



**GROUND
INVESTIGATIONS
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Ground Investigations Ireland

Belgard Gardens,

Tallaght, Dublin 24

Ground Investigation Report

DOCUMENT CONTROL SHEET

Project Title	Belgard Gardens Ground Investigation Report
Engineer	O'Connor Sutton Cronin
Project No	6944-07-17
Document Title	Ground Investigation Report

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
A	Final	M Kennedy	A. Mc Donnell	F McNamara	Dublin	26 October 2018



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1.0 Preamble

On the instructions of O'Connor Sutton Cronin Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between July and September 2017 at the site of the proposed Belgard Gardens, Tallaght, Dublin 24.

2.0 Overview

2.1. Background

It is proposed to construct a new development with associated services, access roads and car parking at the proposed site. The site is currently composed of unoccupied and partially occupied industrial units. The proposed construction is envisaged to consist of deep foundations due to a proposed basement reaching depths of 5.0m BGL with some shallower foundations to the south of the site with pavement make up with some local excavations for services and plant across the site.

2.2. 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 20 No. Trial Pits
- Carry out 9 No. Infiltration tests
- Carry out 20 No. Rotary Boreholes to a maximum depth of 15m BGL
- Installation of 10 No. monitoring wells
- Geotechnical & Environmental Laboratory testing
- Report with recommendations

3.0 Subsurface Exploration

3.1. 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), B.S. 5930:2015 and BS 10175:2011+A1:2013.

3.1. 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. Exploratory holes locations shown on the location plan are indicative only. The final locations of the exploratory holes will be included following the completion of the site survey in the final version of the report. 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.

3.2. Rotary Boreholes

The Geobor S 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. Standard Penetration Tests were carried out to provide information on the strength/density of the overburden.

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. Polymer flush is used for the Geobor S technique of drilling using recirculation tanks to enable the polymer to be reused to cool the bit over the full depth of the borehole. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids.

It should be noted that the conventional 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 3 of this Report.

3.3. 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 4 of this Report.

3.4. Laboratory Testing

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils, groundwater and to provide information for the proposed design.

Environmental testing scheduled by the Engineer was sub sampled and scheduled to be carried out by Jones Environmental Laboratory in the UK.

Geotechnical testing consisting of moisture content, Atterberg limits and Particle Size Distribution (PSD) analyses were carried out in NMTL's Geotechnical Laboratory in Carlow..

The results of all the laboratory testing are included in Appendix 5 of this report.

3.5. Surveying

The exploratory hole locations have been set out and/or 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 Appendix 1 of this report. Exploratory holes locations shown on the location plan are indicative only. The final locations of the exploratory holes will be included following the completion of the site survey in the final version of the report.

4.0 Ground Conditions

4.1. 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
- Made Ground
- Granular Deposits
- Cohesive Deposits

TOPSOIL/SURFACING: Topsoil was encountered in some of the exploratory holes and was present to a maximum depth of 0.4m BGL. Surfacing was present in the remaining exploratory holes from surface consisting of concrete or tarmacadam encountered to a depth up to 0.13m BGL.

MADE GROUND: Made Ground deposits were encountered either from surface or below the topsoil/surfacing present to a depth of 2.2m BGL. These deposits were described generally as *brown sandy gravelly CLAY with plastic, metal, red brick and concrete waste*.

COHESIVE DEPOSITS: Two types of cohesive deposit were encountered either underlying the Topsoil/surfacing or the Made Ground. The first is generally described as a firm or firm to stiff brown sandy gravelly CLAY with cobbles and boulders with varying minor constituents. This was encountered between a depth of 0.8 to 1.5m BGL. This deposit is described as soft to firm in TP101 only. The second type of cohesive deposit is generally described as stiff to very stiff grey/brown slightly sandy gravelly CLAY with cobbles and boulders with varying minor constituents. This was encountered between a depths of 1.1m to 3.4 m BGL.

GRANULAR DEPOSITS: Minor amounts of granular deposits were encountered. The granular deposits were encountered at the interbedded cohesive deposits and were typically described as dense grey brown clayey sandy sub angular fine to coarse GRAVEL. The secondary sand and gravel 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. Based on the SPT N values the deposits are typically medium dense to dense.

4.2. Groundwater

Groundwater strikes are noted on the borehole logs where they occurred. Groundwater levels were monitored in the boreholes on an hourly basis throughout the monitoring period. The groundwater monitoring is included in appendices of this Report.

5.0 Recommendations & Conclusions

5.1. General

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. Limited information has been provided at the ground investigation stage and any designs based on the recommendations or conclusions should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory hole logs.

5.2. Foundations

Due to the expected excavation for a basement on the northern part of the site to be approximately 5.0m BGL we recommend an allowable bearing capacity of 300 kN/m² on the stiff cohesive deposits at a depth of 5.0m BGL on the stiff to very stiff brown/grey sandy gravelly CLAY encountered at this depth across this site. Excavations in the southern part of the site are due to be shallower however we would recommend foundation be taken down to 3.0m BGL due to the size of the proposed building where an allowable bearing capacity of 250 kN/m² is recommended on the stiff cohesive deposits at this depth.

Some granular deposits were encountered interbedded within the cohesive deposits. If in any part of the site, should part of the foundation be on gravel and part be on the clays we would recommend that all the foundations of the unit in question be lowered to the cohesive stratum to avoid differential settlement.

The possibility for variation in the depth of the made ground in the vicinity of these foundations should be considered especially in the southern section of the site where the excavation is not expected to be as deep and foundation inspections should be carried out. Any soft spots encountered at the proposed foundation depths should be excavated and replaced with lean mix concrete.

A ground bearing floor slab is recommended to be based on the firm to stiff cohesive deposits with an appropriate depth of compacted hardcore specified by the consulting engineer and in accordance with the limits and guidelines in SR21:214 and/or NRA SRW CL808 Type E granular stone fill.

The pH and sulphate testing completed on samples recovered from the trial pits indicates the pH results are near neutral and the sulphate results are low, when compared to the guideline values from BRE Special Digest 1:2005. No special precautions are required for concrete foundations to prevent sulphate attack.

5.3. Excavations

Short term temporary excavations in the cohesive deposits will remain stable for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25m BGL or is required to permit man entry.

Excavations in the Made Ground or deep excavations in the Cohesive Deposits will require to be appropriately battered or the sides supported. Excavations in the cohesive are expected to be excavatable with conventional excavation equipment.

Any material to be removed off site should be disposed of to a suitably licenced landfill.

5.4. Soakaway Design

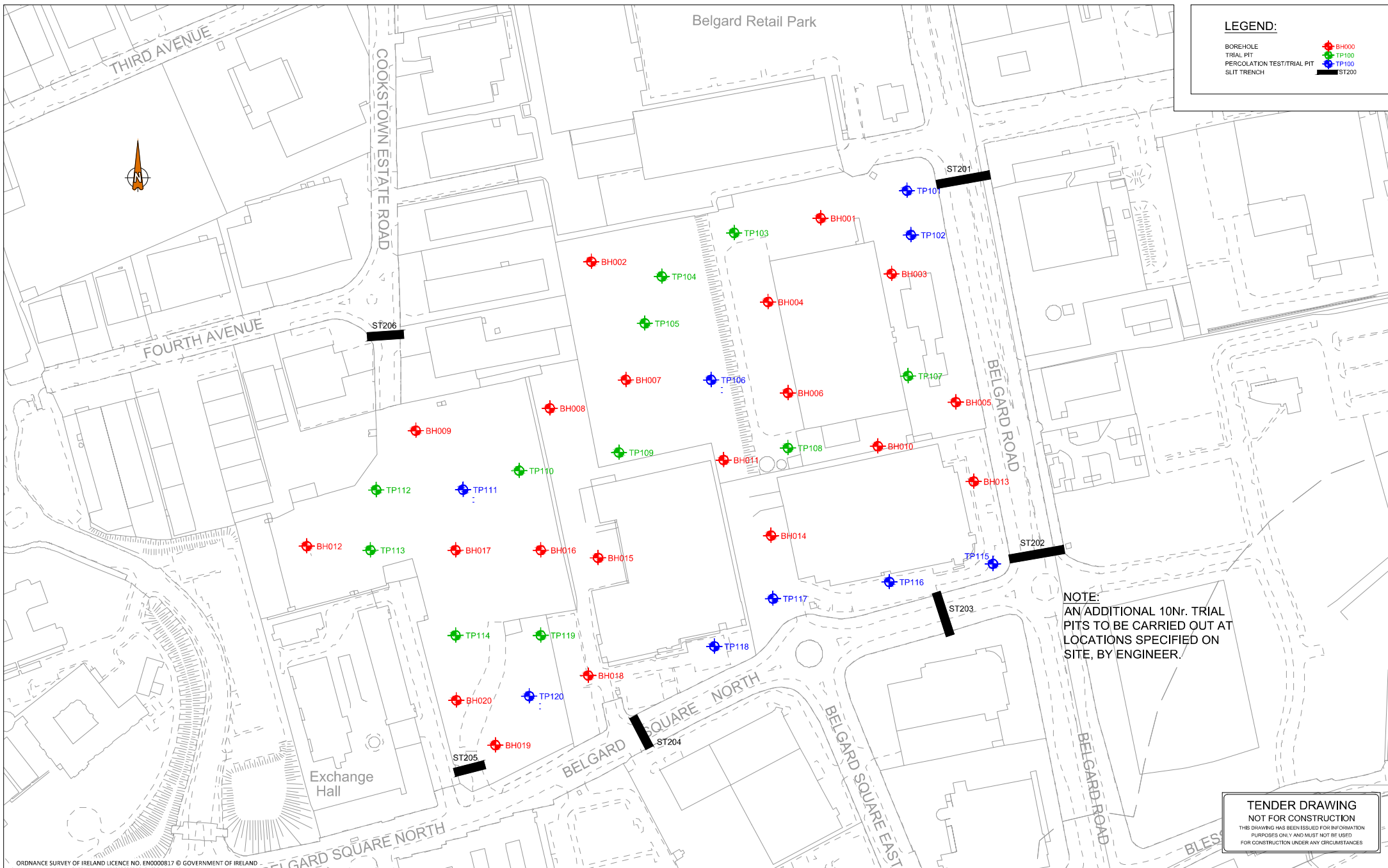
An infiltration rate of 8.02×10^{-6} m/s was calculated for the soakaway location TP115. At the other locations of TP101, TP102A, TP106, TP111, TP116A, TP117A and TP118 the water level dropped too slowly to allow calculation of 'f' the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.

The recommendations provided in this report should be verified in the design of the proposed buildings, using the full details of the loading conditions and taking into consideration the allowable tolerable settlements/movements that the building can accommodate. The founding strata should be inspected and verified by a suitably qualified engineer prior to construction of the building foundations.

APPENDIX 1 - Site Location Plan

LEGEND:

- BOREHOLE ● BH000
- TRIAL PIT ● TP100
- PERCOLATION TEST/TRIAL PIT ● TP100
- SLIT TRENCH ST200



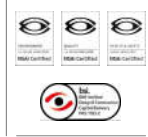
NOTE:
AN ADDITIONAL 10nr. TRIAL PITS TO BE CARRIED OUT AT LOCATIONS SPECIFIED ON SITE, BY ENGINEER.

TENDER DRAWING
NOT FOR CONSTRUCTION
THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES ONLY AND MUST NOT BE USED FOR CONSTRUCTION UNDER ANY CIRCUMSTANCES

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Rev No.	Date	Revision Note	Drn by	Chkd by	Rev No.	Date	Revision Note	Drn by	Chkd by
P01	05.07.2018	ISSUED FOR TENDER	JS	MK					



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Client: ATLAS LIMITED PARTNERSHIP
Project: BELGARD GARDENS

Title: GROUND INVESTIGATION LAYOUT

Code | Originator | Zone | Level | Type | Role | Number | Status | Revision
A557-OCSC-XX-XX-SK-C-0001 | SO | P01.01

Date: 04/07/17 Scale: 1:1000 @ A1 Drn by: JS Chkd by: MK Apprv by: TH

APPENDIX 2 – Trial Pit Records



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Site
Belgard Gardens
Trial Pit Number
TP101

Machine : 13T Excavator Method : Trial Pit	Dimensions 1.6m x 0.8m 2.1m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 31/07/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.13	TARMACADAM		
					0.25	FILL: grey angular crushed rock fill		
					0.50	MADE GROUND: dark brown slightly sandy slightly gravelly CLAY with red brick and plastic		
					0.75	Soft to firm brown slightly sandy slightly gravelly CLAY/SILT with cobbles and boulders		
					1.35			
					2.10	Complete at 2.10m		

Plan	Remarks		
.	Groundwater not encountered		
.	Trial pit stable		
.	Trial pit backfilled on completion		
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	Scale (approx)	Logged By	Figure No.
	1:50	MK	6944-07-17.TP101



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Site
Belgard Gardens
Trial Pit Number
TP102

Machine : 13T Excavator Method : Trial Pit	Dimensions 1.5m x 0.8m 1.3m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 31/07/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.12 0.20 (1.10) 1.30	TARMACADAM FILL: grey angular crushed rock fill MADE GROUND: dark brown slightly sandy slightly gravelly CLAY with red brick and plastic Concrete obstruction at 1.3m BGL Complete at 1.30m		

Plan	Remarks			
<p>Groundwater not encountered Orange clay pipe 150mm encountered at 1.2m BGL running parallel to trench Trial pit stable Trial pit backfilled on completion</p>				
	<table border="1"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By MK</td> <td>Figure No. 6944-07-17.TP102</td> </tr> </table>	Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP102
Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP102		



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Site
Belgard Gardens

Trial Pit Number
TP102A

Machine : 13T Excavator Method : Trial Pit	Dimensions 2.1m x 0.8m x 2.1m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 02/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.07 (0.33) 0.40 (0.17) 0.57	TARMACADAM FILL: grey angular crushed rock fill MADE GROUND: brown slightly sandy Clay with red brick and concrete Stiff brown slightly sandy slightly gravelly CLAY		
2.00	B				(1.53) 2.10	Complete at 2.10m		

Plan	Remarks No Groundwater encountered Trial pit stable Trial pit backfilled on completion		
	Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP102A



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Site
Belgard Gardens

Trial Pit Number
TP103

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.2m x 0.8m x 3.2m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 02/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B		Groundwater seepage		(0.15)	TARMACADAM	[Pattern]	
					(0.45)	FILL: grey angular crushed rock fill	[Pattern]	
2.00	B				0.60	Firm to stiff brown slightly sandy slightly gravelly CLAY with cobbles	[Pattern]	
					(0.98)			
3.00	B				1.58	Stiff dark grey brown slightly sandy slightly gravelly CLAY with cobbles and occasional boulders	[Pattern]	
					(0.92)			
					2.50	Stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders	[Pattern]	
					(0.70)			
					3.20	Complete at 3.20m		

Plan .	Remarks No Groundwater encountered Trial pit stable Trial pit backfilled on completion		
		<table border="1"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By MK</td> <td>Figure No. 6944-07-17.TP103</td> </tr> </table>	Scale (approx) 1:50
Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP103	



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Site
Belgard Gardens
Trial Pit Number
TP104

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.1m x 1.0m 4.35m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 31/07/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				(0.25) 0.25 (0.25) 0.50	TOPSOIL: dark brown slightly sandy slightly gravelly Clay with rootlets MADE GROUND: grey slightly sandy Clay with concrete and red brick Stiff brown/grey slightly sandy slightly gravelly CLAY with cobbles and occasional boulders		
2.00	B				(2.40)			
3.00	B		Groundwater seepage		2.90	Very stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders		
4.00	B				(1.45)			
					4.35	Complete at 4.35m		

Plan	Remarks		
.	Trial pit stable		
.	Trial pit backfilled on completion		
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	Scale (approx)	Logged By	Figure No.
	1:50	MK	6944-07-17.TP104



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Site
Belgard Gardens
Trial Pit Number
TP105

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.7m x 0.8m x 4.5m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 01/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.12 (0.68)	TOP SOIL: brown slightly sandy slightly gravelly Clay with grass rootlets MADE GROUND: dark brown slightly sandy slightly gravelly Clay with concrete plastic and red brick		
2.00	B				0.80 (2.00)	Firm to stiff brown slightly sandy slightly gravelly CLAY with cobbles and occasional boulders		
3.40	B		Groundwater seepage		2.80 (1.70)	Very stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders		
4.00	B				4.50	Complete at 4.50m		

Plan	Remarks Trial pit stable Trial pit backfilled on completion		
	Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP105



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Site
Belgard Gardens

Trial Pit Number
TP106

Machine : 13T Excavator Method : Trial Pit	Dimensions 2.3m x 1.0m 2.1m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 31/07/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.10 (0.50)	TOPSOIL: dark brown slightly sandy slightly gravelly Clay with grass rootlets		
					0.60 (0.40)	MADE GROUND: slightly sandy slightly gravelly Clay with red brick and plastic		
					1.00	Firm brown sandy slightly sandy gravelly CLAY with occasional cobbles		
					(1.10)	Firm to stiff grey/brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B				2.10	Complete at 2.10m		

Plan	Remarks		
.	Groundwater not encountered		
.	Trial pit stable		
.	Trial pit backfilled on completion		
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	Scale (approx)	Logged By	Figure No.
	1:50	MK	6944-07-17.TP106



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Site
Belgard Gardens
Trial Pit Number
TP107A

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.2m x 0.8m x 4.3m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 02/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B		Groundwater seepage		0.07 (0.28) 0.35 (0.15) 0.50	TARMACADAM FILL: grey angular crushed rock fill MADE GROUND: brown sandy slightly Clay with bricks Firm brown slightly sandy slightly gravelly CLAY with occasional cobbles		
2.50	B				1.40	Medium dense brown clayey sandy fine to medium sub-angular to subrounded GRAVEL with cobbles and rare boulders		
3.30	B				(2.90)			
4.00	B				4.30	Complete at 4.30m		

Plan	Remarks		
	No Groundwater encountered Trial pit stable Trial pit backfilled on completion		
	Scale (approx)	Logged By	Figure No.
	1:50	MK	6944-07-17.TP107A



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Site
Belgard Gardens

Trial Pit Number
TP108

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.6m x 1m x 4m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 01/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.12 (0.38) 0.50 (0.70)	TARMACADAM FILL: grey angular crushed rock fill Firm to stiff brown slightly sandy slightly gravelly CLAY with cobbles		
2.00	B				1.20	Very stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders		
3.00	B				(2.80)			
4.00	B				4.00	Complete at 4.00m		

Plan	<p>Remarks</p> <p>No Groundwater encountered Trial pit stable Trial pit backfilled on completion</p>								
	Scale (approx)	Logged By	Figure No.						
	1:50	MK	6944-07-17.TP108						



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Site
Belgard Gardens
Trial Pit Number
TP109

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.8m x 1m x 4.5m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 01/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.12 (1.08)	TOP SOIL: brown slightly sandy slightly gravelly Clay with grass rootlets MADE GROUND: dark brown slightly sandy slightly gravelly Clay with concrete and red brick		
2.00	B				1.20 (1.00)	Possible MADE GROUND: brown slightly sandy slightly gravelly Clay with cobbles		
3.00	B		Groundwater seepage		2.20 (2.30)	Stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders		
4.00	B				4.50	Complete at 4.50m		

Plan	Remarks No Groundwater encountered Trial pit stable Trial pit backfilled on completion		
	Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP109



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Site
Belgard Gardens
Trial Pit Number
TP110

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.1m x 1m x 3.6m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 08/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.10	B				0.05	TOPSOIL: brown slightly sandy slightly gravelly Clay with grass rootlets		
					(0.25)			
					0.30			
2.00	B				(0.30)	FILL: grey angular crushed rock fill		
					0.60	MADE GROUND: dark brown slightly sandy gravelly Clay with plastic		
					(2.30)	Firm to stiff slightly sandy slightly gravelly CLAY with cobbles and boulders		
3.40	B				2.90	Very stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders		
					(0.70)			
					3.60	Complete at 3.60m		

Plan .	Remarks Groundwater not encountered Trial pit stable Trial pit backfilled on completion		
	Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP110



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Site
Belgard Gardens
Trial Pit Number
TP111

Machine : 13T Excavator Method : Trial Pit	Dimensions 2.2m x 1m x 2.1m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 03/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.08 (0.42)	TOPSOIL: brown slightly sandy slightly gravelly Clay with grass rootlets		
					0.50	FILL: Grey angular crushed rock fill		
					(1.60)	Firm brown/grey brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B				2.10	Complete at 2.10m		

Plan	Remarks	
.	Groundwater not encountered	
.	Trial pit stable	
.	Trial pit backfilled on completion	
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	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.TP111	



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Site
Belgard Gardens
Trial Pit Number
TP112

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.4m x 1m x 3.6m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 08/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.70	B				0.05 (0.35) 0.40	TOPSOIL: brown slightly sandy slightly gravelly Clay with grass rootlets MADE GROUND brown slightly sandy slightly gravelly Clay with plastic brick and concrete Firm to stiff brown brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B				(2.40)			
3.20	B				2.80 (0.80) 3.60	Very stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders		
						Complete at 3.60m		

Plan	Remarks Groundwater not encountered Trial pit stable Trial pit backfilled on completion		
	Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP112



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Site
Belgard Gardens
Trial Pit Number
TP113

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.5m x 1m x 3.5m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 08/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.05 (0.45)	TOPSOIL: brown slightly sandy slightly gravelly Clay with grass rootlets		
					0.50	FILL: brown slightly sandy slightly gravelly Clay with plastic brick and concrete		
					(2.20)	Firm to stiff brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B							
					2.70	Very stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders		
3.00	B				(0.80)			
					3.50	Complete at 3.50m		

Plan .	Remarks Groundwater not encountered Trial pit stable Trial pit backfilled on completion		
	<table border="1"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By MK</td> <td>Figure No. 6944-07-17.TP113</td> </tr> </table>	Scale (approx) 1:50	Logged By MK
Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP113	



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Site
Belgard Gardens

Trial Pit Number
TP114

Machine : 13T Excavator Method : Trial Pit	Dimensions 4m x 1m x 3.6m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 04/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.05 (0.55) 0.60	TOPSOIL: brown slightly sandy slightly gravelly Clay with grass rootlets MADE GROUND brown slightly sandy slightly gravelly Clay with plastic brick and concrete Firm to stiff brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B				(2.00) 2.60 (1.00) 3.60	Very stiff dark grey slightly sandy slightly gravelly CLAY with cobbles and boulders Complete at 3.60m		

Plan	Remarks		
.	Groundwater not encountered		
.	Trial pit stable		
.	Trial pit backfilled on completion		
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	Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP114



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Site
Belgard Gardens
Trial Pit Number
TP115

Machine : 13T Excavator Method : Trial Pit	Dimensions 2.9m x 1m x 2.5m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 03/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.08 (0.32)	TARMACADAM		
					0.40	FILL: grey/brown angular crushed rock fill		
					(0.70)	MADE GROUND: brown sandy gravelly CLAY with refuse waste plastic metal clothing and wood		
					1.10 (0.40)	Possible MADE GROUND: brown sandy Clay and Gravel		
2.00	B				1.50	Firm to stiff brown sandy slightly gravelly CLAY with cobbles and boulders		
					(1.00)			
					2.50	Complete at 2.50m		

Plan								
						Remarks		
						Groundwater not encountered		
						Trial pit stable		
						Trial pit backfilled on completion		
						Scale (approx)	Logged By	Figure No.
						1:50	MK	6944-07-17.TP115



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Site
Belgard Gardens
Trial Pit Number
TP116

Machine : 13T Excavator Method : Trial Pit	Dimensions 1.3m x 0.8m x 1.6m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 01/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.10 (0.30) 0.40 (1.20) 1.60	TARMACADAM FILL: grey/brown angular crushed rock fill Possible MADE GROUND: brown slightly sandy slightly gravelly Clay with angular cobbles and boulders Complete at 1.60m		

Plan .	Remarks Groundwater not encountered 25 mm black electric cable encountered at 0.5m BGL perpendicular to pit Trial pit stable Trial pit backfilled on completion		
	<table border="1"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By MK</td> <td>Figure No. 6944-07-17.TP116</td> </tr> </table>	Scale (approx) 1:50	Logged By MK
Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP116	



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Site
Belgard Gardens

Trial Pit Number
TP116A

Machine : 13T Excavator Method : Trial Pit	Dimensions 2.2m x 1m x 2.1m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 03/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.08 (0.22) 0.30 (0.30) 0.60	TARMACADAM FILL: grey/brown angular crushed rock fill Possible MADE GROUND: brown clayey sandy angular cobbles Firm to stiff brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B				(1.50) 2.10	Complete at 2.10m		

Plan	Remarks		
.	Groundwater not encountered		
.	Trial pit stable		
.	Trial pit backfilled on completion		
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	Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP116A



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Site
Belgard Gardens
Trial Pit Number
TP117

Machine : 13T Excavator Method : Trial Pit	Dimensions 2.15m x 1m x 0.6m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 01/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.15	CONCRETE		
					0.19			
					0.45	FILL: grey/brown angular crushed rock fill		
					0.60	Complete at 0.60m		

Plan .	Remarks Groundwater not encountered 100mm black PE electric pipe encountered at 0.6m BGL 150mm orange & black wavin encountered at 0.6m BGL Trial pit stable Trial pit backfilled on completion		
	<table border="1"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By MK</td> <td>Figure No. 6944-07-17.TP117</td> </tr> </table>	Scale (approx) 1:50	Logged By MK
Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP117	



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Site
Belgard Gardens
Trial Pit Number
TP117A

Machine : 13T Excavator Method : Trial Pit	Dimensions 3.6m x 1m x 2.5m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 03/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.10	B				0.15 0.13 0.25 0.40 0.20 0.60	CONCRETE FILL: grey/brown angular crushed rock fill Possible MADE GROUND: brown slightly sandy slightly gravelly Clay Firm to stiff brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B				(1.50) 2.10	Complete at 2.50m		

Plan				Remarks
				Groundwater not encountered 150mm orange wavin storm drain 0.8m BGL parallel to trench Trial pit stable Trial pit backfilled on completion
	Scale (approx)		Logged By	Figure No.
	1:50		MK	6944-07-17.TP118



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Site
Belgard Gardens
Trial Pit Number
TP118

Machine : 13T Excavator Method : Trial Pit	Dimensions 3.6m x 1m x 2.5m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 03/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.10 0.20 (0.70)	TARMACADAM FILL: grey/brown angular crushed rock fill MADE GROUND: brown slightly sandy slightly gravelly Clay with brick angular cobbles and pea gravel		
2.20	B				0.90 (1.60)	Firm to stiff brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
					2.50	Complete at 2.50m		

Plan	Remarks
.	Groundwater not encountered
.	150mm orange wavin storm drain 0.8m BGL parallel to trench
.	Trial pit stable
.	Trial pit backfilled on completion
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	Scale (approx) 1:50
	Logged By MK
	Figure No. 6944-07-17.TP118



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Site
Belgard Gardens

Trial Pit Number
TP119

Machine : 13T Excavator Method : Trial Pit	Dimensions 4.1m x 1m x 3.3m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 04/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.05 (0.25) 0.30	TOPSOIL: brown slightly sandy slightly gravelly CLAY with grass rootlets		
					(1.80)	Possible MADE GROUND brown slightly sandy slightly gravelly Clay Firm to stiff brown brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B				2.10	Stiff Grey slightly sandy slightly gravelly CLAY with cobbles and boulders		
					(1.20)			
3.10	B				3.30	Complete at 3.30m		

Plan .	Remarks Groundwater not encountered Trial pit stable Trial pit backfilled on completion		
	<table border="1"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By MK</td> <td>Figure No. 6944-07-17.TP119</td> </tr> </table>	Scale (approx) 1:50	Logged By MK
Scale (approx) 1:50	Logged By MK	Figure No. 6944-07-17.TP119	



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Site
Belgard Gardens

Trial Pit Number
TP120

Machine : 13T Excavator Method : Trial Pit	Dimensions 2.7m x 1m x 2.1m	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location	Dates 03/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	B				0.10 (0.60) 0.70	TOPSOIL: brown slightly sandy slightly gravelly Clay with grass rootlets MADE GROUND: brown sandy gravelly Clay with brick plastic textile and rope Firm to stiff grey brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
2.00	B				(1.40) 2.10	Complete at 2.10m		

Plan								Remarks
								Groundwater not encountered Trial pit stable Trial pit backfilled on completion
	Scale (approx)			Logged By		Figure No.		
	1:50			MK		6944-07-17.TP120		

Trial Pit photographs for Belgard Gardens

TP101



TP101



TP101



TP102



TP102



TP102



TP102A



TP102A



TP102A



TP103



TP103



TP103



TP104



TP104



TP104



TP105



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TP119



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TP119



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TP119



TP120



TP120



TP120



APPENDIX 3 – Geobor S Borehole Records



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Site
Belgard Gardens

Borehole Number
BH01

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 25/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								Firm to Stiff brown sandy gravelly CLAY with sub rounded to sub angular cobbles		
	71						(1.60)			
2.10	100						1.60	Stiff to Very stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
2.60 2.60-2.99					3,9/15,14,16,5 SPT(C) 50/235		(4.00)			
	100									
4.10 4.10-4.26					8,17/50 SPT(C) 50/10					
	67									
5.60 5.60-6.05					4,9/11,24,15 SPT(C) N=50		5.60 (0.40)	Recovery of medium sub rounded to sub angular COBBLES (Very stiff). Driller notes Boulder Clay		
	100						6.00	Very stiff dark brown slightly sandy gravelly CLAY with some sub rounded to sub angular cobbles.		
7.10	100									
8.60 8.60-8.89					5,10/18,32 SPT(C) 50/135					
	100									

Remarks 50mm Slotted standpipe installed form 15.0m to 5.0m BGL with pea gravel surround. Plain pipe installed form 5.0m to ground level with bentonite seal.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



Ground Investigations Ireland Ltd
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Site
Belgard Gardens

Borehole Number
BH01

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 25/08/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.10							(9.00)			
11.60 11.60-11.76	100				5,20/50 SPT(C) 50/10					
13.10	100									
14.60	75									
15.00							15.00	Complete at 15.00m		

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH02

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 08/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.30)	Dark brown slightly sandy gravelly TOPSOIL		
							0.30	Firm to Stiff brown sandy gravelly CLAY with some sub rounded cobbles		
	68						(1.90)			
2.20 2.20-2.43					12,13/15,35 SPT(C) 50/80		2.20	Stiff brown sandy gravelly CLAY with some sub rounded cobbles		
	100						(0.80)			
							3.00	Very stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
3.70 3.70-4.15					15,10/50 SPT(C) N=50		(3.70)			
	92									
5.20 5.20-5.36					19,6/50 SPT(C) 50/10					
	100									
6.70 6.70-6.79					23,2/50 SPT(C) 25*/80 50/10		6.70	Very stiff grey brown slightly sandy gravelly CLAY with sme sub rounded to sub angular cobbles		
	81									
8.20 8.20-8.36					22,3/50 SPT(C) 50/10					
	100									
9.70 9.70-9.86					14,9/50 SPT(C) 50/10					

Remarks Sealed pip installed from 15.00m to 13.50m BGL. 50mm Slotted standpipe installed form 13.50m to 8.50m BGL with pea gravel surround. Plain pipe installed form 8.50m to ground level with bentonite seal.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH02

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 08/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20 11.20-11.29	100				11,15/50 SPT(C) 26*/80 50/10		(7.80)			
12.70 12.70-12.79	100				22,3/50 SPT(C) 25*/80 50/10					
14.20 14.20-14.29	97				23,2/50 SPT(C) 25*/80 50/10		14.50 (0.50)	Very stiff dark brown slightly sandy silty CLAY with some sub rounded cobbles.		
15.00	100						15.00	Complete at 15.00m		

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH03

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 04/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.50)	MADE GROUND consisting of grey sandy gravelly Clay. Driller notes FILL		
	88						0.50	Firm to Stiff brown slightly sandy slightly gravelly CLAY		
1.60 1.60-1.69					18,7/50 SPT(C) 25*/80 50/10		1.60	Dense brown sandy very clayey fine to coarse sub rounded to sub angular GRAVEL with some sub angular cobbles		
	73						(2.30)			
3.10										
3.70-3.86					14,9/50 SPT(C) 50/10		3.90	Stiff grey brown sandy gravelly CLAY with some sub rounded cobbles		
	53									
5.20 5.20-5.43					11,12/15,35 SPT(C) 50/80		(2.80)			
	80									
6.70 6.70-6.72					25/50 SPT(C) 25*/10 50/10		6.70	No Recovery. Driller notes (Stiff to Very stiff) dark grey sandy gravelly CLAY with cobbles.		
	0						(1.50)			
8.20 8.20-8.65					20,5/50 SPT(C) N=50		8.20	Complete at 8.20m		

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH04

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 28/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.80)	Recovery consists of brown sandy gravelly Clay with some sub rounded cobbles. Driller notes possible MADE GROUND.		
	55						0.80	Recovery consists of dark grey slightly sandy gravelly CLAY with some sub rounded cobbles (Stiff). Driller notes grey sandy gravelly CLAY.		
2.40					4,9/9,8,8,2 SPT(C) N=27		(1.60)			
2.40-2.85							2.40	Medium dense grey fine to coarse sub angular to sub rounded cobbles and GRAVEL.		
	80						(0.80)			
							3.20	Recovery consists of dark grey slightly sandy gravelly CLAY with some sub rounded cobbles (Stiff). Driller notes grey sandy gravelly CLAY.		
3.90					4,8/14,22,14 SPT(C) 50/175		(0.70)			
3.90-4.23							3.90	Recovery consists of dark grey slightly sandy gravelly CLAY with some sub rounded cobbles (Very stiff). Driller notes grey sandy gravelly CLAY.		
	53						(1.50)			
5.40							5.40	Medium dense to dense grey fine to coarse sub angular to sub rounded cobbles and GRAVEL.		
	80						(0.70)			
							6.10	Very stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles.		
6.90					25/50 SPT(C) 25*/10 50/10		(0.80)			
6.90-6.92							6.90	Recovery consists of dark grey slightly sandy gravelly CLAY with some sub rounded cobbles (Very stiff). Driller notes grey sandy gravelly CLAY.		
	50						(1.20)			
							8.10	No Recovery. Driller notes Sand and Gravel (Dense to Very dense)		
8.40					6,6/8,15,14,13 SPT(C) 50/265		(1.80)			
8.40-8.82										
9.90-10.18					4,9/16,34 SPT(C) 50/130		9.90			

Remarks Slotted standpipe installed from 9.9m to 5.7m BGL with pea gravel surround. Plain pipe installed from 5.7m to ground level with bentonite surround.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH05

Machine :	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
Flush :	Location	Dates 31/08/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2
Core Dia: mm				
Method :				

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
9.90-10.16	100				7,9/29,21 SPT(C) 50/110		(2.60)	sub rounded cobbles (Very stiff). Driller notes brown sandy gravelly CLAY.		
11.40 11.40-11.56	100				16,9/50 SPT(C) 50/10		12.40	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles (Very stiff). Driller notes brown sandy gravelly CLAY.		
12.90	100						(2.60)			
14.40 14.40-14.42	100				25/50 SPT(C) 25*/10 50/10		15.00			
15.00								Complete at 15.00m		

Remarks	Scale (approx)	Logged By
	1:50	GK
	Figure No. 6944-07-17.BH05	



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Site
Belgard Gardens

Borehole Number
BH06

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 29/08/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.20) 0.20	Brown TOPSOIL Recovery consists of brown slightly sandy slightly gravelly CLAY with some sub rounded cobbles (Very stiff). Driller notes brown sandy gravelly CLAY.		
1.50	100						(1.10) 1.30 (0.20) 1.50	Recovery consists of black/ grey slightly sandy very gravelly CLAY with some sub rounded cobbles (Very stiff). Driller notes grey sandy gravelly CLAY.		
2.40 2.40-2.85	67				3,5/6,10,9,12 SPT(C) N=37		(0.90) 2.40	Recovery consists of dark grey slightly sandy very gravelly CLAY with some sub rounded cobbles (Very stiff). Driller notes grey sandy gravelly CLAY. Very stiff dark grey sandy very gravelly CLAY with some sub rounded cobbles.		
3.90	100									
5.40 5.40-5.56	100				18,7/50 SPT(C) 50/10		(6.00)			
6.90	91									
8.40 8.40-8.56	40				13,12/50 SPT(C) 50/10		8.40	Recovery consists of brown gravelly fine to coarse COBBLES (Dense). Driller notes brown Sand and GRAVEL with cobbles		
9.90										

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens
Borehole Number
BH06

Machine :		Casing Diameter		Ground Level (mOD)		Client OCSC		Job Number 6944-07-17	
Flush :									
Core Dia: mm									
Method : Rotary Cored		Location Belgard Road		Dates 29/08/2017		Project Contractor Ground Investigations Ireland		Sheet 2/2	

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
9.90-10.35					6,17/39,11 SPT(C) N=50		(3.00)			
11.40 11.40-11.85	0				3,9/10,17,23 SPT(C) N=50		11.40	Complete at 11.40m		

Remarks	Scale (approx)	Logged By
	1:50	MK
Figure No. 6944-07-17.BH01		



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Site
Belgard Gardens

Borehole Number
BH07

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 11/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.30)	Brown slightly sandy gravelly TOPSOIL with some rootlets		
	41						0.30	Firm brown slightly sandy gravelly CLAY with occasional sub rounded cobbles		
2.20					3,4/3,3,4,3		(3.10)			
2.20-2.65	100				SPT(C) N=13					
3.70					4,5/5,4,6,5		3.40	Stiff dark grey slightly sandy gravelly CLAY with occasional sub rounded to sub angular cobbles		
3.70-4.15	81				SPT(C) N=20		(1.80)			
5.20					5,6/7,12,15,16		5.20	Very stiff dark brown sandy gravelly CLAY with sub rounded to sub angular cobbles		
5.20-5.63	100				SPT(C) 50/275					
6.70	100									
8.20	97						(7.60)			
9.70										

Remarks Sealed pipe installed from 15.00m to 13.50m BGL, 50mm slotted standpipe installed from 13.50m to 8.5m BGL with pea gravel surround. Plain pipe installed from 8.50m to Ground level with bentonite surround.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH07

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 11/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20	100									
12.70	100						12.80 (0.75)	Very stiff brown slightly sandy gravelly CLAY with occasional sub rounded to sub angular cobbles		
14.20 14.20-14.65	0				9,10/10,11,12,15 SPT(C) N=48		13.55 (0.45)	Dense grey clayey sandy sub rounded to sub angular fine to coarse GRAVEL with some sub rounded cobbles		
15.00 15.00-15.45					10,9/10,11,10,11 SPT(C) N=42		14.00 (1.00)	No Recovery. Driller notes clayey Gravel		
							15.00	Complete at 15.00m		

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens
Borehole Number
BH08

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 14/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								Recovery of brown sandy gravelly CLAY with some sub rounded cobbles (Possible MADE GROUND). Driller notes Loose Made Ground with a hydrocarbon odour		
2.20 2.20-2.65	37				4,5/4,5,5,5 SPT(C) N=19		(2.20) 2.20	Stiff dark grey slightly sandy slightly gravelly CLAY with some sub rounded cobbles.		
3.70 3.70-3.86					19,6/50 SPT(C) 50/10		3.70	Very stiff dark grey slightly sandy slightly gravelly CLAY with some sub rounded cobbles.		
5.20 5.20-5.29					17,8/25 SPT(C) 25*/80 25/10					
6.70 6.70-6.72					25/50 SPT(C) 25*/10 50/10		(7.50)			
8.20 8.20-8.22					25/50 SPT(C) 25*/10 50/10					
9.70 9.70-9.79					19,6/50 50/10 SPT(C) 25*/80					

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH08

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 14/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20 11.20-11.22	100				25/50 SPT(C) 25*/10 50/10		11.20	Very stiff brown grey very sandy very gravelly CLAY with occasional sub rounded cobbles		
12.70 12.70-13.15	82				4,6/7,8,9,8 SPT(C) N=32		(1.50) 12.70	Recovery consists of grey clayey sandy fine to coarse sub rounded to sub angular GRAVEL with some sub rounded to sub angular cobbles. (Dense) Driller notes very gravelly sandy Clay		
14.20 14.20-14.22	100				25/50 SPT(C) 25*/10 50/10		14.60 (0.40)	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles.		
15.00 15.00-15.02					25/50 SPT(C) 25*/10 50/10		15.00	Complete at 15.00m		

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH09

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 26/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	69						(0.80)	Poor Recovery. Driller notes brown Gravel/ CLAY		
0.80	87						0.80 (1.50)	Stiff brown sandy gravelly CLAY		
2.30 2.30-2.45	100				14,9/50 SPT(C) 23*/100 50/50		2.30 (3.00)	Stiff dark grey slightly sandy gravelly CLAY		
3.80 3.80-9.91	90				19,6/50 SPT(C) 25*/105 50/6005		(3.00)			
5.30	80						5.30 (1.50)	Dense dark grey sandy very clayey fine to coarse sub angular to sub rounded GRAVEL with some sub rounded cobbles		
6.80 6.80-8.44	95				14,11/50 SPT(C) 50/10		6.80 (1.50)	Stiff to Very stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
8.30 8.30-8.38	20				19,6/50 SPT(C) 25*/75 50/5		8.30	Poor recovery of brown sandy fine to coarse sub angular to sub rounded GRAVEL with some sub rounded cobbles (Dense). Driller notes Gravel		
9.80 9.80-9.90					6,19/50 50/10 SPT(C) 25*/90					

Remarks 50mm slotted standpipe installed from 14.2m to 8.2m BGL with pea gravel surround. Plain pipe installed from 8.20m to ground level with bentonite surround.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH09

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 26/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.30 11.30-11.35	43				25/50 SPT(C) 25*/40 50/10		(5.90)			
12.80 12.80-12.87	50				25/50 SPT(C) 25*/60 50/10					
14.20 14.20-14.28	30				22,3/50 SPT(C) 25*/75 50/5		14.20	Complete at 14.20m		

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH10

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 13/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.40) 0.40	Recovery consist of brown slightly sandy gravelly CLAY with some sub rounded cobbles. Driller notes brown sandy gravelly TOPSOIL		
2.40 2.40-2.85	29				3,7,7,8,13,16 SPT(C) N=44		(2.60)	Recovery consists of grey brown sub angular to sub rounded fine to coarse COBBLES and gravels (Dense). Driller notes brown cobby Gravel		
3.90 3.90-4.06	73				8,17/50 SPT(C) 50/10		3.00	Very stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles (Very stiff). Driller notes grey sandy gravelly CLAY.		
5.40	80						(3.90)			
6.90 6.90-7.17	47				11,14/27,23 SPT(C) 50/115		6.90	Recovery consists of brown gravelly fine to medium SAND with sub rounded to sub angular cobbles (Dense to Very dense). Driller notes gravelly coarse SAND		
8.40 8.40-8.85	20				4,5/9,9,15,17 SPT(C) N=50		(3.00)			
9.90							9.90			

Remarks Solid pipe installed from 15.00m to 12.0m. Slotted standpipe installed from 12.00m to 6.0m with pea gravel surround. Plain pipe installed from 6.0m to ground level with bentonite seal.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH10

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 13/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
9.90-10.06	80				18.7/50 SPT(C) 50/10			Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles.		
11.40	100					(5.40)				
12.90 12.90-12.98	100				25/50 SPT(C) 25*/70 50/10					
14.40	100									
15.30							15.30	Complete at 15.30m		

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH11

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 07/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.40)	Firm brown slightly sandy gravelly CLAY		
	75						0.40	Firm to Stiff brown slightly sandy slightly gravelly CLAY with some sub rounded cobbles		
2.00					3,4/4,3,3,4 SPT(C) N=14		(2.00)			
2.00-2.45	100						2.40	Stiff to Very stiff dark grey slightly sandy gravelly CLAY with occasional sub rounded to sub angular cobbles		
3.50					6,5/7,6,6,6 SPT(C) N=25					
3.50-3.95	100									
5.00					6,6/7,8,19,16 SPT(C) 50/275					
5.00-5.43	100									
6.50										
	94									
8.10							(11.50)			
	100									
9.60										

Remarks 50mm slotted standpipe installed from 15.00m to 10.00m BGL with pea gravel surround. Plain pipe installed from 10.00m to Ground level with bentonite surround.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH11

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 07/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.00-11.16 11.10	100				10,15/50 SPT(C) 50/10					
12.60	100									
14.10	100						13.90 (1.10)	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles.		
15.00							15.00	Complete at 15.00m		

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH12

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 26/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								Poor Recovery consists of brown sub rounded to sub angular Cobbles. Driller notes brown Gravel		
2.50 2.50-2.63	12				4.21/50 SPT(C) 25*/125 50/5		(2.50)			
4.00 4.00-4.07	93				25/50 SPT(C) 25*/60 50/10		(4.90)	Stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
5.50	100									
7.00 7.00-7.08	77				24.1/50 SPT(C) 25*/75 50/5		7.40	Stiff to Very stiff dark grey very sandy very gravelly CLAY with some sub rounded cobbles		
8.50 8.50-8.76	93				7.16/29,21 SPT(C) 50/110		(4.10)			
10.00										

Remarks 50mm slotted standpipe installed from 12.9m to 6.9m BGL with pea gravel surround. Plain pipe installed from 6.9m to ground level with bentonite surround.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH12

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 26/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00-10.09	73				14,11/50 SPT(C) 25*/85 50/5					
11.50 11.50-11.58	7				22,3/50 SPT(C) 25*/75 50/5		11.50 (1.40)	Poor recovery of brown sandy fine to coarse sub angular to sub rounded Cobbles with some sub rounded cobbles (Dense). Driller notes Gravel		
12.90 12.90-12.99					18,7/50 SPT(C) 25*/85 50/5		12.90	Complete at 12.90m		

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH13

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 15/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								No Recovery. Driller notes MADE GROUND or FILL		
2.20	0						(2.20)			
3.70 3.70-4.08	100				9,11/10,11,12,17 SPT(C) 50/225		2.20 (1.50)	Stiff brown sandy gravelly CLAY with some sub rounded cobbles		
5.20 5.20-5.22	100				25/50 SPT(C) 25*/10 50/10		3.70 (0.70)	Stiff dark grey sandy gravelly CLAY with some sub rounded cobbles		
6.70 6.70-7.15	100				19,6/50 SPT(C) N=50		4.40 (0.30) 4.70	Stiff brown sandy gravelly CLAY with some sub rounded cobbles		
8.20 8.20-8.65	83				11,4/5,6,6,5 SPT(C) N=22		(3.50)	Stiff dark grey sandy gravelly CLAY with some sub rounded cobbles		
9.70-10.15	41				4,5/4,5,6,5 SPT(C) N=20		8.20 (2.50)	Poor recovery of dark grey slightly clayey medium to coarse SAND (Medium dense). Driller notes: Fine Sand		

Remarks 50mm slotted standpipe installed from 12.20m to 7.20m BGL with pea gravel surround. Plain pipe installed from 7.20m to ground level with benotnite surround.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH13

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 15/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20 11.20-11.65	56				7,8/7,6,7,6 SPT(C) N=26		10.70 (2.30)	Dense brown clayey sandy fine to coarse sub angular to sub rounded GRAVEL with some sub rounded cobbles		
12.70 12.70-12.86	100				19,6/50 SPT(C) 50/10		13.00 (2.00)	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles.		
14.20 14.20-14.28	100				20,5/50 SPT(C) 25*/75 50/5		15.00	Complete at 15.00m		
15.00 15.00-15.16					22,3/50 SPT(C) 50/10					

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH14

Machine :	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
Flush :	Location Belgard Road	Dates 18/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2
Core Dia: mm				
Method : Rotary Cored				

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								No Recovery. Driller notes MADE GROUND or FILL		
2.70 2.70-2.86	48				17,8/50 SPT(C) 50/10		(1.20)	Stiff to Very stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
3.20-3.29	75			19,6/50 SPT(C) 25*/80 50/10		1.20				
3.70	100					(7.20)				
5.20 5.20-5.29	100			18,7/50 SPT(C) 25*/80 50/10						
6.70 6.70-6.79	100			22,3/50 SPT(C) 25*/80 50/10						
8.20 8.20-8.29	88			22,3/50 SPT(C) 25*/80 50/10		8.40	Dense dark grey clayey sandy fine to coarse sub angular to sub rounded GRAVEL with some sub rounded cobbles			
9.70 9.70-10.01					10,11/12,12,26 SPT(C) 50/160					

Remarks 50mm slotted standpipe installed from 12.70m to 6.00m BGL with pea gravel surround. Plain pipe installed from 6.00m to ground level with benotnite surround.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH14

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 18/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20 11.20-11.58	67				8,8/10,12,12,16 SPT(C) 50/230		(4.30)			
12.70 12.70-12.79	93				22,3/50 SPT(C) 25*/80 50/10		12.70 (0.80)	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles		
14.20 14.20-14.22	100				25/50 SPT(C) 25*/10 50/10		13.50 (0.50)	Dense brown clayey sandy fine to coarse sub angular to sub rounded GRAVEL with some sub rounded cobbles		
15.00 15.00-15.02	100				25/50 SPT(C) 25*/10 50/10		14.00 (1.00)	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles.		
					25/50 SPT(C) 25*/10 50/10		15.00	Complete at 15.00m		

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH15

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 13/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(1.10)	No Recovery. Driller notes MADE GROUND		
1.10	0						1.10	Recovery consists of dark grey slightly sandy gravelly CLAY with some sub rounded cobbles (Very stiff). Driller notes grey sandy gravelly CLAY.		
2.20 2.20-2.37					9,14/50 SPT(C) 50/20		(3.00)			
3.70 3.70-3.81					17,8/50 SPT(C) 25*/100 50/10		4.10	Stiff to Very stiff dark grey sandy very gravelly CLAY with some sub rounded cobbles.		
5.20 5.20-5.29					19,6/50 SPT(C) 25*/80 50/10		(5.00)			
6.70 6.70-6.79					22,3/50 SPT(C) 25*/80 50/10					
8.20 8.20-8.22					25/50 SPT(C) 25*/10 50/10		9.10	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles.		
9.70 9.70-9.72					25/50 50/10 SPT(C) 25*/10					

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH15

Machine :		Casing Diameter		Ground Level (mOD)		Client		Job Number	
Flush :						OCSC		6944-07-17	
Core Dia: mm		Location		Dates		Project Contractor		Sheet	
Method : Rotary Cored		Belgard Road		13/09/2017		Ground Investigations Ireland		2/2	

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20 11.20-11.97	100				15.10/50 SPT(C) 50/10		(3.60)			
12.70 12.70-12.79	100				22.3/50 SPT(C) 25*/80 50/10		12.70 (0.30) 13.00	No recovery. Driller notes GRAVEL		
14.20 14.20-14.28	70				25/50 SPT(C) 25*/75 50/5		(2.00)	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles.		
15.00 15.00-15.02	100				25/50 SPT(C) 25*/10 50/10		15.00	Complete at 15.00m		

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH16

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 21/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								Poor Recovery consisting of brown slightly sandy gravelly CLAY with some sub rounded cobbles. Driller notes gravelly Clay		
2.20 2.20-2.65	61				3,10/12,12,7,14 SPT(C) N=45		(2.20) 2.20 (1.50)	Poor Recovery consisting of angular COBBLES (Dense). Driller notes clayey Gravel		
3.70 3.70-3.86					6,19/50 SPT(C) 50/10		3.70 (3.00)	Stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
5.20 5.20-5.36					12,13/50 SPT(C) 50/10		6.70 (1.50)	Stiff dark grey sandy very gravelly CLAY with some sub rounded cobbles		
6.70 6.70-6.86	80				19,6/50 SPT(C) 50/10		8.20 (3.00)	Stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
8.20 8.20-8.51	83				14,11/17,19,14 SPT(C) 50/160			Stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
9.70 9.70-9.72	90				22,3/50 50/10 SPT(C) 25*/10					

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH16

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter		Ground Level (mOD)		Client OCSC	Job Number 6944-07-17
	Location Belgard Road		Dates 21/09/2017		Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20	100									
11.20-11.22	85				25/50 SPT(C) 25*/10 50/10		11.20 (1.30)	Medium dense to Dense brown sandy very clayey sub rounded to sub angular fine to coarse GRAVEL with some sub rounded cobbles		
12.50	100				10.15/50 SPT(C) 50/10		12.50 (2.50)	Very stiff brown sandy gravelly CLAY with some sub rounded cobbles.		
12.50-12.66										
14.00	100				25/50 SPT(C) 25*/10 50/10		15.00	Complete at 15.00m		
14.00-14.02										
15.00										

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH17

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 21/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								Possible MADE GROUND consisting of brown sandy gravelly Clay with cobbles		
1.50	100						(1.50)			
1.80-2.15					5,6,7,10,33 SPT(C) 50/200		1.50 (0.80)	Stiff brown sandy gravelly CLAY with some sub rounded cobbles		
3.10-3.19					12,13/50 SPT(C) 25*/80 50/10		2.30	Stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles		
3.70	75									
5.20					17,8/50 SPT(C) 25*/80 50/0		(7.20)			
5.20-5.28	100									
6.70					25/50 SPT(C) 25*/10 50/10					
6.70-6.72	95									
8.20					10,10/11,14,25 SPT(C) 50/160					
8.20-8.51	100									
9.00							9.50	Poor recovery consisting of sub angular to sub rounded Cobbles (Stiff) Driller notes very gravelly CLAY		
9.00	39									

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens
Borehole Number
BH17

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 21/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.30							10.30 (0.80)	Complete at 10.30m		

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH18

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 12/09/2017	Project Contractor Ground Investigations Ireland	Sheet 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.50)	MADE GROUND consisting of Dark brown slightly sandy very gravelly Clay		
	68						0.50	Stiff brown sandy gravelly CLAY with some sub rounded cobbles		
2.20 2.20-2.43					7,8/9,41 SPT(C) 50/80		(1.90)			
	100						2.40	Stiff to Very stiff dark grey slightly sandy gravelly CLAY with occasional sub rounded to sub angular cobbles		
3.70 3.70-3.86					9,14/50 SPT(C) 50/10		(4.30)			
	100									
5.20 5.20-5.36					14,9/50 SPT(C) 50/10		6.70	Very stiff grey brown sandy gravelly CLAY with some sub rounded cobbles		
	92						(1.70)			
6.70 6.70-6.79					19,6/50 SPT(C) 25*/80 50/10		8.40	Stiff to Very stiff dark grey sandy very gravelly CLAY with some sub rounded cobbles.		
	88						(0.70)			
8.20 8.20-8.29					19,6/50 SPT(C) 25*/80 50/10		9.10	Recovery consists of grey brown clayey sandy sub angular fine to coarse GRAVEL (Dense). Driller notes brown Gravels		
							(1.20)			
9.70 9.70-10.15					8,8/9,8,7,8 SPT(C) N=32					

Remarks Sealed pipe installed from 15.00m to 13.50m BGL, 50mm slotted standpipe installed from 13.50m to 8.5m BGL with pea gravel surround. Plain pipe installed from 8.50m to Ground level with bentonite surround.	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH18

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 12/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20 11.20-11.29	77				22.3/50 SPT(C) 25*/80 50/10		10.30 (1.10)	Very stiff brown sandy gravelly CLAY with occasional sub rounded cobbles		
12.70 12.70-12.72	94				25/50 SPT(C) 25*/10 50/10		11.40 (1.30)	Dense to Very dense brown clayey gravelly medium to coarse grained SAND with occasional cobbles		
14.20 14.20-14.36	100				9,15/50 SPT(C) 50/10		12.70 (0.85)	Very stiff brown slightly sandy gravelly CLAY with occasional sub rounded to sub angular cobbles		
15.00 15.00-15.09	100				25/50 SPT(C) 25*/80 50/10		13.55 (0.75)	Dense to Very dense brown clayey sandy sub rounded to sub angular fine to coarse GRAVEL with some sub rounded cobbles		
							14.30 (0.70)	Very stiff brown slightly sandy gravelly CLAY with some sub rounded cobbles.		
							15.00	Complete at 15.00m		

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH19

Machine :		Casing Diameter		Ground Level (mOD)		Client		Job Number	
Flush :						OCSC		6944-07-17	
Core Dia: mm						Project Contractor		Sheet	
Method : Rotary Cored		Location Belgard Road		Dates 19/09/2017		Ground Investigations Ireland		1/2	

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(1.20)	No Recovery. Driller notes Soft Fill		
	45						1.20	Stiff brown sandy gravelly CLAY		
2.20 2.20-2.65					8,7/9,11,12,15 SPT(C) N=47		(1.00)			
	90						2.20	Stiff to Very stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles.		
3.70 3.70-3.86					14,9/50 SPT(C) 50/10					
	100									
5.20 5.20-5.29					22,3/50 SPT(C) 25*/80 50/10					
	100									
6.70 6.70-6.79					23,2/50 SPT(C) 25*/80 50/10					
	97									
8.20 8.20-8.29					25/50 SPT(C) 25*/80 50/10		(12.80)			
	100									
9.70 9.70-9.79					24,1/50 SPT(C) 25*/80					

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH19

Machine : Flush : Core Dia: mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client OCSC	Job Number 6944-07-17
	Location Belgard Road	Dates 19/09/2017	Project Contractor Ground Investigations Ireland	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20 11.20-11.29	100				23,2/50 SPT(C) 25*/80 50/10		15.00	Complete at 15.00m		
12.70 12.70-12.79	93			21,4/50 SPT(C) 25*/80 50/10						
14.20 14.20-14.22	100			25/50 SPT(C) 25*/10 50/10						
15.00										

Remarks	Scale (approx) 1:50	Logged By MK
	Figure No. 6944-07-17.BH01	



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Site
Belgard Gardens

Borehole Number
BH20

Machine :		Casing Diameter		Ground Level (mOD)		Client		Job Number	
Flush :						OCSC		6944-07-17	
Core Dia: mm		Location		Dates		Project Contractor		Sheet	
Method : Rotary Cored		Belgard Road		21/09/2017		Ground Investigations Ireland		1/2	

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00								Driller notes MADE GROUND		
	68						(0.90)	Stiff brown sandy gravelly CLAY with some sub rounded cobbles		
2.20 2.20-2.43					7,11/13,37 SPT(C) 50/80		0.90 (2.10)			
3.70 3.70-3.79	100				14,11/50 SPT(C) 25*/80 50/10		3.00	Very stiff dark grey slightly sandy gravelly CLAY with some sub rounded cobbles.		
5.20 5.20-5.29	93				17,8/50 SPT(C) 25*/80 50/10					
6.70 6.70-6.86	69				10,12/50 SPT(C) 50/10					
8.20 8.20-8.29	100				19,6/50 SPT(C) 25*/80 50/10					
9.70 9.70-9.79	100				21,4/50 SPT(C) 25*/80		(11.20)			

Remarks	Scale (approx)	Logged By
	1:50	MK
Figure No. 6944-07-17.BH01		



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Site
Belgard Gardens

Borehole Number
BH20

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :			OCSC	6944-07-17
Core Dia: mm	Location Belgard Road	Dates 21/09/2017	Project Contractor	Sheet
Method : Rotary Cored			Ground Investigations Ireland	2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.20	87				20,5/50 SPT(C) 25*/80 50/10					
11.20-11.29										
12.50	100				23,2/50 SPT(C) 25*/80 50/10					
12.70-12.79										
14.00	77				17,8/50 SPT(C) 25*/80 50/10					
14.20-14.29										
14.70	0						14.20 (0.50) 14.70	No Recovery. Driller notes very gravelly CLAY (Very stiff)		
								Complete at 14.70m		

Remarks	Scale (approx)	Logged By
	1:50	MK
	Figure No. 6944-07-17.BH01	

Belgard Gardens – RC Photographs

RC01





RC02





RC03



RC04



RC05

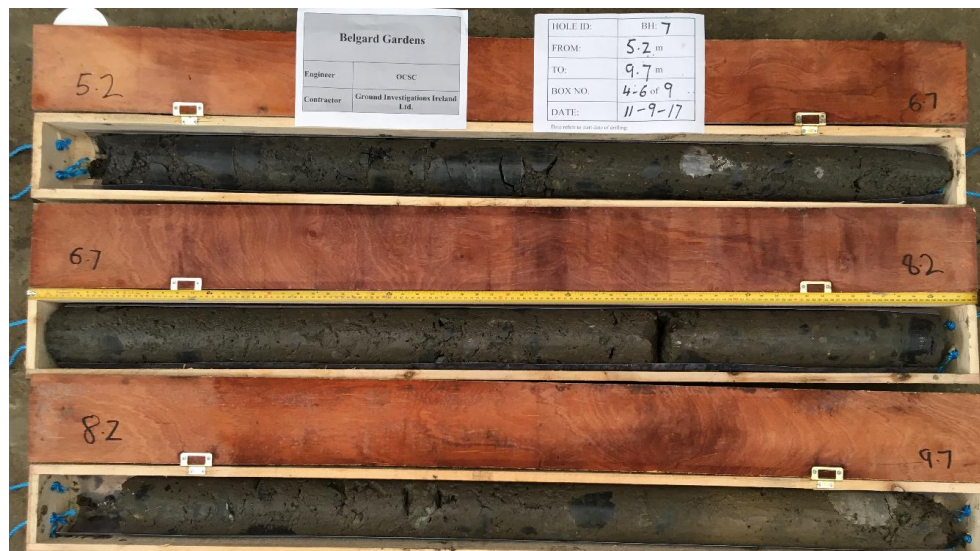




RC06



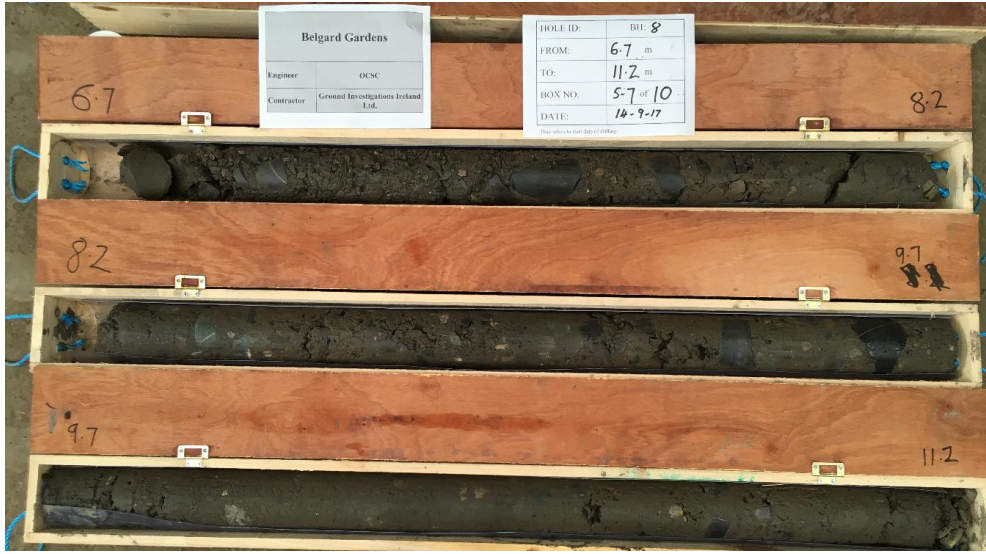
RC07





RC08





RC09





RC10





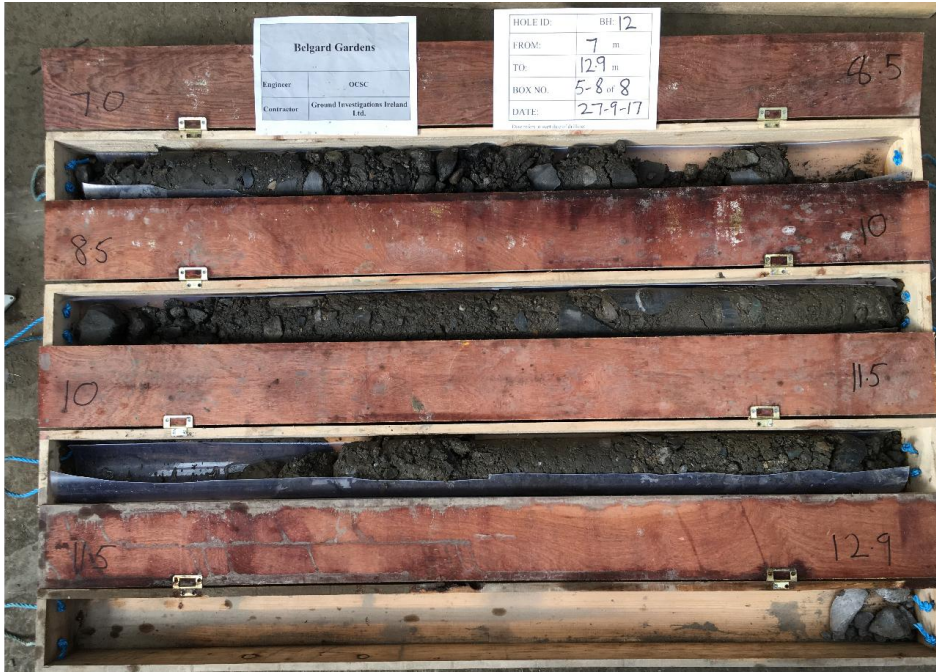
RC11



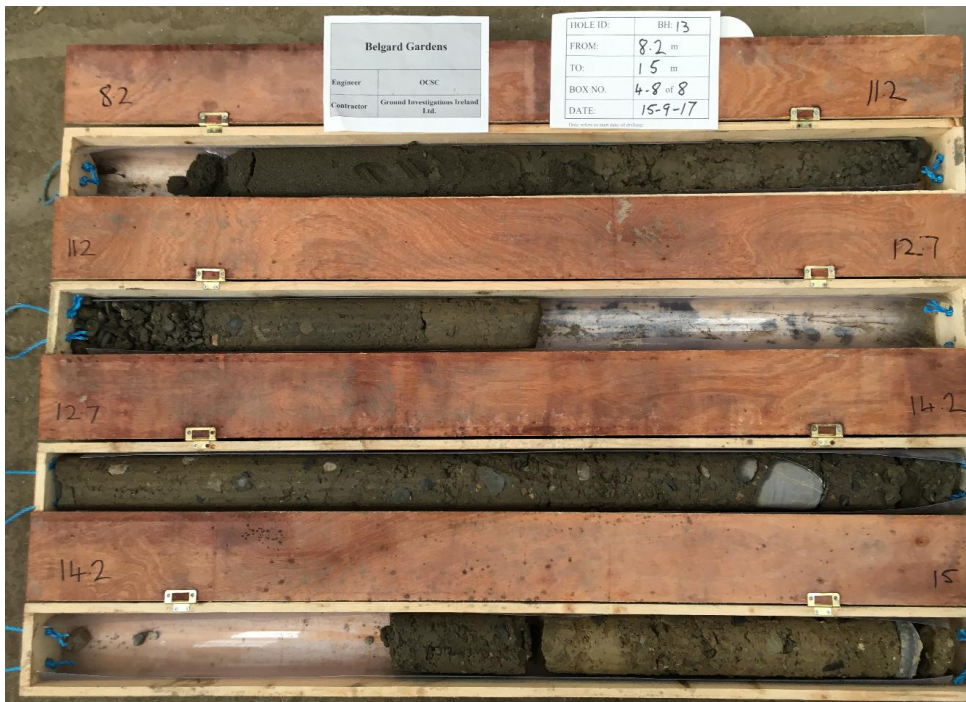


RC12





RC13



RC14





RC15





RC16



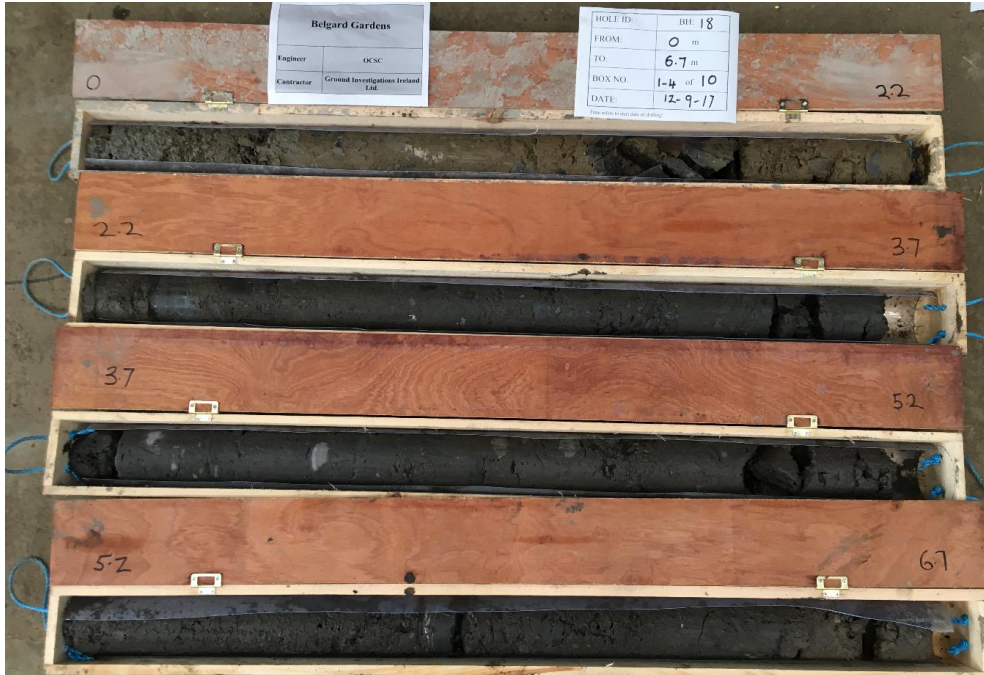


RC17





RC18





RC19





RC20





APPENDIX 4 - Soakaway Testing

Ground Investigations Ireland

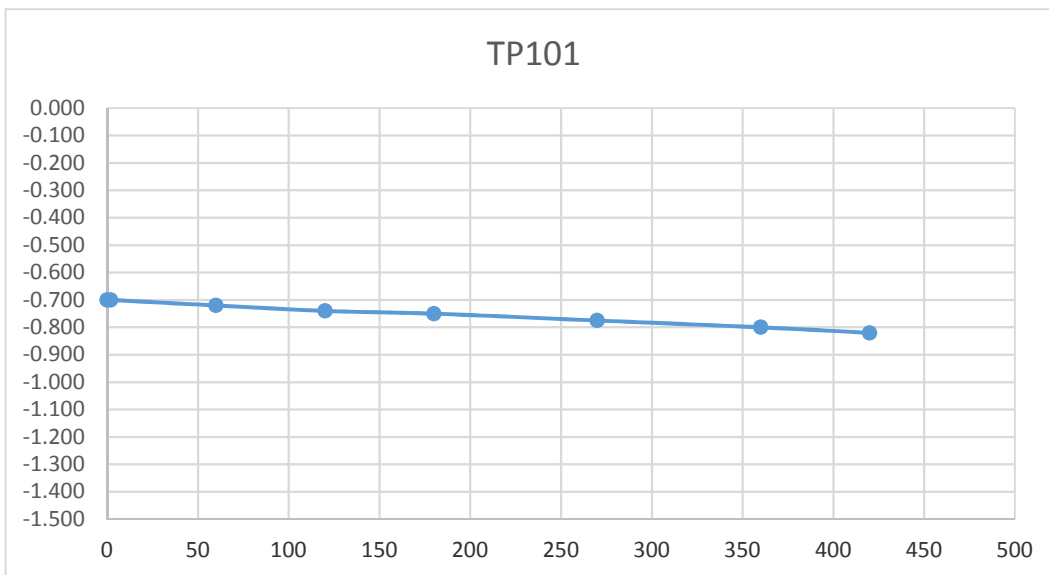
TP101

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 1.5m x 0.8m 1.3m (L x W x D)

Date	Time	Water level (m bgl)
31/07/2017	0	-0.700
31/07/2017	2	-0.700
31/07/2017	60	-0.720
31/07/2017	120	-0.740
31/07/2017	180	-0.750
31/07/2017	270	-0.775
31/07/2017	360	-0.800
31/07/2017	420	-0.820

Start depth 0.70	Depth of Pit 1.300	Diff 0.600	75% full 0.85	25%full 1.15
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
1.500	0.800		0.300	0.36
Tp75-25 (from graph) (s)		64500	50% Eff Depth	ap50 (m2)
			0.300	2.58
f =	FAIL	m/s		



Ground Investigations Ireland

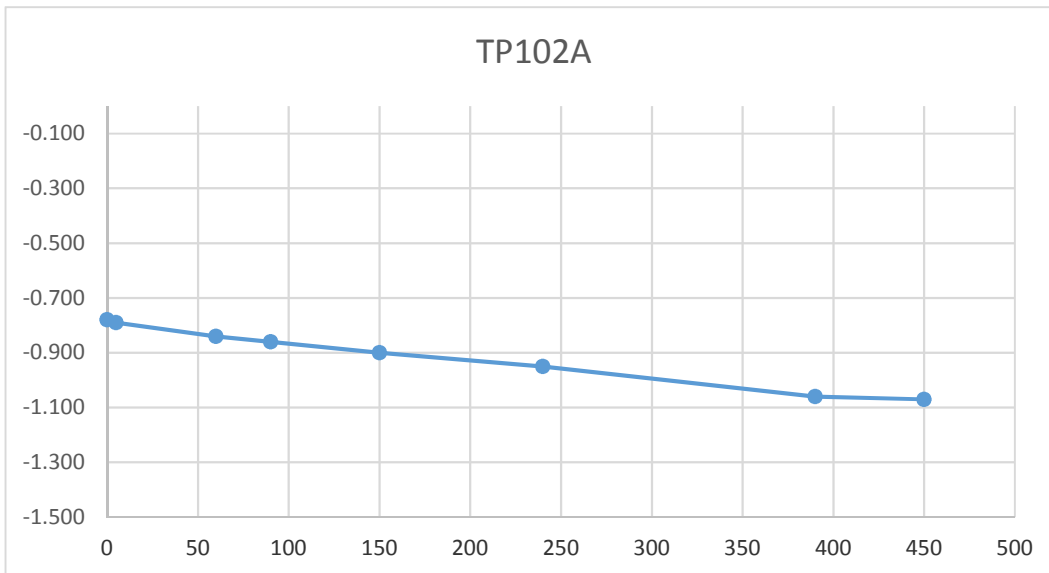
TP102A

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.1m x 0.8m 2.1m (L x W x D)

Date	Time	Water level (m bgl)
02/08/2017	0	-0.780
02/08/2017	5	-0.790
02/08/2017	60	-0.840
02/08/2017	90	-0.860
02/08/2017	150	-0.900
02/08/2017	240	-0.950
02/08/2017	390	-1.060
02/08/2017	450	-1.070

Start depth 0.78	Depth of Pit 2.100	Diff 1.320	75% full 1.11	25%full 1.77
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.100	1.000		0.660	1.39
Tp75-25 (from graph) (s)		19500	50% Eff Depth	ap50 (m2)
			0.660	6.192
f =	FAIL	m/s		



Ground Investigations Ireland

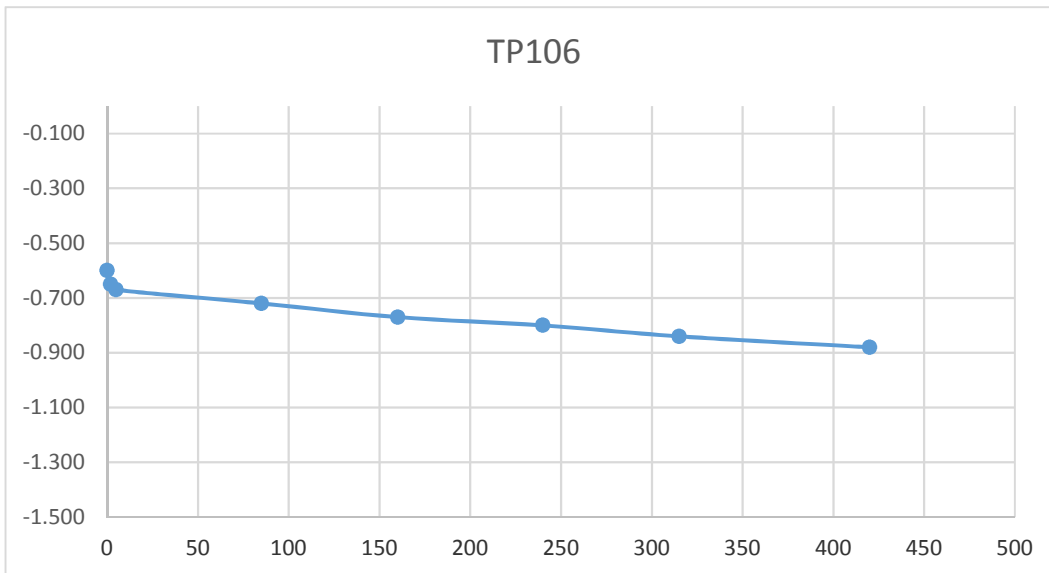
TP106

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.3m x 1m 2.1m (L x W x D)

Date	Time	Water level (m bgl)
31/07/2017	0	-0.600
31/07/2017	2	-0.650
31/07/2017	5	-0.670
31/07/2017	85	-0.720
31/07/2017	160	-0.770
31/07/2017	240	-0.800
31/07/2017	315	-0.840
31/07/2017	420	-0.880

Start depth 0.60	Depth of Pit 2.100	Diff 1.500	75% full 0.975	25%full 1.725
Length of pit (m) 2.300	Width of pit (m) 1.000		75-25Ht (m) 0.750	Vp75-25 (m3) 1.73
Tp75-25 (from graph) (s) 19500			50% Eff Depth 0.750	ap50 (m2) 7.25
f =		FAIL	m/s	



Ground Investigations Ireland

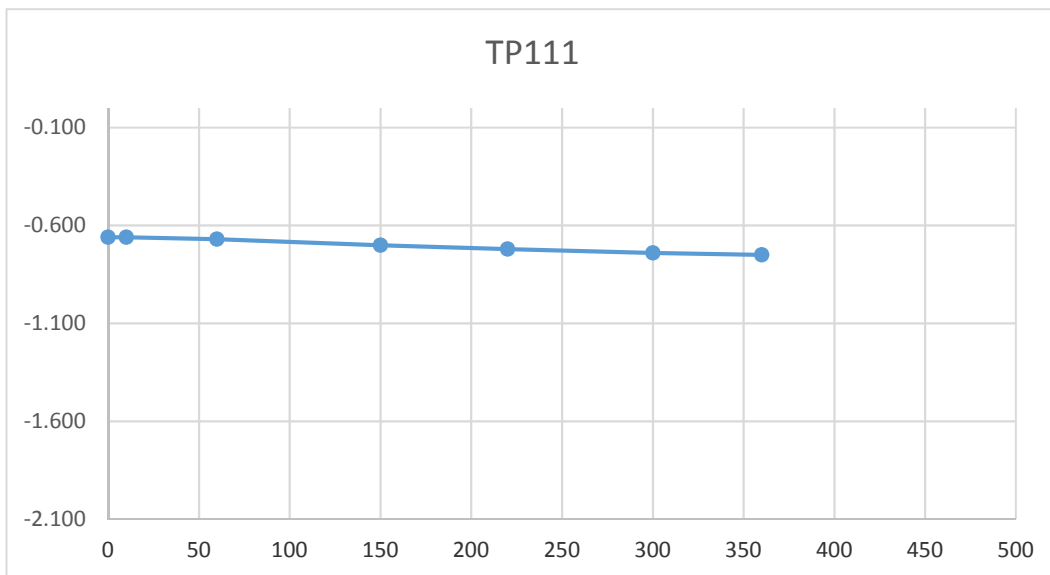
TP111

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.2m x 1m 2.1m (L x W x D)

Date	Time	Water level (m bgl)
03/08/2017	0	-0.660
03/08/2017	10	-0.660
03/08/2017	60	-0.670
03/08/2017	150	-0.700
03/08/2017	220	-0.720
03/08/2017	300	-0.740
03/08/2017	360	-0.750

Start depth 0.66	Depth of Pit 2.100	Diff 1.440	75% full 1.02	25%full 1.74
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.200	1.000		0.720	1.58
Tp75-25 (from graph) (s)		19500	50% Eff Depth	ap50 (m2)
f =		FAIL	0.720	6.808
		m/s		



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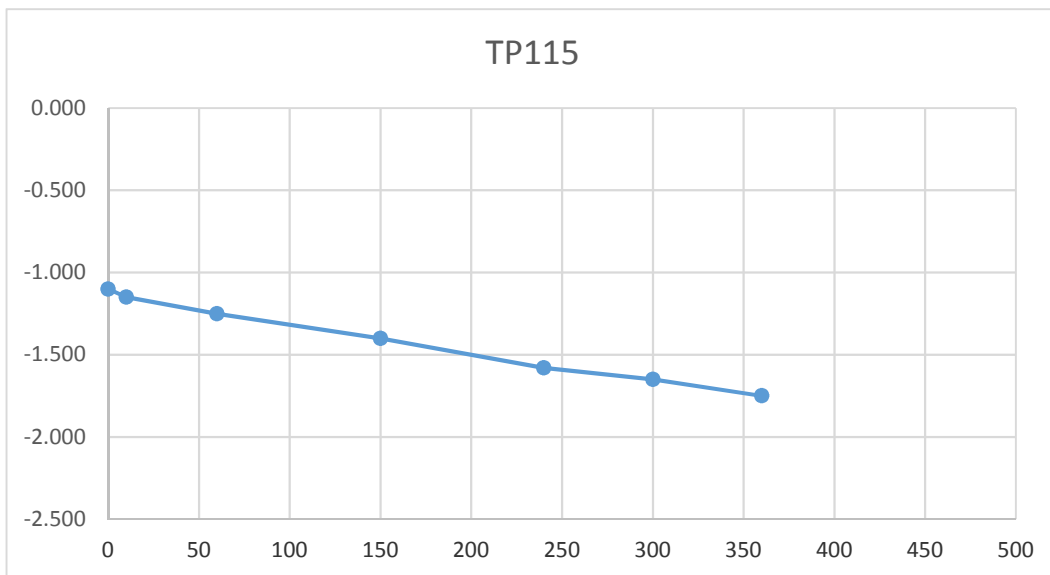
TP115

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.9m x 0.8m 2.5m (L x W x D)

Date	Time	Water level (m bgl)
03/08/2017	0	-1.100
03/08/2017	10	-1.150
03/08/2017	60	-1.250
03/08/2017	150	-1.400
03/08/2017	240	-1.580
03/08/2017	300	-1.650
03/08/2017	360	-1.750

Start depth 1.10	Depth of Pit 2.500	Diff 1.400	75% full 1.45	25%full 2.15
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.900	0.800		0.700	1.62
Tp75-25 (from graph) (s)		27000	50% Eff Depth	ap50 (m2)
			0.700	7.5
f =		8.020E-06	m/s	

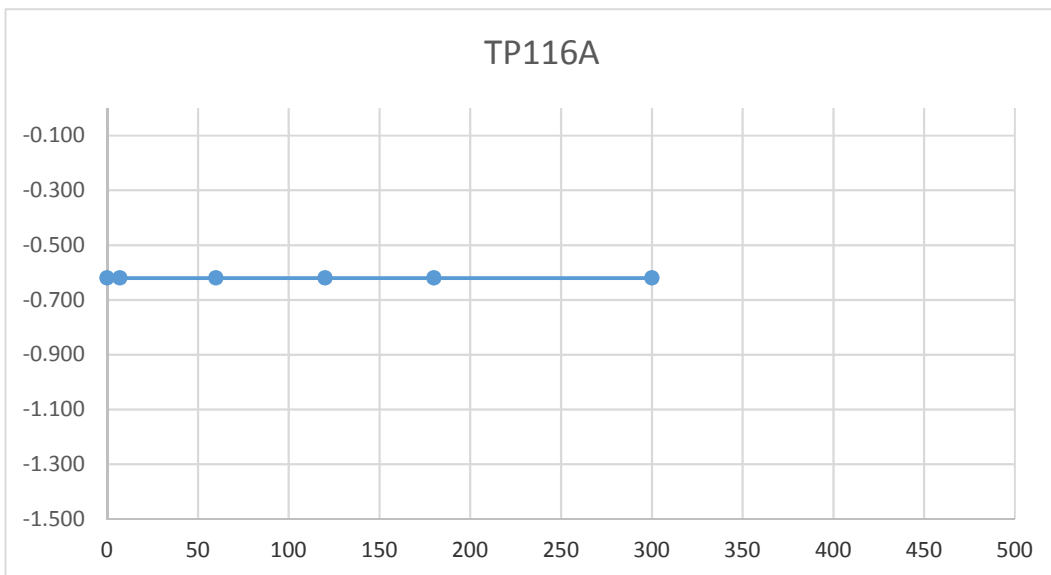


Ground Investigations Ireland

TP116A
Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.2m x 0.8m 2.1m (L x W x D)

Date	Time	Water level (m bgl)
03/08/2017	0	-0.620
03/08/2017	7	-0.620
03/08/2017	60	-0.620
03/08/2017	120	-0.620
03/08/2017	180	-0.620
03/08/2017	300	-0.620

Start depth 0.62	Depth of Pit 2.100	Diff 1.480	75% full 0.99	25%full 1.73
Length of pit (m) 2.300	Width of pit (m) 1.000		75-25Ht (m)	Vp75-25 (m3)
Tp75-25 (from graph) (s)			50% Eff Depth	ap50 (m2)
f =		fail		



Ground Investigations Ireland

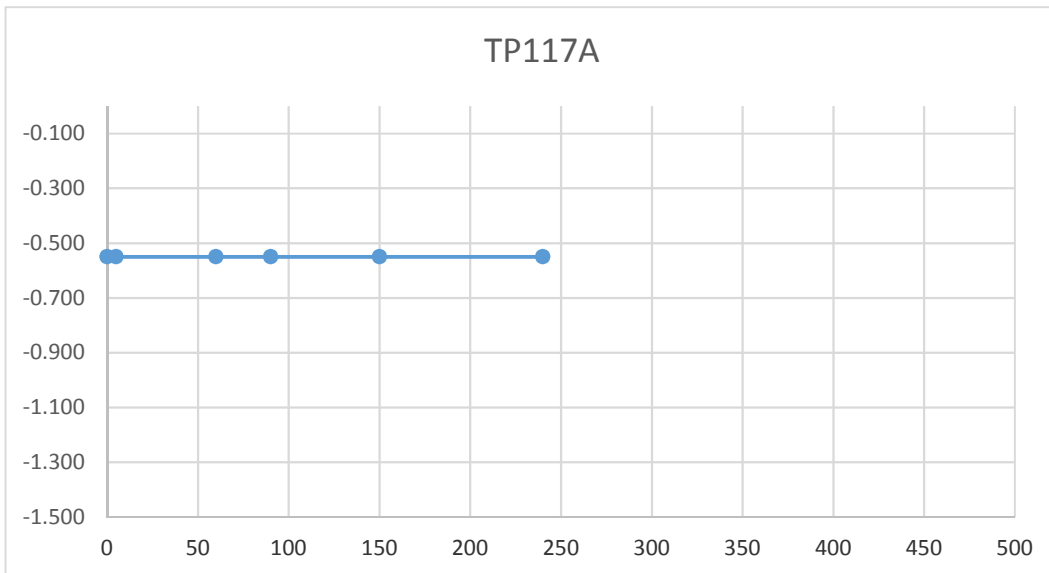
TP117A

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.3m x 1m 2.1m (L x W x D)

Date	Time	Water level (m bgl)
03/08/2017	0	-0.550
03/08/2017	5	-0.550
03/08/2017	60	-0.550
03/08/2017	90	-0.550
03/08/2017	150	-0.550
03/08/2017	240	-0.550

Start depth 0.60	Depth of Pit 2.100	Diff 1.500	75% full 0.975	25%full 1.725
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.300	1.000		0.750	1.73
Tp75-25 (from graph) (s)		19500	50% Eff Depth	ap50 (m2)
			0.750	7.25
f =	fail	m/s		



Ground Investigations Ireland

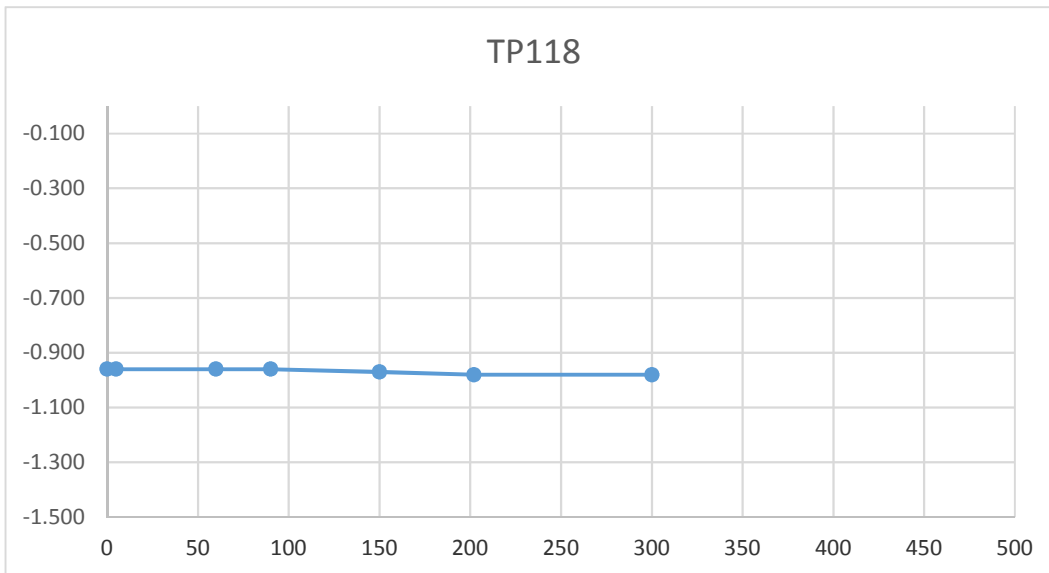
TP118

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 3.6m x 1m 2.5m (L x W x D)

Date	Time	Water level (m bgl)
03/08/2017	0	-0.960
03/08/2017	5	-0.960
03/08/2017	60	-0.960
03/08/2017	90	-0.960
03/08/2017	150	-0.970
03/08/2017	202	-0.980
03/08/2017	300	-0.980

Start depth 0.96	Depth of Pit 2.500	Diff 1.540	75% full 1.345	25%full 2.115
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.300	1.000		0.770	1.77
Tp75-25 (from graph) (s)		19500	50% Eff Depth	ap50 (m2)
			0.770	7.382
f =	fail	m/s		



Ground Investigations Ireland

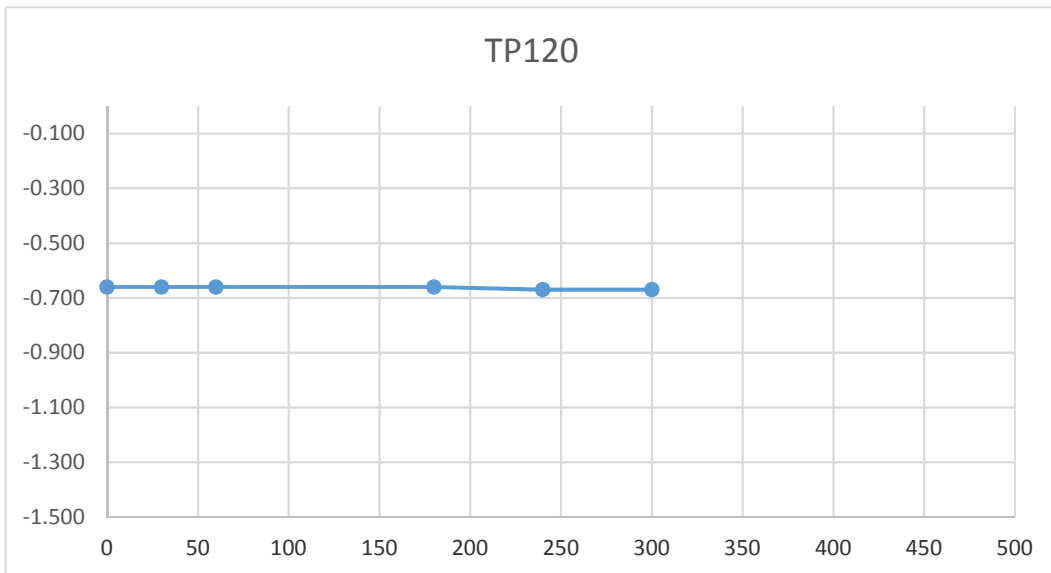
TP120

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.7m x 1m 2.1m (L x W x D)

Date	Time	Water level (m bgl)
03/08/2017	0	-0.660
03/08/2017	30	-0.660
03/08/2017	60	-0.660
03/08/2017	180	-0.660
03/08/2017	240	-0.670
03/08/2017	300	-0.670

Start depth 0.60	Depth of Pit 2.100	Diff 1.500	75% full 0.975	25%full 1.725
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.300	1.000		0.750	1.73
Tp75-25 (from graph) (s)		19500	50% Eff Depth	ap50 (m2)
			0.750	7.25
f =	fail	m/s		



APPENDIX 5 – Laboratory Testing



Exova Jones Environmental

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

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

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Tel: +44 (0) 1244 833780

Fax: +44 (0) 1244 833781



Attention : Aisling McDonnell
Date : 13th September, 2017
Your reference : 6944-07-17
Our reference : Test Report 17/14584 Batch 1
Location : Belgard Gardens
Date samples received : 31st August, 2017
Status : Final report
Issue : 1

Ten samples were received for analysis on 31st August, 2017 of which ten 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.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Ground Investigations Ireland
Reference: 6944-07-17
Location: Belgard Gardens
Contact: Aisling McDonnell
JE Job No.: 17/14584

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

J E Sample No.	1	2	3	4	5	6	7	8	9	10	Please see attached notes for all abbreviations and acronyms			
Sample ID	TP101	TP105	TP106	TP107A	TP109	TP111	TP113	TP116A	TP118	TP119				
Depth	1.00	3.40	2.00	2.50	3.00	1.00	2.00	1.00	2.20	3.10				
COC No / misc														
Containers	T	T	T	T	T	T	T	T	T	T				
Sample Date	31/07/2017	01/08/2017	31/07/2017	02/08/2017	01/08/2017	03/08/2017	08/08/2017	03/08/2017	03/08/2017	04/08/2017				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1	1	1	1	1				
Date of Receipt	31/08/2017	31/08/2017	31/08/2017	31/08/2017	31/08/2017	31/08/2017	31/08/2017	31/08/2017	31/08/2017	31/08/2017	LOD/LOR	Units	Method No.	
Sulphate as SO4 (2:1 Ext) #	0.0359	0.2735	0.0137	0.0181	0.4479	0.0187	0.0155	0.0239	0.0386	0.0964	<0.0015	g/l	TM38/PM20	
pH #	8.42	8.22	8.74	8.86	8.11	8.66	8.77	8.67	8.80	8.55	<0.01	pH units	TM73/PM11	

Client Name: Ground Investigations Ireland
Reference: 6944-07-17
Location: Belgard Gardens
Contact: Aisling McDonnell

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
17/14584	1	TP101	1.00	1	pH, Sulphate	Sample holding time exceeded prior to receipt
17/14584	1	TP105	3.40	2	pH, Sulphate	Sample holding time exceeded prior to receipt
17/14584	1	TP106	2.00	3	pH, Sulphate	Sample holding time exceeded prior to receipt
17/14584	1	TP107A	2.50	4	pH, Sulphate	Sample holding time exceeded prior to receipt
17/14584	1	TP109	3.00	5	pH, Sulphate	Sample holding time exceeded prior to receipt
17/14584	1	TP111	1.00	6	Sulphate	Sample holding time exceeded
17/14584	1	TP116A	1.00	8	Sulphate	Sample holding time exceeded
17/14584	1	TP118	2.20	9	Sulphate	Sample holding time exceeded
17/14584	1	TP119	3.10	10	Sulphate	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/14584

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 overestimate 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.

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) 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 a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/14584

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	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
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

National Materials Testing Laboratory Ltd.

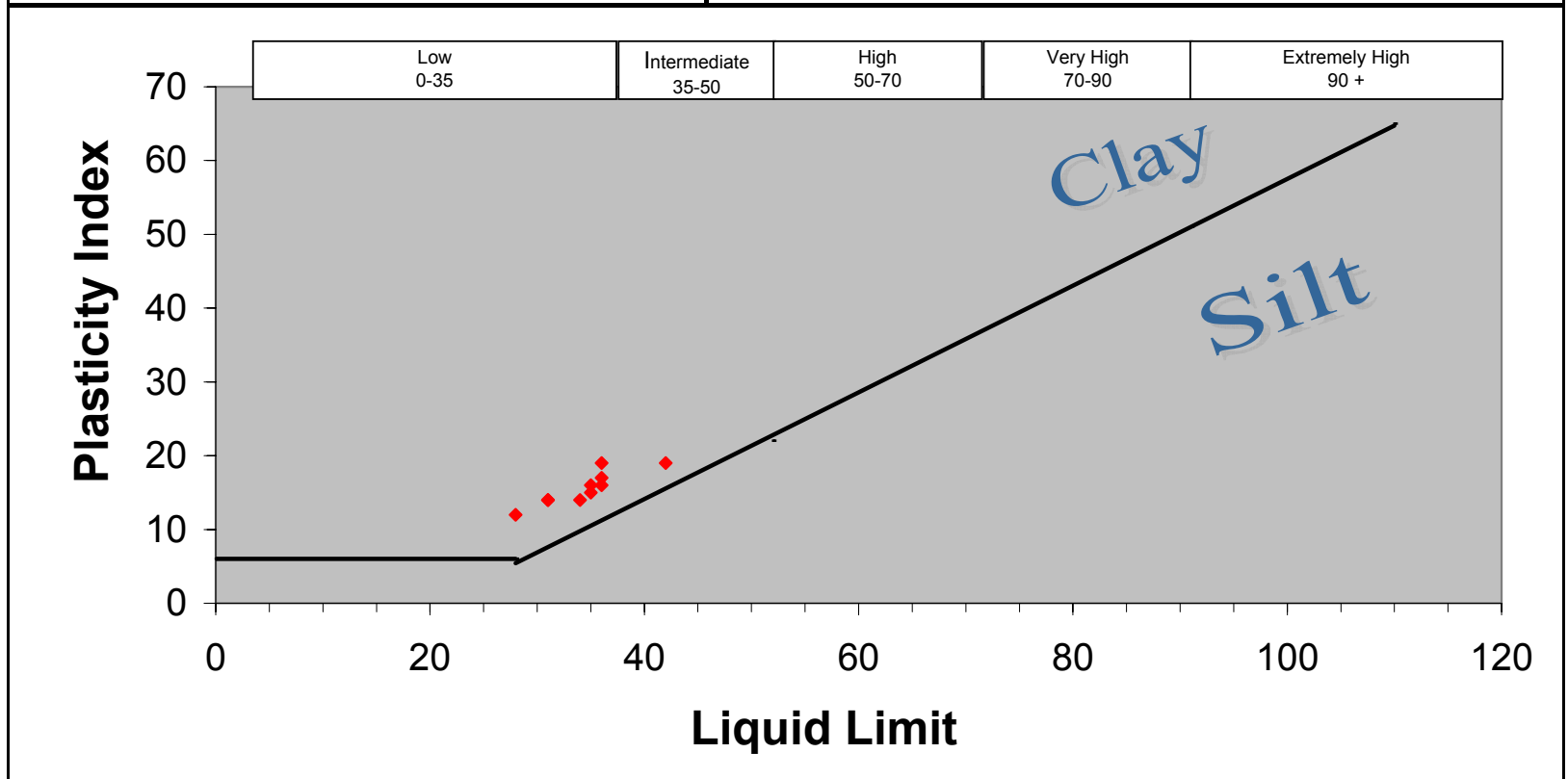
SUMMARY OF TEST RESULTS

BH/TP No	Depth m	sample No.	Moisture %	Particle	<425um %	LL %	Index Properties		Bulk	Cell	Undrained Triaxial Tests		Lab	Mode of Failure
				Density Mg/m3			PL %	PI %	Density Mg/m3	Pressure kPa	Compressive Stress kPa	Strain at Failure %	Vane kPa	
TP101	1.00	B	19.0		50.5	42		23	19					
TP105	3.40	B	9.3		38.9	31		17	14					
TP106	3.40	B	13.6		59.9	34		20	14					
TP107A	2.50	B	11.5		31.6	28		16	12					
TP109	3.00	B	13.0		49.4	36		17	19					
TP111	1.00	B	12.6		47.5	35		19	16					
TP113	2.00	B	13.6		44.2	35		20	15					
TP116A	1.00	B	15.3		51.8	36		20	16					
TP118	2.20	B	11.9		42.5	36		19	17					
TP119	3.10	B	12.6		43.1	31		17	14					
NMTL	Notes :										Job ref No.	NMTL 2256	Table	
	1. All BS tests carried out using preferred (definitive) method unless otherwise stated.										Location	Belgard		

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

Contract: Belgard
Client: Ground Investigations Ireland Ltd
Engineer: N/A

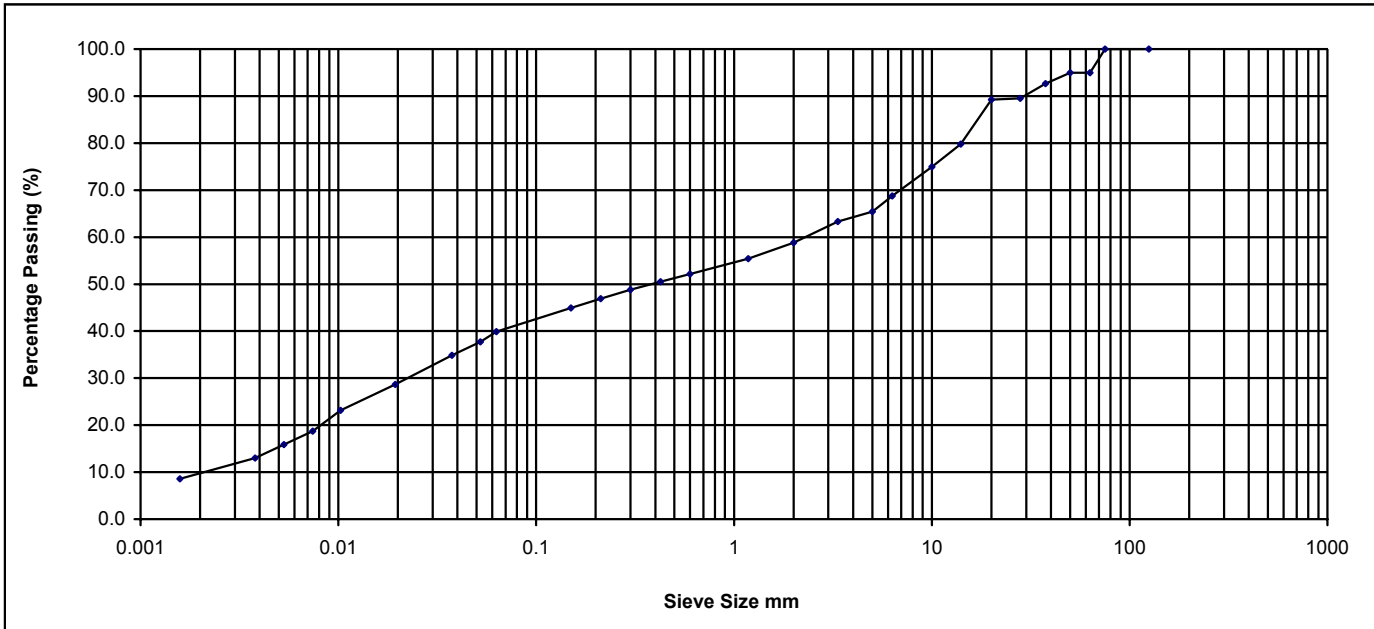
Date: 13/09/2017
Tested By: Tzr **Checked:** Bc
Job ref No. NMTL 2256



NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	95.0
50.000	95.0
37.500	92.6
28.000	89.5
20.000	89.3
14.000	79.8
10.000	75.0
6.300	68.8
5.000	65.4
3.350	63.3
2.000	58.8
1.180	55.4
0.600	52.1
0.425	50.5
0.300	48.8
0.212	46.9
0.150	44.9
0.063	39.9
0.052	37.7
0.038	34.8
0.019	28.7
0.010	23.2
0.007	18.7
0.005	15.9
0.004	13.0
0.002	8.6

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
Silt			Sand			Gravel					
8.6	31.3		18.9			36.2			5.0	0.0	

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

Project No. NMTL 2256

BH/TP No. TP101

Sample No. B

NMTL Ltd

Project Belgard

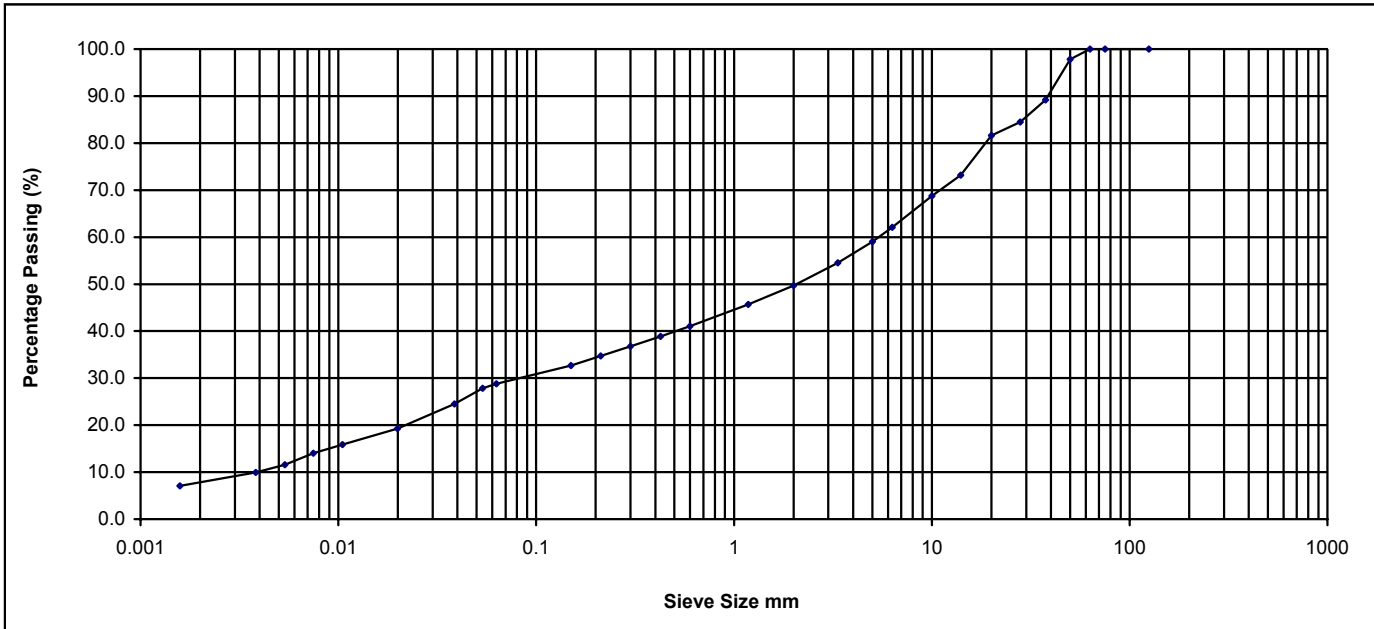
Depth 1.00m

Operator Tzr Checked Nc Approved Bc Date sample tested 07/09/2017

NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	97.8
37.500	89.2
28.000	84.5
20.000	81.6
14.000	73.2
10.000	68.7
6.300	62.0
5.000	59.0
3.350	54.5
2.000	49.7
1.180	45.7
0.600	41.0
0.425	38.9
0.300	36.8
0.212	34.7
0.150	32.7
0.063	28.8
0.054	27.9
0.039	24.5
0.020	19.3
0.010	15.9
0.007	14.0
0.005	11.6
0.004	9.9
0.002	7.1

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
	Silt			Sand			Gravel				
7.1	21.7			20.9			50.3			0.0	0.0

Sample Description Dark brown slightly sandy gravelly silty CLAY.

Project No. NMTL 2256

BH/TP No. TP105

Sample No. B

NMTL Ltd

Project Belgard

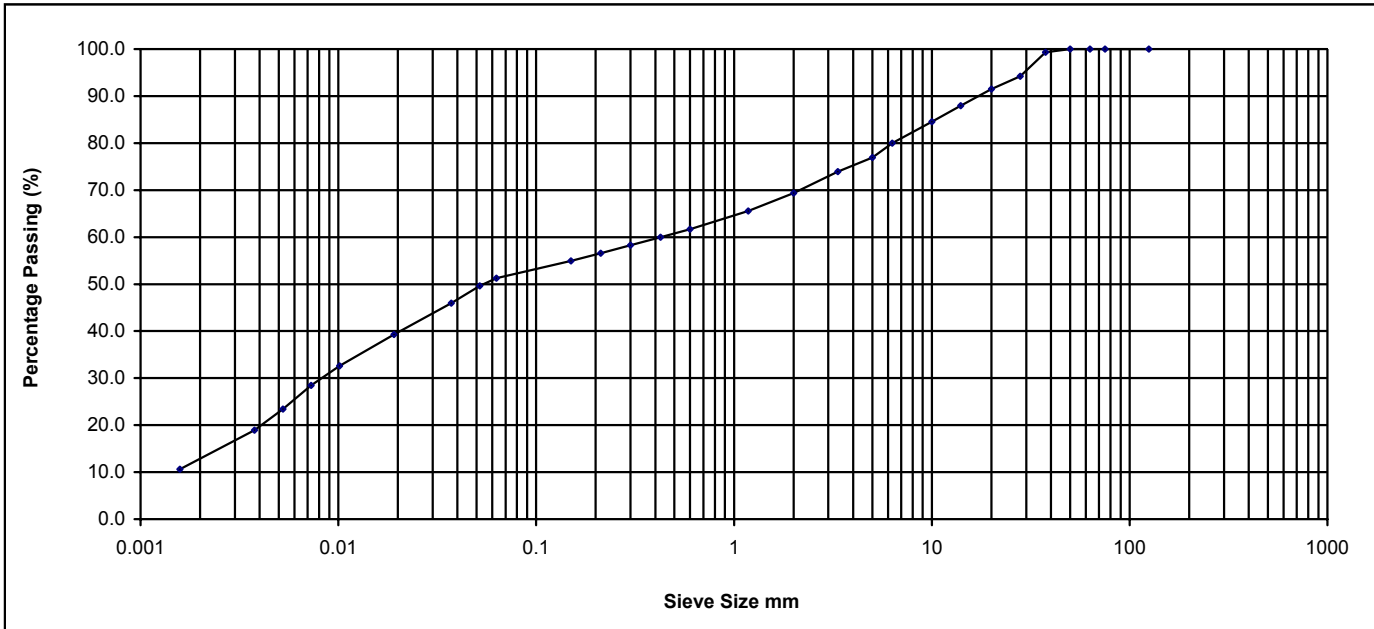
Operator Tzr Checked Nc Approved Bc Date sample tested 07/09/2017

Depth 3.40m

NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	99.3
28.000	94.2
20.000	91.5
14.000	87.9
10.000	84.6
6.300	80.0
5.000	76.9
3.350	73.9
2.000	69.4
1.180	65.5
0.600	61.6
0.425	59.9
0.300	58.3
0.212	56.6
0.150	54.9
0.063	51.3
0.052	49.6
0.037	46.0
0.019	39.3
0.010	32.6
0.007	28.4
0.005	23.4
0.004	18.9
0.002	10.6

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
Silt			Sand			Gravel					
10.6	40.7		18.1			30.6			0.0	0.0	

Sample Description: Brown slightly sandy slightly gravelly silty CLAY.

Project No. NMTL 2256

BH/TP No. TP106

Sample No. B

NMTL Ltd

Project Belgard

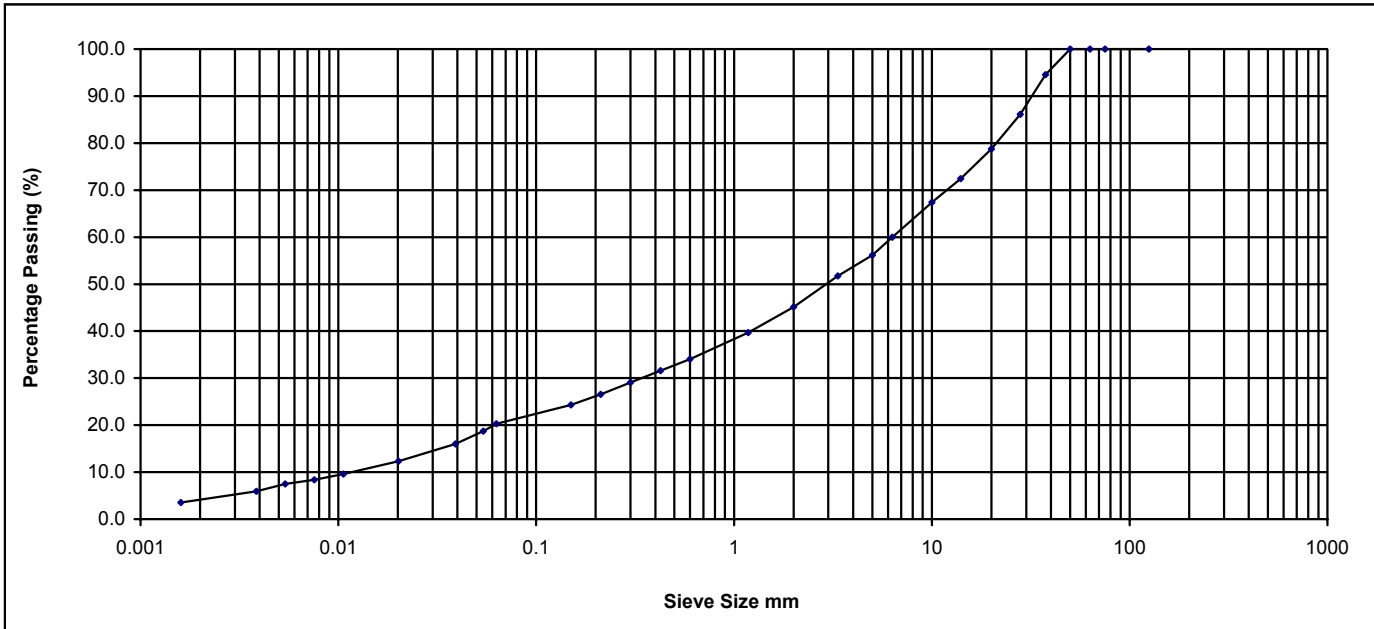
Depth 2.00m

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	07/09/2017
----------	-----	---------	----	----------	----	--------------------	------------

NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	94.6
28.000	86.1
20.000	78.7
14.000	72.4
10.000	67.4
6.300	60.0
5.000	56.1
3.350	51.7
2.000	45.2
1.180	39.7
0.600	34.0
0.425	31.6
0.300	29.1
0.212	26.6
0.150	24.3
0.063	20.3
0.054	18.7
0.039	16.0
0.020	12.3
0.011	9.6
0.008	8.4
0.005	7.5
0.004	5.9
0.002	3.5

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size											
Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
	Silt			Sand			Gravel				
	3.5	16.8		24.8			54.8			0.0	0.0

Sample Description Brown slightly sandy slightly gravelly silty CLAY.

Project No. NMTL 2256

BH/TP No. TP107A

Sample No. B

NMTL Ltd

Project Belgard

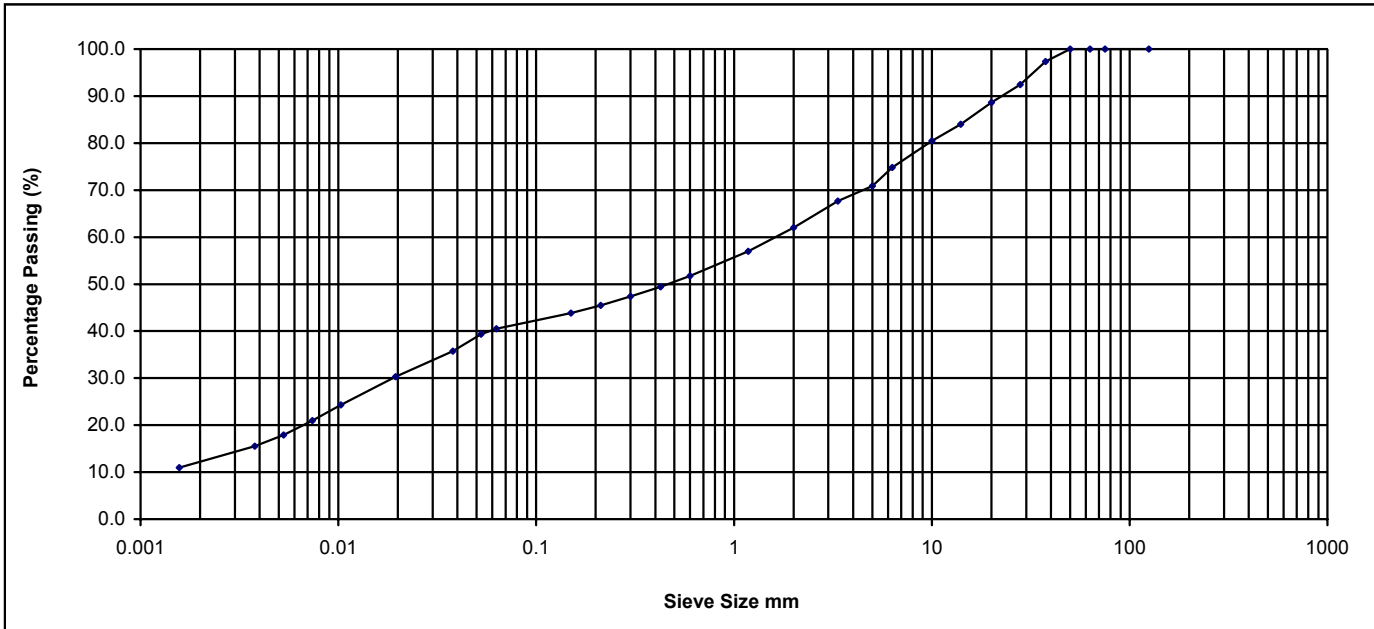
Operator Tzr Checked Nc Approved Bc Date sample tested 07/09/2017

Depth 2.50m

NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	97.4
28.000	92.5
20.000	88.6
14.000	84.0
10.000	80.5
6.300	74.8
5.000	70.8
3.350	67.7
2.000	62.0
1.180	57.0
0.600	51.7
0.425	49.4
0.300	47.4
0.212	45.5
0.150	43.8
0.063	40.5
0.053	39.3
0.038	35.7
0.019	30.3
0.010	24.3
0.007	21.0
0.005	17.9
0.004	15.5
0.002	11.0

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
	Silt			Sand			Gravel				
11.0	29.5			21.5			38.0			0.0	0.0

Sample Description Dark grey slightly sandy gravelly silty CLAY.

Project No. NMTL 2256

BH/TP No. TP109

Sample No. B

NMTL Ltd

Project Belgard

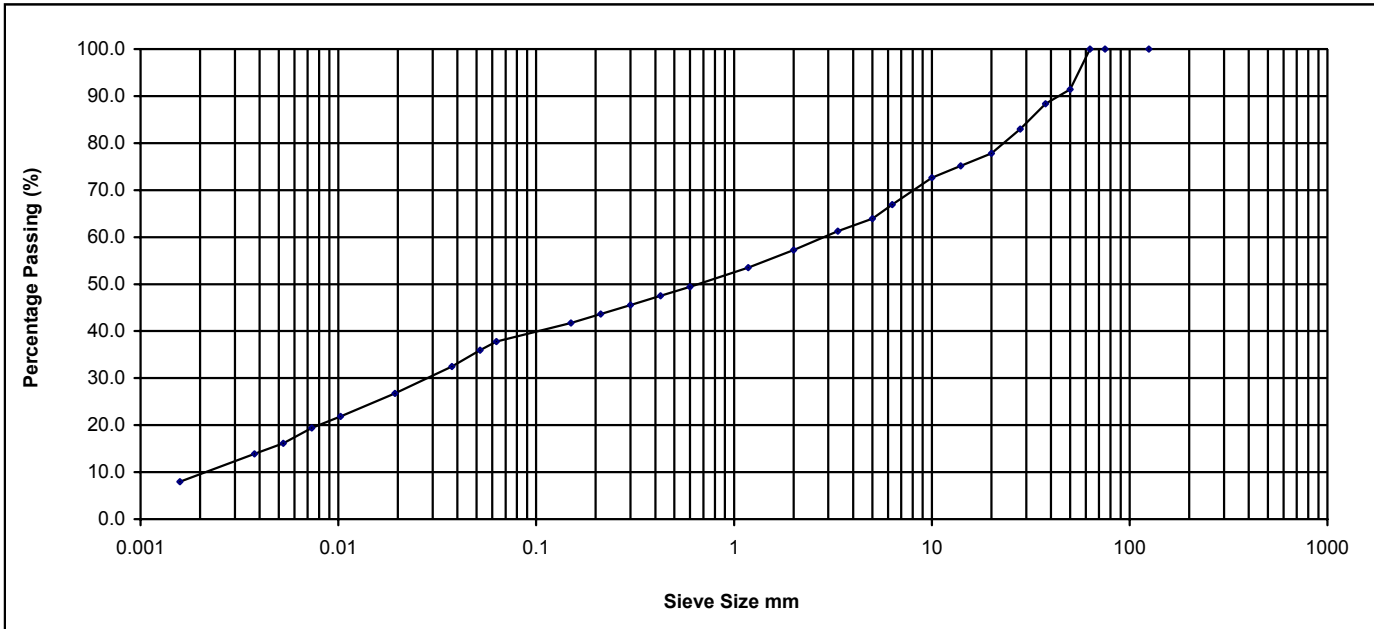
Operator Tzr Checked Nc Approved Bc Date sample tested 07/09/2017

Depth 3.00m

NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	91.4
37.500	88.4
28.000	83.0
20.000	77.8
14.000	75.2
10.000	72.7
6.300	66.9
5.000	63.9
3.350	61.2
2.000	57.3
1.180	53.5
0.600	49.5
0.425	47.5
0.300	45.6
0.212	43.6
0.150	41.7
0.063	37.8
0.052	35.9
0.037	32.5
0.019	26.7
0.010	21.8
0.007	19.4
0.005	16.1
0.004	13.9
0.002	8.0

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
	Silt			Sand			Gravel				
	8.0	29.8		19.5			42.7			0.0	0.0

Sample Description Brown slightly sandy gravelly silty CLAY.

Project No. NMTL 2256

BH/TP No. TP111

Sample No. B

NMTL Ltd

Project Belgard

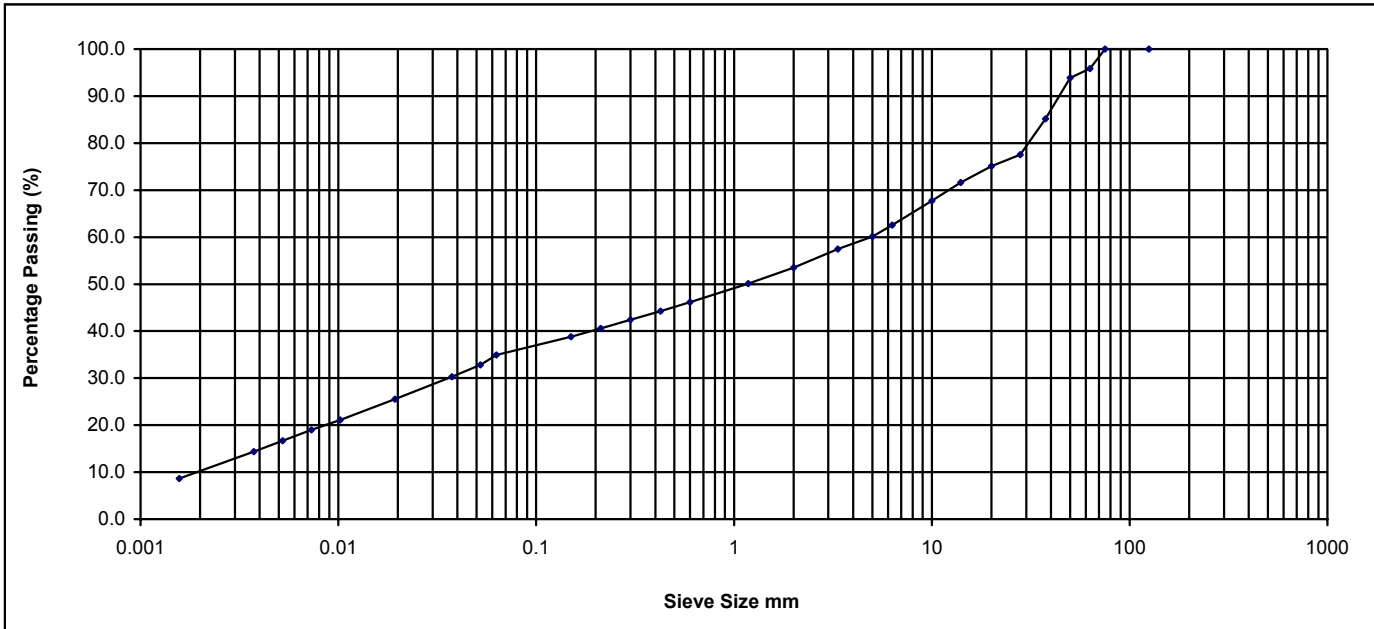
Operator Tzr Checked Nc Approved Bc Date sample tested 07/09/2017

Depth 1.00m

NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	95.9
50.000	93.9
37.500	85.1
28.000	77.5
20.000	75.1
14.000	71.6
10.000	67.7
6.300	62.6
5.000	60.1
3.350	57.5
2.000	53.5
1.180	50.1
0.600	46.1
0.425	44.2
0.300	42.4
0.212	40.6
0.150	38.8
0.063	34.9
0.052	32.8
0.038	30.3
0.019	25.5
0.010	21.1
0.007	19.0
0.005	16.7
0.004	14.4
0.002	8.6

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
	Silt			Sand			Gravel				
	8.6	26.3		18.6			42.4			4.1	0.0

Sample Description Dark brown slightly sandy gravelly silty CLAY with occasional cobbles.

Project No. NMTL 2256

BH/TP No. TP113

Sample No. B

NMTL Ltd

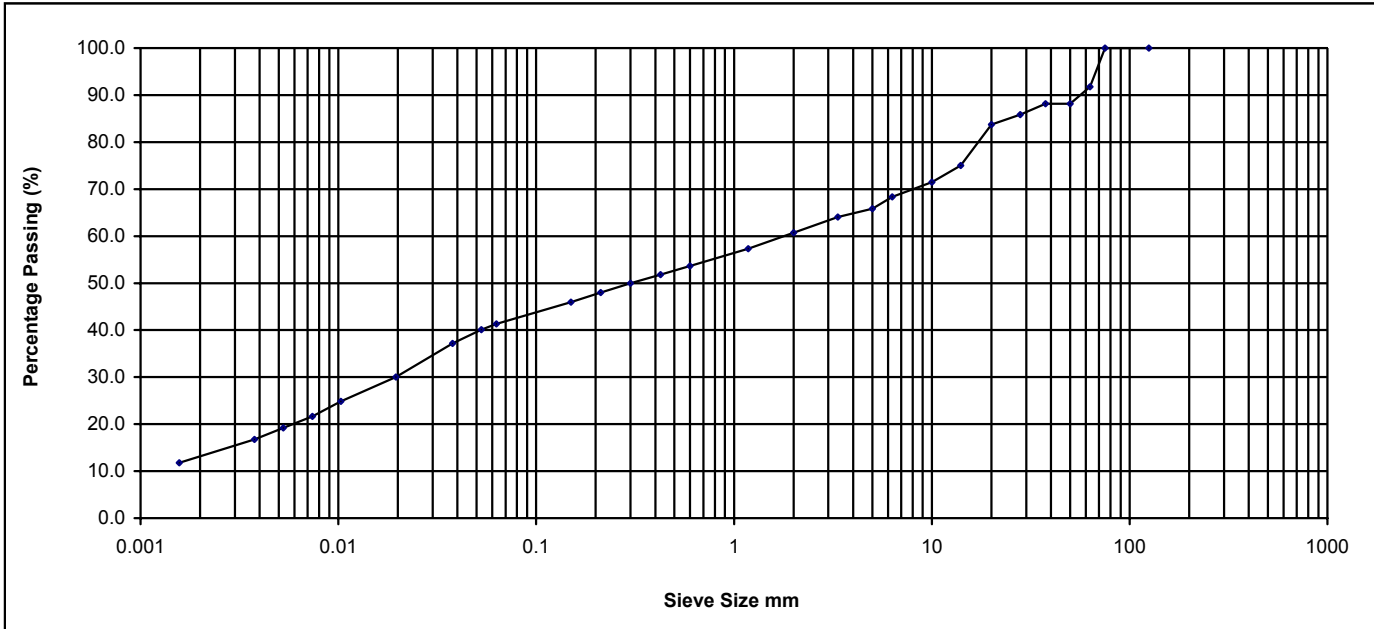
Project Belgard

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	07/09/2017	Depth	2.00m
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NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	91.8
50.000	88.1
37.500	88.1
28.000	85.8
20.000	83.7
14.000	75.0
10.000	71.5
6.300	68.4
5.000	65.8
3.350	64.1
2.000	60.7
1.180	57.3
0.600	53.6
0.425	51.8
0.300	50.0
0.212	48.0
0.150	45.9
0.063	41.3
0.053	40.1
0.038	37.2
0.020	30.0
0.010	24.8
0.007	21.7
0.005	19.2
0.004	16.7
0.002	11.8

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
	Silt			Sand			Gravel				
11.8	29.5			19.4			31.0			8.2	0.0

Sample Description Dark brown slightly sandy slightly gravelly silty CLAY with some cobbles.

Project No. NMTL 2256

BH/TP No. TP116A

Sample No. B

NMTL Ltd

Project Belgard

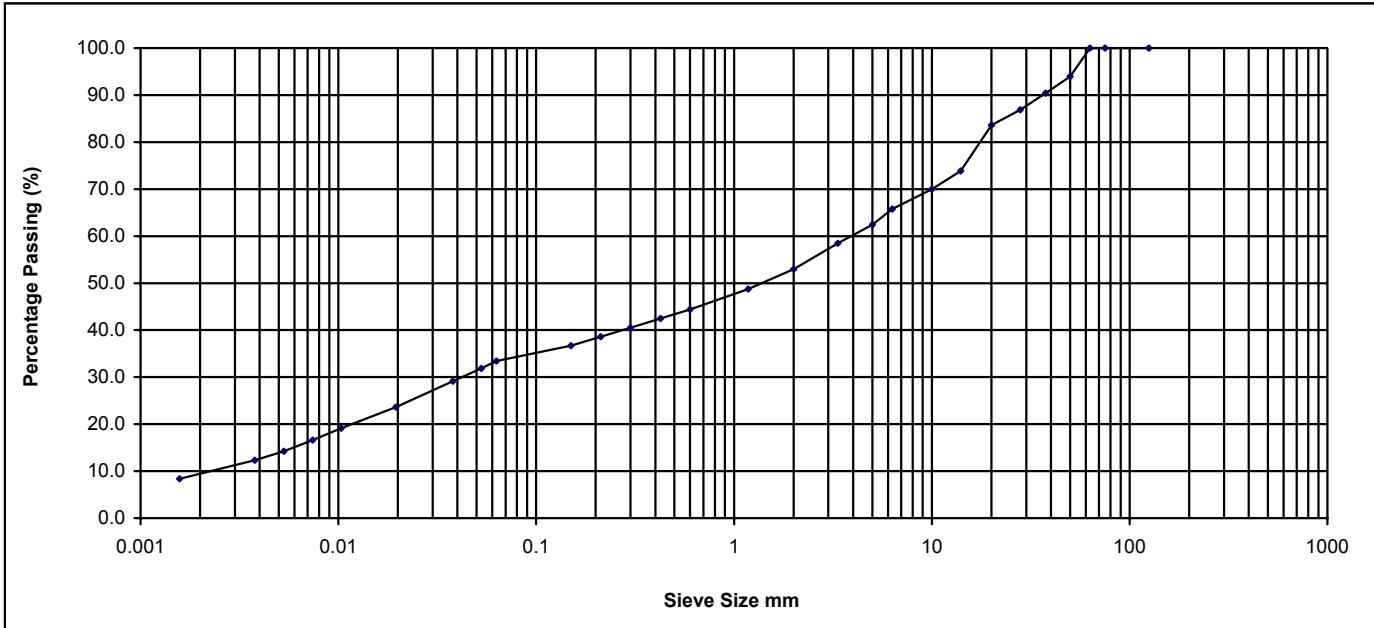
Depth 1.00m

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	08/09/2017
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NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	94.0
37.500	90.4
28.000	86.9
20.000	83.6
14.000	73.8
10.000	69.9
6.300	65.8
5.000	62.4
3.350	58.5
2.000	53.0
1.180	48.7
0.600	44.4
0.425	42.5
0.300	40.5
0.212	38.6
0.150	36.7
0.063	33.4
0.053	31.8
0.038	29.1
0.020	23.6
0.010	19.1
0.007	16.6
0.005	14.3
0.004	12.3
0.002	8.4

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
	Silt			Sand			Gravel				
8.4	25.0			19.6			47.0			0.0	0.0

Sample Description Dark brown slightly sandy gravelly silty CLAY.

Project No. NMTL 2256

BH/TP No. TP118

Sample No. B

NMTL Ltd

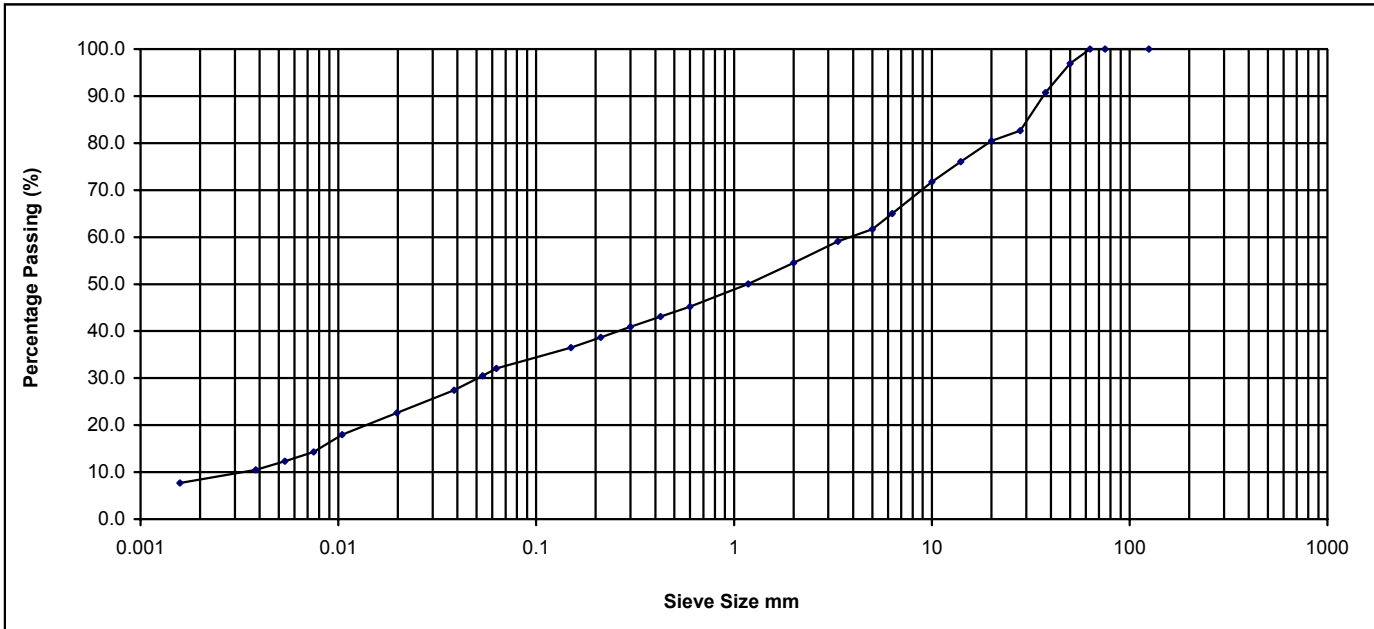
Project Belgard

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	08/09/2017	Depth	2.20m
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NMTL Ltd

Sieve	%
Size mm	Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	96.9
37.500	90.7
28.000	82.6
20.000	80.4
14.000	76.0
10.000	71.7
6.300	65.0
5.000	61.7
3.350	59.1
2.000	54.6
1.180	50.0
0.600	45.2
0.425	43.1
0.300	40.9
0.212	38.7
0.150	36.5
0.063	32.1
0.054	30.5
0.038	27.4
0.020	22.6
0.010	18.0
0.008	14.3
0.005	12.3
0.004	10.5
0.002	7.7

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
	Silt			Sand			Gravel				
	7.7	24.4		22.5			45.4			0.0	0.0

Sample Description Dark brown slightly sandy gravelly silty CLAY.

Project No. NMTL 2256

BH/TP No. TP119

Sample No. B

NM
TL
Ltd

Project Belgard

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	08/09/2017	Depth	3.10m
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