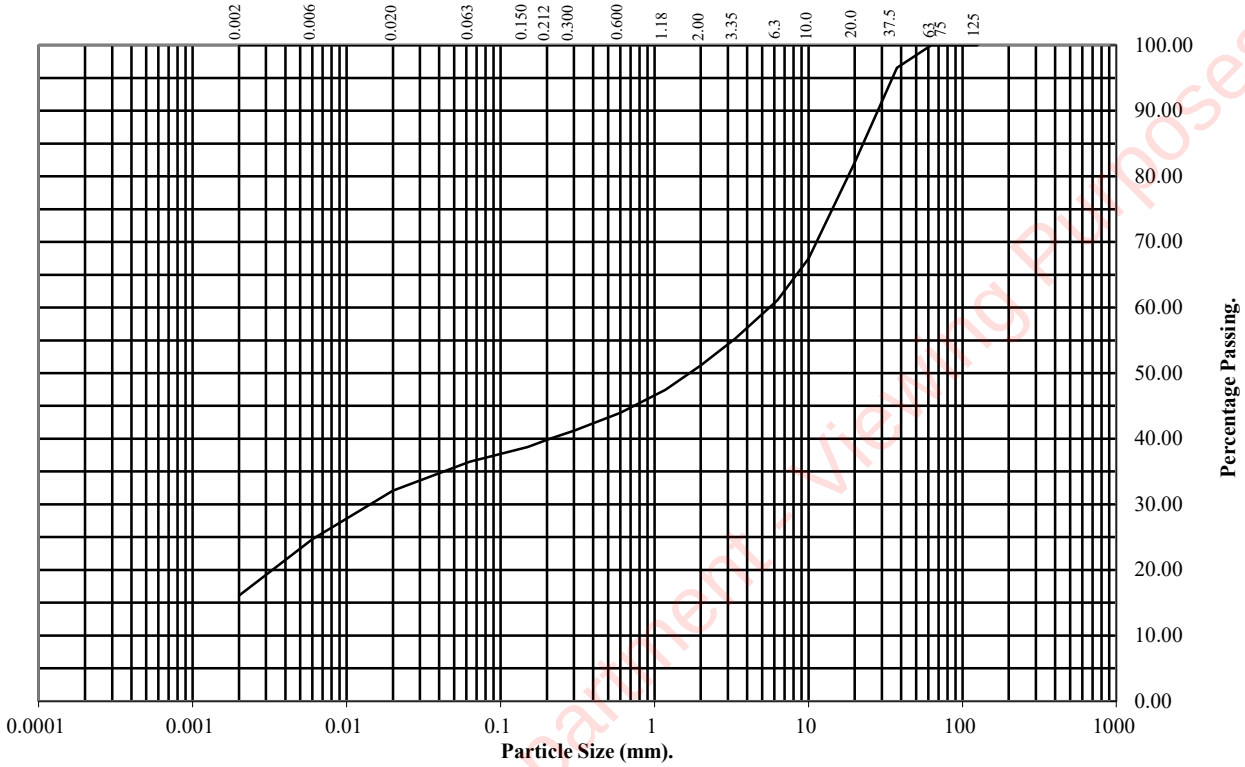
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH09 **Top Depth (m):** 2.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	97
20	82
10	67
6.3	61
3.35	55
2	51
1.18	47
0.6	44
0.3	41
0.212	40
0.15	39
0.063	36

Particle Diameter	Percentage Passing
0.02	32
0.006	25
0.002	16

Soil Fraction	Total Percentage
Cobbles	0
Gravel	49
Sand	15
Silt	20
Clay	16

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

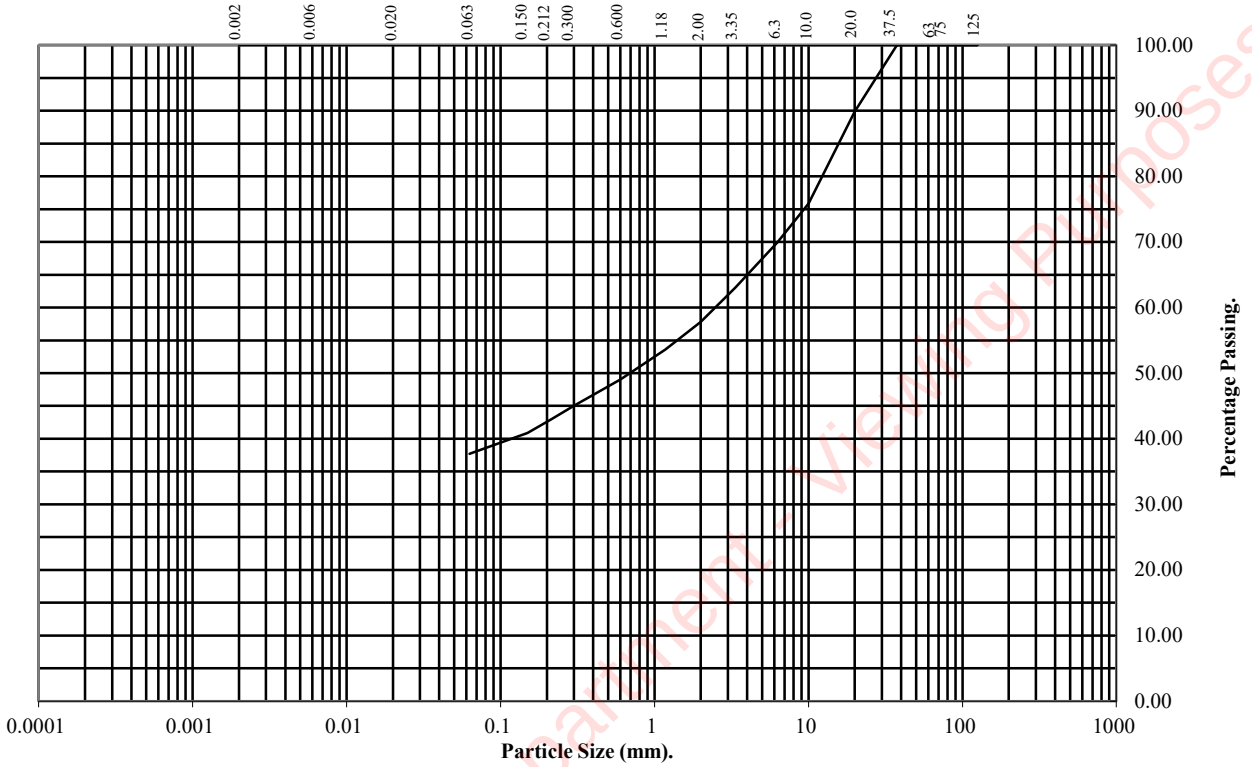
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH10 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	90
10	76
6.3	70
3.35	63
2	58
1.18	54
0.6	49
0.3	45
0.212	43
0.15	41
0.063	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	42
Sand	20
Silt/Clay	38

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

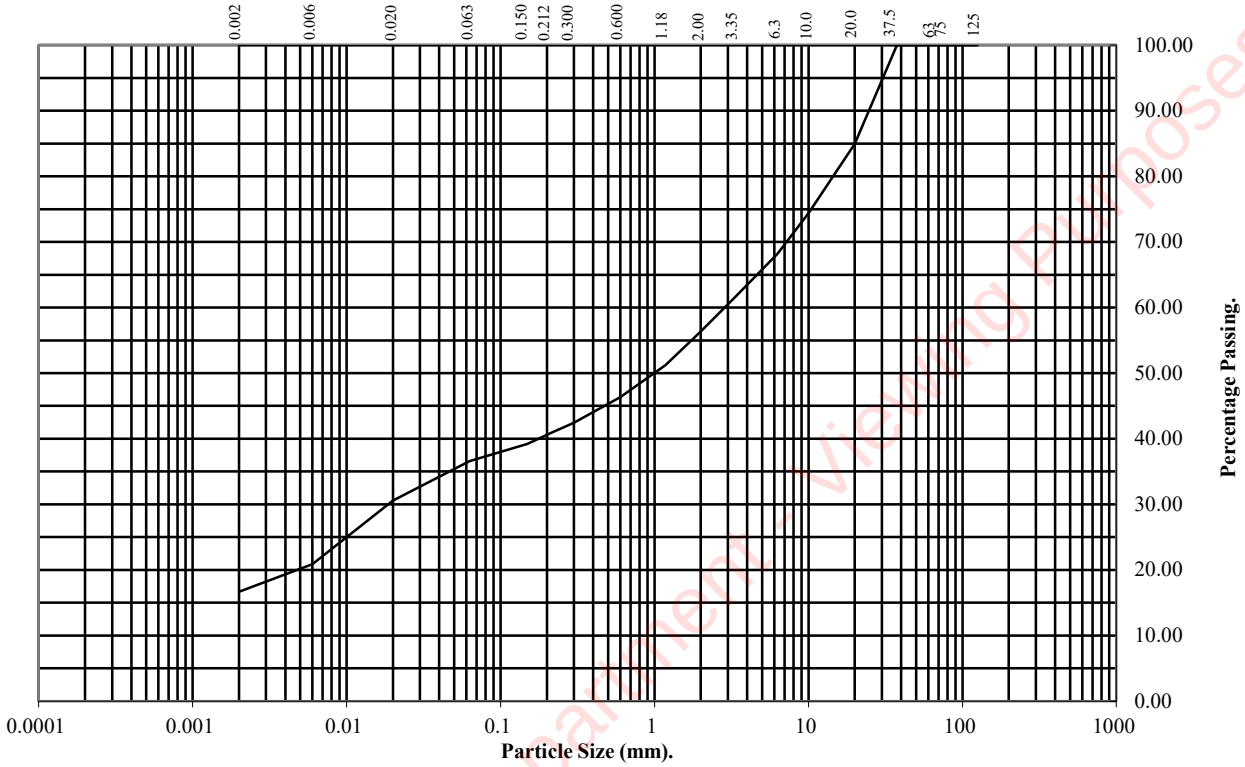
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH15 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	85
10	74
6.3	68
3.35	62
2	56
1.18	51
0.6	46
0.3	42
0.212	41
0.15	39
0.063	37

Particle Diameter	Percentage Passing
0.02	31
0.006	21
0.002	17

Soil Fraction	Total Percentage
Cobbles	0
Gravel	44
Sand	19
Silt	20
Clay	17

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

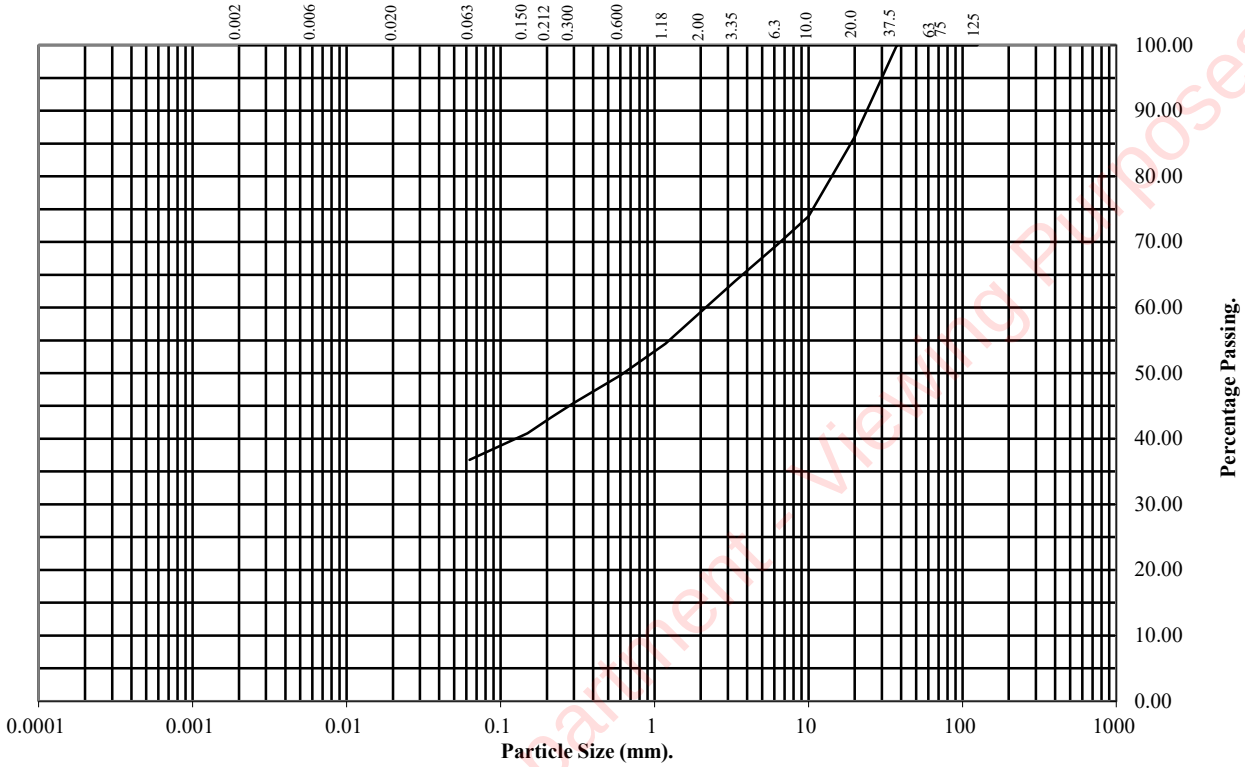
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH17 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	86
10	74
6.3	70
3.35	64
2	59
1.18	55
0.6	50
0.3	45
0.212	43
0.15	41
0.063	37

Soil Fraction	Total Percentage
Cobbles	0
Gravel	41
Sand	22
Silt/Clay	37

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

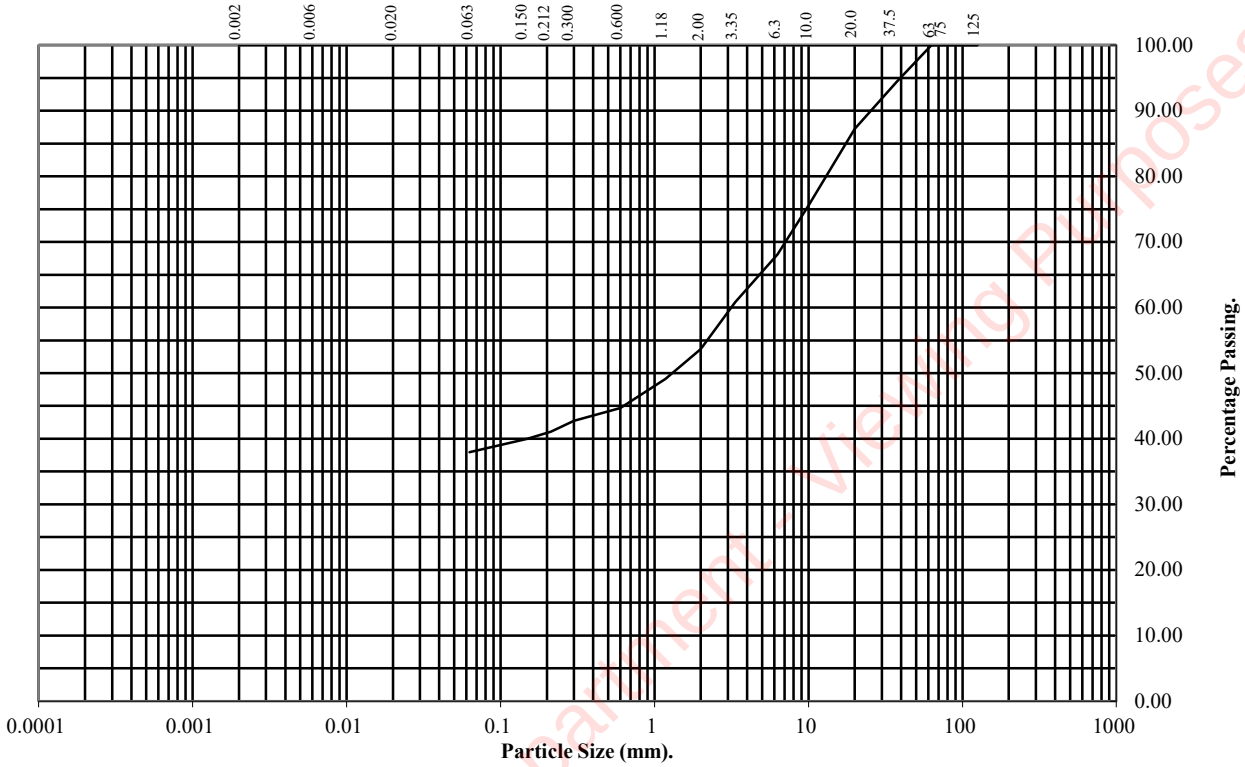
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH18 **Top Depth (m):** 2.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	94
20	87
10	76
6.3	68
3.35	61
2	54
1.18	49
0.6	45
0.3	43
0.212	41
0.15	40
0.063	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	46
Sand	16
Silt/Clay	38

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

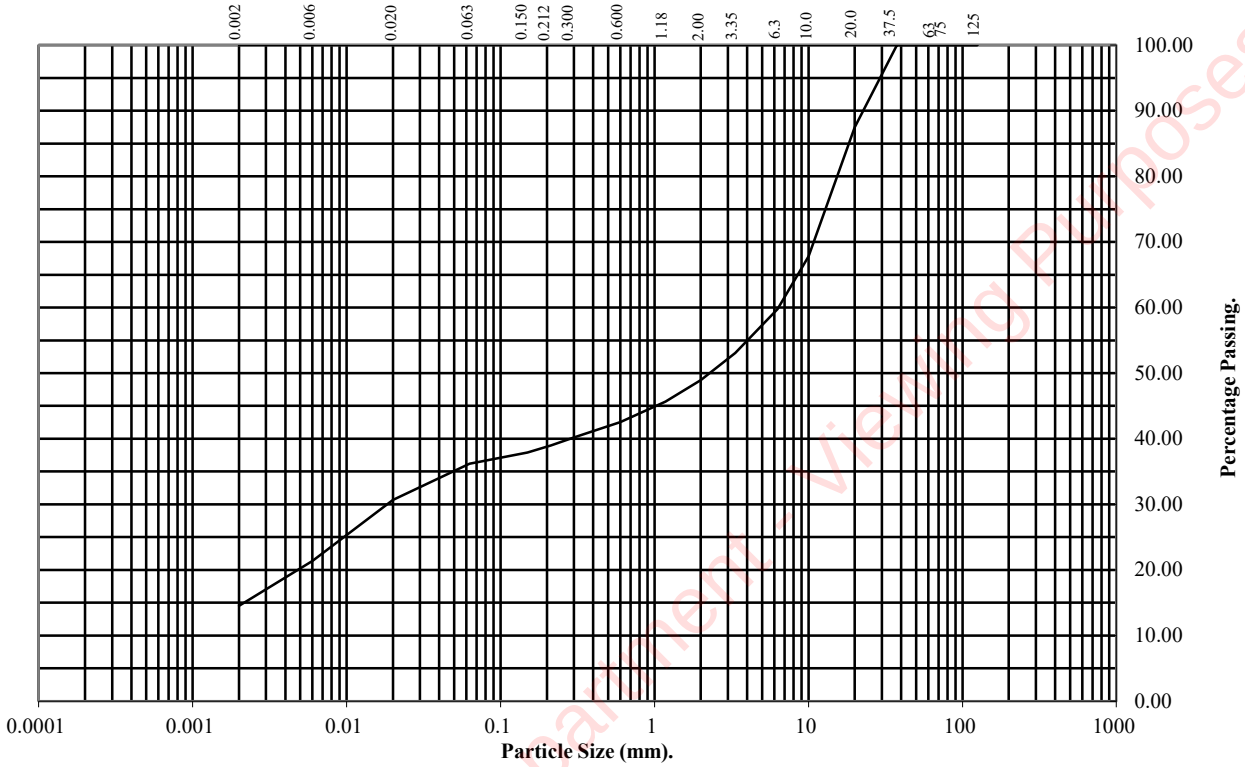
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH19 **Top Depth (m):** 3.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	87
10	68
6.3	60
3.35	53
2	49
1.18	46
0.6	43
0.3	40
0.212	39
0.15	38
0.063	36

Particle Diameter	Percentage Passing
0.02	31
0.006	21
0.002	15

Soil Fraction	Total Percentage
Cobbles	0
Gravel	51
Sand	13
Silt	21
Clay	15

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

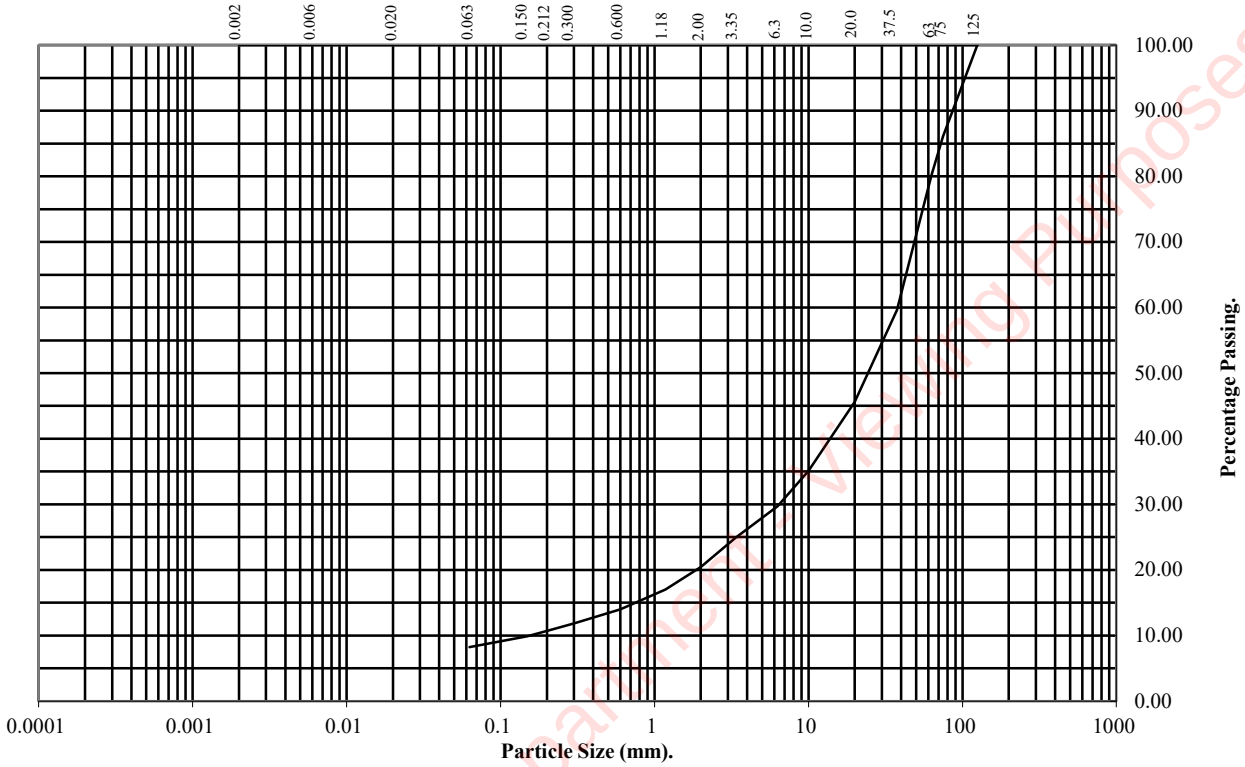
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP03 **Top Depth (m):** 2.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	86
63	80
37.5	60
20	46
10	35
6.3	30
3.35	25
2	20
1.18	17
0.6	14
0.3	12
0.212	11
0.15	10
0.063	8

Soil Fraction	Total Percentage
Cobbles	20
Gravel	60
Sand	12
Silt/Clay	8

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

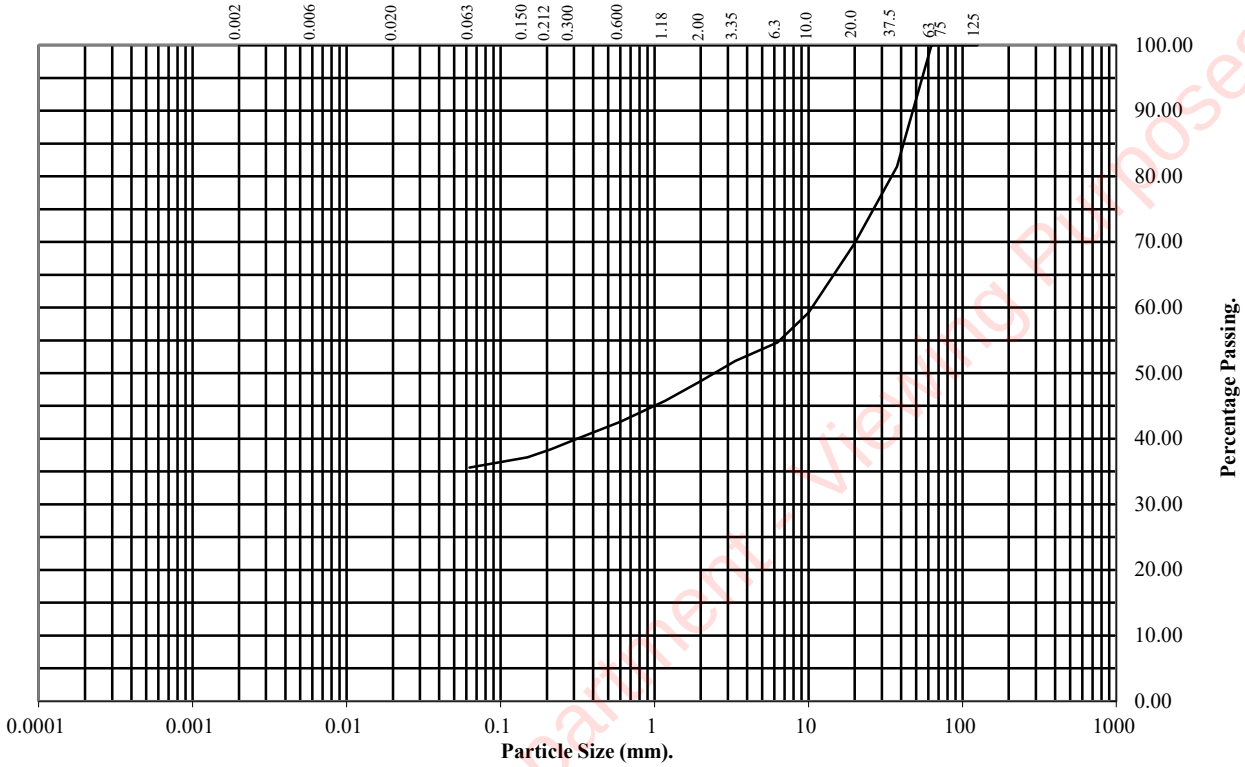
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP12 **Top Depth (m):** 1.20

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	81
20	70
10	59
6.3	55
3.35	52
2	49
1.18	46
0.6	43
0.3	40
0.212	38
0.15	37
0.063	36

Soil Fraction	Total Percentage
Cobbles	0
Gravel	51
Sand	13
Silt/Clay	36

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

PARTICLE SIZE DISTRIBUTION TEST

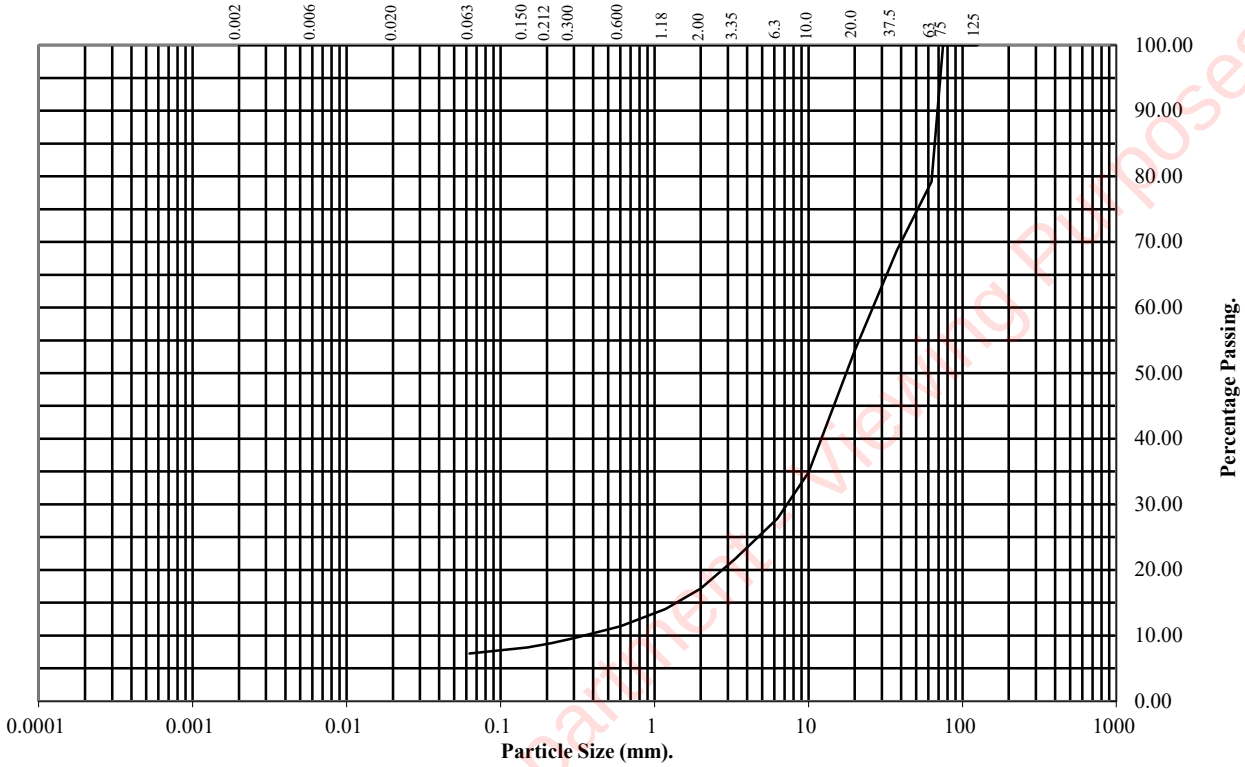
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP29 **Top Depth (m):** 3.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	79
37.5	69
20	53
10	35
6.3	28
3.35	22
2	17
1.18	14
0.6	11
0.3	10
0.212	9
0.15	8
0.063	7

Soil Fraction	Total Percentage
Cobbles	21
Gravel	62
Sand	10
Silt/Clay	7

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043	PSL Professional Soils Laboratory	**IPS Dundalk**	**Contract No:** PSL19/0529 **Client Ref:** 8115-10-18

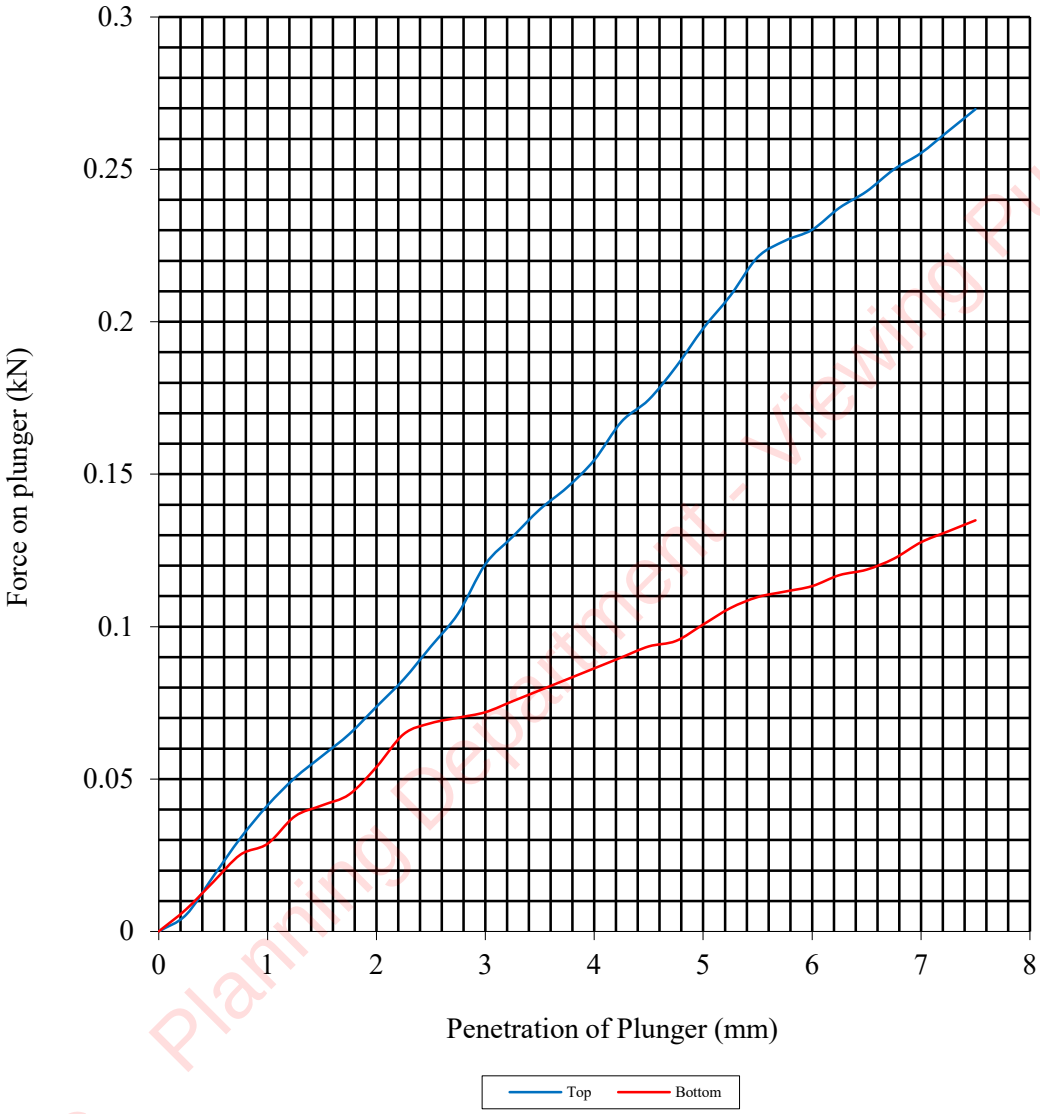
CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

Hole Number: TP12 **Top Depth (m):** 1.20

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	18	Surcharge Kg:	4.20	Sample Top	18	Sample Top	1.0
Bulk Density Mg/m3:	2.08	Soaking Time hrs	0	Sample Bottom	18	Sample Bottom	0.5
Dry Density Mg/m3:	1.76	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			40				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

IPS Dundalk

Contract No:
PSL19/0529
Client Ref:
8115-10-18

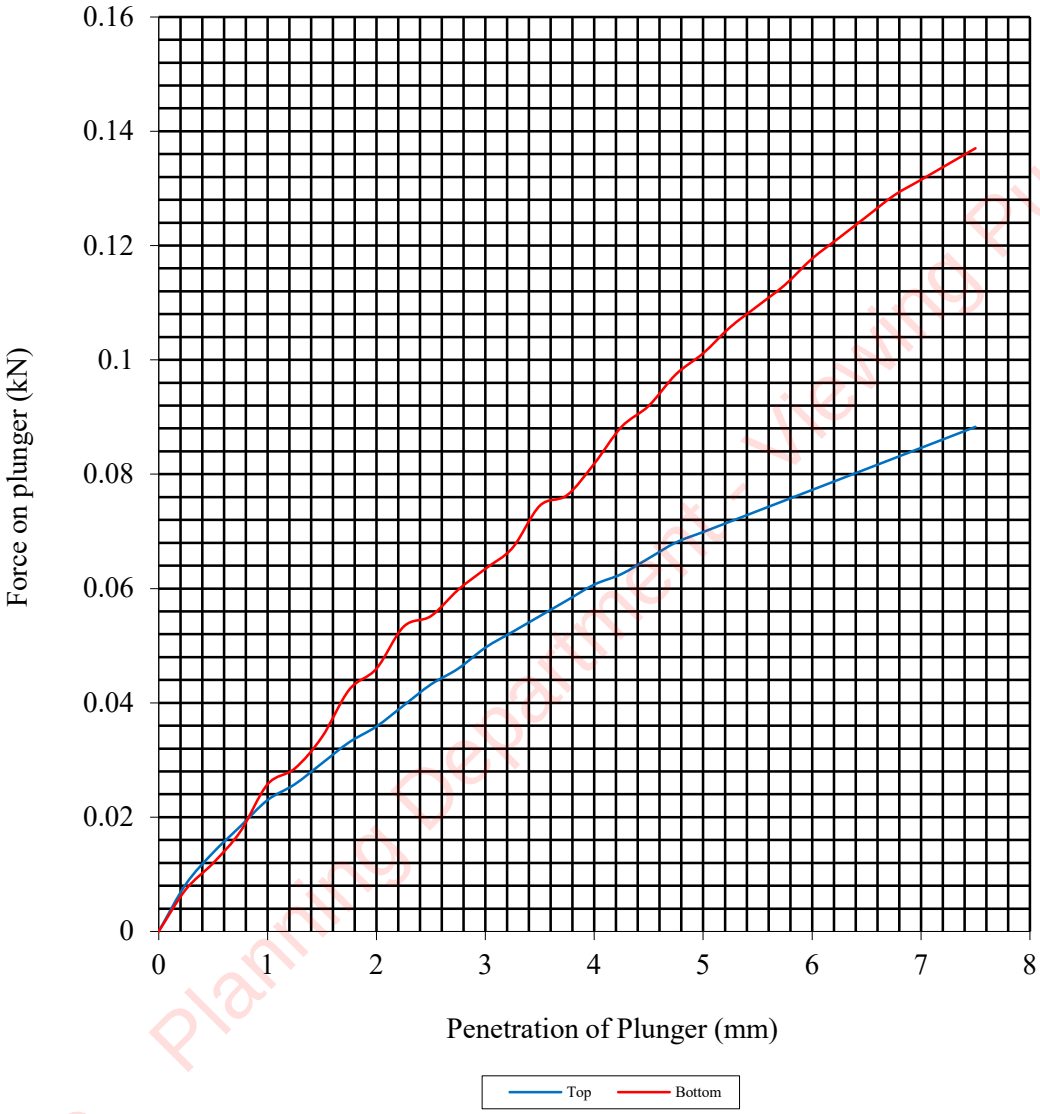
CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

Hole Number: TP16 **Top Depth (m):** 3.40

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	19	Surcharge Kg:	4.20	Sample Top	19	Sample Top	0.3
Bulk Density Mg/m3:	2.10	Soaking Time hrs	0	Sample Bottom	18	Sample Bottom	0.5
Dry Density Mg/m3:	1.77	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			32				
Compaction Conditions		2.5kg					

MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

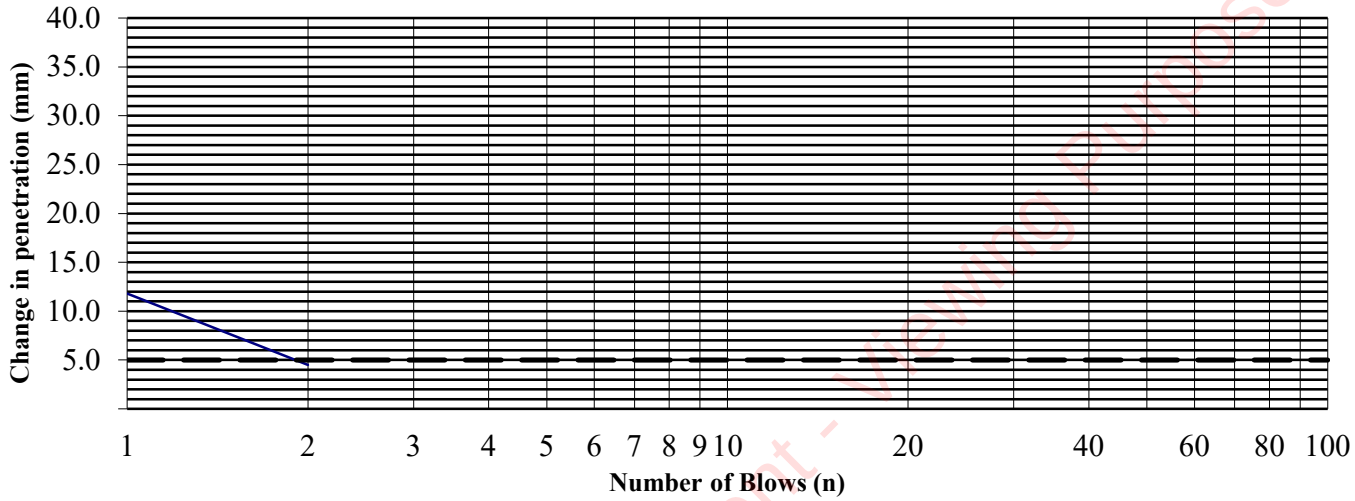
Hole Number: TP02 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B

Material Retained on the 20mm BS Test Sieve (%):	22
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	71.2	11.8
2	63.1	4.5
3	60.0	
4	59.4	
6	58.8	
8	58.6	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Moisture Content (%)	19
MCV	2.9

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

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

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

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Attention :	Conor Costigan
Date :	30th November, 2018
Your reference :	8115-10-18
Our reference :	Test Report 18/18873 Batch 1
Location :	Dundalk IPS
Date samples received :	22nd November, 2018
Status :	Final report
Issue :	1

Seven samples were received for analysis on 22nd November, 2018 of which seven 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:

Bruce Leslie
Project Co-ordinator

Client Name: Ground Investigations Ireland
Reference: 8115-10-18
Location: Dundalk IPS
Contact: Conor Costigan
JE Job No.: 18/18873

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	TP2	TP4	TP14	TP22	TP17	TP24	TP27						
Depth	1.50	2.00	1.00	1.60	1.50	0.90	1.00						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018						
Antimony	2	1	2	1	2	2	2				<1	mg/kg	TM30/PM15
Arsenic #	4.0	2.5	4.6	5.0	5.7	3.4	4.1				<0.5	mg/kg	TM30/PM15
Barium #	120	64	77	112	101	73	117				<1	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM30/PM15
Chromium #	74.8	65.3	96.2	62.2	69.1	67.6	68.7				<0.5	mg/kg	TM30/PM15
Copper #	41	26	40	42	53	36	34				<1	mg/kg	TM30/PM15
Lead #	8	<5	8	11	9	8	7				<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM30/PM15
Molybdenum #	0.3	<0.1	0.7	0.7	0.4	1.0	0.6				<0.1	mg/kg	TM30/PM15
Nickel #	76.8	95.3	79.6	60.6	79.8	63.9	70.7				<0.7	mg/kg	TM30/PM15
Selenium #	1	2	2	<1	<1	<1	<1				<1	mg/kg	TM30/PM15
Zinc #	87	99	88	67	96	80	79				<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<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				<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<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				<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<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				<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<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				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<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				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<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				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<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				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<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				<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	<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				<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<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				<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1				<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	97	99	98	99	99	98	97				<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30	<30	<30				<30	mg/kg	TM5/PM8/PM16

Client Name: Ground Investigations Ireland
Reference: 8115-10-18
Location: Dundalk IPS
Contact: Conor Costigan
JE Job No.: 18/18873

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	TP2	TP4	TP14	TP22	TP17	TP24	TP27						
Depth	1.50	2.00	1.00	1.60	1.50	0.90	1.00						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018						
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<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				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<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				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26	<26	<26				<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<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				<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<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				<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<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				<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<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				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26	<26	<26				<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52	<52	<52				<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1	<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				<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10	<10	<10				<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35	<35	<35				<35	ug/kg	TM17/PM8

Client Name: Ground Investigations Ireland
Reference: 8115-10-18
Location: Dundalk IPS
Contact: Conor Costigan
JE Job No.: 18/18873

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	TP2	TP4	TP14	TP22	TP17	TP24	TP27						
Depth	1.50	2.00	1.00	1.60	1.50	0.90	1.00						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018						
Natural Moisture Content	13.7	7.8	10.4	12.5	13.2	12.6	14.0				<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	12.0	7.2	9.4	11.1	11.6	11.2	12.2				<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0045	0.0021	0.0168	<0.0015	0.0058	0.0136	0.0047				<0.0015	g/l	TM38/PM20
Chromium III	74.8	65.3	96.2	62.2	69.1	67.6	68.7				<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.07	0.10	0.08	0.08	0.15	0.07	0.06				<0.02	%	TM21/PM24
pH #	7.30	8.45	7.16	7.51	7.55	8.25	7.69				<0.01	pH units	TM73/PM11
Mass of raw test portion	0.105	0.1006	0.0988	0.1015	0.1039	0.1017	0.1054					kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09					kg	NONE/PM17

Client Name: Ground Investigations Ireland
Reference: 8115-10-18
Location: Dundalk IPS
Contact: Conor Costigan
JE Job No.: 18/18873

Report : CEN 10:1 1 Batch

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	TP2	TP4	TP14	TP22	TP17	TP24	TP27						
Depth	1.50	2.00	1.00	1.60	1.50	0.90	1.00						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018						
Dissolved Antimony #	<0.002	<0.002	0.002	<0.002	0.003	<0.002	<0.002				<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.02				<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	0.0038	<0.0025	<0.0025	<0.0025	<0.0025				<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	0.038	<0.025	<0.025	<0.025	<0.025				<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.003				<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<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				<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015				<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015				<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<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				<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<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				<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002				<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<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				<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<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				<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001				<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<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				<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3	0.7	<0.3				<0.3	mg/l	TM173/PM0
Fluoride	<3	<3	<3	<3	<3	7	<3				<3	mg/kg	TM173/PM0
Sulphate as SO4 #	0.51	0.27	0.28	0.36	0.31	0.34	0.53				<0.05	mg/l	TM38/PM0
Sulphate as SO4 #	5.1	2.7	2.8	3.6	3.1	3.4	5.3				<0.5	mg/kg	TM38/PM0
Chloride #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4				<0.3	mg/l	TM38/PM0
Chloride #	<3	<3	<3	<3	<3	<3	4				<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	<2	<2	<2	<2	<2	<2	2				<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	20				<20	mg/kg	TM60/PM0
pH	7.95	7.95	8.11	7.92	7.83	7.69	7.01				<0.01	pH units	TM73/PM0
Total Dissolved Solids #	<35	44	<35	<35	<35	<35	181				<35	mg/l	TM20/PM0
Total Dissolved Solids #	<350	440	<350	<350	<350	<350	1811				<350	mg/kg	TM20/PM0

Client Name: Ground Investigations Ireland
Reference: 8115-10-18
Location: Dundalk IPS
Contact: Conor Costigan
JE Job No.: 18/18873

Report : EN12457_2

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	TP2	TP4	TP14	TP22	TP17	TP24	TP27									
Depth	1.50	2.00	1.00	1.60	1.50	0.90	1.00									
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T									
Sample Date	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018									
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1	1	1	1									
Date of Receipt	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018	22/11/2018									
Solid Waste Analysis																
Total Organic Carbon #	0.07	0.10	0.08	0.08	0.15	0.07	0.06				3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025				6	-	-	<0.025	mg/kg	TM31/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035				1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	<30	<30	<30				500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22				-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64				100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	0.038	<0.025	<0.025	<0.025	<0.025				0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015				0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07				2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.02				0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	<350	440	<350	<350	<350	<350	1811				4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	20				500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.105	0.1006	0.0988	0.1015	0.1039	0.1017	0.1054				-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	86.1	89.3	90.6	88.6	86.5	88.4	85.3				-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.885	0.889	0.891	0.888	0.886	0.888	0.885				-	-	-		l	NONE/PM17
Eluate Volume	0.85	0.75	0.6	0.83	0.85	0.85	0.85				-	-	-		l	NONE/PM17
pH #	7.30	8.45	7.16	7.51	7.55	8.25	7.69				-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	<3	<3	<3	<3	7	<3				-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	5.1	2.7	2.8	3.6	3.1	3.4	5.3				1000	20000	50000	<0.5	mg/kg	TM38/PM0
Chloride #	<3	<3	<3	<3	<3	<3	4				800	15000	25000	<3	mg/kg	TM38/PM0

Client Name: Ground Investigations Ireland
Reference: 8115-10-18
Location: Dundalk IPS
Contact: Conor Costigan

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
18/18873	1	TP2	1.50	1-3	No interpretation possible
18/18873	1	TP4	2.00	4-6	No interpretation possible
18/18873	1	TP14	1.00	7-9	No interpretation possible
18/18873	1	TP22	1.60	10-12	No interpretation possible
18/18873	1	TP17	1.50	13-15	No interpretation possible
18/18873	1	TP24	0.90	16-18	No interpretation possible
18/18873	1	TP27	1.00	19-21	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 18/10/8115
Location: Dundalk IPS
Contact: Conor Costigan

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 less than 0.1%, 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
18/18873	1	TP2	1.50	2	27/11/2018	**General Description (Bulk Analysis)**	Soil/Stones
					27/11/2018	**Asbestos Fibres**	NAD
					27/11/2018	**Asbestos ACM**	NAD
					27/11/2018	**Asbestos Type**	NAD
					27/11/2018	**Asbestos Level Screen**	NAD
18/18873	1	TP4	2.00	5	27/11/2018	**General Description (Bulk Analysis)**	Soil/Stones
					27/11/2018	**Asbestos Fibres**	NAD
					27/11/2018	**Asbestos ACM**	NAD
					27/11/2018	**Asbestos Type**	NAD
					27/11/2018	**Asbestos Level Screen**	NAD
18/18873	1	TP14	1.00	8	27/11/2018	**General Description (Bulk Analysis)**	Soil/Stones
					27/11/2018	**Asbestos Fibres**	NAD
					27/11/2018	**Asbestos ACM**	NAD
					27/11/2018	**Asbestos Type**	NAD
					27/11/2018	**Asbestos Level Screen**	NAD
18/18873	1	TP22	1.60	11	26/11/2018	**General Description (Bulk Analysis)**	Soil/Stones
					26/11/2018	**Asbestos Fibres**	NAD
					26/11/2018	**Asbestos ACM**	NAD
					26/11/2018	**Asbestos Type**	NAD
					26/11/2018	**Asbestos Level Screen**	NAD
18/18873	1	TP17	1.50	14	26/11/2018	**General Description (Bulk Analysis)**	Soil/Stones
					26/11/2018	**Asbestos Fibres**	NAD
					26/11/2018	**Asbestos ACM**	NAD
					26/11/2018	**Asbestos Type**	NAD
					26/11/2018	**Asbestos Level Screen**	NAD
18/18873	1	TP24	0.90	17	26/11/2018	**General Description (Bulk Analysis)**	Soil/Stones
					26/11/2018	**Asbestos Fibres**	NAD
					26/11/2018	**Asbestos ACM**	NAD
					26/11/2018	**Asbestos Type**	NAD
					26/11/2018	**Asbestos Level Screen**	NAD
18/18873	1	TP27	1.00	20	26/11/2018	**General Description (Bulk Analysis)**	Soil/Stones
					26/11/2018	**Asbestos Fibres**	NAD
					26/11/2018	**Asbestos ACM**	NAD

Client Name: Ground Investigations Ireland
Reference: 18/10/8115
Location: Dundalk IPS
Contact: Conor Costigan

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/18873	1	TP27	1.00	20	26/11/2018	**Asbestos Type**	NAD
					26/11/2018	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 8115-10-18
Location: Dundalk IPS
Contact: Conor Costigan

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 18/18873						

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.: 18/18873

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

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

JE Job No.: 18/18873

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 amounts 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.

JE Job No: 18/18873

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 BS 7755-3:1995, ISO10694:1995 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

JE Job No: 18/18873

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
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			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. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	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. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	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

JE Job No: 18/18873

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 Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	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
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	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.	PM0	No preparation is required.	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.	PM0	No preparation is required.			AR	Yes
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
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.				
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	

JE Job No: 18/18873

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
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	

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Newcastle,
Co. Dublin

Point Load Index Tests (single diametral determination)

Project: IPS Dundalk

Project No:

Delivery date: 17.01.2019

Test Date: 17.01.2019

Diametric samples

Borehole No.	Depth (m)	Is(50) (Mpa)
BH - 01	5.50 - 5.70	2.52
BH - 01	6.30 - 6.50	2.49
BH - 01	6.85 - 7.05	4.56
BH - 02	3.15 - 3.20	7.09
BH - 02	4.20 - 4.35	6.93
BH - 02	6.50 - 6.70	9.57
BH - 03	4.90 - 5.15	5.09
BH - 03	7.30 - 7.45	10.05
BH - 04	5.40 - 5.60	7.89
BH - 04	9.25 - 9.50	9.14
BH - 05	4.75 - 4.85	2.35
BH - 05	7.70 - 8.10	11.66

Prof. Brendan O'Kelly

Specimens prepared and tested in accordance with suggested method from International Society for Rock Mechanics (ISRM), 1985

APPENDIX 8 – Groundwater Monitoring

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.,
Catherinestown House,
Hazelhatch Road,
Newcastle, Co Dublin.
Tel: 01 601 5175 / 5176 | Fax: 01 601 5173
Email: info@gii.ie | Web: gii.ie

GROUNDWATER MONITORING

IPS Dundalk

BOREHOLE	DATE	TIME	GROUNDWATER (mBGL)	Comments
BH08	14/12/2018	9.00	N/a	
BH10	14/12/2018	9.00	1.25	
BH16	14/12/2018	9.00	2.00	
BH08	03/01/2019	9.00	N/a	
BH10	03/01/2019	9.00	2.08	
BH16	03/01/2019	9.00	2.15	
BH08	10/01/2018	9.00	N/a	
BH10	10/01/2018	9.00	2.08	
BH16	10/01/2018	9.00	2.15	
RC02	10/01/2018	9.00	6.50	
RC03	10/01/2018	9.00	3.80	
RC05	10/01/2018	9.00	4.00	

Appendix 11. Flood Risk Assessment (AtkinsRéalis, 2024)

AtkinsRéalis

Flood Risk Assessment

WuXi Biologics Ireland Limited

April 2024

100085897DG0055

EFFLUENT BALANCING AND RESOURCE RECOVERY SYSTEM

Notice

This document and its contents have been prepared and are intended solely as information for WuXi Biologics Ireland Limited Ireland Limited and use in relation to Flood Risk Assessment.

WS Atkins Ireland Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 15 pages including the cover.

Document history

Document title: Flood Risk Assessment

Document reference: 100085897DG005

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
0	Draft	S. Kamuni	G. Hanratty	N. Dewhirst		28/03/2024
1	Final	S. Kamuni	G. Hanratty	N. Dewhirst	T. Murphy	17/04/2024

Client signoff

Client	WuXi Biologics Ireland Limited
Project	EFFLUENT BALANCING AND RESOURCE RECOVERY SYSTEM
Job number	100085897
Client signature/date	

Contents

Tables

Figures

1. Introduction

This Flood Risk Assessment (FRA) has been prepared by AtkinsRéalis ('Atkins') on behalf of WuXi Biologics Ireland Limited (hereafter referred to as 'WuXi Biologics') to accompany the application for a proposed development of the Effluent Balancing and Resource Recovery System at the Dundalk Science and Technology Park in Haynestown, Dundalk in County Louth. This report is prepared for planning application. Refer to Figure 1-1 for the site location.

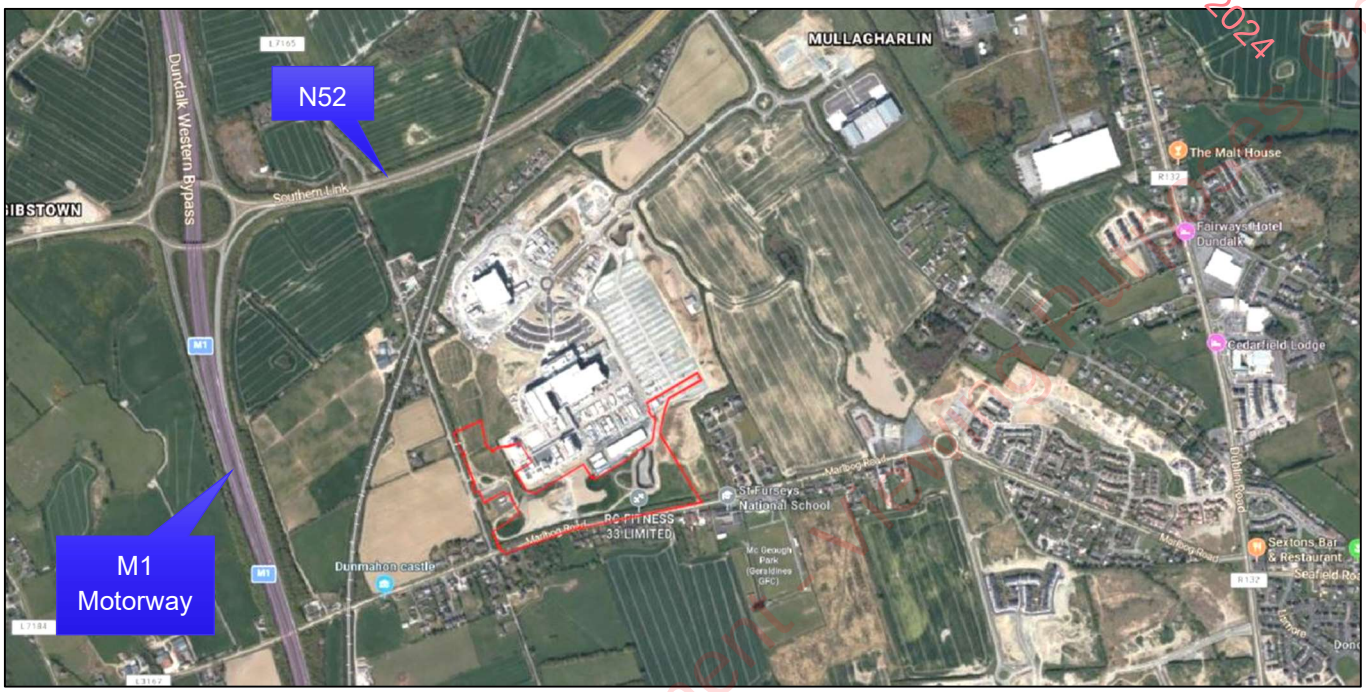

Figure 1-1 - Site Location

1.1 Relevant Guidance

This FRA has been undertaken in consideration with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG November 2009, which is the latest guidance document. The guidance has been issued to ensure that flood risk is a key consideration for developers, planning & regional authorities, and the public in preparing and submitting development proposals. The principles of the guidance are as follows:

- Avoid the risk, where possible
- Substitute less vulnerable users, where avoidance is not possible, and
- Mitigate and manage the risk, where avoidance and substitution are not possible.

A staged approach is recommended within the guidance document in relation to identifying and assessing flood risk. The three stages of appraisal and assessment are as follows:

- Stage 1 Flood risk identification
- Stage 2 Initial flood risk assessment
- Stage 3 Detailed flood risk assessment

1.2 Flood Risk

Flood risk can be quantified by relating the probability of the flood event occurring to the consequence of the flood. Probability, in flood event terms, is gauged by potential annual occurrence/return period and flood consequence is dependent on the nature of the flood hazard and the vulnerability of the inundated area. The source-pathway-receptor model considers the components of flood risk.

The source is the hazard with the potential to cause harm through flooding (e.g., rainfall, high sea levels). The pathway is the mechanism by which the source can affect the receptor (e.g., inadequate drainage, overtopping of coastal defences) and finally, the receptor is anything which is affected by the flood event (e.g., people, infrastructure, property).

1.3 Causes of Flooding

The Planning System and Flood Risk Management Guidelines requires a FRA to consider all potential causes of flooding including the following:

- Coastal flooding
- Inland flooding
    - Overland flow
    - River flooding
    - Flooding from artificial drainage systems
    - Groundwater flooding
    - Estuarial flooding
    - Failure of infrastructure

1.4 Floodplains

A river flood plain is a low-lying area which receives excess flood water when the flow within the watercourse exceeds the capacity of the channel. A coastal flood plain is an area which, during high tide or increased sea levels, becomes inundated with sea water.

1.5 Assessing Flood Risk

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' three flood zones are designated in the consideration of flood risk to a particular site. The three flood zones are described in Table 1-1 below.

Table 1-1 - Flood Zones

Flood Zone	Description
Flood 'Zone A'	where the probability of flooding from watercourses is the highest (greater than 1% or 1 in 100 year for watercourse flooding or 0.5% or 1 in 200 for coastal flooding).
Flood 'Zone B'	where the probability of flooding from watercourses is moderate (between 0.1% or 1 in 1000 year and 1% or 1 in 100 year for watercourse flooding, and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding).
Flood 'Zone C'	where the probability of flooding from watercourses and the sea is low or negligible (less than 0.1% or 1 in 1000 year for both watercourse and coastal flooding). Flood Zone 'C' covers all areas which are not in Zones 'A' or 'B'.

The planning implications for each of the flood zones are:

Zone A - High probability of flooding. Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate in this zone.

Zone B - Moderate probability of flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone. In general, however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will adequately be managed.

Zone C - Low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

2. Site Description

2.1 Site Location

The proposed site is located within a greenfield site adjacent to the existing WuXi Biologics IED Facility (Ref. No. P1122-01). The proposed development will tie into the existing WuXi Biologics IED Facility (P1122-01) and will be treating the wastewater from this facility. Refer to Figure 1-1 for the site location. The site is bounded to the north and east by the existing WuXi Biologics IED Facility (P1122-01), to the west by Mullagharlin road, residential dwellings and agricultural land and to the south by Marlbog Road, residential dwellings and agricultural land. The site lies ca. 480m east of the M1 and the land in the vicinity of the site is for residential, commercial and agricultural purposes. A review of the Louth County Development Plan 2021-2027 shows that the proposed development and much of the land surrounding the proposed development is land-use zoned as 'Business and Technology'. The land to the south of the proposed development is zoned as 'Agriculture' while the area north and south of the proposed development is zoned as 'Residential'.

2.2 Topography

The existing topographical level of the proposed site is circa 24mOD which is approximately 6-7m higher than the rest of the WuXi operational facility / campus.

2.3 Local Hydrology and Existing Drainage

There are no watercourses or surface water features within the proposed development site. The nearest watercourses to the proposed development site are as follows;
The closest watercourse is the Carnabreagh Stream located ca. 700m west of the proposed development site and is separated from the proposed development site by the physical barrier of the M1 motorway. The Carnabreagh Stream flows into the Tates and Carrans Park Stream which outfalls into the larger watercourse of the Fane River which outfalls to Dundalk Bay. EPA datasets identify the Fane River has a Q-value score of 4 during 2020 which indicates a good water quality.
The Haggardstown River is located ca. 750m east and is separated from the proposed development site by the L3161 Marlbog Road. This river outfalls directly into Dundalk Bay. EPA datasets identify the proposed development site is predominantly within the Haggardstown catchment.
The Haynestown Stream is located ca. 1.1km south of the proposed development site. and is separated from the proposed development site by the L3161 Marlbog Road. This stream is a tributary of the larger Fane River. Refer to Figure 2-1.

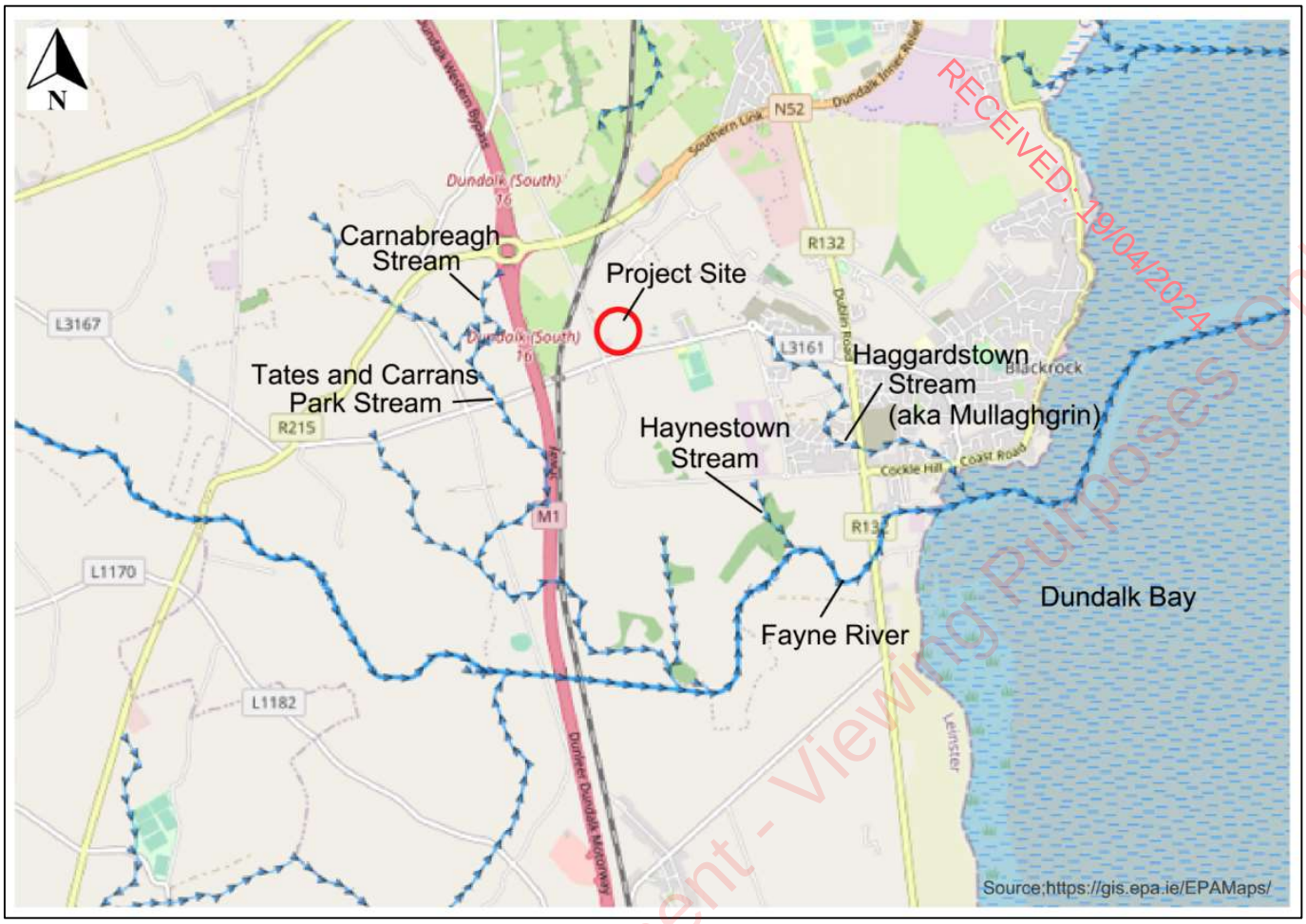

Figure 2-1 - Hydrological Features

The existing drainage on the WuXi operational campus flows from north towards south. The surface water is collected from the gullies and flows through a 300mm dia pipe in the north which finally reaching the attenuation pond changes to a 900mm dia pipe in the south.

3. Flood Risk Identification for the Site

In accordance with the planning guidelines, a Stage 1 Flood risk identification is required to be undertaken to identify if there are any flooding or surface water management issued related to the proposed development site that may warrant further investigation. Initially, the following possible flood mechanisms for the proposed site have been identified:

Table 3-1 - Possible Flooding Mechanisms

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	No	The site is not close to a coastal location
Overland flow	No	The surrounding topography is relatively shallow
River flooding	No	There are no existing streams close to or flowing towards the site
Flooding from artificial drainage systems	No	There is no urban drainage infrastructure within the site and in the immediate vicinity of the site
Groundwater flooding	No	There are no significant springs or groundwater discharges recorded in the immediate vicinity of the site
Estuarial flooding	No	The site is not close to an estuary
Failure of Infrastructure	No	There is no hydraulic structure in the vicinity of the site

Table 3-1 - Possible Flooding Mechanisms.

Table 3-1 above demonstrate that the site is not at-risk of flooding, however the report will continue to confirm the initial assumptions detailed above.

3.1 Flood Risk Investigation

3.1.1 OPW Flood Maps

The Office of Public Works (OPW) interactive map viewer (http://www.floodinfo.ie/map/floodmaps/) displays the predicted flood extents for both rivers and coastal areas over various return periods. The viewer was consulted in relation to the proposed site location. Since there are no detailed flood maps available, by viewing the interactive map, it is evident that the site is not at a risk of flooding.

3.1.2 Historical Flood Report

The GeoHive map viewer (http://map.geohive.ie/mapviewer.html) was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrences in the vicinity of the site.
The Flood Hazard Mapping does not indicate historic floods within the vicinity of the site.

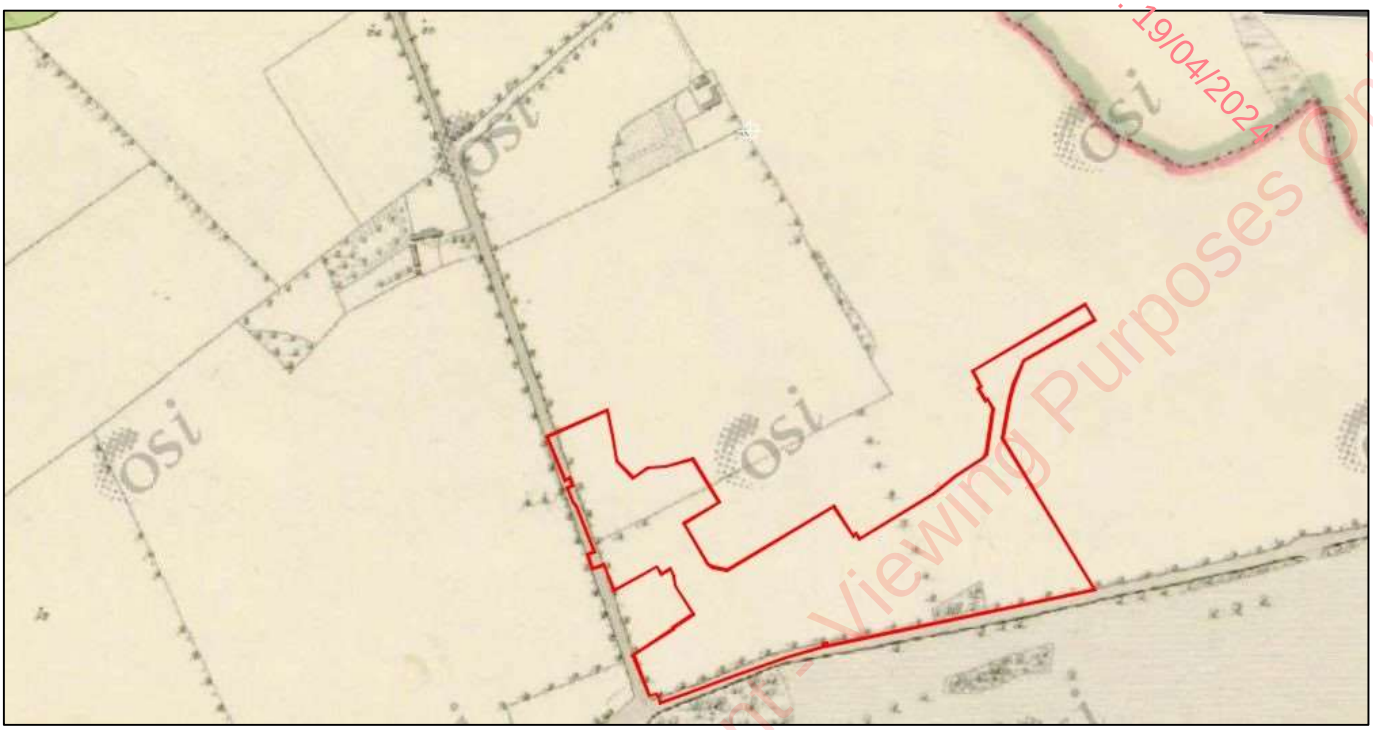

Figure 3 -1 - OSI 6 Inch Colour Map

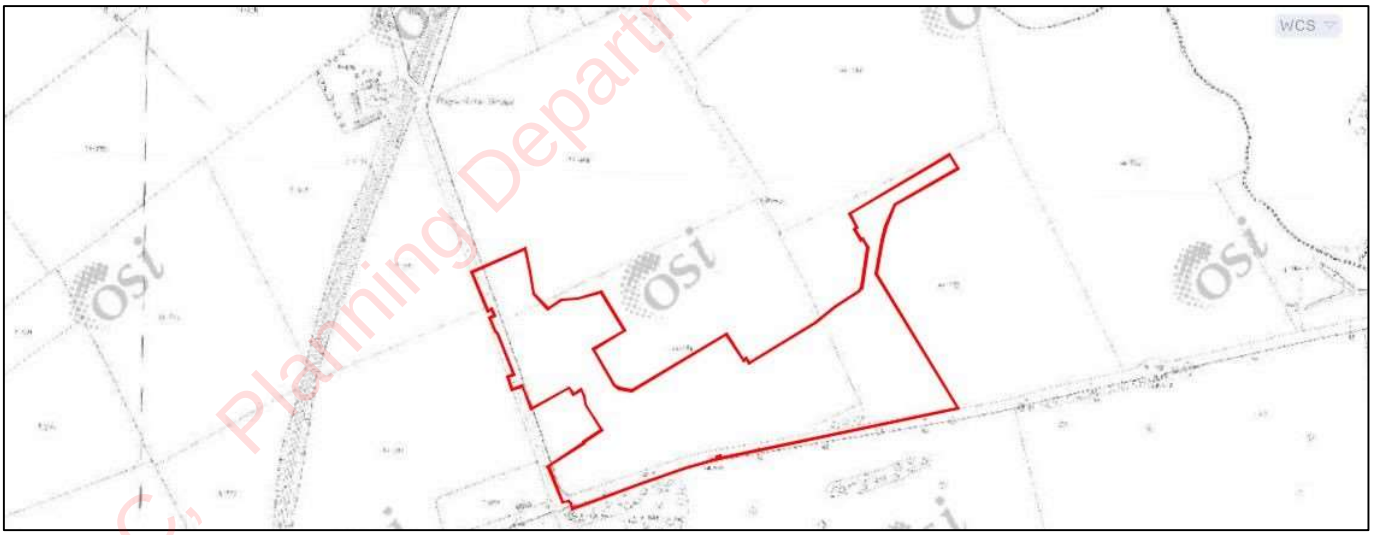

Figure 3-2 - OSI 25 Inch Map

3.1.3 Historic Flooding

The Office of Public Works (OPW) interactive map viewer http://www.floodinfo.ie/map/floodmaps was consulted to view any historic flood events located within the proposed development. No flood events were recorded within the proposed development. There are flood events identified outside of the proposed development within the surrounding environment. Refer to Figure 3-3 which shows the flood events outside the site environs.

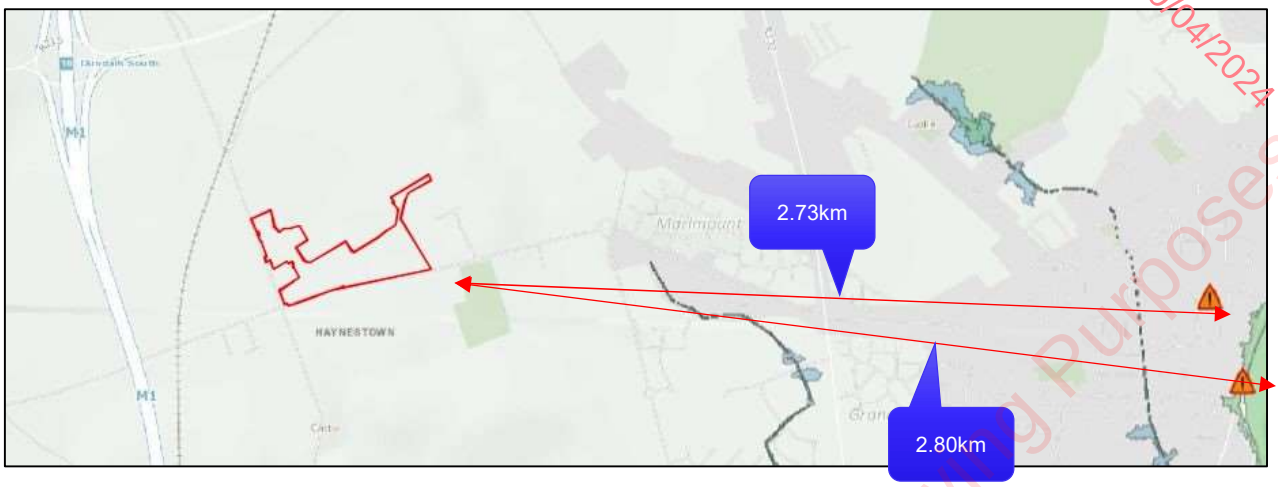

Figure 3-3 - Historic Flood Events

The Flood events identified have happened in February 2002 in Blackrock, Co. Louth. The locations are approximately 2.73km and 2.80km southeast outside the vicinity of proposed site.

3.1.4 Geological Survey of Ireland Mapping

According to the Geological Survey of Ireland (GSI) data the Site is currently a greenfield site and is underlain by till derived from Lower Palaeozoic sandstones and shales. There are deposits of alluvium in surrounding vicinity of the site. Deposition of Alluvium deposits can be an indicator of areas which have flooded in the recent geological past. Refer to Figure 3-4

Figure 3-4 - GSI Soils Map

3.1.5 Louth County Development Plan 2021-2027

A review of the Louth County Development Plan 2021-2027 shows that the proposed development and much of the land surrounding the proposed development is land-use zoned as 'Business and Technology'. The land to the south of the proposed development is zoned as 'Agriculture' while the area north and south of the proposed development is zoned as 'Residential'

The proposed site is outside the Flood Zones A and B. This map was developed by taking the CFRAM programme and other flood schemes undertaken by OPW into account. Refer to Figure 3-5.

Figure 3-5 - Louth CDP - Zoning and Flood Zones

4. Conclusion and Recommendations

4.1 Conclusion of the Flood Risk Identification

The purpose of the Stage 1 Flood risk identification process is to establish whether a flood risk issue currently exists or may exist in the future. If a potential flood risk issue is identified the risk will be investigated in further detail by undertaking a Stage 2 – Initial flood risk assessment. However, if no potential flood risk is identified then the overall assessment can conclude at this point.

In relation to the proposed development at WuXi Biologics site, based on the Stage 1 - Flood risk identification findings discussed above the flood risk study shall be concluded at this point as the proposed site is not at risk from flooding.

A Stage 1 flood risk assessment has been completed in accordance with The Guidelines the following conclusions can be drawn;

- There is no historic risk of flooding at the site
- The proposed development is not at risk of flooding from the 1% AEP event
- Given that the proposed site is located in Flood Zone C (outside Flood Zone A and B), there is low probability of flooding
- Given that the proposed development is located in Zone C, consideration of the Justification Test is not required

4.2 Recommendations

The following recommendations should be considered;

- At the detailed design stage, climate change should be considered and designed accordingly
- If any changes to the existing ground level are made, future surface water design should take into the existing drainage network into consideration and be designed accordingly
- The proposed discharge for the storm-water outfall into the existing storm water network should be set at a maximum discharge rate of QBAR or 2 l/s/ha, whichever is the greater as per the 'Greater Dublin Strategic Drainage Study Volume 2 – New Developments' guidelines
- Suitable Sustainable Urban Drainage systems (SUDs) are to be used within the proposed development to reduce surface water runoff from the site where feasible and designed in accordance with CIRIA report C753 'The SuDS Manual V-6'.

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