Appendix A.5.1.6

Phase 3 Contract 3

N6 Galway City Transport Project Phase 3 Ground Investigation Contract 3,

November to December 2016

A.5.1.6

Our Ref: JMS/Rp/P16185 + attachments (*.pdf)

09th May, 2017

Messrs. ARUP
Corporate House,
City East Business Park,
Ballybrit,
Galway,
H91K5YD.

Re: N6 Galway City Transport Project (GCTP) Phase 3 Contract 3 – Ground Investigation, Factual report.

Introduction

In November 2016, Priority Geotechnical were requested by Arup acting as Employer's Representative on behalf of Galway County Council, to undertake a ground investigation around the east of Galway City, with the majority in Ballybrit, Co. Galway, adjacent to the Galway Racecourse as part of the phase 3 contract 3 – ground investigation. The site works were carried out on private property. Invasive works were primarily in fields with two locations in a paved area.

Scope

The scope of the ground investigation, which was specified by Arup, comprised of:

- 1No. Cable percussion borehole;
- 3No. Rotary boreholes (5no. completed);
- 11No. Soakaway tests in accordance with BRE Digest 365 (17no. completed);
- 4No. Trial pits (5no. completed);
- 1No. 12m deep rotary pumping well;
- In situ testing, including Standard Penetration Tests;

- Surface geophysics survey (2D resistivity and seismic refraction);
- Crack monitoring;
- Groundwater monitoring;
- All associated sampling;
- Associated lab testing and
- Factual reporting.

Objectives

The purpose of the site investigation was to provide information on the soil and rock ground conditions, groundwater levels and karst activity along the proposed route alignment.

This factual report presents the fieldworks records and data obtained with regard to the ground investigation for the N6 GCTP phase 3 contract 3 - Ground Investigation and should be read in conjunction with the exploratory and photographic records and laboratory test data accompanying this report (attached).

Site Works

This investigation was carried out in accordance with Eurocode 7- Geotechnical Design Part 2, ground investigation and testing (BS EN 1997-2: 2007) and the relevant British Standards BS 5930 (2015) Code of Practice for Site Investigation and BS 1377, Method of Tests for Soil for Civil Engineering Purposes, *in situ* Tests Parts 1 to 9).

The fieldworks were undertaken between the 2th November and the 22nd December, 2017 under the supervision of PGL, Engineering Geologist(s). Details of the plant and equipment used are detailed on the relevant exploratory records, attached herein.

Cable Percussion Boreholes

A single (1) cable percussion borehole (BH03-62) was drilled to a depth of 1.90m below existing ground level (bgl) using PGL's Dando 2000 rig. The records are attached, herein.

Rotary boreholes

Five (5) rotary boreholes (RC03-60, RC03-61, RC03-62, RC03-63 and RC03-64) were drilled to depths between 8.0m bgl and 30.0m bgl using PGL's Deltabase 520, 6t rotary rig. The records are attached, herein.

A single (1) 200mm dia. pumping well (PW01) was drilled to a depth of 12.0m bgl by Dempsey Drilling on behalf of PGL.

Trial pits

A total of five (5) number trial pit excavations (TP03-19, TP03-50, TP03-51, TP03-52 and TP03-53) were excavated to depths of 0.8m below existing ground level (bgl) to 4.0m bgl using a 14t tracked excavator. Trial pits terminated above the scheduled depth of 4.5m bgl for a variety of reasons outlined on the relevant exploratory records attached, herein.

Soakaway Tests

A total of seventeen (17) number infiltration/ soakaway tests were carried out in in general accordance with BRE Digest 365, Soakaway Design (2003/ 2007). The data from the testing is presented accompanying the relevant exploratory records, SW03-03, SW03-04, SW03-05, SW03-06, SW03-07, SW03-08, SW03-09, SW03-10, SW03-11, SW03-12, SW03-13, SW03-14, SW03-15, SW03-16, SW03-17, SW03-18, and SW03-19.

Sampling

A total of fifty seven (57) bulk disturbed samples (B), thirty two (32) small disturbed samples (D) and rotary core were recovered from the exploratory holes in accordance with Geotechnical Investigation and Sampling – Sampling Methods and Groundwater Measurements (EN ISO 22475-1:2006).

Survey and Drawings

Upon completion of the fieldworks, the 'as built' exploration locations were surveyed using Trimble 5700/5800 GPS equipment to the Ordinance Survey Irish Transverse Mercator system of co-ordinates (ITM) and elevations to Malin Head datum. The

exploratory locations were shown on the Exploratory Location layout and Plan (P16185-SI-A) attached.

In-Situ Testing

Standard Penetration Test

Standard Penetration Tests, N values, were typically carried out in the boreholes using the 60^{o} solid cone in place of the standard split barrel sampler. The Standard Penetration Test was carried out in accordance with Geotechnical Investigation and Testing, Part 3 Standard penetration test, BS EN ISO 22476-3:2005+A1:2011. The data is presented on the exploratory logs accompanying this factual report. Elevated SPT (SPT = >50) values are attributed to cobble and boulder inclusions.

A geophysical survey consisting of 2D-Resistivity and seismic refraction (p-wave) was carried out as part of the N6 GTCP Phase 3 Contract 3 - Ground Investigation. The reporting is issued separately.

An *In situ* variable head (falling and rising) permeability test was carried out in 200mm diameter standpipe well, BH-MW64. *In-situ* permeability tests were carried out in accordance with BS5930: 1999, Section 4: Cl. 25.4, within the superficial deposits over duration of one (1) hour. The processed test data is presented with this factual report. The shape or intake factor, f was derived from the condition at the base of the borehole at the test depth and test geometry as per Hvorslev (1951).

$$k = \frac{A}{fd} \frac{\log_e (H_0 / H_t)}{t}$$

Generally for all tests the specific depth range of the test was the slotted pipe of the standpipe. The ratio L/d was 20 to 60. A mean k measured ($k_H = k_V$), permeability in the soil was assumed equal in both horizontal and vertical direction, ($k_H / k_V = 1.$). The test geometry provided a shape factor, f of 20 for the tests undertaken.

SUMMARY OF IN-SITU TESTING

Type	Quantity	Remarks
Standard Penetration Test, N values	28No.	Nspt ranging from 8 to 91 including refusal >50. Nspt average = 36
Soakaway tests	17No.	See attached results
Rising head permeability test	01No.	1.20E-08ms^{-1}
Geophysical Survey	2D-Res 5671lin.m Seismic refraction,	See attached results

Laboratory Testing

Laboratory testing was scheduled by Arup and carried out by GSTL on behalf of PGL in accordance with BS1377 (1990), Methods of test for soils for civil engineering purposes and the ISRM suggested methods for rock characterisation, testing and monitoring. The laboratory data accompanies the report and was summarised as follows;

Type	GSTL No.	PGL No.	Remarks
Natural Moisture Content	40	2	4.4% to 48%
Atterberg limits	24	2	Liquid limit, LL 25% and 63% Plastic limit, PL14% to 46% incl. non plastic soils Plasticity index, PI 11 to 28
Particle size distribution analysis	32	2	Incl. 31 hydrometer on fines. Refer to attached results,
pH	4		7.5 to 7.91 units
Water soluble Sulphate, SO_4	4		<0.01g/l to 0.02g/l
Organic Content	5		0.9% to 11.4%
Consolidated Drained Shearbox	3		See attached results.
Consolidated Undrained Shearbox	2		See attached results.

Published Geology

The geology of the study area (GSI 1:100,000 mapping Sheet 14) is defined the Burren Formation (BU), described as pale grey clean skeletal Limestone. Karst features in the form of turloughs, enclosed depressions, caves and springs are common within the formation. Karst is a design risk. The national groundwater aquifer vulnerability mapping indicates high to extreme vulnerability. The extreme rating is likely due to bedrock at or near the surface. A review of geotechnical report ref: 1340 titled 'N6 Galway Eastern Approach Road' identified a series of historical rotary boreholes. Rock was encountered at depths between 0.05m bgl to 0.8m bgl.

Teagasc subsoil mapping indicates that the area is underlain glacial till derived chiefly from Limestone parent rock. Outcropping karstified Limestone bedrock was also indicated on the subsoil mapping.

Ground and groundwater conditions

The full details of the ground conditions encountered are provided for on the exploratory records accompanying this report. The records provide descriptions, in accordance with BS 5930 (2015) and Eurocode 7, Geotechnical Investigation and Testing, Identification and classification of soils, Part 1, Identification and description (EN ISO 14688-1: 2002),– Identification and Classification of Soil, Part 2: Classification Principles (EN ISO 14688-2:2004) and Identification and Classification of Rock, Part 1: Identification & Description (EN ISO 14689-1:2004) of the materials encountered, in situ testing and details of the samples taken, together with any observations made during the ground investigation.

Groundwater was recorded when encountered during boring and trial pit excavations over a period of 20 minutes, noting any changes that may occur. Groundwater levels were also monitored at start and end of drilling shifts. It should be noted that the normal rate of boring may not permit the recording of equilibrium groundwater levels for any one groundwater water strike where casing may exclude low volume flows as the borehole progresses. Groundwater conditions observed in the borings or pits are those appertaining to the period of the investigation. Groundwater levels may be subject to diurnal, seasonal and climatic variations and can also be affected by drainage

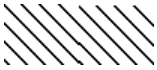
conditions, tidal variations etc. The groundwater regime should be assessed from standpipe well installations, where available.

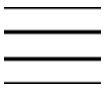
Groundwater was monitored using Rugged Troll 100 Leveloggers. Continuous, absolute pressure (hydrostatic and barometric pressure) was measured *in situ* to determine continual groundwater levels at three (3) number locations RC63, RC64 and PW01. Loggers were installed in standpipe well installations as specified by Arup. Levels were monitored during pumping tests on PW01 to determine drawdown, if any on groundwater levels in the area. Levels were obtained prior to the pump test, during pumping and during the recharge phase. Accuracy was within 0.05% in water depths up to 30m. The data loggers are presented as digital spreadsheet data (*.xls).

Five (5) 50mm diameter standpipes were constructed at locations RC03-60, RC03-61, RC03-62, RC03-63 and RC03-64 to allow for groundwater monitoring, else exploratory boreholes were backfilled with (pelletised) cement-bentonite grout. A summary of groundwater monitoring is shown below.


GRAVEL Backfill to installation/ borehole


GROUT Backfill to installation/ borehole


BENTONITE Backfill to installation/ borehole


uPVC slotted pipe

P16185 - N6 GTCP Phase 3 Contract 3	
Groundwater Readings	
Borehole No.	**24/01/2017**
RC03-60	14.02m
RC03-61	6.85m
RC03-62	6.15m
RC03-63	7.23m
RC03-64	5.15m
Pump Well	14.19m

Should you have any queries in relation to the data collected, please do not hesitate to contact our office.

Yours sincerely,
For **Priority Geotechnical,**

James McSweeney BSc
Engineering Geologist

No responsibility can be held by PGL for ground conditions between exploratory locations. The exploratory logs provide for ground profiles and configuration of strata relevant to the investigation depths achieved during the fieldworks. Caution shall be taken when extrapolating between such exploratory locations. No liability is accepted for ground conditions extraneous to the exploratory locations.

No account has been taken of potential subsidence or ground movement due to mineral extraction, mining works or karstification below or in proximity to the site, unless specifically addressed.

This report has been prepared for Employer and their Representative as outline, herein. The information should not be used without their prior written permission. PGL accepts no responsibility or liability for this document being used other than for the purposes for which it was intended.

KEY TO SYMBOLS ON EXPLORATORY HOLE RECORDS

All linear dimensions are in metres or millimetres

DESCRIPTIONS

**	Drillers Description
Friable	Easily crumbled

SAMPLES

U( )	Undisturbed 102mm diameter sample, ( ) denotes number of blows to drive sampler
U( )F, U( )P	F- not recovered, P-partially recovered
U38	Undisturbed 38mm diameter sample
P(F), (P)	Piston sample - disturbed
B	Bulk sample - disturbed
D	Jar Sample - disturbed
W	Water Sample
CBR	California Bearing Ratio mould sample
ES	Chemical Sample for Contamination Analysis
SPTLS	Standard Penetration Test S lump sample from split sampler

CORE RECOVERY AND ROCK QUALITY

TCR	Total Core Recovery (% of Core Run)
SCR	Solid Core Recovery (length of core having at least one full diameter as % of core run)
RQD	Rock Quality Designation (length of solid core greater than 100mm as % of core run)

Where there is insufficient space for the TCR, SCR and RQD, the results may be found in the remarks column

If	Fracture Spacing in mm (Minimum/Average/Maximum) NI - non intact, NR - no recovery
AZCL	Assumed Zone of Core Loss
NI	Non intact

GROUNDWATER

▽	Groundwater strike
▼	Groundwater level after standing period
Date/Water	Date of shift (day/month)/Depth to water at end of previous shift shown above the date and depth to water at beginning of shift given below the date

INSITU TESTING

S	Standard Penetration Test - split barrel sampler
C	Standard Penetration Test - solid 60^o cone
SW	Self Weight Penetration
Ivp, HVp (R)	In Situ Vane Test, Hand Vane Test (R) demonstrates remoulded strength
K(F), (C), (R), (P)	Permeability Test
HP	Hand Penetrometer Test

MEASURED PROPERTIES

N	Standard Penetration Test - blows required to drive 300mm after seating drive
x/y	Denotes x blows for y mm within the Standard Penetration Test
x*/y	Denotes x blows for y mm within the seating drive
c_u	Undrained Shear Strength (kN/m^2)
CBR	California Bearing Ratio

ROTARY DRILLING SIZES

Index Letter	Nominal Diameter (mm)	
	Borehole	Core
N	75	54
H	99	76
P	120	92
S	146	113

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Drilled By:	Borehole No.
PC	**BH03-62**
Logged By:	Sheet 1 of 1
AH	

Project Name:	N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:**	532896E - 728291N	**Hole Type** CP
Location:	Galway City, Co. Galway		**Level:**	17.77m OD	**Scale** 1:50
Client:	Arup		**Date:**	05/12/2016 - 05/12/2016	

Well	Water Strike (m)	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (mOD)	Legend	Stratum Description
		0.00 - 0.50	B					Topsoil. CLAY.
		0.00 - 0.50	D		0.40	17.37		
		0.50	SPT (C)	N=8 (1,1/2,2,2,2)				Firm, brown, slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are 200mm dia and sub-angular.
		1.00 - 1.80	B		1.00	16.77		Light brown, slightly sandy slightly gravelly CLAY with cobble content. Sand is fine to coarse. Gravel is fine to medium, sub-angular to sub-rounded.
		1.80	SPT (C)	50 (25 for 0mm/50 for 75mm)	1.90	15.87		
		1.90	SPT (C)	50 (25 for 0mm/50 for 75mm)				End of Borehole at 1.900m

Groundwater:

Struck (m)	Rose to	After (mins)	Sealed	Comment
				None encountered.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
1.90	200	200

Equipment: Dando 2000.

Chiselling:

Depth Top	Depth Base	Duration	Tool
1.80	1.90	01:00	Chisel.

Remarks:

Borehole terminated at 1.90m bgl due to obstruction, dense strata - refer to chiseling records.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	05/12/2016 08:00	0.00	Start of shift.
Dry	05/12/2016 18:00	1.90	End of borehole.

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Borehole No.
RC03-60
Sheet 1 of 2

Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 533447.09 - 728232.31	Hole Type RC
Location: Galway City, Co. Galway		Level: 57.28m OD	Scale 1:50
Client: Arup		Dates: 02/12/2016	Logged By AH

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
							0.40	56.88		Open hole boring. Driller described: Topsoil. Clay.
							1.00	56.28		Open hole boring. Driller described: Weathered rock. Assumed Limestone.
		50 (25 for 0mm/50 for 0mm) (C) 1.00 - 2.50	21mm 188mm	100	100	50	27/m			Lithology: Moderately strong to strong, grey, LIMESTONE. Weathering: Slightly weathered, slight orange oxidation, with clay smearing on fracture surfaces. Fractures: Main set oriented 10-25 degrees, close to widely spaced, with undulating rough fracture surfaces. Second set oriented 70-80 degrees, medium spaced, with undulating rough fracture surfaces.
		2.50 - 4.00		100	100	53				
		4.00 - 5.50		100	100	47				
		5.50 - 7.00	91mm 432mm	100	93	27	16/m			
		7.00 - 8.50		100	100	93				
			23mm 504mm				11/m			

1 2 3 4 5 6 7 8 9

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
				None encountered.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
15.40	76	131

Equipment: Deltabase 520.

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:

Borehole terminated at 15.4m bgl. 50mm dia standpipe installed. Response zone from 6.4m to 15.4m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	02/12/2016 08:00	0.00	Start of shift.
Dry	02/12/2016 18:00	15.40	End of borehole.

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Borehole No.
RC03-60
Sheet 2 of 2

Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 533447.09 - 728232.31	Hole Type RC
Location: Galway City, Co. Galway		Level: 57.28m OD	Scale 1:50
Client: Arup		Dates: 02/12/2016	Logged By AH

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
		8.50 - 10.00		100	100	93				
		10.00 - 11.50		100	87	50				*10.00m to 10.40m: Not Intact.*
		11.50 - 13.00	48mm 766mm	100	100	40	16/m			
		13.00 - 14.50		100	100	27				
		14.50 - 15.40	24mm 403mm	100	100	66	21/m			
							15.40	41.88		End of Borehole at 15.400m

10 11 12 13 14 15 16 17 18

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
				None encountered.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
15.40	76	131

Equipment: Deltabase 520.

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:

Borehole terminated at 15.4m bgl. 50mm dia standpipe installed. Response zone from 6.4m to 15.4m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	02/12/2016 08:00	0.00	Start of shift.
Dry	02/12/2016 18:00	15.40	End of borehole.

Photographic Record

Number: RC03-60	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: RC03-60	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: RC03-60	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Borehole No.
RC03-61
Sheet 1 of 2

Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 533623.69 - 728217.59	Hole Type RC
Location: Galway City, Co. Galway		Level: 57.19m OD	Scale 1:50
Client: Arup		Dates: 05/12/2016	Logged By AH

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
							1.20	55.99		Open hole boring. Driller described: Topsoil, Clay.
		10 (25 for 90mm/10 for 0mm) (C) 1.70 - 3.20	124mm 422mm	87	28	0	1.70	55.49		Open hole boring. Driller described: Weathered rock. Assumed Limetsone.
		3.20 - 4.70		100	73	73	19/m			Lithology: Moderately strong to strong, grey, LIMESTONE. Weathering: Moderately weathered with clay smearing on fracture surfaces. Fractures: Main set oriented 10-25 degrees, close to widely spaced, with undulating rough fracture surfaces. *1.70m to 2.40m bgl not intact.*
		4.70 - 6.20		100	80	15				
		6.20 - 7.70	46mm 562mm	100	83	83	14/m			
	▼	7.70 - 9.20		100	100	80				

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
8.30				See shift data.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
15.50	76	

Equipment: Deltabase 520

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:
Borehole terminated at 15.50m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	05/12/2016 08:00	0.00	Start of shift.
8.3	05/12/2016 18:00	15.50	End of borehole.

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Borehole No.
RC03-61
Sheet 2 of 2

Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 533623.69 - 728217.59	Hole Type RC
Location: Galway City, Co. Galway		Level: 57.19m OD	Scale 1:50
Client: Arup		Dates: 05/12/2016	Logged By AH

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / FI	Level (mOD)	Legend	Stratum Description
			108mm 454mm				11/m			Lithology: Moderately strong to strong, grey, LIMESTONE. Weathering: Moderately weathered with clay smearing on fracture surfaces. Fractures: Main set oriented 10-25 degrees, close to widely spaced, with undulating rough fracture surfaces.
		9.20 - 10.70		100	100	100				
		10.70 - 12.20		100	100	52				
			54mm 572mm				18/m			
		12.20 - 13.70		100	100	61				
		13.70 - 15.20		100	100	73	10/m			
			17mm 663mm							
		15.20 - 15.50		20	20	20				
							15.50	41.69		End of Borehole at 15.500m

10 11 12 13 14 15 16 17 18

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
8.30				See shift data.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
15.50	76	

Equipment: Deltabase 520

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:
Borehole terminated at 15.50m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	05/12/2016 08:00	0.00	Start of shift.
8.3	05/12/2016 18:00	15.50	End of borehole.

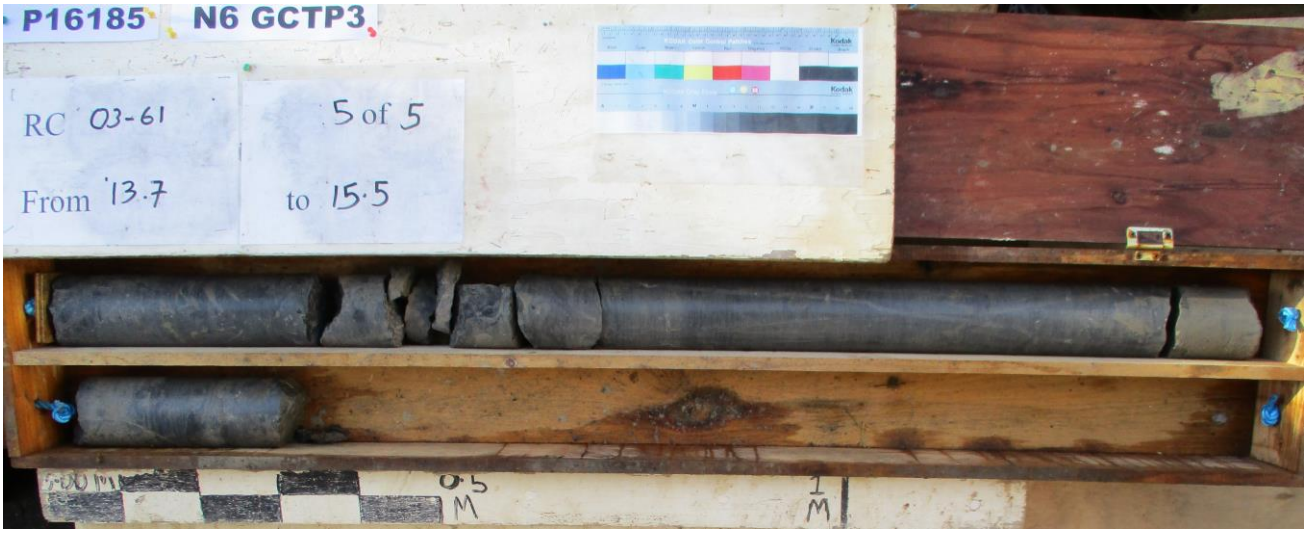
Photographic Record

Number: RC03-61	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: RC03-61	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record



Number: RC03-61	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Borehole No.
RC03-62
Sheet 1 of 4

Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 532895.64 - 728290.66	Hole Type RO
Location: Galway City, Co. Galway		Level: 17.77m OD	Scale 1:50
Client: Arup		Dates: 06/12/2016	Logged By

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
		0.00 - 1.50	B							Open hole boring. Driller described: Sandy Clay.
		1.50 - 3.00 50 (3,4/50 for 0mm) (C)	B				1.70	16.07		Open hole boring. Driller described: Very dense Boulders.
							2.40	15.37		Open hole boring. Driller described: Firm becoming stiff, grey, sandy gravelly Clay.
		3.00 - 4.50 N=12 (3,4/4,3,2,3) (C)	B							
		4.50 - 6.00 44 (5,8/44 for 75mm) (C)	B							
		6.00 - 7.50 50 (25 for 10mm/50 for 10mm) (C)	B							
		7.50 - 9.00 N=35 (8,8/5,8,9,13) (C)	B				7.80	9.97		Open hole boring. Driller described: Medium dense, silty sandy Gravel.
		9.00 - 10.50	B							

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
10.50				See shift data.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
30.00	131	131

Equipment: Deltabase 520

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:
Borehole terminated at 30.00m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	06/12/2016 08:00	0.00	Start of shift.
18.00	06/12/2016 18:00	30.00	End of borehole.

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Borehole No.
RC03-62
Sheet 2 of 4

Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 532895.64 - 728290.66	Hole Type RO
Location: Galway City, Co. Galway		Level: 17.77m OD	Scale 1:50
Client: Arup		Dates: 06/12/2016	Logged By

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
		N=24 (5,6/6,8,4,6) (C)								Open hole boring. Driller described: Medium dense, silty sandy Gravel.
	▼	10.50 - 12.00 N=13 (3,3/1,3,4,5) (C)	B				10.20	7.57		Open hole boring. Driller described: Medium dense becoming very dense, yellow brown, silty sandy Gravel with boulder content.
		12.00 - 13.50 33 (3,5/33 for 115mm) (C)	B							
		13.50 - 15.00 0 (25 for 50mm/0 for 0mm) (C)	B							
		15.00 - 16.50 35 (16,10/35 for 85mm) (C)	B							
		16.50 - 18.00 N=52 (11,9/5,10,18, 19) (C)	B							
		18.00 - 19.50	B							

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
10.50				See shift data.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
30.00	131	131

Equipment: Deltabase 520

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:
Borehole terminated at 30.00m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	06/12/2016 08:00	0.00	Start of shift.
18.00	06/12/2016 18:00	30.00	End of borehole.

pgl priority geotechnical	**Priority Geotechnical Ltd.** **Tel: 021 4631600** **Fax: 021 4638690** **www.prioritygeotechnical.ie**		Borehole No. **RC03-62** Sheet 3 of 4
Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 532895.64 - 728290.66	Hole Type RO
Location: Galway City, Co. Galway		Level: 17.77m OD	Scale 1:50
Client: Arup		Dates: 06/12/2016	Logged By

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
		N=21 (6,6/3,4,7,7) (C)								
		19.50 - 21.00 50 (25 for 0mm/50 for 0mm) (C)	B							
		21.00 - 22.50 N=65 (8,8/10,13,19, 23) (C)	B							
		22.50 - 24.00 25 (24 for 75mm/25 for 0mm) (C)	B							*22.50m: Locally medium dense.*
		24.00 - 25.50 N=91 (9,19/18,24,2 4,25) (C)	B							
		25.50 - 27.00 50 (25 for 30mm/50 for 10mm) (C)	B							
		27.00 - 28.50	B							

19 20 21 22 23 24 25 26 27

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
10.50				See shift data.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
30.00	131	131

Equipment: Deltabase 520

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:

Borehole terminated at 30.00m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	06/12/2016 08:00	0.00	Start of shift.
18.00	06/12/2016 18:00	30.00	End of borehole.

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Borehole No.
RC03-62
Sheet 4 of 4

Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 532895.64 - 728290.66	Hole Type RO
Location: Galway City, Co. Galway		Level: 17.77m OD	Scale 1:50
Client: Arup		Dates: 06/12/2016	Logged By

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
		50 (25 for 0mm/50 for 0mm) (C)								
		28.50 - 30.00 25 (10,16/25 for 10mm) (C)	B							*28.50 - 30.00m: Locally medium dense.*
		50 (25 for 50mm/50 for 10mm) (C)					30.00	-12.23		End of Borehole at 30.000m

28 29 30 31 32 33 34 35 36

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
10.50				See shift data.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
30.00	131	131

Equipment: Deltabase 520

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:
Borehole terminated at 30.00m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	06/12/2016 08:00	0.00	Start of shift.
18.00	06/12/2016 18:00	30.00	End of borehole.

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Borehole No.
RC03-63
Sheet 1 of 2

Project Name:	N6 GCTP Phase 3	Project No. P16185	Co-ords:	534688.05 - 726922.21	Hole Type RO
Location:	Galway City, Co. Galway		Level:	36.20m OD	Scale 1:50
Client:	Arup		Dates:	01/12/2016	Logged By

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
		50 (25 for 10mm/50 for 10mm) (C)					0.30	35.90		Open hole boring. Driller described: Topsoil. Clay.
		50 (25 for 0mm/50 for 0mm) (C)					2.30	33.90		Open hole boring. Driller described: Weathered rock.
										Open hole boring. Driller described: Rock.

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
				None encountered.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
10.00	131	131

Equipment: Deltabase 520.

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:

Borehole terminated at 10.00m bgl. 50mm dia standpipe installed. Response zone from 4.0m to 10.0m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	01/12/2016 08:00	0.00	Start of shift.
Dry	01/12/2016 18:00	10.00	End of borehole.

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Borehole No.
RC03-63
Sheet 2 of 2

Project Name: N6 GCTP Phase 3	Project No. P16185	Co-ords: 534688.05 - 726922.21	Hole Type RO
Location: Galway City, Co. Galway		Level: 36.20m OD	Scale 1:50
Client: Arup		Dates: 01/12/2016	Logged By

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
										Open hole boring. Driller described: Rock.
							10.00	26.20		End of Borehole at 10.000m

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
				None encountered.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
10.00	131	131

Equipment: Deltabase 520.

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:

Borehole terminated at 10.00m bgl. 50mm dia standpipe installed. Response zone from 4.0m to 10.0m bgl.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	01/12/2016 08:00	0.00	Start of shift.
Dry	01/12/2016 18:00	10.00	End of borehole.

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Borehole No.
RC03-64
Sheet 1 of 1

Project Name:	N6 GCTP Phase 3	Project No. P16185	Co-ords:	534688.51 - 726961.05	Hole Type RO
Location:	Galway City, Co. Galway		Level:	37.62m OD	Scale 1:50
Client:	Arup		Dates:	01/12/2016	Logged By

Well	Water Strike (m)	Depth (m)	Type /Fs	Coring TCR	Coring SCR	Coring RQD	Depth (m) / Fl	Level (mOD)	Legend	Stratum Description
							0.30	37.32		Open hole boring. Driller described: Topsoil. Clay.
										Open hole boring. Driller described: Weathered rock with clay bands.
							2.90	34.72		Open hole boring. Driller described: Rock.
							8.00	29.62		End of Borehole at 8.000m

Groundwater:

Struck, m	Rose to	After, min	Sealed	Comment
				None encountered.

Hole Information:

Hole Depth (m)	Hole Dia (mm)	Casing Dia (mm)
8.00	131	131

Equipment: Deltabase 520

Chiselling:

Depth Top	Depth Base	Duration	Tool

Remarks:

Borehole terminated at 8.00m bgl. 50mm dia standpipe installed. Response zone from 5.0m to 8.0m.

Shift Data:

Groundwater	Shift	Hole Depth (m)	Remarks
	01/12/2016 08:00	0.00	Start of shift.
Dry	01/12/2016 18:00	8.00	None encountered

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Trial Pit No
TP03-19
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 531192.33 - 728489.43 **Level:** 18.88	**Date** 12/12/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 4.20 x 2.00		**Scale** 1:25
Client: Arup	**Depth:** 0.25		**Logged** VT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	18.68		Topsoil. Soft, brown, slightly gravelly sandy SILT. Gravel is fine to coarse, angular to sub-angular, Limestone lithology. Sand is fine to coarse.
				0.25	18.63		Firm, light grey to light brown, slightly sandy gravelly SILT with high cobble content and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular, Limestone lithology. Cobbles are angular to sub-rounded, 63-200mm dia. Limestone lithology. Boulders are angular to sub-angular, 200-700mm dia. Limestone lithology.
							End of Pit at 0.25m

1
2
3
4
5

Stability: Good.
Plant: 6t track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 0.25m bgl on bedrock.

Photographic Record

Number: TP03-19	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
TP03-50
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 532910.81 - 728281.73 **Level:** 18.04	**Date** 01/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 4.00 x 1.30 **Depth:** 4.00	**Scale** 1:25
Client: Arup			**Logged** AH

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Topsoil.
				0.40	17.64		Soft to firm, grey, slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse and sub-angular.
	0.80 - 1.50 0.80 - 1.50	B D		0.80	17.24		Firm, grey, slightly sandy gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded to rounded. Cobbles are 63mm to 200mm dia, sub-rounded to rounded.
	1.50 - 2.00 1.50 - 2.00	B D					
	2.00 - 3.00 2.00 - 3.00	B D		2.00	16.04		Very sandy very clayey GRAVEL.
	3.00 - 4.00 3.00 - 4.00	B D		3.00	15.04		Firm, grey, slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse..
				4.00	14.04		End of Pit at 4.00m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.
Groundwater: None encountered.
Remarks: Trial pit terminated at 4.00m bgl, rock/ boulder obstruction.

Photographic Record

Number: TP03-50	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: TP03-50	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
TP03-51
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 533409.80 - 728269.18 **Level:** 57.54	**Date** 06/12/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 3.00 × 1.30		**Scale** 1:25
Client: Arup	**Depth:** 0.80		**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	57.24		Topsoil. Soft, slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse and sub-angular.
				0.80	56.74		Weathered rock. Recovered as: BOULDERS. Boulders are sub-angular, Limestone lithology.
							End of Pit at 0.80m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.
Groundwater: None encountered.
Remarks: Trial pit terminated at 0.80m bgl, on bedrock.

Photographic Record

Number: TP03-51	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: TP03-51	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
TP03-52
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 533536.07 - 728203.64 **Level:** 56.79	**Date** 06/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 2.20 x 1.30 **Depth:** 1.25	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	56.64		Topsoil.
	0.20 - 0.50 0.20 - 0.50	B D					Soft, light brown, slightly sandy gravelly SILT. Sand is fine to coarse.
	0.50 - 1.20 0.50 - 1.20	B D		0.50	56.29		Soft to firm, slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are sub-rounded.
				1.25	55.54		End of Pit at 1.25m

Stability: Moderate.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 1.25m bgl, on bedrock.

Photographic Record

Number: TP03-52	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: TP03-52	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
TP03-53
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 533686.85 - 728181.43 **Level:** 56.85	**Date** 06/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 3.50 x 1.50 **Depth:** 4.00	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Topsoil.
	0.50 - 0.90 0.50 - 0.90	B D		0.40	56.45		Soft, brown, sightly gravelly slightly sandy CLAY. Sand is fine to coarse.
	1.00 - 1.50 1.00 - 1.50	B D		0.95	55.90		Soft to firm, light grey, slightly gravelly sandy CLAY with medium cobble content, low boulder content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are 63mm to 200mm dia and sub-rounded. Boulders are 200mm to 300mm dia , sub-rounded to rounded.
	2.00 - 2.50 2.00 - 2.50	B D					
	2.50 - 3.50 2.50 - 3.50	B D		2.50	54.35		Firm to stiff, light grey, slightly sandy gravelly SILT with medium cobble content. Cobbles are sub-rounded to rounded, Limestone lithology.
	3.50 - 4.00 3.50 - 4.00	B D		3.50	53.35		Sandy very silty very gravely COBBLES.
				4.00	52.85		End of Pit at 4.00m

1 2 3 4 5

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 4.00m bgl. Difficult to excavate very stiff strata.

Photographic Record

Number: TP03-53	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: TP03-53	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-03
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 531747.15 - 728409.59 **Level:** 30.01	**Date** 13/12/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 3.30 x 1.00		**Scale** 1:25
Client: Arup	**Depth:** 0.45		**Logged** VT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15 - 0.45 0.15 - 0.45	B D		0.15	29.86		Topsoil. Soft to firm, brown, slightly sandy SILT. Sand is fine to coarse.
				0.45	29.56		Brown, very gravelly very silty SAND with high cobble content and high boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular, Limestone lithology. Cobbles are angular to sub-angular, 63-200mm dia, Limestone lithology. Boulders are angular to sub-angular, 200-750mm dia, Limestone lithology.
							End of Pit at 0.45m

Stability: 0.45
Plant: 6t track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 0.45m bgl on bedrock. Soakaway test carried out (BRE 365)

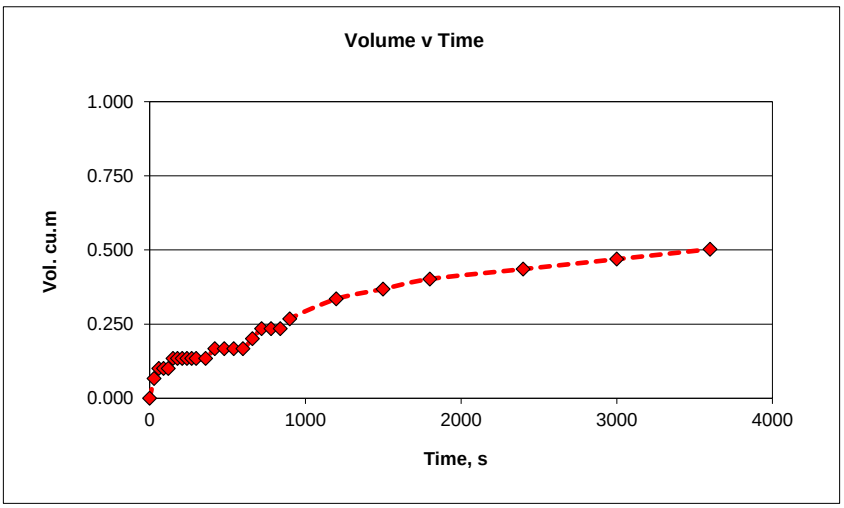
P16185 **N6 GCTP**

Test 1 **SW3/03** **13/12/2016**

				d, m	**0.47**
l, m	**3.35**	b, m	**1**	d_eff, m	**0.17**
l_base, m	**3.35**			d_act, m	**0.15**
l_eff, m	**3.35**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.3	0	0.17	0.00	0.000
0.5	0.32	30	0.15	0.02	0.067
1	0.33	60	0.14	0.03	0.101
1.5	0.33	90	0.14	0.03	0.101
2	0.33	120	0.14	0.03	0.101
2.5	0.34	150	0.13	0.04	0.134
3	0.34	180	0.13	0.04	0.134
3.5	0.34	210	0.13	0.04	0.134
4	0.34	240	0.13	0.04	0.134
4.5	0.34	270	0.13	0.04	0.134
5	0.34	300	0.13	0.04	0.134
6	0.34	360	0.13	0.04	0.134
7	0.35	420	0.12	0.05	0.168
8	0.35	480	0.12	0.05	0.168
9	0.35	540	0.12	0.05	0.168
10	0.35	600	0.12	0.05	0.168
11	0.36	660	0.11	0.06	0.201
12	0.37	720	0.10	0.07	0.235
13	0.37	780	0.10	0.07	0.235
14	0.37	840	0.10	0.07	0.235
15	0.38	900	0.09	0.08	0.268
20	0.4	1200	0.07	0.10	0.335
25	0.41	1500	0.06	0.11	0.369
30	0.42	1800	0.05	0.12	0.402
40	0.43	2400	0.04	0.13	0.436
50	0.44	3000	0.03	0.14	0.469
60	0.45	3600	0.02	0.15	0.503

Area	3.35 m^2				
50% Area_eff, a_{p50}	4.0895 m^2	$V_{p75\text{-}25\ theory}$	volume	0.28475	m^3
50% Area_act, a_{p50}	4.0025 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.25125	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	1440.00	s
		Infiltration Coefficient	*f*	4.359E-05	ms^-1



NOTES:

See SW3/03 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

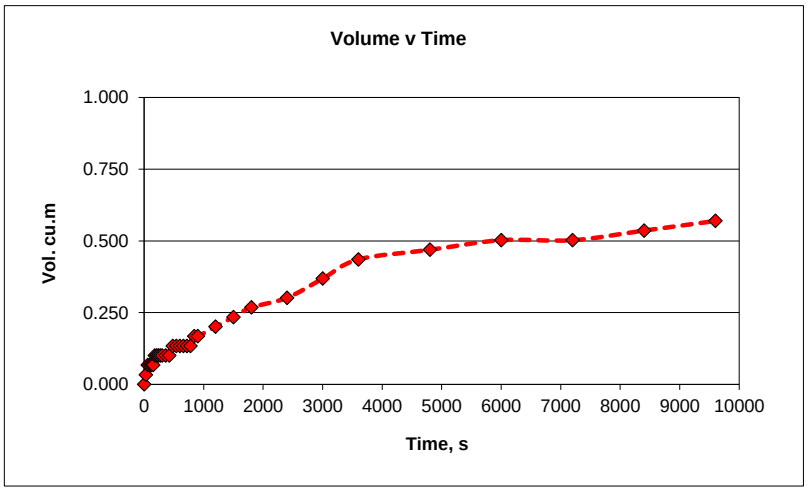
P16185 **N6 GCTP**

Test 2 **SW3/03** **13/12/2016**

				d, m	**0.47**
l, m	**3.35**	b, m	**1**	d_eff, m	**0.17**
l_base, m	**3.35**			d_act, m	**0.17**
l_eff, m	**3.35**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.3	0	0.17	0.00	0.000
0.5	0.31	30	0.16	0.01	0.034
1	0.32	60	0.15	0.02	0.067
1.5	0.32	90	0.15	0.02	0.067
2	0.32	120	0.15	0.02	0.067
2.5	0.32	150	0.15	0.02	0.067
3	0.33	180	0.14	0.03	0.101
3.5	0.33	210	0.14	0.03	0.101
4	0.33	240	0.14	0.03	0.101
4.5	0.33	270	0.14	0.03	0.101
5	0.33	300	0.14	0.03	0.101
6	0.33	360	0.14	0.03	0.101
7	0.33	420	0.14	0.03	0.101
8	0.34	480	0.13	0.04	0.134
9	0.34	540	0.13	0.04	0.134
10	0.34	600	0.13	0.04	0.134
11	0.34	660	0.13	0.04	0.134
12	0.34	720	0.13	0.04	0.134
13	0.34	780	0.13	0.04	0.134
14	0.35	840	0.12	0.05	0.168
15	0.35	900	0.12	0.05	0.168
20	0.36	1200	0.11	0.06	0.201
25	0.37	1500	0.10	0.07	0.235
30	0.38	1800	0.09	0.08	0.268
40	0.39	2400	0.08	0.09	0.302
50	0.41	3000	0.06	0.11	0.369
60	0.43	3600	0.04	0.13	0.436
80	0.44	4800	0.03	0.14	0.469
100	0.45	6000	0.02	0.15	0.503
120	0.45	7200	0.02	0.15	0.503
140	0.46	8400	0.01	0.16	0.536
160	0.47	9600	0.00	0.17	0.570

Area	3.35	m^2			
50% Area_eff, a_{p50}	4.0895	m^2	$V_{p75\text{-}25\ theory}$ volume	0.28475	m^3
50% Area_act, a_{p50}	4.0895	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	0.28475	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	2970.00	s
			Infiltration Coefficient *f*	2.34443E-05	ms^-1



NOTES:

See SW3/03 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed saturated for second test.

Infiltration rate calculated over actual fall.

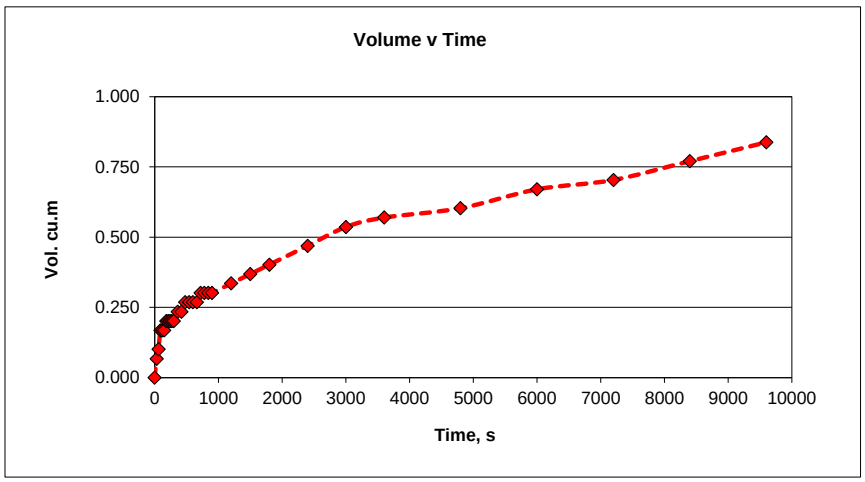
P16185 **N6 GCTP**

Test 3 **SW3/11** **13/12/2016**

				d, m	**0.47**
l, m	**3.35**	b, m	**1**	d_eff, m	**0.25**
l_base, m	**3.35**			d_act, m	**0.25**
l_eff, m	**3.35**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.22	0	0.25	0.00	0.000
0.5	0.24	30	0.23	0.02	0.067
1	0.25	60	0.22	0.03	0.101
1.5	0.27	90	0.20	0.05	0.168
2	0.27	120	0.20	0.05	0.168
2.5	0.27	150	0.20	0.05	0.168
3	0.28	180	0.19	0.06	0.201
3.5	0.28	210	0.19	0.06	0.201
4	0.28	240	0.19	0.06	0.201
4.5	0.28	270	0.19	0.06	0.201
5	0.28	300	0.19	0.06	0.201
6	0.29	360	0.18	0.07	0.235
7	0.29	420	0.18	0.07	0.235
8	0.3	480	0.17	0.08	0.268
9	0.3	540	0.17	0.08	0.268
10	0.3	600	0.17	0.08	0.268
11	0.3	660	0.17	0.08	0.268
12	0.31	720	0.16	0.09	0.302
13	0.31	780	0.16	0.09	0.302
14	0.31	840	0.16	0.09	0.302
15	0.31	900	0.16	0.09	0.302
20	0.32	1200	0.15	0.10	0.335
25	0.33	1500	0.14	0.11	0.369
30	0.34	1800	0.13	0.12	0.402
40	0.36	2400	0.11	0.14	0.469
50	0.38	3000	0.09	0.16	0.536
60	0.39	3600	0.08	0.17	0.570
80	0.40	4800	0.07	0.18	0.603
100	0.42	6000	0.05	0.20	0.670
120	0.43	7200	0.04	0.21	0.704
140	0.45	8400	0.02	0.23	0.771
160	0.47	9600	0.00	0.25	0.838

Area	3.35 m^2				
50% Area_eff, a_{p50}	4.4375 m^2	$V_{p75\text{-}25\ theory}$	volume	0.41875	m^3
50% Area_act, a_{p50}	4.4375 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.41875	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	5500.00	s
		Infiltration Coefficient	*f*	1.71575E-05	ms^-1



NOTES:

See SW3/03 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed saturated for third test.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-03	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-03	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-04
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 533188.89 - 728353.66 **Level:** 52.77	**Date** 01/12/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 1.50 × 1.30		**Scale** 1:25
Client: Arup	**Depth:** 0.35		**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.35	52.42		Topsoil. Soft, brown, slightly gravelly SILT. End of Pit at 0.35m

1
2
3
4
5

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 0.35m bgl, on bedrock. Soakaway test carried out (BRE 365).

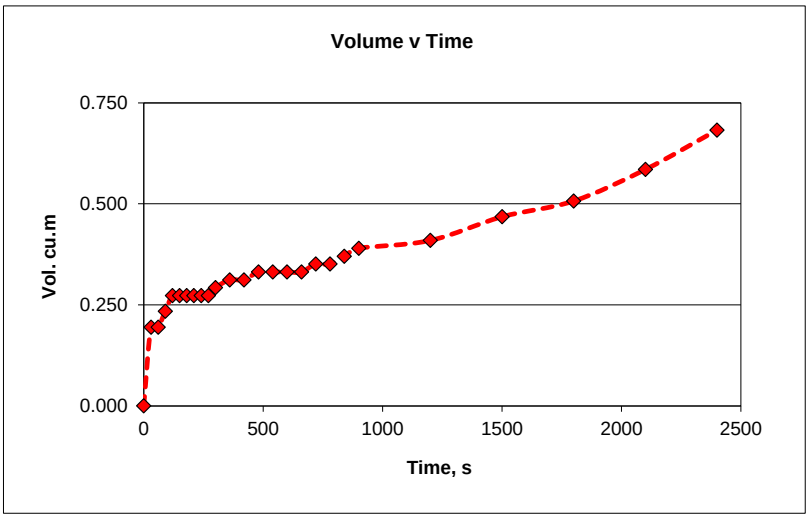
P16185 **N6 GCTP**

Test 1 **SW3/04** **01/12/2016**

				d, m	**0.35**
l, m	**1.5**	b, m	**1.3**	d_eff, m	**0.35**
l_base, m	**1.5**			d_act, m	**0.35**
l_eff, m	**1.5**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0	0	0.35	0.00	0.000
0.5	0.1	30	0.25	0.10	0.195
1	0.1	60	0.25	0.10	0.195
1.5	0.12	90	0.23	0.12	0.234
2	0.14	120	0.21	0.14	0.273
2.5	0.14	150	0.21	0.14	0.273
3	0.14	180	0.21	0.14	0.273
3.5	0.14	210	0.21	0.14	0.273
4	0.14	240	0.21	0.14	0.273
4.5	0.14	270	0.21	0.14	0.273
5	0.15	300	0.20	0.15	0.293
6	0.16	360	0.19	0.16	0.312
7	0.16	420	0.19	0.16	0.312
8	0.17	480	0.18	0.17	0.332
9	0.17	540	0.18	0.17	0.332
10	0.17	600	0.18	0.17	0.332
11	0.17	660	0.18	0.17	0.332
12	0.18	720	0.17	0.18	0.351
13	0.18	780	0.17	0.18	0.351
14	0.19	840	0.16	0.19	0.371
15	0.2	900	0.15	0.20	0.390
20	0.21	1200	0.14	0.21	0.410
25	0.24	1500	0.11	0.24	0.468
30	0.26	1800	0.09	0.26	0.507
35	0.30	2100	0.05	0.30	0.585
40	0.35	2400	0.00	0.35	0.683

Area	1.95	m^2				
50% Area_eff, a_{p50}	2.93	m^2	$V_{p75\text{-}25\ theory}$	volume	0.34125	m^3
50% Area_act, a_{p50}	2.93	m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.34125	m^3
			$t_{p\ 75\text{-}25\ actual}$	time	1818.00	s
			Infiltration Coefficient	*f*	6.406E-05	ms^-1



NOTES:

See SW3/04 log for detailed soil strata details: slightly gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

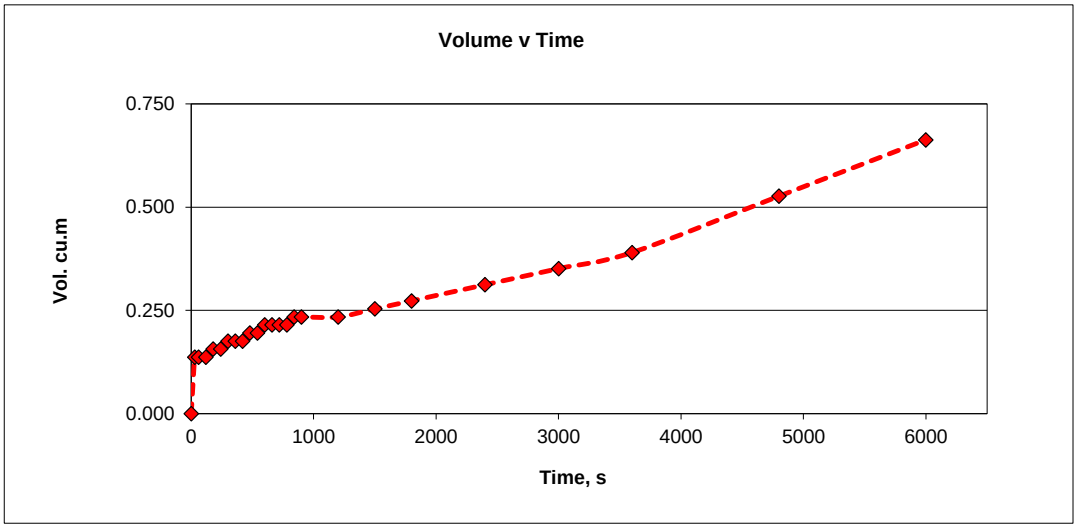
P16185 **N6 GCTP**

Test 2 **SW3/04** **01/12/2016**

				d, m	**0.35**
l, m	**1.5**	b, m	**1.3**	d_eff, m	**0.35**
l_base, m	**1.5**			d_act, m	**0.34**
l_eff, m	**1.5**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0	0	0.35	0.00	0.000
0.5	0.07	30	0.28	0.07	0.137
1	0.07	60	0.28	0.07	0.137
2	0.07	120	0.28	0.07	0.137
3	0.08	180	0.27	0.08	0.156
4	0.08	240	0.27	0.08	0.156
5	0.09	300	0.26	0.09	0.176
6	0.09	360	0.26	0.09	0.176
7	0.09	420	0.26	0.09	0.176
8	0.1	480	0.25	0.10	0.195
9	0.1	540	0.25	0.10	0.195
10	0.11	600	0.24	0.11	0.215
11	0.11	660	0.24	0.11	0.215
12	0.11	720	0.24	0.11	0.215
13	0.11	780	0.24	0.11	0.215
14	0.12	840	0.23	0.12	0.234
15	0.12	900	0.23	0.12	0.234
20	0.12	1200	0.23	0.12	0.234
25	0.13	1500	0.22	0.13	0.254
30	0.14	1800	0.21	0.14	0.273
40	0.16	2400	0.19	0.16	0.312
50	0.18	3000	0.17	0.18	0.351
60	0.20	3600	0.15	0.20	0.390
80	0.27	4800	0.08	0.27	0.527
100	0.34	6000	0.01	0.34	0.663

Area	1.95				
50% Area_eff, a_{p50}	2.93	m^2	$V_{p75\text{-}25\ theory}$ volume	0.34125	m^3
50% Area_act, a_{p50}	2.902	m^2	$V_{p\ 75\ -\ 25\ actual}$ volume	0.3315	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	4620.00	s
			Infiltration Coefficient *f*	2.47254E-05	ms^-1



NOTES:

See SW3/04 log for detailed soil strata details: slightly gravelly SILT

No groundwater was encountered, pit assumed saturated for second test.

Infiltration rate calculated over actual fall.

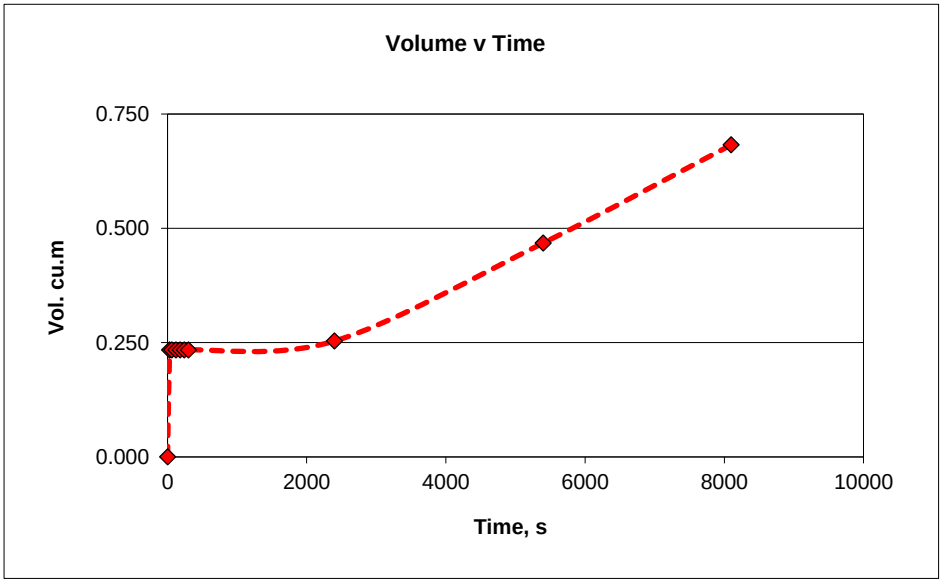
P16185 **N6 GCTP**

Test 3 **SW3/04** **01/12/2016**

				d, m	**0.35**
l, m	**1.5**	b, m	**1.3**	d_eff, m	**0.35**
l_base, m	**1.5**			d_act, m	**0.35**
l_eff, m	**1.5**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0	0	0.35	0.00	0.000
0.5	0.12	30	0.23	0.12	0.234
1	0.12	60	0.23	0.12	0.234
2	0.12	120	0.23	0.12	0.234
3	0.12	180	0.23	0.12	0.234
4	0.12	240	0.23	0.12	0.234
5	0.12	300	0.23	0.12	0.234
40	0.13	2400	0.22	0.13	0.254
90	0.24	5400	0.11	0.24	0.468
135	0.35	8100	0.00	0.35	0.683

Area	1.95				
50% Area_eff, a_{p50}	2.93	m^2	$V_{p75\text{-}25\ theory}$ volume	0.34125	m^3
50% Area_act, a_{p50}	2.93	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	0.34125	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	6066.00	s
			Infiltration Coefficient *f*	1.92001E-05	ms^-1



NOTES:

See SW3/04 log for detailed soil strata details: slightly gravelly SILT

No groundwater was encountered, pit assumed saturated for third test.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-04	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-04	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-05
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 532788.59 - 727597.04 **Level:** 42.27	**Date** 30/11/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 2.40 × 1.60		**Scale** 1:25
Client: Arup	**Depth:** 0.90		**Logged** VT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	42.07		Topsoil. Firm, brown, slightly gravelly SILT with medium cobble content. Gravel is fine to coarse, angular to sub-rounded. Cobbles are 63mm to 200mm dia, angular to sub-rounded, Limestone lithology.
							Soft to firm, slightly gravelly sandy SILT with high cobble content, high boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular. Cobbles are 63mm to 200mm dia, sub-angular to sub-rounded. Boulders are 200mm to 500mm dia, sub-angular to sub-rounded.
				0.90	41.37		End of Pit at 0.90m

Stability: Good.
Plant: 12T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 0.90m bgl, on bedrock. Soakaway test carried out (BRE 365).

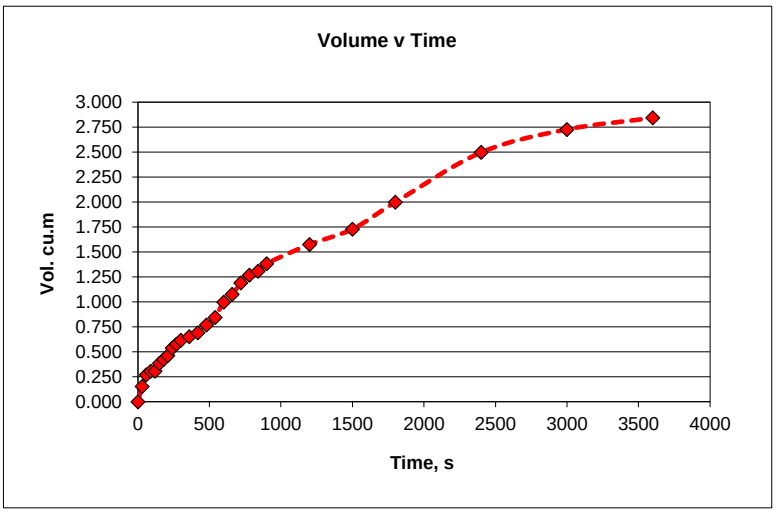
P16185 **N6 GCTP**

Test 1 **SW3/05** **30/11/2016**

				d, m	**0.9**
l, m	**2.4**	b, m	**1.6**	d_eff, m	**0.74**
l_base, m	**2.4**			d_act, m	**0.74**
l_eff, m	**2.4**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.16	0	0.74	0.00	0.000
0.5	0.2	30	0.70	0.04	0.154
1	0.23	60	0.67	0.07	0.269
1.5	0.24	90	0.66	0.08	0.307
2	0.24	120	0.66	0.08	0.307
2.5	0.26	150	0.64	0.10	0.384
3	0.27	180	0.63	0.11	0.422
3.5	0.28	210	0.62	0.12	0.461
4	0.3	240	0.60	0.14	0.538
4.5	0.31	270	0.59	0.15	0.576
5	0.32	300	0.58	0.16	0.614
6	0.33	360	0.57	0.17	0.653
7	0.34	420	0.56	0.18	0.691
8	0.36	480	0.54	0.20	0.768
9	0.38	540	0.52	0.22	0.845
10	0.42	600	0.48	0.26	0.998
11	0.44	660	0.46	0.28	1.075
12	0.47	720	0.43	0.31	1.190
13	0.49	780	0.41	0.33	1.267
14	0.5	840	0.40	0.34	1.306
15	0.52	900	0.38	0.36	1.382
20	0.57	1200	0.33	0.41	1.574
25	0.61	1500	0.29	0.45	1.728
30	0.68	1800	0.22	0.52	1.997
40	0.81	2400	0.09	0.65	2.496
50	0.87	3000	0.03	0.71	2.726
60	0.90	3600	0.00	0.74	2.842

Area	3.84 m^2				
50% Area_eff, a_{p50}	6.8 m^2	$V_{p75\text{-}25\ theory}$	volume	1.4208	m^3
50% Area_act, a_{p50}	6.8 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	1.4208	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	1800.00	s
		Infiltration Coefficient	*f*	0.000116	ms^-1



NOTES:

See SW3/05 log for detailed soil strata details: slightly gravelly sandy SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

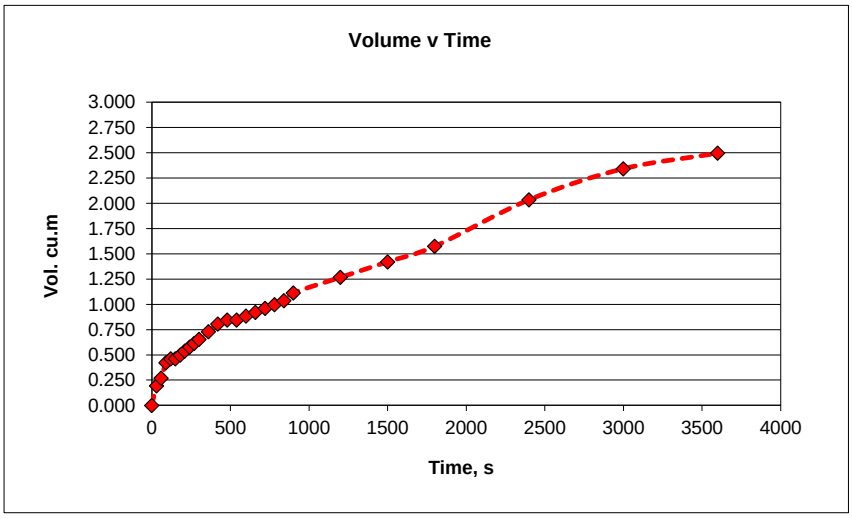
P16185 **N6 GCTP**

Test 2 **SW3/05** **30/11/2016**

				d, m	**0.9**
l, m	**2.4**	b, m	**1.6**	d_eff, m	**0.65**
l_base, m	**2.4**			d_act, m	**0.65**
l_eff, m	**2.4**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.25	0	0.65	0.00	0.000
0.5	0.3	30	0.60	0.05	0.192
1	0.32	60	0.58	0.07	0.269
1.5	0.36	90	0.54	0.11	0.422
2	0.37	120	0.53	0.12	0.461
2.5	0.37	150	0.53	0.12	0.461
3	0.38	180	0.52	0.13	0.499
3.5	0.39	210	0.51	0.14	0.538
4	0.4	240	0.50	0.15	0.576
4.5	0.41	270	0.49	0.16	0.614
5	0.42	300	0.48	0.17	0.653
6	0.44	360	0.46	0.19	0.730
7	0.46	420	0.44	0.21	0.806
8	0.47	480	0.43	0.22	0.845
9	0.47	540	0.43	0.22	0.845
10	0.48	600	0.42	0.23	0.883
11	0.49	660	0.41	0.24	0.922
12	0.5	720	0.40	0.25	0.960
13	0.51	780	0.39	0.26	0.998
14	0.52	840	0.38	0.27	1.037
15	0.54	900	0.36	0.29	1.114
20	0.58	1200	0.32	0.33	1.267
25	0.62	1500	0.28	0.37	1.421
30	0.66	1800	0.24	0.41	1.574
40	0.78	2400	0.12	0.53	2.035
50	0.86	3000	0.04	0.61	2.342
60	0.90	3600	0.00	0.65	2.496

Area	3.84	m^2			
50% Area_eff, a_{p50}	6.44	m^2	$V_{p75\text{-}25\ theory}$ volume	1.248	m^3
50% Area_act, a_{p50}	6.44	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	1.248	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	1630.00	s
			Infiltration Coefficient *f*	0.000118889	ms^-1



NOTES:

See SW3/05 log for detailed soil strata details: slightly gravelly sandy SILT

Second test pit assumed saturated.

Infiltration rate calculated over actual fall.

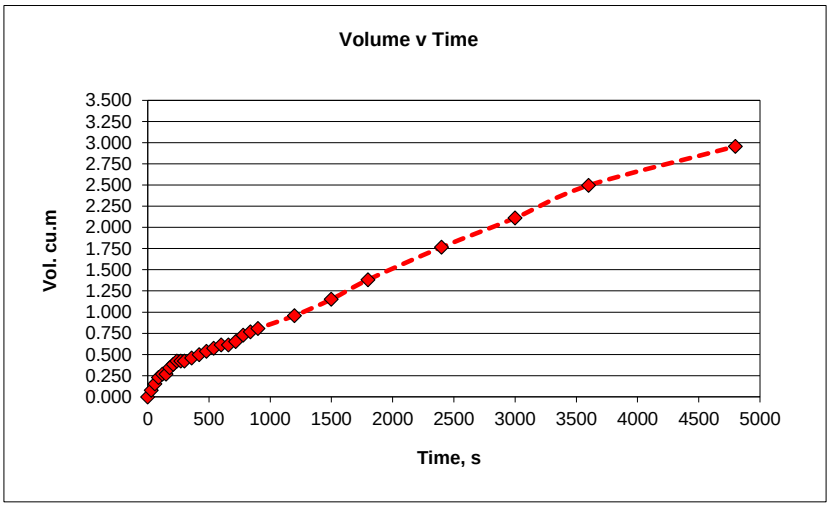
P16185 **N6 GCTP**

Test 3 **SW3/05** **30/11/2016**

				d, m	**0.9**
l, m	**2.4**	b, m	**1.6**	d_eff, m	**0.77**
l_base, m	**2.4**			d_act, m	**0.77**
l_eff, m	**2.4**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.13	0	0.77	0.00	0.000
0.5	0.15	30	0.75	0.02	0.077
1	0.17	60	0.73	0.04	0.154
1.5	0.19	90	0.71	0.06	0.230
2	0.2	120	0.70	0.07	0.269
2.5	0.2	150	0.70	0.07	0.269
3	0.22	180	0.68	0.09	0.346
3.5	0.23	210	0.67	0.10	0.384
4	0.24	240	0.66	0.11	0.422
4.5	0.24	270	0.66	0.11	0.422
5	0.24	300	0.66	0.11	0.422
6	0.25	360	0.65	0.12	0.461
7	0.26	420	0.64	0.13	0.499
8	0.27	480	0.63	0.14	0.538
9	0.28	540	0.62	0.15	0.576
10	0.29	600	0.61	0.16	0.614
11	0.29	660	0.61	0.16	0.614
12	0.3	720	0.60	0.17	0.653
13	0.32	780	0.58	0.19	0.730
14	0.33	840	0.57	0.20	0.768
15	0.34	900	0.56	0.21	0.806
20	0.38	1200	0.52	0.25	0.960
25	0.43	1500	0.47	0.30	1.152
30	0.49	1800	0.41	0.36	1.382
40	0.59	2400	0.31	0.46	1.766
50	0.68	3000	0.22	0.55	2.112
60	0.78	3600	0.12	0.65	2.496
80	0.90	4800	0.00	0.77	2.957

Area	3.84	m^2			
50% Area_eff, a_{p50}	6.92	m^2	$V_{p75\text{-}25\ theory}$ volume	1.4784	m^3
50% Area_act, a_{p50}	6.92	m^2	$V_{p\ 75\ -\ 25\ actual}$ volume	1.4784	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	2280.00	s
			Infiltration Coefficient *f*	9.37025E-05	ms^-1



NOTES:

See SW3/05 log for detailed soil strata details: slightly gravelly sandy SILT

Third test pit assumed saturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-05	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-05	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-06
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 534038.37 - 727783.11 **Level:** 48.56	**Date** 05/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 2.50 x 1.20 **Depth:** 1.50	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Topsoil.
				0.40	48.16		Soft, brown, slightly sandy slightly gravelly SILT.
				0.80	47.76		Light grey, slightly sandy gravelly SILT.
				1.50	47.06		End of Pit at 1.50m

Stability: Moderate.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at required depth of 1.50m bgl.

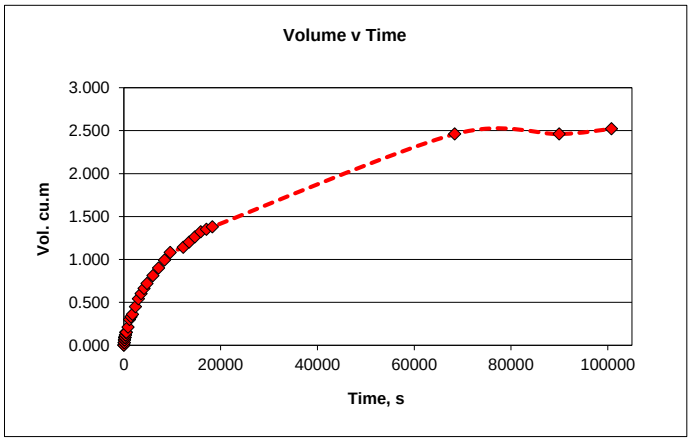
P16185 **N6 GCTP**

Test 3 **SW3/06** **05/12/2016**

				d, m	**1.5**
l, m	**2.5**	b, m	**1.2**	d_eff, m	**1.42**
l_base, m	**2.5**			d_act, m	**0.84**
l_eff, m	**2.5**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.08	0	1.42	0.00	0.000
0.5	0.08	30	1.42	0.00	0.000
1	0.09	60	1.41	0.01	0.030
1.5	0.09	90	1.41	0.01	0.030
2	0.1	120	1.40	0.02	0.060
2.5	0.1	150	1.40	0.02	0.060
3	0.11	180	1.39	0.03	0.090
3.5	0.11	210	1.39	0.03	0.090
4	0.11	240	1.39	0.03	0.090
4.5	0.11	270	1.39	0.03	0.090
5	0.12	300	1.38	0.04	0.120
6	0.12	360	1.38	0.04	0.120
7	0.13	420	1.37	0.05	0.150
8	0.13	480	1.37	0.05	0.150
9	0.13	540	1.37	0.05	0.150
15	0.15	900	1.35	0.07	0.210
20	0.18	1200	1.32	0.10	0.300
25	0.19	1500	1.31	0.11	0.330
30	0.20	1800	1.30	0.12	0.360
40	0.23	2400	1.27	0.15	0.450
50	0.26	3000	1.24	0.18	0.540
60	0.28	3600	1.22	0.20	0.600
70	0.30	4200	1.20	0.22	0.660
80	0.32	4800	1.18	0.24	0.720
100	0.35	6000	1.15	0.27	0.810
120	0.38	7200	1.12	0.30	0.900
140	0.41	8400	1.09	0.33	0.990
160	0.44	9600	1.06	0.36	1.080
205	0.46	12300	1.04	0.38	1.140
225	0.48	13500	1.02	0.40	1.200
245	0.50	14700	1.00	0.42	1.260
265	0.52	15900	0.98	0.44	1.320
285	0.53	17100	0.97	0.45	1.350
305	0.54	18300	0.96	0.46	1.380
1140	0.90	68400	0.60	0.82	2.460
1500	0.90	90000	0.60	0.82	2.460
1680	0.92	100800	0.58	0.84	2.520

Area	3	m^2			
50% Area_eff, a_{p50}	8.254	m^2	$V_{p75\text{-}25\ theory}$ volume	2.13	m^3
50% Area_act, a_{p50}	6.108	m^2	$V_{p\ 75\ -\ 25\ actual}$ volume	1.26	m^3
			$t_{p\ 75\text{-}25\ actual}$ time	38087.40	s
			Infiltration Coefficient *f*	5.42E-06	ms^-1



NOTES:

See SW3/06 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-06	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-06	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-07
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 534619.39 - 726923.63 **Level:** 37.08	**Date** 29/11/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 3.00 x 1.60 **Depth:** 1.10	**Scale** 1:25
Client: Arup			**Logged** VT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				1.10	35.98		Firm, brown, slightly sandy slightly gravelly SILT with high cobble content, high boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular. Cobbles are 63mm to 200mm dia, angular to sub-angular, Limestone lithology. Boulders are 200mm to 500mm dia, angular to sub-angular, Limestone lithology.
							End of Pit at 1.10m

Stability: Moderate to good.
Plant: 12T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 1.10m bgl on bedrock. Soakaway test carried out (BRE 365).

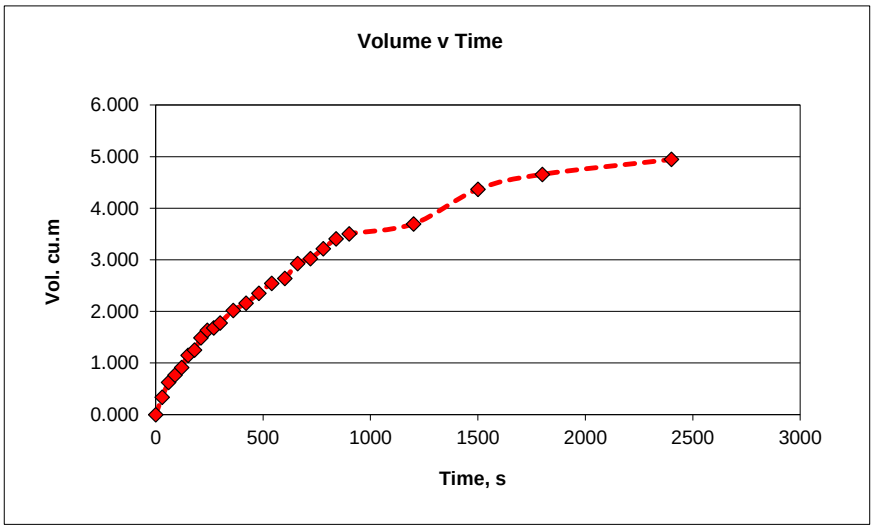
P16185 **N6 GCTP**

Test 1 **SW3/07** **29/11/2016**

				d, m	**1.1**
l, m	**3**	b, m	**1.6**	d_eff, m	**1.03**
l_base, m	**3**			d_act, m	**1.03**
l_eff, m	**3**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.07	0	1.03	0.00	0.000
0.5	0.14	30	0.96	0.07	0.336
1	0.2	60	0.90	0.13	0.624
1.5	0.23	90	0.87	0.16	0.768
2	0.26	120	0.84	0.19	0.912
2.5	0.31	150	0.79	0.24	1.152
3	0.33	180	0.77	0.26	1.248
3.5	0.38	210	0.72	0.31	1.488
4	0.41	240	0.69	0.34	1.632
4.5	0.42	270	0.68	0.35	1.680
5	0.44	300	0.66	0.37	1.776
6	0.49	360	0.61	0.42	2.016
7	0.52	420	0.58	0.45	2.160
8	0.56	480	0.54	0.49	2.352
9	0.6	540	0.50	0.53	2.544
10	0.62	600	0.48	0.55	2.640
11	0.68	660	0.42	0.61	2.928
12	0.7	720	0.40	0.63	3.024
13	0.74	780	0.36	0.67	3.216
14	0.78	840	0.32	0.71	3.408
15	0.8	900	0.30	0.73	3.504
20	0.84	1200	0.26	0.77	3.696
25	0.98	1500	0.12	0.91	4.368
30	1.04	1800	0.06	0.97	4.656
40	1.10	2400	0.00	1.03	4.944

Area	4.8 m^2				
50% Area_eff, a_{p50}	9.538 m^2	$V_{p75\text{-}25\ theory}$	volume	2.472	m^3
50% Area_act, a_{p50}	9.538 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	2.472	m^3
		$t_{p\ 75-\ 25\ actual}$	time	1029.00	s
		Infiltration Coefficient	*f*	0.0002519	ms^-1



NOTES:

See SW3/07 log for detailed soil strata details: slightly gravelly slightly sandy SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

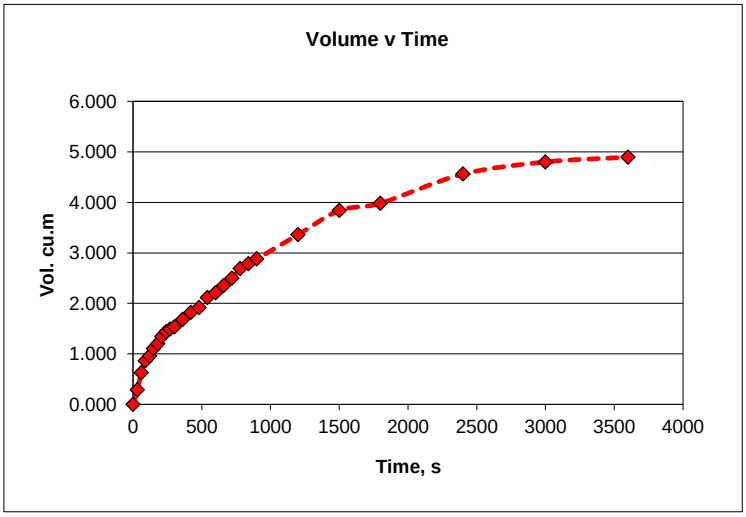
P16185 **N6 GCTP**

Test 2 **SW3/07** **29/11/2016**

				d, m	**1.1**
l, m	**3**	b, m	**1.6**	d_eff, m	**1.02**
l_base, m	**3**			d_act, m	**1.02**
l_eff, m	**3**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.08	0	1.02	0.00	0.000
0.5	0.14	30	0.96	0.06	0.288
1	0.21	60	0.89	0.13	0.624
1.5	0.26	90	0.84	0.18	0.864
2	0.28	120	0.82	0.20	0.960
2.5	0.31	150	0.79	0.23	1.104
3	0.33	180	0.77	0.25	1.200
3.5	0.36	210	0.74	0.28	1.344
4	0.38	240	0.72	0.30	1.440
4.5	0.39	270	0.71	0.31	1.488
5	0.4	300	0.70	0.32	1.536
6	0.43	360	0.67	0.35	1.680
7	0.46	420	0.64	0.38	1.824
8	0.48	480	0.62	0.40	1.920
9	0.52	540	0.58	0.44	2.112
10	0.54	600	0.56	0.46	2.208
11	0.57	660	0.53	0.49	2.352
12	0.6	720	0.50	0.52	2.496
13	0.64	780	0.46	0.56	2.688
14	0.66	840	0.44	0.58	2.784
15	0.68	900	0.42	0.60	2.880
20	0.78	1200	0.32	0.70	3.360
25	0.88	1500	0.22	0.80	3.840
30	0.91	1800	0.19	0.83	3.984
40	1.03	2400	0.07	0.95	4.560
50	1.08	3000	0.02	1.00	4.800
60	1.10	3600	0.00	1.02	4.896

Area	4.8	m^2			
50% Area_eff, a	9.492	m^2	$V_{p75\text{-}25\ theory}$ volume	2.448	m^3
50% Area_act,	9.492	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	2.448	m^3
			$t_{p\ 75\text{-}25\ actual}$ time	1211.00	s
			Infiltration Coefficient *f*	0.000213	ms^-1



NOTES:

See SW3/07 log for detailed soil strata details: slightly gravelly slightly sandy SILT

No groundwater was encountered, pit assumed saturated on second test.

Infiltration rate calculated over actual fall.

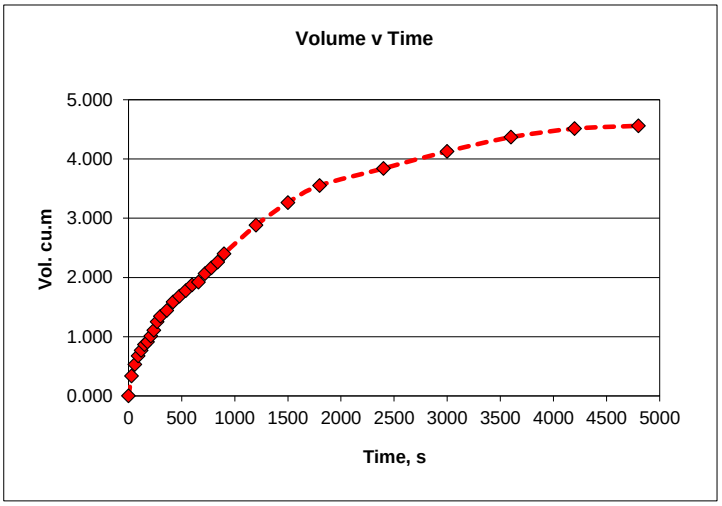
P16185 **N6 GCTP**

Test 3 **SW3/07** **29/11/2016**

				d, m	**1.1**
l, m	**3**	b, m	**1.6**	d_eff, m	**0.95**
l_base, m	**3**			d_act, m	**0.95**
l_eff, m	**3**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.15	0	0.95	0.00	0.000
0.5	0.22	30	0.88	0.07	0.336
1	0.26	60	0.84	0.11	0.528
1.5	0.29	90	0.81	0.14	0.672
2	0.31	120	0.79	0.16	0.768
2.5	0.33	150	0.77	0.18	0.864
3	0.34	180	0.76	0.19	0.912
3.5	0.36	210	0.74	0.21	1.008
4	0.38	240	0.72	0.23	1.104
4.5	0.41	270	0.69	0.26	1.248
5	0.43	300	0.67	0.28	1.344
6	0.45	360	0.65	0.30	1.440
7	0.48	420	0.62	0.33	1.584
8	0.5	480	0.60	0.35	1.680
9	0.52	540	0.58	0.37	1.776
10	0.54	600	0.56	0.39	1.872
11	0.55	660	0.55	0.40	1.920
12	0.58	720	0.52	0.43	2.064
13	0.6	780	0.50	0.45	2.160
14	0.62	840	0.48	0.47	2.256
15	0.65	900	0.45	0.50	2.400
20	0.75	1200	0.35	0.60	2.880
25	0.83	1500	0.27	0.68	3.264
30	0.89	1800	0.21	0.74	3.552
40	0.95	2400	0.15	0.80	3.840
50	1.01	3000	0.09	0.86	4.128
60	1.06	3600	0.04	0.91	4.368
70	1.09	4200	0.01	0.94	4.512
80	1.10	4800	0.00	0.95	4.560

Area	4.8	m^2			
50% Area_eff, a_{p50}	9.17	m^2	$V_{p75\text{-}25\ theory}$ volume	2.28	m^3
50% Area_act, a_{p50}	9.17	m^2	$V_{p\ 75\ -\ 25\ actual}$ volume	2.28	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	1492.00	s
			Infiltration Coefficient *f*	0.000167	ms^-1



NOTES:

See SW3/07 log for detailed soil strata details: slightly gravelly slightly sandy SILT

No groundwater was encountered, pit assumed saturated on third test.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-07	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-07	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-08
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 534660.70 - 726868.16 **Level:** 34.45	**Date** 29/11/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 3.20 x 1.50 **Depth:** 1.60	**Scale** 1:25
Client: Arup			**Logged** VT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.35	34.10		Topsoil. Soft to firm, brown, slightly sandy slightly gravelly SILT with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-rounded. Cobbles are 63mm to 200mm dia, angular to sub-rounded, Limestone lithology.
				1.60	32.85		Firm, brown grey, slightly gravelly sandy SILT with high cobble content, high boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-rounded. Cobbles are 63mm to 200mm dia, angular to sub-angular. Boulders are 200mm to 500mm dia, angular to sub-angular, LImestone lithology.
							End of Pit at 1.60m

Stability: Good to moderate.
Plant: 12T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 1.60m bgl on bedrock. Soakaway test carried out (BRE 365).

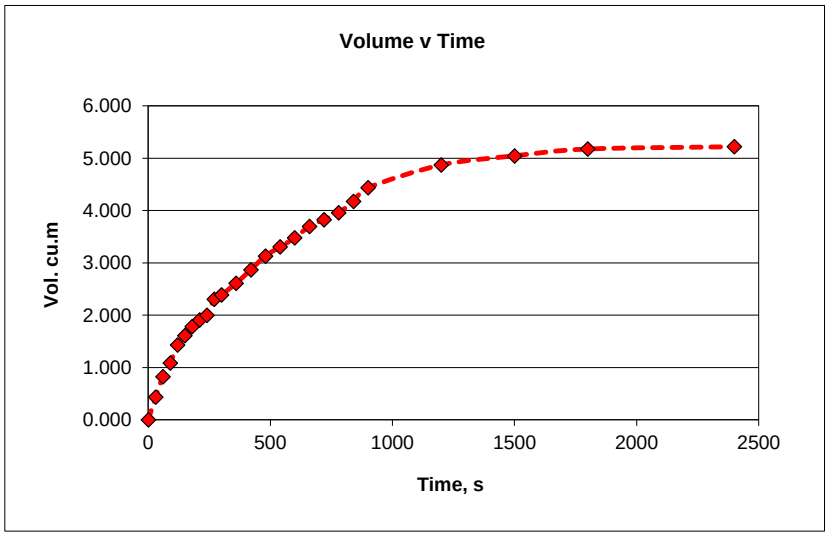
P16185 **N6 GCTP**

Test 1 **SW3/08** **29/01/2016**

				d, m	**1.65**
l, m	**2.9**	b, m	**1.5**	d_eff, m	**1.20**
l_base, m	**2.9**			d_act, m	**1.20**
l_eff, m	**2.9**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.45	0	1.20	0.00	0.000
0.5	0.55	30	1.10	0.10	0.435
1	0.64	60	1.01	0.19	0.827
1.5	0.7	90	0.95	0.25	1.088
2	0.78	120	0.87	0.33	1.436
2.5	0.82	150	0.83	0.37	1.610
3	0.86	180	0.79	0.41	1.784
3.5	0.89	210	0.76	0.44	1.914
4	0.91	240	0.74	0.46	2.001
4.5	0.98	270	0.67	0.53	2.306
5	1	300	0.65	0.55	2.393
6	1.05	360	0.60	0.60	2.610
7	1.11	420	0.54	0.66	2.871
8	1.17	480	0.48	0.72	3.132
9	1.21	540	0.44	0.76	3.306
10	1.25	600	0.40	0.80	3.480
11	1.3	660	0.35	0.85	3.698
12	1.33	720	0.32	0.88	3.828
13	1.36	780	0.29	0.91	3.959
14	1.41	840	0.24	0.96	4.176
15	1.47	900	0.18	1.02	4.437
20	1.57	1200	0.08	1.12	4.872
25	1.61	1500	0.04	1.16	5.046
30	1.64	1800	0.01	1.19	5.177
40	1.65	2400	0.00	1.20	5.220

Area	4.35 m^2				
50% Area_eff, a_{p50}	9.63 m^2	$V_{p75\text{-}25\ theory}$	volume	2.61	m^3
50% Area_act, a_{p50}	9.63 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	2.61	m^3
		$t_{p\ 75\text{-}25\ actual}$	time	651.00	s
		Infiltration Coefficient	*f*	0.0004163	ms^-1



NOTES:

See SW3/08 log for detailed soil strata details: slightly gravelly sandy SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

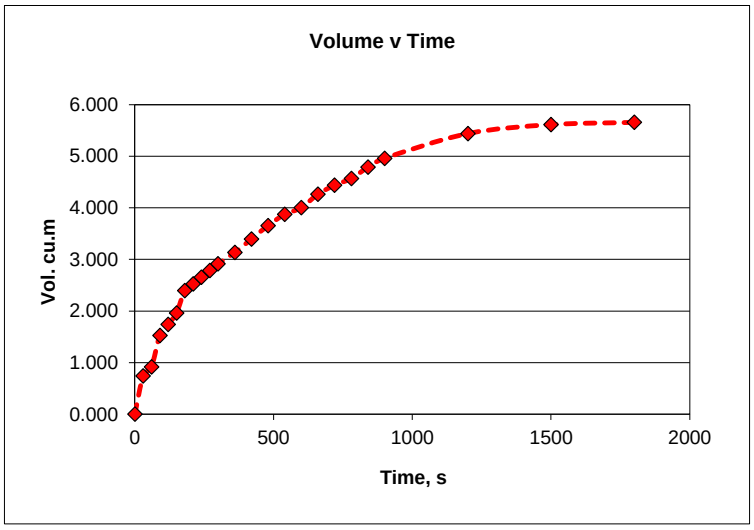
P16185 **N6 GCTP**

Test 2 **SW3/08** **29/01/2016**

				d, m	**1.65**
l, m	**2.9**	b, m	**1.5**	d_eff, m	**1.30**
l_base, m	**2.9**			d_act, m	**1.30**
l_eff, m	**2.9**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.35	0	1.30	0.00	0.000
0.5	0.52	30	1.13	0.17	0.740
1	0.56	60	1.09	0.21	0.914
1.5	0.7	90	0.95	0.35	1.523
2	0.75	120	0.90	0.40	1.740
2.5	0.8	150	0.85	0.45	1.958
3	0.9	180	0.75	0.55	2.393
3.5	0.93	210	0.72	0.58	2.523
4	0.96	240	0.69	0.61	2.654
4.5	0.99	270	0.66	0.64	2.784
5	1.02	300	0.63	0.67	2.915
6	1.07	360	0.58	0.72	3.132
7	1.13	420	0.52	0.78	3.393
8	1.19	480	0.46	0.84	3.654
9	1.24	540	0.41	0.89	3.872
10	1.27	600	0.38	0.92	4.002
11	1.33	660	0.32	0.98	4.263
12	1.37	720	0.28	1.02	4.437
13	1.4	780	0.25	1.05	4.568
14	1.45	840	0.20	1.10	4.785
15	1.49	900	0.16	1.14	4.959
20	1.6	1200	0.05	1.25	5.438
25	1.64	1500	0.01	1.29	5.612
30	1.65	1800	0.00	1.30	5.655
40	1.65	2400	0.00	1.30	5.655

Area	4.35	m^2			
50% Area_eff, a_{p50}	10.07	m^2	$V_{p75\text{-}25\ theory}$ volume	2.8275	m^3
50% Area_act, a_{p50}	10.07	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	2.8275	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	571.00	s
			Infiltration Coefficient *f*	0.000492	ms^-1



NOTES:

See SW3/08 log for detailed soil strata details: slightly gravelly sandy SILT

No groundwater was encountered, pit assumed saturated for second test.

Infiltration rate calculated over actual fall.

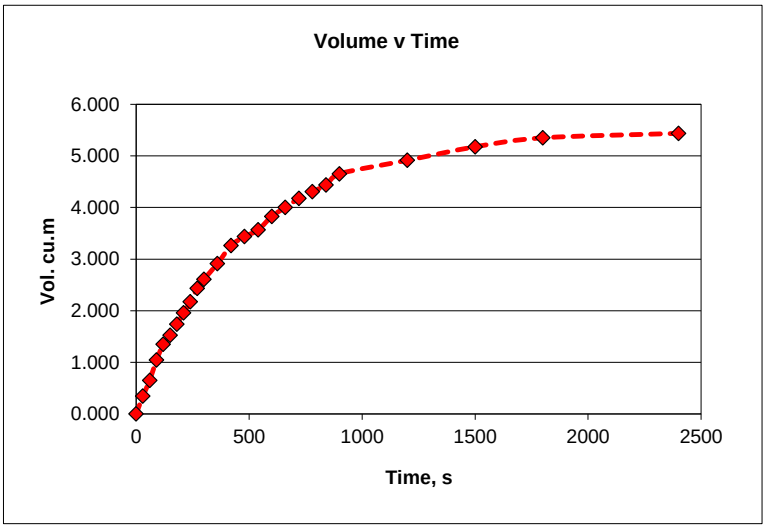
P16185 **N6 GCTP**

Test 2 **SW3/08** **29/01/2016**

				d, m	**1.65**
l, m	**2.9**	b, m	**1.5**	d_eff, m	**1.25**
l_base, m	**2.9**			d_act, m	**1.25**
l_eff, m	**2.9**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.4	0	1.25	0.00	0.000
0.5	0.48	30	1.17	0.08	0.348
1	0.55	60	1.10	0.15	0.653
1.5	0.64	90	1.01	0.24	1.044
2	0.71	120	0.94	0.31	1.349
2.5	0.75	150	0.90	0.35	1.523
3	0.8	180	0.85	0.40	1.740
3.5	0.85	210	0.80	0.45	1.958
4	0.9	240	0.75	0.50	2.175
4.5	0.96	270	0.69	0.56	2.436
5	1	300	0.65	0.60	2.610
6	1.07	360	0.58	0.67	2.915
7	1.15	420	0.50	0.75	3.263
8	1.19	480	0.46	0.79	3.437
9	1.22	540	0.43	0.82	3.567
10	1.28	600	0.37	0.88	3.828
11	1.32	660	0.33	0.92	4.002
12	1.36	720	0.29	0.96	4.176
13	1.39	780	0.26	0.99	4.307
14	1.42	840	0.23	1.02	4.437
15	1.47	900	0.18	1.07	4.655
20	1.53	1200	0.12	1.13	4.916
25	1.59	1500	0.06	1.19	5.177
30	1.63	1800	0.02	1.23	5.351
40	1.65	2400	0.00	1.25	5.438

Area	4.35	m^2			
50% Area_eff, a_{p50}	9.85	m^2	$V_{p75\text{-}25\ theory}$ volume	2.71875	m^3
50% Area_act, a_{p5}	9.85	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	2.71875	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	623.00	s
			Infiltration Coefficient *f*	0.000443	ms^-1



NOTES:

See SW3/08 log for detailed soil strata details: slightly gravelly sandy SILT

No groundwater was encountered, pit assumed saturated on third test.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-08	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-08	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-09
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** - **Level:**	**Date** 29/11/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 2.80 × 1.55 **Depth:** 0.80		**Scale** 1:25
Client: Arup			**Logged** VT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20			Topsoil. Firm, brown, slightly sandy SILT.
				0.80			Soft to firm, brown grey, slightly gravelly very sandy SILT with high cobble content, medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-rounded. Cobbles are 63mm to 200mm dia, angular to sub-rounded, Limestone lithology. Boulders are 200mm to 400mm dia, angular to sub-rounded, Limestone lithology.
							End of Pit at 0.80m

Stability: Good.
Plant: 12T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 0.80m bgl due to obstruction.

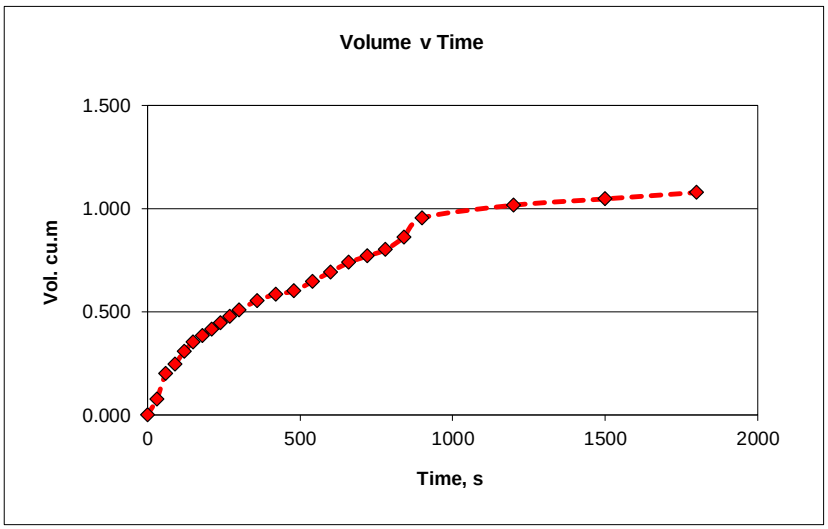
P16185 **N6 GCTP**

Test 1 **SW3/09** **30/11/2016**

				d, m	**0.8**
l, m	**2.8**	b, m	**0.55**	d_eff, m	**0.70**
l_base, m	**2.8**			d_act, m	**0.70**
l_eff, m	**2.8**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.1	0	0.70	0.00	0.000
0.5	0.15	30	0.65	0.05	0.077
1	0.23	60	0.57	0.13	0.200
1.5	0.26	90	0.54	0.16	0.246
2	0.3	120	0.50	0.20	0.308
2.5	0.33	150	0.47	0.23	0.354
3	0.35	180	0.45	0.25	0.385
3.5	0.37	210	0.43	0.27	0.416
4	0.39	240	0.41	0.29	0.447
4.5	0.41	270	0.39	0.31	0.477
5	0.43	300	0.37	0.33	0.508
6	0.46	360	0.34	0.36	0.554
7	0.48	420	0.32	0.38	0.585
8	0.49	480	0.31	0.39	0.601
9	0.52	540	0.28	0.42	0.647
10	0.55	600	0.25	0.45	0.693
11	0.58	660	0.22	0.48	0.739
12	0.6	720	0.20	0.50	0.770
13	0.62	780	0.18	0.52	0.801
14	0.66	840	0.14	0.56	0.862
15	0.72	900	0.08	0.62	0.955
20	0.76	1200	0.04	0.66	1.016
25	0.78	1500	0.02	0.68	1.047
30	0.80	1800	0.00	0.70	1.078

Area	1.54 m^2				
50% Area_eff, a_{p50}	3.885 m^2	$V_{p75\text{-}25\ theory}$	volume	0.539	m^3
50% Area_act, a_{p50}	3.885 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.539	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	690.00	s
		Infiltration Coefficient	*f*	0.0002011	ms^-1



NOTES:

See SW3/09 log for detailed soil strata details: slightly gravelly slightly sandy SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

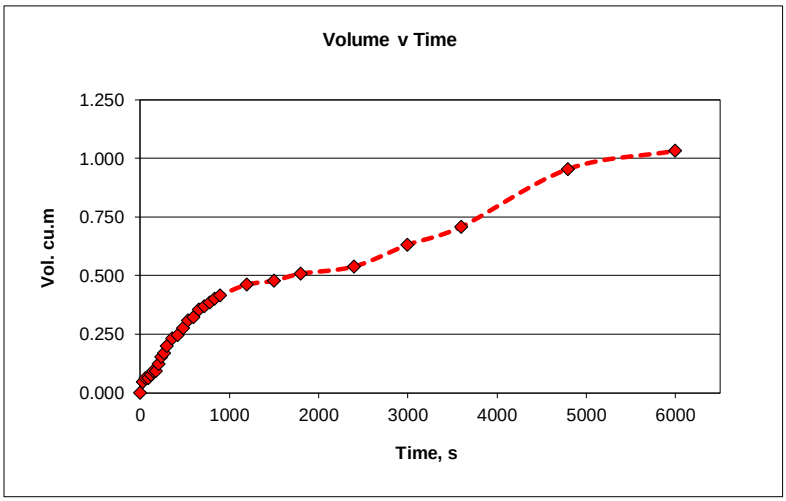
P16185 **N6 GCTP**

Test 2 **SW3/09** **30/11/2016**

				d, m	**0.8**
l, m	**2.8**	b, m	**0.55**	d_eff, m	**0.67**
l_base, m	**2.8**			d_act, m	**0.67**
l_eff, m	**2.8**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.13	0	0.67	0.00	0.000
0.5	0.16	30	0.64	0.03	0.046
1	0.17	60	0.63	0.04	0.062
1.5	0.17	90	0.63	0.04	0.062
2	0.18	120	0.62	0.05	0.077
2.5	0.19	150	0.61	0.06	0.092
3	0.19	180	0.61	0.06	0.092
3.5	0.21	210	0.59	0.08	0.123
4	0.23	240	0.57	0.10	0.154
4.5	0.24	270	0.56	0.11	0.169
5	0.26	300	0.54	0.13	0.200
6	0.28	360	0.52	0.15	0.231
7	0.29	420	0.51	0.16	0.246
8	0.31	480	0.49	0.18	0.277
9	0.33	540	0.47	0.20	0.308
10	0.34	600	0.46	0.21	0.323
11	0.36	660	0.44	0.23	0.354
12	0.37	720	0.43	0.24	0.370
13	0.38	780	0.42	0.25	0.385
14	0.39	840	0.41	0.26	0.400
15	0.4	900	0.40	0.27	0.416
20	0.43	1200	0.37	0.30	0.462
25	0.44	1500	0.36	0.31	0.477
30	0.46	1800	0.34	0.33	0.508
40	0.48	2400	0.32	0.35	0.539
50	0.54	3000	0.26	0.41	0.631
60	0.59	3600	0.21	0.46	0.708
80	0.75	4800	0.05	0.62	0.955
100	0.8	6000	0.00	0.67	1.032

Area	1.54	m^2			
50% Area_	3.7845	m^2	$V_{p75\text{-}25\ theory}$ volume	0.5159	m^3
50% Area_	3.7845	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	0.5159	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	3667.00	s
			Infiltration Coefficient *f*	3.71746E-05	ms^-1



NOTES:

See SW3/09 log for detailed soil strata details: slightly gravelly sandy SILT

No groundwater was encountered, pit assumed saturated for second test.

Infiltration rate calculated over actual fall.

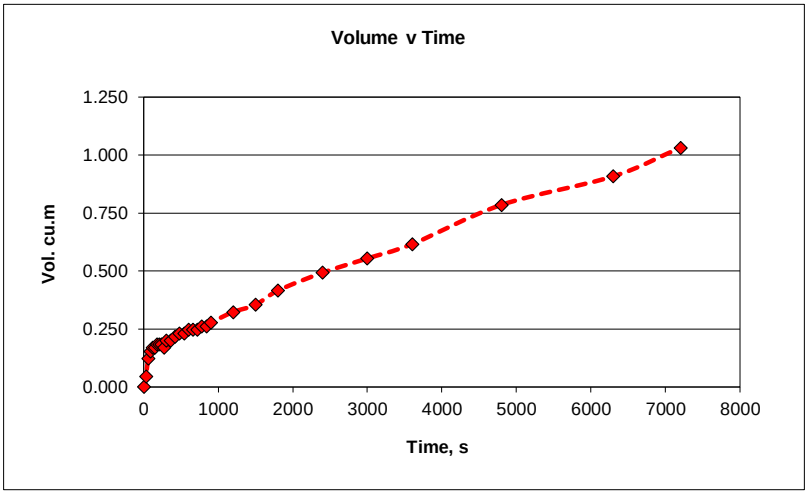
P16185 **N6 GCTP**

Test 3 **SW3/09** **30/11/2016**

				d, m	**0.8**
l, m	**2.8**	b, m	**0.55**	d_eff, m	**0.67**
l_base, m	**2.8**			d_act, m	**0.67**
l_eff, m	**2.8**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.13	0	0.67	0.00	0.000
0.5	0.16	30	0.64	0.03	0.046
1	0.21	60	0.59	0.08	0.123
1.5	0.23	90	0.57	0.10	0.154
2	0.24	120	0.56	0.11	0.169
2.5	0.24	150	0.56	0.11	0.169
3	0.25	180	0.55	0.12	0.185
3.5	0.25	210	0.55	0.12	0.185
4	0.25	240	0.55	0.12	0.185
4.5	0.24	270	0.56	0.11	0.169
5	0.26	300	0.54	0.13	0.200
6	0.26	360	0.54	0.13	0.200
7	0.27	420	0.53	0.14	0.216
8	0.28	480	0.52	0.15	0.231
9	0.28	540	0.52	0.15	0.231
10	0.29	600	0.51	0.16	0.246
11	0.29	660	0.51	0.16	0.246
12	0.29	720	0.51	0.16	0.246
13	0.3	780	0.50	0.17	0.262
14	0.3	840	0.50	0.17	0.262
15	0.31	900	0.49	0.18	0.277
20	0.34	1200	0.46	0.21	0.323
25	0.36	1500	0.44	0.23	0.354
30	0.4	1800	0.40	0.27	0.416
40	0.45	2400	0.35	0.32	0.493
50	0.49	3000	0.31	0.36	0.554
60	0.53	3600	0.27	0.40	0.616
80	0.64	4800	0.16	0.51	0.785
105	0.72	6300	0.08	0.59	0.909
120	0.80	7200	0.00	0.67	1.032

Area	1.54	m^2			
50% Area_eff, a_{p50}	3.7845	m^2	$V_{p75\text{-}25\ theory}$ volume	0.5159	m^3
50% Area_act, a_{p50}	3.7845	m^2	$V_{p\ 75\ -\ 25\ actua}$ volume	0.5159	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	3947.00	s
			Infiltration Coefficient *f*	3.45374E-05	ms^-1



NOTES:

See SW3/09 log for detailed soil strata details: slightly gravelly sandy SILT

No groundwater was encountered, pit assumed saturated for third test.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-09	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-09	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-10
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 535336.71 - 726865.32 **Level:** 39.57	**Date** 02/12/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 1.90 × 1.50		**Scale** 1:25
Client: Arup	**Depth:** 0.70		**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Topsoil. Soft, brown, slightly gravelly SILT.
	0.30 - 0.50	B		0.30	39.27		Firm, grey, gravelly SILT with high cobble content. Cobbles are 63mm to 200mm dia, sub-angular to rounded, Limestone lithology.
				0.50	39.07		Weathered rock. Recovered as: BOULDERS. Boulders are 200mm to 400mm dia, angular, Limestone lithology.
				0.70	38.87		End of Pit at 0.70m

1
2
3
4
5

Stability: Moderate.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 0.70m bgl, on bedrock. Soakaway test carried out (BRE 365).

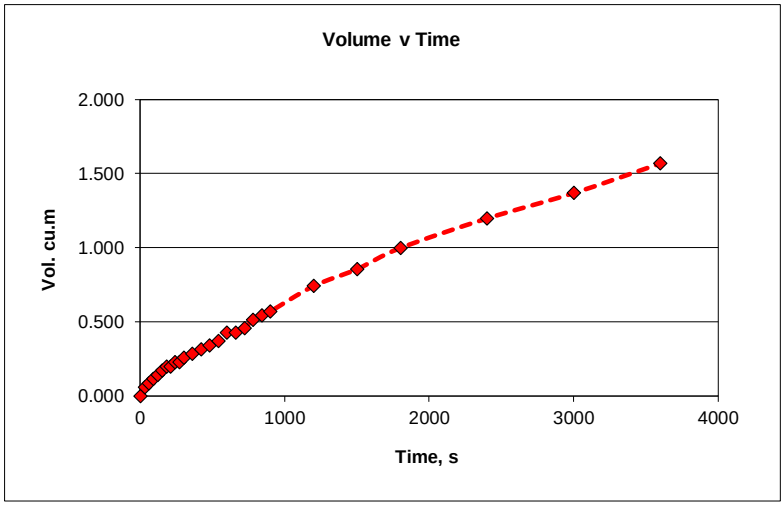
P16185 **N6 GCTP**

Test 1 **SW3/10** **02/12/2016**

				d, m	**0.7**
l, m	**1.9**	b, m	**1.5**	d_eff, m	**0.55**
l_base, m	**1.9**			d_act, m	**0.55**
l_eff, m	**1.9**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.15	0	0.55	0.00	0.000
0.5	0.17	30	0.53	0.02	0.057
1	0.18	60	0.52	0.03	0.085
1.5	0.19	90	0.51	0.04	0.114
2	0.2	120	0.50	0.05	0.143
2.5	0.21	150	0.49	0.06	0.171
3	0.22	180	0.48	0.07	0.200
3.5	0.22	210	0.48	0.07	0.200
4	0.23	240	0.47	0.08	0.228
4.5	0.23	270	0.47	0.08	0.228
5	0.24	300	0.46	0.09	0.257
6	0.25	360	0.45	0.10	0.285
7	0.26	420	0.44	0.11	0.314
8	0.27	480	0.43	0.12	0.342
9	0.28	540	0.42	0.13	0.371
10	0.3	600	0.40	0.15	0.428
11	0.3	660	0.40	0.15	0.428
12	0.31	720	0.39	0.16	0.456
13	0.33	780	0.37	0.18	0.513
14	0.34	840	0.36	0.19	0.542
15	0.35	900	0.35	0.20	0.570
20	0.41	1200	0.29	0.26	0.741
25	0.45	1500	0.25	0.30	0.855
30	0.50	1800	0.20	0.35	0.998
40	0.57	2400	0.13	0.42	1.197
50	0.63	3000	0.07	0.48	1.368
60	0.70	3600	0.00	0.55	1.568

Area	2.85 m^2				
50% Area_eff,	4.72 m^2	$V_{p75\text{-}25\ theory}$	volume	0.78375	m^3
50% Area_act,	4.72 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.78375	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	1759.00	s
		Infiltration Coefficient	*f*	9.44E-05	ms^-1



NOTES:

See SW3/10 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

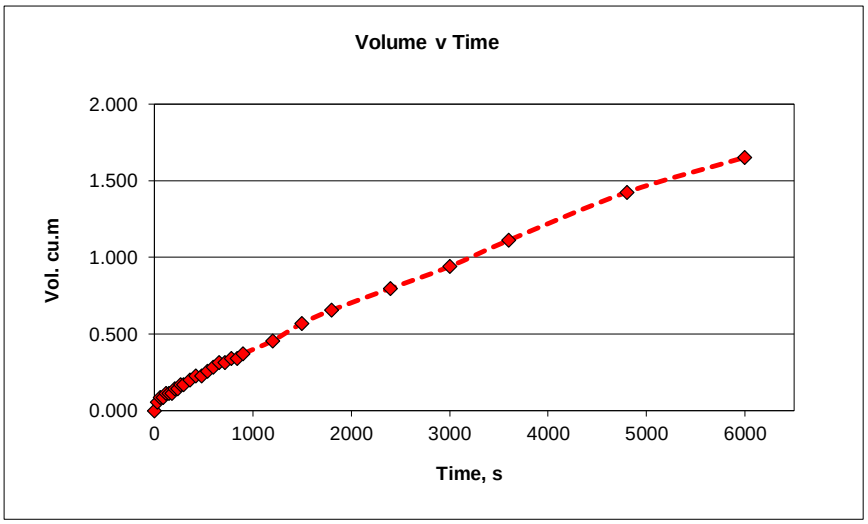
P16185 **N6 GCTP**

Test 2 **SW3/10** **02/12/2016**

				d, m	**0.7**
l, m	**1.9**	b, m	**1.5**	d_eff, m	**0.58**
l_base, m	**1.9**			d_act, m	**0.58**
l_eff, m	**1.9**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.12	0	0.58	0.00	0.000
0.5	0.14	30	0.56	0.02	0.057
1	0.15	60	0.55	0.03	0.086
1.5	0.15	90	0.55	0.03	0.086
2	0.16	120	0.54	0.04	0.114
2.5	0.16	150	0.54	0.04	0.114
3	0.16	180	0.54	0.04	0.114
3.5	0.17	210	0.53	0.05	0.143
4	0.17	240	0.53	0.05	0.143
4.5	0.18	270	0.52	0.06	0.171
5	0.18	300	0.52	0.06	0.171
6	0.19	360	0.51	0.07	0.200
7	0.2	420	0.50	0.08	0.228
8	0.2	480	0.50	0.08	0.228
9	0.21	540	0.49	0.09	0.257
10	0.22	600	0.48	0.10	0.285
11	0.23	660	0.47	0.11	0.314
12	0.23	720	0.47	0.11	0.314
13	0.24	780	0.46	0.12	0.342
14	0.24	840	0.46	0.12	0.342
15	0.25	900	0.45	0.13	0.371
20	0.28	1200	0.42	0.16	0.456
25	0.32	1500	0.38	0.20	0.570
30	0.35	1800	0.35	0.23	0.656
40	0.40	2400	0.30	0.28	0.798
50	0.45	3000	0.25	0.33	0.941
60	0.51	3600	0.19	0.39	1.112
80	0.62	4800	0.08	0.50	1.425
100	0.70	6000	0.00	0.58	1.653

Area	2.85	m^2			
50% Area_	4.822	m^2	$V_{p75\text{-}25\ theory}$ volume	0.8265	m^3
50% Area_	2.85	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	0.8265	m^3
			$t_{p\ 75\text{-}25\ actual}$ time	4464.00	s
			Infiltration Coefficient *f*	6.49642E-05	ms^-1



NOTES:

See SW3/10 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

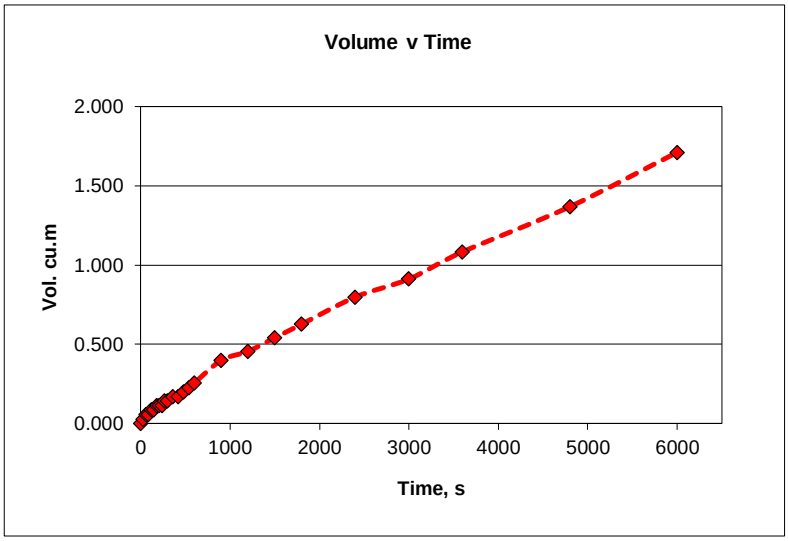
Infiltration rate calculated over actual fall.

P16185 **N6 GCTP**

Test 3		**SW3/10**				**02/12/2016**
				d, m	**0.7**	
l, m	**1.9**	b, m	**1.5**	d_eff, m	**0.60**	
l_base, m	**1.9**			d_act, m	**0.60**	
l_eff, m	**1.9**					

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.1	0	0.60	0.00	0.000
0.5	0.11	30	0.59	0.01	0.029
1	0.12	60	0.58	0.02	0.057
1.5	0.12	90	0.58	0.02	0.057
2	0.13	120	0.57	0.03	0.086
2.5	0.13	150	0.57	0.03	0.086
3	0.14	180	0.56	0.04	0.114
3.5	0.14	210	0.56	0.04	0.114
4	0.14	240	0.56	0.04	0.114
4.5	0.15	270	0.55	0.05	0.143
5	0.15	300	0.55	0.05	0.143
6	0.16	360	0.54	0.06	0.171
7	0.16	420	0.54	0.06	0.171
8	0.17	480	0.53	0.07	0.200
9	0.18	540	0.52	0.08	0.228
10	0.19	600	0.51	0.09	0.257
15	0.24	900	0.46	0.14	0.399
20	0.26	1200	0.44	0.16	0.456
25	0.29	1500	0.41	0.19	0.542
30	0.32	1800	0.38	0.22	0.627
40	0.38	2400	0.32	0.28	0.798
50	0.42	3000	0.28	0.32	0.912
60	0.48	3600	0.22	0.38	1.083
80	0.58	4800	0.12	0.48	1.368
100	0.71	6000	-0.01	0.60	1.710

Area	2.85	m^2			
50% Area_	4.89	m^2	$V_{p75\text{-}25\ theory}$ volume	0.855	m^3
50% Area_	4.89	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	0.855	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	3090.00	s
			Infiltration Coefficient *f*	5.66E-05	ms^-1



NOTES:

See SW3/10 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-10	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-10	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-11
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 535486.56 - 726929.33 **Level:** 37.68	**Date** 02/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 1.60 x 1.30 **Depth:** 1.00	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Topsoil.
				0.30	37.38		Soft to firm, light grey, slightly sandy gravelly SILT with low cobble content. Sand is fine to coarse. Gravel is fine to coarse and sub-angular. Cobbles are sub-rounded to rounded, Limestone lithology.
				0.70	36.98		Weathered rock. Recovered as: BOULDERS. Boulders are angular, Limestone lithology.
				1.00	36.68		End of Pit at 1.00m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 1.00m bgl, on bedrock. Soakaway test carried out (BRE 365).

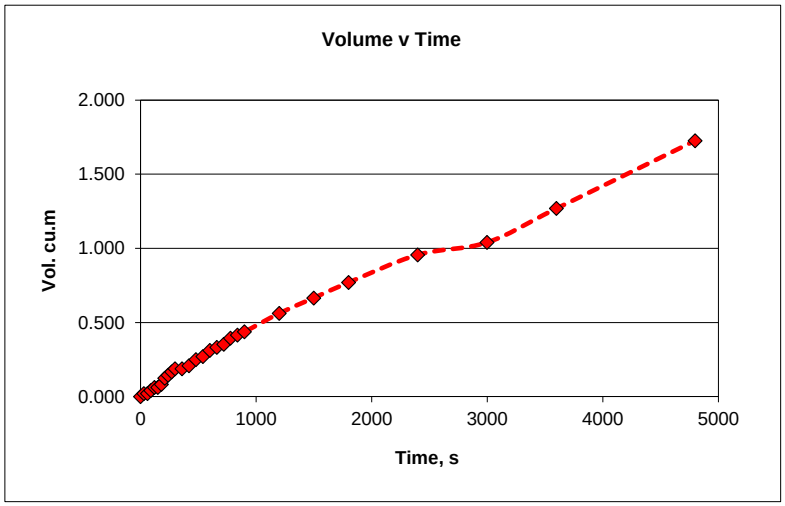
P16185 **N6 GCTP**

Test 1 **SW3/11** ########

				d, m	**1**
l, m	**1.6**	b, m	**1.3**	d_eff, m	**0.90**
l_base, m	**1.6**			d_act, m	**0.83**
l_eff, m	**1.6**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.1	0	0.90	0.00	0.000
0.5	0.11	30	0.89	0.01	0.021
1	0.11	60	0.89	0.01	0.021
1.5	0.12	90	0.88	0.02	0.042
2	0.13	120	0.87	0.03	0.062
2.5	0.13	150	0.87	0.03	0.062
3	0.14	180	0.86	0.04	0.083
3.5	0.16	210	0.84	0.06	0.125
4	0.17	240	0.83	0.07	0.146
4.5	0.18	270	0.82	0.08	0.166
5	0.19	300	0.81	0.09	0.187
6	0.19	360	0.81	0.09	0.187
7	0.2	420	0.80	0.10	0.208
8	0.22	480	0.78	0.12	0.250
9	0.23	540	0.77	0.13	0.270
10	0.25	600	0.75	0.15	0.312
11	0.26	660	0.74	0.16	0.333
12	0.27	720	0.73	0.17	0.354
13	0.29	780	0.71	0.19	0.395
14	0.3	840	0.70	0.20	0.416
15	0.31	900	0.69	0.21	0.437
20	0.37	1200	0.63	0.27	0.562
25	0.42	1500	0.58	0.32	0.666
30	0.47	1800	0.53	0.37	0.770
40	0.56	2400	0.44	0.46	0.957
50	0.60	3000	0.40	0.50	1.040
60	0.71	3600	0.29	0.61	1.269
80	0.93	4800	0.07	0.83	1.726

Area	2.08 m^2				
50% Area_eff,	4.69 m^2	$V_{p75\text{-}25\ theory}$	volume	0.936	m^3
50% Area_act	4.487 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.8632	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	2755.00	s
		Infiltration Coefficient	*f*	6.983E-05	ms^-1



NOTES:

See SW3/11 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

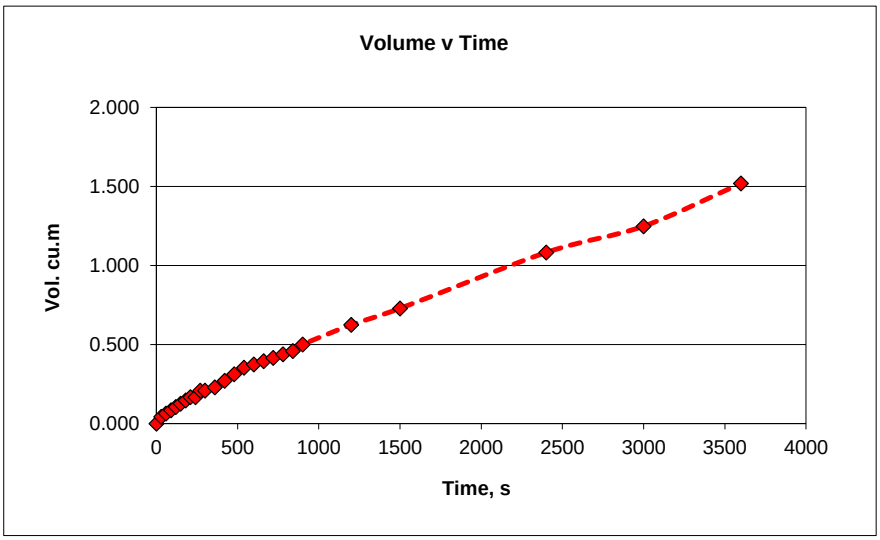
P16185 N6 GCTP

Test 2 **SW3/11** **02/12/2016**

				d, m	**1**
l, m	**1.6**	b, m	**1.3**	d_eff, m	**0.80**
l_base, m	**1.6**			d_act, m	**0.73**
l_eff, m	**1.6**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.2	0	0.80	0.00	0.000
0.5	0.22	30	0.78	0.02	0.042
1	0.23	60	0.77	0.03	0.062
1.5	0.24	90	0.76	0.04	0.083
2	0.25	120	0.75	0.05	0.104
2.5	0.26	150	0.74	0.06	0.125
3	0.27	180	0.73	0.07	0.146
3.5	0.28	210	0.72	0.08	0.166
4	0.28	240	0.72	0.08	0.166
4.5	0.3	270	0.70	0.10	0.208
5	0.3	300	0.70	0.10	0.208
6	0.31	360	0.69	0.11	0.229
7	0.33	420	0.67	0.13	0.270
8	0.35	480	0.65	0.15	0.312
9	0.37	540	0.63	0.17	0.354
10	0.38	600	0.62	0.18	0.374
11	0.39	660	0.61	0.19	0.395
12	0.4	720	0.60	0.20	0.416
13	0.41	780	0.59	0.21	0.437
14	0.42	840	0.58	0.22	0.458
15	0.44	900	0.56	0.24	0.499
20	0.5	1200	0.50	0.30	0.624
25	0.55	1500	0.45	0.35	0.728
40	0.72	2400	0.28	0.52	1.082
50	0.80	3000	0.20	0.60	1.248
60	0.93	3600	0.07	0.73	1.518

Area	2.08 m^2			
50% Area_	4.4 m^2	$V_{p75\text{-}25\ theory}$ volume	0.832	m^3
50% Area_	4.197 m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	0.7592	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$ time	1794.00	s
		Infiltration Coefficient *f*	0.000100831	ms^-1



NOTES:

See SW3/11 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

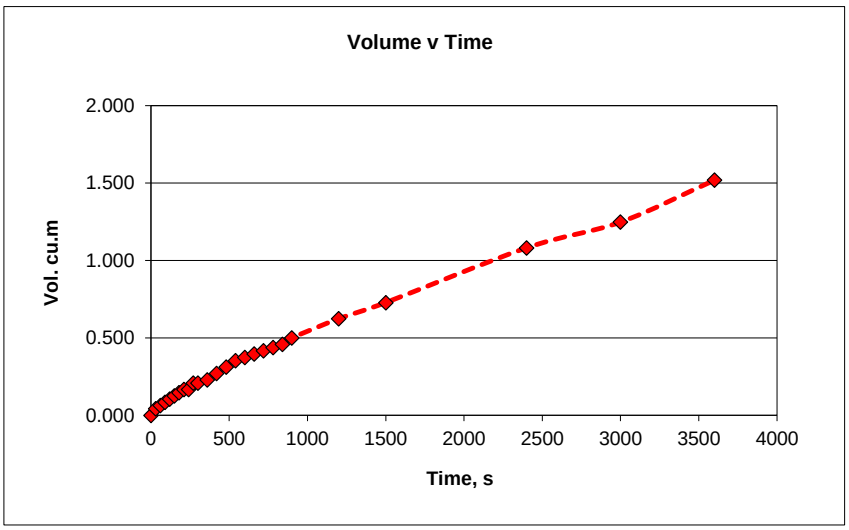
P16185 **N6 GCTP**

Test 3 **SW3/11** **02/12/2016**

				d, m	**1**
l, m	**1.6**	b, m	**1.3**	d_eff, m	**0.80**
l_base, m	**1.6**			d_act, m	**0.73**
l_eff, m	**1.6**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.2	0	0.80	0.00	0.000
0.5	0.22	30	0.78	0.02	0.042
1	0.23	60	0.77	0.03	0.062
1.5	0.24	90	0.76	0.04	0.083
2	0.25	120	0.75	0.05	0.104
2.5	0.26	150	0.74	0.06	0.125
3	0.27	180	0.73	0.07	0.146
3.5	0.28	210	0.72	0.08	0.166
4	0.28	240	0.72	0.08	0.166
4.5	0.3	270	0.70	0.10	0.208
5	0.3	300	0.70	0.10	0.208
6	0.31	360	0.69	0.11	0.229
7	0.33	420	0.67	0.13	0.270
8	0.35	480	0.65	0.15	0.312
9	0.37	540	0.63	0.17	0.354
10	0.38	600	0.62	0.18	0.374
11	0.39	660	0.61	0.19	0.395
12	0.4	720	0.60	0.20	0.416
13	0.41	780	0.59	0.21	0.437
14	0.42	840	0.58	0.22	0.458
15	0.44	900	0.56	0.24	0.499
20	0.5	1200	0.50	0.30	0.624
25	0.55	1500	0.45	0.35	0.728
40	0.72	2400	0.28	0.52	1.082
50	0.80	3000	0.20	0.60	1.248
60	0.93	3600	0.07	0.73	1.518

Area	2.08	m^2			
50% Area_	4.4	m^2	$V_{p75\text{-}25\ theory}$ volume	0.832	m^3
50% Area_	4.197	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	0.7592	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	2384.00	s
			Infiltration Coefficient *f*	7.58771E-05	ms^-1



NOTES:

See SW3/11 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-11	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-12
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 532982.03 - 728221.91 **Level:** 30.50	**Date** 01/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 1.90 × 1.30 **Depth:** 3.50	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.40	30.10		Topsoil.
				0.80	29.70		Soft, brown, slightly gravelly CLAY. Gravel fine to coarse.
	1.00 - 2.00	B					Firm, grey, slightly sandy gravelly SILT with high cobble content. Sand is fine to coarse. Gravel is fine to coarse. Cobbles are sub-angular, Limestone lithology.
	2.00 - 3.00	B					*2.00 - 3.00m: Decreasing gravel content.*
				3.50	27.00		End of Pit at 3.50m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encounterted.

Remarks: Trial pit terminated at 3.50m bgl, on bedrock. Soakaway test carried out (BRE 365).

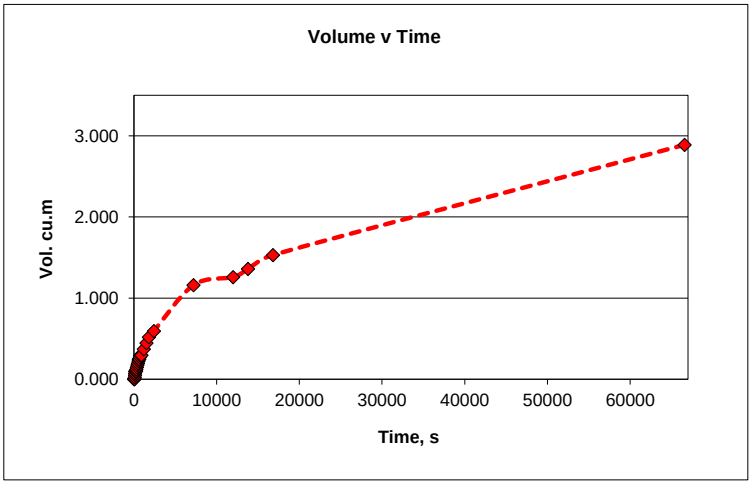
P16185 **N6 GCTP**

Test 1 **SW3/12** **01/12/2016**

				d, m	**3.5**
l, m	**1.9**	b, m	**1.3**	d_eff, m	**3.15**
l_base, m	**1.9**			d_act, m	**1.17**
l_eff, m	**1.9**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.35	0	3.15	0.00	0.000
0.5	0.35	30	3.15	0.00	0.000
1	0.35	60	3.15	0.00	0.000
1.5	0.36	90	3.14	0.01	0.025
2	0.37	120	3.13	0.02	0.049
2.5	0.38	150	3.12	0.03	0.074
3	0.39	180	3.11	0.04	0.099
3.5	0.39	210	3.11	0.04	0.099
4	0.39	240	3.11	0.04	0.099
4.5	0.39	270	3.11	0.04	0.099
5	0.4	300	3.10	0.05	0.124
6	0.41	360	3.09	0.06	0.148
7	0.42	420	3.08	0.07	0.173
8	0.43	480	3.07	0.08	0.198
9	0.44	540	3.06	0.09	0.222
10	0.45	600	3.05	0.10	0.247
11	0.45	660	3.05	0.10	0.247
12	0.46	720	3.04	0.11	0.272
13	0.47	780	3.03	0.12	0.296
14	0.47	840	3.03	0.12	0.296
15	0.47	900	3.03	0.12	0.296
20	0.5	1200	3.00	0.15	0.371
25	0.53	1500	2.97	0.18	0.445
30	0.56	1800	2.94	0.21	0.519
40	0.59	2400	2.91	0.24	0.593
120	0.82	7200	2.68	0.47	1.161
200	0.86	12000	2.64	0.51	1.260
230	0.90	13800	2.60	0.55	1.359
280	0.97	16800	2.53	0.62	1.531
1110	1.52	66600	1.98	1.17	2.890

Area	2.47 m^2				
50% Area_eff, a_{p50}	12.55 m^2	$V_{p75\text{-}25\ theory}$	volume	3.89025	m^3
50% Area_act, a_{p50}	6.214 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	1.44495	m^3
		$t_{p\ 75\text{-}25\ actual}$	time	36702.00	s
		Infiltration Coefficient	*f*	6.336E-06	ms^-1



NOTES:

See SW3/12 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-12	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-12	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-13
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 533661.00 - 728105.09 **Level:** 56.48	**Date** 06/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 2.30 × 1.20 **Depth:** 3.80	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.60	55.88		Topsoil.
				1.20	55.28		Firm, grey, sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded. Cobbles are angular to sub-rounded, Limestone lithology.
	1.50 - 2.50	B		3.80	52.68		Firm to stiff, slightly sandy gravelly SILT with high cobble content, low boulder content. Sand is fine to coarse. Cobbles are sub-rounded to rounded, Limestone lithology. Boulders are 200mm to 300mm dia, sub-rounded, Limestone lithology.
							End of Pit at 3.80m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 3.80m bgl. Soakaway test carried out (BRE 365).

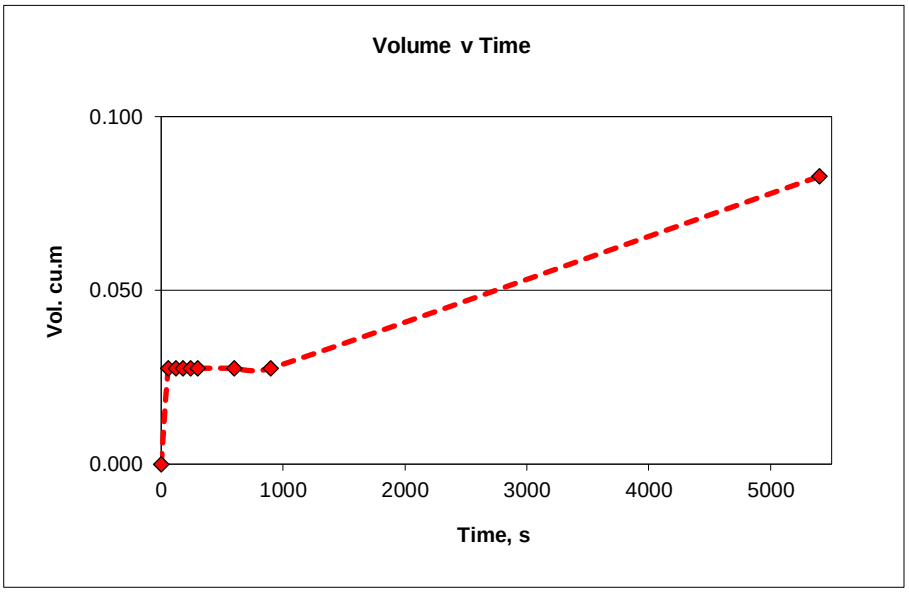
P16185 **N6 GCTP**

Test 1 **SW3/13** **06/12/2016**

				d, m	**3.8**
l, m	**2.3**	b, m	**1.2**	d_eff, m	**2.50**
l_base, m	**2.3**			d_act, m	**0.03**
l_eff, m	**2.3**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	1.3	0	2.50	0.00	0.000
1	1.31	60	2.49	0.01	0.028
2	1.31	120	2.49	0.01	0.028
3	1.31	180	2.49	0.01	0.028
4	1.31	240	2.49	0.01	0.028
5	1.31	300	2.49	0.01	0.028
10	1.31	600	2.49	0.01	0.028
15	1.31	900	2.49	0.01	0.028
90	1.33	5400	2.47	0.03	0.083

Area	2.76 m^2				
50% Area_eff, a_{p50}	11.51 m^2	$V_{p75\text{-}25\ theory}$	volume	3.45	m^3
50% Area_act, a_{p50}	2.865 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.0414	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	3600.00	s
		Infiltration Coefficient	*f*	4.014E-06	ms^-1



NOTES:

See SW3/13 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

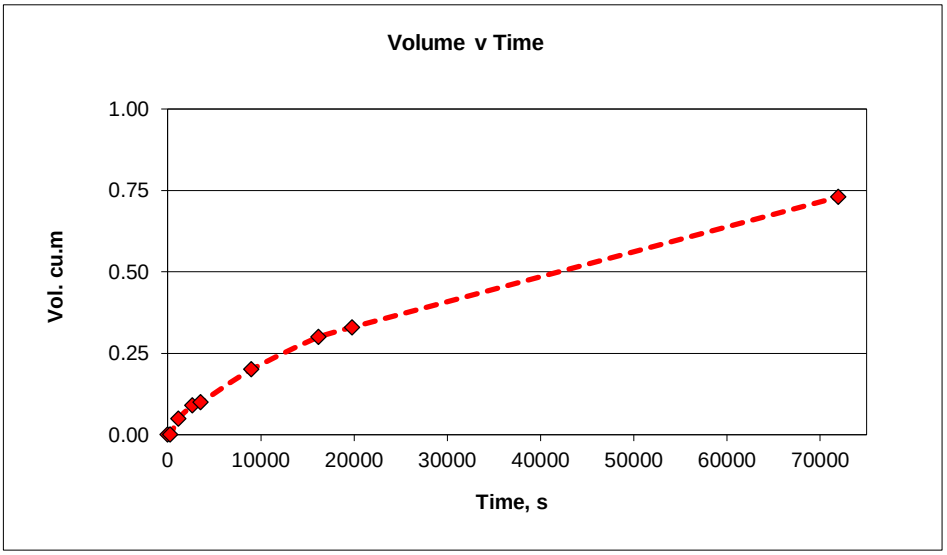
P16185 **N6 GCTP**

Test 2 **SW3/13** **06/12/2016**

				d, m	**3.8**
l, m	**2.3**	b, m	**1.2**	d_eff, m	**3.33**
l_base, m	**2.3**			d_act, m	**0.73**
l_eff, m	**2.3**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.47	0	3.33	0.00	0.000
5	0.47	300	3.33	0.00	0.000
20	0.52	1200	3.28	0.05	0.138
45	0.56	2700	3.24	0.09	0.248
60	0.57	3600	3.23	0.10	0.276
150	0.67	9000	3.13	0.20	0.552
270	0.77	16200	3.03	0.30	0.828
330	0.8	19800	3.00	0.33	0.911
1200	1.2	72000	2.60	0.73	2.015

Area	2.76	m^2			
50% Area_ef	14.415	m^2	$V_{p75\text{-}25\ theory}$ volume	4.5954	m^3
50% Area_ac	5.315	m^2	$V_{p\ 75\ -\ 25\ actu}$ volume	1.0074	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$ time	39960.00	s
			Infiltration Coefficient *f*	4.74322E-06	ms^-1



NOTES:

See SW3/13 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-13	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-13	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-14
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 533110.49 - 728555.83 **Level:** 21.68	**Date** 08/12/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 3.50 × 1.20		**Scale** 1:25
Client: Arup	**Depth:** 4.50		**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	21.48		Topsoil.
				0.40	21.28		Soft, grey, slightly sandy SILT.
	0.50 - 1.50 0.50 - 1.50	B D					Soft, brown, slightly sandy slightly gravelly CLAY. Gravel is fine to coarse and angular.
				1.70	19.98		Soft to firm, light grey, slightly sandy CLAY. Sand is fine to medium.
	2.00 - 2.50 2.00 - 2.50	B D					
				2.90	18.78		Dark grey black, slightly gravelly slightly sandy peaty SILT.
	3.00 - 3.50 3.00 - 3.50	B D					
	4.00 - 4.50 4.00 - 4.50	B D					
				4.50	17.18		End of Pit at 4.50m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at required depth of 4.50m bgl. Soakaway test carried out (BRE 365).

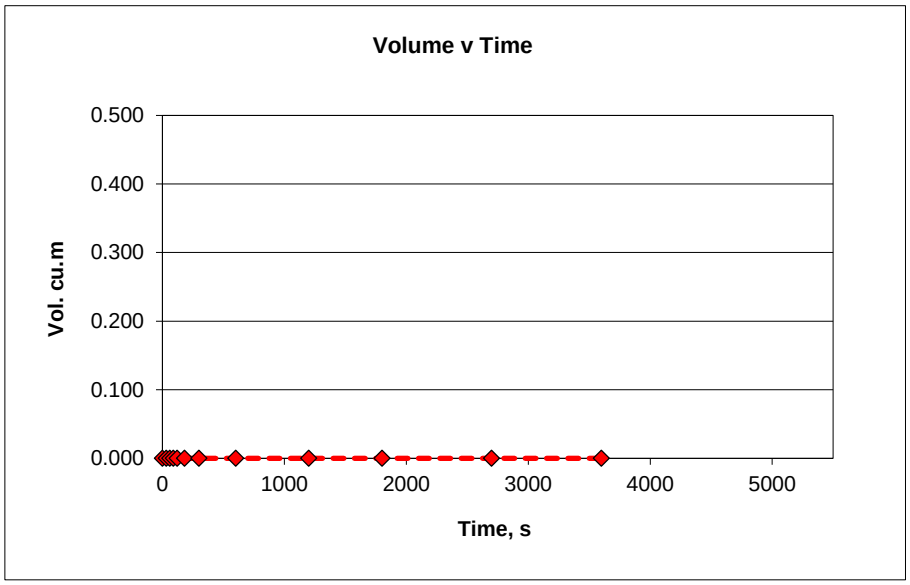
P16185 **N6 GCTP**

Test 1 **SW3/14** **08/12/2016**

				d, m	**4.5**
l, m	**3.5**	b, m	**1.2**	d_eff, m	**0.86**
l_base, m	**3.5**			d_act, m	**0.00**
l_eff, m	**3.5**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	3.64	0	0.86	0.00	0.000
0.5	3.64	30	0.86	0.00	0.000
1	3.64	60	0.86	0.00	0.000
1.5	3.64	90	0.86	0.00	0.000
2	3.64	120	0.86	0.00	0.000
3	3.64	180	0.86	0.00	0.000
5	3.64	300	0.86	0.00	0.000
10	3.64	600	0.86	0.00	0.000
20	3.64	1200	0.86	0.00	0.000
30	3.64	1800	0.86	0.00	0.000
45	3.64	2700	0.86	0.00	0.000
60	3.64	3600	0.86	0.00	0.000

Area	4.2	m^2				
50% Area_eff, a_{p50}	8.242	m^2	$V_{p75\text{-}25\ theory}$	volume	1.806	m^3
50% Area_act, a_{p50}		m^2	$V_{p\ 75\ -\ 25\ actual}$	volume		m^3
			$t_{p\ 75\text{-}\ 25\ actual}$	time		s
			Infiltration Coefficient	*f*		ms^-1



NOTES:

See SW3/15 log for detailed soil strata details: slightly gravelly sandy CLAY/SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate not applicable.

Pit wall collapsed overnight.Final reading disregarded.

Photographic Record

Number: SW03-14	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-14	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-15
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 533069.52 - 728487.25 **Level:** 22.73	**Date** 08/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 3.80 x 1.20 **Depth:** 4.50	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	22.53		Topsoil.
	0.50 - 1.00 0.50 - 1.00	B D					Soft, brown, slightly gravelly slightly sandy SILT. Sand is fine to coarse.
				1.10	21.63		Stiff, light grey brown, slightly gravelly very sandy SILT with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are 63mm to 200mm dia, sub-rounded, Limestone lithology.
	1.50 - 2.00 1.50 - 2.00	B D					*Cobble content increases with depth.*
	2.50 - 3.00 2.50 - 3.00	B D		2.50	20.23		Light grey brown, very sandy very silty GRAVEL with cobble content.
	3.50 - 4.50 3.50 - 4.50	B D		3.50	19.23		Light grey brown, slightly gravelly slightly sandy SILT with cobble content.
				4.50	18.23		End of Pit at 4.50m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at required depth of 4.50m bgl. Soakaway test carried out (BRE 365).

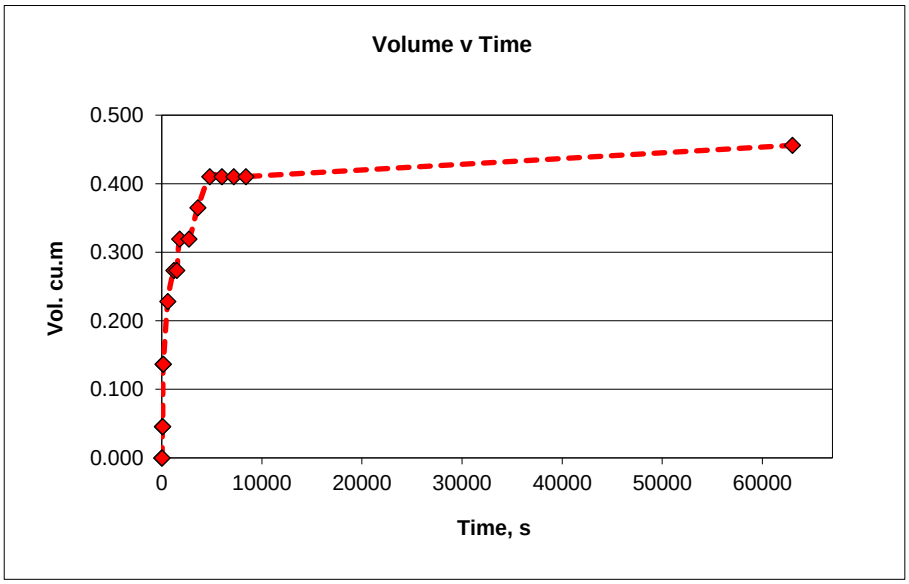
P16185 **N6 GCTP**

Test 1 **SW3/15** **08/12/2016**

				d, m	**4.5**
l, m	**3.8**	b, m	**1.2**	d_eff, m	**1.05**
l_base, m	**3.8**			d_act, m	**0.10**
l_eff, m	**3.8**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	3.45	0	1.05	0.00	0.000
0.5	3.45	30	1.05	0.00	0.000
1	3.46	60	1.04	0.01	0.046
1.5	3.46	90	1.04	0.01	0.046
2	3.48	120	1.02	0.03	0.137
2.5	3.48	150	1.02	0.03	0.137
10	3.5	600	1.00	0.05	0.228
20	3.51	1200	0.99	0.06	0.274
25	3.51	1500	0.99	0.06	0.274
30	3.52	1800	0.98	0.07	0.319
45	3.52	2700	0.98	0.07	0.319
60	3.53	3600	0.97	0.08	0.365
80	3.54	4800	0.96	0.09	0.410
100	3.54	6000	0.96	0.09	0.410
120	3.54	7200	0.96	0.09	0.410
140	3.54	8400	0.96	0.09	0.410
1050	3.55	63000	0.95	0.10	0.456

Area	4.56 m^2				
50% Area_eff, a_{p50}	9.81 m^2	$V_{p75\text{-}25\ theory}$	volume	2.394	m^3
50% Area_act, a_{p50}	5.06 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.228	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	3082.00	s
		Infiltration Coefficient	*f*	1.462E-05	ms^-1



NOTES:

See SW3/15 log for detailed soil strata details: slightly gravelly sandy SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-15	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-15	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-16
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 533014.93 - 728441.91 **Level:** 19.56	**Date** 08/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 3.20 x 1.60 **Depth:** 4.30	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	19.26		Topsoil.
	0.50 - 1.50 0.50 - 1.50	B D					Soft to firm, light grey cream, CLAY.
	1.50 - 2.90 1.50 - 2.90	B D		1.50	18.06		Stiff, dark grey, slightly sandy gravelly CLAY with cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.
	3.00 - 4.00 3.00 - 4.00	B D		2.90	16.66		Firm, yellowish brown, very sandy very silty GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. Cobbles are 63mm to 200mm dia sub-rounded, Limestone lithology. *Cobble content increases with depth.*
				4.30	15.26		End of Pit at 4.30m

1
2
3
4
5

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at 4.30m bgl. Soakaway test carried out (BRE 365).

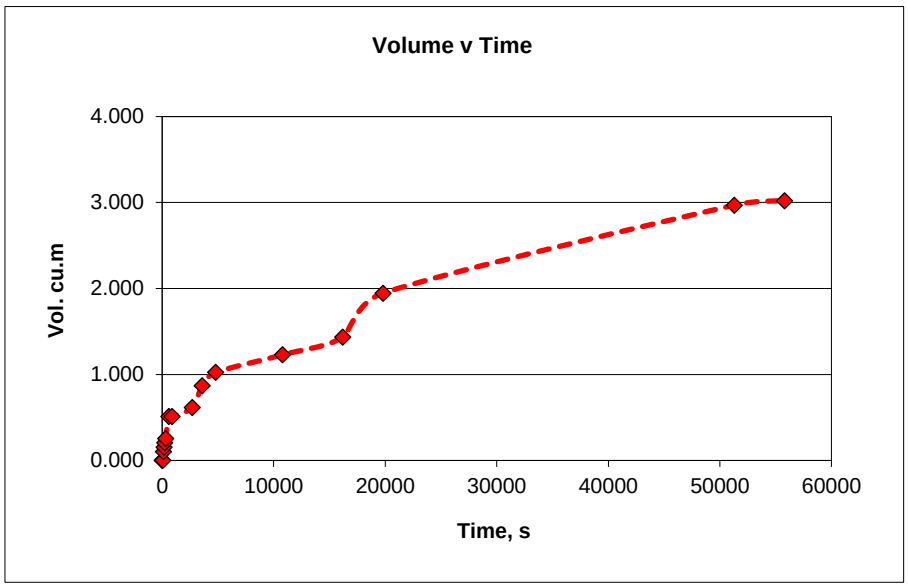
P16185 **N6 GCTP**

Test 1 **SW3/16** **08/12/2016**

				d, m	**4.3**
l, m	**3.2**	b, m	**1.6**	d_eff, m	**1.40**
l_base, m	**3.2**			d_act, m	**0.59**
l_eff, m	**3.2**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	2.9	0	1.40	0.00	0.000
1	2.9	60	1.40	0.00	0.000
2	2.92	120	1.38	0.02	0.102
3	2.93	180	1.37	0.03	0.154
4	2.94	240	1.36	0.04	0.205
5	2.95	300	1.35	0.05	0.256
10	3	600	1.30	0.10	0.512
15	3	900	1.30	0.10	0.512
45	3.02	2700	1.28	0.12	0.614
60	3.07	3600	1.23	0.17	0.870
80	3.1	4800	1.20	0.20	1.024
180	3.14	10800	1.16	0.24	1.229
270	3.18	16200	1.12	0.28	1.434
330	3.28	19800	1.02	0.38	1.946
855	3.48	51300	0.82	0.58	2.970
930	3.49	55800	0.81	0.59	3.021

Area	5.12	m^2				
50% Area_eff, a_{p50}	11.84	m^2	$V_{p75\text{-}25\ theory}$	volume	3.584	m^3
50% Area_act, a_{p50}	7.952	m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	1.5104	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$	time	25767.00	s
			Infiltration Coefficient	*f*	7.371E-06	ms^-1



NOTES:

See SW3/16 log for detailed soil strata details: slightly gravelly slightly sandy SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-16	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-16	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-17
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 532695.57 - 728363.07 **Level:** 16.35	**Date** 07/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 1.70 x 1.25 **Depth:** 1.60	**Scale** 1:25
Client: Arup			**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	16.20		Topsoil.
	0.20 - 0.40 0.20 - 0.40	B D					Soft, grey brown, slightly gravelly sandy CLAY. Gravel is fine and sub-angular.
				0.40	15.95		Soft to firm, brown, CLAY.
	0.50 - 1.50 0.50 - 1.50	B D					*1.50 - 1.60: Grey in colour.*
				1.60	14.75		End of Pit at 1.60m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at required depth of 1.60m bgl. Soakaway test carried out (BRE 365).

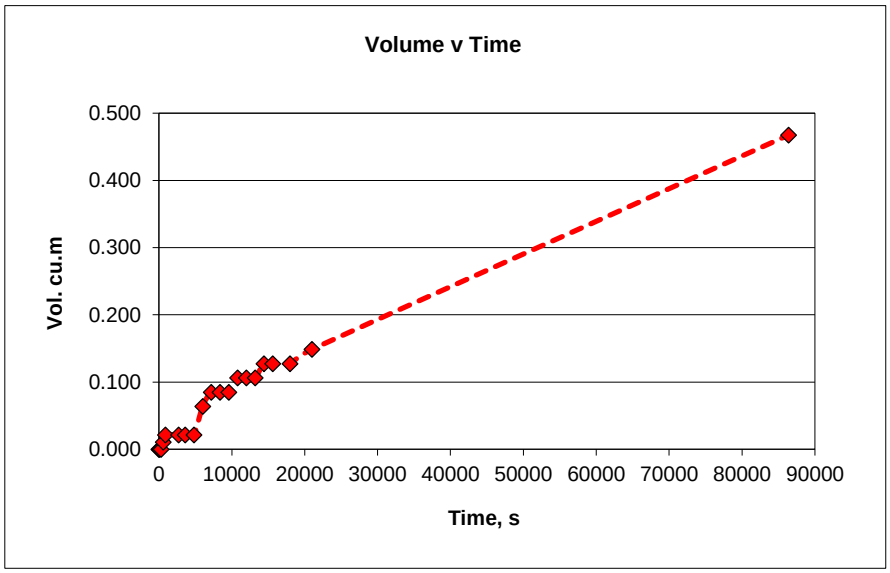
P16185 **N6 GCTP**

Test 1 **SW3/17** **07/12/2016**

				d, m	**1.6**
l, m	**1.7**	b, m	**1.25**	d_eff, m	**1.50**
l_base, m	**1.7**			d_act, m	**0.22**
l_eff, m	**1.7**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.1	0	1.50	0.00	0.000
1	0.1	60	1.50	0.00	0.000
5	0.1	300	1.50	0.00	0.000
10	0.105	600	1.50	0.00	0.011
15	0.11	900	1.49	0.01	0.021
45	0.11	2700	1.49	0.01	0.021
60	0.11	3600	1.49	0.01	0.021
80	0.11	4800	1.49	0.01	0.021
100	0.13	6000	1.47	0.03	0.064
120	0.14	7200	1.46	0.04	0.085
140	0.14	8400	1.46	0.04	0.085
160	0.14	9600	1.46	0.04	0.085
180	0.15	10800	1.45	0.05	0.106
200	0.15	12000	1.45	0.05	0.106
220	0.15	13200	1.45	0.05	0.106
240	0.16	14400	1.44	0.06	0.128
260	0.16	15600	1.44	0.06	0.128
300	0.16	18000	1.44	0.06	0.128
350	0.17	21000	1.43	0.07	0.149
1440	0.32	86400	1.28	0.22	0.468

Area	2.125	m^2				
50% Area_eff, a_{p50}	6.55	m^2	$V_{p75\text{-}25\ theory}$	volume	1.59375	m^3
50% Area_act, a_{p50}	2.774	m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.23375	m^3
			$t_{p\ 75\text{-}\ 25\ actual}$	time	48342.00	s
			Infiltration Coefficient	*f*	1.743E-06	ms^-1



NOTES:

See SW3/17 log for detailed soil strata details: slightly gravelly SILT/CLAY

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-17	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-18
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 532711.15 - 728444.80 **Level:** 16.07	**Date** 07/12/2016
Location: Galway City, Co. Galway		**Dimensions (m):** 1.80 / 1.20	**Scale** 1:25
Client: Arup		**Depth:** 4.50	**Logged** DMC

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	15.87		Topsoil.
	0.50 - 1.00 0.50 - 1.00	B D					Soft to firm, slightly sandy slightly gravelly CLAY. Gravel is fine to medium and sub-angular.
				1.40	14.67		Soft, light grey, slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse and sub-angular.
	1.50 - 2.00 1.50 - 2.00	B D					
	2.00 - 2.50 2.00 - 2.50	B D		2.00	14.07		Soft to firm, grey brown, slightly gravelly slightly sandy CLAY. *2.00 - 3.50m: Thin bands of fine sand (5mm).*
	3.00 - 3.50 3.00 - 3.50	B D					
	3.50 - 4.50 3.50 - 4.50	B D		3.50	12.57		Soft, blue, CLAY.
				4.50	11.57		End of Pit at 4.50m

Stability: Good.
Plant: 14T track machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Soakaway pit terminated at required depth of 4.50m bgl. Soakaway test carried out (BRE 365).

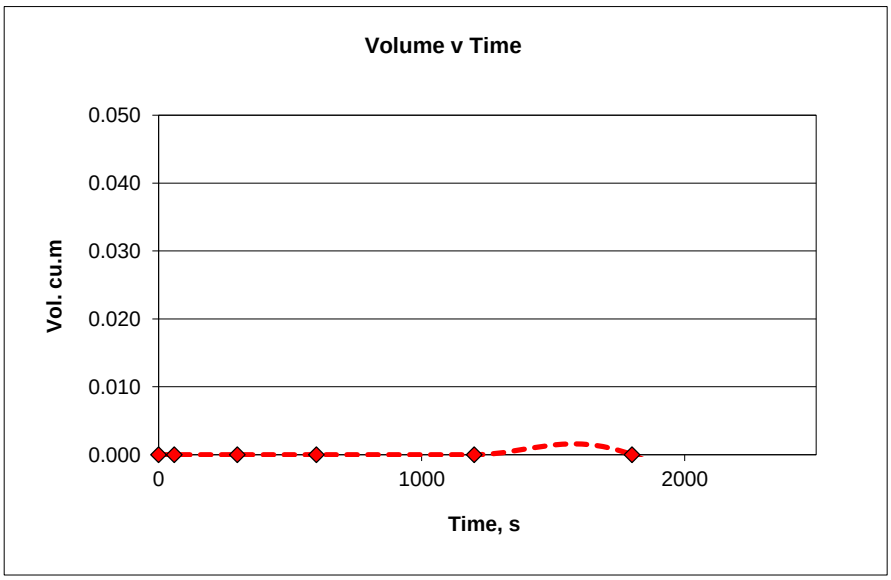
P16185 **N6 GCTP**

Test 1 **SW3/18** **07/12/2016**

				d, m	**4.5**
l, m	**1.8**	b, m	**1.2**	d_eff, m	**1.02**
l_base, m	**1.8**			d_act, m	
l_eff, m	**1.8**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	3.48	0	1.02	0.00	0.000
1	3.48	60	1.02	0.00	0.000
5	3.48	300	1.02	0.00	0.000
10	3.48	600	1.02	0.00	0.000
20	3.48	1200	1.02	0.00	0.000
30	3.48	1800	1.02	0.00	0.000
45	3.47	2700	1.03	-0.01	-0.022
60	3.47	3600	1.03	-0.01	-0.022
80	3.47	4800	1.03	-0.01	-0.022
100	3.47	6000	1.03	-0.01	-0.022
120	3.47	7200	1.03	-0.01	-0.022
140	3.47	8400	1.03	-0.01	-0.022
160	3.47	9600	1.03	-0.01	-0.022
180	3.47	10800	1.03	-0.01	-0.022
200	3.47	12000	1.03	-0.01	-0.022
220	3.47	13200	1.03	-0.01	-0.022
240	3.47	14400	1.03	-0.01	-0.022
1200	3.47	72000	1.03	-0.01	-0.022

Area	2.16 m^2				
50% Area_eff, a_{p50}	5.22 m^2	$V_{p75\text{-}25\ theory}$	volume	1.1016	m^3
50% Area_act, a_{p50}	m^2	$V_{p\ 75\ -\ 25\ actual}$	volume		m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time		s
		Infiltration Coefficient	*f*		ms^-1



NOTES:

See SW3/18 log for detailed soil strata details: slightly gravelly slightly sandy SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate not applicable.

Photographic Record

Number: SW03-18	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

Photographic Record

Number: SW03-18	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

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Trial Pit No
SW03-19
Sheet 1 of 1

Project Name: N6 GCTP Phase 3	**Project No.** P16185	**Co-ords:** 531215.03 - 728480.43 **Level:** 17.29	**Date** 22/12/2016
Location: Galway City, Co. Galway	**Dimensions (m):** 2.30 × 1.00 **Depth:** 0.35		**Scale** 1:25
Client: Arup			**Logged** VT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20 - 0.35 0.20 - 0.35	B D		0.20 0.35	17.09 16.94		Topsoil. Soft, brown, slightly gravelly slightly sandy SILT. Light grey to light brown, very silty very sandy GRAVEL with high cobble content and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular, Limestone lithology. Cobbles are angular to sub-rounded, 3-200mm dia. Limestone lithology. Boulders are angular to sub-angular, 200-400mm dia. Limestone lithology. End of Pit at 0.35m

Stability: Good.
Plant: 6t track machine.
Backfill: Arisings.
Groundwater: None encountered.
Remarks: Soakaway pit terminated at 0.35m bgl on bedrock. Soakaway test carried out (BRE 365).

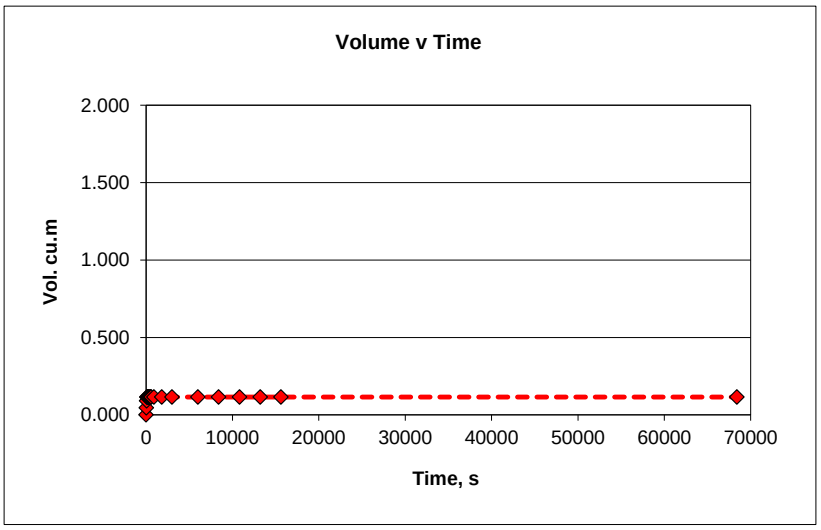
P16185 **N6 GCTP**

Test 1 **SW3/19** **12/12/2016**

				d, m	**0.35**
l, m	**2.3**	b, m	**1**	d_eff, m	**0.27**
l_base, m	**2.3**			d_act, m	**0.05**
l_eff, m	**2.3**				

Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
0	0.08	0	0.27	0.00	0.000
0.5	0.1	30	0.25	0.02	0.046
1	0.12	60	0.23	0.04	0.092
1.5	0.13	90	0.22	0.05	0.115
2	0.13	120	0.22	0.05	0.115
2.5	0.13	150	0.22	0.05	0.115
3	0.13	180	0.22	0.05	0.115
3.5	0.13	210	0.22	0.05	0.115
4	0.13	240	0.22	0.05	0.115
4.5	0.13	270	0.22	0.05	0.115
5	0.13	300	0.22	0.05	0.115
6	0.13	360	0.22	0.05	0.115
7	0.13	420	0.22	0.05	0.115
8	0.13	480	0.22	0.05	0.115
9	0.13	540	0.22	0.05	0.115
10	0.13	600	0.22	0.05	0.115
15	0.13	900	0.22	0.05	0.115
30	0.13	1800	0.22	0.05	0.115
50	0.13	3000	0.22	0.05	0.115
100	0.13	6000	0.22	0.05	0.115
140	0.13	8400	0.22	0.05	0.115
180	0.13	10800	0.22	0.05	0.115
220	0.13	13200	0.22	0.05	0.115
260	0.13	15600	0.22	0.05	0.115
1140	0.13	68400	0.22	0.05	0.115

Area	2.3 m^2				
50% Area_eff,	3.191 m^2	$V_{p75\text{-}25\ theory}$	volume	0.3105	m^3
50% Area_act,	2.465 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.0575	m^3
		$t_{p\ 75\text{-}\ 25\ actual}$	time	36.60	s
		Infiltration Coefficient	*f*	0.0006373	ms^-1



NOTES:

See SW3/19 log for detailed soil strata details: slightly sandy gravelly SILT

No groundwater was encountered, pit assumed unsaturated.

Infiltration rate calculated over actual fall.

Photographic Record

Number: SW03-19	**Project** N6 GCTP **Project No** P16185 **Engineer** Arup	

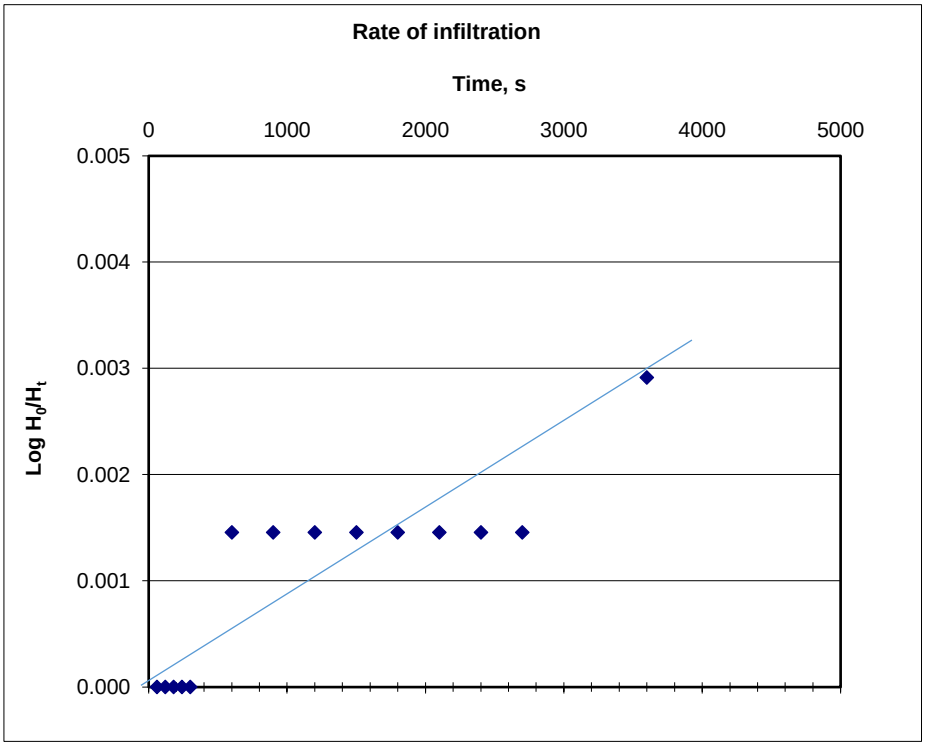
P16185 Rising head permeability test

Location	**Monitoring well**			
BH ID	**BH-MW64**		H_w / H_o	**2.99**
Casing diameter	**200**	mm		
Casing depth	**8.3**	m		
Borehole depth	**8.3**	m		
Groundwater level	**4.10**	mbgl		
Date	**28/03/2017**			

Min	Sec	depth, m bgl	vol, cu.m	H_t	log H_0/H_t
1	60	7.090	0.22263	2.990	0.000
2	120	7.090	0.22263	2.990	0.000
3	180	7.090	0.22263	2.990	0.000
4	240	7.090	0.22263	2.990	0.000
5	300	7.090	0.22263	2.990	0.000
10	600	7.080	0.22231	2.980	0.001
15	900	7.080	0.22231	2.980	0.001
20	1200	7.080	0.22231	2.980	0.001
25	1500	7.080	0.22231	2.980	0.001
30	1800	7.080	0.22231	2.980	0.001
35	2100	7.080	0.22231	2.980	0.001
40	2400	7.080	0.22231	2.980	0.001
45	2700	7.080	0.22231	2.980	0.001
60	3600	7.070	0.22200	2.970	0.003
90	5400	7.060	0.22168	2.960	0.004
120	7200	7.050	0.22137	2.950	0.006
150	9000	7.045	0.22121	2.945	0.007
180	10800	7.035	0.22090	2.935	0.008
210	12600	7.030	0.22074	2.930	0.009
240	14400	7.025	0.22059	2.925	0.010

k_{mean} **1.20E-08** ms^{-1}

$k_H = k_V$



N6 GWTP Stepped Pump Test

Flow Rate (L / min)	Time (min)	Pump Well	MW 3/63	MW 3/64	Note
0	0	4.52	7.22	5.09	15 mins spent getting accurate 1 L/min reading
1 L / min	0.5				
	1	4.57	7.22	5.09	
	1.5				
	2	4.57	7.22	5.09	
	2.5				
	3	4.5	7.22	5.09	
	3.5				
	4	4.65	7.22	5.09	
	4.5				
	5	4.75	7.22	5.09	
	5.5				
	6	4.77	7.22	5.09	
	6.5	4.79	7.22	5.09	
	7	4.81	7.22	5.09	
	7.5	4.83	7.22	5.09	
	8	4.85	7.22	5.09	
	8.5	4.87	7.22	5.09	
	9	4.88	7.22	5.09	
	9.5	4.89	7.22	5.09	
	10	4.9	7.22	5.09	
	12	4.96	7.22	5.09	
	14	5.03	7.22	5.09	
	16	5.1	7.22	5.09	Pump stopped pumping due to height of hose
	18	5.11	7.22	5.09	
	20	5.11	7.22	5.09	
	25		7.22	5.09	
	30	5.28	7.22	5.09	
	35	5.475	7.22	5.09	
	40	5.58	7.22	5.095	
	45	5.67	7.22	5.1	
	50	5.75	7.22	5.1	
	55	5.81	7.22	5.1	
	60	5.88	7.22	5.1	

Depth before data loggers removed-

PW	4.52 m
MW 3/63	7.22m
MW 3/64	5.09m

N.B all levels are from top of standpipe.

Top of standpipe to groundlevel, PW- 0.49m

MW 3/63- 0.85m
MW 3/64- 0.96m

Pump installed at 15m below top of standpipe on pump well (PW)

N6 GWTP Stepped Pump Test

Flow Rate (L / min)	Time (min)	Pump Well	MW 3/63	MW 3/64	Note
0	60 mins	5.88	7.22	5.1	2 mins spent getting accurate 2 L/min reading
2 L / min	0.5	5.87			
	1	5.89	7.22	5.1	
	1.5	5.93			
	2	5.99	7.22	5.1	
	2.5	6.02			
	3	6.08	7.22	5.1	
	3.5	6.08			
	4	6.1	7.22	5.1	
	4.5	6.11			
	5	6.12	7.22	5.1	
	5.5	6.16			
	6	6.19	7.22	5.1	
	6.5	6.215	7.22	5.1	
	7	6.24	7.22	5.1	
	7.5	6.27	7.22	5.1	
	8	6.29	7.22	5.1	
	8.5	6.32	7.22	5.1	
	9	6.345	7.22	5.1	
	9.5	6.37	7.22	5.1	
	10	6.4	7.22	5.1	
	12	6.49	7.22	5.1	
	14	6.58	7.22	5.1	
	16	6.665	7.22	5.1	
	18	6.77	7.22	5.1	
	20	6.85	7.22	5.1	
	25	7.045	7.22	5.1	
	30	7.23	7.22	5.1	
	35	7.32	7.22	5.1	
	40	7.455	7.22	5.1	
	45	7.69	7.22	5.1	
	50	7.915	7.22	5.1	
	55	8.1	7.22	5.1	
	60	8.26	7.22	5.1	

Depth before data loggers removed-

PW	4.52 m
MW 3/63	7.22m
MW 3/64	5.09m

N.B all levels are from top of standpipe.

Top of standpipe to groundlevel, PW- 0.49m

MW 3/63- 0.85m
MW 3/64- 0.96m

N6 GWTP Stepped Pump Test

Flow Rate (L / min)	Time (min)	Pump Well	MW 3/63	MW 3/64	Note
0	120 mins	8.26	7.22	5.1	5 mins spent getting accurate 3 L/min reading
3 L / min	0.5				
	1		7.22	5.1	
	1.5	8.42			
	2	8.45	7.22	5.1	
	2.5	8.5			
	3	8.55	7.22	5.1	
	3.5	8.59			
	4	8.635	7.22	5.1	
	4.5	8.73			
	5	8.735	7.22	5.1	
	5.5	8.76			
	6	8.8	7.22	5.1	
	6.5	8.84	7.22	5.1	
	7	8.89	7.22	5.1	
	7.5	8.93	7.22	5.1	
	8	8.97	7.22	5.1	
	8.5	9	7.22	5.1	
	9	9.05	7.22	5.1	
	9.5	9.09	7.22	5.1	
	10	9.12	7.22	5.1	
	12	9.295	7.22	5.1	
	14	9.47	7.22	5.1	
	16	9.63	7.22	5.1	
	18	9.76	7.22	5.1	
	20	9.91	7.22	5.1	
	25	10.09	7.22	5.1	
	30	10.31	7.22	5.1	
	35	10.67	7.225	5.1	
	40	10.94	7.225	5.1	
	45		7.225	5.1	
	50	11.51	7.225	5.1	
	55	11.785	7.225	5.1	
	60	12.06	7.225	5.1	

Depth before data loggers removed-

PW	4.52 m
MW 3/63	7.22m
MW 3/64	5.09m

N.B all levels are from top of standpipe.

Top of standpipe to groundlevel, PW- 0.49m

MW 3/63- 0.85m
MW 3/64- 0.96m

N6 GWTP Stepped Pump Test

Flow Rate (L / min)	Time (min)	Pump Well	MW 3/63	MW 3/64	Note
0	180 mins	12.06	7.225	5.1	5 mins spent getting accurate 3.5 L/min reading
3.5 L /min	0.5	12.15			
	1	12.18	7.225	5.1	
	1.5	12.22			
	2	12.27	7.225	5.1	
	2.5	12.31			
	3	12.35	7.225	5.1	
	3.5	12.39			
	4	12.44	7.225	5.1	
	4.5	12.51			
	5	12.57	7.225	5.1	
	5.5				
	6		7.225	5.1	
	6.5	12.75	7.225	5.1	
	7	12.82	7.225	5.1	
	7.5	12.86	7.225	5.1	
	8	12.91	7.225	5.1	
	8.5	12.97	7.225	5.1	
	9	13.04	7.225	5.1	
	9.5	13.08	7.225	5.1	
	10	13.13	7.225	5.1	
	12	13.36	7.225	5.1	
	14	13.58	7.225	5.1	
	16	13.74	7.225	5.1	
	18	13.87	7.225	5.1	
	20	14.07	7.225	5.1	
	25	14.57	7.225	5.1	
	30	15.01	7.225	5.1	
	35				
	40				
	45				
	50				
	55				
	60				

Depth before data loggers removed-

PW	4.52 m
MW 3/63	7.22m
MW 3/64	5.09m

N.B all levels are from top of standpipe.

Top of standpipe to groundlevel, PW- 0.49m

MW 3/63- 0.85m
MW 3/64- 0.96m

N6 GWTP Stepped Pump Test

RECHARGE

Flow Rate (L / min)	Time (min)	Pump Well	MW 3/63	MW 3/64	Note
0	0	15.01	7.225	5.1	
	0.5	14.94			
	1	14.94	7.225	5.1	
	1.5	14.94			
	2	14.94	7.225	5.1	
	2.5	14.94			
	3	14.94	7.225	5.1	
	3.5	14.94			
	4	14.94	7.225	5.1	
	4.5	14.93			
	5	14.93	7.225	5.1	
	5.5	14.93			
	6	14.93	7.225	5.1	
	6.5	14.93	7.225	5.1	
	7	14.93	7.225	5.1	
	7.5	14.93	7.225	5.1	
	8	14.93	7.225	5.1	
	8.5	14.93	7.225	5.1	
	9	14.92	7.225	5.1	
	9.5	14.92	7.225	5.1	
	10	14.92	7.225	5.1	
	12	14.92	7.225	5.1	
	14	14.92	7.225	5.1	
	16	14.92	7.225	5.1	
	18	14.92	7.225	5.1	
	20	14.92	7.225	5.1	
	25	14.915	7.225	5.1	
	30	14.915	7.225	5.1	
	35	14.915	7.225	5.1	
	40	14.91	7.225	5.1	
	45	14.91	7.225	5.1	
	50	14.91	7.225	5.1	
	55	14.9	7.225	5.1	
	60	14.9	7.225	5.1	
	70	14.89	7.225	5.1	
	80	14.885	7.225	5.1	
	90	14.88	7.225	5.1	

Depth before data loggers removed-

PW	4.52 m
MW 3/63	7.22m
MW 3/64	5.09m

N.B all levels are from top of standpipe.

Top of standpipe to groundlevel, PW- 0.49m

MW 3/63- 0.85m

MW 3/64- 0.96m

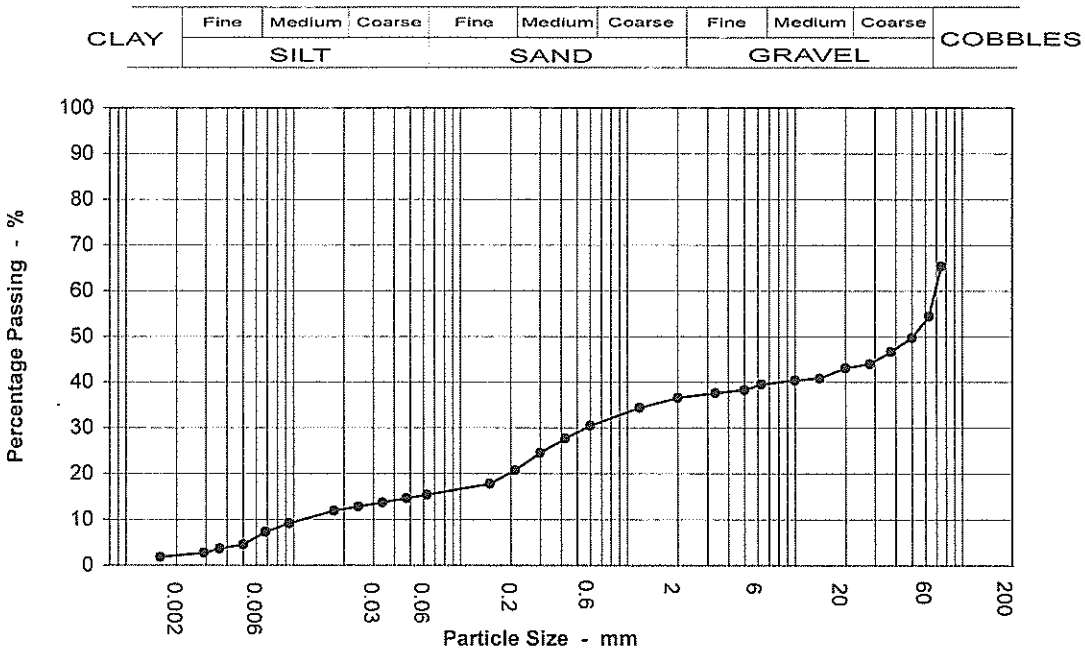
KEY TO SYMBOLS - LABORATORY TEST RESULT

U	Undisturbed Sample	
P	Piston Sample	
TWS	Thin Wall Sample	
B	Bulk Sample - Disturbed	
D	Jar Sample - Disturbed	
W	Water Sample	
pH	Acidity/Alkalinity Index	
SO_3	% - Total Sulphate Content (acid soluble)	
SO_3	g/ltr - Water Soluble Sulphate (Water or 2:1 Aqueous Soil Extract)	
+	Calcareous Reaction	
Cl	Chloride Content	
PI	Plasticity Index	
<425	% of material in sample passing 425 micron sieve	
LL	Liquid Limit	
PL	Plastic Limit	
MC	Water Content	
NP	Non Plastic	
Yb	Bulk Density	
Yd	Dry Density	
Ps	Particle Density	
U/D	Undrained/Drained Triaxial	
U/C	Unconsolidated/Consolidated Triaxial	
T/M	Single Stage/Multistage Triaxial	
100/38	Sample Diameter (mm)	
REM	Remoulded Triaxial Test Specimen	
TST	Triaxial Suction Test	
V	Vane Test	
DSB	Drained Shear Box	
RSB	Residual Shear Box	
RS	Ring Shear	
σ_3	Cell Pressure	
σ_1-σ_3	Deviator Stress	
c	Cohesion	
c_	Effective Cohesion Intercept	
ϕ	Angle of Shearing Resistance - Degrees	
ϕ_	Effective Angle of Shearing Resistance	
εf	Strain at Failure	
*	Failed under 1st Load	
**	Failed under 2nd Load	
#	Untestable	
##	Excessive Strain	
p_o	Effective Overburden Pressure	
m_v	Coefficient of Volume Decrease	
c_v	Coefficient of Consolidation	
Opt	Optimum	
Nat	Natural	
Std	Standard Compaction - 2.5kg Rammer	(¶ CBR)
Hvy	Heavy Compaction - 4.5kg Rammer	(§ CBR)
Vib	Vibratory Compaction	
CBR	California Bearing Ratio	
Sat m.c.	Saturation Moisture Content	
MCV	Moisture Condition Value	

PRIORITY GEOTECHNICAL	Natural Moisture Content/Atterberg Limits Summary BS 1377 : Part 2 : 1990 : Clause 3	Job Ref
Location	N6 GCTP Phase 3	P16185

Hole ID	Sample Ref	Depth (m)	Sample Type	Sample Description	MC	LL	PL	PI	% Pass 425
SW03-03	2	0.15	D	Very silty very gravelly SAND	48	63	46	17	85.6
SW03-19	2	0.2	D	Very sandy very silty GRAVEL	19	42	28	14	59.1

PRIORITY GEOTECHNICAL	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Job Ref	P16185
		Borehole / Pit No	SW03-03
Location	N6 GCTP Phase 3	Sample No	1
		Depth	0.15 m
Soil Description	Very silty very gravelly SAND with high cobble content	Sample type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.063	15
90	70	0.048	15
75	65	0.034	14
63	54	0.024	13
50	50	0.018	12
37.5	47	0.009	9
28	44	0.007	7
20	43	0.005	5
14	41	0.004	4
10	40	0.003	3
6.3	39	0.002	2
5	38		
3.35	38		
2	37		
1.18	34		
0.6	30		
0.425	28		
0.3	24		
0.212	21		
0.15	18		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	46.7
Gravel	16.8
Sand	21.3
Silt	13.1
Clay	2.1

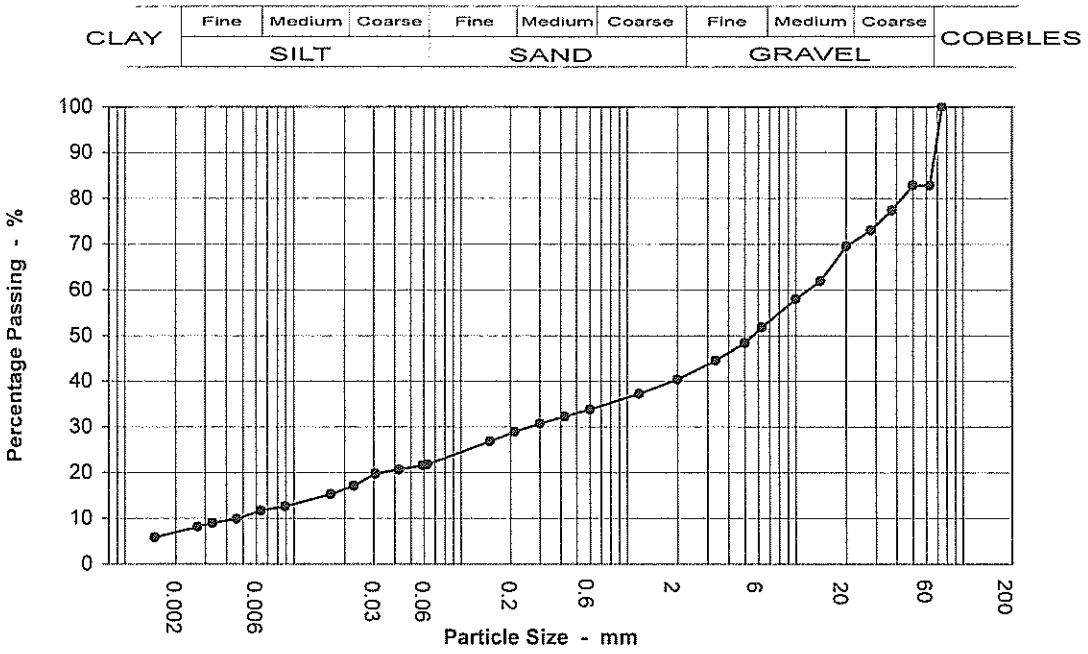
Grading Analysis	
D100	125.000
D60	69.153
D10	0.012
Uniformity Coefficient	5791

PRIORITY GEOTECHNICAL

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	P16185
		Borehole / Pit No	SW03-19
Location	N6 GCTP Phase 3	Sample No	1
		Depth	0.20 m
Soil Description	Very sandy very silty GRAVEL with medium cobble content	Sample type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.059	22
90	100	0.043	21
75	100	0.031	20
63	83	0.023	17
50	83	0.017	15
37.5	77	0.009	13
28	73	0.006	12
20	69	0.005	10
14	62	0.003	9
10	58	0.003	8
6.3	52	0.002	6
5	48		
3.35	45		
2	40		
1.18	37		
0.6	34		
0.425	32		
0.3	31		
0.212	29		
0.15	27		
0.063	22		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	17.2
Gravel	42.4
Sand	18.7
Silt	14.8
Clay	6.8

Grading Analysis	
D100	75.000
D60	12.112
D10	0.005
Uniformity Coefficient	2566

Laboratory Report

2788

GEO Site & Testing Services Ltd

Contract Number: 33812

Client's Reference: **P16185**

Report Date: **03-02-2017**

Client **Priority Geotechnical Limited**
Unit 12
Owenacurra Business Park
Midleton
Co. Cork.

Contract Title: **Galway GCT**

For the attention of: **Colette Kelly**

Date Received: **17-01-2017**

Date Commenced: **17-01-2017**

Date Completed: **03-02-2017**

Test Description	Qty
Moisture Content 1377 : 1990 Part 2 : 3.2 - * UKAS	40
4 Point Liquid & Plastic Limit (LL/PL) 1377 : 1990 Part 2 : 4.3 & 5.3 - * UKAS	24
PSD Wet Sieve method 1377 : 1990 Part 2 : 9.2 - * UKAS	32
PSD: Sedimentation by hydrometer 1377 : 1990 Part 2 : 9.5 - @ Non Accredited Test	31
Organic Matter Content-dichromate method 1377 : 1990 Part 3 : 3 - @ Non Accredited Test	5
Water Soluble Sulphate 2:1 extract 1377 : 1990 Part 3 : 5 - @ Non Accredited Test	4
pH Value of Soil... 1377 : 1990 Part 3 : 9 - @ Non Accredited Test	4

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Alex Wynn (Associate Director) - Benjamin Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Paul Evans (Quality/Technical Manager) - Vaughan Edwards (Managing Director)

GEO Site & Testing Services Ltd
Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

Laboratory Report

2788

GEO Site & Testing Services Ltd

Contract Number: 33812

Test Description	Qty
Consolidated Drained Peak Shear Strength - set of 3 - 60 x 60mm Shear Box Specimens by Direct Shearing (3 days) 1377 : 1990 Part 7 :4 - * UKAS	3
CUD 38mm Consolidated undrained triaxial compression test on a set of three x 38 mm diameter specimens with the measurement of pore water pressure including saturation and consolidation, test duration four days. 1377 : 1990 Part 8 : 7 - @ Non Accredited Test	2
Disposal of Samples on Project	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Alex Wynn (Associate Director) - Benjamin Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Paul Evans (Quality/Technical Manager) - Vaughan Edwards (Managing Director)

GEO Site & Testing Services Ltd
Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

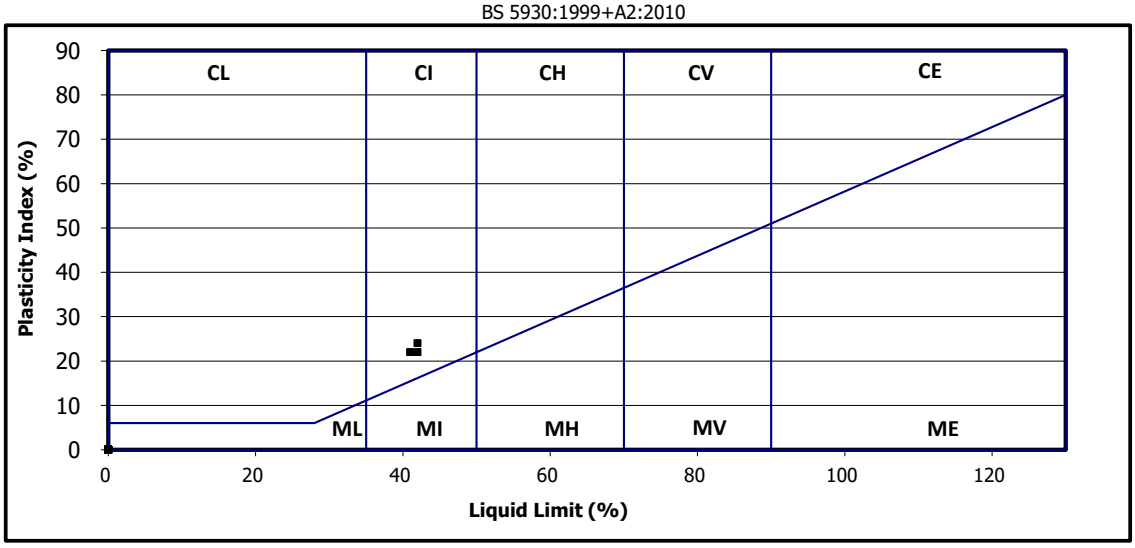
Test Report: **Method of the Determination of the plastic limit and plasticity index**
BS 1377 : Part 2 : 1990 Method 5

Client ref: **P16185**
Location: **Galway GCT**
Contract Number: **33812-**

Hole/ Sample Number	Sample Type	Depth m	Moisture Content % Cl. 3.2	Liquid Limit % Cl. 4.3/4.4	Plastic Limit % Cl. 5.	Plasticity Index % Cl. 6.	% Passing .425mm	Remarks
SW03-12/1	B	1.00	11					
SW03-12/2	B	2.00	11					
SW03-13/1	B	1.50	12					
SW03-14/2	D	0.50	22	41	19	22	100	CI Intermediate Plasticity
SW03-14/4	D	2.00	21	42	20	22	100	CI Intermediate Plasticity
SW03-14/6	D	3.00	24		NP		100	
SW03-14/8	D	4.00	41		NP		100	
SW03-15/1	B	0.50	16		NP		70	
SW03-15/2	D	0.50	25					
SW03-15/4	D	1.50	7.8		NP		60	
SW03-15/5	B	2.50	6.9					
SW03-15/6	D	2.50	9.6					
SW03-15/8	D	3.50	4.4		NP		25	
SW03-16/1	B	0.50	24	42	18	24	100	CI Intermediate Plasticity
SW03-16/2	D	0.50	22					
SW03-16/4	D	1.50	4.5					
SW03-16/6	D	3.00	6.9					

Symbols: **NP : Non Plastic** **# : Liquid Limit and Plastic Limit Wet Sieved**

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.
BS 5930:1999+A2:2010



For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)
Date: 31.1.17

UKAS TESTING 2788

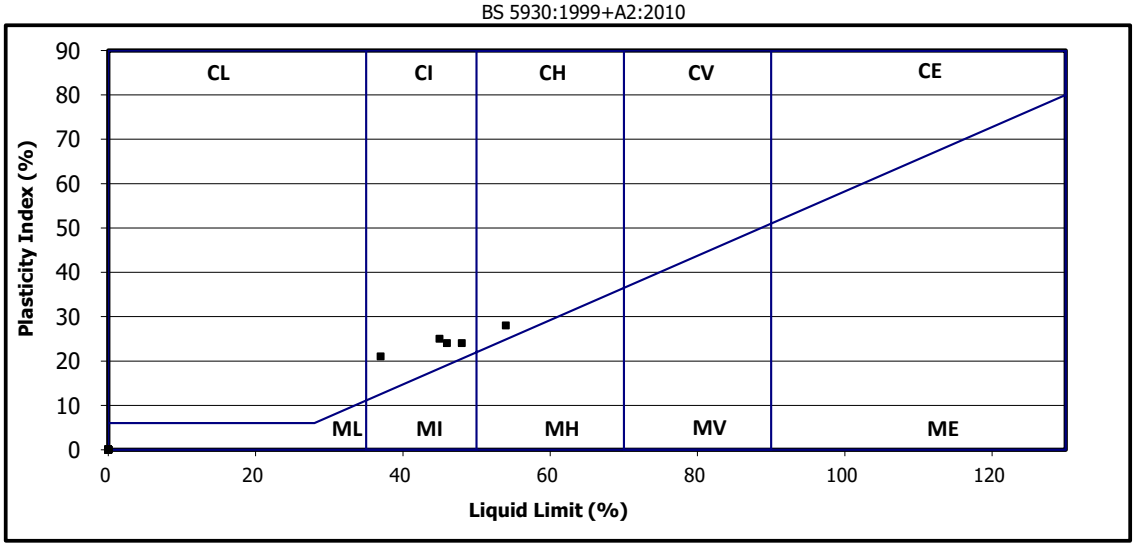
Test Report: **Method of the Determination of the plastic limit and plasticity index**
BS 1377 : Part 2 : 1990 Method 5

Client ref: **P16185**
Location: **Galway GCT**
Contract Number: **33812-**

Hole/ Sample Number	Sample Type	Depth m	Moisture Content % Cl. 3.2	Liquid Limit % Cl. 4.3/4.4	Plastic Limit % Cl. 5.	Plasticity Index % Cl. 6.	% Passing .425mm	Remarks
SW03-17/2	D	0.20	25	48	24	24	88	CI Intermediate Plasticity
SW03-17/4	D	0.50	33					
SW03-18/2	D	0.50	30	54	26	28	100	CH High Plasticity
SW03-18/4	D	1.50	13	37	16	21	59	CI Intermediate Plasticity
SW03-18/6	D	2.00	26	45	20	25	100	CI Intermediate Plasticity
SW03-18/7	D	3.00	24	46	22	24	100	CI Intermediate Plasticity
SW03-18/8	B	3.00	23					
SW03-18/10	D	3.50	27					

Symbols: **NP : Non Plastic** **# : Liquid Limit and Plastic Limit Wet Sieved**

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.
BS 5930:1999+A2:2010



GSTL
GEO SITE & TESTING SERVICES LTD

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)
Date: 31.1.17

UKAS TESTING 2788

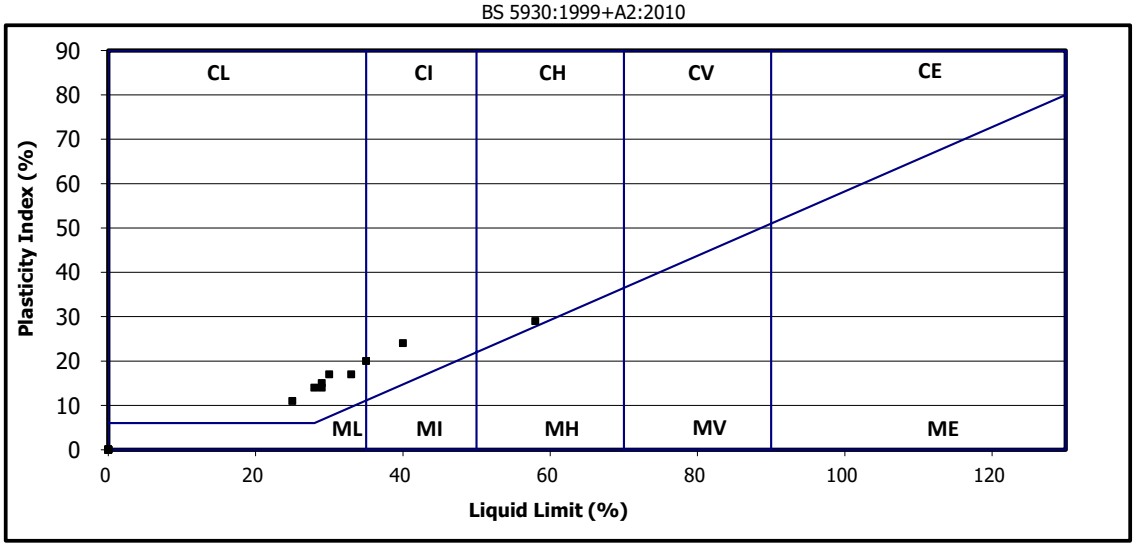
Test Report: **Method of the Determination of the plastic limit and plasticity index**
BS 1377 : Part 2 : 1990 Method 5

Client ref: **P16185**
Location: **Galway GCT**
Contract Number: **33812-**

Hole/ Sample Number	Sample Type	Depth m	Moisture Content % Cl. 3.2	Liquid Limit % Cl. 4.3/4.4	Plastic Limit % Cl. 5.	Plasticity Index % Cl. 6.	% Passing .425mm	Remarks
TP03-50/1	B	0.80	8.9	25	14	11	70	CL Low Plasticity
TP03-50/2	D	0.80	9.1					
TP03-50/4	D	1.50	7.4		NP		56	
TP03-50/6	D	2.00	8.7	29	15	14	75	CL Low Plasticity
TP03-50/8	D	3.00	7.7	29	14	15	70	CL Low Plasticity
TP03-52/2	D	0.20	28					
TP03-52/3	B	0.50	10	30	13	17	70	CL Low Plasticity
TP03-52/4	D	0.50	23	40	16	24	80	CI Intermediate Plasticity
TP03-53/2	D	0.50	22					
TP03-53/3	B	1.00	11	35	15	20	82	CL/I Low/Inter. Plasticity
TP03-53/4	D	1.00	13					
TP03-53/5	B	2.00	9.1	33	16	17	80	CL Low Plasticity
TP03-53/6	D	2.00	10					
TP03-53/8	D	2.50	7.8		NP		60	
TP03-53/10	D	3.50	7.9	28	14	14	69	CL Low Plasticity
BH03-62/1	B	0.00	34	58	29	29	60	CH High Plasticity
BH03-62/2	B	1.00	37					

Symbols: **NP : Non Plastic** **# : Liquid Limit and Plastic Limit Wet Sieved**

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.
BS 5930:1999+A2:2010



For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)
Date: 31.1.17

UKAS TESTING 2788

GEO Site & Testing Services Limited

Unit 4
Heol Aur
Dafen Ind EstateDafen
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SA14 8QN
Tel: 01554 784040
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Certificate of Analysis

Date:	25-01-17
Client:	Priority
Our Reference:	33812
Client Reference:	P1S185
Contract Title:	Galway
Description: (Total Samples)	9
Date Received:	23-01-17
Date Started:	#REF!
Date Completed:	25-01-17
Test Procedures:	(BRE BR 279)
Notes:	

Solid samples will be disposed 1 month and liquids 2 weeks after the date of issue of this test certificate

Approved By:

Authorised Signatories:

Emma Sharp	Ben Sharp	Paul Evans
Laboratory Office Manager	Contracts Manager	Quality Manager

Contract No: 33812
Client Ref: P1S185
Location: Galway
Date: 25-01-2017

Summary of Chemical Analysis

(BRE BR 279)

Hole Number	Sample Number	Sample Type	Depth m	Sulphate Content as SO_4			Chloride Content		pH Value @ 25°C	Total Sulphur % S	Magnesium g/l	Organic Content
				Acid Soluble Sulphate as % SO_4	Aqueous Extract Sulphate as g/l SO_4	Ground-water g/l	Semi Quantative Test Strip mg Cl/l	Quantative g/l				
				BR 279	BR 279	BR 279	BR 279	BR 279	BR 279	BR 279	BR 279	BR 279
SW03-12		B	1.00									1.9
SW03-14		B	3.00									10.2
SW03-14		B	4.00									11.4
SW03-16		B	0.50									0.6
SW03-16		B	1.50		0.02				7.50			
SW03-17		B	0.50		0.02				7.66			
SW03-18		D	3.50									0.9
SW03-50		B	1.50		<.01				7.91			
SW03-53		B	0.50		0.02				7.34			

NCP - No Chloride present

Test Report:

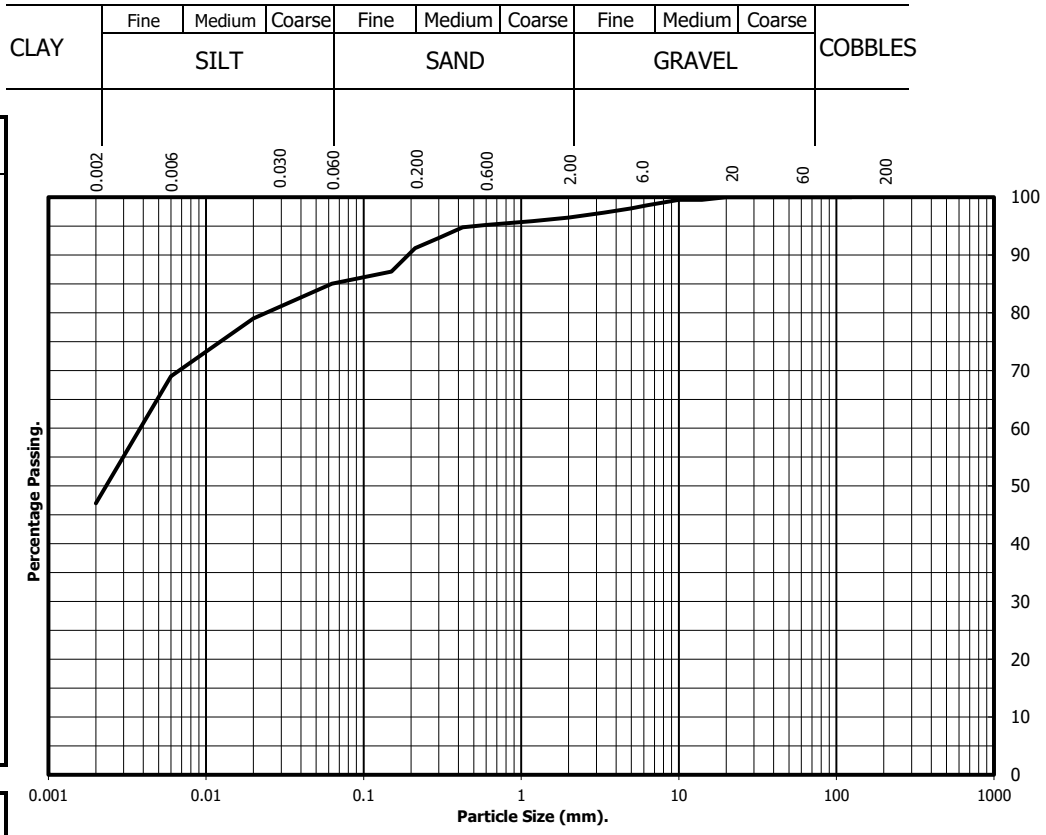
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**2**
Contract Number:	**33812-**	**Depth from (m):**	**1.00**
Hole Number:	**BH03-62**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown gravelly sandy fine to medium silty CLAY.**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	99
5.0	98
3.35	97
2.00	96
1.18	96
0.60	95
0.425	95
0.300	93
0.212	91
0.150	87
0.063	85

Particle Diameter	% Passing
0.02	79
0.006	69
0.002	47

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
47	38	11	4	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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Test Report:

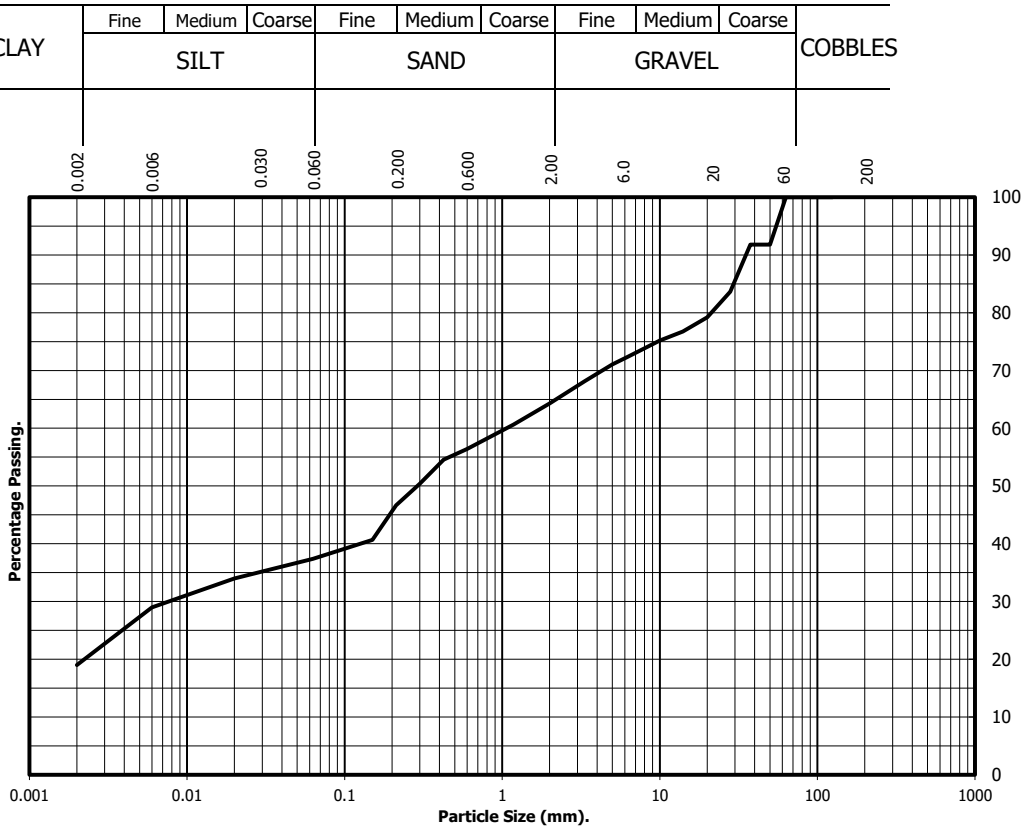
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**1.00**
Hole Number:	**SW03-12**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey sandy fine to coarse GRAVEL**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	92
37.5	92
28	84
20	79
14	77
10	75
6.3	72
5.0	71
3.35	68
2.00	64
1.18	61
0.60	56
0.425	55
0.300	50
0.212	47
0.150	41
0.063	37

Particle Diameter	% Passing
0.02	34
0.006	29
0.002	19

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
19	18	27	36	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

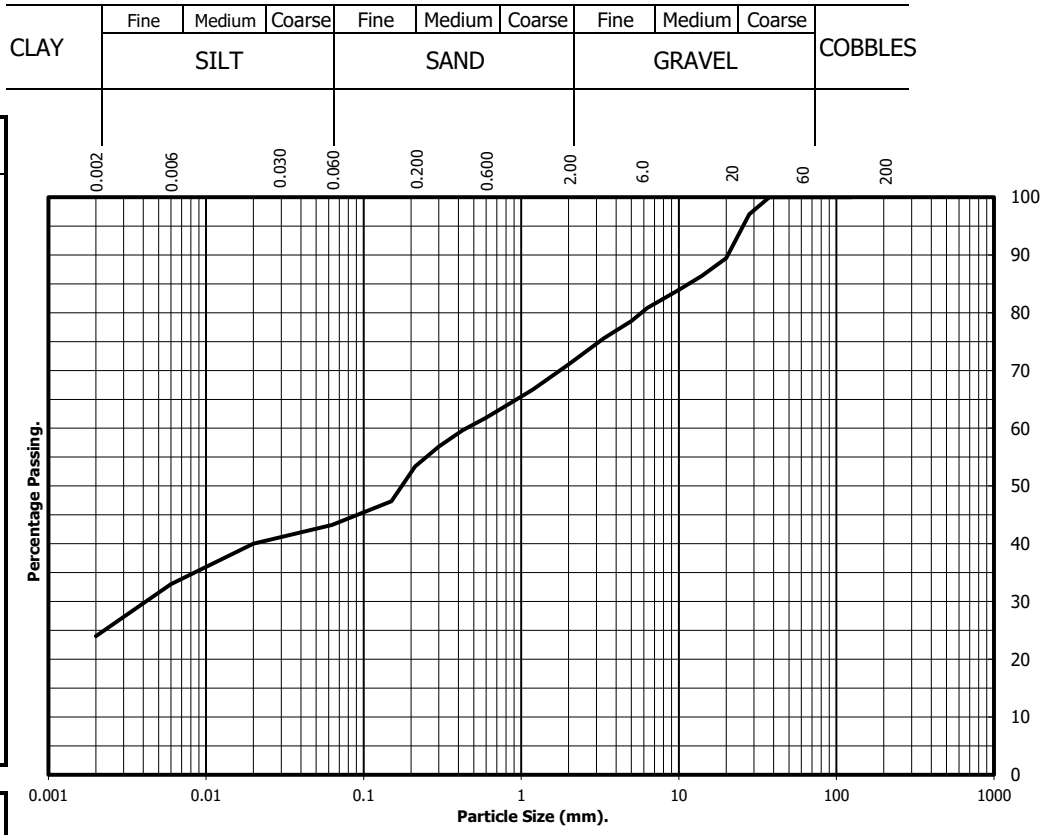
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**2**
Contract Number:	**33812-**	**Depth from (m):**	**2.00**
Hole Number:	**SW03-12**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey sandy fine to coarse GRAVEL**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	97
20	89
14	86
10	84
6.3	81
5.0	79
3.35	76
2.00	71
1.18	67
0.60	62
0.425	60
0.300	57
0.212	53
0.150	47
0.063	43



Particle Diameter	% Passing
0.02	40
0.006	33
0.002	24

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
24	19	28	29	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

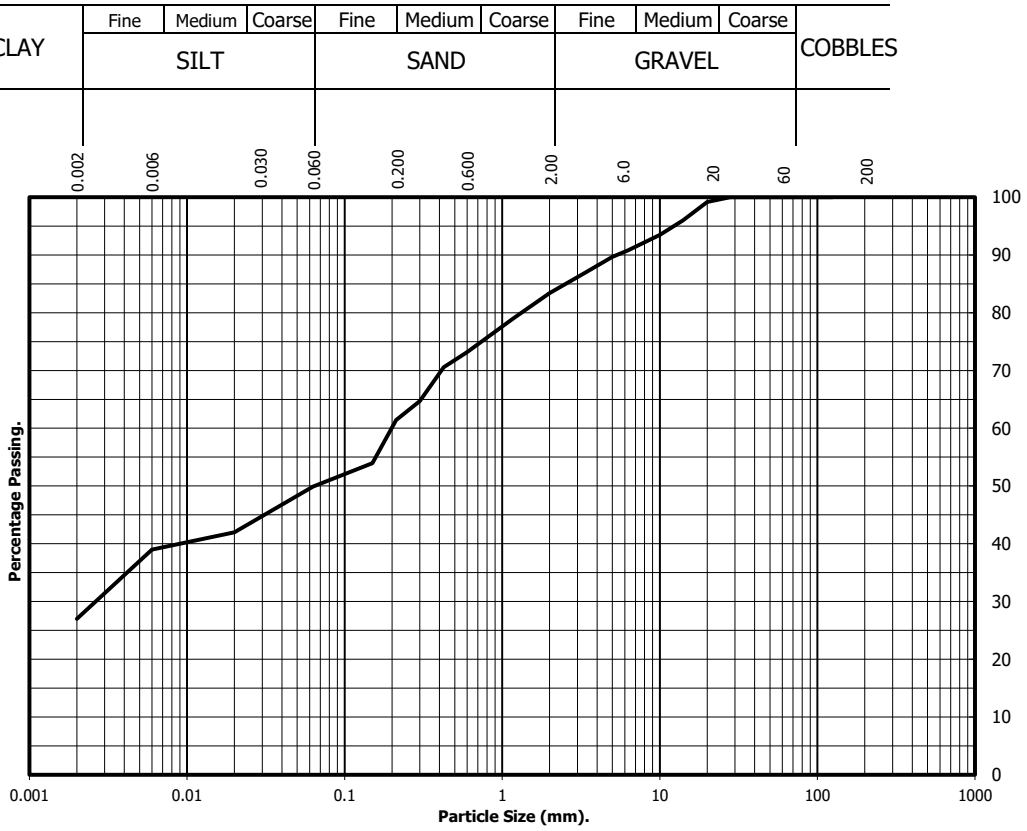
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**1.50**
Hole Number:	**SW03-13**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown fine to coarse gravelly silty clayey SAND.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	99
14	96
10	93
6.3	91
5.0	90
3.35	87
2.00	83
1.18	79
0.60	73
0.425	71
0.300	65
0.212	61
0.150	54
0.063	50



Particle Diameter	% Passing
0.02	42
0.006	39
0.002	27

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
27	23	33	17	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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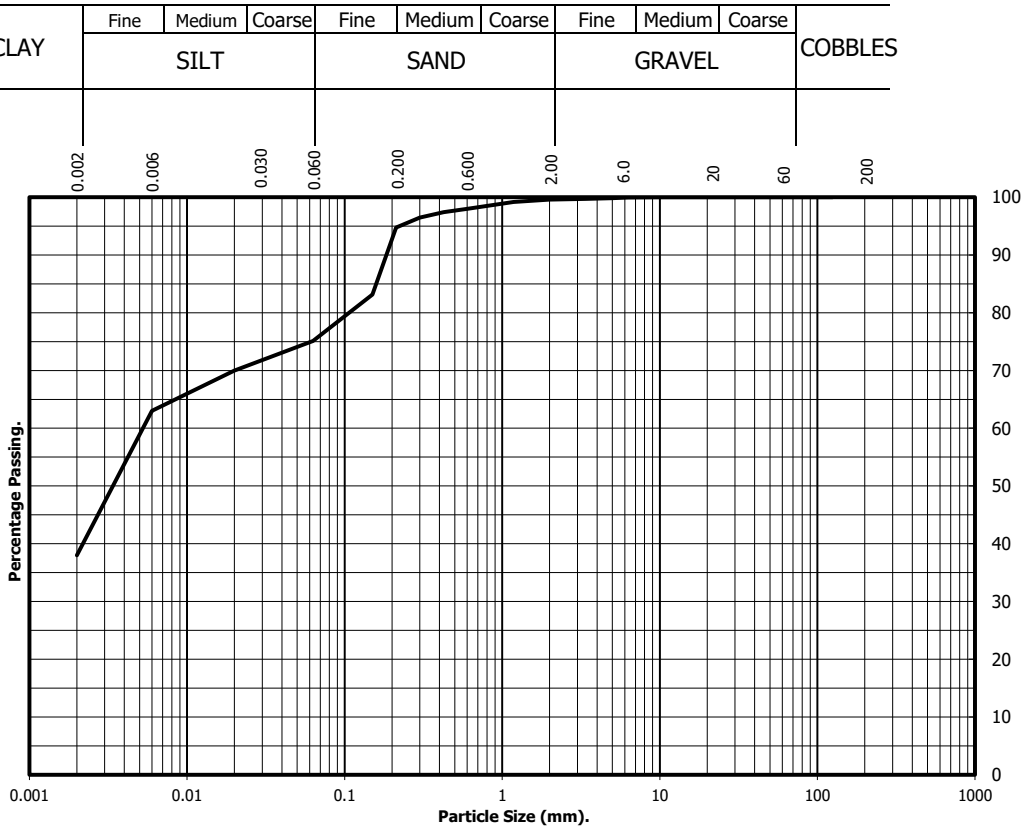
Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**0.50**
Hole Number:	**SW03-14**	**Depth to (m):**	**N/A**
		Sample Type:	**B**
Location:	**Galway GCT**		
Description:	**Brown fine to medium sandy silty CLAY.**		

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5.0	100
3.35	100
2.00	100
1.18	99
0.60	98
0.425	97
0.300	96
0.212	95
0.150	83
0.063	75



Particle Diameter	% Passing
0.02	70
0.006	63
0.002	38

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
38	37	25	0	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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Test Report:

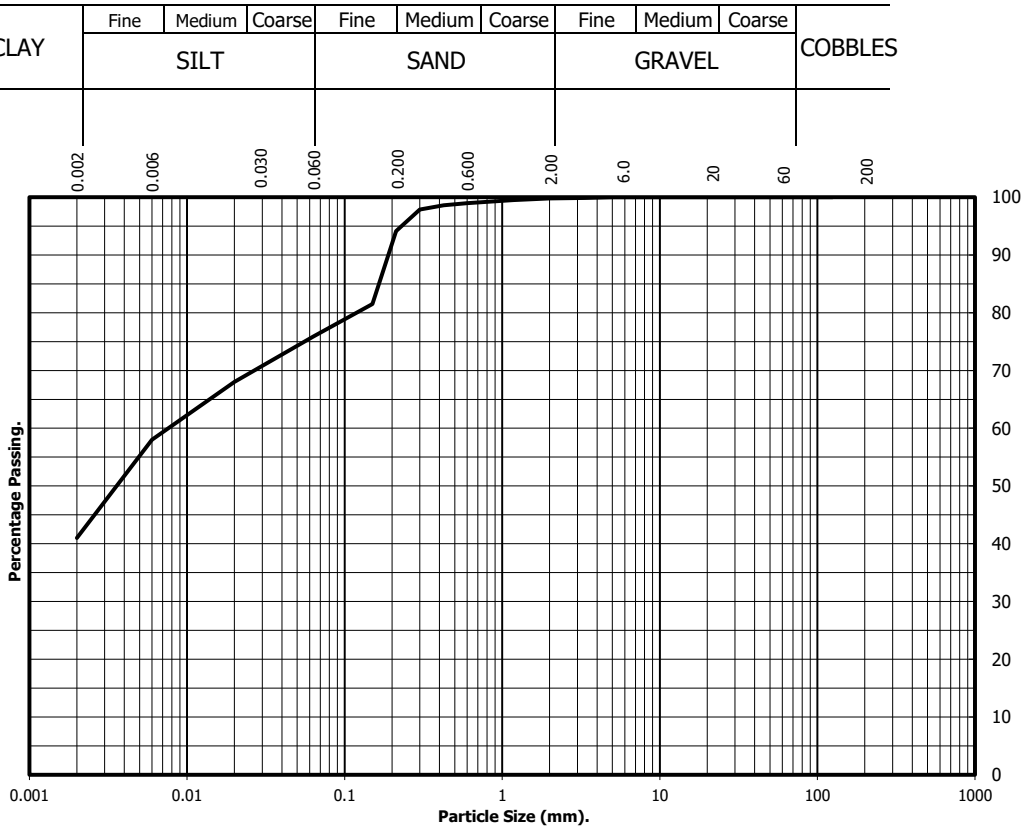
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**2.00**
Hole Number:	**SW03-14**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown fine to medium sandy silty CLAY.**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5.0	100
3.35	100
2.00	100
1.18	99
0.60	99
0.425	99
0.300	98
0.212	94
0.150	82
0.063	76

Particle Diameter	% Passing
0.02	68
0.006	58
0.002	41

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
41	35	24	0	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**5**
Contract Number:	**33812-**	**Depth from (m):**	**3.00**
Hole Number:	**SW03-14**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown fine to medium silty clayey gravelly SAND containing organic material.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	97
6.3	84
5.0	84
3.35	84
2.00	83
1.18	68
0.60	57
0.425	53
0.300	48
0.212	41
0.150	30
0.063	21

Particle Diameter	% Passing
0.02	18
0.006	16
0.002	11

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
11	10	62	17	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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BS 1377 Part 2:1990.

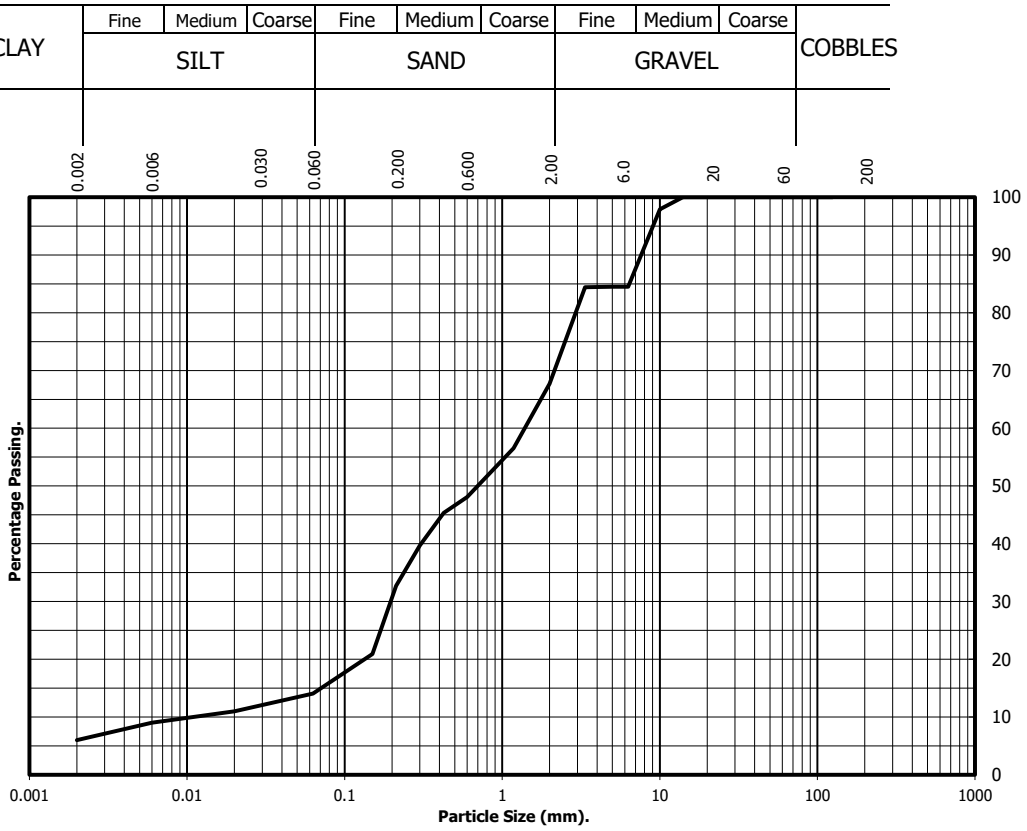
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**7**
Contract Number:	**33812-**	**Depth from (m):**	**4.00**
Hole Number:	**SW03-14**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown fine to medium clayey silty gravelly SAND containing organic material.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	98
6.3	84
5.0	84
3.35	84
2.00	68
1.18	57
0.60	48
0.425	45
0.300	40
0.212	33
0.150	21
0.063	14



Particle Diameter	% Passing
0.02	11
0.006	9
0.002	6

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
6	8	54	32	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

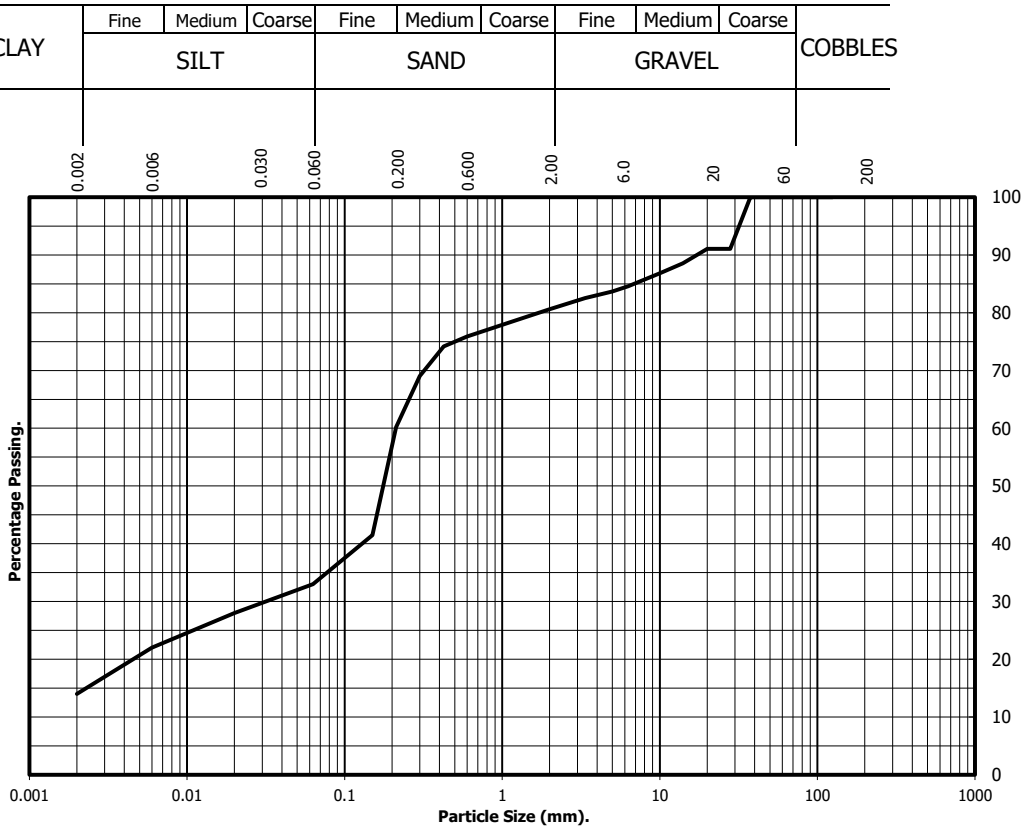
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**0.50**
Hole Number:	**SW03-15**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown clayey silty fine to coarse gravelly SAND.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	91
20	91
14	89
10	87
6.3	85
5.0	84
3.35	83
2.00	81
1.18	79
0.60	76
0.425	74
0.300	69
0.212	60
0.150	42
0.063	33



Particle Diameter	% Passing
0.02	28
0.006	22
0.002	14

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
14	19	48	19	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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Test Report:

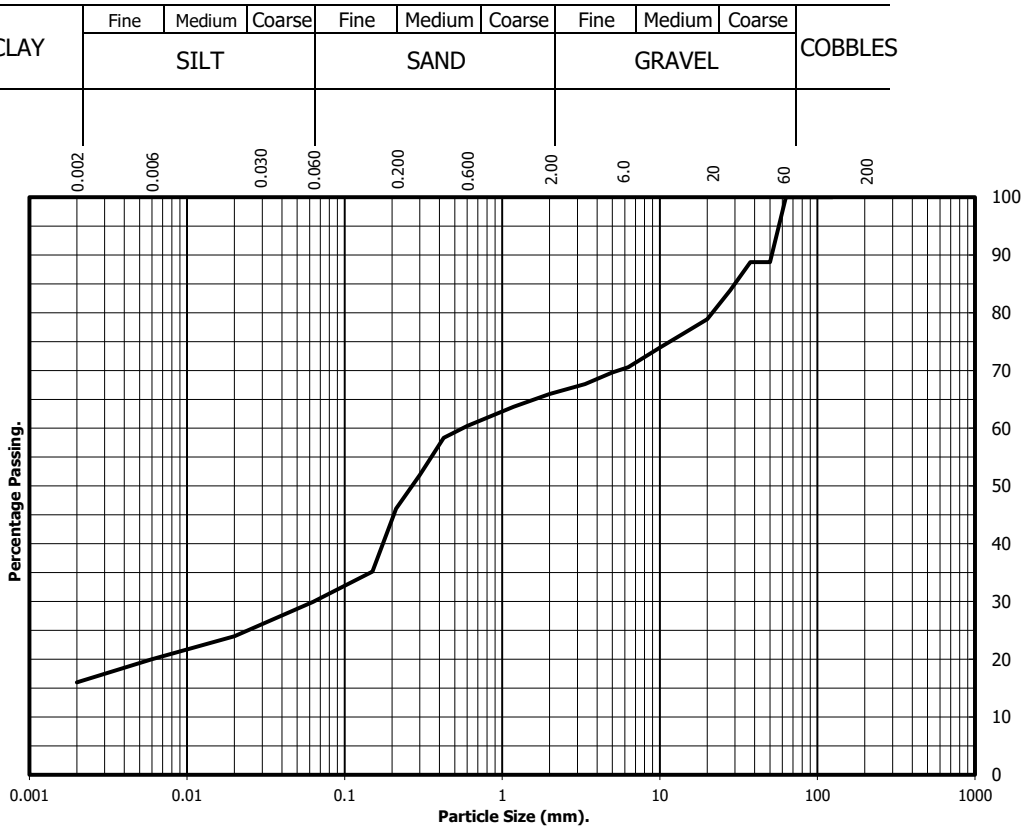
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**1.50**
Hole Number:	**SW03-15**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey fine to coarse gravelly SAND.**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	89
37.5	89
28	84
20	79
14	76
10	74
6.3	71
5.0	70
3.35	68
2.00	66
1.18	64
0.60	60
0.425	58
0.300	52
0.212	46
0.150	35
0.063	30

Particle Diameter	% Passing
0.02	24
0.006	20
0.002	16

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
16	14	36	34	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

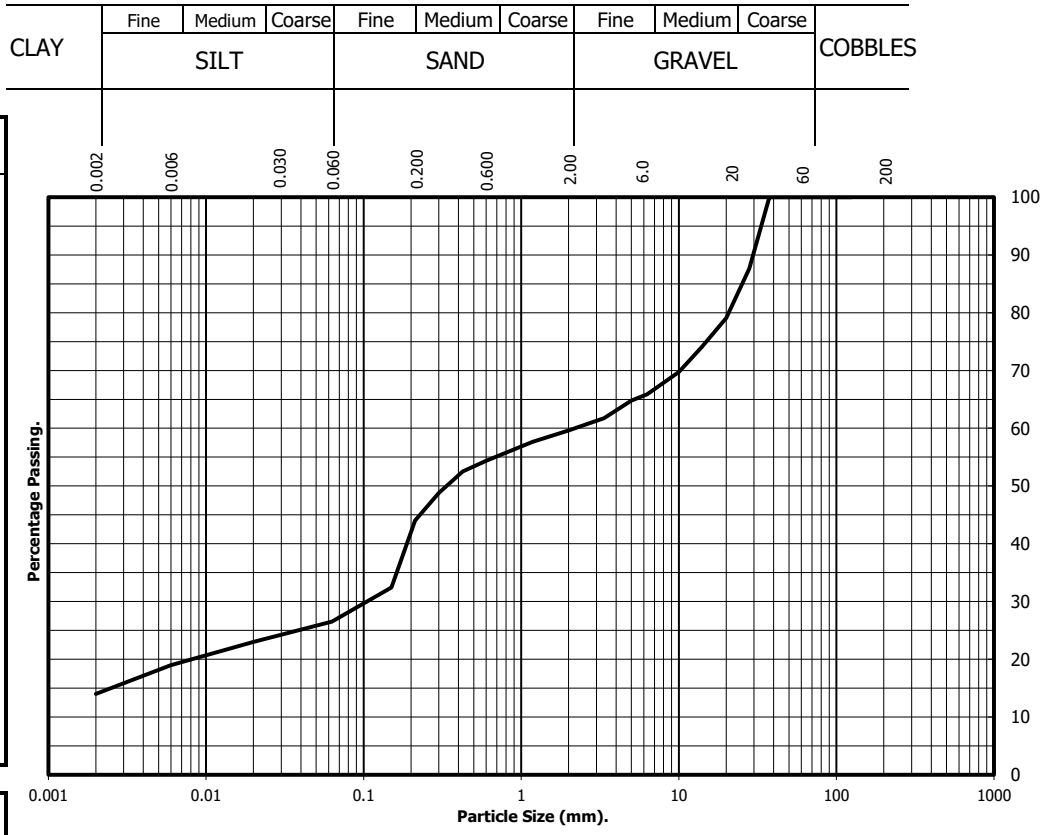
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**5**
Contract Number:	**33812-**	**Depth from (m):**	**2.50**
Hole Number:	**SW03-15**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey sandy fine to coarse GRAVEL.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	88
20	79
14	74
10	70
6.3	66
5.0	65
3.35	62
2.00	60
1.18	58
0.60	54
0.425	53
0.300	49
0.212	44
0.150	32
0.063	27



Particle Diameter	% Passing
0.02	23
0.006	19
0.002	14

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
14	13	33	40	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 30.1.17

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**5**
Contract Number:	**33812-**	**Depth from (m):**	**3.50**
Hole Number:	**SW03-15**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown gravelly silty clayey sandy fine to coarse SAND.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	97
10	94
6.3	90
5.0	89
3.35	86
2.00	84
1.18	81
0.60	76
0.425	73
0.300	68
0.212	64
0.150	55
0.063	50

Particle Diameter	% Passing
0.02	44
0.006	36
0.002	29

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
29	21	34	16	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 30.1.17

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

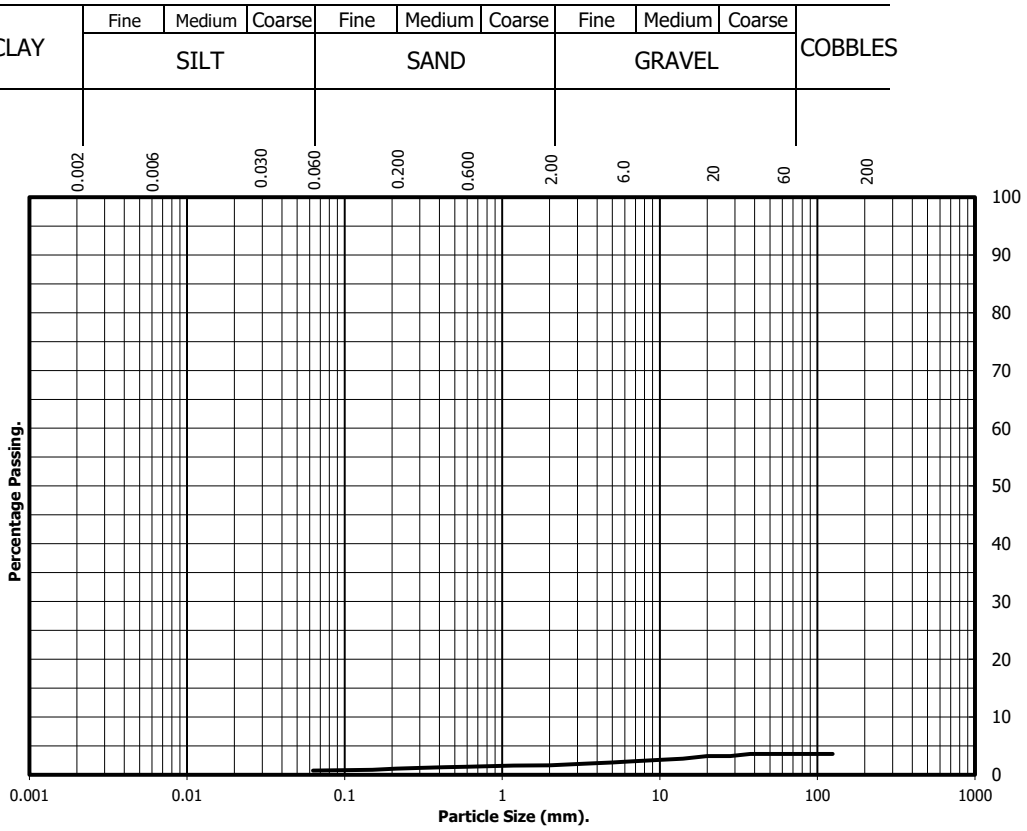
Wet Sieve, Clause 9.2

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**1.50**
Hole Number:	**SW03-16**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey sandy fine to coarse GRAVEL with one large cobble.**

BS Test Sieve	% Passing
125	4
90	4
75	4
63	4
50	4
37.5	4
28	3
20	3
14	3
10	3
6.3	2
5.0	2
3.35	2
2.00	2
1.18	2
0.60	1
0.425	1
0.300	1
0.212	1
0.150	1
0.063	1



Particle Diameter	% Passing
0.02	#
0.006	#
0.002	#

	Silt and Clay	Sand	Gravel	Cobbles	Soil Fraction
	1	1	2	96	Total Percentage

Remarks:

#- not determined

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 3.2.17

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

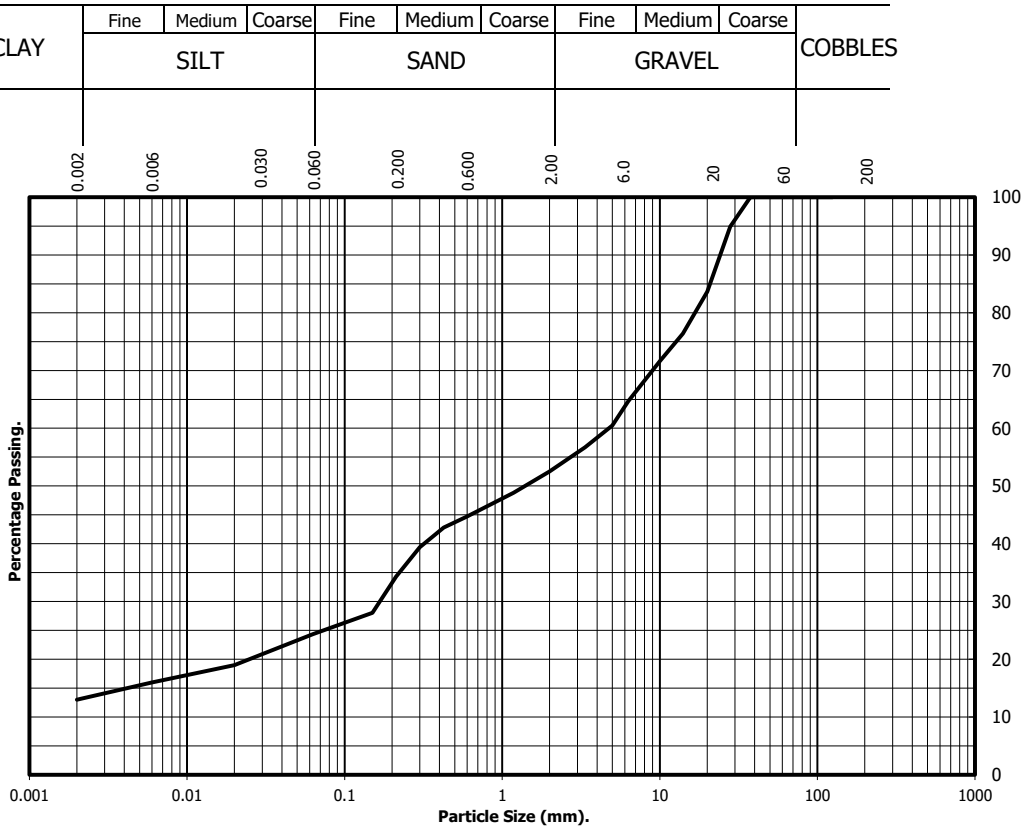
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**5**
Contract Number:	**33812-**	**Depth from (m):**	**3.00**
Hole Number:	**SW03-16**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey sandy fine to coarse GRAVEL.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	95
20	84
14	76
10	72
6.3	65
5.0	60
3.35	57
2.00	53
1.18	49
0.60	45
0.425	43
0.300	39
0.212	34
0.150	28
0.063	24



Particle Diameter	% Passing
0.02	19
0.006	16
0.002	13

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
13	11	29	47	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 30.1.17

GSTL
GEO SITE & TESTING SERVICES LTD

UKAS TESTING
2788

Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

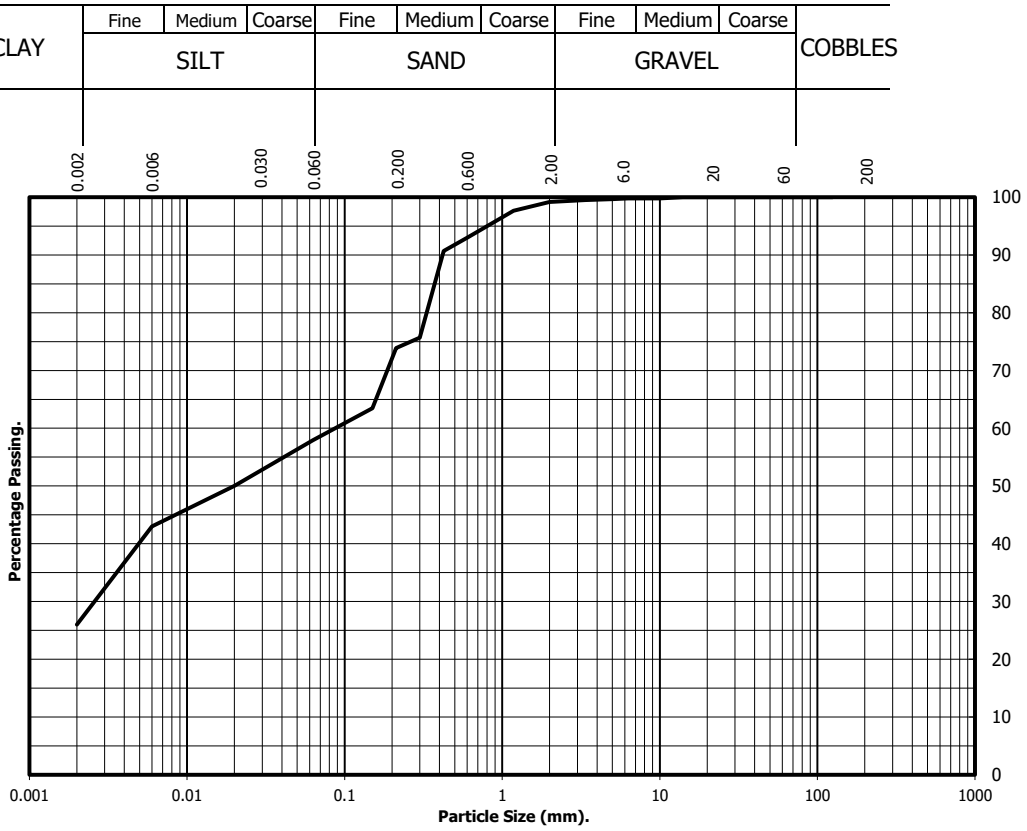
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**0.20**
Hole Number:	**SW03-17**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown gravelly clayey silty fine to medium SAND.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5.0	100
3.35	99
2.00	99
1.18	98
0.60	93
0.425	91
0.300	76
0.212	74
0.150	63
0.063	58



Particle Diameter	% Passing
0.02	50
0.006	43
0.002	26

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
26	32	41	1	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 30.1.17

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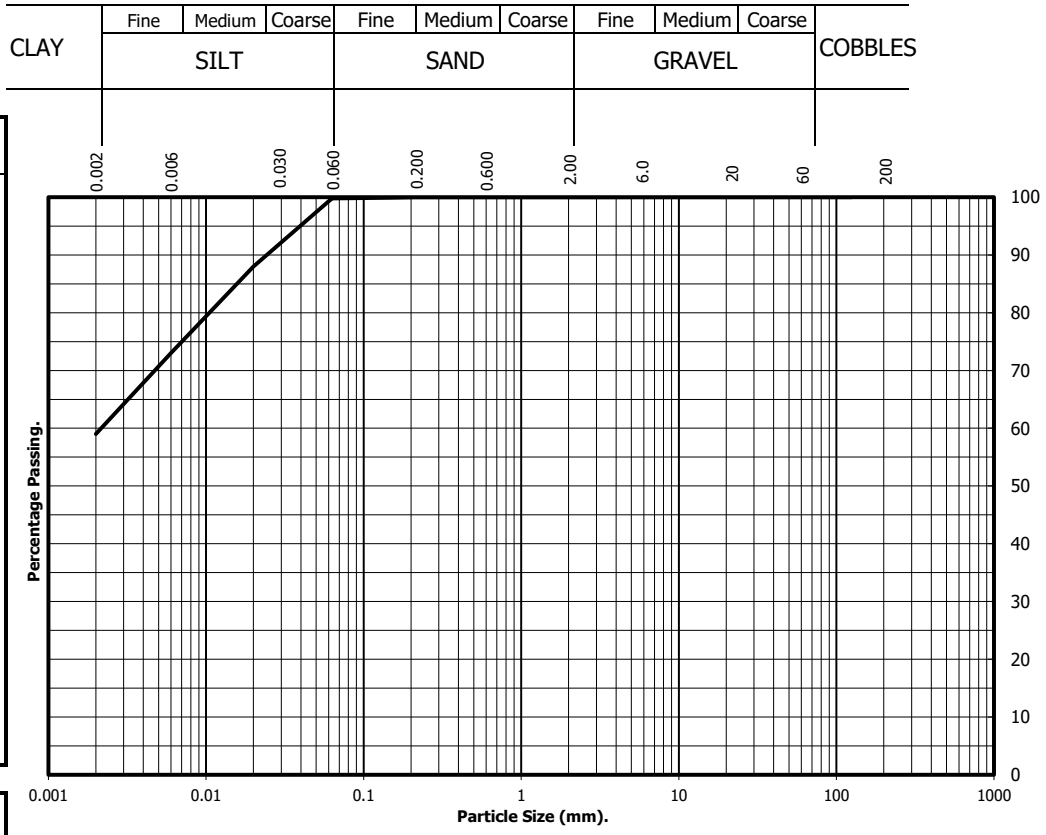
Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**0.50**
Hole Number:	**SW03-17**	**Depth to (m):**	**N/A**
		Sample Type:	**B**
Location:	**Galway GCT**		
Description:	**Brown silty CLAY.**		



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5.0	100
3.35	100
2.00	100
1.18	100
0.60	100
0.425	100
0.300	100
0.212	100
0.150	100
0.063	100

Particle Diameter	% Passing
0.02	88
0.006	73
0.002	59

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
59	41	0	0	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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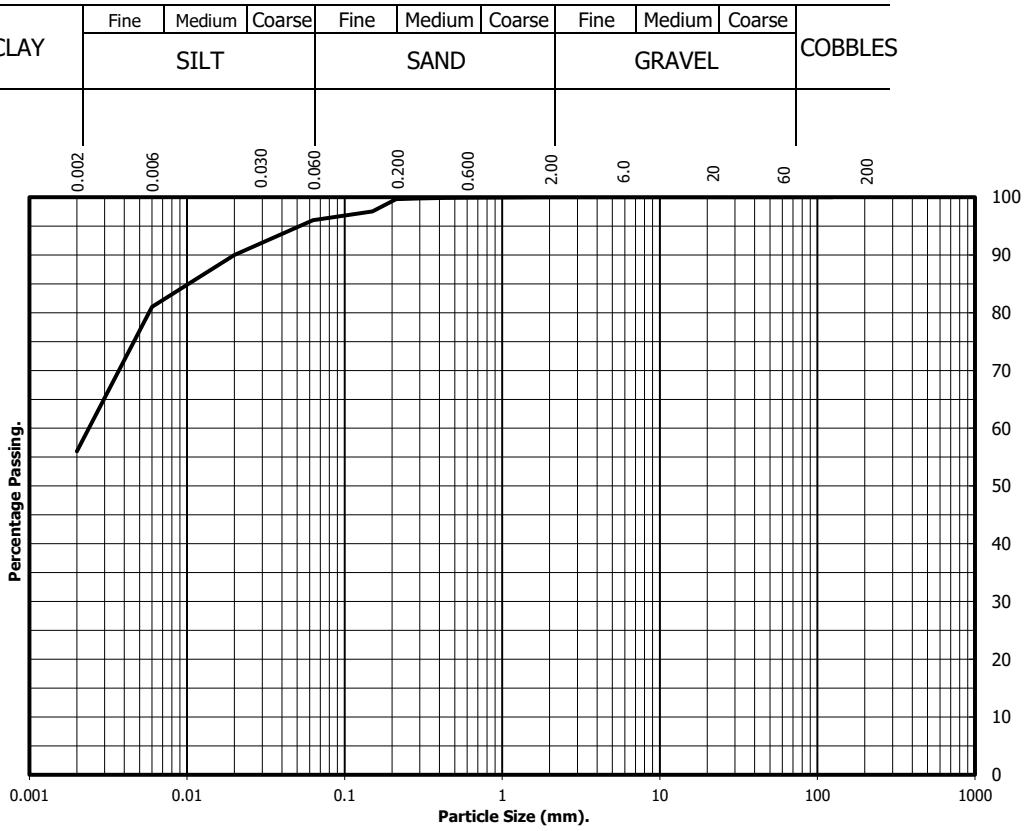
Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**0.50**
Hole Number:	**SW03-18**	**Depth to (m):**	**N/A**
		Sample Type:	**B**
Location:	**Galway GCT**		
Description:	**Brown slightly sandy silty CLAY.**		

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5.0	100
3.35	100
2.00	100
1.18	100
0.60	100
0.425	100
0.300	100
0.212	100
0.150	98
0.063	96



Particle Diameter	% Passing
0.02	90
0.006	81
0.002	56

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
56	40	4	0	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

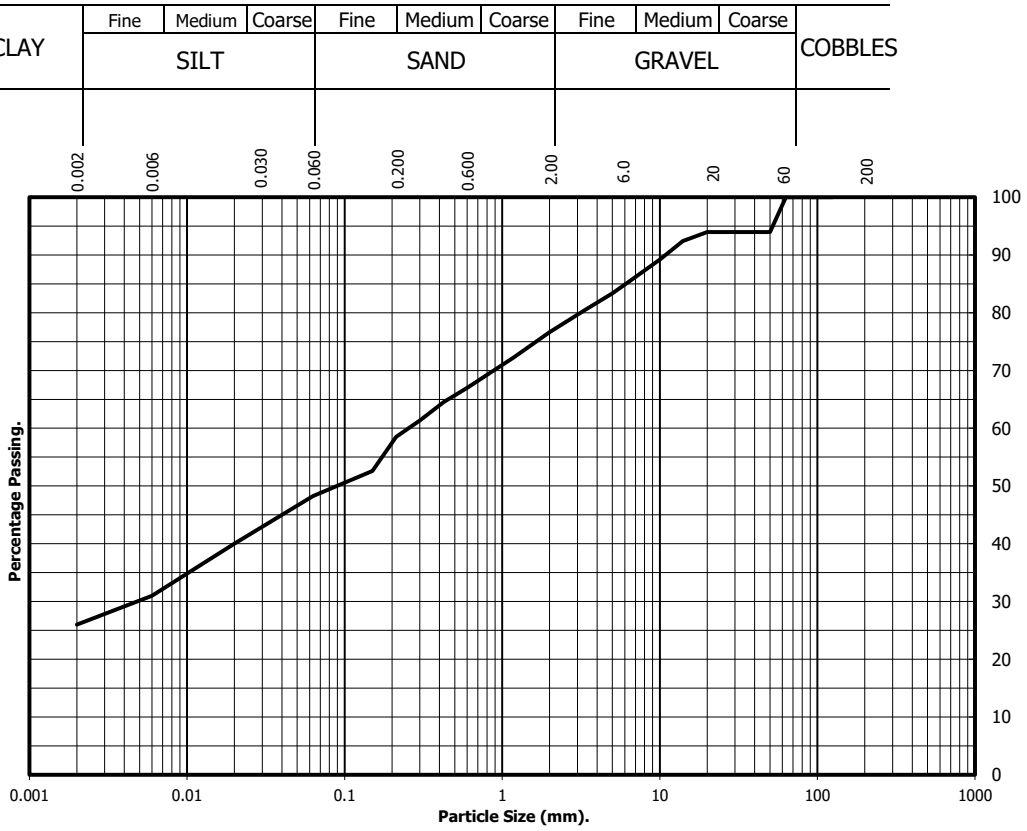
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**1.50**
Hole Number:	**SW03-18**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty fine to coarse gravelly clayey SAND.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	94
37.5	94
28	94
20	94
14	92
10	89
6.3	85
5.0	83
3.35	80
2.00	77
1.18	72
0.60	67
0.425	65
0.300	61
0.212	59
0.150	53
0.063	48



Particle Diameter	% Passing
0.02	40
0.006	31
0.002	26

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
26	22	29	23	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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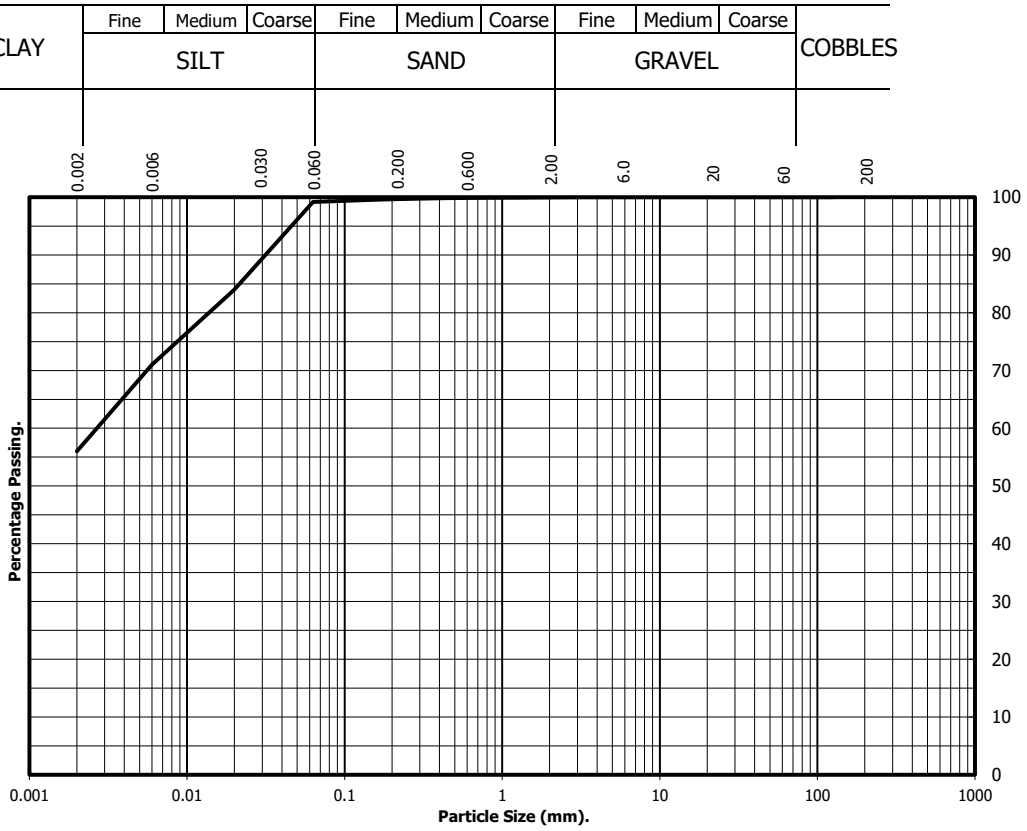
Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**5**
Contract Number:	**33812-**	**Depth from (m):**	**2.00**
Hole Number:	**SW03-18**	**Depth to (m):**	**N/A**
		Sample Type:	**B**
Location:	**Galway GCT**		
Description:	**Brown fine sandy silty CLAY.**		



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5.0	100
3.35	100
2.00	100
1.18	100
0.60	100
0.425	100
0.300	100
0.212	100
0.150	100
0.063	99

Particle Diameter	% Passing
0.02	84
0.006	71
0.002	56

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
56	43	1	0	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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Date: 31.1.17

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Test Report:

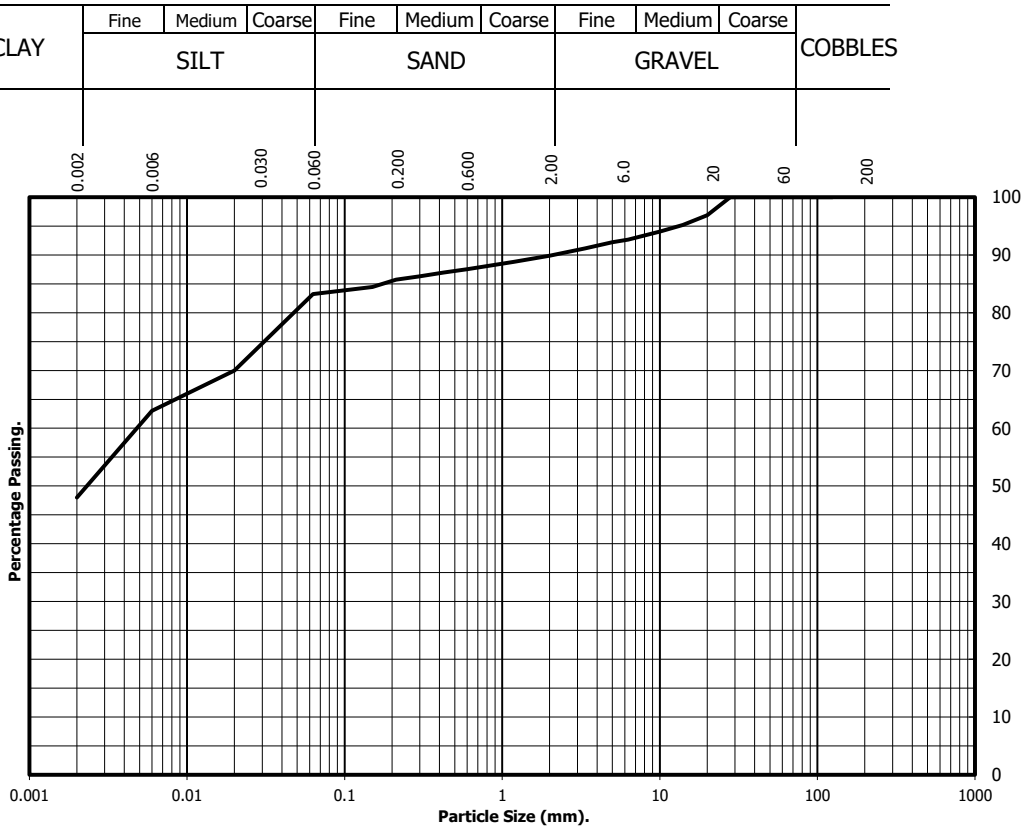
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**7**
Contract Number:	**33812-**	**Depth from (m):**	**3.00**
Hole Number:	**SW03-18**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown sandy fine to coarse gravelly silty CLAY.**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	97
14	95
10	94
6.3	93
5.0	92
3.35	91
2.00	90
1.18	89
0.60	88
0.425	87
0.300	86
0.212	86
0.150	84
0.063	83

Particle Diameter	% Passing
0.02	70
0.006	63
0.002	48

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
48	35	7	10	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 31.1.17

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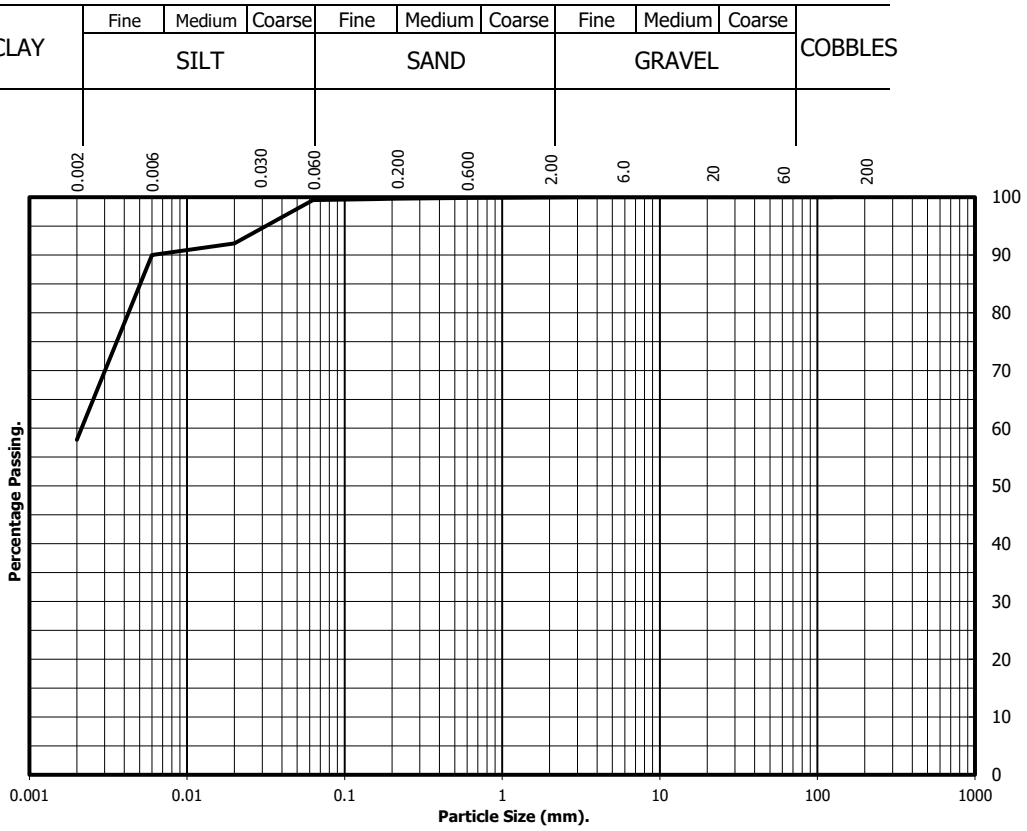
Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**9**
Contract Number:	**33812-**	**Depth from (m):**	**3.50**
Hole Number:	**SW03-18**	**Depth to (m):**	**N/A**
		Sample Type:	**B**
Location:	**Galway GCT**		
Description:	**Greyish brown silty CLAY.**		



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5.0	100
3.35	100
2.00	100
1.18	100
0.60	100
0.425	100
0.300	100
0.212	100
0.150	100
0.063	100

Particle Diameter	% Passing
0.02	92
0.006	90
0.002	58

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
58	42	0	0	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

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Test Report:

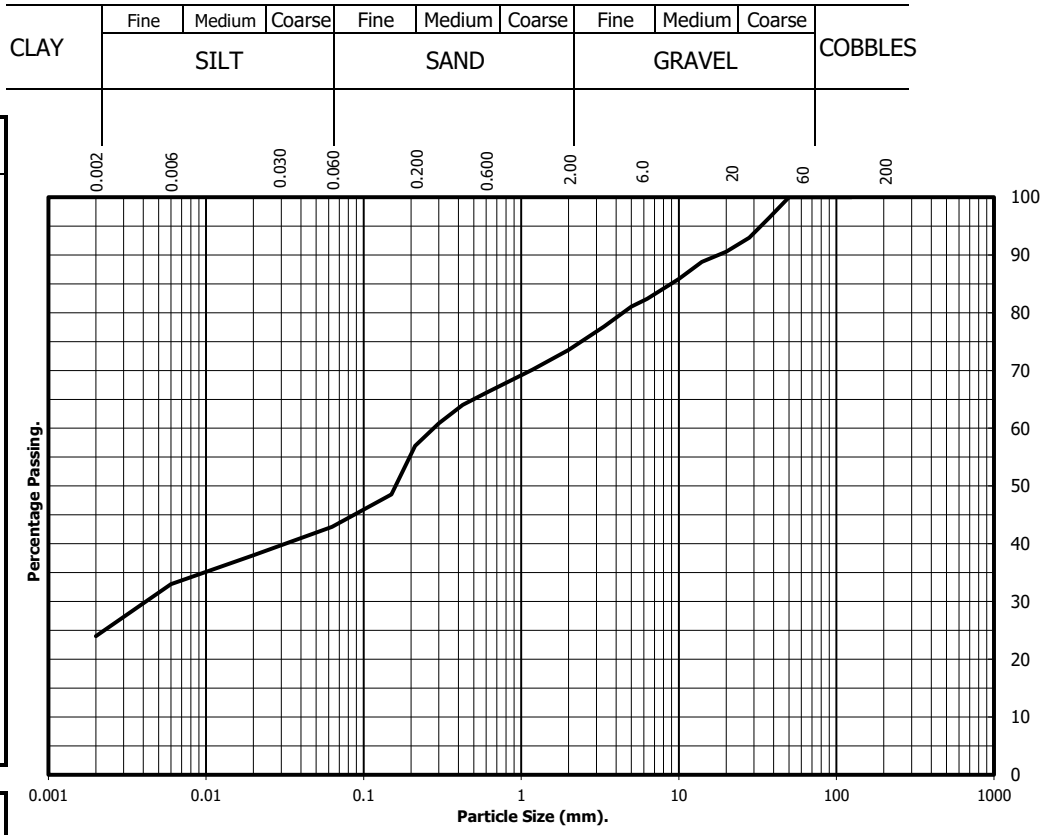
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**0.80**
Hole Number:	**TP03**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey fine to coarse gravelly SAND.**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	96
28	93
20	91
14	89
10	86
6.3	82
5.0	81
3.35	78
2.00	74
1.18	70
0.60	66
0.425	64
0.300	61
0.212	57
0.150	49
0.063	43

Particle Diameter	% Passing
0.02	38
0.006	33
0.002	24

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
24	19	31	26	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 31.1.17

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

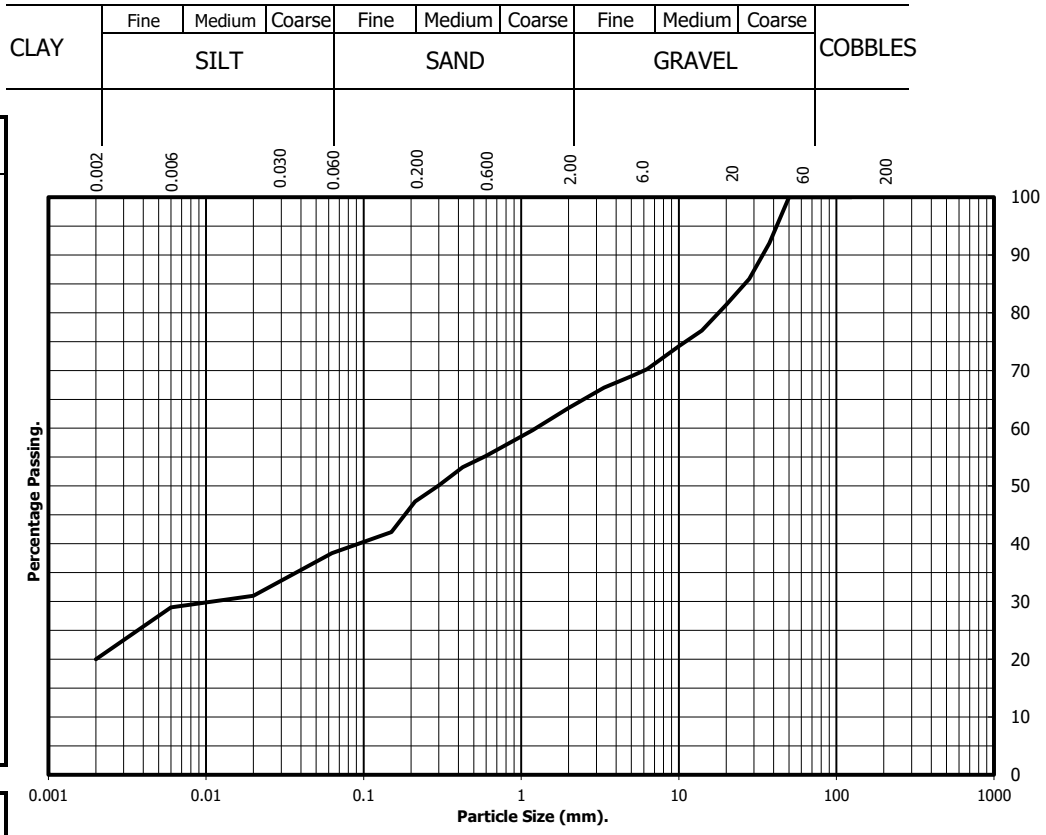
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**1.50**
Hole Number:	**TP03-50**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey fine to coarse sandy GRAVEL.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	92
28	86
20	81
14	77
10	74
6.3	70
5.0	69
3.35	67
2.00	64
1.18	60
0.60	55
0.425	53
0.300	50
0.212	47
0.150	42
0.063	38



Particle Diameter	% Passing
0.02	31
0.006	29
0.002	20

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
20	18	26	36	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

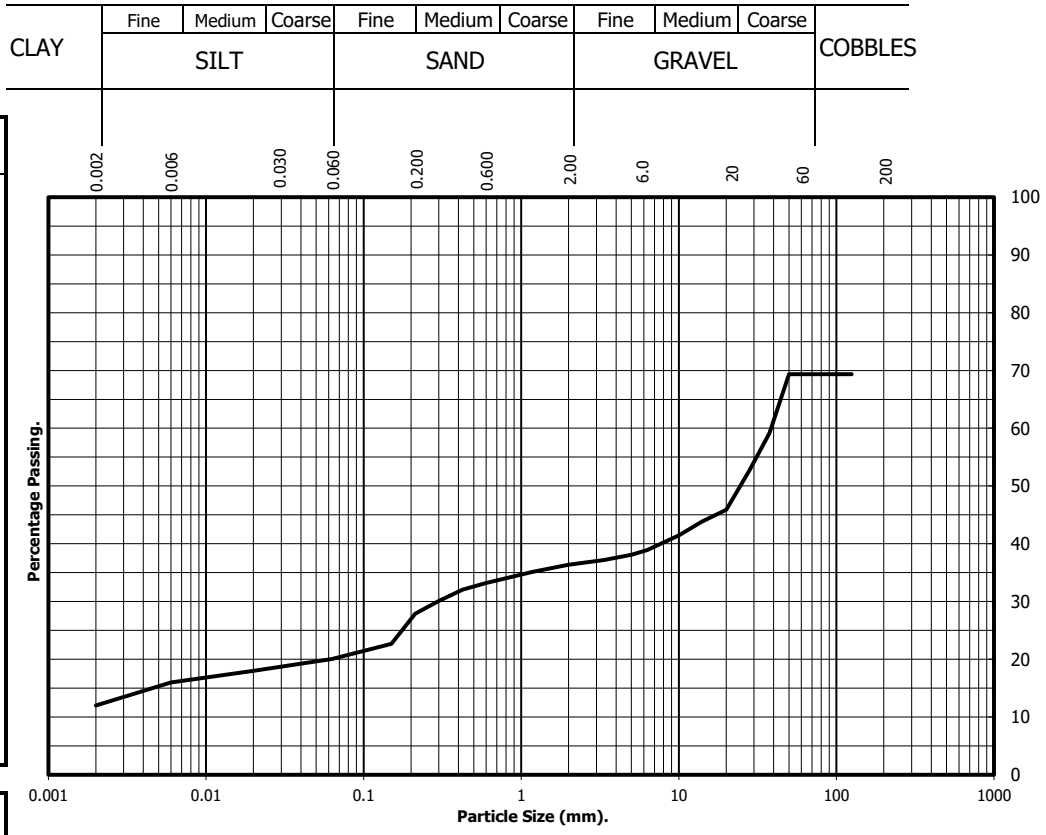
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**5**
Contract Number:	**33812-**	**Depth from (m):**	**2.00**
Hole Number:	**TP03-50**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey fine to coarse sandy GRAVEL with many cobbles.**

BS Test Sieve	% Passing
125	69
90	69
75	69
63	69
50	69
37.5	59
28	53
20	46
14	44
10	41
6.3	39
5.0	38
3.35	37
2.00	36
1.18	35
0.60	33
0.425	32
0.300	30
0.212	28
0.150	23
0.063	20



Particle Diameter	% Passing
0.02	18
0.006	16
0.002	12

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
12	8	16	33	31	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

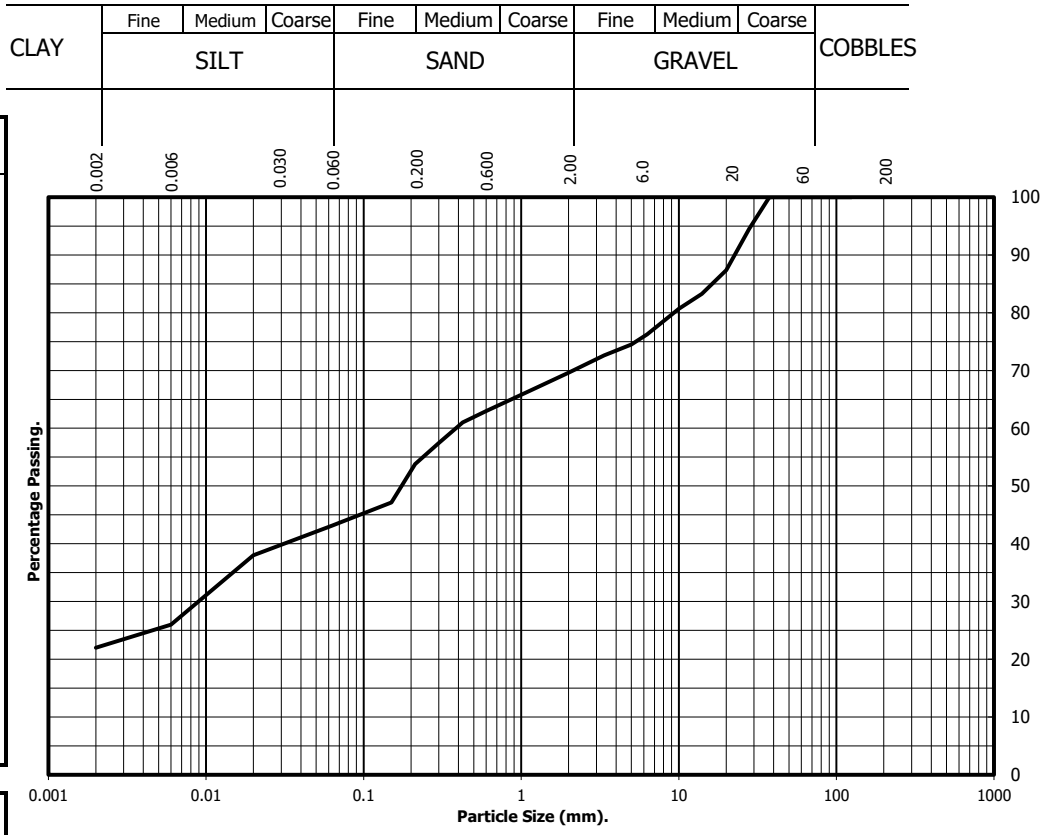
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**7**
Contract Number:	**33812-**	**Depth from (m):**	**3.00**
Hole Number:	**TP03-50**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey fine to coarse sandy GRAVEL.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	95
20	87
14	83
10	81
6.3	76
5.0	75
3.35	73
2.00	70
1.18	67
0.60	63
0.425	61
0.300	57
0.212	54
0.150	47
0.063	43



Particle Diameter	% Passing
0.02	38
0.006	26
0.002	22

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
22	21	27	30	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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Test Report:

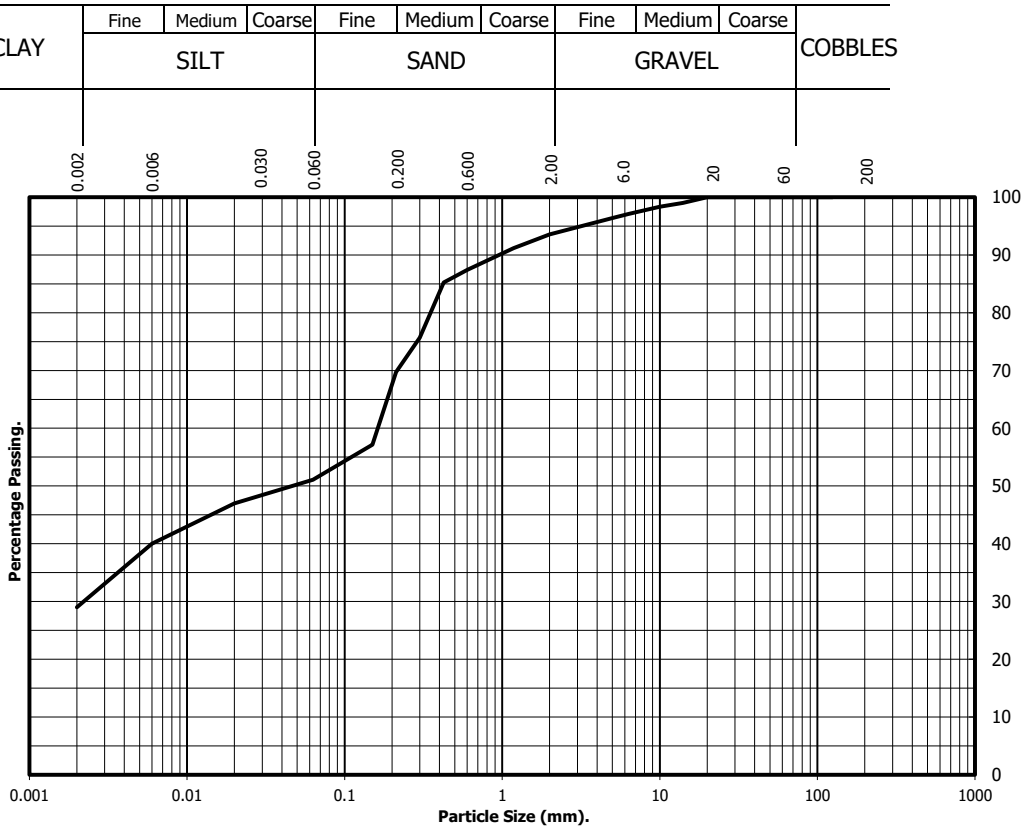
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**0.20**
Hole Number:	**TP03-52**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown gravelly silty clayey fine SAND.**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	99
10	98
6.3	97
5.0	96
3.35	95
2.00	94
1.18	91
0.60	87
0.425	85
0.300	76
0.212	70
0.150	57
0.063	51

Particle Diameter	% Passing
0.02	47
0.006	40
0.002	29

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
29	22	43	6	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**0.50**
Hole Number:	**TP03-52**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey sandy fine to coarse GRAVEL.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	82
37.5	78
28	75
20	69
14	66
10	65
6.3	62
5.0	54
3.35	53
2.00	51
1.18	49
0.60	46
0.425	44
0.300	44
0.212	40
0.150	32
0.063	26

Particle Diameter	% Passing
0.02	22
0.006	19
0.002	16

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
16	10	25	49	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**1**
Contract Number:	**33812-**	**Depth from (m):**	**0.50**
Hole Number:	**TP03-53**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown gravelly silty clayey fine to coarse SAND.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	99
10	98
6.3	96
5.0	94
3.35	93
2.00	91
1.18	88
0.60	85
0.425	83
0.300	78
0.212	71
0.150	59
0.063	53

Particle Diameter	% Passing
0.02	42
0.006	39
0.002	29

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
29	24	38	9	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
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Date: 31.1.17

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Test Report:

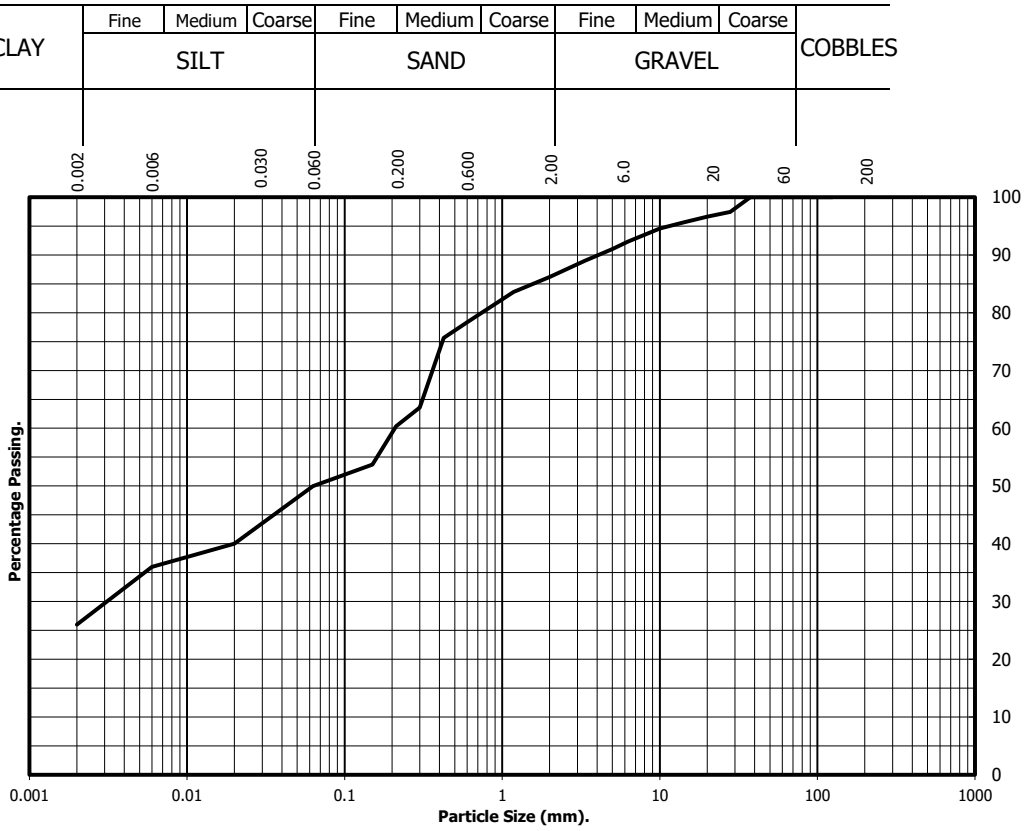
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**1.00**
Hole Number:	**TP03-53**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown fine to coarse gravelly silty clayey SAND.**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	97
20	97
14	96
10	95
6.3	92
5.0	91
3.35	89
2.00	86
1.18	84
0.60	78
0.425	76
0.300	64
0.212	60
0.150	54
0.063	50

Particle Diameter	% Passing
0.02	40
0.006	36
0.002	26

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
26	24	36	14	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 31.1.17

GSTL
GEO SITE & TESTING SERVICES LTD

UKAS TESTING
2788

Test Report:

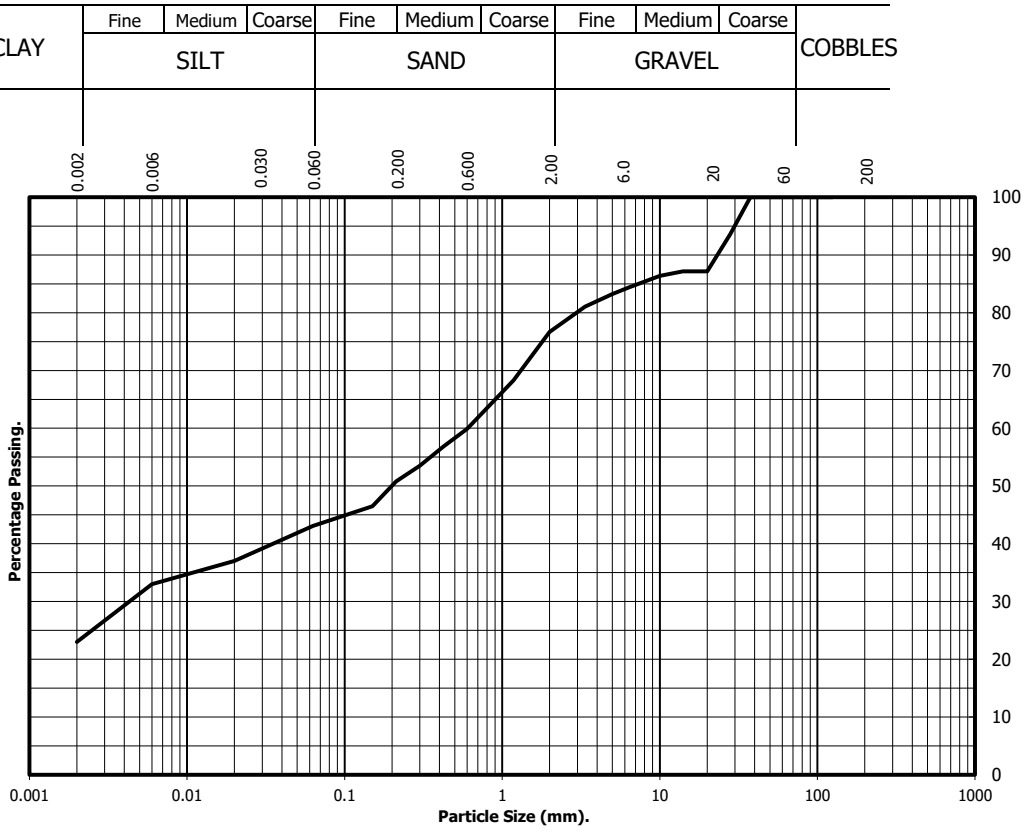
Particle Size Distribution Test
BS 1377 Part 2:1990.

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**3**
Contract Number:	**33812-**	**Depth from (m):**	**2.00**
Hole Number:	**TP03-53**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey fine to coarse gravelly SAND.**



BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	94
20	87
14	87
10	86
6.3	84
5.0	83
3.35	81
2.00	77
1.18	68
0.60	60
0.425	57
0.300	53
0.212	51
0.150	46
0.063	43

Particle Diameter	% Passing
0.02	37
0.006	33
0.002	23

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
23	20	34	23	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 31.1.17

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GEO SITE & TESTING SERVICES LTD

UKAS TESTING
2788

Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

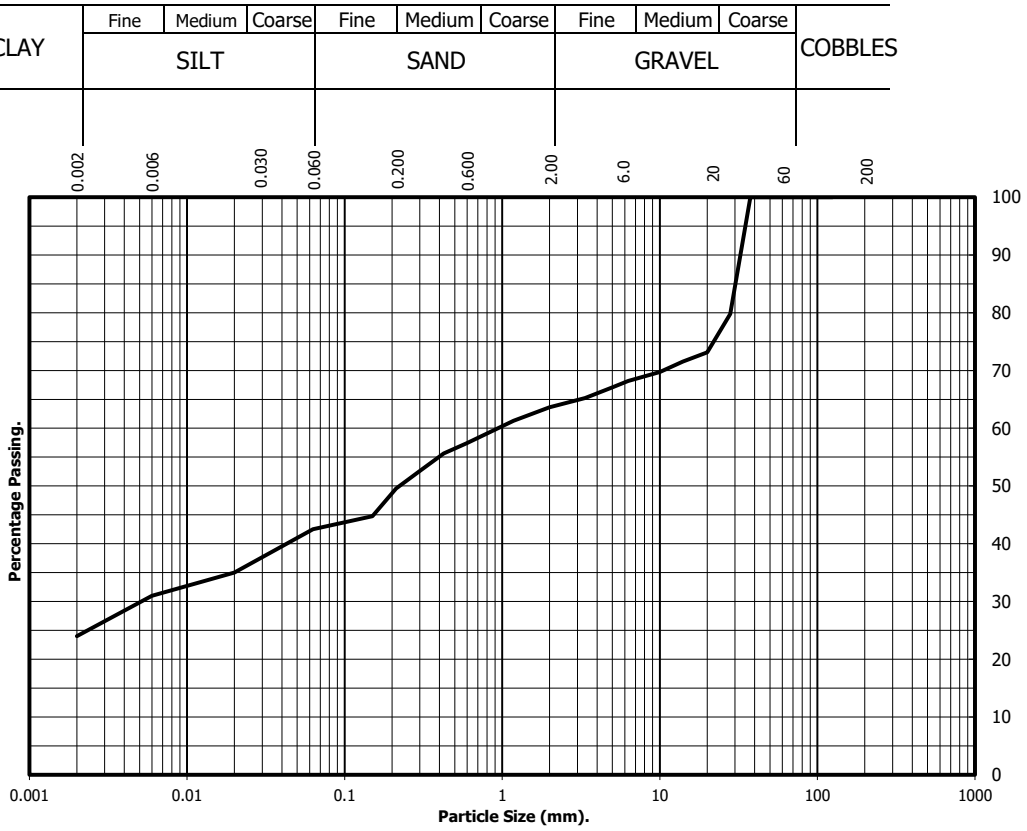
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**7**
Contract Number:	**33812-**	**Depth from (m):**	**2.50**
Hole Number:	**TP03-53**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty sandy clayey fine to coarse GRAVEL.**

BS Test Sieve	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	80
20	73
14	72
10	70
6.3	68
5.0	67
3.35	65
2.00	64
1.18	61
0.60	57
0.425	56
0.300	53
0.212	50
0.150	45
0.063	42



Particle Diameter	% Passing
0.02	35
0.006	31
0.002	24

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
24	18	22	36	0	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 31.1.17

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Test Report:

Particle Size Distribution Test
BS 1377 Part 2:1990.

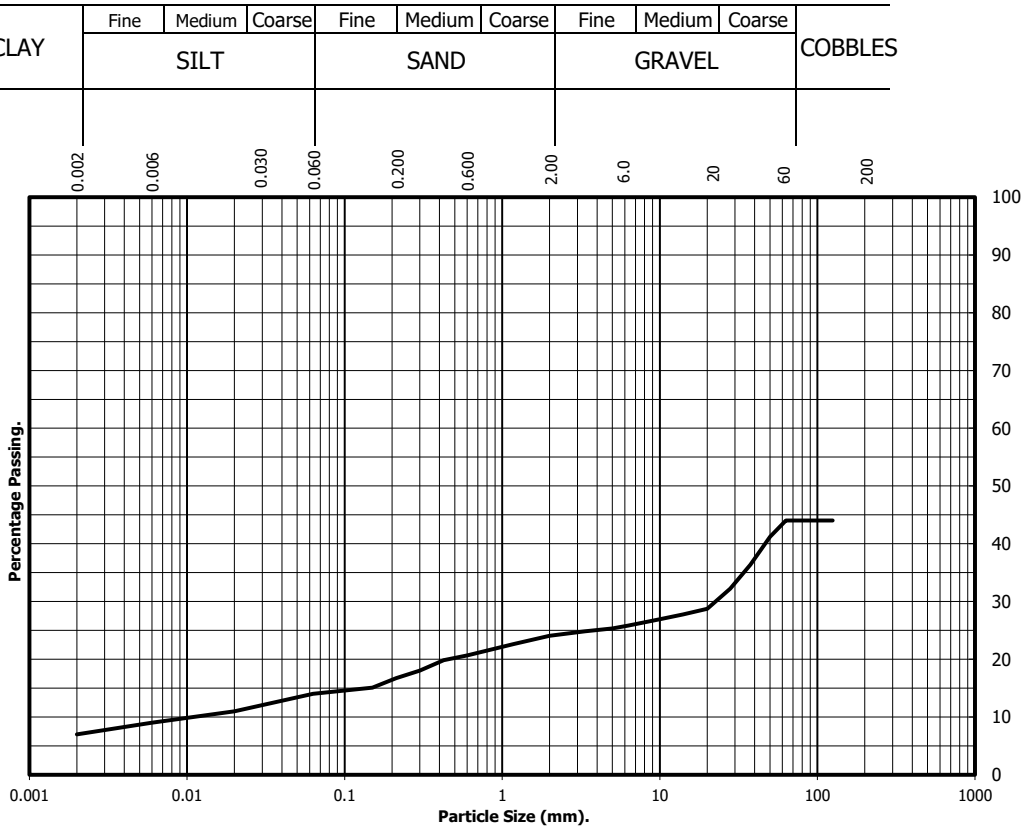
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Client ref:	**P16185**	**Sample Number:**	**9**
Contract Number:	**33812-**	**Depth from (m):**	**3.50**
Hole Number:	**TP03-53**	**Depth to (m):**	**N/A**
		Sample Type:	**B**

Location: **Galway GCT**

Description: **Brown silty clayey sandy fine to coarse GRAVEL with many cobbles.**

BS Test Sieve	% Passing
125	44
90	44
75	44
63	44
50	41
37.5	36
28	32
20	29
14	28
10	27
6.3	26
5.0	25
3.35	25
2.00	24
1.18	23
0.60	21
0.425	20
0.300	18
0.212	17
0.150	15
0.063	14



Particle Diameter	% Passing
0.02	11
0.006	9
0.002	7

Clay	Silt	Sand	Gravel	Cobbles	Soil Fraction
7	7	10	20	56	Total Percentage

Remarks:

Cl 9.4.8 - Sample has not been pretreated

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 31.1.17

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Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

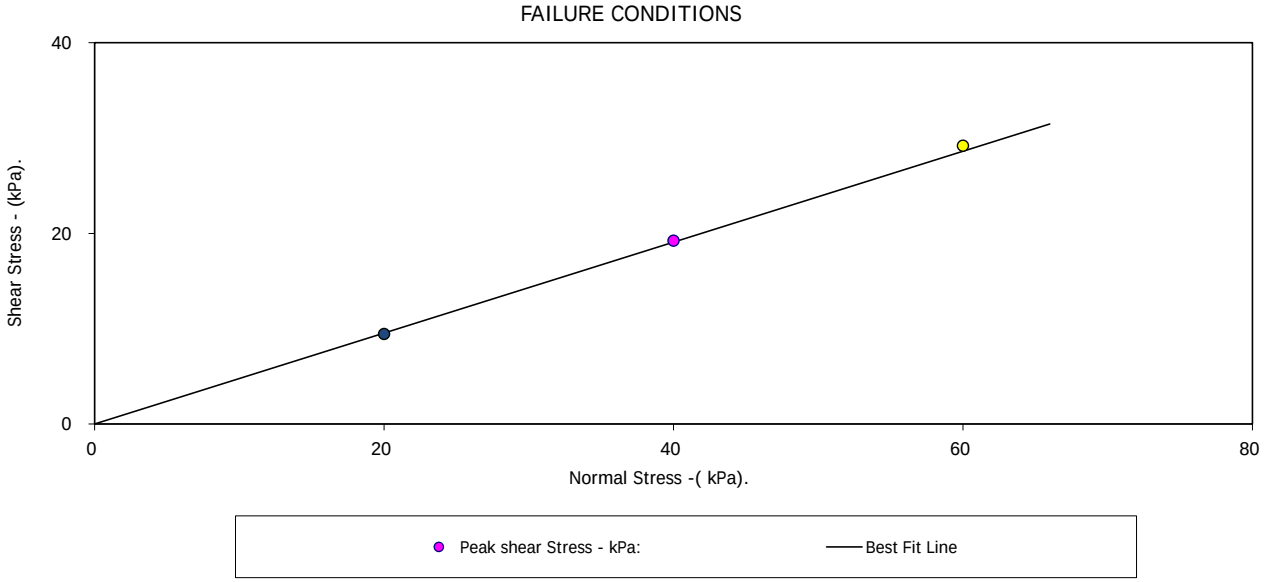
Borehole Number:	TP03-52	Depth from (m):	0.50
Sample Number :		Depth to (m):	3.00

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown slightly silty gravelly (fine-coarse/angular-subrounded) sandy CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.27	24.27	24.27
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	9	9	9
Bulk Density - Mg/m3:	2.10	2.10	2.10
Dry Density - Mg/m3:	1.92	1.92	1.92
Voids Ratio:	0.3811	0.3827	0.3825
Normal Pressure- kPa	20	40	60
Consolidation			
Consolidated Height - mm:	24.21	24.03	23.85
Shear			
Rate of Strain (mm/min)	0.010	0.010	0.010
Strain at peak shear stress (mm)	8.38	7.34	7.33
Peak shear Stress - kPa:	9	19	29

PEAK	
Angle of Shearing Resistance: (~~θ~~)	**25.5**
Effective Cohesion - kPa:	**0**



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Contract No.: **33812**

Galway GCT

Client Ref Number: **P16185**

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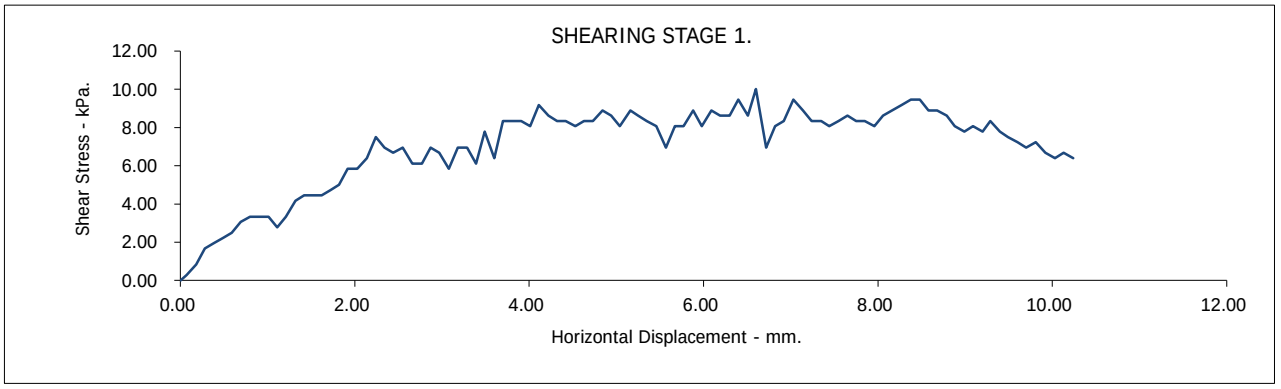
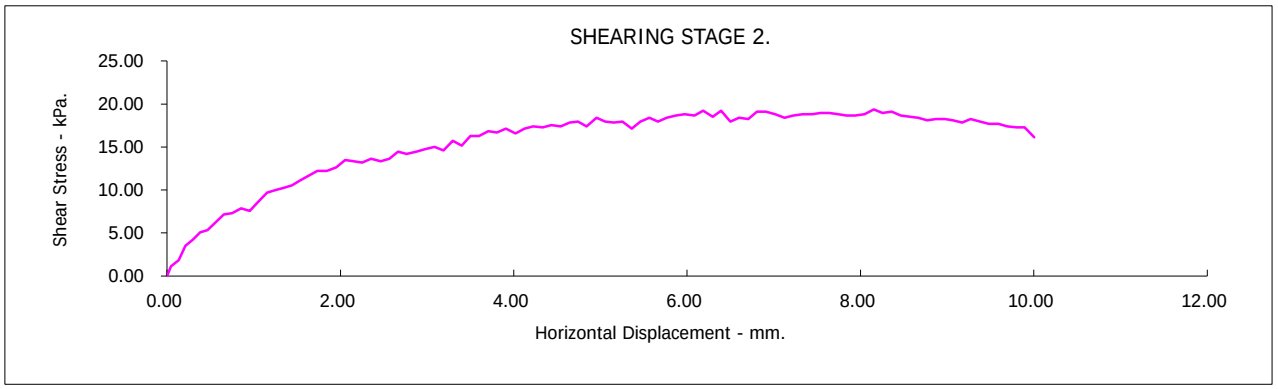
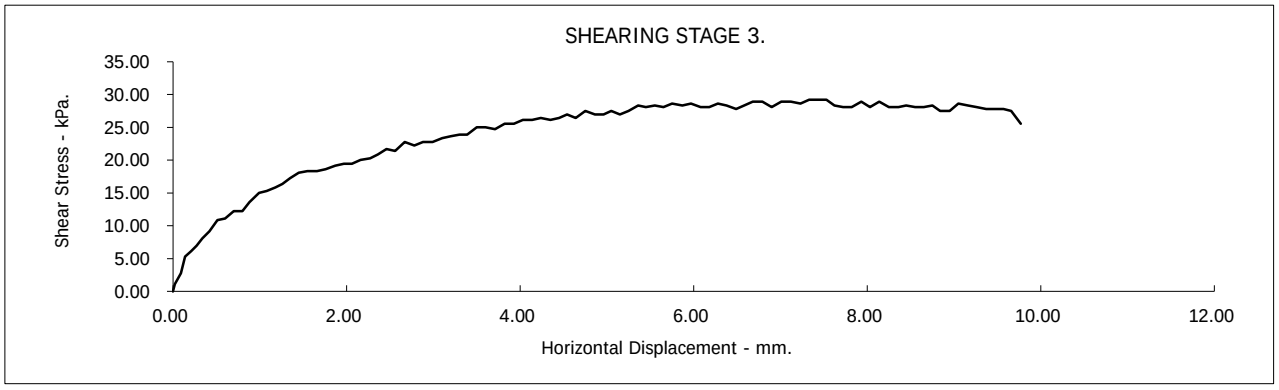
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-52	Depth from (m):	0.50
Sample Number :		Depth to (m):	3.00







Galway GCT

Contract No.:
33812

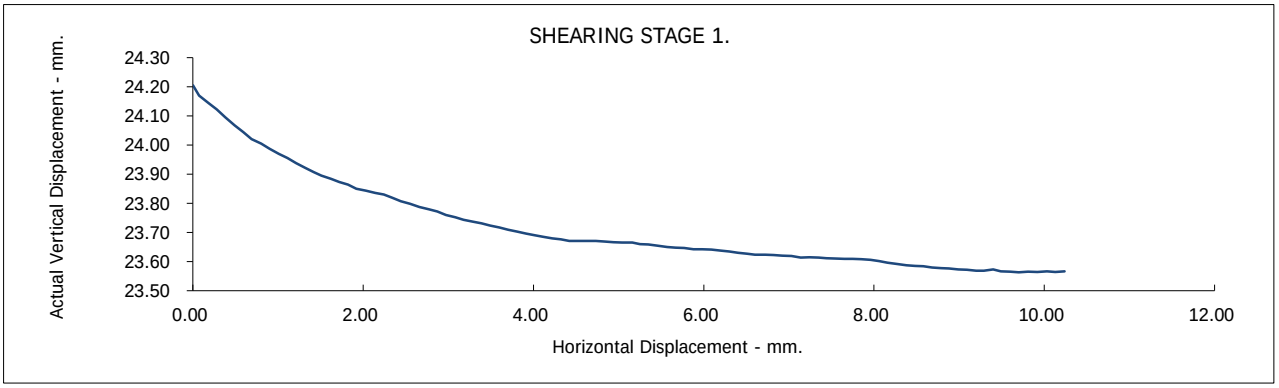
Client Ref Number:
P16185

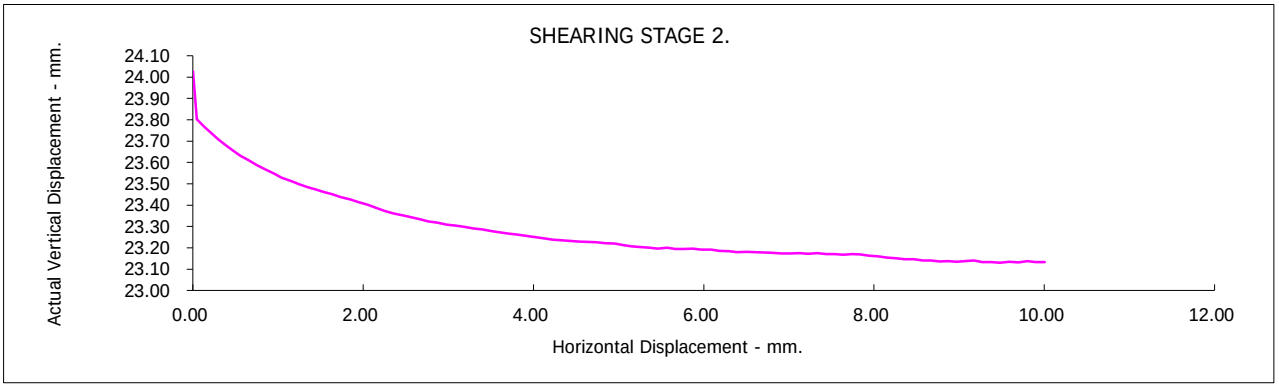
Figure.

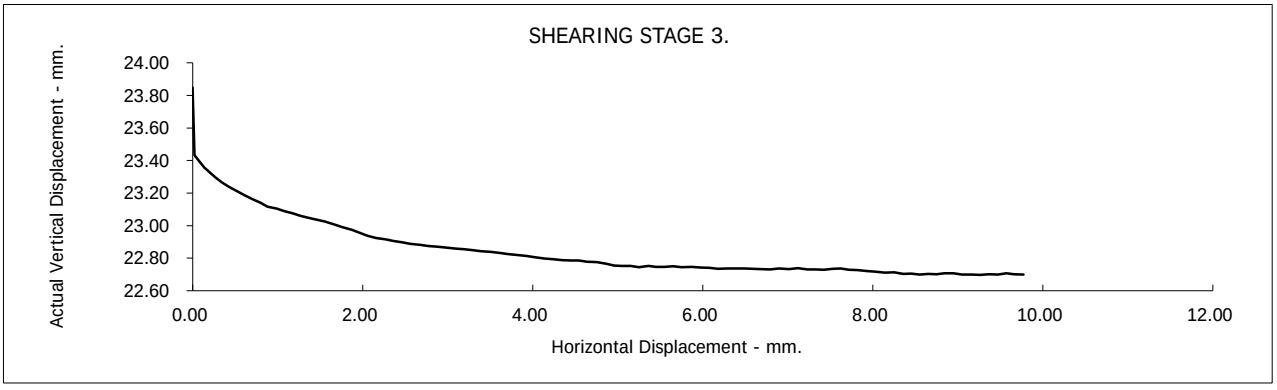
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-52	Depth from (m):	0.50
Sample Number :		Depth to (m):	3.00







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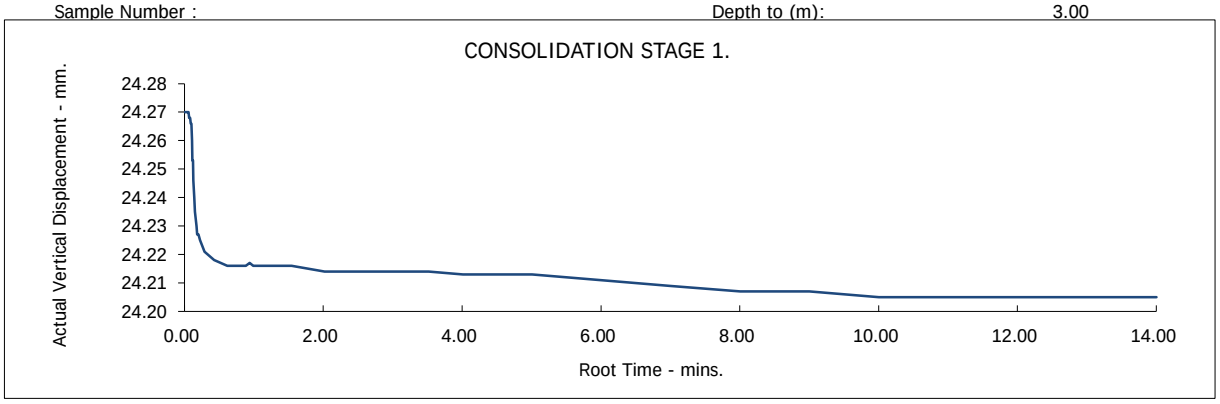
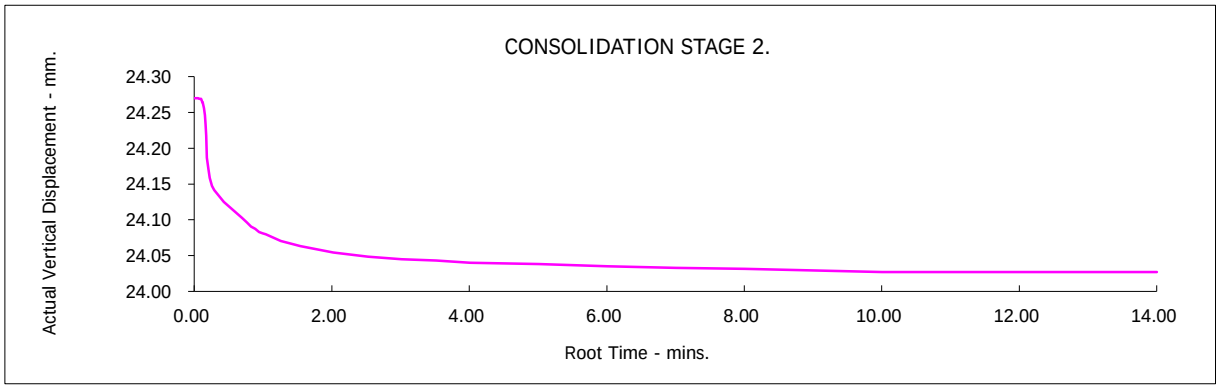
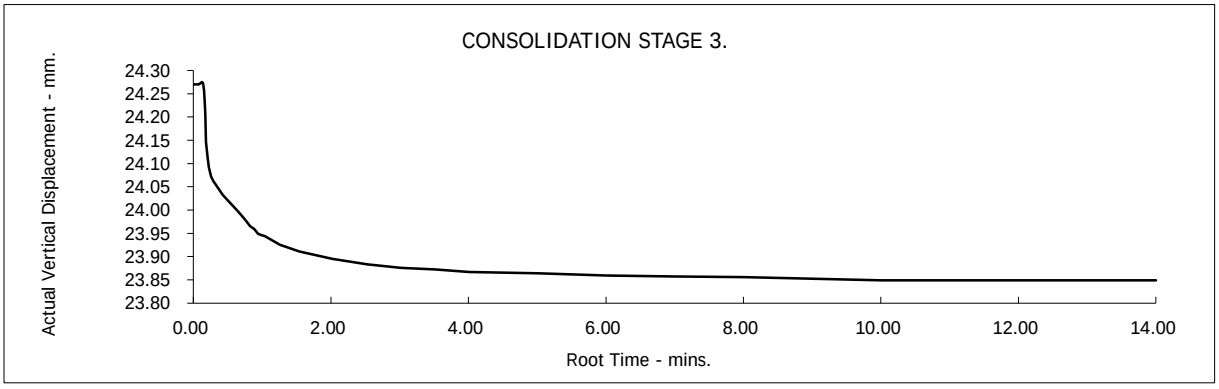
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-52	Depth from (m):	0.50
Sample Number :		Depth to (m):	3.00







Contract No.:
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Galway GCT

Client Ref Number:
P16185

Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-52	Depth from (m):	0.50
Sample Number :	B3	Depth to (m):	3.00

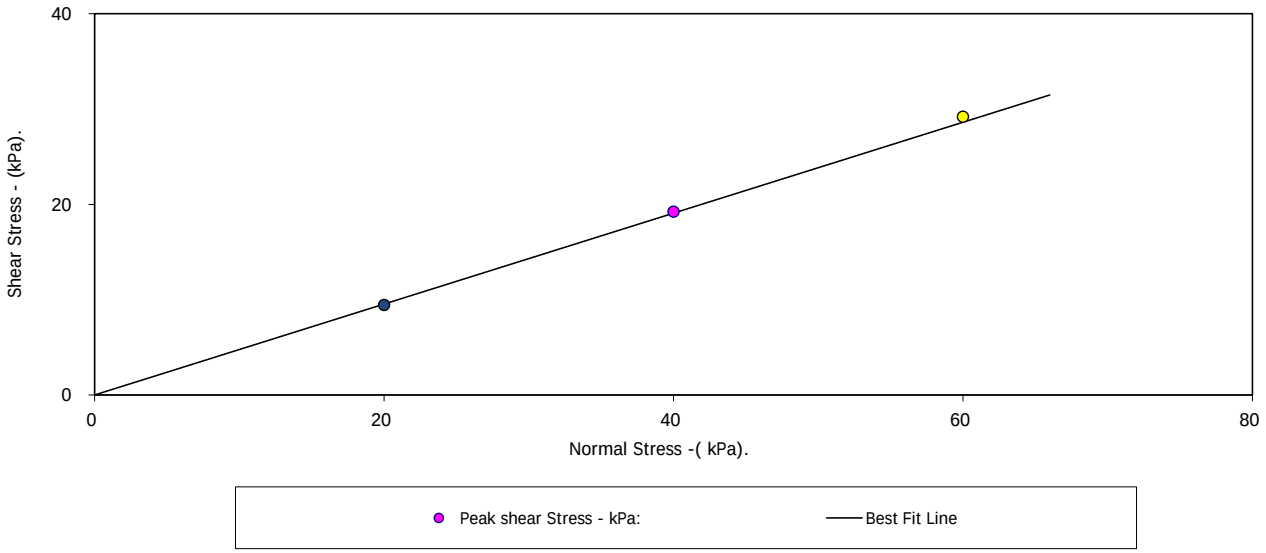
Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown slightly silty gravelly (fine-coarse/angular-subrounded) sandy CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.27	24.27	24.27
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	9	9	9
Bulk Density - Mg/m3:	2.10	2.10	2.10
Dry Density - Mg/m3:	1.92	1.92	1.92
Voids Ratio:	0.3811	0.3827	0.3825
Normal Pressure- kPa	20	40	60
Consolidation			
Consolidated Height - mm:	24.21	24.03	23.85
Shear			
Rate of Strain (mm/min)	0.010	0.010	0.010
Strain at peak shear stress (mm)	8.38	7.34	7.33
Peak shear Stress - kPa:	9	19	29

PEAK	
Angle of Shearing Resistance: (~~θ~~)	**25.5**
Effective Cohesion - kPa:	**0**

FAILURE CONDITIONS



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Contract No.: **33812**

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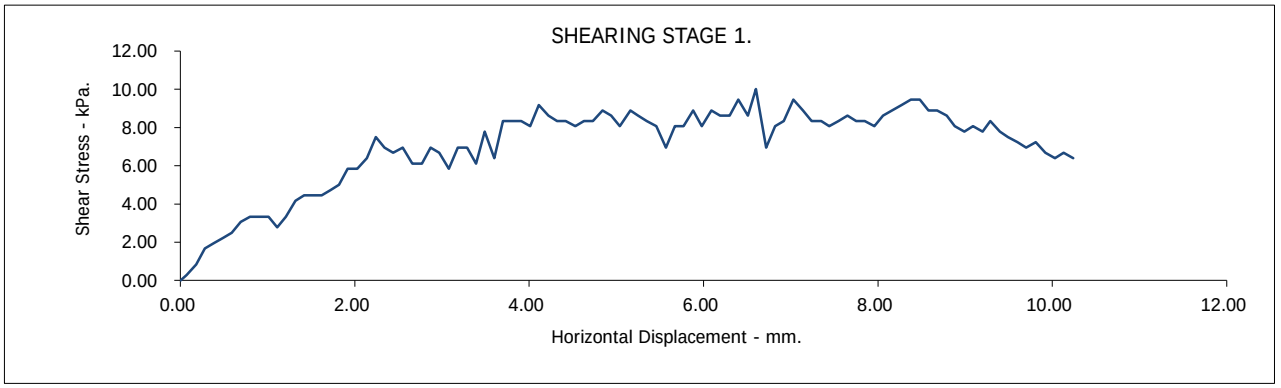
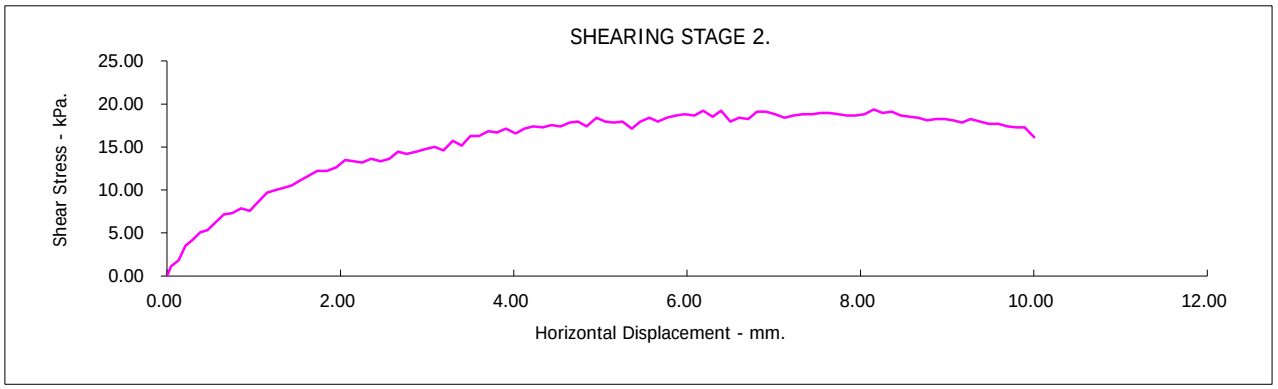
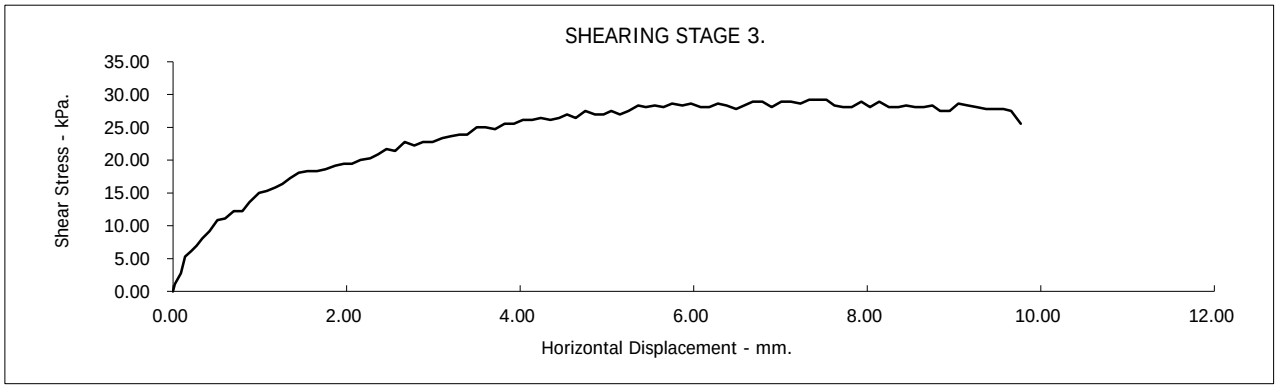
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-52	Depth from (m):	0.50
Sample Number :	B3	Depth to (m):	3.00







Galway GCT

Contract No.:
33812

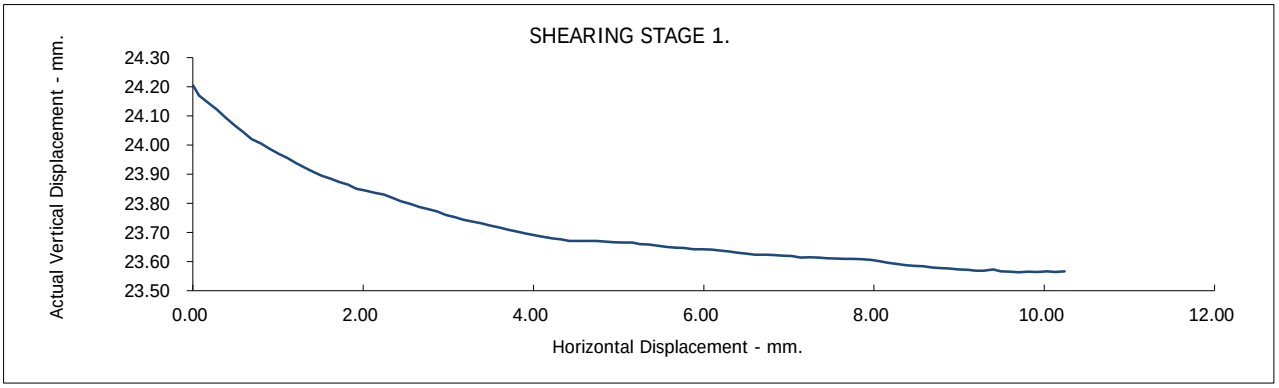
Client Ref Number:
P16185

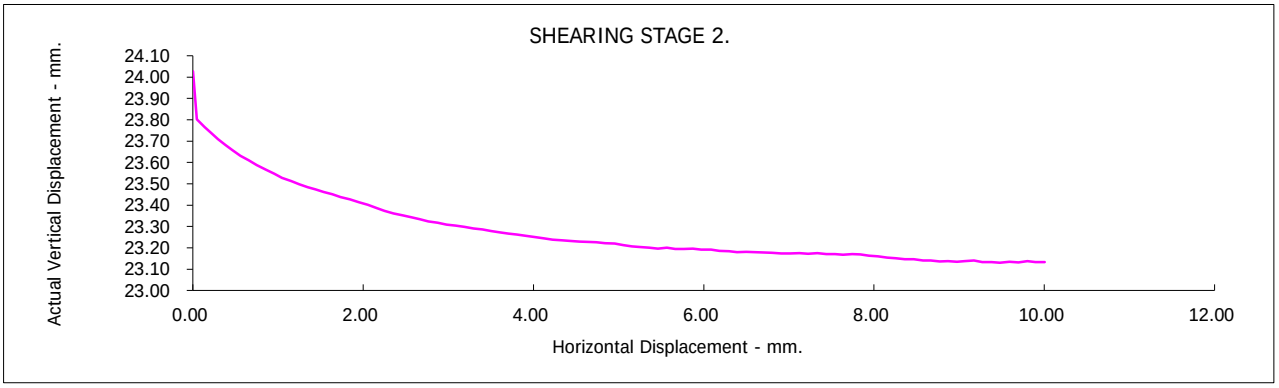
Figure.

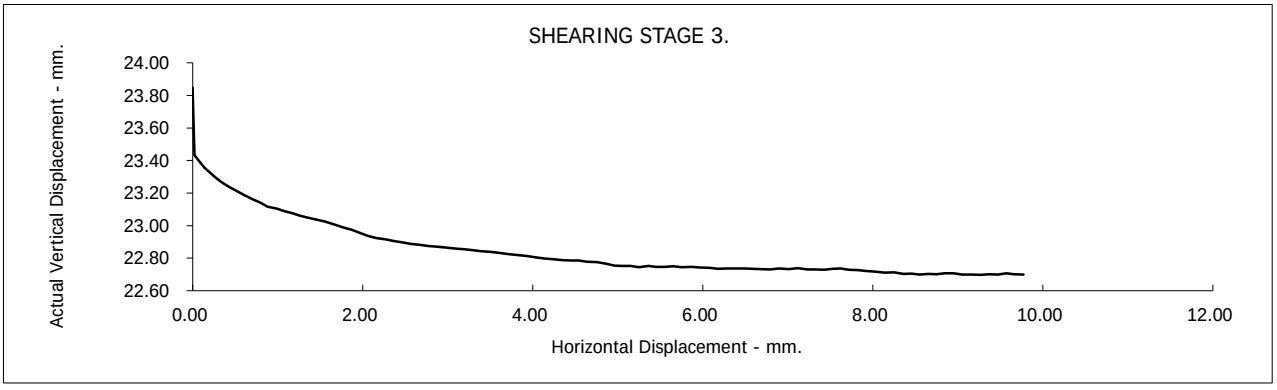
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-52	Depth from (m):	0.50
Sample Number :	B3	Depth to (m):	3.00







Contract No.:
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Galway GCT

Client Ref Number:
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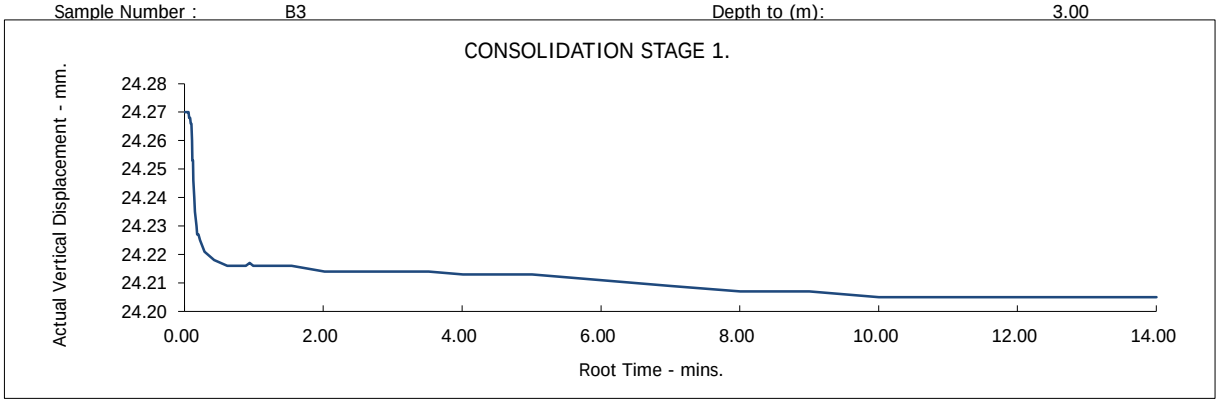
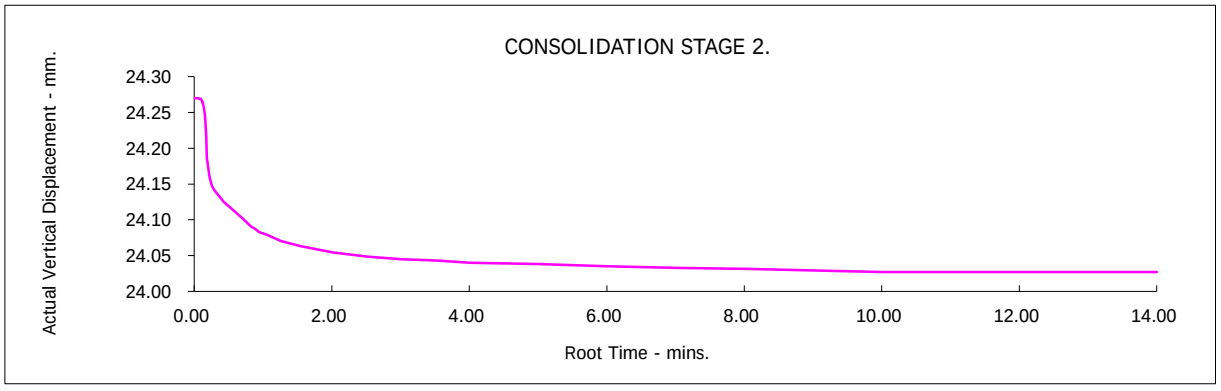
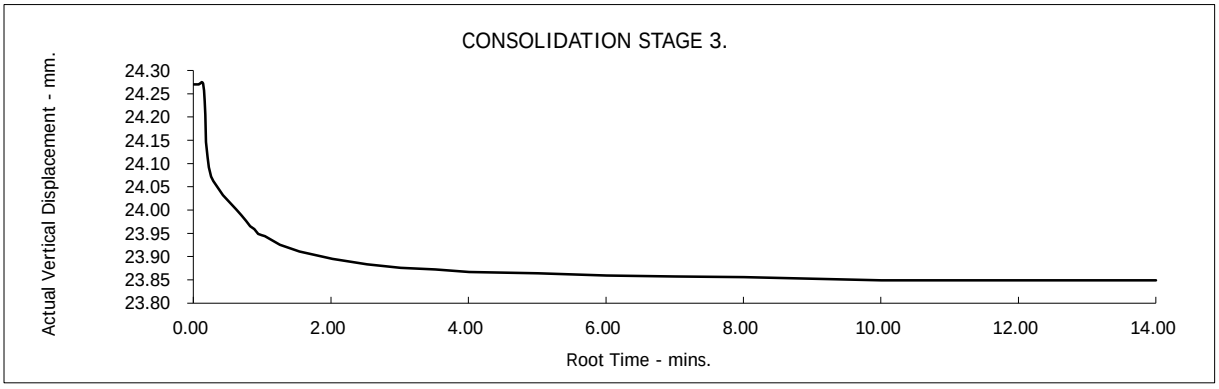
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-52	Depth from (m):	0.50
Sample Number :	B3	Depth to (m):	3.00







Contract No.:
33812

Galway GCT

Client Ref Number:
P16185

Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

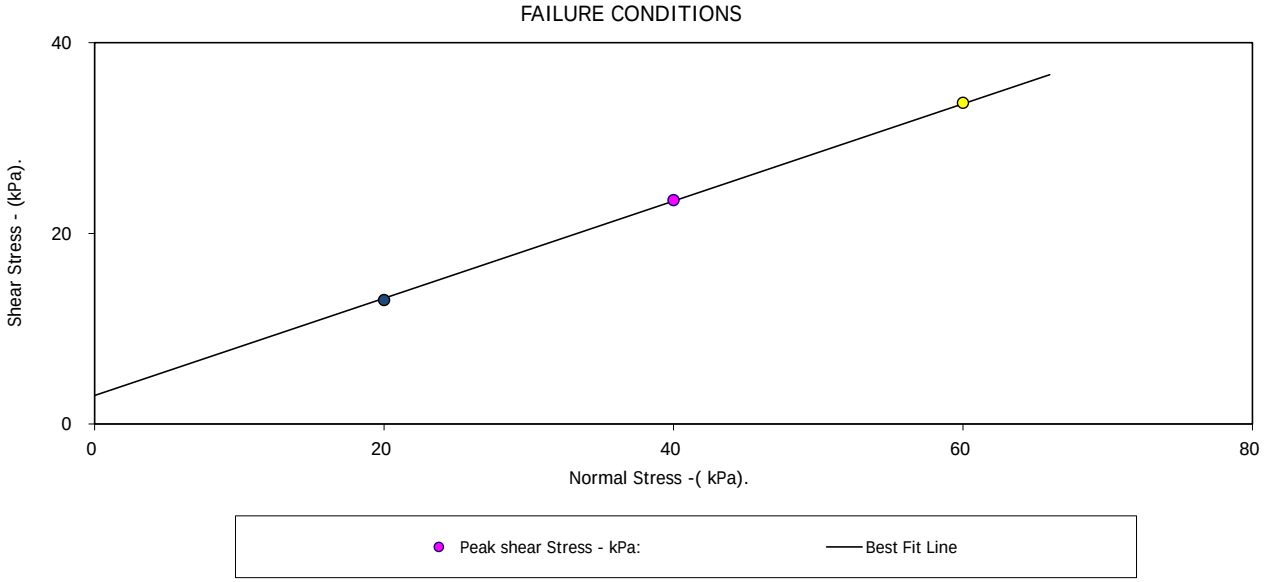
Borehole Number:	TP03-53	Depth from (m):	1.00
Sample Number :	B3	Depth to (m):	3.00

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown slightly silty sandy gravelly (fine-coarse/angular-subrounded) soft CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.27	24.27	24.27
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	10	10	10
Bulk Density - Mg/m3:	2.24	2.25	2.25
Dry Density - Mg/m3:	2.05	2.05	2.05
Voids Ratio:	0.2942	0.2931	0.2935
Normal Pressure- kPa	20	40	60
Consolidation			
Consolidated Height - mm:	24.04	23.79	23.54
Shear			
Rate of Strain (mm/min)	0.010	0.010	0.010
Strain at peak shear stress (mm)	9.52	8.44	6.35
Peak shear Stress - kPa:	13	23	34

PEAK	
Angle of Shearing Resistance: (~~θ~~)	**27.0**
Effective Cohesion - kPa:	**3**



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Contract No.: **33812**

Galway GCT

Client Ref Number: **P16185**

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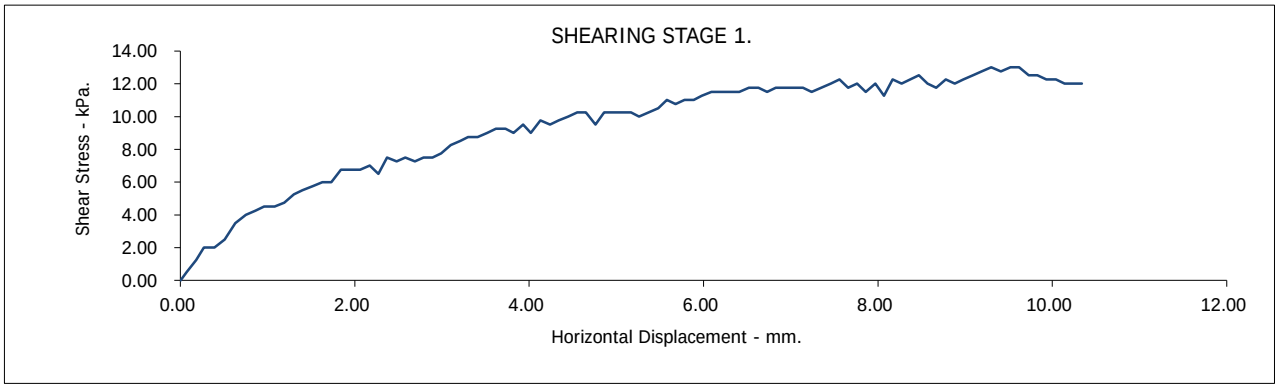
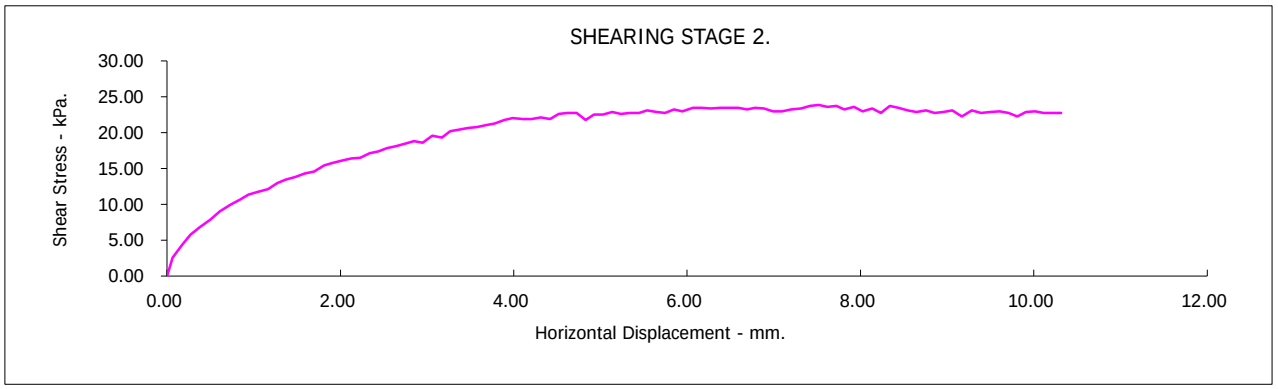
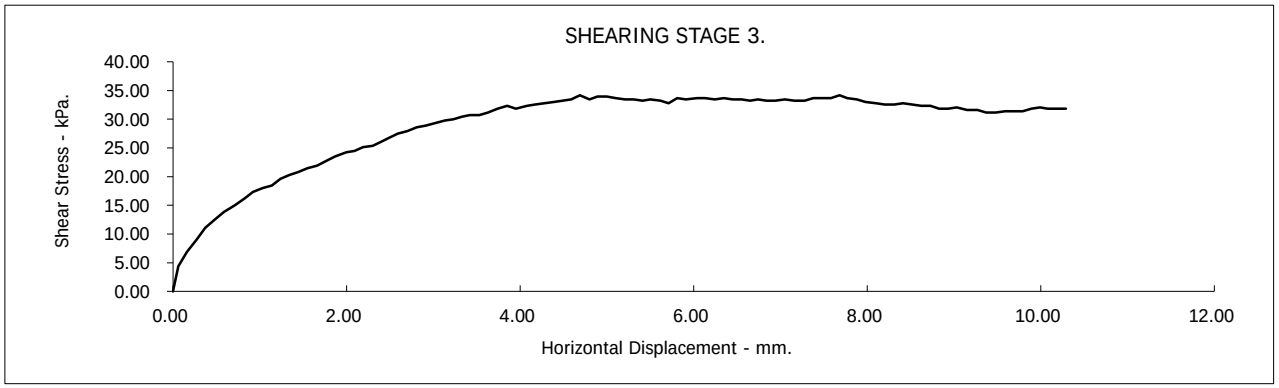
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-53	Depth from (m):	1.00
Sample Number :	B3	Depth to (m):	3.00







Galway GCT

Contract No.:
33812

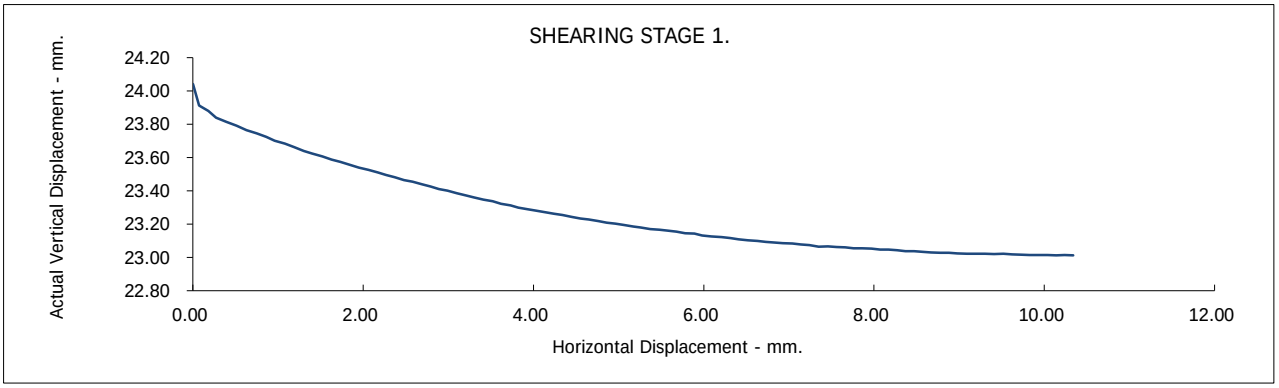
Client Ref Number:
P16185

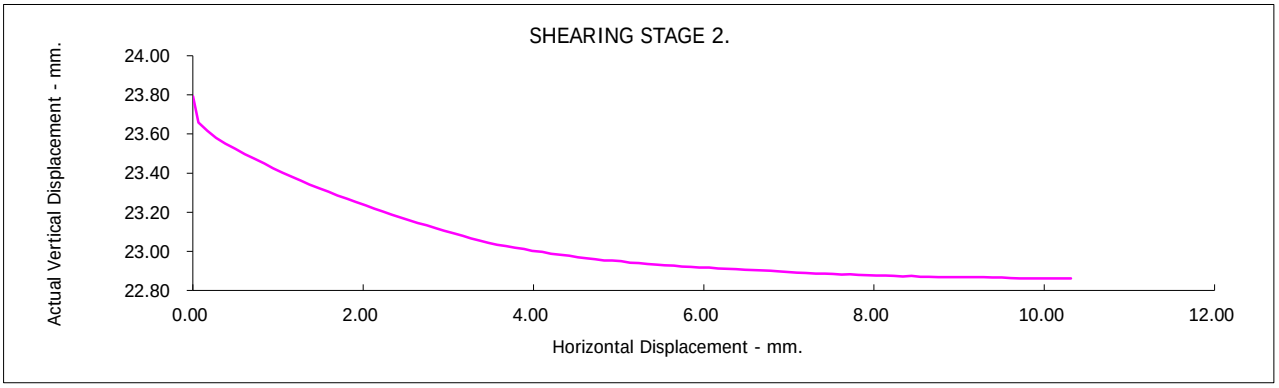
Figure.

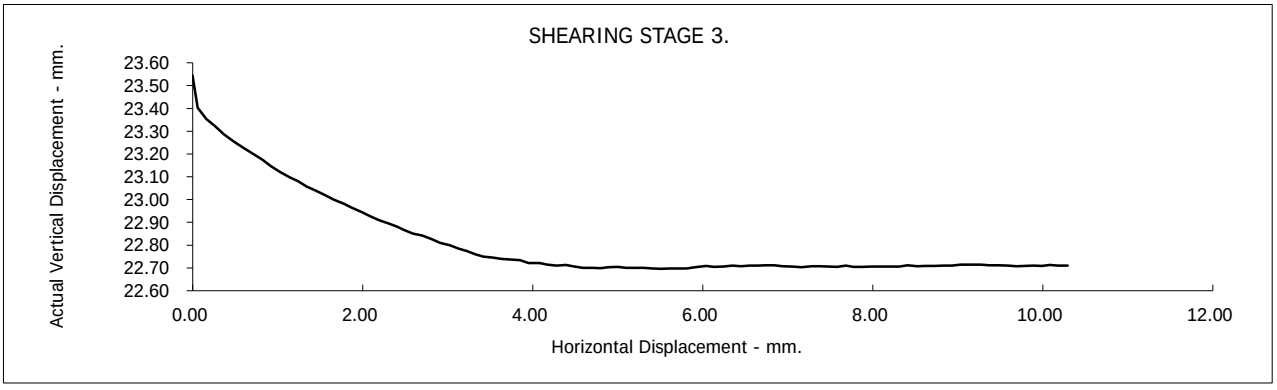
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-53	Depth from (m):	1.00
Sample Number :	B3	Depth to (m):	3.00







Contract No.:
33812

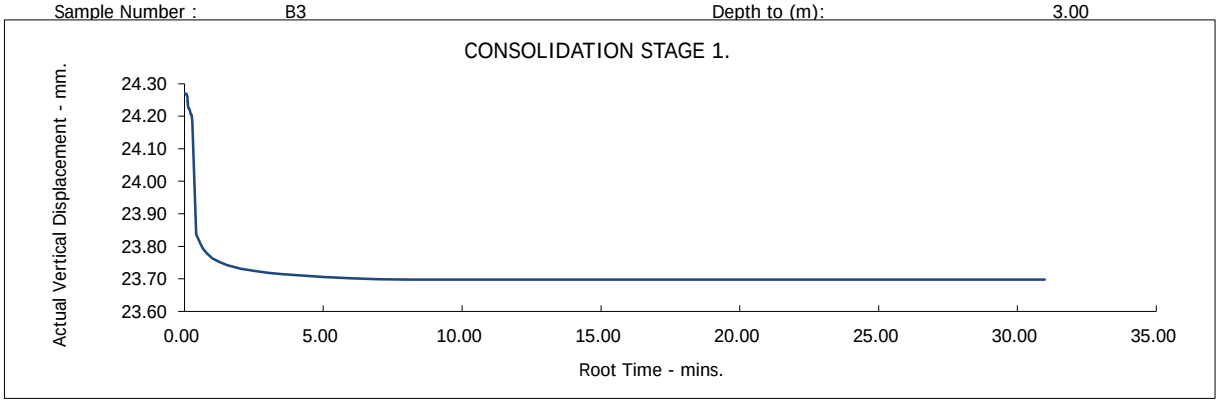
Galway GCT

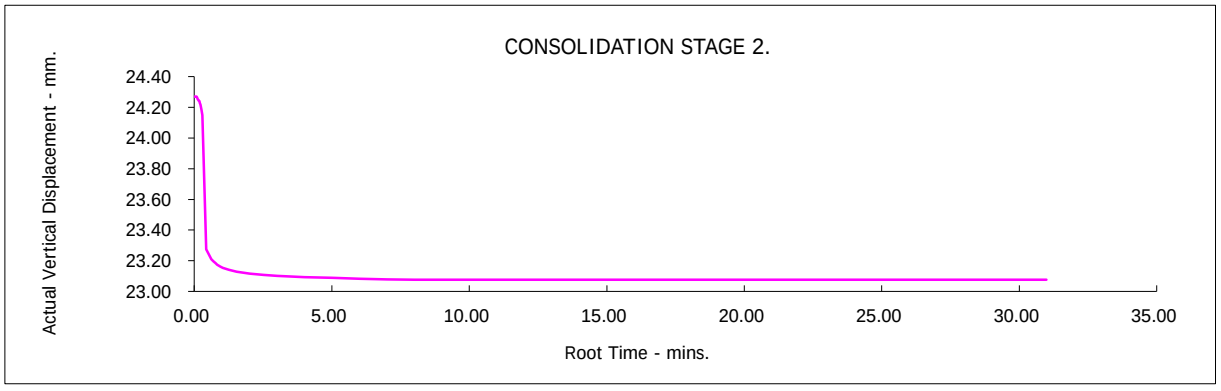
Client Ref Number:
P16185

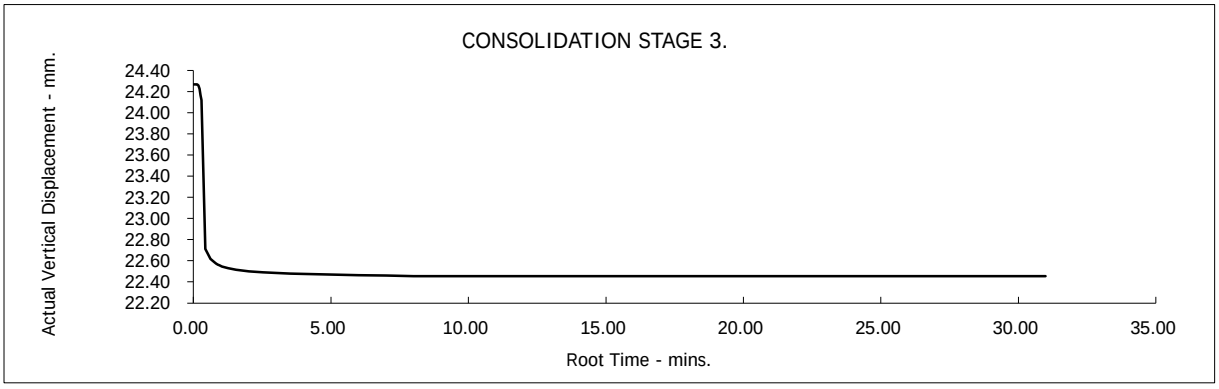
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-53	Depth from (m):	1.00
Sample Number :	B3	Depth to (m):	3.00







Contract No.:
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Galway GCT

Client Ref Number:
P16185

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GEO SITE & TESTING SERVICES LTD

Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

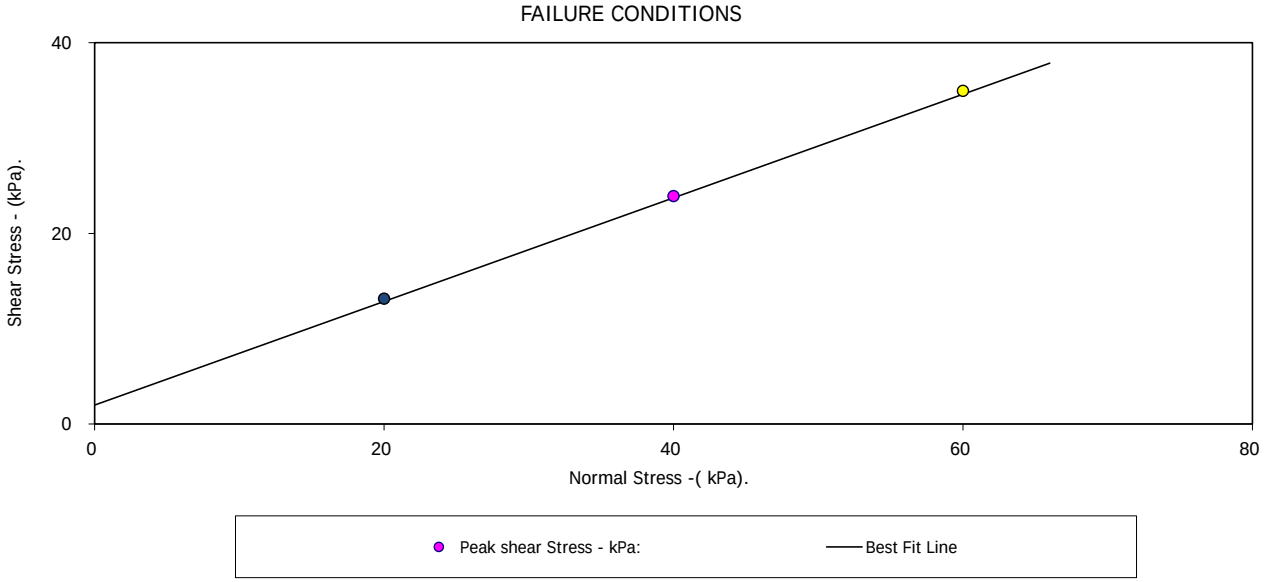
Borehole Number:	TP03-53	Depth from (m):	2.00
Sample Number :	B5	Depth to (m):	5.00

Sample Type:	B
Particle Density - Mg/m3:	2.65 (Assumed)
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.

Sample Description:
Brown slightly silty sandy gravelly (fine-coarse/angular-subrounded) soft CLAY

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	24.50	24.50	24.50
Length - mm:	59.90	59.90	59.90
Moisture Content - %:	11	11	11
Bulk Density - Mg/m3:	2.22	2.22	2.22
Dry Density - Mg/m3:	2.00	2.00	2.00
Voids Ratio:	0.3241	0.3236	0.3242
Normal Pressure- kPa	20	40	60
Consolidation			
Consolidated Height - mm:	24.28	23.97	23.66
Shear			
Rate of Strain (mm/min)	0.010	0.010	0.010
Strain at peak shear stress (mm)	9.74	8.17	7.15
Peak shear Stress - kPa:	13	24	35

PEAK	
Angle of Shearing Resistance: (~~θ~~)	**28.5**
Effective Cohesion - kPa:	**2**



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Contract No.: **33812**

Galway GCT

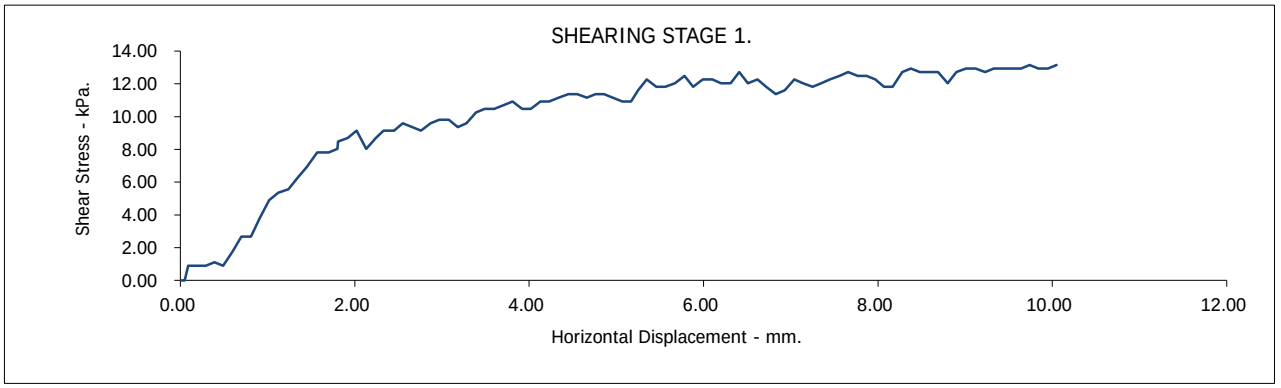
Client Ref Number: **P16185**

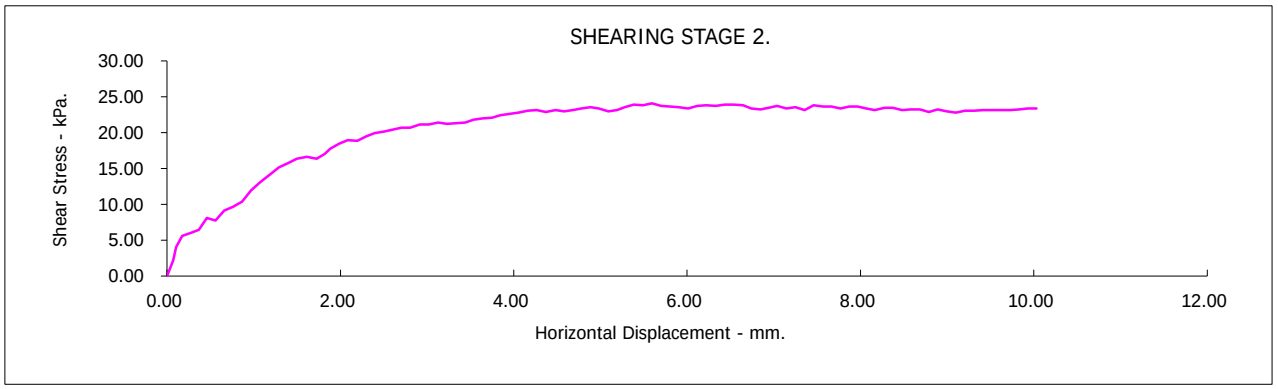
GSTL GEO SITE & TESTING SERVICES LTD

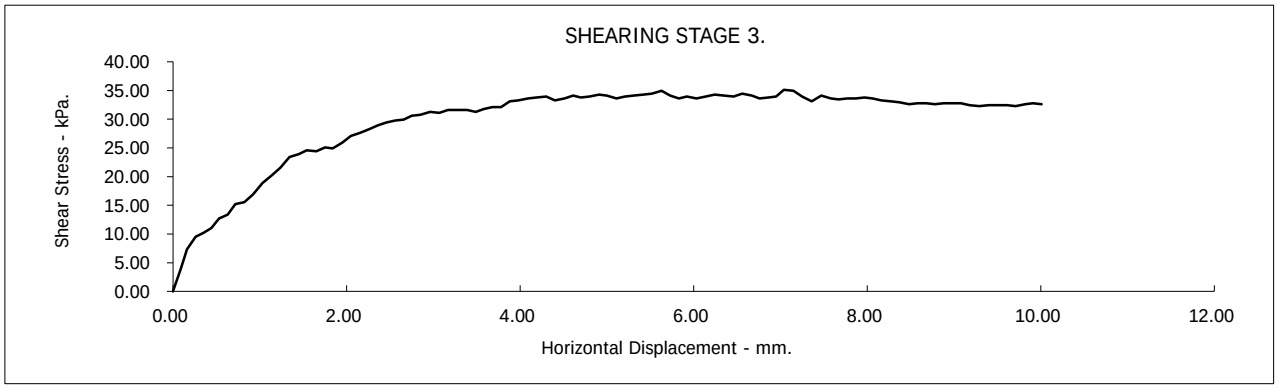
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-53	Depth from (m):	2.00
Sample Number :	B5	Depth to (m):	5.00







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Contract No.: **33812**

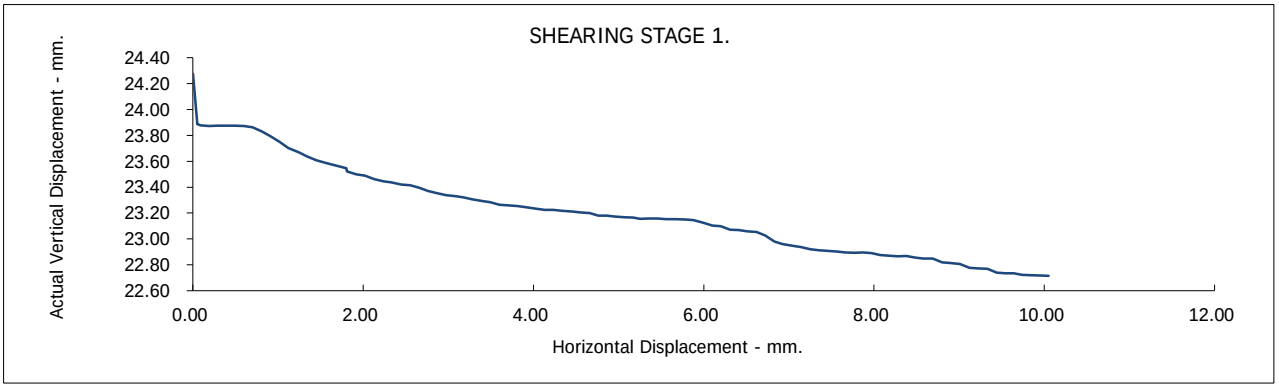
Client Ref Number: **P16185**

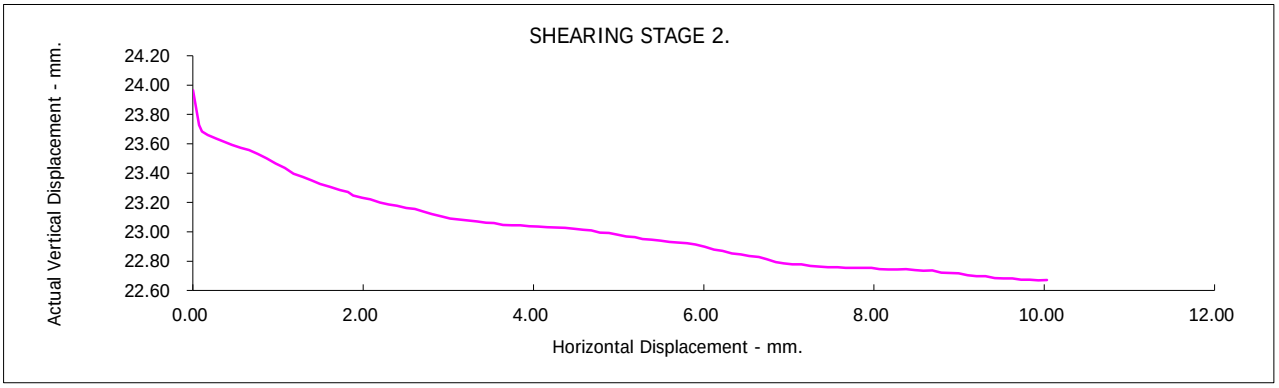
Figure.

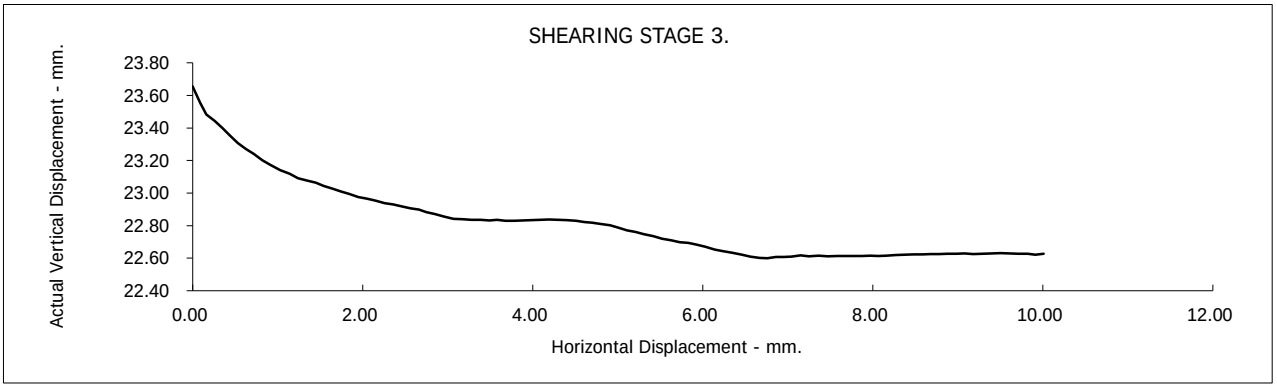
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-53	Depth from (m):	2.00
Sample Number :	B5	Depth to (m):	5.00







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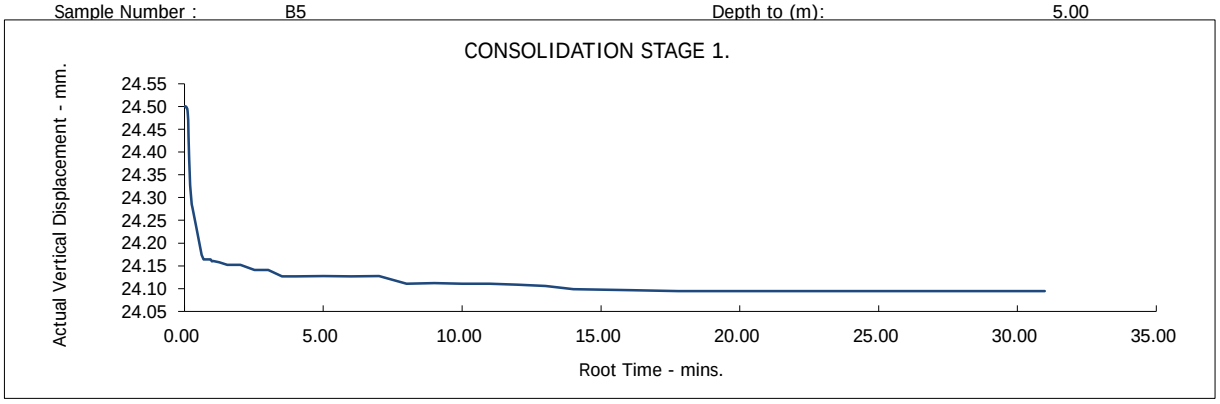
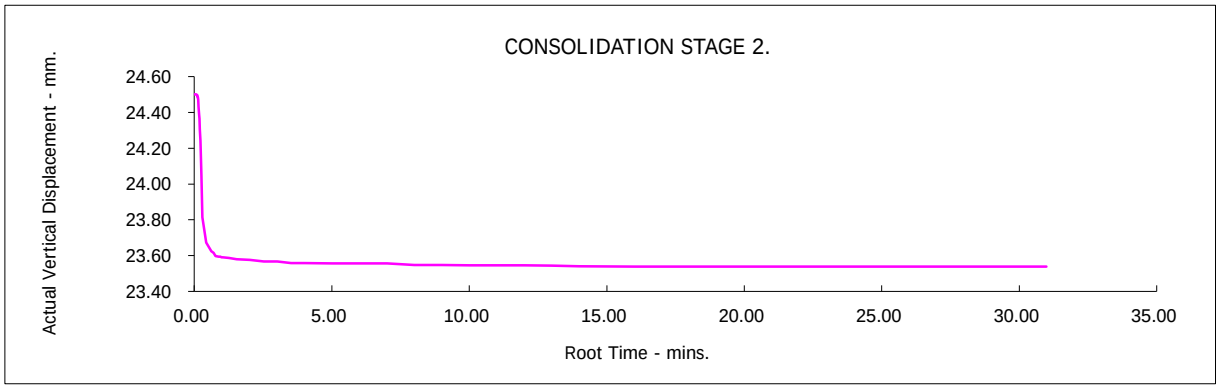
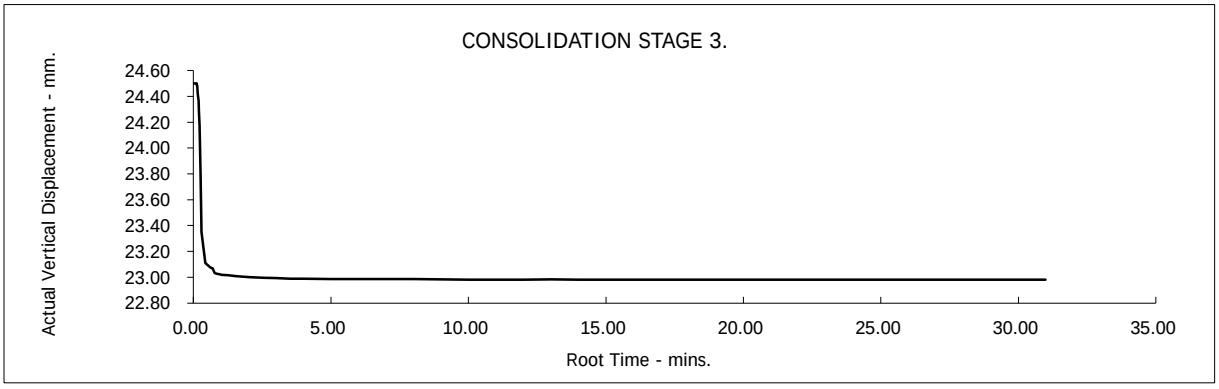
Test Report: CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Borehole Number:	TP03-53	Depth from (m):	2.00
Sample Number :	B5	Depth to (m):	5.00







Contract No.:
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Galway GCT

Client Ref Number:
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Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00
Date		02/02/2017
Disturbed / Undisturbed		Disturbed

Description of Specimen

Brown silty firm CLAY

Initial Specimen Conditions

Height	mm	76.00	76.00	76.00
Diameter	mm	38.00	38.00	38.00
Area	mm^2	1134.11	1134.11	1134.11
Volume	cm^3	86.19	86.19	86.19
Mass	g	192.80	171.00	170.00
Dry Mass	g	135.10	144.00	141.00
Density	Mg/m^3	2.24	1.98	1.97
Dry Density	Mg/m^3	1.57	1.67	1.64
Moisture Content	%	43	19	21
Specific Gravity	kN/m^3	2.65	2.65	2.65
(assumed/measured)		assumed	assumed	assumed

Final Specimen Conditions

Moisture Content	%	19	19	18
Density	Mg/m^3	2.40	2.41	2.70
Dry Density	Mg/m^3	2.01	2.03	2.28

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Contract No

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GEO SITE & TESTING SERVICES LTD

Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Test Setup

Date started		31/01/2017	26/01/2017	26/01/2017
Date Finished		01/02/2017	00/01/1900	00/01/1900
Top Drain Used		y	y	y
Base Drain Used		y	y	y
Side Drains Used		y	y	y
Pressure System Number		P11	P10	P11
Cell Number		C11	C10	C11

Saturation

Cell Pressure Incr.	kPa	100.00	100.00	100.00
Back Pressure Incr.	kPa	95.00	95.00	95.00
Differential Pressure	kPa	5.00	5.00	5.00
Final Cell Pressure	kPa	300.00	500.00	500.00
Final Pore Pressure	kPa	296.00	395.50	495.00
Final B Value		0.97	0.95	0.97

Consolidation

Effective Pressure	kPa	200.00	300.00	400.00
Cell Pressure	kPa	300.00	500.00	500.00
Back Pressure	kPa	100.00	200.00	100.00
Excess Pore Pressure	kPa	196.00	296.00	395.00
Pore Pressure at End	kPa	100.00	200.00	100.00
Consolidated Volume	cm^3	67.19	70.94	61.89
Consolidated Height	mm	70.42	71.52	68.86
Consolidated Area	mm^2	967.45	1000.34	920.96
Vol. Compressibility	m^2/MN	2.20436	0.88465	2.81926
Consolidation Coef.	$m^2/yr.$	0.29190	0.02043	0.37693

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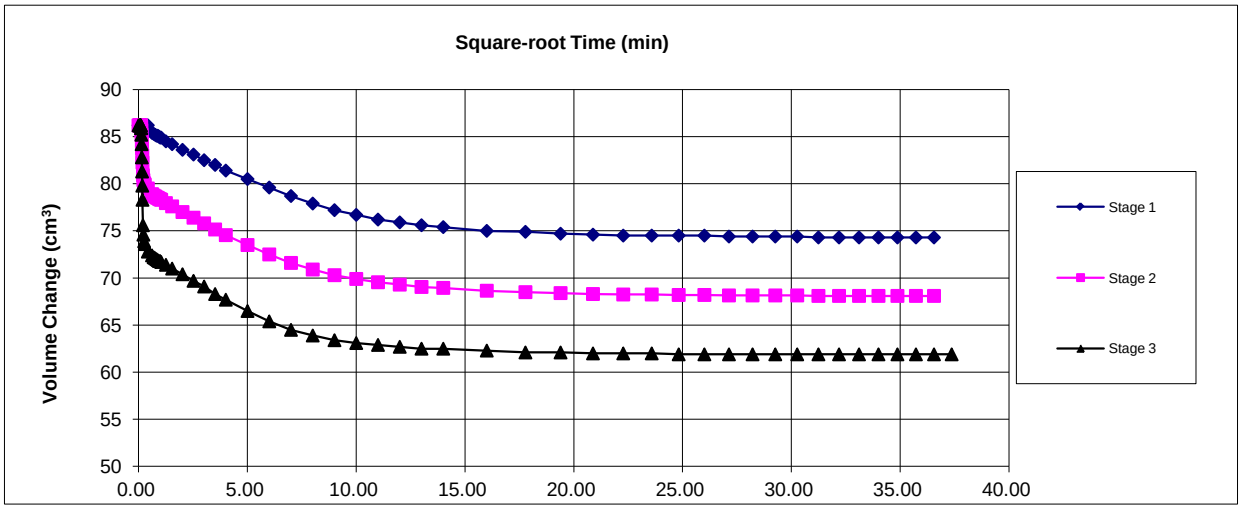
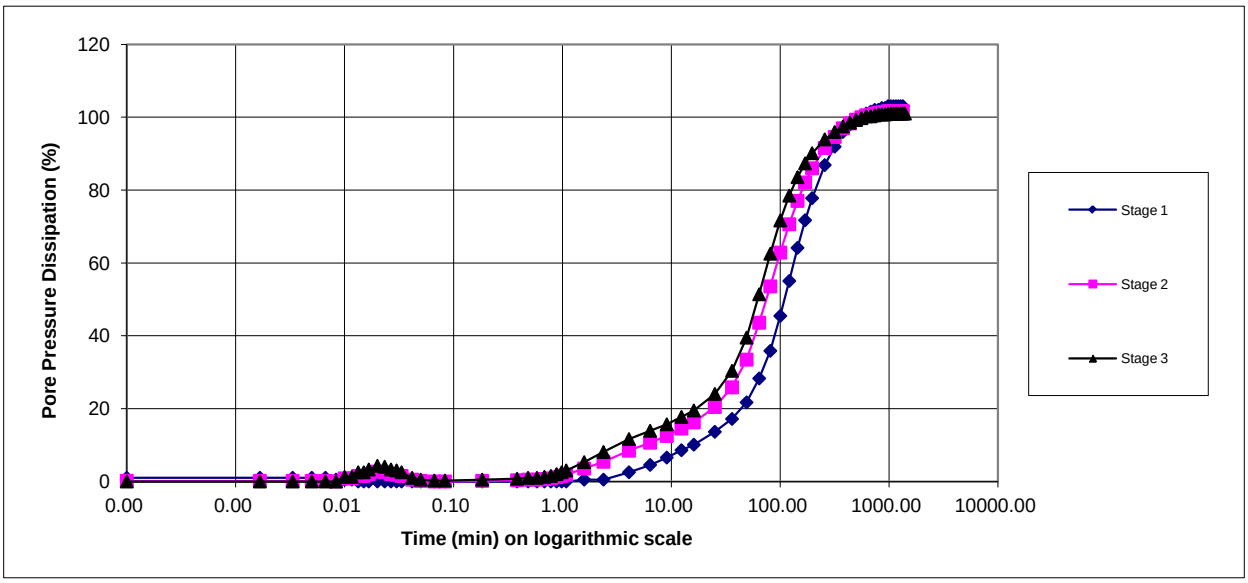
BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Consolidation Stage





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Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Shearing

Initial Cell Pressure	kPa	300	500	500
Initial Pore Pressure	kPa	100	200	100
Rate of Strain	mm/min	0.0150	0.0011	0.0189
Max Deviator Stress				
Axial Strain		9.856	8.977	8.801
Axial Stress	kPa	383.891	562.01	689.23
Cor. Deviator stress	kPa	372.470	549.77	676.95
Effective Major Stress	kPa	516.470	770.27	951.95
Effective Minor Stress	kPa	145.000	220.50	275.00
Effective Stress Ratio		3.562	3.493	3.46
s'	kPa	330.735	495.39	613.47
t'	kPa	185.735	274.89	338.47
Max Effective Priciple Stress Ratio				
Axial Strain		8.592	8.355	8.801
Axial Stress	kPa	382.659	561.823	689.225
Cor. Deviator stress	kPa	370.498	549.710	676.947
Effective Major Stress	kPa	513.498	768.710	951.947
Effective Minor Stress	kPa	143.000	219.000	275.000
Effective Stress Ratio		3.591	3.510	3.462
s'	kPa	328.249	493.855	613.473
t'	kPa	185.249	274.855	338.473
Shear Resistance Angle	degs			33.0
Cohesion c'	kPa			5

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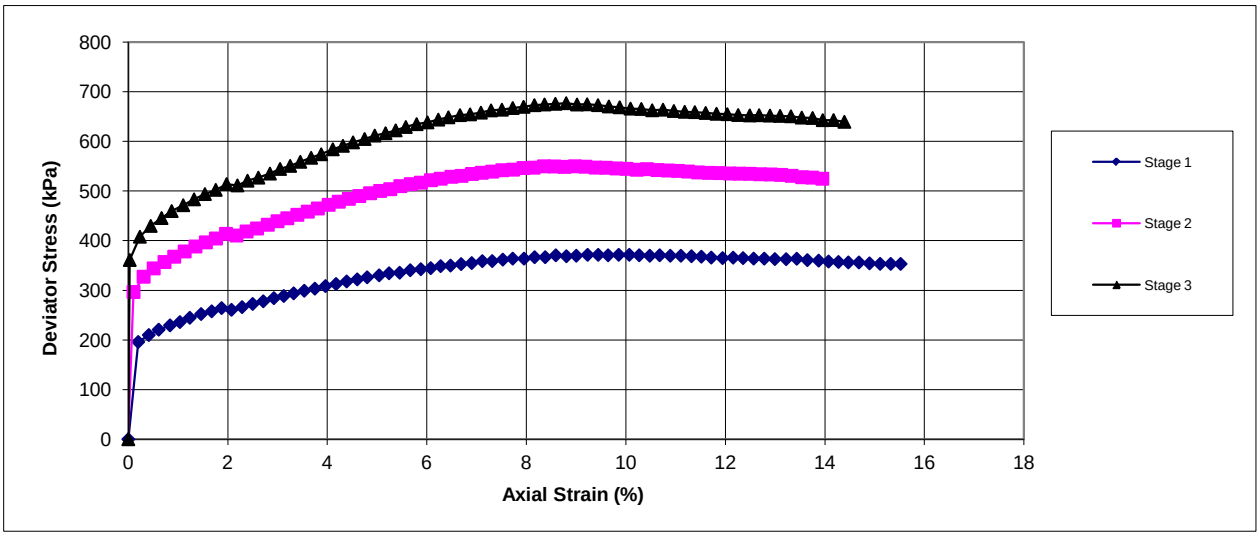
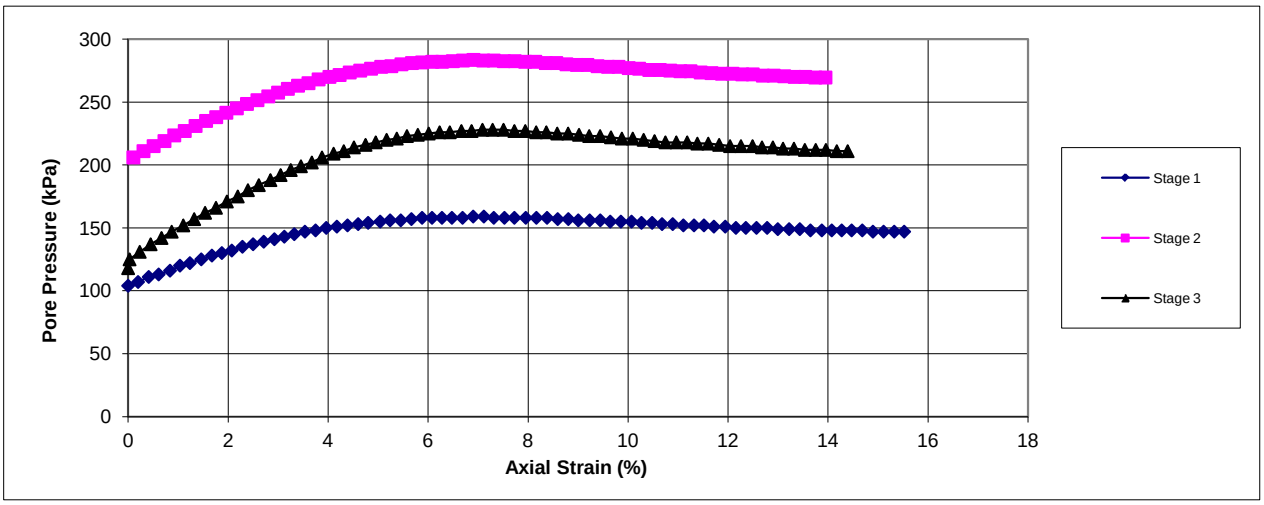
BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Shearing Stage





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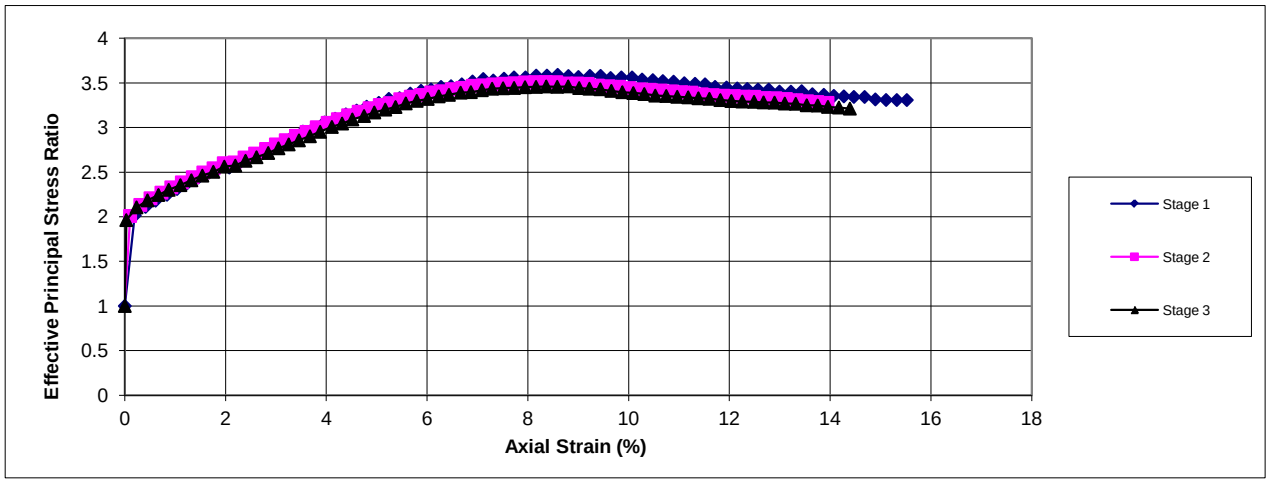
Consolidated Undrained Triaxial Compression Test

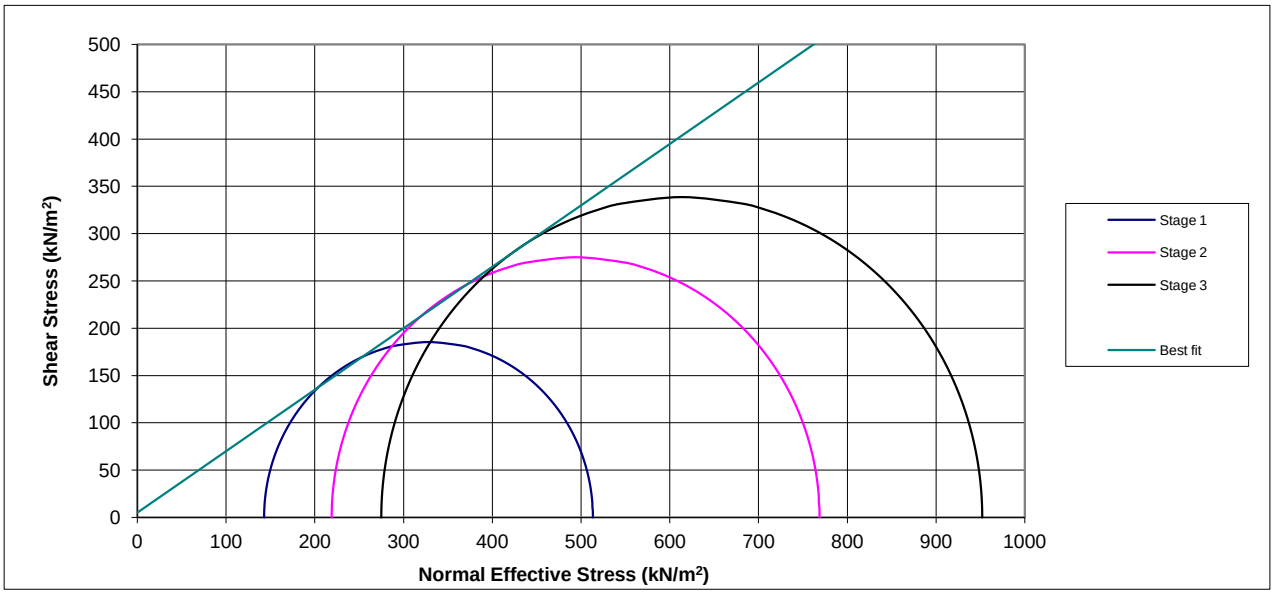
BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Shearing Stage





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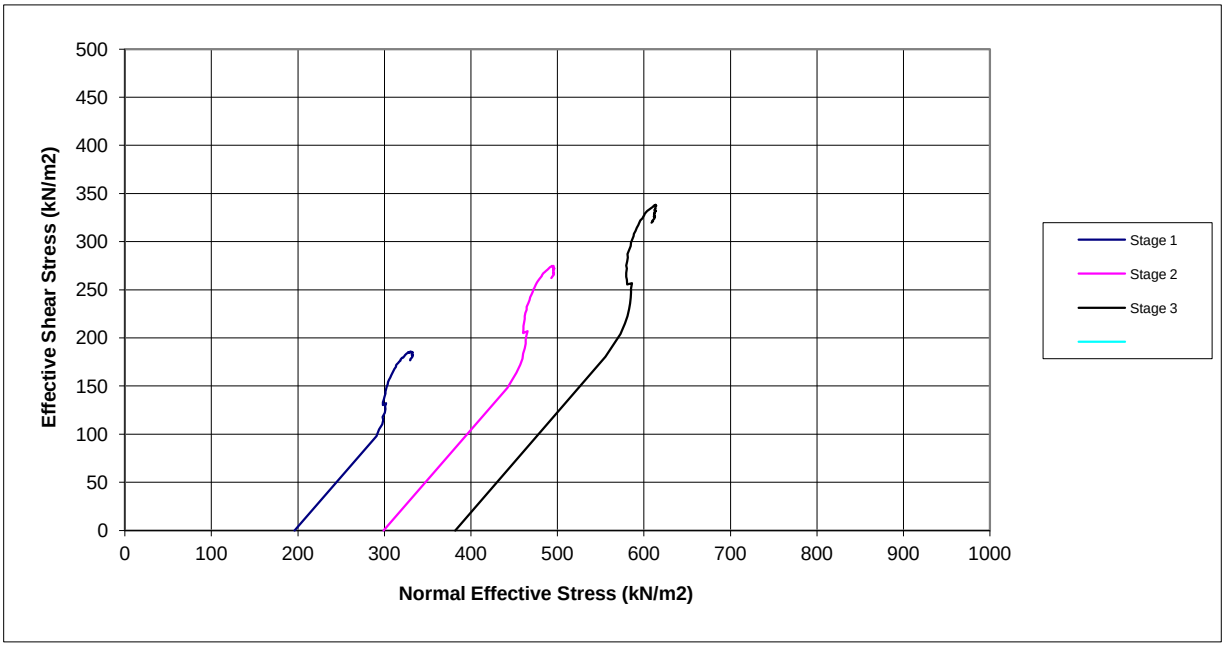
BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Shearing Stage



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Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

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BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00
Date		02/02/2017
Disturbed / Undisturbed		Disturbed

Description of Specimen

Brown silty firm CLAY

Initial Specimen Conditions

Height	mm	76.00	74.00	76.00
Diameter	mm	38.00	37.00	38.00
Area	mm^2	1134.11	1075.21	1134.11
Volume	cm^3	86.19	79.57	86.19
Mass	g	197.80	196.20	192.80
Dry Mass	g	179.00	180.20	177.30
Density	Mg/m^3	2.29	2.47	2.24
Dry Density	Mg/m^3	2.08	2.26	2.06
Moisture Content	%	11	9	9
Specific Gravity	kN/m^3	2.65	2.65	2.65
(assumed/measured)		assumed	assumed	assumed

Final Specimen Conditions

Moisture Content	%	10	9	9
Density	Mg/m^3	2.52	2.54	2.63
Dry Density	Mg/m^3	2.30	2.34	2.42

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Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Test Setup

Date started		31/01/2017	26/01/2017	26/01/2017
Date Finished		01/02/2017	00/01/1900	00/01/1900
Top Drain Used		y	y	y
Base Drain Used		y	y	y
Side Drains Used		y	y	y
Pressure System Number		P11	P10	P11
Cell Number		C11	C10	C11

Saturation

Cell Pressure Incr.	kPa	100.00	100.00	100.00
Back Pressure Incr.	kPa	95.00	95.00	95.00
Differential Pressure	kPa	5.00	5.00	5.00
Final Cell Pressure	kPa	300.00	500.00	500.00
Final Pore Pressure	kPa	296.00	396.50	497.00
Final B Value		0.97	0.95	0.97

Consolidation

Effective Pressure	kPa	200.00	300.00	400.00
Cell Pressure	kPa	300.00	500.00	500.00
Back Pressure	kPa	100.00	200.00	100.00
Excess Pore Pressure	kPa	196.00	297.00	397.00
Pore Pressure at End	kPa	100.00	200.00	100.00
Consolidated Volume	cm^3	77.99	77.12	73.19
Consolidated Height	mm	73.59	73.24	72.18
Consolidated Area	mm^2	1062.19	1053.14	1020.08
Vol. Compressibility	m^2/MN	0.95136	0.15396	1.50825
Consolidation Coef.	$m^2/yr.$	2.64027	0.02043	2.16131

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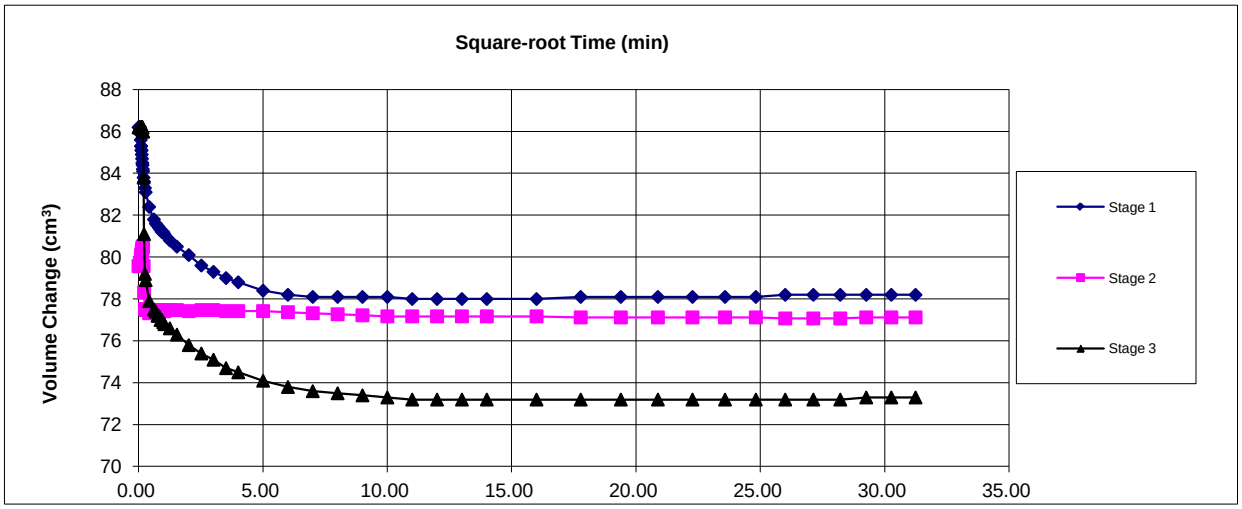
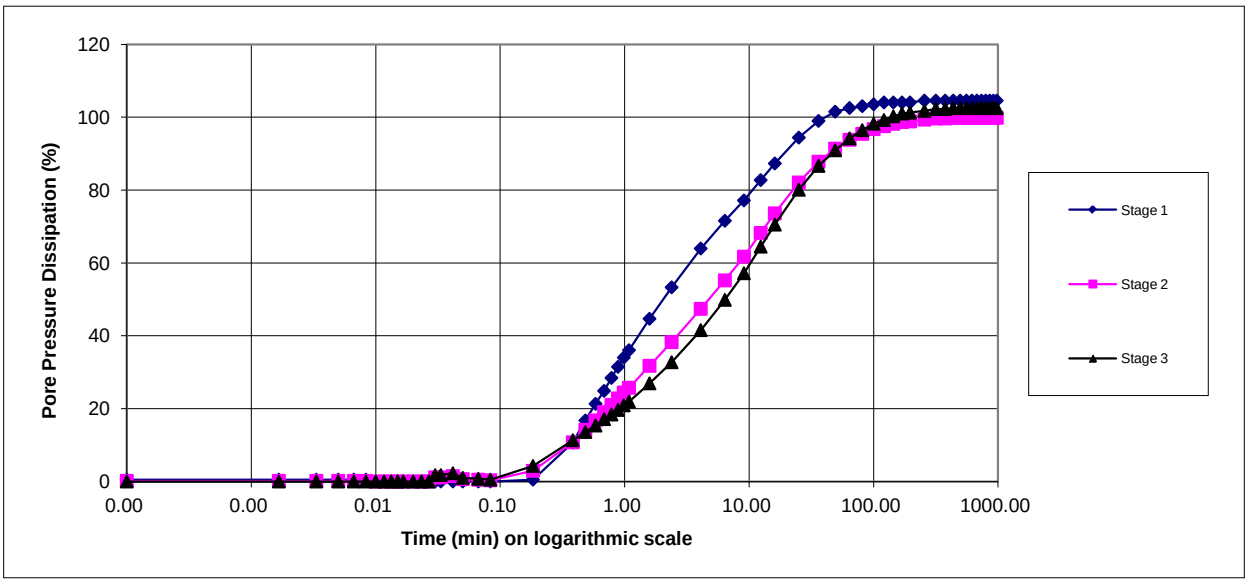
BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Consolidation Stage





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Consolidated Undrained Triaxial Compression Test

BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Shearing

Initial Cell Pressure	kPa	300	500	500
Initial Pore Pressure	kPa	100	200	100
Rate of Strain	mm/min	0.1418	0.0011	0.1139
Max Deviator Stress				
Axial Strain		6.713	6.704	7.398
Axial Stress	kPa	597.215	807.04	1037.60
Cor. Deviator stress	kPa	586.438	795.27	1025.55
Effective Major Stress	kPa	772.438	1063.27	1375.55
Effective Minor Stress	kPa	187.000	268.00	350.00
Effective Stress Ratio		4.131	3.967	3.93
s'	kPa	479.719	665.63	862.77
t'	kPa	292.719	397.63	512.77
Max Effective Priciple Stress Ratio				
Axial Strain		5.612	6.404	6.359
Axial Stress	kPa	586.489	804.753	1032.722
Cor. Deviator stress	kPa	574.937	793.039	1020.835
Effective Major Stress	kPa	757.937	1060.039	1368.835
Effective Minor Stress	kPa	183.000	267.000	348.000
Effective Stress Ratio		4.142	3.970	3.933
s'	kPa	470.469	663.520	858.418
t'	kPa	287.469	396.520	510.418
Shear Resistance Angle	degs			35.6
Cohesion c'	kPa			15

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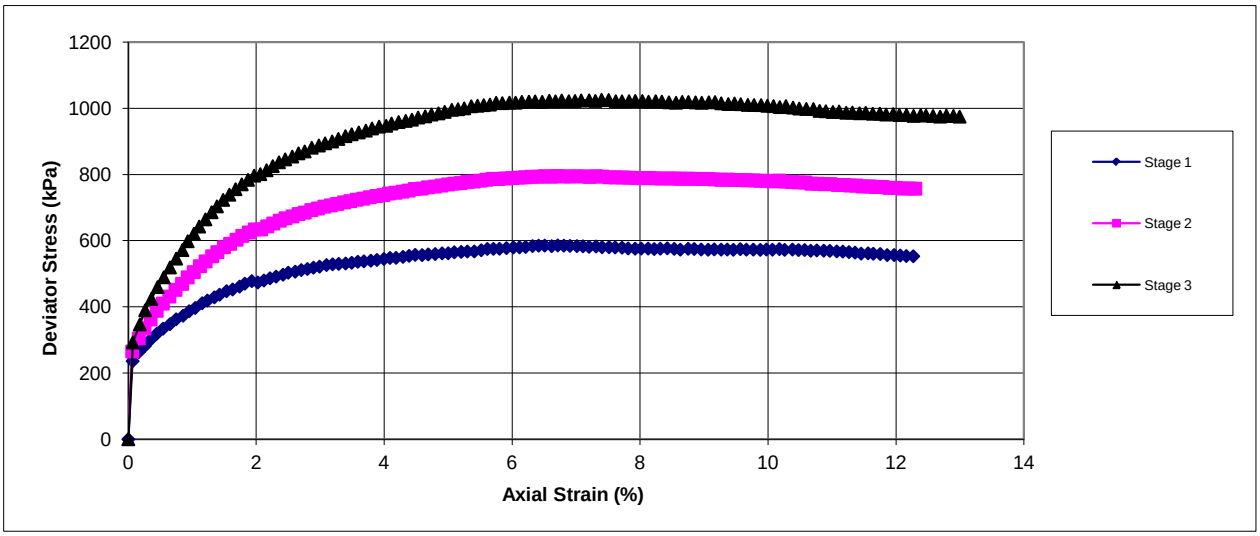
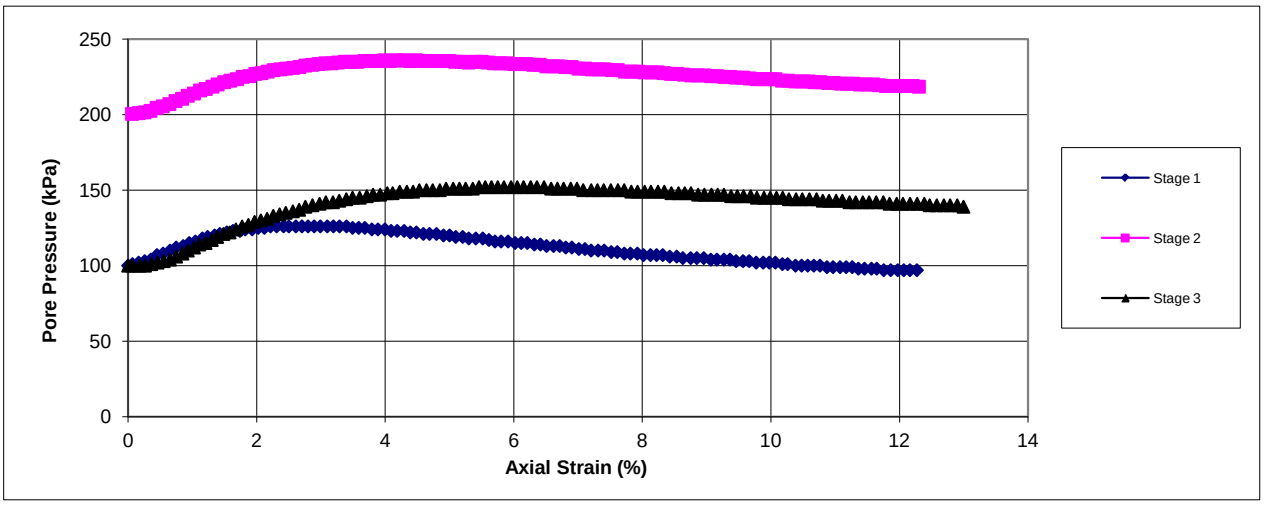
BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Shearing Stage





Checked and Approved By

02/02/17
Date

Client Ref
P16185
Contract No
33812

Galway GCT

GSTL
GEO SITE & TESTING SERVICES LTD

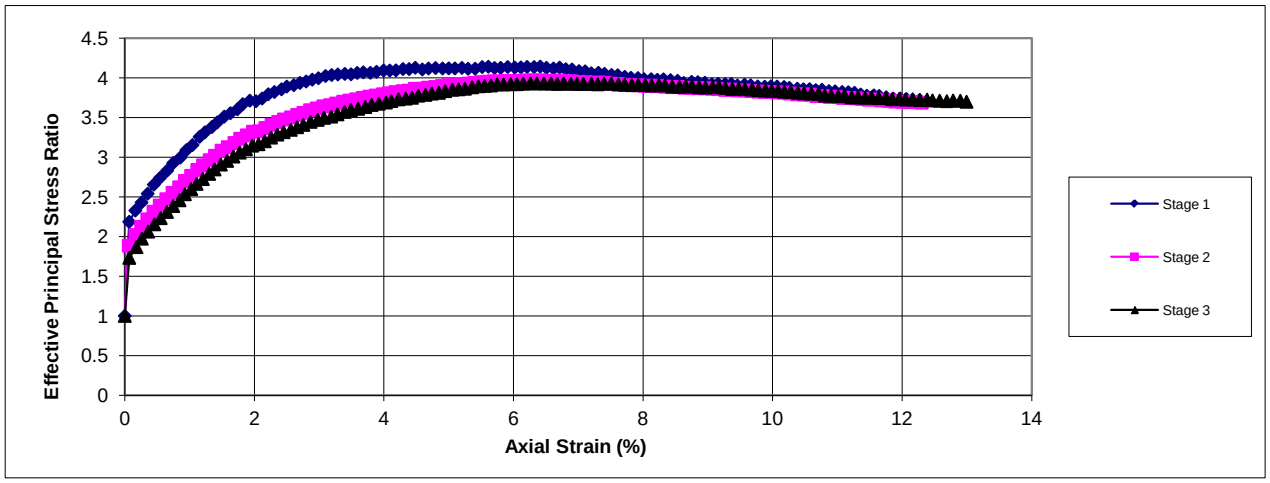
Consolidated Undrained Triaxial Compression Test

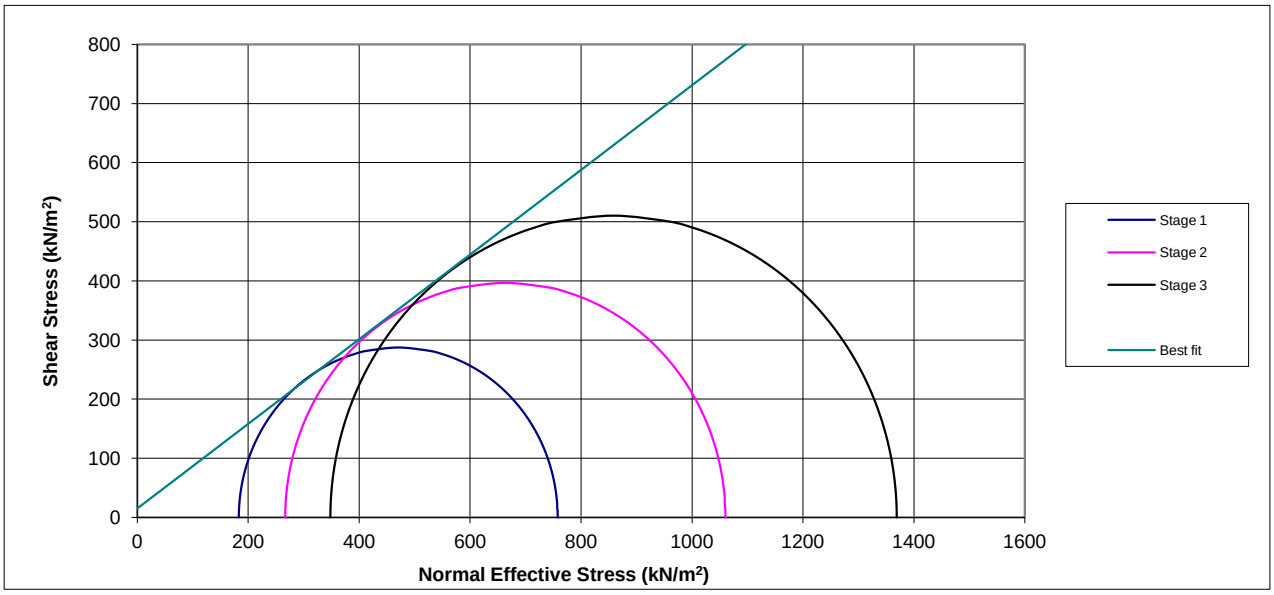
BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

Shearing Stage





D P Gans

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Sample No.		1
Depth	from(m)	0.50
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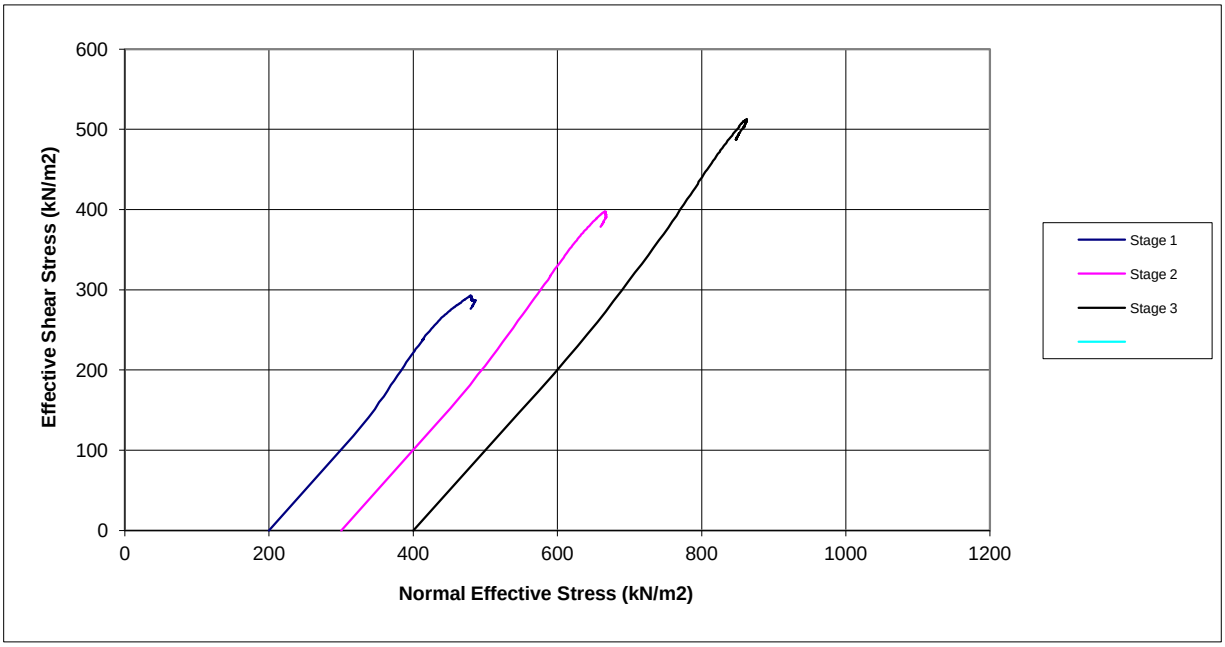
Shearing Stage



D P Evans

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BS 1377 : Part 8 : 1990 : 38mm Set of Three

Specimen Details

Borehole		TP03-50
Sample No.		1
Depth	from(m)	0.50
Depth	to(m)	1.00

D P Grant

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GSTL
GEO SITE & TESTING SERVICES LTD

Galway GCT

Priority Geotechnical Limited

Point Load Test Results

Project: **N6 GCTP Phase 3**

Project No: P16185

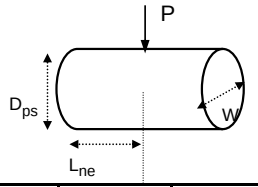
Carried out by: GH

06/01/2017

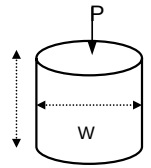
Test Type
D - Diametral, A - Axial, I - Irregular Lump
Direction (U = unknown or random)
Par - parallel to planes of weakness
Per - perpendicular to planes of weakness
Dimensions
Dps - Distance between platens (platen separation)
Dps' - at failure
Lne - Length from platens to nearest free end
W - Width of shortest dimension perpendicular to load, P

Machine Ram Area, cm^2

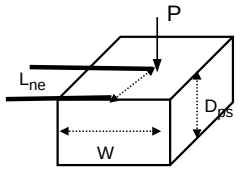
Diametral



Axial



Block/irregular lump



Borehole	Sample Top, m BGL	Sample Ref	Sample Type	Sample Base, m BGL	Specimen Ref	Specimen Depth, m BGL	Description	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions			Gauge reading, kN	P Failure Load, kN	De equivalent diameter, mm	Is MPa	Is(50) point load index, MPa	Remarks
								Type (D, A, I)	Direction (Par/Per/U)		L mm	Dps, mm	W mm						
RC03-60	1.6						Limestone	D	Par	Y	80	86	86	10.21	10.21	86.0	1.38	1.76	Undulating Rough
RC03-60	2.7						Limestone	D	Par	Y	76	86	86	9.44	9.44	86.0	1.28	1.63	Undulating Rough
RC03-60	6.9						Limestone	D	Par	Y	101	86	86	19.95	19.95	86.0	2.70	3.44	Undulating Rough
RC03-60	7.8						Limestone	D	Par	Y	160	86	86	29.13	29.13	86.0	3.94	5.03	Undulating Smooth
RC03-60	12						Limestone	D	Par	Y	110	86	86	22.24	22.24	86.0	3.01	3.84	Undulating Rough
RC03-60	15.3						Limestone	D	Par	Y	82	86	86	16.12	16.12	86.0	2.18	2.78	Undulating Rough
RC03-61	5.0						Limestone	I	Par	Y	95	60	78	16.6	16.60	77.2	2.79	3.39	Undulating Rough
RC03-61	9.1						Limestone	D	Par	Y	68	86	86	27.93	27.93	86.0	3.78	4.82	Undulating Rough
RC03-61	11.3						Limestone	D	Par	Y	89	86	86	28.33	28.33	86.0	3.83	4.89	Undulating Rough
RC03-61	13.9						Limestone	D	Par	Y	126	86	86	23.96	23.96	86.0	3.24	4.14	Undulating Rough

Unconfined Compressive Strength, UCS

Job Name	**N6 GCTP Phase 3**
Job Number	**P16185**

Borehole:	**RC03-60**	
Depth:	**3.5**	**m**
Rock Type	**Limestone**	

Bulk Density	**2.69**	**Mg/m^3**
Load at Failure, P	**147.9**	**kN**
Stress at Failure	**25.41**	**MPa**

Failure mode

NOTES:

Operator	GH
Checked	CK

Unconfined Compressive Strength, UCS

Job Name	**N6 GCTP Phase 3**
Job Number	**P16185**

Borehole:	**RC03-60**	
Depth:	**4.3**	**m**
Rock Type	**Limestone**	

Bulk Density	**2.69**	**Mg/m^3**
Load at Failure, P	**455.6**	**kN**
Stress at Failure	**78.41**	**MPa**

Failure mode

NOTES:

Operator	GH
Checked	CK

Unconfined Compressive Strength, UCS

Job Name	**N6 GCTP Phase 3**
Job Number	**P16185**

Borehole:	**RC03-61**	
Depth:	**3.3**	**m**
Rock Type	**Limestone**	

Bulk Density	**2.69**	**Mg/m^3**
Load at Failure, P	**292.8**	**kN**
Stress at Failure	**50.41**	**MPa**

Failure mode

NOTES:

Operator	GH
Checked	CK

Unconfined Compressive Strength, UCS

Job Name	**N6 GCTP Phase 3**
Job Number	**P16185**

Borehole:	**RC03-61**	
Depth:	**6.3**	**m**
Rock Type	**Limestone**	

Bulk Density	**2.69**	**Mg/m^3**
Load at Failure, P	**455**	**kN**
Stress at Failure	**78.36**	**MPa**

Failure mode

NOTES:

Operator	GH
Checked	CK

Unconfined Compressive Strength, UCS

Job Name	**N6 GCTP Phase 3**
Job Number	**P16185**

Borehole:	**RC03-60**	
Depth:	**9.6**	**m**
Rock Type	**Limestone**	

Bulk Density	**2.68**	**Mg/m^3**
Load at Failure, P	**208.1**	**kN**
Stress at Failure	**35.1**	**MPa**

Failure mode

NOTES:

Operator	GH
Checked	CK

Unconfined Compressive Strength, UCS

Job Name	**N6 GCTP Phase 3**
Job Number	**P16185**

Borehole:	**RC03-61**	
Depth:	**13.25**	**m**
Rock Type	**Limestone**	

Bulk Density	**2.70**	**Mg/m^3**
Load at Failure, P	**560.4**	**kN**
Stress at Failure	**96.51**	**MPa**

Failure mode

NOTES:

Operator	GH
Checked	CK

SI-01

SI-02

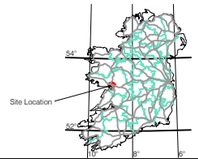
SI-03

SI-04

SI-05

SI-06

Priority Geotechnical Site



JOB NAME:

Galway N6 GCTP Phase 3

Sheet Title:

EXPLORATORY LOCATION LAYOUT

JOB NUMBER:

P16185

DRAWING NUMBER:

P16185-SI-A

DRAWN BY:

Gary Curtin

DATE:

02/02/2017

SCALE:

1:20,000 ON A3

APPROVED:

GH

REVISION:

D01

pgl priority geotechnical

KEY:

- SW00 Denotes Slit Trench and Datum location
- TP00 Denotes Trial Pit location
- BH00 Denotes Borehole location
- RC00 Denotes Rotary Core location

JOB NAME:

Galway N6 GCTP Phase 3

Sheet Title:

EXPLORATION LOCATION PLAN

JOB NUMBER:

P16185

DRAWING NUMBER:

P16185-SI-01

DRAWN BY:

Gary Curtin

DATE:

02/02/2017

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REVISION:

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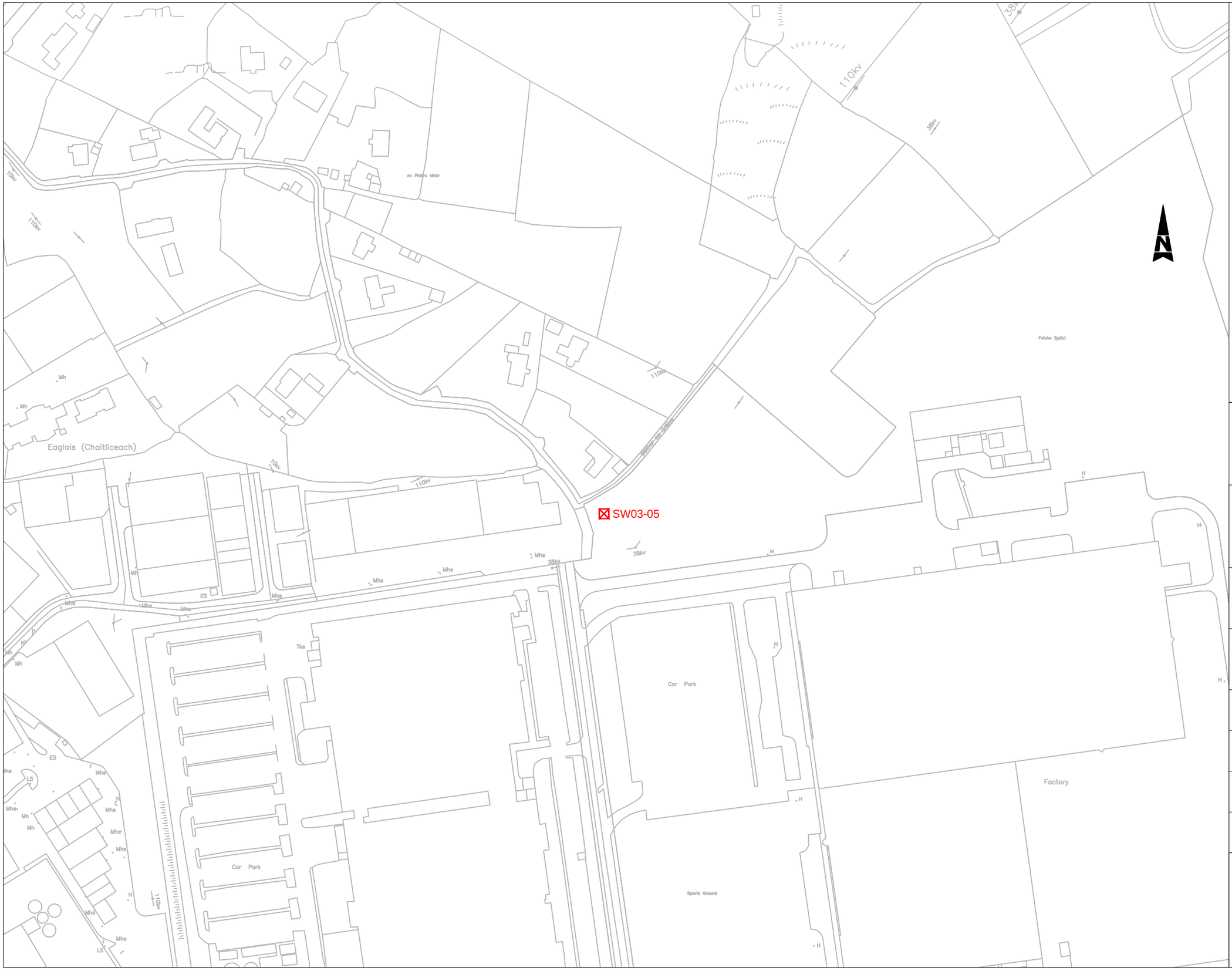
KEY:
SW00 Denotes Slit Trench and Datum location
TP00 Denotes Trial Pit location
BH00 Denotes Borehole location
RC00 Denotes Rotary Core location
SW03-05
N
Eaglais (Chaitliceach)
An Phóirse Mhór
Foiche Spóirt
Car Park
Car Park
Factory
Sports Ground
110kv
38kv
10kv
Mh
Mhs
ES
LS
Tks
H
JOB NAME:
Galway N6 GCTP Phase 3
Sheet Title:
EXPLORATION LOCATION PLAN
JOB NUMBER:
P16185
DRAWING NUMBER:
P16185-SI-02
DRAWN BY:
Gary Curtin
DATE:
02/02/2017
SCALE:
1:1,000 ON A3
APPROVED:
GH
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pgl priority geotechnical

KEY:

- SW00 Denotes Slit Trench and Datum location
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JOB NAME:

Galway N6 GCTP Phase 3

Sheet Title:

EXPLORATION LOCATION PLAN

JOB NUMBER:

P16185

DRAWING NUMBER:

P16185-SI-03

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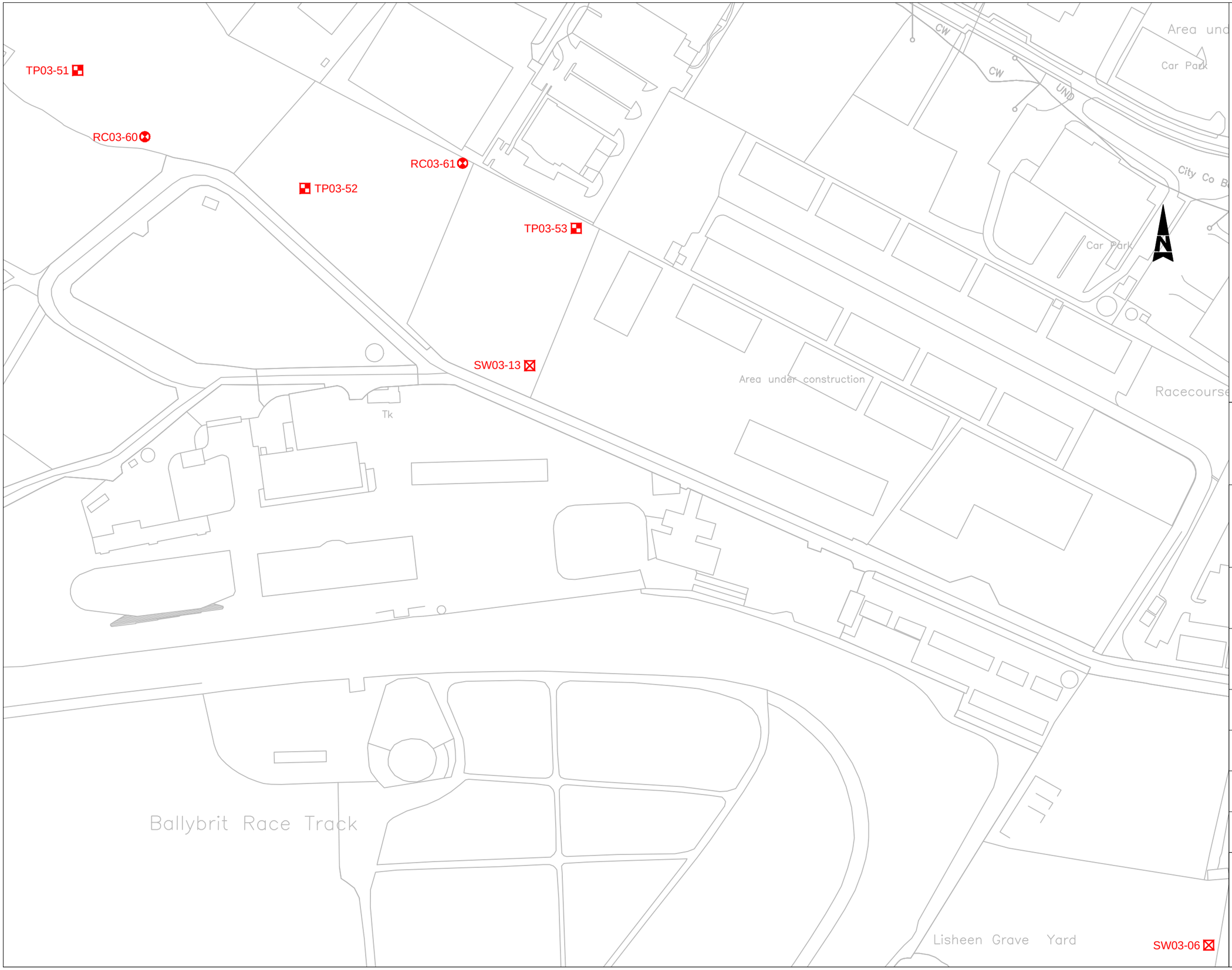

KEY:

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- TP00 Denotes Trial Pit location
- BH00 Denotes Borehole location
- RC00 Denotes Rotary Core location

JOB NAME:

Galway N6 GCTP Phase 3

Sheet Title:

EXPLORATION LOCATION PLAN

JOB NUMBER:

P16185

DRAWING NUMBER:

P16185-SI-04

DRAWN BY:

Gary Curtin

DATE:

02/02/2017

SCALE:	APPROVED:
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REVISION:

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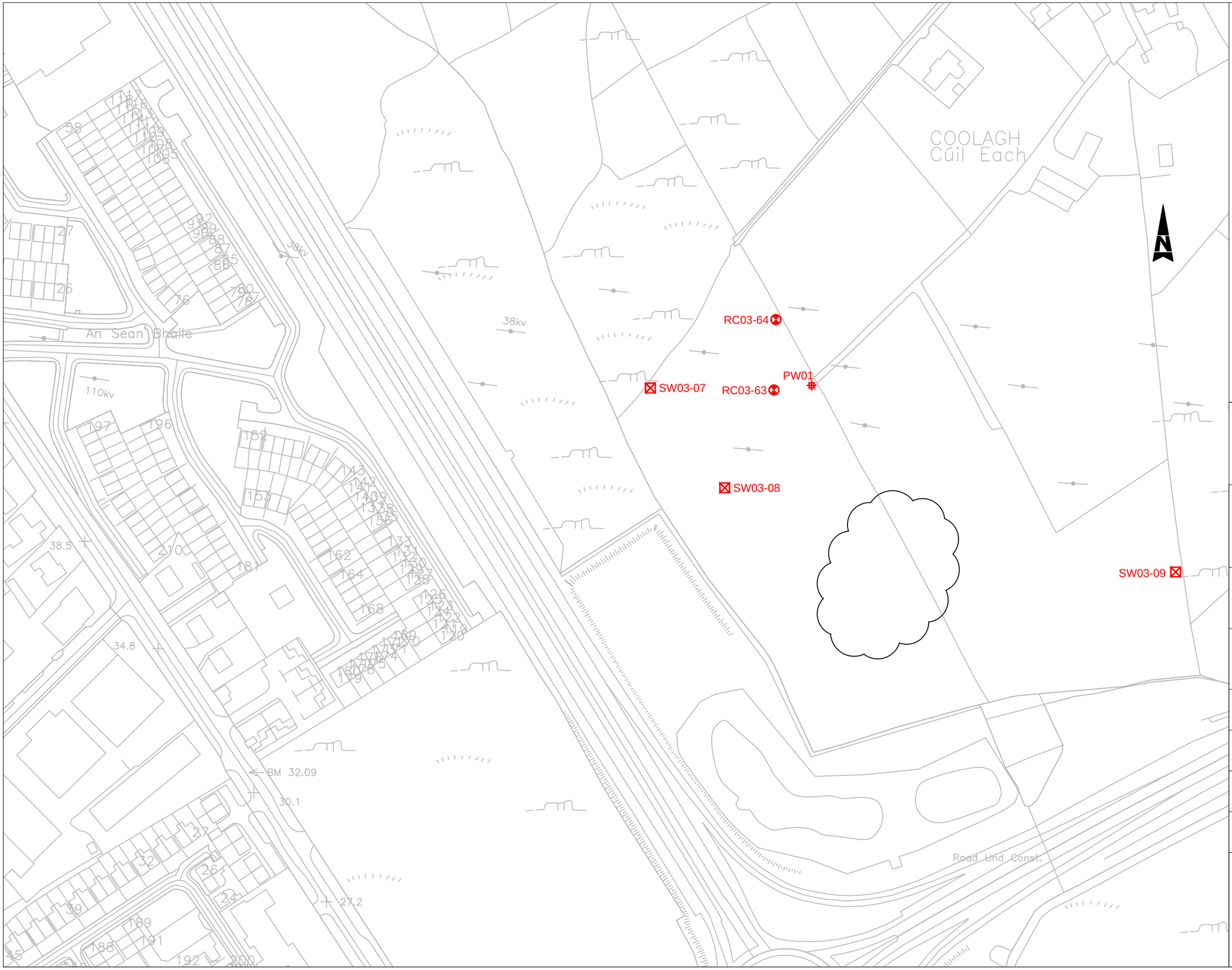

KEY:

- SW00 Denotes Slit Trench and Datum location
- TP00 Denotes Trial Pit location
- BH00 Denotes Borehole location
- RC00 Denotes Rotary Core location
- PW00 Denotes Pump Well location

JOB NAME:

Galway N6 GCTP Phase 3

Sheet Title:

EXPLORATION LOCATION PLAN

JOB NUMBER:

P16185

DRAWING NUMBER:

P16185-SI-05

DRAWN BY:

Gary Curtin

DATE:

02/02/2017

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REVISION:

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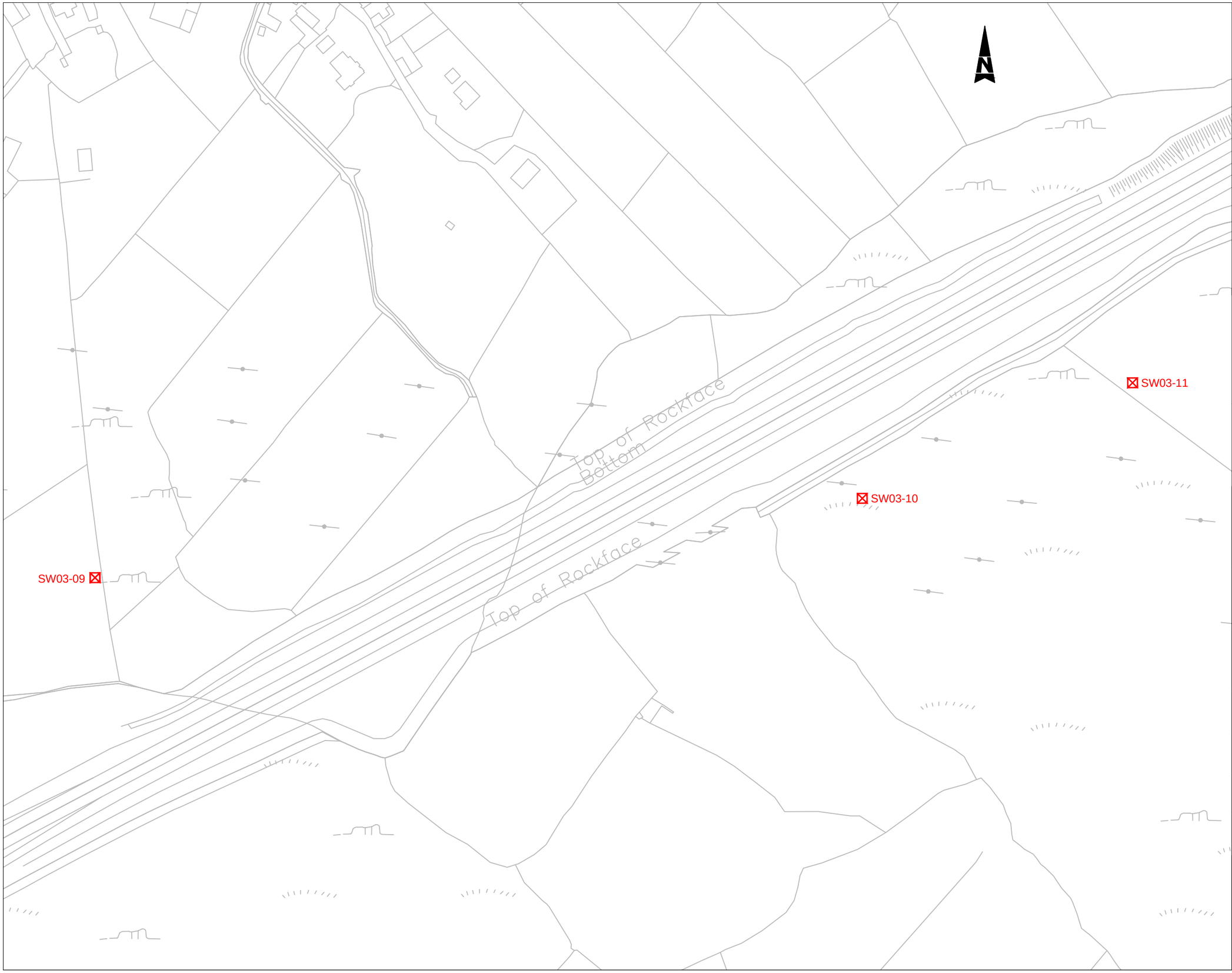

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- RC00 Denotes Rotary Core location

JOB NAME:

Galway N6 GCTP Phase 3

Sheet Title:

EXPLORATION LOCATION PLAN

JOB NUMBER:

P16185

DRAWING NUMBER:

P16185-SI-06

DRAWN BY:

Gary Curtin

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